

The Coordinated Fire Attack

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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 5th 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, pushing, or turbulent?
- Neutral plane height and smoke discharge can indicate the severity of the fire conditions:
 - High and lazy: incipient to early growth phase
 - Medium and pushing: growth to advanced growth phase
 - Low and turbulent (chugging/twirling): imminent 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:
 - Victims
 - Fire
 - 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 disrupt 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 (the “landing strip”) 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)
- Coat (surfaces)
- Seal (approach)
- Cool (space)
- Contract (gases)
- 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 a tight/squashed ‘o’ pattern
 - o Occasionally widen the pattern to capture the floor
 - o Sweeps away debris and scalding water, and sounds and wets the floor
- 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, 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 “Moving in” (engine officer announcing they are advancing in on the fire)

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:

- FF. Jay Bonnifield (Everett, WA), Anatomy of a Push
- FF. Aaron Fields (Seattle, WA), The Nozzle Forward
- Lt. Tim Klett (FDNY), Stretching and Operating the First Line
- Lt. Steve Robertson (Columbus, OH), Stretching for Success
- FF. Bob Athanas (FDNY/SAFE IR), Thermal Imaging
- Capt. Dennis LeGear (Oakland, CA), Hydrants to Nozzles
- UL-FSRI, Coordinated Fire Attack, Water Mapping, and Air Entrainment Studies
- Lt. Ray McCormack (FDNY), Brass Tacks and Hard Facts
- Lt. Mike Ciampo (FDNY), Tactical Tips