

# The Coordinated Fire Attack

## BY NICHOLAS PAPA

### The Mission:

- Position a handline to best protect any occupants and the means of egress
  - o Improving conditions to support the search and maximize victim survivability

### The Objectives:

- Locate
- Confine
- Extinguish

### On Arrival:

#### Size-up:

- Get a view of 3 sides on the approach and check the rear
  - o Look first over the roof top for smoke and fire conditions coming from the rear
  - ❖ Communicate any differences in grade (e.g., a walk-out basement/cellar)
- Access
  - o Terrain
  - o Entry points
- Building
  - o Construction
  - o Layout (rooms and arteries/spans and angles)
- Conditions
  - o Location
  - o Extent
- Locate the seat and determine the boundaries of the fire (“BAG” it):
  - o Where has the fire **B**een?
  - o Where is the fire **A**t now?
  - o Where is the fire **G**oing?
  - ❖ Trace the smoke to its lowest level and look for openings serving as air intakes
- Answer the following:
  - o Is the fire in the basement?
  - o Did the fire start on the exterior?
  - o Is the fire involving the structural spaces/voids?
- Accurately reading the conditions requires a holistic approach
  - ❖ Do not hyperfocus on a single detail – collectively assess and reevaluate

Identify the best means of access:

- Approach the fire on its level and from the up-wind side whenever possible
  - ❖ Avoid operating in the fire's exhaust path
- ❖ Is there an intake of air at the entryway?
  - Full intake (no smoke) – the fire is located above you
  - Intake and exhaust (smoke lifts) – the fire is on your level
  - Full exhaust – (all smoke) – the fire is below you
    - ❖ Can also be on your level if the fire is wind-driven (entryway is downwind)

Create a mental blueprint of the interior to anticipate your travel path:

- “What makes a firefighter a *great* firefighter is understanding layouts” (Lt. Tim Klett)
- Use standard floorplans as a baseline and evaluate the construction features:
  - Use real estate and assessor's websites (e.g., Zillow) as training resources
  - Size-up windows (sizes/styles and orientation) and chimneys and soil pipes
- Use the building shape to identify the spine of the building (i.e., “the long hallway”)
  - Deeper than wide (runs front to back)
  - Wider than deep (runs side to side)
  - Square (rooms interconnected in the center)

Estimate the stretch:

- ❖ Measure in lengths of hose (*not feet*)
- Break it down into three components:
  - Rig to the entry door (average of 1-2 lengths)
  - Door to the fire floor (about 1 length per floor)
  - The fire floor (1 length for an typical dwelling)
- Factor in obstacles and add an additional length if vertical extension is suspected
  - Ensure the main body of fire is knocked down before relocating the handline
- If a well-hole or rope/drop stretch is being performed it must be factored into the estimation
  - 1 length of hose can cover 4 flights (e.g., ground-level to 5<sup>th</sup> floor)

### **Rig-to-Door:**

Drop point:

- Stretch dry as close to the fire as safely possible
  - Entry door for private-dwellings and basement fires
  - Position must be isolated from the fire if stretching to the interior of a multiple-dwelling
- Set up in-line or at 45° on the hinge-side of the (inward-swinging) door whenever possible

- An adjacent apartment or the next flight of stairs can be used if needed
- Working length must be flaked out to minimize kinks and facilitate the advance
- Ensure the lead section of hose is on top of/in front of the trailing section (“attack over supply”)
  - Prevents the hose from binding on itself when advanced

Control the door to the fire area until the handline is charged and ready to advance

- Restricting the intake of fresh air to the fire – limiting its growth/spread

Keep the bale closed while the handline is being charged and pressurized (waiting until it expands)

- Minimizes kink formation (especially for low pressure attack packages)

Conduct a pre-entry flow (“APS”) check prior to making entry to evaluate the following:

- **Air** (bled-off)
- **Pressure** (set)
- **Stream** (quality/pattern)
- After the handline is up to pressure, rack the bale (rapidly open and close it) 3 times
  - Water hammer can remove most mild kinks (without causing any damage)
- ❖ Ensure the coupling is at the door alongside the nozzle

### **Making Entry:**

When opening the door to the fire area, “stay low and let it blow”

- Briefly pause to assess the environment as it reacts to the ventilation

Assess the conditions:

- How is the smoke discharging?
  - Is it lazy, steady, or turbulent?
- Neutral plane height and smoke characteristics can indicate the severity of the fire conditions:
  - High & light/lazy: incipient to early growth phase
  - Middle & dark/steady: growth to advanced growth phase
  - Low & black/turbulent (chugging/twirling): pre-flashover
  - ❖ Large, open floor plans and vaulted ceilings can alter the presentation

Prop the door in the fully open position:

- Maximizes the air exchange – promotes lifting and leaning (balancing the air/fuel mixture)

- Allows for a smoother advance of the handline
- Spring clamps work best (place on the bottom or top of vestibule doors with piano hinges)
- Hose straps can be used for securing a screen/storm door (remove the door if unable)

Conduct a quick entry scan:

- ❖ Look under the smoke (“belly-down”) and sweep behind the door
  - Track the intake – fresh air will flow straight *to* the fire
- Check for the following:
  - Life
  - Location
  - Layout

Utilize the thermal imager to aid in locating the seat of the fire (FF Bob Athanas):

- Shoot the ceiling just inside the doorway and locate the exhausting thermal currents
  - Doorways are a point of low-pressure and serve as a choke point
  - Thermal currents are tracking *from* the seat of the fire
- Trace the ceiling down to the opposite wall and rotate the thermal imager 90°
  - Provides a floor-to-ceiling view of the space
  - Identify the height of the thermal balance
- Move the thermal imager to the left, right, and down in front to map the space and gauge:
  - Heat
  - Height
  - Size

### **Advancing & Attacking:**

When the fire is remote from the entryway capitalize on any visibility *until you reach the attack lane*

- Prematurely opening the nozzle *within the travel lane* will eliminate that advantage
  - Once in the attack lane the nozzle should be promptly opened to initiate suppression
- Get to the attack lane as quickly as possible—the final approach to the fire
  - 10- to 15-foot span leading up to the seat (e.g., hallway or adjoining space)
  - If smoke is at at/below the doorknob height and pushing it begins at the entryway
- If uncertain of the boundaries due to the smoke condition, initiate the attack if:
  - Embers are falling, loud crackling/popping/snapping noises and/or heat is noted
  - Your instincts are telling you to (“gut feeling”)

Once the nozzle is open, flow-and-move all the way to the seat of the fire whenever possible

- Flow-and-move is the gold standard in the hierarchy of fire attack
  - o When in doubt default to opening the nozzle
- Flow-and-move controls the environment (“owning the space”) throughout the advance
  - o Maintains the progress/benefits gained (“positive capture” fire attack)
  - o Leads to a quicker knockdown with less cumulative water usage
  - o May be mandatory if the fire is wind-driven or below-grade
- ❖ When water is not reaching the seat of the fire, the stream is only knocking-back the gases
  - o Not addressing the fuels that are actually burning
  - o Conditions can start to rebound if the nozzle is shut down (“renting the space”)
  - o Fight analogy – If you punch someone, would you stop to wait and see? (Lt. Tim Klett)
- If unable to keep the nozzle open, flow for long intervals as far downrange as possible
  - o In between short/fast movements until you can flow-and-move or you reach the seat

#### Stream function and effect:

- Reach (downrange)                      - Cool (space)
- Coat (surfaces)                         - Contract (gases)
- Seal (approach)                         - Convert (flow)
- Fuels that are wet cannot burn – “anchoring the fuels” (Capt. Dennis LeGear)
  - o A wet floor acts like a heat sink and can prevent flashover
- Use the length of the stream
  - o Approximate reach of a handline stream in a (super-)heated environment is 25-30 feet
  - o Enough to cover and clear any residential space

#### When operating the nozzle, conduct the following:

- Start by applying the stream overhead in a wall-ceiling-wall fashion
  - o Use a side-to-side or ‘zig-zag’ pattern
  - o “Feel” the space to gauge the size/depth and gain control
  - o Lower the stream downrange
- Transition into an ‘o’ pattern
  - o Capture the floor (sweeps debris and scalding water, and sounds and wets the floor)
  - o Tighten the pattern to concentrate on the doorway to the fire room
- Seal off the approach corridor/fire room
  - o The more aggressive the stream movement the more the air entrainment
  - o Flowing-and-moving with a 150 GPM stream entrains 5,000 CFM of air (exponential)
  - o Equivalent to the largest residential ceiling fan on the highest setting
  - o Creates a pressure front and maximizes the air exchange
  - o Can convert the flow from bi-directional to uni-directional with an opposing vent
  - o Be cautious of stream movement in small/confined spaces (e.g., knee-wall voids)

- Maximize the stream angle, water mapping, and auditory feedback:
  - o Approach junction points slightly offset (wide angle) to get water downrange sooner
  - o Take corners high and outside – “turning like a forklift” (FF Jay Bonnifield)
  - o Advance down hallways on the side opposite the fire room
  - o Impacting the far side of the doorframe can deflect the stream into the fire room
  - o Thermal imager can be placed in front of the nozzle firefighter to help aim the stream
  - o Use the sound of the stream to find entryways when there is poor visibility

Set a steady cadence of advance and do not outpace the stream or the back-up firefighter:

- Let the water work
- “Be a 185 GPM bulldozer” (Lt. Steve Robertson)
- Use the threshold of entryways as checkpoints to re-assess conditions

Back-up firefighter must proactively manage the supply of hose and support the nozzle firefighter

- Mind pinch points and load adjacent spaces with surplus hose
- Keep the hose low and straight into the nozzle firefighter
- Absorb the nozzle reaction and drive the advance
- Keep your head “on a swivel” and monitor conditions throughout the advance

### **Victims:**

Procedure if a victim is encountered on the approach:

- Nozzle firefighter calls out “victim, victim”
- Back-up firefighter radios command and requests assistance (identify the location)
- Back-up firefighter bumps-up with surplus hose
- Back-up firefighter removes/relocates the victim (passing them off as soon as possible)
- Nozzle firefighter finishes the push or holds position until the back-up firefighter returns

### **Ventilation:**

Coordinate ventilation opposite the advance and/or above the fire:

- Ensure the handline is *at least* moving in on the fire and capable of reaching the seat
- Horizontal ventilation will be sufficient for most living space (contents) fires
  - o Largely compartmentalized with ample windows

- Vertical ventilation is highly beneficial for unfinished/void spaces (structural) fires
  - o Attics/cocklofts and knee-walls
  - o Largely uncompartimentalized with limited or no natural openings
  - o Helps confine the fire and relieve the pressure
- Wind-impacted, hoarding, and deep-seated fire conditions require conservative timing
  - o Must ensure the nozzle team *at least* has water on the seat of the fire
  - o No potentially wind-impacted openings should be made until after knockdown
  - o Additional authorization from the incident commander ensures coordination
- Use clear and concise commands:
  - o “In position.” (venting firefighter announcing they are set up and where)
  - o “Hold off.” (engine officer announcing they are not ready for vent)
  - o “Vent. Vent.” (engine officer announcing they are ready for vent)

**Progress:**

The handline is either moving or it is losing (outgunned, poor water mapping, or under-vented)

- Reevaluate if stalled – reposition the handline/stream, back it up, or back it out if needed
- Request additional ventilation (if applicable)
- If getting overrun/outflanked and a retreat is required:
  - o Back-up firefighter must immediately notify command and request assistance
  - o Face the fire and keep the nozzle fully open
  - o Back-up firefighter must continuously take-up the slack in the handline

If multiple rooms off a hallway are involved, do not overcommit:

- Work the stream downrange and get water into the far room if possible
  - o Use the doorframe (far jack-stud) to deflect the stream into the space
  - o Give it a substantial hit to hold it off so, the previous room(s) can be knocked-down
- Do not fully enter the first/intermediate room(s) – get your shoulders just past the doorframe
  - o Work the stream for long enough to get a knockdown
  - o Back-up firefighter must monitor the hallway and notify if conditions rebound
  - o Alternate between the hallway and the room if needed
- Repeat the process until arrival at the final room

When entering an involved room, conduct the following:

- Quickly work the stream overhead—wall-ceiling-wall—to cool and contract the gases
- Transition into a wide ‘o’ pattern to capture the floor and the fuels that are burning
- Hit the back (“dry”) wall to address any involvement behind you

Once the nozzle firefighter can complete extinguishment, the back-up firefighter can:

- Search the immediate area (and beyond if needed)
- Provide additional horizontal ventilation (if needed)

After the fire has been knocked-down, the nozzle firefighter should hydraulically ventilate

- Requires no additional personnel or equipment
- Uses negative pressure
  - o Minimizes turbulence/large-scale mixing and maximizes air exchange
  - o Exhausts the by-products immediately out of the most contaminated area
  - o Can draw from adjacent spaces
- Position in-line with the opening and as far back as possible
  - o Lengthening the stream increases the air entrainment
- Use a narrow fog pattern or a broken stream
  - o For smoothbore nozzles, remove the tip and open the bale halfway
  - o Place the tip in a pocket for safe-keeping
  - o Replace immediately when completed or if spot fires flare up
- Work the stream within the opening to maximize air entrainment

### **Overhaul:**

Address any hot spots and check for extension:

- Utilize the thermal imager
- Open up walls and ceilings until the voids are 'clean' (no soot staining/charring)
  - o Remove the baseboard before pulling the wall sheathing to expose the stud channels
  - o Thoroughly wash down involved areas to prevent a rekindle

### **References:**

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