

## Model Railroad Terminology

Like many other activities, model railroading has its own terminology. Some initial posts, from people joining the forum, include apologies for not knowing the right name for something train-related.

First off, there is no earthly reason to apologize. When anyone first starts some new endeavor, there's usually a bunch of new words to learn.

Second, the people who have been on this forum awhile are pretty good at understanding what you are asking, even if your questions are not phrased in the technically correct terms. Generally, we are a fairly loose, and friendly, group who won't pick at you because you used one word rather than another.

Still, it's nice to learn more about what model railroading is about, and one part of that process is learning some of the terms that are used in this hobby.

Many model railroad terms are borrowed from real railroads, others are not. Often more than one name applies to the same item. An example (which has generated more verbiage than I feel its worth) is the word "switch."

The piece of track that routes a train from the main line onto a siding is commonly called a "switch" on real railroads. Model railroaders prefer to use the word "turnout," for the same item. The reason for this is to avoid confusing references to these track switches, with the electrical switches that are also common on model railroads. This is not a big deal. From the context of your question, we can usually tell which kind of switch you mean. However, it's handy to know what some discussion of the merits/problems of various brands of "turnouts" refers to when you see that word used here.

So, I'm going to list some commonly used terms, and some not so common. There are many more, and other members are hereby encouraged to add to this list. In some cases, I've also included some background information about the possible history of the term. These non-definition anecdotes are set off [in brackets] to help those who wish to skip them.

“Abutment” The end supports for a bridge, most commonly made of concrete, but wood, and stone, have also been used.

“ACC” (also called “CA” and “Super Glue.”) Alpha Cyanoacrylate Adhesive. An instant setting, very powerful, adhesive used in model railroading. The original, “ACC” designation has been largely replaced by “CA” but both refer to the same adhesive. “Super Glue” is one of many trade names for the same product.

**SAFETY WARNING!** If you are using CA for the first time, carefully read all the directions, and warnings, on the label. CA bonds human skin instantly, and permanently. If you glue your fingers to each other, or to anything else, you are likely to lose a little skin. The fumes from CA are irritating to the eyes and throat. Heating CA, such as soldering something that has CA on it is dangerous. Hot CA produces a lot of very strong and potentially toxic fumes!

“Acrylic Gloss Medium” A water-based art supply product. It is the high gloss version of the flat finish “matte medium” below. The very expensive acrylic gloss medium has been used to add the final, shiny, coat to artificial water scenery on model railroads. Much cheaper products, like varnish, or Modge Podge, will do the same job, just as well, for a lot less money.

“Acrylic Matte Medium” A water-based art supply product sometimes used as an adhesive on model railroads to bond ballast, dirt, grass, or other scenery materials to the layout. Matte Medium is quite expensive, and quite unnecessary. White glue will do the same job, just as well, for a lot lower cost.

“Airbrush” A miniature version of a paint sprayer. Airbrushes are popular with model railroaders for laying down a smooth, even, coat of paint without the brush strokes often left by an artist’s type, hand brush. An airbrush is also useful for weathering models.

“Air test” A test of the train’s airbrake system. The test is done before moving the train, in order to move it at all, and to be sure that it can be stopped safely. The airbrake system requires a certain level of air pressure be pumped into the “train line” in order to RELEASE the brakes, and allow the train to be moved. Unlike automobile brakes, rail car brakes are normally ON all the time. The engineer

engages the airbrakes by releasing air from the system. The gentleness or severity of the stop is regulated by how much, and how quickly, air is released. This is a fail-safe feature of railroad airbrakes. The train line is composed of pipes, hoses, and air reservoirs running from the locomotive all the way to the last car of the train. If any part of the train line leaks, or breaks, the airbrakes will automatically start to slow, and then stop, the train.

“American” An early design of steam locomotive used extensively on American railroads. The wheel arrangement was 4-4-0 with a four-wheel pilot truck, four drivers, and no trailing wheels. The pilot truck helped this type cope with the rough track of America’s early railroads.

“Amtrak” Operating name of the National Railroad Passenger Corporation, a private enterprise, with state and federal government subsidies, that took over the operation of rail passenger service in 1971. [Passenger service had not been profitable for the railroads for most of the twentieth century. By the 1960s railroad companies were losing a tremendous amount of money operating passenger trains. However, as “common carriers” they were required by law to offer passenger service. The companies appealed to the federal government to allow them to get out of the passenger business. In 1971 Amtrak took over the passenger business, and the railroad companies got rid of it, saving a ton of money in the process. Amtrak cut the number of trains, cities served, and routes, drastically and concentrated on the routes between major cities that seemed to offer the best chance of turning a profit. Amtrak continues to operate today.

“Archbar truck” An early type of rail car truck assembly made from many built-up parts, as opposed to a few large, steel, castings. Archbar trucks can be recognized by the strap springs at the sides of the truck. Archbar trucks were used on civil war-era rail cars. They were outlawed many years ago because they were not as safe as more modern designs. Model Archbar trucks are available from Kadee, and Micro-Trains, in several scales.

“Automobile Boxcar” An older type of boxcar internally fitted out to carry several early (think model ‘T’ type) automobiles inside. More modern versions of this type of car were fitted to carry large auto parts, like frame assemblies. Other cars were

developed to carry finished autos, externally. A tri-level auto rack car is an example. Soon railroads found out the hard way, that this type of rail car was vulnerable to vandals and thieves. Metal side panels were added to protect the autos from rocks thrown at them. Later the fully enclosed auto carrying rail car was developed to keep thieves from getting at the autos and stealing parts.

“Atlantic” A type of steam locomotive with a 4-4-2-wheel arrangement. That is, four pilot wheels, four drive wheels, and two trailing wheels. Many atlantics were fitted with large diameter drivers that gave them high speed capability. The Milwaukee Road’s Original “Hiawatha” crack passenger trains were pulled by atlantics and were capable of speeds of one hundred mile per hour, and higher!

Armstrong interlocking” Railroader’s slang for a manually-operated interlocking plant. The turnouts, derails, and semaphores, of such a plant were operated by long levers in the interlocking tower. Due to the weight and friction involved, in the long movable pipes that operated the turnouts, signals, and derails, it took a pair of strong arms to move the levers, hence “Armstrong”

“Armstrong, John” A pre-eminent expert model railroad track planer, and author of several highly regarded books on the subject. Most notably his “Track Planning for Realistic Operation.” His books have inspired, and entertained, several generations of model railroaders.

“Articulated”

1) A type of large steam locomotive that has two sets of drive wheels mounted under the same boiler, with one set hinged to allow the locomotive to negotiate curves in the track. [Models of articulated steam locomotives typically have both sets of drivers hinged, rather than just the front set, like a real loco. This double articulation lets the models negotiate our much tighter curves.]

2) A type of modern freight, or passenger, car that shares a single truck assembly with the next car, or section of a car. An example is the articulated well car used to carry shipping containers. These can have from three to five sections. The outboard ends of this multi-section assembly have conventional trucks and couplers. The middle sections share one truck between two sections. The entire

assembly is considered one car. The advantage of this design is lower overall car weight which helps save fuel.

“Armature” the center part of an electro-magnet. Also, the trunk and branch structure of model trees.

“Back shop” A railroad owned facility equipped to do major, heavy repair of locomotives. A back shop was often located behind the roundhouse in an engine terminal. This may explain the name.

“Bad order” Railroader’s term for broken down. Applied to locomotives, and cars, that cannot be used without first being repaired.

“Baggage car” A rail car assigned to carry the personal baggage of train passengers. Baggage cars were sometimes used to transport express packages and mail on short trains that didn’t carry enough of either to require the addition of separate express, or mail, cars. Baggage cars might also be used to carry payroll, or other currency, on such trains. The baggage, or express/mail cars were the prime target for train robbers in the early years of railroading. Many models of different baggage cars are available, from several manufacturers.

Ballast” The crushed stone supporting railroad track. On the prototype, ballast aids critical drainage, and, by its sheer weight, helps keep the track from shifting from pressures exerted by passing trains. Model railroad track doesn’t get rained on, and isn’t traversed by hundreds of moving tons of weight. Model ballast is simply for appearance. Several manufacturers produce model railroad ballast in many sizes, and colors. Model ballast is also made from two different materials. Woodland Senics ballast is made of crushed walnut shells. Arizona Rock & Mineral, Highball, and other brands use actual crushed rock. Either type will work.

[I personally prefer the actual rock type, because the walnut shell variety is so lightweight, and semi-buoyant, that it tends to float out of position when being applied. While it’s possible to work around this, I’ll take the easier type.

Benchwork” Model railroad term for the table, or other structure, used to support the railroad.

“Berkshire” A steam locomotive with a 2-8-4-wheel arrangement. Two pilot wheels, eight drivers, and four trailing wheels. The four-wheel trailing truck of a Berkshire was used to support a larger firebox than those used in some earlier types of locomotives. This translated to more heating surface, more steam volume, and more power. Berkshires were used as passenger, and fast freight locomotives.

“Bettendorf” A truck design used throughout the steam era. It was simple and generally reliable. One weak point of this design was the bearings. Solid metal bearings were encased in a “Journal box” at each end of the axles. The bearings were lubricated with oil, and the oil was retained in oil-soaked rags. If the oil ran out, the bearing got hot, and could ignite the rags, causing a “hotbox.” This was a very dangerous condition, and train crews watched out for hotboxes.

“Bipolar” A type of electric locomotive used by the Milwaukee Road. The name comes from the design of the drive system. Bipolars had no gears. The rotor part of an electric motor was directly attached around fourteen of the locomotive’s sixteen axles. (The outboard wheelset at each end was not powered.) The two “poles” of each motor (hence “bipolar”) were stationary electro-magnets attached to the truck frames, close to either side of the rotor/axle assemblies. This multi-motor setup gave the bipolar great power. The absence of gears made them very quiet. In stations, and yards, the bell was kept ringing continuously as long as the loco was moving. Despite its size, and weight, the bipolar was capable of sneaking up on an unwary railroad employee.

[Only five bipolars were ever built, but they got lots of attention, and what today would be called “very good press”. The locomotives were featured heavily in the railroad’s advertising, and often in staged, “Tug-of War” publicity stunts where the mighty electric would humble one, or even two, steam locomotives. Bipolars were so popular in the 1920s that they were the inspiration for several early toy train versions.]

“Block” A section of track that is electrically insulated from other parts of the track. This is done for several reasons. First on model railroads that use DC (Direct Current) control, blocks allow independent operation of two, or more, trains; so

long as two trains are not in the same block at the same time. Second, blocks are used for signal detection circuits. On real, and model, railroads; keeping trains a safe distance apart from each other prevents collisions. Electric circuits detect the presence of a train in a particular block, and set the signals to warn other trains that the block is occupied. Third, on model railroads that use DCC, (Digital Command Control) the insulated blocks can be used as “power districts.” These separate districts prevent one short circuit from shutting down power to the whole railroad.

“Block signals” Line-side railroad signals that indicate the occupancy status of the blocks of track just beyond the signal. I’m describing only the most basic functions here. Those that would be suitable for a model railroad. Real railroads use signals in additional ways, and use additional aspects.

A red light means the block immediately past this signal is occupied by another train, and your train must stop immediately to avoid a collision.

A yellow light indicates that the block immediately beyond the signal is not occupied, but the block after that is occupied. Your train can proceed, but at reduced speed, and prepared to stop at the next signal.

A green light means that at least two succeeding blocks are unoccupied, and your train may proceed at normal speed. Block signals have evolved over time. Semaphores were used early on. They were largely replaced by various types of light signals.

“Block Occupancy Detector” An electronic device used on model railroads to detect the presence of a train in that block.

“Bobber Caboose” A small caboose with four wheels, not mounted in trucks, but rather attached under the frame like the wheels of some European “goods wagons” (freight cars) Bobbers were rough riding cars and “bobbed” all over the place when in motion. These little cars were used on many logging railroads, which tended to have a lot of unusual rolling stock, much of it cobbled together by the railroad, or ordered from specialized suppliers.

“Bolster” The crosswise beam under a railroad car that the trucks (wheel assemblies) are attached to.

“Boom Car” An old gondola, or flat car, converted to hold the boom of a wrecker crane while it was being moved in a train. Such cars also transported wheels, ties, rails, and other emergency repair material to wreck sites

“Boxcab” A name given to several types of electric, and very early diesel, locomotives with a rectangular, box-shaped exterior. The Milwaukee road’s first electric locomotives were boxcabs. They were so well built, that some served for seventy years!

“Brakeman” One of two junior members of a five-man train crew. The head brakeman rode at the front of the train and the rear brakeman at the back. To stop the train, both men ran along the car’s roof-mounted running boards toward the center; setting hand brake wheels on each of the cars as they went. The adoption of automatic air brakes ended this very dangerous practice.

“Branch Line” An offshoot section of a larger railroad, built to serve a town, or large customer, which is not near the railroad company’s main line.

“Brite Boy” Trade name of a type of abrasive track cleaning block in the shape of a large eraser. Brite boys contain abrasive particles that help remove dirt from the rails, and let power flow from them, up into the wheels of model locomotives.

“Brushes” In this context, the two spring-loaded, metal and carbon wipers that carry current to the commutator of an electric motor.

“Buffer” A type of piston, mounted in pairs, on the ends of older European locomotives, and rolling stock. Buffers were used as a safety device when a trainman went between the cars to operate the non-automatic “couplings” used at the time.

“Bumper” a device mounted at the end of a siding, and designed to stop a rolling rail car by letting the coupler bump into it. Bumpers were installed at the ends of sidings and the tracks of a “Stub” type passenger station. There are many different types of bumpers, as well as other hardware that stops a car by blocking

the forward progress of wheels rather than the coupler. These are called “Wheel Stops.”

“Bus Wires” Heavy (14ga.\*) wires run under the table of a model railroad, and connected electrically parallel to the rails. Bus wires provide a low-resistance, continuous, reliable, path for electric power to the rails, throughout the layout. Smaller, (28ga.\*) “feeder”, or “drop,” wires are soldered to the rails at regular intervals, (6’\*) and drop down under the table to connect to the bus wires. Rail joiners can lose their ability to conduct electricity well over time, due to dirt and corrosion. The use of bus wires, particularly if connected to every section of track, means that you never have to rely on rail joiners to conduct electric power. (\*These are typical sizes. Wire sizes, and the distance between drop wires, may be larger or smaller.)

“Business Car” A passenger car used by railroad company management, as a rolling office, or for inspection of railroad right-of-way, and to entertain VIPs.

“CA” Cyanoacrylate Adhesive” An instant setting and very powerful adhesive used to assemble various parts in model railroading. It is also called, “ACC” and super glue.

SAFETY WARNING! CA bonds skin instantly and permanently. If you glue your fingers together, or to anything else, you are likely to lose a bit of skin. Acetone has had some success in releasing a CA bond. The fumes from CA are irritating to the eyes, and throat. Heating CA, for example soldering something with CA on it, releases more and stronger, fumes. These fumes are powerful eye & nose irritants, and potentially toxic. Never heat CA, or mix soldering and CA on the same area.

“Cab” The driver’s cabin on a real locomotive. On model railroads, the power pack, or other speed control device, is sometimes called a cab. For example, the “Dual cab control” system uses two power packs

“Cab-forward” a special type of steam locomotive, developed by the Southern Pacific Railroad, to help alleviate the toxic effect of smoke on engine crews when

traveling through that line's numerous tunnels. The cab was located at the front of the locomotive and the smoke stack was well behind the cab.

"Car." In railroad terms, any railroad car, passenger or freight; as distinguished from automobiles.

"Car Ferry" 1) A self-propelled boat, or small ship, equipped with rail tracks, and fittings to restrain railcars. A car ferry was able to carry more railroad cars than the smaller car floats. The name "Car Ferry" is also used for ferry boats that carry automobiles, rather than railcars.

[The Berkley, a railcar ferry that once plied San Francisco bay, is preserved here in the San Diego maritime museum.]

"Car Float" A barge equipped with rail tracks and fittings to restrain railcars. Floats are pulled, or pushed, by tugboats.

[Several railroad companies owned car floats and tug boats. The Milwaukee Road had car floats that shuttled between Seattle, and Port Townsend, Washington for many years. The Harlem River Railroad used car floats to transfer cars from one yard to another. Some of these yards had no direct rail connection and were served only by water.]

"Caboose" a special car designed to carry some crew members (typically the conductor and rear brakeman) and also supplies. The caboose was a "home away from home" for crews. It was equipped with a stove for heating and cooking; also bunks and seats for the crew. An elevated cupola, or side-mounted bay windows, let the crew keep an eye on the train's condition. "Hot Boxes" (overheated bearings) produced smoke that might be seen from the caboose. Normally the caboose was the last car on the train.

"Cantilever Bridge" A type of bridge where the center section is supported only by the heavily-anchored arch sections at the ends. The bridge can be built over wide empty terrain or waterways. The two end sections are self-supporting. The center section can be thought of as a small bridge attached to, and supported by, two halves of an arch bridge. Cantilever bridges are more common on highways than

railroads, but there are some railroad cantilever bridges. A famous example is Santa Fe's Canyon Diablo Bridge.

"Capacitive Discharge Unit" (CDU) An electronic circuit that can, (and should) be used to power twin-coil switch machines. The device prevents the all- too-common burnout of the coils when operated only by push buttons.

"Catenary" the overhead wire, and its supporting structure, used to power electric locomotives.

"Cattle Guard" A grid work "floor" constructed of wood planks, or metal pipes, placed where a railroad, or road, crosses through the fence around cattle grassing areas like a farm, or ranch. The grid discourages cattle from walking across it and onto the track, or roadway.

"Chair car" A passenger car fitted with a number of, often swiveling, plush armchairs. Also called a parlor car, it served as a comfortable, living room on wheels for train passengers.

"Challenger" A dual-purpose, fast, powerful, articulated steam locomotive with a 4-6-6-4-wheel arrangement. Used in passenger and fast freight service.

"Circus Style Loading " In the early days of railroading "TOFC" (Trailers On Flat Cars) service, truck trailers were backed, by their own tractors, onto a string of flatcars equipped with folding steel ramps that were used to bridge the gaps between flat cars; and then on across other flat cars until spotted on the last unoccupied car. The name comes from the fact that traveling circuses loaded their wagons and trucks this way. Later, safer means were employed. Today the shipping containers used in "intermodal" service have largely replaced the loading of truck trailers. The container forms the "body" of a specially-equipped truck trailer. It can be transferred from ship, to truck, or train, and back to truck, by front end loaders, or cranes. Intermodal service is a huge part of modern railroading. There are model versions of the containers, railcars, trucks, cranes, and front-end loaders; available.

“Classification lights” Kerosene lamps, or later, electric lights, on the front of the locomotive. These lights indicated the status of the train. White lights meant that this train was running as an “extra” (not listed on the schedule.) Green lights indicated that there was another section of the train following.

“Club car” A passenger train car that is equipped as a bar, making it very popular with drinkers! Also called a lounge car, or tavern car.

“Commutator” The rotating part of a DC motor, like those that power our model locomotives. Properly speaking, the entire moving assembly is called a rotor. The actual commutator is the drum-shaped set of contact wipers that turn between the motor’s brushes. They act as an electrical switching device to change the polarity of the electromagnets in the motor. Commutators get dirty with use and need occasional cleaning. A pencil eraser, or a Q-tip dipped in alcohol, can be used to clean it. Be careful when cleaning it though, there are tiny wires attached to small solder terminals at one end of the drum. If one of these wires is broken off, the motor will be seriously damaged, and may have to be scrapped. The copper plates should be shiny and bright. While you’re looking at the commutator, you can check the number of poles the motor has. The more poles the better, as far as smooth motor operation is concerned. Most motors in recently produced locomotives will have five poles (the number of copper plates is the number of poles.) Earlier motors had only three poles. They did not run smoothly, at slow speed, due to an effect called “cogging.” This meant the motor, and it’s locomotive, would often stop when operated at slow speed; very frustrating when trying to switch cars! The iron plates, and coils of a motor’s commutator assembly can also be straight, or skewed. (Skewed is better.) Viewed from the side, a straight commutator will have the gap between plates horizontal. A skewed commutator’s gaps will appear diagonal. Skewed commutators aid slow speed performance by reducing cogging.

“Common rail” a control system used on some DC-powered model railroads. Including any layouts based on Atlas track plans. [Please see both bracketed notes below] One rail of the entire track on the model railroad is not broken into insulated blocks. The opposite rail of the track is divided. Two completely separate power packs must be used. [Note: Using a dual-speed-control power

pack will typically create a short circuit that is virtually impossible to find, since it is inside the power pack itself.] One terminal of each pack is connected to the common rail. Sometimes the common rail is also attached to an electrical ground. This system's advantages are, fewer rail gaps, fewer wires to the control panel, and slightly cheaper single pole electric switches, rather than the double pole switches used on conventional panels. ["Common rail" is not so commonly used today, with one quite notable exception. The Atlas company uses common rail on all of its many published track plans. The electric controls made by Atlas ("Controllers", "Selectors", Etc.) are based on the use of common rail.]

"Coach" An economy-class passenger car. A passenger got a seat, and not much more. The seats were generally comfortable and roomy. Often, they reclined, and passengers managed to sleep in them, although not in much comfort.

[The "Coach" section of a modern airliner is a direct descendent of the railroad coach. The airlines have taken the notion of "coach class" to the max! The seats are neither comfortable nor roomy, though they do recline, a little. As for sleeping in one, well good luck with that!]

"Combine" A type of passenger train car that had one end set up for passengers, and the other end for baggage. Express, and/or mail might also be carried in the baggage end. These cars were used on secondary, light traffic, branch lines and in other situations where both passengers and baggage came in small bunches.

"Composite Cars" were a type of freight cars built during world war one. The car bodies were made mostly of wood, with steel channels holding the wood planks in place, and providing strength to the car's structure. Composite cars were built this way in order to save steel for the war effort. Boxcars, gondolas, and hopper cars were some of the types of composite cars made. They were also known as "war emergency cars."

"Conductor" \* The person in charge of a train crew. A traditional full crew was composed of five men. The conductor who handled all paperwork, and was responsible for the train staying on schedule, the engineer who controlled the locomotive, the fireman who was responsible for maintaining steam pressure in the boiler, two brakeman who, before the adoption of automatic air brakes, had

the very dangerous job of going along the tops of cars, and setting hand-operated brake wheels to stop the train. Modern train crews are two person. A conductor and an engineer.

[\* I once met a man who worked as a conductor for Amtrak. He had been shocked a few times while hooking up the head end power cables of Amtrak trains. His hobby was conducting a local amateur orchestra. He claimed he had therefore served as a “conductor” according to all three definitions of the word!

“Consolidation” A very popular steam locomotive design, with a 2-8-0-wheel layout. Consolidations were used by many railroads in passenger, freight, and switching service.

“Cookie Cutter benchwork” A type of model railroad support structure where the track pattern is cut into a piece of plywood, and then the cut portion is raised to create the elevations needed. Vertical wooden “risers” are used to support the raised portion.

“Coupler” The device mounted on the ends of a rail car, and used to attach it to the other cars that make up a train. North American railroads use an automatic, fist-shaped, coupler called a Janney coupler after its inventor. Model trains have used many different couplers as they developed. Today most new models come with some form of knuckle couplers attached. In theory, all knuckle couplers, in a given scale, are compatible. In actual practice this is not always true. The far-and-away favorite brands of knuckle couplers are those made by Kadee and Micro-Trains. Kadee makes them in HO-scale and larger. Micro-trains makes the N-scale, and Z-scale, versions.

[ I advise new modelers to try the knuckle couplers that come attached to the cars they purchase. Eventually, especially if you encounter problems, you will likely end up converting to the Kadee, or Micro-Trains couplers.]

“Cross Buck” An ‘X’-shaped wood, or metal, sign used to warn motorists at a railroad crossing. Simple cross buck signs are used at lightly traveled crossings. Larger, busier crossings may have flashing lights, bells, and sometimes gates; for additional protection.

“Crossing” a track arrangement that allows two rail lines, or a rail line and a road, to cross each other at the same grade, or level.

“Crossover” Two turnouts arranged back-to-back to let a train run from one track, onto another, parallel, track. Crossovers are used on double track rail lines to let a train “pass”, or overtake another. This is equivalent to “passing” another automobile on a road. They also allow an eastbound train to get by a westbound one. This maneuver is called a “meet.”

“Cornfield meet” Railroader’s slang term for a head-on collision between two trains.

“C.T.C.” (Centralized Traffic Control) a system of interlocked signals, and motor driven track switches, that let one human operator control a large section of track safely from a remote, control center.

“Culvert” A pipe, or other passage, installed to allow water to pass under a railroad track, or road. Culverts, because of the essential drainage they provide, are very common on real railroads, but much more seldom seen on model railroads. They are easy to make\* and commercial models are available. They are a nice little detail item that can make a model railroad look more realistic.

[\* I have a “corrugated pipe” culvert on my railroad that I made by wrapping very thin brass sheet around a fine-thread machine screw. There are also several “concrete” culverts made from basswood. Culverts, embankments, bridges, and drainage ditches go a long way toward making your railroad look more like the real thing. Real railroads have to have drainage, or the track would soon be washed out.]

“Current routing turnout” A type of model turnout which can function as both a track switch, and an electrical switch. The point rails and stock rails of a current routing turnout pass power to the track route the points are set for; and remove power from the route not selected. This feature allows a locomotive to be parked on a siding and only receive power when the turnout is set for the siding. When the turnout is set for the mainline, the siding will be electrically” dead” and the

loco will not move. Peco brand “Insulfrog” turnouts are an example of a current routing turnout.

DC (Direct Current) a control system that goes back through much of the history of model railroading. Current from a DC power pack travels through wires to the rails. Locomotive wheels pick up the current and pass it on into the motor that drives the locomotive. DC is very simple, until you want to run more than one train at a time. Then the track has to be divided into blocks, each one electrically insulated from all the others. To control power distribution to these blocks, you will need a control panel with a toggle switch for each block. Each individual toggle switch selects which of two power packs is connected to that block. This system is called “Dual Cab Control” and it requires a lot of wiring.

DCC (Digital Command Control) This is a newer control system for model railroads. It operates much like the radio control system used with model airplanes, cars, drones, and boats. The modeler holds a transmitter which sends signals through the air to a receiver inside the model. The signals control the model’s speed and direction. With DCC we use the metal rails to carry the control signals. A receiver, called a “DCC decoder,” uses the signals to control the locomotive’s speed, and direction. Some DCC decoders can also control lights, whistles, bells, and other sounds on the locomotive. Each locomotive’s decoder has its own digital address. It responds only to the signals addressed to it, and ignores all other signals. This means you can run two, or more, trains on the same track, while maintaining individual control of each train. Unlike DC Dual Cab Control, only two wires from controller to track are required. It’s a very simple system.

“Decal” A thin film containing letters, stripes, Railroad heralds, and other markings that can be applied to model locomotives and cars. Decals are used to simulate painted-on signage on the prototype locomotive, or car. Decal film comes on a waterproof paper backing. To apply a decal, you soak it in water until it slides off the paper easily, or floats off. The decal is then applied to the model’s surface and blotted with a Q-tip to remove most of the water. Decal setting solutions will soften the decal and help it snug down around molded on details on the model.

“Deck Bridge” Any bridge built with all of its major structural elements below the track deck. Examples are deck girder, and deck truss, bridges, and virtually all trestles. Railroads prefer deck bridges over through bridges. Deck bridges are cheaper to build, and have their components clear of the track. Track maintenance crews have easy access to all the track components, and there is nothing substantial above track level for a derailed car to collide with. Through bridges are used when there is insufficient clearance below the bridge location for highway, rail, or water-borne, traffic to pass safely beneath the bridge.

“Depressed Center Flatcar” A freight car used to carry very large, excess height, cargoes. The name is the description. The center part of the flatcar’s deck is lower than the ends. The bottom of this center portion is sometimes at minimal clearance above the rails. The center portion has very strong bracing, both to maintain the structural integrity of the car itself, and to accommodate the great weight of many excess height pieces of freight.

“Diner” A passenger train car that served as a rolling restaurant for passengers. Dinning car food was excellent, modestly priced, and was one of the things railroads used to attract, and retain, passenger business. The diner was usually coupled in the middle of the passenger-carrying cars. This made for easy access for all passengers, rather than have anyone need to walk through the entire length of the train. Diners were operated, and maintained, by a dedicated crew of cooks and waiters. Service was always first class. The diner was kept spotless. Tables seated two, or four, passengers each. The demand was often high enough to require two, or three, sittings per meal, so the diner’s crew was kept busy! Today’s Amtrak “café car” is a poor replacement for the diners that once were a feature of many fine passenger trains.

“Disconnect logging car” A pair of railroad truck assemblies, each with a coupler at one end; and a frame for holding large logs on top. The “main body” of the car is the log load itself. The log is the only thing holding the trucks together. The load is tightly chained down. These little cars were well suited to the sharp curves, and rough track typical of logging railroads.

“Dormitory Car” A passenger train car used as a sleeping area by train crews; most commonly by the diner staff. For this reason, the dormitory car was often coupled to the diner.

“Doubleheader” a train pulled by two steam locomotives. Sometimes an extra locomotive (and crew) would be needed to move a heavy train up a grade. Diesel locomotives can be connected for “multiple unit operation.” (MU) Using this system, one engineer can control several locomotives simultaneously. This eliminated the need for a second crew, and double heading.

“Draft gear” The box and springs that hold a coupler on a model car.

“Drawbar” A bar of plastic, or metal, used to semi-permanently attach a steam locomotive to its tender.

“Drover Caboose” An extra-long caboose with some, basic, accommodation for passengers. Used in very light traffic areas, as an alternative to a separate passenger train. A drover caboose let a few passengers travel at the back of a freight train.

“Dry Transfers” an alternate lettering system to decals. Dry transfers do not use water, but instead are applied dry, by burnishing them onto the model with hand pressure, applied through a “burnishing tool”, or stick.

“Easements” Gentler segments at the ends of a curve. Their purpose is to ease the transition from straight track into, and out of the main curve. “Vertical Easements” are used at the top, and bottom, of a grade. They serve the same purpose as their horizontal brethren. They ease the transition from level track into the main grade. For instance, if the main grade rises at 3% then a vertical easement of 1-1.5% should be built at the top, and bottom, of the grade. Not using vertical easements can cause problems. Coupler knuckles may shift enough, vertically, to slip above, or below, the mating coupler; possibly causing a runaway of part of the train. Coupler trip pins can dig into the ties at the bottom of an uneased grade, damaging, or derailling a locomotive. Failure to use horizontal easements can result in tip over of a car if running at speed. The transition from straight track into a tight curve can also put horizontal stress on couplers of longer

cars, and sometimes derail them. [ I strongly recommend using easements on all curve and grades.]

“Electrofrog” Peco Company’s trade name for their turnouts with metal frogs that can be electrically powered.

“Enginehouse” A building used to store, and service, locomotives. In the steam era a common form of engine house was the “Roundhouse.” These structures were semi-circular in shape and built near a turntable used to rotate a locomotive. With the arrival of diesels designed to be operated in either direction, the turntable, and roundhouse, started to disappear from the railroads. Modern enginehouses are typically rectangular, rather than round.

Epoxy cement” A two-part strong adhesive that can bond dissimilar materials like wood to metal. Different epoxy products have different curing times ranging from a few minutes to nearly an hour. Epoxy is one of the many adhesives available to model railroaders.

“Epoxy Resin” A form of Epoxy used to form a high-gloss waterproof surface on furniture like bar tops, and used to coat some floors. Model railroaders use epoxy resin to form artificial water. Epoxy resin has the advantage of being able to be applied in thick enough layers to submerge weeds, logs, trash, etc. in the “water” and have them visible from above.

“Extruded foam insulation board” A rigid type of foam board manufactured as home insulation. It has become a very popular model railroad base, and scenery material. It is sold in 4’x8’ sheets of various thicknesses, at home improvement stores. The product may be pink, blue, or green, depending on the brand. A somewhat similar looking, but white-colored board may also be sold in the same stores. This is Styrofoam” bead board.” It is much softer, and more fragile, than extruded foam, and is not recommended as a layout base, or scenery material. Extruded foam can be easily cut and shaped, to form riverbeds, or underpasses, below track level. It can be stacked like layers of a cake and glued together to form hills or other above-track-level terrain features.

“Flag stop” a rarely used passenger pick-up location. When a passenger wanted to board the next train, he would set out a small flag that signaled the train to stop for him.

“Flagging a train” when a train stopped in an unexpected location, perhaps due to breakdown, the crew was required to send out “Flagmen” (typically the head, and rear brakemen) in both directions, to protect their train from collision. They carried red warning flags, “fusees” (the railroad equivalent of a road flare), and “torpedoes.” This last item had nothing to do with submarine warfare. It was a small explosive charge, designed to be clamped to the top of a rail. When a locomotive ran over it, the charge exploded, giving a loud, unmistakable, audible warning to stop immediately, in order to avoid a collision.

“Flange” The inner edge of a railroad wheel. The flange projects out from the rest of the wheel and is used to guide the wheel along the rail.

” Frog” The part of a turnout where the inner rails of both possible routes, cross each other. [The origin of the term is not known for certain. One possibility is that this ‘X’-shaped turnout part, when viewed from above, vaguely resembles the four outstretched legs of an animal frog, in mid leap.] Model frogs come in metal and plastic. The metal ones can be electrically “live” or not. If a live frog is used, it must be electrically switched in some fashion, since it will be the right-hand rail on one route through the turnout; and the left-hand rail on the other route. The frog may also be electrically isolated, or connected both electrically and physically to the point rails. The isolated frog turnouts are sometimes marketed as “DCC friendly”, “DCC compatible” etc. Actually any type of turnout will work with DCC, or DC. [This frog business is very confusing! Better call Kermit!]

“Frog Juicer” An electronic device that instantly changes the electrical polarity of a “live” (powered) turnout frog; when it senses a short circuit. It can also be used with reverse loops, wyes, and turntables.

“Frog number” a system used to express the sharpness of a diverging route’s departure from the main route, within a turnout. The frog number indicates how many units of forward, linear, wheel travel are needed to obtain a given amount of sideways divergence from the main track. As an example, a #4 frog requires

four units of wheel travel to produce one unit of sideways diversion from the main route. A #6 frog requires six units of wheel travel to produce the same one unit of sideways divergence from the main route. Basically, the lower the frog number, the more sharply one route of a turnout splits off from the other route. Model turnouts are often labeled, and sold, by their frog number. You may see a turnout advertised as a #6 turnout. This means it has a #6 frog. Model railroad turnouts are made in several frog numbers. Numbers 4, 4.5, 5, 6, and 8 are common sizes available. Numbers below five may not accommodate large locomotives and long passenger, or freight, cars well. Numbers 6, and higher, will generally be able to handle any model car or locomotive. One of the most common HO-scale turnouts sold is the Atlas "Snap switch." It is not made to a specific frog number, but rather to fit in place of an 18" radius curved piece of sectional track. To do this, it is made with short sections of straight rail, and a built-in kink between these rails and the next pair. It is very roughly equivalent to a #4 turnout, and therefore, a very sharp turnout.

"G-scale" A large scale of model trains, (approx. 1/24<sup>th</sup>) most commonly used outdoors on "Garden Railways."

"Gage (or gauge)" The distance between the inside surfaces of the two rails on a railroad track. The same word is also used for the tool that is used to measure this distance. The standard gage on North American railroads is 4'-8-1/2".

[\*This rather awkward dimension dates back to ancient Roman chariots. It was passed on to European carts, wagons, and carriages. Since the first railway passenger cars were converted horse-drawn carriages, it was passed on to railroads. In model railroad circles, gage is often confused with scale. The confusion dates back to very early electric toy trains. There were no industry standards back then. Each maker used whatever track gage he wanted, and needed, to accommodate the large models needed to enclose the bulky electric motors of the time. At some point, someone came up with one gage that was used by a few different companies. This became "Standard gage", or "Number One Gage". When Lionel introduced their smaller trains, they called them zero gage, or O-gage." Many years later a smaller size came along which was about

half the size of O-gage, so it was called “Half O” or HO-gage. N-scale was first introduced, from Europe, in the 1960s; it used a track gage of nine millimeters. In many European languages the word for “nine” started with an N, which is how N-scale got its name.

[In the very early development of electric toy trains, track gage, the distance between rails, was about the only thing even remotely close to consistent among the early brands. It didn’t matter how big, or small, the trains were as long as their wheels fit the track. As the hobby grew, so did the demand for more realistic-looking and accurately scaled trains. This eventually evolved into today’s model railroad scales.]

[By the way, contemporary G-scale trains have a somewhat similar situation. Different manufacturers produce trains in slightly different scales, that all fit on the same 45mm gage track.]

“Gas-Electric” a type of self-propelled passenger car. These cars were used for passenger service on lightly traveled branch lines. They were also called “Doodlebugs. On these cars, a gasoline engine drove a generator, which powered the electric traction motors to move the car. This same system is used on nearly all diesel locomotives. Technically they are actually diesel-electric locomotives, but are most commonly just called diesels.

“Geep” Railroader’s nickname for a series of diesel road switcher locomotives made by EMD, the Electromotive Division of General Motors Corp. The name comes from the letters ‘GP’ in the model designation: such as GP-7, and GP-9. The ‘GP’ stood for General Purpose. These locomotives could be used as switchers, freight road locomotives, and, with modification, also handle passenger trains. Geeps had four-wheel trucks, with a traction motor on each axle. Six-wheel variants were designated ‘SD’ for “Special Duty” SD units typically had slower speed gear ratios than their GP cousins. The center wheel set in each six-wheel truck was usually not powered. They were used primarily in heavy, slow, “Drag Freight” service. They were also assigned to lightly-built branch lines because their twelve wheels distributed their weight more evenly on the light rail.

“Grab Irons” metal bars used as handholds on the ends, and roofs, of railroad cars.

“Grade Crossing” A place where a railroad crosses a street, or highway, at the same grade level, as opposed to crossing with either the railroad track, or the roadway, crossing over the other on a bridge. Rural, lightly-trafficked, grade crossings may be protected only by simple cross buck signs. Busy grade crossings may have flashing lights, bells and gates to warn motorists of an approaching train.

“Ground foam” Finely ground bits of dyed foam rubber used as grass, leaves, etc. on model railroads. The product is sold by Woodland Senics, and other companies, in a variety of textures and colors.

“Ground throw” a low-to-the-ground mounted lever mechanism used to move the points of a prototype switch. Operating model ground throws are available from Caboose Industries Co. in several model railroad scales.

“Guard Rails” Pieces of rail, or special castings, fastened just inside the running rails of a railroad track. On turnouts, guard rails are used to keep wheels from taking the wrong route through a frog, and derailing. Guard rails are also used to help guide wheels through rail crossings; and help restrain/re-rail derailed wheels on a bridge or just ahead of the entrance to a tunnel. (Called a “Portal”)

“Guard Timbers” Heavy timbers bolted to the outer top surface of the ties on a bridge, or trestle. They help to stop a derailed car from falling off the side of the bridge, or trestle.

“Hard shell scenery” Model railroad scenery made with plaster-soaked paper towels; laid over a crumpled newspaper, or cardboard web, temporary support structure. A newer, and much neater, method uses commercially available plaster-impregnated towels that are laid in place dry, and then sprayed with water while already in place.

“Head-end cars” The baggage, mail, and express, cars placed at the front (head) end of a passenger train. Typically, right behind the locomotive and tender. Mail

and express packages were carried on passenger trains because, at one time, that was the fastest way to move them in bulk. Today mail and express move by air.

“Heavyweight” Railroad term for a type of all-steel passenger car introduced in the late nineteenth and early twentieth century. The car bodies were made of steel plates, riveted together. They usually rode on six-wheel, heavy duty, trucks. These trucks both supported the considerable weight of the car; and helped to smooth out the ride for passengers. Heavyweight passenger cars were used throughout the steam era, and beyond. They were eventually replaced by lighter, streamlined cars.

“Helix” A spiral-shaped wood ramp that supports track as it climbs between the levels of a multi-level model railroad. A helix contains a considerable length of track. Some modelers take advantage of this fact by using the helix as a staging track. A helix is not especially attractive to the eye, and therefore is usually concealed by scenery, or other view blocks. [Waiting for a train to make it through a hidden helix can try your patience severely!]

“Helper” an extra engine added to the front, middle, or rear, of a heavy train to help it climb a steep grade.

“Highball” Rail term for proceed at maximum allowed speed.” The term dates back to a type of line side signal used in the very early days of railroading. The signal was a large wood, or metal, ball that could be raised up the side of a mast by a rope and pulley system. Raising the ball to the top was the clear signal; meaning the track ahead was clear of other trains. This meant your train could go ahead at the maximum speed. Semaphores, and light signals, eventually replaced the ball signal.

[ However, the term “highball” as a way of saying” let’s get moving”, or” hurry up”, lingers on. Perhaps the drinks called “highballs”, with their high alcohol content, get one drunk faster, and that’s how they got the name.]

“Homosote” Trade name of a pressed-paper insulation board, used in home construction. Some model railroaders use Homosote as a roadbed material directly under the track. Homosote is a good sound deadening material, if used

correctly\*. It also holds spikes well, and yet is soft enough to let the spikes be pushed in with pliers. This makes it popular with hand-laid track enthusiasts.

SAFETY NOTE: Cutting Homosote with a saw produces large, dense, clouds of fine-grain paper dust, which is harmful to human lungs and eyes. Always wear a respirator and goggles when cutting Homosote.

[\*For anything to deaden the sound of moving model trains it must either totally isolate the track from the plywood “sounding board” below; or keep that sounding board from vibrating. Bare Homosote isolates the track somewhat from the plywood. However, when ballast, and other scenery material, is glued onto, and around the track, and the Homosote roadbed, it forms a sound-conducting path that circumvents the isolation of the Homosote.]

Homabed A commercial roadbed made of Homosote.

“HO-scale” the most popular model railroad scale (1/87<sup>th</sup>) HO-scale trains are about half the size of O-scale, and roughly twice the size of N-scale. A typical HO-scale boxcar is about six inches long.

“Hotbox” An overheated axle bearing on a railcar. Before roller bearings were introduced, solid bearings were kept lubricated with oily rags in a metal “Journal Box” that housed the “Journal”, or end of the axle. When the oil ran out, the bearing could get hot enough to set the rags on fire. Train crews riding in the caboose would watch out for smoke from a hotbox. A hotbox could cause a train wreck if not quickly fixed. The journal could melt and break off the rest of the axle, causing a wreck.

“Hot Wire Foam Cutter” a special tool used to make neat, clean cuts in extruded foam board. The tool melts its way through the foam rather than cutting like a saw. The tool produces none of the dust associated with saw cutting. It does, however produce potentially harmful fumes. Have plenty of air circulation when using a hot wire cutter.

“Hudson\*” A fast, powerful, type of steam locomotive used on crack high speed passenger trains. The name comes from the route where it was first used. New York Central’s famous “water level route” along the Hudson River.

[\*Also, the first name of the world’s cutest grandson, Mine!]

“Hump Yard” a type of railroad freight yard, where most of the spotting of cars is done by gravity. Strings of cars are pushed up onto a raised section of track called a “Hump.” A car is uncoupled and allowed to roll into position on a designated track. Electro-mechanical, computer controlled, “retarders” slow the car as needed to let it roll up to the other cars on that track at a safe speed.

“Hydrocal” Trade name of a high-strength plaster sold by US Gypsum Company. Hydrocal is used by model railroaders to make “Hard Shell scenery.” Hydrocal, and the even stronger, “Ultracal” are strong enough to be self-supporting in thin layers. This saves weight, and increases the strength, of plaster scenery.

“Insulfrog” Peco Company’s trade name for their turnouts with plastic frogs. \*

\*(Also see, “current routing turnout” and “Electrofrog.”)

“Immigrant car” A very “bare bones” type of “passenger” car with hard wooden seats and no comforts whatever. [They were precursors of “coach class” accommodations on today’s airlines, only worse!] Seating on these cars was sold at very low rates to encourage 19<sup>th</sup> century European Immigrants to travel to the western United States. There they would buy a bit of the vast land granted to the railroads as an incentive to build the transcontinental railroad, and other rail routes.

[Railroad companies employed agents in eastern U.S. cities, and Europe, to recruit as many immigrants as possible. These agents used all sorts of exaggerated claims, and outright lies, regarding the “paradise” of fertile farm land available in the American west, in order to raise revenue for the railroads by selling off their government land grants]

“Interchange” A junction where two, or more, railroads cross each other and cars can be transferred from one company’s track to another’s. On model railroads,

interchanges are sometimes called “universal industries”, since they can logically be the point where any type of freight car can be picked up, or dropped off.

“Interlocking” (Also called an “interlocking plant”) a system of turnouts, and/or crossings, protected by signals that will only allow one train at a time to pass through it. Mechanical, or electric, locking devices make it impossible to set up a dangerous route where two trains might possibly collide. Hence the turnouts and signals are “interlocked.”

“Interlocking signals” The signals used to protect an interlocking, or any spot where two trains could easily collide without the signal. For example, at a crossing of two rail lines. Interlocking signals look similar to block signals, but there are important differences. The arrangement, and number, of “heads” on the signal is different, and an interlocking signal is less likely to permit any train movement. They are often strict, “stop and stay” signals. The preceding definition is a considerable simplification, and far from completely accurate. However, it should be adequate for model railroads.

“Interurban” A type of light railway, normally powered by overhead wire that carried passengers, and some freight, between cities. Before superhighways linked cities, the interurban lines provided fast, reliable transportation.

[The vast Pacific Electric System’s “red cars” once connected Los Angeles to many of its suburbs. The service was fast, smog-free, safe and reliable. The Pacific Electric Co. was bought by automobile/bus, gasoline, and rubber tire manufacturers; then scrapped, to be replaced by freeways, which are now clogged with millions of slowly crawling, smog-producing, automobiles!]

“Jordan spreader” A type of maintenance-of-way railcar that is equipped with a plow, and two hydraulically-positioned “wings.” (Long, thinner, plows) Jordan spreaders are used to widen cuts in heavy snow made by snowplows. They can also be used to spread dirt, or ballast.

“Journal” The end of a wheel set’s axle that is inside the bearing, mounted in a truck assembly.

“Kingpin” In model railroad terms, a plastic pin, or metal screw, used to mount a truck to the bolster on the bottom of a car. The truck pivots around the kingpin to allow the car to travel through curves.

“Kitbashing” the practice of using the parts of two, or more, model kits to build something different from either of the original models.

“Ladder Track (Often just “Ladder” as in “Yard Ladder.”) A series of turnouts arranged to allow access to each track in a rail yard.

“Lap Turnout” A type of three-way turnout with two sets of points located in sequence to each other. Essentially two turnouts overlapped, to save some of the space that two conventional turnouts would occupy.

“Layout” a commonly used synonym for a model railroad.

“LEDs” Light Emitting Diodes small, solid-state, electronic lighting components. LEDs are in common use everywhere. Your home, auto, cell phone, and just about any electronic device you own, will likely use LEDs. They are very popular with model railroaders too. LEDs are used for headlights, classification, and ditch lights on model locomotives. They light passenger cars, signals, street lamps, and structures. They are also used as indicator lights on control panels to show the position of a turnout, for example. LEDs consume very little power, produce almost no heat and, if proper current limiting resistors are used with them, LEDs hardly ever burn out. For all these reasons, plus their availability in extremely small sizes, LEDs have largely replaced incandescent light bulbs on model railroads.

“L-girder” a system of model railroad benchwork invented in the 1960s, where the main support members are wood versions of angle irons. Two planks glued and screwed together in an ‘L’ shape. L-girders are extremely strong and perfectly rigid. The full original system isn’t used as much today. However, the basic L-girder shape can be used in other forms of benchwork, to resist warping.

“Little Joe” Nickname for a type of powerful, fast, electric locomotive used on the Milwaukee Road, and the Chicago and South Shore Railroad. Little Joes were the

last electrics purchased by the Milwaukee, and most lasted until the end of the electrification in the early 1970s.

[These locomotives were originally built by General Electric Co. for sale to the Soviet Union to be used on the Trans-Siberian Railway. Cold war tensions nixed the sale, and GE looked for another customer. The Milwaukee bought most of them. Three went to the South Shore, and five to Brazil. The exact origin of the name "Little Joe" is not known, but one theory is that it related to the original purchaser, Joseph Stalin, then dictator of the USSR.]

"Main line" The principal track of any railroad company that trains travel between cities.

"Maintenance-of-Way" equipment. (MOW) Rail, or road, vehicles used to maintain a railroad's right of way. These include wedge and rotary type snow plows, cranes, flangers, rail grinders, and any other cars, or equipment, used for this purpose. On a model railroad, MOW equipment, whether sitting ready on a siding, or posed in action along the main line, makes an eye-catching detail. Commercial models of many types of MOW equipment are available.

"Mallet" (pronounced mal A) A type of articulated compound steam locomotive. The compound steam system was invented by Swiss engineer Anatole Mallet in an attempt to increase the efficiency of steam locomotives. Compound steam locomotives use their steam twice. The exhaust of one pair of high-pressure cylinders is re-used by feeding it into a second pair of low-pressure cylinders, and finally venting it out from this second pair of cylinders. Compound articulated locomotives were maintenance headaches, plagued with steam leaks, and never quite managed to deliver the level of improvement in operating efficiency expected of them. This eventually led to most of them either being converted to "simple" (two-cylinder, one steam use) articulated locomotives, or scrapped.

[The name Mallet was pronounced "Mal E" as in the Irish last name, "O'Malley" by American railroad workers. Many of them were Irish immigrants, or their direct descendants. All of them, Irish or not, could pronounce O'Malley, and few, if any, could pronounce Mallet as "Mal A." The name mallet, with the American pronunciation "Malley" came to be used for any articulated locomotive.

“Markers” These were lamps, first kerosene, and later electric, carried on the back of a caboose. They indicated a train’s status, and also served as a nighttime warning to following trains.

“Mikado” The most widely produced steam locomotive in history. Popular with practically every American railroad, and used in both freight, and passenger, service. Mikados had a wheel arrangement of 2-8-2.

“Modge Podge” A craft product used to apply a high gloss coat over craft projects. This product is useful to model railroaders in making ponds, streams, etc. appear wet. After painting the basic colors of the body of water, painting a layer of Modge Podge over it will make it shiny and help it to resemble water. In many cases, Modge Podge can be used instead of the much more expensive epoxy resin, or acrylic gloss medium.

“Modular layout” A model railroad built to the standards of one of the many modular railroad groups. Modules of a given length, and configuration, are physically interchangeable, and operationally compatible. For instance, any four-foot-long, straight, N-Track module can take the place of any other four-foot-long, straight, N-Track module. This is the difference between modular layouts, and sectional layouts. Sectional layouts can only be assembled in one configuration, and sections are not usually interchangeable. One of the first, largest, and best known, modular organizations is N-Track. It has hundreds of participants worldwide. The terms “modular” and “sectional” are often confused with one another, and tend to be used interchangeably. While there is a technical difference, nobody sweats it much. We will know what you mean.

“Multiple Unit” (MU) A control system that lets one engineer operate two, or more, linked diesel locomotives. Hoses and cables at the ends of locomotives are used to connect them into a multiple unit consist.

NMRA the National Model Railroad Association. An organization of model railroad enthusiasts that have greatly helped the hobby by creating standards for many items used in model railroading.

NMRA standards Gage. A tool that can measure such things as track, and wheel gage, minimum clearances for tunnel and bridge height, and for trackside structures. The gage can also measure many critical parts of turnouts. The gage is based on standards set by the NMRA, and is an essential tool for any model railroad. Gages are available in many scales.

“N-scale” the second most popular model railroad scale. (1/160<sup>th</sup>) a typical N-scale boxcar is about 3” long.

[N-scale track has a gage of nine millimeters. Early N-scale models were made in Europe, and the scale was introduced here in the early 1970s. In many European languages the word for nine begins with the letter ‘N’. This is how N-scale got its name.]

“Narrow gage” Railroads that run on track with a gage of less than the standard gage of 4’- 8.5 inches. Narrow gage railroads were cheaper, and faster, to build. They were built with tighter curves, and steeper grades, than standard gage railroads. Narrow gage railroads were primarily used by mining and timber interests in rugged, mountainous territory. The two most popular narrow gages in America were three-foot gage, and two-foot gage. Narrow gage lines could not interchange cars with standard gage railroads. This hastened their demise. The few narrow gage railroads that survive today are used as tourist lines.

“Northern” A large, very powerful, very fast, steam locomotive with a wheel arraignment of 4-8-4. Widely used by many railroads in fast freight, and passenger service.

[Some southern railroads preferred to call their 4-8-4 locomotives “Dixies” instead of “Northerns” for obvious reasons.

“O-scale” The third most popular model railroad scale. (1/48<sup>th</sup>) A typical O-scale boxcar is about 12” long. O-scale trains are similar in size to Lionel toy trains. O-scale track comes in two distinctly different, types. Three-rail, and two-rail. The three-rail track electrical system uses the center rail as the power feed and the two outer rails as the return path for the AC (Alternating Current) that powers the trains. The two-rail electrical system is identical to that used in other model

railroad scales. One rail supplies the incoming, DC (Direct Current) to the trains, and the other rail serves as the return path. These two track, and electrical, systems are incompatible with each other. Each system has its own group of enthusiasts.

“Observation Car” (early version) A passenger car, typically the last car in the train, with an outside, railed off, porch-like, platform at the very back of the car, with a few hard, wooden, chairs where passengers could sit and admire the scenery. (Later versions) had inside seating, and oversize windows. The passengers could still admire the scenery, but in safety, and comfort. Some observation cars had sleeping compartments. Some were combined with a lounge car. Seating and window arrangements varied a lot; many cars had a semi-circle of inward-facing seats, which didn’t help the view of the outside scenery much. Others had some seats facing the rear windows, and still others had rooftop domes.

“On the Ground” Railroader’s term for a derailment, minor, or major. Something, a single wheel, or an entire rail car, that is normally on rails, has come off and is now, “On the Ground.”

“Open grid benchwork” a model railroad support structure consisting of a box made of wood planks. (Typically, 1x3” or 1x4” pine lumber.) Additional planks are mounted about every 16” to form a grid. Open grid benchwork is fairly lightweight, strong, and easy to build. However, it does not resist warping well.

“Operator” The railroad employee in charge of a small station, or tower. An operator was responsible for recording the passing of each train past his location, and the time it passed. This practice was called recording a train “OS” (for “On Sheet” (a.k.a. recorded on paper) Operators sometimes acted as telegraphers, station agents, and operated the hardware of interlocking plants.

“Out of gage” Means that the wheels on an axle are too close together, or too far apart. The same term can also refer to track. The two rails of a track are too close together, or too far apart. For model track, there is a tool for measuring the gage of both wheels and track, along with many other things. It is an NMRA standards gage, and they are available for all the major modeling scales.

“Out of quarter” Refers to the position of the crank pins on the driver wheels of a steam locomotive. The two driver wheels at opposite ends of an axle are supposed to be 1/4th of a revolution of the wheel apart from each other. In other words, the crank pin on one side of the wheelset should lead the other crank pin by ninety degrees of rotation. If the two crank pins are not in the correct position, the model locomotive may bind and stall or buck its way down the track.. The axle and wheels that combine to form a wheelset normally have splines on the axle that fit into matching grooves in the wheels. Pulling a driver off the axle, and shifting the splines one grove over may help get them back in proper quarter. This is not a job for a beginner, or the faint of heart. It is easy to mess things up. Northwest Short Line ([www.nwsl.com](http://www.nwsl.com)) sells a special tool called a “Quaterer” to help line things up properly.

“Pantograph” a device mounted on top of an electric locomotive that can be raised to rub along overhead wire to pick up power.

“Pedestals” A pair of steel supports found between each end of a bridge and its abutment. The pedestals at one end of the bridge will have rollers, or some other hardware, to let the bridge structure move slightly when it expands, or contracts, due to temperature changes. Pedestals are essential parts of virtually all prototype bridges, but are seldom included on models. Commercial castings of pedestals are available in several scales.

“Percent of grade” A method of measuring the steepness of a grade. Model railroad grades should be kept at 3% or less if at all possible. Steeper grades will mean that trains will need to be short, or they may stall while trying to climb the grade. The system works like this. If the grade is 100” long, and it rises 2” in that 100” of horizontal travel, then it is called a two percent grade. If it rises 3” in that same 100” length then it is a three percent grade. Grades take up a lot more length of track than most modelers think. They get even longer when you add vertical easements at the top, and bottom, of the grade. This is a very good practice, and should be used on every model railroad grade. (See easements)

“Points” The moving rails of a turnout. When a turnout is thrown, one of the points presses tightly against one of the stock rails to force the wheels to take the intended route.

“Picking the points” The most common type of turnout-caused derailment. If a wheel flange can get between the point and the stock rail, it has “picked the points”, and will cause some of a rail car’s wheels to take the wrong route; causing a derailment. Filing the ends of the point rails thinner and filing a notch in the stock rail for the point to fit into; prevents wheels from picking the points.

“Point-To-Point Layout” a model railroad that does not have the usual track oval or other means of continuous running. Point-to-point layouts can be built on relatively narrow shelves, even in larger scales. They use the same basic “track plan” as all prototype railroads. Real railroads move freight or passengers, in a continuous line, between cities. Not in meaningless, repetitive, circles. Trains enter a yard at either end of the main line, and are broken down, and switched as needed. When a locomotive needs to be turned, a turntable, or wye, is used. A new train can then be made up, and sent out in the opposite direction. If the modeler doesn’t want to spend that much time switching, and has space available, a point-to-loop design will cut the amount of switching in half. Since it has only one yard, a point-to-loop layout, will need fewer turnouts than a point-to-point one, which saves money.

“Prototype” A model railroad term for a real, full-sized, railroad. Often, it is applied to the particular railroad company, locomotive, or car being modeled.

“Pullman” A luxury sleeping car used on long-haul passenger trains. Pullman cars were not owned by the railroads on which they rolled, but by the Pullman Co. Pullman porters, and Pullman conductors, likewise were not railroad employees, but Pullman company employees. Pullman porters were renowned for their excellent service. Everything on Pullman cars (usually called just Pullmans) was kept spotless, and in good working order. It was a matter of pride, among Pullman porters, to provide anything a passenger asked for, if possible, even before the

passenger needed to ask. Nearly all Pullman porters were black men. Racial prejudice was far more widespread, and blatant, back in the era of Pullman travel. Being a Pullman porter was one of the better paid jobs available to a black man then. The porters formed the first rail worker's labor union.

"Pullman, George." The inventor of the first practical sleeping car. Pullman founded his own company to build, and operate, a large fleet of Pullman cars that ran on railroads all over the country.

[Pullman was something of a "benevolent despot." He built a company-owned town to house his factory workers, and provided basic services. He also wrote the "laws" for the company town, and every worker had to obey them or be fired. No alcohol was allowed in the town for example. When business slumped, Pullman cut the worker's already barely sufficient wages. This caused a bitterly violent labor riot, and troops were sent in to stop it. Several workers were killed, and any idea of benevolence on George Pullman's part, died with them. By the time Pullman himself died, He was so reviled by some of his workers that he left instructions in his will to have his grave covered with rails, welded together, to discourage his many enemies from digging up, and desecrating his corpse! Talk about Mr. Unpopularity! ]

"Rail" one of the two steel rails that a train rides on and is guided by. Model rail is available separately, or as part of model railroad track sections. Model rail is available in many sizes. The size of the rail is indicated by a numbered "Rail Code." This code number is simply the height of the model rail, measured in thousandths of an inch. For example, "code 83" rail is 83/1000ths" high, and "code 55" rail is 55/1000ths" high. Generally, model trains will operate well on any code rail. The rail codes are simply about appearance. Some model rail is very oversize. Using a smaller code # rail looks closer to scale, and more like real track.

"Rail joiners" the little, trough-shaped, metal, or plastic, fittings used to join sections of model track together, and keep rail ends lined up properly. Metal rail joiners also conduct electricity between track sections. (Although not always very well.) Plastic rail joiners are used specifically to prevent conducting electricity between sections; for train control, or signaling purposes.

“Rail Rack” A trackside fixture used to hold spare sections of rail for use by track maintenance crews. With the invention of welded rail and the specialized cars used to haul, and lay, it; the rail rack has largely disappeared from the modern railroad right of way. It would make an interesting detail for a model railroad that was set in the past. A model would be easy to make. Rail racks were built of wood, metal posts, and even old rail.

“Rail Nippers” trade name for a type of diagonal cutting pliers with hardened cutting jaws. They are designed specifically for cutting model rail.

“Railway Express Agency” A private company in the business of transporting packages quickly, and reliably. The equivalent of Federal Express today. Railway express was one of railroading’s biggest customers. Their packages were shipped on passenger trains, in dedicated express passenger-type cars. They also used special boxcars, and refrigerator cars, equipped with high speed passenger trucks. Express cars also had all the same hardware as passenger cars, including hoses, and piping for steam heat from the locomotive to reach the passenger cars. Particularly valuable, or sensitive, shipments were protected by an “express messenger,” who traveled in the express car.

“RDC” A Rail Diesel Car. This was a diesel-powered successor to the earlier gas-electric car. It was used to carry passengers on lightly traveled routes, where it was unprofitable to operate a conventional passenger train.

“Reefer” Railroad slang for a refrigerated boxcar. Early reefers were cooled by large pieces of ice, loaded through special hatches in the car’s roof. Modern reefers are cooled mechanically, with a small diesel engine mounted on the car, driving the compressor of a refrigeration system to cool the car’s interior.

Re-railer a piece of sectional model track with molded-in plastic guides that can help derailed wheels to get back on the track. The re-railer is somewhat disguised as a road grade crossing.

“Relay Box” A steel locker used to house the large electric relays used to operate railroad signals. Relay boxes were located along the track, and were a fixture at

rail/road crossings that were protected by flashing lights, and gates. Commercial castings of relay boxes are available in several popular model railroad scales.

“Reversing Loop” A loop of model railroad track that lets an “eastbound” train change its direction and emerge as a “westbound” train, on the same track. Reversing loops, (on the two-rail track used on most model railroads) form an electrical short circuit. The “north” rail of the feeder track is directly connected to the “south” rail by the loop. To prevent this short circuit, a section of track, approaching, or within, the loop has both rails insulated, at both ends of the section, from the rest of the track. This “X-section” is equipped with its own track polarity reversing circuitry. This can be a simple toggle switch, a set of contacts on a switch machine, or a “Frog Juicer” circuit; which automatically reverses the track polarity when it senses the short circuit caused when a locomotive bridges the insulated joint between the X-section and the rest of the loop. Reverse loops, wyes, and turntables; all use some version of this electrical arrangement, because they all let a locomotive reverse its direction of travel on the same track. This is true whether the layout uses conventional DC, common rail DC, or DCC control.

\*Reversing loops are quite rare on prototype railroads; they call them “Balloon Tracks.” A balloon track takes up more valuable real estate than a wye, or turntable. One place that they were used was near busy passenger stations, because they had the advantage of turning the entire train in one movement. Balloon tracks were also sometimes used in heavy snowfall areas, because a snowplow could be turned without backing up, as would be necessary on a wye, and possibly getting stuck in the snow behind it.]

“Right of way” The actual land on which a railroad track is built. A railroad’s right of way may be miles; hundreds of miles, or even thousands of miles long; but, except for yards and terminals, the typical width is only about one hundred feet. This is a factor in planning a realistic model railroad. Real railroads are very long, but not very wide. Many model railroads are built on a 4’x8’ piece of plywood. As is, this sheet of wood is nothing like the shape of a real railroad’s right of way. Dividing the wood sheet, either visually with a backdrop, or hill; or physically, with a saw, can help the model railroad to look more like the real thing.

“Riprap” Large pieces of stone used to shore up an embankment, and prevent erosion.

“Rip track” The “rip” part of this term stands for “repair in place.” This is a track where cars are spotted for minor repairs that don’t require a visit to a full-blown repair shop. A rip track can make an interesting small scene on a model railroad. It can serve as a logical temporary destination for any type of rail car, and thus adds operating interest.

“Risers” Are the vertical wood plank sections used to support the sub-roadbed of a model railroad. Risers are attached to the horizontal joists, or stringers, of open grid, or L-girder, benchwork. On a flat-topped train table, risers may be attached to the plywood top. Woodland Senics Co. markets a set of pre-made Styrofoam risers.

“Roller Bearing Trucks” A modern type of railcar truck assembly with the older, solid bearings replaced by roller bearings. This design reduces rolling friction throughout the train, which saves fuel. It also eliminates the dangerous “Hot Box” possible with solid bearings.

“Route Control” A system for controlling the position of several model turnouts simultaneously. With route control one control panel electrical switch can set all the turnouts needed to direct a train to particular track, or route, at the same time. There are several different circuits for doing this. Route control is most commonly used on crossovers, and yard ladders.

“RPO” A Railway Post Office car. These cars ran at the head end of passenger trains. Mail was picked up at station stops, or “on the fly” by using a special “mail crane” that would snatch sacks of mail hung on a frame at a station where that train was not scheduled to stop. Mail sacks, destined for that location, could also be thrown out onto the station platform, or the track bed, by postal workers inside the RPO car. Aboard the car, mail was sorted by destination, and then offloaded at that location.

“Roundhouse” A semi-circular structure used to house, and repair steam locomotives. The roundhouse was built near the turntable used to turn locomotives, and also access the stalls of the roundhouse.

“S-scale” a model railroad scale (1/64<sup>th</sup>) smaller than O-scale, and larger than HO-scale. S scale trains are similar in size to American Flyer toy trains.

“Scale” The size of a model, in proportion to the prototype being modeled. Common model railroad scales are G-scale (1/22.5-through 1/25<sup>th</sup>) O-scale (1/48<sup>th</sup>) S-scale (1/64<sup>th</sup>), HO-scale (1/87<sup>th</sup>), N-scale (1/160<sup>th</sup>) and Z-scale (1/220<sup>th</sup>).

“Scratchbuilding” Constructing a model from basic materials, (wood, styrene, metal, etc.) rather than from a commercial kit. Scratchbuilding lets a modeler construct models that are not available in kit form.

“Sectional layout” any model railroad that can be taken apart in sections. Sections, (unlike modules) do not need to meet anyone’s standards but the owner’s and are typically not compatible with any other sectional layout, or interchangeable with each other. The terms “sectional” and “modular” are often confused with one another, and tend to be used interchangeably. While there is a technical difference, nobody sweats it much. We will know what you mean.

“Signal head” the operative portion of a signal, used to convey track status to oncoming trains. Signal heads are mounted on trackside masts, or on Signal Bridge structures built over the tracks. There are many different types of signal heads. Early signals had moveable semaphore arms, and lighted, colored, glass “roundels” (lenses) for night use. Later signals use electric lights, in various colors, and/or positions, to convey the track status.

“Skeleton Log Cars were basically two trucks, two couplers, two log holding frames, and a thin center beam, between the trucks. Like disconnect log cars, they were purpose-built for the logging railroads.

“Sleeper” 1) In North American railroad parlance, any sleeping car, whether operated by the railroad company or by Pullman Co. 2) Also the British name for a railroad tie.

“Slip switch” a complex type of turnout that can also function as a crossing. Slip switches were rare on real railroads. They are costly to build and maintain. They were used in congested areas where there wasn’t room for separate turnouts and crossings. Large urban passenger stations commonly did use many slip switches. They enabled switching to any of several platform tracks, and “run-around” movements by locomotives.

[In my personal opinion, model railroaders should avoid using slip switches on model railroads, due to reliability problems.]

“Slug” A diesel-electric locomotive with the diesel engine removed, but the electric traction motors still functional. Slugs were connected to a regular diesel locomotive to provide extra pulling power.

“Smash Board” A guaranteed-to-get-your-attention-right-now, railroad emergency signal. A smash board looks like an oversized semaphore blade. It is made of wood and is positioned over the track where an oncoming train will hit, and smash through, it. Smash boards are used as “last chance” warnings to train crews approaching a dangerous condition like an open drawbridge. Smash boards are normally out of the path of trains, and are only lowered into the train’s path when the bridge is open. Conventional interlocking signals precede smash boards. The smash board will only be smashed if the engineer runs past a red stop signal.

“Snow Shed” A wood, or concrete, structure built over track in areas subject to heavy snowfall; primarily in mountainous terrain. Snow sheds are stoutly built, and heavily braced, to resist damage by avalanches.

“Spotting a car” Railroad term for “parking” a rail car at a specified location. Normally on a given siding, and sometimes in front of a particular door at the customer’s location.

“Stock rails” The outside rails of a turnout.

“Streamliner” Publicity-generated name applied to a generation of new design locomotives, and cars that first appeared in the 1930s, and flourished through the 1950s. The streamlined trains were designed to recapture public enthusiasm for

rail travel, in an attempt to generate more revenue for the railroads. The trains were designed for high speed passenger service. Externally they were styled so as to “reduce air resistance” although in reality this was not a significant factor in their actual operation. One comment of the time was that “Streamlining has less to do with reducing air resistance than reducing passenger resistance.”(To train travel.) Light weight construction, and diesel power, were the real factors that enabled higher train speed. Steam locomotives were also streamlined with sheet metal, professionally-styled, bodies over conventional steam locomotives. Two famous examples are the streamlined Hudson locomotives used to pull the New York Central’s “Twentieth Century Limited,” and the streamlined Atlantics that pulled the Milwaukee Road’s “Hiawatha.”

“Sub-Roadbed” The plywood support under the track, and its cork, foam, or other, roadbed. Sub- Roadbed is often supported on vertical, wooden, “Risers” to raise the track that forms a model railroad grade.

“Superelevation” The practice of gradually raising the outside rail on a curved track, to allow trains to negotiate the curve at higher speed. Not needed on model railroads, but sometimes modeled for appearance.

“Switch” 1) Another name for a turnout. Commonly used on the prototype, somewhat less often on model railroads.

“Switch” 2) An electrical switch of any kind\*. Toggle, slide, and rotary, electrical switches are types commonly used on model railroad control panels.

[\*This is the reason for the adoption of the word “turnout” by model railroaders, to avoid confusion between these two completely different types of “switches.” This helps prevent confusing language like, “I use this switch (electric toggle) to “switch” (operate) that (track) switch.

Switch stand” a mechanical device for moving the points of a prototype railroad switch, manually, by moving a lever. Some working model switch stands are available, but most switch stands on model railroads are cosmetic, rather than functional.

“Switch machine” a mechanical, or electro-mechanical, device used to move the points of a turnout on a model railroad. There are two common types, “Twin-coil” machines, and “Stall motor” machines.

“Talگو trucks” Model railroad trucks with couplers attached.

“Tangent track” is simply another name for straight track.

“Tank” A railroad-owned water tower next to the track used to fill the tenders of steam locomotives.

\*Also, the origin of the disparaging phrase “Tank Town” referring to a small, dull, town. When early railroads were built, the railroad company determined the locations of stations, and hence towns, along the line. The railroad also selected a name for the station/town. Sometimes the town, or even the station, hadn’t been built yet. The only structure in the designated “town” was the essential water tank.]

“Tank engine” A steam locomotive that carried its water in a tank built around the boiler. Tank engines also carried their own fuel, and consequently, did not require a tender. Because they could carry only a limited amount of fuel and water, they were commonly used as short-range yard, or industrial, switchers where they had easy access to additional supplies of fuel and water.

“Telltale” A wood, or metal, framework built over a railroad track, with many ropes hanging from it, across the track, and just above the roofs of passing trains. Telltales were used to warn train crew members (and the occasional hobo) of a low-clearance obstacle ahead; such as a tunnel portal, or low bridge. When roof walks were outlawed, and removed, train crews no longer worked, or rode, on top of the cars so, the telltale lost its purpose. Telltales are no longer used on prototype railroads, but would make an interesting detail on a model railroad set in the past.

“Three-way turnout” A turnout with three exit track routes. Three-way turnouts were used in congested areas where their operational equivalent of two opposite turnouts in a row, would take up too much space. Three-way turnouts are used at

the entrance to rail yards, especially large “hump yards.” They were also commonly used at large passenger terminals.

“Tortoise” brand name of a very popular stall motor switch machine used on many model railroads.

“Track” strictly speaking, a collective noun for the entire assembly of rails, ties, tie plates, spikes, etc. that, together, make up single railroad track. Often called “tracks” by the general public. This is probably due to miss-calling the two rails “tracks.” [Examples, “Now boarding, on TRACK number three, the orange blossom special.” \* “She came from the wrong side of the TRACKS.”]

Commercial model railroad track is available in three basic types.

- 1) “Sectional track” consists of short (5”-9”) rigid, straight, and various radii curved, pieces. Sectional track does not come with roadbed attached. It is usually laid on top of separate cork, or foam, commercial roadbed.
- 2) “Roadbed track” is a special type of sectional track that does come with a rigid plastic base that simulates the crushed rock “ballast” that real railroad track is built on top of. Examples are Bachman EZ-Track, and Kato Unitrack.
- 3) “Flex track” consists of longer sections (30-36”) that can be bent into any desired curve radius. It is cheaper per foot than sectional, or roadbed, track. It is, by far, the most popular track with experienced model railroaders. Flex track requires fewer rail joints than sectional, or roadbed, track. This reduces the number of potential electrical breaks and derailment opportunities. Flex track pieces that will be used in a curve can (and should) be soldered together at their joints, while the pieces are laid out straight, and then bent to the desired curvature. This good practice dramatically reduces the risk of building kinks into the curve.

Model railroad track can also be “hand laid” that is, built up on site, by the modeler, using separate ties, rails, and spikes.

“Track Code” The height of the rails on a piece of model railroad track measured in 1000ths of an inch. (See “Rail, and “Rail Code.”) Code 83 track has rails 83/1000ths.” high.

“Traction” Collective term loosely applied to all electrically-powered locomotives and cars. In the early steam era, before diesels, electric locomotives were the only ones with traction motors. This is likely the origin of the term.

\*Electric locomotives were more commonly called “Motors” rather than “Locomotives,” back then. Perhaps proud steam locomotive crews didn’t want to have the name of their prized charges sullied by being applied to these “newfangled” machines! Electric locomotive crews got a bit of their own back by wearing clean white overalls and caps. This showed that their locomotives didn’t generate the extensive dirt, coal, and oil, stains of those dirty steam locomotives!]

“Tender” A special car used to carry fuel and water for a steam locomotive. Tenders were usually semi-permanently attached to their locomotives by steel drawbars, rather than couplers. Early tenders carried wood fuel. Later coal, and/or oil, replaced wood as steam locomotive fuel. Most steamers were “hand fired” by a fireman moving coal from the tender to the locomotive’s firebox manually with a “scoop.” (Shovel) This was grueling work. As steam locomotives got larger, the demand for coal went beyond the physical capacity of a single fireman to supply it. Two firemen were used, and later a “mechanical stoker”, a type of screw conveyer, was used to keep bigger and bigger hungry fireboxes supplied with coal. Oil and water were fed from tender to locomotive by hoses. The oil was very thick, and had to be heated to just the right consistency to be sprayed into the firebox.

“Throttle” A device used to control the speed of a locomotive. On a steam locomotive the throttle was a long steel lever used to regulate the amount of steam going into the cylinders. In model railroad terms the speed control of a power pack, or DCC controller, acts as a throttle.

“Throwbar” The part of a model railroad turnout that moves the points from side to side.

“Tower control” An electrical control system used on some DC powered model railroads. Using the tower control system, each operator was responsible for controlling trains as they traversed his block of track. Trains were handed off from one operator to the next. This system was favored by clubs with large layouts where it was impractical for a single operator to travel with his train, as it ran along the main line. In some cases, no one spot gave a clear view of the entire layout. Tower control has the advantage of simple wiring. There are no block control panels full of switches needed. The system does require multiple power packs, but each pack needs only two wires to it’s block of track. Tower control can also be used on a smaller layout, and be controlled by a single operator. Before switching to DCC I operated my home layout with tower control. My former club also used a form of tower control, even though their layout was designed so that each operator could walk along with his train. Each track block was wired to its own transistor throttle, and the operator simply controlled speed and direction with the throttle for each succeeding section, as both he, and his train, traveled along. With the advent of DCC, tower control, and the more common “Dual cab control” DC systems are starting to be used by fewer model railroaders, but both are still viable control systems, for those who prefer to stick with DC power.

[The name “tower control” refers to the elevated towers that were once common on real railroads. Of course, the operator in each of these prototype towers didn’t directly control trains, as in the model railroad version. However, each operator was still responsible for his track block, and the trains that traveled through it. Each passing train needed to be “OS-ed” that is written “On Sheet” as having passed his tower, and the exact time when it passed. Before the widespread use of automatic block signals, OS reports helped the dispatcher keep track of each train’s location. Towers were also equipped with “Train order boards” (signals controlled by the towerman.) telegraph, and later telephone communication with the dispatcher.]

” Train order” a paper form authorizing a train movement not shown on the schedule. Train orders were nick-named “flimsies” because of the thin paper on which they were printed. Duplicate copies of a train order were given to the engineer and the conductor. They might have to stop their train at a station to

pick up, and sign for, the orders. Alternatively, the orders could be “hooped up” to them as the train passed the station at reduced speed. The delivery method depended on the contents of the order. Serious orders directly affecting safety were signed for inside the station. More routine orders could be hooped up, and did not require signatures.

“Train order board” A semaphore, or other type of signal, located at a station, or tower. Train order signals do not directly control train movements, like block, or interlocking signals do. A train order signal’s only function is to let train crews know whether or not there are orders waiting for them at that location. Typically, a green signal would indicate, “I have no orders for you.” A yellow signal might be used to tell the crew that their orders would be “hooped up” to them as their train slowly passed the station. A red signal meant stop. “You have orders waiting that require your signatures.”

“Transfer table” A bridge used for moving locomotives, like the bridge of a turntable. However, a transfer table does not rotate. Instead it travels from side-to-side. Transfer tables were commonly used at locomotive “back shops.” They could move a locomotive into position at any one of many doors to enter the shop.

“Trestle” A type of bridge structure with multiple vertical supports along most of its length. Wooden trestles were built in two different ways.

- 1) “Pile Trestles” were erected on top of long wood pilings driven deep into the ground. The piles were quite stable, so this type of trestle sometimes used minimal cross bracing.

- 2) “Frame trestles” were erected on top of the ground with some form of support structure under each frame. (Typically, large creosoted timbers, or concrete footings) These trestles were fully cross braced, since they didn’t have the fixed foundation of deep-driven piles. Wooden trestles were used extensively in early railroad construction, including on the transcontinental railroad. They were fast, and cheap, to build. But many were not built to handle very heavy loads, or last through the ages. They were also susceptible to fire, sometimes set by burning embers in the exhaust of wood-burning locomotives. Later many wood trestles

were replaced by steel, or concrete, trestles; or buried in dirt and rock fill to form an embankment.

Steel trestles were built as a series of deck plate girder bridges, supported by towers made of steel box girders, or beams. They were much stronger than most wooden trestles and some are still used today. Some low-level wood pile trestles are also still used. They are a relatively cheap way to carry track over a broad waterway without damming up the water flow as an embankment would. Wood pile trestles are often used as the approach structures for other types of bridges.

“Troop cars” Were boxcars converted to provide basic passenger car type accommodation for troops. Used extensively during world war two, troop cars also had troop kitchen, troop sleeper, and troop ambulance variants. This last type was used to transport wounded personal.

“Timetable” 1) The official schedule, given to railroad employees, that listed the superiority, class, and meeting locations and times, for the railroad company’s train traffic. 2) A simpler form of timetable printed for use by passengers, and the general public. This timetable listed the arrival and departure times of the passenger trains at stations along the line.

“Timetable and train order operation” An operating method used by some real railroads, and gaining popularity as a method of operating model railroads realistically.

“Trolley” A type of electrically- propelled rail passenger car once common in cities across this country, and overseas. The term trolley was used for the overall local transport system, “trolley company”; or one, or more, of the system’s routes “trolley line(s)”, the “trolley cars” that ran on that system, the type of overhead wire network that powers the cars “trolley wire(s)”, and the rooftop pole and wheel that conducted current from the trolley wire, to the trolley car. “Trolley pole” and “trolley wire.” Trolley lines were typically built for local travel within a city. This differentiates them from “Interurban” lines that ran between cities. There was often overlap. The Pacific Electric company operated both local trolleys and inter-city interurbans for example. Trolley cars often ran in the middle of city streets, and were sometimes referred to as “street cars.” Actually, the first street

cars were horse-drawn. They were replaced by the newer electric trolley cars. Another type of “streetcar” is the cable car. These cars have no motors, trolley poles, or trolley wires. They are pulled by a steel mechanical cable that runs in a trench under the street. Cable cars can climb steep hills. Very hilly San Francisco California has a quite famous cable car system. Today electric trolley cars still operate in some cities. In modern U.S. “govermentspeak”, they are called “Light Rail Vehicles.” Overseas they are called “Trams.”

“Truck” The pivoting assembly, under each end of a rail car, which holds the wheel sets.

“Turnout” Model railroading’s preferred term for a track switch. This is to avoid confusing track switches, with electrical switches, in print, online, and in conversation.

“Turntable” a railroad bridge that can be rotated to turn a locomotive around, or access roundhouse stalls.

“Unit train” a type of freight train, on which the entire train is used to carry only one type of freight. A common load for unit trains is coal.

USRA The United States Railroad Association. A government bureau that took over operations of American railroads during world war one. They produced some very good designs for steam locomotives. Many of these USRA-designed locomotives were used throughout the steam era.

“Varnish” Railroad slang for passenger trains. Early wooden passenger cars were protected from the elements by several coats of shiny varnish.

“Wheelset” An assembly of two railroad wheels on the same axle.

“Whistle post” A wood, or concrete, post with a ‘W’ marking facing oncoming trains. It served as a reminder to the engineer to blow the whistle. Whistle posts were often placed on the approaches to a road grade crossing.

“White Glue” Water-based glue used for fastening wood or paper. Model railroaders use white glue to assemble benchwork, and wood models. Diluted

with water, white glue is used to fasten ballast, dirt, grass, and other scenery materials to the layout. A very common brand of white glue is “Elmer’s glue.” (Note: Elmer’s, and other brands, of “School Glue” are intentionally made weaker than normal white glue. “School glue” is not recommended for model railroad use.)

“Wig Wag” An early type of electrically-operated signal used at grade crossings to warn motorists of an approaching train. Wig Wag signals had a metal target, fitted with a red light at the center, suspended on a metal arm. Target and arm were swung side-to side, in pendulum fashion, by electromagnets mounted in the box above the arm. This mechanism duplicated the stop signal given by a human crossing watchman with a red flag, or lantern. This type of signal was widely used by the Pacific Electric Interurban lines throughout the Los Angeles area. It was adopted by other railroads and became quite common. Wig Wag signals were eventually replaced by the cross buck and flashing red light signals still used today.

” Wrecker” A large, powerful, heavy-lift-capable, crane mounted on a heavy-duty railcar base. Wreckers were used to retrieve locomotives and cars derailed at the site of a train wreck. They were also called “Wreck Cranes” and “Big Hooks.”

“Wye” An arrangement of track, and three turnouts, that let a locomotive or short train, turn around and change its direction of travel. A wye lets the locomotive/train perform the railroad equivalent of an automobile “K turn.” Wyes are common at junctions of two rail lines. They let trains transition between lines from either direction. Today, wyes have replaced nearly all turntables. They are cheaper to build, and maintain, than turntables. Also, turntables were much more commonly used for steam locomotives, in conjunction with a roundhouse. Diesels didn’t need turntables, or roundhouses, as much as steam locomotives did.

“Wye turnout” A turnout with the two outgoing tracks diverging equally from the centerline in opposite directions. Wye turnouts are designed specifically to build a wye in a slightly smaller space than would be possible with conventional turnouts.

“X-section” 1) An electrically insulated section of model track shared as part of two track routes.

2) The same type of insulated track section used in conjunction with a reverse loop, wye, or turntable, to change its own electrical polarity; in order to allow reversing moves without a short circuit.

“Yard” A group of sidings used to sort, and store, rail cars and/or make them up into trains.

“Yard Ladder” A group of connected turnouts that form the entrance/exit end of a rail yard. By setting the various turnouts within the ladder, a car, or an entire train, can be directed into any track in the yard. Some yard ladders, both prototype and model are automated to a degree. Many model yard ladders have been wired for “route control” a system that lets the operator set all the necessary turnouts to the positions that will direct a car/train onto the desired track using a single button, or switch. Prototype yards can be highly automated, computer-controlled affairs, or manually operated by simple switch stands, and human muscle. The degree of automation, or lack thereof, depends on the size, purpose and frequency of use of the particular yard.

“Yard limits” The boundaries of the trackage a switching locomotive may use without obtaining clearance from the dispatcher.

“Yard Goat” Slang for a switching locomotive assigned to a rail yard.

“Yardmaster” The person in charge of the operation of a rail yard real, or model.

Z-scale A very small model railroad scale. (1/220<sup>th</sup>.)

“Zebra stripes” (also called “scare stripes” or, in the case of the orange and black type, “tiger stripes.”) Large, diagonal, boldly painted, stripes put on the ends of locomotives as a visual warning device, in an attempt to reduce grade crossing accidents.

“Zip texturing” An older scenery coloring technique that uses dry pigments, or fabric dyes dusted over wet plaster. With the wide range of excellent scenery materials commercially available today, zip texturing is seldom used anymore.

