"Fire Department In A Box"

By C. F. Marley

In rural Alaska, where roads are poor and water mains often are not available, dozens of villages now have a new alternative to the conventional fire department. It's called a "fire department in a box" and calls for fighting fires with foam instead of water. The idea might also be useful in other rural parts of North America.

The fire fighting equipment is contained in two metal trailers that can be pulled behind pickups, all terrain vehicles, or even snowmobiles. The trailers use compressed air to produce firefighting foam from a small amount of water. The trailers contain all the firefighting equipment needed, including a 30-gal. solution tank to make the foam, 400 ft. of hose, a hose reel, and a water pump. They also carry hand-held extinguishers, an ice auger, helmets, gloves, goggles and pick axes.

The equipment is less expensive to maintain than a fire truck and doesn't require a fire house for storage. And the trailers maneuver easily on poor roads and can be used where water is scarce or mostly frozen.

Actually, fighting fires with foam is a technique well established by the U.S. military. This is just a new adaptation of it.

"In a small compact package you have the ability to produce 1,200 gal. of firefighting foam in a very short period of time," says Tom Harris, president and chief executive of Alaska Village Initiatives, an Anchorage nonprofit that developed the Micro-Rural Fire Department, as it's formally called. Fiftyfive Alaskan communities now have the new equipment, and 12 units are being built. The project's goal is to provide 250 rural Alaskan communities with the equipment in five years.

Once at the scene of a fire, it takes only five seconds for the firefighting foam to activate, and 600 gal. of foam can be discharged in 90 seconds, even at temperatures down to 40 degrees below zero.

Steve Schreck, Alaskan rural fire training specialist, says each fully equipped trailer costs about $70,000 which is less than one third the price of an average fire truck.

The system works. Two instructors recently gave 28 hours of instruction over a three-day period to show the locals how to use the equipment, and two days later there was a house fire in one village. It was extinguished in only two minutes and damage was confined to one room.

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Fire fighting equipment is contained in two metal trailers that can be pulled behind pickups, ATV's, or even snowmobiles.

Clark Carpenter made this truck-mounted fire-fighting unit to protect his house from local brush fires.

Truck-Mounted Fire Fighting Unit

Clark Carpenter, Hamilton, Mont., made a truck-mounted fire-fighting unit to protect his house from local brush fires.

A 600-gal. tank bolted to the floor serves as a water tank. Beside it is a Nissan 4-cyl., 50 hp engine and a 10,000-watt generator mounted on a steel frame. The belt-driven generator powers a 1 1/2 hp electric motor that operates a pressure pump that delivers water to a handheld spray wand. Four 1-in. dia. threaded rods - one at each corner of the generator mounting plate - are used to raise and lower the generator in order to adjust belt tension.

"We get a lot of forest fires in this area. This setup lets me put out small fires during the fire season," says Carpenter. "I can use the handheld wand to send water out about 75 feet. I plan to add a pressure boosting pump in series with the original pressure pump so I can send water out even farther. "

He had a local machinist make a plate that replaces the original pressure plate on the engine's flywheel, with a shaft sticking out of the plate to mount pulleys to drive the belt-driven generator.

"It works better than using a gas engine powered water pump because I don't have to carry anything down to the water," says Carpenter. "The generator was originally designed to mount on wheels, and I use it often to operate drills and electric impact wrenches. To mount it on the truck I remove the wheels and then use a chain hoist to lift it onto the bed.

"To fill the tank, I just drop the submersible pump over a bridge and into the water, then hook up a hose to the tank and start the generator. The submersible pump weighs only about 10 lbs. compared to a water pump that might weigh up to 100 lbs. I paid $300 for the generator. I already had the car engine."

Belt-driven generator powers an electric motor, which operates a pressure pump that delivers water to handheld spray wand.

The generator is designed to run at 3,600 rpm's. Carpenter slowed the engine down to 3,000 rpm's by installing a big pulley on the engine and a smaller one on the generator. "The slower speed is easier on the engine and also uses less gas. I use a car's cruise control to keep the engine running at a constant rpm," notes Carpenter.

He uses inverted car tires to stow the water hoses. An inverted ATV tire is used to store the extra nozzles and quick couplers. He made the machine that's used to invert the tires. "It'll invert two tires per minute," notes Carpenter.

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Old Army Jeep "generator trailer" is used to create 10-ft. wide foam barriers that stop fires in their tracks.

Trailer-Mounted "Pumper" Uses Foam To Put Out Fires

After a bark beetle epedimic killed almost all the spruce trees on his ranch, creating a lot of dead trees and a big fire danger, Lloyd Schade of Homer, Alaska, put together his own self-contained fire pumping system using an old Army Jeep "generator trailer." It's used to create 10-ft. wide foam barriers that stop fires in their tracks.

The 2-wheeled trailer can be pulled behind any 4-WD tractor, truck, or pickup, allowing it to be used off the road and in fields and woods.

"It's a low-cost but highly efficient system. I think it could be used anywhere in rural North America," says Schade, who operates a beef cow operation on 600 acres. "It lets us go to any fire and put it out while it's still small, instead of waiting on the road for the fire to build up and come to us."

He installed a 500-gal. tank on the Jeep trailer and a gas engine-driven pump, as well as four 1 1/2-in. dia., 100-ft. long hoses equipped with foam applicator nozzles.

"In my opinion, it works ten times better than using conventional fire trucks," says Schade. "We live in a remote area where tankers and fire trucks often have to be flown in. Our trailer-mounted fire pumper lets us build a fire break rapidly with foam when the fire is still small and contain it in a small acreage, eliminating the need to cut miles of firebreak.

"I built my first trailer three years ago and have since built two others. Our community volunteer fire department uses all of them. I left the metal frame on the trailer for people to hold onto if they want to ride along. We use three-man teams to work the trailer - one to operate the truck or tractor, one to operate the pump, and one to handle the hose. Since we drive to the fire, most of the time one or two hoses is all we need. We use Barricade BFFF foam which breaks down in only two or three days. It lasts much longer and penetrates better than traditional foams, and it's also easy to clean up.

"The pump is belt-driven by a 30 hp gas engine, which we have to throttle down in order to avoid wasting water. I run the pump at 95 to 100 psi. I gravity-fill the tank out of a spring or fill it out of a 5,000-gal. fire department tanker truck. I use a 400-gal. transfer tank mounted on another vehicle to go with the pump system," he notes.

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