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Got the Time? At Grand Central, It Has Never Been That Simple

By MICHAEL LUO

For years, they have maddened riders. Above information booths, on walls and on platforms, there they are — a babel of different times on different clocks in a place that depends mightily on people knowing the right time.

Several times a day, riders troop into the stationmaster's office in Grand Central Terminal to complain. Even the four faces of the signature brass clock above the information booth in the main concourse, irate riders often point out, are different.

The culprit is not the clocks themselves but something that resembles a giant filing cabinet, tucked away in a closet above one of the Beaux-Arts terminal's platforms. It is a 15-year-old master clock system, with dials in the middle and two digital displays.

It connects each day at 3 a.m. by shortwave radio signal with the National Institute of Standards and Technology's atomic clock in Boulder, Colo., and then sends electrical impulses to the terminal's 20-some historic clocks.

The problem is, the electromechanical devices in the terminal's master clock system that are sending these signals are becoming increasingly unreliable, making the clocks inaccurate. What's more, the time displayed on video monitors throughout the terminal is controlled by a different system, not tied to the atomic clock at all.

Now, however, officials at Metro-North Railroad, the keepers of the clocks in Grand Central, are setting out to improve things for the 700,000 people who depart or arrive daily on 550 commuter trains and countless subways. Next month, they will install a new $59,000 master clock that will synchronize every second of every day by satellite with the Boulder atomic clock to ensure accuracy up to a fraction of a nanosecond, which is a billionth of a second.

With the new system will come devices that will be entirely electronic and will not, like the current equipment, use mechanical parts to send pulses to the historic clocks. Then all the older, separate systems will be done away with, unifying time in the terminal for the first time in its 91-year history.

In other words, if you are late, don't blame the clocks.

"We will have a dependable clock system that everyone knows is dependable," said Steve Stroh, superintendent of electrical maintenance at Grand Central.

Mr. Stroh has had the unenviable task of shepherding the current system through its recent changes. Digital clocks in the rail operations center are tied directly to the master clock, and so provide accurate time for those who run the railroad.

But several times a week, Mr. Stroh walks around the brass clock above the information booth, checking to make sure the faces show the same time. He insists that many riders' complaints come from the fact that the time looks different when the clocks' hands are seen from different angles. Sure enough, a series of inspections by a visitor proves his point.

But Mr. Stroh admits there are also plenty of times when the clocks have, well, plenty of times.

"You come in here and think you have a couple of minutes but run down and find the train's just not there," said Andrew Flint, 26, waiting by the historic clock in the main concourse to catch a train to New Haven on Friday.

Besides the problems with the master clock system, the historic clock's motors are also wearing out, Mr. Stroh explained. A few months ago, he sent one face's motor back to its manufacturer in Switzerland to be repaired.

As part of all the upgrades, new motors will be ordered for all four clock faces, along with a spare motor in case one breaks. Digital clocks will also be added to platforms, replacing old L.E.D. clocks that were taken down recently because they depended on the same unreliable pulse system.

Time has always been crucial to the running of railroads. Indeed, timekeeping, as it is known today, was essentially invented out of necessity in the late 1800's by a collection of railroads, including the New York Central, a predecessor of Metro-North.

Before the railroads, time was a local matter, set in each town according to the sun. Therefore, noon in Cincinnati, for example, would be slightly different from noon in Cleveland. But this was obviously a problem for railroads. Coordination of traffic on the tracks, as well as schedules for picking up passengers, depended on a standardized time system.

"A train could leave Syracuse at 12 o'clock and come into Utica, and it would still be 12 o'clock," said Pierce Haviland, a Metro-North employee who is also a railroad historian. "That wasn't working."

At first, railroad managers set up 100 different railroad time zones, but that proved too complicated. Finally, on Nov. 18, 1883, four standard time zones - Eastern, Central, Mountain and Pacific - were adopted by the railroads. At noon on that day, the time was transmitted by telegraph from the United States Naval Observatory in Washington to all the railroads in the United States and Canada. Twice a day thereafter, railroad clocks were resynchronized with the Naval Observatory's clock.

However, it was not until 1918, when Congress passed the Standard Time Act, that the railroads' time zones became the standard for everyone in the United States.

"They didn't invent time, obviously," said Mr. Haviland. "But as far as standard time and time zones, they certainly mandated the need for it, and they were the first adopters."

In recent years, more and more transportation hubs, along with telecommunications companies, radio and television stations and utilities, have begun upgrading to satellite-based technology. Such technology allows them to synchronize with one of the country's official atomic clocks down to the nanosecond.

The term "atomic clock" is often misunderstood, said Michael Newman, a spokesman for the National Institute of Standards and Technology, which provides the official time for the United States. It is not nuclear-powered, but simply a timekeeping device that uses the regular vibrations of a specific atom to keep time in somewhat the same way that a clock pendulum's movements mark the passage of time. Most, if not all, airports in the country now depend on a system similar to the one Metro-North will be adopting, tied to Boulder's atomic clock. Railroad stations, however, have been slower to follow.

In November, Penn Station upgraded to a system that connects to the atomic clock, according to officials at Amtrak, which owns the station. Previously, the station relied on a more haphazard system that required someone to actually call up a place that had an atomic clock to check that the station's clocks were synchronized correctly. The station's clocks would then be adjusted by computer.

Faced with conflicting information, veterans of Grand Central have learned to employ their own systems to keep track of time.

"I never look at the clocks because I don't trust them," said David Turner, 23, a student at Vassar College in Poughkeepsie who often takes trains in and out of the city on weekends. "I just use the clock on my phone."

Many Metro-North workers do not trust the clocks either. Train conductors use their own wristwatches to decide when to leave, said Dan Brucker, a spokesman for the railroad, although they are required to synchronize their watches periodically with either the video monitors or the operations center.

The railroad prides itself on a reported on-time performance of better than 95 percent. But for anyone who has ever been frustrated by a late train, there is now the obvious question: Which clock are they using?