**5.4.4.3 SEQUENTIAL DOOR OPER. (F/R)?** - This option is available only if independent rear doors are present. If this option is set to *YES* then the front and rear doors of the car do not open at the same time. Whenever the controller receives a front and rear call to the same landing, the car will, upon reaching that landing, first open the front doors and close them, then open the rear doors and close them. The default is to open the front doors first unless the rear doors have already started to open.

**5.4.4.4 CAR CALL CANCELS DOOR TIME?** - If this option is selected, pressing a car call button when the doors are fully open will cause the doors to start closing. There is one exception. If the car is stopped at a floor, pressing the car call button *for that same floor* will not cause the doors to close, but will cause the doors to reopen if they are in the process of closing.

**5.4.4.5 NUDGING DURING FIRE PH. 1? -** If this option is selected, the controller will turn *ON* the NUDG output while the doors are closing during Fire Phase 1. The NUDG output signals the door operator to close the doors at a reduced speed. This option is useful for elevators that do not have mechanical safety edges. During Fire Phase 1, all smoke sensitive reopening devices must be disabled. This includes photo eyes and other devices that use infrared beams. If there are no other reopening devices active, then the doors should be closed at reduced speed.

**5.4.4.6 RETIRING CAM OPTION?** - This option should be selected for elevators with retiring cams. This option affects the car only when it is sitting at a floor. Without this option, the controller will wait until the doors are closed and locked before it turns *OFF* the door close signal. However, if the elevator has a retiring cam, the doors will not be locked until the retiring cam is activated.

If this option is selected, the controller will turn *OFF* the door close signal when the doors are *closed* instead of waiting for the doors to be locked. More precisely, the controller will turn *OFF* the door close output signal (DCF) when the DCLC (Doors Closed Contact) input is *ON* or when the DCL (Door Close Limit) input is *OFF*, instead of waiting for the DLK (Door Lock) input to turn *ON*.

**5.4.4.7 PRE-OPENING?** - If this option is selected, the controller will begin to open the doors just before the car completely stops at a floor. More precisely, the controller will turn *ON* the DOF (Door Open Function) output signal when the DZ (Door Zone) input turns *ON*. Typically, the DZ input first turns *ON* when the car is about 3 inches away from the final stopping point. This option is not recommended for elevators that may spend an extended period of time in leveling.

**5.4.4.8 MECHANICAL SAFETY EDGE?** - If this option is selected, the Nudging Operation will cycle until the doors are fully closed. Otherwise, the nudging function will operate continuously to comply with code requirements where a door reopening device is not used (see Section 5.4.4.1 for more details).

**5.4.4.9 NUDGING OUTPUT/BUZZER ONLY?** - If this option is selected with the Nudging option, the NUDG output will be activated when the Nudging Timer elapses. However, if either the Mechanical Safety Edge or the Door Open button is activated, the doors will stop and reopen fully. If this option is not selected, the doors will simply stop under these circumstances, but will not reopen fully. This option may be useful when only a nudging buzzer is required, but the actual Nudging Operation is not needed (see Section 5.4.4.1 for more details).

**5.4.4.10 D.C.B. CANCELS DOOR TIME?** - When the doors are fully open, this option will cancel any pre-existing door time and cause the doors to start closing when the Door Closed button is pressed.

**5.4.4.11 LEAVE DOORS OPEN ON PTI/ESS?** - With this option set and either the Power Transfer (PTI) input or the Elevator Shutdown Switch (ESS) input selected and active, once the car has stopped at a floor, the doors will remain open instead of cycling closed.

**5.4.4.12 NUDGING DURING FIRE PHASE 2? -** If this option is selected, the controller will turn *ON* the NUDG output while the doors are closing during Fire Phase 2. The NUDG output signals the door operator to close the doors at reduced speed.

**5.4.4.13 DIR. PREFERENCE UNTIL DLK? -** This option causes the car to maintain its present direction preference until the doors are fully closed. Otherwise, the direction preference is maintained only until the door dwell time expires.

**5.4.4.14 FULLY MANUAL DOORS? -** Set this option to *YES* whenever the doors are opened and closed manually versus automatically.

**5.4.4.15 CONT. D.C.B. TO CLOSE DOORS? -** When this option is set to *YES*, the doors will remain open while the car is at a landing until the Door Close button is pressed. While the Door Close button is pressed, the doors will continue to close. If the Door Close button is released before the doors have closed fully, the door will re-open.

**5.4.4.16 CONT. D.C.B. FOR FIRE PH 1? -** When set to *YES*, the doors will remain open when the car goes on Fire Phase 1 until constant DCB forces them closed.

**5.4.4.17 MOMENT. D.O.B. DOOR OPENING ? -** This option is used to require the momentary pressure on the Door Open Button (DOB) to open the doors. If set to *NO*, momentary pressure on the DOB is not required to open the doors when the car reaches a landing. The doors open automatically in response to a call.

**5.4.4.17.1 MOMENT D.O.B. FOR:** *(FRONT CALLS/ REAR CALLS/ BOTH CALLS)* - Choose whether front calls, rear calls or both calls need momentary D.O.B.

- *FRONT CALLS* - this option necessitates that DOB be pressed when the car responds to *front* door calls. Rear door calls are not affected.
- *REAR CALLS* - this option necessitates that DOB be pressed when the car responds to *rear* door calls. Front door calls are not affected.
- *BOTH CALLS* - this option necessitates that DOB be pressed when the car responds both *front* and *rear* door calls.

**5.4.4.17.2 MOMENT D.O.B. FOR:** *(HALL CALLS/ CAR CALLS/ ALL CALLS)* - Choose whether hall calls, car calls or all calls need momentary D.O.B.

- *HALL CALLS* - this option necessitates that DOB be pressed when the car responds to *hall calls*. Car calls are not affected.
- *CAR CALLS* - this option necessitates that DOB be pressed when the car responds to *car calls*. Hall calls are not affected.
- *ALL CALLS* - this option necessitates that DOB be pressed when the car responds to both *hall calls* and *car calls*.

**5.4.4.18 DOORS TO OPEN IF PARKED:** (*NONE/FRONT/REAR/BOTH*) - If set to *NONE*, the doors remain closed while the car is parked. When set to *FRONT, REAR,* or *BOTH,* the

corresponding doors automatically open and remain open while the car is parked. This option is available only if a parking floor is programmed in the Basic Features menu. *BOTH* option is not available if the car is programmed for sequential door operation. See Section 5.4.4.3 for more details.

**5.4.4.19 DOORS TO OPEN ON MAIN FIRE?** - The choices for this option are FRONT, REAR and BOTH. This option determines which door(s) should open once the car has completed a Main Fire return (only if option 5.4.2.4 is set to *YES*).

**5.4.4.20 DOORS TO OPEN ON ALT FIRE?** - The choices for this option are FRONT, REAR and BOTH. This option determines which door(s) should open once the car has completed an Alternate Fire return (only if option 5.4.2.4 is set to *YES*).

**5.4.4.21 LEAVE DOORS OPEN ON CTL?** - When set to *YES*, and the CTL (car to lobby) input is active, once the car has returned to the lobby, the doors will remain open instead of cycling closed.

**5.4.4.22 LIMITED DOOR RE-OPEN OPTION** - Once the doors begin to close after a door dwell time has expired, if a re-opening device input (PHE or SE) is seen, this option will allow the doors to re-open as long as the re-opening device is active. Once the re-opening device is inactive, the doors will immediately begin to close again. Without this option set, in this same case, the doors will re-open fully for a short door time and then close.

**5.4.4.23 REDUCE HCT WITH PHOTO EYE** - This option will cause a normal hall call time to be shortened to a short door time if a photo eye input is seen.

**5.4.4.24 LEAVE DOORS OPEN ON EPI** - When set to *YES*, and EPI (Emergency Power) input is active, once the car returns to the emergency power return floor, the doors are left open instead of cycling closed.

**5.4.4.25 DOORS TO OPEN IF NO DEMAND:** (*NONE/FRONT/REAR/BOTH*) - When set to NONE, the doors remain closed when the car is at a landing with no demand. When set to *FRONT, REAR,* or *BOTH,* the corresponding doors automatically open and remain open when the car is at a landing with no demand. *BOTH* option is not available if the car is programmed for sequential door operation. See Section 5.4.4.3 for more details.

**5.4.4.26 CONST. PRESS OP. BYPASS PHE?** - This option is used to indicate if Constant Pressure Operations, such as Independent Service, Attendant Service, or if the Constant Pressure Door Close option is set to YES, should bypass the Photo Eye when the Photo Eye is active and there is a demand to close the doors and move the car. When set to YES, the car will bypass the Photo Eye and nudge the doors closed. When set to NO, the car will not bypass the Photo Eye; the doors will remain open until the Photo Eye is cleared.

## 5.4.5 TIMER MENU OPTIONS

**5.4.5.1 SHORT DOOR TIMER (Range: 0.5-16.0 Seconds)** - This is the length of time the doors will stay open after being reopened by the Photo Eye, Safety Edge or Door Open button.

**5.4.5.2 CAR CALL DOOR TIMER (Range: 0.5-16.0 Seconds)** - This is the length of time the doors will stay open when the car stops to answer a car call.

**5.4.5.3 HALL CALL DOOR TIMER (Range: 0.5-16.0 Seconds)** - This is the length of time the doors will stay open when the car stops to answer a hall call.

**5.4.5.4 LOBBY DOOR TIMER (Range: 0.5-16.0 Seconds)** - This is the length of time the doors will stay open when the car stops to answer either a hall call or a car call at the Lobby Floor. The location of the Lobby Floor is programmable (see Section 5.4.2.6).

**5.4.5.5 NUDGING TIMER (Range: 10-60 Seconds)** - This timer is used only if the Nudging option is selected. Door Nudging Operation will begin when the Nudging Timer elapses. The Nudging Timer will start when the regular door timer elapses (see Section 5.4.4.1 for more details).

**5.4.5.6 TIME OUT OF SVCE. TIMER (Range: 15-60 Seconds)** - This timer is used to take a car out of service when the car is held at one floor excessively when there are calls registered at other floors. The timer will start when there is a call registered at another floor. If the timer expires before the car closes its doors and begins to move, then the car will become out of service. Typically, this occurs when the doors are held open by continuous activation of the photo eye, a call button or another reopening device.

When the timer expires, the Timed Out of Service Indicator on the MC-PCA board will turn *ON*. The controller will ignore the PHE (Photo Eye) input, if the Stuck Photo Eye Protection option is selected. In duplexes, the car's assigned hall calls will be assigned to the other car. When the car closes its doors and begins to move again, it will go back into Normal service.

**5.4.5.7 MOTOR LIMIT TIMER (Range: 1.0 - 6.0 Minutes)** - This timer starts whenever the controller attempts to move the car in the up direction and is reset when the car reaches its destination floor. If the timer expires before the car reaches its destination, the controller will stop trying to move the car up, to protect the motor. The car will then lower to the bottom floor and shutdown. The Motor/Valve Limit Timer Indicator on the MC-PCA board will turn *ON*.

**5.4.5.8 VALVE LIMIT TIMER (Range: 1.0 - 6.0 Minutes)** - This timer starts whenever the controller attempts to move the car down, and is reset when the car reaches its destination floor. If the timer expires before the car reaches its destination, the controller will stop trying to move the car, in order to protect the valves. The Motor/Valve Limit Timer Indicator on the MC-PCA board will turn *ON*.

**5.4.5.9 DOOR HOLD INPUT TIMER (Range: 0-120 Seconds)** - This timer will be used only if there is a DHLD (Door Hold) input on the controller (see Section 5.4.7). Usually, a Door Hold Open button will be connected to this input. This timer determines the amount of time that the doors will stay open when the door hold open button is pressed. The timer will be canceled and the doors will begin to close, if either the Door Close button or a Car Call button is pressed. If a Door Hold Key switch (instead of a button) is connected to the DHLD input, this timer value should be set to 0, so that the doors will close when the switch is turned to the *OFF* position.

**5.4.5.10 PARKING DELAY TIMER (Range: 0.0-6.0 Minutes)** - This timer is used only if a parking floor is selected (see Sections 5.4.2.7 and 5.4.2.8). The timer starts when the car is free of call demand. The car will not park until the timer elapses.

**5.4.5.11 FAN/LIGHT OUTPUT TIMER (Range : 1.0-10.0 Minutes)** - Used with the FLO output. This timer sets the amount of time that will pass before the FLO output will be activated. The time will start when the car becomes inactive. The FLO output should be connected to a relay that when activated, will turn *OFF* the fan and light within the car.

**5.4.5.12 HOSPITAL EMERG. TIMER (Range : 1.0-10.0 Minutes)** - This timer sets the amount of time that the car will remain at the hospital emergency floor with the doors open before automatically returning to normal service (refer to Section 5.4.9.15).

**5.4.5.13 DOOR OPEN PROTECTION TIMER (Range 8 - 30 Seconds)** - This timer determines how long the door operator will attempt to open the doors. If DOL does not go low within this time, the doors will then begin to close.

**5.4.5.14 CTL DOOR OPEN TIMER (Range: 2.0 - 60.0 seconds)** - This timer is used to indicate how long the doors should remain open after lowering to the lobby floor when the CTL spare input is activated.

### 5.4.6 GONGS/LANTERNS MENU OPTIONS

**5.4.6.1 MOUNTED IN HALL OR CAR?** - This option determines when the lanterns and gongs will be activated, as the car slows into the floor for hall mounted fixtures or after the door lock opens for car mounted fixtures. If both types of lanterns will be used, then the Hall option is recommended.

**5.4.6.2 DOUBLE STRIKE ON DOWN?** - This option causes a double strike of the lanterns and gongs, if the direction preference of the car is down.

**5.4.6.3 PFG ENABLE BUTTON? (Passing Floor Gong Enable Button)** - If this option is selected, the Passing Floor Gong will only be operative when initiated by a momentary pressure pushbutton. Once initiated, the Passing Floor Gong will operate for the current direction of travel but will be rendered inoperative when the car reverses direction. The PFGE spare input (see Section 5.4.7) should also be selected if this option is turned *ON*.

**5.4.6.4 EGRESS FLOOR ARRIVAL GONG? / MAIN EGRESS FLOOR #** - To program this option (Michigan Code), set one of the spare outputs to EFG. Then, set EGRESS FLOOR ARRIVAL GONG? to *NO* (no gong) or press ***S*** to select the floor number where the gong should activate (after the door lock opens). If ***S*** is pressed, the display will read MAIN EGRESS FLOOR #1. Press ***S*** until the desired floor number is displayed.

### 5.4.7 SPARE INPUTS MENU OPTIONS

There is 1 additional or spare input terminal available on the Relay board, marked SP1. There are also 8 spare input terminals on the HC-IOX board(s) and 16 spare input terminals on the HC-I4O board(s). The maximum number of terminals possible is 49. Any of these spare inputs (SP1, SP2, ...) may be used for any of the input signals listed below.

| SPARE INPUTS MENU OPTIONS | |
|---|---|
| **ABI** | Alarm Bell Input. This input monitors the car through the CRT or with CMS software. There are three conditions that will display a warning on the screen. First, if the Alarm Button is pressed when the car is stopped outside of the door zone. Next, if the Alarm Button is pressed four times in 60 seconds without the car moving. And lastly, if the car fails to complete an LSA movement check after being idle for 10 minutes at a landing. All of these failures will alert the monitoring station through the PA board. |
| **ALV** | Alive Input - This input is used in a duplex configuration and is received from the other car. If the input is on for this car, it states that the other car is powered. This input is used in emergency power applications. |
| **API** | Alternate Parking Input. This input is used to determine whether to park at the primary parking floor, or at the alternate parking floor. When API is low, the car will park at the primary floor. When API is high, the car will park at the alternate floor. |
| **ATS** | Attendant Service Input. |

| SPARE INPUTS MENU OPTIONS | |
|---|---|
| **AUTO** | Emergency Power Auto Selection Input. This input is for duplexes only. |
| **AXR** | Auxiliary Reset Input - Usually connected to a pushbutton on a controller to reset redundancy error conditions. |
| **BSI** | Building Security Input - This input is used to activate MCE Security when the Lockout Security Key (in the Extra Features Menu) is set to ENABLED. |
| **CCC** | Car Calls Cancel Input - Activation of this input will unconditionally cancel car calls. Because this input has no logical qualification in the software, it is highly suggested that necessary qualification be done in external circuitry (e.g., disable the signal feeding this input when on fire phase II). |
| **CNP** | Contactor Proof Input - This input is used for redundancy checking. It monitors the main power contactors. If any of these relays fail to open in the intended manner, the CFLT relay will pick, dropping the safety relays. |
| **CTL** | Car-to-Lobby Input - When activated, this input will cause the car to immediately become non-responsive to hall calls, and will prevent the registration of new call calls. The car will be allowed to answer all car calls registered prior to activation of the CTL input. Once all car calls have been answered, the car will travel to the lobby landing, perform a door operation, and will be removed from service. |
| **DCL** | Door Close Limit Input - Breaks when the car door is approximately 1 inch from being closed. DCL input will be low once the doors fully close. Moving the door approximately 1 inch will reapply power to the DCL input due to the switch making up. Needed for CSA code with door lock bypass. |
| **DCLC** | Doors Closed Contact Input. |
| **DHLD** | Door Hold Input for Normal Service (not for Fire Service.) A Door Hold button or key switch can be connected to this input (see Section 5.4.5.9 for more details). |
| **DHLDR** | DHLD for Rear Doors. |
| **DLI** | Dispatch Load Input - A load weigher device can be connected to this input. When the input is activated, the door dwell time will be eliminated when the elevator has an up direction at the Lobby Floor. |
| **DLS** | Door Lock Sensor Input - Monitors the state of the contacts in the landing door lock string. Power will be present on the DLS input when all landing doors are closed and locked. |
| **DLSR** | DLS for rear doors. |
| **DNI** | Down Input (Attendant Service). |
| **DSTI** | Door Stop Input. |
| **DSTIR** | DSTI for rear doors. |
| **ECRN** | Emergency Car Freeze Input - This input is used with EMP-OVL product and will cause the car to freeze, allowing others cars to return on emergency power. |
| **EMSC** | Emergency Medical Switch Car. |
| **EMSH** | Emergency Medical Switch Hall. |
| **EPI** | Emergency Power Input (see Section 5.4.9.4 for more details). |
| **EPR** | Emergency Power Return Input - This input is used with the EMP-OVL product and allows the car to return to the lobby landing on emergency power. |
| **EPRUN** | Emergency Power Run Input. |
| **EPSTP** | Emergency Power Stop Input. |
| **ERU** | Emergency Return Unit Input |
| **ESS** | Elevator Shutdown Input - When this input is activated, the car stops at the next landing in the direction of travel, cycles the doors and shuts down. |
| **EXMLT** | External Motor Limit Timer |

| SPARE INPUTS MENU OPTIONS | |
|---|---|
| **FCCC** | Fire Phase 2 Call Cancel Button Input. |
| **FCHLD** | Fire Phase 2 Switch HOLD Position Input. |
| **FCOFF** | Fire Phase 2 Switch OFF Position Input. |
| **FRAA** | Fire Phase 1 Alternate (2nd alternate) Input. |
| **FRAON** | Fire Phase 1 Alternate Switch ON Position Input. |
| **FRBYP** | Fire Phase 1 Switch BYPASS Position Input. |
| **FRHTW** | Fire Sensor Hoistway - This input is used to indicate when a fire sensor placed in the hoistway has been activated. This input is normally high and is considered active low. When activated, Fire Phase 1 is initiated and the FWL output will flash. |
| **FRMR** | Fire Sensor Machine Room - This input is used to indicate when a fire sensor placed in the machine room has been activated. This input is normally high and is considered active low. When activated, Fire Phase 1 is initiated and the FWL output will flash. |
| **FRON** | Fire Phase 1 Switch ON Position Input. |
| **FRON2** | Fire Phase 1 Switch ON Position Input (additional input - same as FRON). |
| **GS** | Gate Switch Input - Makes up when the car door is approximately 1 inch from fully closed. With the car door closed, there should be power on the GS input. |
| **GSR** | Gate Switch Rear Input. |
| **HEATD** | Heat Detector Input. |
| **HLI** | Heavy Load Input - A load weigher device can be connected to this input. When the input is activated, the controller will not answer hall calls. |
| **HML** | Home Landing Input - This input is used with the primary parking feature and will determine whether the car will park or not. |
| **HOSP** | Hospital Emergency Operation Input. |
| **LLI** | Light Load Input - A load weigher device can be connected to this input (see Section 5.4.9.5 for more details). |
| **LOS** | Low Oil Switch - (PHC controllers) - This input is connected to a level switch in the oil reservoir. Once activated, the car will immediately lower to the bottom landing and cycle the doors. To clear this condition, the car must be put on inspection and then back into normal operation, or the RESET button must be pressed. |
| **LSR** | Landing System Redundancy Input - This input is used for redundancy checking. It monitors DZ (Door Zone), LU (Level Up), and LD (Level Down). The LSR input will go low at least once during a run. If, however, the DZ sensor has failed closed, power will be present on the LSR input and the car will not be able to restart. The LSR FAIL message will be displayed. |
| **NSI** | Non-Stop Input (Attendant Service) |
| **OVL** | Overload Input. |
| **PFGE** | Passing Floor Gong Enable Input (see Section 5.4.6.3). |
| **PTI** | Power Transfer Input - When this input is activated, it causes the car to stop at the next landing in the direction of travel, open the doors and shut down. This input is typically used with Emergency Power when transferring from normal power to emergency power (testing) or emergency power to normal power. |
| **R5, R4, R3, R2** | Floor Encoding Inputs - These inputs are required for jobs with absolute floor encoding. See Section 5.4.9.2 for more information about floor encoding inputs. |
| **RDLSR** | Rear Hoistway Door Lock Contacts Relay Status - The RDLSR input monitors the status of the DLSR relays, for the purpose of redundancy checking. |

| SPARE INPUTS MENU OPTIONS | |
|---|---|
| **REO** | Re-Open Input. |
| **RGS** | Gate Switch Relay Redundancy - Makes up when the car door is approximately 1 inch from fully closed. With the car door closed, there will be power on the RGS input. |
| **RGSR** | Gate Switch Relay Redundancy Rear Input |
| **SAB** | Sabbath Operation Input. This input is used to select Sabbath Operation. This mode will move the car through the hoistway, stopping at landings that are programmed in the Extra Features Menu. |
| **SIMP** | Simplex Input - Activation of this input will cause the car to behave as a simplex. As a simplex, the car will respond to hall calls registered on its own call circuitry (it will not accept hall calls assigned to it by another controller connected to it) and will perform its own parking function (independent of the other controller). |
| **STARTIN** | Start Input - The STARTIN input is used for the START position of the three position fire phase two switch for Australian jobs. When activated, it will cause the front and rear doors to close. The car will not proceed to answer car calls during fire phase two until the STARTIN input has been activated. |
| **SYNCI** | Synchronization Input - (PHC controllers) - Momentary activation of this input will initiate the jack synchronization function. This function is intended to equalize hydraulic pressure in systems that utilize more than one piston to move the car(generally two). When appropriate (the car is idle), the car will be taken to the bottom landing. The down normal limit switch is bypassed by activation of a relay connected to the SYNC output, and the car is moved at slow speed in the down direction. The down slow valve circuits are energized for 30 seconds to ensure that the car has been lowered all the way to the buffer. Once this timer elapses the car is moved back up to the bottom landing. |
| **TEST** | TEST Switch Input. This input monitors the TEST/NORM Switch located on the Relay Board to differentiate between Test and Independent Operation. This input is normally high and will go low when the switch is placed in the Test position. |
| **UPI** | Up Input (Attendant Service). |
| **VCI** | Viscosity Control Input. |
| **WLD** | Emergency Dispatch Input. |

### 5.4.8 SPARE OUTPUTS MENU OPTIONS

There are 8 spare output terminals on an HC-IOX board. The maximum number of spare outputs possible is 32, 8 on each HC-IOX board. Any of these spare outputs may be used for any of the output signals listed below.

| SPARE OUTPUTS MENU OPTIONS | |
|---|---|
| **ABZ** | Attendant Service Buzzer Output. |
| **CCT** | Car Call Time Flag Output - This flag is activated upon *normal* response and cancellation of a car call, and remains active until the car call door dwell time elapses or is canceled. |
| **CCDE** | Car Call Disconnect Enable Output - This output comes *ON* when the car calls are canceled during PHE anti-nuisance operation |
| **CD** | Car Done on Emergency Power Output - This output is active when the car has finished returning on emergency power or when it has been determined that the car cannot lower. |

| SPARE OUTPUTS MENU OPTIONS | |
|---|---|
| **CFLT** | This output is currently used for Canadian Standards Association (CSA) code only. If this is the applicable code for the installation, please refer to the Compliance Report included with the job. |
| **CGED** | Car Gong Enable Down Output. |
| **CGEDR** | CGED for rear doors Output. |
| **CGEU** | Car Gong Enable Up Output. |
| **CGEUR** | CGEU for rear doors Output. |
| **CGF** | Car Generated Fault Output. |
| **CSB** | Car Stop Switch Bypass Output. |
| **CSEO** | Code Sequence Enable Output. Formerly called SCE (Security Code Enable). This output will be *ON* during the time a security code is being entered to register a car call while on MCE's Standard Security. |
| **CSR** | Car Selected to Run Output - This output is generated when the car is selected to run on emergency power phase 2 (via the AUTO or EPRUN input). |
| **CTLDOT** | Car-to-Lobby Door Open Timer Output - This output is generated upon completion of the car to lobby function (the car has returned to the lobby landing, the doors have opened, and the CTL door timer has expired). |
| **DHEND** | Door Hold End Output. This output will turn *ON* five seconds prior to when the Door Hold Timer expires. |
| **DNENDR** | Door Hold End Rear Output. This output will turn *ON* five seconds prior to when the Door Hold Rear Timer expires. |
| **DHO** | Door Hold Output - This output indicates that the doors are being held open by the *door hold input* function (the DHLDI input is active, or the timer associated with the door hold function has not yet elapsed). |
| **DLOB** | Door Left Open Bell Output. |
| **DNO** | Down output (Attendant Service). |
| **DO1,** | **DO2, DO4, DO8, DO16, D032** Binary coded P.I. outputs for digital P.I. devices. |
| **DSH** | Door Time Shortening Output (intermediate) - This output is generated whenever a *destination car call* button is pressed (this action causes the shortening of the door dwell time if the doors are fully open). |
| **DSHT** | Door Time Shortening Front Output (final) - This output is generated if either a *destination car call* button is pressed, or if the door close button for the front doors is pressed |
| **DSHTR** | Door Time Shortening Front Output (rear) - This output is generated if either a *destination car call* button is pressed, or if the door close button for the rear doors is pressed. |
| **ECRN** | Emergency Power Car Run Output - This output is associated with the emergency power logic. Activation of this output indicates that the car is being prevented from running by the emergency power operation logic. |
| **EFG** | Egress Floor Gong Output. |
| **EMSB** | Emergency Medical Service Buzzer Output |
| **EMSIC** | Emergency Medical Service Indicator Car Output. |
| **EMSIH** | Emergency Medical Service Indicator Hall Output. |

| SPARE OUTPUTS MENU OPTIONS | |
|---|---|
| **EP1** | Emergency Power Phase 1 Output - This output is generated when the system is in the first phase of emergency power (the sequential lowering phase). |
| **EP2** | Emergency Power Phase 2 Output- This output is generated when the system is in the second phase of emergency power (the *normal running* of a car on emergency power generators). |
| **FLO** | Fan/Light Operation Output - This output is used to turn *OFF* the fan and the light within the car. The output is usually *OFF.* It is turned *ON* after the Fan/Light Timer elapses. The timing starts when the car becomes inactive. |
| **FRC** | Fire Service Phase 2 Output. |
| **FRM** | Fire Service Phase 1 Output. |
| **FSA** | Fire Service Alternate Output. |
| **FSM** | Fire Service Main Output. |
| **FSO** | Fire Service On Output. |
| **FSVC** | True Fire Service Output. This input is used to indicate when the car is on Fire Service Phase One or Two. |
| **FWL** | Fire Warning Light Output - This output is used to indicate when the car is on Fire Phase 1 or 2. It will flash if the Machine Room or Hoistway fire sensor is active. |
| **HCP** | Hall call pushed output - This output is active whenever a hall call button is pressed. It is only activated for the amount of time that the button is being pressed. |
| **HCR** | Hall Call Reject Output. |
| **HDSC** | Heat Detector Shutdown Complete Output. |
| **HLW** | Heavy Load Weigher Output - This output will be generated when the car is heavy loaded, shown by the HLI input (see Section 5.4.7). |
| **INDFRC** | Independent Service/Fire Service Phase 2 Output - This output is needed for all elevators with either Single Button Collective or Single Automatic Pushbutton Operation (see Section 5.4.2.2). This output will be used to cut out hall calls during Fire Service and Independent Service. |
| **ISRT** | In Service and Running Output. This output reflects the car's ability to respond to hall calls(the ISRT status). ISRT is active when the car's status is such that it can answer hall calls. |
| **ISV** | In Service Output. |
| **LLW** | Light Load Weigher Output - This output will be generated when the LLI input is activated and the required number of car calls have been registered (see Section 5.4.9.5 for more details). |
| **MISV** | Mechanically In Service Output. |
| **MLT** | Motor Limit Timer Elapsed Output |
| **MLTP** | Motor Limit Timer Elapsed Output (not activated by EXMLT). |
| **NCD** | Car Not Done with Emergency Power Return Output - This output may only be used if the elevator has Emergency Power Operation (see Section 5.4.9.4). |
| **OFR** | One Floor Run Output - This output is generated when the car initiates a run and remains active until the car encounters the first door zone in its movement (the output is active while traversing the first floor height in its direction of travel). |

| SPARE OUTPUTS MENU OPTIONS | |
|---|---|
| **OLW** | Overloaded Car Threshold Output - This output is set when the threshold value considered to be unsafe to move the elevator is reached. When this threshold is exceeded, the car will remain at the floor with doors open. |
| **PH1** | Fire Service Phase 1 Return Complete Output - This output is most often used as a signal to activate the machine room sprinklers. |
| **SIMPO** | Simplex Output - This output comes on when the SIMP input is activated or when Simplex Operation is chosen through KCE (if available). |
| **SYNC** | Synchronization Output - (PHC controllers) - This output is used to bypass the down normal limit switch to allow the car to be moved to the buffer at leveling speed. The computer generates the down direction output (DNDO) to move the car in the down direction. This output will be generated for 10 seconds to allow the car to move completely onto the buffer. Once this time elapses, the computer will generate the up direction output to move the car in the up direction at leveling speed, until the car reaches the bottom landing dead zone. At this time the up direction travel is initiated and the SYNC output is turned *OFF*, removing the bypass around the down normal limit switch. |
| **TOS** | Time Out of Service Output. |
| **UPO** | Up Output (Attendant Service). |
| **WLDI** | *Wildop* Indication Output - This output is generated if the car is in emergency dispatch mode of operation (i.e., if the hall call bus fuse is blown and *emergency dispatching* is activated). |
| **900** | Car Call Cancellation Output - This output is generated at the time of registration of a car call. This output is used to comply with specific handicap codes (*barrier-free* codes) that require an audible acknowledgment of car call registration |

## 5.4.9 EXTRA FEATURES MENU OPTIONS

**5.4.9.1 PI OUTPUT TYPE** - Choose either 1 WIRE PER FLOOR or BINARY-CODED PIs, depending on the inputs required by the P.I. device itself.

**5.4.9.2 FLOOR ENCODING INPUTS?** - If this option is selected, whenever the car is in a door zone the computer checks the floor code inputs and corrects the P.I., if necessary. The code inputs are provided by the landing system (refer to the Job Prints). Refer to R4, R3, R2 in Section 5.4.7.

**5.4.9.3 ENCODE ALL FLOORS?** - This option is only available when the Floor Encoding option is programmed to YES. This option indicates at what landing the Absolute Floor Encoding values begin. When set to YES, then every landing must have AFE code values, including the terminal landings. When set to NO, then only intermediate landings must have AFE code values.

**5.4.9.4 EMERGENCY POWER OPERATION? / EMERGENCY POWER RETURN FLOOR** - If this option is selected, the controller will put the elevator into Emergency Power Operation when the controller receives the Emergency Power Input (EPI) signal. During Phase 1 of Emergency Power Operation, the car will be moved to the emergency power return floor. In a duplex controller, each car will be moved to the emergency power return floor, one at a time. During Phase 2 of Emergency Power Operation, if the car's Emergency Power Run (EPRUN) input is activated, the car will run normally. Otherwise, the car will remain at the emergency power return floor and will not respond to any calls.

For a simplex controller, the car's EPRUN input is sometimes connected to a switch, so that the input can be turned *ON* and *OFF*. For a duplex controller, both cars' EPRUN inputs are usually connected to a Run Selection switch. The position of this switch determines which car will run during Phase 2 of Emergency Power Operation.

Often there is an AUTO position on the Run Selection switch connected to the AUTO input on both controllers in a duplex. If the AUTO input is activated, then one car will be automatically selected to run during Phase 2 of Emergency Power Operation. For example: If one car happens to be out of service when the operation begins, the other car will be automatically selected to run.

If the Emergency Power option is selected, then the appropriate spare inputs should be selected also (see Section 5.4.7).

**5.4.9.5 LIGHT LOAD WEIGHING? / LIGHT LOAD CAR CALL LIMIT** - This option is only used when the Light Load Weigher Input is activated (refer to Section 5.4.7, LLI spare input). To program this option, activate the LLI input. Then, set LIGHT LOAD WEIGHING? to *NO* or press ***S*** to select the maximum number of car calls registered before all the car calls are canceled. If ***S*** is pressed, the display will read LIGHT LOAD CAR CALL LIMIT. Press ***S*** until the desired number is displayed.

**5.4.9.6 PHOTO EYE ANTI-NUISANCE? / CONSEC STOPS W/O PHE LIMIT** - When this option is *ON*, the car calls will cancel if the Photo Eye input has not been activated after a programmed number of consecutive stops. The number of consecutive stops must be programmed before the car calls will cancel. To program this option, set PHOTO EYE ANTI-NUISANCE? to *NO* or press ***S*** to select the number of consecutive stops. If ***S*** is pressed, the display will read CONSEC STOPS W/O PHE LIMIT. Press ***S*** until the desired number is displayed.

**5.4.9.7 PERIPHERAL DEVICE?** - If this option is set to *YES*, it allows for various peripheral devices to be used. Currently the controller has 2 Communication Ports that can be programmed. Press ***N*** to select the media for COM Port 1. The display will read PA COM1 MEDIA. One of the following media may be selected:

- SERIAL CABLE
- MODEM
- LINE DRIVER
- NONE

Press N again to select the peripheral device that will be connected to COM Port 1. The display will read PA COM 1 DEVICE. One of the following peripherals may be selected:

- CRT - NO KEYBOARD (color or monochrome)
- CRT AND KEYBOARD (color or monochrome)
- PERSONAL COMP. (to be used with CMS or as a graphic display)

If one of the CRT options was selected, the next option will be COLOR CRT? Select *YES* if you have a color CRT or *NO* if you have a monochrome CRT. If PERSONAL COMPUTER was selected as the peripheral device, the next option will be FUNCTION. Select CMS or GRAPHIC DISPLAY.

A similar set of options will be displayed for COM Port 2. Each Communication Port (COM 1 and COM 2) must be programmed for a device and a media according to the particular job specifications to allow the particular peripheral device to operate properly.

**5.4.9.8 AUTOMATIC FLOOR STOP OPTION? / AUTOMATIC STOP FLOOR #?** - When this option is set to a specific floor number, the car will automatically stop at that floor if the car is in motion.

**5.4.9.9 CC CANCEL W/DIR REVERSAL?** - This option will cause all of the previously registered car calls to be canceled whenever a direction reversal is detected.

**5.4.9.10 CANCEL CAR CALLS BEHIND CAR?** - If this option is set to *YES* and the car has a direction arrow (SUA/SDA), no car calls can be registered behind the car's current position. For example: If a car is at the fifth floor moving down, no car calls can be registered from sixth floor and above.

**5.4.9.11 CE ELECTRONICS INTERFACE?** - This option allows information such as position and arrival gong outputs to be provided for a CE electronics device. This option is to be used with the CE2242 CE Electronics Interface board which provides a 3-wire serial interface to CE electronic fixtures.

**5.4.9.12 MASSACHUSETTS EMS SERVICE? / EMS SERVICE FLOOR #** - This option is provided in the state of Massachusetts only. This option is key-operated and provides immediate car service for Massachusetts Emergency Medical Service personnel.

**5.4.9.13 MASTER SOFTWARE KEY** - This option is a board-level control of the security system. MCE's Standard Security is initiated by the Master Software Key. There are three possible settings for the Master Software Key: ACTIVATED, ENABLED or DEACTIVATED.

- If set to ACTIVATED, Security is initiated.
- If set to ENABLED, Security is initiated only if the Building Security Input (BSI) is turned *On.*
- If set to DEACTIVATED, Security is deactivated regardless of the status of the BSI input.

**5.4.9.14 PI TURNED OFF IF NO DEMAND?** - Setting this option to *YES* will allow the PI outputs to turn *OFF* if the car has been inactive for an adjustable time (from 1 to 10 minutes).

**5.4.9.15 HOSPITAL EMERG. OPERATION?** - This option calls any eligible in-service elevator to any floor on an emergency basis. If this installation has Hospital Emergency Service Operation, a hospital emergency call switch will be installed at each floor where this service is desired.

When the hospital emergency momentary call switch is activated at any floor, the hospital emergency call registered light will illuminate at that floor only, and the nearest available elevator will respond to the hospital emergency call. All car calls within the selected car will be canceled and any landing calls which had previously been assigned to that car will be transferred to the other car. If the selected car is traveling away from the hospital emergency call, it will slow down and stop at the nearest floor without opening the doors, reverse direction, and proceed nonstop to the hospital emergency floor. If the selected car is traveling toward the hospital emergency floor, it shall proceed nonstop to that floor. At the time of selection, if the car happens to slow down for a stop, it will stop without opening the doors and then start immediately toward the hospital emergency floor.
When the car reaches the hospital emergency floor, it will remain with doors open for a pre-determined time interval. After this interval has expired, if the car has not been placed on in-car Hospital Emergency Service Operation, the car will automatically return to normal service.

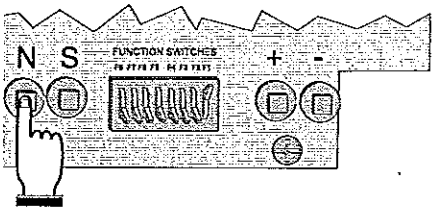
A hospital emergency key switch will be located in each car operating station for selecting in-car Hospital Emergency Service Operation. Upon activation of the key switch, the car will be ready to accept a call for any floor, and after the doors are closed, will proceed nonstop to that floor. Returning the key switch to the normal position will restore the car to normal service.

Either car selected to respond to a hospital emergency call will be removed from automatic service and will accept no additional calls, emergency or otherwise, until it completes the initial

hospital emergency function. If both cars are out of service and unable to answer an emergency call, the hospital emergency call registered light will not illuminate.

Four outputs are available on the first HC-CI/O board used for the hospital emergency service calls. Hospital Emergency Operation (HEO) will flash once the car has been selected to respond to a hospital emergency call and will remain flashing until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned *ON* expires. Hospital Emergency Warning Indicator (HWI) will remain steadily *ON* for a car on Independent Service when the hospital call is registered. Hospital Emergency Select (HSEL) will remain steadily *ON*, indicating that the car has been selected to answer a hospital call, until the in-car hospital switch is turned *ON* or the time interval expires. Hospital Emergency Phase 2 (HOSPH2) will remain *ON*, indicating that the car has arrived at the floor where the hospital call was registered, until the in-car hospital switch is returned to normal or the time interval that the car must wait for the in-car switch to be turned *ON* expires.

If you do not have Hospital Emergency Service Operation, set this option to *NO* by pressing the ***S*** pushbutton. Then, press the ***N*** pushbutton to exit this option.




If you have Hospital Emergency Service Operation, set this option to *YES* by pressing the ***S*** pushbutton. Press the ***N*** pushbutton to continue. The following display will appear:

```
HOSPITAL CALLS
FRNT/FLR1? YES
```

If you want Hospital Emergency Service to this landing, then set this option to *YES* by pressing the ***S*** pushbutton (press ***S*** again to set the option to *NO*). Press the '+' pushbutton to scroll through the available landings. Press the ***N*** pushbutton to continue. If this car has rear doors, then the following will be displayed:

```
HOSPITAL CALLS
REAR/FLR1? YES
```

Press the '+' pushbutton to scroll through the available landings. The computer will continue to present these options for each floor, up to the top floor. Press the ***N*** pushbutton to exit the Hospital Emergency Service option.

**5.4.9.16 FIRE BYPASSES HOSPITAL?** - Set this option to YES if Hospital Service is used for VIP, Priority or Commandeering Service. Set this option to NO if Hospital Service is *truly* used for Hospital Service.

**5.4.9.17 HIGH SPEED DELAY AFTER RUN?** - Setting this option will insert a fixed delay (3 seconds) between the completion of a run and the initiation of the next run. This option should be used in applications in which an immediate "stop/start" is undesirable. Under most "normal" circumstances, the initiation of a run is delayed by the time required for the door operation. In some cases, however, the car may stop and start immediately in the absence of a door operation (example: a direction reversal upon being assigned a hall call while the car is parking).

**5.4.9.18 SABBATH OPERATION** - If you do not have Sabbath Operation, set this option to *NO* by pressing the ***S*** Pushbutton. Then, press the ***N*** pushbutton to exit this option.

If you have Sabbath Operation, set this option to *YES* by pressing the ***S*** pushbutton. Press the ***N*** pushbutton to continue. The following display will appear:

"FRONT UP STOP AT FLOOR 1?"

If you want to set the car to stop at this floor while traveling in the UP direction, change *NO* to *YES* by pressing the ***S*** pushbutton (press ***S*** again to set this option to *NO*). Press the + pushbutton to increment floor value to the next landing. Continue until all of the desired front UP stops are set to *YES*.

Press the ***N*** pushbutton to proceed to the next eligibility map. If there are no walk through doors on this controller, then the rear eligibility maps will not display. In order, the next eligibility maps are as follows:

"REAR UP STOP AT FLOOR 1?"
"FRONT DOWN STOP AT FLOOR 2?"
"REAR DOWN STOP AT FLOOR 2?"

Remember that the + pushbutton increments the floor value to the next landing. And that the ***N*** pushbutton will proceed to the next eligibility map.

**5.4.9.19 LEVELING SENSOR ENABLED/DISABLED** - If this option is set to disabled, the LFLT ON, LFLT OFF and DZ STUCK errors will not be generated.

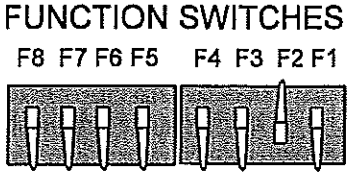
**5.4.9.20 KCE ENABLE / DISABLE** - The KCE Enable is set to ON when ENABLE is selected or OFF when DISABLE is selected from the menu display.

## 5.5 EXTERNAL MEMORY MODE

External Memory mode can be used to view memory addresses in the external RAM on the MC-PCA board. The external memory address is denoted by the letters DA (Data Address). The ability to view the external memory can also be helpful for diagnosing and troubleshooting the elevator system. The Computer External Memory Chart (Table 5.6) shows the meaning of the data digits at different addresses.

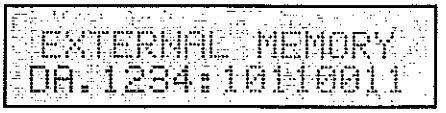
### 5.5.1 GETTING INTO EXTERNAL MEMORY MODE

External Memory mode is initiated by placing the *F2* switch in the up position (see Figure 5.1). The following is a description of the LCD display format and the function of the N, S, +, and - pushbuttons during External Memory mode.




*External Memory mode*

### 5.5.2 FUNCTION OF N PUSHBUTTON




The ***N*** pushbutton (see Figure 5.1) allows for the advancement of the computer memory address, which is displayed on the second line of the LCD display. For example, for this display, pressing the ***N*** pushbutton once (hold it for 1-2 seconds) will cause the 1 in the address 1234 to begin blinking. By continuing to press the ***N*** pushbutton, the 2 in the address 1234 will begin to blink. The cycle will continue while the ***N*** pushbutton is being pressed. Once the digit needed to be changed is blinking, the address can then be modified.

The data (8 digits) that correspond to the external memory address is displayed to the right of the address. This data display will change as the memory address changes.

### 5.5.3 FUNCTION OF S PUSHBUTTON

The ***S*** pushbutton (see Figure 5.1) ends the ability to change the address by stopping the digit from blinking. If the ***S*** pushbutton is not pressed, the selected digit will stop blinking automatically after 20 seconds.

### 5.5.4 FUNCTION OF + PUSHBUTTON

The + pushbutton (see Figure 5.1) modifies the digit of the computer memory address selected by the ***N*** pushbutton. If the + button is pressed, the selected digit is incremented by one. The data display will also change as the address changes. For example, if the 2 of the address 1234 is blinking, pressing the + pushbutton once will change the address from 1234 to 1334. Pressing the + pushbutton several more times will change the address to 1434, 1534, 1634, etc., up to 1F34 and then back to 1034.

### 5.5.5 FUNCTION OF – PUSHBUTTON

The – pushbutton (see Figure 5.1) modifies the digit of the computer memory address selected by the N pushbutton. If the – pushbutton is pressed, the selected digit is decrement by one. The data display will also change as the address changes. For example: If the 2 in the address 1234 is blinking, pressing the – pushbutton once will change the address from 1234 to 1134. Pressing the – pushbutton several more times will change the address to 1034, 1F34, 1E34, etc.

### 5.5.6 TROUBLESHOOTING USING EXTERNAL MEMORY MODE

By using the computer's External Memory mode, it is possible to find out if the controller is receiving call signals correctly, as well as HC-IOX board input and output signals.

**5.5.6.1** The following example illustrates how to use Table 5.6 to check a signal in the computer's external memory.

Example problem: The DHLD (Door Hold Open Switch) input will not cause the doors to stay open. DHLD is programmed for the Spare 5 input.

**Step 1:** Find SP5 in Table 5.6 (next page). Notice that the Address of SP5 is 02AF and the Position is 4.

**Step 2:** Look up the signal on the computer. Change the address on the display to Address 02AF (see Section 5.5). Look at data bit number 4 (from the right), which is underlined in the following display:


This digit represents the computer's interpretation of the Spare 5 input signal. If the digit is 1, the computer thinks that the SP5 signal is *ON*. If the digit is 0, the computer thinks that the SP5 signal is off.

This information can be used to determine the source of the problem. If the Spare 5 input is programmed for the DHLD (Door Hold) input and the doors are not staying open, the diagnostic display will show that the SP5 input is off. If this is the case, checking the voltage on the SP5 terminal will show whether the problem is inside or outside the controller.

*TABLE 5.6 Computer External Memory Chart*

| | HALL CALLS | | | | | | CAR CALLS | |
|---|---|---|---|---|---|---|---|---|
| ADD | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 0140: | 601R/UC1R | 601/UC1 | | | | | 101R/CC1R | 101/CC1 |
| 0141: | 602R/UC2R | 602/UC2 | 502R/DC2R | 502/DC2 | | | 102R/CC2R | 102/CC2 |
| 0142: | 603R/UC3R | 603/UC3 | 503R/DC3R | 503/DC3 | | | 103R/CC3R | 103/CC3 |
| 0143: | 604R/UC4R | 604/UC4 | 504R/DC4R | 504/DC4 | | | 104R/CC4R | 104/CC4 |
| 0144: | 605R/UC5R | 605/UC5 | 505R/DC5R | 505/DC5 | | | 105R/CC5R | 105/CC5 |
| 0145: | 606R/UC6R | 606/UC6 | 506R/DC6R | 506/DC6 | | | 106R/CC6R | 106/CC6 |
| 0146: | 607R/UC7R | 607/UC7 | 507R/DC7R | 507/DC7 | | | 107R/CC7R | 107/CC7 |
| 0147: | 608R/UC8R | 608/UC8 | 508R/DC8R | 508/DC8 | | | 108R/CC8R | 108/CC8 |
| 0148: | 609R/UC9R | 609/UC9 | 509R/DC9R | 509/DC9 | | | 109R/CC9R | 109/CC9 |
| 0149: | 610R/UC10R | 610/UC10 | 510R/DC10R | 510/DC10 | | | 110R/CC10R | 110/CC10 |
| 014A: | 611R/UC11R | 611/UC11 | 511R/DC11R | 511/DC11 | | | 111R/CC11R | 111/CC11 |
| 014B: | 612R/UC12R | 612/UC12 | 512R/DC12R | 512/DC12 | | | 112R/CC12R | 112/CC12 |
| 014C: | 613R/UC13R | 613/UC13 | 513R/DC13R | 513/DC13 | | | 113R/CC13R | 113/CC13 |
| 014D: | 614R/UC14R | 614/UC14 | 514R/DC14R | 514/DC14 | | | 114R/CC14R | 114/CC14 |
| 014E: | 615R/UC15R | 615/UC15 | 515R/DC15R | 515/DC15 | | | 115R/CC15R | 115/CC15 |
| 014F: | 616R/UC16R | 616/UC16 | 516R/DC16R | 516/DC16 | | | 116R/CC16R | 116/CC16 |
| 0150: | 617R/UC17R | 617/UC17 | 517R/DC17R | 517/DC17 | | | 117R/CC17R | 117/CC17 |
| 0151: | 618R/UC18R | 618/UC18 | 518R/DC18R | 518/DC18 | | | 118R/CC18R | 118/CC18 |
| 0152: | 619R/UC19R | 619/UC19 | 519R/DC19R | 519/DC19 | | | 119R/CC19R | 119/CC19 |
| 0153: | 620R/UC20R | 620/UC20 | 520R/DC20R | 520/DC20 | | | 120R/CC20R | 120//CC20 |
| 0154: | 621R/UC21R | 621/UC21 | 521R/DC21R | 521/DC21 | | | 121R/CC21R | 121/CC21 |
| 0155: | 622R/UC22R | 622/UC22 | 522R/DC22R | 522/DC22 | | | 122R/CC22R | 122/CC22 |
| 0156: | 623R/UC23R | 623/UC23 | 523R/DC23R | 523/DC23 | | | 123R/CC23R | 123/CC23 |
| 0157: | 624R/UC24R | 624/UC24 | 524R/DC24R | 524/DC24 | | | 124R/CC24R | 124/CC24 |
| 0158: | 625R/UC25R | 625/UC25 | 525R/DC25R | 525/DC25 | | | 125R/CC25R | 125/CC25 |
| 0159: | 626R/UC26R | 626/UC26 | 526R/DC26R | 526/DC26 | | | 126R/CC26R | 126/CC26 |
| 015A: | 627R/UC27R | 627/UC27 | 527R/DC27R | 527/DC27 | | | 127R/CC27R | 127/CC27 |
| 015B: | 628R/UC28R | 628/UC28 | 528R/DC28R | 528DC28 | | | 128R/CC28R | 128/CC28 |
| 015C: | 629R/UC29R | 629/UC29 | 529R/DC29R | 529/DC29 | | | 129R/CC29R | 129/CC29 |
| 015D: | 630R/UC30R | 630/UC30 | 530R/DC30R | 530/DC30 | | | 130R/CC30R | 130/CC30 |
| 015E: | 631R/UC31R | 631/UC31 | 531R/DC31R | 531/DC31 | | | 131R/CC31R | 131/CC31 |
| 015F: | | | 532R/DC32R | 532/DC32 | | | 132R/CC32R | 132/CC32 |

**SPARE INPUTS**

| ADD | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| 02AF: | SP9 | SP8 | SP7 | SP6 | SP5 | SP4 | SP3 | SP2 |
| 02B0: | SP17 | SP16 | SP15 | SP14 | SP13 | SP12 | SP11 | SP10 |
| 02B1 | SP25 | SP24 | SP23 | SP22 | SP21 | SP20 | SP19 | SP18 |
| 02B2 | SP33 | SP32 | SP31 | SP30 | SP29 | SP28 | SP27 | SP26 |
| 02B3 | SP41 | SP40 | SP39 | SP38 | SP37 | SP36 | SP35 | SP34 |
| 02B4 | SP49 | SP48 | SP47 | SP46 | SP45 | SP44 | SP43 | SP42 |

**SPARE OUTPUTS ***

| ADD | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| 02EF: | OUT8 | OUT7 | OUT6 | OUT5 | OUT4 | OUT3 | OUT2 | OUT1 |
| 02F0: | OUT16 | OUT15 | OUT14 | OUT13 | OUT12 | OUT11 | OUT10 | OUT9 |
| 02F1: | OUT24 | OUT23 | OUT22 | OUT21 | OUT20 | OUT19 | OUT18 | OUT17 |
| 02F2: | OUT32 | OUT31 | OUT30 | OUT29 | OUT28 | OUT27 | OUT26 | OUT25 |

* This table shows the spare outputs for HC-IOX boards. If an HC-I40 board is used, the outputs follow those of an HC-IOX board and are in the following format. Increment the output numbers accordingly.

**HC-I4O board spare output format**

| ADD | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| 02xx: | OUT4 | OUT3 | OUT2 | OUT1 | not used | not used | not used | not used |

*TABLE 5.7 Computer's Hospital Call and Eligibility Memory Chart*

| | HOSPITAL CALL ELIGIBILITY | | | | HOSPITAL CALLS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | OTHER CAR | | THIS CAR | | ASSIGNED HOSPITAL CALLS | | REGISTERED HOSPITAL CALLS | | |
| | REAR | FRONT | REAR | FRONT | REAR | FRONT | REAR | FRONT | |
| ADD | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |
| 0240: | | | | | | | ECR1 | EC1 | Floor # 1 |
| 0241: | | | | | | | ECR2 | EC2 | Floor # 2 |
| 0242: | | | | | | | ECR3 | EC3 | Floor # 3 |
| 0243: | | | | | | | ECR4 | EC4 | Floor # 4 |
| 0244: | | | | | | | ECR5 | EC5 | Floor # 5 |
| 0245: | | | | | | | ECR6 | EC6 | Floor # 6 |
| 0246: | | | | | | | ECR7 | EC7 | Floor # 7 |
| 0247: | | | | | | | ECR8 | EC8 | Floor # 8 |
| 0248: | | | | | | | ECR9 | EC9 | Floor # 9 |
| 0249: | | | | | | | ECR10 | EC10 | Floor # 10 |
| 024A: | | | | | | | ECR11 | EC11 | Floor # 11 |
| 024B: | | | | | | | ECR12 | EC12 | Floor # 12 |
| 024C: | | | | | | | ECR13 | EC13 | Floor # 13 |
| 024D: | | | | | | | ECR14 | EC14 | Floor # 14 |
| 024E: | | | | | | | ECR15 | EC15 | Floor # 15 |
| 024F: | | | | | | | ECR16 | EC16 | Floor # 16 |
| 0250: | | | | | | | ECR17 | EC17 | Floor # 17 |
| 0251: | | | | | | | ECR18 | EC18 | Floor # 18 |
| 0252: | | | | | | | ECR19 | EC19 | Floor # 19 |
| 0253: | | | | | | | ECR20 | EC20 | Floor # 20 |
| 0254: | | | | | | | ECR21 | EC21 | Floor # 21 |
| 0255: | | | | | | | ECR22 | EC22 | Floor # 22 |
| 0256: | | | | | | | ECR23 | EC23 | Floor # 23 |
| 0257: | | | | | | | ECR24 | EC24 | Floor # 24 |
| 0258: | | | | | | | ECR25 | EC25 | Floor # 25 |
| 0259: | | | | | | | ECR26 | EC26 | Floor # 26 |
| 025A: | | | | | | | ECR27 | EC27 | Floor # 27 |
| 025B: | | | | | | | ECR28 | EC28 | Floor # 28 |
| 025C: | | | | | | | ECR29 | EC29 | Floor # 29 |
| 025D: | | | | | | | ECR30 | EC30 | Floor # 30 |
| 025E: | | | | | | | ECR31 | EC31 | Floor # 31 |
| 025F: | | | | | | | ECR32 | EC32 | Floor # 32 |

***Legend for Table 5.7:***

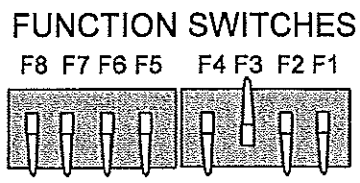
→ Registered hospital calls for the floor opening.
1 = call is registered 0 = call is not registered

→ Assigned hospital calls for the floor opening.
1 = Call is assigned 0 = Call is not assigned

→ The car is eligible for Hospital Emergency Service Operation for the floor opening.
1 = Hospital emergency call can be entered for the floor opening
0 = Hospital emergency call cannot be entered for the floor opening

## 5.6 SYSTEM MODE

System mode allows the user to change certain system-wide options that do not require the car to be on inspection. Currently, there is only one available menu in System mode, the Building Security Menu. To enter System mode, move the ***F3*** switch to the up position.




*System mode*

### 5.6.1 BUILDING SECURITY MENU

The Security code for each floor may consist of one to eight characters where each character is one of the floor buttons found in the elevator car. Any floor with a Security code is a secured floor. The appendix entitled ELEVATOR SECURITY INFORMATION AND OPERATION at the end of this manual provides instructions for elevator passengers on the use of Security operation. Space has also been provided for listing the security codes for each floor.

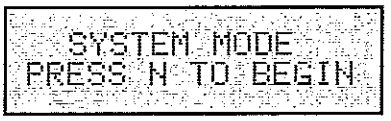
MCE Security is initiated by the Master Software Key in the Extra Features Menu (Program mode). There are 3 possible settings for the Master Software Key: ACTIVATED, ENABLED, and DEACTIVATED.

- If set to ACTIVATED, Security is initiated.
- If set to ENABLED, Security is initiated only if the BSI input is turned *ON.*
- If set to DEACTIVATED, Security is deactivated regardless of the status of BSI.

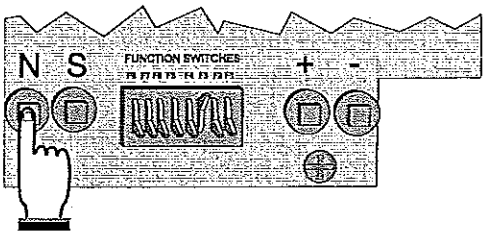
To find the BSI input, refer to the job prints. Once Security is initiated, all car calls are screened by the computer and become registered only if 1) the call is not to a secured floor, or 2) the floor is secured and its code is correctly entered within 10 seconds.

**5.6.1.1 VIEWING THE BUILDING SECURITY MENU** - Place the ***F3*** switch in the up position (with all other switches in the down position).

The following display appears:

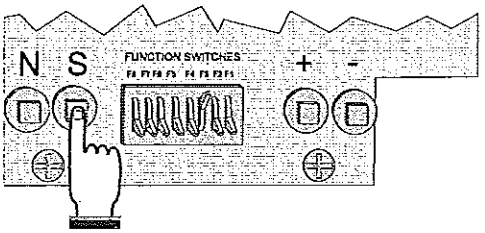



Press the ***N*** pushbutton.




The following display appears:

**5.6.1.2 PROGRAMMING AND VIEWING THE SECURITY CODES** - Press the ***S*** pushbutton to start programming or changing the Security codes (or to view the codes).



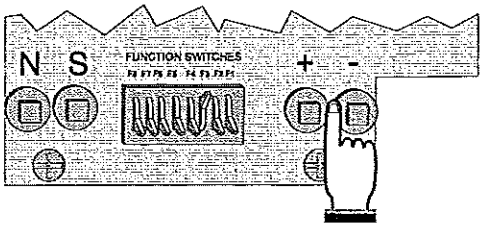

If no code has been programmed, then the computer displays NO CODE PROGRAMMED for that particular floor number. Press the ***S*** pushbutton again to start programming the Security code.

```
Flr 1f: NO
CODE PROGRAMMED
```

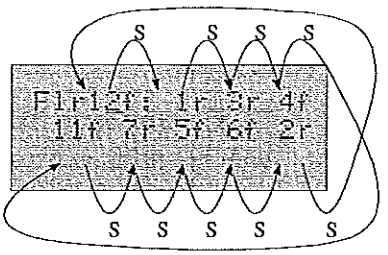
If a code has already been programmed, then the computer displays the security code. The cursor will blink below the floor number for the Security code being displayed.

```
Flr 1f: 8r 3f 4f
 2r21f31r19f17r
```

Press the + and – pushbuttons to change the floor number. The + pushbutton increments the value that is being displayed to the next eligible value. The – pushbutton decrements the value.




Press the ***S*** pushbutton to move the cursor to the first character of the Security code. Press the + and – pushbuttons to change the value of the first character. Repeat these steps (pressing the ***S*** pushbutton followed by the + and – pushbuttons) until the desired number of characters are programmed (maximum of 8 characters). The ***S*** pushbutton moves the position of the blinking cursor according to the diagram at the right. If any character is left blank, or after all eight characters have been programmed, and the ***S*** pushbutton is pressed, the cursor returns to the floor number.




Repeat these steps (Section 5.6.1.2) to program the Security codes for all the floors. You may exit the Building Security Menu at any time during programming by pressing the ***N*** pushbutton. When the ***N*** pushbutton is pressed, the LCD will display the following:

```
Exit this menu?
N=No S=Yes
```

Press the ***S*** pushbutton to exit or the ***N*** pushbutton to return to the previous display. If ***S*** is pressed, the following will appear (only if changes have been made):

Press ***S*** to save the changes or ***N*** to exit without saving (any original codes will remain in effect if the changes are not saved).

```
Save Changes?
N=No S=Save
```

5.6.2 **PASSCODE REQUEST MENU** - The Passcode Request Operation can be used to require a password to be entered in order to run the car on any mode of operation other than Inspection.

**NOTE:** If a passcode has not been programmed for this controller, the Passcode Request Menu will not appear.

If a passcode has been programmed, the LCD screen will flash the "PASSCODE REQUESTED" message when Passcode Request Operation is activated.

```
                PASS REQ
PI 8 20: 10001000
```

In order to clear or set the Passcode Request Operation, the controller must first be placed into the System Mode as described in Section 5.6. By pressing the ***N*** pushbutton when the display reads "BUILDING SECURITY MENU," the Passcode Request Menu will appear:

```
*  PASSCODE  *
  REQUEST MENU
```

Screen 1

**CLEARING THE PASSCODE** - With Screen 1 displayed, press the ***S*** pushbutton. If Passcode Request Operation is activated, the following screen appears:

```
REQUESTED  PASS-
CODE:    000000000
```

Screen 2

The first character of the passcode to be entered will blink. The "+" and "-" pushbuttons will scroll through the numbers 0-9 and letters A-Z for each character of the passcode. The ***N*** pushbutton will advance to the next character position of the passcode. Pressing the ***S*** pushbutton will cause the program to verify that the passcode entered was correct. If it was not correct, the following screen will appear:

```
* INVALID CODE *
S=CONT.  N=EXIT
```

Screen 3

Pressing the ***S*** pushbutton will display Screen 2. Pressing the ***N*** pushbutton from this screen will return the display back to Screen 1.

If the correct passcode was entered, the following screen appears:

```
*  VALID CODE  *
    N=EXIT
```

Screen 4

Pressing the ***N*** pushbutton will return the display to Screen 1. The car may now be run on Normal operation mode.

**ACTIVATING THE PASSCODE** - With Screen 1 displayed, press the ***S*** pushbutton. If Passcode Request Operation is not activated, the following display appears:

```
ACTIVATE
PASSCODE?  NO
```

Screen 5

Pressing the ***S*** pushbutton will toggle the display from "NO" to "YES". Pressing the ***N*** pushbutton while "NO" is displayed will return the display back to the Screen 1. Pressing the ***N*** pushbutton while "YES" is displayed will activate the Passcode Request Operation and return the display back to Screen 1. With Passcode Request Operation *activated*, the passcode must be entered in order to run the car on any mode of operation other than Inspection.

## 5.7 DUPLEXING

A great advantage of the PTC Series is how easily it can be duplexed. Because the duplexing logic is completely internal to the computers, it requires only a connecting cable and the selection of the Duplex option (see Section 5.4.2.1). The duplexing logic provides for proper assignment of hall calls to cars and increases efficiency and decreases waiting time.

### 5.7.1 DISPATCHING ALGORITHM

The dispatching algorithm for assigning hall calls will be real time-based on estimated time of arrival (ETA). In calculating the estimated time of arrival for each elevator, the dispatcher will consider, but not be limited to, the location of each elevator, the direction of travel, the existing hall call and car call demand, door time, MG start up time, flight time, lobby removal time penalty and coincidence call.

### 5.7.2 HARDWARE CONNECTIONS

There are two critical items in duplexing hardware: Proper grounding between the two controller subplates and proper installation of the duplexing cable. The hall calls will be connected to both cars simultaneously. Once in a duplex configuration, either of the two controllers can become the dispatcher of hall calls. The controller that assumes the dispatching duty on power up remains the dispatching processor until it is taken out of service. If, for any reason, the communication link between the two controllers does not function, each car will respond to the registered hall calls independently.

### 5.7.3 TROUBLESHOOTING

In a duplexing configuration, the controller that assumes dispatching duty is identified by the letter *D* in the upper left corner of the LCD display. The other car is identified by the letter *S* (slave), in the upper left corner of the LCD. If the upper left-hand corner of the LCD is blank (neither the *D* nor the *S* is displayed), the cars are not communicating, the following troubleshooting steps should be taken:

**Step 1:** Check for proper grounding between the two subplates.

**Step 2:** Check the communication cable hook-up.

**Step 3:** The JP3 jumper is installed on both MC-PCA boards (found next to the power supply terminals, see Figure 5.1) as the default configuration for duplex communication. JP3 is an EIA-485 Standard Communication Termination jumper. However, in an attempt to optimize the duplex communication, the JP3 jumper may be removed from either one or both of the MC-PCA boards.

**Step 4:** If all of the above are unsuccessful, contact MCE.

If the *D* and/or *S* indicators on the LCD are flickering, it is most likely caused by bad communication and the following troubleshooting steps should be taken:

**Step 1:** Check the Communication Time-Out Error Counter shown in Table 5.3 (Address 42). If the counter is actively counting errors, the slave computer is not responding to the dispatcher's request for information. If the cause is a communication problem, complete Steps 1-4 above.

**Step 2:** Check the Communication Checksum Error Counter shown in Table 5.3 (Address 43). If the counter is actively counting errors, the data being received is bad or does not have integrity and cannot be used by the computer. If the cause is a communication problem, complete Steps 1-4 above.

# SECTION 6
# TROUBLESHOOTING

## 6.0 GENERAL INFORMATION

MCE's PHC controllers are equipped with certain features that can help field personnel speed up troubleshooting. The system is designed so that tracing signals from the field wires onto various boards and into the computer can be achieved without the need for mechanical removal of any components or for rear access to the boards. The following pages will describe how to use these features and speed up the troubleshooting process.

Overall, the computer (MC-PCA board) and the program are the most reliable parts of the system. Diagnostic mode on the computer is the most helpful tool for troubleshooting. Therefore, it is best to start with the computer. Refer to Section 5.3 of this manual for instructions on using Diagnostic mode. When viewing the diagnostic LCD display, be observant of any contradictory information (i.e., the High Speed light should not be on while the Doors Locked light is off).

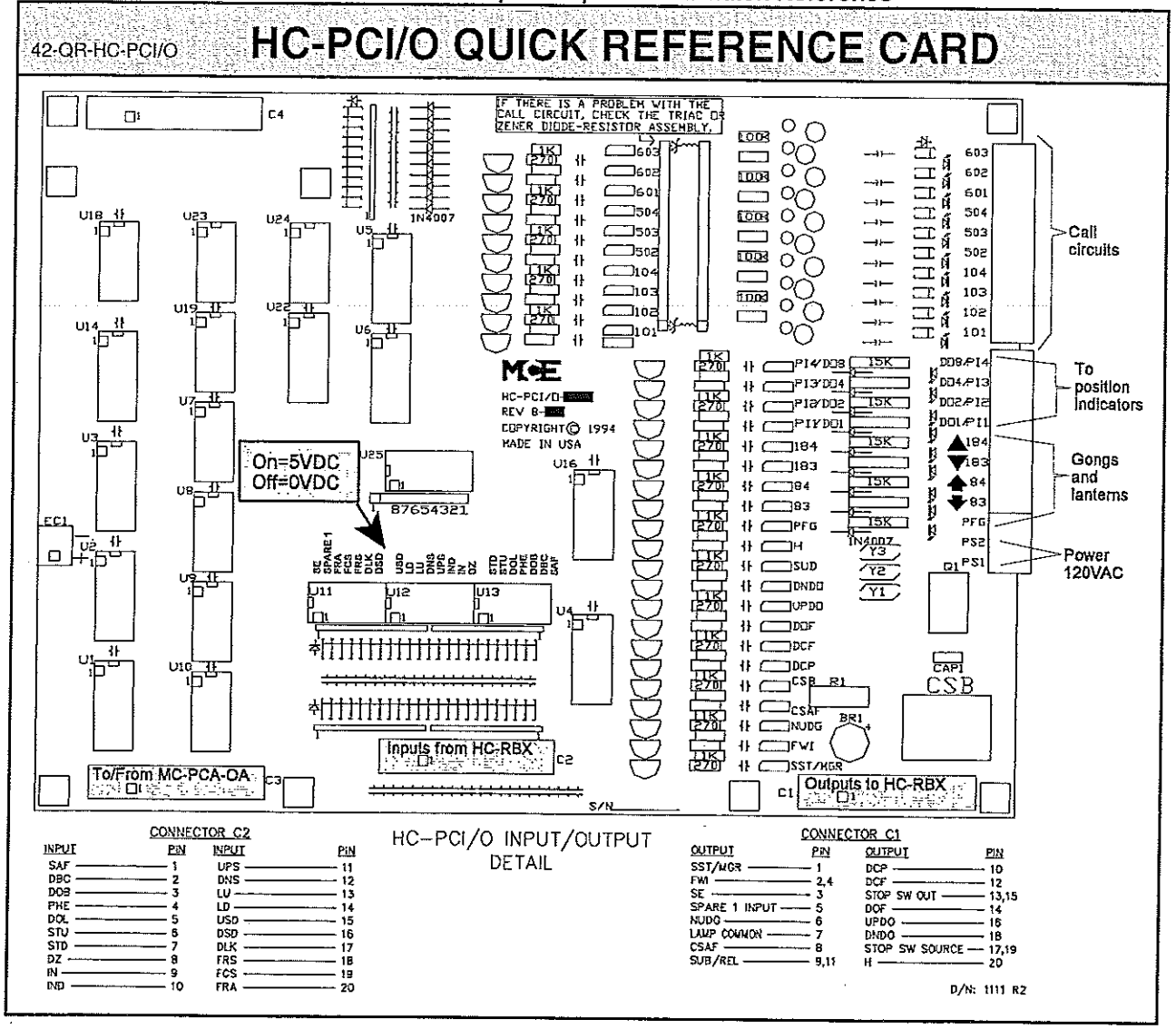
## 6.1 TRACING SIGNALS IN THE CONTROLLER

Typically, a malfunction of the control system is due to a bad input or output signal. Inputs are signals generated outside the controller cabinet and are brought to the designated terminals inside the cabinet and then read by the computer. Outputs are signals generated inside the computer, and are usually available on terminal blocks inside the controller cabinet. Since a fault on any input or output can be the cause of a system malfunction, being able to trace these signals and find the source of the problem is essential. The following is an example that shows how an input signal can be traced from its origination point to its destination inside the computer. For example, look at the Door Zone (DZ) input. Using the Diagnostic mode instructions in Section 5.3 of this manual, use the ***N***, ***S***, **+**, and **–** pushbuttons to address and observe the Door Zone (DZ) flag, which shows the status of the Door Zone (DZ) input. Moving the car in the hoistway should cause this flag to turn on (1) and off (0) whenever the car passes a floor. If the status of the (DZ) flag does not change, one of the following could be a cause of the problem:

1. A defective Door Zone switch or sensor on the landing system car top unit.
2. Incorrect hoistway wiring.
3. Bad termination of hoistway wiring to the (DZ) terminal inside the controller.
4. A defect on the HC-RBH Relay board or HC-PCI/O board.

The first step is to determine if the problem is inside or outside of the controller. To do so, use a voltmeter to probe the Door Zone terminal (27) on the Relay board. This terminal is in Area 3 of the Job Prints (areas of the Job Prints are marked on the left-hand side of the pages and certain signals may be in locations different from the print area mentioned in this guide). Moving the car in the hoistway should cause the voltmeter to read 115VAC when the car is at Door Zone. If the signal read by the voltmeter does not change when the car passes the Door Zone, then the problem must be external to the controller and items (1), (2), or (3) should be examined. If the signal read by the voltmeter *does* change as the car passes the Door Zone, the problem must be internal to the controller and item (4) must be examined. From the print, notice that this input goes to the right-hand side of the DZ relay and to a 47K 1W resistor. The 47K 1W resistor conducts the signal to pin 8 of the C2 connector on the top of the HC-RBH Relay board. Next, a 20-pin ribbon cable conducts the signal to pin 8 of the C2 connector on the HC-PCI/O board.

*FIGURE 6.1 HC-PCI/O Power and Call Input/Output Board Quick Reference*

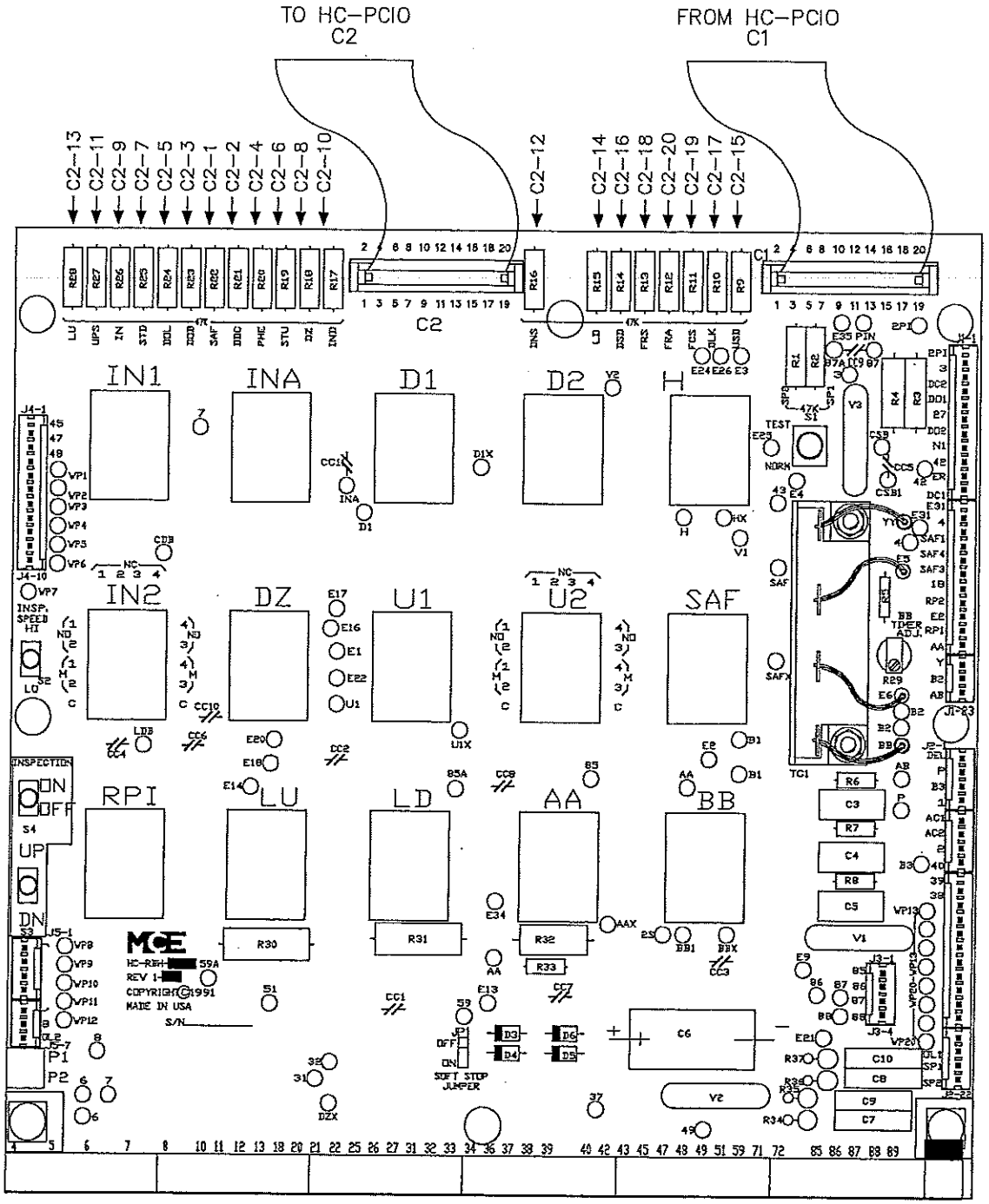



Figures 6.1 and 6.2 show pictures of the HC-PCI/O and HC-RBH boards showing where the DZ signal can be found on these boards. Notice that if terminal 27 is powered, there should be approximately 115VAC at the bottom of the 47K 1W resistor corresponding to DZ on the HC-RBH board . Whereas the top of the same resistor should read approximately 5VAC if the C2 ribbon cable is connected. If the ribbon cable is disconnected, the reading should be 115VAC at the top of this same resistor. This is because the other half of the voltage divider is on the HC-PCI/O board.

The HC-RBH board has test pads on the front of the board for every relay and connector. The relay on the lower left-hand side (RPI) has the legend describing which pad corresponds to which contact of the relay or its coil. To see if the input from terminal 27 is making its way to the relay coil, use the test pad on the lower right-hand side of the DZ relay (the right-hand side of the relay coil symbol on the job print corresponds to the right-hand side on the board). If 115VAC is present across the relay coil and the relay is not picked, then the relay may be defective.

It is therefore not necessary to remove the relay or access the back of the HC-RBH board to trace the signals on the board. The signals can also be traced on the HC-PCI/O board. See Figure 6.1 for details. If the signal gets to the HC-PCI/O board but does not get to the computer, it would be safe to assume that the problem is on the HC-PCI/O board.

*FIGURE 6.2 HC-RBH Main Relay Board Detail*




## 6.2 DOOR LOGIC

As complex as it is, the Door Logic portion of the software answers one simple question: Should the doors be open? The computer looks at certain inputs and then calls upon specific logic to determine the answer to this basic question. All of these inputs and all of the flags generated by the specific logic are available for viewing through Diagnostic mode on the computer. When troubleshooting a door problem, inspecting the action and sequence of these flags and inputs is very important. When the meaning of the flags becomes more familiar, the state of these flags will generally serve to point to the root of the problem. Once the computer has determined the answer to the door status question, the appropriate outputs are turned on and/or off to attempt to cause the doors to be in the desired state.

The computer looks at the following inputs:

| | | |
|---|---|---|
| DBC | - | Door Close Button Input |
| DCLC | - | Door Closed Contacts Input (Retiring Cam only) |
| DLK | - | Door Locks Input |
| DOB | - | Door Open Button Input |
| DOL | - | Door Open Limit Input |
| DZ | - | Door Zone Input |
| PHE | - | Photo Eye Input |
| SE | - | Safety Edge Input |

The computer generates the following outputs:

| | | |
|---|---|---|
| DCF | - | Door Close Function Output |
| DCP | - | Door Close Power Output |
| DOF | - | Door Open Function Output |

Associated important computer-generated logic flags:

| | | |
|---|---|---|
| CCT | - | Car Call Time Flag |
| DOI | - | Door Open Intent Flag |
| DSH | - | Door Shortening (Intermediate) Flag |
| DSHT | - | Door Shortening (Final) Timer Flag |
| HCT | - | Hall Call Time Flag |
| LOT | - | Lobby Call Time Flag |
| SDT | - | Short Door Time Flag |

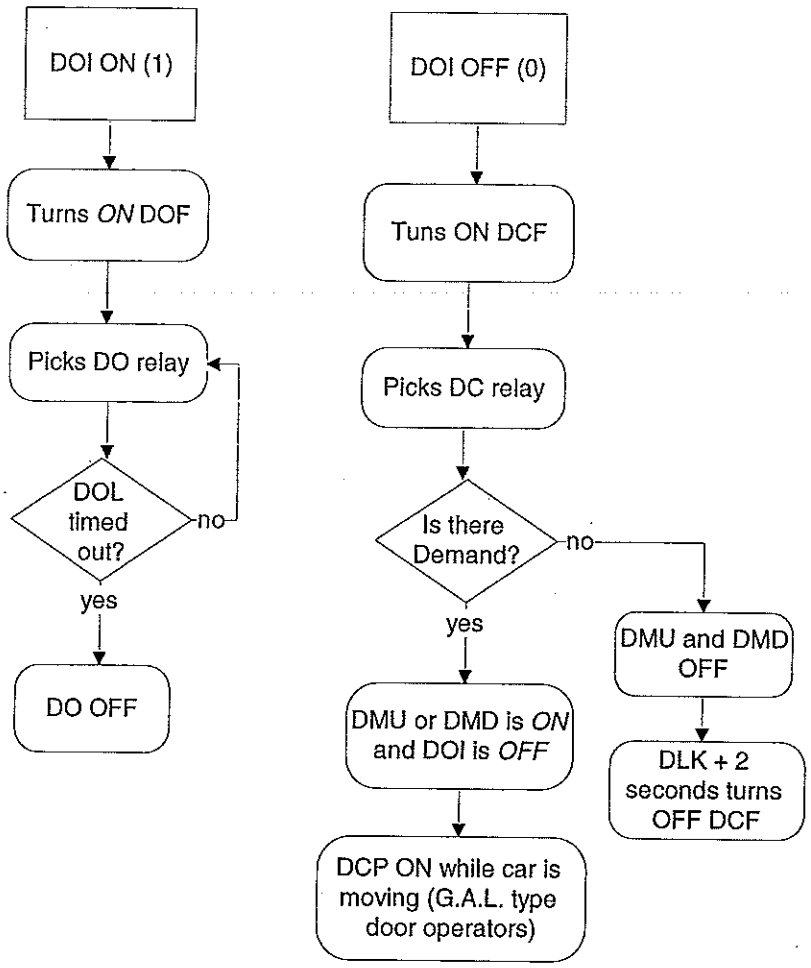
The computer uses the flags and inputs listed above to make a decision concerning the desired state of the doors. This decision has only two possible goals: *doors open* or *doors closed*. The computer's answer to this question is reflected in the state of the Door Open Intent (DOI) flag. This flag can be seen by using Diagnostic mode on the computer.

- If the computer decides the **doors should be open**, ***DOI*** *flag is set to ON* (**1**)
- If the computer decides the **doors should be closed**, ***DOI*** *flag is set to OFF* (**0**).

The DOI flag is a useful flag to inspect when troubleshooting door problems. This flag shows the *intention* of the computer concerning the state of the doors. Figure 6.3 shows how DOI relates to door operation, as is described in the following paragraph.

Remember that if the DOI flag is *ON* (1), it will turn *ON* the DOF output which should pick the DO relay. The door will remain open until the DOL (Door Open Limit) input goes away. This will shut off the DOF output while the doors are open and DOI is on. Turning off the DOI flag will turn on the DCF output, which will pick the DC relay and close the doors. While there is no demand to go anywhere, the signal that shuts off the DCF output is DLK (Doors Locked), or possibly DCLC if the car has a retiring cam. However, there is a 2-second delay before the DCF output turns off after the doors are locked. If there is any demand (as is evidenced by the DMU or DMD flags being on) and if the DOI flag is *not* on (0), then the DCP output will be turned on regardless of the position of the door. The DCP output is used to provide door closing power for those door operators requiring power while the car is running, such as those manufactured by G.A.L. Corporation.

*FIGURE 6.3 Door operation flowchart*




The various values of door standing open time result from the type of call canceled or responded to. A hall call cancellation will give an HCT flag and a car call cancellation will give a CCT flag. A door reopen from a hall or car call button at the lobby, or a lobby hall or car call cancellation will give a LOT flag. A door reopen from the Photo Eye, Safety Edge or Door Open button will give a SDT flag. Each flag (HCT, CCT, LOT or SDT) has a separate door standing open time.

The door logic provides protection timers for the door equipment both in the open and the close direction. If the doors get stuck because of the door interlock keeper failing to lift high enough to clear the door interlock during the opening cycle, then the doors cannot complete their opening cycle. This could result in damage to the door motor. The door open protection timer will eventually stop trying to open the doors so the car can go on to the next call. Similarly, if the doors do not close all the way (i.e., the doors do not lock), the computer will recycle the doors at a programmed interval in an attempt to clear the problem.

To provide a clearer understanding of the computer logic, note that the logic looks for a reason to open the doors. If a valid reason to open the doors is *not* found, or if conditions are detected that prohibit the opening of the doors, the logic will close the doors (reset or turn off DOI). To open the doors, the car must be in a door zone and not running at high or intermediate speed. Once the car has settled into a proper position to open the doors, a condition must exist that says to the logic that the doors should be open.

Some of these conditions are listed below:

- Call demand at the current landing (or a call has just been canceled)
- Safety Edge/Door Open button (DOB) input
- Emergency/Independent Service conditions
- Photo Eye input

When a call is canceled, one of the following door time flags should be set (turned on): CCT, HCT or LOT. When one of the reopening devices is active (SE, PHE or DOB), the SDT flag should be set. When an Emergency or Independent Service condition exists, the presence of a particular condition will cause the DOI flag to be set. Some of these conditions include the following: Fire Service, Emergency Power operation, Independent Service, Attendant Service, etc.

Once the intention of the computer has been determined, inspect the high voltage hardware to see if the appropriate functions are being carried out. For example, if the doors are closed and DOI is set, the doors should be opening (DO relay picked). If the doors are open and DOI is cleared (turned off), the doors should be closing (DC relay picked).

The trouble arises when the door control system is not doing what the mechanic thinks it should be doing. However, when troubleshooting, it is vital to determine if the control system is doing what *it* thinks it should be doing. If the control system (high voltage section) is doing what the logic intends it to do, then determining how the logic is coming to its conclusions is important. If the control system is *not* doing what the logic intends it to do, then determining what is preventing the desired function from being carried out is equally important (bad relay, bad triac, etc.). Diagnostic mode on the MC-PCA Computer board will help to determine which situation is present. The output flags will show which outputs the computer is attempting to turn on or off. These flags can be compared with what is actually happening in the high voltage hardware. Consider, as an example, this problem: the doors are closed and locked, but the DC relay is *always* picked, preventing the doors from opening when they should. The cause of the problem must first be isolated. If both the DCF and DCP flags are cleared (turned off) in the computer, the DC relay should *not* be picked. If the DC relay *is* picked, then a problem obviously exists in the output string to the DC relay. However, if either the DCF or DCP flag is *always* set in the computer, then the problem is not with the output circuit, but possibly a problem with the door lock circuitry. If the doors are truly physically locked, inspecting the DLK flag in the computer would be wise. If the flag is not set in the computer, then there is obviously a fault in the input circuit from the door lock input. A simple inspection of the computer's Diagnostic mode will substantially narrow down the cause of the problem.

## 6.3 CALL LOGIC

### 6.3.1 NORMAL OPERATION

In the MCE call input structure, calls are input to the system by grounding the appropriate call input, as labeled on the HC-PCI/O board (with more than four floors, both the HC-PCI/O board and one or more HC-CI/O-E Call boards). The act of physically grounding the call input terminal will illuminate the corresponding call indicator LED on the call board. Latching of the call by the computer (recognition and acceptance) will cause the indicator to remain illuminated on the board. Cancellation of the call will cause the indicator to turn off. With the MCE call input/output structure, the single input/output terminal on the HC-PCI/O (or HC-CI/O-E) board will accept a call input from the call fixture and serves as the output terminal which illuminates the call fixture to show registration of the call. This means that the field wiring is identical to that which would be used for most standard relay controllers.

Calls may be prevented from latching by the computer in certain circumstances. If none of the car calls are allowed to be registered, the computer may be purposely preventing these calls from being registered. When the computer prevents car call registration, it sets (turns on) the Car Call Disconnect (CCD) flag for that car. Inspection of this flag using Diagnostic mode will show if it is the computer that is preventing the registration of these calls. If the CCD flag is set (on), the reason for this CCD condition must be discovered. There are many reasons for a CCD condition: Fire Service, Motor Limit Timer elapsed condition, bottom or top floor demand, etc.

A corresponding flag exists for hall call registration prevention. The computer may detect conditions for preventing hall calls from being registered, and will set the Hall Call Disconnect (HCDX) flag. This is a system flag (as opposed to a per car flag), but is available for viewing in Diagnostic mode along with the car operating flags. There are also many reasons for the computer to reject hall call registration: Fire Service, a hall call bus problem, no available cars in service to respond to hall calls, etc.

It should also be mentioned that if a call circuit becomes damaged or stays on due to a stuck pushbutton, the elevator will release itself from the stuck call automatically. It will probably return there later, but will again release itself automatically, thereby allowing continued service in the building.

### 6.3.2 PREPARATION FOR TROUBLESHOOTING CALL CIRCUITS

Review Section 5.5 (External Memory mode) of this manual. Then, look at Table 5.6. It shows where to look up the calls in the computer memory (addresses 0140 through 015F). By looking at this memory, it is possible to see if a particular call is being recognized by the computer.

Prepare a jumper with one end connected to terminal #1 which is the same as ground (subplate is grounded), then use the other end to enter the call by grounding the call terminal in question.

### 6.3.3 TROUBLESHOOTING THE CALL CIRCUITS

1. Once the wires have been disconnected from the call input terminal, the system should be turned ON and in a normal running configuration. Use Diagnostic mode on the computer as described previously to check the status of the HCDX flag and CCD flag. If they are ON, they will shut OFF hall calls and car calls respectively.

**NOTE:** If it appears that there is a problem with a call, disconnect the field wire (or wires) from that call terminal in order to find out if the problem is on the board or out in the field. The calls can be disconnected by unplugging the terminals or by removing individual wires. If the individual field wire is disconnected, lightly tighten the screw on the terminal. If the screw is loose while trying to ground the terminal using a jumper, contact may not be made.

2. If HCDX and CCD are normal (or OFF), take a meter with a high input impedance (such as a good digital meter) and check the voltage on the call terminal in question. Depending on the voltage that the call circuits were set up for, the reading should be approximately the voltage on the call terminal called for (or up to 15% less). If the voltage is lower than what is specified, and the call terminal is on an HC-CI/O-E board, turn OFF the power and remove the resistor-fuse associated with the call terminal (i.e., if the call terminal is the fifth one from the bottom, remove the fifth resistor-fuse from

the bottom). Turn the power back ON. The reading should be the voltage as discussed above. Note: the HC-PCI/O board does not have these resistor-fuses.

**NOTE:** The resistor-fuse is an assembly made up of a 10 Volt zener diode and a 22 ohm ¼ Watt resistor.

**NOTE:** Number 3 below relates to only those jobs that have more than 4 floors and therefore have a HC-CI/O-E board included.

3. If the job has more than four floors, the controller will include at least one HC-CI/O-E Call Input/Output board. If the problem terminal is on this board and the necessary voltage does not read on the terminal, make sure the jumper plug (or header) is in position on the Call board. The jumper plug socket is on the right-hand side of the Call board near the call indicators. If a Call board is replaced, this jumper plug must *always* be transferred to the new board and stay in the same position. If this plug is *not* installed, any calls on the new board may become registered if the field wiring is not connected, so make sure the jumper plug is in place (see Figure 6.4).

4. For both the HC-PCI/O board and the HC-CI/O-E board(s), make sure that the correct voltage is coming into the terminals on the board marked PS1, PS2, and PS3. Note that there may be power on all three of these terminals, only two, or at *least one*, depending on the type of calls on the board.

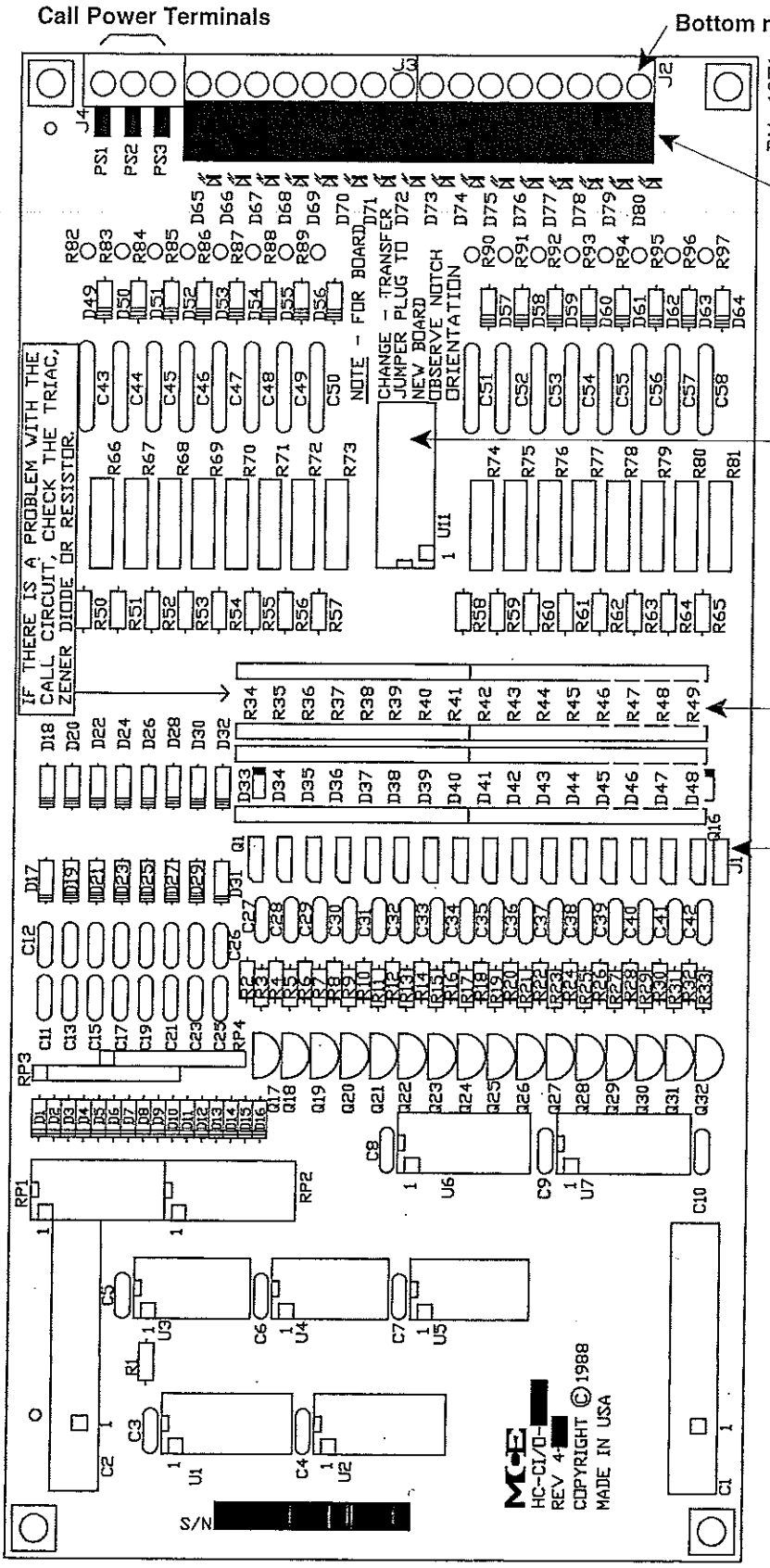
5. Once the proper voltage is on the call terminal in question, use External Memory mode and Table 5.6 to examine the call in the computer memory. The call should *not* be ON. If it is, reset the computer for that car. Let the car find itself or run it to a terminal landing to make sure the CCD flag is turned OFF. If the resistor-fuse has been removed (if necessary), the field wires disconnected, HCDX and CCD both OFF, and the proper voltage exists on the call terminal, the call should *not* be registered. Shorting the call terminal to terminal 1 (or ground) should register the call in the computer according to External Memory mode. This does not mean the call registered light on the Call board will work correctly. If the call does not register and cancel under the conditions mentioned in this step, then a condition exists on the board that cannot be corrected in the field and the board should be replaced.

6. If the call works correctly in the previous step, and it does not register, and the board is not arranged for neon indicator lamps in the fixtures, the indicator for that call on the board will glow dimly. If the board *is* arranged for neon indicators, the call indicator on the board will not glow. In this case, a dim glow indicates that the incandescent bulb in the fixture is burned out (when the call has the resistor-fuse plugged in and the field wire connected normally).

*FIGURE 6.4 HC-CI/O Call Input/Output Board Quick Reference*

42-QR-HC-CI/O Rev. 2

# HC-CI/O QUICK REFERENCE CARD (BOARD 2)




**Call Label Strip***
If a call board is replaced, remove the Call Label Strip and transfer it to the new board

**Jumper Plug**
If a call board is replaced, the jumper plug must be transferred to the new board and the notch orientation must stay the same

**Bottom most Resistor Fuse***

**Bottom most Triac***
Watch out for polarity when replacing

* The Triacs, Resistor Fuses and Call Terminals are layed out in the same sequence as shown on the Call Label.

## TROUBLESHOOTING THE CALL CIRCUITS

NOTE: Call terminal voltage must be ≥ 85% of call supply voltage. *Example:* If supply is 100VAC, terminal voltage may be 85VAC to 100VAC. 80VAC is insufficient.

If there is a problem with a call, first disconnect the field wire or wires from that call terminal to determine if the problem is on the board or in the hoistway wiring or fixtures. Disconnect the calls by unplugging the terminals, or removing individual wires. If the individual field wire is disconnected, lightly tighten the screw terminal since it may not make contact if an attempt is made to ground the terminal using a jumper when the screw on the terminal is loose.

| Problem | Recommended steps to resolve the problem |
|---|---|
| Call Terminal Voltage is insufficient | 1. Turn OFF the power and remove the resistor fuse associated with that terminal.<br>2. Turn ON the power and check terminal voltage again.<br>3. If no voltage is present on the terminal:<br>a. Check the jumper plug (header) on the HC-CI/O Call board. The jumper plug socket is located on the right hand side near the call indicators. If a Call board is replaced, this jumper plug must be transferred to the new board and stay in the same board position (more than one Call board on the controller).<br>b. Verify that the correct incoming power is on terminals marked PS1, PS2 and PS3. NOTE: Power will exist on *at least one* and possibly more of these terminals. |
| Call LED is ON even though the field wire is removed | 1. Reset the computer (Computer Reset pushbutton on Swing Panel).<br>2. Run the car to the nearest landing to reset PI.<br>3. It may be necessary to reset the computer in the Group Supervisor (other car in a duplex system) in order to reset a latched hall call.<br>4. If the call does not cancel under these conditions--replace the call board |
| Cannot register a hall call at the call board | To discover whether the problem is with the call board or the field wiring:<br>1. First remove the resistor fuse and disconnect the field wire(s).<br>2. Verify that the HCDD, Hall Call Disconnect Computer Variable Flag is OFF (Address 2C, LED 6). For PTC or PHC controllers, verify that the HCDX flag is OFF (address 2C, LED4).<br>3. Verify that there is proper voltage on the call terminal.<br>4. Register a call by shorting the call terminal to terminal 1 or GND and verify with EOD as described in Section 4.3.4, *Viewing and Entering Calls* (the call registered light on the call board may not work correctly). For PTC or PHC controllers see Table 5.6.<br>5. If the call does not register under these conditions--replace the call board.<br>6. If the call circuit works with field wires removed, before connecting wires, jumper the wire(s) to ground or terminal 1 and press the call pushbutton. If a fuse blows, there is a field wiring problem. If connecting the call wires causes a problem, the call board may be damaged. |
| Call remains latched even though the car arrives at that landing | Remove the associated resistor fuse. If call cancels, replace the bad resistor fuse. |

## TROUBLESHOOTING THE CALL INDICATORS

**NOTE:** Before troubleshooting the call indicators, ensure that the call circuit is working correctly, the field wires are connected and the resistor fuses are plugged in. If the board is arranged for neon (or LED) indicators (HC-CI/O -N board), the board indicators are not affected by the fixture bulbs.

When working correctly, a call indicator glows brightly when a call is registered and glows dimly or not at all when a call is not registered.

| Problem | Recommended steps to resolve the problem |
|---|---|
| With a call registered, the Call Indicator is dimly lit (Call Board is HC-CI/O) | Incandescent bulb in the fixture for the call is burned out or missing. Replace the bulb. |
| Indicator glows bright whether or not there is a call registered | Bad triac or triac driver transistor. Check triac with power OFF and field wire removed. Failed triac usually measures a short circuit from the metal back (collector) to terminal 1. If board is not in system, measure short between metal back and pad area around mounting hole. Be careful, the metal back of the triac is connected to AC when power is ON. NOTE: bottom triac corresponds to bottom terminal. |

7. With a known good resistor-fuse plugged into the proper call position, check to see that the indicator on the Call board works correctly (glows brightly when the call is registered and glows dimly, or not at all, when the call is not registered). If the call indicator burns brightly when the resistor-fuse is plugged in and shows no change in brightness whether the call is registered or not, then there is a bad triac or triac driver transistor. The triacs are plug-in types and can be easily replaced. Usually, if a triac has failed, it will measure as a short circuit between the metal base and terminal 1 with the power disconnected and the field wire removed. If the Call board is not in the system, check for a short circuit between the metal base of the triac to any pad area around a mounting screw hole. On the HC-CI/O-E board, the bottom most triac corresponds to the bottom most terminal, and terminals and triacs are corresponding from there on up (see Figure 6.4). On the HC-PCI/O board, the triacs are labeled the same as the call terminals (see Figure 6.1).

8. If the call has passed all of the previous tests, then it should be working properly while the field wires are not attached. Before reconnecting the field wires, jumper the wire (or wires) to terminal 1 and go out to that hall or car call push-button and press it. If a fuse blows, then a field wiring problem exists. If everything seems okay, then connect the call wires and test it. If connecting the call wires causes a problem, the board may have again been damaged. In any event, once the board checks out okay, any other problems will probably be field wiring problems and should be investigated.

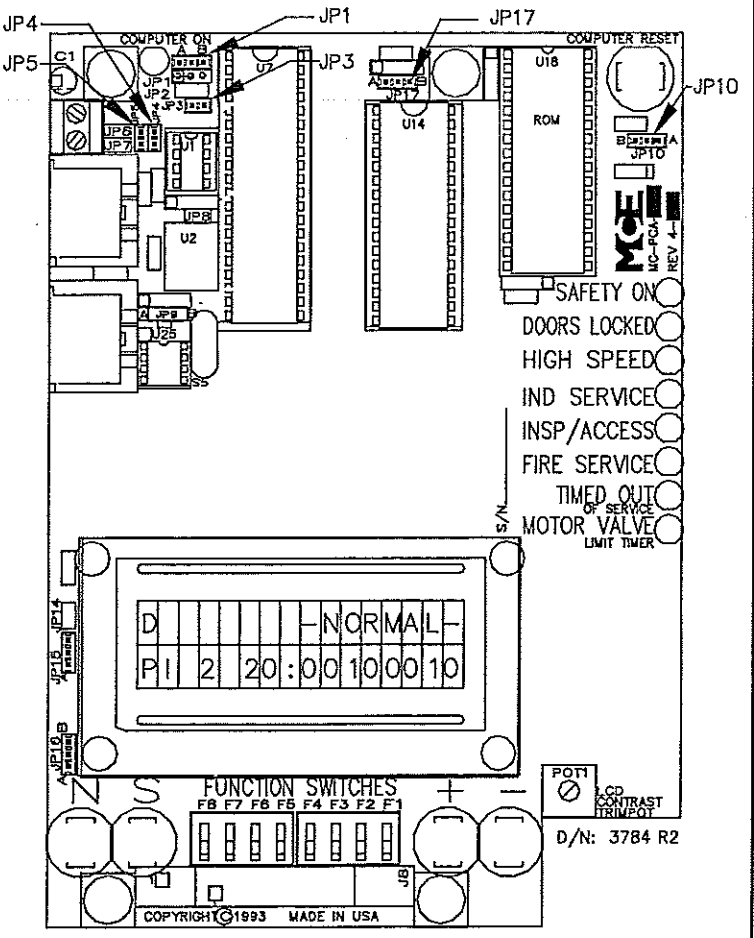
*FIGURE 6.5 MC-PCA Quick Reference*

# MC-PCA Quick Reference

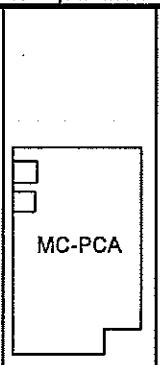
Part # 42-QR-MC-PCA (Rev.2)

## PTC and PHC Connections

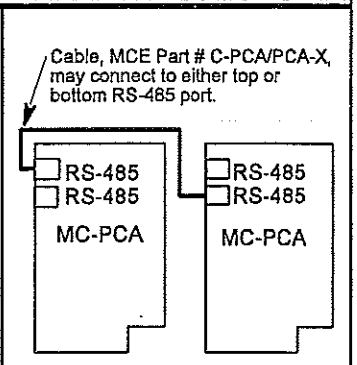
### MC-PCA-OA Board



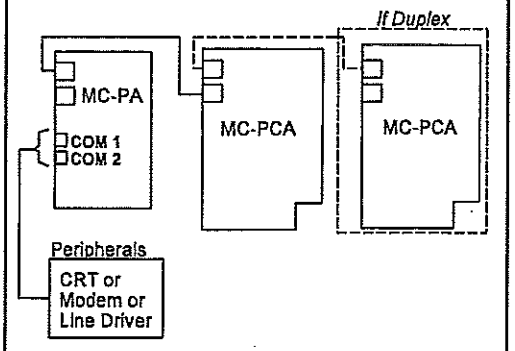

### Simplex




### Duplex Configuration




### Configuration with MC- PA (Peripherals Adapter Board)




| JUMPER TABLE | |
|---|---|
| **MC-PCA-OA** (PHC & PTC Controllers) | |
| **JP1** | B * |
| **JP3** | ON * * |
| **JP4** | ON * * * |
| **JP5** | ON * * * |
| **JP8** | N/A |
| **JP9** | N/A |
| **JP10** | A |
| **JP15** | Set at factory |
| **JP16** | Set at factory |
| **JP17** | A |

* If U7 on the MC-PCA-OA board contains a 21-LB-217A microcontroller, set JP1 to position B, otherwise set to position A.

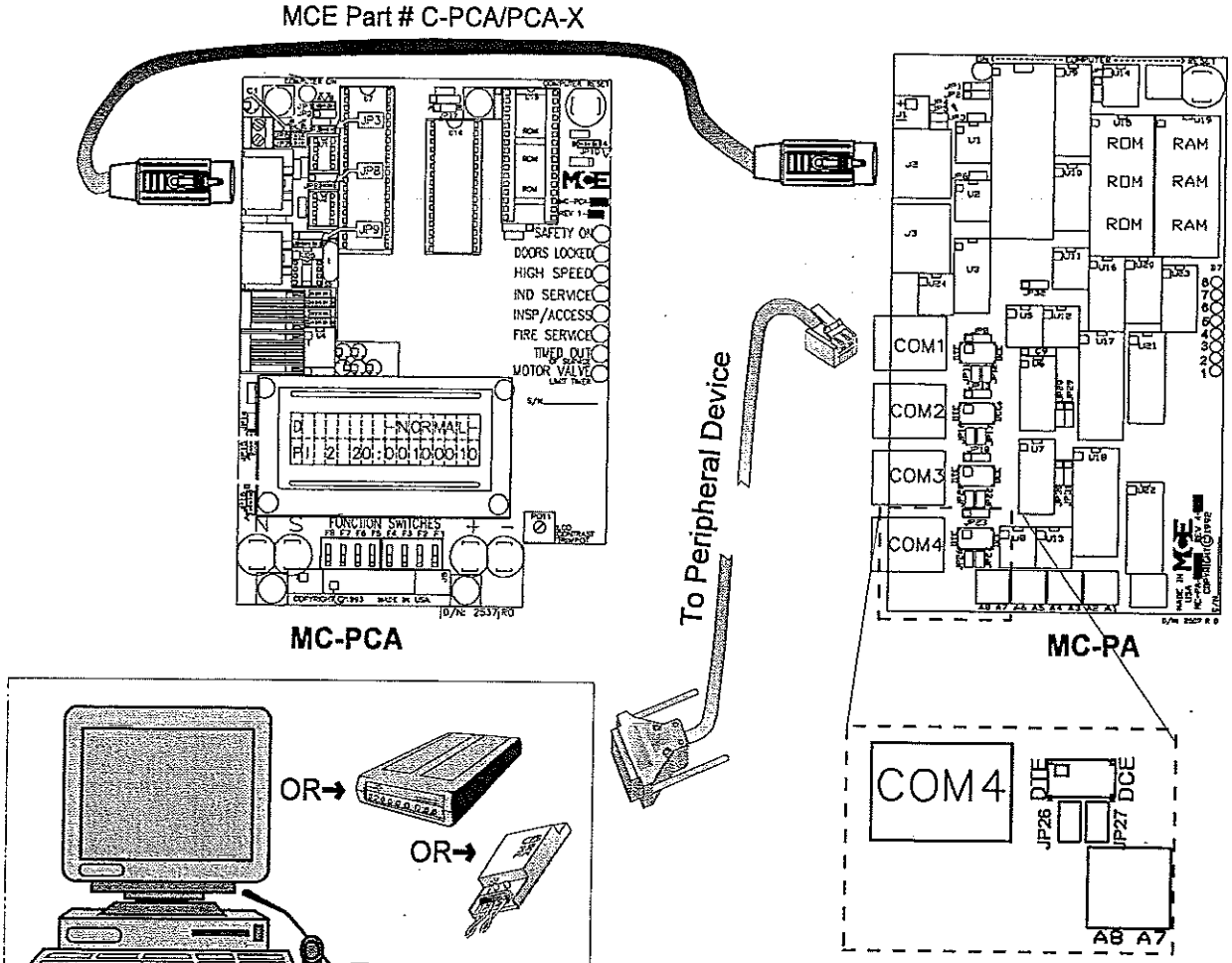
* * The JP3 jumper should be in the ***OFF*** position if the MC-PCA-OA board is not at the end of a daisy chain in a duplex configuration, i.e. between MC-PCA or MC-PA boards.

* * * Try JP4 and JP5 in either the ON or OFF position until car to car or car to PA communication is established.

*FIGURE 6.6 MC-PA Quick Reference*

42-QR-MC-PA

# MC-PA QUICK REFERENCE CARD




| Port Switch Setting | Cable and Peripheral |
|---|---|
| DCE | SERIAL CABLE to CRT Terminal or PC |
| DTE | LINE DRIVER / MODEM to CRT Terminal or PC |

## 6.4 USING THE OPTIONAL CRT FOR TROUBLESHOOTING

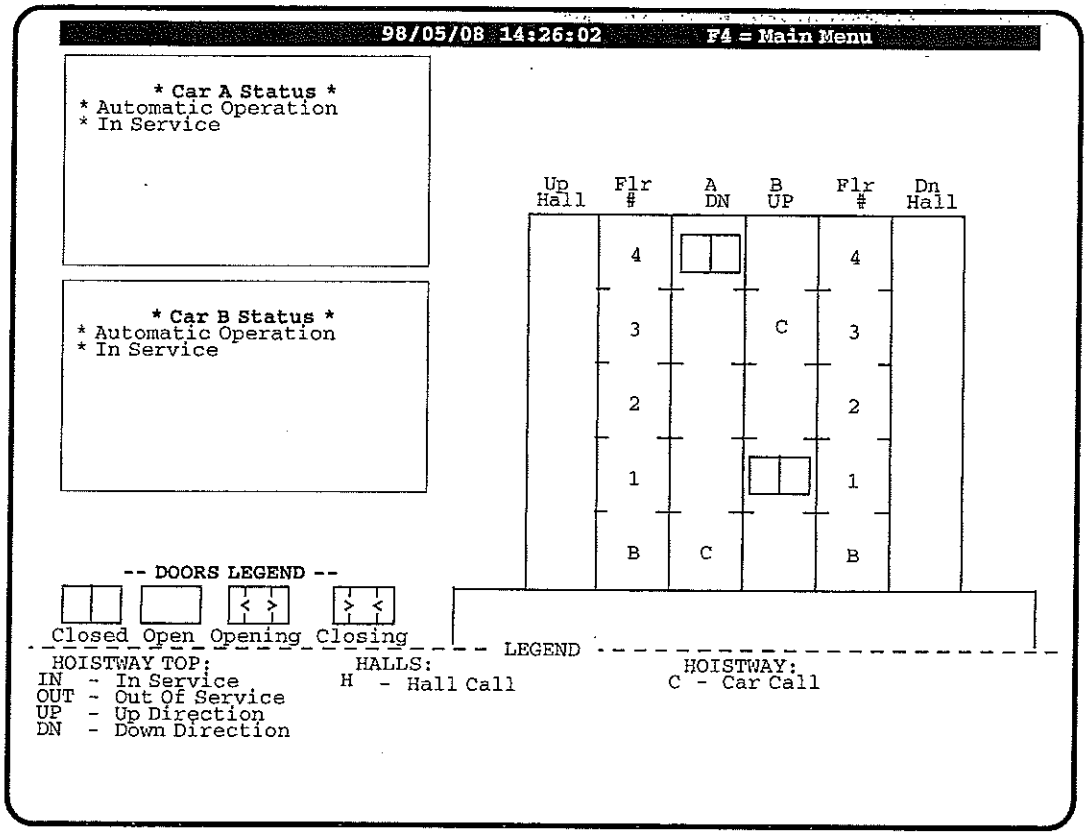
### 6.4.1 GRAPHIC DISPLAY OF ELEVATOR (F3) SCREEN

The F3 screen shows the hoistway graphic display (see Figure 6.7).

a. HOISTWAY GRAPHIC DISPLAY - shows car position, direction arrows, car calls, assigned hall calls and position of the doors.

b. CAR STATUS DISPLAY - This portion of the display describes the current status of the car.

*FIGURE 6.7 Graphic Display of Elevator (F3) Screen (Color CRT)*




dnID168

### 6.4.2 MCE SPECIAL EVENTS CALENDAR ENTRIES (F7 - 1) SCREEN

Events that could affect car functions are recorded inside the MC-PA computer memory. This data is available to the mechanic for troubleshooting and analysis of the events (see Figure 6.8). The Special Events Calendar logs the following information:

- DATE (month/day)
- TIME (hour/minute)
- EVENT (cause for logging the data, such as; doorlock clipped, stop switch pulled, etc.)
- PI (car PI at the time the data was logged)

Table 6.1 provides a list of Special Events Calendar messages and their definitions.

*FIGURE 6.8 Special Events Calendar - Display Special Event Entries (F7 - 1) Screen*

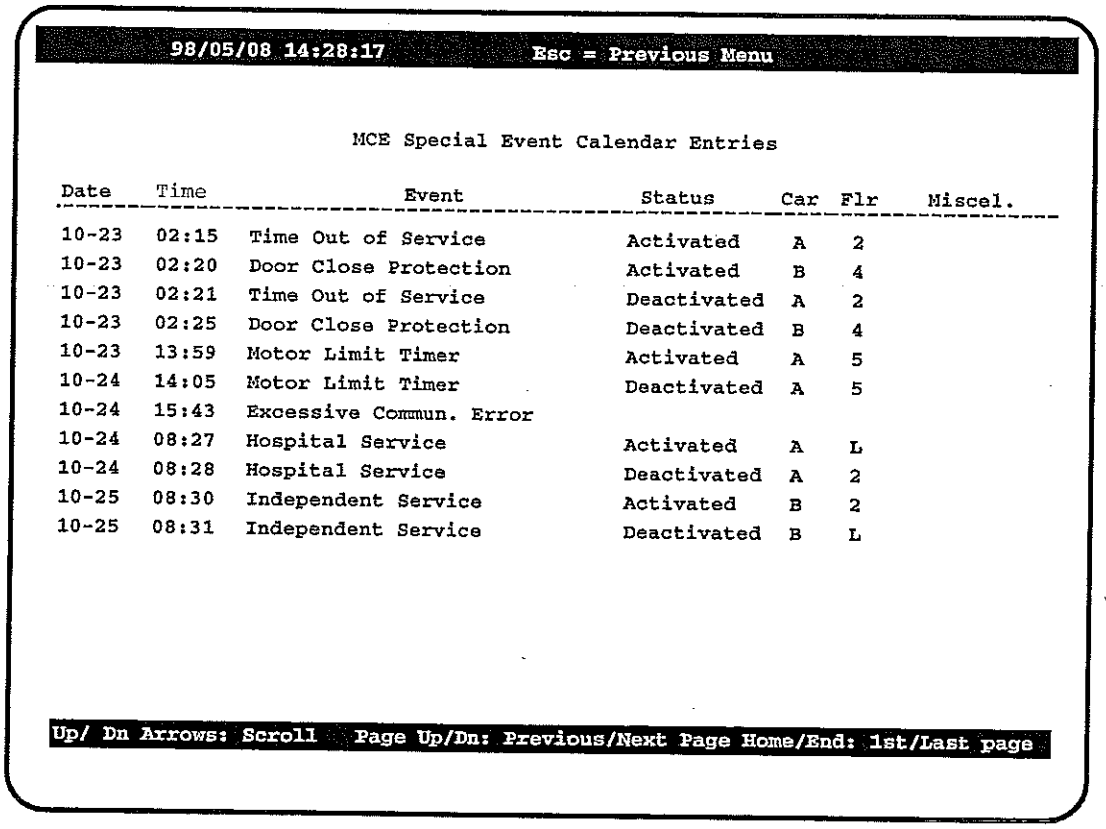



*TABLE 6.1 Special Events Calendar Messages*

| | |
|---|---|
| **Bottom Floor Demand** | Generated when car comes off of Inspection or when car PI indicates top terminal landing but car is not there. Check top terminal landing slowdown switches and USD input. |
| **Both USD and DSD are Open** | Both USD and DSD are simultaneously active (low). Check wiring on terminal switches. |
| **Bus Fuse Blown (2H)** | No power exists on the Hall Call Common Bus. Check fuse F4 on group. |
| **Bus Fuse Blown (2)** | No power exists on the Car Call Common Bus. Check fuse F4 on car. |
| **Car Out of Svc w/ DLK** | Car was delayed from leaving a landing for a significant period of time. Doors were locked. Suspect a malfunction of the running circuits. |
| **Car Out of Svc w/o DLK** | Car was delayed from leaving a landing for a significant period of time. Doors were not locked. Suspect an obstruction that has kept the doors from closing, thus preventing the car from leaving the landing. |
| **Communication Loss** | Car not communicating with PA. See troubleshooting guide in manual. |
| **DOL Open and DLK Active** | Car is shutdown due to unsafe conditions of the DOL and/or DLK sensors. Door Open Limit input (DOL) activated (low) and Door Lock input (DLK), activated (high). Check DOL and DLK inputs. |
| **Door Close Protection** | Doors unable to close and lock in specified time. Check door lock string contacts and individual doors for physical obstruction. |
| **Earthquake** | Earthquake input (CWI or EQI) activated (high). |
| **Emergency Power** | System placed on emergency power. Power removed from EPI input. |
| **Fire Service Main** | Main Fire Service input (FRS) activated (low). |
| **Fire Service Alternate** | Main Fire Service input (FRS) activated (low) and Alternate Fire Service input (FRA) activated (high). |
| **Fire Service Phase 2** | Phase 2 Fire Service input (FCS) activated (high). |

*TABLE 6.1 Special Events Calendar Messages*

| | |
|---|---|
| **Hospital Service** | Car assigned to a HOSPITAL EMERGENCY CALL. |
| **Independent Service** | Car placed on Independent Service. |
| **Inspection** | Hoistway access or car top inspection. |
| **Lost DLK During Run** | The DOOR LOCK input was deactivated while the car was traveling through the hoistway. |
| **Motor Limit Timer** | Motor stalled due to excessive time to complete run. Put car on inspection then take it off or reset processor. Check Up and Down Sense inputs (UPS and DNS), and generator and motor brushes. |
| **Photo Eye Failure** | The PHOTO EYE input has been continuously active for a considerable period of time. Suspect an abnormal blockage of the optical device or failure of the PHOTO EYE input circuit. |
| **Safety String Open** | Check on-car and off-car safety devices (e.g. governor overload, over- travel limit switches and car stop switches) and SAF input. |
| **Stop Sw/Safety Relay Ckt** | In-Car Stop switch activated or the Safety Relay Circuit opened. |
| **System Out of Service** | The supervisor has lost communication with all cars in the group or the hall call common bus (2H) has failed. |
| **Top Floor Demand** | Car PI indicates bottom terminal landing but car is not there. Check bottom terminal landing slowdown switches and DSD input. |
| **Time Out of Service** | Elevator abnormally delayed in reaching destination in response to a call demand. Doors cannot close and lock or motor stalled. |
| **Valve Limit Timer** | Down detection energized for excessive amount of time. Check jack packing and down section of valve assembly. |

## 6.5 USING THE MLT / VLT DATA TRAP

The MLT / VLT "data trap" records many of the controller's operation "flags" at the moment the MLT or VLT occurs. This allows you to see what flags led up to the fault.

Once an MLT or VLT shuts down the car, use these steps to look at the stored flags.

1. Do not reset the computer as this will clear the data trap on software version 5.19.0001 or earlier. To return the car to service and not harm the data, simply toggle the relay panel inspection switch from OFF to ON and back to OFF.

   Note: On software version 5.19.0002 or later, the data is not cleared on power up or reset. The data is overwritten each time a new MLT occurs. However, the data may be cleared and the MLT counter reset by placing the F1, F2, F7 and F8 switches in the up position.

2. On the MC-PCA board place the F2 switch up (ON) to select External Memory. All other switches should be down (OFF). The LCD display shows the default address, DA.0100 (address 100H) followed by the eight memory bits at that location.


3. Use the DATA TRAP MEMORY CHART to determine the addresses where the saved data is stored. Section 5.5 in the Controller Installation Manual provides a complete description of how to use the External Memory Mode. Briefly, use the **N** pushbutton to select the digit to be changed (digit blinks on and off). Press **+** or **-** to change the digit.

4. Record the data displayed on the LCD for all rows shown on the chart. It helps if you have a few photocopies of the chart. Simply mark the positions in the chart that are shown as a "1"

on the LCD display. Addresses 480H thru 493H contain car status flags. Address 494H contains the car's position indicator value at the instant the MLT or VLT condition occurred and address 495H contains the MLT counter (ver 5.19.0002 or later). Only the labeled positions are important to mark.

5. Once all of the addresses have been marked you may reset the computer to clear the recorded memory area (software versions 5.19.0001 or earlier).

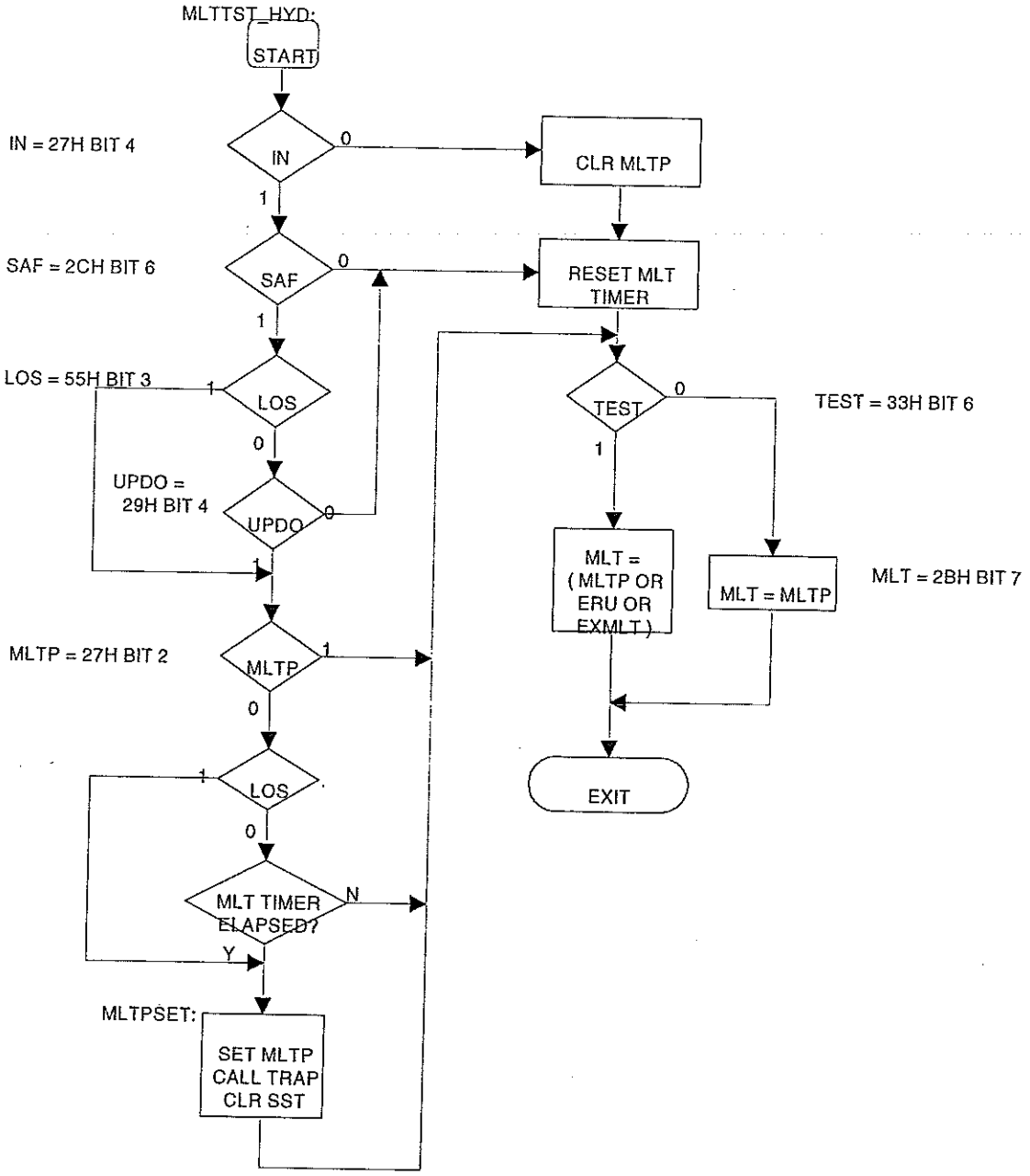
6. Use the recorded values and the timer logic flowcharts to help determine the cause of the problem. Then call MCE for assistance if any is needed.

## PHC HYDRO DATA TRAP MEMORY CHART

| | DIAGNOSTIC INDICATORS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 480H | DOLM | PHE | DZ | DOL | DBC | DOB | GEU | GED |
| 481H | TFA | DC | UC | CC | NDS | FDC | DHO | DOI |
| 482H | DCFN | DCP | DOF | LOT | GHT | HCT | CCT | SDT |
| 483H | DOC | SE | DCLC | CSB | DCC | NUDG | NUGBPS | DSHT |
| 484H | VCI | FRA | FCS | FRS | DNS | UPS | STD | STU |
| 485H | SCE | FCCC | FCHLD | HLI | VCA | EXMLT | FWI | PIC |
| 486H | LFP | UFP | NYDS | CCH | DIN | DPR | GTDE | GTUE |
| 487H | HD | FCOFF | DHLD | IND | IN | DLKS | MLTP | MLTDO |
| 488H | LLW | DLK | DDF | SUD | ISR | INCF | REAR | LLI |
| 489H | DNDO | LD | DPD | DDP | UPDO | LU | UPD | UDP |
| 48AH | DMD | DCB | UCB | CCB | DMU | DCA | UCA | CCA |
| 48BH | TOS | MLT | VLT | SST | H | HSEL | DSH | RUN |
| 48CH | DZP | STC | SAF | HCR | HCDX | CCD | ISV | ISRT |
| 48DH | TEMPB | UFQ | DZORDZ | FCSM | FRM | FRSS | FRAS | FRC |
| 48EH | SD | SDA | DSD | BFD | SU | SUA | USD | TFD |
| 48FH | FRBYP | FRON | HYD1_TRC0 | ECC | CD | ECRN | EPR | PFG |
| 490H | CODE4 | CODE2 | CODE3 | FREE | DEADZ | DHLD1 | PH1 | NDGF |
| 491H | CTLDOT | CTLF | CTL | ALV | EPSTP | AUTO | EPRUN | EPI |
| 492H | FRMM | OFR | WLDI | WLD | CCMEM | OLW | OVLM | OVL |
| 493H | API | SAB | TEST | DHENDR | DHEND | CTST | HOSPH2 | HOSP |
| 494H | PI | PI | PI | PI | PI | PI | PI | PI |
| 495H | LOS | | | | MLT Counter | MLT Counter | MLT Counter | MLT Counter |

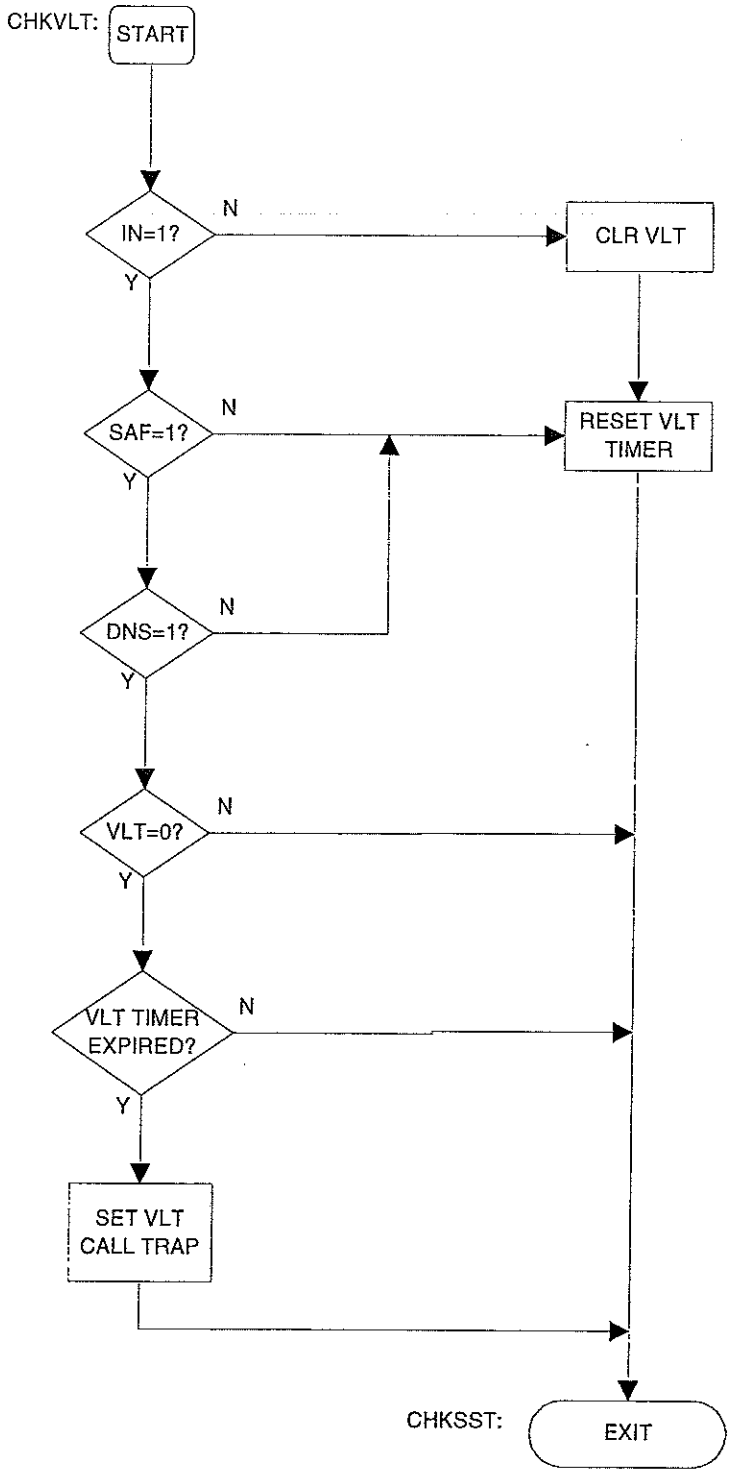
Note 1: In software version 5.19.0001 and earlier, LOS is located at address 495H bit 2.
Note 2: In software version 5.19.0001 and earlier, TRAPLOCK is located at address 495H bit 1 and is cleared only when the controller is reset.

# HYDRO MOTOR LIMIT TIMER LOGIC




VER 05.13.0005

# HYDRO VALVE LIMIT TIMER LOGIC



# APPENDIX

# APPENDIX A
# ORIGINAL PROGRAMMED VALUES AND THE RECORD OF CHANGES

| OPTIONS | MCE VALUES | NEW VALUES |
|---|---|---|
| **BASIC FEATURES** | | |
| Simplex or Duplex? | ___ Simplex ___ Duplex | ___ Simplex ___ Duplex |
| Operation: | ___ Sel. Coll. ___ Single Button<br>___ Single Auto PB | ___ Sel. Coll. ___ Single Button<br>___ Single Auto PB |
| Top Landing Served (Car A)? | | |
| Car Doors are Walk-Thru (Car A)? | _____ Yes _____ No | _____ Yes _____ No |
| Car Serves Frnt/Flr (Car A)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Car Serves Rear/Flr (Car A)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Top Landing Served (Car B)? | | |
| Car Doors are Walk-Thru (Car B)? | _____ Yes _____ No | _____ Yes _____ No |
| Car Serves Frnt/Flr (Car B)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Car Serves Rear/Flr (Car B)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Parking Floor | | |
| Secondary Park Floor | | |
| Lobby Floor | | |
| Car Identifier | Set first car to A, next car to B | Set first car to A, next car to B |
| Number of IOX Boards: | _____ Valid range is 0-4. | _____ Valid range is 0-4. |
| Number of I4O Boards: | _____ Valid range is 0-3. | _____ Valid range is 0-3. |
| **FIRE SERVICE** | | |
| Fire Service Operation? | _____ Yes _____ No | _____ Yes _____ No |
| Fire Phase 1 Main Floor | | |
| Fire Phase 1 Alt. Floor | | |
| Fire Service Code | | |
| Fire Phase 1, 2nd Alt Landing | | |
| Bypass Stop Sw. on Phase 1? | _____ Yes _____ No | _____ Yes _____ No |
| Honeywell Fire Operation? | _____ Yes _____ No | _____ Yes _____ No |
| NYC Fire Phase 2 w/ ANSI 89? | _____ Yes _____ No | _____ Yes _____ No |
| White Plains, NY Fire Code? | _____ Yes _____ No | _____ Yes _____ No |
| **DOOR OPERATION** | | |
| Nudging? | _____ Yes _____ No | _____ Yes _____ No |
| Stuck Photo Eye Protection? | _____ Yes _____ No | _____ Yes _____ No |
| Sequential Door Oper.(F/R)? | _____ Yes _____ No | _____ Yes _____ No |
| Car Call Cancels Door Time? | _____ Yes _____ No | _____ Yes _____ No |
| Nudging During Fire Phase 1? | _____ Yes _____ No | _____ Yes _____ No |
| Retiring Cam Option? | _____ Yes _____ No | _____ Yes _____ No |
| Pre-Opening? | _____ Yes _____ No | _____ Yes _____ No |
| Mechanical Safety Edge? | _____ Yes _____ No | _____ Yes _____ No |
| Nudging Output/Buzzer Only? | _____ Yes _____ No | _____ Yes _____ No |
| D.C.B. Cancels Door Time? | _____ Yes _____ No | _____ Yes _____ No |
| Leave Door Open on PTI/ESS? | _____ Yes _____ No | _____ Yes _____ No |
| Nudging During Fire Phase 2? | _____ Yes _____ No | _____ Yes _____ No |
| Dir. Preference Until DLK? | _____ Yes _____ No | _____ Yes _____ No |
| Fully Manual Doors? | _____ Yes _____ No | _____ Yes _____ No |
| Cont. D.C.B. to Close Doors? | _____ Yes _____ No | _____ Yes _____ No |
| Cont. D.C.B. for Fire Phase 1? | _____ Yes _____ No | _____ Yes _____ No |
| Moment. D.O.B. door opening?<br>Moment D.O.B. for:<br>Moment D.O.B. for: | _____ No<br>____Front ____Rear ____Both Calls<br>____Hall Calls ____Car Calls ____All Calls | _____ No<br>____Front ____Rear ____Both Calls<br>____Hall Calls ____Car Calls ____All Calls |

| OPTIONS | MCE VALUES | NEW VALUES |
|---|---|---|
| **DOOR OPERATION (CONT)** | | |
| Doors to open if parked? | ___None ___ Front ___ Rear ___ Both | ___None ___ Front ___ Rear ___ Both |
| Doors to Open on Main Fire? | ___ Front ___ Rear ___ Both | ___ Front ___ Rear ___ Both |
| Doors to Open on Alt. Fire? | ___ Front ___ Rear ___ Both | ___ Front ___ Rear ___ Both |
| Leave Doors Open on CTL | _____ Yes _____ No | _____ Yes _____ No |
| Limited Door Re-Open Option | _____ Yes _____ No | _____ Yes _____ No |
| Reduce HCT with Photo Eye | _____ Yes _____ No | _____ Yes _____ No |
| Leave Doors Open on EPI | _____ Yes _____ No | _____ Yes _____ No |
| Doors to open if No demand? | ___None ___ Front ___ Rear ___ Both | ___None ___ Front ___ Rear ___ Both |
| Const. Press Op. Bypass PHE? | _____ Yes _____ No | _____ Yes _____ No |
| **TIMER** | | |
| Short Door Timer | _____ seconds | _____ seconds |
| Car Call Door Timer | _____ seconds | _____ seconds |
| Hall Call Door Timer | _____ seconds | _____ seconds |
| Lobby Call Door Timer | _____ seconds | _____ seconds |
| Nudging Timer | _____ seconds | _____ seconds |
| Time Out of Service Timer | _____ seconds | _____ seconds |
| Motor Limit Timer | _____ minutes | _____ minutes |
| Valve Limit Timer | _____ minutes | _____ minutes |
| Door Hold Input Timer | _____ seconds | _____ seconds |
| Parking Delay Timer | _____ minutes | _____ minutes |
| Fan/Light Output Timer | _____ minutes | _____ minutes |
| Hospital Emerg. Timer | _____ minutes | _____ minutes |
| Door Open Protection Timer | _____ seconds | _____ seconds |
| CTL Door Open Timer | _____ seconds | _____ seconds |
| **GONGS/LANTERNS** | | |
| Mounted in hall or car? | _____ hall _____ car | _____ hall _____ car |
| Double strike on Down? | _____ Yes _____ No | _____ Yes _____ No |
| PFG Enable Button? | _____ Yes _____ No | _____ Yes _____ No |
| Egress Floor Arrival Gong? | _____ No Main Egress Floor = _____ | _____ No Main Egress Floor = _____ |
| **SPARE INPUTS** | | |
| SP1 used for: | | |
| SP2 used for: | | |
| SP3 used for: | | |
| SP4 used for: | | |
| SP5 used for: | | |
| SP6 used for: | | |
| SP7 used for: | | |
| SP8 used for: | | |
| SP9 used for: | | |
| SP10 used for: | | |
| SP11 used for: | | |
| SP12 used for: | | |
| SP13 used for: | | |
| SP14 used for: | | |
| SP15 used for: | | |
| SP16 used for: | | |
| SP17 used for: | | |
| SP18 used for: | | |
| SP19 used for: | | |
| SP20 used for: | | |
| SP21 used for: | | |
| SP22 used for: | | |
| SP23 used for: | | |
| SP24 used for: | | |
| SP25 used for: | | |
| SP26 used for: | | |
| SP27 used for: | | |
| SP28 used for: | | |
| SP29 used for: | | |
| SP30 used for: | | |
| SP31 used for: | | |

| OPTIONS | MCE VALUES | NEW VALUES |
|---|---|---|
| **SPARE INPUTS (CONT)** | | |
| SP32 used for: | | |
| SP33 used for: | | |
| SP34 used for: | | |
| SP35 used for: | | |
| SP36 used for: | | |
| SP37 used for: | | |
| SP38 used for: | | |
| SP39 used for: | | |
| SP40 used for: | | |
| SP41 used for: | | |
| SP42 used for: | | |
| SP43 used for: | | |
| SP44 used for: | | |
| SP45 used for: | | |
| SP46 used for: | | |
| SP47 used for: | | |
| SP48 used for: | | |
| SP49 used for: | | |
| **SPARE OUTPUTS** | | |
| OUT1 used for: | | |
| OUT2 used for: | | |
| OUT3 used for: | | |
| OUT4 used for: | | |
| OUT5 used for: | | |
| OUT6 used for: | | |
| OUT7 used for: | | |
| OUT8 used for: | | |
| OUT9 used for: | | |
| OUT10 used for: | | |
| OUT11 used for: | | |
| OUT12 used for: | | |
| OUT13 used for: | | |
| OUT14 used for: | | |
| OUT15 used for: | | |
| OUT16 used for: | | |
| OUT17 used for: | | |
| OUT18 used for: | | |
| OUT19 used for: | | |
| OUT20 used for: | | |
| OUT21 used for: | | |
| OUT22 used for: | | |
| OUT23 used for: | | |
| OUT24 used for: | | |
| OUT25 used for: | | |
| OUT26 used for: | | |
| OUT27 used for: | | |
| OUT28 used for: | | |
| OUT29 used for: | | |
| OUT30 used for: | | |
| OUT31 used for: | | |
| OUT32 used for: | | |
| **EXTRA FEATURES** | | |
| PI Output Type: | ____ 1 wire ____ Binary | ____ 1 wire ____ Binary |
| Floor Encoding Inputs? | ____ Yes ____ No | ____ Yes ____ No |
| Encode All Floors? | ____ Yes ____ No | ____ Yes ____ No |
| Emergency Power Operation? | ____ No Emergency Power Return Floor = ____ | ____ No Emergency Power Return Floor = ____ |
| Light Load Weighing? | ____ No Light Load Car Call Limit = ____ | ____ No Light Load Car Call Limit = ____ |
| Photo Eye Anti-Nuisance? | ____ No Consec Stops w/o PHE Limit = ____ | ____ No Consec Stops w/o PHE Limit = ____ |
| Peripheral Device? | ____ Yes ____ No | ____ Yes ____ No |

| OPTIONS | MCE VALUES | NEW VALUES |
|---|---|---|
| | **EXTRA FEATURES (CONT.)** | |
| PA COM 1 Media: | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem |
| PA COM 1 Device: | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No |
| PA COM 2 Media: | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem |
| PA COM 2 Device: | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No |
| PA COM 3 Media: | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem |
| PA COM 3 Device: | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No |
| PA COM 4 Media: | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem | _____ None _____ Serial Cable<br>_____ Line Driver _____ Modem |
| PA COM 4 Device: | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No | Personal Computer:<br>____ CMS ____ Graphic Display<br>CRT - No Keyboard:<br>Color CRT: ____ Yes ____ No<br>CRT and Keyboard:<br>Color CRT: ____ Yes ____No |
| Automatic Floor Stop Option? | _____ No Floor # for Car to Stop at:_____ | _____ No Floor # for Car to Stop at:_____ |
| CC Cancel w/Dir. Reversal? | _____ Yes _____ No | _____ Yes _____ No |
| Cancel Car Calls Behind Car? | _____ Yes _____ No | _____ Yes _____ No |
| CE Electronics Interface? | _____ Yes _____ No | _____ Yes _____ No |
| Massachusetts EMS Service? | _____No EMS Service Floor #:_____ | _____No EMS Service Floor #:_____ |
| Master Software Key | ___ Activated ___ Deactivated<br>___ Enabled | ___ Activated ___ Deactivated<br>___ Enabled |
| PI Turned off if No Demand? | _____ Yes _____ No | _____ Yes _____ No |
| Hospital Emerg. Operation (Car A) | _____ Yes _____ No | _____ Yes _____ No |
| Set Hospital Calls (Car A)? | _____ Yes _____ No | _____ Yes _____ No |
| Hospital Calls Frnt/Flr (Car A)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Hospital Calls Rear/Flr (Car A)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Hospital Emerg. Operation (Car B) | _____ Yes _____ No | _____ Yes _____ No |
| Set Hospital Calls (Car B)? | _____ Yes _____ No | _____ Yes _____ No |
| Hospital Calls Frnt/Flr (Car B)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Hospital Calls Rear/Flr (Car B)? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Fire Bypasses Hospital? | _____ Yes _____ No | _____ Yes _____ No |
| High Seed Delay After Run? | _____ Yes _____ No | _____ Yes _____ No |
| Single Speed A.C. Option? | _____ Yes _____ No | _____ Yes _____ No |
| Sabbath Operation? | _____ Yes _____ No | _____ Yes _____ No |
| UP Front Call? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 |
| UP Rear Call? | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | 1 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 |
| DOWN Front Call? | 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| DOWN Rear Call? | 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | 2 3 4 5 6 7 8 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 |
| Leveling Sensors | ___Enabled ____ Disabled | ___ Enabled ____Disabled |
| KCE | ___Enabled ____ Disabled | ___ Enabled ____Disabled |

# APPENDIX B
# NOMENCLATURE

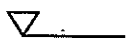
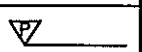
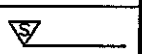
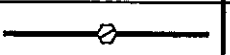
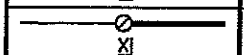
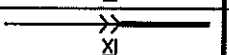
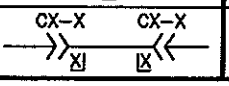
| Motion Control Engineering, Inc. | NOMENCLATURE | | |
|---|---|---|---|
| F:\DOCS\Nmcltr1Shipping.frm | Effective Date: 11/27/00 | Approved By: Engineering Manager | Page 1 of 2 |

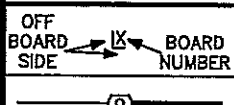
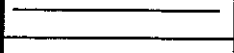
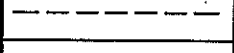
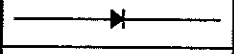
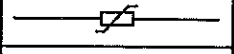
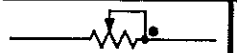
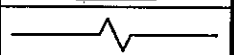
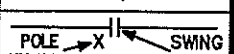
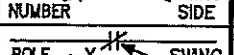
| # | PC BOARD | DESCRIPTION |
|---|---|---|
| 1 | HC-RB4 | Traction Controller Main Relay Board |
| 1 | HC-RBH | Hydraulic Controller Main Relay Board |
| 2 | HC-CI/O | Non Programmable Controller Call I/O Board |
| 2 | HC-CI/O-E | Programmable Controller Call I/O Expander Board |
| 3 | HC-PI/O | Non Programmable Controller Power I/O Board (Car A) ① |
| 3 | HC-PCI/O | Programmable Controller Power And Call I/O Board |
| 4 | HC-PI/O | Non Programmable Controller Power I/O Board (Car B) ① |
| 6 | HC-TAB | Traction Adapter Board |
| 7 | HC-RDRB | Rear Door Relay Board |
| 8 | HC-RD | Rear Door Logic Board (Car A) ① |
| 9 | HC-RD | Rear Door Logic Board (Car B) |
| 10 | HC-DB-MOD | Front G.A.L. MOD Door Interface Board |
| 11 | HC-DB-MOD-R | Rear G.A.L. MOD Door Interface Board |
| 12 | HC-DPS | Door Power Supply Board |
| 13 | HC-PIX | Position Indicator Expander Board (Car A) ① |
| 14 | HC-PIX | Position Indicator Expander Board (Car B) |
| 15 | HC-SRT | Suicide Relay Timing Board |
| 16 | HC-SCR | SCR Interface Board |
| 17 | HC-EQ | Earthquake Board |
| 18 | HC-IOX | I/O(8 Input / 8 Output) Expander Board (Car A) ① |
| 19 | HC-IOX | I/O(8 Input / 8 Output) Expander Board (Car B) |
| 20 | HC-IOX | Additional I/O(8 Input / 8 Output) Expander Board (Car A) ① |
| 21 | HC-IOX | Additional I/O(8 Input / 8 Output) Expander Board (Car B) |
| 26 | HC-DYNA | Dynalift Interface Board |
| 27 | MC-ACFR | AC Feedback Relay Board |
| 28 | IMC-GIO | General Turbo DF I/O Board |
| 29 | IMC-RB | Turbo DF Relay Board |
| 30 | HC-DB-MOM/H | Front G.A.L. MOM/MOH Door Interface Board |
| 31 | HC-DB-MOM/H-R | Rear G.A.L. MOM/MOH Door Interface Board |
| 32 | HC-OA | Output Adapter Board |
| 33 | IMC-RI | M/G Relay Interface Board |
| 34 | IMC-PRI | M/G Power Relay Interface Board |
| 35 | IMC-DIO | Digital I/O Board |
| 36 | IMC-DAS | Data Acquisition Board |
| 37 | HC-I4O | I/O(16 Input /4 Output) Expander Board (Car A) ① |
| 38 | HC-I4O | I/O(16 Input /4 Output) Expander Board (Car B) |
| 39 | HC-I4O | Additional I/O(16 Input / 4 Output) Expander Board (Car A) ① |
| 40 | HC-I4O | Additional I/O(16 Input /4 Output) Expander Board (Car B) |
| 41 | SCR-RI | SCR/AC Relay Interface Board |
| 42 | SCR-PRI | SCR/AC Power Relay Interface Board |
| 43 | HC-LB | Lock Bypass Board |
| 44 | HC-GB | Gong Board |
| 45 | HC-GB | Additional Gong Board |
| 46 | HC-SIB | Selectable Input Buffer Board (Car A) ① |
| 47 | HC-SIB | Selectable Input Buffer Board (Car B) |
| 48 | HC-RT | Relay Tester Board |
| 49 | IMC-ACIB | AC Baldor Interface Board |
| 50 | HC-DPS-MOM/H | Front G.A.L. MOM/MOH Door Interface and Power Supply Board |
| 51 | HC-ACI | AC Drive Interface Board |
| 52 | HC-ACIF | AC Flux Vector Interface Board |
| 53 | HC-DPS-MOM/H-R | Rear G.A.L. MOM/MOH Interface and Power Supply Board |

| # | PC BOARD | DESCRIPTION |
|---|---|---|
| 54 | IMC-MBX | IMC Enhanced Motherboard |
| 55 | SCR-RIX | SCR Relay Interface Extension Board |
| 56 | HC-HBF | A.S.M.E. Front Door Lock Bypass Board |
| 57 | HC-HBFR | A.S.M.E Front and Rear Door Lock Bypass Board |
| 58 | IMC-ACIM | AC MagneTek Interface Board |
| 59 | HC-TACH-MG | Tach Adjust Board for VVMC-MG Controller |
| 60 | HC-TACH-SCR | Tach Adjust Board for VVMC-SCR Controller |

① Individual group cars use board numbers for car A only

## SCHEMATIC SYMBOLS

| SYMBOL | DESCRIPTION |
|---|---|
|  | BUS LOCATED ON PC BOARD |
|  | BUS LOCATED OFF PC BOARD |
|  | MICROCOMPUTER OUTPUT OR CALL CIRCUIT |
|  | MICROCOMPUTER INPUT |
|  | PATTERN GENERATOR OUTPUT |
|  | PATTERN GENERATOR INPUT |
|  | PATTERN GENERATOR SAFETY INPUT |
|  | POWER TERMINAL |
|  | PANEL MOUNT TERMINAL |
|  | EYELET ON PC BOARD |
|  | SCREW TERMINAL ON PC BOARD |
|  | IDC CONNECTOR ON PC BOARD |
|  | RIBBON CABLE CONNECTOR |

| SYMBOL | DESCRIPTION |
|---|---|
|  | BOARD DESIGNATOR |
|  | SOLDER CONNECTION ON REAR OF PC BOARD |
|  | WIRING INSIDE CONTROL CABINET |
|  | TRACE ON PC BOARD |
|  | CUSTOMER WIRING INTO CONTROL CABINET |
|  | ALL UNMARKED DIODES ARE 2.5 AMP 1000 VOLT |
|  | VOLTAGE SPIKE SUPPRESSOR |
|  | DOT BY RESISTOR INDICATES TOP OR LEFT SIDE AS MOUNTED |
|  | BOX INDICATES UNUSED ITEM |
|  | RELAY COIL |
|  | NORMALLY OPEN (N.O.) RELAY CONTACT |
|  | NORMALLY CLOSED (N.C.) RELAY CONTACT |
| N/C | NO CONNECTION |

| WIRE GAUGES | |
|---|---|
| SYMBOL | SIZE |
| 03 | 3/0 AWG |
| 02 | 2/0 AWG |
| 0 | 0 AWG |
| 1 | 1 AWG |
| 2 | 2 AWG |
| 4 | 4 AWG |
| 6 | 6 AWG |
| 8 | 8 AWG |
| 10 | 10 AWG |
| 12 | 12 AWG |
| 14 | 14 AWG |
| 16 | 16 AWG |
| 18 | 18 AWG |

## WIRE SYMBOLS

| SYMBOL | DESCRIPTION |
|---|---|
|  | #X AWG THHN WIRE 90° C |
|  | #X AWG PVC WIRE 105° C |
|  | #X AWG PTL WIRE 125° C |
|  | #X AWG TEFLON WIRE 200° C |

UNLESS NOTED, ALL WIRES ARE #18 AWG PVC, WITH EXCEPTION TO THE PC BOARD WIRING, WHICH IS DETERMINED BY ENGINEERING.

| | | |
|---|---|---|
| MCE Motion Control Engineering, Inc. | NOMENCLATURE | |
| | Approved By: Engineering Manager | |
| F:\DOCS\NMCLR2.DWG | Effective Date: 10/16/96 | Page 2 |

# APPENDIX C
# ELEVATOR SECURITY INFORMATION AND OPERATION

Building name: _____

Building location: _____

Security activation: Key switch or Time clock

| | | |
|---|---|---|
| Mon: | from _____ | to ____ |
| Tue: | from _____ | to ____ |
| Wed: | from _____ | to ____ |
| Thu: | from _____ | to ____ |
| Fri: | from _____ | to ____ |
| Sat: | from _____ | to ____ |
| Sun: | from _____ | to ____ |

Instructions: To gain access to secured floors, follow the steps below while in the elevator car. The steps may be taken while the car is moving or standing still. Requests for a car from a hallway or corridor are answered without restriction.

1. While in the car, press the button for the desired floor. If the destination floor is secured, the button for that floor will flash on/off.

   If the button for that floor stays solidly illuminated, that floor is unsecured.

2. While the destination floor button is flashing, enter the security code for that floor within 10 seconds. Enter the security code by pressing the corresponding buttons on the panel.

   If the code was entered correctly and within the required time limit, the car will immediately go to that floor. If the code was not entered within the 10-second time limit or was entered incorrectly, the destination floor button light will turn off after 10 seconds and the entire sequence must be repeated.

   If a mistake is made while entering the security code, simply wait until the destination floor button light stops flashing and then start the entire sequence again.

## SECURITY CODES

Maintain a record of the security codes by noting the floor name as found in the elevator cab and each floor's code. Any floor with a security code is a secured floor.

| | | | | |
|---|---|---|---|---|
| 1. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 2. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 3. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 4. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 5. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 6. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 7. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 8. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 9. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 10. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 11. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 12. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 13. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 14. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 15. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 16. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 17. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 18. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 19. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 20. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 21. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 22. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 23. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 24. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 25. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 26. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 27. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 28. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 29. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 30. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 31. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |
| 32. | Floor _____ | security code | = | _ _ _ _ _ _ _ _ |

# APPENDIX D
# FLEX-TALK OPTION

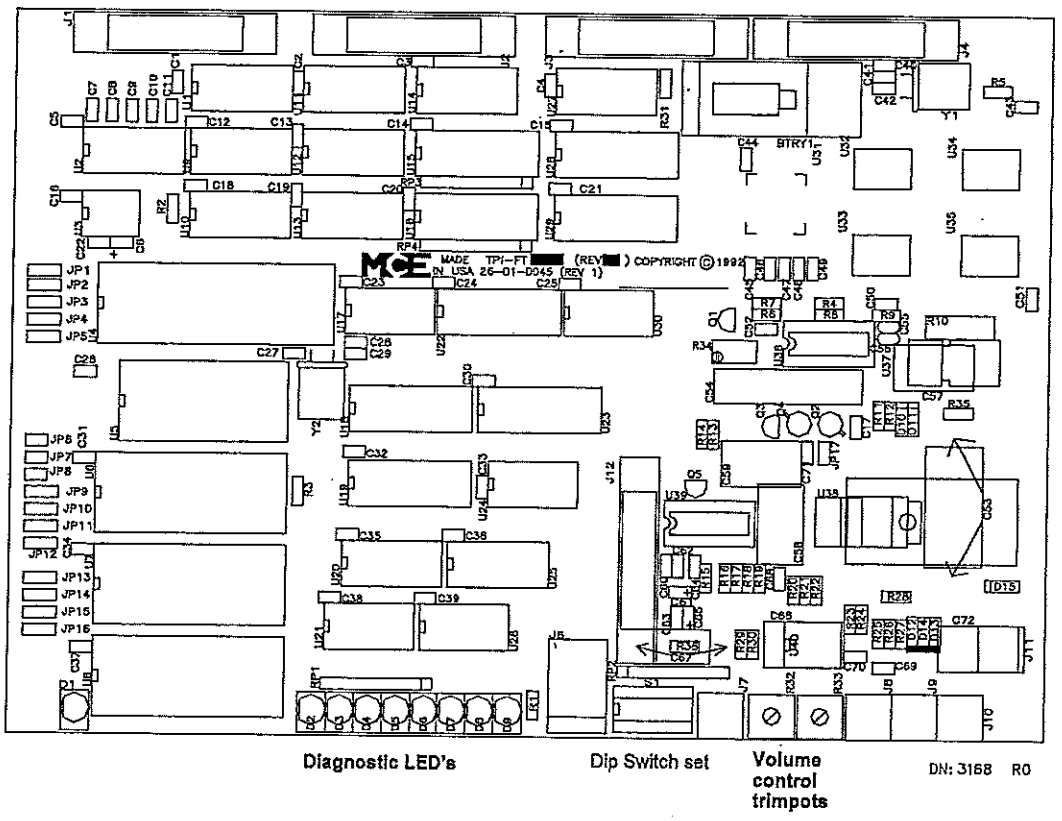
**NOTE:** The following is a listing of diagnostic tools available on a controller if the Flex-Talk option is provided.

Use this addendum in conjunction with the manual. The addendum provides information regarding the diagnostics and volume adjustments for the TPI-FT, and the TPI-FTR options on the Flex-Talk unit.

## 1.0 INTRODUCTION AND THEORY OF OPERATION

The Flex-Talk board is designed for use on any MCE controller to provide flexibility in audio announcement. The ability to add a recording option (RC UNIT) that allows the user to customize the elevator announcement is available on the TPI-FTR. The TPI-FT, or the TPI-FTR boards are installed inside the controller and hooked up to the last board of the daisy chain. The TPI-FT and TPI-FTR receive such needed information as door status, nudging, PI, etc. from the MCE bus. A 5V power supply runs the digital circuitry, and a -/+15V supply operates the analog circuitry of the speaker. There are eight LED's used for diagnostic purposes in conjunction with the dip switches. The input and output connectors (J1 and J2) are used for the MCE bus; however, it is unlikely that the output will be used, as the Flex-Talk board is typically the last in the daisy chain. The exception being a duplex where there are two Flex-Talk boards.

*FIGURE D.1 Flex-Talk Board*



## 2.0 DIAGNOSTICS

The six switches on the dip switch package are used for diagnostics purposes. There are eight LED's (D2 through D9) also, for displaying diagnostics information. These LED's are used in conjunction with the dip switch package (see below).For self-test, turn on switch S2 of the dip switch set. The unit will announce each of the floor messages, direction, nudging and fire service messages (special messages are not included in the self test).This test does not require connection of the MCE bus.

***TABLE D.1 Diagnostic Table***

| DIP SWITCHES | | | | | DIAGNOSTIC LEDS | | | | | | | | MNEM. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S2 | S3 | S4 | S5 | S6 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | |
| 1 | 0 | 0 | 0 | 0 | SELF TEST | | | | | | | | |
| 0 | 0 | 0 | 0 | 0 | UP | DOWN | NUDG | DOOR | MAIN FIRE | SAF | ALT FIRE | HOSP | MODSW |
| 0 | 1 | 0 | 0 | 0 | PIs DISPLAYED IN BINARY ( 00 = BOTTOM) | | | | | | | | PIN |
| 0 | 0 | 1 | 0 | 0 | X | EM3A | EM2A | EM1A | DORA | GDA | GUA | PIA | MAW |
| 0 | 1 | 1 | 0 | 0 | PIs DISPLAYED IN BINARY ( 00 = BOTTOM) | | | | | | | | IPR_3 |
| 0 | 0 | 0 | 1 | 0 | SEC. FLR | HLW | EMP | X | X | X | X | X | SMAW1 |
| 0 | 1 | 0 | 1 | 0 | STOP SW | OVS | LOBM | X | X | X | X | X | SMAW2 |
| 0 | 0 | 1 | 1 | 0 | X | X | EMP | X | X | X | X | X | EMPWIN |
| 0 | 1 | 1 | 1 | 0 | UP | DOWN | NUDG | DLK | FRS | SAF | FRA | HOSP | ITR-1 |
| 0 | 0 | 0 | 0 | 1 | PI0 | PI1 | PI2 | PI3 | PI4 | CSE | HLW | EPR | ITR-2 |
| 0 | 1 | 0 | 0 | 1 | PI5 | X | DOPLFR | X | X | H OR (NOT) STC | ATALT | ATMN | ITR-3 |

Dip switches - switches S2, S3, S4, S5, and S6 are used to select which flags on the TPI are to be displayed.
- switch S2 is used for self test.
- switch S1 is currently not used.
- 0 = switch is "Off" and 1= switch is "On"

D2 thru D9: diagnostic LEDs located on the processor board. Illuminated LEDs indicate that one of the flags listed below D2 thru D9 on the above chart are read as active.

Example: If all switches are off, D4 & D6 are turned on, then nudging and main fire service flags are on.

## 3.0 VOLUME CONTROL

Trimpots R32 and R33 adjust the main and alternate volume. The main volume adjustment (R32) controls the floor announcements (such as "First Floor"). The alternate volume (R33) controls all other announcements (such as "going up"). Turning either trimpot fully counter-clockwise gives maximum volume. The adjustments are easily made with diagnostics switch S2-ON. This will activate the messages and allow the time necessary to adjust volume. These two trimpots do not effect any music volume that may be connected on J8. Music volume is set external of this unit.

## 4.0 TROUBLESHOOTING

If there are no audio messages, then:

- The speaker may not be connected on J9.
- The +/-15V supply on connector J7 may not be present.
- U39 relay may be defective.
- U38 (audio power op-amp) may be defective.
- U5 (program EPROM), U7 or U8 (digitized voice EPROM) may be defective.
- A volume control trimpot may be defective or turned fully clockwise.

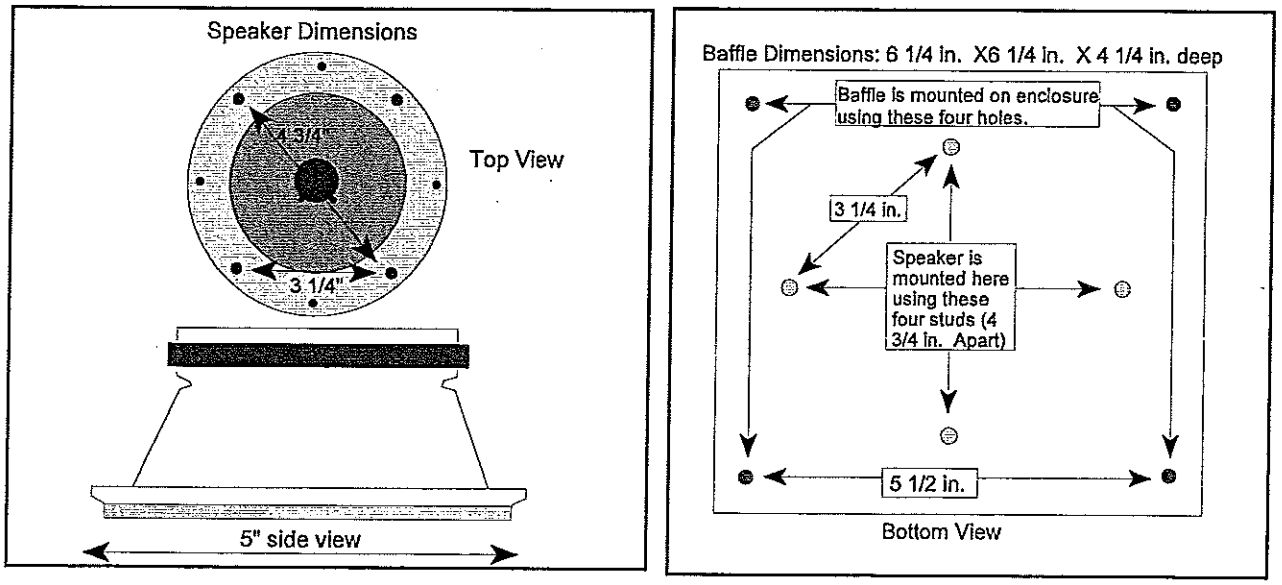
If the message, "Please allow the doors to close" is heard when nudging:

- The photo eye used to detect objects in the door path may be blocked.
- The photo eye may be dirty, or defective.

## 5.0 PERIPHERAL EQUIPMENT

Square recessed mount 6 1/4" by 6 1/4" by 4 1/4" (manufacturer Model # 198-4).
Square surface mount 7" by 7" by 4 1/4" (manufacturer Model # SE 198-4).
Circular recessed mount 6 1/8" by 4 1/4" without lip (manufacturer Model # 94-4).
7" round by 4 1/4" (including lip).
7 3/8" in diameter with a circular grill.

*FIGURE D.2 Speaker Dimensions*



# APPENDIX E
# LS-QUTE LANDING SYSTEM ASSEMBLY DRAWINGS

**NOTE:** If a sensor or the HC-IPLS board is replaced make sure the **orientation of the HC-IPLS** board is correct. Use the chassis ground and the LEDs shown in the figure below for an orientation reference.

*FIGURE E.1 LS QUTE Enclosure Assembly*

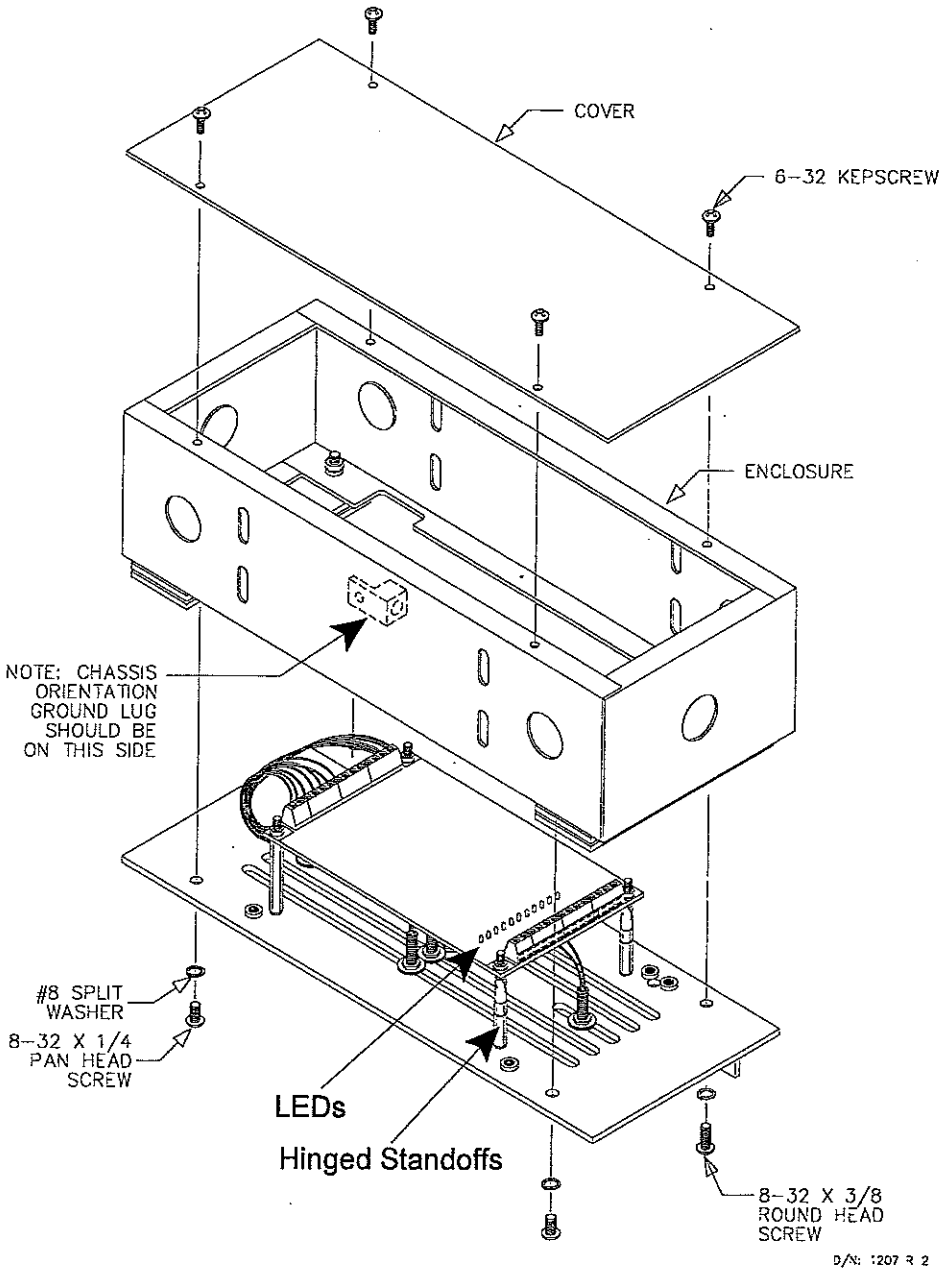
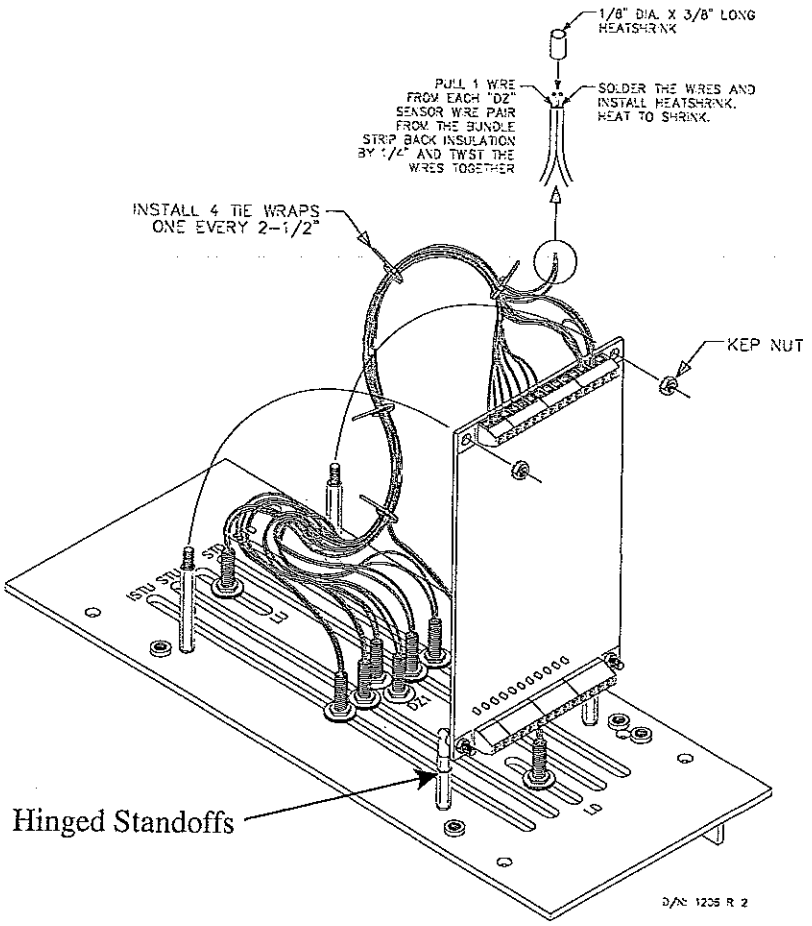


*FIGURE E.2 LS QUTE Wiring Diagram*




| SENSOR | HC-IPLS BOARD TERMINALS | |
|---|---|---|
| DZ1 | DZ2 SENSOR | S18 |
| DZ2 | DZ1 SENSOR | SDZ |
| LD | SLD | S18 |
| LU | SLU | S18 |
| STD | STD | S2 |
| STU | STU | S2 |
| ISTD | ISTD | S2 |
| ISTU | ISTU | S2 |
| One 2 inch jumper | S18 | S2 |

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