RCP-LCXY Control Panel

PESA Switching Systems
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08/21/94 Manual released for initial printing as REV A.

NOTE: This manual contains descriptions of the operation and control of the RCP-LCXY with the RC5500 System Controller. The control of RCP-LCXY <u>is not</u> available in the current release of the RC5500 Controller Software but will be available in a future release/upgrade of the RC5500 Controller Software. The RCP-LCXY <u>is</u> currently controllable by 2400E Controller.

05/15/95 Manual sections 4 and 6 updated to correct discrepancies. Manual released for printing as REV B.

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1.1 Manual Overview

This manual provides detailed instructions for installing and operating both single and dual configurations of the PESA RCP-LCXY Control Panel. This manual is divided into seven sections as shown.

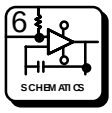
Section 1, **INTRODUCTION**, summarizes the manual, describes both the configurations of the RCP-LCXY Control Panel, presents a list of terms, and provides the panel specifications.

Section 2, **INSTALLATION**, provides installation and setup instructions.

Section 3, **OPERATION**, describes operation procedures.

Section 4, **FUNCTIONAL DESCRIPTIONS**, presents an in-depth description of each RCP-LCXY component.

Section 5, **MAINTENANCE**, explains procedures for maintenance.



Section 6, **SCHEMATICS**, gives a complete package of technical documents such as schematics, and assembly drawings.

Section 7, **PARTS LIST**, provides a detailed list of system parts and components.

1.2 RCP-LCXY Single General Description

The RCP-LCXY Single Control Panel is a touchpad XY panel with a full complement of features allowing access to all outputs for full matrix control or to a selected subset for limited control. The panel can be configured to control a single buss if desired. The RCP-LCXY Single can have direct control of up to 16 independent levels.

The RCP-LCXY Single features a large display area for easy viewing of panel DESTINATION, STATUS, LEVEL, and PRESET. On the left of the display, two illuminated pushbuttons allow the user to quickly scroll through Previous or Next selections.

Full function operational modes include PRESET, LEVEL, DESTINATION, TAKE and CHOP. The panel also provides the ability to PROTECT or LOCK selected outputs and to limit access to certain sources.

This panel comes packaged in a standard 19" one rack unit chassis requiring 3" of depth. Power is supplied through a Plug-in-the-Wall type power pack.

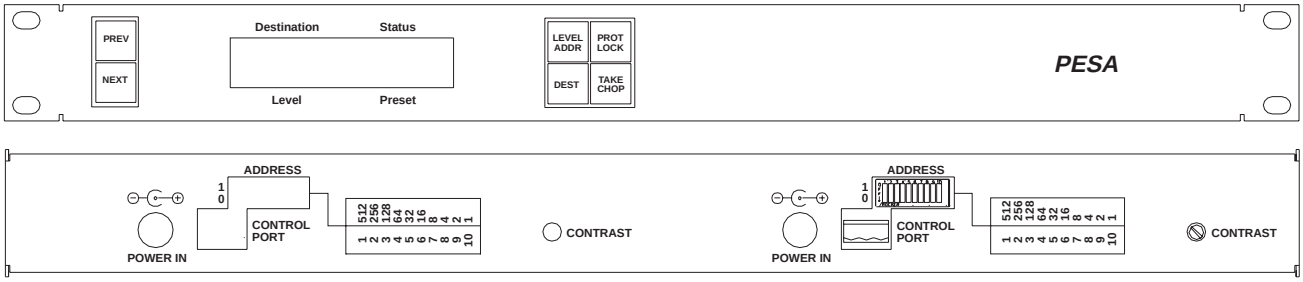


Figure 1-1 RCP-LCXY Single Front and Rear Views

1.3 RCP-LCXY Dual General Description

The RCP-LCXY Dual Control Panel features two complete LCXY Panels enclosed in a 1RU chassis. Each of these LCXY Panels can function completely independent of the other. These independent LCXY Panels are touchpad XY panels with a full complement of features allowing access to all outputs for full matrix control or to a selected subset for limited control. The panels can be configured to control a single buss if desired. Each panel contained in the RCP-LCXY Dual Chassis can have direct control of up to 16 independent levels.

The RCP-LCXY Dual features two large display areas (one per each independent LCXY Panel) for easy viewing of each panel's DESTINATION, STATUS, LEVEL, and PRESET. On the left of the each display, two illuminated pushbuttons allow the user to quickly scroll through Previous or Next selections.

The RCP-LCXY Dual full function operational modes include PRESET, LEVEL, DESTINATION, TAKE and CHOP. Each section of the panel also provides the ability to PROTECT or LOCK selected outputs and to limit access to certain sources.

This panel comes packaged in a standard 19" one rack unit chassis requiring 3" of depth. Power is supplied through two Plug-in-the-Wall type power packs.

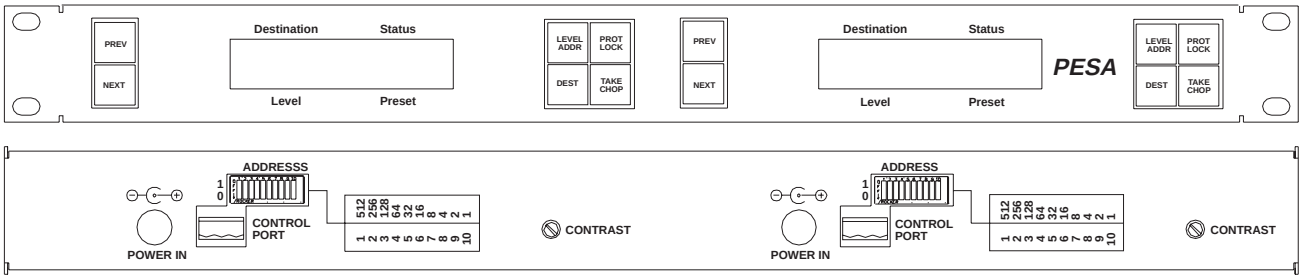


Figure 1-2 RCP-LCXY Dual Front and Rear Views

1.4 Specifications

GENERAL CHARACTERISTICS

Single and Dual

Mounting	Standard 19" Rack
Pushbuttons	Illuminated and Legendable

INPUT CHARACTERISTICS

Single

Connector Type	3 Pin, 2 Part Detachable Plug
Control Interface	RS485
Protocol	PESA Proprietry
Address	One DIP Switch

Dual

Connectors Type	3 Pin, 2 Part Detachable Plug
Control Interface	RS485
Protocol	PESA Proprietry
Address	Two DIP Switches

PHYSICAL CHARACTERISTICS

Single and Dual

One Rack Unit Chassis	19"W X 2"D X 1.75"H 482.6mm X 50.8mm X 44.5mm

POWER CHARACTERISTICS

Single

AC Voltages	110 to 130 Volts, ±10%, 47 to 63 Hz 220 to 240 Volts, ±10%, 47 to 63 Hz
Power	+7.5VDC @ 800mA

Dual

AC Voltages	110 to 130 Volts, ±10%, 47 to 63 Hz 220 to 240 Volts, ±10%, 47 to 63 Hz
Power	2X +7.5VDC @ 800mA

ENVIRONMENTAL CHARACTERISTICS - Operational

Single and Dual

Temperature	0° to 40° C
Humidity	20% to 90% Non-Condensing

2.1 Introduction

This section details RCP-LCXY Single and Dual installation procedures. The following topics are discussed:

- Receipt Inspection
- Location and Mounting
- Polling Address
- Control Panel/Controller Interconnection
- Power Connections

2.2 Receipt Inspection

The RCP-LCXY Single or Dual was inspected and tested prior to leaving the PESA factory. Upon receipt, please inspect the unit for shipping damage. If damage is detected, notify the carrier immediately and hold all packing material for inspection. If assistance is required, please contact PESA Customer Service at the telephone number listed in the front of this manual.

After unpacking, compare all parts received against the packing list. If the unit is undamaged and all components have been received, proceed with installation.

2.3 Location and Mounting

Both the RCP-LCXY Single and RCP-LCXY Dual have been designed to fit in a standard E.I.A. 19" equipment rack and use 1 rack unit of space (1 3/4"). An area should be selected where temperature does not exceed 40°C inside the equipment rack, and where air can circulate freely. The unit should be mounted in an area convenient to control and power connections. Sufficient space must be provided behind the rack to allow for the control and power cables. When the RCP-LCXY is supplied as part of a system including interconnecting cables, a rack layout drawing is usually provided. While adherence to this drawing is not required, it will ensure that the cables are of proper length. All mounting holes should be utilized and hardware tightened securely. All cable should be strained relieved and secured to racks or other supporting structures. Failure to provide adequate cable support can result in cables separating from connectors. If cable runs are to be stored under an elevated floor, they should be tied to the racks as a guide. If cables are run along the floor, do not allow them to lay in the work area behind the racks. Stepping or tripping on the cables may result in connections being pulled free or wire breakage inside the insulation.

2.3 Location and Mounting Continued:

Figure 2–1 illustrates chassis installation.

To install the RCP-LCXY chassis follow these steps:

1. Align the chassis with the slotted opening in the rack.
2. Install the bottom screws first.
3. Install the two top screws
4. Tighten all four screws securely.

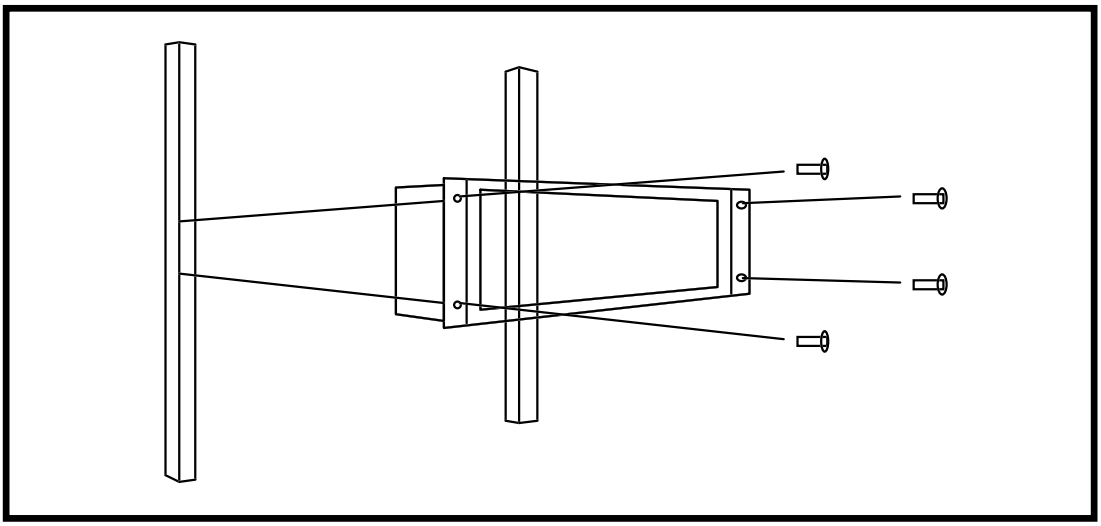


Figure 2-1 RCP-LCXY Chassis Installation

2.4 Polling Address

For the controller to identify a particular control panel, a specific device number or polling address must be assigned to each RCP-LCXY Single and to each switchcard located in the RCP-LCXY Dual. Sequential binary numbers (1 thru 128) are used for this purpose. The appropriate binary number is entered into the control panel by setting an internal 10-position DIP switch to the binary number. All address DIP switches are accessible from the rear of the unit. The panel address is normally assigned and entered at the factory if the panel is purchased as part of a system and a design guide has been completed by the user. If the panel is purchased separately, the user may be required to set the panel address. **Example:** To select polling address 21, set switches 6, 8, and 10 in the "ON" or "1" position. See Figure 2-2 and Figure 2-3.

2.4 Polling Address (Device Number) Continued:

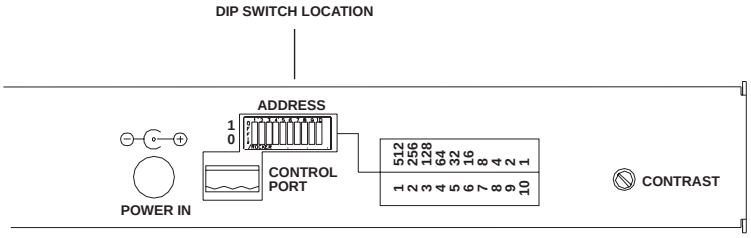


Figure 2-2 DIP Switch Location RCP-LCXY Single

Figure 2-3 DIP Switch Locations RCP-LCXY Dual

2.5 Control Panel/Controller Interconnection

The RCP-LCXY Single Control Panel has a single 3-pin MTA connector located on the rear panel. The RCP-LCXY Dual Control Panel has two 3-pin MTA connectors located on the rear panel. These connectors are used as RS485 communication ports between the control panels and the system controller. Control panels are daisy chained (connected) to a port on the rear of the controller using shielded twisted pair cable. See Figure 2-4.

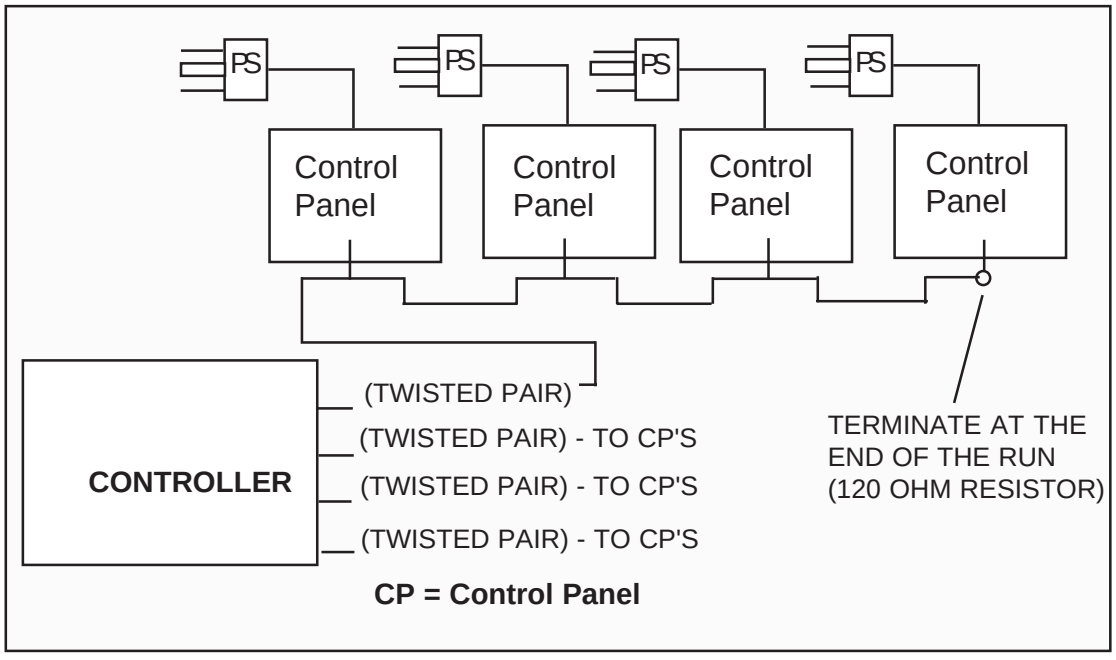


Figure 2-4 Typical Control Panel Controller Interconnection

2.6 Wiring the Control Panel Connector

Should an additional control panel be added to your system, it will be necessary to wire the connector using shielded twisted pair cable and a 3-pin MTA connector. See Figure 2-5.

1. Remove approximately 1 1/2" of insulating jacked from each of the two wires.
2. Remove approximately 1/2" of insulation from the black and red wires.
3. Twist together and insert the two black wire ends into position 1. Crimp down using a screw driver.
4. Twist together and insert the two shield wires into position 2. Crimp down using a screwdriver.
5. Twist together and insert the two red wire ends into position 3. Crimp down using a screwdriver.

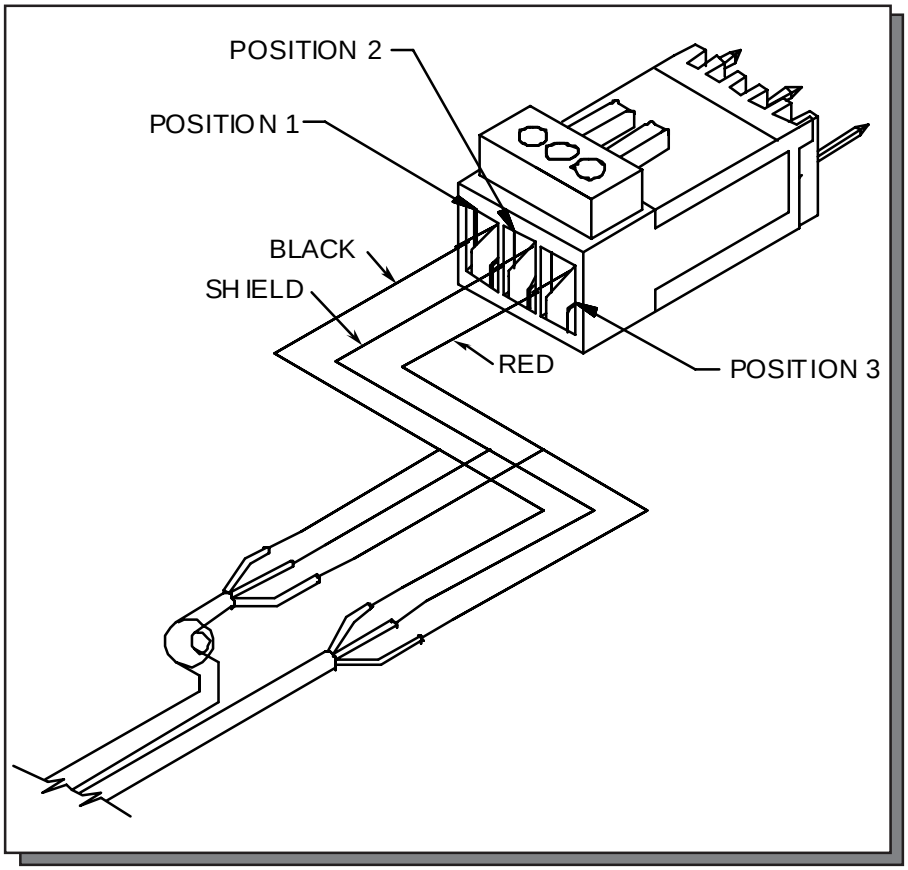


Figure 2-5 Wiring the Control Panel Connector

2.7 Terminating Cable Runs

Each cable run should be terminated at the end of the run with a 120 Ohm, 1/4 watt 5% resistor. The cable is terminated internally at the controller. See Figure 2-6.

1. Uncrimp the black and red leads in position 1 and 3.
2. Insert the resistor ends into position 1 and position 3 along with the black and red leads.
3. Crimp down using a screwdriver.
4. The shield wire remains in position 2.

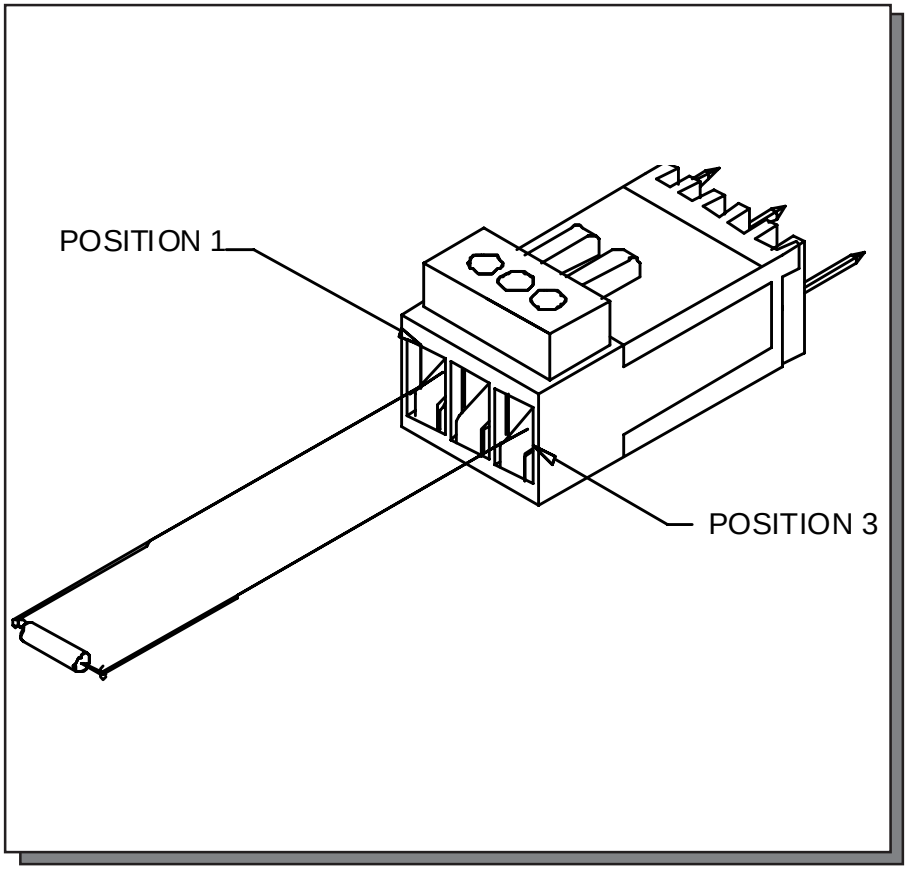


Figure 2-6 Terminating Cable Runs

2.8 Power Connections

Power for the RCP-LCXY Single is supplied by an external 7.5 VDC, 800 mA power supply. Power for the RCP-LCXY Dual is supplied by two external 7.5VDC, 800mA power supplies.

Remove each Power Supply from the box it was shipped in and check to insure that no damage has occurred in shipping. Verify that each Power Supply is rated for the proper AC voltage (i.e. 115 VAC or 230 VAC) before connection to the AC line voltage. The power connector can now be plugged into the **POWER IN** position on the RCP-LCXY. The Power Pack will immediately power the unit upon connection to AC line voltage. See Figure 2-7.

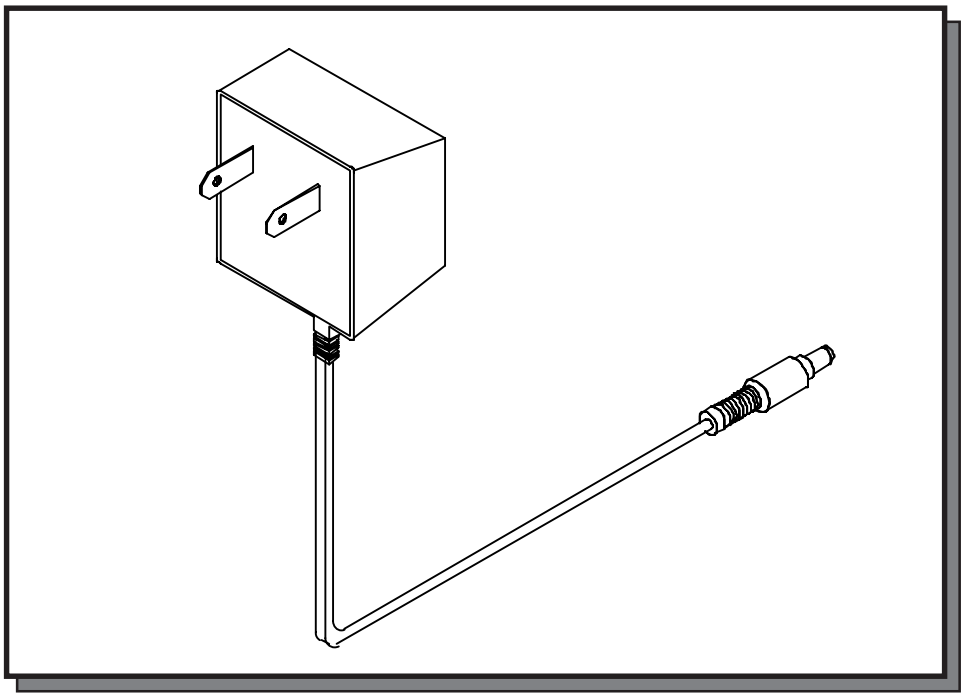


Figure 2-7 Typical Panel Power Supply

3.1 Operations of the RCP-LCXY

Introduction

The RCP-LCXY Control Panels (Single and Dual) can be controlled by either the RC5500 Controller or the 2400E Controller. Refer to Section 3A for operating instructions if you have an RC5500 Controller, or to Section 3B if you have a 2400E Controller. Operations of the RCP-LCXY Control Panels require that they be configured at the controller console and have the appropriate polling address assigned. Connections and power up procedures should be performed on each panel controlled.

General

All RCP-LCXY panels in a routing switcher system are custom configured at the factory prior to shipment. The information needed to configure the panels comes from the System Design Guide filled out by the customer. However, if the system configuration changes, the RCP-LCXY Control Panels can be reconfigured on site using the control system configuration software.

3.2 Breakaway Operation

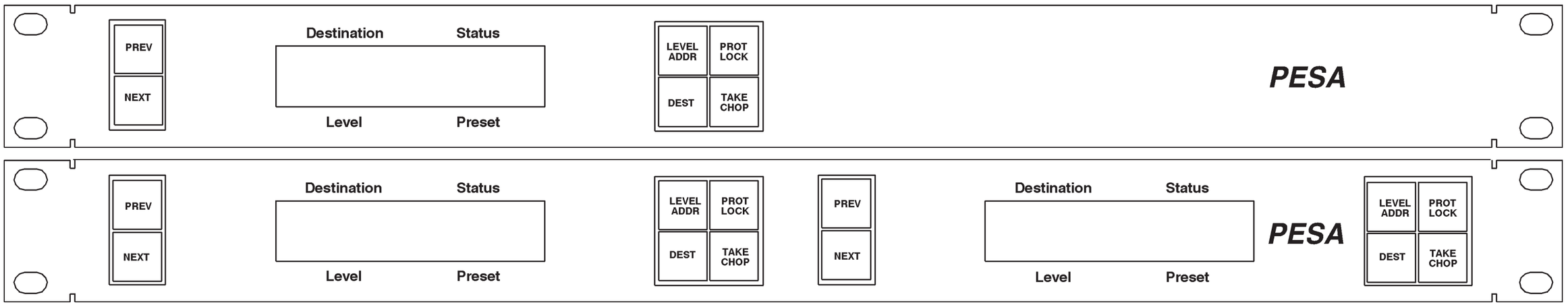
Breakaway operation allows you to select an input on a specific level to be taken to an output on that level. Use the following steps:

To Make a Breakaway Switch:	**Results:**
1) Depress the LEVEL Key	LEVEL Key LED lights. The **PREV** and **NEXT** Keys are now used to scroll through the available levels.
2) Scroll through the names of the available levels using the **PREV** and **NEXT** Keys until you reach your desired level.	The level names are shown in the Level Display. The "All Levs" selection represents all levels assigned to the panel. This is the default level selection.
3) Depress the LEVEL Key again	Returns to the Preset Select Mode. The LEVEL Key LED blinks to show a breakaway condition if not in "All Levs".
4) Select the desired input on the breakaway level by scrolling through the valid input selections using the **PREV** and **NEXT** Keys.	The input name selected will be shown in the Preset Display. Invalid input names entered will blink.
5) Depress the TAKE Key	Takes the inputs selected in the Preset on-line on all levels selected.
Steps 2-5 above can be repeated as long as the user wishes to continue to breakaway input selections on the selected level.	

3.3 Split Operation

Split operation is like Breakaway but it allows you to perform a breakaway on more than one level simultaneously.

To Make a Split Breakaway:	**Results:**
1) Depress the LEVEL Key	LEVEL Key LED lights. The **PREV** and **NEXT** Keys are now used to scroll through the available levels.
2) Scroll through the names of the available levels using the **PREV** and **NEXT** Keys until you reach your desired level.	The level names are shown in the Level Display. The "All Levs" selection represents all levels assigned to the panel. This is the default level selection.
3) Depress the LEVEL Key again	Returns to the Preset Select mode. The Level Select light blinks to show a breakaway condition.
4) Select the desired input on the breakaway level by scrolling through the valid input selections using the **PREV** and **NEXT** Keys	The input name selected will be shown in the Preset Display. Invalid input names entered will blink.
5) Repeat steps 2-4 again	Enters a breakaway input selection on all levels desired.
6) Depress the LEVEL Key	Returns to the Level Select Mode.
7) Scroll the currently selected level to the All Levs selection	All levels with a breakaway input selection will be affected.
8) Depress the TAKE Key	Takes all levels with a breakaway input selection on-line.



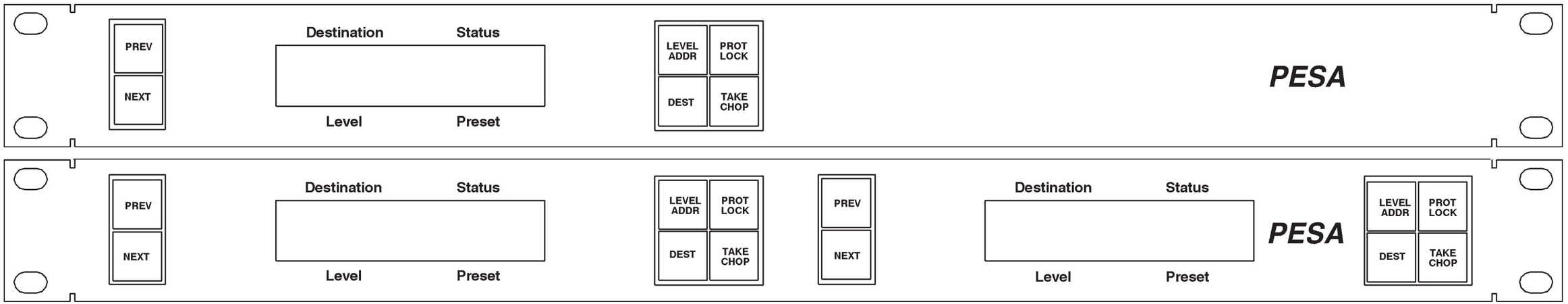
Front View RCP-LCXY Single and Dual

Key Types:

PREV Key - Used to scroll to the *previous* valid Source, Destination, or Level selection depending on the active mode of the panel.

NEXT Key - Used to scroll to the *next* valid Source, Destination, or Level selection depending on the active mode of operation of the panel.

Function Keys - The RCP-LCXY Single has 4 function keys located on the right of the panel's display. The RCP-LCXY Dual has two sets of 4 function keys which are located on the right of the panel's displays. Most of the function keys are associated with 2 possible functions. **NOTE: The primary function is executed when the key is held down less than 1 second. The secondary function is executed when the key is held down more than 1 second.** Each Function Key works as a toggle. If a function is currently enabled, pressing the associated Function Key in the same fashion as before (less than or greater than 1 second) will disable it.



Front View RCP-LCXY Single and Dual

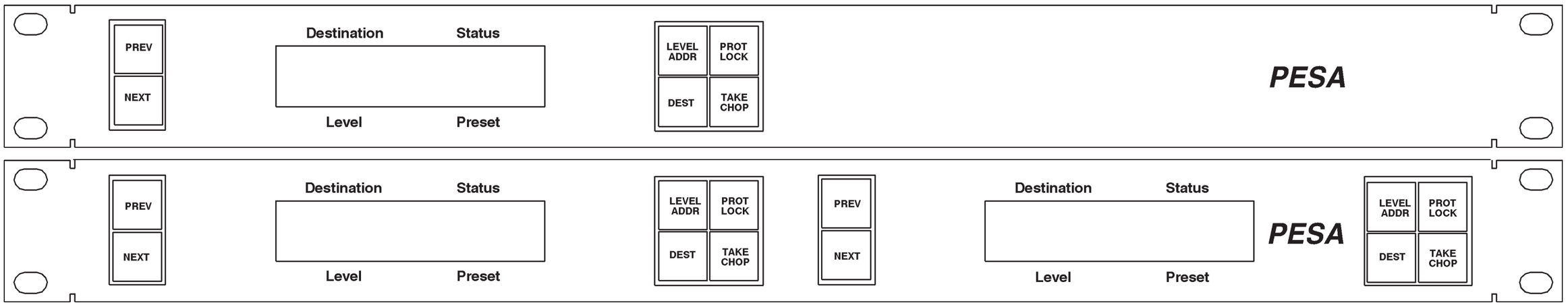
The RCP-LCXY has 4 Modes of Operation:

Preset Select - The Preset Select Mode is the default mode of operation. Deselecting all other modes will return you to Preset Select Mode. In the Preset Select Mode switches may be taken by pressing the TAKE/CHOP Key for less than one second. The LEVEL/ADDR Key is either not illuminated if the panel is in All Levs or blinking if you have selected Breakaway level(s). Sources may be selected in the Preset Display by scrolling using the PREV/NEXT Keys.

Level Select - Selects which levels are to be affected when loading preset sources or when Taking switches on-line. Enter the Level Select Mode by pressing the LEVEL/ADDR Key for less than 1 second. Level Select differs from all other modes in that it can coexist with other modes. The action taken when you press PREV or NEXT, however, always applies to level selection as long as the Level Select Mode is enabled.

Destination Select - Selects which destination group the panel should control. Enter the Destination Select Mode by pressing the DEST Key. The DEST Key LED is illuminated in this mode. You may select destination(s) by scrolling using the PREV or NEXT Keys. Whenever a valid destination is entered, the panel immediately switches control from the previously controlled destination to the new selection. The name of the destination selected is shown in the Destination Display. You may Take the Preset Source selection to the new destination by pressing the TAKE/CHOP Key for less than 1 second. Exit Destination Select Mode by pressing the DEST Key again. **NOTE:** When the RCP-LCXY Control Panels are configured for single buss operation the DEST Key is disabled.

Chop - The panel will alternately switch (about every 1/2 second) the destination currently being controlled between the current on-line source and the Preset source. You enter the Chop Mode by pressing and holding the TAKE/CHOP Key for more than 1 second. The TAKE/CHOP LED blinks when the panel is in Chop. Exit the Chop Mode by pressing the TAKE/CHOP Key again.



Front View RCP-LCXY Single and Dual

Panel Configuration:

Address: Decimal number from 1 to 128 which is used to distinguish each panel on the panel communications bus. Address must match the dip switch settings on the rear of the panel. **NOTE:** Each section of the RCP-LCXY Dual must have its own address assigned at the controller.

Panel Name: Any 8 alphanumeric characters. Currently used only by the controller configuration program to provide a user-friendly method of referring to each panel.

Priority: Choice of 3 priorities: Master, Supervisory or Non-Supervisory. Priorities are used when panel attempts to set or clear a destination Protect or Lock. Only the panel which set a Protect or Lock or someone of higher priority can un-Protect or un-Lock a destination once it is Locked. Default setting is Non-Supervisory.

Status Method: The panel displays status differently based on whether the panel is set for All Levs (changing all levels assigned to panel) or Breakaway (changing only selected levels) operation. In addition, you may select between 2 methods of displaying status when in All Levs (NOTE: these methods only apply when the panel is set for All Levs operation).

1. Group Status:
   Panel will display status based on the Source Group which changed the current destination. If the panel receives status due to a breakaway change request or due to a change made elsewhere in the system, the panel will display the status of the Default Status Level (refer to the Operations Section in your controller manual for details).

2. Default Status Level Status:
   Panel will always display the status of the Default Status Level.

Default Status Level: Level to be statused when panel is in All Levs operation and status is not determined by the Group Status (refer to the preceding Status Method description).

Default Destination Group: Destination group to be controlled by panel when first powered up.

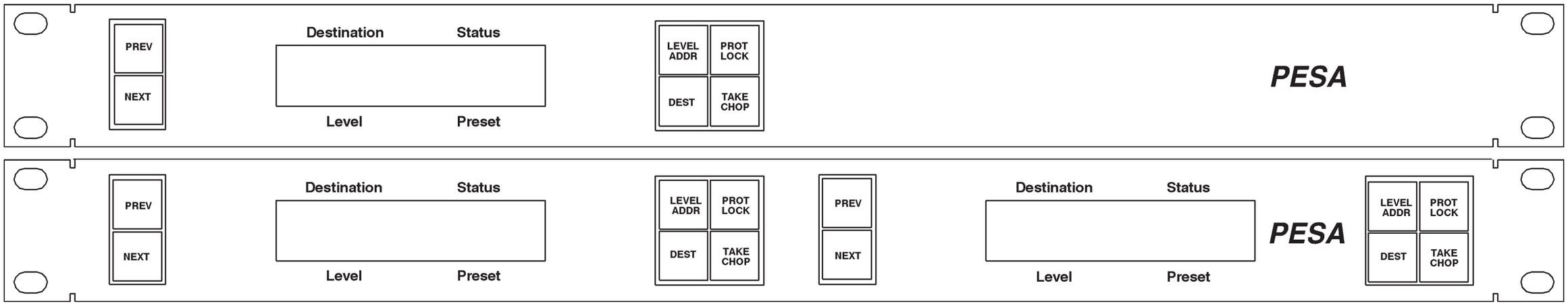
Level List: List of levels to be controlled by panel. Any level not in the assigned Level List will not be accessible to or affected by panel operations.

Include Source List: List of all source groups accessible by this panel.

Exclude Source List: List of any source groups to be un-accessible from the panel. This list is not required if no source group to be excluded from panel is included in the “Include Source List”.

Include Destination List: List of all destination groups controllable by this panel.

Exclude Destination List: List of any destination groups to be excluded from control by this panel. This list is not required if no destination group to be excluded from panel is included in the “Include Destination List”.



Front View RCP-LCXY Single and Dual

Statusing:

Status by Group Status

Status Display - The name shown in the Status Display represents the source switched to the destination currently controlled by the panel. If "All Levs" is displayed in the Level Display and an "*" character is at the end of the Status/Preset Display, then a source on at least one level is different in the Status/Preset Registers. To view the source assigned on each level, enter the Level Select mode and scroll through each level. As you scroll through the levels, the displays will change to show the source assigned for the level currently selected. If the panel receives a status due to changes made elsewhere in the system or due to a breakaway switch request, the panel will attempt to display the name of the source on the default status level. If the destination currently selected has no output on the default status level, the panel will status the next highest priority level which has an output.

Status by Default Status Level

Status Display - The name shown in the Status Display represents the source switched to the destination controlled by the panel on the default status level. If "All Levs" is displayed in the Level Display and an "*" character is at the end of the Status/Preset Display, then a source on at least one level is different in the Status/Preset Registers. To view the source assigned on each level, enter the Level Select mode and scroll through each level. As you scroll through the levels, the displays will change to show the source assigned for the level currently selected. If the destination currently selected has no output on the default status level or their is no source information to display (initial boot-up condition) or no display level can be selected, the panel will show "********" in the display.

Breakaway Statusing

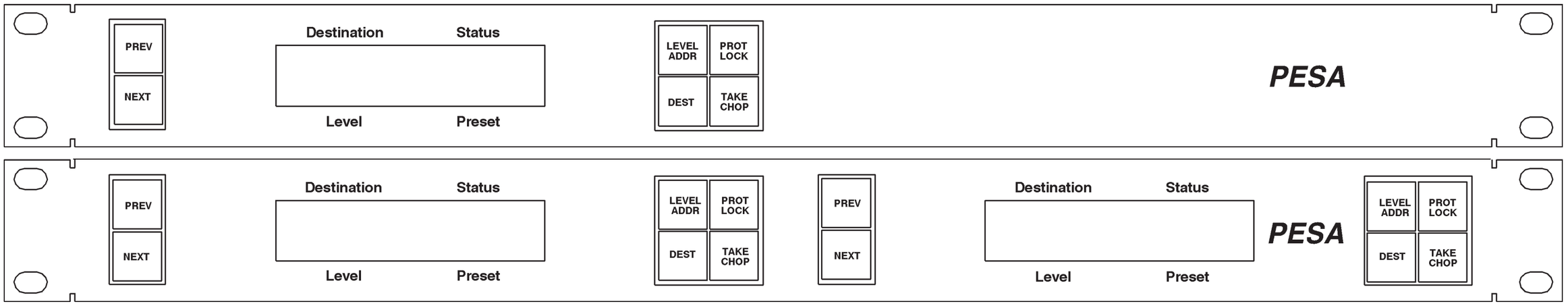
Status Display - Name shown represents the source switched to the destination currently controlled by the panel on the currently selected level. To determine the status of each level controlled by the panel, enter the Level Select mode and scroll through each level. As you scroll through the levels, the display will change to show the source switched to the output controlled by the panel for the level currently selected. If the destination currently selected has no output on the currently selected level, the panel will blank the Status Display. "********" will be displayed if their is no source information to display (initial boot-up condition) or no display level can be selected.

Error Statusing

The panel will display an Error number whenever an error is detected on the level currently being displayed (i.e. "ERROR 1", "ERROR 2", etc.). Error 1 indicates a Confidence Error on the output being controlled. Error 2 indicates a Readback Error meaning the source readback from the router was not the same as the source requested.

Blocked Input Statusing

The panel will display a "BLOCKED" message in the Status Display when a switcher change request is denied due to the requested input being blocked from the requested output.



Front View RCP-LCXY Single and Dual

Preset Select Mode:

LEVEL/ADDR Key:

LEVEL - Activates the Level Select Mode. IMPORTANT: The Level Select Mode differs from all other modes in that it can coexist with other modes. The action taken when you press the PREV or NEXT Key, however, always applies to level selection as long as the Level Select Mode is enabled (refer to Level Select Mode description for further details).

ADDR - Displays the panel address in the Preset Display while the key is held down.

PROT/LOCK Key:

PROT - Protects the destination currently being controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. The PROT/LOCK LED is illuminated to show the destination currently being controlled by the panel is Protected. An "!" is displayed before the destination name if the destination is protected. E.g. "!VTR01".

LOCK - Locks the destination currently being controlled by the panel. Any switch request attempting to affect this destination will be disallowed. The PROT/LOCK LED blinks to show the destination currently being controlled by the panel is Locked. An "*" is displayed before the destination name if the destination is locked. E.g. "*VTR01".

DEST Key:

DEST - Exits the Preset Select Mode and enters Destination Select Mode.

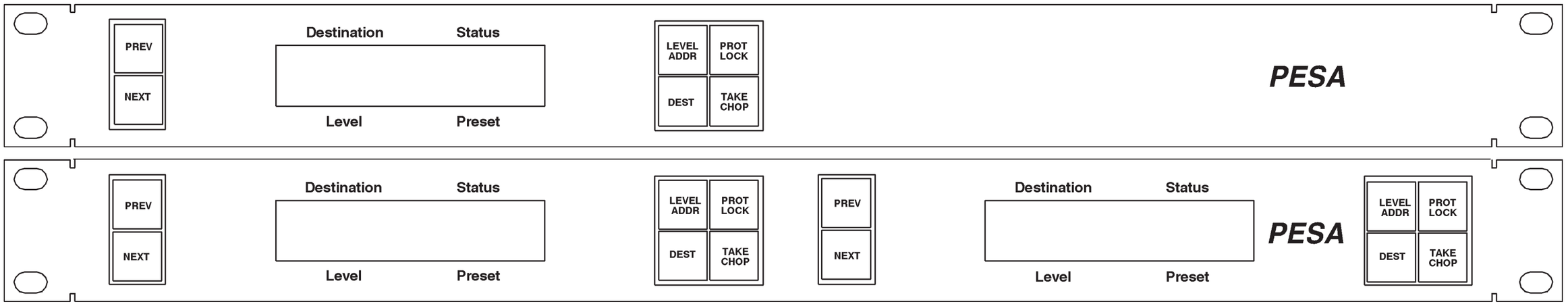
TAKE/CHOP Key:

TAKE - Toggles Preset and On-Line Sources: 1) sends a switcher change request to Take Preset Source to the currently controlled destination on the levels selected, 2) saves the current On-Line Source to the Preset on the levels selected. Since Take toggles the On-Line and Preset Sources, pressing Take again returns the On-Line Status to its previous state.

CHOP - Continuously toggles Preset and On-Line Sources once every 1/2 second (refer to preceding Take description).

PREV Key: Scrolls Preset Source selection to the previous source accessible to panel for the level(s) selected (all levels if in All Levs). Sources are presented to you in alphabetical order. NOTE: For a valid source name to be displayed, it must be a current Source Group that is in the panel's Include Sources List.

NEXT Key: Scrolls Preset Source selection to the next source accessible to panel for the level(s) selected (all levels if in All Levs). Sources are presented to you in alphabetical order. NOTE: For a valid source name to be displayed, it must be a current Source Group that is in the panel's Include Sources List.



Front View RCP-LCXY Single and Dual

Level Select Mode:

LEVEL/ADDR Key:

LEVEL - Exits the Level Select mode. If level selection currently set for "All Levs", then extinguishes the LEVEL/ADDR LED. If any level is selected for breakaway, the LEVEL/ADDR LED blinks. IMPORTANT: The Level Select mode differs from all other modes in that it can coexist with other modes. The action taken when the PREV or NEXT Keys are pressed, however, always applies to level selection as long as the Level Select Mode is enabled (refer to Level Select Mode description for further details).

ADDR - Displays the panel address in the Preset Display while the key is held down.

PROT/LOCK Key:

PROT - Protects the destination currently being controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination currently being controlled by the panel is Protected. An "!" is displayed before the destination name if the destination is protected. E.g. "!VTR01".

LOCK - Locks the destination currently being controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination currently being controlled by the panel is Locked. An "*" is displayed before the destination name if the destination is locked. E.g. "*VTR01".

DEST Key:

DEST - If you are already in Destination Select Mode, use to exit and return to Direct Take Mode. Otherwise, enters the Destination Select Mode.

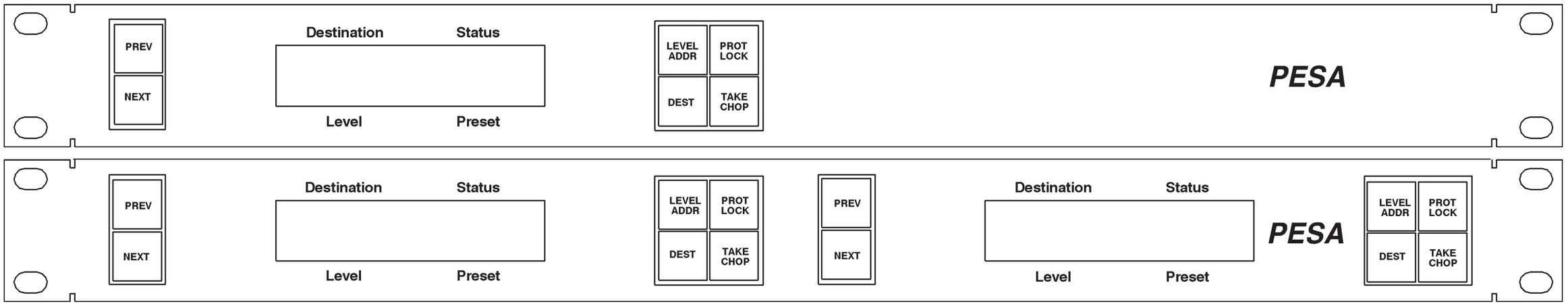
TAKE/CHOP Key:

TAKE - Toggles Preset and On-Line Sources: 1) sends switcher change request to Take Preset Source to the currently controlled destination on the levels selected, 2) saves the current On-Line Source to the Preset on the levels selected. Since Take actually toggles the On-Line and Preset Sources, pressing Take again returns the On-Line Status to its previous state.

CHOP - Continuously toggles Preset and On-Line Sources once every 1/2 second (refer to preceding Take description).

PREV Key: Scrolls Level selection to previous level controllable by the panel or All Levs for all levels. Levels are presented in the order of priority: level 1, level 2, etc. and "All Levs" representing all levels. **NOTE:** PREV Key scrolls backward through the Levels List.

NEXT Key: Scrolls Level selection to next level controllable by the panel or All Levs for all levels. Levels are presented in the order of priority: level 1, level 2, etc. and "All Levs" representing all levels. IMPORTANT: The Level Select Mode differs from all other modes in that it can coexist with other modes. The action taken when the PREV or NEXT Key is turned, however, always applies to level selection as long as the Level Select Mode is enabled.



Front View RCP-LCXY Single and Dual

Destination Select:

LEVEL/ADDR Key:

LEVEL - If the Level Select Mode is active, you will exit Level Select. Otherwise, you will activate Level Select Mode. IMPORTANT: Level Select Mode differs from all other modes in that it can coexist with other modes. The action taken when the PREV or NEXT Key is pressed; however, always applies to level selection as long as the Level Select Mode is enabled (refer to Level Select Mode description for further details).

ADDR - Displays the panel address in the Preset Display while the key is held down.

PROT/LOCK Key:

PROT - Protects the destination currently being controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED illuminates to show the destination currently being controlled by the panel is Protected. An "!" is displayed before the destination name if the destination is protected. E.g. "!VTR01".

LOCK - Locks the destination currently being controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination currently being controlled by the panel is Locked. An "*" is displayed before the destination name if the destination is locked. E.g. "*VTR01".

DEST Key:

DEST - Exits the Destination Select Mode and returns to the Preset Select Mode.

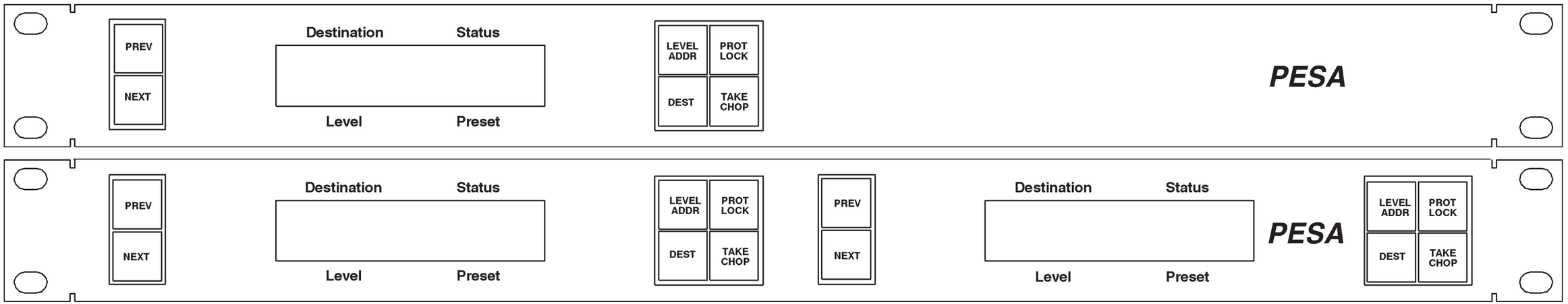
TAKE/CHOP Key:

TAKE - Toggles Preset and On-Line Sources: 1) sends switcher change request to Take Preset Source to the currently controlled destination on the levels selected, 2) saves the current On-Line Source to the Preset on the levels selected. Since Take actually toggles the On-Line and Preset Sources, pressing Take again returns the On-Line Status to its previous state.

CHOP - Continuously toggles Preset and On-Line Sources every 1/2 second (refer to preceding Take description).

PREV Key: Scrolls the Destination selection to the previous destination controllable by panel. Destinations are presented in alphabetical order. NOTE: For a valid destination to be displayed, it must be a current Destination Group that is in the panel's Include Destinations List.

NEXT Key: Scrolls the Destination selection to the next destination controllable by panel. Destinations are presented in alphabetical order. NOTE: For a valid destination to be displayed, it must be a current Destination Group that is in the panel's Include Destinations List.



Front View RCP-LCXY Single and Dual

Chop Mode:

LEVEL/ADDR Key:

LEVEL - No effect.

ADDR - Displays the panel address in the Preset Display while the key is held down.

PROT/LOCK Key:

PROT - Protects the destination currently being controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination currently being controlled by the panel is Protected. An "!" is displayed before the destination name if the destination is protected. E.g. "!VTR01".

LOCK - Locks the destination currently being controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination currently being controlled by the panel is Locked. An "*" is displayed before the destination name if the destination is locked. E.g. "*VTR01".

DEST Key:

DEST - Exits the Chop Mode and enters the Destination Select Mode.

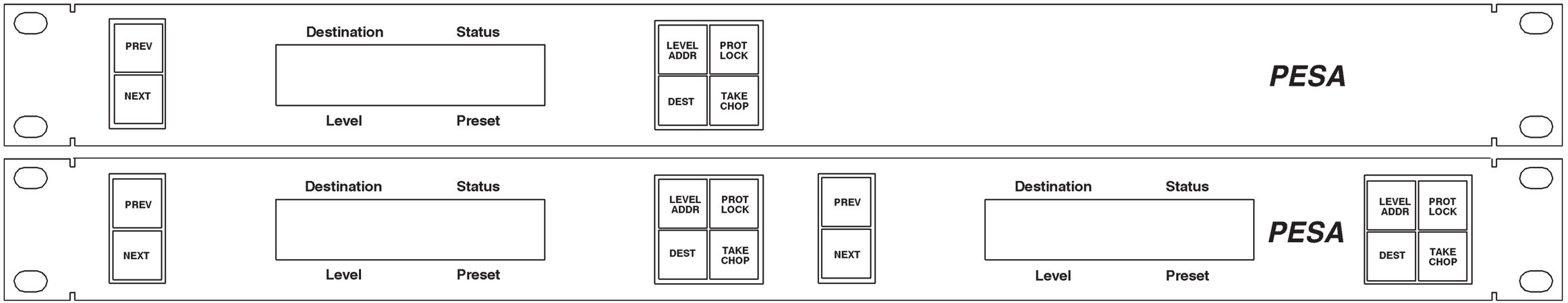
TAKE/CHOP Key:

TAKE - Exits the Chop Mode and returns the state of the destination currently controlled by the panel to the on-line status it was in before entering Chop Mode.

CHOP - Exits the Chop Mode and returns the state of the destination currently controlled by the panel to the on-line status it was in before entering Chop Mode.

PREV Key: No effect.

NEXT Key: No effect.



Front View RCP-LCXY Single and Dual

The RCP-LCXY has 4 Modes of Operation:

Preset Select - Selects sources to be switched to the destination controlled by panel by pressing the TAKE/CHOP Key. Take switches the source in the Preset Register to the current destination and places the old source into Preset. Switch requests are sent immediately. The Preset Select Mode is the default mode of operation.

Level Select - Selects which levels are to be affected when loading preset sources or when Taking switches on-line. Enter the Level Select Mode by pressing the LEVEL/ADDR Key for less than 1 second. Level Select differs from all other modes in that it can coexist with other modes. The action taken when you presses PREV or NEXT, however, always applies to level selection as long as the Level Select Mode is enabled.

Destination Select - Selects which destination is to be controlled by the panel. The user enters Destination Select Mode by pressing the DEST Key. The DEST Key is always illuminated in Destination Select Mode. The TAKE/CHOP LED is turned off. **NOTE:** When the RCP-LCXY Control Panels are configured for single buss operation the DEST Key is disabled.

Chop - Enters Chop Mode to continuously switch between the current and preset source at half second intervals. You enter Chop Mode by pressing the TAKE/CHOP Key for more than 1 second. The TAKE/CHOP Key LED is always flashing in Chop Mode. The CLEAR and DEST Key LEDs are turned off. Upon exiting Chop Mode, the prior state of the panel and the prior status of the current output are restored.

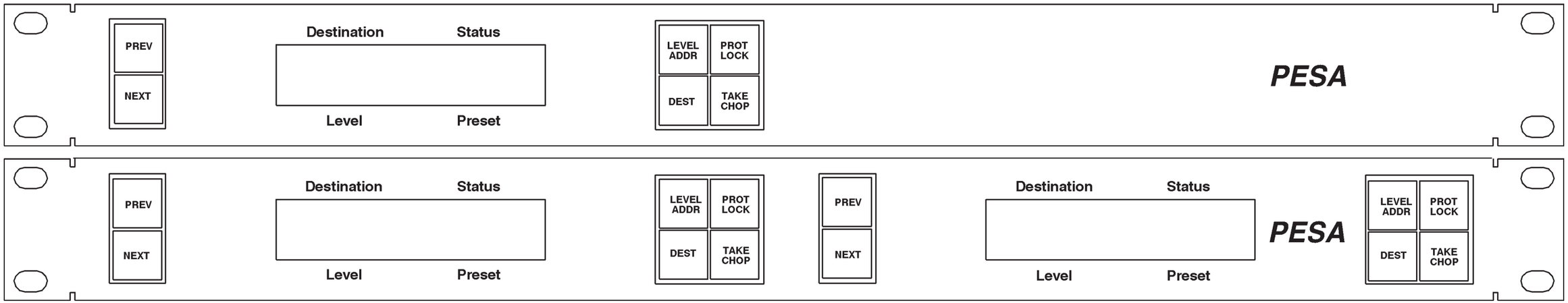
Key Types:

Previous and Next Keys - The panel has 2 keys labeled PREV and NEXT. These keys cycle backwards or forwards through the list of valid levels, destination, and sources. The appropriate Level, Destination, or Preset Display is always updated when these keys are used.

Function Keys - The RCP-LCXY Single has 4 function keys located on the right of the panel's display. The RCP-LCXY Dual has two sets of 4 function keys which are located on the right of the panel's displays. Each function key may be associated with 2 possible functions. **NOTE: The primary function is executed when the key is held down less than 1 second. The secondary function is executed when the key is held down more than 1 second.** Each Function Key works as a toggle. If a function is currently enabled, pressing the associated Function Key in the same fashion as before (less than or greater than 1 second) will disable it.

Status Method:

The panel will always display the status of the Default Status Level, which is predetermined to be Level 1. If the panel is in All Levs the source key corresponding to the input selected on Level 1 will be illuminated. If the panel is in Breakaway, the source key corresponding to the input selected on Level 1 will be blinking.



Front View RCP-LCXY Single and Dual

Preset Select Mode:

PREV/NEXT Keys - In this mode, the Previous/Next Keys allow you to scroll forwards and backwards through the list of valid sources. If Level Selection is activated with the Level Key, the function of these keys changes. During Level Selection, these keys allow the user to scroll forwards and backwards through the list of valid levels to select a single level or All Levs. Once Level Selection is deactivated, these keys revert to their original function of scrolling through the list of valid sources.

PROT/LOCK Key:

PROT - Protects the destination controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination controlled by the panel is Protected.

LOCK - Locks the destination controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination controlled by the panel is Locked.

LEVEL/ADDR Key:

LEVEL - Toggles the Enable/Disable of Level Selection. Illuminates the LEVEL/ADDR LED. Displays the currently selected level in the Level LCD display.

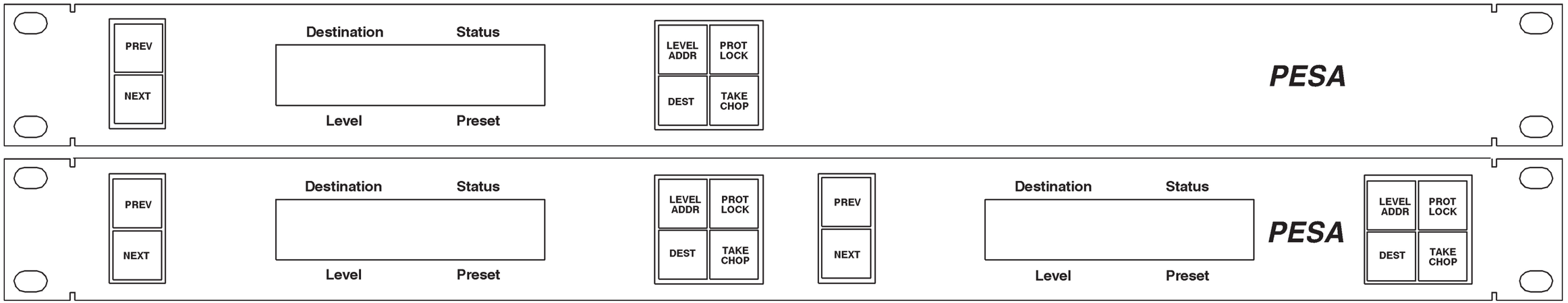
ADDR - Displays the panel address in the Level LCD Display while key is held down. The address displayed will be of the form "ADDR = aaa(bb)", where aaa is the address and bb is an internal decode number.

DEST Key: The DEST Key activates Destination Select Mode. When entering Destination Select Mode, the DEST Key LED is illuminated and any prior mode is deactivated.

TAKE/CHOP Key:

TAKE - Switches the source displayed in the Preset Register to the destination currently controlled by the panel. The new source is displayed in the Source Register and the old source is displayed in the Preset Register on the LCD. If there is no valid preset source selected, then no action is taken.

CHOP - Places the panel in Chop Mode. The sources displayed in the Preset and Source Registers are alternately switched to the current destination every half second. If there is no valid Preset Source selected, then no action is taken.



Front View RCP-LCXY Single and Dual

Level Select Mode:

LEVEL/ADDR Key:

LEVEL - Exits the Level Select mode. If level selection currently set for "All Levs", then extinguishes the LEVEL/ADDR LED. If any level is selected for breakaway, the LEVEL/ADDR LED blinks. IMPORTANT: The Level Select mode differs from all other modes in that it can coexist with other modes. The action taken when the PREV or NEXT Keys are pressed, however, always applies to level selection as long as the Level Select Mode is enabled (refer to Level Select Mode description for further details).

ADDR - Displays the panel address in the Preset Display while the key is held down.

PROT/LOCK Key:

PROT - Protects the destination currently being controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination currently being controlled by the panel is Protected.

LOCK - Locks the destination currently being controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination currently being controlled by the panel is Locked.

DEST Key:

DEST - If you are already in Destination Select Mode, use to exit and return to Direct Take Mode. Otherwise, enters the Destination Select Mode.

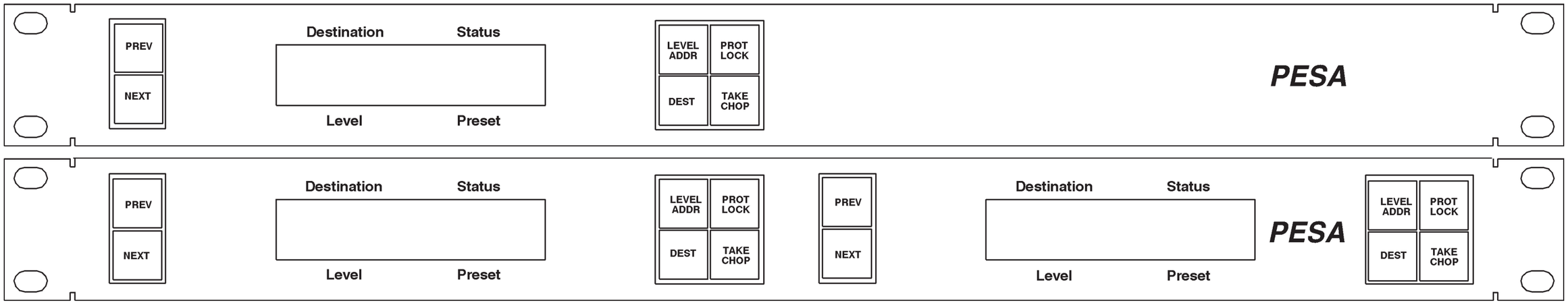
TAKE/CHOP Key:

TAKE - Toggles Preset and On-Line Sources: 1) sends switcher change request to Take Preset Source to the currently controlled destination on the levels selected, 2) saves the current On-Line Source to the Preset on the levels selected. Since Take actually toggles the On-Line and Preset Sources, pressing Take again returns the On-Line Status to its previous state.

CHOP - Continuously toggles Preset and On-Line Sources once every 1/2 second (refer to preceding Take description).

PREV Key: Scrolls Level selection to previous level controllable by the panel or All Levs for all levels. Levels are presented in the order of priority: level 1, level 2, etc. and "All Levs" representing all levels. **NOTE:** PREV Key scrolls backwards through the Levels List.

NEXT Key: Scrolls Level selection to next level controllable by the panel or All Levs for all levels. Levels are presented in the order of priority: level 1, level 2, etc. and "All Levs" representing all levels. IMPORTANT: The Level Select Mode differs from all other modes in that it can coexist with other modes. The action taken when the PREV or NEXT Key is turned, however, always applies to level selection as long as the Level Select Mode is enabled.



Front View RCP-LCXY Single and Dual

Destination Select Mode:

Previous/Next Keys - In this mode, the Previous/Next Keys allow you to scroll forwards and backwards through the list of valid destinations. If Level Selection is activated with the Level Key, the function of these keys changes. During Level Selection, these keys allow the user to scroll forwards and backwards through the list of valid levels to select a single level or Follow. Once Level Selection is deactivated, these keys revert to their original function of scrolling through the list of valid destinations.

PROT/LOCK Key:

PROT - Protects the destination controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination controlled by the panel is Protected.

LOCK - Locks the destination controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination controlled by the panel is Locked.

LEVEL/ADDR Key:

LEVEL - Toggles the Enable/Disable of Level Selection. Illuminates the LEVEL/ADDR LED. Displays the currently selected level in the Level LCD display.

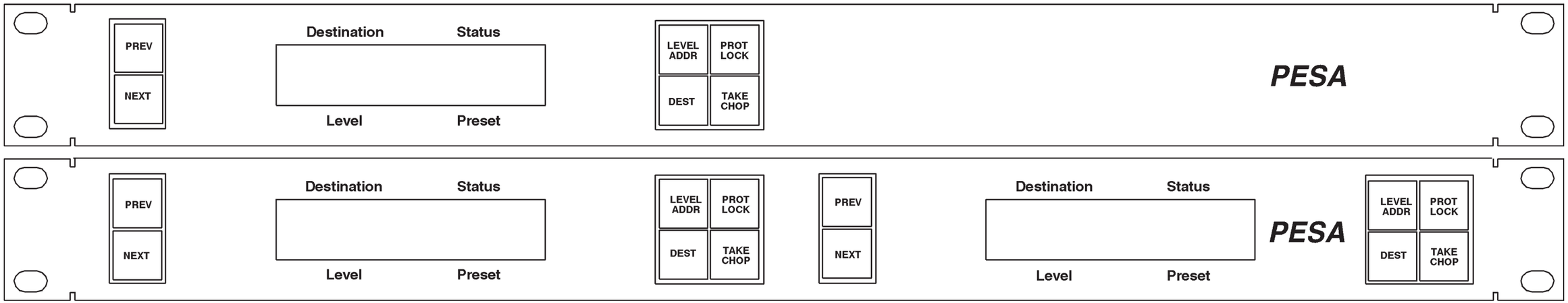
ADDR - Displays the panel address in the Level LCD display while key is held down. The address displayed will be of the form "ADDR = aaa(bb)", where aaa is the address and bb is an internal decode number.

DEST Key: The DEST Key deactivates Destination Select Mode. The DEST Key LED is turned off and the panel is placed in Direct Take Mode.

TAKE/CHOP Key:

TAKE - Switches the source displayed in the Preset Register to the destination currently controlled by the panel. The new source is displayed in the Source Register and the old source is displayed in the Preset Register on the LCD. If there is no valid preset source selected, no action is taken.

CHOP - Places the panel in Chop Mode. The sources displayed in the Preset and Source Registers are alternately switched to the current destination every half second. If there is no valid Preset Source selected, no action is taken.



Front View RCP-LCXY Single and Dual

Chop Mode:

PREV/NEXT Keys: The Previous and Next Keys have no function in Chop mode.

PROT/LOCK Key:

PROT - Protects the destination controlled by the panel. Any switch request attempting to affect this destination made at any location other than this panel will be disallowed. PROT/LOCK LED is illuminated to show the destination controlled by the panel is Protected.

LOCK - Locks the destination controlled by the panel. Any switch request attempting to affect this destination will be disallowed. PROT/LOCK LED blinks to show the destination controlled by the panel is Locked.

NOTE: PROT/LOCK deactivates Chop Mode and returns the panel to Preset Select Mode.

LEVEL/ADDR Key:

LEVEL - Toggles the Enable/Disable of Level Selection. Illuminates the LEVEL/ADDR Key LED. Displays the currently selected level in the Level LCD display.

ADDR - Displays the panel address in the Level LCD display while key is held down. The address displayed will be of the form "ADDR = aaa(bb)", where aaa is the address and bb is an internal decode number.

NOTE: LEVEL/ADDR deactivates Chop Mode and returns the panel to Preset Select Mode.

DEST Key: The DEST Key activates Destination Select Mode. When entering Destination Select Mode, the DEST LED is illuminated and any prior mode is deactivated. When leaving Chop Mode, the Preset and Source Registers are returned to their original state prior to entering Chop mode.

TAKE/CHOP Key:

TAKE - Deactivates Chop Mode and restores the Preset and Source Registers to their original state prior to entering Chop Mode. The panel's mode prior to entering Chop is then activated. No switch is taken.

CHOP - Deactivates Chop Mode and restores the Preset and Source Registers to their original state prior to entering Chop Mode. The panel's mode prior to entering Chop is then activated. No switch is taken.

4.1 Introduction

The RCP-LCXY Single Control Panel's internal circuitry consists of one printed circuit board, the LCXY Switchcard. The RCP-LCXY Dual Control Panel consists of two LCXY Switchcards operating independently. The LCXY Switchcard's electronic circuits contain all components necessary for the operation of the Control Panel including a microprocessor that controls the panel's operations and the panel's communications with the control system. The following is a detailed description of the LCXY Switchcard Assembly.

4.2 LCXY Switchcard Assembly

The LCXY Switchcard Assembly contains all circuitry necessary to communicate with the system controller, to scan six pushbuttons, to drive six LEDs, and to operate a LCD display. The circuitry on the Switchcard Assembly may be divided into the following sections: Power Supply, Microprocessor, Clock, Reset, LED Driver, Keyboard Scan, LCD Display, and RS-485 Communications. The following paragraphs explain each section in detail.

Power Supply

The power supply circuit on the display board consists of a 7805 +5V regulator and filter capacitors. Unregulated DC voltage (7.5 to 9 VDC) is supplied by an external power supply via J1. The voltage regulator U2 reduces the voltage to 5.0 VDC. The output voltage (+5VDC) from U2 provides power to U1, U3-U8, and all related circuits. Unregulated DC voltage provides the VLED for the LCD display. C1 and C8 provide filtering for the input of the regulator. Bypass capacitors (.1 uF) are scattered about the board to provide power supply bypassing for individual chips.

4.2 LCXY Switchcard Assembly Continued:

Microprocessor

The heart of the display board is the Motorola 68HC11 microprocessor (U7). This IC contains the microprocessor and peripheral circuitry used to operate the panel. In addition, the 68HC11 contains a PROM containing the software used to operate the panel. The 68HC11 is operated in single chip mode, where the address and data busses are never brought external to the microprocessor. In this mode, most of the pins on the IC package are used to provide discrete inputs and/or outputs between the microprocessor and the peripheral circuitry. These pins are under software control of the microprocessor.

Clock

The master system clock is provided by oscillator U8 pin 8. SYSCLK is available to the processor (U7 pin 7). The frequency of SYSCLK is 7.3728 MHz. This value was chosen to provide an appropriate frequency for the baud rate generator inside the 68HC11. The 68HC11 internally divides SYSCLK by four to derive the bus operating frequency. The frequency of E clock (bus operating frequency) is 1.8432 MHz (SYSCLK/4).

Reset

As with all microprocessors, the 68HC11 requires initialization during power-up. The 68HC11 requires that the RESET pin (U7 pin 17) be held low for 4064 cycles of E clock (2.2 mS @ 1.8432 MHz E clock). In addition the RESET pin must be held low while VDD is below legal limits to protect internal EEPROM register contents. A Maxim MAX690 chip (U6) performs the reset function for the 68HC11. The MAX690 monitors the supply voltage and asserts RESET (U7 pin 17) whenever VCC falls below 4.5 VDC. The RESET signal is guaranteed to be asserted for a minimum of 50 mS after VCC rises above 4.75 VDC. This is more than adequate to meet the 2.2 mS requirement of the 68HC11.

4.2 LCXY Switchcard Assembly Continued:

LED Driver

The LCXY Switchcard contains circuitry capable of lighting up to eight LEDs. The LCXY Switchcard uses only six of these LEDs, one per pushbutton. U4 is used to latch the LED state. The microprocessor places the appropriate logic values on D0-D7 and then pulses LED_CLK. Data is latched into U4 on the rising edge of LED_CLK. Latching a high will cause the LED to be reversed biased and thus will not be illuminated. Latching a low causes the LED to be forward biased, causing the LED to conduct and to be illuminated.

Keyboard Scan

The LCXY Switchcard contains circuitry capable of scanning up to eight pushbuttons. The scan circuit is arranged as an one row by eight column array. While the circuitry is capable of serving 8 pushbuttons, LCXY only uses six of these pushbuttons. To scan the keyboard, the CPU asserts KBD_SEL (low). When KBD_SEL is asserted, U5 places the state of switches S1-S6 on D0-D5. One side of each switch is connected to ground. The other side is pulled to +5V through RP1, and is connected to U5. If a switch is pressed, the corresponding input of U5 is connected to ground through the switch. If the switch is not pressed, then the input to U5 is pulled high through RP1. Thus, by reading U5 the CPU can determine the state of pushbuttons S1-S6 by looking at the state of data lines D0-D7. If S1 is pressed, then D0 will be low. Likewise, if S2 is pressed, D1 will be low.

LCD Display

The input signals to the LCD display are provide by U7. U7, the microprocessor, places a eight bit ASCII character on signal lines D0-D7 (U1 pins 7-14). U7 also drives the DSP_RS, register select, line. When DSP_RS is in the high logic state U1, the LCD display, is receiving commands. When DSP_RS is in the low logic state U1 is interpreting data. U7 provides the DSP_RW , display read/write signal to U1 pin 5. As DSP_RW pulses U1 reads the data on D0-D7 and writes the data to the selected display. As a final step, U7 pulses DSP_SEL (U1 pin 6) low to latch the data on DO-D7 into the display chip. The LCD chip contains the decoding and drive circuitry necessary to translate the ASCII character code into the segment drive signals. Resistor R1 and variable resistor R2 provide a means to adjust the contrast of the LCD display.

4.2 LCXY Switchcard Assembly Continued:

RS-485 Communications

Communication between the panel and the system controller is accomplished by the 68HC11 internal Serial Communication Interface (SCI). The SCI is an asynchronous receiver/transmitter, sometimes referred to as a UART. The RS-485 standard is used for the electrical interface between panels and the system controller. A 75ALS176 (U9) chip is used to convert between RS-485 and the levels required by the SCI. Transmit data (TXD) is presented by the SCI on U7 pin 21. This signal drives the input to the RS-485 transceiver on U9 pin 4. Data received from the system controller is converted to the appropriate levels by the RS-485 transceiver and presented on U9 pin 1. This received data (RXD) signal is then fed to the SCI receiver at U7 pin 20. Since the RS-485 interface requires the transmitter to be tri-stated when not in use, a third signal is required to enable/disable the RS-485 transmitter. The processor provides the TX_ENABLE signal under software control at U7 pin 25. This signal is connected to the RS-485 transceiver at U9 pin 3. When TX_ENABLE is asserted (high), U9 drives the RS-485 bus (U9 pins 6 and 7 to J2 pins 1 and 3). When TX_ENABLE is negated (low), U9 ceases driving the bus and allows other devices to drive the bus. During reset, the TX_ENABLE signal from the processor is initialized to an input and is not driven to a particular state. A pull-down resistor R6 has been added to ensure that U9 does not drive the RS-485 bus during power-up or other reset conditions. A shield connection is provided for the RS-485 bus on J2 pin 2. The shield is connected to ground through B1 (formerly R5).

5.1 General

The RCP-LCXY Control Panel is a solid state electro-mechanical device designed to give long, trouble free service with minimum maintenance requirements. If problems do occur, follow the troubleshooting procedure provided. If additional technical assistance is required, refer to the General Assistance and Service information in the front of the manual.

5.2 Preventive Maintenance

There is little need for preventive maintenance on the RCP-LCXY other than the normal care which should be given to any quality electronic equipment.

5.3 Test Equipment

The test equipment recommended for servicing the RCP-LCXY is listed below. Equivalent test equipment may be used.

EQUIPMENT	FUNCTION
Oscilloscope - 20 MHz or higher	Waveform Monitoring and Tracing
VOM - 20,000 ohm per volt or higher	Voltage and Resistance Measurements

5.4 Corrective Maintenance

The following paragraphs provide information to assist the servicing technician in maintenance of the RCP-LCXY. The functional description (Section 4) contains board/circuit level information to help identifying specific problems.

Factory Repair Service

If desired, equipment or boards may be returned to the factory (transportation prepaid) for repair. Refer to the General Assistance and Service information sheet in the front of this manual.

5.4 Corrective Maintenance Continued:

Factory Repair Service Continued:

⇒ Pack the equipment securely and label with the correct address. Proper packaging saves money. The small amount of extra care and time it takes to cushion a part or unit properly may prevent costly damage while in transit. Make certain that the address is both legible and complete. Failure to do so often results in delay or even loss.

Adjustment/Alignment

The RCP-LCXY provides an adjustment for LCD contrast on the rear of the panel. Adjust per your preference.

Troubleshooting

Troubleshooting an RCP-LCXY Control Panel requires the routing switcher system to be used as a test fixture. The panel does not function except as part of the system. The only troubleshooting which can be accomplished without opening the control panel is to check input power (from plug-in power module).

To open the control panel for troubleshooting, remove the front cover and disassemble the unit as far as required to gain access to the component side of the circuit boards. Place the disassembled panel on a nonconducting surface and arrange the parts so the unit can be operated. You must be able to operate the pushbuttons and observe the resulting status indicators. You must also have sufficient access to the boards to measure voltage or observe waveforms.

Procedure: Put the RCP-LCXY through the operating sequence described in the operation section. Refer to Section 3.

5.4 Corrective Maintenance Continued:

Troubleshooting Continued:

If the panel is nonresponsive, there may be a power problem or the microprocessor is not operating.

1. Refer to the Power discussion in Section 4. Refer to the Switchcard Assembly schematic in Section 6 if it is necessary to make voltage checks at the chip or component level.

2. If power is functioning properly and the microprocessor is not operating, refer to the Microprocessor functional description in Section 4. The microprocessor requires a clock, a power-up reset, communications from the system controller.

For partial failures:

1. Pushbutton switches fail to initiate desired operation. Refer to the Keyboard Scan functional description in Section 4.

2. Control indicators fail to light. Refer to the LED Driver discussion in the functional description section.

⇒ If a source input fails to function it may be a blocked input. Check the system configuration at the controller.

5.5 Changing the Legend in a Switch Cap Assembly

The RCP-LCXY Single and Dual Control Panels are equipped with legendable switch caps. The customer may change the legends per customer needs. To change the legend follow the steps listed below and refer to Figure 5-1:

1. Carefully remove the Legend Clear Cap from Switch Base by snapping it loose either with your fingers or a pair of pliers. If you use a pair of pliers be careful not to mar the Legend Clear Cap.

3. Next slide the White Legend Retaining Cap out of the Legend Clear Cap. Once the Legend Retaining Cap is removed, the Legend can be removed and replaced.

4. To reassemble the Switch Cap Assembly after the Legend is replaced, slide the Legend Retaining Cap back into the Legend Clear Cap.

5. Next snap the Legend Clear Cap onto the Switch Base. Make sure the Legend Clear Cap is firmly attached to the Switch Base.

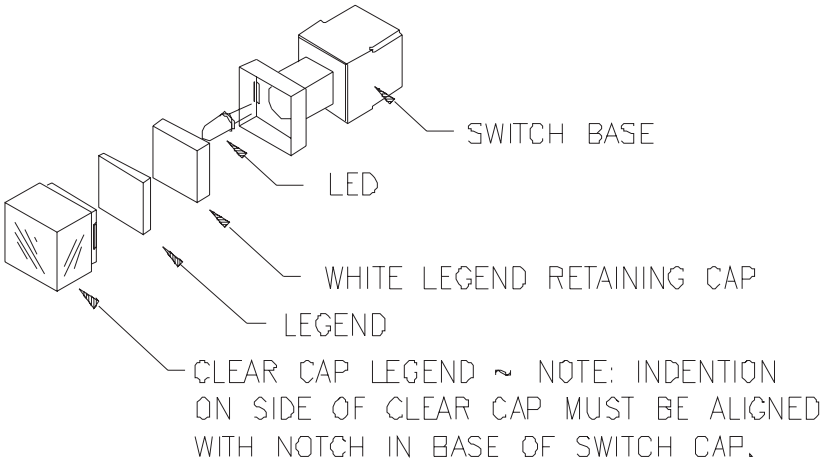
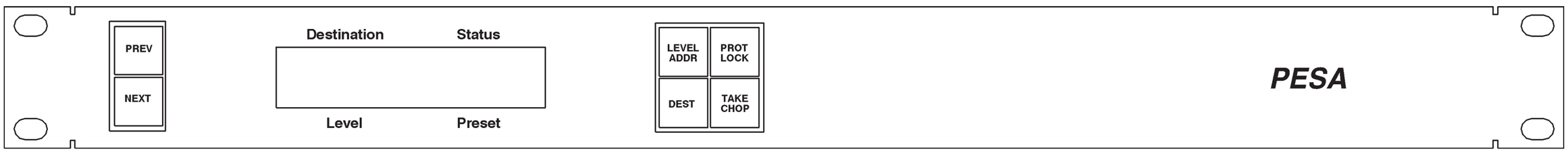


Figure 5-1 Switch Cap Assembly

6.1 Schematics

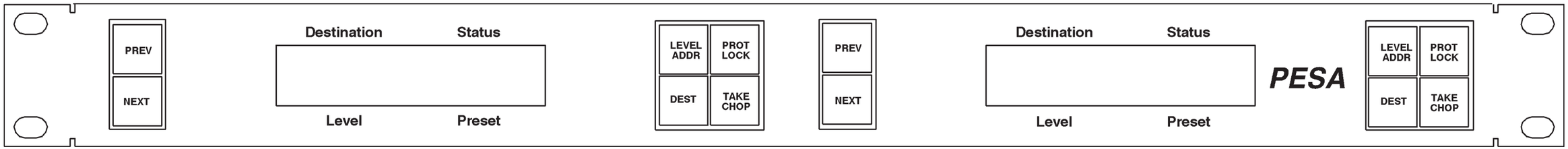
General

This section contains the schematic diagrams and parts location diagrams for the RCP-LCXY Control Panel. Refer to this section when troubleshooting the equipment or replacing defective parts.



RCP-LCXY Single Front View

RCP-LCXY Single Rear View

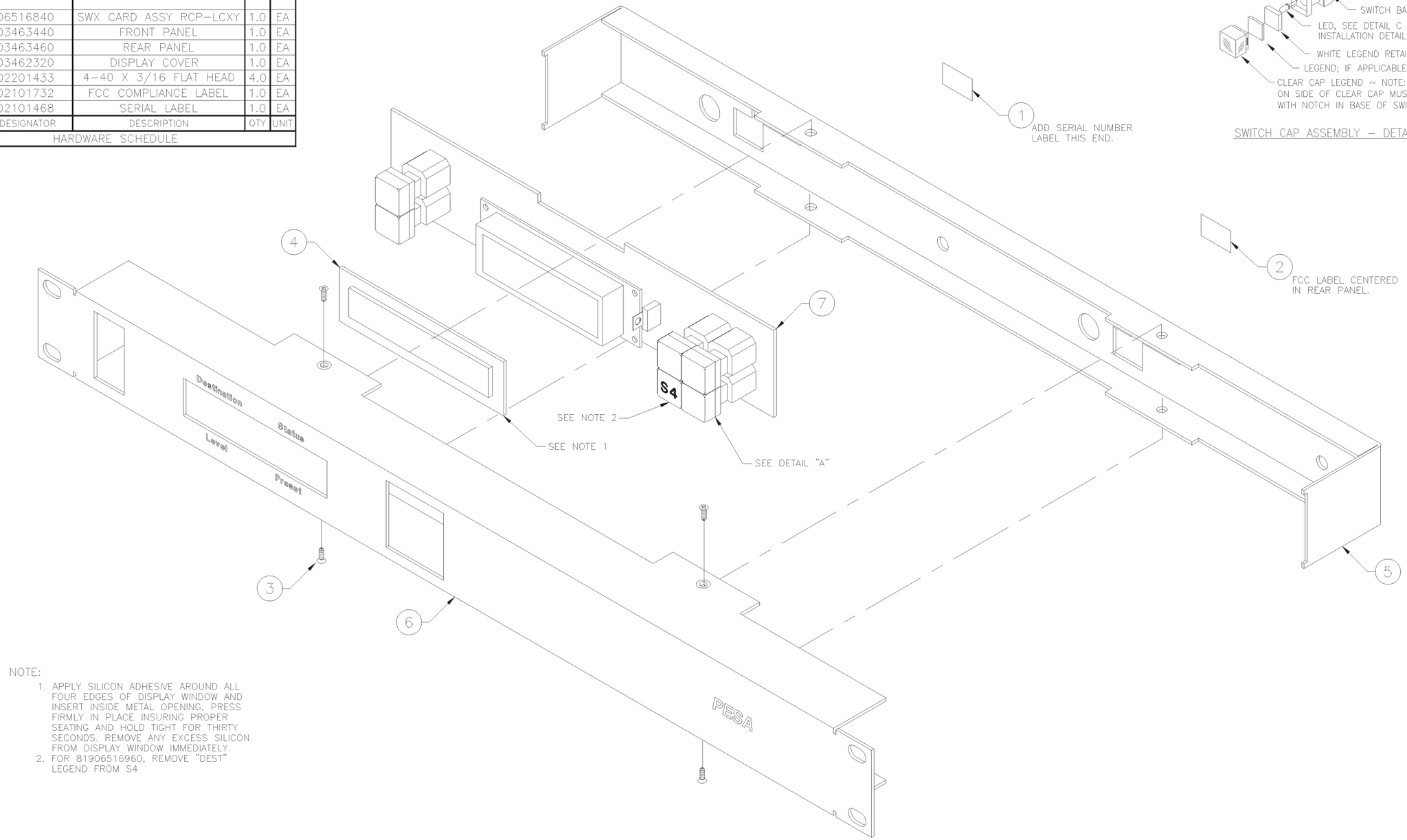


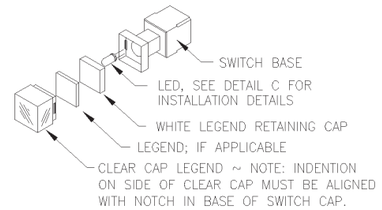
RCP-LCXY Dual Front View

RCP-LCXY Dual Rear View

NO	REF. DESIGNATOR	DESCRIPTION	QTY	UNIT
7	81906516840	SWX CARD ASSY RCP-LCXY	1.0	EA
6	81903463440	FRONT PANEL	1.0	EA
5	81903463460	REAR PANEL	1.0	EA
4	81903462320	DISPLAY COVER	1.0	EA
3	81902201433	4-40 X 3/16 FLAT HEAD	4.0	EA
2	81902101732	FCC COMPLIANCE LABEL	1.0	EA
1	81902101468	SERIAL LABEL	1.0	EA

HARDWARE SCHEDULE





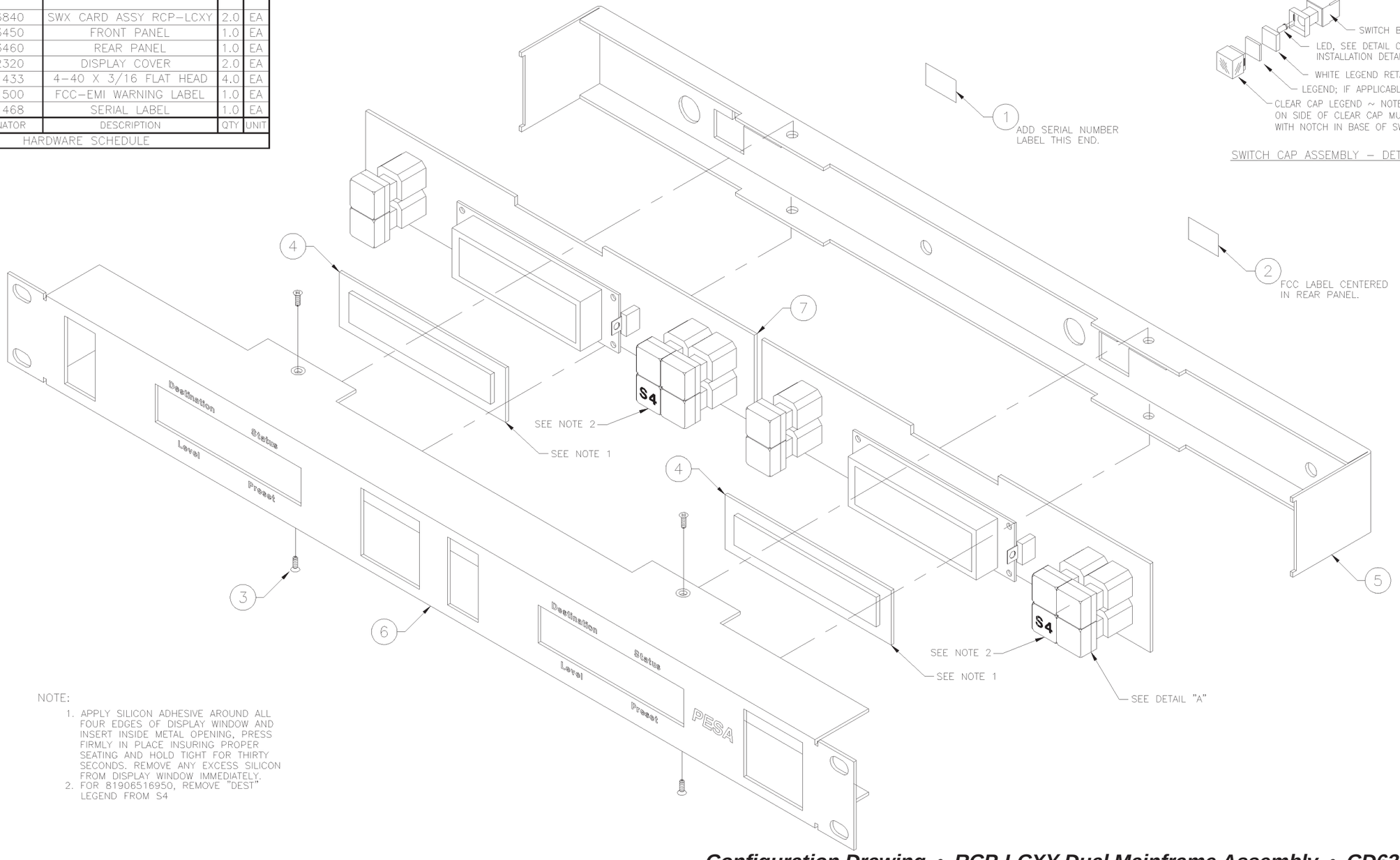
SWITCH CAP ASSEMBLY – DETAIL "A"

NOTE:

1. APPLY SILICON ADHESIVE AROUND ALL FOUR EDGES OF DISPLAY WINDOW AND INSERT INSIDE METAL OPENING, PRESS FIRMLY IN PLACE INSURING PROPER SEATING AND HOLD TIGHT FOR THIRTY SECONDS. REMOVE ANY EXCESS SILICON FROM DISPLAY WINDOW IMMEDIATELY.
2. FOR 81906516960, REMOVE "DEST" LEGEND FROM S4

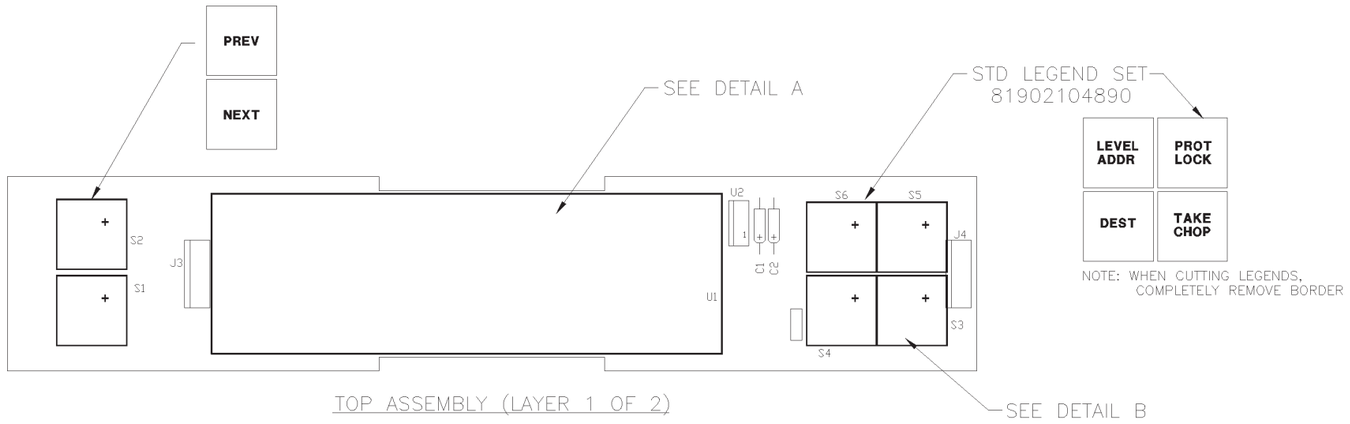
NO	REF. DESIGNATOR	DESCRIPTION	QTY	UNIT
7	81906516840	SWX CARD ASSY RCP-LCXY	2.0	EA
6	81903463450	FRONT PANEL	1.0	EA
5	81903463460	REAR PANEL	1.0	EA
4	81903462320	DISPLAY COVER	2.0	EA
3	81902201433	4-40 X 3/16 FLAT HEAD	4.0	EA
2	81902101500	FCC-EMI WARNING LABEL	1.0	EA
1	81902101468	SERIAL LABEL	1.0	EA

HARDWARE SCHEDULE

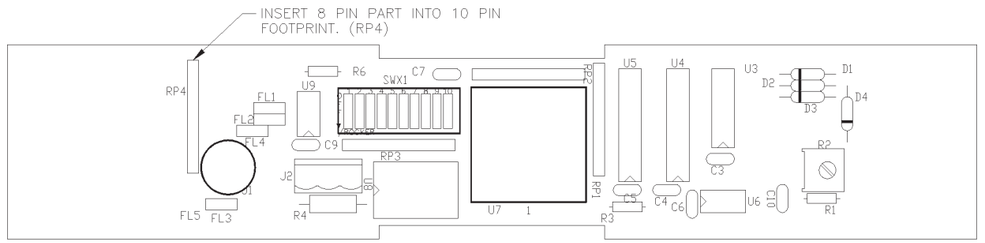


NOTE:

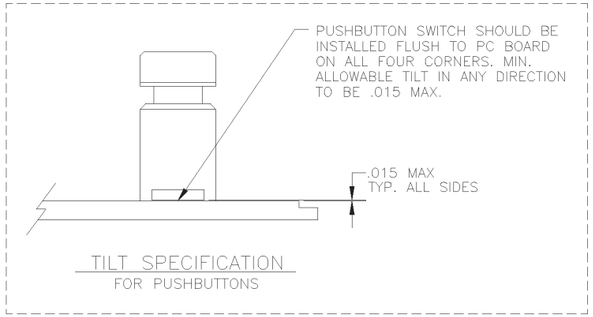
1. APPLY SILICON ADHESIVE AROUND ALL FOUR EDGES OF DISPLAY WINDOW AND INSERT INSIDE METAL OPENING, PRESS FIRMLY IN PLACE INSURING PROPER SEATING AND HOLD TIGHT FOR THIRTY SECONDS. REMOVE ANY EXCESS SILICON FROM DISPLAY WINDOW IMMEDIATELY.
2. FOR 81906516950, REMOVE "DEST" LEGEND FROM S4



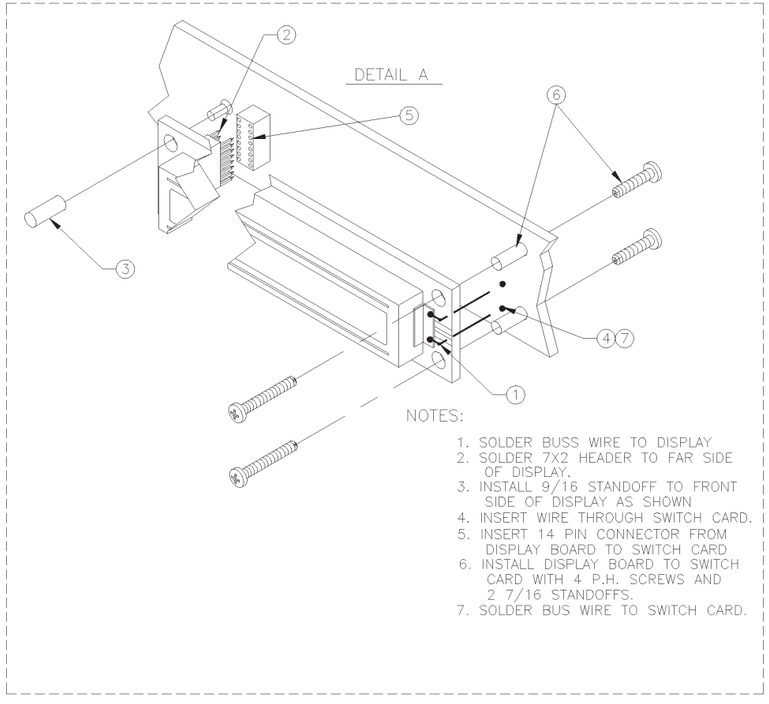
TOP ASSEMBLY (LAYER 1 OF 2)

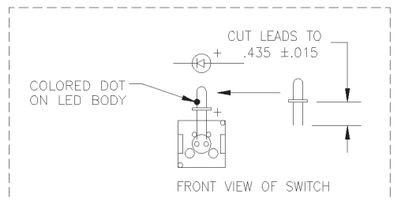


BOTTOM ASSEMBLY (LAYER 2 OF 2)

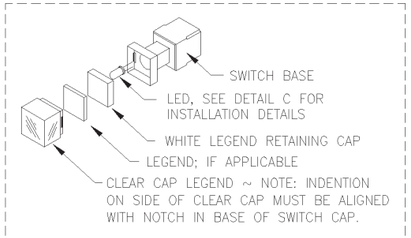


TILT SPECIFICATION
FOR PUSHBUTTONS

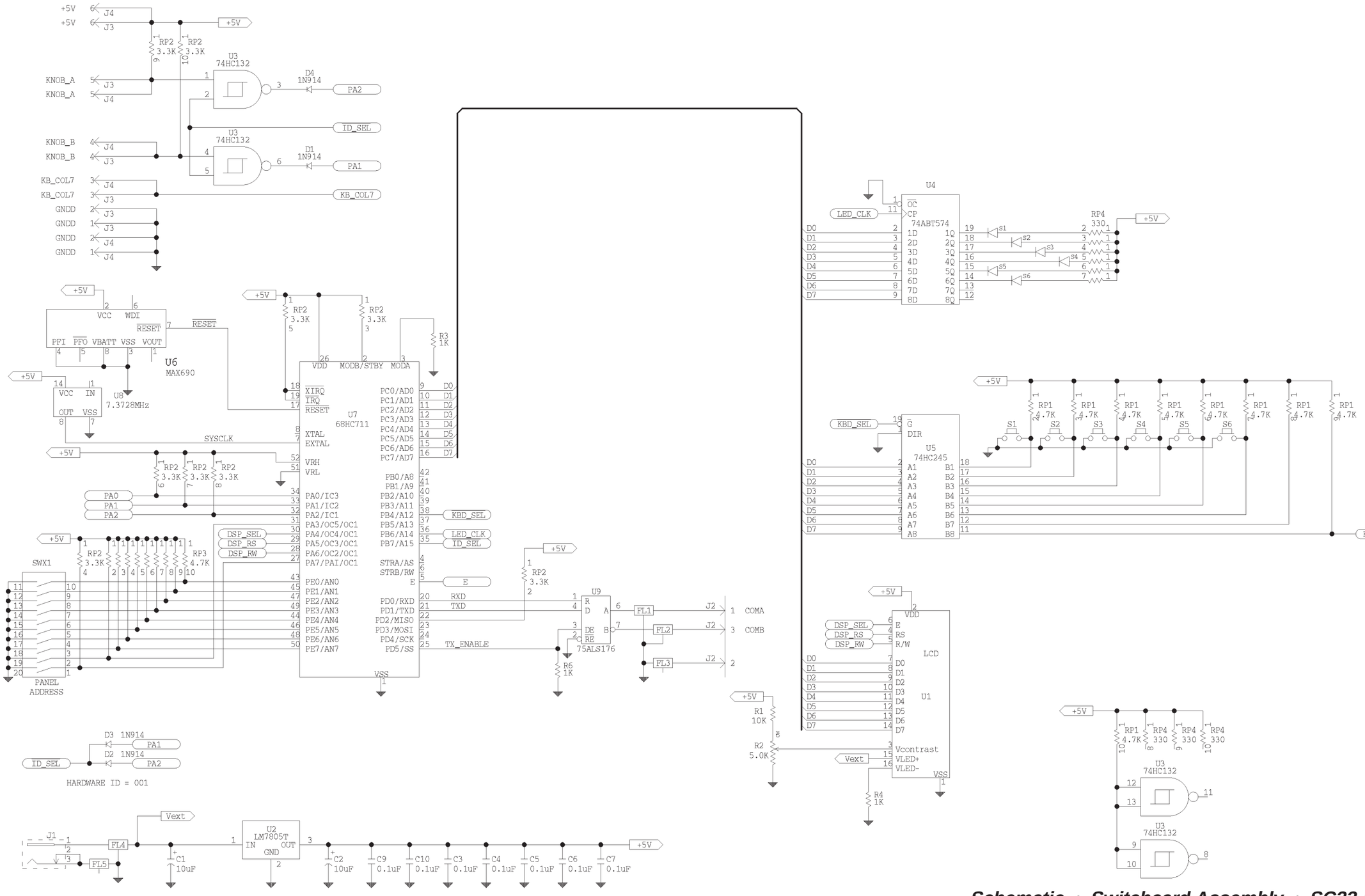




LED INSTALLATION – DETAIL C



SWITCH CAP ASSEMBLY – DETAIL B


+5V
J4
J3
RP2 3.3K
U3 74HC132
D4 1N914
PA2
ID_SEL
D1 1N914
PA1
KB_COL7
GNDD
U4
74ABT574
LED_CLK
RP4 330
S1
S2
S3
S4
S5
S6
U5 74HC245
KBD_SEL
RP1 4.7K
U6 MAX690
RESET
U8 7.3728MHz
SYSCLK
U7 68HC711
XIRQ
IRQ
XTAL
EXTAL
VRH
VRL
PA0
PA1
PA2
R3 1K
SWX1
PANEL ADDRESS
DSP_SEL
DSP_RS
DSP_RW
RP3 4.7K
U9
75ALS176
RXD
TXD
TX_ENABLE
R6 1K
FL1
FL2
FL3
J2
COMA
COMB
LCD
U1
Vcontrast
VLED+
VLED-
R1 10K
R2 5.0K
R4 1K
Vext
D3 1N914
D2 1N914
HARDWARE ID = 001
J1
FL4
FL5
U2 LM7805T
C1 10uF
C2 10uF
C9 0.1uF
C10 0.1uF
C3 0.1uF
C4 0.1uF
C5 0.1uF
C6 0.1uF
C7 0.1uF

7.1 Parts List

General

The Parts List in this section have been grouped according to each assembly associated with the RCP-LCXY. Refer to each list by name of card, board, or section of the equipment requiring replacement parts.

RCP-LCXY Single Mainframe - 81906516940

81902101468	LABEL EQUIP SERIALIZATION	1	EA
81902101732	LABEL FCC PART 15 SUB-CLASS	1	EA
81902201433	SCREW 4-40 X 3/16 FLAT HEAD PHIL	4	EA
81902907800	CONN 3-POS W/STRAIN RELIEF	1	EA
81903462320	DISPLAY COVER 20X2 X/Y	1	EA
81903463440	FRONT PANEL SINGLE RCP-LCXY	1	EA
81903463460	REAR PANEL RCP-LCXY	1	EA
81906516840	RCP-LCXY ASSEMBLY	1	EA
PK65-1694	DOC RCP-LCXY T.B. SINGLE	REF	

RCP-LCXY Dual Mainframe - 81906516970

81902101468	LABEL EQUIP SERIALIZATION	1	EA
81902101500	LABEL WARNING FCC-EMI	1	EA
81902201433	SCREW 4-40 X 3/16 FLAT HEAD PHIL	4	EA
81902907800	CONN 3 POS W/STRAIN RELIEF	2	EA
81903462320	DISPLAY COVER 20X2 X/Y	2	EA
81903463450	FRONT PANEL DUAL RCP-LCXY	1	EA
81903463460	REAR PANEL RCP-LCXY	1	EA
81906516840	RCP-LCXY CARD ASSEMBLY	2	EA
PK65-1697	DOC RCP-LCXY T.B. DUAL	REF	

LCXY Switchcard Assembly - 81906516840

81900200668	RESISTOR 1K 5% 1/4W	R3 R6	2	EA
81900200908	RESISTOR 10K 5% 1/4W	R1	1	EA
81900300393	RESISTOR 75 OHM 5% 1/2W	R4	1	EA
81900500125	POT 5K	R2	1	EA
81900600958	SIP 4.7K 10-PIN 9-RESISTOR	RP1 RP2 RP3	3	EA
81900600966	SIP 180 OHM	RP4	1	EA
81900700055	CAP 0.1MF CERAMIC RADIAL	C4-C10	7	EA
81900900309	CAP 4.7PF 20V TANT AXIAL	C1 C2	2	EA
81901500017	DIODE 1N914 500MW	D2 D3	2	EA
81901601187	REG MC7805C +5V 1A TO-220	U2	1	EA
81901604314	IC 74HC245 CMOS BUSTRANSV	U5	1	EA
81901606061	IC MAX690CPA POWER SUP MON	U6	1	EA
81901606830	IC 7.3728MHZ OSCILLATOR	U8	1	EA
81901606880	IC 74ALS176 RS485 TRANCV	U9	1	EA
81901606910	IC 74ATB574 OCTAL LATCH	U4	1	EA
81902000546	STANDOFF 7/16 X 4-40 ROUND		2	EA
81902001122	STANDOFF 9/16 X 4-40 ROUND		1	EA
81902101930	LENS ASSY BKC-6	S1-S6	6	EA
81902104890	LEGEND SET CONTROL PANEL		1	EA
81902202647	SCREW 4-40 X ¼ SIMM PAN HEAD		5	EA
81902412510	PCB RCP-LCXY		1	EA
81902600543	SWITCH 10-POS DIP PC MOUNT	SWX1	1	EA
81902600584	SWITCH PB T-5K-M-NO	S1-S6	6	EA
81902800507	WIRE 22AWG BUSS		2	IN
81902905991	SOCKET 52-PIN PLCC PC MOUNT	REF: U7	1	EA
81902906353	CONN 3-POS MALE POLAR STAR	J2	1	EA
81902907410	CONN HEADER 7X2 UNSHROUNDED	REF: U1	1	EA
81902907450	CONN RECEPTACLE 7X2	REF: U1	1	EA
81902907460	CONN POWER JACK PCB MOUNT	J1	1	EA
81903200301	LED YELLOW U-BRITE	S1-S6	6	EA
81903200590	DISPLAY 20 CHAR 2-ROW LCD	U1	1	EA
81903900740	FILTER EMI SUPPRESSOR	FL1-FL5	5	EA
81906516860	SOFT ASSY RCP-STAT PANEL		1	EA
CA25-1251	DOC ASSY RCP-LCXY		REF	
DD52-1251	DOC ASSY RCP-LCXY		REF	
SC33-1251	DOC ASSY RCP-LCXY		REF	