TRANSIT MANUAL

BAY AREA RAPID TRANSIT
SAN FRANCISCO MUNICIPAL RAILWAY
AND
CALTRAIN

SAN FRANCISCO FIRE DEPARTMENT

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Transit Manual

October 4, 2010

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FOREWORD

The goal of this manual is to establish standard operating practices as authorized by the Chief of Department and implemented by the Division of Training.

The purpose of this manual is to provide all members with the essential information necessary to fulfill the duties of their positions, and to provide a standard text whereby company officers can:

- Enforce standard drill guidelines authorized as a basis of operation for all companies.
- Align company drills to standards as adopted by the Division of Training.
- Maintain a high degree of proficiency, both personally and among their subordinates.

All manuals shall be kept up to date so that all officers may use the material contained in the various manuals to meet the requirements of their responsibility.

Conditions will develop in fire fighting situations where standard methods of operation will not be applicable. Therefore, nothing contained in these manuals shall be interpreted as an obstacle to the experience, initiative, and ingenuity of officers in overcoming the complexities that exist under actual fire ground conditions.

To maintain the intent of standard guidelines and practices, no correction, modification, expansion, or other revision of this manual shall be made unless authorized by the Chief of Department. Suggestions for correction, modification or expansion of this manual shall be submitted to the Division of Training. Suggestions will be given due consideration, and if adopted, notice of their adoption and copies of the changes made will be made available to all members by the Division of Training.

Joanne Hayes-White
Chief of Department

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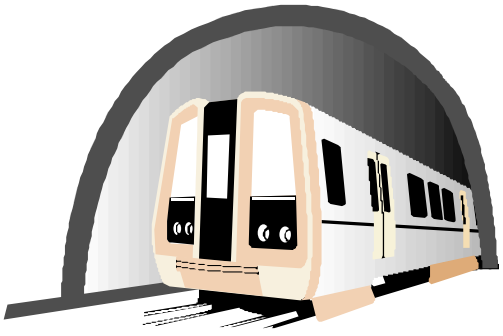
PART 1

BAY AREA RAPID TRANSIT

(BART)



SECTION 1. BART TRANSIT SYSTEM

The BART system encompasses four counties:

- San Francisco
- Alameda
- Contra Costa
- San Mateo

There are one hundred and ten miles of track way and thirty-four passenger stations. Oakland is the hub of the system with lines branching in four directions, identified as

1. **A line** to Fremont
2. **C line** to Concord
3. **M line** to Daly City (San Francisco line)
4. **R line** to Richmond
5. **CX line** through downtown Oakland
6. **L line** to Livermore
7. **W line** to San Francisco International Airport (SFIA)
8. **Y line** from SFIA towards Millbrae and San Bruno

REVENUE VEHICLES

A - CAR

- The A-car is equipped with a fiberglass operator's cab (which extends the front of the car 5 feet), automatic train operating equipment, and two-way communication system.

- The length of the car is 75 feet. The car seats 72 passengers, carries 120 persons with a standing and sitting load, and up to 150 persons in a crush load.

- The A-car has an attendant's cab which is double-hulled molded-fiberglass seamless pod.

- On the A-car, the cab is at the Y end. The X end is that end where the A-car would normally couple to another car.

B - CAR

- Intermediate car (without cab).
- The length is 70 feet and the passenger load is the same as the A-car.
- All BART cars have an X and Y end. From the outside of all cars the X end can be determine by either the presence of small annunciator lights on the sides up near the end of the roof panel, or by the letter designation next to the car number.
- In the interior of all cars, the X end can be determined by the presence of the car annunciator light over the car control panel located at the left side end wall (at X end).

C – CAR

- The C-car operates as a lead, trailing or intermediate car of a train. Each C-car is equipped with an operator's compartment.
- The C-car is 70 feet long. Due to the operator's cab, the seating capacity is limited to 68 persons per car.
- The cab end of the car is Y end.
- The train attendant's cab is a double-hulled pod of molded fiberglass.
- The car body has been designed to absorb all anticipated stresses, and to structurally utilize and support its own loaded weight. Additional welded steel reinforcing frame support is built into the ends of the cars and at the side doors.
- Except for the steel ribs, the floor beams, and the reinforcing frames, the entire car body is aluminum. Other car components such as the trucks and couplers are steel. The wheels are a combination of steel and aluminum. The ceiling and floor are insulated with a polystyrene or urethane foam core. The walls are insulated with high-density polyurethane.

PROPULSION

The BART cars receive power through collector shoes that rest on atop of the third rail. Each car has four collector shoes located front and rear on each side of the car tracks, and is 55 feet apart on each side. All collector shoes are interconnected; **"when one is hot, they are all hot".**

Warning: Any car can have contact with a rail on either side of a car. If any collector shoe on a car is energized, the other three shoes are also energized. The exposed shoes are highly hazardous and must be avoided at all times.

The cars utilize third rail power through four traction motors, one for each axle (two on each truck). Traction motors are 150 HP each, giving each car a total of 600 HP. Trains have a top speed of 80 MPH and accelerate and decelerate at 3 MPH per

second. Primary braking is dynamic through the propulsion motors. There are also hydraulically operated friction brakes, which also act as a parking brake.

CAR BODIES

WINDOWS

All windows are fixed except the small ones on the sides of the operator's cab. The windshield on the attendant's cab is high impact resistant safety glass more than one inch thick. The small operable windows on the attendant's cab are laminated safety glass approximately 1/4-inch thick. The panoramic view side windows are tempered, laminated safety glass approximately 1/4-inch thick. They are of two sizes, 3 x 4 feet or 3 x 5 feet. All windows are firmly mounted to the body by a molding of black neoprene rubber. It is possible to release the windows by removing a portion of this neoprene molding.

SIDE DOORS

Each car has four doorways, two on each side. Each doorway has two center closing door panels. They are operated independently by individual electric motors. Normally, both door panels operate simultaneously to provide a 4-1/2-foot wide opening.

Door Operation

The special keys to operate the door switches are on the BART key rings. The train attendant and BART personnel responding to the incident also carry them. The doors operate as follows:

- During revenue service, side door operation is initiated by an internally generated computer signal in the automatic train control system.
- The doors may also be operated by a remote control from the train attendant's console.
- The doors may also be operated individually with a key-operated switch located to the left of the door.

Emergency Door Release Lever

In an emergency, one door panel per doorway may be opened from the inside by activation of the **Emergency Door Release Lever**. This lever is located inside the car on the left side (facing out from inside) of each door immediately above the back of the seat adjacent to the doorway. The lever unlocks the nearest door panel only and also disconnects the electric power to the door mechanism. When the emergency door lever is moved from its closed position, an electrical switch initiates an immediate disconnect of the propulsion power of the train and automatically applies the brakes.

EMERGENCY (HIGGINS) PLANK

The Higgins Plank, a channel beam, reinforced, aluminum emergency plank, is located within each car. Unfolded and extended, the plank measures 12-inches wide and 5-feet long. The Higgins Plank is hinged at mid-point, folded and locked behind a panel within the back frame of the right hand seat at the X end of each car.

During emergencies, the Higgins plank may be used on aerial track ways from one train to another alongside. This plank safely supports 450 pounds at center with a maximum span of 4 feet 6 inches. Two planks side by side will accommodate a wheelchair.

UNDER CAR COMPONENTS

Access to the underside of the cars is very difficult because there is so little clearance between the equipment and the running rails. There are many components beneath each car, including air conditioning equipment, motor alternator, auxiliary electrical box and circuit breakers, auxiliary on/off switch, battery box, semiconductor (chopper) box and 8 car bodyjacking pads.

RESISTORS

The resistors develop considerable heat each time the train is brought to a stop. Be cautious, these resistors can cause severe burns. There are also resistor coils in the evaporator boxes used for heating. These coils are not exposed unless the box is damaged.

CAPACITOR TRAY UNIT

Capacitor Tray Units are located under each BART car. The Units are capable of storing charged electrical energy. Built-in safeguards protect against shock and make accidental shock extremely unlikely; however, firefighters **should not** work around these units for at least **ten minutes** after the third-rail power has been confirmed to be turned-off.

REFRIGERANT

The refrigerant in the air conditioning system is Freon 22, a non-flammable and comparatively non-toxic in a free air environment. The air conditioning system makes a complete air change each minute through fire resistant plastic ducts, which are lined with polyurethane.

FIRE EXTINGUISHERS

Each car is equipped with two dry chemical fire extinguishers.

- In the A-car, one fire extinguisher is mounted on the bulkhead near the attendant's seat. The second extinguisher is located in the passenger area at the opposite end of the car.
- In the B-cars, a fire extinguisher can be found near either end door, located in the back frame of the left-handed seats nearest the inter-car access way.

HOSTLING CONTROLS

Each car is a self propelled, self contained vehicle that can be operated independently by special limited operational controls called Hostling controls. These controls are located behind a locked panel on the left end doorway frame at both ends of B-cars, and at the X end of A-cars. C-cars have Hostling controls inside attendant's cab.

ELECTRIFICATION

Fire in BART electrical installations should be treated as any other **high voltage electrical fire** - protect exposure and await the advice/direction of BART employees.

PG&E supplies BART with 34.5-kilovolt-power alternating current (AC). There are seven switching stations; one is located in San Francisco. Power is transmitted from the switching stations by cable to traction substations located at BART passenger stations and both entrances to the Transbay Tube. Traction sub-stations require special consideration because the transformers contain combustible oil. A transformer rupture might result in a combined oil-electrical fire. However, indoor transformers are sufficiently diked to contain a full oil spill. Outdoor transformers have drainage ditches and sumps capable of holding the entire oil content of a transformer in the event of rupture.

BART Operations and Control Center (OCC) has the ability to monitor and de-energize some (but not all) electrical circuits within a substation transformer. In the event of a sub-station/transformer fire, a qualified BART electrician will be immediately dispatched to the fire location. If Fire Department personnel arrive before the electrician, it is BART's recommendation that no water be used on substation/transformer equipment until advised by a BART electrician that the equipment is de-energized. This procedure will reduce the potential risk of exposing firefighters to an electrical shock hazard.

Trains operate on 1000 Volts direct current (DC) that it receives from the third rail through out the entire system (tunnels, tubes, elevated and grade level track ways). It will also support power for lights and electro-mechanical equipment.

Traction sub-stations transform and rectify the 34.5 KV-AC to 1000 Volts DC and feed it to the third rail. The running rails act as a negative return at ground potential.

POWER CABLES

Two types of cable are used to transmit 34.5 KV power. Their insulated wrappings and the way they are carried along the BART right of way distinguish each type of cable.

- **Sealed Pipe**. In one instance, the cables are contained in a 4 inch welded steel pipe sealed and pressurized with nitrogen gas to prevent moisture intrusion. This type of installation is found beneath aerial structures, in subways, and in tunnels. The pipe and its cables present very little hazard, and even a directly impinging fire and would rarely necessitate cutting off electric power. A hissing noise from the pipe would indicate a leak of the pressurizing gas. Notify BART of this condition.

- **PILC (Paper-Insulated, Lead-Covered).** This type of insulation is used in cable buried underground immediately adjacent to grade-level track ways, and is protected with a concrete cover.

THE THIRD RAIL

The third rail is constructed in sections throughout the system. These sections can vary in distance from 150 feet to several miles. Each section is identified with a section number. There is a physical gap between each section to allow part of the third rail to be de-energized without shutting down the entire system.

The third rail consists of a steel I-beam with aluminum conductors cast into the web of the beam. The steel provides rigidity and strength. The aluminum provides a more efficient current conductor than the relatively high electrical resistance of the steel.

The third rail is mounted on ceramic insulators attached to an aluminum base, which is bolted to the crossties. All third rails are protected by an overboard of fire-resistive fiberglass strong enough to support a weight of 250 pounds. The coverboard is supported every 10 feet by a durable, non-conductive, plastic covered aluminum bracket. The coverboard will carry the weight of charged fire hoses, but hoses should be spaced to distribute their weight. When laddering an overhead right of way with an aerial, the ladder should **not** be allowed to rest directly on the third rail coverboard. Aerial ladders settle if there is even a slight leak in their hydraulic system. This along with the added weight of firefighters climbing the ladder could cause failure of the coverboard and exposure of the third rail. The location of the third rail in relation to the double trackway varies:

- The Third Rail is outboard on aerial trackway
- The Third Rail is outboard from center platform stations

- The Third Rail is inboard of the rails in stations having two outside platforms
- The Third Rail is in underground tunnels where it will be opposite the walkway

Every car has four collector shoes - two on each side located front and rear. If at any time one of the collector shoes is in contact with the third rail, the entire car is energized. Avoid contact with the collector shoes at all times.

It should be understood that the 1000 volts in the third rail cannot be de-energized by any switch or other mechanical device on the vehicle. The 1000 volts is not transferred or conducted from one car to another.

PHYSICAL GAPS

There are physical gaps in the third rail. These physical gaps are in two categories:

1. **Bridgeable Gap**—The **Bridgeable Gap** is a distance of less than 55 feet—the distance between the collector shoes on a BART revenue car. This means that a revenue car parked between a bridgeable gap could possibly carry power from a live section of track to a dead section. BART has allowed for this by setting up zones in these areas such that when power off is requested, all third rail power on both sides of the section requested, to the nearest non-bridgeable gaps are de-energized.

2. **Non-bridgeable Gap**—The **Non-bridgeable Gap** is a 60 foot physical gap in a section of the third rail. As previously stated, the collector shoes on a revenue car are 55 feet apart, which means that because there is no interconnection of power between cars in this situation, the 1000 volts AC current cannot be passed from an energized section of the third rail to a non-energized section.

WHEN ONE COLLECTOR SHOE IS ENERGIZED, ALL COLLECTOR SHOES ARE ENERGIZED. AVOID EXPOSED SHOES AT ALL TIMES!!!

THIRD RAIL ELECTRICAL DE-ENERGIZATION

Before performing any emergency operations under a BART vehicle or on the track way, electrical power to the incident track should be de-energized. In most cases, power should be left on in the non-incident track to enable use of a rescue train.

Fire Department personnel may cut power to a third-rail either at a Blue Light Station, at a station Platform Emergency Trip, or by contacting BART Operations Control Center through PABX phones. In all cases, BART Operations Control Center **shall** be notified to verify Power Off. Electricians will be dispatched immediately to the scene of the emergency.

It is important that nobody touches the third rail, or any object in contact with the third rail, until BART Operations Control Center has verified that power is off (Power Off) and the electrician has applied ground clamps on both sides of the emergency (Safe Clearance).

The **Power Off** signal **is not sufficient** to ensure absolute site safety, as equipment malfunction or human error may allow the third rail to remain energized. Before receiving **Safe Clearance**, cars may be evacuated or fires may be fought from the platform or walkway after receiving the **Power Off** signal.

Normally, no operations **shall** be conducted below the floor level of the car until **Safe Clearance** is given. **Safe Clearance** is given only after the third rail is de-energized and a BART electrician has applied ground clamps on both sides of the emergency.

Even after receiving **Safe Clearance**, treat the third rail and related components with **extreme caution**. If necessary to save a human life, operations may be conducted after a confirmed **Power Off** is given by BART Operations Control Center however, the third rail and related components must be avoided at all times.

PLATFORM 3RD RAIL EMERGENCY TRIPS

Note: Each platform 3rd rail emergency trip is adjacent to a PABX phone.

These trips are located approximately mid-platform of every station. They are identified by a yellow sign—**Emergency Third Rail Power Trip**. Each trackway third rail is controlled by a separate and independent **Emergency Third Rail Power Trip** button. The trips are activated by breaking the glass and allowing the button to pop out. This cuts power to the corresponding third rail the entire length of the station platform. Platform emergency third rail trips will only cut power to one trackway.

Use caution, outside the limits of the station platform, the third rail may be still hot unless turned off at the next Blue Light Station or by BART Operations Control Center. To re-energize the third rail, the button must be held down and the breakers closed by BART Operations Control Center or at the sub-station. Merely pushing the button back **does not** re-energize the third rail.

Should it be necessary to operate a platform trip, BART Operations Control Center **shall** be notified immediately. Use PABX phone located adjacent to every station platform trip or notify BART through Department of Emergency Communications. BART Operations Control Center can re-energize the third rail and it would not be evident to firefighters on the scene. Extreme caution should be taken when operating under any BART car. Even when power has been turned off to the third rail, some undercar components will take up to 10 minutes to dissipate the electrical charge (see Capacitor Tray Unit, pg. 1.4)

FAIL SAFE

A fail safe system has been incorporated, where ever possible, into all vital circuits and controls. Fail safe means that the control itself, if it fails, will initiate a safe response. It ensures that any malfunction which occurs that could affect safety will cause the system to revert to a condition that is known to be safe. In BART vehicles, the fail safe system stops the train until the malfunction is rectified.

AUXILIARY POWER

All train control and operating circuits are powered by auxiliary power. Auxiliary power is provided by the low voltage power supply unit and battery charger. Auxiliary power controls the following:

- interlocking relays
- communications equipment
- all lights and warning devices
- the traction controls
- the door controls
- air comfort controls
- windshield wiper
- heating
- air conditioning
- air compressor operations
- exhaust and blower fans
- the friction brake system
- small equipment fans
-

The Auxiliary Power Switch is located on the train operator's console. A secondary auxiliary power switch (on/off green and red push-button) is located under the body at the X end. The secondary auxiliary switch enables a complete auxiliary disconnect for the entire train from the outside. It is train lined, so it can either turn on or off all auxiliary circuits throughout the train except for the battery-operated circuits such as those to the electrically operated side doors.

A large battery is located to the left of the auxiliary ON/OFF switch. It is found only at the X end of the cars. The main battery switch, located at the center, is covered by a moisture-proof plastic cover. This switch controls the battery power to the side door switches, door motors, and the emergency lights. It must be on if the doors to individual cars are to be opened by key from the outside.

In the event of a traction power failure, the batteries provide power for emergency lighting, door operation, and inter-train public address and radio communication to BART Operations Control Center for a minimum of two hours.

SECTION 2. TRANSBAY TUBE

DESCRIPTION

Resting on the bottom of San Francisco Bay at a maximum depth of 130 feet is the second longest underwater transit tube in the world. It is 3.6 miles long; 6 miles overall if the San Francisco and Oakland approaches are included.

The Tube consists of two train bores on either side of the upper and lower gallery. The upper gallery serves as a passage way for water supply and electrical as well as the ventilation plenum. The lower gallery serves as emergency access and egress to the trackways and escape route to the Oakland and San Francisco vent structures.

Access to the lower gallery from the bore is through cross passage doors spaced at 330 foot intervals. It is possible for firefighters to walk from a rescue train, through a cross passage door, through the lower gallery, to the incident train on the opposite bore. There are walk ways in each bore between cross passage doors.

Three-inch wet standpipe outlets are located near each cross passage door in the trackways.

The gallery also provides access for fire fighting personnel. Access is through the vent structure at the rear of Ferry Building and through trackway (trainway) doors in the Transbay Tube. (See "VENTILATION STRUCTURE" Section on following pages). During fire conditions, large amounts of smoke may possibly enter the gallery if the doors to the trainway are left open. Therefore ensure that all doors are closed when moving from the trainway to the gallery.

There are two electric golf carts padlocked at each end of the walkway. They are for the exclusive use of the Fire Department. These carts are specially constructed, and capable of transporting firefighters and a limited amount of equipment. Keys for the golf cart padlocks are located on the BART key rings in Box 912 (Embarcadero and Mission).

MILEAGE MARKERS

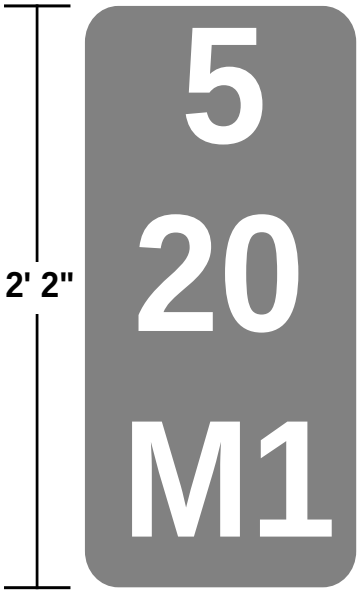
With the viewer's facing to the Oakland wye the M-1 track is always be on the right and the M-2 track will be on the left. Track 1 is outbound from Oakland. Track 2 is inbound to Oakland.

The BART district has established a standard system of designating lines by color code for quick identification. Mileage marker signs in the Transbay Tube and San Francisco trackways are coded blue for the M (Daly City line), with mileage measured from zero miles at Oakland to 15.2 miles at the Daly City terminal. The markers have a blue background with white reflective lettering.

The mileage marker signs are found every one-tenth of a mile (528 feet) on either the right or left track. In the underground, mileage markers are found every one-fiftieth of a mile (105 feet).

All mileage markers display the following information

- Trackway line such as M (Daly City) Line
- Trackway designation M-I (right) or M-2 (left) looking from Oakland
- Distance in miles from Oakland wye



5.20 Miles from Oakland wye

M1 designates trackway

Blue background with white lettering designates M line

VENTILATION STRUCTURE AND PUMPS

Approximately 200 yards behind, or east of, the Ferry Building, BART has constructed a ventilation structure which relieves the air pressure ahead of the trains operating in the transbay tube. SFFD may access the transbay tube through the ventilation structure. The ventilation structure contains two 500 gpm pumps and the supply valve for the 8 inch fire main which runs the entire length of the transbay tube. The vent structure shall be entered by accessing the lock box attached to the vent structure door and obtaining the Knox Box key. Enclosed in the Knox Box is a Swipe Card that is used to unlock the vent structure door by swiping the card to a scan reader, resulting in unlocking the vent structure door. BART personnel also have these keys. A similar ventilation structure and pumps are located on the Oakland side of the tube.

The fire pumps in the vent structures are intended to increase water pressure in the transbay tube should the normal supply be inadequate. Normal water pressure in the main is approximately 125 psi. The pressure will increase to 230 psi if the pumps are put into operation. This pressure will make the use of hand-held lines difficult; therefore, the Incident Commanders should not order activation of the pumps unless the normal supply is inadequate. Confirmation that the automatic fire main valves have been activated should be confirmed by BART Operations Control Center.

Fire Department wet standpipe outlets are located in the track way every 330 feet of the transbay tube at cross passage doors. The 8 inch water main runs in the upper gallery. Although the standpipe system is wet, there are three Outside Screw and Yoke (OS&Y) valves that are normally in the closed position. One valve is located in each vent structure (San Francisco and Oakland) and the third valve is in the upper gallery in the center of the transbay tube. These valves can be opened remotely by BART Central. The vent structure valves can be opened by firefighters at the direction of the Incident Commander.

WARNING: The San Francisco vent structure, on level 4, houses two liquid-cooled transformers, which contain Askarel, a non-flammable solvent that produces a very poisonous hydrogen chloride gas when subjected to electrical arcing.

SECTION 3. COMMUNICATIONS

Communications present a special problem for units operating in the BART underground system. Standard Department portable radios cannot be relied on throughout the subways. While underground, they are limited to line-of-sight operation. Communication with the Department of Emergency Communications (Comm Center), using a tactical channel from the "A" Bank of the portable Motorola 800 MHz radio, is sometimes possible from the station platforms of those stations which BART shares with MUNI.

1. EMBARCADERO COMMAND POST EMERGENCY PHONES

The following communications are available in the Embarcadero Station Command Post, located on the mezzanine level.

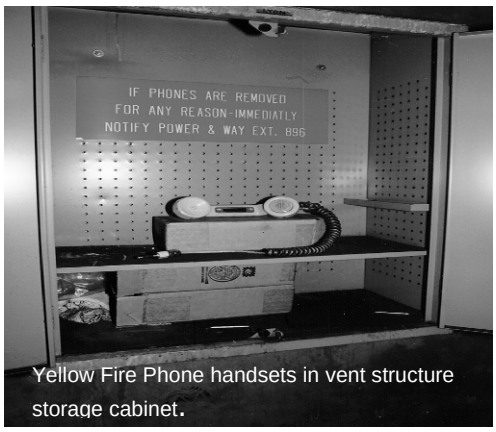
YELLOW FIRE PHONE (EMBARCADERO ONLY))

This is a Dedicated Fire Line with permanent telephone instruments located at the following locations:

- Embarcadero Station Mezzanine Command Post
- San Francisco and Oakland BART Vent structure (at top of stairs)
- Oakland Fire Department Command Center structure

Yellow Fire Phone

The Dedicated Fire Line **shall** be used **exclusively** by the San Francisco and Oakland Fire Departments as the command link during Transbay Tube incidents. The phone line is used primarily between the Branch/Division/Group Leader (at the Yellow Phone plug-in locations in the tube) and the Embarcadero and/or the Oakland Command Post.



Yellow Fire Phone handsets in vent structure storage cabinet.

Other units on the line should monitor operations, but should only use this phone line in an emergency. For example, if it is necessary to use more than one phone at the scene of the incident, the locations **shall** be identified by the units using them (i.e., San Francisco Rescue group, Oakland Operations, etc.).

Yellow Fire Phone plug-in locations:

- At each door in the gallery
- At each Blue Light station in the gallery inside the emergency phone box
- Inside three boxes on the Embarcadero station platform
- In the Surface Command Post Box at the Embarcadero Station

The Yellow Fire Phone handsets or headsets are located:

- Inside three phone boxes on the Embarcadero platform
- In the Surface Command Post Box at the Embarcadero Station
- In a box located in the vent structure (adjacent to elevator)
- In box located at the Embarcadero Station Command Post on the mezzanine level

It is crucial that units responding into the Transbay Tube obtain a Yellow Fire Phone handset at the Command Post or on the equipment carts in Embarcadero Station BART platform to insure back up communication between their unit and the Command Post.

GREEN PHONE (EMBARCADERO ONLY)

The Green Phone is a 3-party hot line connecting the San Francisco Command Post, Oakland Fire Department Command Post, and BART Operations Control Center. When one phone is lifted, the other two phones will automatically light and ring.

RED PHONE (EMBARCADERO ONLY)

The Incident Command Red Phone is a direct Hot Line between the SFFD and OFD Incident Commanders. Lifting the receiver on one phone will automatically ring and light the other phone.

2. OTHER COMMUNICATION LINKS (ALL STATIONS)

PABX PHONE SYSTEM

BART PABX telephones are located in locked boxes on each BART station platform. These flush mounted boxes are unmarked, but are located in the immediate vicinity of the platform emergency trips. A special key, marked PABX, is required to open these boxes. PABX keys are secured to the BART key rings stored in both the Surface Command Post Box and the fire alarm box for each BART station. On the inside of the telephone door are listed the numbers to reach:

- BART Operations Control Center Supervisor
- Central Power Console
- Power and Way Control
- BART Police
- BART Operator
- A communications link from one BART Station to another can be established through of the BART PABX system

SFFD MAIN LINE

The SFFD “Main Line” is our direct line to the Department of Emergency Communications (Comm Center), headquarters, and all fire stations. Dial 9 to access a dial tone for calls outside of the Fire Department.

METS PHONE

The METS phone system can be accessed from a non-METS telephone by dialing 552-9161. The phone will ring twice and give you a dial tone, indicating that you are now connected to the METS phone system. After hearing the dial tone dial the four-digit METS number (or 911).

- BART Police (510) 464-7000
- Department of Emergency Communications is 2268 or 2269
- 911 Center is 911

MINE PHONE SYSTEM (IN TRANSBAY TUBE ONLY)

The Mine Phone is a public address system installed throughout the trans-bay tube gallery. It may be used to signal or alert others in the gallery. When the phone is used and the page button is depressed, communications are heard over all speakers at the other phone locations. If the page button is not depressed, communications are heard between two or more of the mine phone users only. The system extends to the BART Power and Way coordinator's location, and behind the Central Supervisor's position at BART OCC.

Mine Phone

MAINTENANCE PHONE

BART System Safety Representatives stated as of 2007, BART is no longer maintaining the Maintenance Phone System. Therefore, it can no longer be use as a reliable means of communications.

BART PORTABLE RADIOS

BART Portable Radios are the primary tactical communication system in the Transbay Tube and other underground areas of the BART system. The BART portable radio system is an independent radio system using Ericsson portable radios.

Two BART portables are carried in each Battalion and Division Chief's vehicle. Each Rescue Squad unit and each Rescue Captain carries one BART portable radio. All BART Stations contain 3 portable radios with the exception of the Embarcadero Station, which will has five. The Portable radios shall be kept in the Station Agent's Booth with the exception of the Embarcadero Station, where they are kept at the Embarcadero Command Post. The Embarcadero Command Post has 5 battery chargers and 5 spare batteries, and all other stations have 3 of each located in the Annunciator Panel Room. All BART portable radios are kept in a red protective case.

Companies responding to an incident in BART shall immedietly obtain a BART portable radio from the Station Agent's Booth or the Embarcadero Command Post. After obtaining a BART portable radio, the company number and the radio identification number located on the backside of the portable radio shall be reported to and recorded by the Incident Commander on the Company Tracking sheet (refer to Appendix I). This process will enable the Incident Commander to track units in the underground areas. When the portable radio is keyed for talking, the tracking number is displayed on all other portable radios on that channel.

BART radios contain a two-bank system of radio channels. System 1 contains 1-13 channels of which 1- 2 are assigned to San Francisco Fire Dept, 3-4 are assigned to Oakland Fire Dept, 5-6 are assigned to Berkeley Fire Dept, 7-8 are assigned to Moraga/Orinda/Contra Costa Fire Dept, 9-10 are assigned to West Bay Extension Fire Depts. and San Francisco International Airport. Talkgroup channels 11-13 are optional channels available for the departments listed above.

System 1 Talkgroup 1 is the primary tactical channel used by San Francisco in all underground incidents or drills. The additional channel(s) may be used for ICS, EMS, 2nd incident, etc. System 2 Talkgroup 1 is the State of California High Level Fire/EMS mutual aid channel. It is compatible with our Motorola radio on channel C7 in the repeater mode. Normally its use is limited to the underground; however, activation of base repeaters by both Bart and the Department of Emergency Communications extend its capability to the surface.

All units enroute to a BART incident shall tune their portable Motorola radios to channel C7 in repeater mode. The IC shall request C7 repeater to be turned on by Department of Emergency Communications (Comm Center).

To avoid extensive radio traffic **DURING AN INCIDENT IN THE TRANSBAY TUBE**, San Francisco and Oakland Fire Departments shall both use their own tactical channel.

The Yellow Fire Phone (Dedicated) is the hardwire command link, **and the BART Radio System 1 Group 11, shall be utilized by BOTH agencies as the radio command channel.** This is to facilitate communications between both departments' command staffs.

When using BART portables, wait for the channel access beep tone before speaking. The Emergency button and the Special Call Key are disabled on the portable radio. The Scan feature **SHALL NOT BE USED**, as this will cause transmission calls to be missed on the designated channel. An in-depth description of the Ericsson portable radio is found in Appendix I at the end of this manual.

SURFACE COMMAND POST BOXES

BART has provided new Surface Command Post Boxes at one of the entrances to each station. The BART radio frequency penetrates the surface; however, if there is a problem with the base station repeaters, the Surface Command Post Boxes will not be affected. The Command Post Boxes contain a wired connection to the underground BART radio system. The boxes are painted red and are marked BART SFFD. Gain access with the BART wayside key located on BART key rings and Chief's/ISS' key rings. BART Key rings shall be kept in the old surface command post boxes which are accessed with a fire station key.

The new Surface Command Post Boxes are equipped with similar components as the Ericsson portable radio, which include an emergency button, power button, volume control, display mode window, scan option, system control, and talkgroup options. Unlike the Ericsson portable radio, the emergency button in the Surface Command Post Box operates. It shall **only** be used when a life-threatening situation exists at the Surface Command Post Box. BART Dispatch Center is immediately notified and only they can reset the system. The **Scan feature shall not be used** as this will cause transmission calls to be missed on the designated channel. Refer to appendix I.

It is **mandatory** that these Command Post boxes be staffed during BART drills and emergencies. Command Post Boxes provide reliable means of communication between the underground and the surface. Progress reports, requests for additional aid, and other communication can be relayed from the Surface Command Post Box and then over the standard Department radio to the Department of Emergency Communications or surface units. The Incident Commander **shall** designate who and how many individuals are assigned to staff a Surface Command Post Box. Their ICS radio designation is *24th Street Base*, *Civic Center Base*, etc.

New Surface Command Post Box

The ***old*** Surface Command Post box at the Embarcadero Station also contains a Yellow Fire Phone plug-in jack and headset, and also contains a BART keyring.

BART TRAIN RADIO

BART train operators are in constant communication with BART Operations Control Center. Officers may request information updates via the BART Train Radio while enroute to the incident on the rescue train. The rescue train radios afford a back-up communication system should the primary system fail. The train operator's handset may also be used as an intercom to relay information to firefighters elsewhere in rescue train.

INTER-CAR COMMUNICATIONS

Inter-car communication devices are located at the inter-car access way of each car. In an emergency, passengers may speak directly with the train attendant. The handset on the attendant's console can be used through selective switching at the console to:

- Communicate with the remote intercom station within the cars of the train.
- Make public announcements through 10 speakers recessed in the ceiling of each car.
- Communicate with Central Control via the train carried two-way VHF radio. Through switching at the console, BART Operations Control Center can communicate directly with the passengers.

All train operators are equipped with a portable radio to maintain radio contact with BART Operations Control Center in the event they must leave the operator's cab.

CHIEF'S VEHICLE CELLULAR PHONES

All Battalion and Division Chief’s vehicles are equipped with cellular phones which may be used at surface and underground incidents. Transmission and reception varies

depending location. Portable cellular telephones may work on MUNI platforms and in stairways leading to the surface, but **should not** be relied upon for emergency communications from the underground.

BART BLUE LIGHT STATION PHONES

There are two types of Blue Light Stations in the San Francisco jurisdiction: in all underground track ways and in the lower gallery in the transbay tube.

In the **lower gallery** of the transbay tube, the Blue Light Stations have a permanently installed telephone connection to BART Central, and a Yellow Fire Phone jack that connects to the (SFFD and OFD) Incident Command Posts. One Blue Light telephone handset cannot be used to talk to another Blue Light telephone because they are not connected to each other; they can only be used to communicate to BART Central.

In all **underground** track ways Blue Light Stations are located at most every 1000 feet or line of sight. Located at each Blue Light Station:

- Telephone receiver to BART Central
- Third rail trip button
- Sign that gives distance to the nearest exit in both directions
- Dry chemical extinguisher
- Identification plate giving the number of the Blue Light Station
- 110 Volt electrical outlet (5 amps)
- A black maintance phone jack (not maintained)
- Blue light

Trans Bay Tube gallery Blue Light
Station emergency phone with Yellow Fire Phone jack

Pushing the Contact Rail Button trips the power to the third rail on the adjacent track. It does not cut power to the third rail on the opposite track. **Remember**, immediately upon operating a contact rail trip, pick up the emergency telephone or PABX phone and notify BART Operations Control Center of the situation.

A blue light contact rail trip will cut power to one section of the third rail. It is possible that an incident may involve more than one third rail section. Before beginning work at an incident, be absolutely certain that all involved third rail sections are dead. **Get confirmation from BART Central.**

BART STATION VERTICAL YELLOW PHONES

BART station Vertical Yellow phone system allows hardwire connection from the surface to each level of that station down to and including the platform. A Vertical Yellow phone box has a yellow light above it. The light flashes at all phones in that station when the receiver is picked up at any location in that station. It indicates that someone is on the line. When the receiver is picked up at another location within that station, communication is available with any other phone that is off the hook.

This system does not provide communication from one station to another; it is designated for phones within a single station only. Also, it does not provide communication to BART Central, Department of Emergency Communications or any other location other than to similar phones within a specific station. (Do NOT confuse this 'yellow phone' with the yellow phones at the Embarcadero Command Post used for Transbay Tube incidents.)

To open the Station Vertical Yellow Phone box, use the key labeled "**Wayside"** found on the BART key ring. BART key rings are located in the Surface Command box or street fire alarm box or on Chief's portable radios.

SECTION 4. WATER SUPPLIES

WET STANDPIPES AND AUTOMATIC SPRINKLERS

The entire BART and MUNI Metro underground is supplied by a wet standpipe system. The only dry standpipe system remaining in BART is the station under-car sprinkler (deluge) systems. There are 3 inch outlets in each bore of the underground spaced to a maximum of 330 ft. apart. In the event of an incident in the underground, engine companies shall be dispatched to the nearest WSP inlet on each side of the incident and lead lines into the WSP inlets. These shall be charged only on the orders of the Incident Commander and, when ordered, charged at 120 psi.

Embarcadero Station

Market & Van

The BART station wet standpipe and automatic sprinkler systems are normally served by the domestic water supply. Inlets at street level allow the Department to augment the supply of water if needed. These 3-inch inlets are on the outer wall of the surface entrance to a station or on pillar type risers. These inlets may serve both the automatic sprinkler system (in the station) and the WSP system in the station and tunnel. In some instances there will be separate risers for the station automatic sprinkler system and for the station & tunnel WSP system. In these cases, there are separate sets of surface inlets and they are marked as to the area they serve. Those inlets that serve both automatic sprinklers and WSP are marked “Auto Sprinkler & Standpipe”.

Civic Center Station

Main sprinkler shutoff valve locations vary from station to station. Refer to Appendix C for the exact location of the main sprinkler shutoff valve for each station. As with other BART fire appliances, company on-site inspections are necessary to become familiar with locations of the inlets and shutoff valves.

Wet standpipe cabinets are located at all station levels and contain 100 feet of 1-1/2-inch hose with variable fog nozzle, one 20-pound ABC extinguisher, and one 3-inch wet Fire Department hose outlet. Station mezzanines are protected by automatic fire sprinklers in all public areas and by product-of-combustion (POC) detectors in non-public areas.

Smoke detectors and water flow detectors for automatic sprinklers show on the indicator panel in the station agent's booth. The detector also alerts BART Centeral who contacts the DEC (Comm Center) and a box is transmitted.

BART station fire alarm systems are not auxiliarized to City street boxes. BART Operations Control Center must notify the Department of any activation of BART station fire alarm system. A list of BART/MUNI WSP inlet locations is found in Appendix D.

DRY-PIPE UNDER-TRAIN FIRE SPRINKLERS

BART standard practice is to try to bring any train experiencing trouble into a station so that passengers can be removed and fire crews can have access to the trouble area.

Because of the difficult access to the under-train components, BART has installed dry under-train sprinkler systems in the trackways of all underground stations, except Balboa Station. The under-train sprinklers are wide-angle, deluge, full cone spray pattern sprinklers fitted with neoprene or PVC blow-off caps. The heads are spaced every seven feet on the supply line. The average station platform length is 700 feet long and is zoned into five 140 foot zones, each with its own dry-pipe and three-inch inlet. A pressure valve bleeds the air and water in the system until the water pressure builds up to 15 PSI, then the valve closes. When the water supply is removed, the valve drains the supply pipe.

UNDER TRAIN SPRINKLER INLET LOCATIONS

Sprinkler inlet locations vary with each station. At the 16thStreet, 24thStreet, and Glen Park Stations, they supply the trackway opposite the inlet to afford some degree of exposure protection to firefighters making the connection. In the Montgomery, Powell, and Civic Center Street Stations, protection is provided by locating the inlets at the opposite ends of the platform on the same side with the center zone fed from both ends. The Embarcadero Station is fed from the adjacent zone on the same side of the platform. Pre-inspection is essential in learning the layout of each station.

CHARGING THE BART UNDER-TRAIN SPRINKLER (DRY) SYSTEM

To charge the dry-pipe under-train sprinkler system, connect a large line from the 3-inch wet standpipe outlet to the three inch dry sprinkler inlet of the zone to be charged. Some zones require two lengths of large line for this connection. The wet standpipe valve controls the flow of water. BART has installed cabinets on the platform supplied with 3 inch hose for use by the Department. However, it still may be necessary to bring additional 3 inch hose lines from the apparatus for use when charging several sections of the under train-fire sprinkler.

If necessary, sprinkler pressure may be increased by pumping into the wet standpipe inlet at street level. All BART trackways have sufficient drainage capability so that sprinkler use should not cause a flooding problem. Efficient use of this installation

depends on all fire fighting companies familiarizing themselves with the location of related components.

SECTION 5. EMERGENCY EQUIPMENT

BART KEY RINGS

There are three key rings assigned to each BART station. These are found in the Old Surface Command Post box, the New Surface Command Post boxes and the associated nearest street fire alarm box. This is in case one of the boxes becomes vandalized. Each BART key ring contains the following:

- BART master key—Most BART locks can be operated with this key
- PABX telephone box key
- Elevator control key
- Escalator control key/s—there may be more than one type of key
- Fire hose cabinet keys (3-inch hose storage cabinet)
- Wet standpipe cabinet keys
- BART wayside key—opens new surface command post box and Vertical yellow phone
- BART train door keys

Note: Montgomery Station and 16th Street Station have keys located in Lock Boxes instead of Old Surface Command Post Boxes.

San Francisco Vent Structure

Access will be through a swipe card key access. To obtain the swipe card, first open the Lock Box with a firehouse key. Then take out the Knox Box key and open the Knox Box to get the swipe card. The card reader is directly below the Lock Box. One of the keys is to a communications locker located at the bottom of the vent structure stairs. Inside that locker will be Yellow Fire Phone handsets and a BART Grand Master key used to operate the vent structure elevator.

EQUIPMENT ROOMS/BOXES

In the Embarcadero Station, firefighting equipment is stored in a stainless steel storage facility at the east end of the BART Platform. The storeroom and equipment is maintained by, and under the exclusive control of, the San Francisco Fire Department. The door to the compartment is stenciled SFFD, and the fire station key provides access. The storage area contains four loaded hand trucks (see sample inventory below). Other equipment rooms or boxes are located on the MUNI platform levels of all MUNI stations. At the Embarcadero station only, the equipment room is located on the east end of the BART platform level. This equipment may be used for either BART or MUNI metro incidents. The room or box is accessible with the fire station key.
(Refer to 11.7-11.8 of this manual)

- 200 feet of small line
- Large-line wye with 3-inch by 2 ½-inch reducer
- Small line nozzle
- Yellow Fire Phone handsets for the transbay tube (at Embarcadero station only)
- Two empty hand trucks with six lengths of large line (Embarcadero only)
- Four SCBA spare bottles per-cart

SECTION 6. BART EMERGENCY PROCEDURES

None of the fire fighting procedures contained in this manual should be interpreted as inhibiting the initiative and resourcefulness of the Incident Commander or company officers operating at BART incidents. However, because communication and coordination between BART and the Fire Department is so critical during an emergency, procedures have been formulated after lengthy discussions with BART Safety Department personnel.

Between the time of Fire Department notification of an emergency and our arrival on the scene, BART Operations Control Center will initiate certain procedures such as ventilation, rescue train availability, and send BART liaison to the Command Post etc. It is obvious that any drastic deviation from the agreed-upon procedures by either BART or the Fire Department would jeopardize operations.

Every members responding to the platform level for any BART underground tube incidents **shall** bring a Scott Air Pak, plus at least one extra cylinder. All companies equipped with one hour Scott-Air-Pak **shall** respond with the one-hour SCBAs and extra cylinders. Truck companies **shall** also bring appropriate forcible entry tools. All medical equipment should be brought to the platform level. (Reference Page 6.10 on Equipment Chart)

BART EMERGENCIES

The Department of Emergency Communications **shall** notify BART Operations Control Center (OCC) of any alarm concerning BART that was not received from them, (i.e. report from a citizen). An agreement between BART and the Bay Area Fire Departments places final authority for train movement on all tracks at a fire incident scene with the Incident Commander.

BART Central will normally request that the Incident Commander release the non-incident track for operation as quickly as possible. This permits BART to start single tracking trains through the emergency scene and reduce delays to BART patrons. The release maybe revoked at any time deemed necessary by the Fire Department Incident Commander.

It is recognized that circumstances vary with each emergency, and because of the physical layout at the scene, a partial release of the area for train movement may **not** be possible. However, in some areas of BART, there are opportunities to release the non-incident track for revenue operations without any adverse safety impact upon the emergency scene activities. Restoration of even limited service **shall** be consistent with on-scene safety considerations.

BART's Operations Control Center will immediately notify the appropriate Fire Department of any incident that has the potential to endanger lives or destroy property. BART will explain the incident and the Fire Department will respond according to Fire Department procedures.

The BART Central Manager has the authority to cancel notification made to the Fire Department. The Fire Department responding may choose to continue response and investigate.

In the case of a major emergency between stations within San Francisco, a full first alarm response of SFFD units **shall** be dispatched to each station.

Examples of major emergencies:

- Any train fire
- Track way fire
- Suspected fire condition
- Any incident which may endanger life or safety

INVESTIGATION / STANDBY

Reports of smoke, odor, or hazardous condition of undetermined origin will be investigated by BART personnel. In these situations, BART Operations Control Center will retain full control of railroad operations, unless notified by the Incident Commander that a true emergency has developed or been identified and fire department operations are commenced.

INFORMATIONAL REPORT (ADVISORY ONLY)

A BART Advisory is an informational report to the Department of Emergency Communications when an unusual situation is occurring that may affect BART operational plans. Advisory alerts do not require response by the Fire Department.

BART INCIDENT TYPES

BART incidents can be divided into four categories:

1. Station Incidents
2. Underground Bore Incidents - non transbay tube
3. Transbay Tube Incidents
4. Aerial Incidents

The Incident Commander may establish the Command Post at either the Surface Command Post Box, the Station Agents Booth, or the platform level depending upon the incident type. The Incident Commander **shall** maintain contact with BART through

Department of Emergency Communications or through the PABX phone in either the station agent's booth or on platform level. If it is necessary to contact Department of Emergency Communications from within a combined BART and MUNI station, it is advisable to use a tactical channel from the "A" bank of the portable Motorola 800 MHz radio, in order to take advantage of the hard-wired antenna on the MUNI level.

STATION INCIDENT

A fire in a BART station no different than to a building fire. BART stations are partially sprinklered and have a monitored fire alarm system with an indicator panel. It is necessary to obtain the keys from the BART Surface Command Post box, street fire alarm box or the station agent to gain access to the indicator panel. If a train in the station is involved in fire, the power to its track should be cut through the emergency platform trip or through BART Operations Control Center or through Department of Emergency Communications.

Normally, it is not be necessary to cut power to the uninvolved track. Hose lines **shall** be led to the under-car sprinkler system and charged only on orders of the Incident Commander.

To assist with these leads, BART has placed large line in cabinets at various intervals along the platform which are accessible through the use of the hose cabinet key on the BART key ring. Large line may have to be brought down to platform level from apparatus at street level to facilitate hose leads into the under-car sprinkler from the platform Wet Standpipe hose cabinets (3-inch outlet). (See appendix G)

Remember, contact with Department of Emergency Communications via Department portables while underground is sometimes unreliable, and generally limited to platform areas. BART Surface Command Post boxes are hard-wired extensions of the BART portable radios and must be used for communication from underground to surface with the BART portables. It is recommended that two persons be assigned to staff the Surface Command Post Box.

BART Station Agents are similar to building managers. They should be contacted for information and assistance. BART Police automatically respond to an incident and assist the Incident Commander with crowd control, communications etc. At all BART incidents and emergencies, BART will eventually establish a BART liaison for the Fire Department. In order to maintain a consistency of application and safety of operation, one individual from BART should be identified as the Liaison Officer on scene. Once the Liaison Officer arrives, all requests, directions, etc. should be issued through this one individual to BART**.**

BART personnel are trained in the operations of the ICS system and will treat their BART Liaison Officer as part of the Fire Departments incident staff. However, it should be remembered that the Fire Department is in charge of the emergency until the Incident Commander releases it.

UNDERGROUND BORE INCIDENTS - NON TRANSBAY TUBE

INFORMATIONAL REPORT (ADVISORY ONLY)

An advisory alert is an informational report to the Department of Emergency Communications when an unusual situation is occurring that could affect BART operational plans, but which does not involve an immediate potential fire situation. Informational report (advisory) **shall not** involve response of Fire Department equipment.

If the condition is upgraded due to a possible emergency, the first available Battalion Chief and Engine Company respond Code 3 (investigation). In case of a confirmed emergency, a full first-alarm assignment will be requested for response to stations on each side of the incident. For incidents above ground (aerial trackways, etc.) they shall respond to the incident site and evaluate the situation.

INVESTIGATION:

Unit	Duties
Battalion Chief	1. Establish contact with BART through Department of Emergency Communications, PABX phone at the station agent's booth or platform level. 2. Maintain contact with Department of Emergency Communications. 3. Monitor progress of the investigation by BART personnel, and if necessary, upgrade to a full first alarm assignment.
Engine Company	1. Locate equipment box at station if in combined BART/MUNI station. 2. Other duties as required by the Battalion Chief.

CONFIRMED EMERGENCY:

When the Department of Emergency Communications is advised of a train fire in the BART underground, a full box is normally struck for the station on each side of the incident. Ensure Department of Emergency Communications activates underground repeater patch through BART Operations Control Center. ("C-7" Channel on Motorola radios on repeater mode will be able to be used as a backup commucations for the BART radios.)

The first arriving Chief Officer and Incident Support Specialist (ISS) (if available), or Company Officer in their absence **shall** perform the following:

Item	Instructions
1. Keys	Obtain the BART keys from the Surface Command Post Box at street level or appropriate fire alarm box.
2. Maps	Enter the station and obtain maps of the tunnel sections. These are normally found in the station agent's booth, red protective portable radio case or MUNI equipment box .
3. PABX	Contact BART Operations Control Center through the PABX phone in the station agent's booth, at the platform level, or through. Department of Emergency Communications
4. Checklist	Obtain necessary information as per checklist and coordinate with units responding to the incident from the opposite station. Checklist may be found in the red protective portable radio case, ICS boxes in each Chief's vehicle or in the Emergency Operations Binders. (also see checklist example in Appendix F).
5. ICS	Establish Command Post at Surface Command Post Box, Station Agents Booth, or on the platform level. Platform level is recommended to give the Incident Commander a better view of operations when an incident is between stations (Non Transbay Tube Incident). Smoke conditions will determine the most optimal position for the Command Post. Command link can be established by using any of the following: • METS Phone (BART Police (510)464-7000, Department of Emergency Communications ex 2268, 2269) • SFFD Radio (Assigned Control Channel or Division Chief Command channel to Department of Emergency Communications) • Cellular Phones in Chiefs Vehicles • PABX Phones (to communicate between stations) If the ICS Operations section is required, recommend Bart Radio on System 1 Group 11 as station/underground Command Channel

Item	Instructions
6. Rescue Train	Load the rescue train with firefighters and equipment on the opposite track. Members shall load into the third car to keep first two open for rescue. Battalion Chief and Rescue Squad shall ride in first car with train operator. The Battalion Chief is in charge and, consistent with safety, the train operator shall follow the Battalion Chief's orders. The train operator must get clearance from BART to move the train and also wait for the orders of the Battalion Chief to proceed. When the Battalion Chief leaves the train, he/she should leave one member equipped with a portable radio to remain with the train operator. The Battalion Chief on the train shall establish communication with the Incident Commander from the incident site. The train operator may use the train radio to keep BART Operations Control Center informed of the conditions and they in turn can relay information to Department of Emergency Communications. It also serves as a public address system to give instructions to firefighters or civilians on the rescue train. In the Downtown areas where the distance between stations is not too great, it may be more expedient to send the initial companies to the incident on foot. In either case, the initial attack team shall normally be at least a Battalion Chief, Incident Support Specialist (if available) or assigned member, one engine company, truck company, rescue squad, and Medic unit if available. **Note:** The BART tunnel between Montgomery Station and Embarcadero Station has no cross-passage doors between the M-1 and M-2 tracks. If emergency in this section occurs, use incident bore to access incident.
7. WSP Inlets	For a fire between stations, the Incident Commander shall order an engine company to the nearest WSP inlet on each side of the incident. It is important that drivers report to the Surface Command Post Box after dropping off their crews to obtain directions as to what WSP inlets they are required to report to. This information shall be relayed from the Incident Commander using the maps and incident location information to determine which WSP inlet is nearest the incident. Additional engine companies may be assigned to other WSP inlets for additional

Item	Instructions
	pressure/supply if necessary. The BART/MUNI WSP system has been tested and is capable of providing adequate pressure for firefighting hose lines. Have engine companies charge the WSP only on the orders of the IC if water supply problems develop. Charge at 120 psi. (WSP 3 inch outlets in the underground are located a maximum of 330 ft apart). A list of all WSP inlet locations are found in the Surface Command Post Box, red protective portable radio case, Emergency Operations Binder in Chief's vehicles. The entire BART/MUNI underground (tunnel) system is supplied by WSP system.
8. Radios	BART radios shall be operated on System 1, Talkgroup 1 (Primary Tactical Channel). Department units also operate on SFFD Radio channel C7 in repeater mode. Hard wired communications can be made to each station through PABX phones. Additional Bart Radio channels available are System 1, Group 2 and 11-13. Also the High Level Fire/EMS System 2, Group 1 is compatible with SFFD Radio Channel C7 in repeater mode.
9. Hose Leads	Leads for fire fighting in the underground shall be made from the incident bore to maintain integrity of the non-incident bore for passenger evacuation
10. Evacuation	Passenger evacuation is of primary importance. If you are on a rescue train and approaching an incident and passengers are evacuating in your direction, stop and assist in loading them onto your train or assign firefighters to escort walking them out.
11. Equipment	Full PPE, SCBA'S (1 hour), spare bottles, Spare SCBA for train operator, officer wye/reducer, spanner, 4 hose bundles, 3 lengths of large line, flashlights, medical equipment, stokes baskets, forcible entry tools, rope bag, portable generator with lights, metal cutting saw, Thermal Imaging Camera (TIC). Equipment from storage box in BART/MUNI combined stations.

TRANSBAY TUBE INCIDENTS

RESPONSE IN THE TRANSBAY TUBE INCLUDES:

Box 2815 Market & Main Streets for Transbay Tube incident
(Oakland F.D. responds simultaneously to incident from Oakland side).

Assignment:

1 AC
3 BC's
4 Engines
2 Trucks
1 Rescue Squad
2 Medic units
1 Rescue Captain
Mobile Air 1

The Transbay tube is intersected by the San Francisco and Oakland City boundary. When an emergency occurs within the tube, BART Operations Control Center procedures require the notification of both the SFFD and the Oakland Fire Department.

When Department of Emergency Communications is notified of a emergency in the Transbay Tube, Box 2815 is transmitted. The box assignment includes an Assistant Chief and three Battalion Chief's. If no Assistant Chief is available, then a Battalion Chief **shall** respond in the Assistant Chief's place.

Important:
Gallery doors 0 (zero) to 43 are in San Francisco - doors numbered 44 or higher are in Oakland. If the Chief at the Embarcadero Command Post is the Incident Commander, then the Oakland Fire Department acts as support. Conversely, if the emergency occurs in Oakland, their Chief Officer is Incident Commander and SFFD will act as support.

Unit	Duties
Assistant Chief and Battalion Chiefs	1. Obtain keys for the Embarcadero Command Post from Surface Command Post Box or street fire alarm box 2. Activate the BART Embarcadero Station Command Post on mezzanine level, and establish contact with: 1. BART Operations Control Center (PABX Phone in Command Post) 2. Department of Emergency Communications on assigned Control Channel, Division Chief Command Channel, SFFD Main Line, or METS local 2268 or 2269. 3. Oakland Fire Department Command Post (if staffed, RED Phone in Command Post) Monitor the progress of the investigation by contacting BART Operations Control Center and upgrade to a full box if necessary. If this decision is made by the Incident Commander, a full first alarm assignment is dispatched including those companies already on the scene 4. Request “C7” Repeater to be operational 5. Staff Surface Command Post (2 members)
Company Responsibility	1. Locate and open equipment box at East end of BART platform 2. Other such duties as directed by the Assistant Chief or Battalion Chief

Item	**Instructions**
1. Keys	1. Obtain keys from Surface Command Boxes or appropriate fire alarm box 2. Open the Embarcadero Command Post on Mezzanine level. (There is additional set of keys in the Command Post.) (These need to go forward with the rescue train for the train door release.)
2. Maps & Checklists	Obtain Incident Commander checklists and maps of the tunnel sections from the Embarcadero Command Post.
3. ICS	Establish Command Post at mezzanine level. Establish communications with:

Item	Instructions
	1. BART Operations Control Center (PABX Phone) or (510)464-7000 (BART police) 2. Department of Emergency Communications – Main line, Division Chief Command Channel, or METS local 2268 or 2269. 3. Oakland Fire Department Incident Commander (Red Phone) Oakland Fire Department Command Post (Yellow Fire Phone) **(San Francisco) Branch A, (Oakland) Branch B (OFD), & Oak. Command on BART radio System 1 Group** 11 4. Open "C7" Repeater
4. Rescue Train	Minimum rescue train staffing for any underground incident is two Engine Companies, one Truck Company, two Battalion Chiefs (2nd BC is safety officer), Incident Support Specialist (if available), Rescue Squad, two Medic units, Rescue Captain, and RIC. Load rescue train with firefighters and equipment on the non-incident track. Members **shall** load into the third car to keep the first two open for any passengers who might be rescued. The Battalion Chief and Rescue Squad **shall** ride in first car with train operator. The train is under the control of the Battalion Chief on the train and the train operator, consistent with safety, will follow the orders of the Battalion Chief. The train operator must get clearance from BART to move the train and also will wait for orders from the Battalion Chief to proceed. When leaving the train, the Safety Battalion Chief should leave the Incident Support Specialist (if available) or assigned member, with the train operator. The train radio can be used to obtain information from BART Operations Control Center or to relay information to Department of Emergency Communications. It also serves as a public address to give information and instructions to firefighters and civilians on the train. The San Francisco (Branch A) Incident Support Specialist (if available) or assigned member shall be on BART radio System 1, Group 11, the underground radio command channel. When the rescue train reaches its destination, Incident Support Specialist (if available) or assigned member should plug in the Yellow Fire Phone at the cross-passage door and contact the Embarcadero Command Post.

Item	Instructions
5. Radios	BART radios **shall** be operated on System 1, Talkgroup 1, the SFFD tactical channel. All units also operate their SFFD Radio on channel C7 in repeater mode. (Reference SFFD Communcation Manual) The Yellow Fire Phone is used as the emergency phone or command link in the transbay tube. System 1 Group 11 shall be utilized by both fire agencies as the radio command channel. System 1, Groups 2 and 12-13 are also available BART radio channels. The High Level Fire/EMS System 2, Group 1 is compatible with SFFD Radio Channel C7 in repeater mode.
6. Hose Leads	Leads for fire fighting **shall** be made from the incident bore to maintain integrity of the non-incident bore (WSP outlets are located a max. of 330 ft apart in the underground at cross-passage doors)
7. Evacuation	Passenger evacuation is of primary importance. If you are on a rescue train approaching an incident and passengers are evacuating in your direction, stop and assist them in loading onto your train or assign firefighters to escort them out. The middle gallery can be used for this and companies should be sent into the gallery from the vent structure to assist with passenger evacuation and to meet anyone walking out this way. It must be stressed at all times, that all gallery doors should be closed. Personnel **shall** stay far behind the rescue train as it departs, as smoke may be drawn into and through the gallery and follow a departing train if gallery doors are left open.
8. Equipment	Full PPE, SCBA'S (1 hour), spare bottles, Spare SCBA for train operator, officer wye/reducer, spanner, 4 hose bundles, 3 large line, flashlights, medical equipment, stokes basket, forcible entry tools, rope, portable generator with lights, metal cutting saw, Thermal Imaging Camera (TIC) (if available) Equipment from storage box in BART/MUNI combined stations.

ENGINE AND TRUCK COMPANIES BRING THEIR OWN EQUIPMENT AND OBTAIN EQUIPMENT FROM THE ON-SITE EQUIPMENT BOX. LOAD INTO THIRD CAR OF RESCUE TRAIN ON THE NON-INCIDENT TRACK. – **GREATER ALARM COMPANIES MAY BE DIRECTED TO EMBARCADERO BASE, PLATFORM STAGING, AND VENT STRUCTURE TO ENTER GALLERY OR BORES TO ASSIST EVACUEES.**

AERIAL TRACKWAY INCIDENTS

Aerial incidents may require that passengers be removed from the train to a safe area. These safe areas may include an adjacent BART rescue train (using the Higgins plank) or removing passengers onto an adjoining trackway at track level (using a 14 foot ladder to assist). Removing passengers to an adjacent trackway can be extremely hazardous due to the potential contact with the third rail, and numerous obstructions on the trackway that could potentially cause injury. For these reasons, it is imperative that a sufficient number of firefighters be assigned to assist when evacuating passengers in these situations. Also, insure that firefighters are assigned to assist when passengers reach their safe areas and are awaiting removal.

It may sometimes be necessary to remove passengers from a train stopped on an aerial trackway through the use of the aerial ladder. If this becomes necessary, always attempt to place the end of the ladder into the BART car. The BART car doors are wide enough to accommodate an aerial ladder easily. **DO NOT REST AERIAL LADDERS ON THIRD RAIL COVER BOARD.** Instead, keep the aerial approximately 6 inches off the cover board at all times to insure there is no contact with the third rail and the aerial ladder. Also, prior to starting any operation where passengers are removed from a BART train on an aerial trackway structure, insure that the third rail power has been turned off. There are no manual third rail power trips on aerial structures so it will be necessary to contact BART OCC through Department of Emergency Communications (Comm Center) to request third rail power be turned off **("POWER OFF").**

It may be necessary on aerial trackway incidents to bring a water supply up the aerial or ground ladders to the aerial structure. There are no WSP outlets on aerial trackway structures and therefore supply lines must be led to these areas.

VENTILATION

BART UNDERGROUND VENTILATION

TUNNELS BETWEEN STATIONS

BART Ventilation fans are controlled remotely from BART Central. During emergency operations BART controls these fans which can run in either supply or exhaust mode.

Each station has an independent ventilating system. The station fan room is in the station maintenance area.

Ordinarily, before the arrival of the Fire Department, ventilation begins according to a predetermined plan based on the location of the train, the length of the train, and the location of the involved train car(s). The objectives of the ventilation plan are:

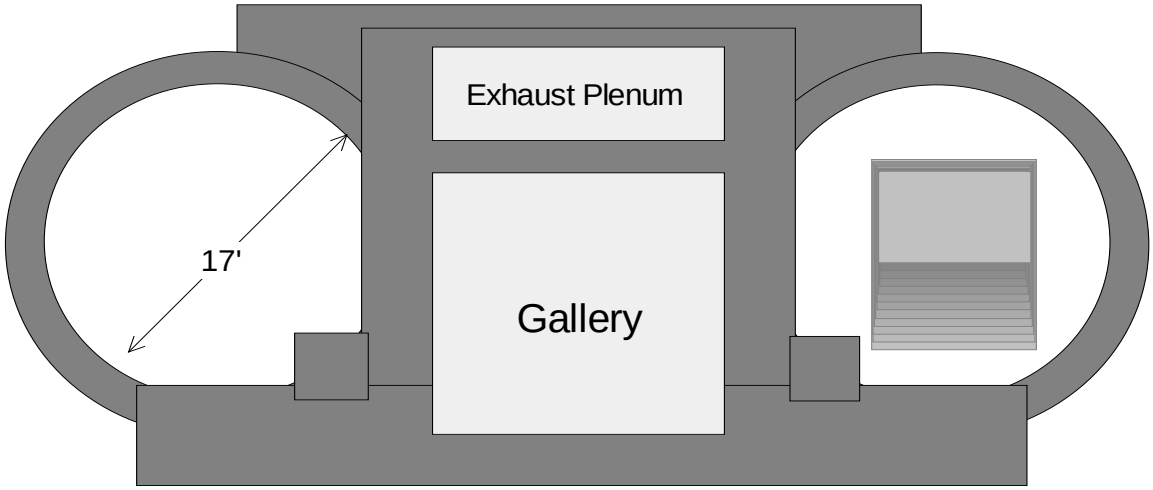
- To move the smoke in a direction so that the major portion of the train will remain in clean air
- To provide the most advantageous evacuation route for the passengers.

If the Division/Group Leader determines that the ventilation scheme should be altered (shutdown, increased, reversed, etc.), the Division/Group Leader should recommend such changes to the Incident Commander. Keep in mind that it will take several minutes before the smoke movement is stopped or reversed.

TRANSBAY TUBE VENTILATION

Ventilation in the Transbay Tube is accomplished in a different manner. There is an exhaust plenum ("upper gallery")(see pg. 2.1) provided between the two trackways and above the center ("lower") gallery, along the full length of the tube. Large fans at each end of the plenum operate in an exhaust mode and put the entire chamber under negative pressure.

There are large louvers between this plenum and each trackway at 1000-foot intervals. These louvers are operated remotely from BART Operations Control Center, and can be used selectively to exhaust smoke from any portion of either trackway. Extensive testing has shown that the safest and most efficient smoke removal is accomplished by opening only one set of louvers at a time.



tubecut2.wmf

PROCEDURE FOR STARTING BART STATION ESCALATORS

Because some escalators have been modified throughout the system, two escalator keys are necessary. The correct key can be determined visually or by insertion into the slot. There are three different configurations for the escalators in the system. However, each has:

- An emergency stop button.
- A key slot for ON/OFF or stop.
- A key slot for UP/DOWN.

Escalators can be stopped by turning them off with the key or by using the emergency stop button.

Station Agents normally stop the escalators using the emergency stop button. When this occurs, escalators can be restarted at either end of the escalator by inserting the appropriate key into the Up/Down key slot and turning the key to the desired direction.

If the escalator has been stopped by using the key, the escalator must be restarted at the location where the key was inserted to turn it off. Insert the key into the On/Off slot, move it to ON, then insert the key into the Up/Down slot and turn the key to the desired directional movement.

If the escalator does not respond, the escalator was stopped by use of the key. Try turning it on at this location and then try Up or Down. If this fails, proceed to the other end of the escalator and attempt to control directional movement from there.

Note: The key slots mounted on a box at the end of the escalator require that the key be held in the UP or DOWN position for approximately 10 seconds before the escalator moves without stopping.

Investigation of BART Fires:

BUREAU OF FIRE INVESTIGATION

In order to not unduly affect BART operations, Incident Commanders **shall** immediately summon the Bureau of Fire Investigation ("4710" or "Arson") to any suspicious fire occurring in or about BART trains. An estimated time of arrival **shall** be obtained from the Bureau of Fire Investigation. If it is determined that the Bureau of Fire Investigation response may be delayed for an extended period of time, Incident Commanders are authorized to order the train moved to the Daly City storage site.

IN THE EVENT THAT THE TRAIN IS MOVED TO A STORAGE SITE, THE INVOLVED TRANSIT VEHICLE SHALL BE SECURED AND A FIRE DEPARTMENT OR BART REPRESENTATIVE SHALL ACCOMPANY THE TRAIN TO THE STORAGE SITE.

BART POLICE PROCEDURES

In cases involving fires on BART trains, BART Police responds and conducts a police investigation after the Fire Department has extinguished the fire. BART Officers will conduct a joint investigation with Fire Department investigators, if requested.

If it has been determined that a crime has been committed, BART Officers will provide protection for the crime scene to prevent contamination or removal of evidence. BART officers will be assigned to seal off involved transit vehicles when trains are removed from the incident site (i.e., station or wayside location).

To protect crime scenes, BART Officers will also be stationed on board transit vehicles while the trains are removed from service, yards, or storage tracks. BART Officers will remain until crime scene technicians and/or arson investigators have responded for processing evidence.

SECTION 7. SAMPLE BART ICS SCHEME

BART UNDERGROUND INCIDENT

The Department has adopted the ICS system for use at emergencies. Below is an example of how an ICS system could be utilized in an underground incident in BART between 16th and 24th Street stations.

<table>
<tr><td colspan="2">Division Chief
Incident Commander
Radio designation: Command</td></tr>
<tr><td>16th Street Station</td><td>24th Street Station</td></tr>
<tr><td>Box 5236</td><td>Box 5525</td></tr>
<tr><td><u>Assignments</u>
3 Engines, 2 Trucks, 1 Rescue Squad, 2 BC, 1 AC, 1 Medic Unit Plus 1 RIC Engine,1 RC and Mobile Air if working fire</td><td><u>Assignments</u>
3 Engines, 2 Trucks, 1 Rescue Squad, 2 BC, 1 AC, 1 Medic Unit Plus 1 RIC Engine and 1 RC if working fire</td></tr>
<tr><td><u>3rd Engine on scene and 2nd Truck</u>
Radio Designation: 16th Street Logistics
Engine Officer is Logistics at 16th Street (at station platform) responsible for movement of equipment from surface to platform.
Truck to assist Engine</td><td><u>3rd Engine on scene and 2nd Truck</u>
Radio Designation: 24th Street Logistics
Engine Officer is Logistics at 24th Street (at station platform) responsible for movement of equipment from surface to platform.
Truck to assist Engine</td></tr>
<tr><td><u>Division ISS</u>(Incident Support Specialist)
Radio designation: 16th St. BASE. Assigned as Base Officer 16th Street.
Responsible to staff Surface Command Post box at 16th St. Station.
Relay information as necessary.</td><td><u>Two Members of 2nd Truck</u>
Radio designation: 24th St. Base
Assigned as Base Officer at 24th Street Station.
Responsible to staff Surface Command Post box at 24th St. Station.
Relay information as necessary.</td></tr>
</table>

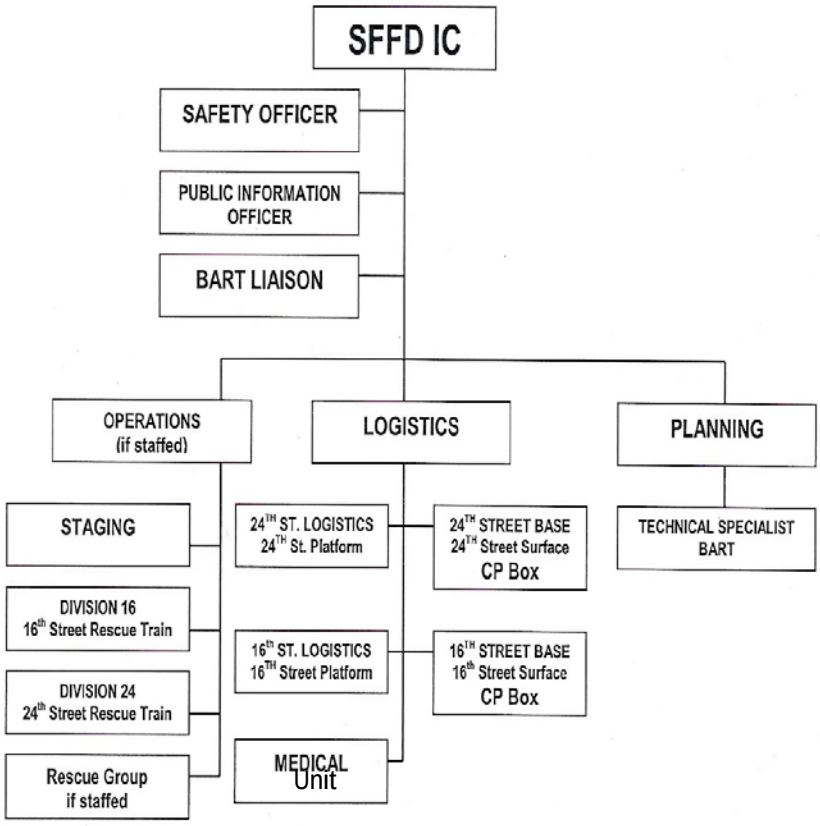
<table>
<tr><td colspan="2">Division Chief
Incident Commander
Radio designation: Command</td></tr>
<tr><td>16th Street Station</td><td>24th Street Station</td></tr>
<tr><td>Box 5236</td><td>Box 5525</td></tr>
<tr><td><u>Battalion Chief</u>
Radio designation: Division 16 Rescue Train
Command of Rescue Train from 16th Street.
2 Engines, 1 Truck, 1 RS, 1 Medic, 1 RC, 1 RIC Engine
Second Battalion Chief (Safety)</td><td><u>Battalion Chief</u>
Radio designation: Division 24 Rescue Train
Command of Rescue train from 24th Street.
2 Engines, 1 Truck, 1 Medic, 1 RIC Engine
Second Battalion Chief (Assistant Safety)</td></tr>
</table>

NOTE: Incident Support Specialist (if available) is on their respective rescue train assisting the Battalion Chief.

This is only an example of how the ICS system can be utilized. It is ultimately up to the Incident Commander to designate divisions and groups and assign companies to various tasks or functions. The above assignments can be further broken down into functional groups. For example a Rescue Squad can be designated as the Rescue Group and given a more specific functional assignment.

Any suspension of transit service results in backup through the entire system. This could include a train or trains being stopped in the Transbay Tube. To avoid panic of passengers on the stalled train and a potential unauthorized train evacuation, it is imperative that the Incident Commander start revenue service as soon as safely possible.

BART UNDERGROUND BETWEEN STATIONS SAMPLE



BART TRANSBAY TUBE INCIDENT

SFFD and Oakland Fire Department have agreed to use full ICS procedures when operating together in the Transbay Tube underground. It is important that units use their proper radio designation when communicating over the radio system. Department units **shall** always precede their radio transmissions by using "San Francisco" in-front-of their radio designation. For example, *San Francisco Rescue Group* or *San Francisco Fire Attack*. In turn, Oakland Fire Department units are instructed to use "Oakland Fire" Attack etc. for their respective radio designations. This will assist in keeping tight radio discipline when multiple agencies are operating at a single incident (because it is possible to contact Oakland Fire Department via the BART Ericsson Radio Channels). Whenever possible, communications should be face to face to avoid unnecessary radio traffic.

San Francisco rescue train will always be identified as **SAN FRANCISCO BRANCH A** and Oakland rescue train will always be identified as **OAKLAND BRANCH B.**

(SAN FRANCISCO) BRANCH A

Assignment	**Responsibilities**
Battalion Chief (or other officer as designated by Incident Commander)	Lead the Fire Attack Group on rescue train and directs tactical/strategic fire fighting and rescue at incident scene. Reports directly to Incident Commander and has radio designation of ***(SAN FRANCISCO) BRANCH A*** Works at scene in conjunction with Oakland Fire Department Fire ***(OAKLAND) BRANCH B***

LOGISTICS OFFICER

Assignment	Responsibilities
Officer/Battalion Chief (as directed by Incident Commander, ISS (Incident Support Specialist)(if available) or othe compines to assist as directcted by Incident Commander)	Platform and station control. Establish and maintain communication between the platform and Command Post using the Yellow Fire Phone or BART radio. Radio designation is *San Francisco Logistics*. Once the Rescue Train has departed the platform, use of the Yellow Fire Phone shall be limited to command link communications and emergency transmissions. This line is primarily a command link between the (San Francisco) Branch A Leader, or Operations Officer, and Incident Commander. Coordinate movement of equipment from surface to platform and deployment of arriving companies to platform. Establish medical triage area. Maintain a roster of all personnel entering the tube

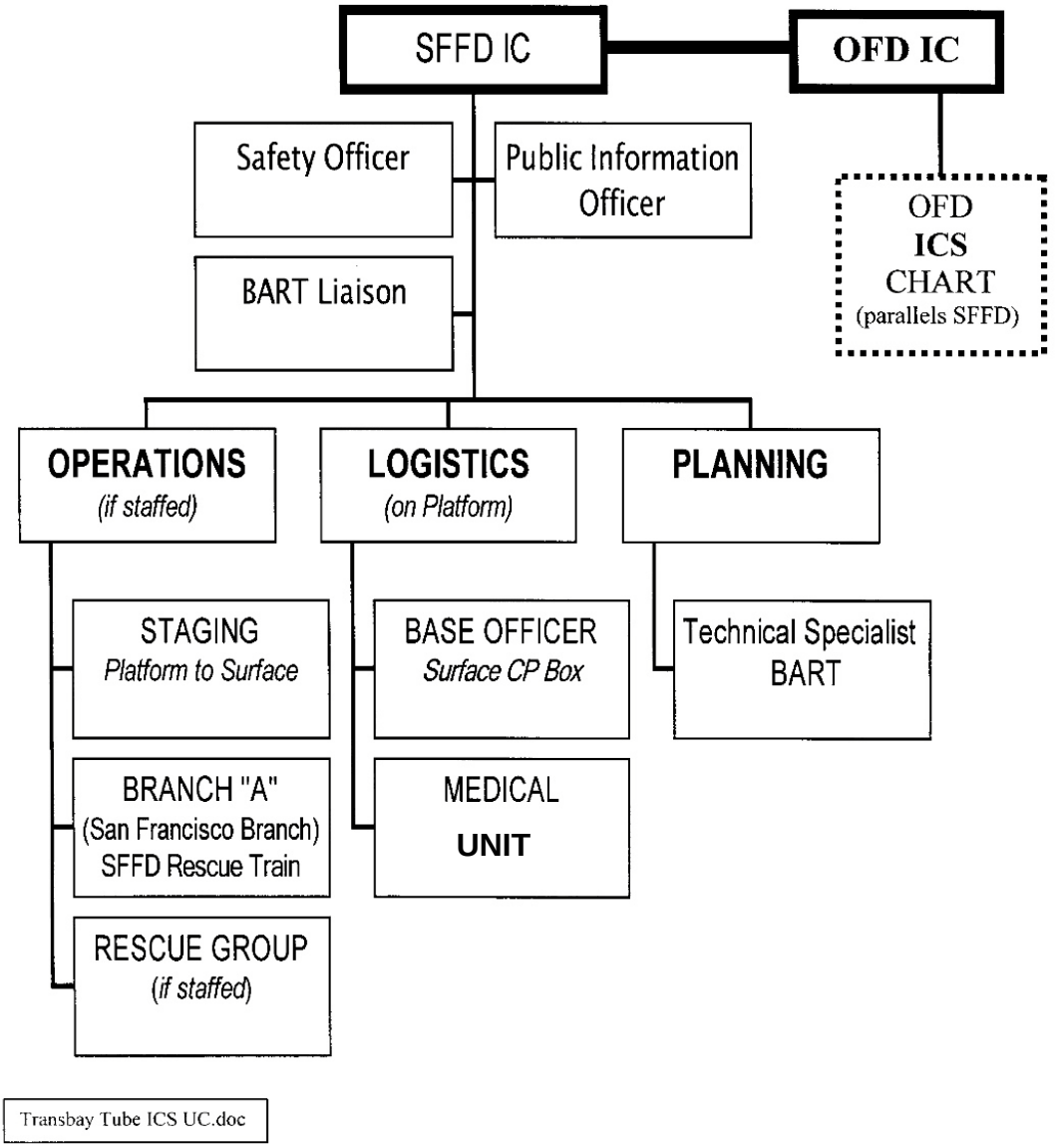
RESCUE GROUP

Assignment	Responsibilities
Rescue company and other units as designated by the Incident Commander	Radio designation: *San Francisco Rescue Group* Conduct a primary and secondary search of incident train to insure all civilians and firefighters are accounted for.

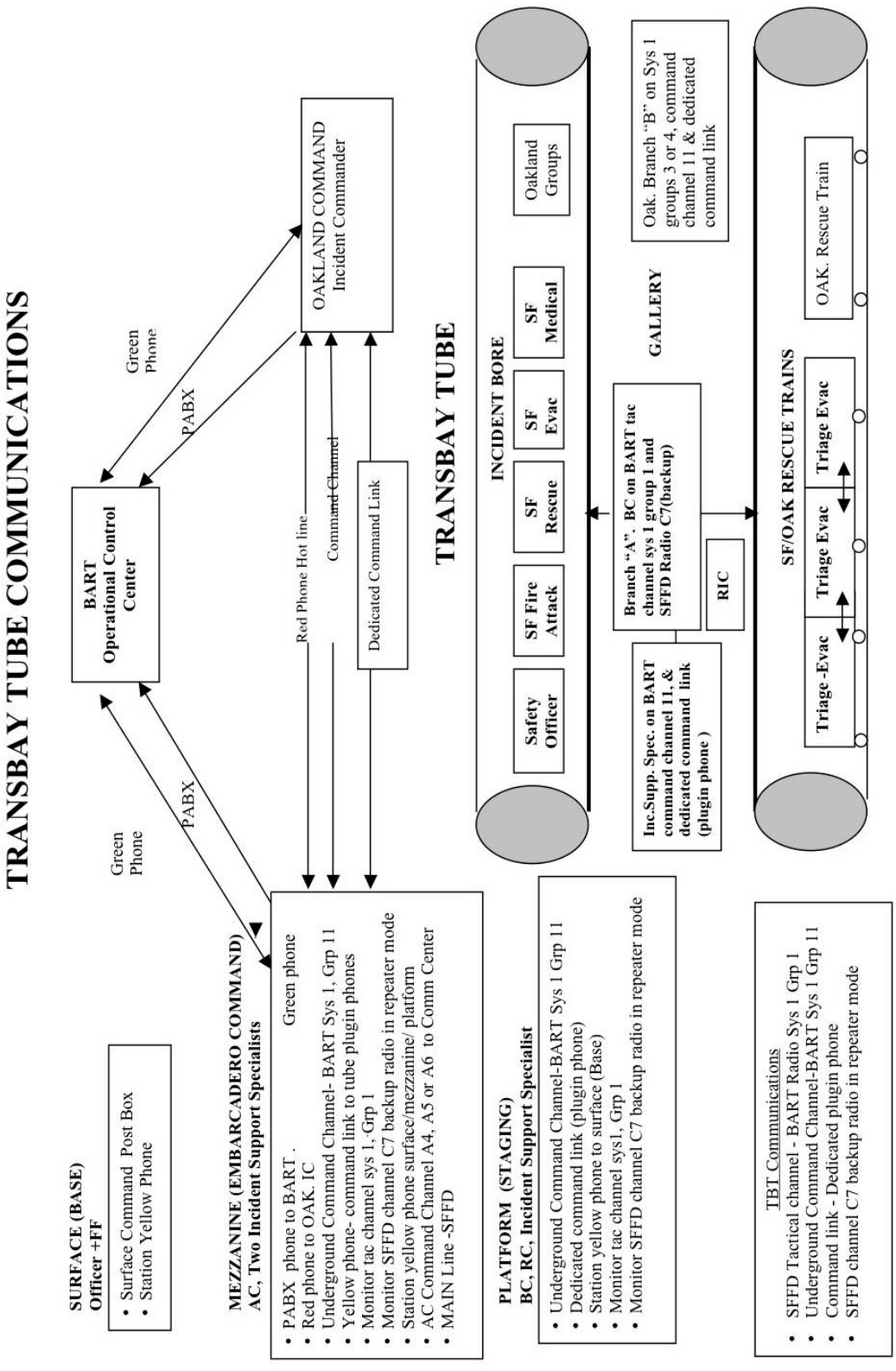
SAFETY OFFICER

Assignment	Responsibilities
Battalion Chief or other Officer as directed by Incident Commander	Radio designation: *San Francisco Safety* Rides on rescue train and insures safe operation at incident scene.

Transbay Tube Incident Command
Sample Unified Command

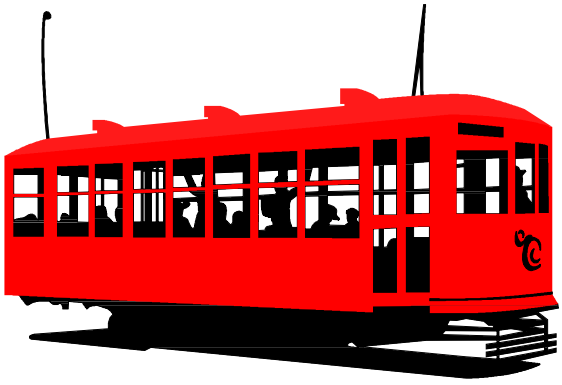


Transbay Tube ICS UC.doc


TRANSBAY TUBE COMMUNICATIONS
SURFACE (BASE)
Officer +FF
• Surface Command Post Box
• Station Yellow Phone
Green Phone
PABX
BART Operational Control Center
Green Phone
PABX
OAKLAND COMMAND Incident Commander
Red Phone Hot line
Command Channel
Dedicated Command Link
MEZZANINE (EMBARCADERO COMMAND)
AC, Two Incident Support Specialists
• PABX phone to BART . Green phone
• Red phone to OAK. IC
• Underground Command Channel- BART Sys 1, Grp 11
• Yellow phone- command link to tube plugin phones
• Monitor tac channel sys 1, Grp 1
• Monitor SFFD channel C7 backup radio in repeater mode
• Station yellow phone surface/mezzanine/ platform
• AC Command Channel A4, A5 or A6 to Comm Center
• MAIN Line -SFFD
TRANSBAY TUBE
INCIDENT BORE
Safety Officer
SF Fire Attack
SF Rescue
SF Evac
SF Medical
Oakland Groups
GALLERY
Branch "A", BC on BART tac channel sys 1 group 1 and SFFD Radio C7(backup)
RIC
Inc.Supp. Spec. on BART command channel 11, & dedicated command link (plugin phone)
Oak. Branch "B" on Sys 1 groups 3 or 4, command channel 11 & dedicated command link
SF/OAK RESCUE TRAINS
Triage -Evac
Triage Evac
Triage Evac
OAK. Rescue Train
PLATFORM (STAGING)
BC, RC, Incident Support Specialist
• Underground Command Channel-BART Sys 1 Grp 11
• Dedicated command link (plugin phone)
• Station yellow phone to surface (Base)
• Monitor tac channel sys1, Grp 1
• Monitor SFFD channel C7 backup radio in repeater mode
TBT Communications
• SFFD Tactical channel - BART Radio Sys 1 Grp 1
• Underground Command Channel-BART Sys 1 Grp 11
• Command link - Dedicated plugin phone
• SFFD channel C7 backup radio in repeater mode

Part 2

MUNI/Metro System



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SECTION 8. MUNI TRANSIT SYSTEM

The MUNI/Metro system consists of approximately sixty three miles of double-track electric railway, of which slightly more than six miles is located underground. These underground sections include:

MARKET STREET SUBWAY

- 3 miles long
- Embarcadero Station to Castro Street Station
- Twin subway tunnels with access doors between bores

TWIN PEAKS TUNNEL

- 2.3 miles long
- Castro Street Station to West Portal Station
- Single large double track tunnel

SUNSET TUNNEL

- 8/10 miles long
- From Duboce and Noe Street to Carl and Cole Street
- Single large double track tunnel

The only location in the Metro system where the inbound and outbound tracks are at different elevations is in the subway under Market Street at Duboce Street (Duboce Junction). To allow trains to enter the tunnel at this location, the outbound track arches over the inbound track much like a freeway interchange. There is a stairway between the two levels. A yellow light identifies the entrances to this stairway, as well as all other access doors between bores throughout the subway.

REVENUE VEHICLES

LIGHT RAIL VEHICLES (LRVS)

Simply stated, an articulated MUNI Metro light-rail vehicle is a streetcar that bends in the middle. It is constructed of steel, with floors of fire-treated ¾-inch plywood, and molded plastic seats. Each car is 73-feet long and seats 68 passengers. With standing room, each car can carry more than 100 people.

Normally, cars are operated individually during surface operation, and are coupled in trains of up to four cars for subway operation. Trains in the subway can operate at

speeds up to 50 MPH, and although there is an operator cab in each car, the train is controlled by the operator in the lead car.

All windows in the car are fixed except the small ones in the operator's cab. There are doors at each end and in the center of each car. The doors open to the sides only and are normally controlled at the operator's panel. There is an emergency switch inside the car by each set of doors which, when activated, will open those doors. The doors may be opened by key from the outside by MUNI personnel.

Each car is equipped with a public address system by which the operator can communicate with the passengers, and a two-way radio for communication with MUNI Central.

VINTAGE STREETCARS

In addition to the subway system light-rail vehicles, vintage streetcars from around the world operate on Market Street at various times. These cars operate on a daily basis. One major difference from an LRV is that these cars receive electric power through a single trolley pole rather than a pantograph.

MUNI STATIONS

Combination MUNI and BART stations (BART trains on the lower level) locations:

- Embarcadero
- Montgomery Street
- Powell Street
- Civic Center

MUNI only station locations:

- Van Ness
- Church Street
- Castro Street
- Forest Hill
- West Portal

When the stations are closed or station agents are not on duty, station keys are found in the fire alarm box nearest the station entrance. Fire alarm box locations are found in Appendix C. The key ring also includes a hose cabinet key and keys for the elevators and escalators.

All MUNI stations have alarm annunciator panels with diagrams showing the location of the annunciator zones. The annunciator for West Portal Station is located at MUNI Central, 131 Lennox Street, above the station.

Eureka Valley Station is no longer used for revenue service. It is located approximately 300 feet West of the Castro Street Station in Twin Peaks Tunnel. There are station platforms for each track and blue light phones on each platform. There is an Emergency Exit stairway from each platform to the street level at Eureka and Market Street. A sidewalk trapdoor can be opened from inside or out to gain access (see Appendix E). A spur on each track also leads to the surface and MUNI cars can enter or exit the underground at this point.

LOCATION MARKERS

Brown location markers are located every 200 feet on the subway walls. Odd numbered markers indicate you are on the outbound track (west bound). Even numbered markers indicate that you are on the inbound track (east bound). There are also yellow signs every 200 feet, which denote the distance, in feet, to the nearest track way exit in either direction. Additionally, between the Embarcadero and Van Ness Stations, the distance to the nearest standpipe outlet is included with the exit signs.

ELECTRIFICATION

Electric power is supplied from a 600 volt DC overhead trolley power line. Each power line is individually supplied. Power may be shut off in one direction, without affecting the other side. When the pantograph is lowered, that car has no power. Electrical power cannot be transmitted from a powered car to a non-powered car. In order for a car to have power, its pantograph must be in contact with the overhead wire.

NORMALLY, A TRAIN OPERATOR INVOLVED IN AN INCIDENT WILL, AT THE DIRECTION OF MUNI CENTRAL, LOWER HIS PANTOGRAPH. SHOULD THE PANTOGRAPH CONTROLS AT THE OPERATOR'S PANEL BE INOPERABLE, THE PANTOGRAPH MAY BE LOWERED BY USING A MANUAL CRANK LOCATED NEAR THE CENTER OF THE CAR (REF. LRV SAFELIFTING OF THE S.F. MUNI LIGHT RAIL VEHICLE IN THE APPENDIX SECTION).

MUNI METRO TURNAROUND

The MUNI Metro Turnaround (MMT) is a section of the MUNI Metro system, which extends from Embarcadero Station underground to Embarcadero and Folsom. The underground section of the MMT consists of two steel lined tunnels which extend approximately 800 ft. east followed by a 1200 foot cut-and-cover section to the portal at Embarcadero & Folsom. The 800 foot steel lined tunnel is equipped with a cross passage approximately at the mid-point. The 1200 foot cut and cover is open to accommodate three trackways. These sections accommodate revenue passenger service as well as storage of MUNI cars in the cut-and-cover. The entire underground is equipped with a 6 inch WSP with SFFD 3 inch outlets spaced every 300 feet. These are wet systems and have been tested to supply 500 gpm for firefighting use. If it is necessary to augment the water supply for firefighting, the system may be supplied by a Fire Department pumper at any of a number of WSP inlets. The locations of these

inlets are listed in Appendix D of the Transit manual. Normal SFFD operational procedures require that an engine company be placed at the nearest WSP inlet on each side of a underground incident. A dry line shall be led into the WSP inlet and charged (120 psi) only upon the orders of the IC.

MMT UNDERCAR DELUGE SYSTEM

The cut-and-cover section of the MMT is also protected with an undercar (wet) deluge system. This system can provide water to a fire condition on the underside of any car within this section. Controls for activation of the undercar deluge system are found at either the Embarcadero station platform (MUNI supervisor's booth) or the control room at the Justin Herman Plaza ventilation structure which is accessible from the trackway (as a means of access and egress for firefighters and passengers in an emergency) and through a lock box and key on the outside surface door. The undercar deluge system controls are also available at Embarcadero MUNI platform and Justin Herman Plaza ventilation structure. These can be operated through MUNI Central or through local controls. Local control operations as follows:

ACTIVATION:

1. Turn on the Master Deluge Enable switch
2. Press the desired white deluge control zone button
   a. This action will cause the selected deluge valve to energize causing water flow
   b. The selected button light will turn ON
   c. The responding catenary system (overhead power) will de-energize when water starts to flow

DEACTIVATION:

1. Push the lighted deluge zone button
   a. The selected solenoid valve will shut down
   b. The OS&Y valve on the track level (black wheel in cabinet adjacent to activated track section) must be shut down manually to stop water flow
   c. The catenary system will be able to be re-energized through MUNI Central
2. Insure that both the Justin Herman vent structure and the Embarcadero platform Master Deluge Enable switches are turned off to fully activate system
3. Advise MUNI that the undercar deluge system controls must be re-set at that control panels

MMT VENTILATION FANS

Operation of the ventilation fans throughout the MMT and MUNI system are provided by computer scheme through MUNI Central. These computer generated schemes are

designed to exhaust the smoke to either the portal or through the Justin Herman Vent structure fans. If it is necessary to change the ventilation scheme, this can be done at the local control panels through MUNI Central. The IC can and should request a MUNI representative to respond to the incident scene to assist with local control fan operation if this becomes necessary.

MMT COMMUNICATIONS

MUNI Central can be contacted through any Red Dedicated Fire Phone or through the METS phone lines. Also, MUNI Central can be contacted through the Department of Emergency Communications (Comm Center) using the appropriate command or tactical channel on the “A” bank of the SFFD Motorola portable radios. As in the entire MUNI Metro system, the entire “A” bank of channels on the Motorola portable radio are useable. The underground area of MUNI and the MMT has a hard-wired antenna that is in place to assist with communication and enhance clarity. This antenna has also been installed in the Justin Herman Ventilation structure.

There are METS phones and Red Dedicated (MUNI) Fire phones for Fire Department use installed at the following locations in the MMT:

- Embarcadero MUNI platform control booth (METS local 4601)
- Justin Herman Plaza vent structure control room (METS local 4602)
- Tunnel exit portal, each trackway (METS local 4603)
- Surface emergency phone box; on sidewalk adjacent to portal exit (METS local 4604)

The METS (Mayors Emergency Telephone System) phones use four-digit numbers to reach the Department of Emergency Communications (2268, 2269) (or any other local on the system).

SECTION 9. COMMUNICATIONS

At every MUNI incident in tunnels and subways, a Battalion Chief and an Incident Support Specialist (if available) are dispatched to MUNI Central to act as liaison between MUNI personnel and the Fire Department.

Upon arrival at MUNI Central, the Battalion Chief should establish communications with MUNI Central and with the Department of Emergency Communications. The primary means of communication should be the Dedicated Fire Phone. The tactical channel of the first due Battalion Chief should be used so that units operating within the system can take advantage of the hard-wired antenna running throughout the MUNI underground.

The Battalion Chief Officer at MUNI Central is in a position to monitor the overall operation. It is the BC's responsibility to keep both MUNI and the Incident Commander informed as to what is occurring. A log shall be kept of actions in chronological order. The Incident Checklist is available at MUNI Central to assist Fire personnel. As is consistent with ICS, the radio designation for the Battalion Chief at MUNI Central is "Lennox Division".

A METS phone has been installed at MUNI Central for communications. METS local at MUNI Central is extension 4054.

FIRE COMMUNICATIONS

- Fire Department Radio
- Dedicated Fire Phone
- Blue Light Stations
- Public Address System
- METS Phone
- Train Radio

FIRE DEPARTMENT RADIO

SFFD portable radios should transmit and receive normally throughout the MUNI underground system, including station areas. In underground areas where antennas from different base stations meet, reception may be poor. Moving a short distance in either direction should improve the reception.

DEDICATED FIRE PHONE

Each station is provided with at least one dedicated fire phone on each station platform. The dedicated fire phone connects directly to MUNI Central and the Department of Emergency Communications. The dedicated phone is located in a red box marked Fire Department ONLY. This box is opened by a fire alarm box key. When the phone in the station is lifted, it activates a hot line in both MUNI Central and Department of Emergency Communications.

Communications from station to station can be established by dialing the appropriate extension. The dedicated phone may also be used as a party line. Lift receiver and press the push to talk button. Each station phone has a 25 foot extension cord with speaker attached.

Call Numbers Assigned To the MUNI Subway Dedicated Fire Phone

Location	Number	Quantity of Telephones
MMT fire panel room	9000	1
MMT tunnel entrance	9001	2
MMT ferry portal	9002	1
Embarcadero tower	9100	1
Montgomery platform	9200	1
Powell platform	9300	1
Civic Center platform	9400	1
Van Ness platform	9500	1
Duboce portal-near trailer	9550	1
Duboce stairway	9551	2
Church platform	9600	2
Castro platform	9700	2
Forest Hill platform	9800	2
West Portal platform	9900	2
Central Control-131 Lennox St.	9999	1
Sunset west portal	9910	1
Sunset east portal	9911	1
Department of Emergency Communications	9111	1

BLUE LIGHT PHONE STATIONS

Blue Light Stations are located on station platforms and within line of sight of one another in the Market Street Subway and Twin Peaks Tunnel. There are no blue light

stations in the Sunset Tunnel. To contact MUNI Central, lift the receiver and press the red button. There is no red button on the blue light phones located on station platforms. These phones activate when the receiver is lifted. The Blue Light Station Phone system may be used to contact Department of Emergency Communications. Dial 9 to get an outside local. To reach Department of Emergency Communications dial 558-3268 OR 558-3269.

MUNI STATION COMMUNICATION (PUBLIC ADDRESS)

Each station agent's booth has a public address system used to make announcements within the station. The white phones on the platform and in each station provide a means for Fire Department or patrons to contact the station agent.

METS PHONE

The METS phone system can be accessed through any local telephone by dialing 552-9161. The phone will ring twice and provide a dial tone, indicating that you are now connected to the METS phone system. After hearing the dial tone dial the 4-digit METS local you wish. Emergency 911 is also accessible on the METS phone.

- Department of Emergency Communications: 2268 or 2269.
- METS Number for MUNI Central: 4054

MUNI TRAIN RADIO

If the designated tactical channel fails, information can be relayed to the Incident Commander from the MUNI train radios through the Battalion Chief at MUNI Central.

RADIO CHANNELS

TACTICAL CHANNEL

The tactical channel for MUNI Incidents is that of the first due Battalion Chief. In some cases where the tactical channel does not function due to dead spots (for example long underground tunnel section), try moving several feet in either direction to get out of the dead area. If this does not work, it will be necessary to go to a direct channel (i.e.: C14 or C15) for communications between units in the underground and then relay information to the MUNI platform or MUNI Central or Department of Emergency Communications via the Blue Light Station phone.

COMMAND CHANNEL

The Incident Commander can utilize any of the following as the command channel at a MUNI incident:

- METS Phone (MUNI Central ext. 4054, Department of Emergency Communications ext. 2268, 2269)
- MUNI Red Phone on platform (Fire Phone)
- MUNI Blue Light Station Phones
- SFFD Radio
- Portable Cellular Phone in Chief's Vehicles

SECTION 10. WATER SUPPLY

WET STANDPIPES

TUNNELS

For incidents in the MUNI underground, a engine company shall be directed to the nearest WSP inlet on each side of the incident location. Normally, the water supply from the city mains is sufficient to supply the pressures needed without the need for augmentation by SFFD engine companies.

Sunset Tunnel wet standpipe inlet

When augmenting the wet standpipe system and/or automatic sprinklers, pump pressure **shall** be 120 psi, unless otherwise ordered. The system should be charged with two supply lines, because one 3-inch hose line does not provide sufficient volume. Charge these lines only on orders of the Incident Commander. (A list of WSP inlets is found in the Appendix D)

STATIONS

Wet standpipe outlets are located in cabinets on the mezzanine and track levels. The cabinets are equipped with a 3 inch outlet and a 1-1/2 inch outlet with 100' of 1-1/2 inch hose connected. A 20 pound ABC extinguisher is also provided in each cabinet.

Normal supply to these wet standpipes is from the domestic water supply. Shutoffs are located in rooms on the mezzanine level. Pumper inlets to augment the system are located in the sidewalk under a steel plate, or on the street side of the station entrance walls. Inlet locations are listed in Appendix D, and in the Emergency Operations Binder found in all Chief's vehicles.

SPRINKLER SYSTEMS

STATIONS

An overhead sprinkler system protects some areas of mezzanine and track levels of MUNI stations. Normal supply to these sprinklers is from the domestic water supply, with shutoffs located in rooms on the mezzanine level. Pumper inlets to augment the system are located in the sidewalk under a steel plate, or on the street side of station entrance stairway walls. Inlet locations are listed in Appendix D and in the Emergency Operations Binder found in all chiefs' vehicles.

UNDER-TRAIN DELUGE

The under-train sprinkler systems do not operate automatically, and must normally be turned on by the Fire Department. These systems are wet in MUNI.

Station	Location
Montgomery Street Station to Van Ness Street Station	A valve in a hose cabinet or on the side wall at track level activates the under-train system.
Embarcadero Station	A solenoid valve is activated in the dispatcher's booth at the west end of the MUNI train platform.
Church Street and Castro Street Stations	The under-train sprinklers are activated by electric switches located in a box at the end of the platform.
Forest Hill Station	The activator switch is located adjacent to the dedicated fire phone.

Because the methods of activation of the under-train deluge system are so varied, it is imperative that Chief and company officers inspect and familiarize themselves with the systems within their response area.

Van Ness Station MUNI undercar deluge control


Powell Station MUNI undercar deluge controls.

SECTION 11. EMERGENCY PROCEDURES

MUNI EMERGENCIES

INFORMATIONAL REPORT (ADVISORY ONLY)

A MUNI Advisory is an informational report to the Fire Department when an unusual situation is occurring that may affect MUNI operational plans. Advisory alerts do not require response by the Fire Department

INVESTIGATION/STANDBY

Used for any report of smoke, odor or hazardous condition of undetermined origin under investigation by MUNI personnel. Under these procedures, MUNI will retain full control of the railroad operations unless:

Notified by the Incident Commander that an emergency exists and Fire Department operations are commenced.

In the case of a major emergency between stations, a full first alarm response **shall** be dispatched to each station. Examples of major emergencies are:

- Any train fire
- Track way fire
- Suspected fire condition
- Major emergency (Major emergency is defined as any incident in progress which may endanger life)

In the event of a major emergency or investigation within the MUNI underground, a Battalion Chief shall be dispatched to MUNI Central at 131 Lennox.

INCIDENT TYPES

The Department of Emergency Communications **shall** notify MUNI Central of any alarm concerning MUNI that was not received from them, (i.e., report from a citizen). An agreement between MUNI and the Fire Department places final authority for train movement on all tracks within a fire incident scene with the Fire Department Incident Commander.

MUNI has requested the earliest possible release of the non-incident track to MUNI. This permits MUNI to start single tracking trains through the emergency scene and reduce delays to MUNI patrons. The release can be revoked at any time deemed necessary by the Fire Department Incident Commander.

It is recognized that circumstances vary with each emergency, and that due to the physical layout at the scene, a partial release of the area for train movement may not be possible. However, in some areas of MUNI, there are opportunities to release the non-incident track for revenue operations without any adverse safety impact upon the emergency scene activities. Restoration of even limited service **shall** be consistent with on-scene safety considerations.

It is intended that, as far as possible, fire fighting and rescue operations should be conducted in the same manner in both MUNI and BART Underground. None of the fire fighting procedures in this manual should be construed as inhibiting the initiative or resourcefulness of the Incident Commander or the company officer operating at transit incidents. However, because communications and coordination between MUNI and the Fire Department is so critical during an emergency, these procedures have been formulated after lengthy discussions with MUNI Safety Department Personnel.

MUNI incidents can be divided into four categories:

1. Incident within a Station
2. Underground incident between Stations
3. LRVs or Street Cars above ground*
4. Diesel or Trolley Buses *

(*These categories will be addressed at a later date)

STATION INCIDENT

A fire in a MUNI station is similar to a building fire. MUNI Stations are partially sprinklered and equipped with wet standpipe systems. Supply lines **shall** be led into the sprinkler and standpipe inlets and charged when so ordered by the Incident Commander.

MUNI under-car sprinkler deluge systems are pre-connected and therefore it is not necessary to lead lines into platform inlets as in BART stations. The MUNI under-car sprinkler system operates via OS&Y valves, hydrant spindle valves or electronically via toggle switches. Each station has different methods of operation, pre-inspection, and familiarizations are necessary to determine how individual systems operate.

Unlike BART, MUNI Stations **DO NOT** have station platform trips. To cut power to the car, the pantograph must be lowered (see Breda car Appendix A). Normally, it should not be necessary to de-energize the overhead wire if the pantograph has been lowered and the trolley wire is not touching the streetcar or LRV. If it is absolutely necessary to de-energize the overhead trolley wire, MUNI Central must be contacted to cut overhead power.

The Incident Commander may establish the Command Post on the surface, at the station agent's booth or on the platform. The Incident Commander **shall** maintain

communications with MUNI Central and the Department of Emergency Communications.

The station agent is similar to a building manager and should be contacted for information and assistance. MUNI will dispatch supervisors and inspectors to assist with operations.

Unlike BART, **MUNI DOES NOT** have a Police Department. If Police assistance is required for crowd control or any other reason, request the SFPD through the Department of Emergency Communications.

THE INCIDENT COMMANDER IS IN CHARGE OF THE EMERGENCY SCENE UNTIL COMMAND IS RELEASED.

MUNI UNDERGROUND INCIDENT IN TUNNEL BORES

Response:

A Full box assignment to stations on each side of incident and additional Battalion Chief to MUNI Central Control.

Duties:

Battalion Chiefs (to stations at each side of incident)

1. Establish contact with MUNI Central using the Dedicated Fire Phone or METS Local 4054.
2. Maintain contact with Department of Emergency Communications.
   - METS Local 2268 or 2269
   - MUNI Dedicated fire phone
   - SFFD radio
   - Landline through Blue Light Stations
3. Monitor the progress of the investigation by maintaining communications with MUNI Central, and if necessary, upgrade incident to Red Alert

   Note: Battalion Chief Assigned to MUNI Central **shall** coordinate Fire Department operations though MUNI and provide information updates to the Incident Commander and Department of Emergency Communications.

MAJOR EMERGENCIES

When the Department of Emergency Communications is notified of a MUNI street car or LRV on fire in the underground system between stations, a Box is normally transmitted for the station on each side of the incident. A number of factors, such as distance from the station, direction in which the smoke is being vented, availability of a rescue train, etc., dictate the direction from which the fire is attacked. Responding Chief Officers

shall establish contact between stations as soon as possible in order to coordinate operations.

Item	Instructions
1. Keys	Obtain the keys to enter the station from the street fire alarm box.
2. Maps	Obtain the envelope containing the subway diagrams from the Equipment Room or Box.
3. Red Phone	Use the Red Phone on the MUNI platform to establish contact with: • Department of Emergency Communications • MUNI Central • Adjoining stations
4. Checklist	Obtain necessary information as per checklist and coordinate with units responding to the incident from the opposite station. Checklist may be found in the equipment room/ box, in Battalion Chiefs ICS box, or in the Emergency Operations Binder (also see checklist example in appendix)
5. ICS	For operations between stations, the Incident Commander may establish a Command Post at the platform level. Tactical Channel is the appropriate "A" bank tactical channel of the 1st due Battalion Chief. **There should only be one tactical channel used!**

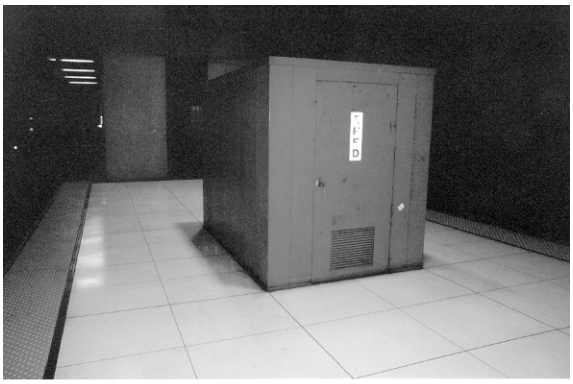
Item	Instructions
6. Rescue Train	Load rescue train with firefighters and equipment on the non-incident track. If the Rescue Train is on the incident track, immediately order the LRV driver to back track and place the rescue train on the non-incident track. This will take time to get clearances from MUNI and therefore should be ordered as soon as possible by the Incident Commander. The Battalion Chief is in charge and, consistent with safety, the train operator shall follow the Battalion Chief's orders. The train operator must get clearance from MUNI to move the train and must wait for the orders of the Battalion Chief to proceed. When the Battalion Chief leaves the train, he/she should leave one member equipped with a portable radio to remain with the train operator. In the Downtown areas where the distance between stations is not too great, it may be more expedient to send the initial companies to the incident on foot. In either case, the initial attack team shall normally be at least a Battalion Chief, Incident Support Specialist (if available), Engine company, RIC, Truck company, Medic Unit and a Rescue Squad if available.

Item	Instructions
7. WSP	For a fire between stations, the Incident Commander shall order an engine company to the nearest WSP inlet on each side of the incident. It is important that drivers report to the Incident Commander to obtain directions as to which WSP inlets they are required to report to. This information shall be relayed from the Incident Commander using the MUNI maps and incident location information to determine which WSP inlets is nearest the incident. Additional engine companies may be assigned to other WSP inlets for additional pressure/supply if necessary. The BART/MUNI WSP system has been tested and is capable of providing adequate pressure for firefighting hose lines. Have engine companies charge the WSP only on the orders of the IC if water supply problems develop. Charge at 120 psi. (3 inch WSP outlets in the underground are located at a maximum of 330 ft apart. A list of all WSP inlet locations is found in the Emergency Operations Binder in Chief's vehicles, in the BART Surface Command Post box in all combined BART/MUNI stations, and in the Appendix D of this manual
8. Radios	Tactical Channel for MUNI incidents is SFFD portable radio on the appropriate "A" bank tactical channel of the 1st due Battalion Chief. **There should only be one tactical channel used!** Command link can be established through: • METS Phone (Department of Emergency Communications 2268 or 2269 • MUNI Central 4054) • MUNI Red Phone on platform • MUNI Blue Light Station Phones • SFFD Radio • Portable Cellular Phone in Chief's vehicles
9. Hose Leads	Leads for fire fighting in the underground shall be made from the incident bore to maintain integrity of the non-incident bore.

Item	Instructions
10. Evacuation	Passenger evacuation is of primary importance. If you are on a rescue train and approaching an incident and passengers are evacuating in your direction, stop and assist in loading them onto your train or assign firefighters to escort walking them out. With a large number of evacuees fleeing from a burning train, it is quite possible the Fire Attack Group/Division could be stopped a great distance from the incident scene by people on the tracks. It is necessary to assist these evacuees but it is also necessary to make certain there is no one left at the scene of the incident. Firefighters can be assigned to assist evacuees walking out of the tunnel bore or place evacuees on a rescue train for removal to a station platform. This is another reason for sending attack teams from both directions as soon as possible.
11. Equipment	Full PPE, SCBA'S (1 hour), spare bottles, Spare SCBA for train operator, officer wye/reducer, spanner, 4 hose bundles, 3 large lines, flashlights, medical equipment, stokes basket, forcible entry tools, rope, thermal imaging camera (TIC), portable generator with lights, metal cutting saw and equipment from storage box in MUNI station.

Unlike BART trains, each LRV is a self contained unit. If desired, one car of a train can easily be separated to transport the Fire Attack Group/Division and the remaining cars left to transport additional manpower and equipment. The Fire Department **shall** provide breathing apparatus for the MUNI or LRV Driver.

EQUIPMENT ROOMS / BOXES



There are fire fighting equipment rooms or boxes located in every MUNI station. These are found on the MUNI platform level of all MUNI metro stations except Embarcadero Station. At the Embarcadero Station the equipment room is located at the East end of the BART platform. Equipment in these rooms and boxes can be used for fire fighting in either the BART or MUNI Metro systems.

The equipment contained in the room includes:

- Four (4) handcarts
- Scott-Air-Pak cylinders
- Eight Hundred (800) feet of 1- 3/4 inch hose
- Two (2) nozzles with spanners
- Two (2) wyes with reducers
- Subway diagrams

Subway diagrams are normally located on the inside of the door to the equipment rooms/boxes. In stations without such rooms, they are in the station agent's booth. Each station has two drawings depicting that station and the trackways to the adjacent stations. The diagrams illustrate the following information.

- Trackway configuration
- Wet standpipe outlet
- Subway cross-passage doors
- Fire hose cabinets (station)
- Blue Light phone locations
- Subway location markers

VENTILATION

EMERGENCY FANS

The fans in the Market Street subway from the Embarcadero Station to Castro Street Station can be operated remotely from MUNI Central in either a supply or exhaust mode. Accordingly, the direction of air and or smoke movement can be controlled. Generally, ventilation is started according to a predetermined plan before the arrival of the Fire Department. The objectives of the plan are:

- To move the smoke in a direction so that the major portion of the train remains in clean air
- To provide the most advantageous evacuation route for the passengers

If the Incident Commander determines that the ventilation scheme should be altered, the request must be made through MUNI Central. Contact the Battalion Chief at MUNI Central for assistance. In the event that MUNI Central is unable to control the fans remotely, the station agents can activate the fans by manual control at fire control panels located in each station.

UNCONTROLLED AREAS

Twin Peaks and Sunset Tunnels depend on natural drafts for air and smoke movement. Since natural drafts are controlled by weather, the direction of ventilation in these two

tunnels is unpredictable. Fans are installed in the Forest Hill Station which should have some effect on air movement in that area.

MUNI ICS STRUCTURE (SAMPLE)

SFFD has adopted the ICS system for use at emergencies. Below is an example of how an ICS structure could be utilized in an underground MUNI Metro incident between Castro and West Portal Stations.

<table>
<tr><td colspan="2">Division Chief
Division Chief becomes Incident Commander and establishes the Command Post</td></tr>
<tr><td>Castro Station</td><td>West Portal Station</td></tr>
<tr><td>Box 5213</td><td>Box 8611 (West Portal)</td></tr>
<tr><td><u>Assignment</u>
3 Engines
2 Trucks
2 Battalion Chiefs
1 Division Chief
1 Rescue Squad
1 Medic Unit
1 Rescue Captain if working fire
1 Engine as RIC if working fire
1-Mobile Air if working fire</td><td><u>Assignment</u>
3 Engines
2 Trucks
3 Battalion Chiefs (1 Battalion Chief to MUNI Central)
1 Rescue Squad
1 Medic Unit
1 Engine as RIC if working fire
1 Rescue Captain if working fire</td></tr>
<tr><td><u>Castro Division</u>
Radio Designation: Castro Division, Division A, or any designation the Incident Commander assigns.
Rescue Train Division/Group from Castro Street Station consisting of:
2 Engines, 1 Truck, 1 Rescue Squad, 1 Medic Unit on rescue train with Battalion Chief. RIC on Train.
1 BC on Platform</td><td><u>West Portal Division</u>
Radio designation: West Portal Division, Division B, or any other designation the commander assigns
Rescue Train Division/Group from West Portal Station consisting of:
2 Engines, 1 Truck, 1 Rescue Squad, 1 Medic Unit on rescue train with Battalion Chief. RIC on Train.
1 BC on Platform</td></tr>
</table>

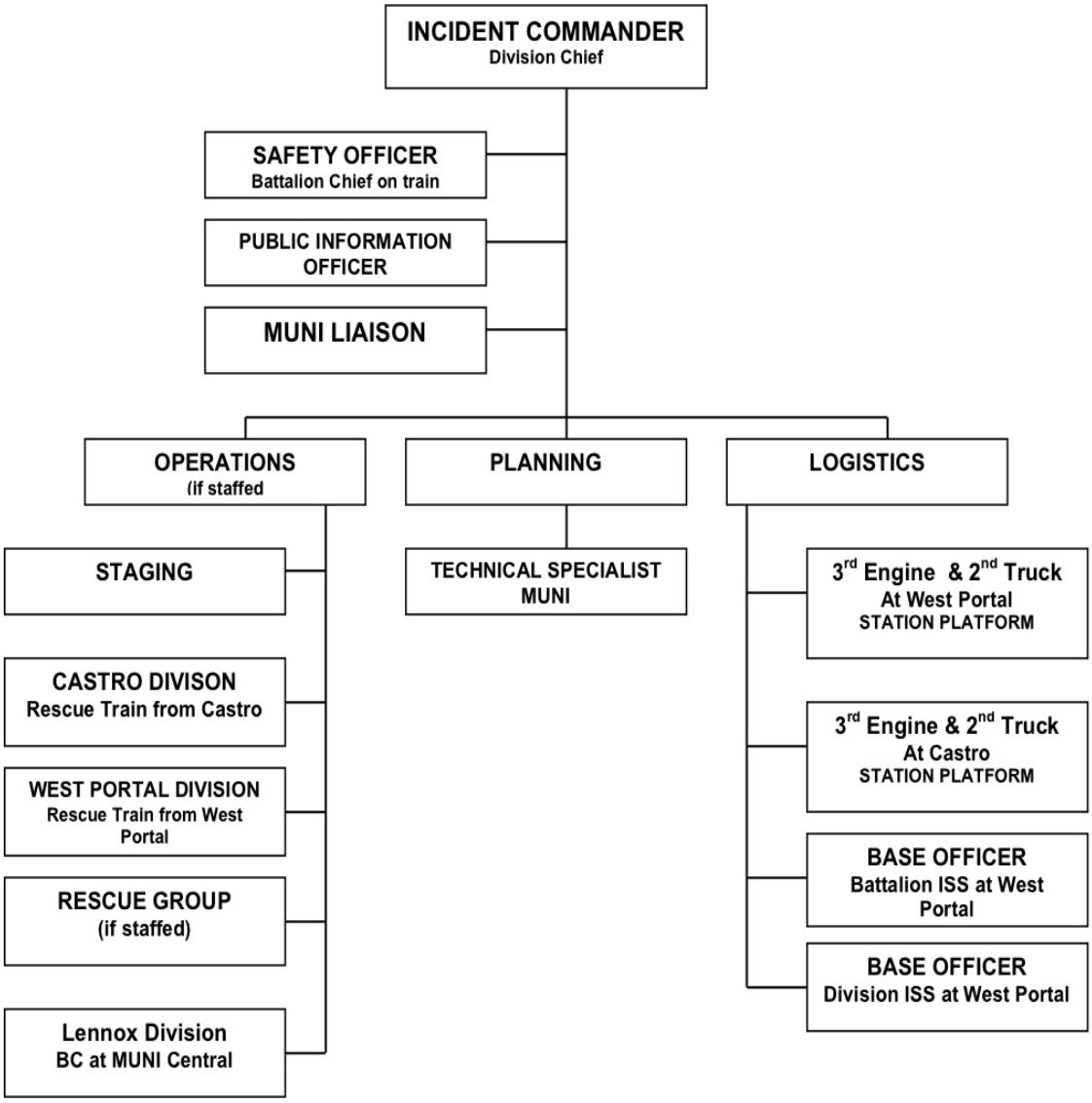
Logistics • Radio designation: *Castro Logistics* • Officer is Logistics at Castro Street Station responsible for movement of Equipment from surface to platform. • Truck to assist.	**Logistics** • Radio designation: *West Portal Logistics* • Officer is Logistics at West Portal • station; responsible for movement of • Equipment to platform. • Truck to assist
Division ISS (Incident Support Specialist) • Radio designation: *Castro Base* • ISS is assigned as Base Officer at Castro Street station surface level for relay of information to companies from Incident Commander;	**Battalion ISS (Incident Support Specialist)(if available) (or designee)** • Radio designation: *West Portal Base* • ISS is Base Officer at West Portal; same responsibility as Castro Base officer;

A Battalion ISS (if available) is on their respective rescue train assisting the Battalion Chief. The other BC is assigned as the Safety Officer. The above assignments can be further broken down into functional groups depending upon the Incident Commander. For example, the Rescue Squad Officer can be assigned as the Rescue Group Supervisor and given a specific functional assignment.

Any Muni Incident requires a BC automatically dispatched to 131 Lennox (MUNI Central) to assist Fire Department operations from MUNI. This BC would have the radio designation of *Lennox Division*.

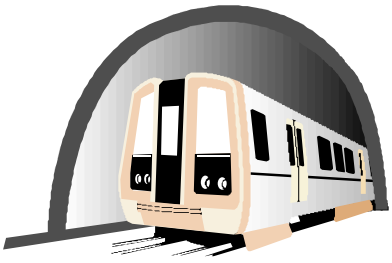
There is only one Command for any incident which is staffed by a senior chief officer. All other radio designations are either Divisions, Groups, Logistics, Base etc. or some other ICS designation. The Incident Commander can give the Divisions, Groups, etc. any name he/she wishes (Castro Division, Division A, etc.)

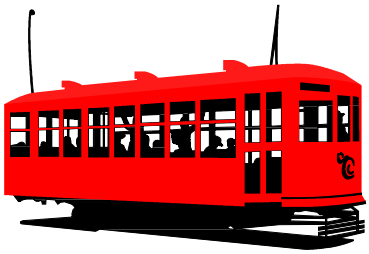
MUNI INCIDENT COMMAND SAMPLE



PART 3

BART - CALTRAIN - MUNI
APPENDICES





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APPENDIX A—SAFE LIFTING OF MUNI BREDA LIGHT RAIL VEHICLES

SAN FRANCISCO FIRE DEPARTMENT

DIVISION OF TRAINING

TRAINING BULLETIN

TRAINING BULLETIN 04-1

SAFE LIFTING OF MUNI BREDA LIGHT RAIL VEHICLES

SAFELIFTING
OF
THE S.F. MUNI
BREDA
LIGHT RAIL VEHICLE

PREPARED FOR THE SFFD

Revised September 2003

BY THE MAINTENANCE TRAINING ACADEMY
OF THE SAN FRANCISCO MUNICIPAL RAILWAY

501 CESAR CHAVEZ (415) 337-2378

UNIT INFORMATION ANALYSIS GUIDE
UIAG

Description: A mini course designed to orient S.F. Fire Department personnel to Safe & Efficient Lifting of the Breda LRV.

Reference: Transit Manual SFFD (Joint Bart & Muni); The Breda Training Guide; Safe Lifting of the Breda LRV Handout, Revision 5, 2003 from the Muni Maintenance Training Academy.

Material & **E**quipment:

Safe Lifting Handout Revision 5; Johnson Bocks (2), Assorted Cribbing as specified; New issue (2003) SPX Hydraulic System as follows:

- 2 - 14 ¼", double handle, 25 Ton capacity Hydraulic Cylinders
- 2 - Hydraulic cylinder Screw Cap w/pin
- 2 - Hydraulic cylinder base
- 3 - 6' Hydraulic hose w/threaded disconnect fittings
- 2 - Hydraulic hand pump w/full oil reservoir
- 1 - Breda LRV with functioning Brake & Air supply systems
- 1 - 6" Torpedo Level (for anticlimber use)

Class: Safe LRV 2 Lifting Procedures

Objectives:

1. **Orient** SFFD personnel to safety sensitive areas of LRV2
2. **Recommend** safe LRV2 Lifting procedures
   A. On level surface
   B. On raised rail
   C. In the Subway
3. **Practice** drill "APSS"

Given: **Block 'A'**, LRV2 classroom
Segment 1. Orientation to Safe LRV2 Lifting
" 2. **A**ssess and Decide **(A)**
" 3. **P**reserve Car body Height **(P)**
" 4. **S**ecure LRV2 **(S)**
" 5. **S**afe lift together **(S)**

Block 'B', Field Exercises (by SFFD)
Segment 1. Checklist

Standard: Participation In Exercises

Duration: 2 hours (Block 'A' = 30 minutes, Block 'B' = 90 minutes

Instructor(s): Louis Alvarez (MUNI)

TABLE OF CONTENTS

BLOCK ‘A’

SEGMENT 1: ORIENTATION TO SAFE LRV2 LIFTING

1.1.0 INTRODUCTION

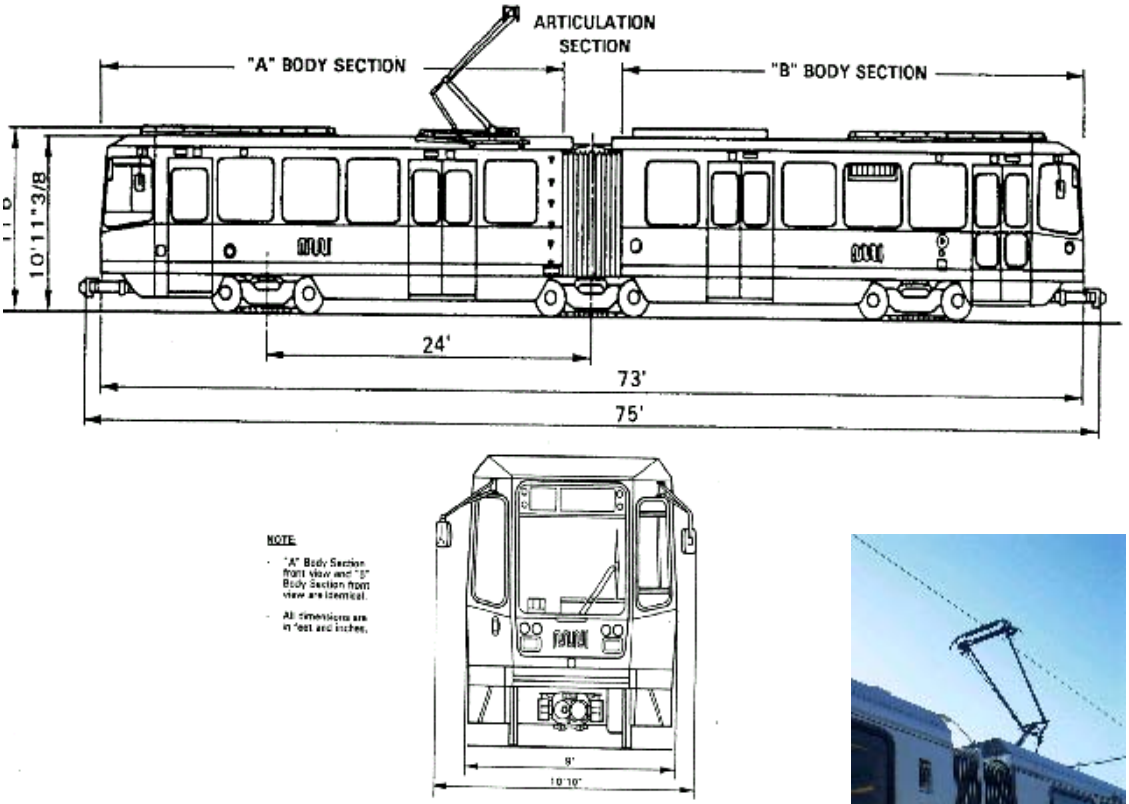
1.1.1. Course Description. Refer to page 1, the UIAG.

1.1.2 Lifting Priorities. The MUNI"s and SFFD's have different objectives in lifting dictate the equipment and procedures to use. Whereas the MUNI is primarily concerned with lifting to gain clearance necessary for Traversing so as to rerail the LRV, the Fire Department's main objective in lifting is to gain sufficient clearance to extricate a victim, quickly and safely. Muni often uses, after a lengthy preparation, heavy duty hydraulic equipment to achieve its purpose, though, recently frequent use has been made of the portable air bags. The SF Fire Department has, until now, relied on the Norton screw-type jack with a possible assist from the Johnson Block and Bar.

Today the primary means for lifting LRV2 by the SFFD will be the hydraulic equipment manufactured by SPX Hydraulic System.

1.2.0 LRV2 SPECIFICATIONS

1.2.1 Dimensions: LRV2, unloaded, weighs 39-40 tons and coupler to coupler measures 75 feet. The weight of an end section being lifted is about 12 tons. The unmotored center section weighs much less. 'A' and 'B' sections of the car are referenced from the location of the Pantograph atop 'A" section. See Figure 1, below.



Physical Characteristics - Figue1

Pantograph connected to 600 vdc

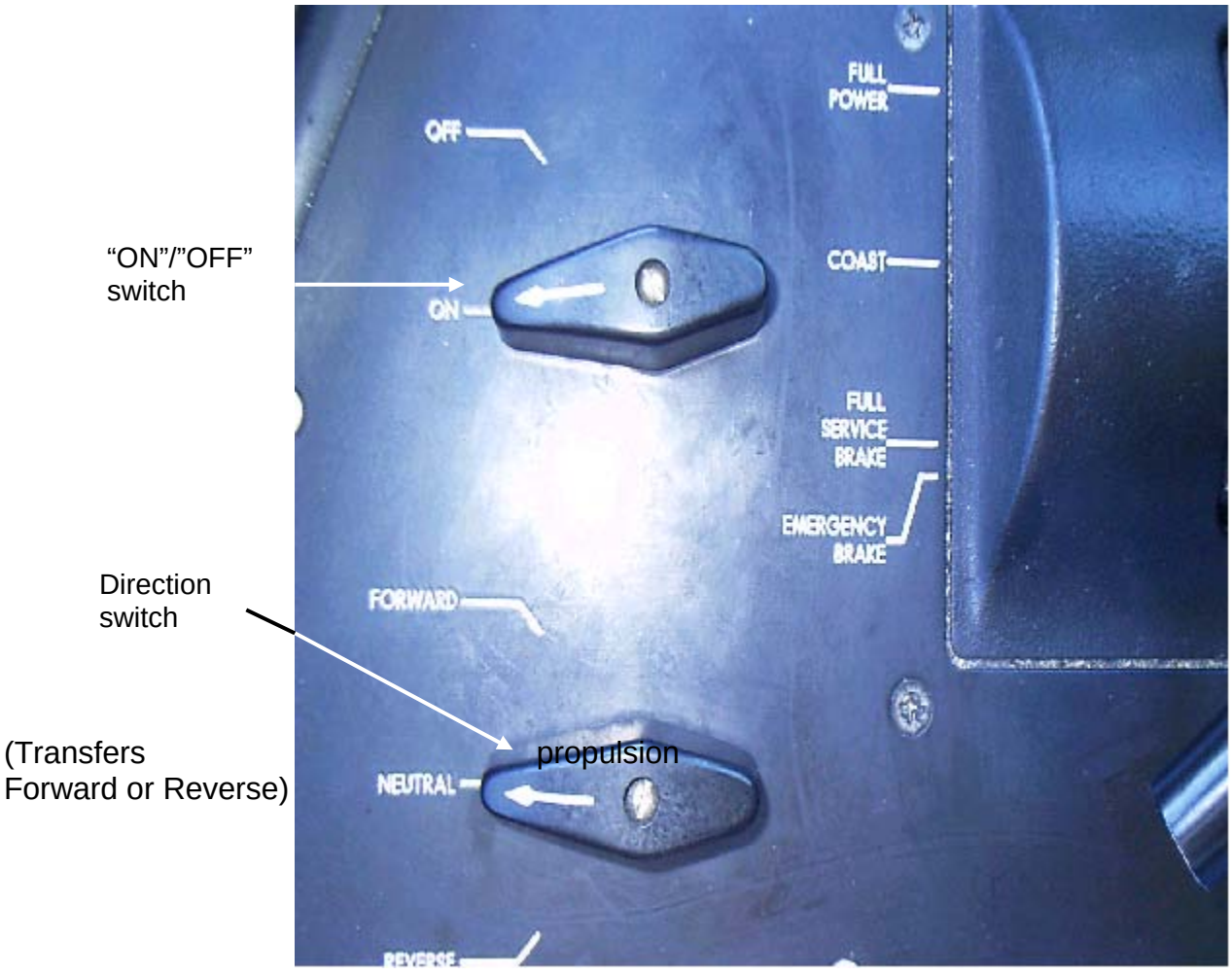
1.2.1. Dimensions (cont.).

Both 'A' and 'B' ends of the Breda LRV contain Operator Cabs with duplicate control panels. The vehicle's Transfer switch (power ON/OFF switch and Direction switch) as well as the Master Controller is located by the operator's left hand. The operator cab door can be opened with the same key used to open the LRV's end doors.

1.2.2 Braking

The Friction Brake System of LRV2 is Spring applied and Air released. Whether the LRV2 is "OFF", as when parked at night, or "ON" with it's service brakes applied, the braking system is active ('ON'). (See Transfer Switch, below.) In both cases the Bellville springs within the brake actuator mounted on six axles expand to apply the pads against the six rotors of the six axels to prevent the vehicle from moving.

Figure 2 TRANSFER SWITCH



1.3.0 HAZARDS

1.3.1 At Roof Level

The 600 VDC overhead wire is connected to the Pantograph. (If necessary, call MUNI Central Control to remove power from the overhead wire at 759-4322). The Brake resistor Grid on roof of B-section remains dangerously hot for some time after power is removed from the vehicle. The HVAC units on either end of roof top contain refrigerant R-22, dangerous when container has been ruptured. Frost bite on contact may result. Take precautions; wear gloves to protect skin.

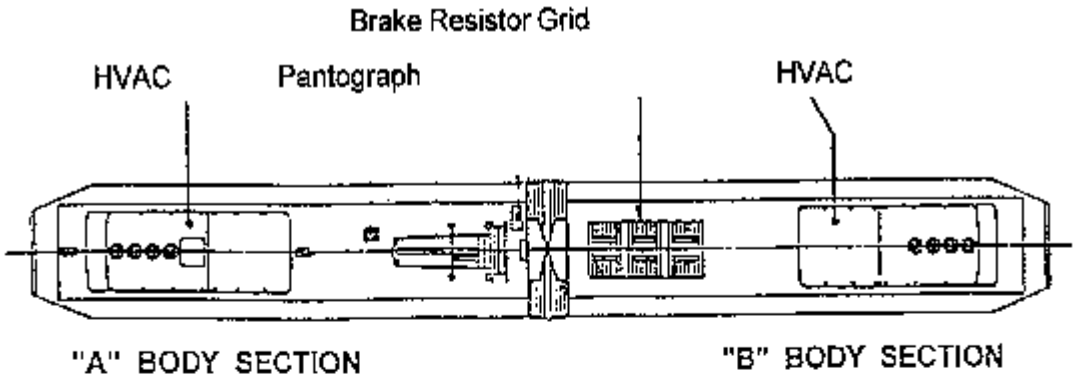
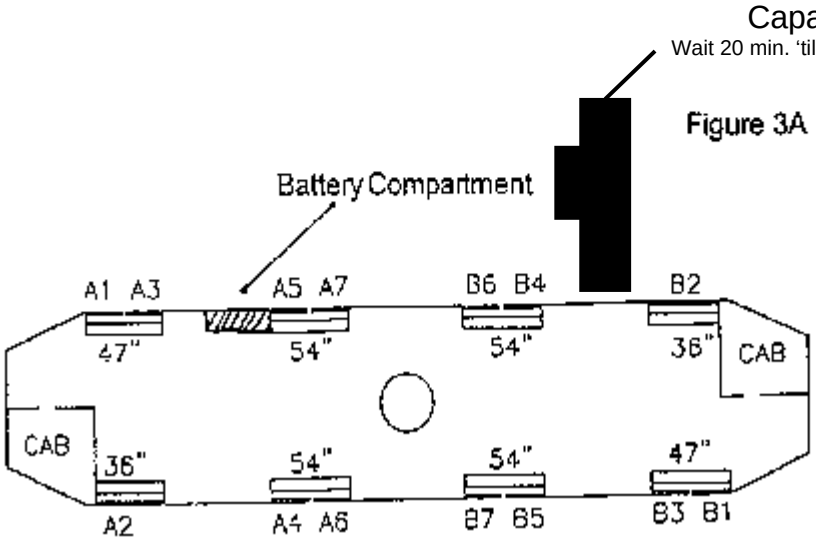
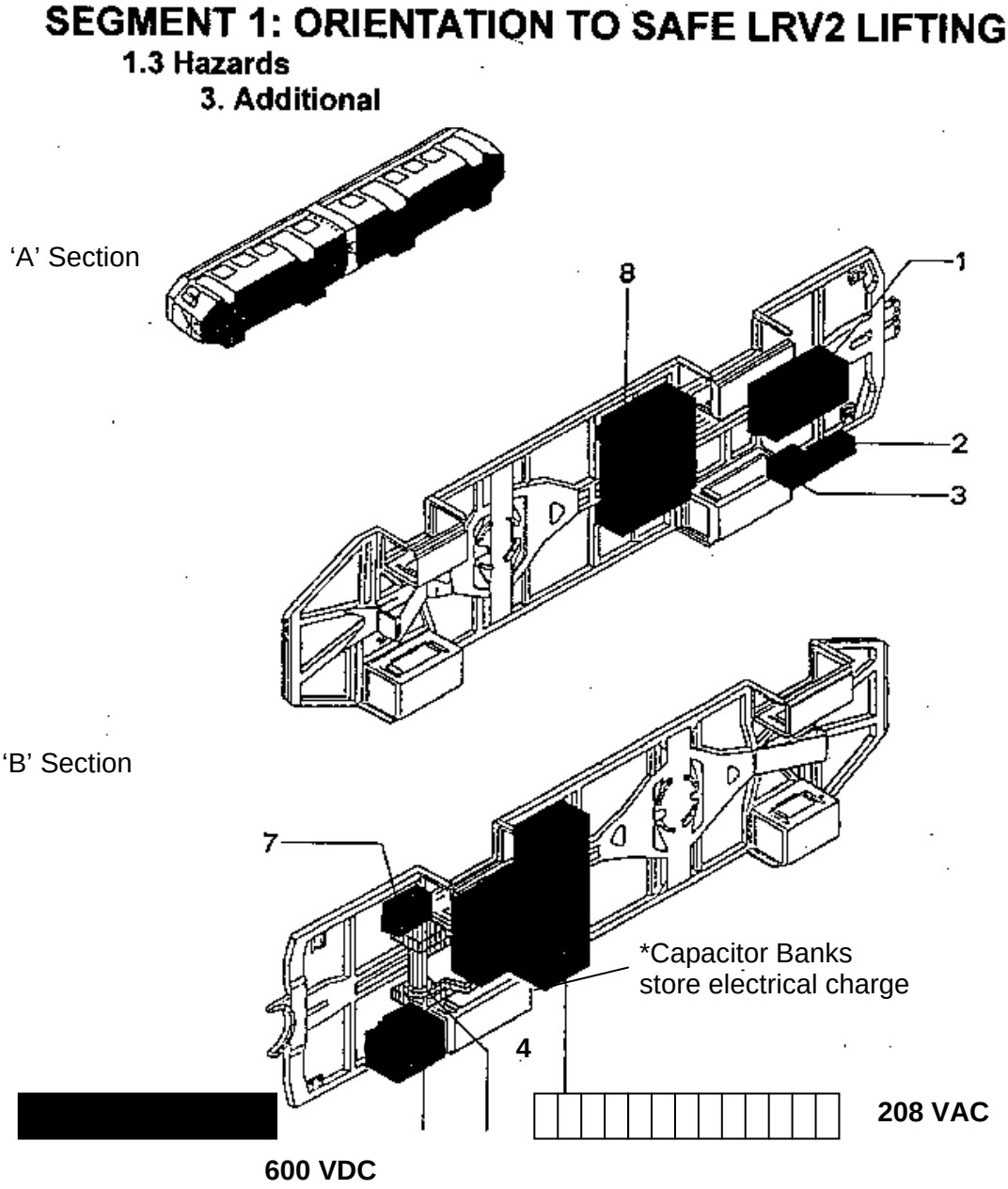


Figure 3

Capacitor banks remain charged for 20 minutes after Pantograph is lowered. If necessary to discharge prematurely do so only after neutralizing gas/explosion hazards.

2. Below Floor Level: The Battery compartment in A-section (right side, first com partment). Beware of possible spills, potassium hydroxide, (electrolyte).





1. Air Supply Unit
2. Knife Switch
3. High Voltage Fuses box
4. Propulsion Inverter*
5. Inverter Blower
6. Line Breaker
7. Line Filter Reactor
8. Auxiliary Inverter

Figure 4 Hazard Areas Under Frame

BLOCK ‘A’

SEGMENT 2: ASSESS AND DECIDE (A)

2.1.0 THE MUNI RESPONSE

The Muni LRV Operator Response to all accidents has been standardized. STOP Vehicle, Notify Central Control and await instructions. In addition, one of the following will be performed:

1. LOWER the Pantograph if another vehicle has collided with LRV Knife Switch compartment. See page 7.
2. DO NOT LOWER the Pantograph if a person is pinned underneath.

2.2.0 THE SFFD RESPONSE

1. **Pantograph Down**—No 600 vdc to compartments. Vehicle impact to Knife Switch compartment? Raining? Can Spacers be used? Initiate "APSS".
2. **Pantograph Up**—600 vdc present. Is person pinned beneath LRV Truck?
   Or LRV Body? Number 1 lifting points or Number 2? Initiate "APSS".
3. Is it Day or Night? Wet or Dry? Assemble the facts.

2.3.0. PRELIMINARY CONSIDERATIONS

2.3.1 Secondary Suspension System. The Pantograph is the means by which the overhead electrical power is routed down to the LRV electrical subsystems. One of these is the compressor maintaining the main reservoir with constant air pressure necessary for the Secondary Suspension System. This Suspension is controlled by dual Leveling valves that inflate or deflate dual bellows on each truck depending on interior weight.

A. This air operated system is designed to maintain the LRV floor height constant (34") above the top of the rail for varying vehicle loads.

B. The Muni response of not lowering the pantograph is predicated on a desire to maintain the LRV secondary suspension pressurized and thereby, keep the carboy at its normal height.

C. Lowering the Pantograph, on the other hand, removes the high voltage needed to power up the air compressor. Consequently, the system depressurizes over time and the LRV Body lowers by about 1 – 2 inches,
enough to cause additional damage to body parts pinned underneath the
LRV carboy.

D. The LRV Truck is not affected by the secondary suspension system. Consequently, if an accident victim is pinned beneath the LRV Truck Procedures for lifting the LRV truck must be initiated.

2.3.2 Considerations

A. **Deflate** the airbags to increase space under the vertical bump 'Stops' to use "spacers". Do not use if vehicle impact involved. See sections 5.5.2, page 23.

B. **Over inflate** airbags to obtain 1 – 2" of extra carboy height. Over inflate both airbags simultaneously. **Lift Leveling valve lever and crib the new height gained simultaneously. See section 5.5.2.**

C. If vehicle impact involved neutralize gas/explosion hazards first before **over inflating** or **deflating** airbags.

2.4.0 SPX Hydraulic System

Beginning 2003, the newly deployed SPX Hydraulic System* will be used to safely lift both the Breda LRV Truck and Carboy.

2.4.1 Equipment. The following Hydraulic equipment has been issued to the SFFD Truck & Rescue Companies:

QTY. ITEM

1 - Bubble level (6" or larger), anticlimber
1 - Plastic tool box, to contain equipment
2 - 22" hydraulic cylinder with 14 1/4 " extension ram, 25 Ton with handle
1 - 13 1/2 " hydraulic cylinder with 6 1/2 " extension, 25 Ton without handle
2 - Screw cap w/ pin (attachment for top of cylinder)
1 - Screw cap w/o pin (" " " " ")
2 - Hydraulic hand pump with diamond plate @ 10,000 psi
2 - 6' hydraulic hose, w/ treaded disconnect fittings
2 - Hydraulic cylinder base
5 - Protective rubber/plastic cover;; for cylinder and hand pump couplers
2 - Bolted lifting aids

* This equipment shall replace the Norton ratchet-type jack for Lifting the Breda Light Rail Vehicle

2.4.2 Operation.

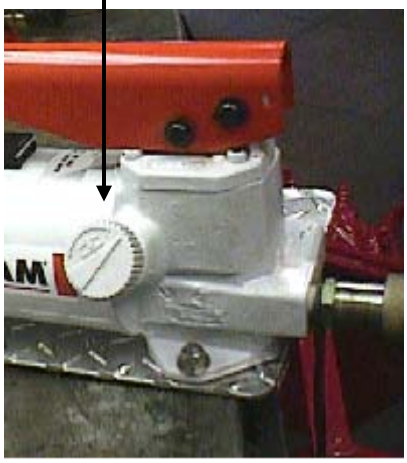
1. Oil Reservoir should be full
2. Close Relief Valve *clockwise*.
3. Place foot on diamond plate.
4. Raise & Lower handle steadily to create pressure.

Note location of Relief Valve Knob

The Handpump (#P12)

Figure 5

Figure 5A



Remember:
Turn Relief Valve clockwise to close, before pumping. Turn Relief Valve counterclockwise, open, to relieve pressure.

2.4.2 Operation (cont.)

Both the 13 1/2” cylinder (Figure 6) and the 22” cylinder (Figure 8) have dust covers on the Quick disconnect fitting. Remove cover and push end of six foot hose (Figure 7) into cylinder fitting. Once mated, thread and tighten fitting sleeve onto hose disconnect.

Figure 6

(13 1/2" body W 6 1/2" ram. One supplied.)

Figure 7
(6’ Hydraulic hose w/ treaded male disconnect at both ends. Three supplied.)

Figure 8
(22” cylinder w/ 14 1/4” ram. Note cylinder cap w/ pin. Two supplied.)

Figure 9
(Cylinder cap without pin screwed onto threaded ram. One supplied.)

Figure 10
(A single action Hydraulic system consisting of a 22” cylinder connected and threaded into the SPX handpump. In the background a coiled 6’ hydraulic hose and a threaded cylinder cap w/pin, two supplied. Note the carry handles and cylinder base supports. Three supplied.

2.4.3 Safety Precautions

Single Action Cylinder, Hand Pump and Hose

1. Avoid getting dirt into quick disconnect couplers. Keep protective cover on quick disconnect couplers when not in use. Recap couplers immediately when disconnected.
2. Prior to use, inspect the couplers or ports for damage. If damaged, discontinue use and return to SFFD B.O.E.
3. Avoid off-center loads which could damage the cylinder or ram and/or cause loss of the load.
4. Do not exceed rated capacities of the cylinder, 25 tons.
5. Stay clear of lifted loads and keep others away.
6. Extensions are not recommended for lifting applications. (Sheet 2, Form 102842, Operating Instructions.) Ideal for horizontal application.
7. Avoid straight light tubing connections in short runs. Straight lines do not provide for expansion and contraction due to pressure and/or temperature changes.
8. Should a hydraulic hose ever rupture, burst or need to be disconnected, immediately shut off the pump and release all pressure.
9. The hydraulic system should be periodically bled. Refer to equipment manual for instructions.
10. Use full protective turnouts, helmet, gloves and goggles.

BLOCK ‘A’

SEGMENT 3: PRESERVE CARBODY HEIGHT (P)

1.	End Doorsill Cribbing	14
2.	Back-Up Cribbing	14
3.	Leveling Valve	14
4.	Airbag Bleeder Valve	14

3.1.0-3.4.0 END-DOORSILL CRIBBING

Preserve Carbody Height before entering vehicle.

Carbody 'Doorsill' is the appropriate place to support. See Figure 11. If preserving height on **raised rail** allow for extra cribbing. In addition, move coupler to one side and crib under the center of the anticlimber as backup, Figure 11A.

Quickly, take up space under Carbody doorsill with sufficient Cribbing. This space increases With raised rail. See Figure 26, Page 23.

Figure 11

Figure 12 above: Near each airbag is located the Leveling valve. 1/2" open-end wrenches can be used to undo bolt and release valve handle.

Figure 11A Back-Up Cribbing. Move coupler aside. Center cribbing beneath anti-climber diamond plate.

Figure 12A: The air drain valve below uncapped. Note valve stem. See Spacers for instruction on bleeding airbags, page 23.

Figure 13

Center hydraulic cylinder beneath the alternate Jack plate. On raised rail, carefully stabilize the cylinder base, Figure 27, page 23.

BLOCK ‘A’

SEGMENT 4: SECURE THE VEHICLE (P)

4.1.0 INTERIOR CONCERNS

4.1.1 Entering / Exiting LRV

A. With Key. Enter any End door-way by lifting cover on Crew Switch and turning the Yale key (provided to all FD Trucks and Engines during training) to the OPEN position. This switch is functional only while Low Voltage is available on the vehicle. See Figure 14 and Figure 14A.

Figure 14

Figure 14A

Lift cover, insert Yale key, Turn to the right.
Two located on either end of vehicle.

B. Without Power. (No voltage available for use of Yale key.) Located under-neath vehicle (Figure 15, #1 below) at either end doorway, passenger side, is a RED handle. It will mechanically release (open) the end door nearest you when you pull the handle toward the front.

Figure 15

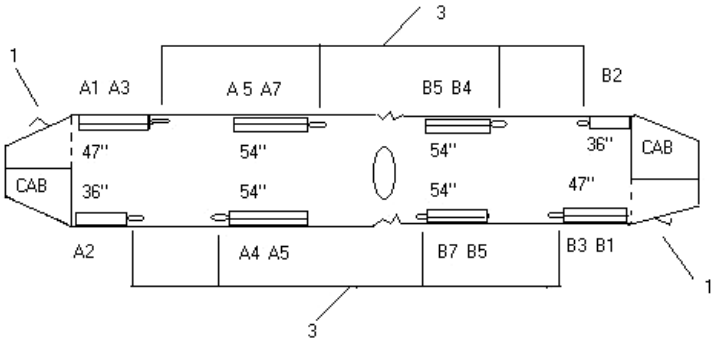


Figure 15A

1. Exterior Release Handle

3. Interior Release Handle

4.1.2 Hi Power Removal

With Console Power

1. Check that Vehicle Transfer Switch is “ON/Neutral”. See page 5). If “OFF” and interior lights are “ON” then vehicle is powered at other end. Activate console Pantograph switch at other end.
2. On upper right side of console, near Red mushroom button, toggle Pantograph switch (Figure 16, page 17) to the “DOWN” position until pantograph assembly locks in place. (A loud thump on roof can be heard.)
3. Tie Pantograph down with rope secured to A-end center door stanchions.

Figure 16
Pantograph Switch

Without Console Power

1. Locate special Pantograph manual crank in right side of A-end operator cab, Figure 17. Remove tool and assemble as in Figure 18.
2. Open Pantograph Access Flange in Ceiling. With small key (provided to all SFFD Trucks and Engines during training) open ceiling pantograph flange, near A-end center doors. Figure 19.

Figure 18 Assembled Crank

Figure 17
Panto-graph Crank (Operator cab, R-hand A-end)

3. Insert pantograph crank tool into ceiling flange and press upward to unlock latching mechanism. While maintaining upward pressure turn Pantograph tool in clockwise direction to lower Pantograph. Keep turning clockwise while maintaining upward pressure until pantograph latches in place on top of roof. Additionally, once pantograph has been lowered and latched, rope it down and tie ends of rope to overhead stanchions in side A-end.

Figure 19
Pantograph Access flange on Ceiling, A-end. (Access with small key).

Figure 19A
Turn counter-clockwise to lower.

4.1.3 Communication. Open doorways on either side of vehicle to facilitate communicationbetween personnel. Also, open center doors A-end.
A. Emergency Door Release. **Red** handles, located overhead near the right of each doorway (Figure 15A, page 16). Pull **downward to 6 o'clock position** and release. This action will mechanically unlock the doors to permit you to push them apart with your hands as well as insure that vehicle brakes are applied and that LRV cannot be easily moved
.

4.2.0 EXTERIOR CONCERNS

4.2.1 Power Removal. Locate Battery compartment on A-end, passenger side, first compartment. Lift compartment cover. Locate Circuit Breaker Box on left side of compartment. Remove cover. Push Circuit Breaker down. Red light in compartment, upper left side, confirms that Battery is tripped (off), i.e., disconnected from vehicle Low Voltage circuits.

Figure 20
Battery Circuit Breaker
(CB90)

4.2.2 Coupling. (For second car braking capabilities, such as, on grades.) If coupling is advisable **place** Connect/Isolate switch in the "ISOLATE" position <u>before coupling</u> to prevent 'trainlining' low voltage. See Figures 21 & 21A.

Figure 21

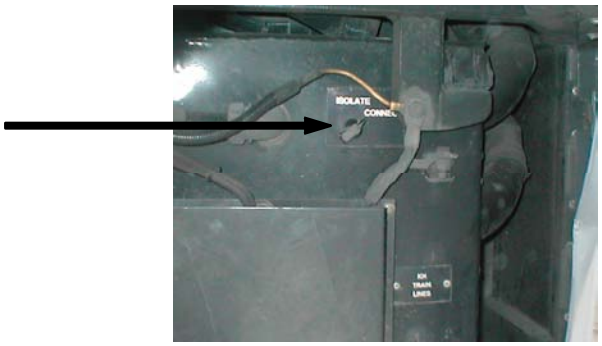


Figure 21A

Switch is mounted on car body under frame on both ends of vehicle, below Operator Cab Floor. Turn switch to the "ISOLATE" position on the end to be coupled on both vehicles **before** coupling.

4.2.3 Uncoupling (Electrically)

Electrical head Actuator Release Valve to be used when accident vehicle is already coupled and you desire to isolate the electrical heads prior to securing the accident vehicle. This is a little, metal, red handle located on Operator side of Coupler underneath the rubber apron. Undo apron from detent[1] by applying upward and outward pressure on rubber edge. Move red handle from 6 o'clock to 9 o'clock position. See Figure 22. This will remove the air from actuator and permit you to engage the manual release handle to retract Electrical Heads.

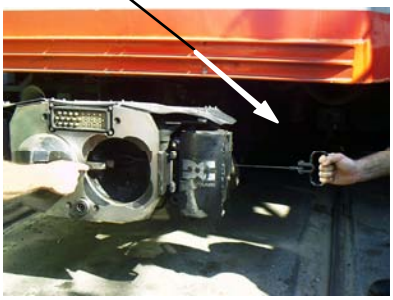
Figure 22

4.2.3 Uncoupling (Mechanically)

To ensure that coupled vehicle uncouples without dragging accident vehicle, use the Mechanical Release valve. See Figures 23 & 23A. Pull cabled handle as shown and instruct non accident vehicle operator to uncouple from accident vehicle.

Figure 23

Figure 23A



[1]A device (as a catch, dog, or spring-operated ball) for positioning and holding one mechanical part in relation to another so that the device can be released by force applied to one of the parts.

BLOCK ‘A’

SEGMENT 5: SAFELIFTING PROCEDURES

(S)

5.1.0 SAFETY AND TEAMWORK

Upon arrival the first SFFD Truck Officer on scene will be the LIFT GROUP SUPERVISOR for the mission, according to protocol. If a rescue is involved it is imperative that the Lift Group Supervisor and the Rescue group Supervisor communicate effectively. In a noisy environment this should involve SFFD radios on Direct or Tactical channel. Lift Group Supervisor shall position in front of coupler (Anticlimber) as in Figure 29, page 24. Safety requires that the **Lift Supervisor** establish communication with the Lifting Group and that **only** the **Lift Supervisor shall issue** lifting commands, no one else! However, **any person of the group shall issue a STOP** command if they consider it unsafe to continue the lift. In addition to the Lift Supervisor, the Lifting Group includes the Left & Right Hand PUMP personnel and Left & Right CRIBBING personnel. Also wheel Spotter and Relay person. The **Lift Group Supervisor** coordinates the lift and stabilizes the load.

Safety, again, requires the Rescue Group Supervisor to communicate directly with the **Lift Group Supervisor** for more lift, as needed and to communicate when the lifting height is sufficient for their needs.

5.2.0 EQUIPMENT AND MATERIAL CHECKLIST

A. END **Carbody** or **Truck** lifting

_____ 2 - Hydraulic cylinders, 22" height
_____ 2 - Cylinder screw caps with pin
_____ 2 - cylinder bases
_____ 2 - hydraulic hand pumps
_____ 2 - hydraulic hoses
_____ 2 - Johnson Blocks
_____ 2 - 'Spacer' with tightening bolt
_____ 2 - SFFD truck outrigger plate
_____ - Torpedo lever
_____ - Assorted wood blocks of varying sizes, including wedges for " "doorsill" cribbing

B. CENTER **Carbody** or **Truck** lifting

This procedure will require the use of double the SPX Hydraulic System as for an END truck, i.e. equipment from two trucks. Cribbing points, if any, have not yet been established. Therefore, it may not be possible to rotate the Center truck.

5.3.0 LIFTING POINTS

5.3.1 End Section Lifting. Second choice: Under center of anticlimber. Figures 24, 24A, and 24B. One 22" jack centered over 4" cribbing and beneath anticlimber pad. Note cribbing on **both** sides of hydraulic cylinder. Note personnel position.

Fig. 24

Fig. 24A

Fig. 24B

5.3.2 Center Section Lifting. Center truck lifting can be performed by using four cylinders placed beneath the four jack pads. (See Figures 25, 25A, and 25B)

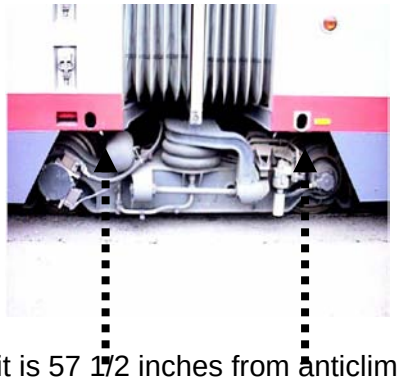


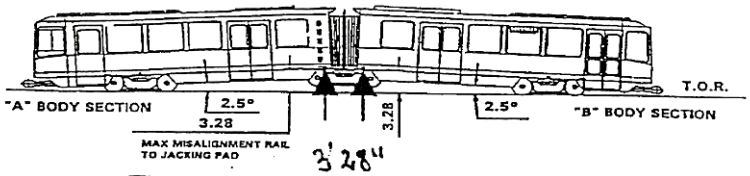
Figure 25
Two alternate jack pads on either side of center section of car body.

5.4.0 LIFTING LIMITS

5.4.1 End Truck. Lifting limit is 57 1/2 inches from anticlimber to top of the rail. (Figures 25C and 25D).

5.4.2 Center Truck. Lifting limit is 39 inches from bottom of jack pad to the top of the rail. (If limits are exceeded damage to articulation may result.) (Figures 25A and 25B).

Figure 25A



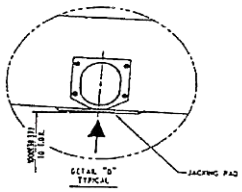
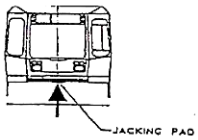


Figure 25B

Figure 25C



Lifting of Front section from both alternate jack

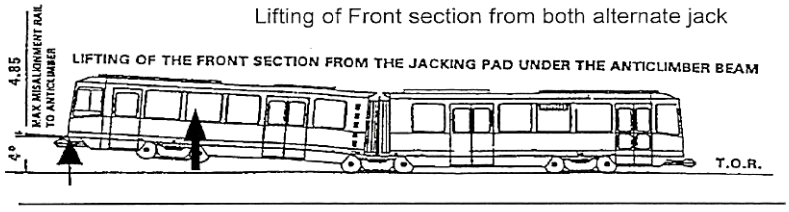


Figure 25D

5.5.0 LIFTING SPACERS

5.5.1 Spacers. If used properly they can save time in Lifting.

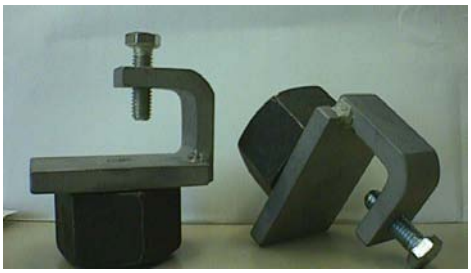


Figure 26

Insert between each vertical Bump Stop and connecting rod support on either side of truck. Tighten lock bolts. See Figures 27 and 28. **See Air Bag Deflating below, section 5.5.2.**

Figure 27

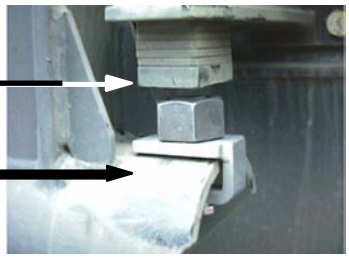
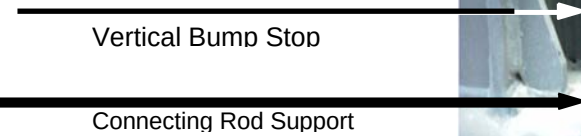


Figure 28



5.5.2 Air Bags

A. Deflating: If necessary to bleed airbags in order to install Spacers be aware that car body will **LOWER** as a result. **Take note of Victim's condition and where located. Take note of any gas fumes, if impact has occurred, and the possibility of creating a spark from metal rubbing on metal if car body is lowered.** Bleed **both** air bags of the same truck, simultaneously as follows:

1. Unscrew air drain valve cover and push air stream inwards with suitable point to bleed air, Figure 12A, page 14.
2. Insert Spacer when sufficient space exists. Tighten Spacer bolt.
3. Replace air drain valve cover.

B. Over Inflating: Take note of Victim's condition and where located. Take note of any gas fumes, if impact has occurred, and the possibility of creating a spark from metal rubbing on metal if car body is raised. Neutralize this hazard first. When over inflating the possibility of rupture exists, be prepared.

1. Remove bolt anchoring Leveling Valve to Turnbuckle with (2) 1/2" wrenches. Simultaneously; Figure 12, page 14.
2. Move leveling valve **lever** upwards.
3. Crib under doorsill to preserve new height.

5.6.0 Truck Rotation Height

Truck rotation height is 38 1/2" from Top Of Rail (TOR) to bottom of Anticlimber when lifting from the sides. When lifting from the front only 37 1/2" are needed. In either case allowing 1/2" for weight settling onto cribbing when cylinders are removed. When 1" – 2" of clearance between the flange and the road surface appears on wheel of Trailing axel on passenger side.

5.7.0 Surface Procedure: Level Rail

5.7.1 Assess the Facts. Decide on corrective action.

(S.F.F.D. Safe Lift Manual Revision 5, Segments 1 & 2)

a. What is the MUNI response? Pantograph up/down?
b. Where is victim or impact? Or both?
c. What is weather/time of day?
d. Location? Level surface? Downhill/uphill? Subway?
e. Equipment needed? Another LRV? Another SFFD truck?
f. Medical Team

5.7.2 Preserve the Carbody Height. Prepare for maximum clearance. (Segment 3)

a. Place cribbing under car body doorsill to maintain existing height (Figure 11, page 14 and Figure 31, page 26).
b. If safe to use, place both Spacers under Bump Stops now. (Figures 27 and 28, page 23 and Figure 34, page 27.
c. Place 2" – 4" cribbing below lifting point
d. Position SFFD truck outrigger plate atop cribbing
e. Place cylinder atop plate and below jack pad
f. Align cap pin in jack pad hole
g. Take up slack and wait for lift command from Relay person.

5.7.3 Secure the Vehicle. (Segment 4)

a. Open all doorways or at least the center doorways of the 'A' section. (Section 4.1.3).
b. Remove Hi voltage. Lower Pantograph with console power or manually.
c. Rope pantograph to inside stanchions. (Section 4.1.2).
d. Remove low voltage. Trip Battery Circuit Breaker, A-end, passenger side. (Section 4.2.1).
e. Couple second car, if necessary. First, activate Isolate/Connect switch under Operator cab floor. (Section 4.2.2).
f. Uncouple, if necessary, Electrical Heads only, Section 4.2.3A or Mechanically, Section 4.2.3B.

5.7.4 Safelift.

5.7.4.1 Tasks:

LIFT GROUP SUPERVISOR(1): Frontal positioning, capable of seeing both Left side & Right side Relays as well as torpedo level atop of anticlimber. Figure 29.

Figure 29

5.7.4 Safelift (cont.):

Coordinates: See Checklist, page 33.

A. Carbody Height Preservation immediately upon arrival at accident.
B. Security of the car. (Neutralizing hazards to Personnel)
C. Safelifting with balanced lift.
D. Lowering of vehicle weight onto **solid** cribbing.
E. Rotation of the truck.
F. Communication with Rescue Group Supervisor.

PUMP PERSONNEL (1): Positioning on either side of vehicle by alternate lift pads.

A. Sets Cylinder in base under lift pad, connects and secures 6' hydraulic hose to both cylinder and hand pump, closes the hand pump valve. Be sure to bottom out threaded sleeve onto threads of hose fittings.
B. Raise ram until cylinder cap/w pin is **snug** (not lifting car body) with lift pad.
C. Stay alert and ready for commands from Lift Group Supervisor.
D. Pump slowly, steadily.

CYLINDER PERSONNEL(1):

A. Together with pump person positions and connects Cylinder to Pump. Also ensures that connections are clean and not leaking.
B. Conducts a precheck of hydraulic system. (If precheck fails replace system.)
C. Monitors cylinder Ram travel. (That it is rising and not stalled).
D. Alternates with pumping, as needed.

CRIBBING PERSONNEL(2): Position on either side of vehicle, in front of end doorsill.

A. Immediately fill space beneath doorsill with cribbing to preserve car body height. As car body is lifted continue cribbing. Use wedge as space develops and replace wedge with solid cribbing as soon as possible.
B. When space permits place Johnson block under doorsill support. The edge of the block under the doorsill and the length facing you. Block should be positioned so that its length will not interfere with truck rotation, if necessary. See pages 14 and 26.
C. Rotation height has been attained when six inches of cribbing on top of the Johnson block has been placed beneath the doorsill.

WHEEL SPOTTER(1):

A. Monitors vertical movement of wheel on passenger side, trailing axel.
B. Stops lift process when minimum lift height has been reached.
C. Informs Lift Supervisor or that 1" of clearance has been attained between wheel flange and road surface.

RELAY PERSONNEL(2):

A. Position in front of lift team, either side, clearly visible to Lift Supervisor's commands.
B. Relays audible and hand signal commands from Lift Supervisor to Pump and Cribbing personnel.

5.7.4 Safelift (cont.):

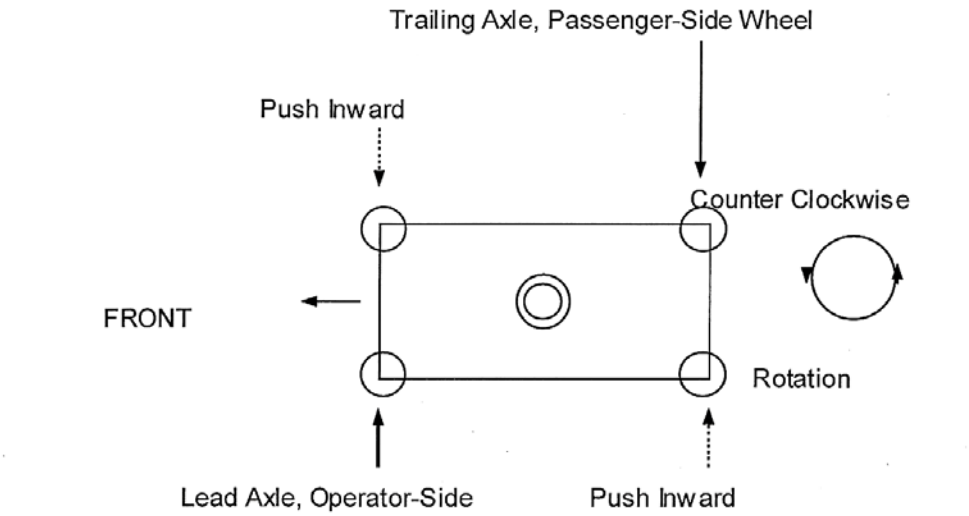
5.7.4.2 Truck Rotation:

When it becomes necessary to rotate the truck, once rotation height has been reached, ensure that vehicle weight will come to rest atop solid cribbing and that wheel clearance will not be negated as vehicle weight settles on cribbing. If uncertain, err on the side of more cribbing or more height.

To effect rotation of the LRV2 end truck:

1. Release hydraulic pressure on both sides of LRV2 turn release valve on hand pump counter-clockwise slowly and simultaneously. Car weight will settle on cribbing and splintering of wood may be heard. Stay alert! Lower cylinder ram until cylinder cap pin has cleared the jack pad hole.
2. Remove hydraulic equipment. Place out of the way for truck rotation.
3. Rotate Truck. Use push force against wheel hub instead of pull in direction desired. Take into consideration location of victim and emergency personnel.
4. Extrication. The largest clearance area will develop toward the front of the end truck as a result of end car body lift. Evacuate unneeded personnel.

Figure 30 Rotation Diagram, counterclockwise



Rotate truck in counterclockwise direction with push power of least powerful crew member, as above.

5.8.0 Surface Procedure: Raised Rail

The procedure for Raised Rail is basically the same as for Level Rail, with 'APSS' as your guide.

Lifting on raised rail was recently accomplished using the newly distributed SPX Hydraulic System. See below.

5.8.0 Surface Procedure: Raised Rail (cont.):

Figure 31 Preserve Carbody Height with suitable cribbing. Place both Johnson block and cylinder with base on level surface. This may require removing gravel and using aluminum plate from fire truck to stabilize jacks.

Figure 32 Note use of 8" block under cylinder base.

Figure 33 Cylinder cap/w pin snug with jack pad surface.

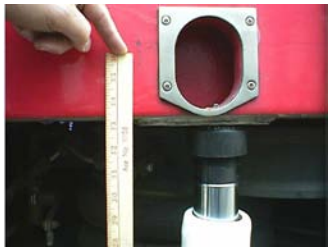
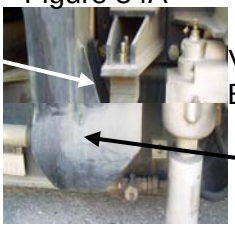


Figure 34 If metal Spacers are used in the lift, process, place them between vertical Bump Stops and connecting rod support. Always use two, one on either side. Insert bolted Spacers before Lift begins.

Figure 34A



5.8.0 Surface Procedure: Raised Rail (cont.):

Raised rail requires that the jacks be stabilized. Depending on vehicle condition, airbags may be more effective in obtaining the desired objective—extrication of the victim.
Diminished illumination requires portable lighting.
Variables determined by the underground emergency must be realistically evaluated on the spot.

5.9.0 Subway Procedure: Raised Rail

Incorporate “APSS” as a guide when involved with subway rescue. The objective being to minimize danger and hazards to responding personnel while affecting the ‘mission’. Confined track-way restricts movement. Electrical/fire hazards may coexist. Contact Central Control for power removal **(759-4322)**.

BLOCK ‘B’

SEGMENT 1: BRENDA FRAME ASSEMBLY

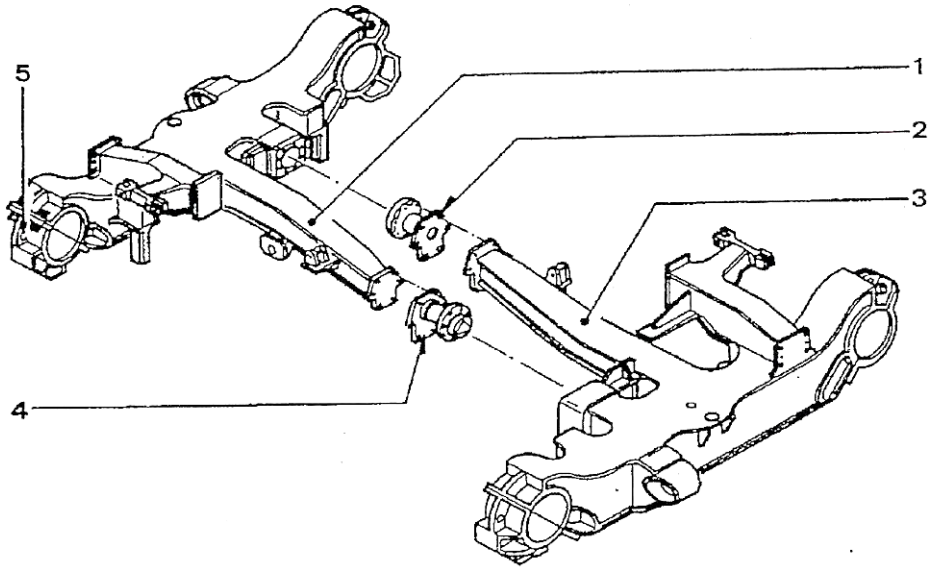
1. FRAME ASSEMBLY
2. AIR SUSPENSION SYSTEM
3. LABELS

2.1.0 BREDA FRAME

This Breda Truck frame is not a single enclosed unit, like the Boeing truck frame. It consists of two separate sides attached to the other with flexible universal joints. This design explains how the weight redistributes to one of the rear and one of the front wheels when the truck is raised, supported only by the car body. The weight of the traction motor lowers that wheel. The suspended truck is held to the car body by the connecting rod that attaches to the Bolster. The bolster, in turn, is bolted to the car body via the Center Ring.

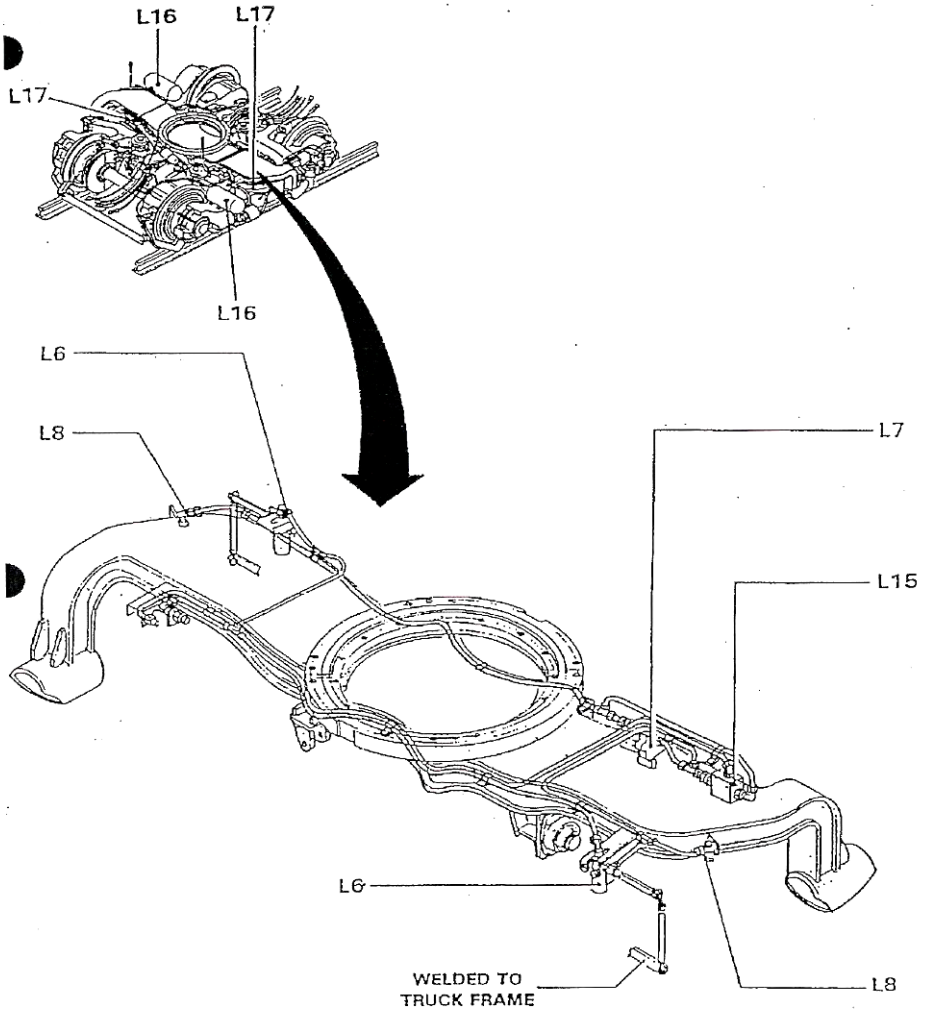
3-2.2.2 Frame Assembly

The Truck Frame (refer to fig. 3-2.36) is designed to have 30 years service life (under normal service conditions and preventive maintenance operations) without structural repairs or alterations.
The Truck Frame consists of two main Side Frames (1, 3) made of electrically welded steel plates (FE 501D), interconnected by two Transom Joints (2, 4). This assembly is designed to have the required stress resistance and the load equalization characteristics to operate and to prevent unstable oscillations in any operating condition.
On the Truck Frame are welded brackets designed to support the truck main components (Secondary Suspension, Wheel Set Assembly, Brake Caliper, Track Brakes, Pneumatic and Electrical System Components).
One Truck Hoisting Eye (5) is provided on each journal box to hoist the truck for maintenance operations.



1. Truck Side Frame
2. Transom Joint
3. Truck Side Frame
4. Transom Joint
5. Truck Hoisting Eye

Figure 3-2.36 Trailer Truck Frame Assembly - Components

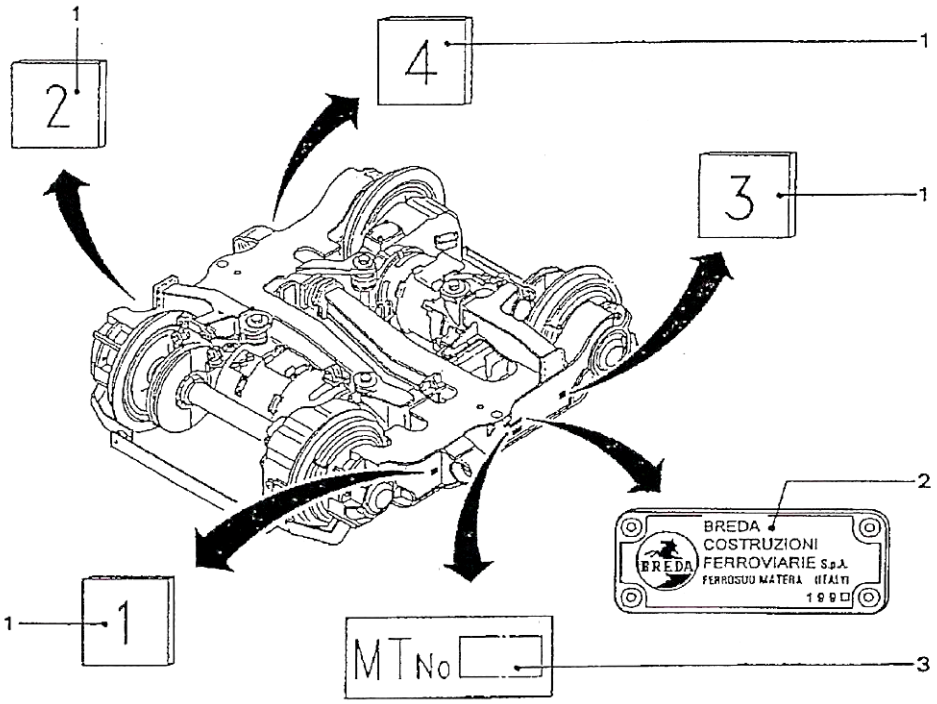


L6 Leveling Valve
L7 Duplex Check Valve
L8 Test Fitting
L15 Double Check Valve
L16 Air Reservoir
L17 Air Spring

Figure 3-4.3 Air Suspension System, "A"/"B" Motor Truck, Components Location

3-2.1.5.4 Labels

The identification Labels, installed on the power truck are placed to indicate the wheel number, the MFR name, truck serial number and built year.
The Labels are made with light alloy and are attched to the frame by screws or glued with a two-component adhesive type glue. The glue specifications are S.I.P.A.L. AREXONS COD 4565, Fig. 3-2.23 shows the motor truck labels locations and identification.



1. Wheel Number Labels
2. MFR Name Label
3. Serial Number Label

Figure 3-2.23 Labels - Location

Checklist

1. **A**ssess the facts. Decide on corrective action.
   (S.F.F.D. Safe lift Manual Rev. 5, Segments 1 & 2)
   a. What is the MUNI response? Pantograph Up/Down?
   b. Where is victim or impact?
   c. What is weather/time of day?
   d. Level surface? Downhill/uphill?
   e. Equipment needed? Another LRV?
   f. Medical equipment?

2. **P**reserve the car body height. Prepare for maximum Clearance. (Segment 3)
   a. Place cribbing under car body end doorsill to maintain existing height.
   b. Next, insert Spacers under Vertical Bump Stops, both sides.

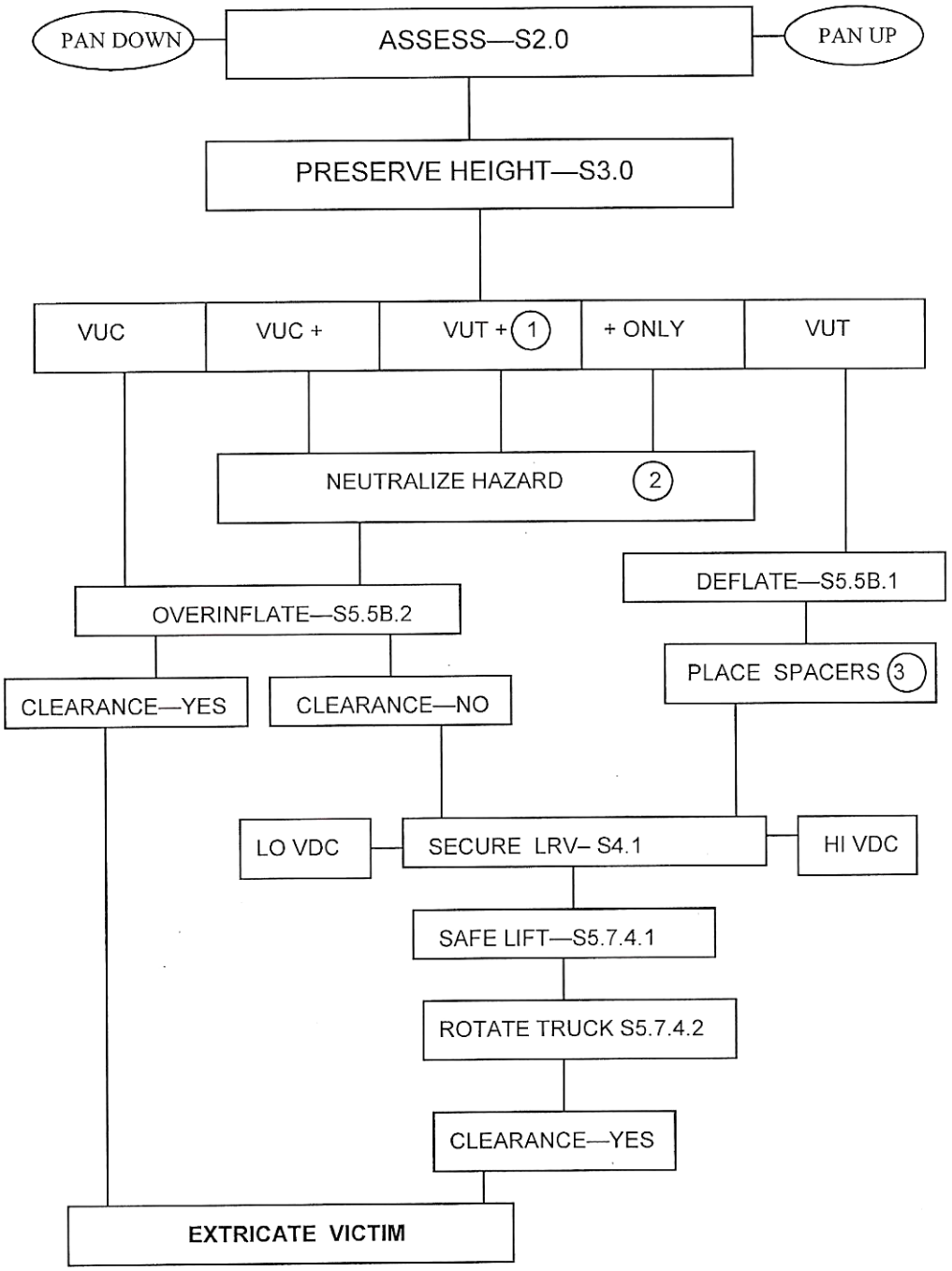
3. **S**ecure the vehicle. (Segment 4)
   a. **Open** all doorways or at least the A-end center doorway section. (Section 4.1.3)
   b. **Remove Hi voltage.** Lower Pantograph with console power or manually.
   c. Rope pantograph to inside stanchions of A-end. (Section 4.1.2)
   d. **Remove low voltage.** If necessary, trip Battery Circuit Breaker, A-end, passenger side. (Section 4.2.1)
   e. **Couple** second car, if necessary. Activate Isolate/Connect switch under Operator cab floor. (Section 4.2.2)
   f. **Uncouple** Electrical Heads **only** from second car. (Section 4.2.3A)
   g. Uncouple Mechanically with certainty. (Section 4.2.3B)

4. **S**afe lifting together. **LIFT GROUP SUPERVISOR** (First SFFD Officer on Scene) directs Lift. (Segment 5)

CHECKLIST for Lift Leader (ENDLIFT)

1.	Hydraulic Equipment in place?	Left side	_____	Right side	
2.	Cribbing in place?	L	_____	R	_____
3.	Equipment connected and fittings tightened?	L	_____	R	_____
4.	Position Cylinders under lift points on LRV?	L	_____	R	_____
5.	Close valves on hand pumps.	L	_____	R	_____
6.	Cylinder rams raise **snug** with Lift points?	L	_____	R	_____
7.	Read to Lift & Crib?	L		R	

8. Lift & Crib
9. Lift Group Supervisor maintains a balanced lift. Stop one side while the other side pumps to correct the unbalance, if any.
10. Cease Lifting when taking measurement or making under car checks.
11. Rotation height reached? (minimum wheel clearance)
    Or that needed by Rescue Leader?
12. Hydraulic Equipment Removed
13. Push Personnel positioned.
14. Rotate Truck Slowly



LEGEND:
VUC = Victim Under Carbody ; VUC+=VUC and Impact to LRV by another vehicle.
VUT = Victim Under Truck ; VUT+=VUT and Impact to LRV by another vehicle ; + only = Impact only.
NOTES:
1. If vehicle impact “B-end” Capacitor Bank wait 20 minutes after LRV is keyed “OFF” or Pantograph lowered…
2. If gas fumes or gasoline spill evident neutralize the explosive Hazard before Over inflating airbags.
3. Safe to use Spacers when lowering Carbody will not inflict further damage to victim or equipment. Remember to remove initial cribbing before deflating airbags.

APPENDIX B—AMTRACK & CALTRAIN RESPONSE EDUCATION MANUAL

CALTRAIN

Passenger Train Emergency Response Education for San Francisco Bay Area

PREFACE

The National Railroad Passenger Corporation (AMTRAK) and the Peninsula Corridor Joint Powers Board (Caltrain) present this manual to familiarize public safety agencies with routine and emergency procedures regarding Caltrain trains and operations. This manual focuses on proper methods for car entry and evacuation of passengers and crewmembers. This edition dated November 2007 and supersedes all previous editions.

Emergency response personnel may refer to this manual for procedures and precautions applicable to railroad equipment, stations and yards operating within their areas of jurisdiction. While this manual may be employed as an informational resource at the scene of an emergency, it is not intended to replace or override any established procedures of emergency response agencies in relieving an emergency situation.

Rail passenger cars and locomotives are constructed to withstand extreme stress under all conditions. As a result, forcible entry and extraction are not easily accomplished. By following the directions outlined in this handbook, emergency personnel will be able to detect the particular locations on every type of locomotive and passenger car that permit swift entry.

Prepared by Amtrak's Office of Emergency Preparedness
And Caltrain Safety & Security Division

How To Use This Manual

This manual is intended as a resource to be used at the scene of an Caltrain incident. This manual is also helpful in establishing pre-plans for emergency response and for training emergency response personnel.

At the scene of an incident involving Caltrain equipment, the user should ensure that the appropriate train dispatcher controlling train movements at the incident location is notified prior to the arrival of emergency responders on railroad property.

The Incident Commander or person-in-charge of emergency responders must contact the train's conductor, or crewmember designated by the conductor, to ascertain the nature of the problem. The conductor and other crewmembers are trained to provide all information to enable a size-up to be determined. This information will help in planning the appropriate emergency response.

CALTRAIN SYSTEM MAP

EMERGENCY CONTACTS

Emergency (800) 683-4114

Amtrak Police (877)-723-7245

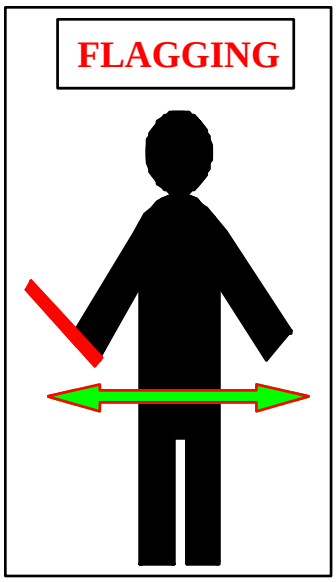
RIGHT OF WAY

The railroad right of way is the land owned by the railroad for its track and related equipment. This private property may extend from the center of the rails to a distance of 20 to 100 feet. This distance can vary greatly from one area to another.

As private property, it is trespassing for anyone to enter the property without proper permission. First responders do not need permission from the railroad to respond to emergency situations and they are encouraged to make pre-planning reviews of railroad properties in their area of responsibility. It is most important that first responders notify the railroad dispatcher whenever they enter railroad property. The railroad dispatcher can then notify railroad employees, including train crews, of the first responder's presence.

First responders should confirm that the railroad dispatcher has been notified and that the dispatcher has given approval for them to approach the tracks. Notification of the railroad dispatcher is the preferred method of stopping trains.
This section provides information on flagging approaching trains, grade crossing safety guidelines and personal safety concerns while on railroad property.

FLAGGING



Flag Protection consists of traveling a specified distance (based on train speed) from the incident with (three) 30-minute highway flares. Stand no closer than 15 from the closest rail, with the tracks on your right. When facing approaching train traffic, this places the person doing the flagging on the engineer's side of the tracks. A flare must be lit from this position immediately after hearing or seeing a train. Wave the flare horizontally at be a signal to stop, flares are universally recognized as a warning and/or signal to stop. and other conditions can hinder the engineer's visibility to signals other than flares. While anything waved intensely near tracks is considered to the engineer to stop the train Flags or flashlights may be used in place of flares, but weather, darkness,. When flagging, personnel must travel in both directions from the incident site. The distances that personnel must travel are based upon authorized train speeds in the vicinity of the incident and the various stopping distances of trains. The higher the authorized train speed, the farther from the incident site personnel must go. This is especially critical in tunnels and on bridges because personnel will not have a safe haven if trains suddenly appear on the track.

When using flares on railroad property, be aware of any flammable materials such as grass, weeds, wood timbers, ties, oil and grease. Be certain the flares are dry, in good condition and ready to light in the event an approaching train is seen or heard. right angles to the track, as shown in the box at the right. This will signal

Weather and environmental conditions hinder the effectiveness of flagging protection.

Terrain, fog, snowfall and other background noises all can dampen the sound of approaching trains. The sound of an approaching train is diminished when one is standing directly in front of it, when compared to standing off to the side. Electrically-propelled trains are quieter than those propelled by diesel locomotives.

Once you are certain that the train dispatcher is aware of your presence on the right-of-way, personnel providing flagging protection can be recalled to the incident site. Nevertheless, we recommend designating a lookout at the incident scene should be maintained in the event of a communications failure between the train dispatcher and the train.

ADDITIONAL INFORMATION FOR EMERGENCY RESPONDERS

Public highway/rail grade crossings are at grade intersections, where the roadway crosses railroad tracks. For public safety, state highway departments and railroad companies have marked them with one or more of the following indicators. Learn what they mean and watch for them. These warning devices alert you that the road you are traveling on is approaching railroad tracks and implies the possible presence of a train.

ADVANCE WARNING SIGN

This is usually the first sign seen when approaching a highway-rail crossing. This round yellow sign, with its “R X R”, is located a sufficient distance ahead of the crossing to allow a motorist to stop before reaching the crossing. The Advance Warning Sign advises the driver to slow down, look and listen for trains and be prepared to stop for an approaching train.

PAVEMENT MARKING

This roadway marking is adjacent to the advance warning sign and consists of a box with “R X R”, followed by a stop limit line closer to the tracks. These may be painted on the paved approach to a crossing. Stay behind the limit line while waiting for a train to pass.

CROSSBUCK SIGN

Crossbuck signs are the familiar white X-shaped sign with the words “Railroad Crossing” printed on the X. This sign is found at highway-rail crossings, and should be understood as a Yield Sign. All drivers are legally required to stop and yield the right-of-way to trains. Slow down, look and listen for a train. Stop clear of the tracks if a train is approaching. When the road crosses more than one set of tracks, a sign below the crossbuck sign indicates the number of tracks crossed by the road.

FLASHING RED LIGHTS

At many highway-rail grade crossings, the crossbuck sign is also equipped with flashing red lights and bells. When the lights begin flashing, STOP! A train is approaching. Emergency responders are legally required to stop and yield the right-of-way to trains. If there is more than one set of tracks at the crossing, make sure all tracks are clear before crossing.

GATES

Many crossings have gates with red flashing lights and bells. STOP when the lights begin flashing and before the gates come down. Remain stopped until the gates come up and the lights have stopped flashing. Proceed across the crossing only when safe.

SITE SAFETY

Site safety during an emergency is a major concern on railroad property. The surface around the tracks is often uneven, slippery and unstable, particularly on embankments. The ballast (gravel used on rail beds) is designed to allow for water drainage and maintains the integrity of the roadbed. Ballast does not provide a stable walking surface. Ladders placed on the ballast must be adequately heeled in order to insure that they do not move while being used.

Debris and other foreign objects on the right-of-way are tripping hazards. Train dispatchers generally operate switches on main line tracks remotely. Keep feet and equipment clear of movable switch components at all times.

Rails are usually highly polished from use and stepping on them can be very dangerous, especially if the rails are wet or coated with oil. Step over the rails, not on top of them. Personnel working around an incident on the railroad right-of-way must be aware of possible downed power lines, which may be energized. Both the local utility company and the railroad must be notified to de-energize downed power lines.

Many utility companies have made contractual agreements with the nation's railroads to use the railroad right-of-way for fiber optic communication lines, natural gas and petroleum pipelines. Utilities that are buried next to the tracks at a depth of 30-45 inches below the ballast present problems of their own and must be addressed when responding to a railroad emergency situation.

TIPS FOR EMERGENCY RESPONDERS

- Plan routes (using a preplan worksheet) that allow the driver and other crew members clear sight down the railroad tracks in both directions.
- Keep emergency numbers for the railroad's dispatch centers on board all emergency vehicles. Know which railroad controls the tracks, especially if more than one railroad operates in your community.
- During long-term brush or structure fire responses, contact the dispatch center to obtain clearance to remove the ballast and feed the hose under the tracks to allow both safe fire fighting and safe train operation.
- Do not place emergency vehicles on tracks and expect the train to stop quickly enough to avoid a collision. It takes a fully-loaded freight train traveling 55 mph a mile or more to stop.
- To stop a train, contact the dispatch center.
- Give exact locations, using all available reference points.
- Check signal house for DOT crossing number, e.g. 123456E.
- Use railroad mileposts.
- Name of road.
- Crossroads.
- Town.
- If a train is blocking a crossing along your planned route, contact the railroad dispatch center.

FREQUENTLY ASKED QUESTIONS ABOUT HIGHWAY-RAIL INTERSECTIONS

- Why can't a train yield to an emergency vehicle?
- It takes an average freight train, carrying 6,000 tons and traveling at 55 mph, a mile or more to stop.
- Which is louder: a train horn and bell, or an emergency vehicle's siren and horn?
- Even if emergency sirens and air horns are deactivated as an emergency vehicle approaches a crossing, ambient noise levels in the cab may still mask the sound of an approaching train horn.
- What should an emergency vehicle operator do when approaching highway-rail intersections?
- Turn off sirens, air horns, and any other sound-producing devices; roll down the vehicle's window, stop and look both ways to determine if a train is approaching. If a crossing has obstructions or a severe curvature that interferes with ability to see, stop the emergency vehicle and send a crew member on foot to determine the safety of crossing.
- How can an Emergency Response Team minimize driving hazards?
- Whenever possible, plan an emergency response route that avoids highway-rail grade crossings, or plan routes so that they include only crossings with active warning devices.
- How can emergency responders assist the emergency vehicle operator?
- One crew member can initiate face-to-face communication with the driver to determine the driver's intentions when approaching a highway-rail intersection. This will remind the driver of the carefully planned procedures for traversing a particular crossing.

THINGS YOU SHOULD KNOW

1. Freight trains do not travel on predicted schedules and passenger trains can be late or may have unscheduled train movements. Always expect a train at any time on any track in any direction.
2. Do not get boxed in on a highway-rail grade crossing by other vehicles. Do not attempt to drive over a railroad crossing unless you are certain the tracks can be cleared without stopping. Remember that locomotives and train cars overhang the rail by three feet on both sides. Stop well clear of the tracks.
3. If the gates are down, consider the road closed. Stop and wait until the gates go up and the red lights stop flashing.

4. When stopped at a crossing where there is more then one set of tracks and a train is passing through the crossing, look and listen carefully for another train on another track.
5. If a response vehicle stalls on the crossing or is caught in traffic and a train is approaching, evacuate the vehicle immediately and get away from the tracks. Notify emergency authorities to report the emergency situation.
6. It is a difficult to judge the speed of a train by looking at it; it will appear to be traveling slower then it actually is.
7. Trying to beat a train to a highway crossing is a fool's game. In the event of a tie you lose.

CREW ORIENTATION

It has been said that the engineer runs the locomotive, but the conductor runs the train.

On Caltrain trains, it is the conductor who is responsible for the safety of the passengers, fare collection and the overall operation of the train.

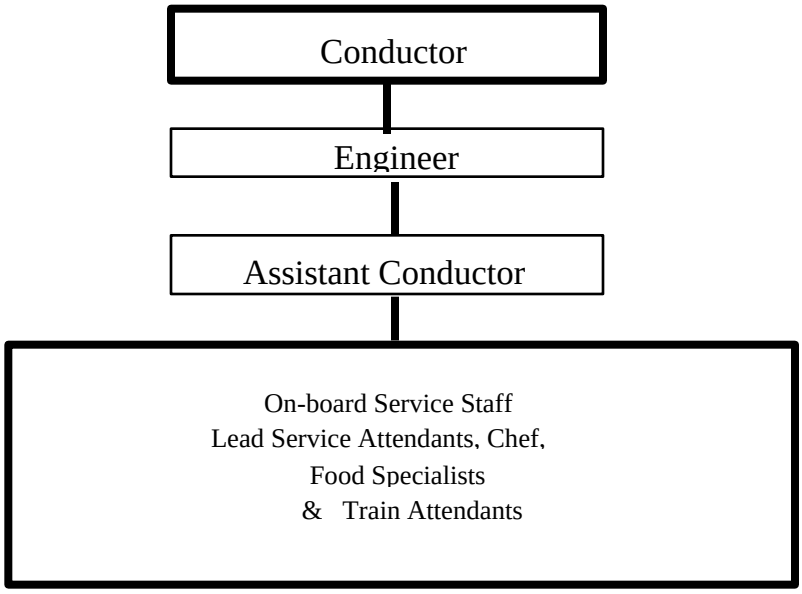
The engineer runs the locomotive at the direction of the conductor and in accordance with railroad operating rules and trackside signals.

In the event of an emergency, the conductor is the Railroad Incident Commander until the arrival of the first responders. It is recommended that the first responder have the conductor stay with the Incident Commander until another representative of the railroad arrives. The conductor will have information about passengers, railroad equipment and the circumstances of the incident. Additionally, the conductor will have a railroad radio and important telephone numbers for railroad offices and personnel.

While Caltrain trains run with one engineer and one conductor,

Examples of the different crews are covered in the following charts.

CALTRAIN INTERCITY TRAINS



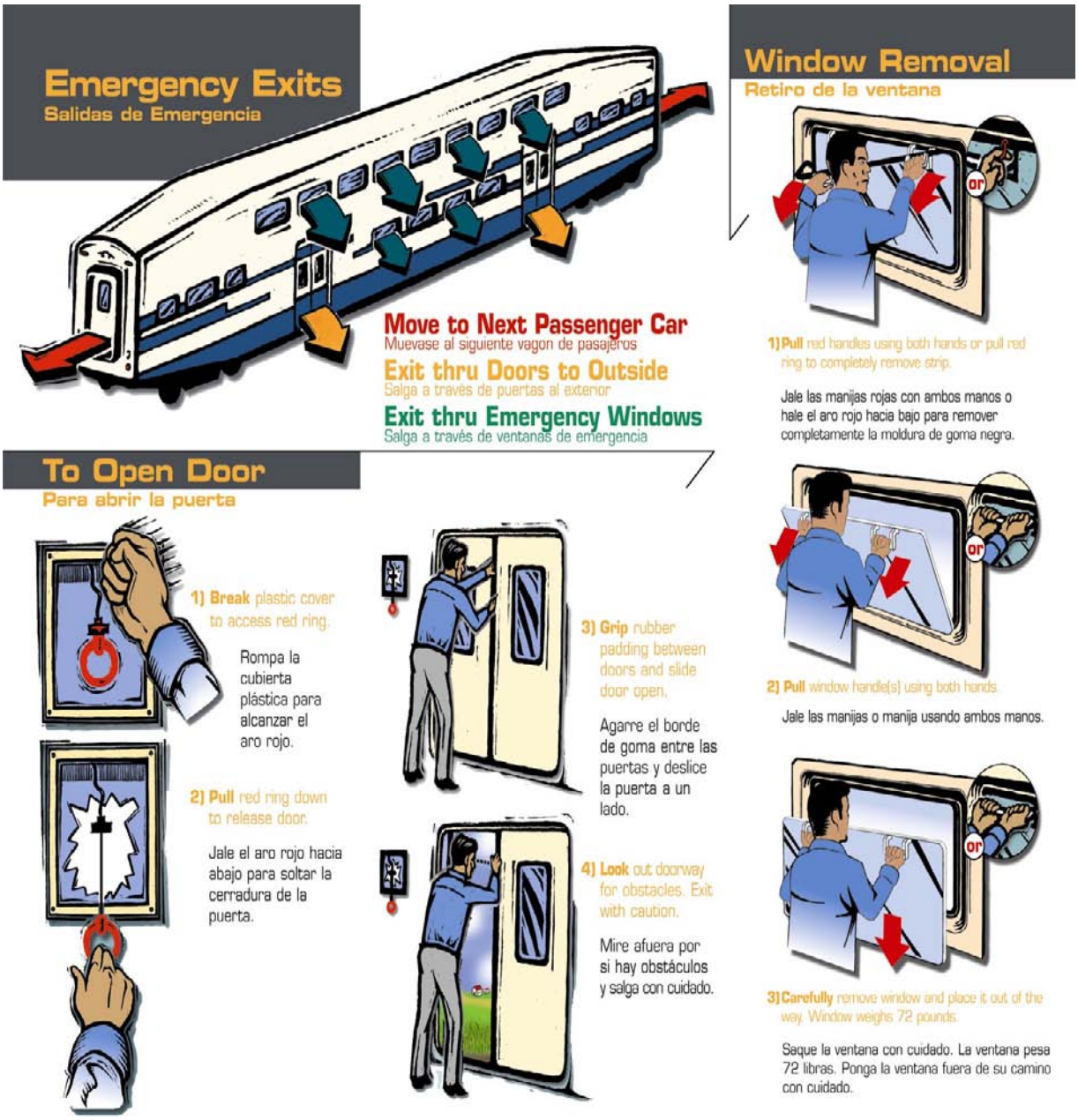
CALTRAIN EMERGENCY WINDOWS

- Caltrain emergency windows are similar to Amtrak emergency windows. The window can be removed by peeling away the rubber molding between the window and the passenger car body.
- On the outside of the car, this requires the use of a screwdriver or similar tool to start the removal of the rubber sealing strip. On the inside of the car, an emergency handle is attached to the rubber.
- A pry bar or screwdriver will aid in removing the window.
- Remember, Caltrain windows are double-pane safety glass and they are heavy, 75 to 80 pounds.
- Always place removed windows in a safe location inside the train. A window falling out of the train could cause serious injury.

EXTERIOR WINDOW REMOVAL INSTRUCTIONS—INTERIOR WINDOW REMOVAL

Interior windows are removed by pulling the handle or ring on the window gasket, and then pulling the silver colored handled on the window inward

CALTRAIN EMERGENCY EVACUATION INSTRUCTIONS



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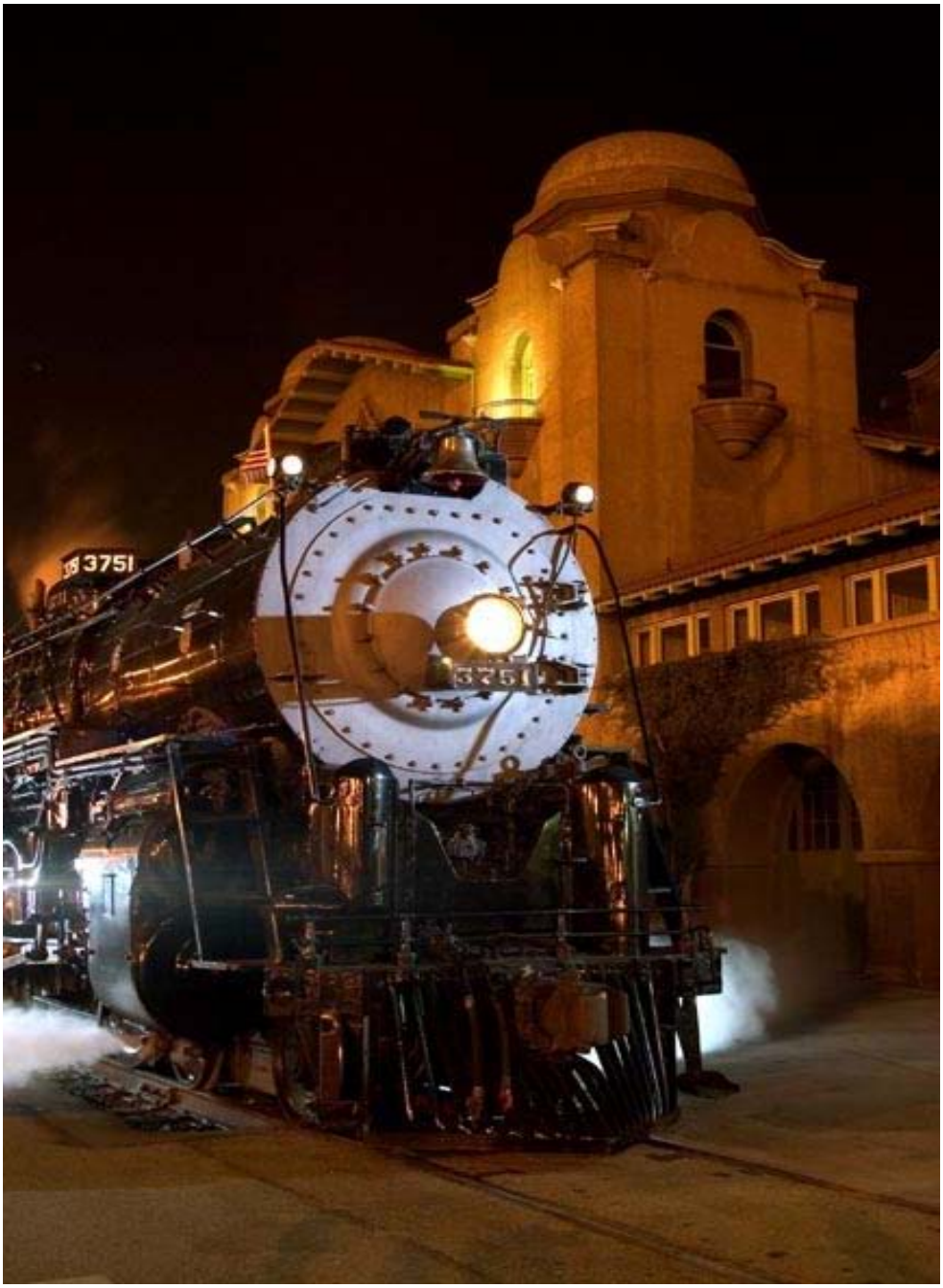
CALTRAIN EMERGENCY EQUIPMENT

- Four 10-pound dry chemical A-B-C fire extinguishers (on the lower level in the restroom sidewall, near the drinking water, and on the bulkhead opposite the bicycle rack; above each stairwell on the upper level of each passenger car)
- Sledge hammer
- First Aid kit
- Flashlight
- Pry Bar
- Hand Saw


FLASHLIGHT
Fire Extinguisher


Fire Extinguisher
Break cover for access.
Extinguidor de Incendios
FIRST AID KIT

EQUIPMENT DIAGRAMS

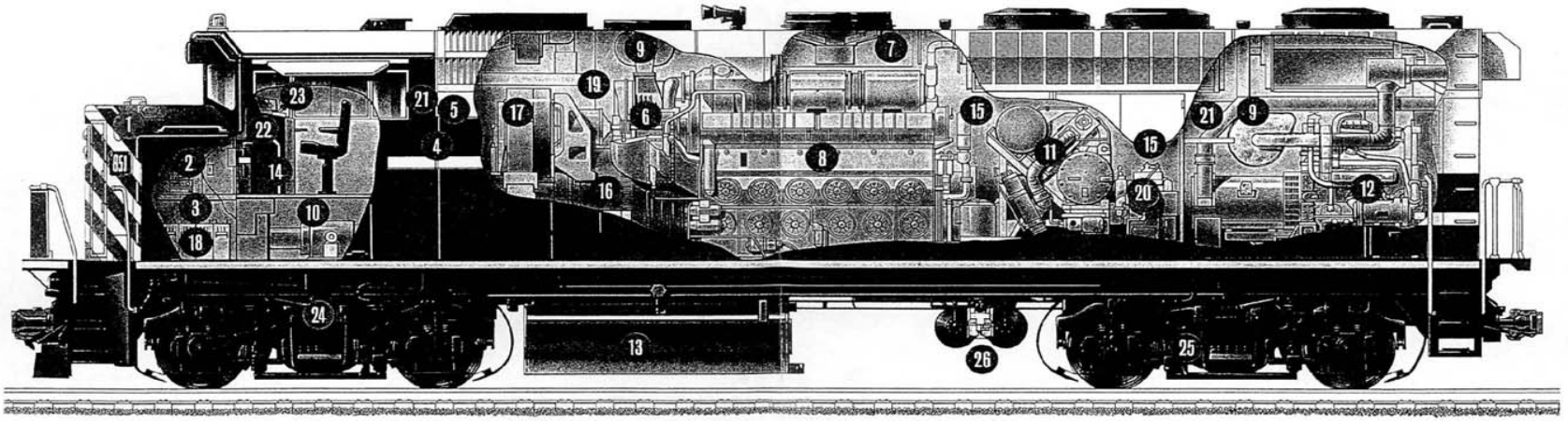


THE POWER BEHIND

METROLINK

The GM F59PH Locomotive

The F59PH is a wide-body 4-axle locomotive based on the highly successful GM Series 60 pattern. To meet METROLINK specifications for passenger service, the F59PH was developed with a lighter weight, enhanced crew cab features, reduced fuel consumption, lower exhaust and noise emissions, and with separate propulsion and HEP power systems. With blended dynamic braking and a full 3000 HP available for motive power, the F59PH is designed to operate in "stop & go" conditions with consists of up to 10 bi-level cars weighing as much as 700 tons.



General Motors Locomotives

GM Locomotive Group

1. Collision posts
2. Radio room
3. Battery charger
4. Microprocessor
5. Clean-air compartment
6. Turbocharger
7. Dynamic brake blower
8. 12/710G3A diesel engine
9. Mufflers
10. H/V/AC
11. Accessory rack
12. 8V/149 diesel engine (HEP)
13. Fuel tank (2200 USG)
14. Fire extinguisher
15. Start stations
16. AR15 Traction alternator
17. Traction motor blower
18. Batteries
19. Engine air filters
20. Air compressor
21. HEP control panels (500 kW)
22. Blended D/B control
23. Throttle and reverser
24. GP truck
25. D87B traction motor
26. Air reservoir

General Data

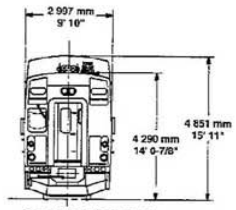
Type of vehicle	Bi-Level Commuter Car
Owner	Southern California Regional Rail Authority
Operator	Amtrak
Total order	87 vehicles (31 cab cars)
Train consist	Up to 10 vehicles

Weight and Capacity

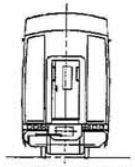
	Metric	Imperial
Empty weight (Trailer car)	50 200 kg	111,000 lbs
Empty weight (Cab car)	51 800 kg	114,500 lbs
Seating	Cab Cars	Trailer Cars
-with wheelchairs & bicycles	134	146
-without wheelchairs or bicycles	142	149
Crush load		360 passengers

Miscellaneous

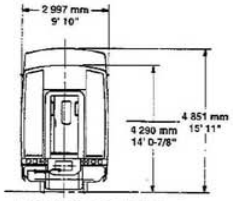
Underframe	Low-allow, high-tensile steel
Superstructure	Aluminum alloy structure and sheathing, painted
Floor	Plymetal covered with carpet or rubber flooring
Doors	Two pneumatically operated two-leaf sliding pocket doors per side, service doors at each end
Side windows	Fixed, tinted double glazed, meeting FRA Type II standards
Fixed seats	Aluminum frames, molded fiberglass with upholstered inserts
Trucks/Bogies	Two per vehicle, cast steel with inboard bearings
Primary suspension	Chevron rubber spring
Secondary suspension	Air spring
Wheelslide protection	Yes
Brakes	Pneumatic tread brakes and disk brakes
Parking brake	Mechanical hand brake
Heating	Electric convection floor heaters, overhead air heaters
Air conditioning	Two self-contained units, one at each end of vehicle
Toilet room	One per car, fully accessible



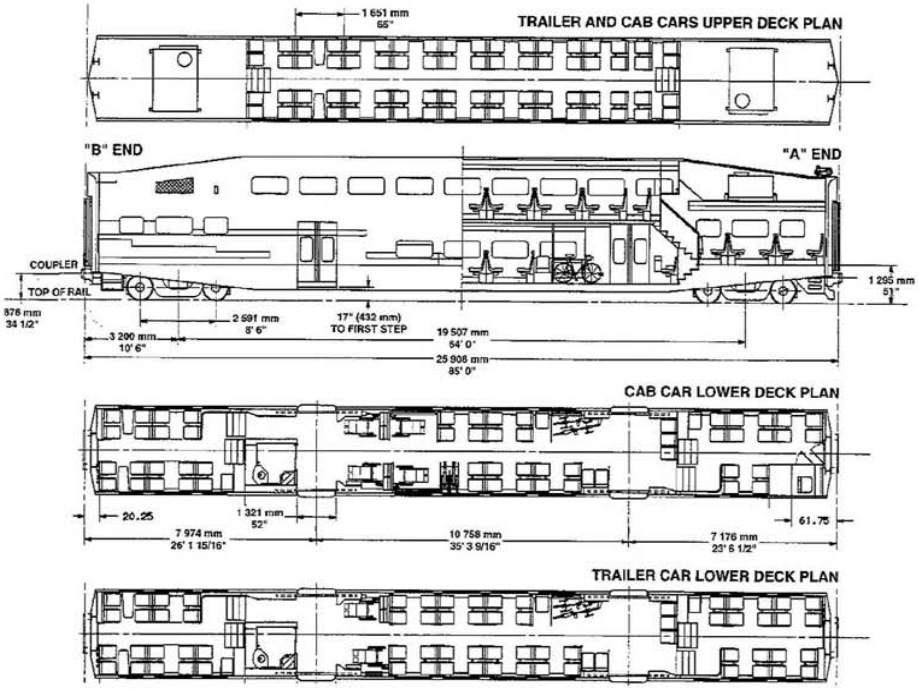
CAB CAR "A" End



CAB & TRAILER CAR "B" End



TRAILER CAR "A" End



Electrical System

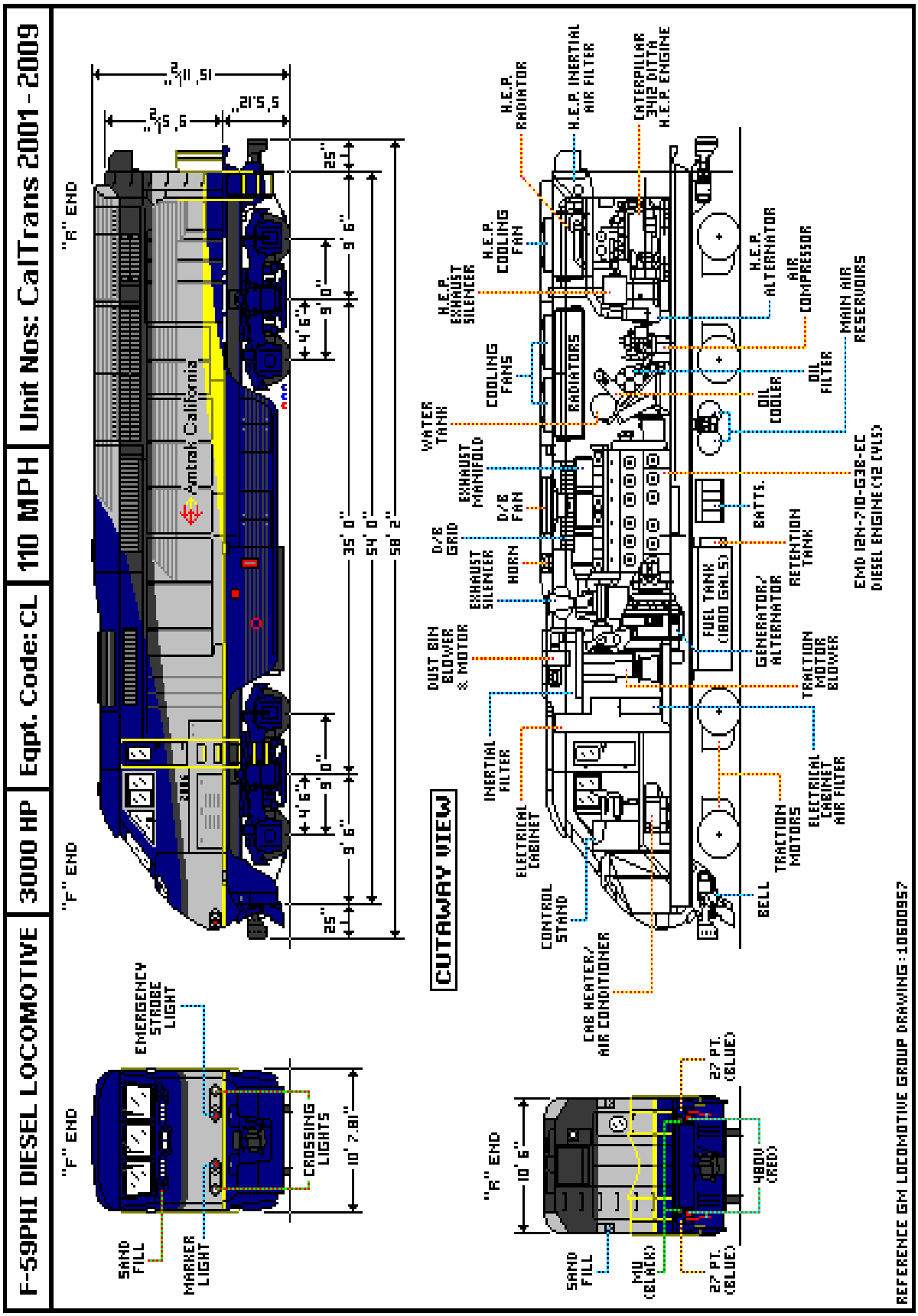
Power supply	480 V, 3 ph, 60 Hz head end power
Low-voltage power supply	36 VDC, nickel-cadmium emergency battery
Auxiliary power supply	Static battery charger and low-voltage power supply
Interior lighting	Fluorescent

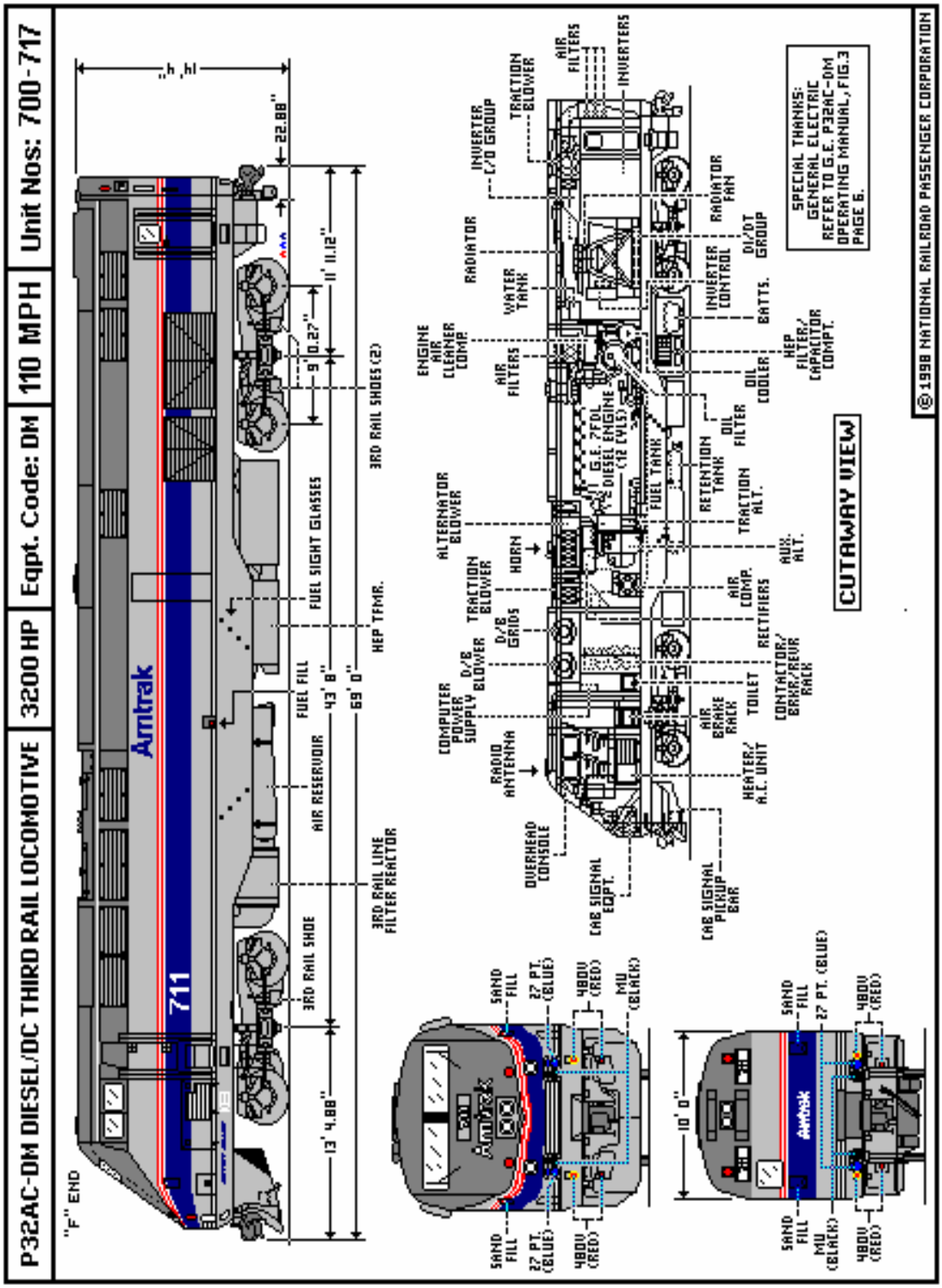
Performance

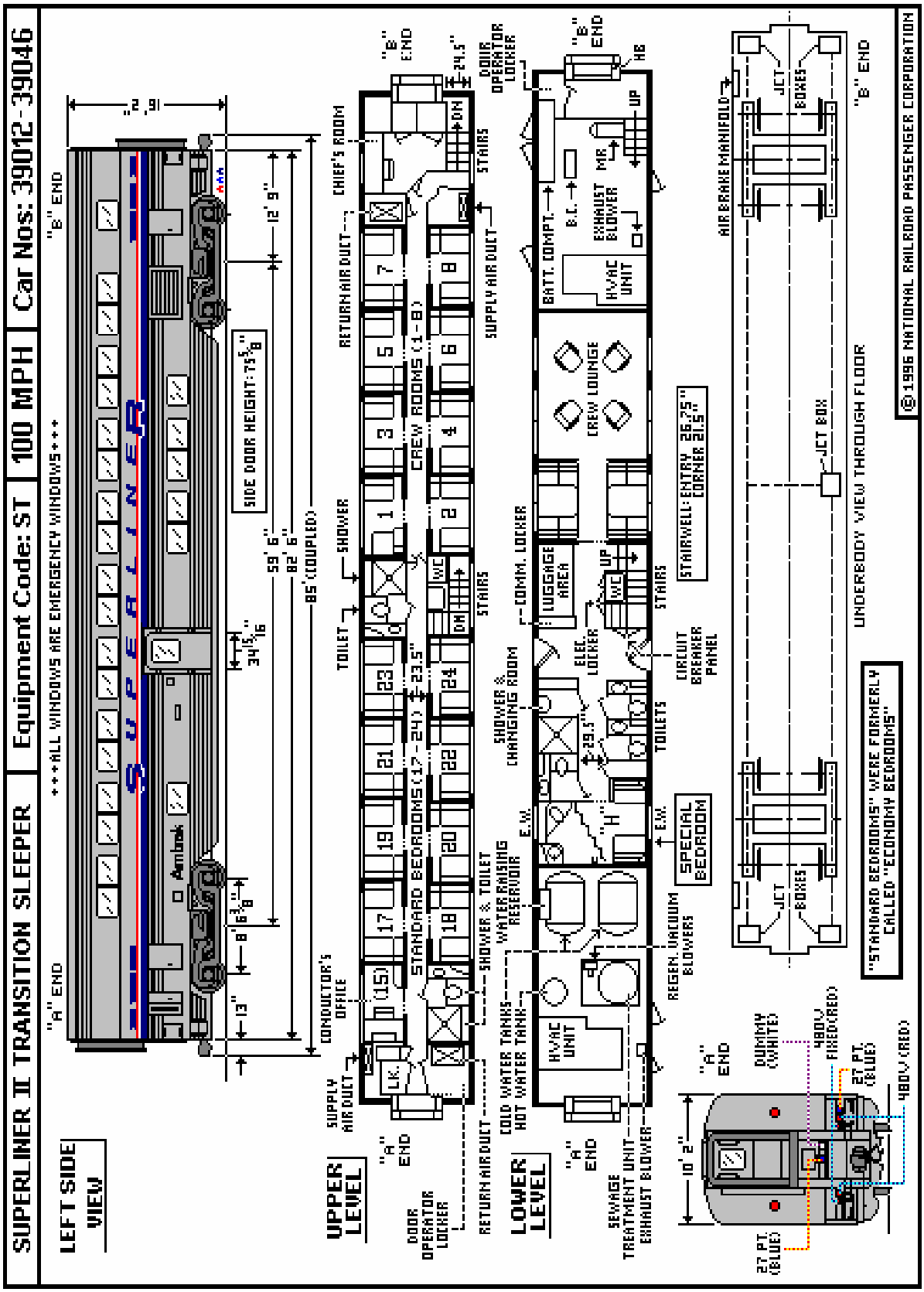
	Metric	Imperial
Maximum design speed	160.9 km	100 mph
Maximum operating speed	135.2 km	84 mph
Service braking	2.41 kmphps	1.5 mphps
Emergency braking	2.90 kmphps	1.8 mphps
Minimum horizontal curve radius	76.2 m	250 ft
Minimum vertical curve radius	609.6 m	2,000 ft

Dimensions

	Metric	Imperial
Length (over couplers)	25 908 mm	85' 0"
Length (over body ends)	25 705 mm	84' 4"
Width (over side sheets)	2 997 mm	9' 10"
Height (rail to roof)	4 851 mm	15' 11"
Height (rail to lower floor)	635 mm	2' 1"
Headroom (center aisle)	2 007 mm	6' 7"
Doorway width	1 321 mm	52"
Doorway height	1 981 mm	6' 6"
Step height (above standard low platform)	254 mm	10"
Step height (above top of rail)	432 mm	17"
Truck centers	19 507 mm	64' 0"
Truck wheelbase	2 591 mm	8' 6"
Track gauge	1 435 mm	4' 8 1/2"
Wheel diameter	838 mm	33"
Aisle width (upper deck)	735 mm	28' 15/16"
Aisle width (lower deck)	756 mm	29' 3/4"


F-59PHI DIESEL LOCOMOTIVE
3000 HP
Eqpt. Code: CL
110 MPH
Unit Nos: CalTrans 2001-2009
"F" END
"R" END
Amtrak California
CUTAWAY VIEW
H.E.P. RADIATOR
H.E.P. INERTIAL AIR FILTER
CATERPILLAR 3412 DITTA H.E.P. ENGINE
H.E.P. COOLING FAN
H.E.P. EXHAUST SILENCER
H.E.P. ALTERNATOR
AIR COMPRESSOR
COOLING FANS
RADIATORS
OIL COOLER
OIL FILTER
MAIN AIR RESERVOIRS
WATER TANK
EXHAUST MANIFOLD
EMD 12N-710-G3B-EC DIESEL ENGINE (12 CYLS)
D/B FAN
D/B GRID
BATTS.
EXHAUST SILENCER
HORN
FUEL TANK (1800 GALS.)
RETENTION TANK
DUST BIN BLOWER & MOTOR
GENERATOR/ ALTERNATOR
TRACTION MOTOR BLOWER
INERTIAL FILTER
ELECTRICAL CABINET
ELECTRICAL CABINET AIR FILTER
CONTROL STAND
TRACTION MOTORS
BELL
CAB HEATER/ AIR CONDITIONER
EMERGENCY STROBE LIGHT
CROSSING LIGHTS
SAND FILL
MARKER LIGHT
27 PT. (BLUE)
MU (BLACK)
HBOV (RED)
REFERENCE GM LOCOMOTIVE GROUP DRAWING: 10600957


P32AC-DM DIESEL/DC THIRD RAIL LOCOMOTIVE
3200 HP
Eqpt. Code: DM
110 MPH
Unit Nos: 700-717
CUTAWAY VIEW
SPECIAL THANKS: GENERAL ELECTRIC REFER TO G.E. P32AC-DM OPERATING MANUAL, FIG.3 PAGE 6.
©1998 NATIONAL RAILROAD PASSENGER CORPORATION
"F" END
Amtrak
711
22.88"
9' 0.27"
11' 11.12"
13' 4.88"
43' 8"
69' 0"
10' 0"
3RD RAIL SHOE
AIR RESERVOIR
FUEL FILL
FUEL SIGHT GLASSES
HEP TFMR.
3RD RAIL SHOES (2)
3RD RAIL LINE FILTER REACTOR
SAND FILL
27 PT. (BLUE)
HBOU (RED)
MU (BLACK)
ENGINE AIR CLEANER COMP
AIR FILTERS
RADIATOR
WATER TANK
INVERTER C/O GROUP
TRACTION BLOWER
AIR FILTERS
INVERTERS
RADIATOR FAN
INVERTER CONTROL
DI/DT GROUP
BATTS.
HEP FILTER/ CAPACITOR COMPT.
OIL COOLER
OIL FILTER
RETENTION TANK
TRACTION ALT.
AUX. ALT.
G.E. 7FDL DIESEL ENGINE (12 CYLS)
FUEL TANK
ALTERNATOR BLOWER
HORN
TRACTION BLOWER
D/B GRIDS
D/B BLOWER
COMPUTER POWER SUPPLY
RADIO ANTENNA
OVERHEAD CONSOLE
CAB SIGNAL EQPT.
CAB SIGNAL PICKUP BAR
AIR COMP.
RECTIFIERS
CONTACTOR/ BRKR/REVR RACK
AIR BRAKE RACK
TOILET
HEATER/ A.C. UNIT


SUPERLINER II TRANSITION SLEEPER
Equipment Code: ST
100 MPH
Car Nos: 39012-39046
LEFT SIDE VIEW
"A" END
"B" END
ALL WINDOWS ARE EMERGENCY WINDOWS
SUPERLINER
Amtrak
85' (COUPLED)
82' 6"
59' 6"
12' 9"
SIDE DOOR HEIGHT: 75 5/8"
UPPER LEVEL
LOWER LEVEL
CONDUCTOR'S OFFICE
STANDARD BEDROOMS (17-24)
CREW ROOMS (1-8)
CHIEF'S ROOM
TOILET
SHOWER
STAIRS
DOOR OPERATOR LOCKER
RETURN AIR DUCT
SUPPLY AIR DUCT
SHOWER & TOILET
WATER RAISING RESERVOIR
COLD WATER TANKS
HOT WATER TANK
HVAC UNIT
SEWAGE TREATMENT UNIT
EXHAUST BLOWER
SHOWER & CHANGING ROOM
COMM. LOCKER
LUGGAGE AREA
ELEC. LOCKER
TOILETS
REGEN. VACUUM BLOWERS
SPECIAL BEDROOM
CIRCUIT BREAKER PANEL
STAIRWELL: ENTRY 26.75" CORNER 21.5"
BATT. COMPT.
B.C.
EXHAUST BLOWER
MR
HB
HVAC UNIT
CREW LOUNGE
AIR BRAKE MANIFOLD
JCT BOXES
JCT BOX
UNDERBODY VIEW THROUGH FLOOR
"STANDARD BEDROOMS" WERE FORMERLY CALLED "ECONOMY BEDROOMS"
DUMMY (WHITE)
480V FIREBOX (RED)
27 PT. (BLUE)
480V (RED)
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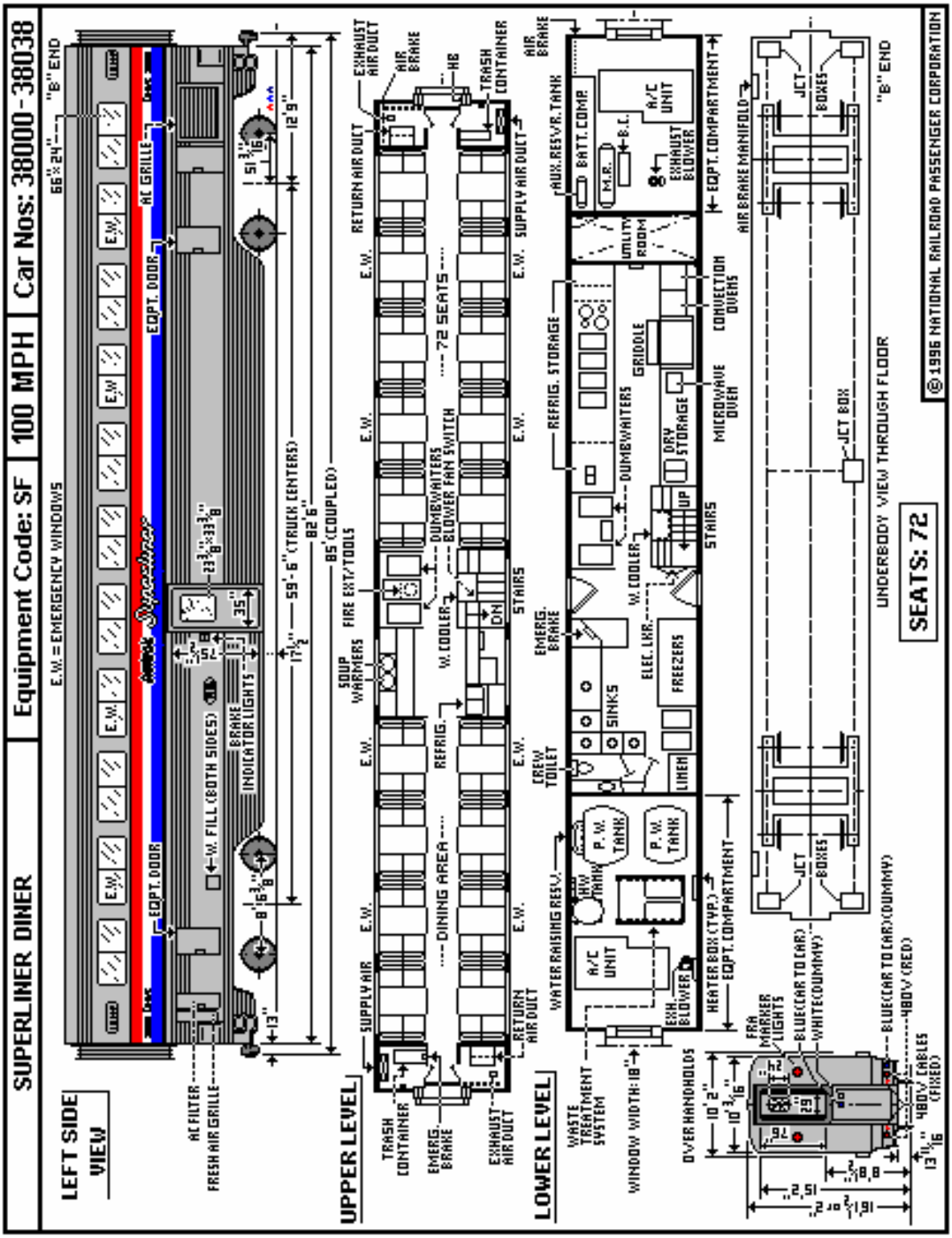
SUPERLINER DINER
Equipment Code: SF
100 MPH
Car Nos: 38000-38038
LEFT SIDE VIEW
E.W. = EMERGENCY WINDOWS
"B" END
66"x24"
EQPT. DOOR
A/C GRILLE
Amtrak Superliner
W. FILL (BOTH SIDES)
BRAKE INDICATOR LIGHTS
A/C FILTER
FRESH AIR GRILLE
59'-6" (TRUCK CENTERS)
82'6"
85' (COUPLED)
UPPER LEVEL
SUPPLY AIR
RETURN AIR DUCT
EXHAUST AIR DUCT
AIR BRAKE
HB
TRASH CONTAINER
SOUP WARMERS
FIRE EXT/TOOLS
DUMBWAITERS
BLOWER FAN SWITCH
W. COOLER
72 SEATS
STAIRS
REFRIG.
DINING AREA
EMERG. BRAKE
LOWER LEVEL
WATER RAISING RESV.
HW TANK
P.W. TANK
A/C UNIT
EXH. BLOWER
CREW TOILET
SINKS
LINEN
FREEZERS
ELEC. LKR.
REFRIG. STORAGE
GRIDDLE
CONVECTION OVENS
MICROWAVE OVEN
DRY STORAGE
UP
STAIRS
AUX. RESVR. TANK
BATT. COMP.
M.R.
B.C.
A/C UNIT
EXHAUST BLOWER
UTILITY ROOM
EQPT. COMPARTMENT
AIR BRAKE MANIFOLD
JCT BOXES
JCT BOX
HEATER BOX (TYP.)
WASTE TREATMENT SYSTEM
WINDOW WIDTH: 18"
OVER HANDHOLDS
FRA MARKER LIGHTS
BLUE (CAR TO CAR)
WHITE (DUMMY)
480V (RED)
480V CABLES (FIXED)
UNDERBODY VIEW THROUGH FLOOR
SEATS: 72
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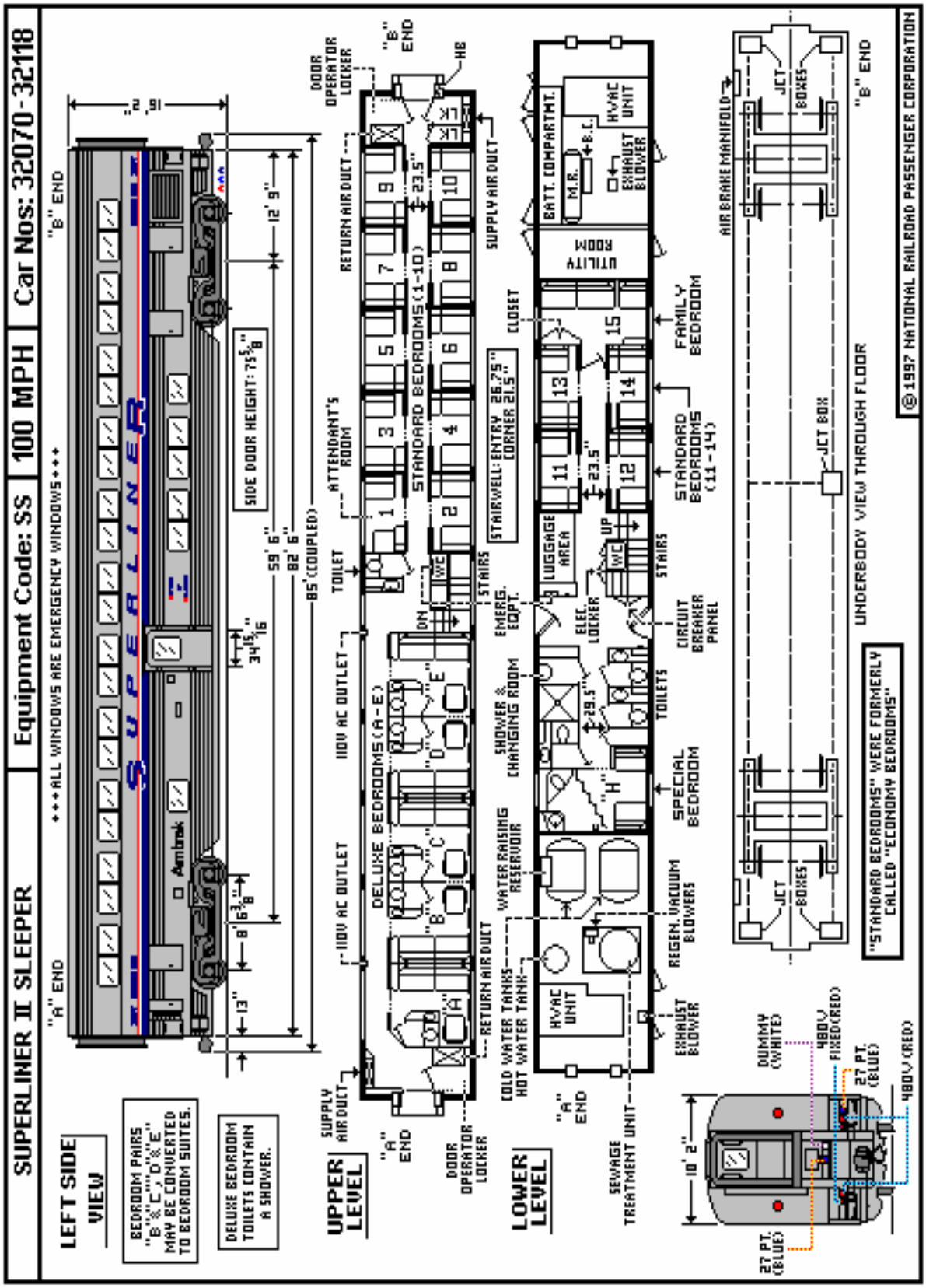
SUPERLINER II SLEEPER
Equipment Code: SS
100 MPH
Car Nos: 32070-32118
LEFT SIDE VIEW
+++ALL WINDOWS ARE EMERGENCY WINDOWS+++
"A" END
"B" END
SUPERLINER
Amtrak
SIDE DOOR HEIGHT: 75 5/8"
BEDROOM PAIRS "B"&"C","D"&"E" MAY BE CONVERTED TO BEDROOM SUITES.
DELUXE BEDROOM TOILETS CONTAIN A SHOWER.
UPPER LEVEL
LOWER LEVEL
DELUXE BEDROOMS (A-E)
STANDARD BEDROOMS (1-10)
ATTENDANT'S ROOM
TOILET
STAIRS
STAIRWELL: ENTRY 26.75" CORNER 21.5"
CLOSET
LUGGAGE AREA
UTILITY ROOM
BATT. COMPARTMT.
M.R.
H.C.
HVAC UNIT
EXHAUST BLOWER
FAMILY BEDROOM
STANDARD BEDROOMS (11-14)
SPECIAL BEDROOM
TOILETS
SHOWER & CHANGING ROOM
EMERG. EQPT.
ELEC. LOCKER
CIRCUIT BREAKER PANEL
WATER RAISING RESERVOIR
COLD WATER TANKS
HOT WATER TANK
REGEN. VACUUM BLOWERS
SEWAGE TREATMENT UNIT
110V AC OUTLET
SUPPLY AIR DUCT
RETURN AIR DUCT
DOOR OPERATOR LOCKER
AIR BRAKE MANIFOLD
JCT BOXES
JCT BOX
UNDERBODY VIEW THROUGH FLOOR
"STANDARD BEDROOMS" WERE FORMERLY CALLED "ECONOMY BEDROOMS"
DUMMY (WHITE)
480V FIXED (RED)
27 PT. (BLUE)
480V (RED)
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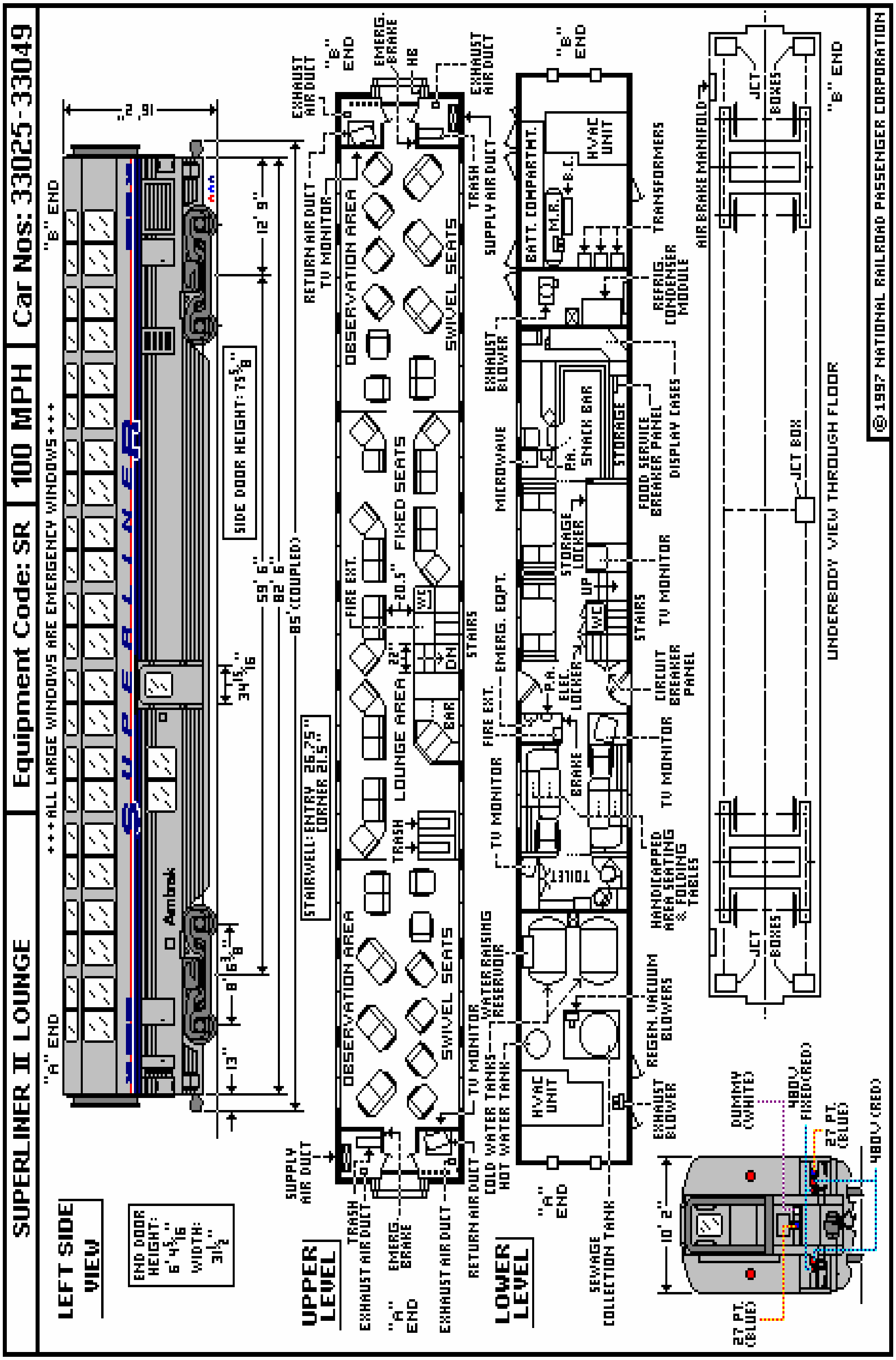
SUPERLINER II LOUNGE
Equipment Code: SR
100 MPH
Car Nos: 33025-33049
LEFT SIDE VIEW
+++ALL LARGE WINDOWS ARE EMERGENCY WINDOWS+++
"A" END
"B" END
SUPERLINER
Amtrak
END DOOR HEIGHT: 6' 4 5/16" WIDTH: 31 1/2"
SIDE DOOR HEIGHT: 75 5/8"
STAIRWELL: ENTRY 26.75" CORNER 21.5"
59' 6"
82' 6"
85' (COUPLED)
12' 9"
16' 2"
13"
8' 6 3/8"
34 15/16"
UPPER LEVEL
OBSERVATION AREA
SWIVEL SEATS
LOUNGE AREA
FIXED SEATS
TRASH
BAR
STAIRS
FIRE EXT.
TV MONITOR
RETURN AIR DUCT
EXHAUST AIR DUCT
SUPPLY AIR DUCT
EMERG. BRAKE
HB
LOWER LEVEL
HVAC UNIT
BATT. COMPARTMT.
TRANSFORMERS
REFRIG. CONDENSER MODULE
EXHAUST BLOWER
MICROWAVE
SNACK BAR
STORAGE
FOOD SERVICE BREAKER PANEL
DISPLAY CASES
STORAGE LOCKER
TV MONITOR
EMERG. EQPT.
ELEC. LOCKER
CIRCUIT BREAKER PANEL
BRAKE
TOILET
HANDICAPPED AREA SEATING & FOLDING TABLES
WATER RAISING RESERVOIR
COLD WATER TANKS
HOT WATER TANK
REGEN. VACUUM BLOWERS
SEWAGE COLLECTION TANK
AIR BRAKE MANIFOLD
JCT BOXES
JCT BOX
UNDERBODY 'VIEW THROUGH FLOOR
10' 2"
DUMMY (WHITE)
480V FIXED (RED)
27 PT. (BLUE)
480V (RED)
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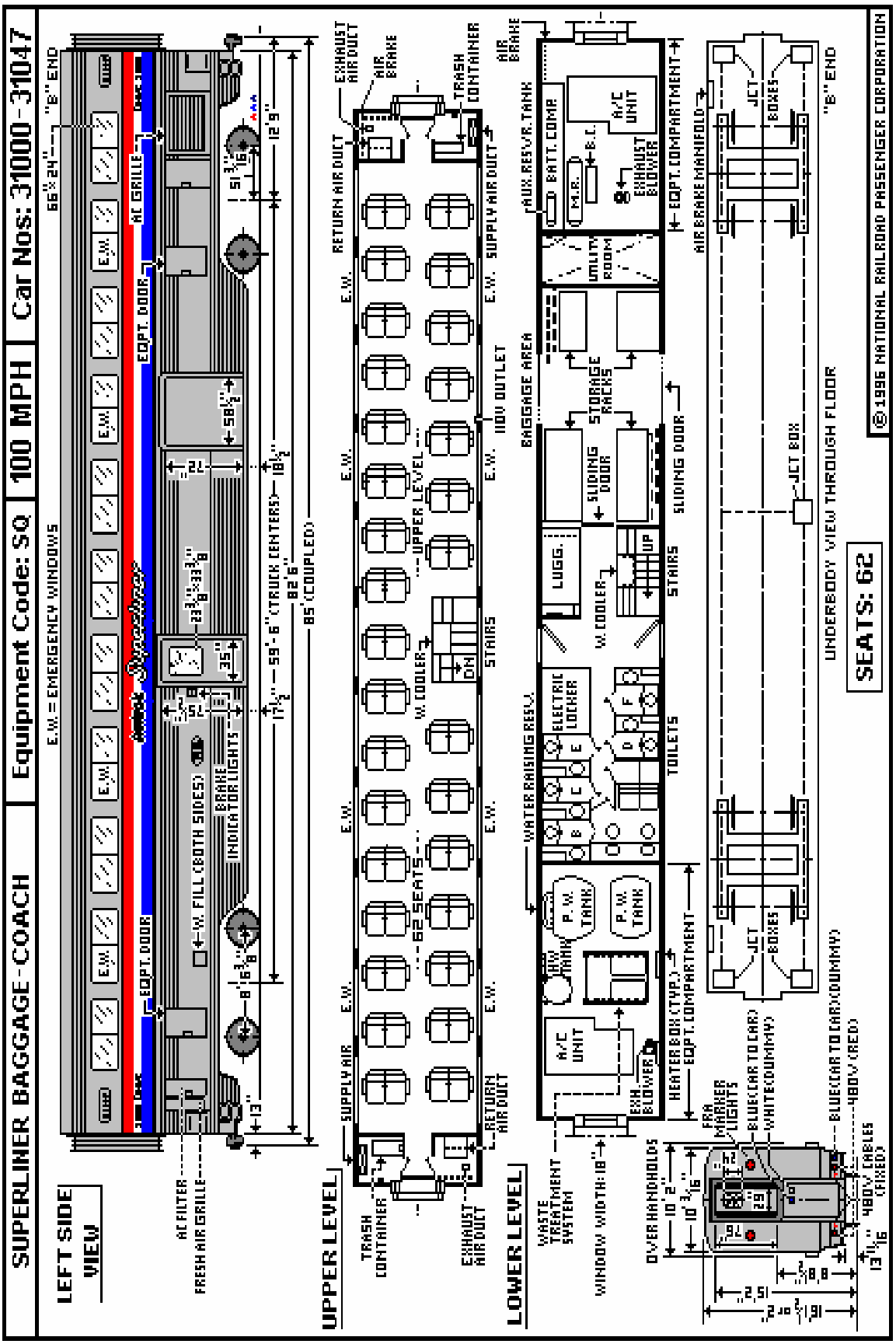

SUPERLINER BAGGAGE-COACH
Equipment Code: SQ
100 MPH
Car Nos: 31000-31047
LEFT SIDE VIEW
E.W. = EMERGENCY WINDOWS
"B" END
AC GRILLE
EQPT. DOOR
W. FILL (BOTH SIDES)
BRAKE INDICATOR LIGHTS
AC FILTER
FRESH AIR GRILLE
UPPER LEVEL
LOWER LEVEL
62 SEATS
W. COOLER
STAIRS
SUPPLY AIR
RETURN AIR DUCT
EXHAUST AIR DUCT
TRASH CONTAINER
RETURN AIR DUCT
SUPPLY AIR DUCT
AIR BRAKE
TRASH CONTAINER
HOV OUTLET
BAGGAGE AREA
STORAGE RACKS
SLIDING DOOR
AUX. RESVR. TANK
BATT. COMP.
M.G.
B.C.
A/C UNIT
EXHAUST BLOWER
UTILITY ROOM
EQPT. COMPARTMENT
AIR BRAKE MANIFOLD
JCT BOXES
JCT BOX
"B" END
UNDERBODY VIEW THROUGH FLOOR
SEATS: 62
©1996 NATIONAL RAILROAD PASSENGER CORPORATION
WATER RAISING RESV.
ELECTRIC LOCKER
LUGG.
W. COOLER
SLIDING DOOR
STAIRS
TOILETS
P.W. TANK
H.W. TANK
A/C UNIT
EXH. BLOWER
HEATER BOX (TYP.)
EQPT. COMPARTMENT
WASTE TREATMENT SYSTEM
WINDOW WIDTH: 18"
OVERHANDHOLDS
FRA MARKER LIGHTS
BLUECAR TO CAR WHITE(DUMMY)
BLUECAR TO CAR(DUMMY)
480V (RED)
480V CABLES (MIXED)

GLOSSARY

Active warning devices: Electrical warning devices such as flashing lights, ringing bells and crossing arms that are located at grade crossings which warn of an approaching train.

Angle cock: A valve that is located at the end of each car which controls the compressed air flow on the air brake system and main reservoir systems.

Cab Car Forward: Virtually all commuter railroads in North America operate their trains using the locomotive/cab car forward configuration. The locomotive (train engine) is at one end of the train, and a control cab is at the other. When the train arrives at the end of the trip, the engineer moves from the locomotive cab to the cab car. The engineer then operates the train from the cab car for the return trip. This allows the train to be controlled by a locomotive engineer at the front of the train at all times.

Dynamic Brake Grid: When the locomotive engineer activates the dynamic braking system, the traction motors (electric motors on each axle of the locomotive) act as generators. This retarding action is used to slow the train. The electricity produced is sent to a grid located on the roof of the locomotive where a fan blows the heat into the atmosphere. First responders should avoid contact with this grid unless it has been confirmed that the grid is not hot.

Glad hand: A heavy, metal fitting which connects air hoses between locomotives and cars in a train consist. The glad hands are designed to come apart when the locomotives or cars are disconnected. When the hoses are stretched parallel to the ground, the glad hands separate. The combination of air pressure in the hoses and the weight of the glad hands can cause them to whip violently and cause serious injuries.

Head End Power (HEP): Electrical power generated on a passenger locomotive which provides 480 volts to passenger cars. This electricity is used for cooking, lighting, 110-volt outlets and public address systems.

Milepost/Mile Marker: Mileposts are used to specify exact locations on the railroad right-of-way. Milepost zero is traditionally located at the headquarters of the railroad. Railroad mileposts are not equivalent to mile markers on highways; even if the railroad right-of-way and the highway are parallel each other.

Signal House: A small building used to house electrical components at public crossings with active warning devices. The outside wall shows the name of the railroad, the emergency telephone number and the milepost number. It also displays the Department of Transportation or DOT number. This number, consisting of six digits and a letter, is a unique identification number for that specific crossing. Commercial electrical power, 110 or 220 volts AC, is supplied to this building. These warning devices are powered by approximately 11 volts DC. Emergency batteries supply power in the event that commercial power fails.

APPENDIX C—STATION DATA SHEETS

FOREST HILL STATION - MUNI

Entrance	Dewey Boulevard and Laguna Honda Blvd.
Street Box	8641
Fire Alarm Panel	Mezzanine level opposite station agents booth
Sprinkler Controls	Platform level
Sprinkler Inlets (building)	N/A
Wet Standpipe Inlets (tunnel underground)	at 131 Lennox: 50 feet East of entrance
MUNI Wet Undercar Sprinkler Control	Lock box on wall at mid platform both sides
Equipment Box	Mezzanine Level
Inspecting Company	Engine 20
Inspection Schedule	January and July
Keys	Street Fire Alarm Box 8641
Phone	Mid platform each side near the sprinkler controls

WEST PORTAL STATION - MUNI

Entrance	West Portal and Ulloa
Street Box	8611
Fire Alarm Panel	In MUNI Central at 131 Lennox
Wet Standpipe Inlets (underground)	at 131 Lennox: 50 ft. East of entrance
Equipment Box	East end of platform
Inspecting Company	Engine 39
Inspection Schedule	June and December
Keys	Fire Alarm Box 8611
Phone	Mid Platform on both sides of station

CASTRO STREET STATION - MUNI

Entrance	Market and Castro
Street Box	5253 - Market and Castro
Fire Alarm Panel	Room 105
Sprinkler Controls	Room 102
Sprinkler Inlets	Street side of North entrance bulkhead at Castro and Market
Wet Standpipe Inlets	Street side of North entrance bulkhead at Castro and Market
MUNI Wet Undercar Sprinkler Control	At one end of platform, depending on trackway Control switches are located in gray box. Accessible with firehouse key.
Equipment Box or Room	Mezzanine level on the South side near the station agent booth
Inspecting Company	E21
Inspection Schedule	June and December
Keys	Street Box 5253
Phone	Mid platform on both sides of station
Emergency Exit	In front of 2377 and 2380 Market Street. Eureka and Market. In front of 2645 and 2652 Market Street. Emergency exit key in box 5253.

CHURCH STREET STATION - MUNI

Entrance	Church and Market
Street Box	5213 - Church and Market
Fire Alarm Panel	Room 108
Sprinkler Controls	Room 115
Sprinkler Inlets	Church and Market. Street side of North entrance bulkhead.
Wet Standpipe Inlets	Church and Market. Street side of North entrance bulkhead.
MUNI Wet Undercar Sprinkler Control	At one end of platform, depending on trackway. Control switches are located in gray box. Accessible with firehouse key.
Equipment Box or Room	Mezzanine level near station agents booth.
Inspecting Company	Engine 6
Inspection Schedule	May and November
Keys	Box 5213 - Church and Market
Phone	Mid Platform on both sides

VAN NESS STATION - MUNI

Entrance	Van Ness and Market
Street Box	3211 - Van Ness and Oak
Fire Alarm Panel	Room 105
Sprinkler Controls	Room 111
Sprinkler Inlets	South side of Market, sidewalk box approximately 25 feet West of 11th Street.
Wet Standpipe Inlets	South side of Market, sidewalk box approximately 25 feet West of 11th Street.
MUNI Wet Undercar Sprinkler Control	OS&Y valves in WSP cabinets on platform
Equipment Box or Room	East end of platform
Inspecting Company	E36
Inspection Schedule	April and October
Keys	Box 3211 Van Ness and Oak
Phone	Mid platform

BALBOA PARK - BART

Entrance	Geneva and San Jose
Street Box	8313 - Geneva and San Jose
Surface Command Post Box	Geneva and San Jose - West side of Geneva Street
Fire Alarm Panel	Room 104
Sprinkler Controls	Room 101
Sprinkler Inlets	Sidewalk box at North East corner of Interstate I-280 and Geneva Avenue.
Wet Standpipe Inlets (station)	Sidewalk box at North East corner of Interstate I-280 and Geneva Avenue.
Keys	Surface Command Post Box and Box 8313 at Geneva and San Jose
Emergency Phone	PABX at platform and in station agents booth
Emergency Exit	East end of platform exits to Ocean Avenue. West end exits to Geneva Ave.

GLEN PARK STATION - BART

Entrance	Diamond and Bosworth
Street Box	8261 - Monterey and Diamond
Surface Command Post Box	Surface station entrance
Fire Alarm Panel	Room 203. Enter through Room 101 then downstairs to Room 203.
Sprinkler Controls	Room 105. Adjacent to ticket purchase area
Sprinkler Inlets	Opposite 2930 Diamond Street. Sidewalk box on the East side of Diamond Street midway between Monterey and Bosworth.
Wet Standpipe Inlets	Same as above.
BART Dry Undercar Sprinkler Inlets	Throughout platform level. Adjacent to zone on opposite side of platform.
Equipment Box	Hose cabinets on platform.
Inspecting Company	E26
Inspection Schedule	June & December
Keys	Surface Command Post Box. Street box 8261 at Monterey and Diamond. Emergency exit keys (BART master key) in Box 5626 - Mission and Courtland.
Phone	PABX at platform and in station agents booth.
Emergency Exit	Each end of platform. East end exits to opposite 38 Wilder. West end exits to opposite 2948 Diamond, Trackway exits in-front-of 3128 mission. Emergency exit structure from trackway at Mission and Randal.

24TH AND MISSION STREETS - BART

Entrance	24th and Mission
Street Box	5525 - 24th and Osage
Surface Command Post Box	Southwest corner 24th and Mission entrance at top of stairway.
Fire Alarm Panel	Room 101
Sprinkler Controls	Room 101
Sprinkler Inlets	Sidewalk box West side of Mission approximately 75 feet south of 24th Street.
Wet Standpipe Inlets	Same as above.
BART Dry Undercar Sprinkler Inlets	Throughout platform level. Adjacent to zone on opposite side of platform.
Equipment Box or Room	Hose cabinets on platform
Keys	In Surface Command Post box and Street Box 5525, 24th and Osage.
Phone	PABX at platform and in station agents booth.
Emergency Exit	In front of 2770-76 Mission . Key in surface Command Post box.

16TH AND MISSION STREETS - BART

Entrance	16th and Mission
Street Box	5236 - 16th and Mission
Surface Command Post Box	Southwest corner of 16th and Mission Street entrance at top of escalator.
Fire Alarm Panel	Room 101
Sprinkler Controls	Room 101
Sprinkler Inlets	Sidewalk box on the west side of Mission approximately 75 feet south of 16th Street.
Wet Standpipe Inlets	Same as above.
BART Dry Undercar Sprinkler Inlets	Throughout platform level. Adjacent to zone on opposite side of platform.
Equipment Box or Room	Hose cabinets on platform
Keys	Surface command box at Street Box 5236.
Phone	PABX at platform and station agents booth
Emergency Exit	In front of 1968-1980 Mission Street between 15th and 16th Streets. Key located in surface Command Post box.

CIVIC CENTER STATION - BART AND MUNI

Entrance	7th and Market. 8th and Market. In front of 1145 Market. On plaza across from 1145 Market.
Street Box	2316 - 7th and Market
Surface Command Post Box	In front of 1145 Market
Fire Alarm Panel	Room 105
Sprinkler Controls	Room 103
Sprinkler Inlets	In front of 1170 Market Street
Wet Standpipe Inlets	Same as above. Separate box from sprinkler inlets.
MUNI Wet Undercar Sprinkler Control	In wet standpipe cabinet on platform. OS&Y valve
BART Dry Undercar Sprinkler Inlets	At opposite ends of the platform on the same side with the center zone fed from both ends.
Equipment Box or Room	East end of platform on MUNI level. BART hose cabinets on platform.
Inspecting Company	Engine 1
Inspection Schedule	March and September
Keys	Surface Command Post Box and Street Box 2136.
Phone	MUNI at approximately mid-platform. BART PABX at platform and station agents booth.

Powell Street Station - BART and MUNI

Entrance	In front of 780, 799, 800, 875, and 901 Market Street. Ben Swig Pavilion
Street Box	1364
Surface Command Post Box	In front of 901 Market
Fire Alarm Panel	Room 102. Northwest side of station.
Sprinkler Controls	South side of station in the rear of the Men's rest room.
Sprinkler Inlets	North side of Market Street near Stockton. In front of 786 Market Street on side of entrance bulkhead. South side of Market Street opposite Powell, in-front-of 875 Market Street
Wet Standpipe Inlets	Wet standpipe system for tunnel between Powell and Civic Center, approximately in-front-of 1170 Market.
MUNI Wet Undercar Sprinkler Control	Hydrant valves at west end of station for T/L. East end of station for T/R.
BART Dry Undercar Sprinkler Inlets	At opposite ends of the platform on the same side with the center zone fed from both ends.
Equipment Box or Room	East end on MUNI platform level. BART hose cabinets on platform.
Inspecting Company	Engine 8
Inspection Schedule	February and August
Keys	Surface Command Post Box at street box 1364
Phone	MUNI - mid platform . BART PABX at platform and station agents booth.

MONTGOMERY STREET STATION - BART AND MUNI

Entrance	In front of 544, 575, 595 Market Street. New Montgomery and Market Streets. Market and Post Streets.
Street Box	1236 Montgomery and Post
Surface Command Post Box	Southwest side of New Montgomery and Market Streets
Fire Alarm Panel	Room 101A. Northeast side of station.
Sprinkler Controls	Room 106. Southeast side of station.
Sprinkler Inlets	South side of Market Street near 2nd Street. In front of 595 Market Street on the side of the entrance bulkhead.
Wet Standpipe Inlets	Same as above.
MUNI Wet Undercar Sprinkler Control	Wall hydrant valves at west end of station for T/L. East end of station for T/R.
BART Dry Undercar Sprinkler Inlets	At opposite ends of the platform on the same side with the center zone fed from both ends.
Equipment Box or Room	East end on MUNI Platform level. BART hose cabinets on platform.
Inspecting Company	Engine 13
Inspection Schedule	January and July
Keys	Surface Command Post Box and Street box 1236
Phone	MUNI dedicated phone at mid platform . BART PABX at platform and Station Agents booth.

EMBARCADERO STATION - BART AND MUNI

Entrance	Market and California. Market and Main
Street Box	2815 Market and Main
Surface Command Post Box	North side of Market between Main and Beal
Command Post	Interior: Station mezzanine level. Controls are in Room 105.
Fire Alarm Panel	Room 101A. Northwest corner of building through Room 100C and down corridor.
Sprinkler Controls	Room 107, directly across from command post.
Sprinkler Inlets	North side of Market opposite Main Street at elevator
Wet Standpipe Inlets	Same as above
MUNI Wet Undercar Sprinkler Control	Supervisors booth west end of platform
BART Dry Undercar Sprinkler Inlets	Throughout platform level. Adjacent to zone on same side of platform.
Equipment Box or Room	East end of BART platform
Inspecting Company	Engine 35
Inspection Schedule	April and October
Keys	Surface Command Post Box. Fire alarm street box 2815 at Market and Main Streets. Vent structure keys (Ref. 2.1 of this manual) Eletric Golf Cart Keys in Box 912
Phone	MUNI phone located at Supervisors booth on west end of MUNI platform. BART phones are located in Command Post on mezzanine level. BART PABX phone on platform and station agents booth.
Street Elevator	North side of Market Street opposite Main Street.

APPENDIX D - BART & MUNI METRO WSP AND SPRINKLER INLETS

THE FOLLOWING WSP INLETS SUPPLY BART & MUNI:

Embarcadero and Folsom on the bulkhead wall at the portal
Justin Herman vent structure

1. SF Vent. Structure 200 yards East of the Ferry Bldg. at vent structure entrance
2. IFO 202 Market St. (Market & Main near BART elevator)
3. IFO 595 Market St.
4. IFO 786 Market St. (supplies station East concourse only; no tunnel supply)
5. IFO 891 Market St.
6. IFO 1168 Market St.

The following WSP inlets serve BART ONLY. These serve both tunnel WSP and station automatic sprinkler system.

7. IFO 1914/1922 Mission
8. IFO 2012 Mission
9. IFO 2040 Mission
10. IFO 2644 Mission
11. IFO 2812 Mission
12. IFO 2834 Mission
13. Corner of San Jose and Mission (at Randall) in side of emergency exit concrete house
14. IFO 3188 Mission
15. Across from 2928 Diamond (Glen Park station)
16. Next to # 42 Colonial Way (inlets in cyclone fence)
17. End of Sgt. John V. Young drive in front of Ingleside Police Station (inlets in cyclone fence)
18. Next to # 53 Nashua St. (inlets in cyclone fence)
19. Geneva and Balboa at Freeway entrance under sidewalk plate

The following WSP inlets supply MUNI METRO ONLY

20. IFO 1515 Market St.
21. IFO 2100 Market St.; Church St. station bulkhead entrance

22. IFO 2420 Market St.; Castro St. station bulkhead entrance
23. North side of Market St. East of Octavia under freeway; (in sidewalk box; supplies tunnel underground only)
24. South/East corner of Eureka and Market St. (supplies tunnel underground only)
25. At 131 Lennox St. approximately 50 ft. North of bldg. entrance (supplies tunnel underground only)
26. At 131 Lennox St. approximately 25 ft. South of bldg. entrance (supplies bldg. sprinkler system only)
27. Duboce & Scott St. (supplies tunnel underground only)
28. Cole & Carl St. (supplies tunnel underground only)

APPENDIX E - BART AND MUNI EMERGENCY EXIT LOCATIONS

There are emergency exits located at various points along the BART and MUNI systems. Many of these are through stairways which exit from inside the station or underground trackway to the surface through sidewalk trapdoors. From the inside these are operable through the use of installed panic bars. Access through the trapdoors from the outside is through a special wrench which fits into either a male or female fitting in the sidewalk trapdoor. This wrench then operates a spring loaded lock when turned.

Wrenches are issued to Battalion Chiefs and companies who respond to locations along the BART/MUNI lines where these emergency trap doors are located (first alarm companies). These wrenches are also located in the BART surface Command Post box at 16th, 24th and Glen Park station and in box 5253 at 17th and Castro (MUNI).

Pre inspection of these emergency exits and locations is essential to insure familiarization with individual conditions which may vary from location to location or station to station.

BART EMERGENCY EXITS

16th and Mission Station - in-front-of 1968 -1980 Mission Street (between 15th and 16th)

23rd and Mission Station - In front of 2776 Mission Street (between 23rd and 24th)

Valencia and Mission - In front of 3182-3184 Mission Street at Wilder Street - Across from #38 Wilder Street inside BART facility. Enter through locked gate with BART master key available from BART surface Command box at Glen Park Station or inside Street Box 8261 Monterey and Diamond, and Street Box 5626 at Mission and Courtland.

Glen Park Station - in sidewalk across from 2948 Diamond Street

Note: All of the above BART emergency exits are sidewalk trapdoors which require special wrench to open. These are found inside BART surface command boxes as indicated above and have been issued to Battalion Chief's and first alarm companies who respond to these locations

Mission and Randall Streets - North corner; stairway leads from trackway to door in concrete hut on surface at N corner of Mission and Randall: access to the door is with key located in the fire alarm box at Mission and Cortland, box 5626, or BART master key on BART key ring.

MUNI Emergency Exits

In front of 2652, 2645, 2377 and 2380 Market Street are sidewalk trapdoors operable from outside by use of special wrench (in Box 5253 and on first alarm companies and Battalion Chief's vehicles).

At the Northwest corner of Market and Buchanan Street in the MUNI gated property (Duboce Stairway). Access to area with key located in lock box atop of gate. A special wrench for the trapdoor is carried by first alarm companies and also stored in the Red Dedicated Fire Phone Box at the Duboce Portal entrance.

APPENDIX F - INCIDENT CHECK LISTS

Non Transbay Tube
BART Incident Check List

1st ACTIONS

1. ☐ Contact BART Operations Control Center (OCC)
   ☐Use PABX phones (station agents booth or platform)
   ☐ (BART police) 510-464-7000 or through the . Access line is 415-552-9161

What is happening?_____

_____

_____

_____

2. INCIDENT LOCATION and DESCRIPTIONTrack # ____Mile Post #____Door #_____
   How many cars in train? ____ Which/how many cars involved?_____
   ☐ Fire ☐ Non-fire (Accident, etc.) ☐ Accident Description:_____

   _____

_____

Passenger load per car:		☐ seated 72	☐ standing 120	☐ crush 150
Handicapped aboard:		☐ Yes	☐ No	How many? _____
Ventilation system working		☐ Yes	☐No	
Direction of smoke flow		_____		
Evacuation:		☐ Yes	☐ No	Start Time_____
			Completion_____	
Status of 3rd rail:	M-1	☐ ON		☐ OFF
	M-2	☐ ON		☐ OFF

2nd ACTIONS

- ☐ Order rescue train for OPPOSITE TRACK
- ☐ Order BART Emergency Vehicle to respond to station for use on incident track way *if necessary* (may take up to one hour to arrive on scene)
- ☐ Establish Communications:
- ☐ Department of Emergency Communications (relay from Surface Command Box or METS local 2268 or 2269, or Division Chief Command Channel)
- ☐ Underground tactical channel is BART radio on System 1, Group 1. Additional channels avialble on System 1 are Group 2 and 11-13
- ☐ All units also operate on SFFD Motorola Radio channel C7 in repeater mode (backup)
- ☐ Verify with Comm. Center that base repeaters are turned on for underground to surface capability of channel C7. SFFD portable radio must be in repeater mode
- ☐ If operations section required, System 1 Group 11 is recommended underground command channel

(over)

- ☐ Drivers of engine companies shall report to Surface C.P. Box. From this location drivers can be directed to assignments (standpipe inlets) by those staffing Surface C.P.
- ☐ WSP inlets on each side of incident located and dry lines led into

Note: BART Radio System 2 Group 1 High Level Fire/EMS channel, is compatible with SFFD radio channel C7

Incident Commander_____ Date_____

Transbay Tube
BART Incident Check List

1st ACTIONS

1. ☐ Contact BART Operations Control Center (OCC)

- ☐ PABX Phone in Command Post
- ☐ BART police (510)-464-7000 or through Department of Emergency Communications.

What is happening?_____

_____

If incident warrants rescue:

- ☐ **Order rescue train for NON-INCIDENT BORE IMMEDIATELY**
- ☐ Insure that valves for 8 inch water main opened

2. **INCIDENT LOCATION and DESCRIPTION** Track # _____ Mile Post #_____ Door #_____

How many cars in train? ____ Which/how many cars involved?_____

☐ Fire ☐ Non-fire (Accident, etc.) ☐ Accident Description:_____

_____

Passenger load per car:	☐ seated 72	☐ standing 120	☐ crush 150
Handicapped aboard:	☐ Yes	☐ No	How many? _____
Ventilation system working	☐ Yes	☐ No	

Direction of smoke flow _____

Evacuation: ☐ Yes ☐ No Start Time_____

Completion_____

Status of 3rd rail:	M-1	☐ ON	☐ OFF
	M-2	☐ ON	☐ OFF
Damper open:		☐ ID#_____	☐ Over gallery door # _____

(over)

2nd ACTIONS

☐ Establish Communications:

- ☐ Department of Emergency Communications (SFFD Main Line, METS local 2268 or 2269) Assigned Control Channel or Division Chief Command Channel
- ☐ Undeground tactical channel is BART radio on System 1, Group 1 (SFFD)
- ☐ Undeground radio command channel is BART radio on System 1, Group 11 (agreement between SFFD and Oakland)
- ☐ All units also operate on SFFD Motorola Radio channel C7 in repeater mode (backup)
- ☐ Verify with Comm. Center that base repeaters are turned on for underground to surface capability of channel C7. SFFD portable radio must be in repeater mode
- ☐ Oakland Fire Department Command Post (Yellow Fire Phone)
- ☐ O. F. D. Incident Commander (Red Phone at Oakland Command Post)
- ☐ (San Francisco) Branch A leader or Operations Officer (in tube at cross passage door)on BART Radio System 1 Group 1, and SFFD Motorola Radio on C7(repeater mode). ISS (if avabile) on BART Radio System 1 Group 11(underground radio command channel), and plugged into Yellow Fire Phone jack.
- ☐ Additional Bart Radio channels available on System 1 are Group 2 and 12-13. BART Radio System 2 Group 1 High Level Fire/EMS channel, is compatible with SFFD Motorola Radio channel C7

NOTE:

1. Any incident WEST of Mile Post 4.25 is within the jurisdiction of the SFFD. These numbers increase coming from Oakland toward San Francisco.
2. Doors within the Transbay Tube are numbered from 0 to 78 starting at 0 on the San Francisco end of the tube. Doors 0 to 43 are on the San Francisco side of the tube.
3. ICS Terminology: At all BART Transbay Tube incidents.
    - SFFD rescue train will be designated as: *(San Francisco) BRANCH A*
    - Oakland Fire Department rescue train will be designated as: *(Oakland) BRANCH B (OFD)*

Incident Commander_____ Date _____

MUNI Metro Command Post
Incident Check List

1st ACTIONS

1. ☐ **Contact MUNI Central**:
   - ☐ Dedicated Fire Phone
   - ☐ METS Local # 4054 (Access line is 415-552-9161)
   - ☐ **Contact Battalion Chief at MUNI Central**
     - ☐ Tactical Channel of 1st due Battalion chief
     - ☐ METS Local # 4054 or dedicated Red Phone

   What is happening?_____

   _____

   If incident warrants rescue:

   - ☐ **Order rescue train for NON-INCIDENT TRACK IMMEDIATELY.**
   - ☐ MUNI Operator to get clearance from MUNI Central .
   - ☐ Load rescue train with necessary personnel/equipment
   - ☐ Order driver (Rescue Train) to proceed:
   - ☐ **I**f necessary, Supplement supply to WSP (see Emergency Operations Binder in Chief's vehicles for list of inlet locations.)

2. **INCIDENT LOCATION and DESCRIPTION**

   ☐ Inbound Track ☐ Outbound Track ☐ Mile Post #_____

   ☐ Fire ☐ Non-fire ☐ Accident Description:_____

   _____

   Ventilation system working ☐ Yes ☐ No

   Direction of smoke flow ☐ Inbound ☐ Outbound

   Evacuation ☐ Yes ☐ No Start _____

   Completion _____

2nd ACTIONS

- ☐ Maintain Communications with
  - ☐ Department of Emergency Communications
    - ☐ Division Chief Command Channel
    - ☐ Dedicated Fire Phone
    - ☐ METS 2268 or 2269.
    - ☐ Blue light station phone
  - ☐ MUNI Central Battalion Chief
    - ☐ Tactical Channel of 1st due Battalion chief
    - ☐ Dedicated Fire Phone
    - ☐ METS Local # 4054
  - ☐ Adjacent stations:
    - ☐ Tactical Channel of 1st due Battalion chief
    - ☐ Dedicated Fire Phone
    - ☐ Blue Light Station Phone

NOTE: The tactical channel is that of the 1st due Battalion Chief; the dedicated fire phone, METS, or Division Chief Command Channel to Department of Emergency Communications.

Incident Commander_____ Date _____

MUNI Central Checklist
131 Lennox Street
Lennox Division

1st ACTIONS

1. ☐ Check with MUNI Dispatcher:
    - ☐ Dedicated Fire Phone
    - ☐ METS Local # 4054. (Access line is (415) 552-9161)
    - ☐ What is happening?_____
    - ☐ Location of incident?_____
        - ☐ Inbound track _____
        - ☐ Outbound track _____
        - ☐ Mileage marker _____
2. ☐ Ventilation working? ____ Direction? _____
3. ☐ Passenger load? _____
4. ☐ Evacuation started? _____ Direction? _____
5. ☐ Power on? _____ Off _____ (Pantagraph lowered _____)
6. ☐ Assist obtaining clearance for rescue train on opposite track
7. ☐ Establish Communications:
    - ☐ Department of Emergency Communications (Division Chief Command Channel, Dedicated (Red) Fire phone or METS 2268 or 2269)
    - ☐ Station Platforms (tactical channel of 1st due Battalion Chief, Dedicated (Red) Fire phone)
    - ☐ Incident Commander (tactical channel of 1st due Battalion Chief, Dedicated (Red) Fire phone)
    - ☐ MUNI Blue Light Station, dial 9 for outside local

☐ Battalion Chief at MUNI Central should maintain contact with Incident Commander at regular intervals to update and relay information to MUNI Central personnel (MUNI Central Battalion Chief ICS designation is Lennox Division)

☐ NOTE: Tactical Channel of 1st due Battalion chief for MUNI incidents (between units); and dedicated fire phone, Division Chief Command Channel, or METS are command channels with Department of Emergency Communications.)

2 nd ACTIONS:

1. ☐ Additional Rescue trains needed?
2. ☐ Medical assistance required
3. ☐ Supply to WSP
4. ☐ Maintain a chronological log

Incident Commander _____ Date _____

APPENDIX G - HOSE CHANGE SCHEDULE

1. MUNI has provided equipment rooms/boxes in all MUNI stations. These contain firefighting equipment for Department use in underground emergencies. Equipment rooms/boxes are located on the station mezzanine or platform levels and are accessible by SFFD firehouse key.
1. BART has placed large hose line in metal cabinets on the platform level of all BART stations (except Balboa) for use with the BART dry under-car sprinkler systems and for other firefighting needs. Access into these cabinets is through the hose cabinet key on the BART key rings.
2. It is the responsibility of the Department to maintain the equipment in these locations, including testing and rotating of hose.
3. The following companies **shall** be responsible for rotating the hose in the stations indicated as per the enclosed schedule. Companies responsible for MUNI hose **shall** also insure that the inventory of firefighting equipment room/box is complete and up to date. These **shall** be tested as part of the inventory check.
4. Any company that does not have adequate hose in their hose inventory to complete the rotation **shall** contact the Bureau of Equipment for issue of additional hose.
5. A General Form report **shall** be forwarded to the Bureau of Equipment each time the hose is rotated and the inventory checked. This report **shall** be submitted through Battalion along with the regular monthly reports.

MUNI EQUIPMENT BOXES AND BART HOSE CABINETS

Embarcadero Station	E35	April and October
Montgomery Station	E13	January and July
Powell Street Station	E8	February and August
Civil Center Station	E1	March and September

MUNI EQUIPMENT BOXES

Van Ness Station	E36	April and October
Church Street Station	E6	May and November
Castro Street Station	E21	June and December
Forest Hill Station	E20	January and July
West Portal Station	E39	June and December

BART HOSE CABINETS

16th Street Station	E7	April and October
24th Street Station	E11	May and November
Glen Park Station	E26	June and December

APPENDIX H - COMMUNICATIONS TESTING PROCEDURES

The following procedures shall be followed for testing of the MUNI Metro and BART Communications systems:

MUNI METRO:

1. Monthly test of the MUNI Dedicated (RED) fire phone shall be conducted on the second Wednesday of each month.
2. Battalion 8 shall coordinate the testing with Battalions 1, 2, 3, 7, and 9. Battalion Chiefs shall monitor the dedicated MUNI Fire phone at the following MUNI platform locations:

Battalion 1	Embarcadero/Montgomery station (alternate months)
Battalion 3	Powell Street/Muni Metro Turnaround (alternate months)
Battalion 2	Civic Center/VanNess /Duboce Portal (alternate months)
Battalion 2	Church Street/Castro Street/Sunset East Portal (alternate months)
Battalion 7	Sunset West Portal
Battalion 8	MUNI Central Control at 131 Lenox Avenue
Battalion 9	Forest Hill/West Portal Station (alternate months)

3. There are three newly installed dedicated fire phone sites at the Muni Metro Turnaround. All three sites located at the tunnel entrance, panel room, and the ferry portal shall be tested.
4. The MUNI Dedicated phone at the Department of Emergency Communications shall also be included in the testing. Portable radios on the “A” Bank (MUNI tactical channels) shall also be tested at this time.
5. All companies shall make appropriate journal entries. Battalion 8 shall prepare a General Form report to be forwarded to the Chief, Department of Emergency Communications, indicating date and time of test and any problems, or if no problems, successful completion of the test.

BART TRANSBAY TUBE EMERGENCY YELLOW FIRE PHONE:

1. Testing of the BART Transbay Tube Emergency Yellow Fire Phone (Dedicated) system is conducted on the second Thursday of each month, in the Gallery Section at the Blue Light Station.
2. Battalion 3 shall meet with a BART representative at 14:00 hours (on testing day) at the BART vent structure located approximately 200 yards behind the Ferry Building. The vent structure shall be entered by accessing the lock box attached to the vent structure door and obtaining the Knox Box key. Enclosed in the Knox Box is a Swipe Card that is used to unlock the vent structure door by swiping the card in a scan reader. Battalion 3 and the BART representative shall take the **Yellow Fire Phone** handsets obtained from the storage cabinet and shall then

proceed to the Transbay Tube Gallery and test the Yellow Fire Phone at several different jack locations. The Mine phone shall also be tested at this time. DO NOT ENTER TRACKWAYS!!!

3. The Transbay Tube Emergency Yellow Fire Phone is tested in conjunction with the Oakland Fire Department. A SFFD unit should also be assigned to the Embarcadero Command Post during this test (Embarcadero station mezzanine level) to test the Yellow Fire Phone set in the Command Post. Also test the BART portable radio on System 1, Talkgroup 1.
4. If it is not possible for Battalion 3 to attend the test, all attempts shall be made to have a company participate in lieu of Battalion 3. If it appears that the SFFD will not be able to participate in the test due to unforeseen circumstances, notify BART at **(510) 834-1297** and advise them of the situation.
5. All companies shall make appropriate journal entries. A General Form report shall be forwarded to the Chief, Department of Emergency Communications by Battalion 3 indicating date and time of test and any problems, or if no problems, successful completion of the test.

BART STATION VERTICAL YELLOW PHONES:

1. BART has installed hard-wired communications system at each BART station to provide communication from surface to various levels of the station including the platform. (see Transit manual)
2. Vertical Yellow phone box with a light above designates this system. The light will flash whenever the receiver of any unit in that station is picked up and indicates some one is on the line. When another receiver is picked up, communication is possible with any other receiver that is off hook.
3. This system does not provide communication to any other locations (i.e. BART or Department of Emergency Communications). It is designated for similar phones within that station only. The boxes containing these Vertical **Yellow phones** are opened with the key (on the BART keyring) labeled “wayside” and/or marked “10 x 14”.

Battalion Chiefs shall insure that the BART station **Vertical Yellow phones** and Surface Command Post Boxes / BART Portable Radios are tested on a monthly basis. Battalion Chiefs shall be responsible for testing the stations as listed below:

Battalion 1	Embarcadero & Montgomery station
Battalion 3	Powell street station
Battalion 2	Civic Center & 16th street station
Battalion 6	Glen Park station
Battalion 9	Balboa station
Battalion 10	24th street station

Battalion Chiefs shall make appropriate journal entries. A General Form report shall be forwarded by the Battalion Chiefs listed above to the Chief, Department of Emergency Communications. The report shall indicate the date and time of the test and any problems, or if no problems, successful completion of the test.

BART SURFACE COMMAND POST BOXES/ BART PORTABLE RADIOS:

-Because the designated BART radio frequency may not penetrate to the surface, BART has provided Surface Command Post Boxes at one of the entrances to each station. The Command Post Boxes contain a wired connection to the underground BART portable radio system. The boxes are painted red and are marked BART SFFD. Gain access with the BART Wayside Key located on Chief & ISS keyrings or the BART keyrings found in the old red Surface Command Post Box or nearest designated street box. Gain access to the old Surface Command Post box with the fire station key.

-The BART Portable Radios are the primary communication system in the underground areas of the BART system.

APPENDIX I - NEW 800 MHZ BART RADIO SYSTEM:

BART has supplied the Bay Area fire districts with the new Ericsson 800 MHz trunked radio system. These radios contain a two-bank system of radio channels. System 1 (Talkgroups 1-13) contains 13 trunked talkgroup channels of which 1-2 are assigned to SFFD, 3-4 assigned to Oakland Fire Dept, 5-6 assigned to Berkeley Fire Dept, 7-8 assigned to Moraga/Orinda/Contra Costa Fire Depts, 9 -10 assigned to West Bay Extension Fire Depts and San Francisco International Airport. Channels 11 through 13 are additional channels for use by the departments listed above. **System 1 operates both above and below ground through base station repeaters and the newly installed fiber optic hardware antenna system (New Red Surface Command Post Boxes).**

System 2 Talkgroup 1, contains only the non-trunked duplex Mutual Aid Channel. This channel is the State of California High-Level Fire/EMS mutual aid channel. Normally its use is limited to the underground only; however, activation of base repeaters by both Bart & the Communication extend its capability to the surface. System 2, Group 1 is also compatible with our SFFD Motorola 800 MHz radio on channel “C7” in the repeater mode.

The trunking technology in System 1 allows the system to track individual activity of each portable radio to trace any abuse and track companies in the underground. Each portable radio has a brass identifying ID ring. **When a radio is keyed for talking, the radio ID number is displayed on all other portable radios that are on that channel.** The Incident Commander should track companies assigned BART portable radios and entering the underground by using a Company Tracking Sheet. (Refer to Appendix I)

Strict radio discipline is required and transmissions should be brief and professional. NOTE: BART portable radios are only to be used on BART property.!

USAGE

System 1, Group 1 will be the primary tactical radio channel used by SFFD in all stations, underground bores, and the Transbay Tube. San Francisco has 2 channels on System 1 in which the second channel, System 1, Group 2, may be used for ICS, EMS, 2nd incident, etc. Additionally, talkgroups 11-13 are available. System 2, Group 1 is also another option to be used. Normally its use is limited to the underground; however, activation of base repeaters by both BART & the Department of Emergency Communications extend its capability to the surface. (System 2, Group 1 is also compatible with our SFFD Motorola 800 MHz radio on channel “C7” in the repeater mode.)

All BART portable radios shall be kept in a red protective case. All Division and Battalion Chief’s vehicles shall carry two portable radios. Rescue Captains and Rescue Squads shall carry one. All BART Stations shall have 3 portable radios with the exception of the Embarcadero Station, which will have 5. Portable radios shall be kept in the Station Agent’s Booth with the exception of the Embarcadero, which will be kept at the

Embarcadero Command Post. The Grand Master Key on the BART key ring opens the Station Agents Booth. Battalion Chiefs responding to an incident shall obtain the BART portable radios from the Station Agents Booth, and assign them to designated ICS groups. After obtaining a BART portable radio, the company number and the radio ID number located on the backside of the portable radio (or the brass ID tag) shall be reported to and recorded by the Incident Commander on the new Company Tracking Sheet. This process will enable the Incident Commander to track units in the underground. All units at a BART incident shall also be tuned to channel C7 in repeater mode on their SFFD Motorola portable radios.

In summary: San Francisco shall use the designated fire talkgroups 1 and 2 on System 1. Additional talkgroup channels available on System 1 are 11 through 13. System 2, Group 1 is also available. SFFD portable radios are to be on C7.

BART portable radios shall be kept on their assigned apparatus at all times except when in use. Portable radios, spare batteries, Incident checklists, Company Tracking Sheets, station maps and BART data sheets shall be kept in the red protective case. The BART red protective cases are located in the Station Agents Booth (except at the Embarcadero Station). The red protective cases at the Embarcadero Station are located at the Command Post on the Mezzanine level. Battery chargers as well as spare batteries shall be located in the annuciator panel room of each BART Station. Refer to Transit Manual Appendix “C” for annuciator panel room number, as each station is different. During the monthly BART radio test, Battalion Chiefs shall change batteries and test the assigned portable radios in each BART Station. On Wednesdays and Sundays at 0830 hours, units shall change the batteries to their assigned BART portable radios and a journal entry shall be noted as to completion. Spare batteries shall be kept charged.

The Emergency button and the Special Call Key are disabled on the BART portable radios. The **Scan feature SHALL NOT BE USED**, as this will cause transmission calls to be missed on the designated channel. (Refer to instructions for BART Ericsson 800 MHz Radios in this appendix.)

The Ericsson portable radio does not have the immediate capabilities to contact BART Central or BART Police. Requests to BART Central can be made at the Station Agent’s Booth, the PABX phone on the station platform, or the emergency phones in the tunnels at Blue Light Stations in order to have the proper authority switch to the appropriate channel for communication. BART will always have a BART liaison responding to an incident in order to assist with communications.

NOTE: Do not operate the radio near or in an area where blasting is taking place or when in the presence of a suspected explosive device. Some explosive devices are radio controlled and a transmission from the radio can set them off.

NEW SURFACE COMMAND POST BOXES

The new Surface Command Post Boxes are equipped with similar components as the Ericsson portable radios which include: an emergency button, power button, volume control, display mode window, scan option, system control, and talkgroup options.

Unlike the Ericsson portable radio, the emergency button in the Surface Command Post Box **DOES** operate. It shall only be used when a life-threatening situation exists at the Surface Command Post Box. BART Dispatch Center is immediately notified and only they can reset the system. The Scan feature **SHALL NOT BE USED** as this will cause transmission calls to be missed on the designated channel. (Refer to other parts of this Appendix.)

SFFD BART SURFACE COMMAND POST BOX MOBILE RADIO.

The wayside key attached to BART key rings, as well asto BART key rings on Chief/ Incident Support Specialist (if available) keyrings, opens the new Surface Command Post Box as well as the existing station Vertical Yellow Phone box. BART key rings will remain in the old surface command post boxes, which are opened with a fire station key.

The new Ericsson 800 MHz Portable radio and Surface Command Post Boxes shall also be tested by Battalion Chiefs on a monthly basis. The primary tactical channel System 1, Talkgroup 1, is the channel designated for testing.

SFFD BART ERICSSON 800 MHz RADIO SYSTEM AUGUST 2000

SFFD BART PORTABLE RADIO USER'S MANUAL

PCS PORTABLE
RADIO MODEL

THIS IS AN OPERATIONS MANUAL TO ASSIST SAN FRANCISCO FIRE DEPARTMENT PERSONNEL WHO USE THE ERICSSON PCS (SCAN MODEL) PORTABLE RADIO. NOT ALL FEATURES DESCRIBED IN THIS MANUAL ARE OPERATIONAL IN SFFD PCS RADIOS.

B A R T

DEFINITIONS

An understanding of the following definitions will be helpful to San Francisco Fire Department radio system users.

CHANNEL: The radio frequency (ies) on which a radio transmits and/or receives information.

CONTROL CHANNEL (CC): The radio channel that a trunked radio system uses to send digital steering information to/from radios in the trunked system.

CONVENTIONAL CHANNEL: A radio channel used in a conventional (non-trunked) radio system.

CONVENTIONAL RADIO SYSTEM: A conventional radio system generally refers to a non-trunked radio system in which radio channels are dedicated to predetermined user groups.

EDACS: Enhanced Digital Access Communications System. Ericsson's proprietary name for their trunked radio technology.

GROUP: See TALKGROUP.

GROUP CALL: A radio transmission on a TALKGROUP in a trunked system.

INDIVIDUAL CALL: A call between two individual radios within a trunked system.

LID: The LOGICAL IDENTIFICATION number (like an electronic serial number) assigned to each individual radio. Each radio operating in a trunked system is identified by its unique LID. Using the LID number assigned to each portable radio, Incident Commanders shall track units entering the underground with the new Company Tracking Sheet (See Appendix I).

LOGICAL IDENTIFICATION NUMBER: See LID.

MESSAGE TRUNKING: An operational mode within a trunked radio system in which an accessed working radio channel is not released immediately upon completion of a transmission (release of push to talk button). The channel remains available for a predetermined (programmable) hang time. (See transmission trunking)

SYSTEM: A list of TALKGROUPS or CONVENTIONAL RADIO CHANNELS which are programmed into BART radios. A BART radio can be programmed with a number of SYSTEMS in it, like chapters in a book. TALKGROUPS and CHANNELS are located within SYSTEMS like pages within chapters. Each SYSTEM (chapter) can have up to 16 TALKGROUPS or CONVENTIONAL CHANNELS (pages) but not both in the same system. To operate on a talkgroup or channel, a user must first select a system and then the talkgroup or channel within the system.

TALKGROUP: A software entity within a trunked radio system that appears to the user to be and to function like a conventional radio channel. Radio users in a trunked system who need to communicate together as a group can select and communicate on an in common talkgroup just as they would select a dedicated radio channel in a conventional system.

TRANSMISSION TRUNKING: An operational mode within an EDACS system in which each transmission (activation of the push to talk button on the radio) accesses a new working radio channel and releases the channel for reassignment immediately upon release of push to talk. (See message trunking)

TRUNKED RADIO SYSTEM: A radio system that uses a control channel and digital switching to allow multiple radio users to access multiple radio channels within the system. Within the trunked system, individual radio channels are not dedicated to specific users but are accessed on a real-time basis with each transmission. BART's trunked radio system is manufactured by Ericsson using EDACS (Enhanced Digital Access Communications System) technology. Trunked systems provide a number of unique features unavailable in conventional radio systems and achieve exceptional spectrum efficiency.

WORKING CHANNEL: A term for the channels a trunked radio system assigns to radios for intercommunication purposes. The term applies to all channels except the control channel. Through signaling on the control channel, radios are switched to working channels for intercommunication.

PCS CONTROL AND DISPLAY FEATURES

1. BATTERY INSTALLATION

A. Turn radio OFF.

B. From the back side of radio, align rails on sides of battery mounting structure (on top of battery) with slots on bottom of radio.

C. Slide battery forward into slot until battery latch clicks into place.

2. BATTERY REMOVAL

A. Turn radio OFF.

B. Release battery latch (located on rear of radio at top of battery) by pushing/holding it down.

C. Slide battery away from back of radio to remove.

3. POWER ON-OFF SLIDE SWITCH (LEFT SIDE OF BATTERY)

A. Use POWER ON-OFF slide switch on left side of battery to turn the radio on and off.

B. Slide switch up for on and down for off.

4. VOLUME BUTTONS (LEFT FRONT SIDE OF RADIO)

A. The VOLUME buttons are used to ramp up or down to adjust the volume.

B. A tone sounds each time the VOLUME buttons are pressed, except when a call is in progress.

5. SYSTEM/GROUP SELECT: UP - DOWN KEYS (TOP OF RADIO, LEFT SIDE)

A. The SELECT: UP - DOWN keys are used to scroll up and down through systems, talkgroups or channels or other options depending on mode radio is in.

B. Press the UP key to scroll up through a list and press the DOWN key to scroll down through a list. In the normal mode, the radio will scroll up or down through the talkgroups or channels in the selected system. The LCD display (4 characters) will change to show the group or channel NUMBER you have selected.

6. PUSH-TO-TALK (PTT) BUTTON (LEFT SIDE OF RADIO)

A. To transmit, press the PTT BUTTON, wait for the channel access BEEP TONE then talk into the microphone (located under LCD display on left side of radio).

B. Releasing the PTT BUTTON returns the radio to the receive mode.

7.SHIFT/CLEAR BUTTON (TOP UPPER LEFT SIDE)

A. This button has several purposes depending on programming and operating mode.

B. Pressing the SHIFT/CLEAR button while activating the SELECT: UP/DOWN button will cause the radio to scroll up or down through the SYSTEMS that are programmed into the radio. The LCD display will show the NUMBER of the selected system.

C. Pressing the SHIFT/CLEAR button while activating the SCAN button will add or delete a selected talkgroup or channel from the SCAN LIST. ***DO NOT USE***

D. When in the trunked mode, pressing the SHIFT/CLEAR button twice (double click) will invoke the CLEAR function, which is used to exit the SPECIAL CALL mode and return the radio to normal operation. ***DISABLED***

E. Double clicking the SHIFT/CLEAR button when in the conventional mode will disable or (alternately) enable the channel guard.

8. EMERGENCY/HOME BUTTON (LEFT BUTTON ON FACE OF RADIO) DISABLED

9. SPC (SPECIAL) KEY (FACE OF RADIO UNDER DISPLAY) DISABLED

10. SCAN - A/D BUTTON (FACE OF RADIO UNDER DISPLAY) DO NOT USE

11. UNIVERSAL DEVICE CONNECTOR (RIGHT SIDE OF RADIO)

A. The UNIVERSAL DEVICE CONNECTOR (UDC) is used to program the radio and for accessory connection.

12. DISPLAY (FRONT FACE OF RADIO)

A. The liquid crystal display (LCD) screen has one line on which large numeric characters (total of 4) can display the selected SYSTEM, GROUP, or CHANNEL (identified by numbers). The digits (up to 2) on the left (over “SYS”) indicate the selected SYSTEM, and the digits (up to 2) on the right (over “GRP”) indicate the selected talkgroup. If the radio is selected on a system containing channels rather than talkgroups, the “GRP” flag disappears. The LCD also displays various STATUS INDICATORS in smaller letters and numbers which reflect various OPERATING CONDITIONS of the radio.

B.STATUS INDICATORS (small characters in display)

(1). SV: SERVICE. Trunked mode only. Upper left corner of display. When displayed, indicates radio is receiving control channel. When displayed with “NO” (NO SV), indicates radio is out of range of control channel.

(2). BT: BATTERY. Lower left of display. When displayed, indicates battery is low and needs to be charged.

(3). BSY: BUSY. Left side of display.

When displayed In trunked mode, indicates radio is transmitting OR receiving. When flashing, indicates a call has been queued.

When displayed in conventional mode, indicates a call is being received.

(4). TX: TRANSMIT Upper left of display. When displayed, indicates the radio is transmitting.

(5). SCN: SCAN. ***DO NOT USE***

13. ALERT TONES

A. A variety of alert tones or BEEPS are provided to indicate various operating conditions. When an “unexpected” tone is heard, check the LCD display to see if a “problem” condition is displayed.

B. A short mid-pitched BEEP tone after pushing the PTT button indicates that a channel (trunked or conventional) has been assigned and the operator can commence talking. DO NOT TALK UNTIL AFTER YOU HEAR THE CHANNEL ACCESS BEEP OR ALL OR PART OF YOUR TRANSMISSION WILL BE LOST.

C. A short low-pitched BEEP tone when the push to talk is activated indicates that the call has been DENIED (radio not authorized) or that the radio is beyond the RANGE of the system (no control channel access).

D. A low-pitched tone every 130 seconds indicates that the battery is getting low and needs charging.

E. A high-pitched tone after pressing the PTT button indicates that all channels in the trunked system are busy and the system has placed the call request in queue. All other radios selected on the same talkgroup will hear the same alert tone. If the push to talk is released the radio will sound a mid-pitched (channel access) beep tone when a channel is assigned and the radio's transmitter will key (autokey) to hold the channel. Upon hearing the channel access beep, the operator need only press the PTT to keep the assigned channel.

F. A pulsed tone signal will sound when a preprogrammed transmission length has been exceeded and the transmitter is about to shut down. This radio transmission cut-off or time-out is standard in most radio systems. It is intended to prevent radio system abuse or channel jamming due to stuck or accidentally keyed mikes.

PCS RADIO OPERATIONS

1. TURNING THE RADIO ON

A. Slide the POWER ON-OFF switch on the battery back to the UP position.

B. A charged battery must be in place and the antenna properly connected.

C. When the radio comes on it will display the last selected system and talkgroup or channel. If operating in the trunked mode and within reach of the trunked system control channel, the display will reflect SV upon acquisition of the control channel.

D. If NOSV is displayed, the radio cannot find the control channel and is searching (scanning) for it. If the radio cannot find and lock onto the control channel, it cannot operate in the trunked mode. If the radio cannot find the control channel, you are out of range of the system.

(1). You may be out of range because of distance from base station equipment or because of obstructions to the control channel...i.e., inside a building, in a "hole", etc..

(2). If you are within the normal operating range of the system and have lost the control channel because of a building or geographic obstruction(s), you may be able to regain access to the system (control channel) by moving a short distance, sometimes only a few feet. In general you may improve chances of regaining the control channel by moving to a higher elevation or moving to a window if in a building.

(3). If you are beyond the range of the system because of distance from base station equipment, you cannot operate in the trunked mode until you return to the area of coverage provided by the BART trunked system.

E. If your radio will not operate in the trunked mode because you are beyond the range of the system, your radio should still be able to operate on a conventional radio channel. If conventional radio channel(s) are provided in your radio, and you are aware of proper operational protocols associated with use of the conventional channel(s), you may switch to a conventional channel in order to operate.

2. ADJUSTING THE VOLUME

A. Use the up and down volume ramps on the left face side of the radio to adjust the volume.

B. Press the UP ramp to increase volume and the DOWN ramp to decrease volume.

3. SELECTING A SYSTEM

A. The PCS radio can be programmed with several systems in it. A system in the radio is like a page in a book. Radio channels or talkgroups are like lines on a page (system). Each system can have up to 16 talkgroups or channels in it. In order to communicate with others, the radio user must know the talkgroup or channel to be used and the system in which it is found. The radio operator then selects the proper system and then the proper group or channel within the system and communication is established. BART has supplied the Bay Area fire districts with 2 systems. System 1 (Talkgroups 1-13) contains 13 trunked talkgroup channels of which 1-2 are assigned to SFFD; 3-4 are assigned to Oakland Fire Dept, 5-6 are assigned to Berkeley Fire Dept, 7-8 are assigned to Moraga/Orinda/Contra Costa Fire Depts, 9 -10 are assigned to West Bay Extemsion Fire Depts and the San Francisco International Airport. Channels 11 through 13 are additional channels for use by the departments listed above. San Francisco Fire Department primary tactical channel is System 1, Group 1. System 1 Group 2, may be used for ICS, EMS, 2nd incident occurring at the same time, etc.

During an incident in the Transbay Tube and to avoid large amount of radio traffic, San Francisco and Oakland Fire Departments shall use separate tactical channels. The plugin Yellow Fire Phone is the command link, and also**, System 1 Group 11 shall be used as the radio command channel between both departments.**

System 2 Group 1, contains only the non-trunked duplex Mutual Aid Channel. This channel is the State of California High-Level Fire/EMS mutual aid channel. Normally its use is limited to the underground, however, **activation of base repeaters by both Bart & the Department of Emergency Communications** extend its capability to the surface. System 2 Group 1, is also compatible with our SFFD Motorola 800 MHz radio on channel C7 in the repeater mode.

B. SYSTEM SELECTION USING SHIFT/CLEAR AND SELECT BUTTONS

(1). Press the SHIFT/CLEAR BUTTON on the side of the radio. While holding the SHIFT/CLEAR BUTTON in, press the UP or DOWN SYSTEM/GROUP SELECT BUTTON (on left face of radio above volume buttons) to scroll up or down through the SYSTEM LIST. Hold the SELECT BUTTON down to ramp through the list

(2). The LCD DISPLAY will show the selected system number above “SYS” on the display. The selected group or channel will display to the right of the system above “GRP” (if a talkgroup).

4. SELECTING A TALKGROUP OR CHANNEL

A. Once a system is selected, you must select an appropriate talkgroup or channel within the system in order to communicate.

B. Talkgroup and channel selection within a system is accomplished by using the UP or DOWN SYSTEM/GROUP SELECT BUTTONS on the left face of the radio WITHOUT using the SHIFT/CLEAR BUTTON. The NUMBER of the selected group or channel will display on the LCD display to the right of the selected system.

C. Up to 16 talkgroups or channels can be programmed into each system. Trunked radio up to 16 talkgroups AND conventional radio channels can be programmed into the same system. If a radio has both talkgroups and conventional channels in it, you will have to select one system for talkgroups and another for conventional channels.

5. SENDING AND RECEIVING CALLS

A. Transmitting or SENDING a call is accomplished by selecting the desired system and then selecting the desired talkgroup or channel within the system. Press the PTT button to transmit or send a call. **Be sure to wait for the channel access tone before speaking**. **If you begin to speak before channel assignment notification, all or part of your transmission will be lost.**

B. If you are transmitting on a talkgroup (within a trunked system), your radio will transmit it’s identification (LID) with every PTT. Your radio’s LID (or associated ALIAS) will display at any dispatch console and on the LCD of certain radios with this capability which are selected on the same talkgroup. The EDACS system will verify your LID with every transmission before allowing your radio to operate within the system. The EDACS system also keeps record of every radio’s PTT activity within the trunked system.

C. When turned on, your radio will receive any transmissions on the selected talkgroup or channel. LIDs are not transmitted or displayed on conventional radio channels.

D. If you are BEYOND THE RANGE of the BART trunked radio system you will not be able to transmit or receive on the BART trunked radio system. Under these conditions, you must switch to a conventional radio channel in order to communicate with another radio. See your radio program guide to determine if your radio is equipped with simplex or duplex conventional channels.

7. SCANNING OPERATIONS DO NOT USE

8. EMERGENCY OPERATIONS (DISABLED)

OPERATIONAL CONSIDERATIONS

The fact that trunked radio technology can create many talkgroups from limited radio channels tends to mask the fact that the available radio channels are limited. BART's trunked radio system has many users and many talkgroups but only 10 radio channels. One of these channels is the control channel so at any given time, only 9 working channels are available to ALL users. Just as with any conventional radio system, strict radio discipline is required to maintain system availability for all users. In accordance with FCC standards and rules, radio transmissions should be brief and professional and limited to that which is necessary.

Always release your PTT button immediately upon completing your transmission. Holding the PTT button down ties up the channel and prevents your radio from receiving transmissions from other radios.

INDIVIDUAL CALLS and TELEPHONE INTERCONNECT CALLS tie up radio working channels for prolonged periods of time and should be used sparingly and only as necessary.

Trunking technology allows the system to track individual radio activity. This provides an extra measure of safety in emergency situations but it also allows abuse to be traced to the abuser.

Report of a lost or stolen radio to a supervisor immediately. A lost or stolen radio can be deactivated "over the air" so that it cannot monitor or interfere with BART operations.

Do no operate the radio near or in an area where blasting is taking place or when in the presence of a suspected explosive device. Some explosive devices are radio controlled and a transmission from your radio can set them off. Do not operate the radio in an explosive atmosphere. The radio is an electrical device with switches that can cause an explosion in an explosive atmosphere.

It is a violation of FCC rules to: (1) interrupt or send a false emergency or distress message; (2) use profane or obscene language; (3) send personal messages except in emergencies. All messages must be brief and job related.

BART ERICSSON 800 MHZ PORTABLE RADIO

BATTERY CHARGE INSTRUCTIONS

ERICSSON BATTERY

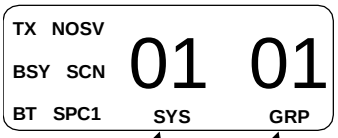
- Turn off radio at battery (on/off switch located on the battery).
- Remove battery from radio.
- **TURN ON BATTERY** (on/off switch). Battery must be on in order to charge.
- Place battery in battery charger upside down with the writing on the bottom of the battery
- facing the same way as the writing on the charger. The two prongs on the bottom of the battery will lineup inside the charger with the two metal conductors.
- Press and hold START button if charger does not start.
- Amber light indicates charging.
- Green light indicates fully charged. Allow more than 1 hour.
- Connect fully charged battery to radio and turn radio off at battery switch.
- The battery charger drains and erases any memory and will fully recharge the battery.
- See backside of charger for further instructions.
- Charge after every emergency and drill.
- Battalion Chief's change BART Station portable radios batteries monthly during radio test. The fully charged battery is connected to the radio and the replaced battery is inserted into the charger. Units assigned radios charge on Wednesdays & Sundays at 0830 hours.

JBRO BATTERY

- Same instructions as above with the following difference in insertion procedure:
- Place battery in battery charger with the 2 metal prongs down and the 3 aluminum rectangle pads facing towards the front of charger.

S.F.F.D. PCS MODEL PORTABLE RADIO

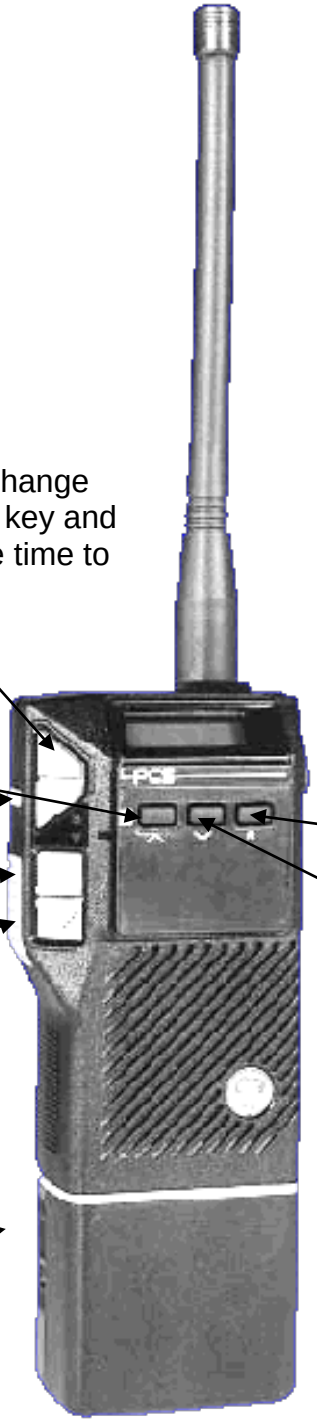
Display:



System Group

SYSTEM/GROUP SELECT

Press Up/Down key to change groups. Press Shift/Clear key and Up/Down key at the same time to



Emergency key **(DISABLED)**

Shift/Clear key

Volume Control up//down (up/down)

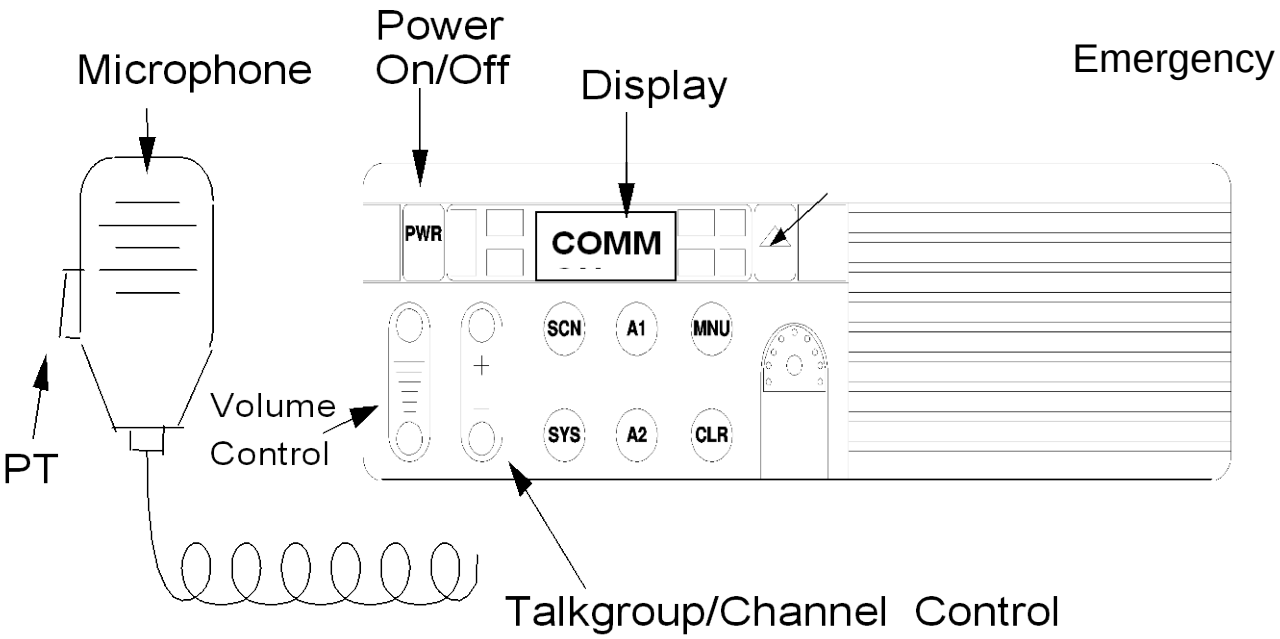
Push To Talk (PTT) Wait for "beep" before talking.

On/Off switch on side of battery.

DO NOT USE !!
Scan Key

Special Call Key (**DISABLED)**

S.F.F.D. BART SURFACE COMMAND POST BOX MOBILE RADIO



MDX MOBILE RADIO
SCAN MODEL
USER'S MANUAL

SURFACE COMMAND POST BOX RADIO CONTROLS AND OPERATION

1. POWER ON-OFF AND VOLUME CONTROLS

   A. Use POWER ON-OFF (**PWR**) button, on front upper left-hand corner of radio to turn the radio on and off.

   B. Use **VOLUME CONTROL ramp buttons** (lower left front side of radio) to adjust volume.

   C. When the radio comes on it will display the last selected system and talkgroup or channel.

   D. If *NC* is displayed, the radio cannot find the control channel and is is searching (scanning) for it. (NC = No Control Channel) If the radio cannot find and lock onto the control channel, it cannot operate in the trunked mode. If the radio cannot find the control channel, you are out of range of the system.

      (1). You may be out of range because of distance from base station equipment or because of obstructions to the control channel...i.e., inside a building, in a “hole”, etc..

      (2). If you are within the normal operating range of the system and have lost the control channel because of a building or geographic obstruction(s), you may be able to regain access to the system (control channel) by moving a short distance, sometimes only a few feet. In general you may improve chances of regaining the control channel by moving to a higher elevation.

      (3). If you are beyond the range of the system because of distance from base station equipment, you cannot operate in the trunked mode until you return to the area of coverage provided by the BART trunked radio system. If your radio program includes conventional channels, you may still be able to communicate locally, radio-to-radio, on simplex talkaround channels.

2. SYSTEM SELECT CONTROLS AND PROCEDURES

   A. Use the SYSTEM (**SYS**) button (lower left/front) to change SYSTEMS.

   B. Press and release the **SYS** button to display the currently selected system. The system displays for a few seconds and then the display returns to display the currently selected talkgroup or channel.
      (1). Press and release the SYS button again to INCREMENT the system selection. Each time this is done, the system will display momentarily.

(2). If you want to ramp the system choices up or down, press the GROUP/SEL RAMP CONTROL + or - while the system name is displayed. A tone sounds each time a system name changes.

C. The MDX radio can be programmed with several systems in it. A system in the radio is like a page in a book. Radio channels or talkgroups are like lines on the page (system). Each system can have up to 16 talkgroups or channels in it. In order to communicate with others, the radio user must know the talkgroup or channel to be used and the system it is found in. San Francisco Fire Department primary tactical channel is System 1, Talkgroup 1. The radio operator selects the proper system and then the proper group or channel within the system and communication is established.

D. Trunked radio talkgroups AND conventional radio channels cannot be programmed into the same system. If a radio has both talkgroups and conventional channels in it, you will have to select one system for talkgroups and another for conventional channels.

3. GROUP/CHANNEL SELECTOR RAMP CONTROLS AND PROCEDURES

A. The **GROUP/CHANNEL selector ramp control**, located on the lower left of the radio face (to right of volume ramp control) is used to select your desired group or channel.

B. Press the "+" end of the ramp control to ascend through groups/channels or press the "-" end of ramp to descend through groups/channels. The display (above) will show the selected group/channel. San Francisco Fire Department primary tactical channel is System 1, Talkgroup 1. San Franciso has a total of 2 channels on system 1 in which the other channel may be used for a 2nd incident occurring at the same time, ICS, EMS, etc. In addition, channels 11-13 are available for use.

C. NOTE: This ramp control is also used to ADD/DELETE groups or channels to/from the scan list (see section 5 below) and to increment or decrement systems (see section 2 above).

4. PUSH-TO-TALK (PTT) BUTTON (ON HAND MICROPHONE ATTACHED TO FRONT OF RADIO)

A. To transmit, press the PTT BUTTON, wait for the channel access BEEP TONE then talk into the microphone.
B. Releasing the PTT BUTTON returns the radio to the receive mode.

5. SCAN ON/OFF BUTTON AND SCANNING PROCEDURES ***DO NOT USE***

6. BUILDING A SCAN LIST ***DO NOT USE***

7. DISPLAY FEATURES AND INDICATORS

A. The MDX display provides an 8 character dot matrix LED alpha/numeric display and 7 status indicators which are arranged on either side of the alpha/numeric display.

B. STATUS INDICATORS (ON when lit, OFF when unlit)

(1). **TX** ON indicates radio is TRANSMITTING.

(2). **BSY** ON when there is radio traffic (BUSY) on your selected talkgroup or channel.
FLASHES when call is QUEUED on trunked system.

(3). **SCN** ON indicates SCAN feature is activated. ***DO NOT USE***

(4). **S** ON indicates selected talkgroup or conventional channel is in the scan list with
NO SCAN PRIORITY. ***DO NOT USE***

(5). **P1** ON indicates that the selected channel is assigned SCAN PRIORITY 1
(Conventional channels only). *NOT INSTALLED*

(6). **P2** ON indicates that selected channel is assigned to SCAN PRIORITY 2
(Conventional channels only). *NOT INSTALLED*

(7). **PVT** Not applicable in BART system. (Indicates selected group is operating in
digital encryption mode).

C. DISPLAY INDICATORS (8 character alpha/numeric)

(1). In the normal operating mode, the MDX's alpha/numeric display will show the name of the selected talkgroup or conventional channel. If the radio is in the SCAN mode, the display will show the name of the group or channel that is "captured" while transmitting.

(2). When you change SYSTEMS, the display will momentarily display the name of the selected system then will revert to the name of the selected talkgroup or channel.

(3). The alpha/numeric display will display a number of message indicators reflecting
a variety of operating conditions. Some of these messages include:

(a). **ID####** Indicates that your radio is receiving an INDIVIDUAL CALL. (#### is the logical id or LID of the calling radio)

(b). **PHN CALL** Indicates your radio is receiving a telephone call through the trunked radio system. *NOT INSTALLED*

(c). ***NC*** Displayed when your radio is unable to find the control channel. NC = NO CONTROL CHANNEL. (See 1.D. above)

(d). **EMERGENCY** Displays when operator declares an emergency. Flashes when another user declares an emergency on selected talkgroup.

(e). **C*** Indicates an INDIVIDUAL CALL has been received and NOT ANSWERED.

(f). **E*** Displayed when an active voice call on a trunked system is in an emergency state.

8. MDX ALERT TONES

A. CALL ORIGINATE: A mid-pitched “beep” tone activated after push-to-talk, indicating that a working channel has been assigned. If you begin to talk before you hear the call originate beep tone, i.e., before a working channel is assigned, your transmission will not be heard.

B. CALL QUEUED: A high-pitched “chirp” tone sounds when the system places the call quest in a queue upon PTT. This tone indicates that all channels in the trunked system are currently busy and you will have to wait for a channel to become available. If you release your PTT (push-to-talk) your radio will autokey (automatically PTT) when a channel becomes available.

C. SYSTEM BUSY: Three short medium-pitched “beep” tones upon PTT indicate that the receiving party is already on the system or the system is busy and its queue is full. You must re-key later to access the system.

D. CALL DENIED: A low-pitched “boop” tone upon PTT that indicates your radio is not authorized on the selected system or your radio is beyond the range of the system.

E. TIMING OUT: Like most radios, the MDX has a time-out feature that will turn off the transmitter if the PTT is pressed continuously for a prolonged period

of time. This programmable feature prevents system abuse or channel jamming due to stuck or accidentally keyed mikes. Just before your transmitter shuts off you will hear four high-pitched "beeps" followed by a low-pitch "boop." Release and re-key the mike to continue communications.

9. MENU BUTTON AND FUNCTIONS (LOCATED FRONT OF RADIO UNDER SCAN DISPLAYS)

A. Press the **MNU** (MENU) button to access a variety of features and functions. Each press of the MNU key causes it to step to the next menu function. Menu functions include:

(1). BACKLIGHT adjustment.

(2). SCAN ADD/DELETE ***DO NOT USE***

(3). SPECIAL CALL ***DISABLED***

B. When appropriate, use the "**+**" or "**-**" end of the **GROUP/CHANNEL** selector to increment or decrement through options within a selected menu function.

C. Press the **CLR** (CLEAR) button to return to normal radio operations.

10. EMERGENCY BUTTON AND OPERATIONS ***USED ONLY WHEN A LIFE THREATENING SITUATION EXISTS AT THE SURFACE COMMAND POST***

A. The **EMERGENCY BUTTON** (button on the front of the radio located to the right of the display) is used to declare an emergency condition on the SELECTED TALKGROUP or, depending on programming, to home to a predetermined system an talkgroup and declare an emergency there.

B. To DECLARE AN EMERGENCY condition, press and hold the emergency button for at least one second. Your radio will display "**EMERGENCY**" and be given priority access to the next available radio channel. Other radios on your talkgroup will display a flashing "**E***" in the first two positions of their seven character radio displays. Dispatch consoles with access to your talkgroup will receive visible and audible notification of your emergency and your radio's LID (logical identification) will display at the console.

NOTE: The emergency feature is a trunked radio function. Therefore, an emergency can only be declared when you are selected on a trunked radio "talkgroup." Emergencies may NOT be declared on conventional radio channels. If you are operating in a system containing conventional

channels and you need to declare an emergency, move your radio to a system containing talkgroups before attempting to declare an emergency.

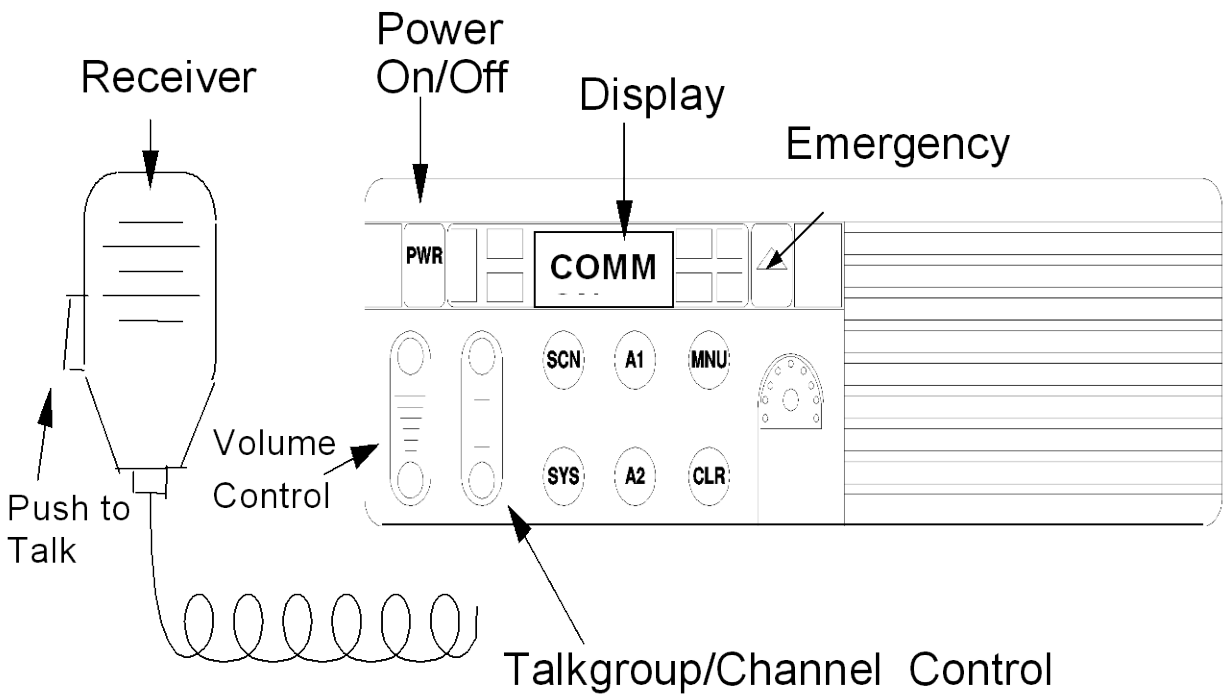
C. Normally, emergencies will be cleared by dispatchers at a dispatch console. Some supervisory MDX radios may be programmed to clear emergencies. It is accomplished by Pressing holding the **CLR** button and then pressing and releasing the **EMERGENCY** button. The "EMERGENCY" should be removed from the screen. Release the **CLR** button.

11. CLEAR BUTTON FUNCTIONS

A. The **CLR** (CLEAR) button on front of radio under the **MNU** button is used for a number of functions as already mentioned. Normally, pressing the **CLR** button will clear you from any operation you are involved in and return your radio to normal operation on your selected system/group or channel.

B. The **CLR** button can be used to exit or terminate a SPECIAL CALL (individual call or phone call) or to exit any menu function. If your radio is so programmed, it is used to clear an emergency call.

S.F.F.D. BART SURFACE COMMAND POST BOX MOBILE RADIO



- **EMERGENCY BUTTON: used only when a life-threatening situation exists at the Surface Command Post**. **Notifies BART Dispatch Center and can only be reset by BART.**
- SCN: *DO NOT USE!!* ***Make sure the SCN in the display window is off!*** **This will cause you to miss calls on selected channel.**
- **A1/A2:** INT/EXT Speaker disabled.
- **MNU:(MENU)** BRIGHT: adjusted by "+" and "–" on talkgroup channel control.
- SCAN ADD/DELETE: ***DO NOT USE!!***
- **CLR: (CLEAR)** Returns to normal operation.

SFFD TRUNKED TALKGROUP / CHANNELS			
Group	SYSTEM 1	DISPLAYED ON	USE
1	SFFD Fire 1	Sys 1 Grp 1	PRIMARY UNDERGROUND TACTICAL CHANNEL Station/Tunnel/Transbay Tube
2	SFFD Fire 2	Sys 1 Grp 2	ICS, EMS, 2nd Incident, etc.
3-4	Oakland	Sys 1 Grp 3-4	Oakland Underground
5-6	Berkeley	Sys 1 Grp 5-6	Berkeley Underground
7-8	Mor/Ori/CC	Sys 1 Grp 7-8	Berkeley Hills Tunnel
9-10	West Bay Ext. Fire Depts & SFI Airport	Sys 1 Grp 9-10	West Bay Extension Underground
11-13	All Agencies above	Sys 1 Grp 11-13	ADDITIONAL CHANNELS AVAILABLE Group 11 is radio command channel in Transbay Tube between SFFD and Oakland Fire Depts.
Group 1	*SYS 2 HL FIRE*	*SYS 2 GRP 1 NON TRUNKED*	*STATE WIDE HIGH LEVEL FIRE/EMS MUTUAL AID CHANNEL. COMPATIBLE WITH SFFD MOTOROLA RADIO CHANNEL C7 ON REPEATER MODE. NORMALLY LIMITED TO BART UNDER- GROUND. ACTIVATION OF REPEATERS BY BOTH BART AND THE DEPARTMENT*

Operations Chief

SAN FRANCISCO FIRE DEPARTMENT BART ERICSSON 800 MHZ RADIOS

Incident Location_____
Check unit entering underground

Company Tracking Sheet

COMPANY	COMPANY TRACKING ID#
D1	8282
D1A	8283
D2	8284
D2 A	8285
D3	8286
D3 A	8287
B1	8288
B1 A	8289
B2	8290
B2 A	8291
B3	8292
B3 A	8293
B4	8294
B4 A	8295
B5	8296
B5A	8297
B6	8298
B6 A	8299
B7	8300
B7A	8301
B8	8302
B8 A	8303
B9	8304
B9 A	8305
B10	8306
B10A	8307
EMS Special	8308

COMPANY	COMPANY TRACKING ID#
RC01	8309
RC02	8310
RC03	8311
RC04	8312
RS01	8313
RS02	8314
CD01	8315
CD02	8316
CD03	8317

BART STATION PORTABLE RADIOS

COMPANY	COMPANY TRACKING ID#
Embarcadero Station at Command Post	
8318	_____
8319	_____
8320	_____
8321	_____
8322	_____
Montgomery Station at Station Agents Booth	
8323	_____
8324	_____
8325	_____

SAN FRANCISCO FIRE DEPARTMENT BART ERICSSON 800 MHZ RADIOS

Incident Location_____
Check unit entering underground

Company Tracking Sheet

COMPANY	COMPANY TRACKING ID#
Powell Station at Station Agents Booth	
8326	_____
8327	_____
8328	_____
Civic Center Station at Station Agents Booth	
8329	_____
8330	_____
8331	_____
16th Station at Station Agents Booth	
8332	_____
8333	_____
8334	_____

COMPANY	COMPANY TRACKING ID#
24th Station at Station Agents Booth	
8335	_____
8336	_____
8337	_____
Glen Park Station at Station Agents Booth	
8338	_____
8339	_____
8340	_____
Balboa Park Station at Station Agents Booth	
8341	_____
8342	_____
8343	_____

BATTERY CHARGER LOCATION

Embarcadero Station : at Command Post
Montgomery Station: Room #101A N/E side of station
Powell Station: Room # 102 N/W side of station
Civic Center Station: Room # 105

16th Station: Room # 101
24th Station: Room # 101
Glen Park Station: Room # 203; Enter thru Room 101 then downstairs to Room 203
Balboa Park Station: Room # 104

IC _____

Date_____