

**How the New York Central Railroad Set  
the U.S. Speed Record for a Passenger Train  
in July 1966**



# **The Flight of the M-497**

Hank Morris with  
Don Wetzel

(Cover) Don Wetzel strikes a heroic pose in front of the M-497.  
(Inside Cover) The M-497 at Bryan, Ohio, at a point near where the timing point was located.  
(Both, collection of Don Wetzel)

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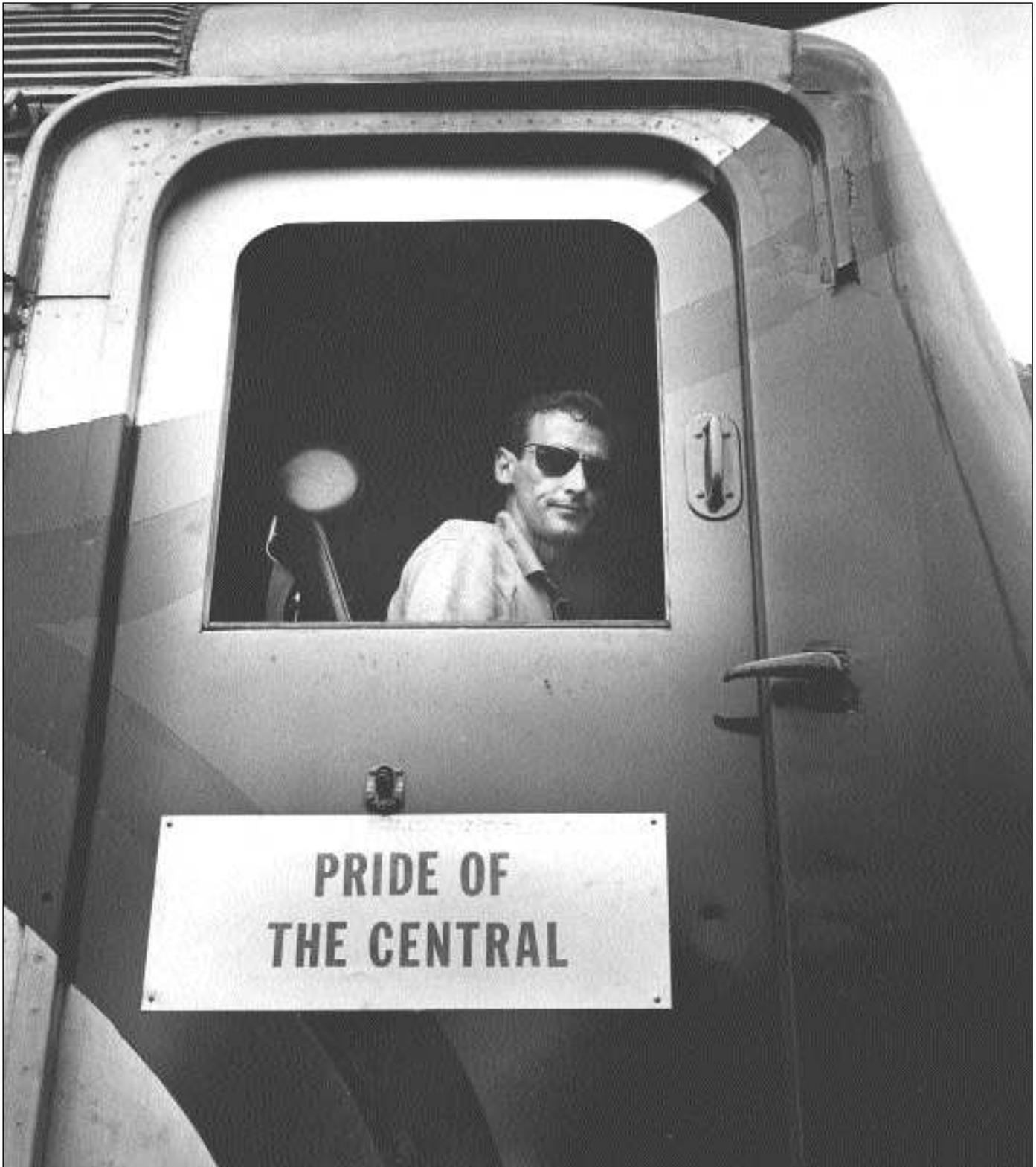
Manufactured in the United States by Hank Morris

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*Dedicated to--*

*Our wives and children who tolerated our devoting so much time to this project*

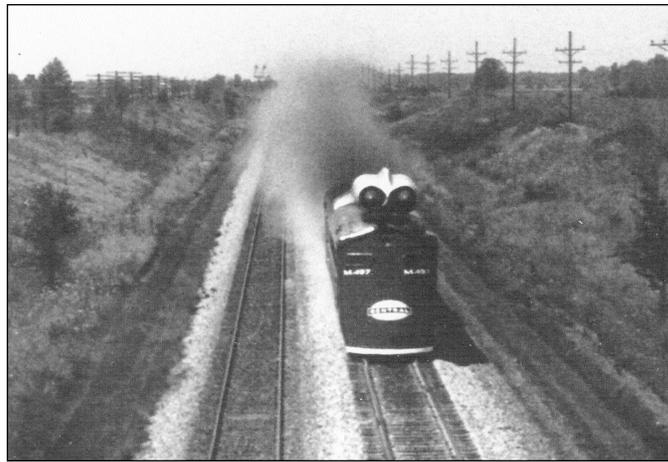
*--Hank and Don*



Don Wetzel looks out of the engineer's cab for the NYC's cameraman. The sign was removed after the first run because some felt that the sign might be interpreted to mean Don, rather than the M-497, itself. (Collection of Don Wetzel)

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The M-497 during the second run, which is the one in which it set the U.S. Speed Record for a passenger train. (Photo, Howard W. Ameling)

# The “Flight” of the M-497

The jet engines thunder with a deafening roar as the pilot and copilot push their powerful test vehicle toward its limit. Instrumentation meticulously measures the stress on metal parts, the rising temperatures, and the vibrations created by mounting velocity; all the while monitoring the speed of the machine. Then, the run is over! Observers announce a new speed record.<sup>1</sup>

The pilot and copilot step down from their test vehicle. They remove their white helmets emblazoned on the front of which is a New York Central Railroad logo! They chat with onlookers. Behind them sits a TRAIN!?!

This surrealistic scene took place, not at a secret experimental United States Air Force base hidden in acres of mountain-surrounded wasteland, a la “Area 51,” but in a tranquil stretch of bountiful farmland in western Ohio. The time frame is the summer of 1966.<sup>2</sup>

Donald C. Wetzel, the Assistant to the Director of Technical Research of the New York Central Railroad’s (NYC) Technical Research Laboratory<sup>3</sup>—located at the Collinwood Yards on Cleveland’s East Side—was the engineer [read “pilot”] that day as the vehicle established a land-speed-record for a train<sup>4</sup> that still stands. His “copilot” was none other than the President of the NYC, Alfred E. Perlman!

It all happened during a nadir in American railroad history. A year and a half later, two of the country’s best-known and most-loved rail lines, the New York Central and the Pennsylvania Railroads, would be forcefully “shoehorned” into one of the least-beloved, the Penn Cen-

tral (consummated on February 1, 1968<sup>5</sup>).

## GENESIS OF AN IDEA

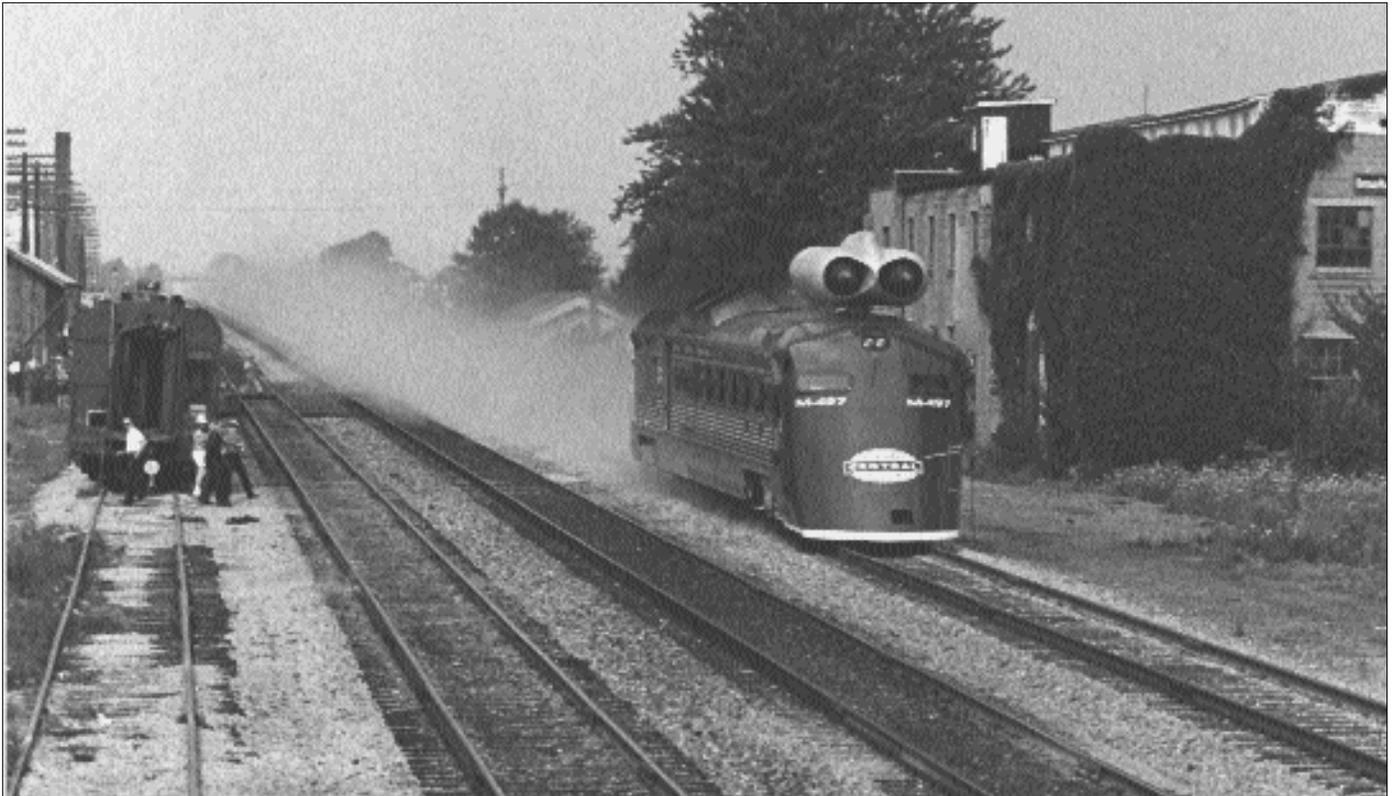
In the 1960s, passenger rail travel was dying out all over the nation. Its demise attributed to two factors:

1. The Eisenhower Interstate Highway System (Federal-Aid Highway Act of 1956 signed by President Eisenhower without fanfare in a hospital bed on June 29, 1956. The original name was the “National System of Interstate and Defense Highways.” In October 1990, the first President Bush signed legislation changing the name to the “Dwight D. Eisenhower System of Interstate and Defense Highways”<sup>6</sup>)and,

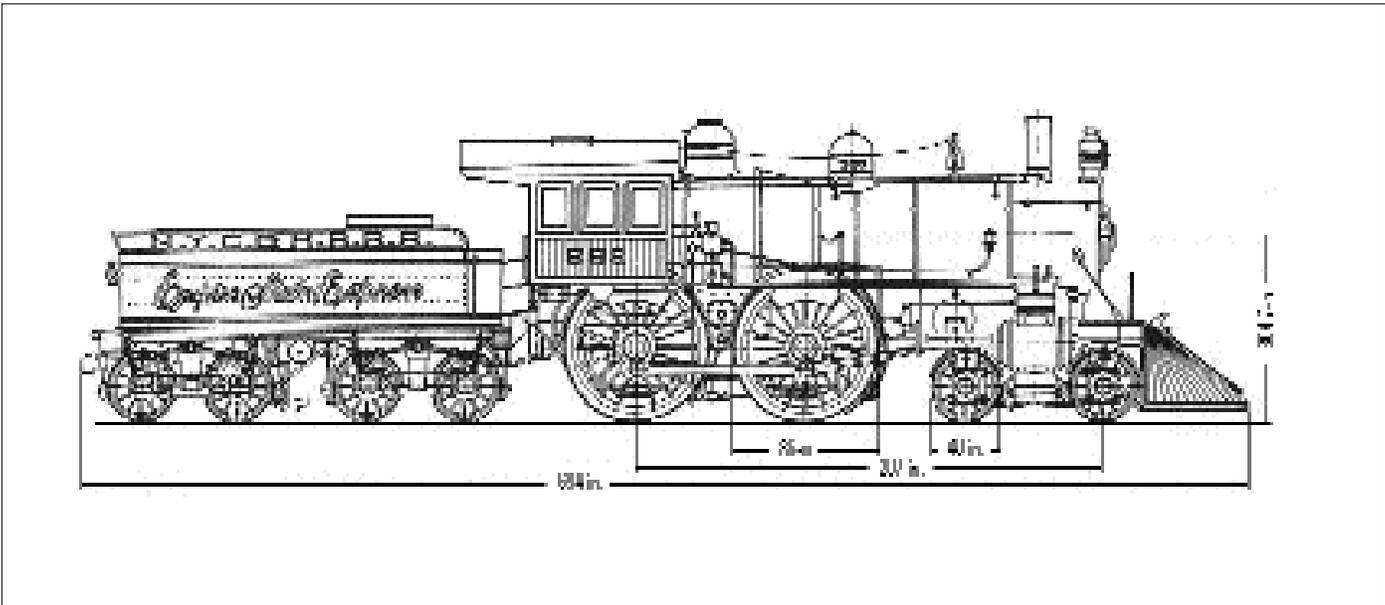
2. The increase in airline passenger travel. No small thanks to the widespread introduction of mass-produced jet-powered aircraft.

American railroads were losing market share to automobiles well before World War II, but its share was artificially propped up by wartime restrictions on private-car usage. Immediately after the war, the rail’s passenger role continued to plummet.<sup>7</sup>

The National Passenger Rail Corporation (Amtrak) wouldn’t be born for another decade (May 1, 1971, to be exact<sup>8</sup>). Even on the busy East-Coast Corridor (Boston to Washington, D.C.), passenger traffic was forced to endure the indignities of dilapidated rolling stock, archaic motive power, less-than-helpful personnel, and “maintenance-deferred” roadbed. Yet, amid all these woes the New York Central was in the process of testing high-speed, jet-powered rail service.



The M-497 setting the U.S. Speed Record of 183.85 mph on July 23, 1966. (Collection of Don Wetzel.)



New York Central's *Empire State Express* No. 999 reached a speed of 112.5 mph on May 10, 1893. (Redrawn by Hank Morris)

Like today, politicians and concerned citizens were worried about "Megtrans." Megtrans is an acronym for Megalopolitan Transportation—a megalopolis being a heavily populated stretch in which one metropolitan cluster of city and suburbs virtually grows into another. It was hoped that the jet-powered rail car would provide operating data that could herald a new era in railroad commuting in these megalopolitan areas.<sup>9</sup>

Brought to the New York Central from the Denver & Rio Grande by Robert R. Young, Alfred E. Perlman (1903-1983), was president of the NYC in the 1950s. He would survive to be the president of the ill-fated Penn Central Railroad, too.

Mr. Perlman was, and still is, recognized as one of the foremost railroad executives in the nation. After leaving the Penn Central, effective December 1, 1970 Alfred E. Perlman was recalled from retirement and elected as the tenth president of the Western Pacific Railroad.<sup>10</sup> On April 30, 1983 Alfred E. Perlman died. He was 80 years young.<sup>11</sup>

Al Perlman supported a wide range of tests at the New York Central's Technical Research Center. The Tech Center, opened in 1957, was one of the few laboratories in America dedicated solely to railroad research. Their mission, as charged by Perlman, was to make trains run safer, faster and at less cost. While the "railroader scientists" did routine research such as humdrum, albeit necessary, procedures as material stress tests and engine performance runs, to improve equipment on the NYC, they also conducted numerous "over-the-edge" experiments, such as:<sup>12</sup>

\* Using giant floatation (dunnage) bags to protect fragile cargo, guided missiles, nuclear reactors, etc. and,

\* Using plastic explosives on railroad track intersections (diamonds and switch points) to harden the steel and extend their operating life.

One such idea hatched by the crew at the Tech Center in 1965 was to use a jet engine to propel a locomotive. Consideration had even been given to installing a Rolls

Royce "Dart" turbo-prop engine from a Vickers "Viscount" aircraft into an EMD "F" unit. James J. Wright, then Director of the Tech Center, submitted the idea of trying a pure jet engine to Al Perlman, but it was shelved. Shelved, that is, until 1966.<sup>13</sup>

The folks at the NYC were all too familiar with the search for speed. After all, it was the home of the Empire State Express No. 999.

In the late 19<sup>th</sup> century, as railroad speed wars for passenger service started to erupt, one of the tactics was to build passenger locomotives with ever-larger driving wheels. The limited weight such a locomotive could pull was not so much of a problem for a passenger train (Passenger trains are less heavy than freight trains.), particularly those with wooden cars, and a fast acceleration rate is important only in commuter service. NYC 999 was one of those high-driven engines. [You'll note that through the early 1900s one also found Atlantic types (4-4-2) with similar high drivers for express passenger service on many other railroads.]

The storied run occurred on May 10, 1893 over the NYC's Syracuse-Buffalo line near Batavia, about 37 miles from Buffalo. Hauling four cars, No. 999 reached a speed of 112.5 mph.<sup>14</sup>

But, we digress ...

In January 1999, Don Wetzel reminisced, "The idea was shelved, but I know Jim Wright had talked to Mr. Perlman about it—might even have written him a letter, but the idea was deferred. And then, it had to be over a year later, I was in Jim Wright's office—brown-bagging it—having a sandwich, just talking, and a call came in from Mr. Perlman. They talked—Jim put the phone down and said, 'guess what?'"

"I asked 'What's that?'"

"He said, 'You're going to run a jet-powered Budd Car.'"

"I said 'WHAT?!?'"

"He said, 'We just got approval to do it.'"

He didn't say it right then, but it was the typical good

news-bad news scenario. The good news is, we're going to do it, the bad news you have to do it in 30 days. This was a bolt out of the blue, and just before July 4<sup>th</sup>, a long weekend that year."<sup>15</sup>

So anxious was Al Perlman, that Don Wetzel, and his colleagues were given a blank check to put the program together. Don Wetzel commented, "The Collinwood back shop was scheduled to be shut down for personnel vacation at that time. The project was so hot, however, that the Lab was empowered to bring in any shop personnel deemed necessary for the project—straight time became, of course, double time—overtime turned out to be double time and one half. A lot of money was made by the shop people—and well deserved. Union agreement rules were never brought up once! They all had a real pride of accomplishment."

### **BUILDING THE JET-POWERED M-497**

The NYC used its No. M-497<sup>16</sup>, a 13-year-old Budd RDC-3, (a self-propelled diesel commuter car, which seated 48 passengers—12 rows of 2 x 2 seating—and had both a baggage and RPO (railway post office) compartments. Known as a "Beeliner" on the NYC<sup>17</sup>). The first of three RDC-3s<sup>18</sup> bought by the NYC,<sup>19</sup> the M-497 was used in several assignments, first in "doodlebug-style" service running between Detroit or Bay City to Mackinac City, Michigan run,<sup>20</sup> then on the St. Lawrence Division be-

tween Syracuse and Massena, N.Y., and finally in Harmon-Poughkeepsie, N.Y. suburban service.<sup>21</sup>

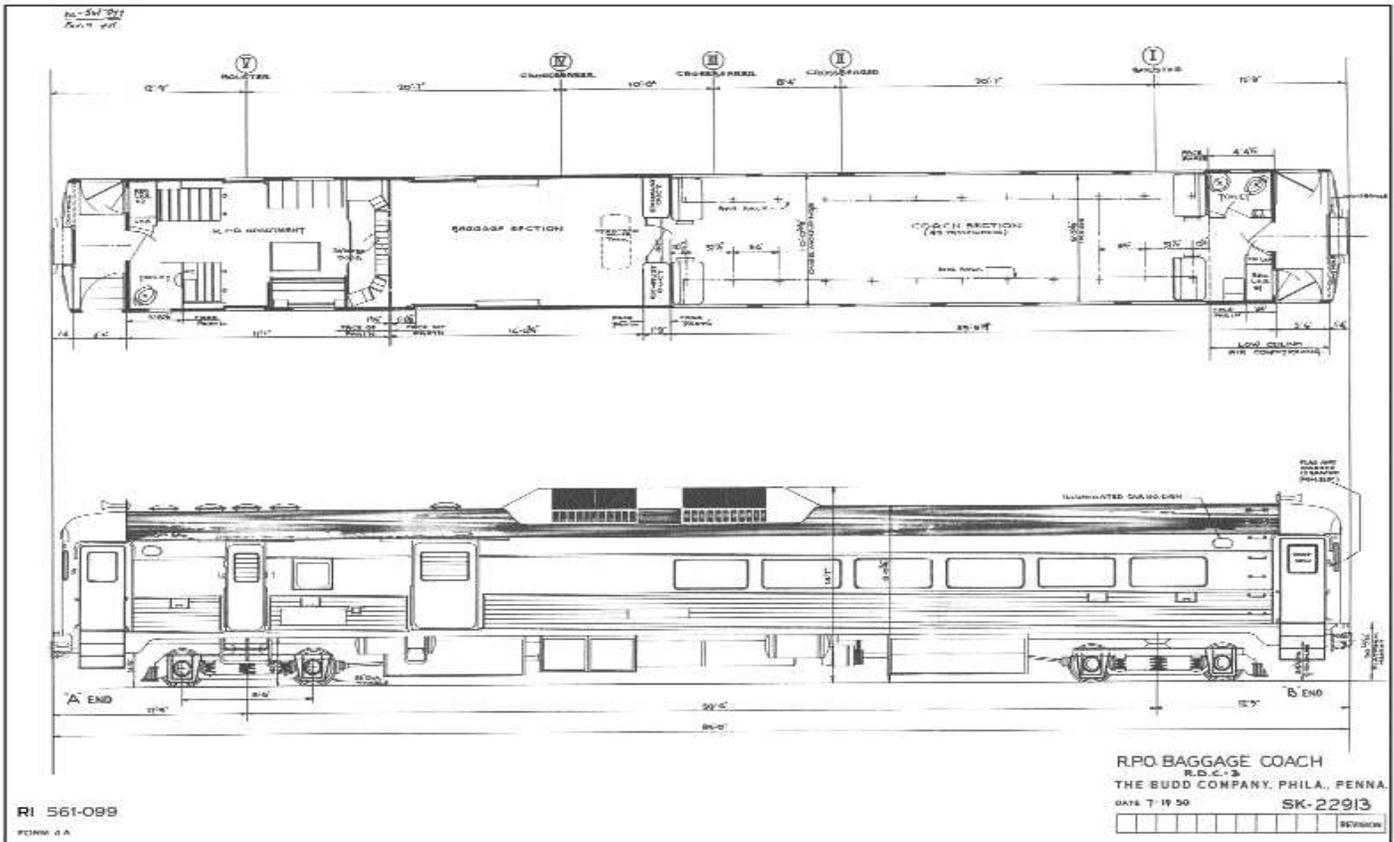
Chuck Crouse's book<sup>22</sup> shows the following: b/n 5705, RDC-3 was built in Jan. 1953 for NYC as M-497.

The NYC towed M-497 to Cleveland and its Collinwood Technical Center/back shop, where the drive shafts were disconnected from the engines. Some of the passenger seats were removed to make room for the jet engine mounting structure. More than 50 instruments to measure speed, stress, bearing temperatures, and ride characteristics were installed in the baggage area. Fuel tanks for the jets were fabricated and installed in the RPO section. The stock tapered-tread wheels were replaced with wheels having cylindrical treads. Small radio transmitters were affixed to the front axles to telemeter stress data to the on-board recorders. Electronic and mechanical sensors studded other parts of the locomotive. Real-time data was written to magnetic tape, displayed on oscilloscopes, and recorded by direct-writing oscillographs.<sup>23</sup> Remote control cameras made a visual record. Sadly, the gun cameras failed and didn't get a frame. The track irregularities were recorded digitally.<sup>24</sup>

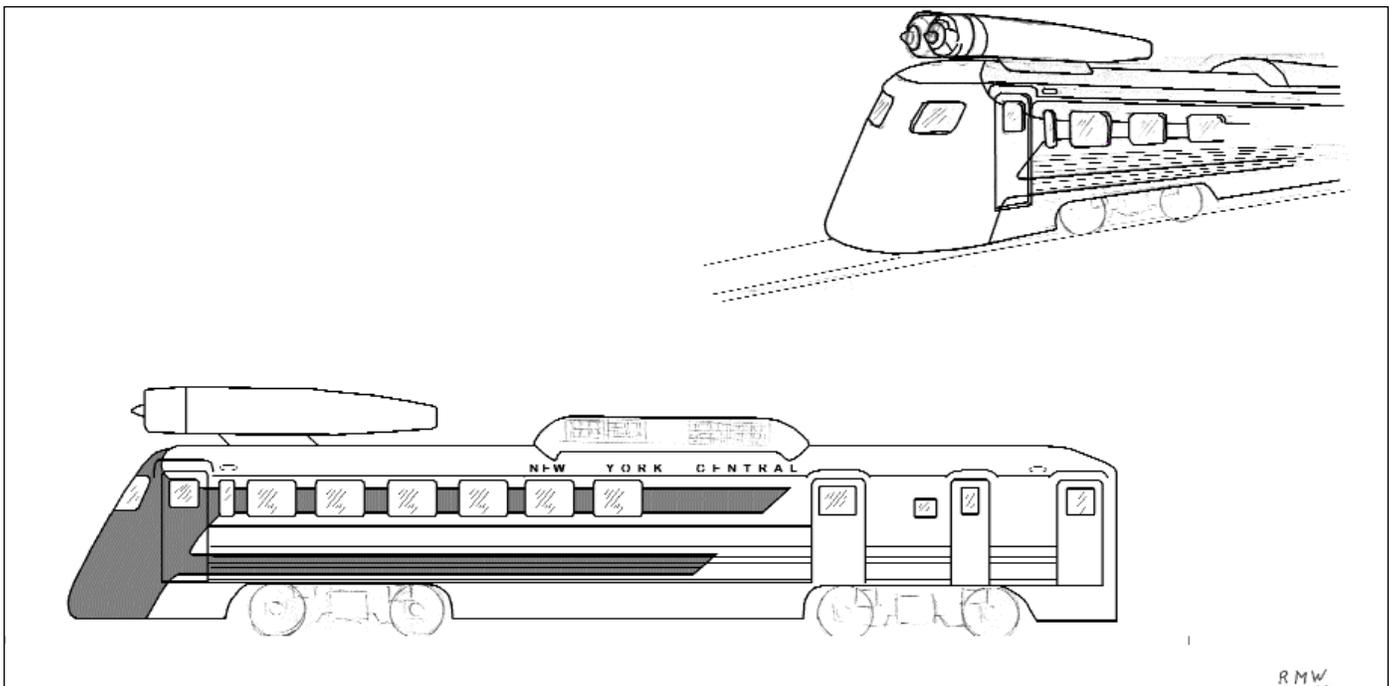
While this may seem very high-tech for 1966, the basic idea for such a real-time rolling laboratory had been used by the NYC since the 1930s, when instrument-filled baggage cars were used to test various track and locomotive performance.



The original M-497 in its "Beeliner" paint scheme. The 13-year old Budd RDC-3 was drafted from its service on the St. Lawrence Division where it ran between Syracuse and Massena. (Collection of Don Wetzel)



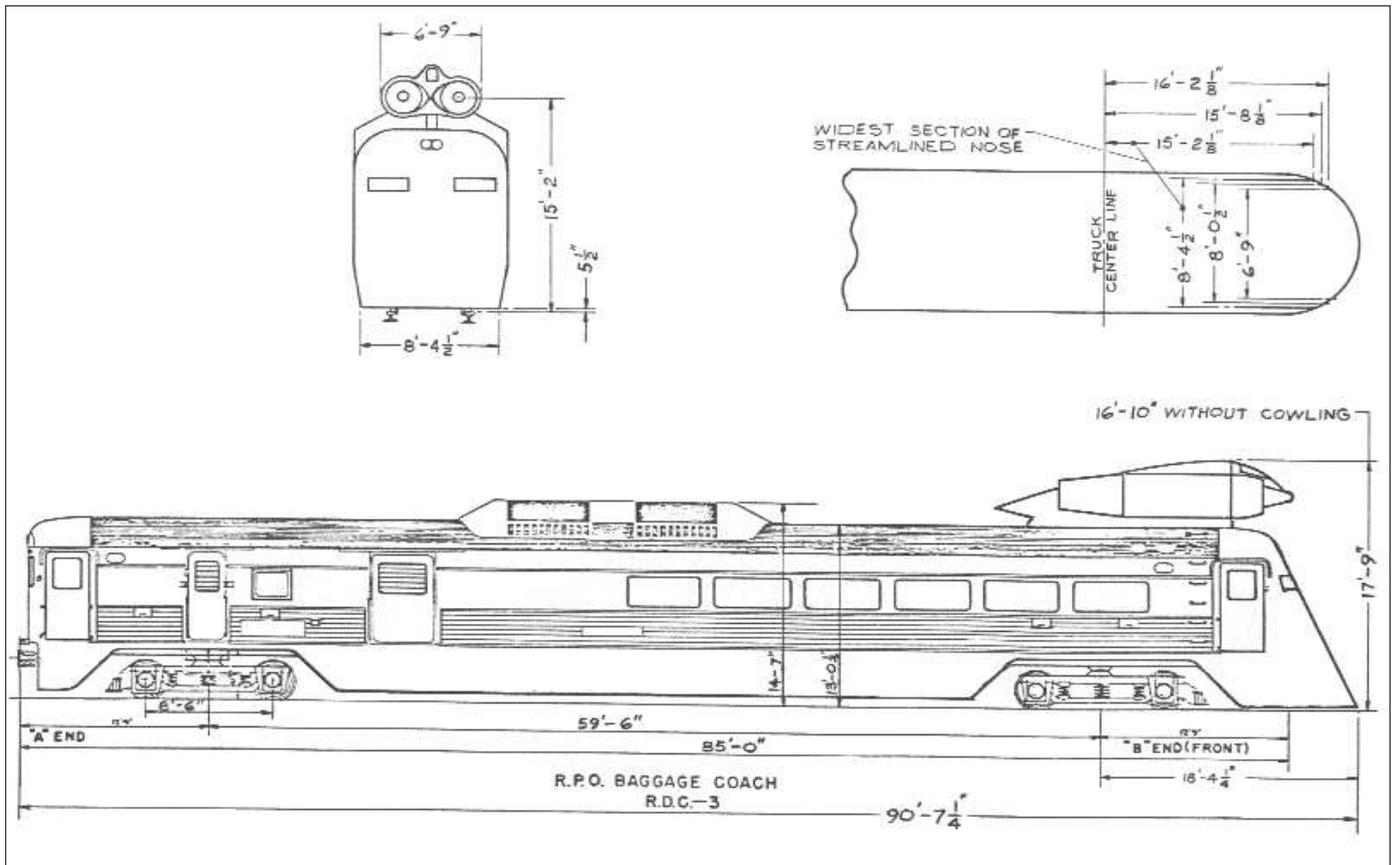
The plan of the original, "from factory" M-497 drawn by the Budd Company. (Collection of Don Wetzel.)



Don Wetzel's wife, Ruth, sketched the M-497's preliminary appearance and paint job. This drawing was used to help determine the final cosmetics. (Drawn by Ruth Wetzel)

A streamlined metal fairing, designed by Don's wife, Ruth, a commercial artist [and tested first in a wind tunnel before the design was finalized], was installed on the "B" end of the car. The windows inserted into the fairing were number boards from EMD F-units.<sup>25</sup> Wind tunnel tests were conducted at Case Western Reserve University in Cleveland—Dick Shackson's alma mater. The M-497

was decorated in a fancy, futuristic gray, silver and black paint job<sup>26</sup> which rapidly earned it the nickname "Black Beetle" by the media.<sup>27</sup> Other than bringing the car up to "as built" specifications, no other changes were made to the Budd RDC-3. The total cost of the experiment was officially put at between \$30,000 and \$35,000 [here, accounts vary on the amount-hm]; the actual figure was



This dimensional drawing was made by Tom Preisel. It shows the final M-497 design. The fairing's actual shape was developed based on wind tunnel tests conducted at Case Western Reserve University, Cleveland. Note the more angular nose fairing and the cut-outs around the wheels. (Collection of Don Wetzel)

probably many times that. (The company boasted that the project did not use one cent of government funds.)

Don Wetzel and his crew adapted two surplus General Electric J47-19 turbojet engines, each producing 5,200 pounds of thrust and which had been designed as boosters for the USAF Strategic Air Command's Convair B-36 "Peacemaker" 10-engined intercontinental bomber. The airplane had six Wright R-4360 reciprocating "pusher" engines (4360 indicates the cubic inch displacement of the engine) plus four J47-19 jet engines [two per wing], mounted in outboard, under-wing pods. The jets permitted increases in maximum takeoff weight, payload, speed, and service ceiling.<sup>28</sup> At Collinwood, the engines were rotated 180 degrees in their mounts because the pod containing the two engines was inverted on the M-497 from its normal operating position on the aircraft.<sup>29</sup>

On the M-497, the jet engine pod was mounted just above the engineer's station at the "B" end of the car. Don Wetzel's original design had the jet engines at the rear, but this changed after his wife Ruth, making her point with some sketches on a dinner napkin, suggested that the locomotive would look better with them mounted forward. This switch, along with canting the engine pod down five degrees, helped load the front of the M-497 and keep the nose of the locomotive securely on the tracks. However, the car was not nose-heavy and was fairly balanced because of the fuel tanks in the rear.<sup>30</sup>

A foolish rumor circulated that the M-497 was actually airborne over road crossings. [In correspondence, Don

Wetzel insists that this statement is not factual. He should know!—hm.]

The Budd car was designated M-497. (Since its purchase from Budd, the RDC-3's actual NYC road number had always been M-497 and it wasn't changed just for the test.<sup>31</sup>) Although the Media called it the "Black Beetle,"<sup>32</sup> on the engineer's door was a plaque reading "Pride of the Central."<sup>33</sup> The plaque was removed because someone thought it might be interpreted as referring to Don Wetzel rather than the M-497.<sup>34</sup>

As Don Wetzel recalled: "What we did, and it started as just another wild idea, was talk about setting some speed records using jet power for the attempt. The original sketch of the jet train had the jet engines mounted on the rear. We had an original Budd car drawing with the engines shown on the rear. I don't know why, but for some reason, that didn't appeal to me [or his wife, Ruth, it appears]. I can't give you a good, scientific reason why—I just didn't care for it. I always found that if something looked good, it usually worked pretty well. It's a curious thing to say, but, for example, airplanes that look good usually fly well."<sup>35</sup>

Don should know. He had started to take flying lessons at age fourteen at Parma Airport, a small airport outside of Cleveland. While he served in the Marines Corps, he received further pilot's training.

When Don joined the NYC in 1950 as a Locomotive Fireman, he later became one of the last persons to be qualified to run steam locomotives. So, it's ironic that Don





Larry Simmons is checking out some of the sensors used for the axle displacement measurements. (Collection of Don Wetzel)

Wetzel, one of the last steam engineers on the New York Central was, on the eve of his 20-year plus railroad career, its *first and only* jet engineer.

One of the reasons why Don Wetzel was chosen to make the run because he was locomotive engineer, a pilot, and also familiar with jet engines. "Rather a unique combination," he says. "I was already the Chief Pilot for the railroad (flying the NYC's converted WWII B-25 'Mitchell' bomber), and I had conducted various railroad research projects."

### "FLYING" IN OHIO

The M-497 was taken to the stretch of New York Central main line that runs between Butler, Indiana, and Air Line Junction (west of Toledo), Ohio—the longest multiple track railroad line in the U.S.—68.49 miles. At that time, the line consisted almost entirely of standard, 39-foot sections of 26-year-old bolted 127-lb/yd Dudley Modified rail (with one short four-mile portion of continuously welded rail). The stretch was picked by C.T. Popma, (known as "The Jolly Green Giant" because of his physical stature) NYC's Assistant Vice President of Engineering, from a number of proposed suitable sites on the New York Central.<sup>36</sup> Popma brought the stretch of track up to the New York Central's first-class quality track specifications.

The track had been pounded by heavy freight trains for more than 26 years and the roadbed had received only normal maintenance.<sup>37</sup> "Except for the addition of the jet power, necessary to attain the ultra-high speeds required for the tests, we used ordinary tools under ordinary conditions to make a realistic study," said Mr. Perlman.<sup>38</sup> The use of the B-36's twin jet engine pod provided the least expensive source of 10,000, plus, horsepower required.

The M-497 was fired up for a series of test runs that were conducted on Saturday, July 23, and Sunday, July 24, 1966.<sup>39</sup> Al Perlman, was there, and having both observed and ridden the locomotive, he approved a series of runs

### The Flight of the M-497



You can see the pitot tube quite well in this photograph. What is not visible is the antenna that ran upwards from below the headlight toward the engines that was used for communication between Don Wetzel piloting the M-497 and Bob Kern, the pilot of the Twin Beech D-18 "chase plane." (Collection of Don Wetzel.)

to measure the effects of ultra-high speed.

Standard Budd disc brakes were used on the braking system of the test car. The unit was slowed by aerodynamic drag to about 120 mph. At this point, a normal brake application further reduced the speed to about 50 mph and was then released to allow the brakes to cool. Finally, a light brake application was made to bring the unit to a stop. During one run, when Wetzel applied the brakes, all eight wheels locked up and the car began to slide. They had entered a piece of track that had not been recently used. Leo Lombardo radioed Wetzel over the intercom that the instrumentation showed that the wheels had "picked up." Wetzel also saw the speedometer drop to zero and knew what had happened. He "kicked off" the brakes and made a lighter application and the stop was made—a bit farther than planned, however. Ray Swanson, who had the responsibility for the trucks, examined all the wheels and determined there were no flats spots—a potential test killer. The trucks, although completely rebuilt, were standard equipment.<sup>40</sup> During the first run, hot exhaust from the jet engines passing over the roof radiators caused the M-497's diesel engines<sup>41</sup> to overheat and shut down which meant, of course, that the engine-driven air compressors also ceased functioning. The only air available was that which remained in the main reservoir. For every run after that, the engine over temperature shut-down relay was blocked closed. Running out of air for the brakes would have been a serious problem—to say the least.

A Beech D-18 Twin Beech aircraft<sup>42</sup> was chartered and flew ahead of the charging RDC-3 to warn the crew if anything unexpected was in front of them. At one point, Bob Kern, the pilot of the D-18, warned Don Wetzel that there was "something" on the track ahead. It was too late to stop, so Don continued. What appeared to be a sheet of



The timing point which was used to determine the speed of the M-497. (Collection of Don Wetzel)

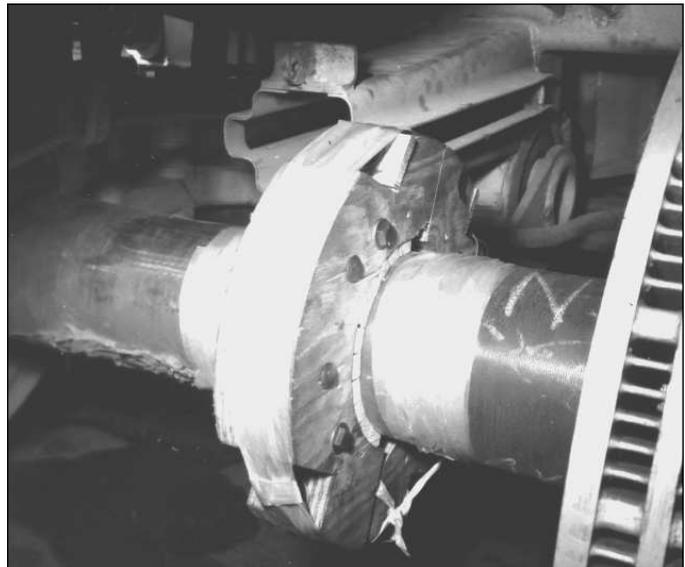
steel was a four- by eight-foot sheet of plywood placed on the track by someone. Wetzel recalls he had a large lump in his throat but he put his head down and only heard a slight rumble as the Budd hit the plywood. The M-497 was in communication with the Twin Beech by radio on an FAA "Unicom"<sup>43</sup> frequency.

Because there's been misunderstandings about the following, Don Wetzel wanted to set things straight. "Bob Kern was at a somewhat reduced cruise [speed], about 160/170 mph, at about 1,500 feet above ground level, and slightly ahead of us. As our speed increased, Bob called down that we were passing him. I radioed back and told him that he should 'put the nose down'. NEVER did I state or imply that we were near the Beech's  $V_{ne}$ <sup>44</sup> or that he couldn't go as fast or faster than we were going—merely that we were outrunning him at that time and under those conditions. He never outpaced us because we ended the run and he peeled off."<sup>45</sup>

New York Central personnel were stationed at each grade crossing, two people per crossing, regardless of whether it was a simple, unsignalled farm lane or gate-protected main thoroughfare.<sup>46</sup>

On Saturday July 23, 1966, Don Wetzel, the engineer/pilot, wearing a white jet pilot's helmet emblazoned with the New York Central logo, opened up the throttles of the GE jets and sent the M-497 rolling. According to Don, "We were just holding on. It was a ride!" With Jim Wright (also wearing a protective helmet<sup>47</sup>) in the copilot's seat and Al Perlman also up front. Richard H. Shackson, Leo R. Lombardo, and Lawrence C. Simmons, the instrumentation engineers, were in the rear at the consoles observing the scientific recordings during the test runs.<sup>48</sup>

According to Don Wetzel, "The speedometer on the M-497 was absolutely accurate. It was a Barco mechanical unit (as opposed to electronic) and had been closely calibrated to the M-497's wheel diameter—much closer than the shop would generally do because of the importance of



Axle strain gauges. The axle stress information was sent by hard wire to the instrument bay in the M-497. (Collection of Don Wetzel.)

accuracy associated with the project. We had special gears cut to double its indicated speed, i.e., the top speed of the standard Barco in use on the Budd was 120 mph—we double-timed it so its top speed was 240 mph and had a new face made. Also, I had a backup airspeed indicator which closely matched the Barco's indication. (That's a pitot tube you see under the headlight.) Both speed indicators closely matched the highly accurate trackside speed measuring device described in the technical report. Bottom line—we damn well knew how fast we were going at all times—and accurately."<sup>49</sup>

During the second run on Saturday, the movie camera posted at milepost 347+13 recorded the M-497 flashing by at the record 183.85 miles per hour<sup>50</sup>, (The car operated over a 300 foot section in 1.112 seconds<sup>51</sup>) near Bryan, Ohio,<sup>52</sup> a U.S. rail-speed record that stands to this day! The instrumentation used to validate the speed was considered accurate enough to be considered as "official."

According to Don Wetzel, the Budd got away from him and had reached 196 mph; but he had been instructed to go through the timing traps at 180 mph, so he was actually decelerating when the record was set through the speed traps! Once or twice, because of its' light weight, the M-497, failed to close a track circuit. The "track occupied" light went out at the dispatcher's board in Toledo giving the observers there a few moments of anxiety until the Budd car entered the next circuit and lit the track light again.

According to an article in the Saturday July 23, 1966 issue of the Toledo newspaper, *The Blade*, "Railroad officials were keeping quiet about the train's performance, but their smiles showed through...No comment would be made about the train's speed but veteran railroad observers and newsmen estimated the final run at between 160 and 180 mph....If confirmed by railroad officials, possibly at a press conference next week, the speed would give the NYC the record for a railroad run within the United States."<sup>53</sup> After the record run, because the crew



M-497 and its entourage prepare to leave Bryan, Ohio. The tests were over and the M-497 had a date with Al Perlman in New York City for a press conference. (Collection of Don Wetzel)

had not eaten, Al Perlman sent out for ham sandwiches (interesting in itself because Al Perlman was of course, Jewish) and cold beer. Needless to say, Rule G<sup>54</sup> was badly bent that day.

Four tests were made, two on Saturday and two on Sunday. One jet engine suffered a starter failure on Sunday. As a result, the Sunday runs were considerably slower, on the order of 90-144 mph.<sup>55</sup> As the car accelerated with one dead engine, Don Wetzel saw the “dead” engine begin to rev up because of ram air passing through it and he was able to accomplish an “air start” and did get the engine on-line for part of the run. While bringing the engine up to operating rpm, a bit of flame occurred and was seen in the exhaust by crossing guards who, mistakenly, thought the engine was on fire. Many of the shop people were on-board for one Sunday run to experience firsthand the results of their craftsmanship.

On Saturday, there was a two-hour delay between tests so that two eastbound trains could clear Bryan. Technicians finally gave the go-ahead for the second test.<sup>56</sup> While headed east and sitting in position on the westbound, waiting for the signal to go, a freight train, moving east on the eastbound (the same direction the M-497 was headed), passed the M-497. Al Perlman came out of his seat like a shot and wanted to know who let that train by. He was assured by Toledo that the freight was going to stop just ahead and wouldn't be a problem. What could have been a problem, however, was that a farm tractor had come loose from its tie-down and was hanging off the side of a flat car of the freight. The tractor missed side-swiping the jet by inches as it passed.

However, this is not the *world's* land-speed record for trains. That's held by the French TGV. For several years, the French railways tested ways to improve the speed of their trains. The culmination of these test programs was a new world speed record of 320.3 mph, set on May 18 1990.<sup>57</sup>

It is not the condition of the track which affected the speed of the train, according to railroad officials. Signals for the activation of crossing gates and flashers on the New York Central are set for 90 mph. This gives ample



NYC jet-powered snow blower X29493. This was the direct beneficiary of the surplus jet engines after the M-497's historic run. (Collection of Don Wetzel)

time for the crossing protection to go into operation before the train arrives. “But, when you're operating a train at twice this speed, it will require twice the distance for a warning. This means a tremendous expenditure of work and money,” said Ronald Mangan, Director of Applied Research at NYC's Technical Research Center.<sup>58</sup>

#### THE PARTY'S OVER

The M-497 was towed from Collinwood to New York City in a special train where it was expected to be shown at a press conference being held by NYC officials.<sup>59</sup> Due to clearances, the M-497 was brought down the west side of the Hudson River and taken across on a car float pushed by a New York Central tug. The sight of the jet car going across the river must have been striking. The nose streamlining dragged badly as the car came off the float and up the steep ramp. The M-497 was put on public and press display at the NYC 60<sup>th</sup> street yard.

At the press conference held on Tuesday, July 26 1966, in New York City, Al Perlman called the tests a success because they proved that high-speed rail service was feasible on a conventional right-of-way. However, the M-497 was little more than an improvised affair, the quickest and least expensive way to accomplish the immediate goals, i.e., “Can conventional equipment be used on conventional track?” It was never seriously considered for practical passenger service. (Perlman was the originator of the “hub” theory envisioning fast city-to-city trains operating at distances of 200 to 300 miles, leaving the long haul to the airlines.)

Today's modern, high-speed trains in France, Belgium, Italy, Spain, China, Korea, Australia, Japan, England, and the United States all use conventional diesel-electric or all-electric motive power on conventional although certainly welded and highly maintained roadbed.

After its moment of glory the M-497 was sent to the Beech Grove shops at Indianapolis, where it was dismantled. The trucks were reconnected to the engines and the seats restored. All signs of its short high-speed life were removed except for the blast deflectors which were added to the dome to prevent overheating. It returned to its Quotidian life as an ordinary NYC commuter car. After

# NEWS

*from the*



*ROAD TO THE FUTURE*

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AFTER 2:30 P. M.

TUESDAY, JULY 26, 1966

New York, N. Y. --A New York Central jet-powered test car, M-497, established a new U. S. rail speed record of 183.85 miles per hour during research operations last weekend, Alfred E. Perlman, president, announced today.

"The test car is a rolling laboratory," he said, "equipped to provide data never before obtained." Mr. Perlman stressed that while he is "gratified" the unit set a new speed record, the information accumulated during the test period is more important and will assist the railroad in determining future policy with regard to rail passenger services. "This is part of Central's overall forward planning in projecting the future of its passenger business," Mr. Perlman said. "It includes a marketing study, utilizing the latest technological and marketing tools to determine possible costs and revenues in order to set our future course."

Tests with the world's first jet-powered rail car were conducted

the tests, an unconfirmed report said that the M-497's first assignment was hauling commuters from Grand Central Station to Albany, N.Y.<sup>60</sup> [To confirm this fact, Don Wetzel conferred with Charles Smith, one of the top guns of the NYC Mechanical Department. He believes the M-497 rarely, and likely never, went past Harmon due to its limited seating capacity. *If* it did, it was towed in-train with one engine shut down and the other held at idle to reduce exhaust fumes but still run the AC.<sup>61</sup>-hm] It is known that the M-497 spent its last years as a pedestrian RDC3 running on the Hudson Line between Poughkeepsie and Harmon for Metro-North.<sup>62</sup>

As of a result of the Penn Central Merger (1968) M-497 was renumbered No. 97, and renumbered again in 1969 as No. 98. It was maintained in Croton Harmon, N.Y. and usually used on upper Harlem and Poughkeepsie runs. It was sold to Conrail in May 1976.

The ex-M-497, ex-No. 97 actually was signed over to MTA as No. 98 but never ran for MTA. The car was shopped and cannibalized and finally retired in December 1977. After sitting ignominiously in the deadline surrounded by the weeds of Croton East yard for seven years, it was finally scrapped by Metro-North in 1984.<sup>63</sup>

## JET SNOW BLOWERS

After the M-497 tests, Don Wetzel and his team reused the jet engines for another research project they had been working on, a high-powered snow blower for opening ladder tracks in switching yards. In tests at the NYC's Buffalo yards, the jet exhaust nozzle angle was a bit too steep, so the jet efficiently cleared the rails by blowing around a lot of ballast, some of it through a bar's front window., as all onlookers (except the hapless operating technician) ran for their lives!<sup>64</sup>

It also blasted most of the ties and ballast from under them. But, after a few adjustments, the blower proved less destructive, and it eventually went into regular service, becoming a prototype for myriads of jet-powered snow blowers now found in service on many railroads across the country.

## RETROSPECTIVE

Although federal transportation officials and other railroads dismissed the M-497 as a publicity stunt staged to encourage federal funding for high-speed rail, the test itself was taken seriously by many. Termed "a standardized instrument platform" by J.J. Wright,<sup>65</sup> M-497 produced a great deal of usable data and suggested that high-speed rail was not only possible, but feasible on existing roadbeds. The NYC's showy use of jet engines to reach the record speed, though, is what cast a dubious tinge to the whole affair. However, where else could they have obtained so much power for such a low price?

The NYC's own press office cited Al Perlman's statement, "The technology for developing high-speed intercity rail transportation is and has been available to us for some time. The future of rail passenger services now hinges on the economic and marketing aspects of the business."<sup>66</sup>

It's believed that the M-497 had one real problem from day one, no real reverse. although a hydraulic pump was

attached to one of original propulsion diesels and drove a hydraulic motor coupled to an axle with a with a removable chain, The M-497 could be hostled in reverse—just not very fast. So a "chase locomotive," was assigned. It was the EMD GP7 No. 5759 [Class - DRSP-4n, order No. 5183, built in May 1953, and b/n No. 18463.] After each run, 5759 pulled the M-497 back when they wanted to test it again.<sup>67</sup>

No. 5759, with its original number intact, survived the Penn Central merger and lasted through to Conrail.<sup>68</sup> Although Conrail started rebuilding their aging GP7 fleet into 1,500 hp GP8s in the 1970s,<sup>69</sup> No. 5759 was listed as a GP7 on all available rosters until its demise on August 8, 1984.<sup>70</sup>

There were five major concerns about using pure jet power as opposed to turbo-shaft engines for real-world commerce raised by these tests:

1. Reverse movement—it was not considered an insurmountable problem, as conventional "bucket" or clamshell thrust reversers would have worked perfectly well, but not efficiently.<sup>71</sup>

2. In the second case, for revenue service, roof-mounted jet engines simply would not clear many of the older overhead bridges and would have to be "buried" in the carbody. [Remember, this was pre-double-stack-container days-hm]

3. The jet's exhaust would have posed a major safety hazard for onlookers and passersby from flying ballast and other debris. It would have to be deflected vertically upwards—creating a whole new set of problems.

4. The interior of M-497 had to be fitted with a structural support pylon for the engines, which would obstruct passenger movement in revenue passenger equipment.<sup>72</sup>

5. Lastly, pure jet engines are terribly fuel inefficient at speeds below 300/350 mph.

6. According to Al Perlman, the M-497 tests were strictly "to determine how we can best serve the needs of the traveling public for fast, reliable and less-costly intercity transportation, and, at the same time, combat the rising trend of our passenger deficit which is threatening the continuation of all rail passenger services."

In a signed editorial, publisher Robert G. Lewis of *Railway Age* said, in part, "That a conventional rail diesel car with regular trucks and standard suspension could operate safely and comfortably over switches which had only been spiked and on track consisting of 26-year-old jointed rail attests to the basic soundness of the engineering of the entire American railway plant."<sup>73</sup>

[Mr. Lewis went on to found the *International Railway Journal*,<sup>74</sup> where he remains on staff to this day, in the position of Director, Special Projects.<sup>75</sup>—hm]

Sadly, shortly after the M-497 tests, Al Perlman announced that the NYC was abandoning conventional passenger service on routes longer than 200 miles—including such storied trains as the *20th Century Limited*, the *Wolverine*, and the *Empire State Express*—to concentrate on fast

intercity service on shorter runs. This and other plans disappeared with the 1968 Penn Central merger.

In view of the current sorry state of high-speed intercity rail service in the United States (as witnessed by the *Acela Express* cracked castings fiasco), one can only wish that the NYC's experiment had appeared less glitzy and more of the technical data been published. Don wishes "it had been received by the Pennsylvania Railroad people as a true step forward rather than a matter to be derided—unfortunately another case of the NIH (Not Invented Here) syndrome. The Pennsy people hadn't been consulted about the project and, therefore, they resented it. Unfortunately, the Pennsylvania personnel always had trouble with the Central's Technical Research group and their work. Moreover, the red team/green team competition probably was one of the major reasons for the downfall of the Penn Central merger. To this day, there is still animosity between those that lived through the merger of the two railroads."

Hope is on the horizon. Bombardier and the FRA have jointly developed and introduced their *JetTrain* technology. Have we come full circle?<sup>76</sup>

#### ACKNOWLEDGEMENT

It is with great appreciation that I acknowledge the help and support of Mr. Donald C. Wetzel, the pilot of the M-497 who graciously agreed to help produce this book. Over the years, Don had been quite irritated at many other articles written about this historic event which he felt contained erroneous and misleading statements. I'm glad we were able to give him a chance to set the record straight, once and for all.—Hank Morris.

**Don Wetzel** has been involved in railroading for most

of his professional career. He worked for the NYC for 17 years (1950-1967), the Norfolk and Western (now Norfolk Southern) for three years (1967-1970), and then owned his own business until 1992, when he retired. His company, Quest Corporation, is now owned by his son, Kurt. It produces engineered to specification force measuring electronic systems (scales) and railroad equipment.

Don says "I'm quite proud of the fact that I invented, patented, and marketed the pulsing locomotive 'ditch lights' used by CSX, Norfolk Southern, and many other U.S. railroads."

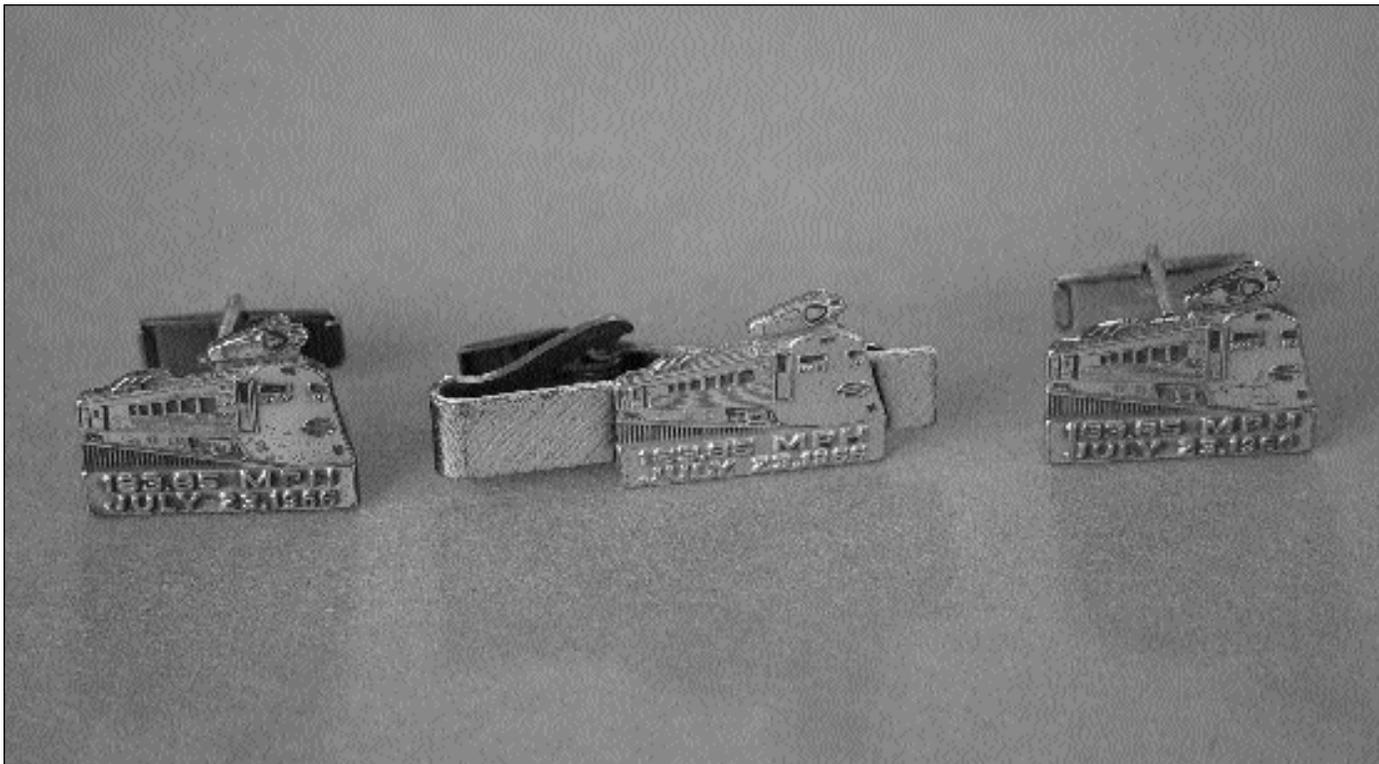
Don and Ruth now live in Strongsville, Ohio. Don's other hobbies include boating—he owns a twin-engine boat—and he also owns and rides a vintage 1970 Harley-Davidson FLH motorcycle. Don still flies. He has a commercial pilot's license with instrument, multiengine, and bomber ratings.

**Hank Morris** retired after 20-1/2 years as an editor on the staff of *Control Engineering* magazine (published by Reed Business Information, Oak Brook, Illinois). He has written over 200 by-lined, published feature articles on various topics of technology.

Hank was the editor of the *National Railway Bulletin*, (published by the National Railway Historical Society, Philadelphia, Pennsylvania) until illness forced him to step down, and is presently the consulting editor for that publication.

Prior to becoming an editor, Hank was a designer/engineer at Zenith Electronics for 9 years where he was responsible for the mechanical engineering of Zenith's line of tape recorders.

Hank and his wife, Carol, reside in Chicago, Illinois.



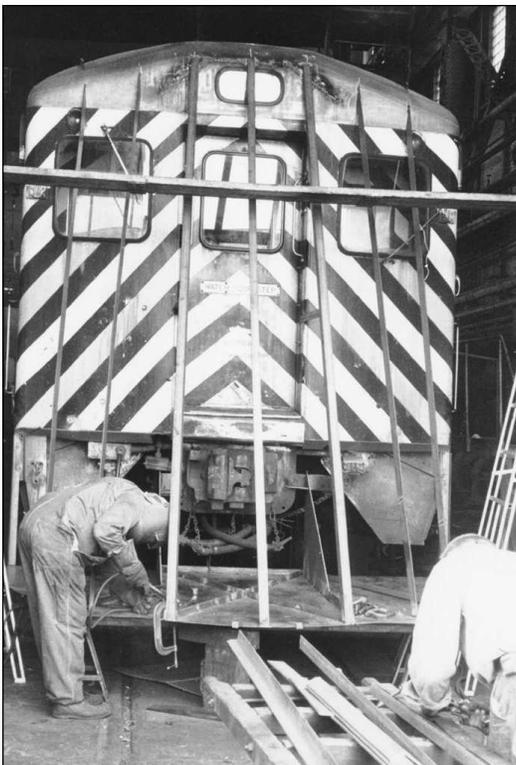
Members of the M-497 team received these special cuff link tie clasp sets from the NYC to honor their record-setting efforts. This is the set received by Don Wetzel. (Collection of Don Wetzel)

**REFERENCES:**

- 1 Pershey, Ed, *American Heritage of Invention & Technology*, Fall, 1999, Vol. 15, No. 2, pp. 63-64.
- 2 Pershey
- 3 According to Don Wetzel, The Cleveland Technical Center, Inc. was a wholly owned NYC Corporation set up to market the products and services developed by the lab.
- 4 A train is a locomotive or locomotives with or without cars that displays markers. According to Don Wetzel, "Technically, we were a train."
- 5 Per Web site <http://www.pcrhs.org/history.html>
- 6 Per Web site <http://www.eisenhower.utexas.edu/highway.htm>
- 7 Per Web site [http://www.jrtr.net/jrtr03/f32\\_tho.html](http://www.jrtr.net/jrtr03/f32_tho.html)
- 8 Per Web site <http://www.amtrakhistoricalsociety.com/bah.htm>
- 9 "Megtrans,' Test Declared a Success," *Freemont News-Messenger*, Monday, July 25, 1966, p. 18.
- 10 Per Web site [http://www.wplives.com/wp/History/Page\\_12/page\\_12.html](http://www.wplives.com/wp/History/Page_12/page_12.html)
- 11 PRR Chronology, 1980-1989, per Web site [www.prrths.com/Downloads/PRR1980.pdf](http://www.prrths.com/Downloads/PRR1980.pdf)
- 12 Per Web site <http://www.wrhs.org/cw/visualize.htm>
- 13 *ibid.*
- 14 Per Web site [http://luebeck.com/~lux/lo\\_lx/lore.htm](http://luebeck.com/~lux/lo_lx/lore.htm)
- 15 Per Web site <http://www.wrhs.org/cw/visualize.htm>
- 16 Budd Builders Number 5705, built 1/29/1953. Per Duke, Donald and Keilty, Edmund, *RDC, The Budd Rail Diesel Car.*, Golden West Books, San Marino, Calif., ISBN 0-87095-103-3, p. 195.
- 17 Per Web site <http://www.railfan.net/lists/erielackdi->



This is the "B" end of the M-497 as it looked when running as Penn Central No. 98. You'll note the rusty blast deflectors still mounted to the top hump. They did not affect the operation of the car as an RDC, so they were never removed. (Collection of Don Wetzel.)



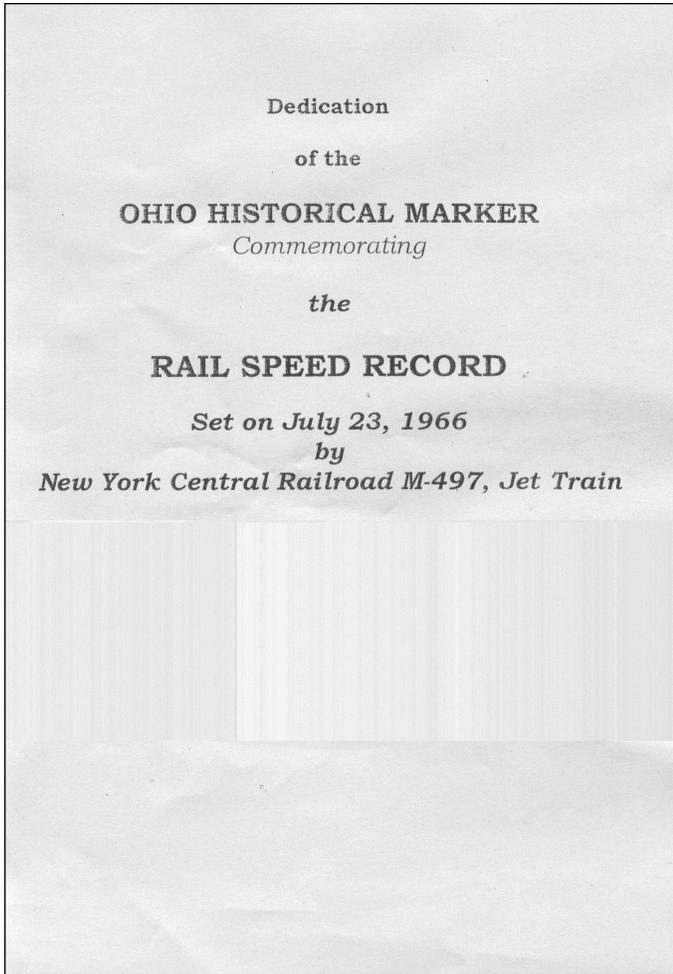
(Left) The M-497's "B" end was the end chosen to be fitted for its new face. This photo should settle the argument as to whether the front had to be removed or not. It's clear that it's in place and that the framing was attached on top of it.



(Right) The front fairing has been attached to the M-497 which is still under construction at Collinwood. The J47 engine pod has been installed. (Both photos from the collection of Don Wetzel.)

- gest/200004/
- 18 The NYC purchased a total of 20 RDCs: 16 RDC1 (M-450 to M-465); one RDC2 (M-480); and three RDC3 (M-497 to M-499). Per Duke and Keilty, p. 195.
  - 19 Crouse, Chuck, "Whoosh! What the 'Pride of the Central' was...and wasn't," *Trains*, February 1989, Kalmbach Publishing Co., Milwaukee, Wis., p. 27.
  - 20 Per Web site <http://groups.yahoo.com/group/NYC-Railroad/message/925>
  - 21 Crouse, *Trains*, p. 27.
  - 22 Crouse, Chuck, *Budd Car, The RDC Story*, The Weekend Chief Publishing Co. Mineola, NY, 1990, ISBN 0-9612814-2-1
  - 23 Crouse, *Trains*, p. 27
  - 24 *Enginemen's Press*, September 2, 1996, p. 5
  - 25 Doughty, Geoffrey, H., *New York Central and the Trains of the Future*, TLC Publishing, Inc., Lynchburg, Virginia., 1997, ISBN 1-883089-28-X, p. 61.
  - 26 Harvey, Henry, "Jet-Powered Train Tested; Officials Silent But Smiling," *The Blade*, July 23, 1966.
  - 27 This nickname was hated by Don Wetzel and the NYC crew but much-loved by the media. It stuck through the years, but not here.
  - 28 Per Web site <http://www.aerospaceweb.org/aircraft/-bomber/b36/index.shtml>
  - 29 *Enginemen's Press*, p. 5
  - 30 If the center of pressure is behind the center of mass your vehicle is positively stable. If it is closer than the body is wide, or in front of the center of mass, your vehicle is not stable. Per Web site <http://www.worldforchrist.org/-races/rockets/html/stabilit.htm>
  - 31 Per Web site <http://www.railfan.net/lists/erielack-digest/200004/>
  - 32 Pershey
  - 33 Crouse, *Trains*, p. 27
  - 34 Per Don Wetzel.
  - 35 This quote was edited by Don Wetzel for this book.
  - 36 Crouse, *Trains*, p. 27.
  - 37 "Jet Powered Railroad Car Tested by NYC," *Headlight* magazine, September, 1966, Vol. 27, No. 8, New York Central, New York, N.Y., p. 4.
  - 38 *Headlight*, p. 5
  - 39 Crouse, *Trains*, p. 27.
  - 40 *Enginemen's Press*, p. 5
  - 41 In normal service, the Budd RDC car was powered by two General Motors diesel engines. The diesels remained to provide electrical power, air conditioning, and compressed air for braking, but the drive shafts to the trucks were removed during the runs.
  - 42 For specifications, visit Web site: <http://www.risingup.com/planespecs/info/airplane69.shtml>
  - 43 Universal Communication (Unicom) is an airport radio information service on the Mandatory Broadcast Zone (MBZ) or Common Traffic Advisory Frequency (CTAF) associated with the airport at which it operates. The service is an information service, not an air traffic service. A Unicom provides information about local weather conditions, runway in use and refueling facilities at the airport as well as other operational or company information.
  - 44  $V_{ne}$  = Velocity Never Exceed—top speed of an aircraft.
  - 45 Per e-mail from Don Wetzel, April 4, 2003.
  - 46 Crouse, *Trains*, p. 27
  - 47 Pewr Web site <http://www.w3c.org/TR/1999/REC-html401-19991224/loose.dtd>
  - 48 "Zoom! N.Y.C. Jet-Powered Test Car Sets New U.S. Rail Speed Record of 183.85 M.P.H.," *The Westerner*, August/September, 1966, NYC Western District, p. 1
  - 49 Per e-mail correspondence with Don Wetzel, April 4, 2003.
  - 50 The record at the time was 205 mph, achieved by the French with electrically powered equipment in the 1950s.
  - 51 Crouse, *Trains*, p. 28.
  - 52 Per Web site <http://www.w3c.org/TR/1999/REC-html401-19991224/loose.dtd>
  - 53 Harvey.
  - 54 Railroad work rule against the use of intoxicants.
  - 55 Crouse, *Trains*, p. 28.
  - 56 Harvey.
  - 57 Per Web site <http://mercurio.iet.unipi.it/tgv/recintro.html>
  - 58 "Record Setting Commuter Now Just Diesel," *The Blade*, Toledo, Ohio, Sunday, April 9, 1967,
  - 59 "Data Expected on Jet Train," *The Blade*, Toledo, Ohio, Sunday, July 24, 1966
  - 60 *The Blade*, April 9, 1967
  - 61 Per e-mail correspondence with Don Wetzel, April 4, 2003.
  - 62 Per Web site <http://groups.yahoo.com/group/NYC-Railroad/message/920>
  - 63 Per Web site <http://www.railfan.net/lists/erielack-digest/200004/>
  - 64 *ibid.*
  - 65 Crouse, *Trains*, p. 29
  - 66 *ibid.*
  - 67 Per Web site <http://www.railfan.net/lists/erielack-digest/200004/>
  - 68 Per Web site <http://www.railfanusa.com/rosters/-cr76.html>
  - 69 Per Web site <http://crcyc.railfan.net/locos/emd/gp8/-gp8.html>, Conrail began rebuilding GP7s into GP8s in 1976, assigning them to the 5400-5462 series. However, GP7 No. 5759 was NOT converted.
  - 70 Per e-mail reply 10/11/2002
  - 71 Per Web site <http://www.railfanusa.com/rosters/-cr76.html>
  - 72 *ibid.*
  - 73 Crouse, *Trains*, p. 29
  - 74 Per Web site <http://www.railjournal.com/2000-01/worldreport.html>
  - 75 Per Web site <http://www.railjournal.com/abouteditors.html>
  - 76 On October 15, 2002, the Bombardier JetTrain locomotive was unveiled at Union Station in Washington D.C.

**HISTORIC PLAQUE DEDICATION CEREMONY  
BRYAN, OHIO, 11:00 AM (EST), FRIDAY NOVEMBER 14, 2003**



*INTRODUCTION & MODERATOR*  
Diana Holloway  
Bryan City Council

*WELCOME*  
Mayor Douglas Johnson

*SPEAKERS*  
Beth Hanson  
Ohio Bicentennial Commission

J.D. Britton  
The Ohio Historical Society

Sheldon Lustig  
New York Central System Historical Society

Donald Wetzel  
Engineer, New York Central M-497, Jet Train

*UNVEILING AND CLOSING REMARKS*  
Sheldon Lustig/Tom Gerbracht  
New York Central System Historical Society

*Many Thanks to*  
*Ohio Bicentennial Commission/The Longaberger Company*  
*New York Central System Historical Society*  
*The Ohio Historical Society*

(Above and right) The program from the dedication ceremony for an Ohio Historical Plaque which was dedicated at 11:00 A.M. (EST) on Friday November 14, 2003, memorializing the runs of the New York Central M-497 Jet Train which set the U.S. Speed Record for a passenger train on July 23, 1966. As well as gathering important engineering data relative to high-speed rail transport. The M-497's U.S. Speed Record still stands today. The plaque site is located adjacent to the Amtrak Station in Bryan, Ohio. Many of the people who built the M-497 came to Bryan on a bus to be there. (Collection of Hank Morris)



Don Wetzel holds the plaque before its installation. The plaque reads:  
 "In 1966 the New York Central Railroad (A.E. Perlman president) proposed a test of existing rail passenger equipment to determine the feasibility of operating high-speed passenger service between cities up to 300 miles apart. The site chosen for the test was near Bryan, Ohio on the longest multiple track straight railroad line in the world. The sixty-seven mile straight trackage from Toledo, Ohio to Butler, Indiana was originally constructed by the Northern Indiana Railroad Company of Ohio incorporated March 3, 1851. On July 23, 1966, the New York Central Technical Research Department ran their Budd RDC-3 passenger car number M-497 fully instrumented for stress analysis and propelled by two roof-mounted jet aircraft engines. The speed of 183.85 miles per hour was attained, the highest recorded on a railroad in North America at that time and to this day. Ohio Bicentennial Commission, The Longaberger Company, New York Central System Historical Society, The Ohio Historical Society, 2003."  
 (Photo Ruth Wetzel)

The Flight of the M-497



The night before the dedication, the Bryan, Ohio area was beset by lots of high-speed winds. Don Wetzel commented that, if the ceremony had been held the day before, they would have had the fastest tent on the railroad.



The plaque, was protected by a blanket literally tied to it to keep it from being blown off. Beneath the blanket is a ceremonial cover which will be removed during the dedication to "unveil" the plaque. (Both photos, Hank Morris)

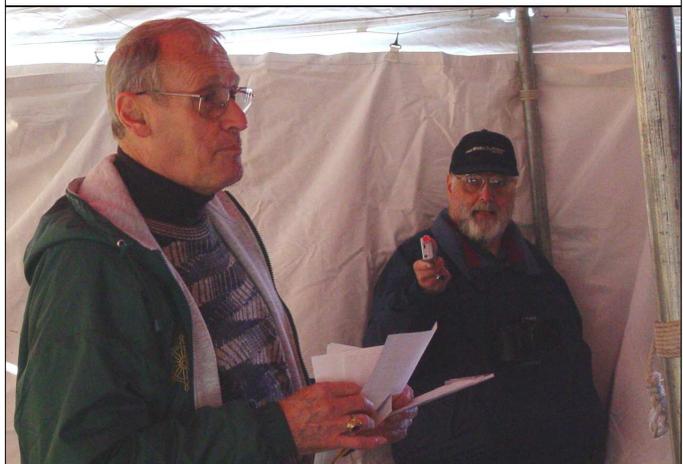


(Above) Don Wetzel (left) and Douglas Johnson, Mayor of the City of Bryan, Ohio.(Photo, Ruth Wetzel)

(left) The plaque with its Ohio Bicentennial Commission ceremonial cover before the dedication. (Photo, Hank Morris)

(lower left) Sheldon Lustig (left) and Don Wetzel (right) unveil the plaque for all to see. (Photo, Hank Morris)

(below) Hank Morris recording Don Wetzel's comments at the dedication ceremony. (Photo, Ruth Wetzel)



**D.C. Wetzel speech, Bryan, Ohio, November 14, 2003, at the dedication of the Ohio Bicentennial Plaque commemorating the New York Central's high-speed train, the M-497.**

Don't be frightened by the number of pages I'm pulling out- they're 14 pt. Font and double spaced- thanks to my daughter Jennifer for teaching me how to double space with my computer's word processor.

It seems my pages are out of order- reminds me of the politician who had an argument with his speech writer. When he turned to page two while presenting his speech, the words "you're on your own, sucker" were written.

Now they're in order. Jenny didn't teach me how to number pages.

Thank you all for being here. Thankfully, this wasn't planned for yesterday. As Cynthia Kerr said, we would have had the fastest tent on the railroad.

I also wish to thank Beth Hanson of the Ohio Bicentennial Commission, J.D. Britton, of the Ohio Historical Society, the Longaberger Basket Company, the New York Central System Historical Society, Bryan's Mayor, Douglas Johnson, Diana Holloway of the Bryan City Council, Mr. Todd Roth, Bryan City Engineer, Mr. David Schumm, retired director of Bryan Parks and Recreation and, for sure, Cynthia Kerr from Todd Roth's office- she's a treasure. There are many others to thank who are here, but time is the ultimate censor.

I really appreciate the opportunity to speak today. However, the Jet Train project involved many people with diverse talents and skills. Being asked to be the spokesman for this group is a real honor.

Initially, I must acknowledge some people who have left us but were vitally involved in and responsible for the Jet Train project in 1966 and, subsequently, this plaque today. First, the President of the New York Central, Mr. Alfred E. Perlman, who had the courage to commit the railroad's funds, manpower and resources to the project as well as showing his faith in the people that built and ran the M-497 by riding as a crew member during the speed runs. Mr. Perlman was always proud of the fact that no government funds were used in the high-speed train investigation. Next, Mr. James J. Wright, who was the Director of Technical Research at the railroad's laboratory at the Collinwood Shops in Cleveland when the M-497 was built. He was the leader of our team and he also rode as a crew member during the runs. It's one thing to be a manager, but quite another to be "hands on." Jim was a unique individual and headed the only facility in the railroad industry totally dedicated to railroad research. Last, I must mention Mr. H. Lansing Vail, Jr. Mr. Vail was one of the founders of the New York Central System Historical Society. While Lans was not involved with the Jet Train project, per se, he was directly involved with the Ohio Bicentennial Commission and the Ohio Historical Society to make the historic plaque that we are dedicating here into a reality. Lansing started the discussions and continued his efforts even after being hospitalized with the illness that finally took him from us a few months ago. I know

Tom Gerbracht and Sheldon Lustig of the New York Central System Historical Society join me in these thoughts. Also, I'm sure Mr. Perlman, Mr. Wright and Mr. Vail are with us in spirit today. Mr. Sheldon Lustig, Trustee of the New York Central System Historical Society, stepped in to the breach to take over when our friend, Lans Vail, left us. Thanks Shel.

Mr. Chuck Popma, Engineering Vice-President for the Central in 1966 deserves recognition today. Chuck was responsible for insuring that the track was in condition to take the speeds and stresses it would see. He is an outstanding individual.

There were at least 75 people involved in the building of the M-497 at Collinwood-both shop and laboratory personnel. I wish I could mention all of them today. A cross section of those involved is: Bob Wright and Ralph Holl the range safety officers-Ron Mangan, the run planner, Tom Preisel the man in the plane overhead, Teddy Bernhardt-the mechanic in charge of the jet engines-Dick Shackson and Leo Lombardo the electronic whizes who did such a fine job with instrumentation-Jimmy Walsh, Al Hastert, Freddy Hoyt, the Chandler Brothers, and Howard Rose. Don McClaren and Phil Fleisig were on board the M-497 along with Larry Simmons taking care of the myriad of details that cropped up. Bless `em all. Some are with us here today. I think the person that traveled the farthest to be with us is standing over there, Mr. Hank Morris, a writer and author who drove in from Chicago. I know I've not mentioned many people and I truly regret not having the time to do so. Railroad people enjoy a bond that most of them don't think about or might even be embarrassed to admit to-a great association only seen in a few industries. The men and women who worked on the M-497 never thought about the fact they were engaged in a historic event-very typical of railroaders.

The purpose of the M-497 project was to prove the validity of the steel wheel on steel track and the strength of the engineering history of that technology. Mr. Perlman envisioned the hub system that the airlines use today. He felt that fast trains making runs of two to three hundred miles with convenient meets would serve the traveling public well. He knew the long-haul passenger trains would loose out to the airlines. Unfortunately, the merger of the Pennsylvania and New York Central railroads stopped his dream from coming true. Perhaps in the future.

Mr. Perlman was one of the giants in railroading. If you have access to a computer and can get to Google, type in "Alfred E. Perlman." What you find will surprise you. Not only is he renowned in the railroad industry, his quotes are legendary.

Running the M-497 during the tests was absolutely the thrill of a lifetime. A certain amount of training, circumstances and fate put me in the engineer's seat. However, opening the throttles and hanging on for the ride doesn't require a PhD. The one thing that always stuck in my mind was the fact that I had a number of lives in my hands and I had to do the best job I could.

The men who rode as crew members and who sat there and did their jobs gathering the engineering data

showed real courage. The M-497 was far from being a space shuttle. However, pushing the envelope is pushing the envelope and those men that put their sweat, skills and hide on the line to further the science of high-speed rail transport participated in a noble endeavor.

I thank my family, children and grandchildren, and especially my wife, Ruthan, an accomplished artist, who designed the M-497 streamlining, for all being here today. Thank you all also for coming.



Sheldon Lustig (left), J.D. Britton (center), and Don Wetzel (right) unveil the historic plaque. (Both photos, Hank Morris)



Kristian Brown from WTVG (Channel 13, Toledo) interviews Don Wetzel after the dedication. (Photo, Hank Morris)



Don Wetzel makes a few appropriate remarks after the unveiling of the historic marker. (Photo, Hank Morris)



Jim Funderburg (left) from Bryan's local cable outlet was on hand to interview Don Wetzel (right) and Sheldon Lustig. (Photo, Hank Morris)

## M-497 PHOTO GALLERY



One of M-497's regular duties was to serve as a U.S. Mail Railway Post Office ("RPO"). The RPO sign next to the mail door had to be removed since the car was temporarily not in U.S. Mail service. Note also that the trucks (wheel assemblies) have been removed to be checked. (Collection of Don Wetzel)



The masking tape and brown paper mean that it's time to start painting. The jet engines will be installed on top, just behind the door. (Collection of Don Wetzel)



The lower side body panels (skirts), like the nose fairing, were not part of Budd's original RDC-3 design. Based on wind tunnel tests, the back of the car was also modified to improve the flow of air. (Collection of Don Wetzel)



This is the nose fairing on M-497 just before painting. The air horn behind the grill was from an E-8 class diesel locomotive. The wide metal plate covers a link that could be used to tow M-497 from the front if necessary. (Collection of Don Wetzel)



The J47 pod arrives at Collinwood from Davis-Monthan Air Force Base, Tucson, Arizona. (Collection of Don Wetzel.)

**The Flight of the M-497**



The NYC team adapted two surplus General Electric J47-19 turbojet engines. Each engine was capable of producing 5,200 pounds of thrust. They had been designed as boosters for the USAF Strategic Air Command's Convair B-36 Peacemaker ten-engine intercontinental bomber. (Collection of Don Wetzel)



Two photos showing the interior details of the engine mount structure. Many of the original passenger seats in this area had to be removed to provide clearance so someone could get around the engine support when traveling from one end of the M-497 to the other. (Collection of Don Wetzel.)



Collinwood's technicians install the jets onto the roof of the M-497. (Both photos from the collection of Don Wetzel)

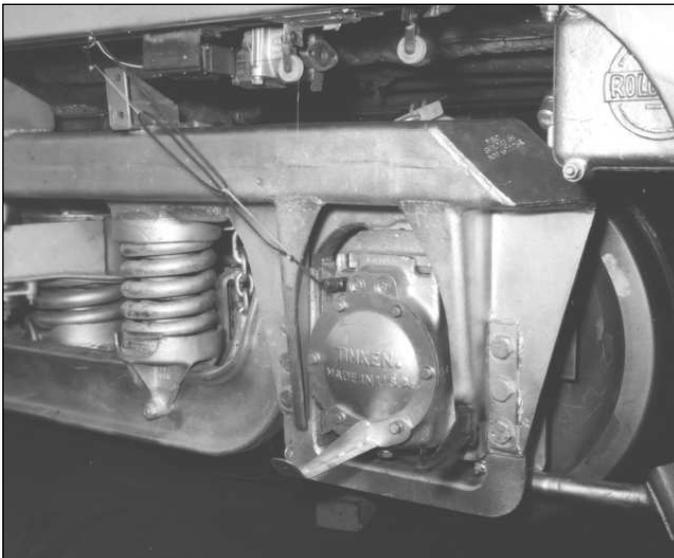




A look at the J47s from the M-497's roof at Collinwood. (Collection of Don Wetzel.)



Plate steel had to be laid on the forward radiator hatch to protect it from the heat of the jet engines' exhausts. (Collection of Don Wetzel.)



Pickup for journal bearing temperatures on front truck of M-497. The information was sent by telemetry to the instrument car in Bryan. (Collection of Don Wetzel)



A technician at NYC Collinwood radios information to another person located elsewhere. (Collection of Don Wetzel)



The seats purchased by the NYC came from government surplus market and had been originally used in a Boeing KC97 Stratotanker. (Collection of Don Wetzel)



Fuel filters and fuel tank. (Collection of Don Wetzel)



The NYC Collinwood's staff who created, built and manned the M-497 pose in front of the results of their efforts before the trials began. This is the official "Builders Photo." (Collection of Don Wetzel)



(Above) Alfred E. Perlman (far right), President of the NYC, at the ribbon cutting ceremony to open the research lab at Collinwood in 1957. Instead of the traditional scissors—to show the futuristic, far-seeing environment Collinwood was to foster—the tape was cut by an electrical device that ignited, burning the tape apart.

(Left) The New York Central's Collinwood, Ohio, facility was located north and east of Cleveland. The long building under the rooftop "box" near the center of the photo was where M-497 was converted. CSX's Cleveland intermodal yard is presently located at Collinwood. (Both, collection of Don Wetzel)



Chuck Popma, J.J. Wright, Wayne Hoffman and Ed Polk (sunglasses, hands on hips, standing alone) gather around the "A" end of the M-497 to discuss the run. The equipment bay door is open. (Collection of Don Wetzel.)



The "A" end of the M-497 was smoothed to reduce turbulence and hence drag. (Collection of Don Wetzel)



You can see the pitot tube quite well in this photograph. What is not visible is the antenna that ran upwards from below the headlight toward the engines that was used for communication between Don Wetzel piloting the M-497 and Bob Kern, the pilot of the Twin Beech D-18 "chase plane." (Collection of Don Wetzel)

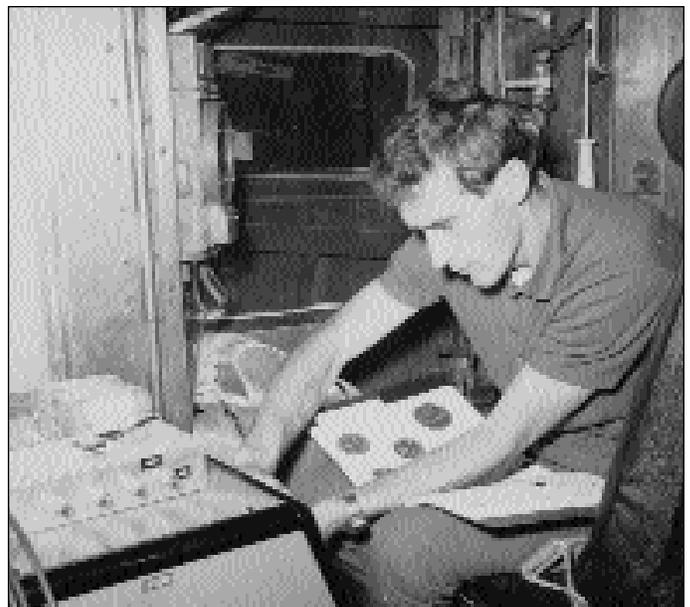


At Bryan, Ohio. Dick Shackson is on top and J.J. Wright is on the ground. The person examining the jets is Ted Bernhardt. Ted was formerly a jet mechanic in the USAF, which made him the immediate choice for this assignment as "Flight Engineer." (Collection of Don Wetzel)

Don Wetzel didn't just design and drive the M-497. Here he is working on the control panel in the pilot's (right-front) seat. In normal service this was the "B" end of the RDC-3, next to the passenger seating area. Don was responsible for propulsion and control systems during the conversion.

Behind Don's right shoulder you can see the normal operator's window and through it, the F-Unit number frame which was used as a window in the fairing. (Collection of Don Wetzel)

**The Flight of the M-497**





Technicians and engineers prepare the M-497 for the first run on Saturday morning. The man in the white shirt is leaning against milepost 357. The freight train wasn't supposed to have been here and left before the run began. When another freight train passed the car later an unsecured piece of equipment hanging too far over the side of a flatcar almost hit the side of M-497, which fortunately was not in motion at the time. (Photo, Craig Berndt, Collection of Don Wetzel)



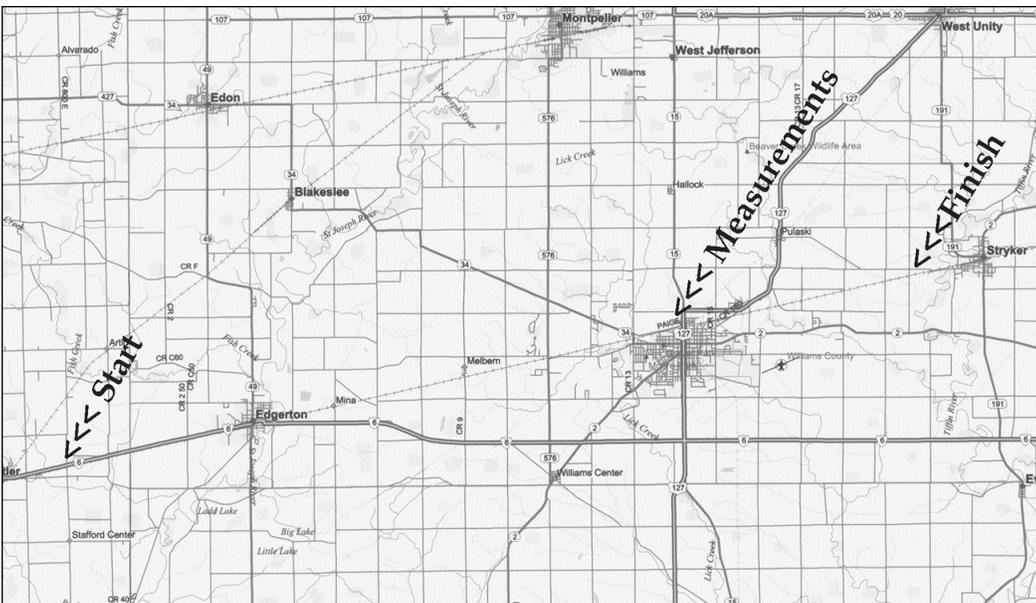
The M-497 (shown at the lower left) is being towed behind NYC GP-7 No. 5759 with a NYC caboose between. The train was shadowed by a Beech D-18 Twin Beech aircraft piloted by Bob Kern. Don Wetzel in the M-497 was in constant communication with the Twin Beech by radio on an FAA "Unicom" frequency. (Collection of Don Wetzel)



After each test, the M-497 had to be towed back so it could be made ready for the next run. (Collection of Don Wetzel)



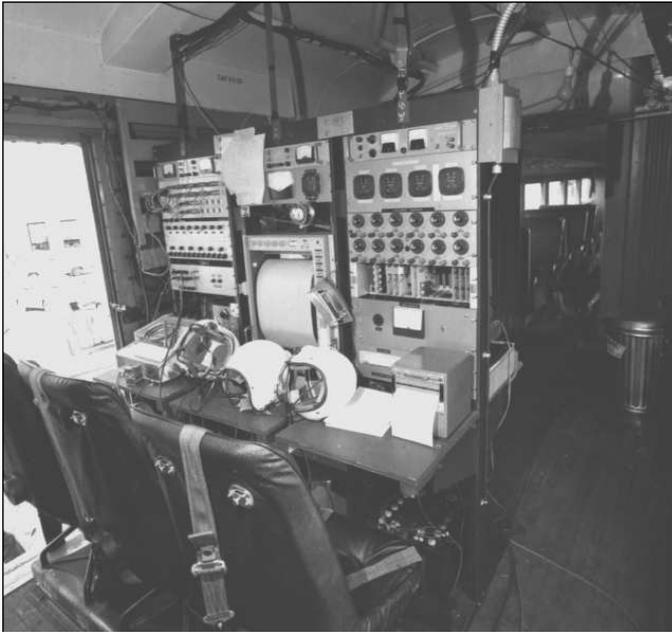
The white stripes were used for showing wind flow during the tests. They were only on the left side. In the first test, the strips were red, but this color proved to be too hard to view. (Photo, Howard W. Ameling)



According to Guinness, the track from Butler, Indiana to Toledo, Ohio is the longest double-track mainline in the world. The distance from the starting point east of Butler to the finish point west of Stryker is about 21 miles. Speed, track deflection and other measurements were taken by the instrument car at Bryan near the freight depot.

A pile of ties was placed across the track near Toledo to derail the RDC should it not be able to stop.

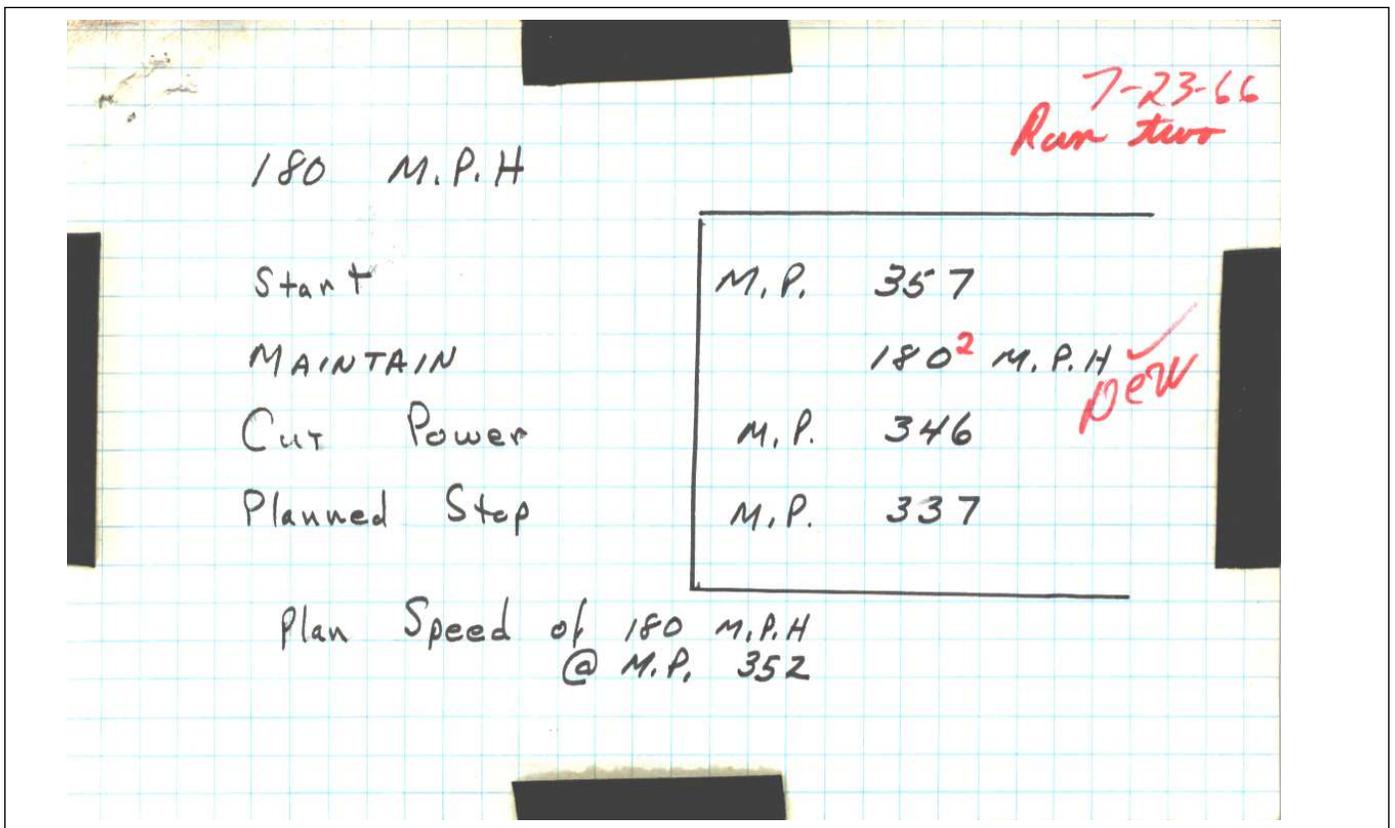
(Collection of Don Wetzel)



The instrumentation bay of the M-497 after its installation at Collinwood. This spot was quite busy during the test runs. You can see the passenger section where the jet pod is installed. There are no seats so the crew could move around the car. (Collection of Don Wetzel)



Instrument bay from the rear. (Collection of Don Wetzel)



The above and the following three pages are the actual pages used by Don Wetzel. They are the official record of the run that set the U.S. rail speed record and the check list for the record-setting run.

On the third page, you can see the names of the individuals who were on board the M497 on its historic run.

The M-497 actually exceeded the official speed. But, because Don Wetzel was under orders to be "at or around 180 mph" when he passed MP 352, he actually had to decelerate from his 196 mph top speed.

(All four pages from the collection of Don Wetzel)

The Flight of the M-497

CHECK LIST

DATE 7-23-66  
OPERATOR W. C. Kettel  
RUN NO. Two

PRELIMINARY - BRYAN

(PLEASE  
INITIAL)

INTERIOR

- |   |                                     |                                   |           |
|---|-------------------------------------|-----------------------------------|-----------|
| 1 | Check Fuel Tanks, Condition & Level | $\approx 130\frac{1}{2}''$ #2 27" |           |
| 2 | Fuel Shut Offs, On                  |                                   | <u>JB</u> |
| 3 | Check Fuel Lines                    |                                   | <u>JB</u> |
| 4 | Battery Switch, On                  |                                   |           |
| 5 | Check Engine Pylon                  |                                   | <u>JB</u> |
| 6 | Check Control Panel                 |                                   | <u>JB</u> |
| 7 | All Switches, Off                   |                                   | <u>JB</u> |
| 8 | Throttles, Off                      |                                   | <u>JB</u> |

EXTERIOR

- |   |  |  |           |
|---|--|--|-----------|
| 1 | Check Engine Air Intakes                 |  | <u>JB</u> |
| 2 | Check Engine Cowling                     |  | <u>JB</u> |
| 3 | Check Lube Oil Level                     |  | <u>JB</u> |
| 4 | Check Exhaust Cones                      |  | <u>JB</u> |
| 5 | Check Car Roof Forward & Rear of Engines |  | <u>JB</u> |

FINAL - EDGERTON

- |   |   |  |           |
|---|---|--|-----------|
| 1 | Fire Guard, Posted  |  | <u>JB</u> |
| 2 | Start #1, at 30% Receive OK from Ground Observer          |  | <u>JB</u> |
| 3 | Start #2, at 30% Receive OK from Ground Observer          |  | <u>JB</u> |
| 4 | Make <sup>KE</sup> visual check of engines, give Pilot OK |  | <u>JB</u> |
| 5 | Check Fuel Tanks  |  | <u>JB</u> |
| 6 | Check Fuel Lines  |  | <u>JB</u> |
| 7 | Check Engine Pylon  |  | <u>JB</u> |

FINAL - EDGERTON (Continued)

(PLEASE INITIAL)

- 8 Give Pilot OK JB
- 9 Leave Car JB
- 10 Give Pilot All Clear for application of 100% Power JB
- 11 Observe engines, receive signal from Pilot that engines are at 100% JB
- 12 Give Pilot final OK JB

TERMINATION

EXTERIOR

- 1 Check engine air intakes JB
- 2 Check engine cowling JB
- 3 Check lube oil level JB
- 4 Check exhaust cones JB
- 5 Check car roof forward and rear of engines JB

INTERIOR

- 1 Check fuel tanks, condition & level #1 20" #2 16 1/2" JB
- 2 Fuel shut offs, Off JB
- 3 Check Fuel Lines JB
- 4 Battery Switch, OFF JB
- 5 Check engine Pylon JB
- 6 Check control Panel JB
- 7 All Switches, OFF JB
- 8 Throttles, OFF JB

Crew - DC Wetzel  
 J J Wright  
 PL Fleisig  
 L C Simmons  
 L R Lombardo  
 R H Jackson

NZ McClaren  
 T Bernhard  
 W M Hoffman  
 A E Perlman

TEST RUN SPEED MILEAGES

		<u>RUN #1</u>	
MILES	ABOVE	100	- 12.7
		110	- 10.2
		120	- 8.5
		130	- 3.2
		140	- .5

		<u>RUN #2</u>	
MILES	ABOVE	100	- 14.8
		110	- 14
		120	- 13
		130	- 12
		140	- 10.8
		150	- 9.4
		160	- 7.6
		170	- 5.6
		180	- 3.4

		<u>RUN #3</u>	
MILES	ABOVE	100	- 21.1
		110	- 19.5
		120	- 18.1
		130	- 16.1
		140	- 10.9

TOTAL MILES ABOVE			CC 7107			BB 9004
			FR.			FR
100	-	48.6	-	26	-	26
110	-	43.7	-	23.5	-	23.5
120	-	39.6	-	21.5	-	20.5
130	-	31.3	-	19.8	-	18
140	-	22.2	-	18.5	-	17.17
150	-	9.4	-	16.8	-	15.5
160	-	7.6	-	13.0	-	13
170	-	5.6	-	9.3	-	11
180	-	3.4	-	7.5	-	8



The Whistle [horn] cord was removed from M-497, inscribed, and presented to Don Wetzel by the crew. They said he never let go of it during the test runs.

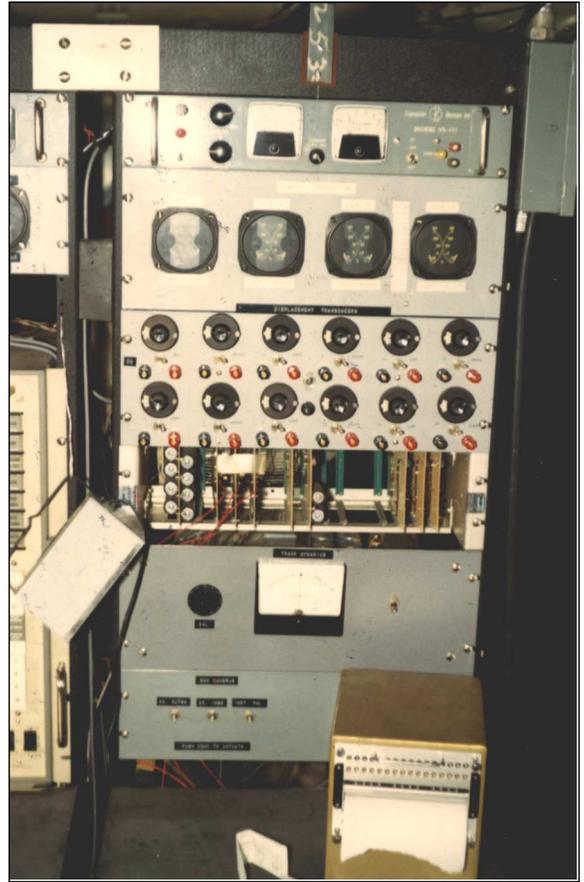
The MEGTRANS button was specially made for the event by one of the lab personnel who paid for it out of his own pocket and passed it out to everyone involved with the experiment. MEGTRANS is an acronym for MEGalopolitan TRANSportation— a megalopolis being a heavily populated stretch in which one metropolitan cluster of city and suburbs virtually grows into another. It was hoped that the jetpowered M-497 would provide operating data that could herald a new era in railroad commuting in these megalopolitan areas. (Collection of Don Wetzel)



(Right) The right side of the instrument panel in the instrumentation bay. Shown is a D.C. power supply and controls. The photo was taken by Thomas Preisel. Tom was also the observer flying in the Twin Beech during the tests.

(Left) A closeup of the jet engine controls at Don Wetzel's station. From here, he had full control of the twin-jet engines' performance. Those Dymo labels sure came in handy.

Both photos from the collection of Don Wetzel.



The engineers got in and out of the instrument car via a ladder at one end. (Collection of Don Wetzel)



X 23417, the NYC's instrument car was based at Bryan, Ohio during the test. The crossing guards slept in the roomettes in two passenger cars coupled behind the instrument car. (Collection of Don Wetzel)



Inside the NYC's instrument car, which was based at Bryan, Ohio, is Don Bartlett farthest from and facing the camera, sitting down with the white shirt). Standing is Robert H. Wright, who went on to become Deputy Director of Railroad Safety for the FRA, U.S. Department of Transportation and later Chief Mechanical Officer of the Alaska Railroad. In the middle, with his back to the camera is Al Hastert. Closest and with his back to the camera in a white shirt is Ralph Holl. Ralph was the "Range Safety Officer" who was notified by each crossing guard when their particular crossing was closed. When all crossings were reported closed, Ralph radioed Don in the M-497 that it was good to go. (Collection of Don Wetzel)



Andrea Flagg was one of the early female engineers employed by the NYC. Rather a ground-breaking situation for the era, 1966. She married a fellow employee of the NYC, a chemist in the laboratory, Jim Story. (Collection of Don Wetzel)



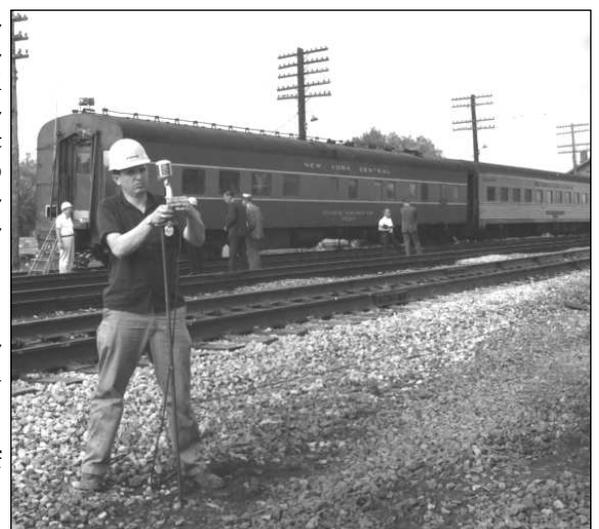
Inside the instrument car we see Gary Williamson, an engineer at NYC's lab. The instrument car was based at Bryan, Ohio during the runs. (Collection of Don Wetzel)

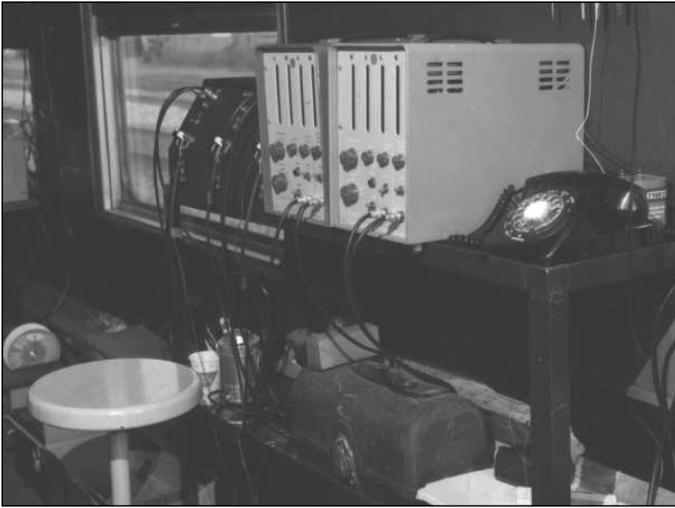


(Right) Gary Williamson setting up the microphone to record the sound of the passes as the M-497 went by. The sound was so loud that the microphones were destroyed during the tests.

(Left) Gary Williamson is measuring rail displacement.

(Both, collection of Don Wetzel)





The instruments that were used for the timing of the runs were installed inside the instrument car. (Collection of Don Wetzel)



Don McClaren is seated in the instrument car and appears to be talking to someone by radio. (Collection of Don Wetzel)



Don Wetzel gets the keys to the M-497. Next stop—Bryan, Ohio. (Collection of Don Wetzel)

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SPECIFICATION FOR LOCOMOTIVE UNIT NO. M-497

Operated by \_\_\_\_\_ Company

Built by The Budd Company at Philadelphia, Pa. date January 29, 1953

Builder's number 5705 Propelled by Two (2) 275 HP Diesel Engines

Gauge of wheels 56-1/2"

Kind and number of current collectors None

Trolley wire or third rail voltage None

Number, make and type of motors None

\_\_\_\_\_ Voltage - - -

Make and type of control equipment Delco Remy

\_\_\_\_\_ Control circuit voltage 24 Volts

Make and type of internal combustion engine Detroit Diesel

Six (6) Cylinder 275 HP

Kind of air brakes NYAB Modified "HSC"  
(Give make, type and schedule number)

Number, make and type of air compressors One (1) WAB #3-YC

Main air reservoir pressure 120# Train line pressure 90#

Make and type of lightning arrester None

Does unit carry steam boiler? No

Total weight, working order \*121980# Pounds, weight on  
driving wheels 62480# pounds, weight on trucks 59500 pounds

Maximum tractive effort 8100#

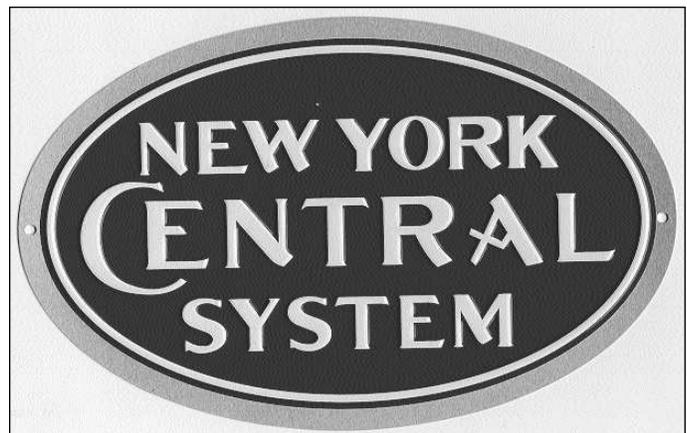
Attach to or make hereon diagram showing general outline of unit and principal dimensions.

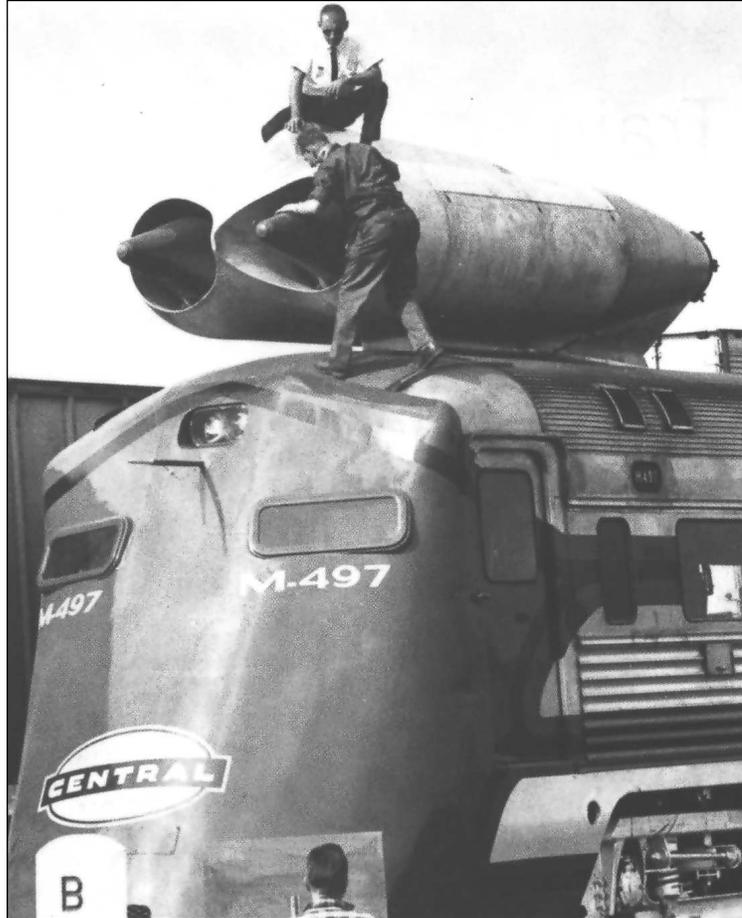
**\*Includes 2 Crew**

Approved \_\_\_\_\_  
Title \_\_\_\_\_

Car as weighed	119,400 #
	300
sand	650
service water 75 gal	1,240
Fuel oil 180 gal	<u>121,680</u>
Crew	300
wt - working order	<u>121,980 #</u>

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M-497 poses for its portrait at the NYC's Collinwood, Ohio lab. Sadly, nothing is known as to the identity of the artist nor of the disposition of the painting. (Collection of Don Wetzel)

High-speed rail passenger service is a "hot topic" today. In Europe high-speed trains are an every-day thing. New high-speed trains are popping up all over the globe. China, Australia, Japan, and other countries have introduced high-speed rail passenger service to their populations, and more are coming on line every year.

In the U.S. we finally have the troubled Amtrak Acela Express. There are highspeed rail consortiums in several interstate markets promoting the concept to the various state legislatures.

Where did it all start? That point could be argued and various efforts can make the claim. We're not going to thrash this out here.

One beginning of the search for high-speed passenger service began when the New York Central Railroad made its own high-speed attempt going all the way back to the Number 999 Empire State Express, which held the U.S. speed record for a steam-powered train of 112.45 mph back on May 10, 1893.

With these roots, it is no surprise that the NYC continued to be interested in providing its ridership with high-speed, high-quality passenger service. Witness the fierce competition between the NYC and Pennsylvania Railroads to provide deluxe, high-speed service between Chicago and New York City.

In 1966, the New York Central conducted another experiment to discover those qualities of track and roadbed that would allow it to provide higher speed service to compete with the airlines. This time, they put a pair of surplus jet engines ontop of a Budd RDC-3 self-propelled railcar. In doing so, the experiment set a new U.S. rail speed record for a passenger train.

This is the story of that historic test.