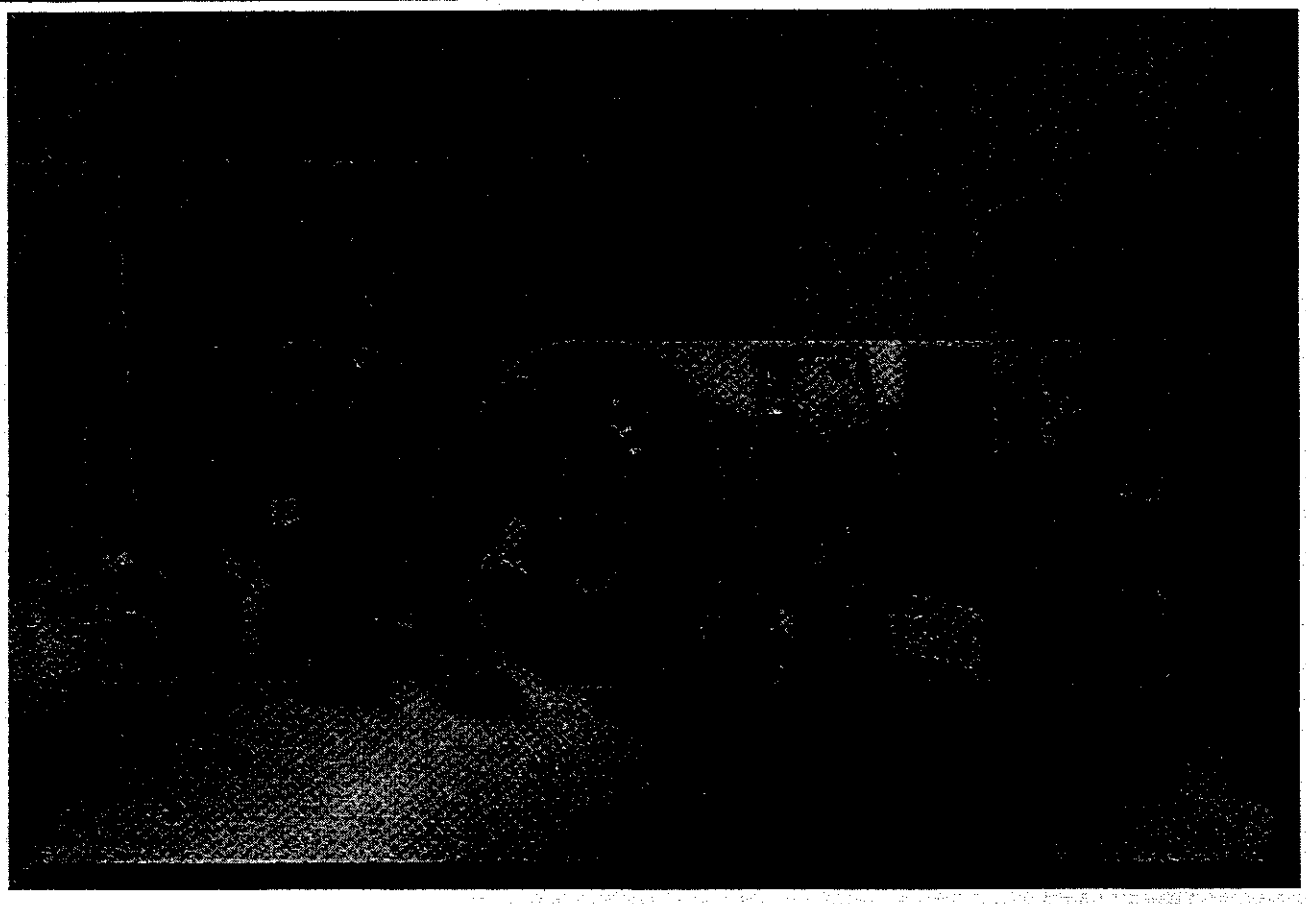

BY RICHARD A. FRITZ

Let's try an experiment. Put a firefighter in a round room that has no doors or windows. He can't reach the ceiling, and the floor is rock solid. The task for the firefighter is to escape from the room.

If we were to come back in about three hours, we would find the firefighter still in the room. But, give the firefighter a set of irons and in no time he would have the place dismantled and probably would be halfway through building a barbecue with the rubble.

The point is that a well-trained firefighter armed with a complementary set of tools, such as irons, would be unstoppable at almost any task given him.

Firefighters must rely on two things: training and tools. To be effective, we need to train with and learn all the possible applications of the tools we carry on the apparatus. Having a set or, better yet, several sets of irons on the apparatus gives us a combination set of tools

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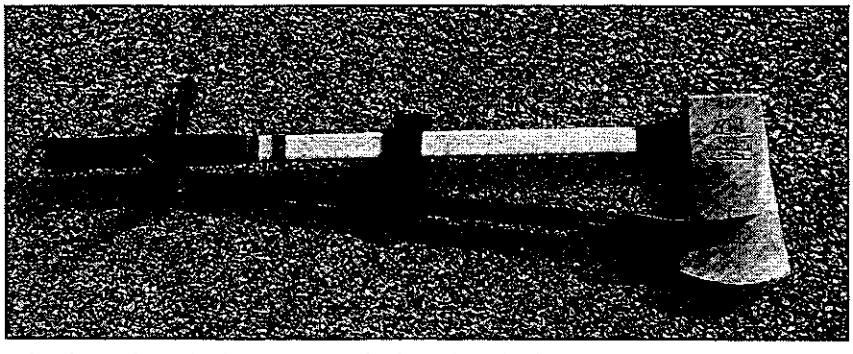
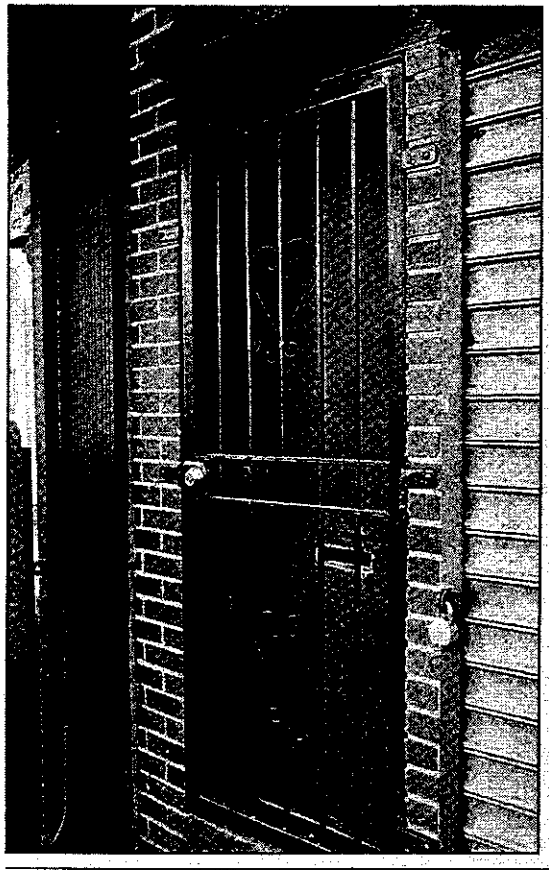
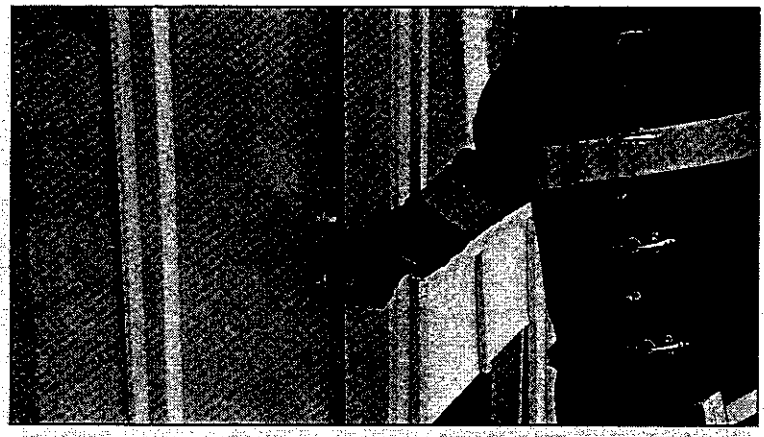


(Left) When used properly, the irons, a married and carried set of tools, can be used for 90 percent of the work needed on the fireground. (Photos by author.) (Right) Force and leverage are the key elements when using the irons.





(Left) A set of irons is especially suited to meeting forcible entry needs, which have become the rule instead of the exception today. (Top right) Always try the lock first. Note that the firefighter is carrying the set of irons. (Bottom right) A two-person team of a "hammer man" and an "irons man" will make short work of most forcible entry situations.

that can perform almost 90 percent of the tasks we need to accomplish on the fireground at any one time.

SET OF IRONS

A set of irons consists of a striking tool and a prying tool, married and carried together. The most common set of irons is an eight-pound flathead ax with a 30-inch halligan-type bar. The bar can include the halligan or a halligan-type bar, the San Francisco bar, and the Chicago Patrol bar. If your department doesn't have the tools listed above, any good striking tool, such as a sledgehammer, and a prying tool, such as a claw tool or pinch bar, can be put together to form a set of irons.

The most important factors to keep in mind when putting the set together are force and leverage.

• *Force.* The irons allow a firefighter to deliver striking force with the ax or sledgehammer. The force capabilities of the eight-pound ax are far superior to those of the six-

pound ax. This force may be used to breach walls, knock open doors, break windows, or deliver force to the bar to position it for maximum leverage.

• *Leverage.* Leverage allows the firefighter to pry. Prying can open locked doors, cause windows to slide open without removing glass, or move a heavy object out of the way.

When these two powers are combined into a set of tools that can easily be carried and used by one or two firefighters, the possibilities for success in any given operation increase greatly. If the firefighter using the tools is well trained, the chance of success rises dramatically. A well-trained firefighter with an imagination and such a set of tools is an unstoppable force on the fireground.

The irons tool set should be available to a pair of firefighters required to perform forcible entry. Taking the set apart, the team will become "the hammer man" and the "irons man." This team will be able to force most of the common locking devices found in residential or commercial occupancies.

The irons also have special uses such as for roof work.

SCENARIO

Firefighters arrive at a residential fire around midmorning. Sizing up the situation, they determine that no one is home and smoke is showing. Taking a set of irons, the forcible entry team approaches the front door. It is locked. The team splits the tools: One firefighter takes the ax, the other the halligan bar. The irons man (the guy holding the bar) places the fork of the halligan about six inches above or below the lock. The bevel side of the fork should be against the door. The irons man slightly angles the bar downward or upward, whichever would be easiest for the hammer man to strike.

The second firefighter, swinging the ax from the hip,

strikes the halligan with the backside of the flatheaded ax. He strikes only when the irons man tells him to. The hammer man delivers slow, forceful strikes. The force of the ax drives the halligan bar into place. The irons man's objective is to drive the forked end of the halligan past the interior door jamb. As the bar is struck, the irons man slowly moves the bar perpendicular to the door being forced to prevent the fork from penetrating the interior door jamb. The irons man will probably have to really lean on the bar to get it to move after each strike. Once he is sure that the tool is sufficiently set into the door and the halligan is fully perpendicular to the door, he applies pressure on the halligan toward the door, forcing it open. The hammer man can use a rope or strap to control the door.

OTHER USES

This is just one of the most typical instances in which a firefighting team may encounter a need for the irons. The irons are also invaluable for forcing open padlocks and breaking chain links.

The halligan bar can be used to foot a ladder in soft ground. Place the halligan on the ground. Use the ax to gently tap the adz and pick into the ground so that the bar is level. Place the feet of the ground ladder on the bar. The ladder cannot slide out and away from the building easily. This technique isn't a replacement for the heel man, but it works in a pinch when staffing is short and you have to use that ladder.

As I mentioned before, a well-trained firefighter with an imagination and a set of irons would be able to rattle off lots of uses for the tool set. There is no gimmick or trick. The ax can be married to the halligan bar by simply turning the ax upside down and standing it on its head. Slip the fork of the halligan onto the ax head. Push the bar forward until the handle of the ax is nestled between the adz and the pick. You can keep them together by using a strap. Those rubber tourniquets with self-fastening strips are great. If the tools do not have a fork on one end, you'll have to be a bit more creative. The original irons man of days gone by carried two pinch bars fastened at the handle end with a piece of rope. He slung the bars over his shoulder and carried them with one bar in front and one in the rear.

Lay the tools out, and give it some thought. You'll figure out a way to get them together.

Once married, the irons should be carried together on the fireground and on the apparatus. They can be mounted in compartments or on the outside of the apparatus. At the Illinois Fire Service Institute, we installed a bracket on the roof of one of our pumpers so the tools could be accessed from the pump walkthrough.

Whatever you design will work as long as the tools are together and easy to access. There is nothing more unprofessional than having to root out a jumble of tools in a compartment before finding the right one.

The irons set was developed by the fire service. Over the years, different styles and combinations of tools have been tried. Experiments are ongoing, and new sets are being developed. Firefighters from New York City to Oak Lawn, Illinois, are finding that combining a cut-down sledgehammer (see "The Cut-Down Sledgehammer," Tools of the Trade, January 1998) with the halligan bar is an extremely effective tool for use with concrete block. Even steel doors in steel frames set into concrete block walls yield readily to this updated version of the standard set of irons.

Decide which tools will constitute your set of irons. Get them together, and then get out there and drill with them. The tools can't be effective without a smart operator. ■

FORCIBLE ENTRY FOR GLASS STOREFRONTS

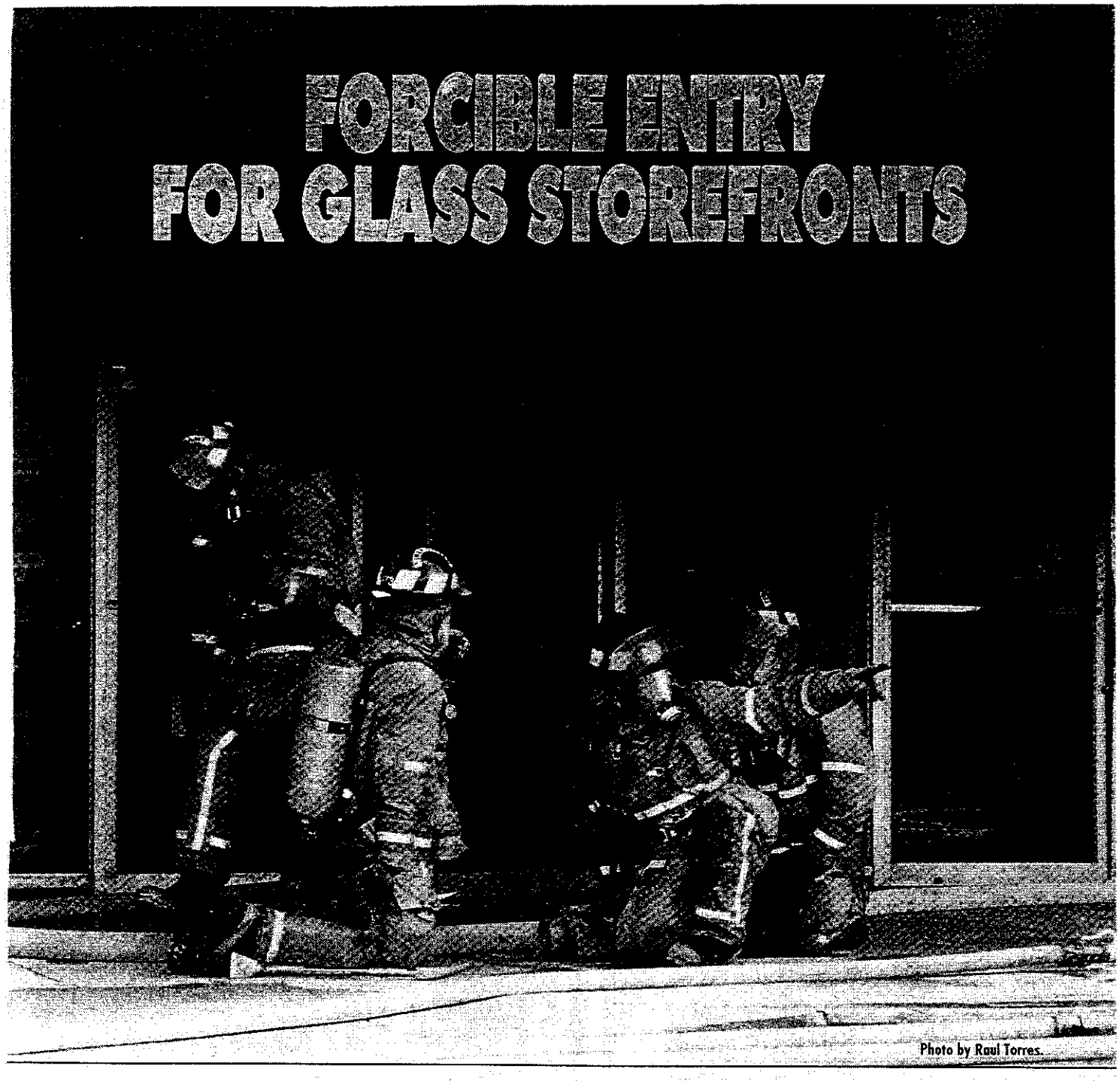


Photo by Raul Torres.

BY BILL GUSTIN

At first glance, it may seem that venting or forcing entry in the front of a commercial occupancy consisting largely of glass doors and show windows doesn't present much of a challenge—simply break the glass. After all, glass is one of the least expensive building materials and usually offers little resistance to breakage when proper techniques are employed. However, we should not always smash our way into a building, and when forcing entry does become necessary, it must be done safely and effectively—it is not always as easy as it may seem.

Breaking glass improperly or when it is not warranted can adversely affect fire behavior, personnel safety, and property conservation. For example, once a window or glass door is broken, we lose control of that opening and the flow of oxygen to the fire. Breaking storefront windows before effecting vertical ventilation can precipitate a backdraft and expose personnel operating directly in front of the fire building to flying glass and the force of the explosion. Broken glass leaves a building vulnerable to thieves and the elements.

■ **BILL GUSTIN** is a captain with the Metro-Dade County (FL) Fire Department and lead instructor in his department's officer training program. He began his 24-year fire service career in the Chicago area and teaches fire training programs in Florida and other states. He is a marine firefighting instructor and has taught fire tactics to ship crews and firefighters in the Caribbean countries. He also teaches forcible entry tactics to fire departments and SWAT teams of local and federal law enforcement agencies. He is an editorial advisory board member of *Fire Engineering*.

Firefighters are breaking storefront glass to get ahead of a rapidly spreading fire. Wind direction, the type of glazing, timing with vertical ventilation, and the potential for a backdraft are critical considerations that influence how, when, and where storefront glass is broken. (Photo by Raul Torres.)

At most fires, extensive glass breakage is seldom warranted. It can cost more to repair than the damage caused by the fire, prevent ventilation by positive pressure, and be perceived as unnecessary damage by the public. Breaking glass for ventilation or entry will be safer, more effective, and appropriate when it is preceded by a thorough size-up that takes into account the following factors: the type of emergency, fire conditions, and the type of glazing on the glass.

TYPE OF EMERGENCY

The type of emergency determines the urgency of the situation and, accordingly, the speed at which the building must be entered and the amount of damage that will be acceptable in gaining entry. Automatic fire alarms, water leaks, and a slight odor of gas or smoke are examples of calls at which it may be hard to justify breaking glass, especially in those instances when someone with a key to open the business can arrive in a reasonable period of time. Forcible entry in less-than-urgent situations is most appropriate when it is accomplished "through the lock," which will be addressed later.

FIRE CONDITIONS

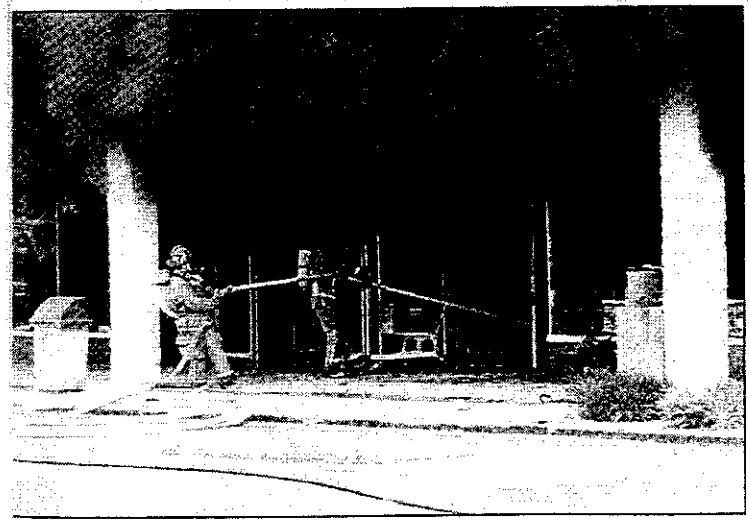
Make no mistake. Conditions that warrant extensive glass breakage must be immediately and accurately identified. Glass should not be spared when fire fills a structure with volumes of thick, billowing, pressurized smoke. These conditions require aggressive breakage to relieve a structure of toxic, flammable products of combustion; improve visibility; and provide an alternate means of escape.

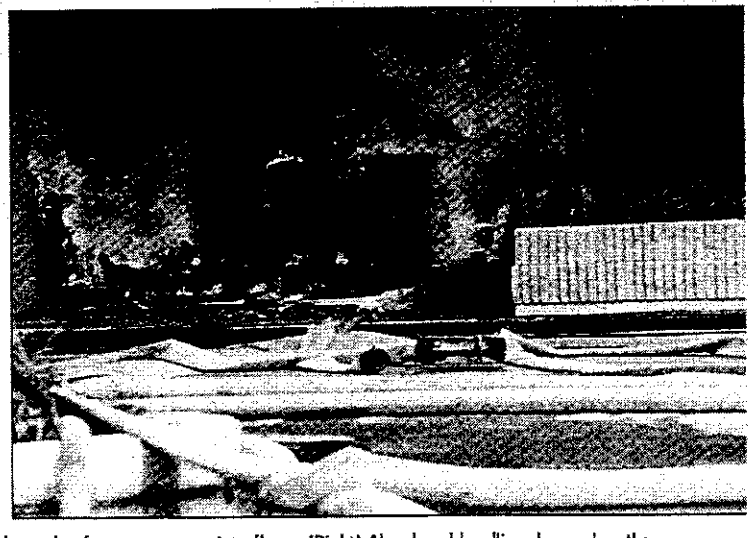
Buildings have been destroyed because officers overly concerned with criticism over property damage left glass intact, impeding ventilation and allowing fire to takes possession of the structure.

How much glass to break is determined more by the *pressure* at which the smoke is escaping from a building than by the amount or color of the smoke. A small contents fire involving synthetic materials such as plastics, foam rubber, or vinyl upholstery can generate considerable dense, dark smoke, but the smoke will tend to drift gently out of openings because it is relatively cool. Often, the most effective and least damaging way to purge a building of this smoke is to leave the glass largely intact and ventilate with positive pressure. In contrast, smoke that pushes out of openings indicates a hot, intense fire and warrants extensive glass breakage in the attempt to save the building.

BREAKING GLASS

Glass must be broken in a controlled, systematic, and profession-





(Left) Firefighters beat a hasty retreat before the heavy smoke, mixing with a fresh supply of oxygen, erupts into flame. (Right) Abandoned handlines burn when the building lights up. Companies regrouped for a defensive attack. Examine storefront glass carefully as part of your size-up. It can tell what conditions are like inside a closed-up building and sometimes how a fire will behave after the glass is broken. Hot glass darkened by soot and dense smoke pushing under pressure indicate a hot, intense fire. (Photos by Raul Torres.)