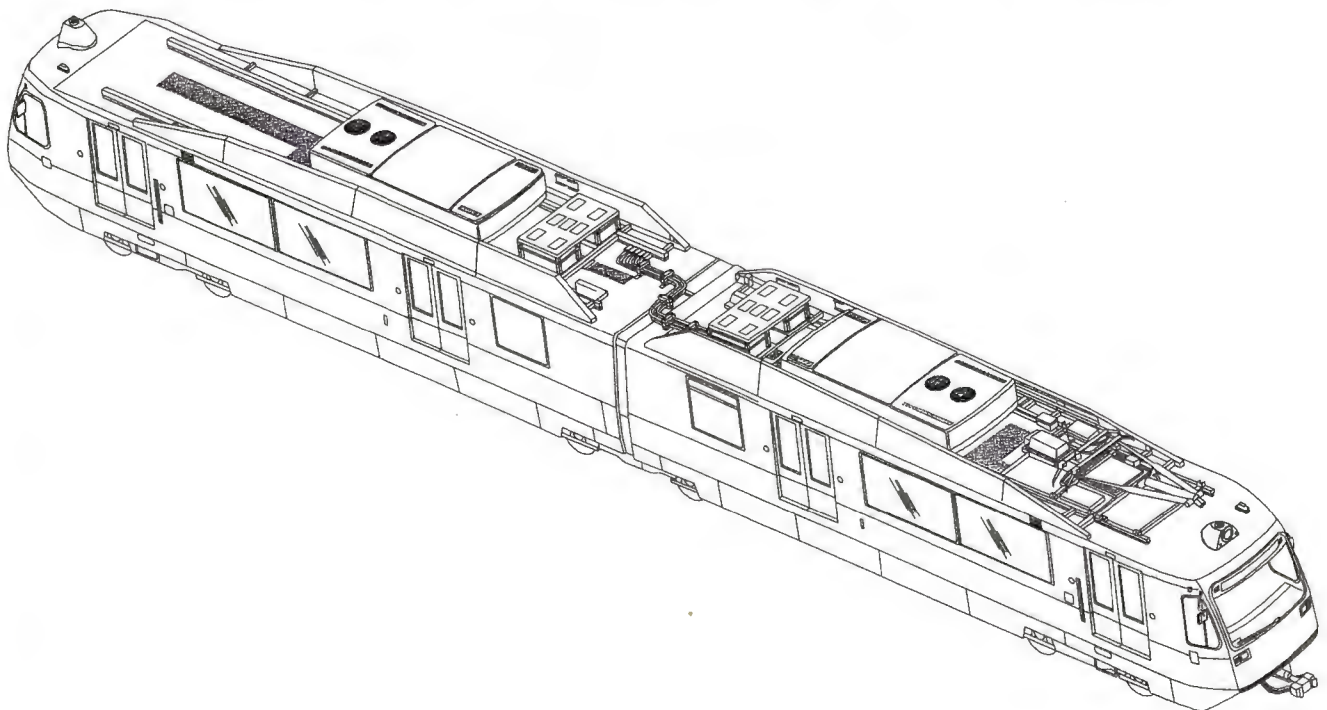




**Los Angeles County
Metropolitan
Transportation Authority**

**METRO GOLD LINE:
LOS ANGELES TO PASADENA**

**FAMILIARIZATION &
CHARACTERISTICS
OF THE
METRO GOLD LINE**





**FAMILIARIZATION
and
CHARACTERISTICS
of the
METRO GOLD LINE**

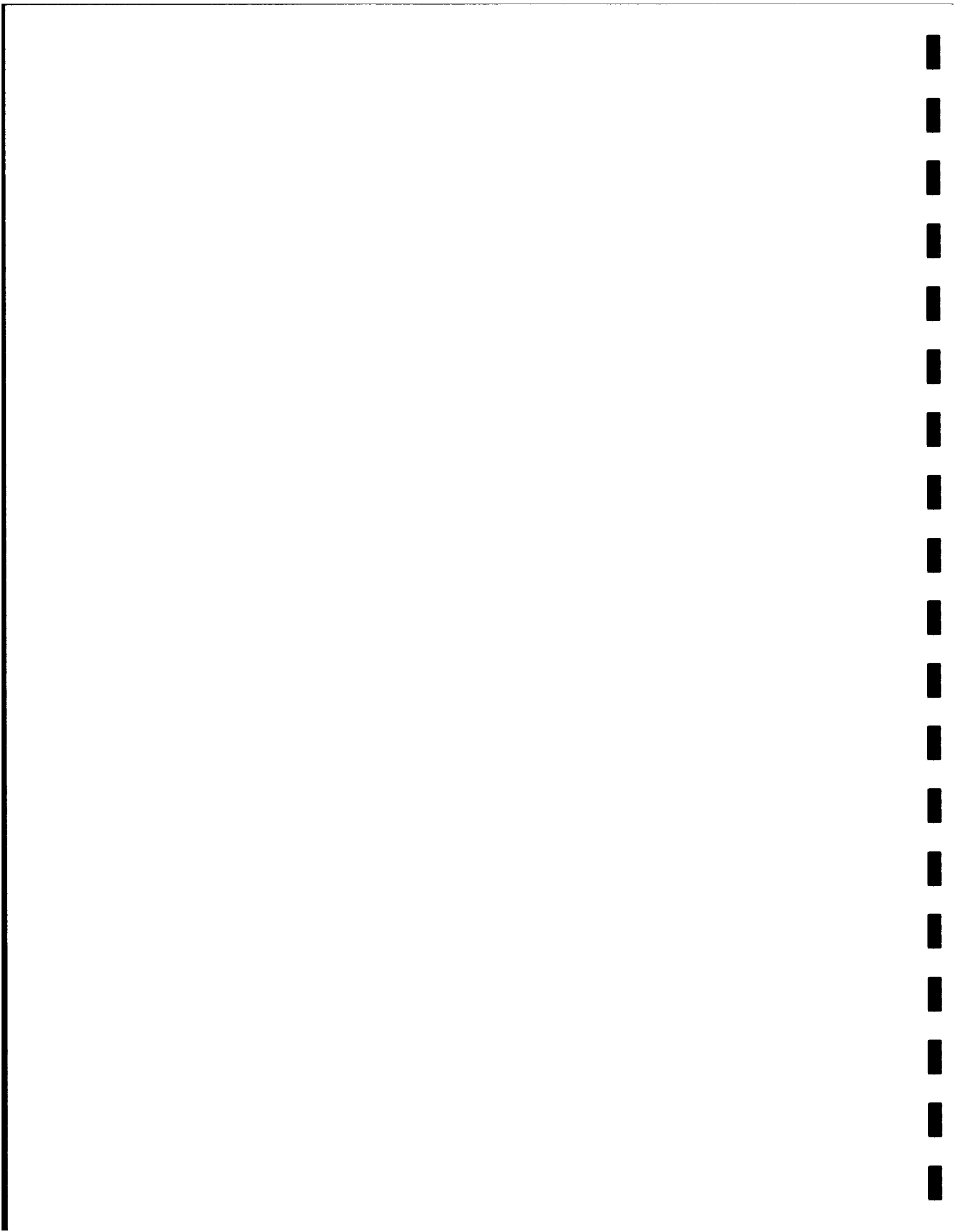
Produced by:
LACMTA
Metro Gold Line Rail Operations

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PURPOSE

The purpose of this manual is to familiarize Emergency Response Agency Personnel with operating characteristics and unique features of the Los Angeles County Transportation Authority's (LACMTA's) Metro Gold Line.

This manual will also provide a general overview of the Light Rail System as utilized on the Metro Gold Line, including explanations on the Rail Vehicle, Traction Power Distribution System, Mainline Right-of- Way (R.O.W.) and other important elements within the system.

OBJECTIVE

The objectives of this manual are threefold:

- To generate common knowledge among personnel in Emergency Response Agencies, such as Law Enforcement, Fire/Rescue and Paramedic Units and to enhance their response together with Rail personnel, when emergency interaction between agencies is required.
- To minimize potential danger to passengers and emergency response personnel.
- To maximize the effectiveness of the responding agencies in emergency situations by increasing their knowledge and understanding of the Metro Gold Line Light Rail System.



HISTORY OF THE METRO GOLD LINE

In April 1988, The Los Angeles County Transportation Commission (LACTC) authorized the preparation of an Environmental Impact Report (EIR) for the Metro Pasadena Project, clearing the way for conceptual engineering and preparing the Project for implementation as part of the Metro Rail Transit System. Pursuant to the California Environmental Quality Act (CEQA), the LACTC prepared a final EIR for the Project in February of 1990. On February 28 1990, the LACTC certified that the Project's final EIR had been prepared in compliance with CEQA.

On March 28, 1990, the LACTC approved the Project by adopting the Findings, Statement of Overriding Considerations and Mitigation Monitoring Program and authorized the filing of a Notice of Determination. These actions were separate from funding or scheduling decisions. The adopted Project corridor, termed the "Highland Park Alignment," was defined as a 13.7 – mile line from Union Station to eastern Pasadena.

In April 1991, the LACTC amended the approved Project to include an aerial alignment and station in the Chinatown area of Los Angeles.

In October 1991, the LACTC approved staffing to perform Preliminary Engineering (PE) for the Project.

In September 1992, a Supplemental EIR (SEIR) was released that analyzed potential impacts from construction alternatives to the Project EIR that was approved in February 1990.

On May 19, 1992, Assembly Bill 152, signed by Governor Pete Wilson, merged the LACTC and the Southern California Rapid Transit District (SCRTD) into one agency known presently as the Los Angeles County Metropolitan Transportation Authority (LACMTA), effective February 1, 1993.

On February 27, 1998, a de-mobilization went into affect, temporarily, discontinuing work for the Metro Gold Line.

The Los Angeles to Pasadena Metro Blue Construction Authority (known as the Authority), was formed in 1998 by State Legislation (SB1847), and became effective January 1, 1999. The Authority was given the responsibility of completing the project begun by LACTC and inherited by LACMTA after the merger of LACTC and SCRTD.



HISTORY (continued)

At Union Station, the Metro Gold line passengers will have the ease to connect with the Metro Red Line to the Metro Blue Line and to the Metro Green Line. In addition, Metro Gold line passengers may connect to and from the Metrolink trains to Moorpark, Santa Clarita, San Bernardino, Riverside, Clairmont, Anaheim and San Fernando.

The Nick Patsaouras Bus Plaza at Union Station is also available providing bus services with LACMTA, Foothill and Dash bus lines connecting commuters to points north, east, south and west.

Union Station is a terminal for Amtrack train service for the entire nation with Amtrack bus service to outline regions.

The Metro Gold Line will truly be an important link to the inter-modal transportation system serving the businesses and residents of the Los Angeles area.

History indeed, will ultimately tell if we are on the right track. The Metro Gold Line project has been a difficult task during all its planning and construction. The Los Angeles to Pasadena Blue Line Construction Authority, contractors, consultants, engineers and all the staff at the LACMTA involved in the conceptual design, construction and preparedness of the Metro Gold Line have worked hard to build a World Class Rail System, without inconvenience to our riding public and the citizens of the County of Los Angeles. LACMTA is proud to provide the citizens of Los Angeles County with a safe, reliable and environmentally clean running alternate mode of transportation, bridging all of us, well into the 21st Century.



HISTORY (continued)

The Los Angeles to Pasadena Metro Blue Line Construction Authority has been designing and building the project from Union Station in Los Angeles to Sierra Madre Villa Station in Pasadena with fully funded state and local money and is currently under construction using design – build contracts.

On November 29, 2001, the LACMTA Board of Directors renamed the Pasadena Blue Line, choosing the name “Metro Gold Line.”

When construction is completed by the Los Angeles to Pasadena Metro Blue Line Construction Authority, LACMTA will assume ownership and operate the Metro Gold Line, Light Rail System.

The current schedule for Revenue Operating Day (ROD) is July 01, 2003.

The line will serve the communities of Los Angeles, Chinatown, Lincoln Heights, Highland Park, South Pasadena and Pasadena. The trip from Sierra Madre Villa Station in Pasadena to Union Station in Los Angeles will take 33 minutes.

Phase I of the 13.7 mile line will link both the existing east-west Interstate 210 freeway right-of-way and the north-south leg of the former Atchison-Topeka and Santa Fe railroad right-of-way.

The Metro Gold Line will have 13 passenger stations. From Los Angeles to Pasadena, the stations are Union Station (LA), Chinatown Station (LA), Avenue 26 Station (LA), French Avenue Station (LA), Southwest Museum Station (LA), Avenue 57 Station (LA), Mission Station (S. PAS.), Fillmore Station (PAS.), Del Mar Station (PAS.), Memorial Park Station (PAS.), Lake Avenue Station (PAS.), Allen Avenue Station (PAS.) and Sierra Madre Villa Station (PAS.).

Council of Governments (COG) has decided to pursue a Phase II extension of the Metro Gold Line east to Claremont. Phase II will serve cities of Pasadena, Arcadia, Monrovia, Duarte, Irwindale, Glendora, San Dimas, Laverne, Pomona, Claremont and some unincorporated areas of the County of Los Angeles. Phase I and II will consist of a total of 37 miles.

In addition, the Eastside Light Rail (ELRT) Project is moving forward and is estimated to be completed sometime in early 2008 and will be part of the Metro Gold Line extending south from Union Station to Pomona Avenue and Atlantic Avenue in East Los Angeles.



RAIL OPERATIONS CONTROL AND YARD CONTROL

RAIL OPERATIONS CONTROL (ROC)

The Operations Control Facility, staffed by Rail Transit Operations Supervisors (RTOS's), who perform duties as Rail Controllers, is the nerve center for Rail Operations. The Rail Controllers on duty at **ROC**, have absolute authority over train movements and other activities affecting train movements and Mainline operations. This facility is located at 2000 East Imperial Highway, Los Angeles, CA. The facility more commonly known as the **ROC**, operates 24 hours per day, 7 days a week, 365 days a year.

The Rail Controllers work closely with Law Enforcement Departments from various jurisdictions, local Fire Departments, Rail Transit Operations Supervisors in the field, Train Operators, Equipment Maintenance and Facilities Maintenance Personnel and Closed Circuit T.V. (CCTV) Observers. The CCTV Observers are also located at the **ROC**. In addition, contact with Bus Dispatchers enhances Rail Operations. Radio and telephone communications link the Rail Controller with the personnel vital to Rail Operations.

The Rail Controller has the capabilities to monitor a variety of critical functions vital to the system by means of Transit Automatic Control and SCADA (TRACS). SCADA is Supervisory Control and Data Acquisition.

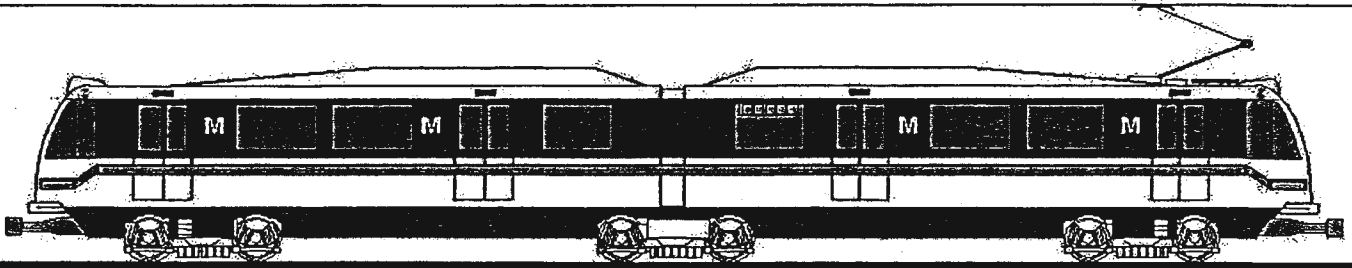
Some of those functions that are monitored are:

- Traction Power and related facilities
- Train Control and Communications Buildings
- Track Circuitry
- Passenger Stations
- Fire Detection at vital facilities
- Radio Communications
- Station Ticket Vending Machines
- Ventilation





RAIL VEHICLE CHARACTERISTICS



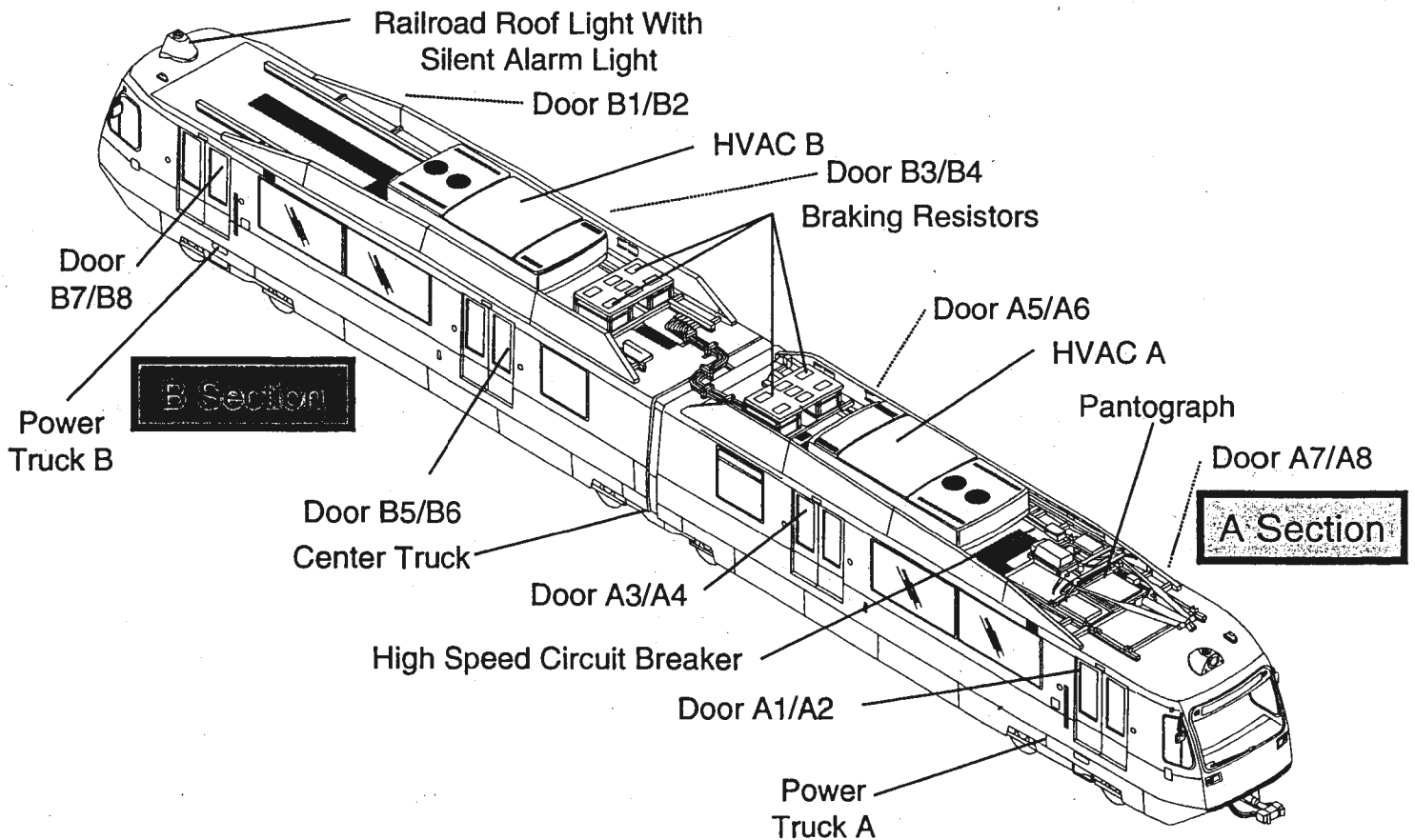
| | |
|------------------------|---|
| SUPPLIER: | SIEMANS TRANSPORTATION SYSTEMS, INC. |
| OPERATING AUTHORITY: | LOS ANGELES COUNTY TRANSPORTATION AUTHORITY |
| CONSTRUCTION: | CARBODY IS LOW ALLOY HIGH TENSILE STEEL (LAHT) & STAINLESS STEEL, AND IS ASSEMBLED BY WELDING AND RESISTANCE WELDING. |
| SYSTEM LENGTH: | 13.7 MILES |
| FLEET SIZE: | 26 CARS (INITIAL METRO GOLD LINE FLEET) |
| SUPPLY VOLTAGE: | 750 VOLTS DIRECT CURRENT (VDC) |
| RAIL GAUGE: | 56.5 INCHES (1,435 MM) |
| VEHICLE MODEL: | SD 460, SIX-AXLE, ARTICULATED LIGHT RAIL VEHICLE |
| VEHICLE LENGTH: | 89 FEET, 6 INCHES (27.26 MM) |
| VEHICLE WIDTH: | 8 FEET, 9 INCHES |
| VEHICLE WEIGHT: | 99,000 LBS. (EMPTY) 139,348 LBS. (MAXIMUM LOAD) |
| SEATED LOAD: | 76 PASSENGERS AW 1 (ASSIGNED WEIGHT) |
| CRUSH LOAD: | 262 PASSENGERS AW 4 (ASSIGNED WEIGHT) |
| BOARDING: | FOUR HIGH LEVEL DOORS PER SIDE |
| DISABLED ACCESS: | HIGH LEVEL PLATFORMS |
| SUSPENSION SYSTEM: | PRIMARY RUBBER CHEVRON SPRINGS SECONDARY AIR SUSPENSION |
| FRICTION BRAKE SYSTEM: | SERVICE: PNEUMATIC APPLIED, PARKING: SPRING APPLIED |
| PROPULSION SYSTEM: | 3 - PHASE AC, DUAL-MOTORED TRUCK (FOUR MOTORS PER CAR) |
| TRACTION MOTOR RATING: | 165 HORSE POWER |
| MAXIMUM SPEED: | 55 MPH |
| MAXIMUM ACCELERATION: | 3 MPH PER SECOND |
| FULL SERVICE BRAKING: | 3.5 MPH PER SECOND |



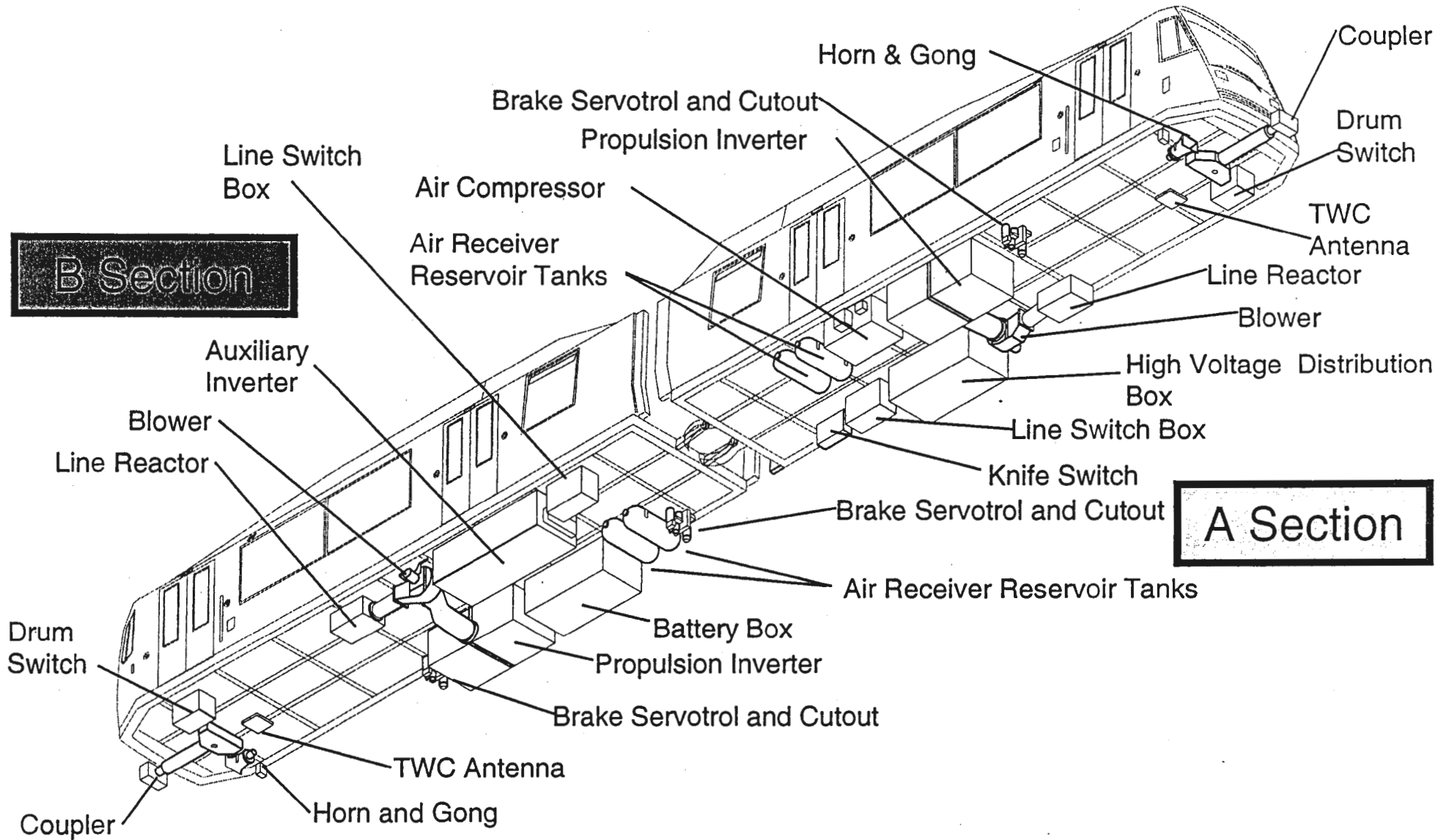
CAR EXTERIOR

The passenger rail vehicles operating on the Metro Gold Line are built by Siemens-Duewag and are identified as the P-2000 Car. Each car is 90 feet long and is constructed of light-weight steel with an "A" end, "B" end and an articulated section in the center. Each P-2000 Car has three "truck" assemblies. Truck assemblies support the vehicle and contain vital parts such as the wheels, axles, traction (electrical motors, gearboxes and friction (disc) brakes. Trucks located on the A and B end are equipped with traction motors; the center truck beneath the articulated section is not powered, however, it is equipped with a pair of friction brakes on each axle.

SIEMENS LACMTA P2000 Vehicle - Roof View



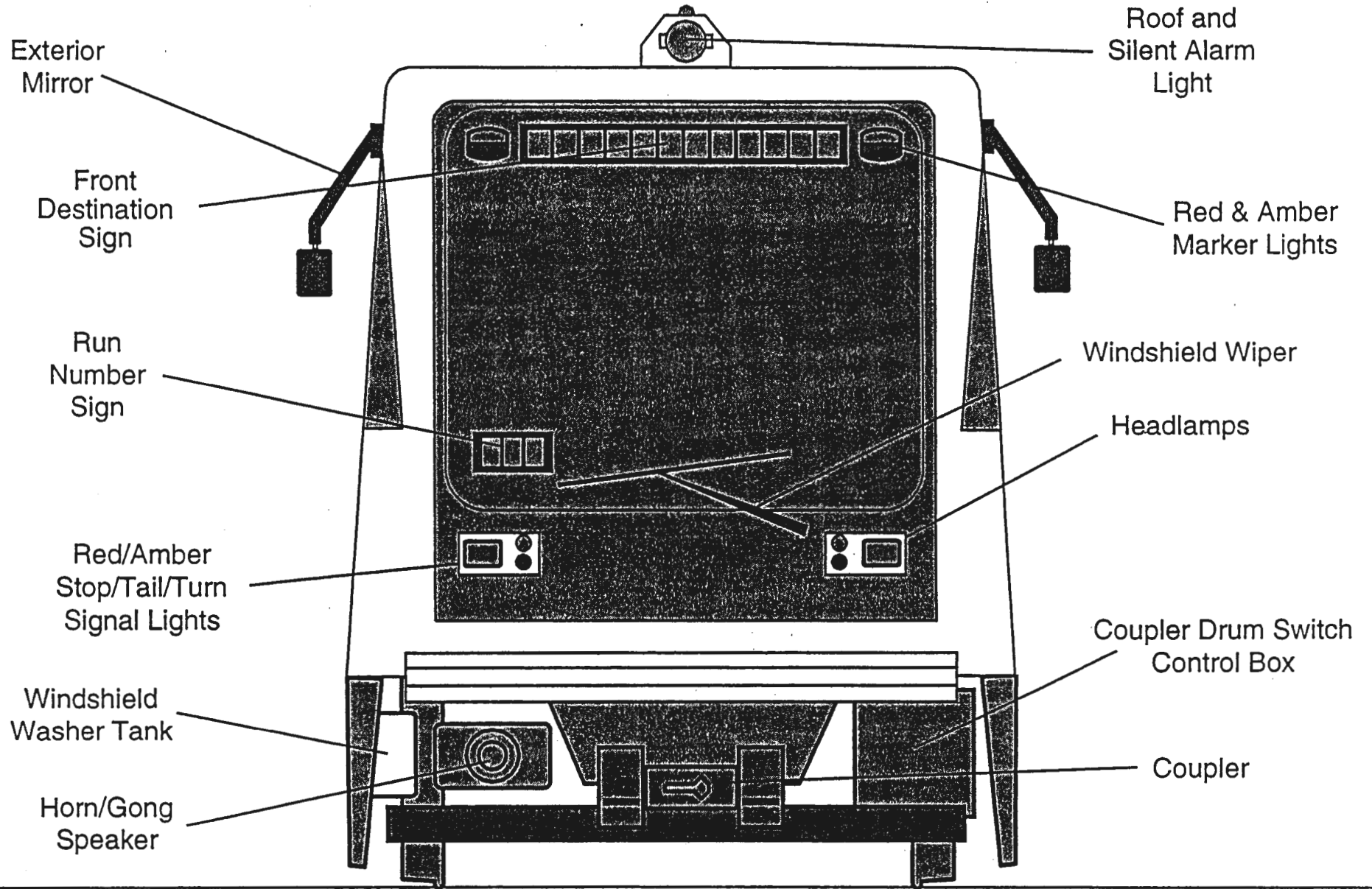






SIEMENS

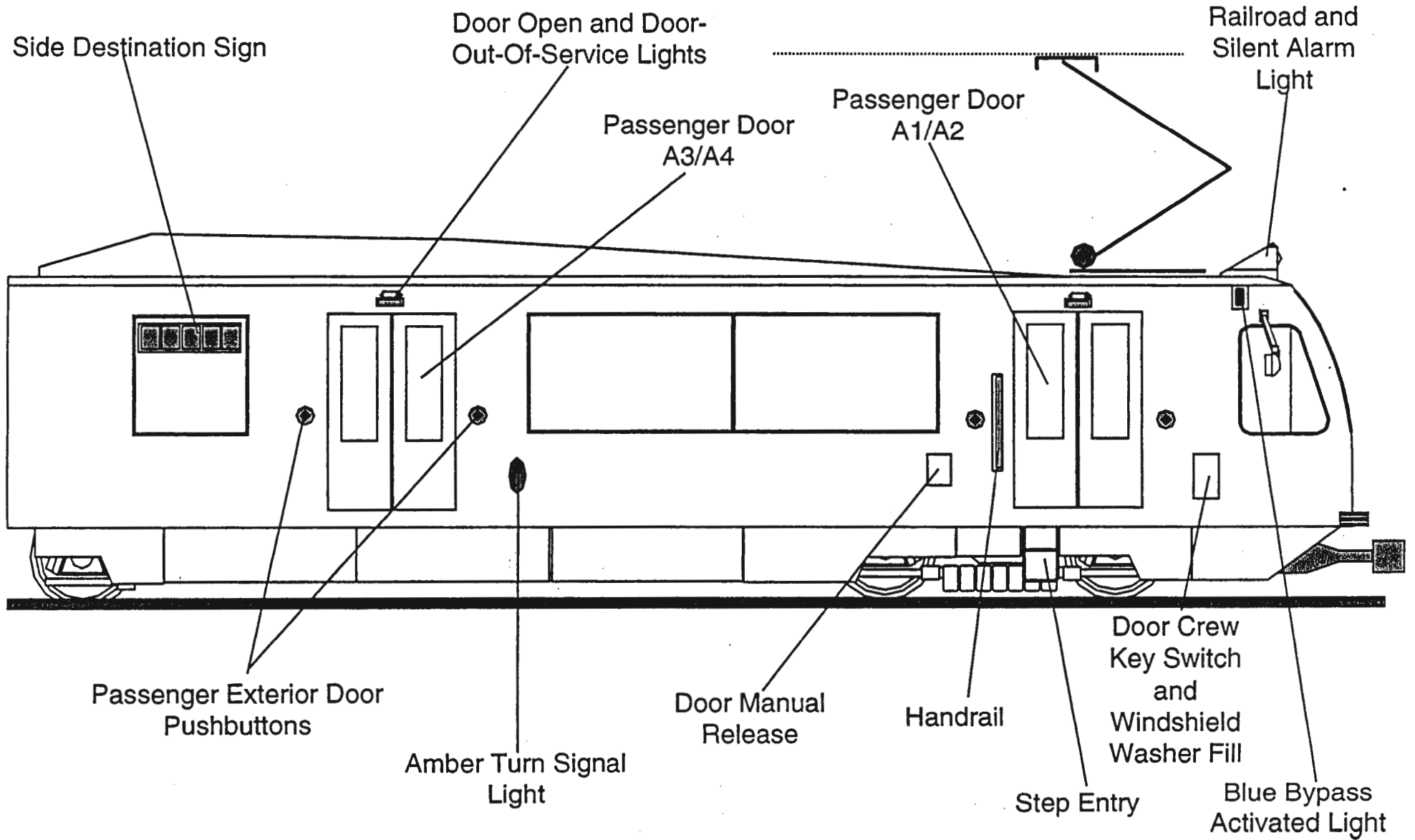
LACMTA P2000 Vehicle - Front View



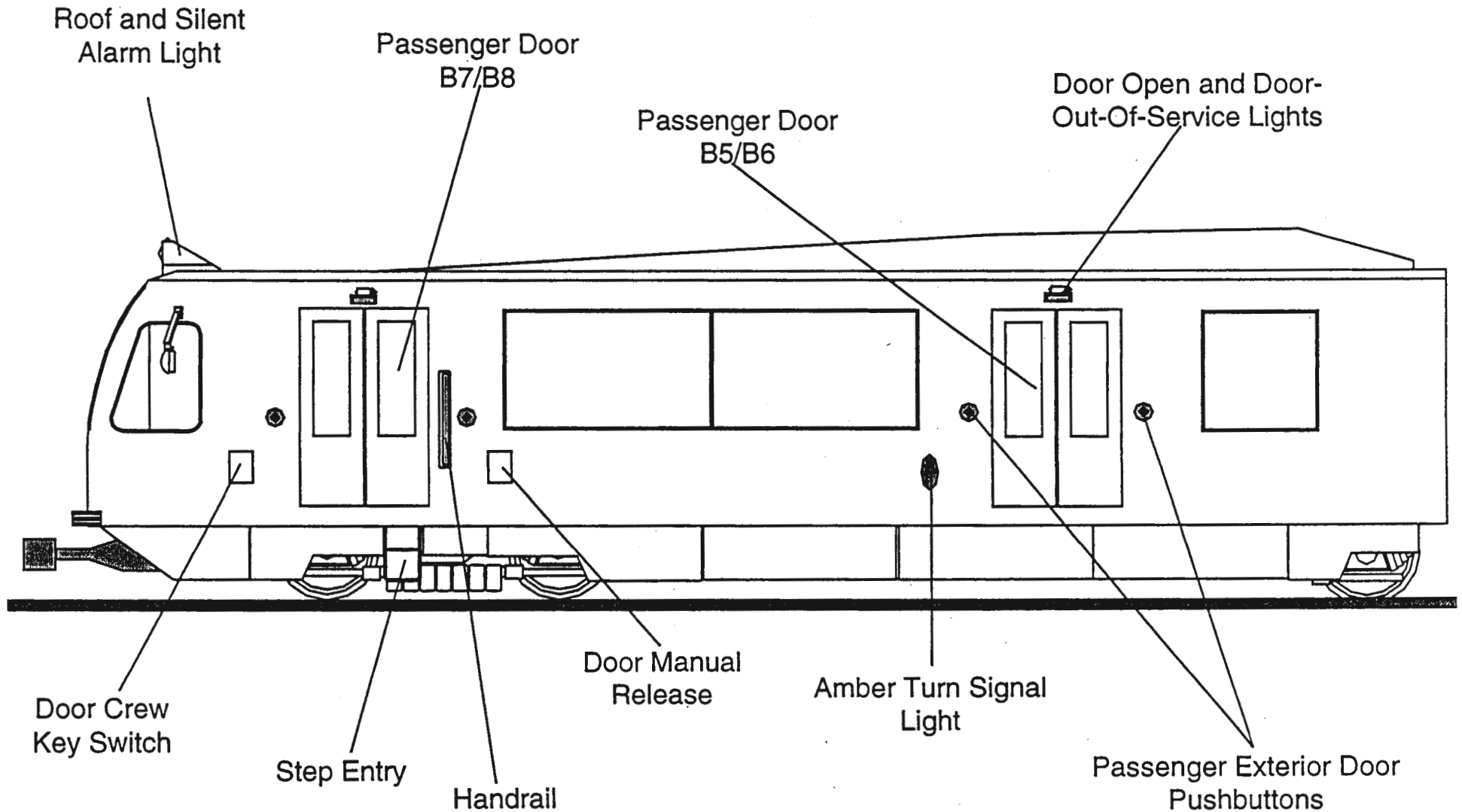


SIEMENS

LACMTA P2000 Vehicle - A Section Side View









CAR INTERIOR

Each car seats 76 passengers and can accommodate 262 passengers during a standing "Crush Load". The car is designed with no front-end doors between them. Other than at passenger platforms, movement by passengers from one car to the other is not possible. Both the A and B section of each car, as illustrated on diagram on next page, has a set of seats that folds upward to provide for an accessible location for wheelchair patrons.

FIRE EXTINGUISHERS

Each car is equipped with two (2) ten (10) pound (4.5 KG) Foray multi-purpose ABC dry chemical fire extinguishers. Each Train Operators Cab is equipped with a fire extinguisher.

PASSENGER ASSISTANCE INTERCOMS

There are four (4) Passenger Intercom (PIC) push button controls per car, for emergency communications with the Train Operator. The PIC control panel illuminates a flashing green LED light when a passenger depresses the push to call button on the intercom unit and continues to flash green until the Train Operator responds. After the Train Operator responds, the green LED light remains steady until the Train Operator has cleared the PIC.

BATTERY

The batteries are Nickel Cadmium and are located at the under-floor of the B section of the car. The car battery supplies 37.5 Volts direct Current (VDC) to the interior lighting system, passenger doors and the unit for raising and lowering the Pantograph.



PASSENGER DOORS

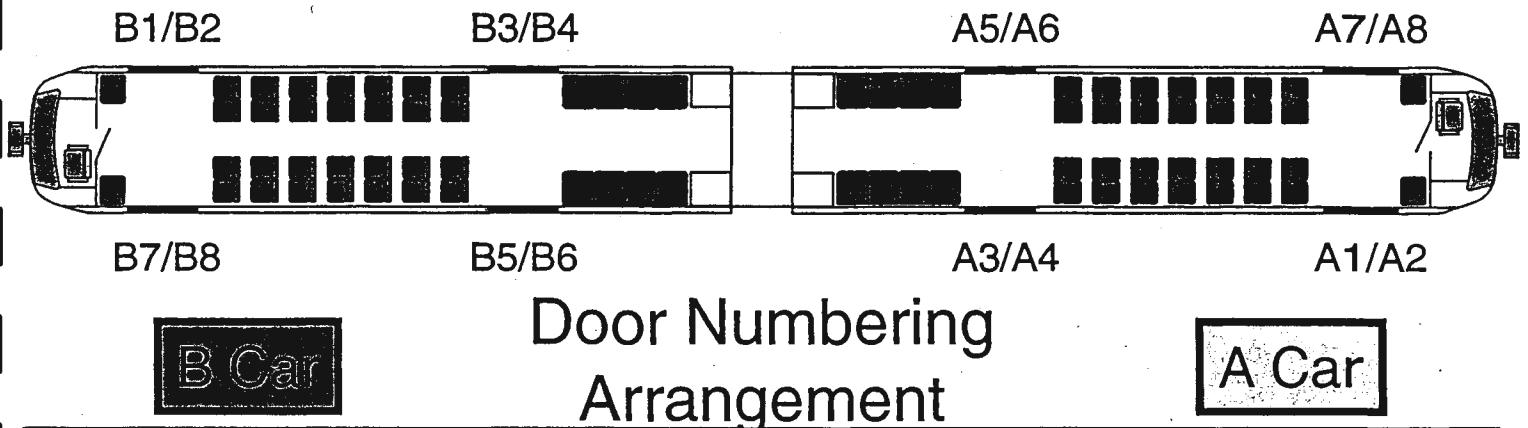
There are four (4) double sliding passenger doors on each side of a car for a total of eight (8), on each car. Door operation is controlled from the Train Operator's Cab and allows the Train Operator to open all doors on either or both sides of the train and only when train is completely stopped.

Passenger doors are electrically powered, by 37.5 VDC reversible Motors.

Between each set of passenger doors, there is a "Sensitive Edge" within the door edge molding that detects obstacles and protects passengers.

The passenger doors also have a locking mechanism to keep doors in the closed position.

Passenger doors are numbered as illustrated below.



EXTERIOR DOOR COMPONENTS

There is an "Exterior Door Open Indicator Light" above each set of passenger doors. When illuminated, Train Operators can verify if that particular set of passenger doors are open or closed. When the doors are in the open position, the Exterior Door Open Indicator Light will remain illuminated with a red colored light until the passenger door is completely closed.

There is a Passenger Door Release Pushbutton on each side of each set of passenger doors and on both sides of the LRV. Only when activated by the Train Operator, from within the Train Operator's Cab, can the Passenger Door Release Pushbuttons become operable. When activated, passengers or personnel can initiate the passenger doors to open by depressing the Passenger Door Release Pushbutton.



EMERGENCY DOOR OPERATION (EXTERIOR)

During an emergency, whenever personnel require entry into the interior of an LRV and assistance from the Train Operator is not possible, entry can be achieved with the utilization of the Exterior Door Manual Release compartment, located on each side of both front (F) ends (A and B Sections) of the P-2000 LRV.

By lifting the Exterior Door Release compartment cover plate, a Red handle is exposed. Pull upward on the Red Handle and the:

- Locking mechanism to that set of passenger doors will be released.
- Motor to the Passenger Door is cut out.
- Passenger Door opens 1 to 2 inches.
- Emergency response personnel can manually open the set of passenger doors to gain access into the P-2000 LRV.

By lowering the Red handle, located behind the Exterior Door Release compartment cover plate, to the closed (down) position, Passenger Door will automatically close and lock after 15 to 20 seconds.

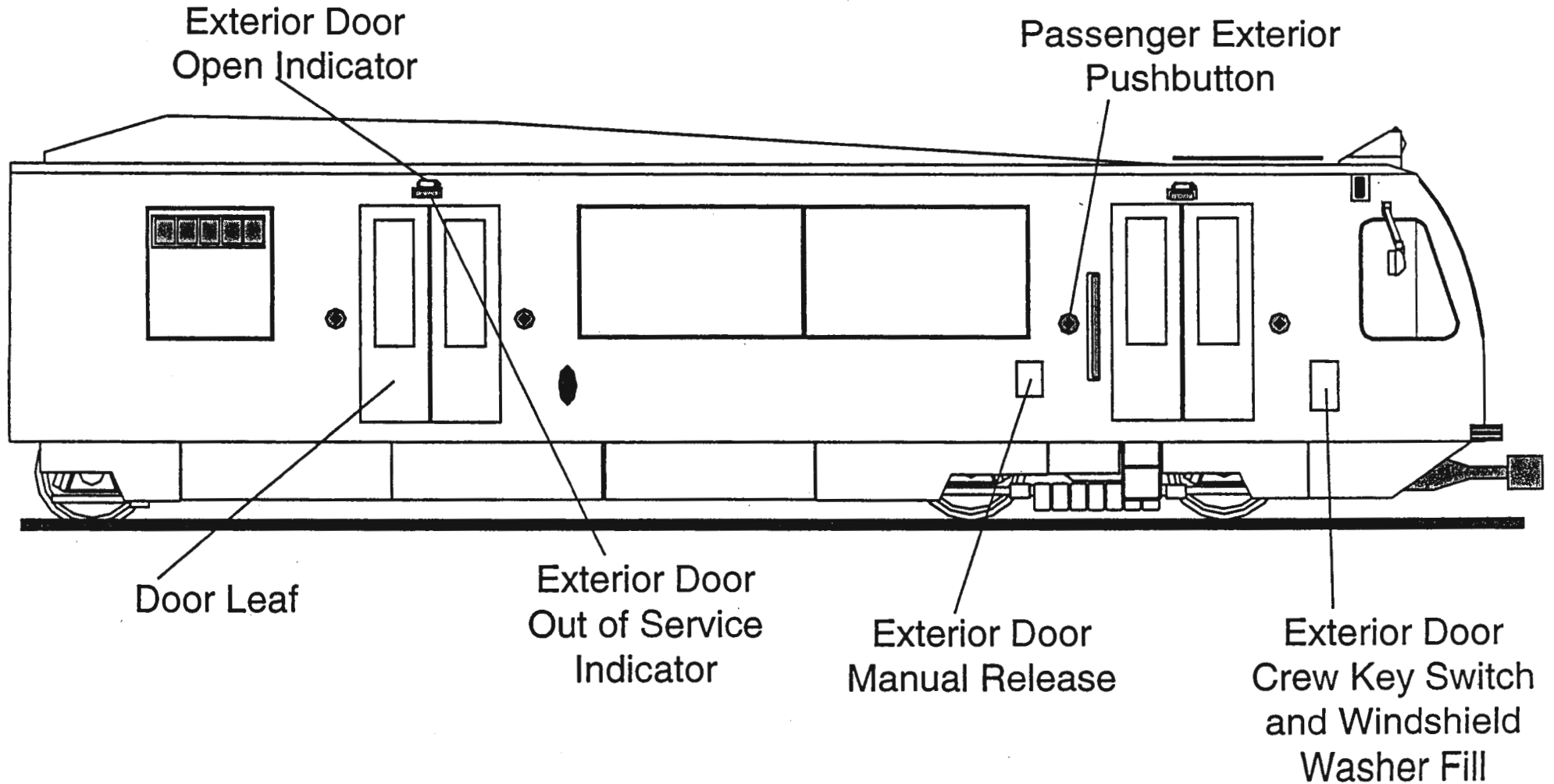
Additionally, there is a Crew Key Switch located on both sides near the Front-end of the P-2000 LRV and on both sides of the A and B ends. By inserting the Barrel key into the Crew Key Switch mechanism, personnel can operate the adjacent set of passenger doors to an opened or closed position. The barrel keys are issued to Train Operators, Rail Transit Operations Supervisors (RTOS's) and Equipment Maintenance Personnel.

The following functions are described on the next three diagrams.

- Exterior Door Open Indicator Lights
- Passenger Exterior Door Release Pushbuttons
- Passenger Door leafs
- Exterior Door Manual Release
- Exterior Crew Key Switch



Cab Right Side

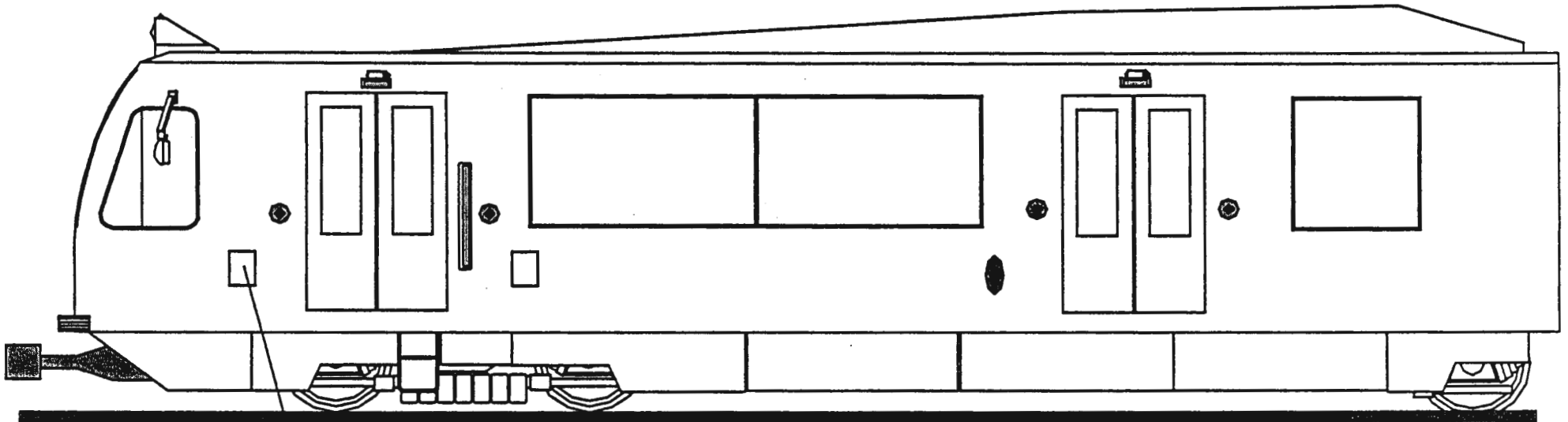




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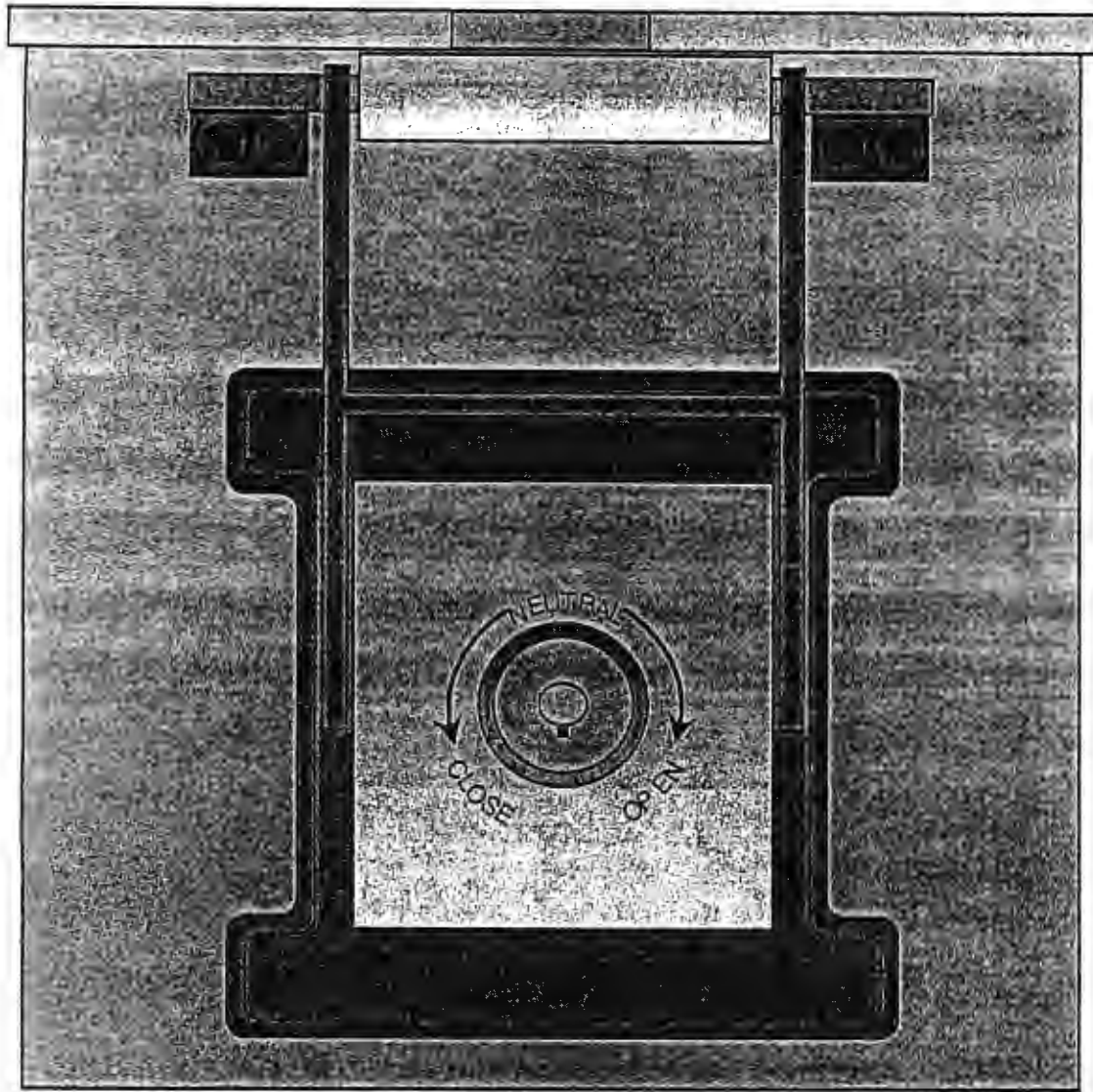
Door System Components

Cab Left Side



Exterior Door Crew Key
Switch Without
Windshield Washer Fill





Exterior Crew Key Switch

- Located on Cab Left Side
- Only on (Outer) Doors Nearest the Cab
- Use Crew Key to Operate Door Either Open or Closed



INTERIOR DOOR COMPONENTS

There is an "Interior Door Open Indicator Light" above each set of passenger doors that will illuminate whenever the door is open or on release.

An interior Crew key Switch is also available above each set of passenger doors as illustrated on the diagram on the next page.

EMERGENCY DOOR OPERATION (INTERIOR)

When emergency response personnel require exiting from inside of a P-2000 LRV and Train Operator assistance is not possible, exiting the LRV can be achieved by turning the red Interior Emergency Manual Release handle located above each set of passenger doors. Each set of passenger doors throughout the LRV can be manually opened during emergencies by using this procedure.

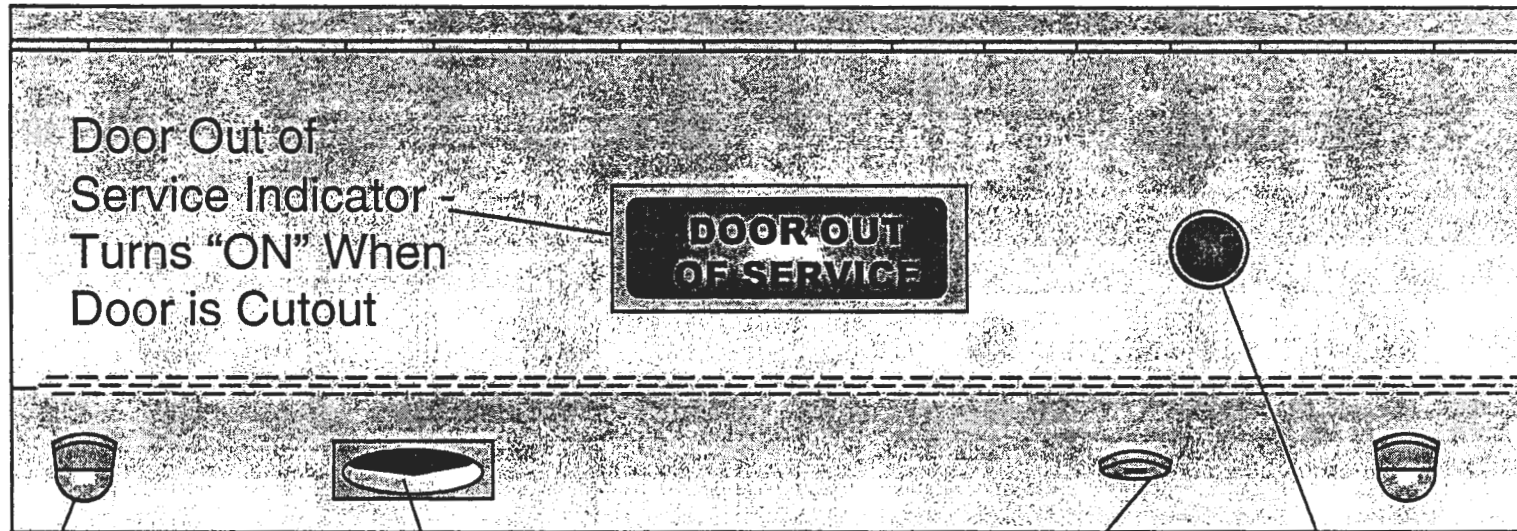
When turning the Red Emergency Manual Release handle, the:

- Locking mechanism to that set of passenger doors will be released.
- Motor to the Passenger Door is cut out.
- Passenger Door opens 1 to 2 inches.
- Emergency response personnel can manually open the set of passenger doors to exit the P-2000 LRV.

Caution: Prior to exiting an LRV under these conditions, make certain that the set of passenger doors are adjacent to a high level platform. If no high level platform is available, use extreme discretion when required to exit during an emergency.



Interior Indicators and Controls



Door Out of Service Indicator - Turns "ON" When Door is Cutout

DOOR-OUT OF SERVICE

Door Closing Indicators - Flash "ON" When Doors Are Closing

Interior Manual Emergency Release* - Works the Same Way as Exterior Emergency Release

Interior Crew Key Switch - Operate Door With Crew Key - Doors Nearest the Cab Only

Door Open Indicator - Turns "ON" whenever Door is *Open* or on *Release*



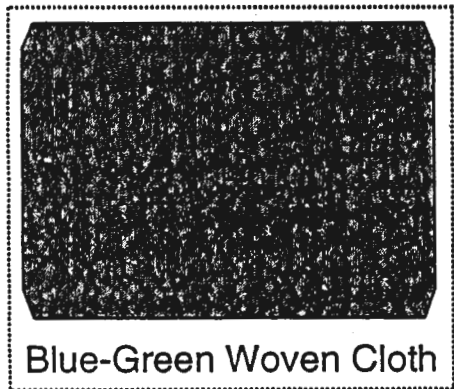
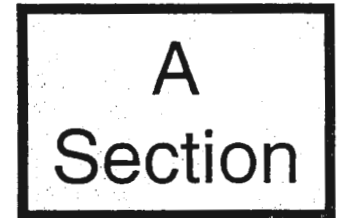
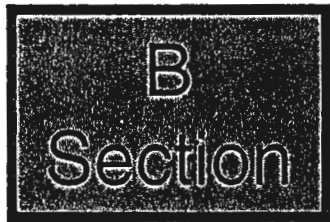
**Do Not Use for Normal Entry -- Use Crew Key Switch - Unlike P2020/P865 Cars With Loss Of Air Pressure, Electrical Crew Switches are Available at All Times*

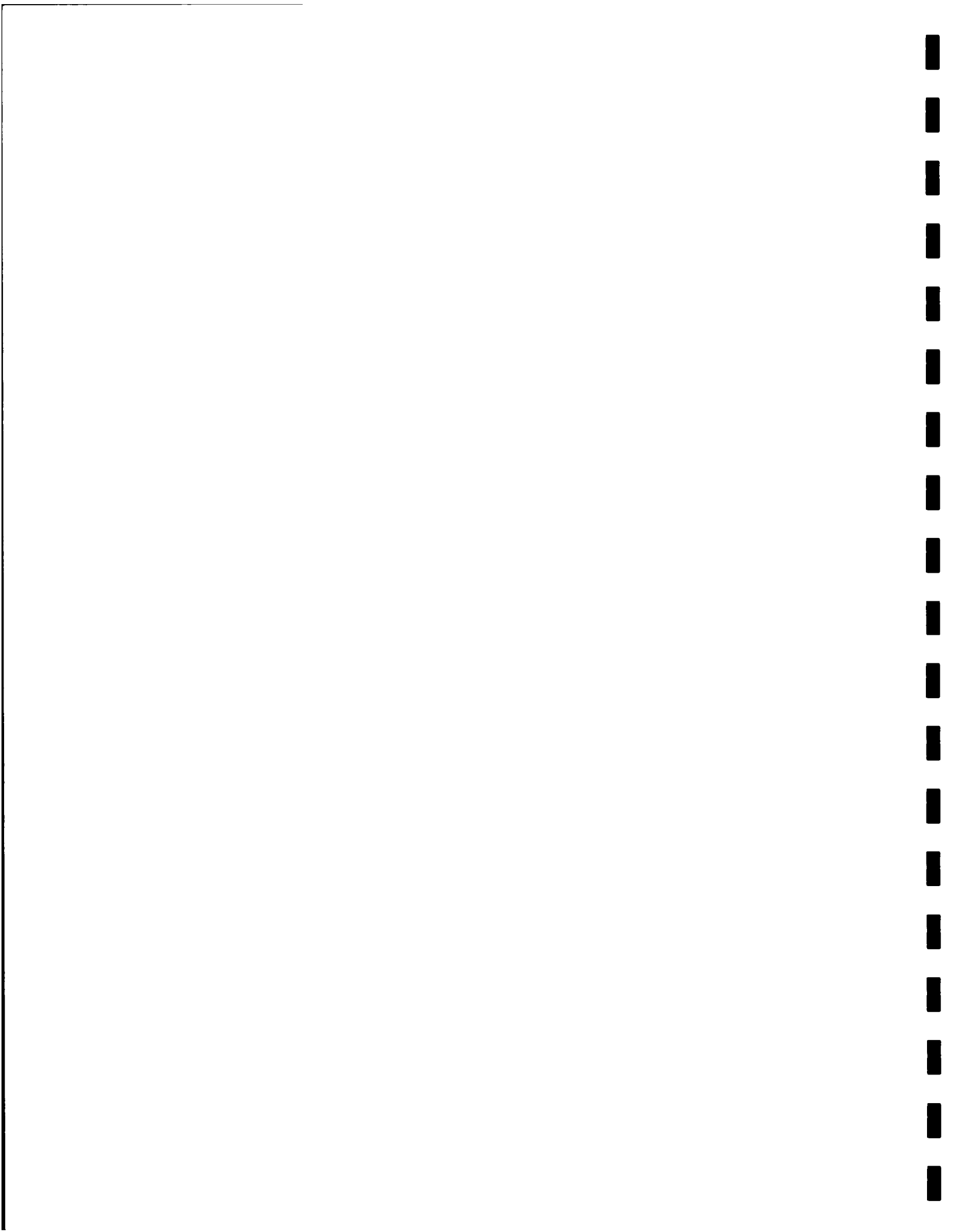


LACMTA P2000 Vehicle - Seating and Equipment

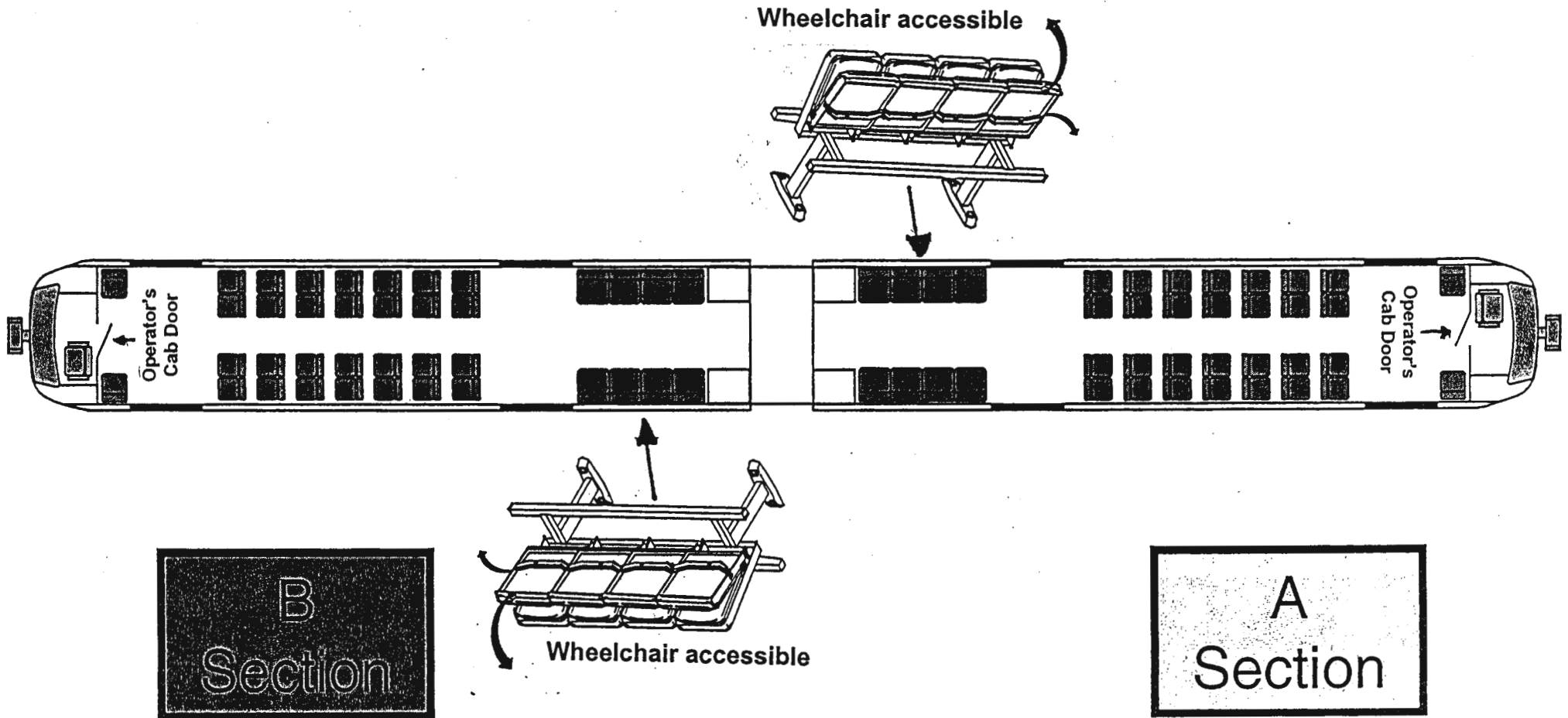
Interior View

Articulation
Lockers





LACMTA P2000 Vehicle - Seating Arrangement



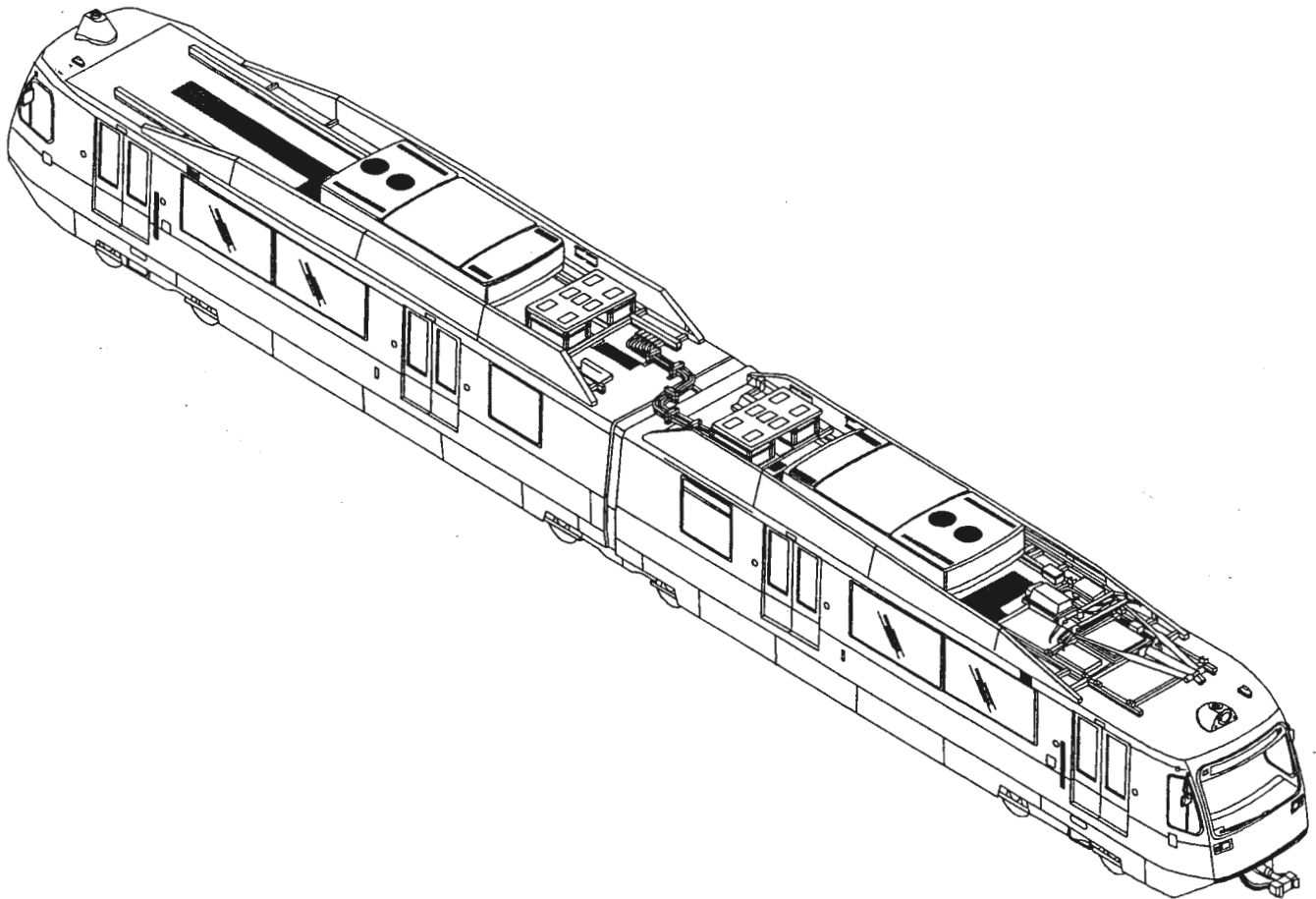


WINDOWS

The P-2000 LRV contains:

- Twelve large laminated safety glass windows provide passenger viewing and cannot be opened.
- Sixteen laminated safety glass passenger door window panels.
- Four laminated safety glass Train Operator side windows.
- Two large laminated safety glass Front-end LRV windshields rated with a 9-pound impact with a cinder block at 35 MPH.

The aforementioned windows, exceeds the safety glass standards so as to inhibit penetration of the velocity of small round fire.





BRAKES

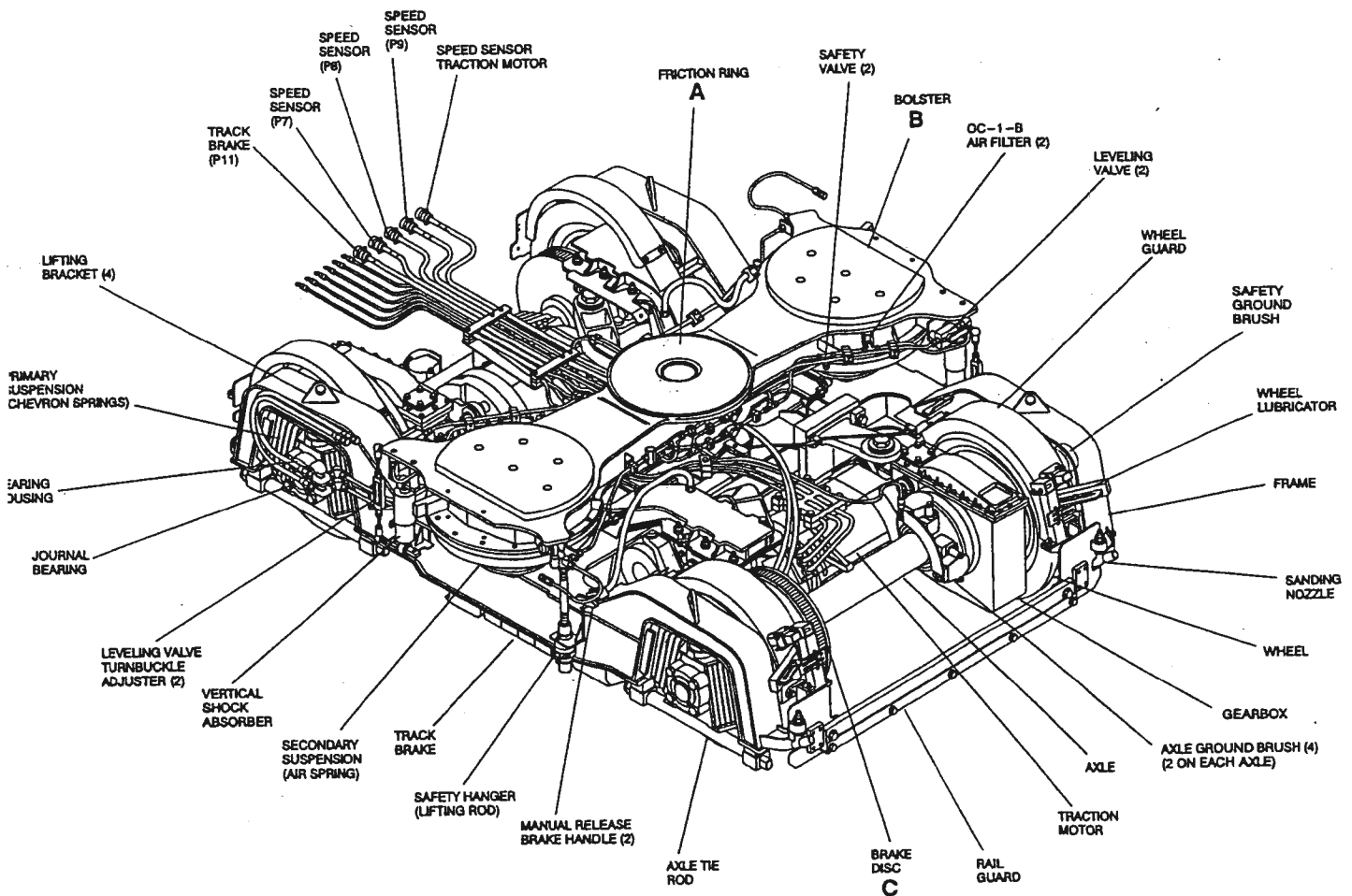
There are three types of brakes on each rail vehicle,

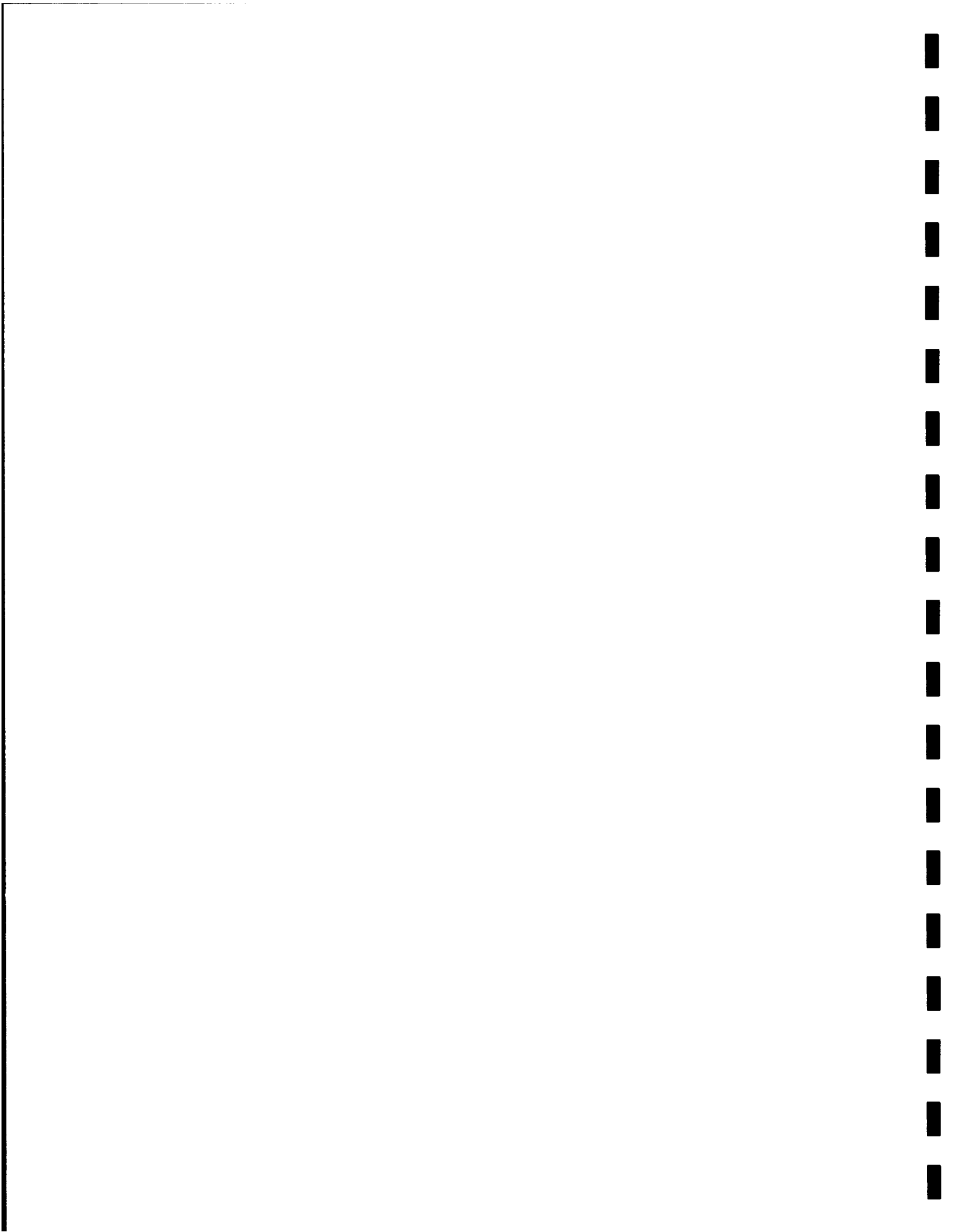
- Dynamic (electric) brakes,
- Friction (disc) brakes
- Magnetic Track brakes

Dynamic braking is the primary braking system in which electric current, derived from the motors, acts as a generator and provides controlled braking. Normal braking is a combination of dynamic braking and friction braking referred to as blended braking. The track brakes are primarily used in emergency situations.

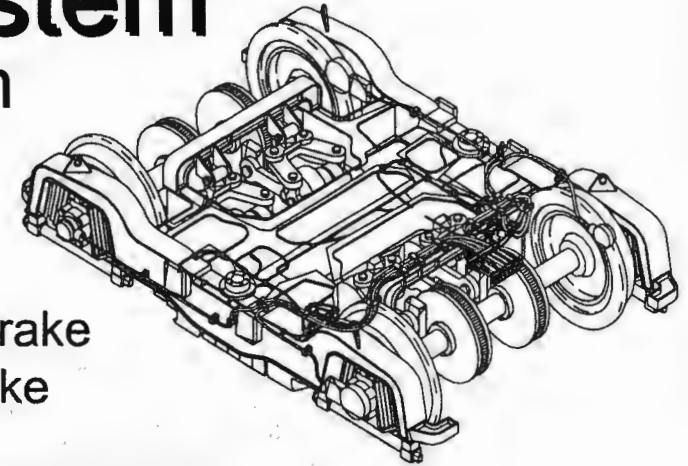
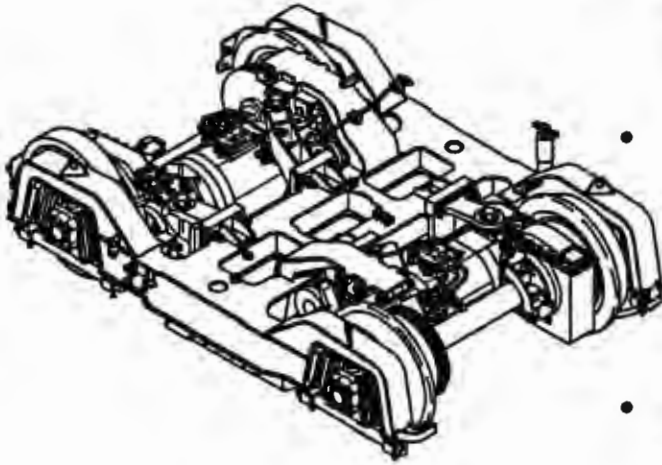
Full service braking is the maximum braking that can be obtained without going into an emergency stop condition.

Emergency braking is the maximum braking that can be obtained, but one activated cannot be released until the train has come to a complete stop and required associated actions are initiated.

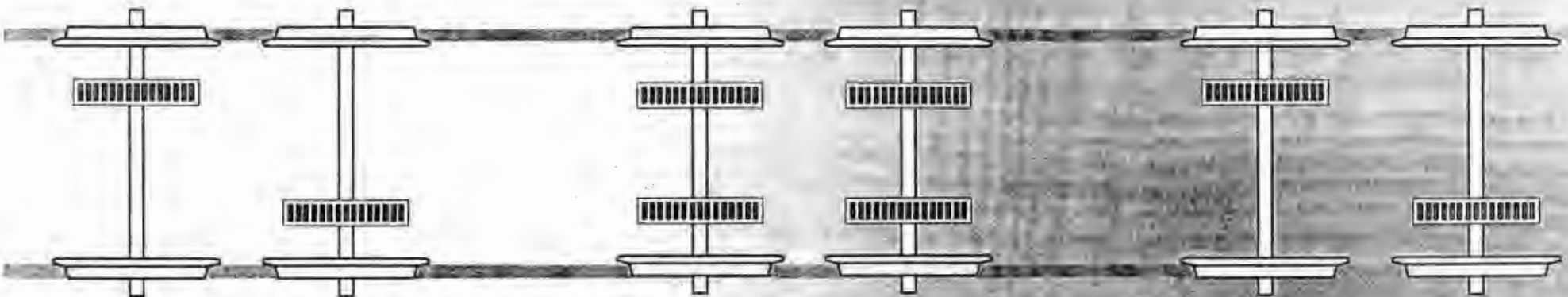




Friction Brake System Brake Configuration



- Power Trucks:
 - Single Disk Per Axle
 - *Spring Applied Parking Brake* + *Air Applied Service Brake*
- Center Truck:
 - Double Disks Per Axle
 - Air Applied Service Brake Only



Power Truck B

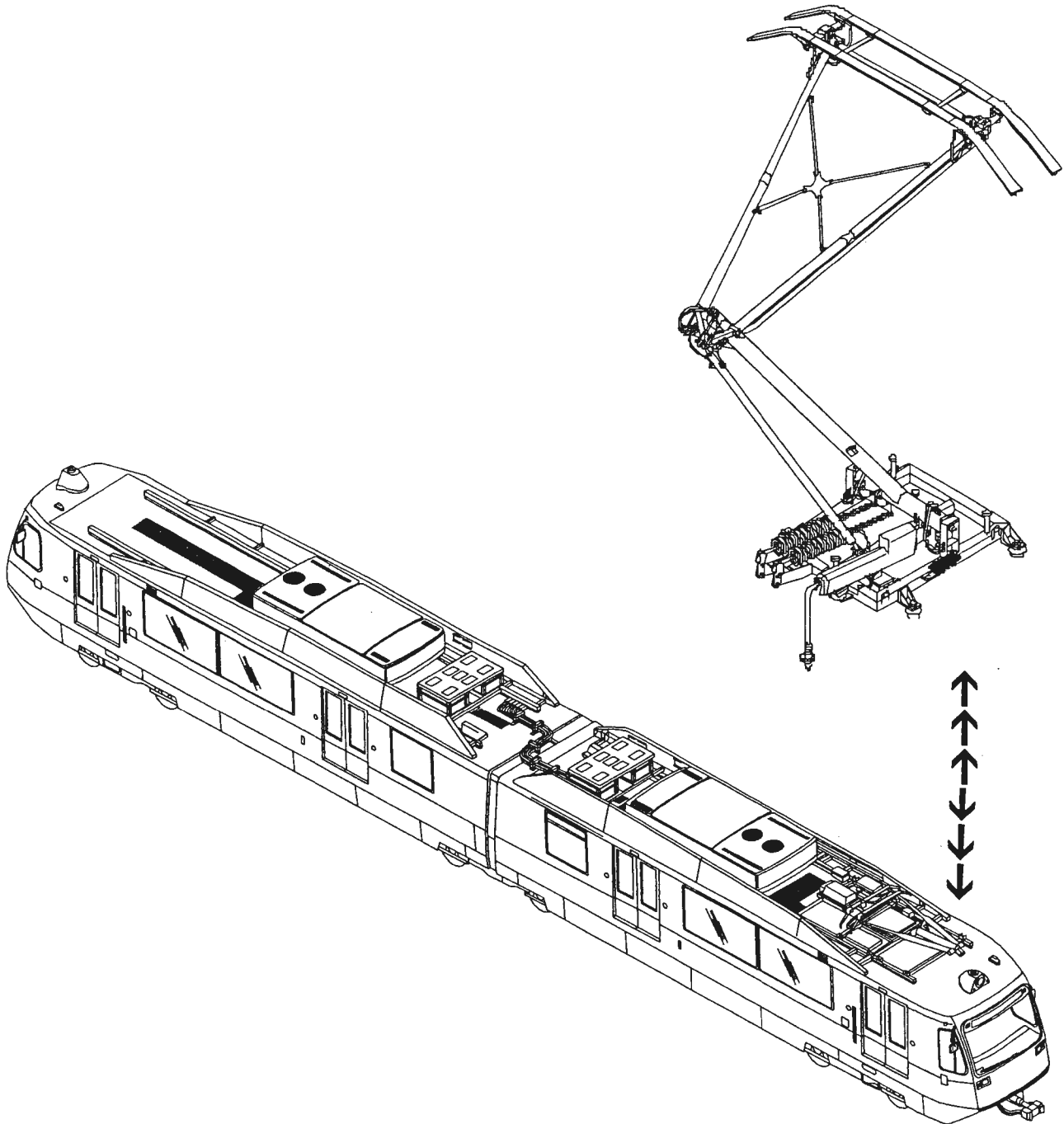
Center Truck C

Power Truck A



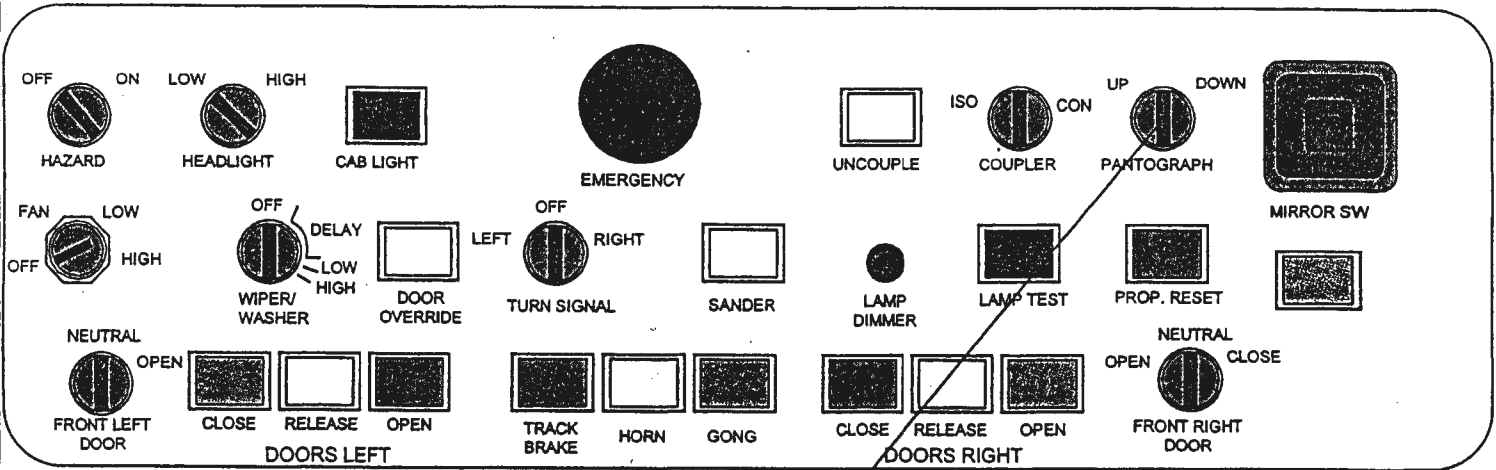
PANTOGRAPH

The Pantograph is a graphite and metal device mounted on top of the "A" end of the P-2000 LRV. The Pantograph extends above the roof of the LRV and when raised to touch/slide along the overhead Contact Wire, the Pantograph collects 750 Volts Direct Current (VDC) for traction power to the LRV. The Contact Wire is part of the Overhead Catenary System (OCS).

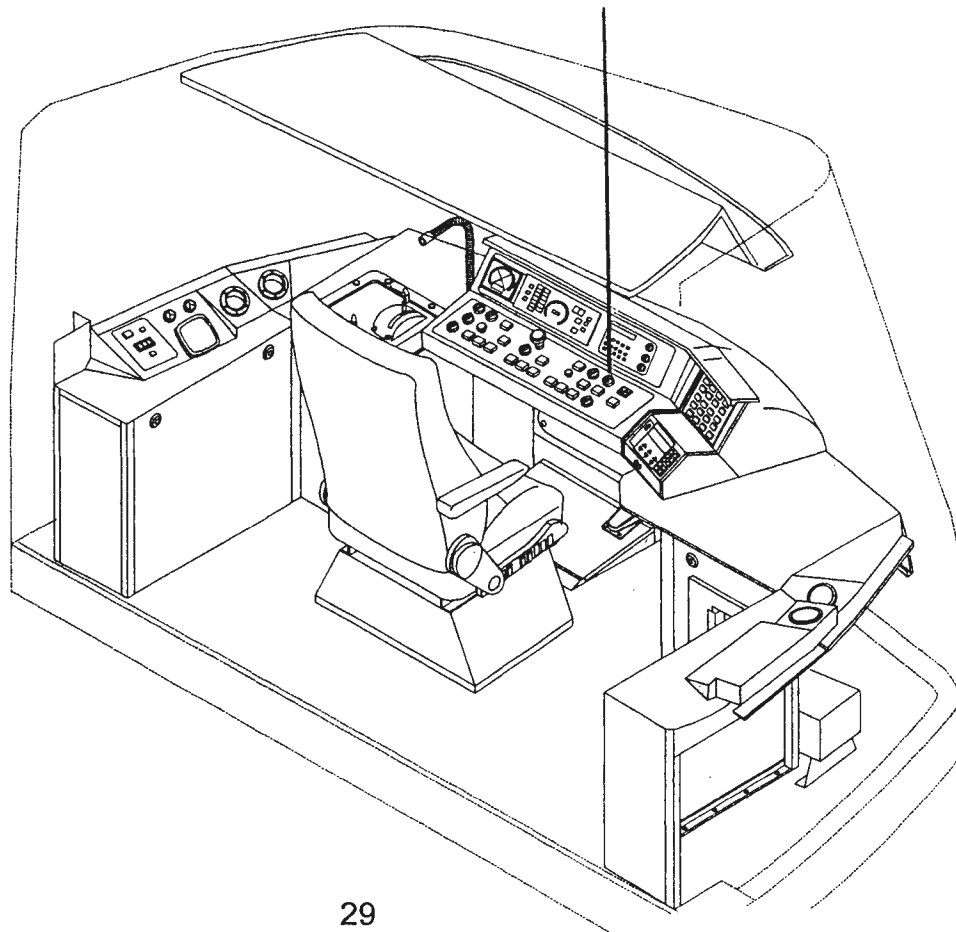




The Pantograph may be raised and lowered electrically from the Train Operator's Cab.



PANTOGRAPH UP/DOWN SWITCH
**REQUIRES ACTIVE CAB TO BE KEYED UP*





MANUAL PANTOGRAPH OPERATION

The Pantograph may be raised or lowered by manual operation when normal raising and lowering is not possible.

If required, by emergency response personnel, to manually lower the Pantograph the procedure is as follows:

- Ensure the Transfer Switch is in the OFF Position, in the Train Operators Cab.
- Obtain Manual Crank from third overhead compartment behind Train Operators seat, in the passenger seating area and only at the "A" end of the LRV. (T-key is required to open overhead compartment).
- Remove Manual Crank from within the overhead compartment, unfold handle and insert Manual Crank into the hole provided for the Manual Crank, located at the ceiling between left and right side passenger doors, behind Train Operators Cab at the "A" end.
- **CONTINUALLY PRESS UPWARDS ON HANDLE WHILE TURNING** to Engage Manual Clutch Mechanism. Turn handle approx. 30 times to cycle Pantograph up or down.
- **TO LOWER PANTOGRAPH** – Turn Hand Crank in a Counter Clockwise direction, looking upwards to the ceiling. Continue to turn until you hear a thud on the roof of the LRV.

When required to manually lower the Pantograph, the Manual Hand Crank must be inserted into the hole at the ceiling for each "A" end of a one (1), two (2) or three (3) car P-2000 LRV, which could be coupled together to make up the train. After manually lowering all Pantographs, **exit the train and make an exterior walk-around inspection to verify that all Pantographs are lowered.** This will insure that the 750 VDC from the Overhead Catenary System (OSC) is not being transferred to the LRV.

- **TO RAISE PANTOGRAPH** – Turn Hand Crank in a Clockwise direction, looking upwards to the ceiling.

When manually Raising or Lowering Pantograph, Use Extreme Caution Not to Damage Drive Unit!

NOTE: *The purpose of lowering the Pantograph during an emergency is that this procedure will remove power from the affected train without affecting other trains within the power zone.*



MAINLINE CHARACTERISTICS

CAB SIGNALS

Cab Signals primary functions are to maintain safe distance between trains to ensure separation of all trains in the system. The Automatic Train protection (ATP) system, assures train detection, train separation and speed regulation. By controlling train speeds, separation of trains at a safe distance is maintained. If a train attempts to close in on a preceding train, and separation between the trains is reduced, the Cab Signal System will impose a lower speed, or a **STOP** signal until a safe distance between trains can be restored.

Speed commands are transmitted to the train through the track rails and picked up by receiver coils mounted under the operating cab of the train. If the Cab Signals on the Train are reduced, the Train Operator must respond by applying sufficient braking, to reduce the train's speed, to the displayed speed reduction on the Train Operating Console. Should the train operator fail to respond to the speed reduction commands received by the ATP, an over speed situation develops and the train will automatically be stopped.

MILEMARKERS

For ease of identification and as a specific reference point, Mile-Post Markers are used between the northern and southern terminals.

EMERGENCY WALKWAYS

In an emergency, passengers will always exit the train according to the instructions received from the Train operator. There are designated walkways between the tracks to allow emergency personnel access to equipment and trains, and to evacuate passengers in cases of extreme emergencies.

On bridges or elevated guideways, the emergency walkways are located in the middle of the bridge between the northbound and southbound mainline tracks. Where track switches are present, the emergency walkways are on the outside portion of the guideway.

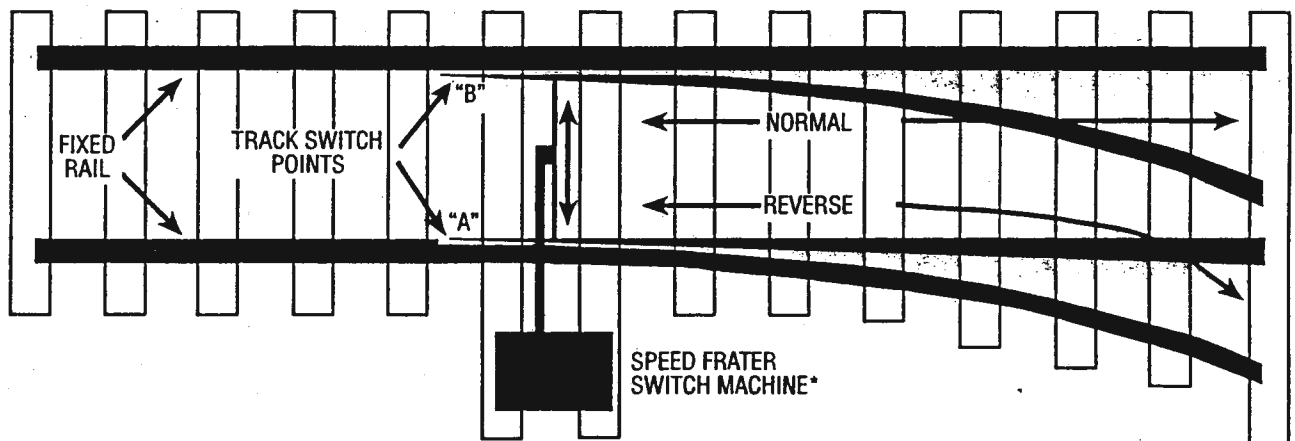


TRACK SWITCHES

The Metro Gold Line has remote controlled track switches, which are used to divert a train from one track to another. These same track switches can also be manually operated and therefore are considered dual controlled track switches.

Under normal conditions, the track switches on the mainline are moved by remote control from ROC or other locations, at distances far away from the track switches. At the Midway Yard, the track switches are controlled from Yard Control.

Track switches have moveable components such as, opened and closed end track switch points that are fixed against the stock rail, track switch rods, and track switch machines and can move without warning. Therefore, personnel must never step, stand, sit or walk on any part of the track switch components. And never place feet/foot or any portion of hands between the opened end track switches, as it may close unexpectedly and crush/trap the person. Switch machines have enough power to crush a persons' hand or foot. Always stand clear of track switches.



NOTE: Tampering with track switches is prohibited and could potentially cause an accident and/or derailment.

ACCESS TO RIGHT-OF-WAY (R.O.W.)

In the event access to the R.O.W. is required during an emergency and entry from platform areas is not practical, personnel have three other options:

1. Ride a train from the opposite direction.
2. Make entry at access gates, located at several locations.
3. An opening may be cut in the fencing, after ROC is notified of the problem.



TRACTION POWER SUBSTATION

CHARACTERISTICS OF TRACTION POWER

Electrical power for the Metro Gold Line is supplied by standard high-voltage Alternating Current (AC) power service from the City of Los Angeles Department of Water and Power (DWP) at locations within the MGL serviced by the City of Los Angeles and the Pasadena Department of Water and Power (PDW&P) for those locations within the MGL that is serviced by the City of Pasadena.

The incoming electrical power stations, contain the standard supply configuration consisting of two 34,500 volts of alternating current feeders, distributed from separate buses. This "dual feed" arrangement ensures that the probability of service interruption due to line or switchgear problems is quite low. A controlled transfer switch selects between the feeds, supplying only one service to each TPSS at any instant.

Adjacent to each incoming electrical power substation is an LACMTA Traction Power Sub-Station (T.P.S.S.), where the 34,500 Volts of Alternating Current (34.5 KVAC) dual feeds are introduced into the T.P.S.S.'s.

The T.P.S.S.'s contain various high voltage electrical apparatus, such as transformers, rectifiers, direct current (DC) feeder breakers etc. At the TPSS's, the 34.5 KVAC is transformed to lower voltages of AC, then the rectifiers convert AC power to DC power and is increased to 750 volts of Direct Current (750 VDC). 750 VDC is then routed to the Overhead Catenary System (OCS), which covers the entire Metro Gold Line.

The 750 VDC is collected from the Contact Wire, which is a component of the OCS, to the P-2000 LRV through the Pantographs of the train, which energizes the electric motors of the LRV, thus supplying traction power to the train.

Each Traction Power Sub-Station is located strategically along the Right-of-Way on the mainline and Midway Yard and can be identified by a Blue Light located adjacent to or on the roof of the structure.

The illuminated Blue Light is not an indication of an energized or de-energized status; it's simply a location marker, for identification purposes. The Blue Light, known as the "Blue Light Station (BLS)", identifies the general location of the Emergency Trip Station (ETS).



CHARACTERISTICS OF TRACTION POWER (continued)

EMERGENCY REMOVAL OF TRACTION POWER

Whenever it ever becomes necessary, during an emergency, to de-energize traction power to the OCS, emergency response personnel can cause de-energization (removal of power) with the utilization of the ETS.

ETS's are orange colored boxes throughout the system, located adjacent to BLS's, that contain a red pushbutton mushroom device called an Emergency Trip Switch that when activated, causes the DC feeder breakers to open at the T.P.S.S. and de-energizes traction power to the affected power zone.

Activation of an ETS also has a lock-out feature. When a Red Mushroom Device is pushed, causing the DC feeder breakers to open that supply power to the power zone affected by the ETS, ROC cannot close the DC feeder breakers from ROC by remote control capabilities. Not until the person who caused removal of power, from the ETS, releases the Red Mushroom Device, can ROC close the DC breakers by remote control.

Power zones may be back-fed from more than one TPSS. When an ETS is activated, all of the DC feeder breakers tied into that particular ETS, will be opened and de-energized. A decal attached to the ETS box will describe which track and limits of the power zone is affected.

THE EMERGENCY TRIP STATION SHOULD ONLY BE USED IN AN EMERGENCY, so as to not involve trains not affected in the emergency and creating an even larger problem.

The ETS box also contains an Emergency Telephone (**E-TEL**). The E-TEL is a direct ring-down to ROC. When emergency response personnel, activates an ETS during an emergency, ROC must be notified with the E-TEL.

Additionally, at Memorial Park Station, the ETS box contains an Under-car Deluge button. The Under-car Deluge button is for fire suppression. If a train, at Memorial Park Station was on fire, the Under-car Deluge button may be pushed to activate the sprinkler system located between each track to assist in fire suppression. Activating the Under-car Deluge button will first de-energize traction power to the affected area.



CHARACTERISTICS OF TRACTION POWER (continued)

When emergency response personnel arrive at a scene and emergency removal of traction power is not absolutely necessary, but required after assessing the situation, ROC can be notified with the use of the E-TEL located within the ETS boxes with a "Request for emergency removal of traction power". This would eliminate the need to activate the ETS from the field.

ROC has the capability to de-energize OCS traction power to specific locations within the system through remote control. Where an individual ETS may only de-energize a single power zone, for a specific location, upon request, the Controllers at ROC can quickly de-energize specific locations or the entire OCS system. The Controllers can also verify, through the computer, when de-energization has occurred. The OCS is controlled monitored by the Controllers at ROC through the computer system called Supervisory Control & Data Acquisition (SCADA).

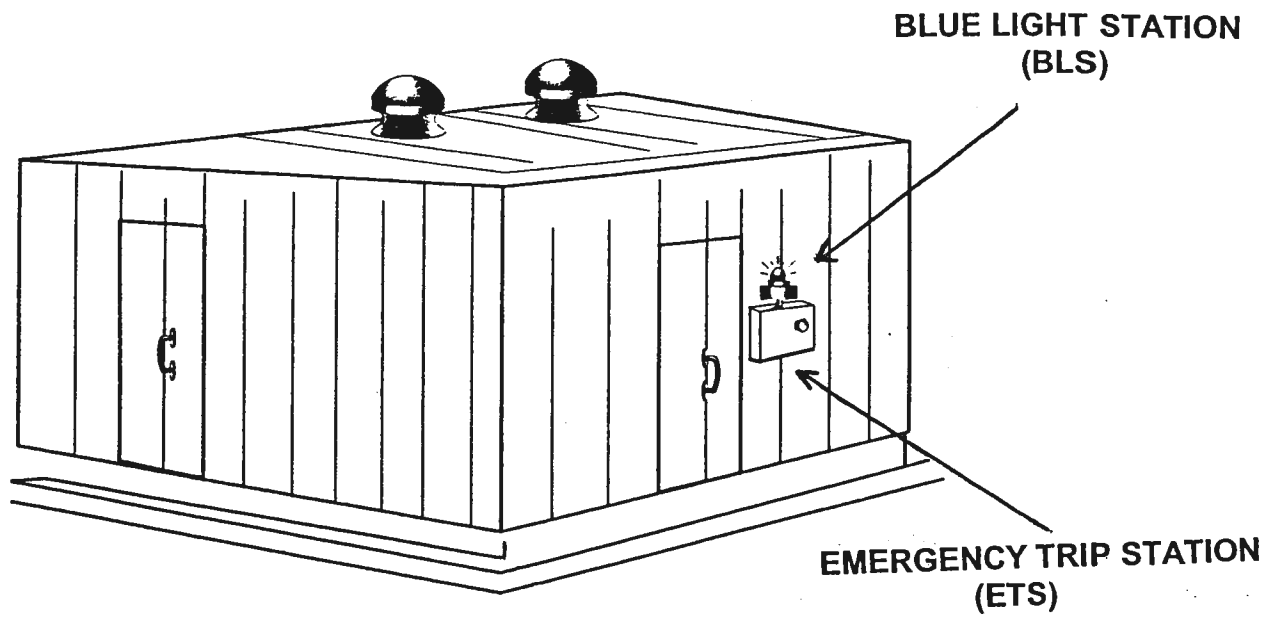
The outside agencies providing electrical power to the TPSS's are the only persons with capabilities in removing 34,500 VAC power from within the incoming electrical power substations.

NOTE: Always consider all electrical apparatus energized at all times, including:

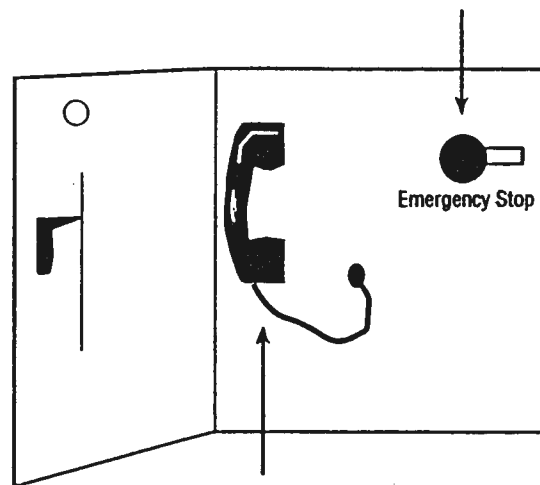
- Incoming Electrical Power Sub-stations (DWP,SCE or PWP)
- Traction Power Sub-stations (T.P.S.S.'s)
- Auxiliary Power Sub-stations
- Overhead Catenary System (OCS)
- Electrical components of a P-2000 LRV



TYPICAL TRACTION POWER BUILDING



EMERGENCY TRIP SWITCH (Red Mushroom Device)



EMERGENCY TELEPHONE (E-TEL)



TRACTION POWER SUBSTATION (TPSS)

The following are a list of the permanent addresses assigned to the Metro Gold Line Traction Power Substations (T.P.S.S.'s).

| TPSS ADDRESSES | VICINITY | INCOMING |
|---|----------------------------------|---------------------------------------|
| 1. Union Station TPSS 401 Bauchet St. Los Angeles | Bauchet & Vignes | DWP (34.5 KVAC) Main Office |
| Midway Yard TPSS 2. 1561 ½ N. Broadway Los Angeles | MIDWAY YARD | DWP (34.5 KVAC) Artesian |
| Baker Street TPSS 3. 1800 Baker Street Los Angeles | Baker & Broadway | DWP (34.5 KVAC) Main Office |
| 4. French Avenue TPSS 3541 Pasadena Avenue | Pasadena Ave. & 110 FWY | DWP (34.5 KVAC) Main Office |
| 5. Avenue 50 TPSS 4970 Marmion Way | Avenue 50 & Marmion Way | DWP (34.5KVAC) Main Office |
| Monterey TPSS 6. 300 Monterey Road South Pasadena | Pasadena Ave. & Monterey Road | SCE (16 KVAC) |
| Glenarm TPSS 7. 57 East State Street Pasadena | Glenarm & Raymond Ave. | PWP (17 KVAC) |
| Walnut Avenue TPSS 8. 167 East Walnut Street Pasadena | Walnut Street | PWP (17 KVAC) |
| Craig Avenue TPSS 9. 2152 Maple Street Pasadena | Craig & 210 FWY | PWP (17 KVAC) |
| 10. Titley Avenue TPSS 3055 East Walnut Street Pasadena | Walnut & Titley | PWP (17 KVAC) |

The list of addresses has been filed with the Fire/Life Safety Committee and will be used to expedite emergency responses.



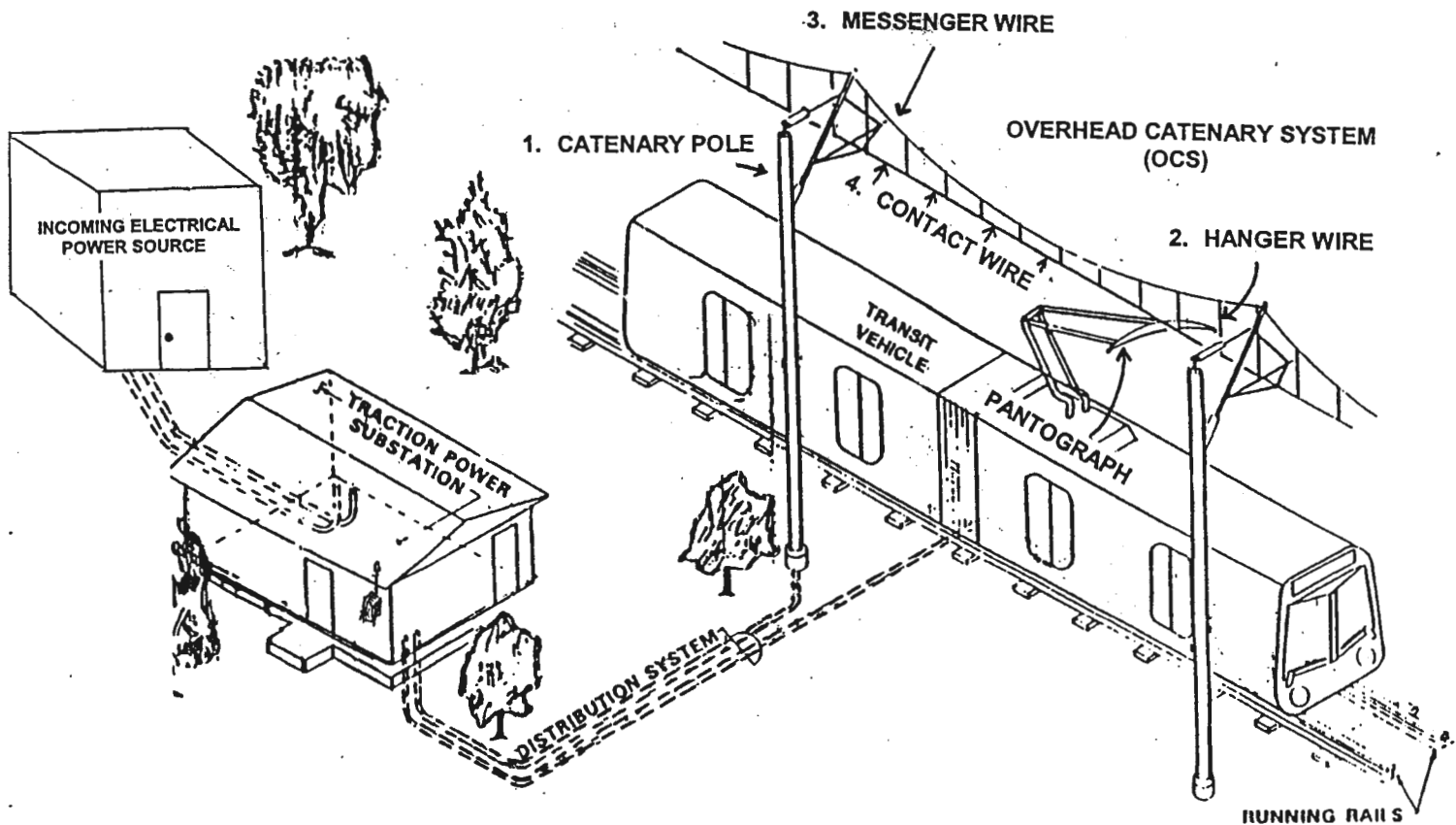
OVERHEAD CATENARY SYSTEM

The Overhead Catenary System (OCS) contains several interdependent components identified as:

1. CATENARY POLE
2. MESSENGER WIRE
2. HANGER WIRE
3. CONTACT WIRE

The height of the OCS above the track varies from 13' 3" to 22'. The constant tension "Messenger Wire" supports and energizes the "Contact Wire. Constant tension is made possible by sliding weights within the "Catenary Poles", which allow for expansion and contraction of the Messenger Wire and Contact Wire. Hangers provide constant spacing between the messenger wire and the contact wire. The Contact Wire is what actually makes contact with the Pantograph located on the roof of the "A" end of each P-2000 LRV.

CAUTION: At no time shall any object or person come within 10' of the Overhead Catenary System (OCS) without prior authorization from Rail Operations Control (ROC).





STATION CHARACTERISTICS

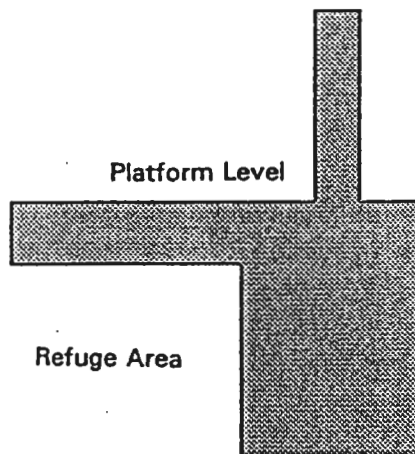
Upon completion of construction, the Los Angeles to Pasadena **Metro Gold Line** will have 13.7 miles of track that will consist of thirteen (13) passenger stations.

Station characteristics range from at-grade high level, aerial and guideway placement. Location were established because they:

- Provide reasonable station spacing for maximum service coverage and operating speed.
- Provide cross-corridor transit connections.
- Service major sources of ridership.

Access to passenger stations can be accomplished by a combination of stairways, elevators and escalators. Not all stations have escalators and elevators.

If a person should become trapped on the Right-of-Way at station locations, there is a refuge area directly under the platform overhang.



Sideview of Platform

Stations that do not have Fire Department Standpipe Connections located at each end of the platform, have fire hydrants within 300 feet of any portion of a station.



STATION CHARACTERISTICS (continued)

If an emergency at a passenger station should occur and evacuation is required, patrons may exit at stairways to street level or parking lot levels. In addition, emergency exits are located at each end of the platform, which will allow patrons to exit the platform and enter the Right-of-Way.

Most stations have auxiliary rooms located in different locations, which house electrical equipment that may include the elevator/escalator system wiring and apparatus, signaling circuitry and traction power sources. Detailed explanations of each room can be provided upon request.

Metro Gold line passenger platforms have been designed to accommodate 3-car trains. The length of a 3-car train is 270 feet.

8 stations will have center loading platforms. 5 stations will have side loading platforms; they are Avenue 26 Station, French Avenue Station, Mission Station, Del Mar Station and Memorial Park Station. At these stations, passengers will have to be directed by rail personnel, to wait for trains at the appropriate side-platform when trains are traveling in the reverse direction of the normal traffic.

Station amenities include canopies, which covers approximately 90 feet of each loading platform. Benches will be provided. Each station will be provided with public telephones and Passenger Assistance Intercoms (P-Tels). Parking will be available at the following stations:

For security reasons, public restrooms will not be provided.

If an abnormal operating condition is expected to interrupt Metro Gold Line service for an extended period of time, alternative bus service may be instituted. The Rail Controller at ROC will coordinate this action, called a "Bus Bridge," with the Bus Operations Control Center (BOCC).



STATION CHARACTERISTICS (continued)

Memorial Park Station is equipped with a public address (PA) system to assist with emergencies and evacuations. The PA system is controlled locally from the Emergency Management Panel (EMP).

At Memorial Park Station, the EMP is a command panel on the wall of the public area of the station for local control of the PA system, where emergency telephones are located and is the location where the first responders will arrive during an emergency.

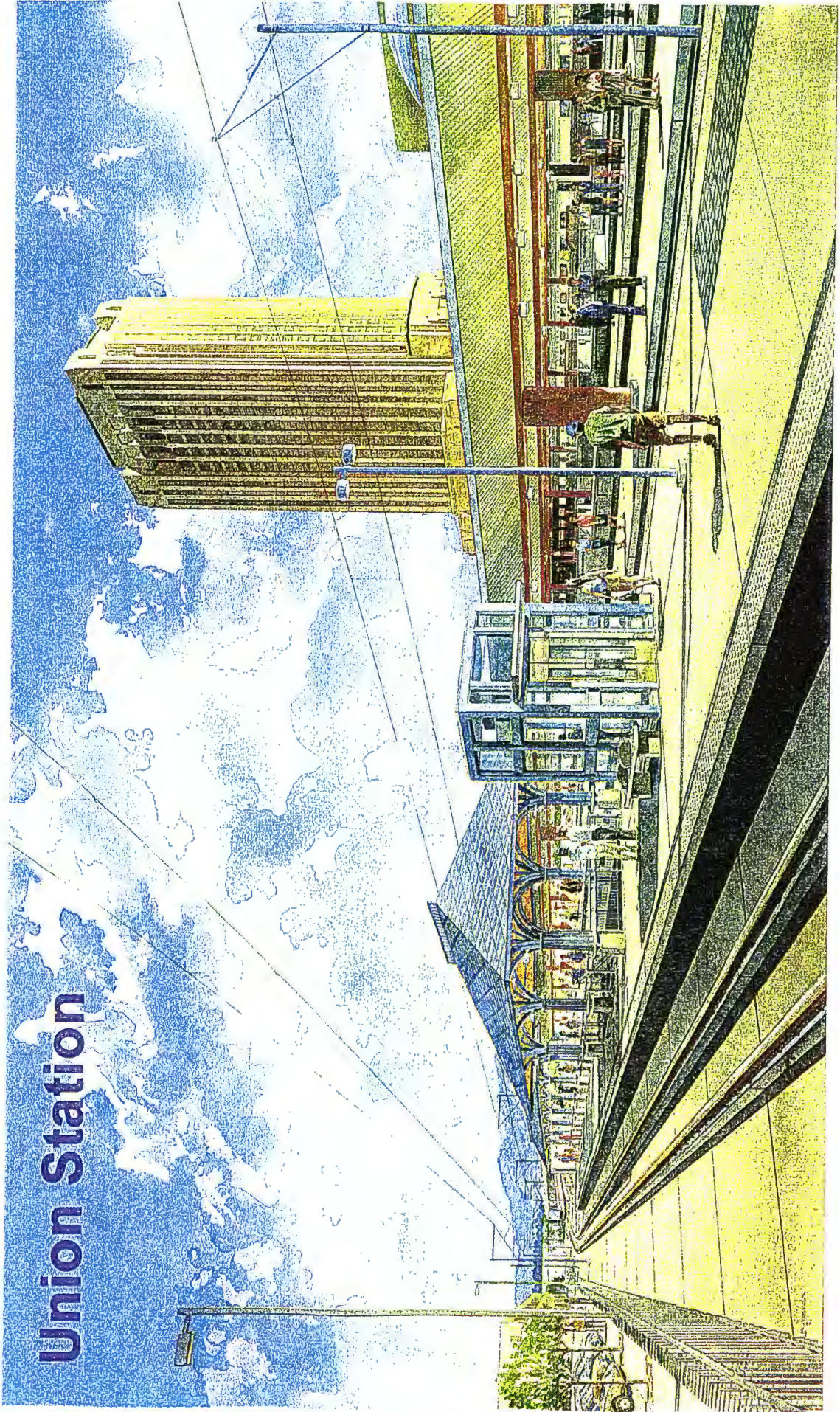
As the system expands, it becomes more complex. Knowing and understanding the light rail system is vital to all emergency response agencies. Therefore, it is imperative that you constantly familiarize yourself with as many components necessary to be proficient during emergency response procedures. This will insure the best possible response time necessary during any emergency.

Addresses for the 13 passenger stations are as follows:

- | | |
|--------------------------------|--------------------------------------|
| 1. Union Station | 810 North Vignes Street, Los Angeles |
| 2. Chinatown Station | 901 north Spring Street, Los Angeles |
| 3. Avenue 26 Station | 370 West Avenue 26, Los Angeles |
| 4. French Avenue Station | 3545 Pasadena Avenue, Los Angeles |
| 5. Southwest Museum Station | 4600 Marmion Way, Los Angeles |
| 6. Avenue 57 Station | 151 North Avenue 57, Los Angeles |
| 7. Mission Street Station | 905 Meridian Avenue, South Pasadena |
| 8. Fillmore Station | 95 Fillmore Street, Pasadena |
| 9. Del Mar Station | 230 South Raymond Avenue, Pasadena |
| 10. Memorial Park Station | 125 East Holly Street, Pasadena |
| 11. Lake Avenue Station | 340 North Lake Avenue, Pasadena |
| 12. Allen Avenue Station | 395 North Allen avenue, Pasadena |
| 13. Sierra Madre Villa Station | Sierra Madre Villa Avenue, Pasadena |

The following 13 pages are water colored conceptual renditions of the Metro Gold Line passenger stations, from Union Station to Sierra Madre Villa Station.

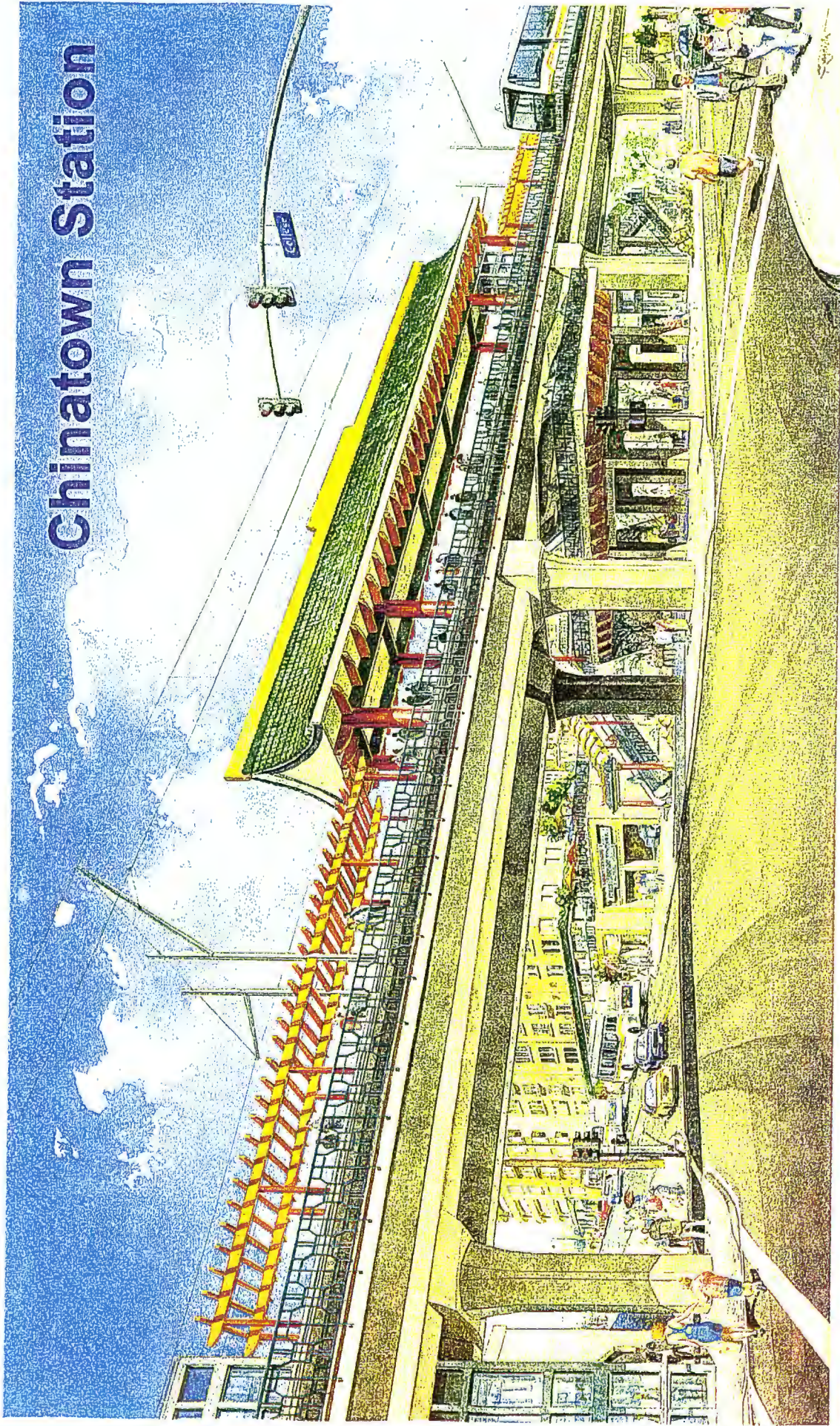




Union Station



Chinatown Station





Avenue 26 Station



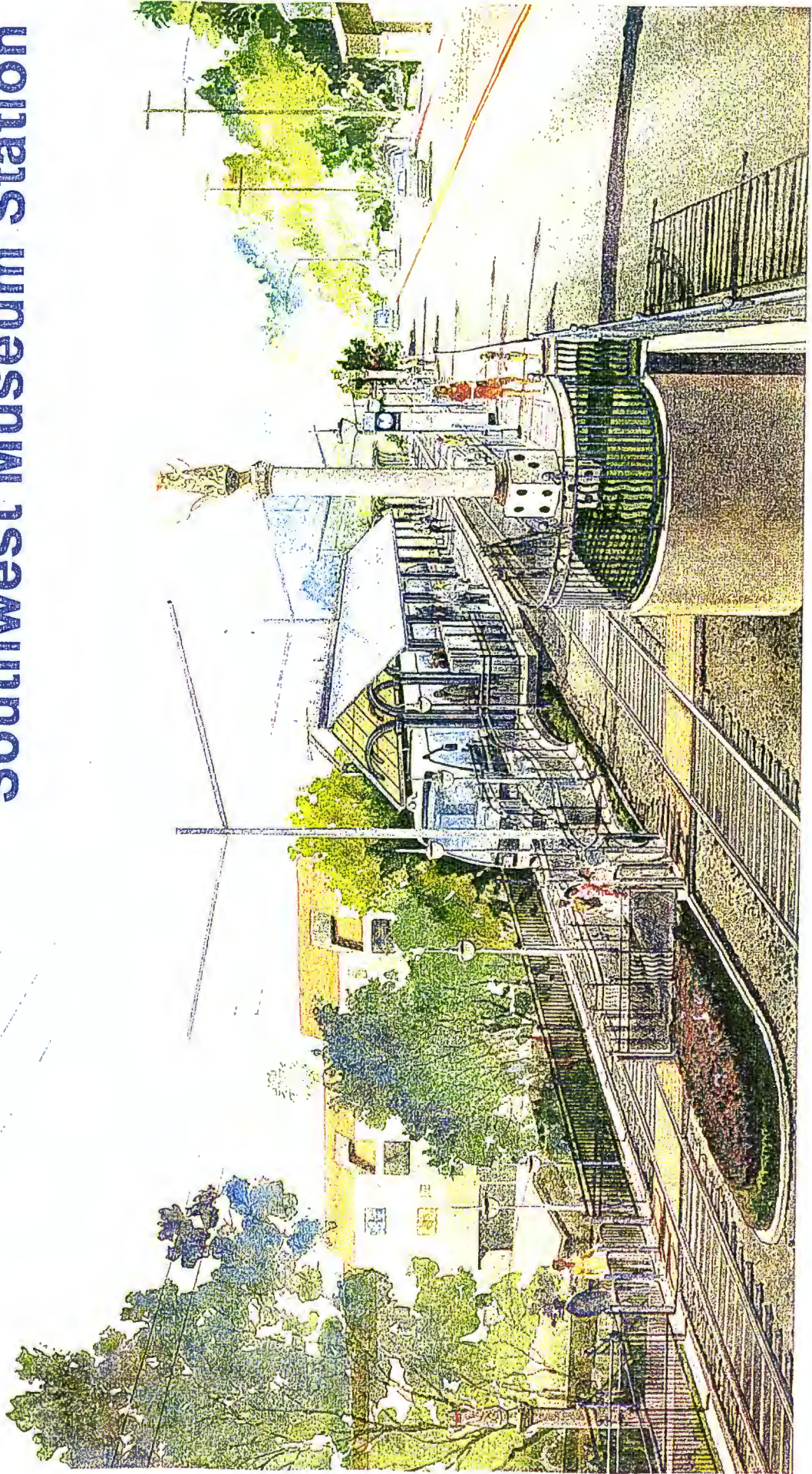


French Avenue Station



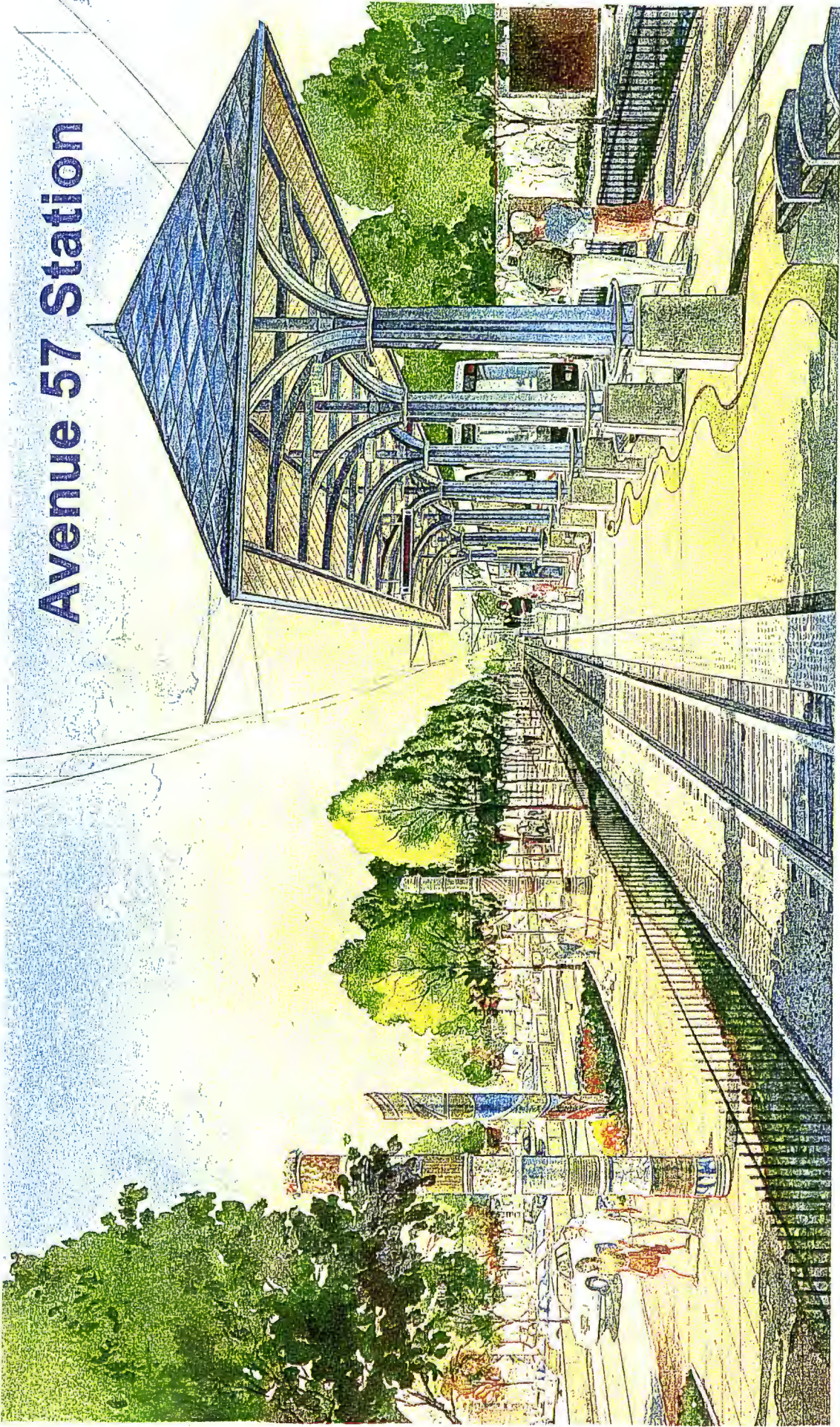


Southwest Museum Station





Avenue 57 Station





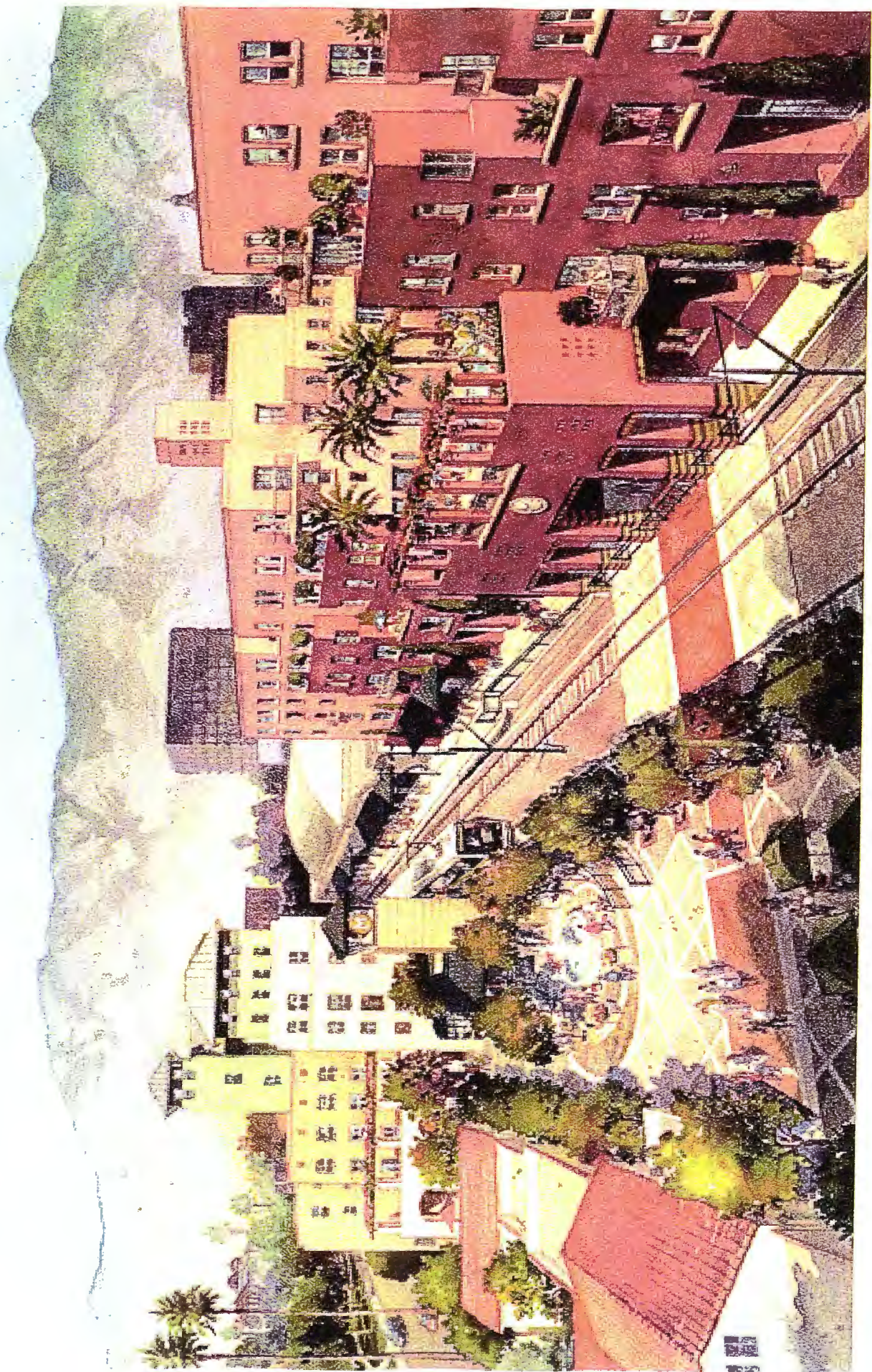




Fiimore station







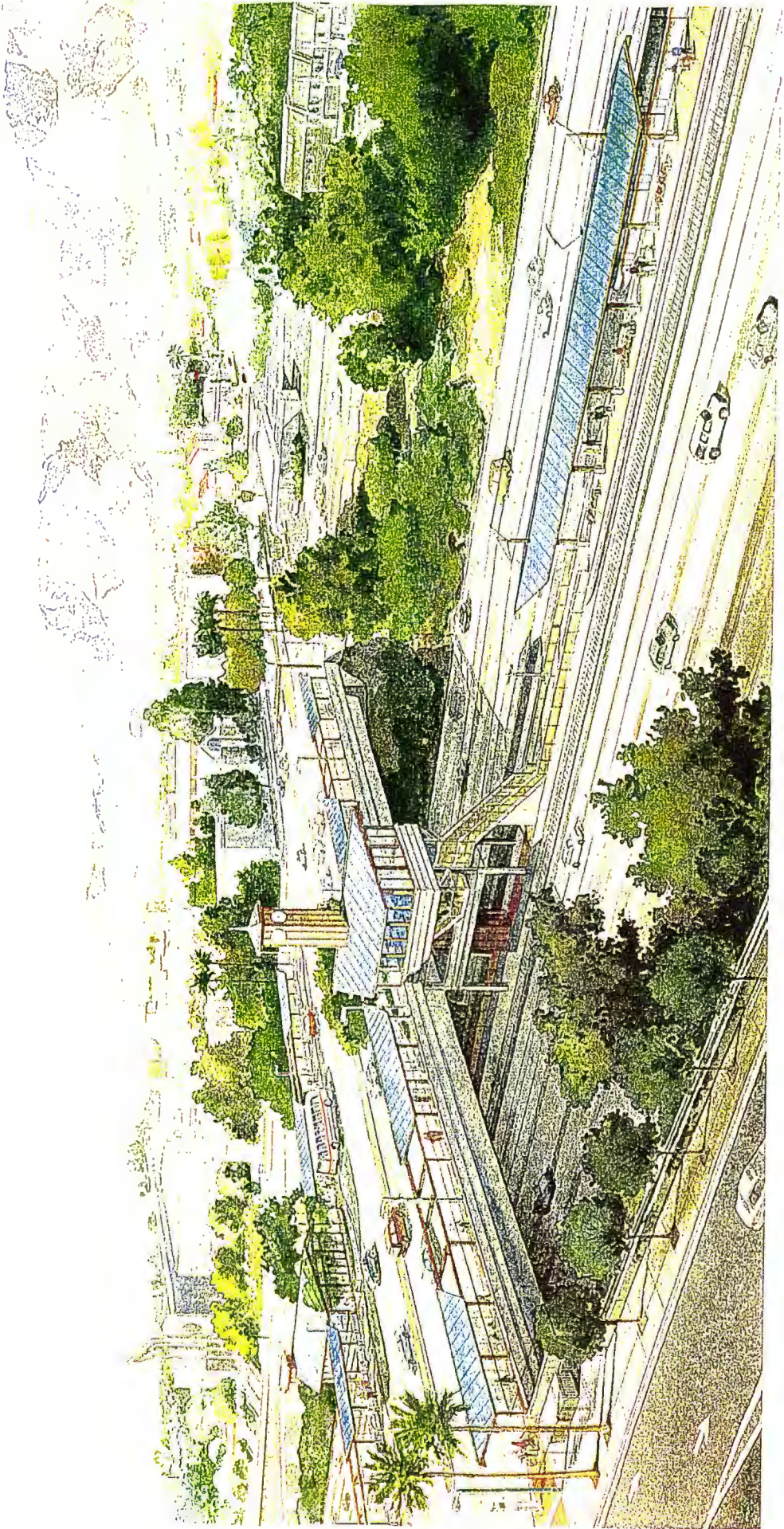


Memorial Park Station



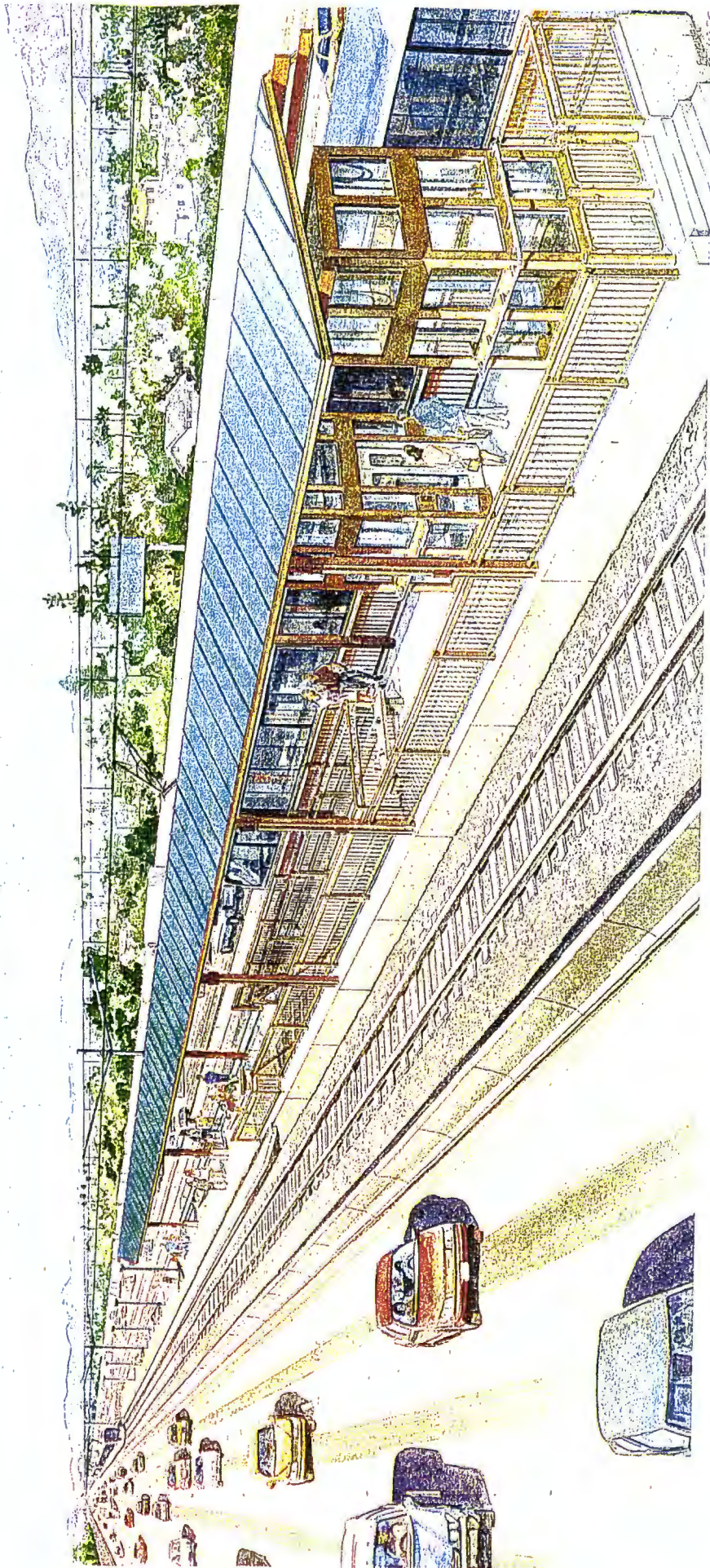


Lake Station



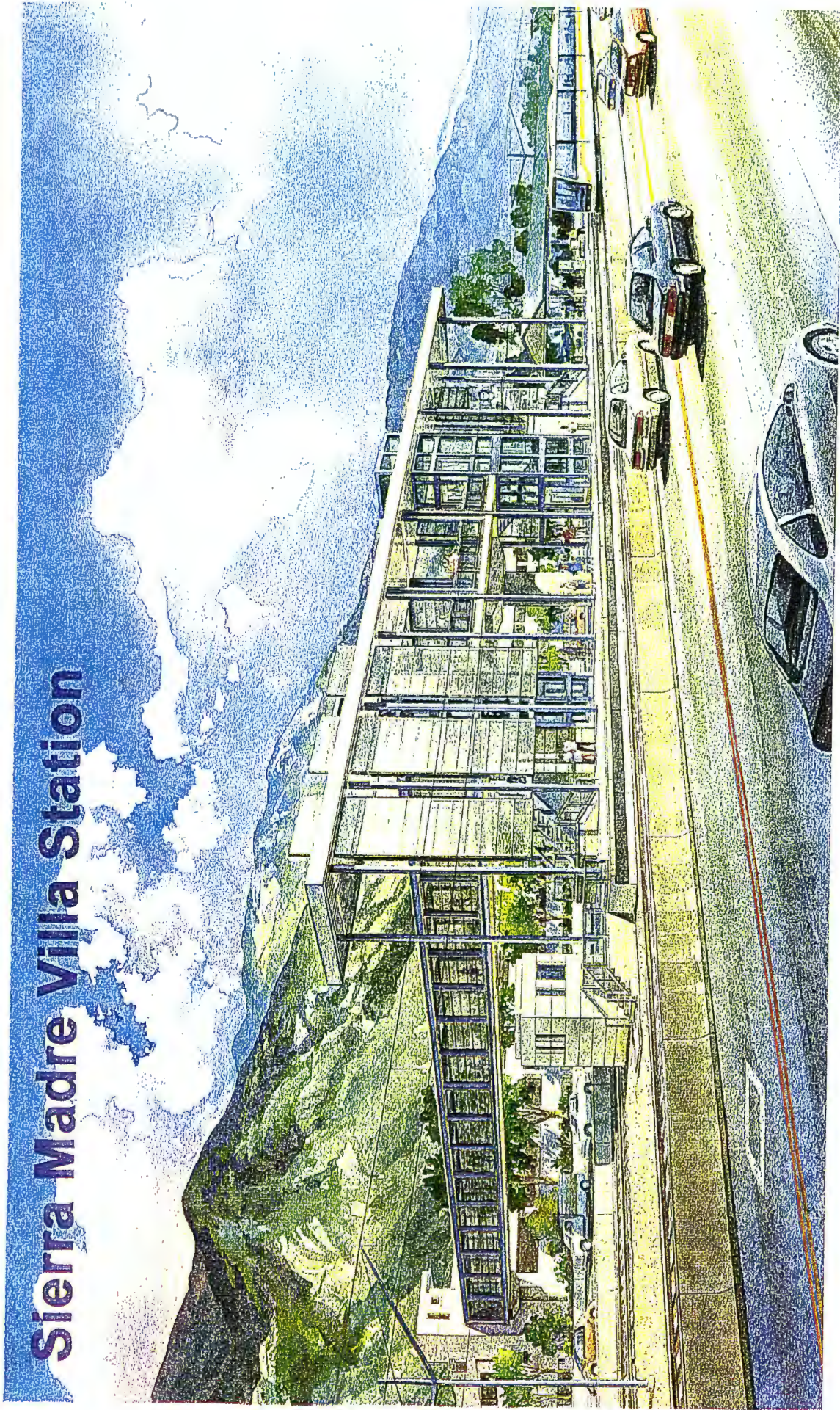


Allen Station





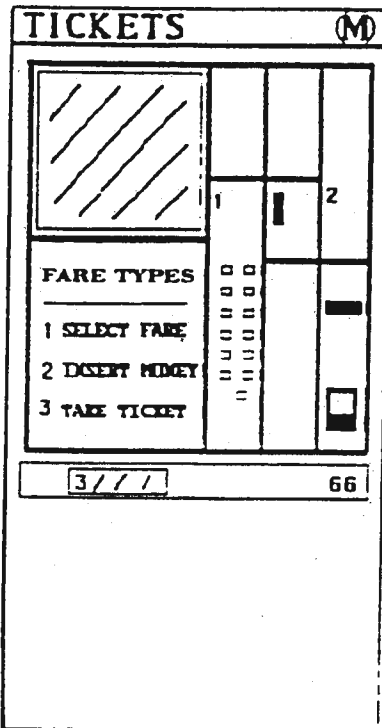
Sierra Madre Villa Station





FARE COLLECTION FOR THE METRO GOLD LINE

Each station will have at least two Ticket Vending Machines (TVM's). The TVM's are located in an area designated as "Free Zones"



M How to buy a Metro Gold Line Ticket

STEP 1 Select Fare

| Regular Fare | Press Button | Cost of Fare: |
|--------------------------------------|--------------|---------------|
| One-Way | A | \$1.35 |
| One-Way with Transfer to Bus or Rail | B | \$1.60 |
| Round Trip (No Transfer Available) | C | \$2.70 |

Two (2) children (under age 5) may ride free with each adult.

| Senior/Disabled* | Press Two Buttons | Cost of Fare: |
|------------------------------------|---------------------|---------------|
| One-Way | A + b | \$0.45 |
| Way with Transfer to Bus or Rail | B + b | \$0.55 |
| Round Trip (No Transfer Available) | C + b | \$0.90 |

*Medicare Card holders qualify.

STEP 2 Insert Money/ Tokens

STEP 3 Take Ticket/ Change from Loser tray

Your ticket is valid one-way until the printed expiration time. A round-trip ticket is valid for return to this station on date printed.

Persons on the platform or train must present a valid fare on request. Failure to do so could result in a citation (Section 640 California Penal Code.)

Para Comprar un Boleto Para el Metro, Linea Oro

PASO 1 Seleccione el Pasaje

| Precio Regular | Oprima el boton | Precio del pasaje |
|---|-----------------|-------------------|
| En una dirección | A | \$1.35 |
| En una dirección con boleto de transferencia para autobuses o ferrocarril | B | \$1.60 |
| Ida y vuelta sin boleto de transferencia | C | \$2.70 |

Dos niños, menores de 5 años, pueden viajar gratis con cada adulto.

| Mayores de edad/ Incapacitados* | Oprima dos botones | Precio del pasaje: |
|---|---------------------|--------------------|
| En una dirección | A + b | \$0.45 |
| En una dirección Con boleto de transferencia para autobuses o ferrocarril | B + b | \$0.55 |
| Ida y vuelta sin boleto de transferencia | C + b | \$0.90 |

*Medicare Card holders qualify.

PASO 2 Deposite el Dinero/ Ficha

PASO 3 Tome el Boleto y el Cambio de la Bandeja Inferior

El boleto de ida en una dirección es válido hasta la hora de vencimiento impresa en el mismo. El boleto de ida y vuelta es válido para regresar a esta estación en la fecha impresa en el mismo.

Los pasajeros deberán presentar un boleto válido en las plataformas o en los trenes. No tener boleto o prueba de pago puede resultar en una multa (Sección 640 del Código Penal de California).

The ticket vending system is a self-service, barrier free system. Patrons do not have to pass through any turnstiles or barriers, allowing for quick and easy boarding or egress.

The system is "user-friendly". The video display screen, as well as text instructions, describes to patrons where to insert money/tokens and push buttons. The machines will print custom tickets for various destinations and return change.

Once patrons have purchased tickets, they may wait in a specially designated "PAID AREA" on the platform until their train arrives.



LIGHT RAIL SECURITY

Security for the Metro Gold Line will be contracted with an outside local law enforcement agency. Security will consist of uniformed and plain clothed Law Enforcement Officials, assigned to the trains. Typical coverage includes officers patrolling the line in marked patrol vehicles and riding trains throughout the system, requesting proof of fares. Ordinances are enforced by the issuances of citations, which is processed through local Municipal Courts.

Additional Law Enforcement responsibilities include; preparing incident or arrest reports, issuance of parking violation citations and impounding vehicles, when required, testifying in court when subpoenaed, assisting and providing information to the public, ensuring the safety of patrons on the trains and in the stations/parking lots and among other duties, assisting during emergencies and evacuations.

Law enforcement officers, will circulate randomly, verifying that patrons occupying the "Paid Area" on the platforms and patrons on the trains have paid their fare, issuing citations to those who are in not possession of valid proof of fare payment.

A major concern involving all of our stations is the safety and security of our patrons, employees and equipment. The use of Closed Circuit Television will allow limited surveillance from Rail Operations Control (ROC). From ROC, CCTV Observers, monitor the CCTV screens.

LACMTA Transit Security Officers will be tasked with securing the box structures and their gates, closing and securing the gates at the completion of revenue service and unlocking the gates prior to the beginning of revenue service, on a daily basis.

Patrols by Law Enforcement Agencies, along with LACMTA personnel (Rail Transit Operations Supervisor's, Supervisors, Operators and Facility Maintenance Personnel) will enhance security. All LACMTA personnel will be in direct contact with Rail Operations Control (ROC).



EMERGENCY SITUATIONS

Response to an emergency condition begins when an employee becomes aware of the condition and makes the necessary notification to ROC. The employee is trained to contact ROC and give as much information as possible regarding location, direction, description of persons involved during a crime, the nature of the problem and remain on scene, giving periodic updates to ROC until a Rail **Transit Operations Supervisor (RTOS)** arrives on the scene and assumes the duty of the Rail "**On-Scene-Coordinator**" (**OSC**).

The primary duties of the **OSC** is to be a liaison between the **Incident Commander "IC"** of the responding outside agency and all other LACMTA personnel responding to the scene. Where the IC has set-up the **Incident Command Post (ICP)**, that's where the OSC should be. When the IC needs anything from LACMTA, it must be requested through the OSC. There must be one direct line of communication between the incident/accident scene and ROC. The OSC will be the individual to communicate to ROC and will give ROC periodic updated information. The **OSC** can be identified by a white vest with lettering identifying this individual as **ON-SCENE-COORDINATOR**.

***NOTE:** The RTOS who declares him/herself as the OSC is intended to assist the Incident Commander during an emergency situation. The knowledge and direct radio contact the OSC has with ROC is extremely beneficial to the IC and increases safety of all personnel at the scene. Utilizing this procedure during emergencies will greatly minimize conflicting requests from to ROC from the scene during an emergency, especially during a "Unified Command" situation.*

LACMTA considers the following as being incidents and/or accidents:

- Broken or faulty signals.
- Broken or faulty Control/TRACS indications.
- Broken or faulty wayside equipment.
- Broken or faulty vehicle equipment.
- Violations of instructions, Train Orders and/or Rail Operations Bulletins.
- Collision of a train with a maintenance vehicle or alighting personnel from a train that requires medical attention.



EMERGENCY SITUATIONS (continued)

- Mainline or Yard derailments.
- Any incident and/or accident that requires evacuation of personnel.
- Fire or explosion on a train or LACMTA facility or construction site.
- Collision between trains.
- Collision between trains and track or wayside equipment.
- Incidents and/or accidents involving a runaway train.
- Incidents and/or accidents involving Mainline Interlockings.
- Chemical spills or uncontrolled release of a compressed gas or hazardous materials.
- Any individual with any injury requiring medical treatment.
- Industrial injuries occurring at a LACMTA facility or construction site.
- Intrusions affecting any Rail property.
- Death.

After arriving at the scene, the RTOS who has become the OSC will relay pertinent information responding personnel and ROC. In addition, an assessment of damage, injuries, condition of the stations, traction power system and tracks will be conveyed to ROC while working with the IC.

In any situation, when all equipment is removed from track areas and anyone requiring medical attention has been attended to, the first priority for the OSC is to restore normal train service. It is for that reason that the OSC will request that electrical power be restored, if it has been removed, and that the tracks are cleared of all vehicles and/or equipment.

In all incidents/accidents, the OSC will work closely with outside Emergency Response Agencies, to give support and any information that may be required.



EMERGENCY SITUATIONS (continued)

Even during emergencies, we must not lose focus on our responsibility to transport our patrons. It is for that reason that if one track can be cleared, the OSC will request from the IC to clear the track, so as to run trains on at least one track. This will greatly assist us in reducing revenue service disruption.

If the incident is on one side of a station platform, and the incident can be isolated, we may request to operate service on one side of a station platform. If not possible, and if safe to do so, we may request to at least bypass the station on one track without stopping the train and at a reduced speed.

The RTOS's are responsible for line supervision, and when necessary, implementing emergency response procedures. Additionally, the RTOS will conduct special investigations of accidents, prepare follow-up reports and make safety recommendations, for LACMTA purposes. The RTOS/OSC will remain on scene until the incident site is released by the appropriate Emergency Response Agency.

NOTE: Evacuation of passengers from the trains, except in a dire emergency, must be done with the Rail Controllers approval from ROC.

Actual rescue of victims is the responsibility of the local Fire Department. On occasion, assistance may be required from transit system personnel or equipment. This assistance shall be provided as requested.

It is recognized that certain operations, such as jacking train cars and removing pinned victims require specialized equipment and should only be done by trained LACMTA personnel. Effective liaison between the Fire and/or Law Enforcement personnel in charge and the Accident Investigation Team is vital to avoid situations, which may further endanger personnel or result in excessive damage to equipment.

Special note: Because trains rely on unobstructed tracks to operate, it is essential to maintain at least one clear track whenever an accident or incident which requires response and subsequent investigation by local Emergency Response Agencies. It is for this reason that Metro Gold Line Rail Transit Operations Supervisors (RTOS') will request at least one track to be opened/cleared when an accident/incident occurs.



EMERGENCY SITUATIONS (continued)

The Rail Accident Investigation Team for LACMTA is comprised of:

- On-Scene Coordinator
- Rail Operations Manager
- Vehicle Equipment Maintenance
- Facility Maintenance
- Rail Safety
- Risk Management

To help address any problems that might occur, emergency scenarios will be set up in the near future. All agencies that might be affected by an emergency will be asked to attend. The following page will describe the type of Emergency Scenarios (Drills) that will take place.

Rail Safety training classes are on-going and arrangements can be made for any interested parties to attend.



UPCOMING EMERGENCY SCENARIOS

| DRILL NUMBER | DRILL TITLE |
|--------------|---|
| D-001 | Earthquake with Loss Of Power and System Evacuation |
| D-002 | Train Vs Vehicle at Grade Crossing |
| D-003 | Derailment with Injuries |
| D-004 | Train Vs Train Collision with Injuries |
| D-005 | Train Fire |
| D-006 | Hostage Situation on Train with Weapons Involved |
| D-007 | Suicide/Accidental Death on Right-of-Way |
| D-008 | Fire/Smoke in Tunnel |
| D-009 | Bomb Threat on Train |



IMPORTANT ADDRESSES /PHONE NUMBERS

Rail Operations Control (ROC)

2000 East Imperial Highway
Los Angeles, CA 90059
1-800-396-2166
Gold Line Controller No. TBD

Metro Gold Line Yard (Midway Yard)

1800 Baker St.
Los Angeles, CA 90012
Phone No. TBD

Director of Rail Activation

320 S. Santa Fe Ave.
Los Angeles, CA. 90013
213-922-3250

Rail Activation/Operations Secretary

213-922-3332

Director of Rail Operations

320 S. Santa Fe Ave.
Los Angeles, CA. 90013
213-922-3232

Rail Operations Control (ROC) Manager

2000 East Imperial Highway
Los Angeles, CA 90059
323-563-5026

Metro Gold Line Manager, Rail Operations

320 S. Santa Fe Ave.
Los Angeles, CA. 90013
213-922-3220

Metro Gold Line Instruction

320 S. Santa Fe Ave.
Los Angeles, CA. 90013
213-922-3258
perezr@mta.net



IMPORTANT ADDRESSES/PHONE NUMBERS (continued)

Director of Rail Services (Equipment Maintenance)
213-922-3340

Director of Maintenance of Way (MOW)/Communications
213-922-3122

Director of Operations Safety
One Gateway Plaza
Los Angeles, CA. 90012
213-922-3275

LACMTA News Bureau
One Gateway Plaza
Los Angeles, CA. 90012
213-922-4609 (or On-call person)

Test Control (Red Tag Desk)
988 S. Fair Oaks Ave.
Pasadena, CA. 91105
Phone No. TBD



DEFINITIONS

ACCIDENT-

Unforeseen event or occurrence which results in injury or property damage.

ASPECT-

Appearance or sound of a signal.

AUTOMATIC TRAIN CONTROL (ATC)-

Complete, automated train control system of ATP and ATS.

AUTOMATIC TRAIN PROTECTION (ATP)-

Sub-System within ATC, which monitors and maintains safe train operation through a combination of train detection, train separation and speed regulation.

AUTOMATIC TRAIN SUPERVISION (ATS)-

Sub-System within ATC, which monitors train operation, maintains scheduled traffic patterns and is subordinate to ATP.

AUTHORIZATION TIME-

Time issued by the Test Controller whenever instructions or authorization is given for appropriate rail activities.

BALLAST-

Selected material placed on the rail roadbed for the purpose of holding the track structure in line.

BLOCK-

Length of track of defined limits, the use of which is controlled by signals, Cab Signals or Test Control's authorization.

BLOCK, ABSOLUTE-

Length of track of defined limits determined by Test Control, which shall only be occupied by a single train.

BLOCK, MANNUAL-

Procedure for controlling train movement into or within defined limits governed by the authorization from Test Control.

BLOCK, PERMISSIVE-

Length of track of defined limits determined by Test Control, which may be occupied by another train.



BLOCK, TEST-

Length of track, specified for a specific test or tests and authorized by Test Control. Test Blocks shall be absolute or permissive.

BLUE FLAG/LIGHT-

Flag/Light displayed on both ends of a train on the track is an indication that rail employees are on or about the vehicle.

BLUE LIGHT STATION (BLS)-

Designated locations within the Rail System, identified by a blue light, that is a location marker, where adjacent to the BLS is an ETS with the capabilities to DE-ENERGIZE traction power and where emergency telephones are located.

BRAKE, DYNAMIC-

Primary braking system in which the electric current, derived from the motors, acting as a generator, provides controlled braking.

BRAKE, EMERGENCY-

Maximum braking that can be obtained with Friction Brakes. Once activated, emergency brakes cannot be released until the train has come to a complete stop.

BRAKE, FRICTION-

Controlled, air-blended systems applying stopping forces to brake discs on each axle.

BRAKE, TRACK-

An electromagnetic brake located between the wheels of each truck, which functions through friction contact with the running rails.

BRAKING (FUL SERVICE)-

Maximum braking, that can be obtained with a combination of dynamic and friction braking used for normal stopping without implementing emergency braking.

CAB-

The operating compartment of a rail vehicle from which the control of the vehicle is achieved.

CAB SIGNAL TERRITORY-

That part of the mainline where cab signals govern train movement and speed.



CALL SIGN-

Alpha-Numeric designation assigned to Rail Personnel.

CAR MOVER-

A self powered auxiliary vehicle used to move a disabled vehicle, or move a vehicle in a de-energized territory.

CATENARY-

A system of overhead wires in which the contact wire is supported from one or more longitudinal messenger wires, either directly by hangers or by hangers in combination with auxiliary conductors and clamps. The catenary wire provides the 750 V.D.C. traction power to the vehicle through contact with the Pantograph, which provides power for the vehicle.

CHOCK, WHEEL-

A device placed under a rail vehicle between the top of the rail and the rail vehicle wheel to prevent vehicle movement when brakes are not applied or are defective.

CLEARANCE CARD-

The Clearance Card when properly completed, authorizes a Train Operator to operate the train or other rail vehicle with sealed switches broken and bypass switch activated, pass an interlocking signal displaying a **STOP** indication or enter a Block occupied by a Hi-Rail Vehicle.

CLEARANCE, NO-

Locations within the rail system where no clearance exists between fixed wayside structures and moving vehicles operating on tracks.

CONSIST-

The number and specific identity of the cars that make up a train.

CONTROLLER-

Designated rail employee on duty at ROC, or other location, having absolute authority over train movements and other activities affecting train movements and Mainline Operations.

COUPLE-

Connecting rail vehicles together in order to permit the resulting train to be operated from one cab.

COUPLER-

A device for mechanical, electrical and pneumatic joining of rail vehicles and for trainline control functions.



CROSSOVER-

Switches and track so arranged to provide a routed from one track to another.

DEADMAN CONTROL-

Device built into the Manual Controller on the vehicle operating console which must be held in the operating position before any vehicle movement can occur and is designed to bring a moving train to a full service stop if proper positioning is not maintained while the train is being operated.

DE-ENERGIZE-

To remove electrical power.

DERAILMENT-

Occurrence in which one or more wheels of a rail vehicle, loses its normal relationship with the head of the rail.

DIVERGING ROUTE-

A route in which changes a train's directional movement over a reverse switch position allowing for a crossover movement.

EMERGENCY-

A condition that may result in injury or death to persons, employees or damage to equipment or property.

EMERGENCY TELEPHONE (E-TEL)-

Located throughout the system providing direct communications to the Proper Authority.

EMERGENCY TRIP STATION (ETS)-

An orange box located adjacent to a Blue Light Station (BLS) that contains a Red Push Button device that when activated, de-energizes traction power to each designated track section within the limits of the power feed. Additionally, the ETS houses an emergency telephone (E-TEL) with a direct ring-down to the Proper Authority.

EMERGENCY WALKWAY-

Footpath for right-of-way access/egress.

ENERGIZE-

To apply electrical power.

ENERGIZED EQUIPMENT-

Electrical apparatus, wires, cables, switches and motors which are connected to an electrical power source and should be considered energized at all times.



FLAG-

Devices used for relaying hand signals or to restrict operations. Flags may be made of cloth, metal or other suitable material or may be a light during hours of reduced visibility, darkness or in underground sections.

FLAGGER-

A person designated to protect a work party and/or their equipment.

FLAG PROTECTED AREA-

Flags/lanterns placed by work crews for protection whenever working within 10 feet centerline of the track.

GRADE CROSSING-

A crossing over the rails at rail level used for a roadway or footpath.

GUIDEWAY-

Elevated mainline tracks.

HAZARD-

Real or potential condition that may cause injury, death, damage or loss of equipment/property.

HI-RAIL VEHICLE-

Vehicle with rubber tires equipped with steel flanged wheels that allow the vehicles to be operated on or off the tracks or other rail borne track maintenance equipment.

IMMEDIATE SUPERVISOR-

Designated rail supervisor and management personnel.

INCIDENT-

Unusual event or occurrence which does not result in injury or property damage.

INCIDENT COMMANDER (IC)-

An individual of an emergency response agency, that assumes command of the incident, with duties consisting of establishing an Incident Command Post (ICP) and is assisted by the On-Scene Coordinator (OSC).

INDICATION-

Information conveyed by the aspect of a signal.



INTERLOCKING-

An arrangement of signals, switches, tracks and controls apparatus so interconnected that functions shall succeed each other in a predetermined sequence, thus permitting train movements over routes only if non conflicting conditions exists.

JERSEY BARRIER/K-RAIL-

Concrete divider 42" high topped with a 5' high fence, which separates the right-of-way from vehicular traffic.

LIGHT RAIL VEHICLE (LRV)-

An electrically self-propelled, passenger carrying rail vehicle.

LOCAL CONTROL PANEL-

Wayside train control equipment having interlocking controls located in train control bungalows.

MAINLINE-

Territory controlled by Test Control consisting of main tracks, interlockings, turnbacks, tail tracks, controlled sidings and yard lead tracks to the Yard Limit sign. Mainline Tracks are identified as:

- Track 1 – Northbound from Union Station to Sierra Madre Villa Station.
- Track 2 – Southbound from Sierra Madre Villa Station to Union Station.

MANUAL CONTROLLER-

Control handle device that allows the Train Operator to manually control the movement of the train, through acceleration and braking.

O.C.S.

Overhead Catenary System

OFFICIAL DIVISION CLOCK-

Clock located in Test Control, which is synchronized with ROC at 0300 hours daily.

ON-SCENE COORDINATOR (OSC)-

Rail Transit Operations Supervisor (RTOS) who arrives at the scene and declares as "in charge" of the accident/incident scene for all Rail Operations response activities. The **OSC** is Rail Operations primary contact with all emergency response agencies and is also the liaison between the Incident Commander (IC) and Rail Operations Control (ROC).



OPERATE ON SIGHT-

Operate prepared to stop within the range of vision.

PANTOGRAPH-

A roof mounted device over the "A" section of a Light Rail Vehicle (LRV) and when raised to make contact with the Overhead Contact Wire, collects 750 Volts Direct Current (VDC) from the OCS to energize and give propulsion forces to the LRV.

PORTAL-

Location where trains enter/exit underground sections.

POSTED SPEED-

Maximum allowable speed over a section of track by fixed or temporary signals and rules.

PROPER AUTHORITY-

Governing authority within its jurisdiction for either test operations, revenue mainline locations, yards or shops.

PROPULSION-

Electrical forces produced for LRV acceleration.

RAIL VEHICLE-

Self propelled vehicle operating on tracks, which could be a passenger vehicle, Hi-Rail vehicle or other truck and track equipment.

READBACK TIME-

Time issued by a Test Controller, which validates Clearance Cards, Train Orders.

RED TAG-

A two-part, red identification tag issued by the Track Allocation Coordinator/Designee to designated construction, testing or maintenance personnel that have been approved in the Track Allocation Meeting to work in an area where the Overhead Catenary System (OCS) will NOT be energized and train operations will not be conducted while the Red Tag is in their possession. The Track Allocation Coordinator/Designee located at the Red Tag Desk will give the designated individuals one-half of the Red Tag and keep the other half. Not until all Red Tags are returned to the Track Allocation Coordinator/Designee, will traction power be restored or reassignment of the Red Tags be permitted by the Track Allocation Coordinator/Designee.



RED TAG AREA-

An area where the Overhead Catenary System will not be energized and train operations will not be conducted while a Red Tag is issued for that area. The limits of the Red Tag Area may change during the weekly Track Allocation meeting. The Track Allocation Coordinator/Designee will define, at the weekly Track Allocation Meeting, the limits of the Red Tag Area for the following week.

RED TAG DESK-

The desk where Red Tags are distributed and returned. The Track Allocation Coordinator/Designee is located at the Red Tag desk. The Red Tag Desk is located at the Test Control Facility.

RESCUE TRAIN-

Rail vehicle used to transport rescue personnel, passengers or retrieve disabled trains.

RESTRICTED SPEED-

Operating speed that will permit stopping a train within one-half the range of vision, short of an improperly aligned switch, track defect, rail vehicle or train or any obstruction, never exceeding 15 mph.

REVERSE RUNNING-

Train movement in reverse direction on designated track.

RIGHT-OF-WAY (R.O.W.)-

Designated area of Mainline and Yard within fences.

RAIL OPERATIONS CONTROL (ROC)-

Location from which Mainline Operations are authorized and directed for the Metro Red Line, Metro Blue Line, Metro Green Line and for the Metro Gold Line at the commencement of Pre-revenue service.

ROUTE-

Path a train follows through tracks, crossovers or interlockings.

R.T.O.S.-

Rail Transit Operations Supervisor.

SECTION INSULATOR-

A device used in the contact wire at specific locations to isolate the flow of traction power within a defined track section.

SECTIONALIZING-

De-energizing a specific section of the OCS/track area for work or other purposes.



SIDING-

A track auxiliary to the main track for turn-backs and storing trains.

SIGNAL-

A device or method of conveying a visual message to the Train Operator, concerning conditions affecting train movement. The signal as viewed by the Train Operator is the "Aspect". The information conveyed by the "Aspect" is the signals "Indication".

SIGNAL, HAND-

Aspect conveying an indication given by the motion of a person's hand/arm, flag, light or object.

SINGLE TRACK OPERATION-

Operation within defined limits governing bi-directional train movement over a single track on the Mainline.

SLIP/SLIDE SYSTEM-

An onboard protection system for detecting wheel slip on rail cars that prevents the rail car wheels from locking.

SLOW ZONE-

Area within defined limits for wayside conditions requiring reduced operating speeds.

SPEED LIMIT-

Maximum allowable speed a train may operate.

STATION RUN-THROUGH-

Passing a station platform without stopping.

SWEEP TRAIN-

The first train to operated over any section of the mainline each day or after an interruption of service exceeding one hour. Train Operators shall operate "On-Sight" and be alert, stopping short of:

- Obstructions on the track
- Damage to track, OCS or Wayside Signals
- Improperly aligned switches
- Conditions which may be hazardous to the operation of trains



SWITCH-

Device for establishing a route from one track to another.

T.P.S.S.-

Traction Power Sub-Station

TERMINAL STATION-

Location where scheduled trips begin and end and where turn-back operations are normally made.

TEST CONTROLLER-

The designated employee on duty at the Test Control Facility, or other location, having absolute authority over train movements and other activities affecting a Test Operations Area of the Metro Gold Line.

TEST COORDINATOR-

Designated employee responsible for coordinating tests.

TEST CONTROL FACILITY-

The location where all Start-Up Segment operations shall be authorized, directed and controlled.

TEST OPERATIONS AREA -

An area, the limits of which are defined by the Track Allocation Coordinator, in which work shall be performed for specific test operations or for work to be performed within the Test Operations Area.

TRACK-

Two adjacent running rails, over which, trains operate.

TRACK ALLOCATION-

Published weekly summary that indicates the specific contractors, maintenance and testing personnel that will be scheduled to work on the Metro Gold Line system for the following week. It indicates the limits, time, and dates of the week for these activities.

TRACK ALLOCATION COORDINATOR-

Designated personnel responsible for coordination of Track Allocation requests and activities for the Metro Gold Line, thereby ensuring that there are no conflicting issues and all work is performed safely and efficiently. In addition, but not limited to, conducting a weekly Track Allocation meeting, publishing and distribution of the weekly summary of the Track Allocation Notice.



TRACTION POWER SUB-STATION (T.P.S.S.)-

Facility used to transform and rectify 34.5KVAC to 750VDC for distribution to the Overhead Catenary System (OCS).

TRACTION POWER SYSTEM-

Electrical power distribution system that provides 750VDC to operate Light Rail Vehicles (LRV's).

TRAIN-

One or more rail vehicles combined into an operating unit, with headlights displayed to the front and tail-lights/ marker lights to the rear. A rail vehicle is designated a train by way of a schedule or Train Order.

TRAIN OPERATOR-

Rail employee responsible for direct control and responsibility for the safe movement of a train.

TRAIN ORDER-

Written set of instructions, in format, which indicates instructions given by Test Control affecting train movement.

TRAINLINE-

System where electric and pneumatic functions are routed through and between vehicles so that signals may be transmitted to all vehicles.

TRUCK-

Wheel assembly that car body rests on. Primary components are traction motors, suspension and brakes.

WAYSIDE PUSHBUTTON-

Wayside device for selecting routes.

WORK PERMIT-

A written order issued by the Track Allocation Coordinator/Designee providing protection within specific time periods for work that will be performed outside of the Red Tag Area and does not require power removal.

WORK TRAIN-

Multiple vehicles operating as a single unit under one Train Order.

WORK TRAIN PILOT-

The employee identified to Test Control as being responsible for coordination of all movement of vehicles within a Work Train.



YARD CONTROLLER-

The designated on duty rail employee, at the Midway Yard, and at the beginning of Pre-revenue service, with absolute authority over all movements with in the yard.



