

**LARGE CALIBER STREAMS**

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**11. LARGE CALIBER STREAMS****11.1 LARGE CALIBER STREAM DEFINED:**

A large caliber stream (also called a "master stream") is any fire stream with a flow of 300 gpm or more. Flows this high require mechanical assistance for safe handling due to the tremendous nozzle reaction forces generated by the large volumes of water. Large caliber streams (LCS) are potent weapons in the FDNY arsenal. Their tremendous versatility and fire suppression potential is well recognized, but they must be used carefully due to the high pressures and high volumes they produce which can cause serious injuries. A variety of large caliber stream devices (also called "master stream devices" or "master stream appliances") are employed by this Department and can be broadly divided into three categories:

- Portable or ground based.
- Engine apparatus based.
- Elevated.

The specific types of LCS operated by the FDNY are listed as follows:

**PORTABLE**

Akron "New Yorker" multiversal (see Fig. 11-1):

- Consists of LCS nozzle and detachable support base.
- Can be set up remote from pumping apparatus--on the ground or on the roofs of exposure buildings or setbacks.
- Includes three "stacked tips".
- Playpipe (stream shaper) must be left in place to assure a good quality stream with maximum reach.
- Water supply is provided by two 3 1/2-inch lines, but 2 1/2-inch hose can be used if necessary although the upper end flows will not be attainable.
- Consult Training Bulletin **Tools 17 Akron New Yorker Multiversal Nozzle** for specific information on assembling, maintaining, and using this LCS device.

## ENGINE BASED

Akron "New Yorker" deckpipe: (see Fig. 11-2)

- Sometimes incorrectly called a "Stang" nozzle. Stang refers to a brand of LCS no longer in service with the FDNY except for the Satellite Water System.
- Permanently affixed to engine apparatus and supplied directly by a 3-inch pipe from the pump.
- A gate valve is included between the pump and LCS device.
- Requires positioning engine apparatus near the fire building, which may necessitate the use of in-line pumping.
- Includes three "stacked tips."
- Playpipe (stream shaper) must be left in place to assure a good quality stream with maximum reach.

Stang "Intelligiant" monitor used by Satellite Water Unit (total of 6 plus spares:)

- Each "Intelligiant" gun is capable of flows up to 4700 gpm through a 3 1/2-inch tip. Other tip sizes are available.
- For more information, consult **AUC 274 "Satellite Water System Operations."**

## ELEVATED

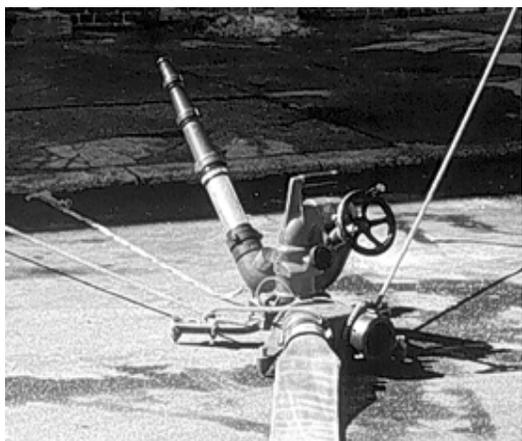
Akron ladder pipe nozzle (see Fig. 11-3):

- Carried by ALL aerial ladder apparatus.
- Must be manually attached to rungs of aerial ladder fly section.
- Controlled by halyards at ground level or turntable.
- Specific operating parameters exist concerning tip pressures and aerial ladder angle/extension. Consult **Evolutions 21 and 21A** for more information.
- Interchangeable tips are provided.
- Playpipe (stream shaper) must be left in place to assure a good quality stream with maximum reach.
- Supplied by 3 1/2-inch hose. Two supply sources are recommended to prevent undue stress on the aerial ladder in the event a sudden loss of water occurs. A 3-inch ball valve and 3-inch by 3-inch siamese are carried by ALL aerial ladders. Aerial ladders are also equipped with two lengths of 3 1/2-inch hose to supply the ladder pipe.

Akron tower ladder basket based monitor (See Fig. 11-4):

- Most flexible type of LCS used by the FDNY.
- Permanently affixed to basket of tower ladder.
- Includes three "stacked tips".
- Flows up to 1200 gpm are possible through the 2-inch tip when supplied by two 3 1/2" lines.
- Playpipe (stream shaper) must be left in place to assure a good quality stream with maximum reach.
- 200 to 250 psi is required at the inlet of the tower ladder apparatus for effective operation.
- Water flow is controlled exclusively by the supply pumper.

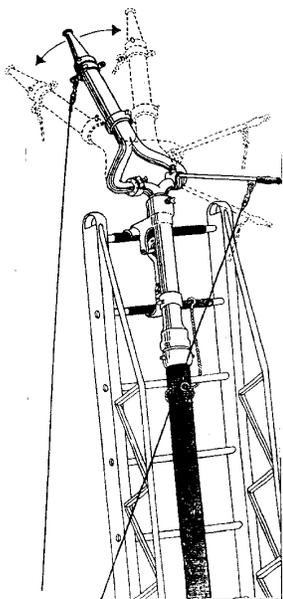
LCS are also carried by fireboats.



**Fig. 11-1**



**Fig. 11-2**



**Fig. 11-3**



**Fig. 11-4**

## 11.2 SAFETY

LCS use requires strict adherence to various safe operating procedures to avoid serious injury or unnecessary property damage. High pressure LCS can dislodge glass, masonry, slate shingles, asphalt shingles and other materials and turn them into dangerous projectiles. The force of the stream can knock a firefighter down and cause severe injuries. Water accumulation in buildings due to the tons of water per minute discharged by LCS can precipitate collapse, as can the structural stress sustained by a building hammered by the high pressure stream. LCS also move large amounts of air and can drive fire into other areas of the building forcing a hasty retreat by operating members.

- 11.2.1 The use of a LCS can only be ordered by the Incident Commander (IC). This includes the first arriving engine using its "Deck Pipe" for a quick fire knock down or exposure protection.
- 11.2.2 If LCS use is ordered, all operating forces within the building must be notified and time permitted for their safe withdrawal to unexposed positions. Confirmation of their safe withdrawal should be verified by handie-talkie or face-to-face communication with the IC.
- 11.2.3 As an additional safety measure, the LCS should be quickly swept through the building without stopping at any window or other opening to serve as a warning to any members left in the area of operation.

## 11.3 SPECIFIC OPERATING TACTICS

- 11.3.1 At well involved frame buildings, vacants, and taxpayers, tower ladder operations can be anticipated and engine apparatus should position with this in mind. Use of the "deckpipe" should not interfere with proper tower ladder positioning for effective use of elevated LCS.
- 11.3.2 When arriving at any of the above fire situations and a hydrant is not in proximity to the fire building, a 3 1/2-inch line should be "dropped" (in addition to a handline) to best assure rapid employment of tower ladder LCS. (The same consideration may be made for a ladder pipe if no tower ladder is assigned to or available for the box.)
- 11.3.3 To reduce the destructive effects of "water hammer" on pumps, appliances, and members, all valves and gates used in supplying LCS must be opened and closed slowly. A water hammer is the sudden force that is exerted upon hoses and appliances when supply is suddenly or rapidly shut down. This can result in damage to pumps, appliances and hose and can also cause injuries to members.
- 11.3.4 Whenever possible, an engine company supplying LCS should be dedicated to that task and not engaged in supplying handlines. This makes for a safer operation due to the tremendous water hammer created by the sudden shutdown of an LCS, which could cause a burst length or cause members to lose control of a handline. **RELIEF DEVICES MUST BE USED WHEN SUPPLYING LCS.**
- 11.3.5 An engine company supplying a LCS during in-line pumping must be augmented as soon as possible.