DATA SHEET

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Title:	**REALISTIC OPERATION: Prototype Passenger Trains**
Updated by:	**Ross E. Pollock Operations SIG**
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EVOLUTION OF PASSENGER OPERATIONS

Passenger operations may be conveniently divided into five major eras:

Pioneer	1830 - 1870
Palace Car	1870 - 1912
Standard	1912 - 1940
Streamlined	1940 - 1971
Amtrak	1971 - current

THE PIONEER ERA

During the pioneer era, trains were short, cars were built of wood, overnight travel was unusual, and most travel was in coaches. Through cars operating over more than one railroad were virtually unknown and, as a matter of fact, were impossible in many cases because of the change in track gauge between different railroads.

Trains stopped briefly at "eating stations" during meal times to feed their passengers, so there weren't any dining cars. Many railroads built hotels at important stations and junction points so passengers could break their journey for a good night's sleep. The sleeping car had not been perfected. A typical train might consist of one or more baggage cars for the carriage of passenger baggage, mail and important less-than-carload freight, plus one or more coaches. Speeds were slow. Many passenger trains also handled freight cars.

Operations were relatively simple. Most trains were dispatched by timetable only during much of this period. If a superior train were delayed, all opposing trains had to wait until it arrived.

THE PALACE CAR ERA

The rapid development of technology during and after the American Civil War changed much of this. The first car built expressly as a dining car appeared in 1868 and by about 1870, the sleeping car was coming into general use. Track gauge was being standardized at 4'-8½", making through cars possible. At first, there were numerous competing sleeping car companies. By the end of this era, the Pullman Company had a virtual monopoly on this business.

In 1864 the Post Office began sending mail by rail and sorting it en route in railway postal cars. The express companies became an important source of income.

Cars were still built of wood, but became longer, bigger and heavier as time passed, and trains became longer too, requiring larger, more powerful locomotives to haul them. The Westinghouse air brake and the manual block system for dispatching trains were both introduced in 1865. Together these allowed safe movement of more trains at faster speeds over a given stretch of track.

Trains were divided into express and local with commuter trains added for service from the suburbs into the downtown area of major cities. A typical overnight express train might carry a railway post office car, several baggage cars (mostly for express traffic), a combine car as a

PALACE CAR ERA - continued

smoking car with space for passenger's baggage, several coaches, a dining car, several sleeping cars, and a lounge-observation car for first-class passengers.

There were numerous express companies, each operating over one or more railroads, most of which interchanged both packages and entire cars with each other. During this era all-first-class trains appeared on a few railroads in the heaviest traveled corridors.

Local (or accommodation) trains might consist of a combination railway post office-baggage-express car, several baggage-express cars, a coach-baggage car as a smoker, and one or more coaches. Local trains did not normally carry first-class cars, and stopped at every station on the line. Mixed freight-passenger trains were common on branch and lesser main lines.

Commuter trains became common. Many carried a passenger-baggage combine car as a smoker and to handle the limited passenger baggage, newspapers, and sometimes milk.

Towards the end of the era the steel underframe was introduced which allowed the operation of still heavier and faster trains.

THE STANDARD ERA

With the opening of the Pennsylvania Railroad tunnels under the North River into downtown New York City in 1912, fireproof cars were required. Once these newer, safer cars were introduced, the public began to demand that all railroad cars be of this construction. By the 1920s, most mainline passenger cars had been replaced with cars of all-steel construction. Most of the wooden cars that remained in mainline service were sheathed in steel, but wood cars remained in branchline service for many years until they were bumped by steel cars that themselves had been replaced by the appearance of lightweight streamlined cars. During World War I, the government forced the amalgamation of the various express companies into one universal company -- the Railway Express Agency.

In this period, trains might be divided into all-first-class (usually extra-fare), express, local and commuter. Mixed freight and passenger trains were fast disappearing.

The all-first-class trains generally operated over longer, more heavily trafficked lines with stops only at the most important cities en route. They often carried through cars for interchange with other railroads. On the east coast, entire trains operated in through service from Boston and New York to the Florida winter resorts with only change of locomotives and operating crews en route. These trains tended to have a minimum of head-end cars -- just enough to serve the needs of the passengers on the train, and sometimes a railway postal car. There was often a combination baggage-club car with a bar (and sometimes a barber and shower too) at the head of the train. This would be followed by several sleeping cars, a diner, more sleepers, and an observation car. The observation car usually had some sleeping space -- open sections in the early years, all rooms later -- a bar and lounge, and an open observation platform at the end. The open-platform observation was replaced in many cases during the late 1920s and early 1930s with a fully enclosed solarium car. As trains became longer, additional dining cars and sometimes mid-train lounges were added. The lounge car would usually also have some revenue space in the form of

STANDARD CAR ERA - continued

8 to 10 open sections. Daytime trains would carry parlor cars in place of the sleepers. On trains which traversed longer distances, a parlor car would be cut in between major cites that were served in daylight. Passengers whose trip included travel at night would ride in regular sleeping cars. These trains were real money-makers for the railroads and many presidents received a daily report on their premier trains showing not only passengers carried, but the cause for any delays en route (woe to the employee who caused delay to a name train!)

Express trains carried mail and express cars on long-distance runs. Some operated with only an older coach as a rider car intended primarily for the convenience of employees, but some also carried coaches, a diner and sleeping cars. The more important express trains might even carry an observation car at the end for the use of first-class passengers and a combine car for the smoking coach passengers. These trains ran on somewhat slower schedules than did the all-first class trains, with more stops and much switching of express cars in and out of the train at cities along the line. In addition to a railway post office car, which was almost universally carried as the first car of the train, there might be a baggage-express car used as a "working mail car" with bags of mail to be sorted by the RPO car's crew en route and space to restow sorted mail. There might also be one or more sealed mail cars which carried pre-sorted mail and newspapers between regular city pairs. Express was carried in baggage-express cars or in freight cars provided with passenger trucks and piping for steam and signal lines. Sealed cars were dispatched between city pairs. One working car might carry an express messenger who accepted and dropped packages at lesser stations along the route. Railway Express Agency also operated express refrigerated cars for the dispatch of higher value refrigerated cargoes. Railway Express cars, and in later years railroad-owned express cars in REA service, were freely interchanged between lines. PRR cars might be seen in an ATSF train; B&O cars in an Erie train. Especially in the northeast, milk cars were an important source of revenue. In many cases, baggage, mail, express and milk cars had regular runs.

The Pullman Company found that they could make money on a car operating between any two pair of cities (or even towns) with an average patronage of only 12 passengers per night. Hundreds of car lines were set up for the convenience of these passengers. Passengers were able to board a Pullman car sitting on a sidetrack at the station at a stated time the evening before their trip and go to bed; the car would then be picked up by a passing train and often set out again at another station down the line during the night. When a train arrived at its destination or a car was set off in the early morning hours Pullman passengers were usually allowed to occupy the car until a more reasonable time in the morning.

During the Great Depression the railroads began to notice that coach passengers actually provided most of their passenger revenues and began to pursue their business more aggressively. Cars were refurbished with nicer interior color schemes, more comfortable chairs, and air conditioning. Lunch-counter cars began to appear with less-expensive meals for coach passengers. Luxury all-coach trains began to run between major cities on similar schedules to those of the all-first-class trains.

In order to provide more efficient use of dining cars, they were often cut out of a train after a meal, often at a very minor station, and then cut back into another train (usually traveling in the opposite direction) for the next meal.

STANDARD CAR ERA - continued

Local and commuter trains remained about as before. Equipment tended to be older cast-offs from the mainline trains. When new equipment was provided, often it was fitted out more with the idea of durability than of comfort. During the 1920s, the automobile began to cut into the passenger base of the local trains, a process which accelerated during the 1930s and 1940s as the government paved more and more roads and more and more people could afford their own cars.

THE STREAMLINED ERA

Streamlined trains began to appear in the mid-1930s, usually using newly available lightweight materials. By the end of the 1930s, it became apparent that this was the kind of equipment in which the public wanted to travel. As money became available, a massive program to replace older equipment with new or rebuilt streamlined equipment began, generally with diesel power. These programs were interrupted by World War II, but as soon as the War was over they resumed. By 1950 most railroads were operating all-streamlined trains on all of their major runs. Secondary trains often continued with older heavyweight equipment repainted into the new corporate colors.

Luxury all-coach trains became common on runs between major markets, matching the fast schedules, equipment and even some of the amenities of the all-first class trains. Through sleeping cars had been operating for many years over one or more railroads. New through coast-to-coast coaches were introduced too. Some equipment was repainted into the colors of connecting railroads for these services, including Baltimore & Ohio cars in Missouri Pacific "Eagle" colors or Chicago & Northwestern cars painted in Union Pacific yellow.

Branchline trains began to disappear in numbers during the Depression. By the end of this era almost all were gone. In the late 1950s, the post office began to switch mail from the rails to trucks and air. Mail service had provided much of the revenue for many passenger trains. Without it, they became big money losers. In the early 1960s, the commercial jet airliner became both practical and popular. Passengers left the rails in droves. Express traffic also fell off as UPS began its phenomenal growth. The 1960s saw many trains consolidated with others or eliminated entirely. Even so, passenger trains were hemorrhaging money.

As in all of the preceding eras, there was much rearranging of cars at each end of a train's trip. Combines and observation cars had to be turned on a turntable or wye. Sleeping cars were normally carried towards the rear of the train for a more comfortable ride and coaches towards the front, requiring reshuffling. Postal, baggage and express cars were carried at the head of the train (hence "head end cars") to allow easy setouts and pickups at intermediate stations with the train's own motive power. A few terminals provided a loop track for turning entire intact trains, but there were runs on which this was not considered desirable. For instance, the New York Central operated the 20th Century Limited's sleeping cars with the rooms always on the scenic river side. Switching at major junctions could be a very complex operation involving "cutting" the train, one or more backing moves or runaround moves to merge several trains into one with its cars properly arranged, or to separate a train into one or more sections proceeding to different destinations. The road engine and one or more switchers might do the work. Passenger safety and comfort were the first concerns. If a head-end cut was to be set out, the road engine might do the work while

STREAMLINER ERA - continued

the train was being loaded, but more intricate cutting usually required that all passengers be on board and the train moved out of the station.

THE AMTRAK ERA

On May 1, 1971, the federal government took over operation of most of the country's inter-city passenger trains under the management of a semi-governmental corporation, the National Railway Passenger Corporation. NRPC soon chose the name "Amtrak" for its services. Initially, 20 of the 26 railroads that were eligible to join Amtrak did so. The lines which did not choose to join were required to continue to operate their passenger service.

Only the best equipment (about 14% of the total available) was taken into the Amtrak system. Unfortunately, "the best" were often not very good, so for a number of years Amtrak was forced to concentrate on a rebuilding program. Amtrak trains in the first year were certainly colorful as a train might have cars from any of the 20 original railroads in its consist. As things settled down, cars were repainted in a standard Amtrak color scheme. New equipment began to appear in the 1980s, but "heritage" equipment continued to run in some trains into the 1990s.

Initially, Amtrak tended to follow the practices followed by the original railroads in operating its trains. But in recent years, it has tended to minimize switching charges as much as possible. Though there have been exceptions (such as the breakup of southbound Florida trains at Jacksonville into east coast and west coast sections, and reassembly of northbound trains there, or the break-up of the Texas Eagle into Houston and San Antonio sections) most Amtrak equipment sets have been assembled and allowed to run back and forth between endpoints without change in the consists except for those necessitated by maintenance. For this reason also, through cars operating in more than one train have been relatively uncommon.

There has never been an adequate pool of equipment that might be added to trains in periods of high traffic under Amtrak operation. Modern practice often has cars not needed for actual service allowed to run empty (or deadhead), rather than switching them in and out of trains. In another money-saving change, Amtrak has virtually eliminated cars (such as combines and observation cars) which require turning at each end of a run. All of this has eliminated many of the more interesting (from the model railroader's point of view) aspects of passenger train operation.

Because of tunnel limitations, cars for east coast service must be lower in profile than those for the west coast runs. East coast trains remain single decked with the original "heritage" equipment operating there into the 1990s. Trains along the Mississippi river and to its west are now universally double deckers.

In recent years, Amtrak has been aggressively seeking additional revenue through mail contracts and express traffic. Mail is no longer sorted en route but travels in sealed cars between specific end cities. There are now some Amtrak all-express trains running, mostly to return empty cars where this traffic is unbalanced in direction.

Many of the railroads kept some passenger equipment not taken by Amtrak on their rosters for use in company service business trains. Other equipment has moved into private hands or museum

AMTRAK ERA - continued

ownership. Operation of the latter equipment in excursion trains has become more and more difficult as insurance requirements have increased. Also, as the railroad industry becomes more and more centralized in fewer and fewer companies, the refusal of a single line to handle excursions has a greater effect. But a very occasional excursion or business train can make an interesting addition to operations.

Virtually all commuter traffic has now been taken over by (generally State-owned) public operating authorities which either own the tracks over which they operate or contract with the freight railroads for use of their track. Most commuter trains now use push-pull equipment with a locomotive at one end and a compartment with train controls for the engineer at the other end so that the engine no longer needs to be cut off and run-around the train at the ends of each run. This adds a possible third major player to larger layouts: a freight railroad, Amtrak, and a commuter rail system.

Modelers tend to overlook the potential for operational activity in passenger service. Many considerations make such trains as interesting in their own way as the humbler freight service.

DETETERMINING TRAIN CONSISTS

Until the advent of Amtrak, the General Passenger Department of the railroad issued orders for the make-up of trains at originating terminals according to:

Timetable: See the "Equipment" section of a system timetable or Official Guide for a list of minimum equipment assigned to a particular train.

Seasonal Traffic: Minimum equipment is augmented according to predicted traffic patterns such as vacation and holiday travel peaks, school and camp openings, sports and other special events. Sections of scheduled trains and extra trains were added as traffic patterns demanded.

Traffic Needs: As shown by advance ticket sales.

Head End Cars: Baggage, mail and express cars, and milk cars often had regular runs and were carried by almost all but commuter trains and extra-fare limited trains. Some commuter runs (Erie and Lackawanna) carried milk tank cars. Sometimes the duties of the local passenger train were combined with those of the mail-express train.

Trailer-on-flat-car service: As passenger profitability and priority declined, some roads attached "piggyback" flats to regular passenger trains for maximum speed in transit of the trailer-carrying cars.

BREAK-UP AT DESTINATION

On arrival at the end of its run a passenger train may be broken up as follows:

Locomotive: Moved to roundhouse or engine terminal for servicing.

Head-End Cars: Switched out to appropriate mail, express and baggage platforms, or spotted for transfer to consignee if a carload lot. Observation and other special cars: Turned on a turntable or wye. Entire trains may be turned on a wye or, if available, a loop. This keeps the train in uniform car-to-car arrangement, and, in the case of "corridor" Pullmans, assures that the rooms will always be on the "quiet" side of the train. Considerable savings in switching are involved. Trains may be washed in the course of such a move. Short-run locals and commuter trains may have special terminals, usually originating within 50 miles of the large city. Consist is rarely changed at the end of the run. Introduction of diesel-electric locomotives has eliminated the need for turntables at the end of the run. The push-pull commuter trains originated on the Chicago & Northwestern don't even need run-around moves. A control cab at the inbound end of the train allows the engine crew to run the train from a point eight or more cars removed from the locomotive.

SWITCHING DURING THE RUN

Sometimes called "route switching". Headend and rearend cars may be set out and picked up at important division points according to traffic needs. Some New York-Chicago trains on the New York Central carried coaches between New York and Albany only, and between Cleveland and Chicago only. Certain Union Pacific trains picked up and set out extra dining cars at Omaha on their runs between Chicago and the West Coast. Electric lines "cut" and "add" cars at various points in mid-run.

Through Cars: Where traffic justifies it, railroads will switch cars from one road to another to allow passengers to travel without changing trains. Cars were routed through from Boston to Miami over the New Haven, Pennsylvania, Richmond, Fredericksburg & Potomac, Atlantic Coast Line and Florida East Coast Railroads. More frequently, cars were set out at junctions or division points to be picked up by branchline or division local trains without interchange. Examples: On the New York Central, the Advance Empire State Express used to set out diners and coaches at Utica to be picked up by Adirondack Division trains for Lake Placid. In 1950, NYC No. 97, the Paul Revere, Boston to Chicago, carried a Boston-Pittsburgh sleeper, picked up a sleeper for Pittsburgh at Albany, and picked up a Watertown-Pittsburgh sleeper from the St. Lawrence Division at Syracuse. At Buffalo, the three Pittsburgh cars were switched out to train 279 for delivery to the Pittsburgh & Lake Erie at Youngstown. One Chicago car went via Detroit in Train 17, the Wolverine, and another via Cleveland in number 19, the Lake Shore Limited.

SWITCHING DURING THE RUN - continued

Sleeping Cars: are given special treatment to enable passengers to get more sleep. New Haven train No 3, the Owl, left Boston at 12:30 A.M., arriving in New York at 6:15 A.M., but passengers could enter the sleepers in Boston at 10:00 P.M. and remain in the cars in New York until 8:00 A.M. Head-End Cars: Most large cities have special sidings for mail, express and baggage cars. One Albany-Utica local on the NYC dropped two express cars daily at Fonda to be delivered to Gloversville by the Fonda, Johnstown & Gloversville RR. Northern Pacific express refrigerator cars were carried on NYC passenger trains from Chicago to Harmon, where they were switched out for freight trains which run down the west side of Manhattan to the yards at St. Johns Park.

Engine Changes: The advent of the diesel-electric cut down the number of engine changes on long runs, with locomotives running through from Chicago to the West Coast without the changes which were formerly dictated by ruling grades, servicing needs, etc. However, some changes of power were still made at division points, and on the California Zephyr, a pool train, the Western Pacific, Rio Grande and Burlington roads each supplied their own power. Changes are made on partly-electrified roads at the end of the electrified division. Harmon, on the New York Central, and New Haven, on the New Haven road are points at which such changes are made, unless special locomotives equipped to run on both electric and their own diesel power are used.

FURTHER READING (listed in order of date of publication)

Night Trains, the Pullman System in the Golden Years of American Rail Travel: Peter T. Maiken, Lakme Press, Chicago: 1989

Zephyrs, Chief & Other Orphans, the First Five Years of Amtrak, Fred W. Frailey, RPC Publications, Godfrey, IL: 1977

Amtrak Consists, Robert J. Wayner, Wayner Publications, New York, NY 1976 (paper)

Journey to Amtrak, Harold A. Edmonson, Kalmbach Publishing Co., Milwaukee, WI: 1972

Car Names Numbers and Consists, Robert J. Wayner, Wayner Publications, New York, NY: 1972 (paper)

From Zephyr to Amtrak, David Randall, Prototype Publications, Park Forest, IL: 1972 (paper)

Passenger Train Consists of the 1940s, Robert J. Wayner, Wayner Publications, New York, NY undated (paper)

The Trains We Rode: Lucius Beebe & Charles Clegg, Two Volumes, Howell North Books, Berkeley, CA: 1965

FURTHER READING - continued

Some Classic Trains: Arthur D. Dubin, Kalmbach Publishing Co., Milwaukee, WI: 1964

More Classic Trains: Arthur D. Dubin, Kalmbach Publishing Co., Milwaukee, WI: 1974

Steam Steel & Limiteds: William W. Kratville, Kratville Publications, Omaha, NE 1967, 1984

The Official Guide of the Railways and Steam Navigation Lines of the United States, Canada, Mexico, and Cuba, National Railway Publishing Co., New York, NY: published on varying schedules since 1867 (paper)

Public Timetables issued by the railroad of your interest during the years of your interest.

Passenger Train Consist Books issued by the railroad of your interest during the years of your interest, often now available as reprints.

Books dealing with the passenger service of your railroad, many of which have appeared in recent years.