

Harris Tower

Application for listing on the National Register of Historic Places by the National Railway Historical Society (NRHS) - Harrisburg Chapter

Some items edited/corrected by Fred Wertz from the original submission. Please note that the original document was written in early 1990; thus, a number of the facts are different today.

Brief Description

Harris interlocking and block station, commonly known as a "switch tower" or simply "tower", is a two-story, 27' X 37' brick structure built in mid-1929 for the Pennsylvania Railroad, and put into full use on April 28, 1930. Exterior styling is primarily Colonial Revival, having Flemish bond brickwork and a soldier course belt rail separating floors. A bay on the second story facing the tracks, faced with cut stone, is a function of the building's use rather than a style element. End walls rise above the roof line and are capped with concrete parapets. The majority of windows have concrete keystones. The basement walls are concrete also.

Structural integrity is good. The most obvious deviation from the as-built appearance is the addition of a chimney on the south elevation, constructed in the mid-1980s when the building was disconnected from the Walnut Street Steam Plant's (Harrisburg Steam Works, Ltd.) network and an oil furnace installed. Other minor alterations include the filling in of two trackside (east elevation) basement windows and the addition of storm windows on the second- story windows.

Statement of Significance

Harris switch tower is an example of a railroad interlocking tower. The function of an interlocking tower is to provide control over a junction of track switches, which allow trains to change course or direction, and lineside signals, which control trains' speed. In 1946 there were almost 550 of these structures lining the tracks of the Pennsylvania Railroad, and 4400 in the nation. Today the Pennsylvania Railroad no longer exists, (along with a great percentage of its trackage), and the number of interlocking towers has dwindled as well -- of 29 towers that stood along the Pennsylvania Railroad main line to Pittsburgh as recently as 1980, only five still exist. Harris tower stands one block north of the Harrisburg passenger station, whose 1887 brick building and Fink truss train sheds are listed on the National Register, and once controlled all train activity just to the north of the station. In the 1930s this consisted of nearly 100 passenger trains a day, 20 freight trains, and countless switching moves as locomotives and cars were changed in trains. Today, although 17 passenger trains arrive or depart Harrisburg daily, just two come under Harris tower's control. [In 1999, the number of passenger trains is 19, and none come under Harris' control. -FW] The number of freights,

however, has increased to nearly 60 in a day's time. Just as Harris switch tower was an important part of the railroad, so the railroad was an important part of the city of Harrisburg. The Pennsylvania Railroad, in conjunction with the Reading Railroad, was the largest employer in the city, putting 38 percent of Harrisburg's employable persons to work at the time the tower was built.

History, Significance, and Background

A lengthy feature article in the May 1936 issue of Fortune magazine described the Pennsylvania Railroad this way:

Do not think of the Pennsylvania Railroad as a business enterprise. Think of it as a Nation. It is a bigger nation than Turkey or Uruguay. Its boundaries are wider and it has larger revenues and a larger public debt than they. Corporately also it behaves like a nation; it blankets the lives of its 100,000 citizens like a nation, it requires an allegiance as single as a patriot's.

During this time period the PRR operated more than 11,000 routemiles of track (28,000 total miles), entered 57 of Pennsylvania's 67 counties and served 12 other states and the District of Columbia. It was the largest transportation network in America, serving New York, Philadelphia, Baltimore, Washington, Norfolk, Buffalo, Pittsburgh, Cleveland, Detroit, Indianapolis, Chicago, St. Louis, Cincinnati, and Louisville. It carried 10 percent of the nation's freight and 20 percent of its passengers, which during the 1920s totaled 49 billion ton-miles of freight and 4.8 billion revenue passenger-miles.

The Pennsylvania Railroad began as a small, intrastate carrier, chartered in 1846 to connect Harrisburg with Pittsburgh (railroad connections from Philadelphia to Harrisburg already existed). Its conception and construction were primarily a reactionary move on the part of Philadelphia financial interests, as that city in the 1820s and 1830s had lost ground as a commercial center to New York and Baltimore, both of which had superior transportation systems (canals and later, railroads) into what was then the interior of a young nation. New York reached for the west through Albany and Buffalo; Baltimore did so through lanes of commerce stretching west along the Potomac River to Cumberland, Md. Although Philadelphia in the 18th century was far larger than either New York or Baltimore, the transportation advantage they held allowed them both to achieve population gains and port status far above that of Philadelphia. The only routes to the west Philadelphians had available were by road (17 days to Pittsburgh for a loaded freight wagon) and an ingenious but slow, costly and inefficient rail-to-canal-to-rail-to-canal system owned by the Commonwealth of Pennsylvania (3-1/2 days to Pittsburgh). Thus, Philadelphia residents became determined to more efficiently tap the natural resources of the interior -- the region around and beyond the Ohio River -- and they put up financial backing for the Pennsylvania Railroad as an all-rail access to Pittsburgh.

Completion of the Pennsylvania Railroad (in its original form, Harrisburg to Pittsburgh) came on February 15, 1854, and it soon became a great commercial and financial success. Travelers could make the trip across the state in 12 hours. Philadelphia began

to reap the benefits of its investment. The carrier's success allowed it to expand and annex connecting railroads, and by the 1870s it had achieved what would become its ultimate contours -- from New York and Washington on the east to Chicago and St. Louis to on the west. All of the company's freight and passenger trade between east and west was channeled through the steel-rail vortex that Harrisburg became. Freight and passenger traffic flows from New York, Philadelphia, Baltimore and Washington gathered at Harrisburg for forwarding west across the Allegheny Mountains. This historical traffic pattern continued and expanded in volume through the 19th century and well into the 20th century. In modified form and under different management, it continues even today.

Harrisburg was a major junction point on the Pennsylvania Railroad, with tracks leading from the city in six directions: north to Buffalo, Erie, and Wilkes-Barre; east to Lancaster, Philadelphia, and New York; south to Baltimore via Columbia; south to Baltimore via York; west to Pittsburgh, St. Louis, Chicago, Cleveland, Cincinnati, Indianapolis, and Detroit; and southwest to Carlisle and Hagerstown. It was also an important terminal point, where fresh steam locomotives were placed on trains so that they could continue their journeys. In 1938, with the electrification of trackage from Philadelphia, it became the western terminus for all Pennsylvania Railroad electric-locomotive operations.

In the early days of railroading, multiple train control was governed by "smoke signal", meaning that each train crew kept a lookout for other trains' steam-locomotive smoke (exhaust). This often led to arguments as two trains stopped head-to-head while their crews debated who had the right of way and who had to back to a siding where the trains could safely pass. Sometimes, when an engineer missed another train's "signal", consequences more dire than an argument ensued.

Thus was born the block system of train control, where trackage was arbitrarily divided into lengths called blocks. Only one train was allowed in a block at a time, and access to the block was controlled by a signal at each end. The development of the telegraph allowed employees controlling the signals to communicate the location and status of trains along the railroad, improving overall efficiency immensely. As mechanical systems grew more reliable, some of these block stations also took on the remote control of nearby track switches. The first mechanical systems consisted of shoulder-high levers that moved long rods that led to the track switches, physically governing the position of switch rails and thus controlling the direction of train travel. The area that could be controlled by one of these systems was restricted by friction inherent in the metal linkage (a series of pipes, rods, rollers and pins) and the limitations of human strength. Later systems were electromechanical, in which small levers caused electric motors to perform the same function, and electro-pneumatic, in which small levers changed the flow of air in pipes that led to the track switches and moved them. Both of these systems allowed the control of larger areas, since the limiting element -- man -- was removed from the physical linkage.

With the addition of power to the linkage came a new safety feature, the interlocking of signals, where the signals and track switches controlled by a switch tower were

interlocked in such a way that an operator could not set up routes that conflicted. When a route was set up for a train, alternate and conflicting routes were automatically locked out. This added immeasurably to the safety of rail transportation wherever it was applied. The term "interlocking" quickly became used to describe not the process but the physical plant -- the switch tower controlled an "interlocking".

Invented in the 1930s, Centralized Traffic Control, often called CTC, began to find more widespread acceptance during the 1940s. With CTC, in which linkage to controlled tracks was electrical, control over much larger territory could be consolidated into one location. At this point the future of interlocking towers was jeopardized. Western [U.S.] railroads, where long single-track main lines were dominant, began centralizing their train control in the 1940s. Modernization has taken longer for eastern railroads, whose financial difficulties in the 1950s, 1960s, and 1970s prevented much investment in fixed plant. Further, the complicated track structures associated with operations in and around Eastern metropolitan population centers were more difficult and costly to convert to centralized control.

The latest version of CTC is by computer, where the linkage is electronic. The limit once again has become man, but it is the mental limit of how much a man can remember, not the physical restriction of how much a man can push or pull. The addition of computers to CTC has hastened the phaseout of interlocking control from local, individual, lineside buildings. Every interlocking tower in the country is probably now marked for eventual replacement by this centralized form of control. The time for centralized control in the East has finally arrived, as evidenced by Consolidated Rail Corporation's recent consolidation of all of its Harrisburg Division train control into one "movement office" at Harrisburg. Here four dispatchers do the work that took more than 60 operators just a few years ago, replacing approximately 60 interlocking towers. The area controlled is vast: from Harrisburg to Hagerstown, Md.; from Harrisburg to Alburtis (just outside of Allentown); from Reading to Phoenixville; from Marysville (just west of Harrisburg) to Perryville, Md; and all of the Shamokin anthracite coal country -- Reading to Mt. Carmel Junction and Pottsville. The movement office is nearly two miles from the nearest tracks, but they still watch trains go by on their computer consoles. Their duties are similar also, in that they control switches and signals, but now they do it by touching computer screens, not by throwing levers.

When Harris switch tower was put into service on April 26, 1930, it was one of the most modern facilities of its type on the Pennsylvania Railroad. It still represents one of the latest types of interlocking tower built in the United States. At approximately the same time it was opened, technological advances in signal control and circuitry made remote control of railroad junctions possible, and from the 1930s on, few interlocking towers were built. The opening of Harris tower itself allowed the Pennsylvania Railroad to close three older nearby interlocking towers. This consolidation meant that 12 employees instead of 21 could control train movements in the same amount of territory. This area was a corridor approximately 4000 feet long and 15 tracks wide, stretching from the north end of Pennsylvania station to Herr Street. Harris switch tower controlled the passage of the vast majority of passenger trains, local and express, into and out of

Harrisburg. Since its opening, the Broadway Limited, the Spirit of St. Louis, the Red Arrow, and countless other trains, named and not, have passed daily through Harris, control; nearly 100 in a day's time during its peak period, trains ridden by movie stars, presidents, dignitaries, soldiers going to war, and countless "common folk". Many freight trains also came under its control during its 60 years of operation.

Harris switch tower is important for the role it played in the operation of the railroad. Interlocking towers were the unsung heroes of the railroad. Unlike stations, which were the highly visible facade of the railroad, towers were more often than not in out-of-the-way locations, their function unknown to the traveling public. Each tower, however, played a vital role in maintaining the continuity of the traffic on the railroad, and in preventing mishaps. An operator in a tower, at the instructions of a supervising dispatcher who kept track of the movements of trains over a wide territory, manipulated levers to change the settings of the switches and signals. Another important job of the operator was to report train locations to the dispatcher, and to "hand up" orders to the trains' crews informing them of schedule changes, temporary speed restrictions, work in progress, or other conditions that affect how the on-board crew members should conduct their jobs. Also, tower operators observed passing trains for any obvious irregularities that could jeopardize safe operation. An operator could alert a train crew if anything unusual was sighted (such as a door left open, an overheated axle bearing, or a load shifted on a freight car.)

Because of its behind-the-scenes yet extremely important involvement, Harris switch tower is a symbol of the day-to-day operation of a railroad, and is a monument to the hundreds of employees who worked within it over its 60 year life to keep the movement of trains through Harrisburg safe and smooth. When Harris tower was built, and for some decades after, its owner, the Pennsylvania Railroad, was the largest railroad in the world, and the largest employer in the nation. At the end of 1929 it employed 183,260 persons, and had a payroll of \$349,474,248. This influence extended to Harrisburg, where its tracks stretched the length of the city. The Pennsylvania Railroad, in combination with the Reading Railroad, was the largest industry in town, employing 8,000 of the 21,000 potential wage earners of the city's 80,000 population. [The next largest employer in town was the state, with 5,300.] The town of Enola, just across the Susquehanna River, was dominated by the largest railroad yard in the world. That the railroad was a dominant force in town may be discovered by the realization that in the first half of the century the newspapers of town (there were three) all carried daily columns devoted solely to railroad news. Scarcely a day passed that the Pennsylvania Railroad was not also mentioned elsewhere in the paper as a newsmaker.

Harris switch tower is also significant in that it is an example of a viable, working interlocking tower. Because of its late build date, it is virtually unchanged from its as-built state, retaining even the majority of machinery installed in 1929 to control train movements. It was built during what many consider to be the "golden years" of railroading, operated 40 years under the parentage of the self-proclaimed "Standard Railroad of the World" (the PRR), then under the ill-fated Penn Central, and finally under Amtrak control.