A I R P O R T F I R E P R O T E C T I O N

AIRPORT FIRE DIVISION
MIAMI INTERNATIONAL AIRPORT

Station #12 is situated near the geographical center of Miami International Airport. The primary function of this station is to provide Crash/Fire/Rescue services for aircraft and passengers utilizing the air field. Most of the fire equipment housed here is specifically designed for aircraft fire fighting.

Since it is necessary to cross the Aircraft Operations Area (AOA) to reach Station #12, personnel assigned here cannot come directly to the station in their private vehicles. This is due to the fact that vehicles operating on the AOA must be in radio contact with the FAA Ground Control Tower. Fire fighters reporting for duty, rendezvous at a point near the East Security Gate (see map at end of this section) and are escorted to Station #12 by a fire department vehicle. Off-going personnel are escorted from Station #12 to the east gate in the same manner. Once on duty and aboard the apparatus, fire fighters have communications with the tower via the vehicle ground control radio and movement on the AOA is not restricted; however, tower clearance is still required prior to movement.

Station #12 is also one of the few remaining Dade County fire stations which operates a manned 24-hour watch office. This is necessary because many of the alarms received come directly to Station #12 and not through the Fire Alarm Office. This is especially true in aircraft emergencies, since the call usually comes directly from the FAA Control Tower.

Watch duties are rotated among the fire fighters assigned to Station #12. Watch duties are normally scheduled as follows:

0700 hours to 1200 hours - first watch
1200 hours to 1600 hours - second watch
1600 hours to 2000 hours - third watch
2000 hours to 2300 hours - fourth watch
2300 hours to 0700 hours - fifth watch

All watches are "wake" watches with the exception of the fifth. The watch office is equipped with a bunk and fire fighters assigned to the fifth watch are allowed to sleep.

The watch office is located within Fire Station #12 and has a console for telephone call directors, a public address system, an alarm system, door opening mechanisms, station light controls, Metro Dade Fire Department fire frequency radios and FAA Ground Control radio. Other Emergency Telephones consist of direct lines to the Metro Dade Fire Department Alarm Office and the FAA Control Tower.

The watch office is in effect an emergency communications center where alarms are received and vehicles are dispatched according to the requirements of the situation. These dispatches and other watch office functions are aided by the use of a Hewlett Packard 150 II Touch Screen computer.

When an alarm is received, the watchman announces the nature of the call on the public address system, follows this with a short alerting

call on the claxon and repeats the information. He copies the message on a note pad, makes a carbon copy and records a call-back phone number. He repeats the message to the caller to assure accuracy. If the area of dispatch might be difficult to locate, he advises the caller to have someone meet the responding unit(s) to direct them to the scene. The watchman issues a copy of the alarm address and information to the unit responding to the incident. There is a back-up watchman assigned for each watch who reports to the watch office immediately after the initial announcement of an alarm. He assists with radios and telephones and covers the watch office function if the original watchman is assigned to a responding unit.

The Airport Fire Division maintains 9 different emergency vehicles (including reserve apparatus) which might be dispatched to various types of alarms. The watchman dispatches these units to the particular incident, then monitors his radios closely in case the arriving vehicle(s) request more assistance or additional specialized equipment.

On all rescue calls to the Airport Terminal (paramedic unit request), the watchman notifies the Terminal Information Booth. The information booth personnel notify the Terminal Supervisor's office. This relay assures that privacy screens are rolled to the incident to shield the victim from passers-by if there is a need to do so.

The watchman maintains a daily activity log. This official record lists fire station activities and reflects personnel changes, vehicles

sent to repair shop, units dispatched for fires, rescues, first aid, fuel spills, building inspections, hydrant and fire well checks, training, structural or aircraft fires, pre-fire planning surveys, fuel tank farm surveys, fire prevention and protection surveys in the Terminal, Satellite and hotel high-rise complexes.

Normal routine daily activities for fire personnel at Station #12 consist of the basic routine duties performed by all Dade County fire fighters.

These include apparatus and equipment checks, building inspections and surveys, hydrant and field well details, housekeeping, etc.

Training for airport fire fighters consists of classroom and drill activity related to structural and aircraft fire fighting procedures as well as procedures for handling other types of emergencies. Since our prime function is that of a C/F/R unit, heavy emphasis is placed on aircraft fire fighting and aircraft familiarity. Such training is required by the FAA for all fire fighters assigned to C/F/R units.

A full-time training officer is assigned to the Airport Division. He is responsible for the development of training modules, coordination of the program and maintenance of training records for each individual fire fighter. Most training is conducted by company officers, however the training officer does frequently teach class and conduct drills and at times experts are brought in to provide information and training in specialty areas. The training process is continual and closely monitored at all times.

1/87

AIRCRAFT PROTECTION FROM HYDROCARBON FUEL FIRES

The principle fire fighting vehicles are mandated by the Federal Aviation Administration (F.A.A.) Regulations, Part 139.49.

Miami International Airport is assigned a currently applicable Index "E" reflected in the F.A.A. National Airport System Plan. Index "E" covers fire protection for aircraft over 200 feet in length. The minimum requirements for Index "E" are :

(1) One lightweight vehicle providing at least 450 pounds of dry chemical extinguishing agent and 50 gallons of pre-mixed Aqueous Film Forming Foam (AFFF).

(2) Two additional self-propelled fire extinquishing vehicles collectively carrying 6,000 gallons of water for production of fluoroprotein foam or Aqueous Film Forming Foam (AFFF).

Crash/Fire/Rescue vehichles in service at Fire Station #12 which conform to these requirements are:

(1) Foam #4 and Foam #5-two Oshkosh T-12's . On these unique vehicles the water tank carries 3,170 gallons and the foam tank carries 410 gallons of extinguishing agent. The foam tank contains AFFF (Aqueous Film Forming Foam) concentrate. The high-performance diesel engine provides a high-horsepower to-weight ratio and excellent off-road performance.

One driver-operator can operate this vehicle and turret functions. The hydraulically power-assisted turret can produce 1,500 gallons per minute of foam solution, projecting this stream up to 278 feet. The operator can also activate the bumper turret (300 g.p.m.) and under-truck nozzles (two) at 17 gallons per minute each.

These versatile vehicles respond at high speeds to alarms and alerts. Each vehicle has a 1 1/4" handline, which can project water or foam streams (at 60 g.p.m.). This feature enables the fire fighters to enter aircraft to attack interior fires or extinguish small fuel fires around the aircraft.

Both modern vehicles carry a large selection of forcible entry tools and appliances designed to quickly extricate passengers from aircraft which have encountered conditions that obstruct normal methods of deplanning.

Radio communications between the Battalion Commander, the F.A.A. Control Tower, the Dade County Fire Alarm Office and these vehicles are maintained. Each truck has a mobile Comco transceiver with Ground Control frequencies and a multi-channel Metro Fire radio.

(2) The other vehicle that fullfills the Index "E" protection requirement is the Quick Response Vehicle (QRV#8) housed at the Airport Fire Station. This Emergency One, all wheel drive, 5 1/2 ton GVW, high mobility gasoline-powered, light duty aircraft fire and rescue unit has a pressurized Light Water (AFFF) fire suppression system and dry

chemical fire suppression capability. The high-powered unit accelerates from 0-50 m.p.h. in 25 seconds. It carries 100 gallons of pre-mixed Aqueous Film Forming Foam (50 gallons more than required.) and 450 pounds of Purple K (potassium bicarbonate) dry chemical in spherical tanks. The AFFF and dry chemical is expelled by compressed nitrogen.

The twin manual hose reel is pre-connected to the discharge manifolds. The 100-foot hoses are equipped with a twin-ball type shut-off nozzle. This arrangement allows use of either or both dry chemical or Light Water applications. The 1" high pressure hoses produce 50 g.p.m. for a minimum range of 35 feet for Light Water and a dry chemical discharge rate of 7.5 pounds per second with a minimum range of 45 feet. Another feature of this unit is its low silhouette which greatly enhances its ability to respond to, and enter low clearance areas under aircraft, terminal drives, jetways and parking garages.

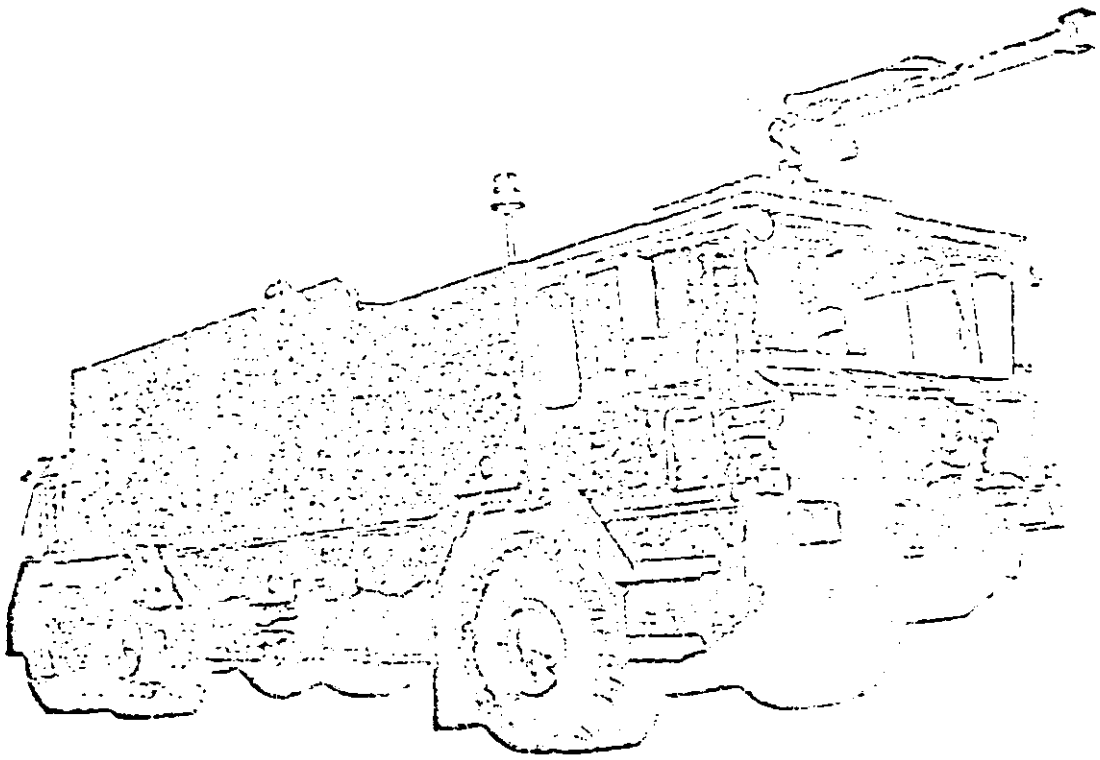
At Station #12 there is a Walters Model CBK Aircraft Crash Fire Fighting truck with a 3,000 gallon water tank and 2 - 250 gallon foam tanks. There is also an additional light Quick Response Vehicle (QRV-6) with 100 gallons pre-mixed AFFF tank and 450 pounds of dry chemical. Both of these units are used as reserve units and are manned as manpower permits.

As the title indicates, this booklet is designed to provide a basic familiarization with these specialized C/F/R apparatus.

In no way is it intended, nor can it be construed, to replace the technical information available in the Operator's Manual, Crash/ Fire/Rescue Vehicle Training Manual or the services manual provided by the Oshkosh Truck Corporation.

Any questions you may have concerning these apparatus, which are unanswered in this pamphlet, should be researched in one or more of the aforementioned manuals.

FAMILIARIZATION PAMPHLET
Oshkosh 1983 T-12 Models
Crash/Fire/Rescue Vehicle
Foam #4 and Foam #5



Foam #4 - Vehicle #21-0135
Foam #5 - Vehicle #21-0136

FOAM #4
FOAM #5
Crash/Fire/Rescue
Oshkosh
T-12

The Oshkosh T-12 is designed for Airport Fire Fighting. On-and-off road capabilities allow the vehicle to respond in a timely manner to aircraft accident sites across terrain which might otherwise be inaccessible to standard highway equipment. Primary function at a crash site is the rapid production and discharge of large amounts of AFFF foam agent. This is vital to rapid fire control necessary to facilitate rescue of victims.

The vehicle is 6 X 6 all wheel drive and front wheel steered. A single mounted, diesel engine, provides power for the drive train, accessories and fire fighting equipment. An all aluminum body houses the engine, drive train components, accessories and fire fighting equipment. The vehicle chassis is constructed of high strength, steel.

The vehicle is powered by a Detroit Diesel, 2-cycle water cooled, turbo charged, 492 HP V-8 engine. Power is transfered from the engine through a power divider. An Allison transmission with 5 forward and 1 reverse speeds is utilized.

The power divider is mounted to the engine flywheel and transmits power from the single engine to:

Transmission and Drive Train

Water Pump/Foam Pump

The pump power-take-off has a hydrulic clutch which is not engage actuated by the control switch located in the operator cab. When the pump is engaged, slippage of the power divider clutch is controlled by the foot throttle allowing only a portion of the engine R.P.M. to be transmitted to the transmission. This allows slow controlled vehicle movement during pump and roll operation while full engine R.P.M. is available to the pump. The pump, however, can be engaged at any speed.

The T-12 cab contains all the instrumentation and controls necessary to direct and monitor the performance of the vehicle during all vehicle operations. It has a certain steering position and seating for 4 fire fighters (including driver).

A cab heater and defroster are installed for crew comfort and to keep the windshield clear of mist. In addition a windshield washer/wiper system is provided to assist in maintaining clear vision for driver operators. The crew cab is air conditioned for warm weather operation and to insure windows will be closed to provide personnel further protection from smoke and potential flash fire situations.

There is an entry/exit door on each side as well as an escape hatch on the cab roof. This hatch also provides access for manual operations of the roof turret.

The articulating body is mounted in three sections (cab, water tank and rear body) to relieve stress on the water tank, body and sheet aluminum coverings.

The DC electrical system provides 24 volts for starting and 12 volts for lighting. An on board power inverter provides a source of 120 volts - 60 cycle AC. Maximum capacity is 2,500 watts. Outlet recepticles are mounted on both sides of the vehicle exterior.

Fire Fighting System:

The fire fighting system consists of the following components:

1. Water and Foam Tank (Stainless Steel)	3170 gals (water) 410 gals (AFFF)
2. Water and/or Foam Pump (Hale-single stage centrifugal)	1800 g.p.m. at 220 psi
3. Handlines w/Electric Rewind	150 feet each line
4. Under Truck Nozzles (3)	17 g.p.m. each
5. Non-aspirating Bumper Turret	300 g.p.m. at 220 P.S.I
6. Remote Hydraulic Roof Turret	750 or 1500 g.p.m. at 220 P.S.I.
7. Side Discharge Panel	2-2 1/2" discharges
8. Foam pump (single stage centrifugal)	160 g.p.m. at 220 P.S.I.

The Hale Water and Waterous foam pumps are actuated by switches in the operator's cab. Both pumps are gravity primed.

The foam proportioning system is a "discharge side automatic pressure balanced" type, mannually adjustable from 2% - 10%. This system provides accurate proportioning at all foam discharge rates. Oshkosh units are preset at 6% for the AFFF now being used.

The vehicle has 150 feet of 1/4" booster hose handline controlled by a manual discharge valve. The reel is located on the front underside of the truck and is equipped with electric/manual rewind. The handline nozzle- is non asperating with variable patterns.

Two (2) discharge connections are located on each side of the truck. The connections are 2 - 2 1/2" NST male thread and have individual shut off valves. Pressure at these discharges is controlled by the gate valves. Extreme care must be exercised when using these discharges . When in auto pump 220 P.S.I. will be available thru a fully opened discharge gate. Gates must be opened slowly and the pressure regulated by monitoring the appropriate pressure gauge.

The roof mounted "Feecon" turret has a single nozzle and is non-asperating with variable streams. The turret is hydraulically powered and controlled from within the cab or from controls located at the base of the turret on the cab roof. Maximum turret ranges are:

Straight Stream	300 feet
Fully Dispersed	85 feet

Turret discharge rates of either 750 ro 1500 g.p.m. can be selected by the operator.

The Santa Rosa bumper turret has a single nozzle and is non-asperating with a variable stream. Control is remote hydraulic for rotation, elevation and nozzle pattern. Straight stream setting provides a reach of approximately 140 feet.

Three (3) strategically located 17 g.p.m. undertruck nozzles provide protection from ground fires for the vehicle itself.

Two (2) discharge connections are located on each side of the truck.

The connections are 2 - 2 1/2" NST male thread and have individual shut off valves. Pressure at these discharges is controlled by the gate valves. Extreme care must be exercised when using these discharges . When in auto pump 220 P.S.I. will be available thru a fully opened discharge gate. Gates must be opened slowly and the pressure regulated by monitoring the appropriate pressure gauge.

The roof mounted "Feecon" turret has a single nozzle and is non-asperating with variable streams. The turret is hydraulically powered and controlled from within the cab or from controls located at the base of the turret on the cab roof. Maximum turret ranges are:

Straight Stream	300 feet
Fully Dispersed	85 feet

Turret discharge rates of either 750 ro 1500 g.p.m. can be selected by the operator.

The Santa Rosa bumper turret has a single nozzle and is non-asperating with a variable stream. Control is remote hydraulic for rotation, elevation and nozzle pattern. Straight stream setting provides a reach of approximately 140 feet.

Three (3) strategically located 17 g.p.m. undertruck nozzles provide protection from ground fires for the vehicle itself.

PRECAUTIONS and NOTES RELATING TO FOAM 4 AND FOAM 5

Note: The vehicle is equipped with a neutral safety switch to prevent starting while the transmission is in gear.

Note: If the brake system air pressure is low, an audible alarm will sound and warning light illuminate. Continue with starting procedures. The alarm will cancel after the engine has started and air pressure builds up to 65 p.s.i.

Caution: DO NOT OPERATE STARTER CONTINOUSLY FOR LONGER THAN 30 SECONDS. After 30 seconds allow starter to cool for 5 minutes before attempting to start the engine again.

Caution: DO NOT DRIVE THE TRUCK WHILE THE LOW AIR PRESSURE Buzzer is sounding. Under Emergency conditions, the truck can be operated as soon as the low air pressure alarm cancels.

Note: Normal Gauge Readings

1. Engine Temp.	160 - 180 degrees F.
2. Oil Pressure	40 - 60 p.s.i.
3. Transmission Temp.	160 - 200 degrees F.
4. Transmission Pressure	90 - 270 p.s.i.

NOTE: The engine must be allowed to idle for at least 2 minutes before shutdown to avoid damage to the turbo charger.

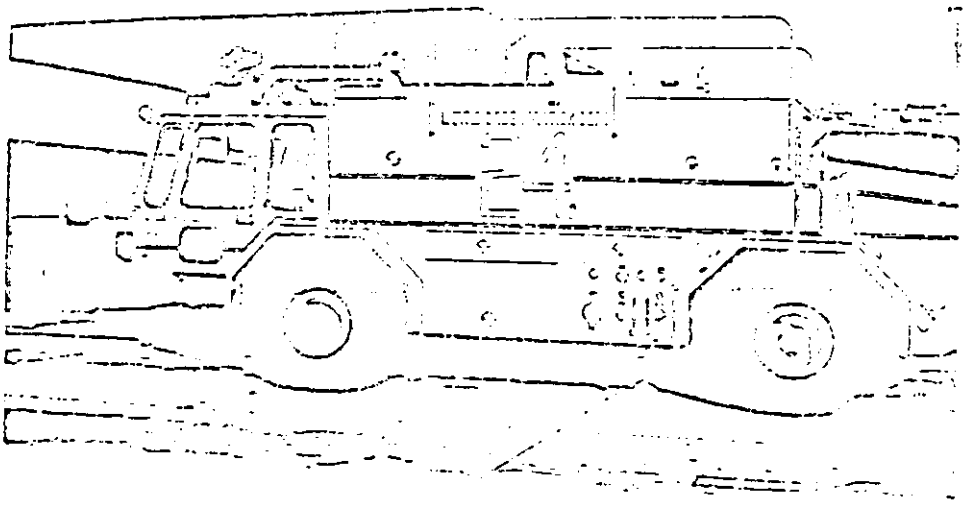
NOTE: DO NOT operate pump without discharging water and/or foam. When no water is moving through the pump rapid overheating will result. This can cause serious damage to seals and other pump components.

FOAM #4 and FOAM #5

(A)	DIMENSIONS (INCHES)	
	1. Length	423
	2. Wheelbase	240
	3. Height (overall empty)	144
	4. Width	112
(B)	WEIGHT (POUNDS)	
	1. Empty	36,800
	2. Loaded	66,750
(C)	PERFORMANCE CHARACTERISTICS	
	1. Accerleration (0-50 mph)	45 seconds
	2. Top Speed (mph)	60
	3. Gradeability	60%
	4. Side Slope Stability	50%
	5. Ground Clearence	13" (under axle)
	6. Angle of Approach	30 degrees
	7. Angle of Departure	30 degrees
	8. Turning Radius	105 feet

2/87

FAMILIARIZATION PAMPHLET
Emergency One
1984 Titan III Model
Crash/Fire/Rescue Vehicle



QRV #24 - Vehicle # 21-1068

QRV - #24
Quick Response Vehicle
Emergency One
Titan III

The Titan III is designed for Airport Fire Fighting. On-and-off road capabilities allow the vehicle to respond in a timely manner to aircraft accident sites across terrain which might otherwise be inaccessible to standard highway equipment.

The vehicle is 4 X 4 all wheel drive and front wheel steered. A single mounted, diesel engine, provides power for the drive train, accessories and fire fighting equipment. An all aluminum body houses the engine, drive train components, accessories and fire fighting equipment.

The vehicle is powered by a Detroit Diesel, 2-cycle water cooled, turbo charged V-8 engine. Power is transfered from the engine through a power divider.

The power divider is mounted to the engine flywheel and provides power to:

Transmission and Drive Train
Water Pump/Foam Pump

The pump power-take-off has a hydrulic clutch which is not engaged unless actuated by the control switch located in the operator cab. When the pump is engaged, slippage of the power divider clutch is controlled by the foot throtle allowing only a portion of the engine R.P.M. to be transmitted to the transmission. This allows slow controlled vehicle movement during pump and roll operation while full engine R.P.M. is available to the pump. The pump, however, can be engaged at any speed.

The Titan III's cab contains all the instrumentation and controls necessary to direct and monitor the performance of the vehicle during all vecicle operations.

A cab heater and defroster are installed for crew comfort and to keep the windshield clear of mist. In addition a windshield washer/wiper system is provided to assist in maintaining clear vision for driver operators. The crew cab is air conditioned for warm weather operation and to insure windows will be closed to provide personnel further protection on from smoke and potential flash fire situations.

There is an entry/exit door on each side as well as an escape hatch on the cab roof. This hatch also provides access for manual operation of the roof turret.

The reel is located in the front left compartment and is equipped with electric rewind. The handline nozzles are of the pistol grip type with dual seperately controlled on/off valves, allowing the operator to utilize either or both agents.

Discharge connections are located on either side of the truck. The connections are 2 - 2 1/2" NST male thread and have individual shut off valves. These can provide either water or foam. Pressure at these discharges is controlled by the gate valves. Extreme care must be exercised when using these discharges. When in auto pump 220 P.S.I. will be available through a fully opened discharge gate. Gates Must Be Opened Slowly and the pressure regulated by monitoring the appropriate pressure gauge.

The roof mounted turret has a single nozzle and is non-asperating with variable streams. The turret is hydraulically powered and controlled from within the cab or by controls located at the base of the turret on the cab roof.

The Santa Rosa bumper turret has a single nozzle and is non-asperating with a variable stream pattern. Control is remote hydraulic for rotation, elevation and nozzle pattern.

PRECAUTIONS and NOTES RELATING TO QRV - 24

Note: The vehicle is equipped with a neutral safety switch to prevent starting while the transmission is in gear.

Note: If the brake system air pressure is low, an audible alarm will sound and warning light illuminate. Continue with starting procedures. The alarm will cancel after the engine has started and air pressure builds up to 65 p.s.i.

Caution: DO NOT OPERATE STARTER CONTINOUSLY FOR LONGER THAN 30 SECONDS. After 30 seconds allow starter to cool for 5 minutes before attempting to start the engine again.

Caution: DO NOT DRIVE THE TRUCK WHILE THE LOW REAR AIR PRESSURE LIGHT IS ILLUMINATED. Under Emergency conditions, the truck can be operated as soon as the low air pressure alarm cancels.

Note: Normal Gauge Readings

1. Engine Temp.	160 - 180 degrees F.
2. Oil Pressure	40 - 60 p.s.i.
3. Transmission Temp.	160 - 200 degrees F.
4. Transmission Pressure	90 - 270 p.s.i.

Note: Procedure for engine shut-down is to bring the truck to a stop. Place transmission in neutral position and engage parking brake. Operate engine at half-speed with no load for two (2) minutes to stabilize turbo temperature.

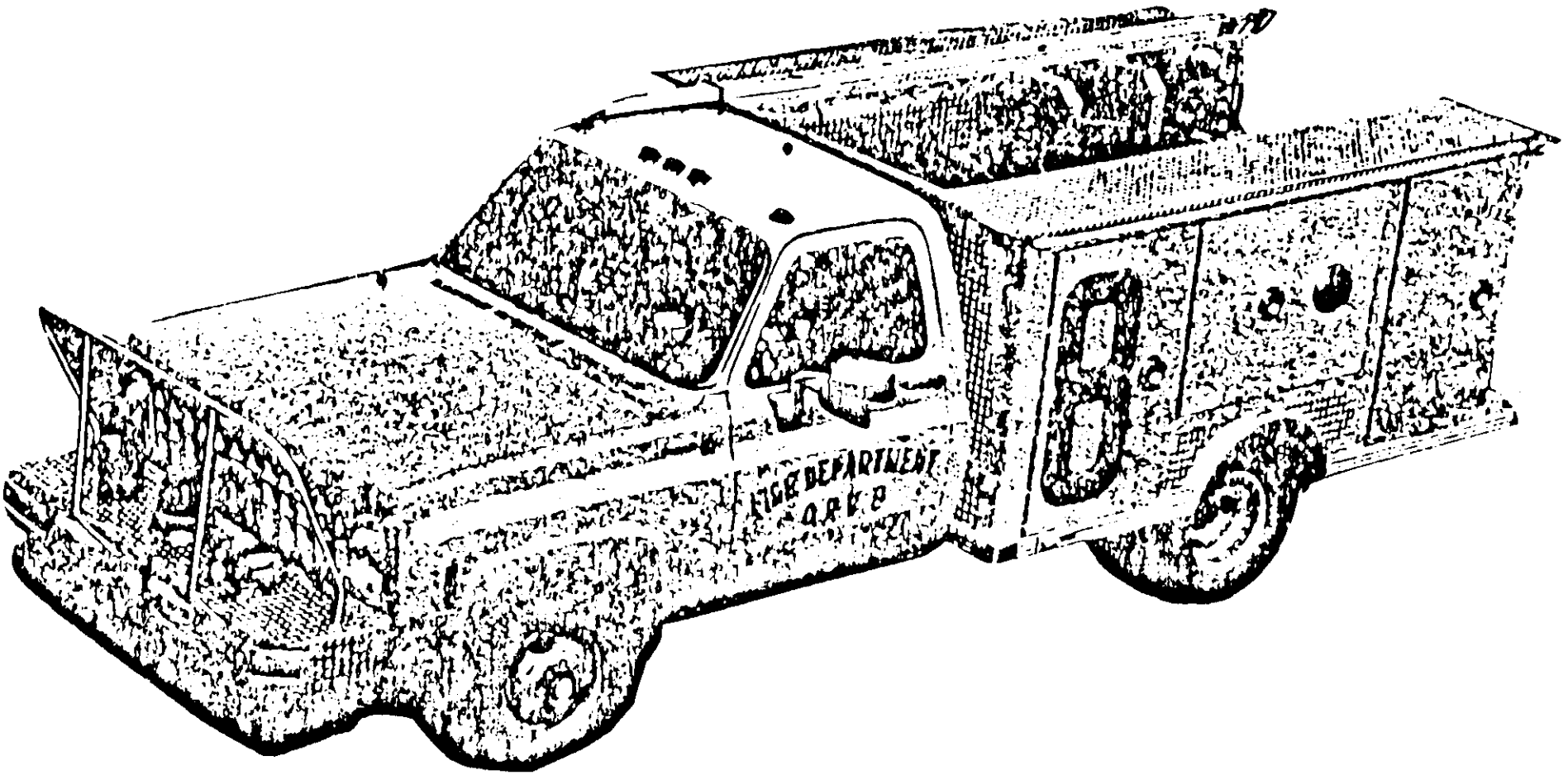
NOTE: DO NOT operate pump without discharging water and/or foam. When no water is moving through the pump rapid over heating will result. This can cause serious damage to seals and other pump components.

QRV - 24

(A)	DIMENSIONS (INCHES)	
	1. Length	360
	2. Wheelbase	190
	3. Height (overall empty)	130
	4. Width	112
(B)	WEIGHT (POUNDS)	
	1. Empty	28,000
	2. Loaded	44,000
(C)	PERFORMANCE CHARACTERISTICS	
	1. Accerleration (0-50 mph)	25 seconds
	2. Top Speed (mph)	65
	3. Gradeability	50%
	4. Side Slope Stability	40%
	5. Ground Clearence	13" (under axle)
	6. Angle of Approach	30 degrees
	7. Angle of Departure	30 degrees

FAMILIARIZATION PAMPHLET

Emergency One Model
Quick Response Vehicle



QRV-8

13-0682

QRV - 8

MAKE: Chevrolet

MODEL: 1980 Emergency One Body

PURPOSE: This quick response vehicle is designed to combat aircraft and flammable liquid fires in either on or off road terrains.

Its prime function is to provide quick attack, meeting time requirements for first unit in, as per Federal Air Regulation Part =139.

GENERAL INFORMATION

The vehicle consists of an 8 cylinder, 400 cubic inch displacement gasoline engine with fully automatic transmission and four wheel drive capability. The Chasis and cab are standard Chevrolet equipment while the body is all aluminum construction of Emergency One design. The truck body is designed with three compartments on each side and a fire boss fire system is mounted in the bed. These compartments contain serveral rescue and forcible entry specialty tools which everyone should familiarize themselves with. ie: Rescue Gator - Sawzall - Worm Drive Skill Saw - Back Pak Cutting Torch - etc. The personnel cab seats two and is equipped with air conditioning heating and defroster for crew comfort and safety.

The four wheel drive shifting lever is located at the mid-point of the floor board of the cab. To engage the four wheel drive the following steps are to be followed:

1. Put transmissions in neutral.
2. Put transfer case shifting lever in four wheel low. (four wheel high is not recommended)
3. Lock the front wheels by turning the dial, located in the hubs of each of the front wheel, clock wise to the lock position. (vehicle is now in four wheel drive mode)

Return to the normal driving mode by reversing the above procedure. Rock wheels for easy hub release.

CAUTION:

The four wheel drive rode is to be used for soft unstable surfaces. Do not use this mode on paved surfaces.

To the right of the steering column, mounted low on the dash, is a hand throttle control which is utilized as a high idle feature. This feature is utilized on long standby's to maintain engine RPM at a level high enough to keep the electrical system functioning and the battery charged.

1/87

SPECIFICATION INFORMATION

Acceleration: 0-50 MPH within 25 second

Wheel base: 135"

Height: 79"

Suspension: Heavy duty suspension package. Air shocks on rear.

Brakes: Power

Steering: Power

Fuel: 20 gallon capacity (gasoline)

Weight: 11,000

NOTE: The 79" height was part of the original vehicle specifications. This height provides adequate clearance for access to the airport parking garages. Currently QRV - 6 and QRV - 8 are the only Airport Fire Suppression Vehicles which can access these garages.

DESCRIPTION OF FIREFIGHTING SYSTEMS

AFFF (lite water)

This system consists of a 100 gallon capacity carbon steel spherical tank which contains a premixed 6% solution of AFFF. The tank interior surface is coated with a coal tar epoxy to prevent corrosion.

The agent is expelled by pressure from a 300 cubic foot (2,400 PSI) nitrogen cylinder (which is regulated to 250 PSI) through 100' of 1" hose with a 50 GPM air aspirating nozzle. Still air range - 35'.

DRY CHEMICAL (potassium chloride base)

This system consists of a carbon steel spherical tank containing 450 pounds of dry chemical agent such as Purple K. This agent is expelled by pressure from a 300 cubic foot (2,400 PSI) nitrogen cylinder (which is regulated to 250 PSI) through 100' of 1" hose with a nozzle discharge rate of 7.5 pounds per second and a still air range of 50'

NOTE: The AFFF and dry chemical discharge lines are enclosed in a single polyester jacket and the nozzles are twinned with a single pistol grip. This configuration enables the nozzleman to utilize either agent, or both, as needs may dictate. The agents are compatible with one another so twin discharge poses no problem. These twinned 100' by 1" lines are contained on a manually operated reel.

FOAM #25 21-112 OPA LOCKA C/F/R
FOAM #1 21-111 RESERVE C/F/R
1977 C/F/R Vehicles Walters - Model CBK

Foam #1 and Foam #25 are Walters Model CBK aircraft crash fire fighting trucks, designed to meet the specific needs of airport fire fighting crash rescue functions. Foam #25 is the first line unit for Opa Locka (station #25). Foam #1 is maintained at station #12 as a reserve unit.

The principal fire extinguishing agents are AFFF and fluoroprotein foam with nozzle aspiration. The water tank has a capacity of 3,000 gallons. Two 250-gallon foam tanks carry the AFFF and fluoroprotein foam concentrates. The vehicle is equipped with twin high performance diesel engines and duplicate pump systems. The standard discharge devices include one hydraulic turret mounted on the cab roof which has a 1,500-gallon per minute capability. Other features are Santa Rosa bumper turrets (300 g.p.m.), two under-truck nozzles at 17 g.p.m. and two handlines at 60 g.p.m.

Special equipment carried includes a large array of forcible entry crash rescue tools, a first aid kit and a self-contained breathing apparatus for each man.

C.B.K. 3000 - FOAM #1 AND FOAM #25

1. Make:
   A. Walters - C.B.K. 3000 Crash Truck
2. Agent:
   A. 3,000 gallons of water
   B. 250 gallons of protein 3% foam
   C. 250 gallons of AFFF 6% foam (light water)
3. Turrets:
   A. Top 1,500 g.p.m. at 200 p.s.i. on both engines
   B. Santa Rosa (Bumper) 300 g.p.m. at 200 P.S.I.
4. Hand Lines:
   A. Jump line - 150' of 1 1/2" hose on left side, 150' of 1 1/4" hose on right side midship, with Rockwood nozzles rated at 60 g.p.m.
5. Under Truck Nozzles:
   A. Two nozzles, (front and rear). These nozzles are rated at 17 g.p.m. each at 200 p.s.i.
6. Drive Engines:
   A. Twin Detroit diesel engines at 534 total horsepower, (267 h.p. each).
7. Transmission:
   A. Two fully automatic transmissions, (one matched to each engine) and torque converters.
8. Steering:
   A. Equipped with power steering, Ross cam and twin roller type - powered by hydraulic pressure

9. Brakes:
    A. Brakes are air-pressured and are aircraft disc type brakes; also brake application is independent system for each axle
10. Weight:
    A. 65,000 lbs. fully loaded
11. Height:
    A. 12'10"
12. Width:
    A. 9'8"
13. Length:
    A. 32 feet
14. Acceleration:
    A. 0 to 50 m.p.h. in sixty (60) seconds
15. Construction:
    A. Chassis and body of the apparatus is integrated into a single unit and is constructed of aluminum alloy
16. Fuel and Tank:
    A. Diesel fuel
    B. 100 gallon fuel tank

ENGINE #12 (Vehicle 21-0170)
Emergency One
1,500 GPM Pumper

In addition to Foam #4 and Foam #5 and QRV #8 other first-line equipment responding out of Station #12 include Engine #12 and Rescue #12.

Engine #12 is a 1,500 g.p.m. Emergency One standard attack pumper. It responds to all aircraft incidents to assist with extinguishment and rescue operations and provide water supply to crash vehicles. This unit also responds to other fire and emergency situations on and off-field and serves as a back-up rescue unit for Rescue #12. Four fire fighters are assigned to this vehicle, including a lieutenant.

E-12 carries 1400' of 5" light weight fire hose. This large diameter hose is necessary to provide the large volumes of water required to expediously reservice operating C/F/R vehicles. This hose can also be used as a water rescue flotation device when necessary. All adapters and air bottles necessary to quickly deploy it as a water rescue vehicle are carried aboard E-12.

9/88

ENGINE #12 - 21-0170

MAKE:	Emergency One Attack Pumper, 320 cu.in.
ENGINE MANUFACTURER:	Caterpillar Diesel Model 3208
PUMP MANUFACTURER:	Hale QSMG, Midship
PUMP TYPE:	Centrifugal - Single Stage
PUMP CAPACITY:	1500 gpm @150 psi
PRIMING DEVICE:	Electric
PRESSURE CONTROL:	Relief Valve
CHASSIS MAKE:	Emergency One, Hurricane
WHEEL BASE:	191", width: 96"
BOOSTER TANK CAPACITY:	500 gallons
GROSS MAXIMUM ALLOWABLE WEIGHT:	37,020 lbs.
HEIGHT:	8'6" (loaded)
WIDTH:	9'3"
LENGTH:	31'7"
IGNITION SYSTEM:	12 volts
ALTERNATOR OUTPUT:	200 amperes
DUAL BATTERIES:	220 amperes each
DIESEL FUEL TANK CAPACITY:	50 gallons
TIRE SIZES:	11R22.5
HARD SUCTION HOSE SIZE:	6", total 20-feet

AUTOMATIC TRANSMISSION:	Allison MT-647
LIGHT WATER FOAM TANK:	20 gallons with around the pump proportioning system
5" HOSE:	1400 feet
1 1/2" HOSE:	200' each side, 400' total pre-connected (jump line)
3" HOSE:	200'
1" BOOSTER LINE:	150'
EXTENSION LADDER:	35'
ROOF LADDER:	14'
ATTIC LADDER:	10'

PA

1/87

RESCUE #12 (Vehicle 13-1084)
Ford Modulance

Rescue #12 is a custom-built modulance, fitted with compartments designed to secure specialized equipment. It carries the Life Pak #5, the latest portable battery-operated defibrillator, cardioscope, recorder and telemetry system. Also, the oxygen-powered cardiopulmonary resuscitator is aboard to provide external cardiac compression and time-cycled positive pressure ventilation.

Standard first aid equipment and medical supplies, mandated by the State of Florida, make up the numerous medical supplies and life-saving devices.

Numerous forcible entry tools, including the "Jaws of Life", make up a useful and efficient selection of crash/rescue appliances.

Sophisticated communications components are part of Rescue #12's capability. Mounted in Rescue #12 is the Comco 730 four-frequency mobile radio. These frequencies allow Vehicle-to-Air Traffic Control Tower communications at three airports- Miami International, Opa-Locka and Tamiami. A mobile telephone is installed in Rescue #12 and multi-frequency Metro Fire radio is also used. This is in conjunction with the Converta-Com mobile radio console. An MT-500 handie-talkie is mounted in the Converta-Com. This device is a mobile transmitter and a charger for the MT-500. The eight channel MT-500 is carried by the Rescue Lieutenant on all of Rescue #12's responses.

Rounding out the communications is the Biophone which permits paramedic-to-doctor dialogue for patient (enroute) treatment.

The normal crew for Rescue #12 consists of a Paramedic Fire Lieutenant and two Paramedic Fire Fighters.

This high-speed vehicle, equipped with modern flasher lighting and twinsonic sirens is a very effective first-response unit, reaching victims on or about the Airport within minutes.

At a disaster scene, the Van is utilized by the Fire Department as the Medical Sector Command Post and medical supplies distribution point. On board radios permit communication on Fire Department and Airport Ground Control frequencies.

Large red crosses on the sides and top of the Van identify it to responding paramedic personnel who will be issued the medical/triage boxes containing first aid supplies and equipment, I.V. solutions and drugs. Rescue Personnel would then be given instructions and assignments by a medical Sector Officer-in Charge.

Temperature inside the Van is maintained at 68 degrees fahrenheit by a refrigeration unit which operates by either electrical power or gasoline engine. This prevents heat and moisture damage to drugs, I.V. and medical supplies stored in the Van.

The supplies aboard the Van are maintained by fire fighting personnel assigned to Station #12. Drugs and I.V. solutions are inventoried monthly and replaced at least six months prior to their expiration dates. All other equipment is checked for proper operation every six months and replaced if necessary. Batteries for laryngoscopes and flashlights are replaced at this time also.

This unit is equipped with external telescoping flood lights, large auxiliary generator and a 5 gallon can of gasoline.

FOAM RESERVE INVENTORY

The fuselage skin of commercial aircraft will withstand flame inpingement for a period of only three to five minutes, and when engulfed in flames, will burn through in 90 to 120 seconds. In crash/fire situations, it is absolutely essential for C/F/R equipment to arrive quickly. Speed of response cannot not be over-emphasized. However, appropriate caution must be exercised to prevent accidents enroute to the scene. This is especially critical near the crash site, where survivors are sometimes found considerable distances from the wreckage. Once on the scene, this apparatus must have the ability to discharge extinguishing agents (AFFF usually) at a high rate of application in order to gain rapid suppression and extinguishment of the fire. The combined application rate capability of Foam #4 and Foam #5 is 3,000 g.p.m. through the turrets alone.

Large reserve inventories of AFFF, fluoroprotein foam concentrates and Purple K dry chemical are maintained at Station #12. Current inventory figures show 37,000 gallons of AFFF, 7,100 gallons of fluoroprotein and 4,300 pounds of Purple K. This reserve inventory does not seem so large when you consider N.F.P.A. recommended solution flow rates for hydrocarbon fuel fires indicate an application rate of over 7,900 g.p.m. would be required to extinguish a fire involving the largest fuel farm leasehold (Pan American Airways) at the Airport. At this rate, AFFF concentrate would be expended at the rate of 474 g.p.m., fluorcprotein concentrate at 237 g.p.m. N.F.P.A. further recommends enough reserve concentrate readily available to sustain this

application for a period of 55 minutes. As there are nine leaseholds in the Tank Farm complex, keeping crash trucks and other units supplied with foam would be a major undertaking, requiring a large number of personnel.

These foam reserves are, of course, used for the normal reservicing of C/F/R vehicles.

Storage or shelf life for AFFF is generally considered to be indefinite. There are documented cases of this agent being used successfully on large tank fires after having been stored for 20 years.

Fluoroprotein foam is relatively new on the market and shelf life is undetermined. It is expected to be at least 15 years. Both agents must be stored under proper conditions.

Foam reserves are inventoried monthly. The oldest product is always used first.

PROTECTIVE GEAR

Aircraft crashes frequently result in extremely hot fires. The liquid hydro-carbon fuels involved produce about twice the amount of heat per pound as normal Class "A" materials. (Roughly 16,000 BTU's per pound as compared to 8,000). In addition, these liquids are consumed at a much faster rate. As a result, the total amount of heat produced is tremendous when large quantities of fuel are involved.

Fortunately, almost all fires involving large amounts of flammable and combustible liquids occur outdoors. Much of the heat produced is dissipated into the atmosphere. Radiant heat, however, is not dissipated in this manner but eminates from the fire in all directions in great quantities.

Fire fighters must be provided with protection from radiant heat in order to be able to approach an aircraft fire. Bunker gear worn by aircraft fire fighters is designed to do this.

This gear is similar to normal gear except for the aluminized outer covering which presents a smooth, shiny surface capable of reflecting much of the radiant heat away from the fire fighter.

Gear consists of pants, boots, coat, gloves, and proximity hood. All are covered with this aluminized reflective material except the boots. The hood has a gold anodized face plate to afford both visibility and protection. It can be worn over S.C.B.A. masks.

This type gear is less than desirable for interior structural fire fighting because of the difference in the type heat encountered. The relatively light inner liner does not afford a high degree of protection from convected heat.

AIRPORT STRUCTURE FIRES

Some of the most valuable structures in the community are located on airport property. While the actual structure and content value of these buildings is considerable, it is in many cases insignificant when compared to the potential for lost jobs and revenues which would directly and adversely affect the local community in the wake of a major fire.

M.I.A. in many ways is much like a small city. There is a wide variety of different type occupancies. Some of the structures are quite old and lack the built-in fire protection systems required by today's building codes.

The Airport Fire Division conducts building inspections and surveys for structures located on Aviation Department property. Currently, there are two Fire Inspector/Investigators. Assigned to the division.

When a building fire occurs on airport property, the fire equipment dispatched from Station #12 will depend on the type situation and location reported. Rescue #12 and Engine #12 will be dispatched on all such calls. Since Foam #4, and Foam #5 and QRV #8 are not designed to function as structual apparatus, they may or may not be dispatched.

Building fires at M.I.A. and other airports are sometimes reported directly to the Airport Fire Station. When this occurs, the OIC

dispatches the appropriate Airport apparatus and requests a building assignment from the Fire Alarm Office.

There are many structual situations in which crash equipment can function very effectively, and as a general rule, Battalion #6 will dispatch one foam vehicle (along with Engine #12 and Rescue #12) to building fires at M.I.A. If the call is received from Fire Alarm, they will dispatch a building assignment which normally includes Battalion #6, Engine #12 and Rescue #12. Regardless of how the call is received, if the building has a high life hazard classification, all Airport units are dispatched.

TOWER PROCEDURES

Runway designations are determined by the compass heading of the aircraft as it approaches the runway. For instance, as an aircraft approaches Miami International Airport from the west, traveling due east, the compass heading in 90 degrees and right or left refers to the pilot's perspective as he approaches the field. An aircraft approaching from due east will have a heading of 270 degrees and will land on either Runway 27-Left of 27-Right (the "0" is dropped from the references). 27-L is the east end of 9-R and 27-R is the east end of 9-L.

The third runway has a compass heading of 120 degrees when approached from the northwest and 300 degrees if approached from the southeast. Since there is no parallel runway on this heading, the designation is simply 12 and 30.

Clearance from the F.A.A. Ground Control Tower is always required prior to crossing a runway. This is true even of fire apparatus responding to an emergency. The need for this regulation should be obvious; aircraft landing or departing would be unable to avoid collision with a vehicle which pulled into its path. The results would, of course, be disastrous. Normally, fire apparatus do not cross runways unless responding to an emergency. Instead, the service roads around the runways are utilized. This is due to the heavy volume of aircraft traffic at M.I.A. which often results in a lengthy wait for clearance to cross.

In emergency situations, fire apparatus should request permission to cross the appropriate runway and advise the Tower they are responding to an emergency. The Fire Department and the F.A.A. traffic controllers have a long history of cooperation and have worked well together over the years. This is not only beneficial to both agencies, but to the entire community and the traveling public. Once the Control Tower is made aware the Fire Department is responding to an emergency, they will do whatever is possible to expedite clearance to cross a runway. In some cases, this may include diverting the aircraft on aproach or delaying departures.

When requesting clearance to cross a runway, it is important to designate your position as accurately as possible. This will enable the ground controller to quickly spot the fire apparatus and observe traffic conditions in the area. An example of the proper procedure would be as follows:

> "Ground Control, Engine #12 requesting clearance to cross Runway 9 - L at mid-field. Responding to an emergency off-field."

It is not necessary to wait until you are at the runway to request clearance to cross. The request can be made as the apparatus approaches the crossing point. If clearance is given immediately, there will be no need to stop at the runway. Even when clearance is granted, personnel should still look both ways before crossing a runway. This is simply a good habit to form for safety reasons.

Over the years, there have been several occasions in which accidents were averted by this practice. Small aircraft can be extremely difficult to see under certain conditions. DO NOT CROSS RUNWAYS UNLESS YOU ARE CERTAIN THAT CLEARANCE HAS BEEN GRANTED BY THE TOWER FOR YOUR UNIT. IF IN DOUBT, WAIT!

The F.A.A. Ground Control Tower controls all ground vehicular traffic at the Airport. Clearance is required to move from any one point to another, except when traveling within the designated roadways.

When responding to an emergency which does not require apparatus to cross runways (such as from Station #12 to the Airport Terminal), units should still advise the Tower it is an emergency response. The Tower will then give priority to the responding fire department units and clear other ground traffic out of the response path. This does not mean apparatus operators can then assume they have a clear path and the right-of-way. They must still exercise the same caution as when responding to any alarm.

Following is an example of proper radio procedures in such cases:

"Ground Control, Rescue #12 requesting clearance from the Fire Station to Concourse Bravo on a rescue call."

The usual response would be:

"Rescue #12, proceed as requested."

This would be followed by any information concerning aircraft traffic on a ramp or other conditions which the rescue crew might need to be aware of.