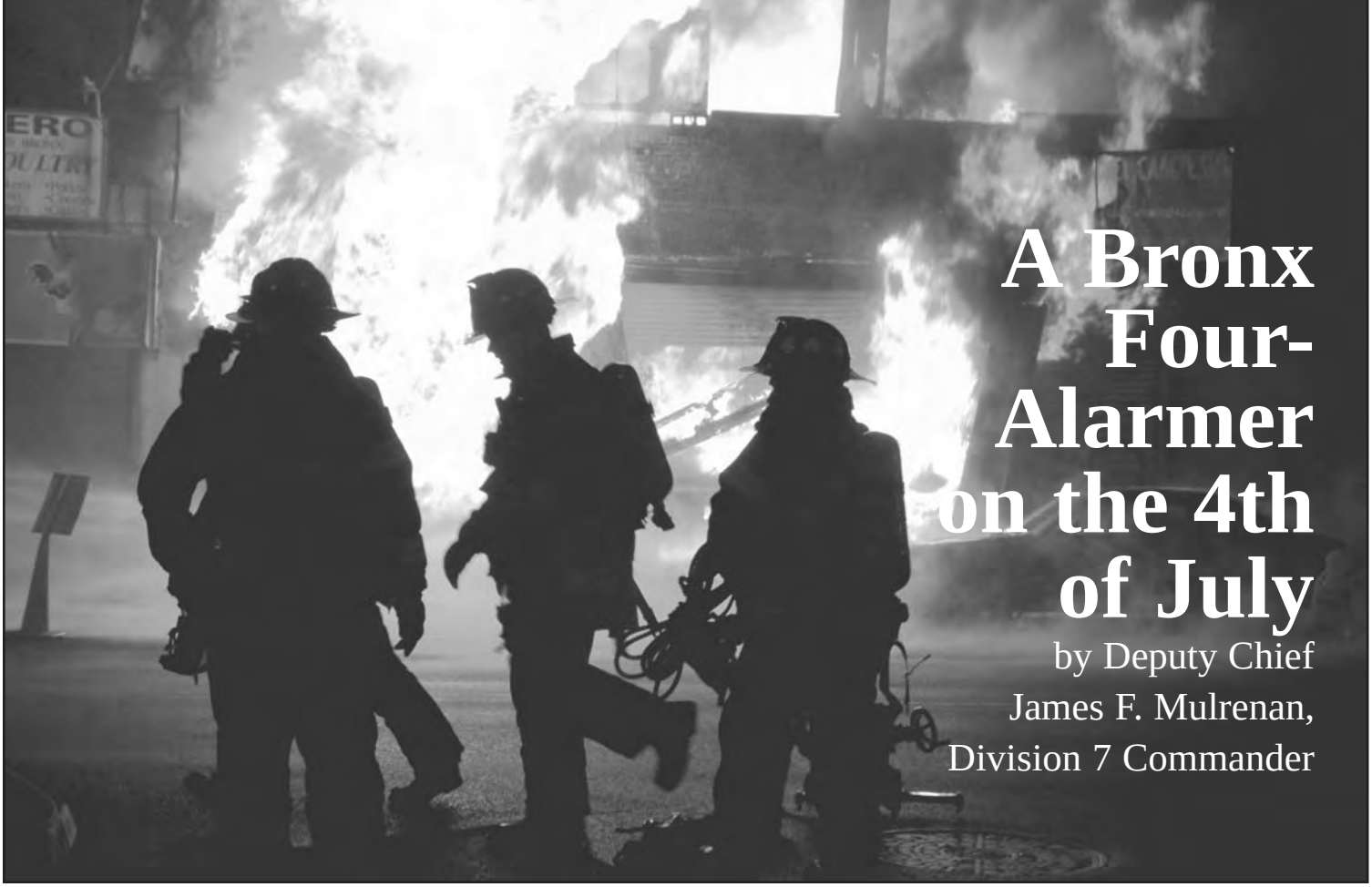

A Bronx Four-Alarmer on the 4th of July

by Deputy Chief James F. Mulrenan, Division 7 Commander

all photos by Matthew P. Daly, unless noted otherwise

This photo demonstrates the fire intensity on arrival of FDNY units and the reason for using a deck gun to control the radiant heat.

At 2239 hours on July 4th, 2005, Box 4769 was transmitted for a reported building fire at 1675 Jerome Avenue in the Bronx. At 2241 hours, Engine 42 transmitted a 10-75 because of heavy smoke in the street as they approached, followed quickly by a second alarm at 2243 hours when flames were seen shooting through the roof of the fire building. This fire eventually required a fourth alarm to control and involved operations on two separate street fronts with a grade elevation difference of three stories between the streets. That was the easy part.

Battalion 19 arrived and conducted the preliminary size-up, which revealed the following:

- The fire building was a one-story, non-fireproof (NFP) taxpayer, measuring 150 by 100 feet, with a wood joist and wood deck roof. Information about the roof was on the CIDS card.
- The fire building had two occupancies: a tire store, which was fully involved with flames through the roof, and an ironworks facility, where heavy smoke was pushing through cracks in the brickwork and around the edges of its roll-down gates.
- Exposures #2 and #4 were similar one-story taxpayers. Initially, it was difficult to determine whether fire had extended to these occupancies.
- Exposure #3 consisted of several NFP multiple dwellings located on Davidson Avenue, which is three stories above Jerome Avenue. The multiple dwellings located on Davidson Avenue are three stories above the Jerome Avenue taxpayer. These buildings were being exposed to heavy smoke. The flames shooting through the roof of the tire shop were reaching high enough to cause extension, due to either direct flame impingement or radiant heat.
- Exposure #1, Jerome Avenue, was located under the elevated train tracks (el). The pillars supporting the el would restrict not only apparatus placement, but also severely limit the range of operation of elevated Tower Ladder (TL) buckets.

Battalion 19 had several immediate problems to deal with simultaneously and ordered the following operations:

- Engine 42 was instructed to operate its deck gun to control a high radiant heat condition that was preventing close access to the fire building.
- The front of the building was to be kept clear to facilitate TL placement. In anticipation of placement difficulties and limited range of operation problems caused by the el, the Bronx dispatcher was told to ascertain that one of the second-alarm trucks was a TL. Since a TL responded on the Box, this would ensure two TLs available to deal with these problems.
- Trucks and Rescue were ordered to force all roll-down gates to gain access and define the extension of the fire.
- Engine companies were directed to stretch $2^1/_2$-inch hand-lines to protect the trucks forcing the roll-down gates and operate on the exposed fire.
- The dispatcher was told to send one engine and one truck to Davidson Avenue to define the problem in exposure #3.

Division 7 arrived soon after the second alarm and was briefed on actions taken and progress made. At this point, the roof over the ironworks facility became involved and a large quantity of cylinders containing oxygen, acetylene and argon were discovered inside the roll-down gates of this building. Members attempting to search the ironworks building had moved in only a few feet and were quickly and easily withdrawn. The full involvement of the roof over the ironworks structure indicated a common cockloft.

Fire could be seen dropping down in this occupancy, indicating that the contents soon would add fuel to the fire and greatly increase its intensity. Division 7 transmitted a third alarm at 2251 hours and requested a third TL response. Exposure #2A was a gas station with a large, open, flat area, which provided ideal placement for a TL. A fourth alarm was transmitted at 2259 hours to assure sufficient reserves on a hot and humid night. A fourth TL was called to attack the fire from the exposure #4 side.

The increased intensity of the fire heightened the danger of extension to all exposures. The arrival of the third- and fourth-alarm units under the el and the need for operations on multiple fronts presented many problems. The fire problems and their corresponding solutions follow.

photo by FF Chris Landano

View from the top of exposure #3. Four tower ladders and hand-lines are on the roofs of exposures #2 and #4. The roof of the fire building burned off. This is the scene that confronted Battalion 13 while coordinating the tower ladders with the hand-lines.

Lateral fire extension--Aggressive roof examination hole-cutting and pulling the ceilings in exposures #2 and #4 revealed no extension. These were separate buildings with separate side walls and no common cockloft. After the boundaries of the fire building were determined, portable ladders were raised to indicate these boundaries. Under the supervision of Battalion Chiefs, hand-lines were stretched to the roofs of exposures #2 and #4 to control the fire and prevent extension. Sufficient portable and aerial ladders were raised to ensure safe egress from these roofs should conditions warrant.

Vertical fire extension--The expanding roof fire greatly increased the danger of extension to exposure #3. Division 7 sent another engine and truck, along with a Battalion Chief, to this exposure to augment initial operations. Two of the three buildings required evacuation due to high CO readings. A $2^{1}/_{2}$-inch hand-line was stretched to the rear of the six-story multiple dwelling to assist in fire control. The fire was controlled before it could extend to any of these multiple dwellings.

Operations under the el--In addition to placement obstructions and movement limitations of TL booms and buckets, the el also posed noise and electrocution hazards. The noise of a train passing directly overhead is deafening and often would prevent normal, as well as emergency, handie-talkie transmissions. Electrified track immediately above elevated booms--which might be forced to move too close to the el to operate--presented an unnecessary risk to apparatus and personnel. To eliminate both problems, the MTA was asked to cease all train traffic and shut off power to the tracks.

Parapet wall collapse--The initial fire in the tire store was of such intensity that it twisted the I-beam over the front windows. This I-beam supported the front parapet wall, which now was bowed and leaning. Since units had no way of knowing if the wall was tied together for the entire length of the building front, it was assumed that the collapse of any part would bring down the entire parapet wall. Consequently, the entire sidewalk in front of both stores was declared a collapse zone and units were withdrawn to the safety of the street.

Haz-mat and explosion potential--The numerous cylinders discovered in the ironworks facility were within the collapse zone and, therefore, could not be moved. If they were heated too much by radiant heat, the potential for safety valve failure or cylinder explosion existed. To prevent this, the cylinders were constantly

These cylinders (containing oxygen, acetylene and argon) were found by FDNY members. Note the fire coming through the parapet, near the top of the roll-down gate.

This photo reveals just how constricted FDNY operations were under the el. All members now are withdrawn from the collapse zone on the sidewalk and are operating from the safety of the street.

cooled by a hand-line and monitored by members with gas detectors and a thermal imaging camera.

Civilian traffic problems--Unfortunately, the fire building was in proximity to the busy Cross Bronx Expressway entrances and exits on Jerome Avenue. In fact, the Command Post was set up directly in front of the westbound exit ramp. Police assistance was requested for both crowd and traffic control. The westbound entrance and exits were closed and the eastbound exit ramp traffic was diverted away from FDNY operations.

Water pressure problems--DEP responded and was able to alleviate problems caused by reduced hydrant pressure. Four TLs operating simultaneously, in addition to multiple $2^1/_2$-inch hand-lines, stretch the capacity and pressure capability of local water mains.

Lessons learned/reinforced

This fire was successfully extinguished with no extension beyond the fire building because attention was paid to basic firefighting tactics and procedures. Although members now must consider terrorism and haz mat as an increasingly larger part of FDNY's responsibilities, do not forget the basics of firefighting and fireground safety. To put the fires out and send everyone home at the end of the tour, the basics are essential.

- Size-up is still the most important primary function at a fire. You cannot fight a fire if you cannot recognize and understand the conditions and factors you must overcome. Battalion 19 quickly realized that the heavy fire through the roof on arrival precluded interior or roof operations for the tire store and required elevated, large-caliber streams. Multiple alarms were quickly transmitted to deal with anticipated extension. TL placement was anticipated, areas for that placement kept clear and sufficient supply-lines were stretched. Being proactive and getting ahead of the fire is still the best way to go.
- Operations on separate streets with a grade elevation difference of three stories requires sufficient manpower and supervision, as well as increased coordination and communications. Once conditions were stabilized in the multiple dwellings that comprised exposure #3, members turned the disadvantage of the grade difference to FDNY's advantage. From the roof of the six-story multiple dwelling in exposure #3, Battalion 13 had the most advantageous and comprehensive view of the entire fireground. He was able to provide accurate reports of fire and structural conditions for the Incident Commander and also was used to coordinate and direct the stream operations of the four TLs.
- The collapse potential of parapet walls is well understood in this Department. The entire sidewalk running the length of the parapet was declared a collapse zone and all members were withdrawn to the safety of the street. That takes care of the horizontal collapse danger, but this fire also required action for the danger zone immediately above the collapse area. A roof collapse causing a parapet wall collapse or a parapet wall collapse causing a roof collapse often results in a great increase in the volume of fire extending upward. This increase in fire can affect taller exposures or TL buckets that might be extended over the building. Members had to deal with both at this fire. Additionally, the two TLs operating from underneath the el directly over the fire building would have little room to maneuver if their buckets were suddenly endangered by an increase in fire below them. As the condition of the parapet deteriorated, the TL buckets were constantly advised and moved to safer operating positions as conditions warranted. Firefighters were unable to use a regular surveyor's transit to sight parallel with the parapet wall due to building layout, so a laser range meter was used and positioned perpendicular to the parapet wall. Firefighters were able to observe any movement of the wall and increase our margin of safety as the wall continued to bow and tilt. This meter, when used in lieu of, or in combination with, the traditional surveyor's transit, could prove invaluable to any Incident Commander facing a collapse situation. FDNY now has the ability to observe the smallest movements from multiple angles. These meters currently are carried by some Rescue and TAC units. All Chief Officers should familiarize themselves with this tool and consider special-calling one if no unit on the scene has one or it is deemed advantageous to use multiple meters.
- The operation of multiple TLs differs from the operation of stationary large-caliber streams. TL buckets move quite frequently, as do their powerful streams. If using exterior mobile LCS in conjunction with exterior hand-lines, you must coordinate their operations to prevent injury. At this fire, hand-lines initially were placed on the roofs of exposures #2 and #4 to prevent extension and control the fire. Officers were able to keep those units on the roof and use their hand-lines in conjunction with the TL streams because all TLs were made aware of their presence and Battalion 13 was able to coordinate both the TLs and the hand-lines. These hand-lines proved indispensable in a lateral attack on fire directly behind parts of the parapet wall, which had not collapsed. If members had attempted extinguishment with the full force of a TL stream, most likely it would have forced the collapse of the remaining sections of the parapet, particularly those sections directly above the cylinders in the ironworks structure.
- Communications and control are essential in any collapse situation. The potential for collapse and its increasing probability should be communicated to all units on the scene. A roll call of all units to determine the safety of all members and their unit locations should be done ***before*** the collapse occurs. This information not only will speed up any post-collapse roll call, but it could be essential if members are suspected of being missing after any collapse. Our leverage in dealing with collapse comes from anticipating and recognizing those conditions and factors

that are conducive to collapse and making sure that all members on the scene are aware of the danger. No IC can predict accurately the exact moment of collapse nor the precise path that the collapse will follow, but an IC can increase the collapse zone and ensure that no members are in it.

- The Battalion Chiefs who operated as Sector Chiefs at this fire truly understood that their roles encompassed not only direct supervision of operations in their sectors, but also the need to coordinate and integrate their operations with the other sectors and overall strategy. Whether coordinating TL and hand-line operations from exposure #3, initial search and then roof hand-line operations in exposures #2 and #4 or controlling the collapse zone in exposure #1, all Sector Chiefs constantly communicated with each other and the IC to ensure continuity of operations as well as Firefighter safety. No IC can safely and effectively control any multi-building, multi-exposure or multi-street level operation alone. ICs and Sector Chiefs must both understand and appreciate how essential one is to the other to assure safe, effective fireground operations.
- Unit pride still matters. The tactical difficulties associated with TL placement under the el, long and heavy stretches of $3^1/_2$-inch supply-lines and $2^1/_2$-inch hand-lines and the overall heat, humidity and heavy smoke were overcome by units that displayed initiative, determination and dedication. You still can't beat that combination when it comes to fighting fires.

Members are urged to review the following *WNYF* articles:

- "Laser Range Meter," by Battalion Chief Fred LaFemina, on page 5 of this issue.
- "Special Apparatus, Collapse Units," by Battalion Chief John A. Calderone, on page 6 of this issue.
- "State Street, Brooklyn, Collapse, Rescue Operations," by then-Battalion Chief Raymond M. Downey, in the 4th/2000 issue.
- "Large-Caliber Stream Safety," by Deputy Chief Vincent Dunn, in the 3rd/98 issue.
- "Thermal Imaging Cameras," by then-Battalion Chief Raymond M. Downey, in the 2nd/2001 issue.
- "Forcible Entry Notebook, Roll-Down Security Gates," by Captain Robert R. Morris, in the 1st/2000 issue.
- "What Brought Down the Parapet Wall This Time?," by Battalion Chief Frank J. Miale, in the 4th/98 issue.
- "Parapet Walls...and their collapse," by Deputy Chief Vincent Dunn, in the 4th issue, 1978.

About the Author...

Deputy Chief James F. Mulrenan is a 32-year veteran of the FDNY. He is the Commander of Division 7. As a Battalion Chief, he was assigned to Battalion 18. Previously, he served with Tower Ladder 14, Engine 91, Engine 64, Engine 40, Ladder 26 and Engine 58. He holds a BA degree in History from Queens College. This is his second contribution to WNYF.

Laser Range Meter

by Battalion Chief Fred LaFemina

The laser range meter is a device used to measure distances, calculating areas and volumes and lengths. It also calculates the addition and subtraction of lengths. It can be used to detect movement in a structure and attachments to structures, such as signs, marquees and parapet walls. It also can be used to determine the distance to trapped victims in collapsed areas of structures that may be remote from the access point of the rescuer. The operating modes for the meter are individual measurements, continuous measurements and calculations. All of these modes could be used at fire and/or rescue operations.

The red laser spot clearly identifies the target from which the measurement is taken. The range of the meter depends on reflectance and finish of the target surface. The measuring range of the meter is from four inches to 300 feet. Measuring range of distances can vary according to the material. For Fire Department purposes, the projected measures follow:

- For concrete and brick--up to 150 feet
- For dry wall--up to 210 feet

This could be valuable information to the Incident Commander when determining proper distances for anticipated collapse of any area of the structure. The range meter takes a measurement and the member monitoring the instrument can determine if there was any movement of the projected target. The meter has the capability to be placed in a fixed position on the area being measured and automatically adjusts the LED readout as the distance changes. This will assist the IC in adjusting his tactics throughout the operation.

The meter does have some limitations and the operator must be aware of them when using this device for Fire Department operations. Taking measurements from surfaces with low reflectance surrounded by areas with high reflectance may lead to measurement errors. Measurements taken from highly reflective surfaces may be inaccurate. If you are pointing the laser through panes of glass, the measurement will be inaccurate. Rapid changes in measurements are influenced by people walking across the laser beam. In this case, a new measurement would have to be taken. Another key safety point is that the meter is not intrinsically safe and cannot be used where there is a risk of explosion.

Although this tool was developed for the construction industry, FDNY members developed other innovative ways of using this tool. This is true for many tools available to the Department today. Members continue to explore and develop use of these tools to enhance their operations in the fire service. These methods used by Firefighters will continue to improve safety and assist Incident Commanders in developing tactics in the future.

The laser range meter, a tool that can prove especially useful to the IC when trying to determine the likelihood of building collapse.

photo by Battalion Chief Joseph R. Downey, SOC

About the Author...

Battalion Chief Fred LaFemina, Special Operations Command, is a 19-year veteran of the FDNY. Sixteen of those years have been spent in SOC, including assignments with Squad 1, Rescue 4, Rescue 1 and Squad 270. He is the former Director of the FDNY Tech Rescue School. He is the NY-TF1 Urban Search & Rescue Task Force leader. He contributes frequently to WNYF.