Doc. 6001073
Rev B

INSTALLATION INSTRUCTIONS FOR THE "LP" MODEL OVATION SYSTEM

Sentexsystems

IMPORTANT NOTICE

Make sure you know the local telephone tariff arrangements before installing this system. In some areas, the telephone company assumes responsibility for the phone lines up to each resident's apartment. In that case, either the telephone company will assume responsibility for the installation of the RJ71C jack to the telephone lines (as is normally the case), an additional pair of wires will have to be run to and from each apartment, or the building owner will have to assume responsibility for the phone lines between the Ovation and their apartments.

The Ovation system contains static sensitive parts. To avoid damage to the static sensitive parts, ground the system and yourself while handling the board(s). Also, do not disconnect or reconnect anything from the system while the power is connected to any element of the system.

PLEASE NOTE: The locks on most Sentex System's cabinets are commonly keyed. This lock can be easily replaced. If you wish to have the lock on your system individually keyed, contact a locksmith.

TABLE OF CONTENTS

This document is divided into eleven sections and seven appendices as follows:

IMPORTANT: The Sentex Systems warranty on this system is conditioned upon Sentex Systems being paid in full for this equipment. This warranty will not be honored until such payment is received by Sentex Systems.

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1 - SYSTEM OVERVIEW

The Ovation system is a telephone entry system that connects directly to all of the resident telephone lines in your building. Thus, residents are called without the system having to dial through the central office. As a result, the Ovation System does not generate telephone charges, either on a monthly or per call basis.

The system is made up of two basic components and an optional third component:

1. **The Ovation Controller** controls the switching of the resident's telephone lines as well as door control and communications with the visitor. The "LP" (Lobby Phone) series is housed in a plain NEMA-type enclosure which is mounted in the telephone room or utility closet. In order for a visitor to call the resident, one of two features is installed on the auxiliary port of the controller board; a tone dial telephone or a Vandal-Proof Lobby Panel (option). The tone dial telephone is installed in an indoor, lobby area and is used for calling a resident in the building or for gaining entry to the building by dialing entry codes. The Vandal-Proof Lobby Panel is a vandal-resistant door unit which is installed next to the entrance of the building or complex (see number 3 below for more details).

   The controller for each of these systems is then connected to a chain of Line Interface Boards, each of which is connected to as many as twelve resident telephone lines.

2. **The Line Interface Boards (LIBs)** allow each resident's telephone line to be connected to the Ovation Controller when a visitor wants to contact that resident. At all other times, the resident's telephone line is connected directly to the telephone company. The Line Interface Boards are contained in an LIB housing which is mounted somewhere **inside** the building, usually close to the telephone junction box.

3. **The Vandal-Proof Lobby Panel (option)** is located at the entrance of the building/complex and is used in door control and communications with the visitor. The Vandal-Proof Lobby Panel is enclosed in a vandal-resistant stainless steel enclosure with an audio board and keypad inside. This unit is connected to the auxiliary port on the Ovation controller board.

The Ovation System is capable of carrying out the following functions (several of these functions are optional, so check with your dealer to determine which capabilities have been included in your system):

1. **Visitor entry:** When the visitor presses a "#" key on the controller's keypad followed by the resident's directory code, this switches the selected resident's telephone line to the controller and rings the resident's telephone. The resident can then communicate with the visitor and allow entry at the main door or gate by dialing a "9" on a tone or pulse dialing telephone. If the system is controlling a second door or gate, the resident would dial "5" on a tone or pulse dialing telephone to allow entry at that location.
2. **Call waiting:** If the resident's telephone is in use, he/she will hear 2 short tones to signal that a visitor is attempting to contact him/her. The resident can then dial a "2" and the call in progress will be put on hold and the telephone will be connected to the visitor. If the resident allows entry (as described above), he/she will be automatically switched back to the telephone call in progress.

   The resident can also deny entry and switch back to the call in progress by dialing a "*". Alternatively, if the resident is talking with a visitor and the resident receives a normal phone call, he/she will hear two short tones at which point he/she can put the visitor on hold and switch over to the normal telephone call by dialing a "2" and back again to the visitor by dialing another "2."

3. **Entry codes:** Each resident (and any one else you authorize) can have a unique 4-digit entry code. When this code is entered on the Vandal-Proof Lobby Panel or lobby phone keypad, it will cause the main door or gate to open. The Ovation can have up to 3,000 entry codes programmed into it.

4. **Door monitoring:** The installer can place sensors on the door to monitor the status of any door that the system controls. If the door is forced open or held open 60 seconds after it should have been closed, you can program the system to respond in one of the following ways:

a. **Alarm Call (option)*:** The system will first call a pre-programmed outside telephone line and send a message via modem. If there is no modem at the pre-programmed number, whoever answers will hear a series of tones. Pressing any key on their tone dial telephone will acknowledge someone has received the alarm call and the system will connect the answering phone to the system speaker and microphone or ring the Lobby Phone. If the lobby phone is picked up, the answering phone will be connected to the lobby phone. If there is no answer at the pre-programmed number, the system will call the pre-programmed manager lines in their order of priority and report with tones as described above.

b. **Close a relay:** If relay 2 is programmed as an alarm relay, the system will close that relay to activate a device the installer has connected to it (for example, a siren).

5. **Free exit through a monitored door:** The system can provide free exit through either controlled entry to allow exit without causing a forced open door condition.

6. **Access for the Post Office or Fire Department:** Connections are included in the system to make certain the post office and fire department can gain access to the building without contacting anyone to allow entry. These features will be connected by the installer and the relevant agency.

7. **Direct operator control of doors/gates (option)*:** The controlled doors or gates can be activated from the manager's tone dial or any off site tone dial telephone *(using the door/gate control functions requires that the remote programming option be purchased, you are using the relays on the Ovation controller board, and that your system's configuration is not a multiple Vandal-Proof Lobby Panel installation.)*

8. **Remote Programming (option)*:** The Ovation System can be remotely programmed from the manager's tone dial telephone or from any outside tone dial telephone.

9. **Remote diagnostics (option)*:** The Ovation system can be called using a terminal connected to a Hayes-compatible modem or a personal computer running terminal emulation software. You can then access information concerning the system's operating parameters, the entry codes programmed into the system, the LIB board numbers used by the system, and the customized directory codes programmed into the system.

* These items do not require the installation of a separate reserved telephone line.

2 - BASIC INSTALLATION RULES

In the sections that follow, detailed procedures are discussed for each step required to install an Ovation system. In addition to these specific procedures, there are general rules which will help ensure that your installation is done correctly and efficiently:

1. **GROUND THE SYSTEM.** The Ovation system contains parts which may be damaged by static discharge. This type of damage is not covered by Sentex's warranty. A proper earth ground connected to the controller, LIB housings, and Vandal-Proof Lobby Panel (at the grounding screws shown in Appendices 1, 2, 3, and 4) will significantly reduce the chances of damage or improper operation. The shields in the cables specified for all remote sensors and controls should also be connected to earth ground at the point shown in Appendix 1.

   To be effective, the ground connection must be made by running 12 awg copper wire to a good ground point (e.g., an electrical panel, a metallic cold water pipe that runs into the earth, or a grounding rod at least 10 feet in length that is driven into the earth) within 12 feet of the system. If you cannot meet these requirements, a ground will be of little value. Even if you have a good earth ground, you should still try to discharge any static electricity before handling the circuit boards.

2. **PROVIDE POWER FROM A DEDICATED SOURCE**. The outlet(s) into which you plug the transformers provided, or a DC power supply, should be wired to their own circuit breaker. This will reduce the line noise introduced into system power and minimize the risk of having other equipment interrupt system operation. Additionally, each Ovation controller, LIB housing, Vandal-Proof Lobby Panel, and door strike must have their own individual transformer.

3. **DO NOT OVERLOAD THE TERMINAL BLOCKS**. The terminal blocks used in the Ovation System are unpluggable and the pins are soldered into the boards. To connect your wires, remove the "head" from the correct terminals and open the screws. Insert the wire into the correct opening on the front and tighten the screw until the wire is held snugly. When you have made all connections for a given "head," plug it back onto the pins designated for that terminal block.

   Stranded wire must be between 16 and 24 awg. Solid wire must be between 18 and 24 awg. This is the total thickness measurement, so if you are putting two wires in together, the combined thickness must fall within this range.

4. **ENSURE GOOD CONNECTIONS**. A light tug on the wire will tell you if the connection is secure. When reconnecting system components, make sure all pins are straight on chips, connectors, and terminal block heads.

5. **READ THE MARKINGS CAREFULLY**. The connection points are marked on the boards clearly. Before making any connection, be sure to read the marking and check it against the corresponding figure in these instructions so that you understand the connection you are making.

6. **TRAIN YOUR CUSTOMER**. The Ovation system is very simple to program and use once a short learning period has been completed. However, untrained programmers can cause serious problems for you and themselves. Therefore, you should read the accompanying document entitled "Programming and Use Instructions for all Ovation Systems" carefully and SPEND TIME NOW to train your customer on proper use of the system. It will save you and them a great deal of aggravation and inconvenience later.

3 - GENERAL ARRANGEMENT OF SYSTEM COMPONENTS IN A SAMPLE INSTALLATION

The following section, and the diagrams that accompany it, explain the arrangement of the Ovation system components once a basic installation is completed.

Single Entrance

There are two different models of the single entrance Ovation "LP" system. One model includes a tone dial telephone (TDT) and the other includes a Vandal-Proof Lobby Panel (VPLP). There are three basic components to each system. The TDT model includes the Ovation Controller, the Line Interface Boards, and the tone-dialing telephone. The VPLP model includes an Ovation Controller, Line Interface Boards and a Vandal-Proof Lobby Panel. An short explanation of each component and how it is to be installed into the system is discussed below.

PLEASE NOTE: For the sake of simplicity, the illustration depicting a single entrance installation is of an Ovation "LP" model with a Vandal-Proof Lobby Panel.

1. The Ovation Controller

The controller is located in the telephone room or utility closet. The LIB housing and the Vandal-Proof Lobby Panel are connected to this component of the system. The LIB housing is connected to the Ovation controller by a 4 twisted-pair cable attached to the connector board located in the LIB housing cabinet. The Vandal-Proof Lobby Panel is connected to the Ovation controller by a twisted-pair cable.

2. Line Interface Boards

Each LIB controls up to 12 resident telephone lines (therefore a 55 unit building requires 5 LIBs). Every 10 LIBs (or part thereof) are contained within an LIB housing located by the telephone junction box inside the building. All of the LIBs together are referred to as the LIB stack. The LIBs are connected in a chain using 8 conductor flat telephone cables with an RJ45 connector on each end.

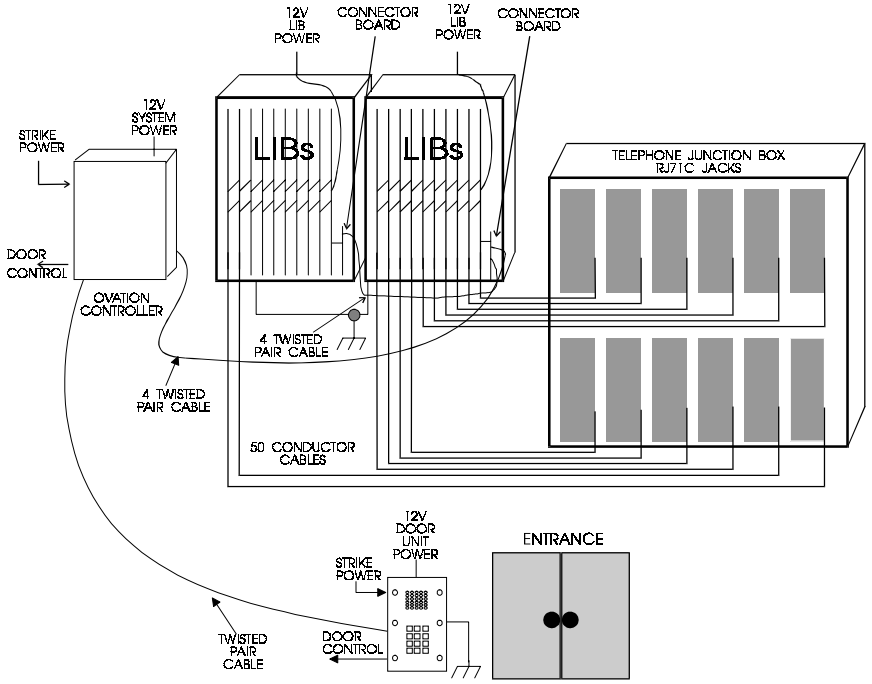
WARNING: The Ovation controller housing and the LIB housing are not weather-proof. Therefore, it is imperative that they are installed inside of a building.

3. Tone-Dialing Telephone (TDT model only - not provided with the system)

In a TDT system, a normal tone-dialing telephone will be used to provide communication between the visitor and the tenant and as an input device for entry codes. It is to be located in a secure, indoor location (such as a lobby area). The telephone is connected to the system by a 2 conductor twisted pair cable connected to area TB9 of the Ovation Controller board.

4. The Vandal-Proof Lobby Panel (VPLP model only)

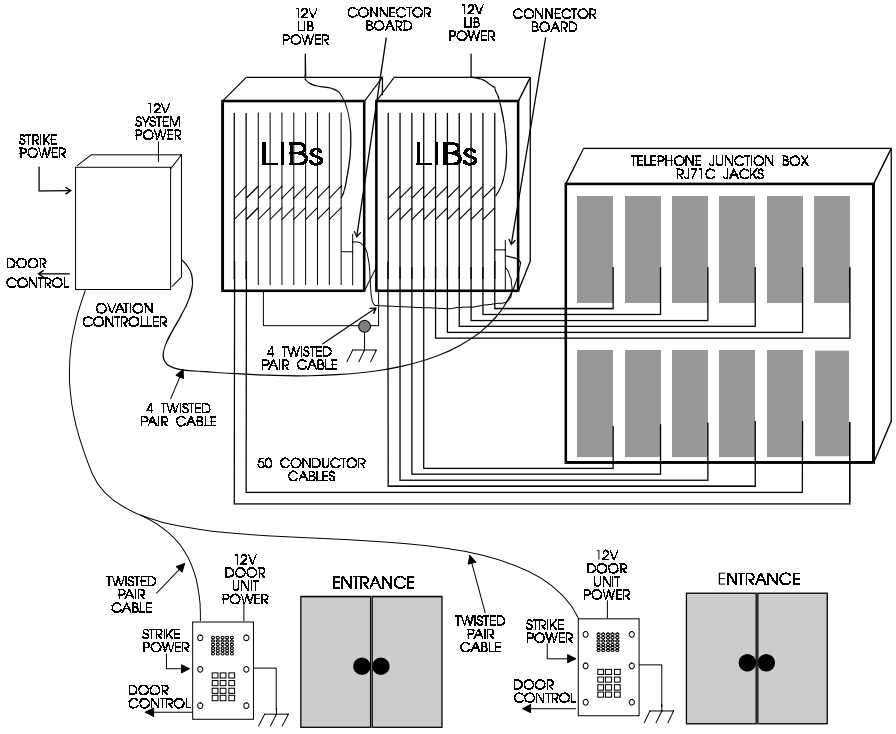
In a VPLP system, the Vandal-Proof Lobby Panel is to be installed next to the entrance which it is going to control (whether it be an indoor or outdoor location). It will be used to provide communication between the tenant and the visitor as well as an input device for entry codes. The Vandal-Proof Lobby Panel is connected to the Ovation Controller by a twisted pair cable between area TB1 on the Lobby Panel board and the auxiliary port on the controller board.



Multiple Entrances

If your Ovation system is an "LP" model with multiple Vandal-Proof Lobby Panels, the installation is similar to the single Vandal-Proof Lobby Panel installation, except you would run the additional Vandal-Proof Lobby Panels in parallel to the controller board.

NOTE: If there is more than one Vandal-Proof Lobby Panel connected to the same controller board, only one Vandal-Proof Lobby Panel can be used at a time. Therefore, if a visitor attempts to use one of the Vandal-Proof Lobby Panels while another one is in use, a busy tone will be emitted from the speaker.



4 - ARRANGING FOR PHONE LINE INSTALLATION

You should have your customer arrange with the telephone company to have RJ71C connecting blocks installed in series with each 12 resident telephone lines. These blocks should be installed within an enclosed secured area which is not subject to weather **and should be labeled clearly by unit or apartment number to ease system programming and installation**. The blocks should be installed close to the LIBs to which they will be connected. **You should specify how and where you want them installed and if possible be present during their installation**. Use the form in Appendix 7 to plan the installation and give this information to the telephone company installer to ensure the RJ71C's are installed properly. See Appendix 6 for additional information on the use and installation of these jacks.

When requesting the installation of the connecting blocks, the telephone company will require the following information:

FCC registration number	**:DS8 USA-18617-OT-E**
Ringer Equivalence Number (REN)	**:0.1B**
Type of Connector Required	**:USOC RJ71C**

5 - PULLING CABLES

The following section will outline the procedures for pulling wires to single and multiple entrance systems, as well as describing the different types of cables required for the installation process.

PLEASE NOTE: If the wires you are pulling for this installation are going to be run through an indoor, weather-proof location, it is acceptable to use unshielded cable. If the wires are going to be run through an outdoor location, we recommend that you use shielded cable. Recommendations for both types of cable are provided where needed.

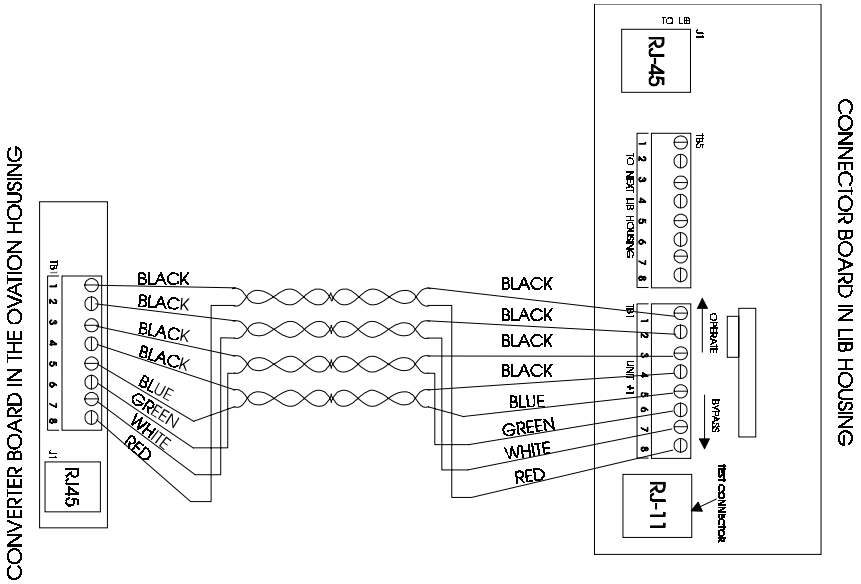
Single Entrance

If you have an "LP" series with a single Vandal-Proof Lobby Panel, the following cabling must be run to the Ovation controller:

a. **A 4 twisted pair cable** (recommended Belden 8757 or equivalent for unshielded installations or Belden 9504 for shielded installations) from the connector board inside the first LIB housing. This cable can be up to 2500 feet in length. The twisted pairs must be identical to those shown in the diagram on the following page.

b. **A 22-24 awg shielded twisted pair copper cable** (recommended Belden #9501) from the Vandal-Proof Lobby Panel. This cable can be up to 5000 feet in length.

IMPORTANT NOTE: This wire must be a 22-24 awg shielded twisted pair copper cable or you will experience problems with your Vandal-Proof Lobby Panel. Also, it is important to note the length of this wire so you can set the "LINE LENGTH" pot to its correct setting (refer to page 20 for this information).



c. **A 2 conductor shielded cable** from the location of the 120 VAC outlet into which you will plug the 12 VAC, 50 VA transformer supplied by Sentex (or a 12 VDC power supply that you provide). See Table 1 below for the wire size required.

DC POWER WIRE SIZE	DISTANCE	AC POWER WIRE SIZE
18 AWG	30' and under	18 AWG
18 AWG	30'-75'	14 AWG
14 AWG	75'-150'	12 AWG
12 AWG	150'-250'	10 AWG
10 AWG	250'-500'	-----

Table 1 - Power Wire Distance and Size

d. **Wiring for additional features** as required. See section 9 for a complete discussion of the cabling required.

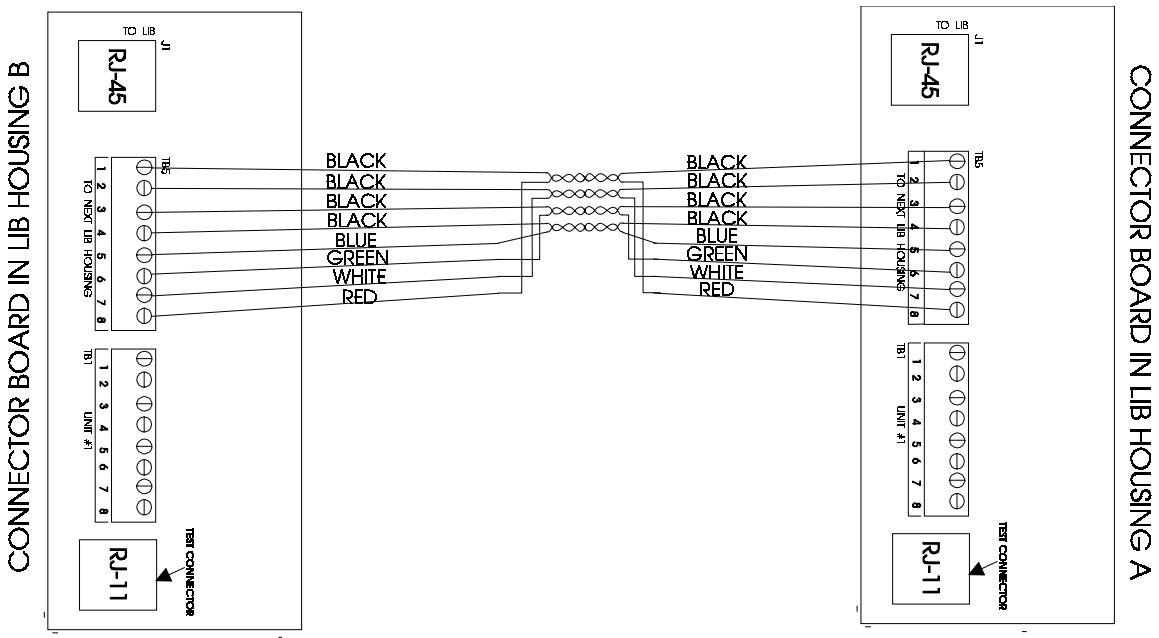
In a single Vandal-Proof Lobby Panel installation, the following cables must be run to the Line Interface Boards:

a. **A 2 conductor shielded cable** from the location of the 120 VAC outlet into which you will plug the 12 VAC, 50 VA transformer supplied by Sentex (or a 12 VDC power supply that you provide). See Table 2 below for the wire size required.

DC POWER WIRE SIZE	DISTANCE	AC POWER WIRE SIZE
18 AWG	30' and under	16 AWG
18 AWG	30'-75'	12 AWG
14 AWG	75'-150'	10 AWG
12 AWG	150'-250'	-----
10 AWG	250'-500'	-----

Table 2 - Power Wire Distance and Size

b. **A 4 twisted pair cable** (recommended Belden 8757 or equivalent) between the connector boards of each LIB housing in the stack. The diagram on the following page illustrates the pairs that need to be twisted for a single unit installation with multiple LIB housings. **PLEASE NOTE**: This diagram only applies to those installations with multiple LIB housings.



The following cable must be run to the Vandal-Proof Lobby Panel:

a. **A 2 conductor shielded cable** from the location of the 120 VAC outlet into which you will plug the 12VAC, 20VA transformer supplied by Sentex (or a 12VDC power supply that you provide). See Table 3 below for the wire size required.

DC POWER WIRE SIZE	DISTANCE	AC POWER WIRE SIZE
18 AWG	30' and under	18 AWG
18 AWG	30'-75'	18 AWG
18 AWG	75'-150'	18 AWG
18 AWG	150'-250'	16 AWG
18 AWG	250'-500'	12 AWG

Table 3 - Power Wire Distance and Size

b. **A 22-24 awg shielded twisted pair copper cable** (recommended Belden #9501) from the Ovation controller board (previously mentioned in the pulling cables section for the Ovation controller board). This cable can be up to 5000 feet in length.

IMPORTANT NOTE: This wire must be a 22-24 awg shielded twisted pair copper cable or you will experience problems with your Vandal-Proof Lobby Panel. Also, it is important to note the length of this wire so you can set the "LINE LENGTH" pot to its correct setting (refer to page 20 for this information)

c. **A 2 conductor cable** from the door strike, magnetic lock, or gate operator to the control relay.

d. **A 2 conductor cable** from the strike power supply, if required.

An "LP" model with a tone dial telephone is installed in the same manner as the "LP" model with Vandal-Proof Lobby Panels except you will not have the Vandal-Proof Lobby Panels to install to the auxiliary telephone pins. Instead, you will install a tone dial telephone to these pins. For this installation, a 2 conductor twisted pair telephone cable with an RJ11 connector at one end must be pulled from the location chosen for the telephone to the controller board.

Multiple Entrances

An "LP" series system with multiple Vandal-Proof Lobby Panels is installed in the exact same manner as a single Vandal-Proof Lobby Panel installation, except the Vandal-Proof Lobby Panels are run in parallel to a single connection on the Ovation controller board. Also, each Vandal-Proof Lobby Panel must have its own 12 VAC power supply connected to it.

6 - MOUNTING THE CABINETS

This section covers the procedures necessary to installing the Ovation cabinets, the LIB housings and the Vandal-Proof Lobby Panels safely.

Controller Board Cabinet

The Ovation controller board cabinet needs to be mounted within a secure, indoor location (preferably the telephone room).

1. Determine which of the "knock-outs" that provide access into the box (back, lower-left, or top center) you will use.

2. Remove the Ovation controller board from the cabinet (see Appendix 1 for location of the mounting screws).

3. Carefully remove the chosen knock-out.

4. Mount the unit on the wall. Put the top two screws/bolts into the wall, but leave them loose. Hang the cabinet on the screws/bolts by inserting them in the larger part of the top two openings. Then put the screws/bolts for the bottom two openings into the wall. Tighten down all four screws/bolts.

5. Pull all of your wires into the cabinet.

6. Ground the enclosure to a suitable earth ground (see Section 2 "Ground the System" for these instructions).

7. Replace the Ovation controller board.

Vandal-Proof Lobby Panel Cabinets

There are two different types of Vandal-Proof Lobby Panels; the Vandal-Proof Lobby Panel with a Back Box and the Vandal-Proof Lobby Panel with Direct Mounting Studs. Please follow the directions below for the type of panel in your installation.

Vandal-Proof Lobby Panels with a Back Box

To install the Vandal-Proof Lobby Panel with a Back Box, select a location next to the entrance to be controlled. If you are installing more than one Vandal-Proof Lobby Panel, chose a location next to each entrance. Use the following steps to install the Vandal-Proof Lobby Panel cabinet:

1. Remove the front panel of the Vandal-Proof Lobby Panel from the back box and set aside on a static-free surface.
2. Determine which of the "knock-outs" that provide access into the box (back. side left, or bottom center) you will use.
3. Cut a hole in the wall that measures 4 3/4" wide, 7 1/2" high, and 2 7/16" deep.
4. Carefully remove the chosen knock-out.
5. Mount the back box into the wall using the mounting holes located on the back, top, bottom, or side of the cabinet. Make sure that the opening of the cabinet does not extend past the edge of the wall.
6. Pull all of your wires into the cabinet through the knock-out.

Vandal-Proof Lobby Panel with Direct Mounting Studs

To install the Vandal-Proof Lobby Panel with Direct Mounting Studs, select a location next to the entrance to be controlled. If you are installing more than one Vandal-Proof Lobby Panel, chose a location next to each entrance. Use the following steps to install the Vandal-Proof Lobby Panel with Direct Mounting Studs:

1. Cut a hole in the wall that measures 4" wide, 7 3/4" high, and 2 1/2" deep. Next, cut six holes 1/4" diameter that correspond with the six mounting studs on the Lobby Panel.

2. Pull all of your wires into the mounting hole.

3. Mount the panel into the wall using the mounting studs located on the back of the panel.

LIB Housing

The LIB housings should be mounted as close as possible to the RJ71C jacks to simplify installation. Fifteen foot cables with connectors on each end are available from Sentex. Longer cables may be specially ordered from Sentex.

1. Remove the LIB circuit boards from their housing(s). Note: each LIB is held in place with its own grounding screw found at the top of the housing.

2. Mount the LIB housing(s) on the wall. Put the two top screws/bolts into the wall, but leave them loose. Hang the cabinet on them by inserting them in the larger part of the top two openings. Then put the screws/bolts through the bottom openings. Tighten down all four screws/bolts securely.

3. Ground the housing to a suitable earth ground. The ground connection is located on the upper right side of the LIB housing.

4. Set the LIB addresses as described in section 7 on the next page.

5. Reinsert the LIBs and reinstall each LIB ground screw.

7 - SETTING THE LIB ADDRESSES

Each LIB must be assigned a ***unique*** 3 digit address using the "decade" switch (or switches) at the top of the LIB board (see Appendices 3 and 4 for the location of these switches). **If there is a duplication of LIB numbers, the Ovation System will operate incorrectly and cause major problems.** The addresses, in essence, take the place of the telephone numbers you would program into a normal telephone entry system.

There are two different types of LIB boards. One type has a single decade switch located in the upper left-hand corner of the board (see Appendix 3). The other type has three decade switches located in the upper left-hand corner of the board (see Appendix 4). In order to properly set the LIB addresses, please refer to the appropriate section for your installation.

LIB with a Single Decade Switch

If you have LIBs with a single decade switch, there should be 10 or less LIBs in your installation. To set the addresses for single decade switch LIBs, use the following instructions:

1. To set the LIB numbers, work from right to left starting with the number 0. Thus, if you have a 10 LIB installation, the decade switch on the LIB located to the far right will be set as "0" and the decade switch on the LIB located to the far left will be set as "9".
2. When you are programming information into a single switch LIB, the first two LIB numbers will always be considered "00". Therefore, if you want to program information into the second LIB from the right, the LIB address will be "001".

Once the LIB addresses are set, determining the address of individual lines is easy. The third line on the second LIB from the right will have an address of 00103 (001 is the LIB number and 03 is the line number). If you have a 10 LIB installation, the fourth line on the tenth LIB will have an address of 00904.

LIB with Three Decade Switches

To make subsequent service and troubleshooting easier, we strongly recommend that these addresses be organized in the following manner:

1. Use the switches labeled S1 and S2 to represent the number of the LIB housing in which the LIB is held. For example, all of the boards in the first LIB housing in a stack would have S1 set to 0 and S2 set to 1. Those in the thirteenth LIB housing would have S1 set to 1 and S2 set to 3. **Helpful Hint:** If there is only one LIB housing, set both S1 and S2 on all LIBs to 0. This will allow you to use a 3 digit default directory code (i.e., 1 digit for the LIB and 2 digits for the line address on the LIB).
2. Use the switch labeled S3 to represent the position of the LIB within the housing, numbering from right to left and starting with 0. Thus, the LIB that was located to the extreme right of the housing would have S3 set to 0. The one to its left would be set to 1, etc. Using this numbering scheme, the fourth LIB from the right in the second LIB housing would have a 3 digit address of 023.

Once the LIB addresses are set, determining the address of individual lines is easy. The third line on the board described above would have an address of 02303. The eleventh line on this board would have an address of 02311. The same type of line addressing scheme is used on all boards. Thus, the eighth line on the fifth board from the right in the first LIB housing would have an address of 01408.

IMPORTANT NOTE: These addresses will ultimately be used when programming the system. They should be noted in the associated RJ71C jack and on the form in Appendix 7, to assist you in programming, testing and troubleshooting the system.

8 - MAKING BASIC CONNECTIONS

This section describes the basics for wiring the Ovation controller, the LIBs, the Vandal-Proof Lobby Panel, and the door strikes.

Installing an "LP" System with a Tone Dial Telephone

Connections to the Ovation Controller Board

1. **Ovation Controller Power:** Connect the power cable that you pulled to TB8 on the Ovation controller board (see Appendix 1) and the other end to the transformer provided with the system. Positive and negative terminals are interchangeable on the Ovation controller board. Alternatively, the system can be connected to a 13.5 VDC power source which is also connected to TB8. Since the Ovation controller will not charge a battery, a UPS-type power supply must be used if you want to use DC power with the system. ***DO NOT APPLY POWER TO THE CONTROLLER BOARD UNTIL ALL OF THE CONNECTIONS IN THE ENTIRE SYSTEM HAVE BEEN MADE.*** Once power has been applied to the controller board, the "POWER ON" indicator at the bottom left of the controller board (see Appendix 1) should be lit

2. **LIB Control:** Connect the 4 twisted pair cable that you pulled from the converter board in the Ovation controller housing to position TB1 on the connector board in the first LIB housing.

3. **Tone Dial Telephone:** Connect the wire side of the twisted pair cable that you pulled to TB9 on the Ovation controller board (see Appendix 1) and the opposite end with the RJ11 connector to the tone dial telephone.

4. **Door/Gate Control:** Connect the wires from your door strike and your door strike power supply or from your gate operator to the relay contacts in areas TB5 and TB6 as follows:

   a. **For normally locked strikes:** Connect one conductor from your strike power supply to the "NO" terminal and one conductor from the door strike to the "COM" terminal. Then connect the remaining conductors from the source by tying them together off the board (e.g., using a wire nut or butt splice).

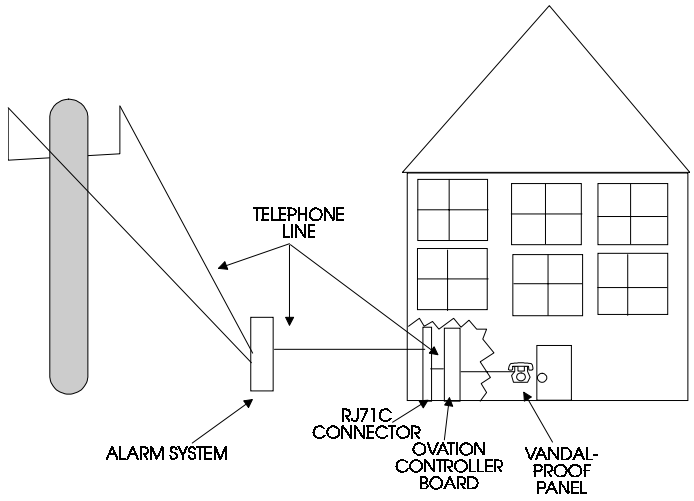
   b. **For magnetic locks or normally open strikes:** Connect one conductor from your power to the "NC" terminal and one conductor from the door strike to the "COM" terminal. Then connect the remaining conductors from each source by tying them together (for example, using a wire nut).

WARNING:	**In order to prevent voltage spikes generated by magnetic lock or DC powered strikes from being induced into the system, it is strongly recommended that a IN4001 diode or a Metal Oxide Varistor be installed across the magnetic lock coil. If you are going to use an IN4001 diode, the cathode of the diode (the end with the band) is connected to the positive connection of the coil and the anode is connected to the negative connection of the coil.**

   c. **For dry contact closure (most gate operators):** Connect one conductor to the "NO" terminal and the other to the "COM" terminal.

Connections to the LIBs

NOTE: If you are using an Ovation system in conjunction with an alarm system, it is imperative that the telephone line encounters the alarm system first. The Ovation system's RJ71Cs should then be connected after the alarm system (see illustration below). If these systems are not connected in this order, it will cause erratic problems with the alarm system and the Ovation system.



1. **RJ71Cs:** Plug a 50 conductor cable with a 50 pin connector on each end to area J4 on each LIB and then into an RJ71C connector block. These cables are available from Sentex in 15 foot lengths. A shorting block will have to be removed from the RJ71C to plug the connector into it. Keep this shorting block with the RJ71C connector blocks. Plugging this shorting block back into the RJ71C jack will restore normal telephone operation should the LIBs become damaged or disconnected for any reason.

   IMPORTANT NOTE: If any of the residents connected to the Ovation system have 3-way calling, you will need to disconnect either the call-waiting feature on the Ovation for that tenant (this feature is an option) or have the tenant discontinue their 3-way calling service from the telephone company. This step is necessary because the tones made by the Ovation when call-waiting is activated will trigger the 3-way calling feature and the tenant will suddenly be connected to a dial tone. For instructions on how to discontinue call-waiting for a single resident, please refer to the manual enclosed with the system entitled, "INSTRUCTION FOR THE PROGRAMMING AND USE OF THE OVATION SYSTEM".

2. **LIB Power:** Connect the power cable from the supplied transformer, or a 12 VDC power supply which you provide, to TB2 (IN) on the first LIB board. Then connect TB1 (OUT) of the same LIB to the TB2 (IN) of the next LIB in the chain and continue this pattern until you have connected power to all of the LIBs in a housing. ***DO NOT APPLY POWER TO THE LIBs UNTIL ALL OF THE CONNECTIONS IN THE ENTIRE SYSTEM HAVE BEEN MADE.***

   NOTE: Do not overload the transformer by connecting more than one cabinet (up to 10 boards) of LIBs.

3. **LIB Control:** Make sure that the short 8 conductor cables with the RJ45 connectors on each end (which are provided with the LIBs) are connected from J1 (OUT) of one LIB to J2 (IN) of the next LIB until all of the LIBs in a housing have been connected together. If you have more than one LIB housing, connect a 4 twisted pair cable from TB5 on the connector board in the first housing to TB1 on the connector board in the second housing.

Installing an "LP" System with Vandal-Proof Lobby Panels

Connections to the Ovation Controller Board

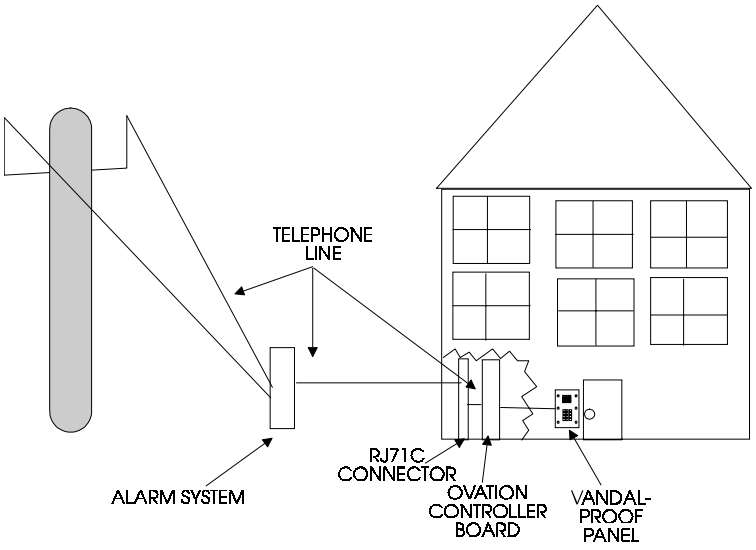
1. **Ovation Controller Power:** Connect the power cable that you pulled to TB8 on the Ovation controller board (see Appendix 1) and the other end to the transformer provided with the system. Positive and negative terminals are interchangeable on the Ovation controller board. Alternatively, the system can be connected to a 12 VDC power source which is also connected to TB8. Since the Ovation controller will not charge a battery, a UPS-type power supply must be used if you want to use battery power with the system. ***DO NOT APPLY POWER TO THE CONTROLLER BOARD UNTIL ALL OF THE CONNECTIONS IN THE ENTIRE SYSTEM HAVE BEEN MADE.*** Once power has been applied to the controller board, the "POWER ON" indicator at the bottom left of the controller board (see Appendix 1) should be lit

2. **LIB Control:** Connect the 4 twisted pair cable that you pulled from the converter board in the Ovation controller housing to position TB1 on the connector board in the first LIB housing.

3. **Vandal-Proof Lobby Panel Control:** Connect the twisted pair cable that you pulled to TB9 on the Ovation controller board (see Appendix 1) and the other end to the area marked "LINE" in block TB1 on the Vandal-Proof Lobby Panel board (see Appendix 2).

Connections to the LIBs

NOTE: If you are using an Ovation system in conjunction with an alarm system, it is imperative that the telephone line encounters the alarm system first. The Ovation system's RJ71Cs should then be connected after the alarm system (see illustration below). If these systems are not connected in this order, it will cause erratic problems with the alarm system and the Ovation system.



1. **RJ71Cs:** Plug a 50 conductor cable with a 50 pin connector on each end to area J4 on each LIB and then into an RJ71C connector block. These cables are available from Sentex in 15 foot lengths. A shorting block will have to be removed from the RJ71C to plug the connector into it. Keep this shorting block with the RJ71C connector blocks. Plugging this shorting block back into the RJ71C jack will restore normal telephone operation should the LIBs become damaged or disconnected for any reason.

   IMPORTANT NOTE: If any of the residents connected to the Ovation system have 3-way calling, you will need to disconnect either the call-waiting feature on the Ovation for that tenant (this feature is an option) or have the tenant discontinue their 3-way calling service from the telephone company. This step is necessary because the tones made by the Ovation when call-waiting is activated will trigger the 3-way calling feature and the tenant will suddenly be connected to a dial tone. For instructions on how to discontinue call-waiting for a single resident, please refer to the manual enclosed with the system entitled, "INSTRUCTION FOR THE PROGRAMMING AND USE OF THE OVATION SYSTEM".

2. **LIB Power:** Connect the power cable from the supplied transformer, or a 12 VDC power supply which you provide, to TB2 (IN) on the first LIB board. Then connect TB1 (OUT) of the same LIB to the TB2 (IN) of the next LIB in the chain and continue this pattern until you have connected power to all of the LIBs in a housing. ***DO NOT APPLY POWER TO THE LIBs UNTIL ALL OF THE CONNECTIONS IN THE ENTIRE SYSTEM HAVE BEEN MADE.***

   NOTE: Do not overload the transformer by connecting more than one cabinet (up to 10 boards) of LIBs.

3. **LIB Control:** Make sure that the short 8 conductor cables with the RJ45 connectors on each end (which are provided with the LIBs) are connected from J1 (OUT) of one LIB to J2 (IN) of the next LIB until all of the LIBs in a housing have been connected together. If you have more than one LIB housing, connect a 4 twisted pair cable from TB5 on the connector board in the first housing to TB1 on the connector board in the second housing.

Connections to the Vandal-Proof Lobby Panel

1. **Vandal-Proof Lobby Panel Power:** Connect one end of the power cable that you pulled to TB2 on the Vandal-Proof Lobby Panel board and the other end to the 12VAC, 20VA power transformer supplied with the system. Alternatively, the system can be connected to a 12 VDC power source which is also connected to TB2. Since the Vandal-Proof Lobby Panel will not charge a battery, a UPS-type power supply must be used if you want to use DC power with the panel. The positive and negative terminals are interchangeable on the Vandal-Proof Lobby Panel board. ***DO NOT CONNECT THE POWER TO THE VANDAL-PROOF LOBBY PANEL UNTIL ALL OF THE CONNECTIONS IN THE ENTIRE SYSTEM HAVE BEEN MADE.*** Once the power has been applied to the Vandal-Proof Lobby Panel, 4 beeps should be emitted from the panel's speaker.

2. **Door/Gate Control:** Connect the wires from your door strike and door strike power supply or from your gate operator to the relay contacts in TB3 on the Vandal-Proof Lobby Panel board as follows:

   a. **For normally locked strikes:** Connect one conductor from your strike power supply to the "NO" terminal and one conductor from the door strike to the "COM" terminal. The connect the remaining conductors from the source by tying them together off the board (e.g., using a wire nut or butt splice).

   b. **For magnetic locks or normally open strikes:** Connect one conductor from your power to the "NC" terminal and one conductor from the door strike to the "COM" terminal. Then connect the remaining conductors from each source by tying them together (for example, using a wire nut).

WARNING: In order to prevent voltage spikes generated by magnetic lock or DC powered strikes from being induced into the system, it is strongly recommended that a IN4001 diode or a Metal Oxide Varistor be installed across the magnetic lock coil. If you are going to use an IN4001 diode, the cathode of the diode (the end with the band) is connected to the positive connection of the coil and the anode is connected to the negative connection of the coil.

c. **For dry contact closure (most gate operators):** Connect one conductor to the "NO" terminal and the other to the "COM" terminal.

PLEASE NOTE: In a Vandal-Proof Lobby Panel Installation, you also have the ability to connect devices to the two relays on the Ovation controller board. The connector for relay 1 is located in area TB5 and the connector for relay 2 is located in area TB6 of the Ovation controller board. The first relay on the Ovation controller board will activate every time the Vandal-Proof Lobby Panel relay activates. Therefore, if you connect a device to the first relay on the Ovation controller board, when a resident dials a "9" to activate the relay on the Vandal-Proof Lobby Panel board, the first relay on the Ovation controller board will also activate. If you have a multiple Vandal-Proof Lobby Panel installation along with a device connected to the first relay on the Ovation controller board, when a resident presses a "9", the relay for the Vandal-Proof Lobby Panel they are calling from will activate along with the first relay on the Ovation controller board. For instructions on how to install your device to the Ovation controller board relays, see section 2 above.

9- INSTALLING ADDITIONAL FEATURES

The following features are connected in the same fashion for the both of the "LP" models, regardless of whether they are being installed at one or multiple entrances.

1. **Postal lock:** The Post Office will require that their own lock be installed when mail-boxes are inside a controlled area. A kit for wiring the postal lock switch is provided with each system. Specific directions for connecting these parts to "ST1" and "COM" on TB1 (or to the "EXIT REQUEST" pins in area TB1 of the Vandal-Proof Lobby Panel board) are included in your postal lock kit. Your customer will have to arrange with the postal carrier to have a postal lock installed before you can install the postal lock kit. Once the kit is installed, the postal carrier turns his/her key in the lock, and the system will activate relay 1 for the programmed period of time.

2. **Aux open/request for access:** Any device (e.g., Knox box or exit button) that provides a contact closure can be hooked up to ST1 and COM on TB1 to activate relay 1, or ST3 and COM on TB2 to activate relay 2 (if set as control). If you have an "LP" system with a Vandal-Proof Lobby Panel attached to it, you would connect the device to the pins marked "EXIT REQUEST" on the Vandal-Proof Lobby Panel Board. Shielded cable should be used (such as Belden 8771) and the shield should be connected to the ground screw shown in Appendix 1. When a contact closure occurs, the system will activate the appropriate relay for the programmed period of time.

3. **Door position sensing:** The Ovation has the ability to monitor the position of the two doors and take appropriate action based on the status. Thus, if the door is pried open or held open for more than a minute after the relay has been deactivated, the system can call a telephone number and report these conditions and/or close a relay and activate any device (e.g., camera, siren, etc.) connected to it.

   To activate this feature, install a switch in the door frame so that the switch is depressed when the door is closed. Hook into the normally closed and common terminals of the switch and then connect these wires to ST2 and COM on TB1 (for door 1) and ST4 and COM on TB2 (for door 2). Shielded cable should be used (such as Belden 8771) and the shield should be connected to the ground screw shown in Appendix 1.

10 - TESTING AND ADJUSTING THE UNIT

The following programming steps must be completed to ensure that LIB addresses and connections are proper. Failure to perform these steps may result in improper operation. These programming steps are also discussed in detail in the "Programming and Use Instructions for the Ovation System" manual and can also be helpful in troubleshooting the system after initial installation.

Verifying Entry Code Capabilities

After you have verified that the LIBs are set properly and that there is no duplication of the 3-digit LIB addresses, the next step is to make sure that the entry codes feature works properly. To test this feature, follow the steps below:

1. Enter the programming mode at the Ovation controller board by entering three asterisks ("✶✶✶") followed by the six digit user defined password (factory setting is 000000) on the controller keypad.

2. If you have a Vandal-Proof Lobby Panel connected to the auxiliary port of the Ovation controller board, enter programming step 34 and enter a "1#" if you are only going to use the Vandal-Proof Lobby Panel's relay or a "2#" if you are going to use the Vandal-Proof Lobby Panel's relay and the Ovation controller board's relay 1 together (please refer to the programming manual for more information regarding this setting).

3. Enter programming step 08 and set the relay activation time for relay 1 followed by the "#" sign. The relay activation time must be entered as two digits and can be between 01 and 99 seconds. If you have one or more Vandal-Proof Lobby Panels attached to the Ovation controller board, the time that you program for relay 1 will also be considered the relay activation time for all of the Vandal Proof panels in your configuration.

4. Enter programming step 16 and enter a four digit entry code followed by the "#" sign.

5. At the front entrance keypad to the building/complex, enter the entry code that you programmed in step 3 above and verify that access is granted for the specified amount of time and that 10 beeps were heard from the front panel speaker.

Adjusting Line Balance

It is important that the line balance is correctly set or you may experience audio and technical problems with your system. To ensure audio clarity, you will need to set the "sidetone balance". To set the sidetone balance, place a volt meter on TP4 (+) and TP5 (-) on the Ovation controller board (see Appendix 1). Next, enter the programming mode by entering three asterisks ("✶✶✶") followed by the six digit user defined password (factory setting is 000000). Then, enter programming step "69" followed by the three-digit LIB number, the two-digit line number of the line you wish to use for this test, and the "#" key. When you hear the tone, adjust the "SIDETONE BALANCE" pot on the Ovation controller board to minimize the DC voltage between these two points.

If you have a "LP" system with Vandal-Proof Lobby Panels attached, you also need to set the "LINE LENGTH" pot on the Ovation controller board to the appropriate setting (see Appendix 1). Please refer to the chart below for the proper setting: **DEFAULT SETTING = 0**.

WIRE LENGTH (in feet)	"LINE LENGTH" POT SETTING
0 - 999	0
1000 - 2999	2
3000 - 5000	4

Verifying Telephone and Door/Gate Connections

The next step in adjusting your Ovation system is to make sure that the connection between the system and each resident's telephone line is good. This involves testing the connections to each resident's telephone in their unit and to the resident's outgoing telephone line. To test the connection to the resident's telephone, you will use the following procedures. To carry out this test, you will need a standard tone dial telephone with a cord that has a modular RJ11 connector on both ends:

1. Enter the programming mode by plugging your test telephone into the test connector on any MUI, lifting the handset, and then entering "✶✶✶5". You will hear a beep telling you that you are in a limited programming mode (you may only do the areas described on this page and the next). See Appendix 5 for the location of the test connector on the MUI.

2. After you hear this beep, enter "23" followed by the 3 digit LIB address and the 2 digit line address of the unit you wish to contact and a "# ". Then hang up the handset. This will ring the test telephone and the resident's phone simultaneously. Do not answer the test set until it stops ringing (meaning someone in the unit answered their telephone) or until you have decided that no one is going to answer the telephone (when you pick up the handset, the ringing will stop). If the resident answers their telephone, pick up your handset and confirm their identity.

3. After you have talked to the resident (or picked up the handset to stop the ringing), hang the handset up. Then repeat the process starting at point 1 above for the next unit.

Attempt to verify that every line is contacting the correct unit within that building. In cases where there is no one available at the residence to answer the telephone, make note of this on the "LIB planning form" in Appendix 7 and have the customer ensure these lines are operating properly when a resident is in.

To test the connection to each resident's outgoing telephone line, follow the procedures shown below. Again, you will need to test the telephone line as described above.

1. Enter the programming mode by plugging your test telephone into the test connector on any MUI, lifting the handset, and then entering "✶✶✶5". You will hear a beep telling you that you are in a limited programming mode (you may only do the areas described on this page and the next). See Appendix 6 for the location of the test connector on the MUI.

2. After you hear this beep, enter "24" followed by the 3 digit LIB address and the 2 digit line address of the unit you wish to contact and a "# ". You will then be placed on the residents telephone line. If the resident is not on the telephone, you will hear the dial tone for their line. If the resident is on the telephone, you will be placed on the line with him/her and the incoming telephone line.

3. After you have verified that the connection is correct, repeat the process starting at point 1 above for the next unit.

Verify that each resident's telephone line is functioning properly within the building. In cases where the resident has no telephone service, no dial tone should be heard.

To test the door/gate connections, call a resident from the keypad located at the front entrance to the building/complex. When the resident answers their telephone, identify who you are and ask them to press "9" on their telephone keypad. Verify that the device attached to relay 1 activates for the specified period of time and that 10 beeps were heard from the front panel speaker. If there is a second door or gate connected to relay 2, call a resident from the keypad located at the front entrance to the building/complex. When the resident answers their telephone, identify who you are and ask them to press a "5" on their telephone keypad. Verify that the device attached to relay 2 activates for the specified period of time and that 10 beeps were heard from the front panel speaker.

Adjusting the Audio

Test the system's audio by establishing communications with a resident or the building manager. Make the following adjustments only if necessary:

1. **Handset or Speaker Volume:** If you have an "LP" system with a tone dial telephone attached to it and the handset volume on the telephone is too loud or soft, you can adjust it by turning the "AUX VOLUME" pot on the Ovation controller board (see Appendix 1).

   If you have an "LP" system with Vandal-Proof Lobby Panels attached to it and the volume at the Vandal-Proof Lobby Panel is too loud or soft, you can adjust it by turning the "SPEAKER VOL" pot on the Vandal-Proof Lobby Panel (see Appendix 2).

2. **Audio Continuity:** If you have an "LP" model with a Vandal-Proof Lobby Panel attached to it and you are experiencing "clipping" in the tenant's or visitor's voice, you will need to adjust the "TENANT BIAS" pot on the Vandal-Proof Lobby Panel board. Call a resident and ask them to speak while you adjust the "TENANT BIAS" pot. If the resident's voice is clipping, turn the "TENANT BIAS" pot clockwise until communications are clear. If the visitor's voice is clipping, turn the "TENANT BIAS" pot counter-clockwise until communications are clear.

11 - GLOSSARY OF DIAGNOSTIC INDICATORS

There are a number of indicator lights that are provided on the Ovation controller board to assist you in determining the status of the board and whether it is installed correctly. See Appendix 1 for the location of these lights.

1. **POWER ON:** This light is lit if power is connected to the system.

2. **C.O. ON HOLD:** This light is lit when the Ovation controller has a resident's telephone line from the telephone company central office on hold. This would occur during the use of call waiting.

3. **BUSY WITH RES.:** This light would normally be lit when the resident is in contact with the visitor entrance.

4. **RINGING HOME:** This light flashes when the controller is ringing a resident.

5. **C.O. BUSY:** This light is lit when the controller has placed a call to an outside telephone number (i.e., not a resident).

6. **RINGING AUX PORT:** This light flashes when the Lobby Telephone (Aux telephone port) is being rung by the controller.

7. **18Hz RING VOLTAGE:** This light flashes when the controller is ringing any telephone.

8. **RELAY 1 ACTIVE:** This light is lit when relay 1 is activated and remains lit for the duration of the gate open time set in the programming mode.

9. **RELAY 2 ACTIVE:** This light is lit when relay 2 is activated and remains lit for the duration of the gate open time set in the programming mode.

Similarly, there are a variety of indicator lights provided on the Line Interface Boards. See Appendices 3 and 4 for the location of these lights.

1. **CONNECT:** This light is lit when an LIB is connecting the controller to the selected resident's telephone or when the LIB is being tested by the installer using programming steps 24 and 25. When a resident's telephone line is being connected one of the line in use indicators should also be lit on that board.

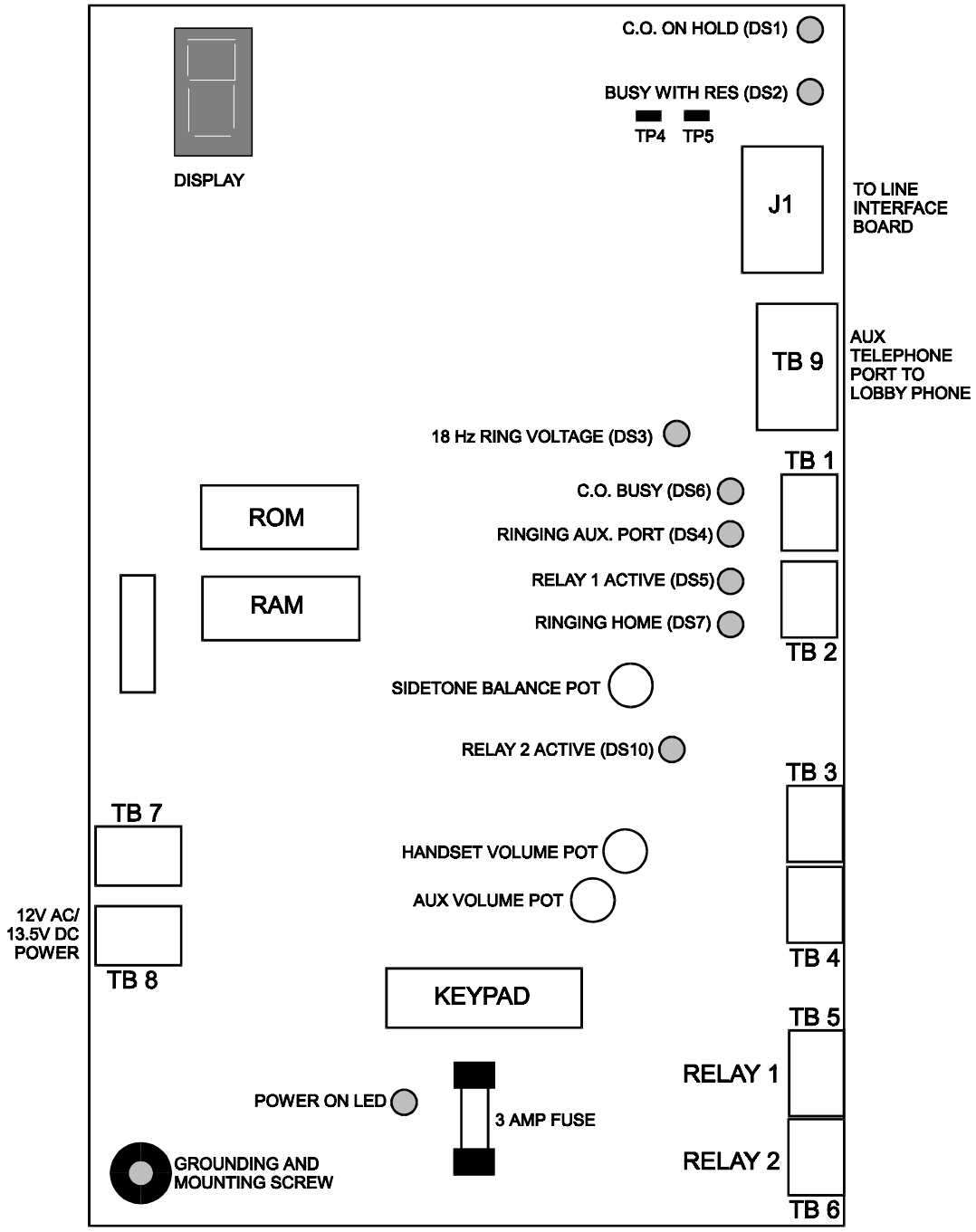
2. **DATA:** This light is lit only when "line selection tones" are being sent to the LIBs from the controller.

3. **POWER:** This light is lit whenever power is connected to the LIB.

4. **1 thru 12:** These lights indicate which line on an LIB is in use. Only one of these lights in the entire LIB stack should ever be lit at one time.

OVATION CONTROLLER BOARD

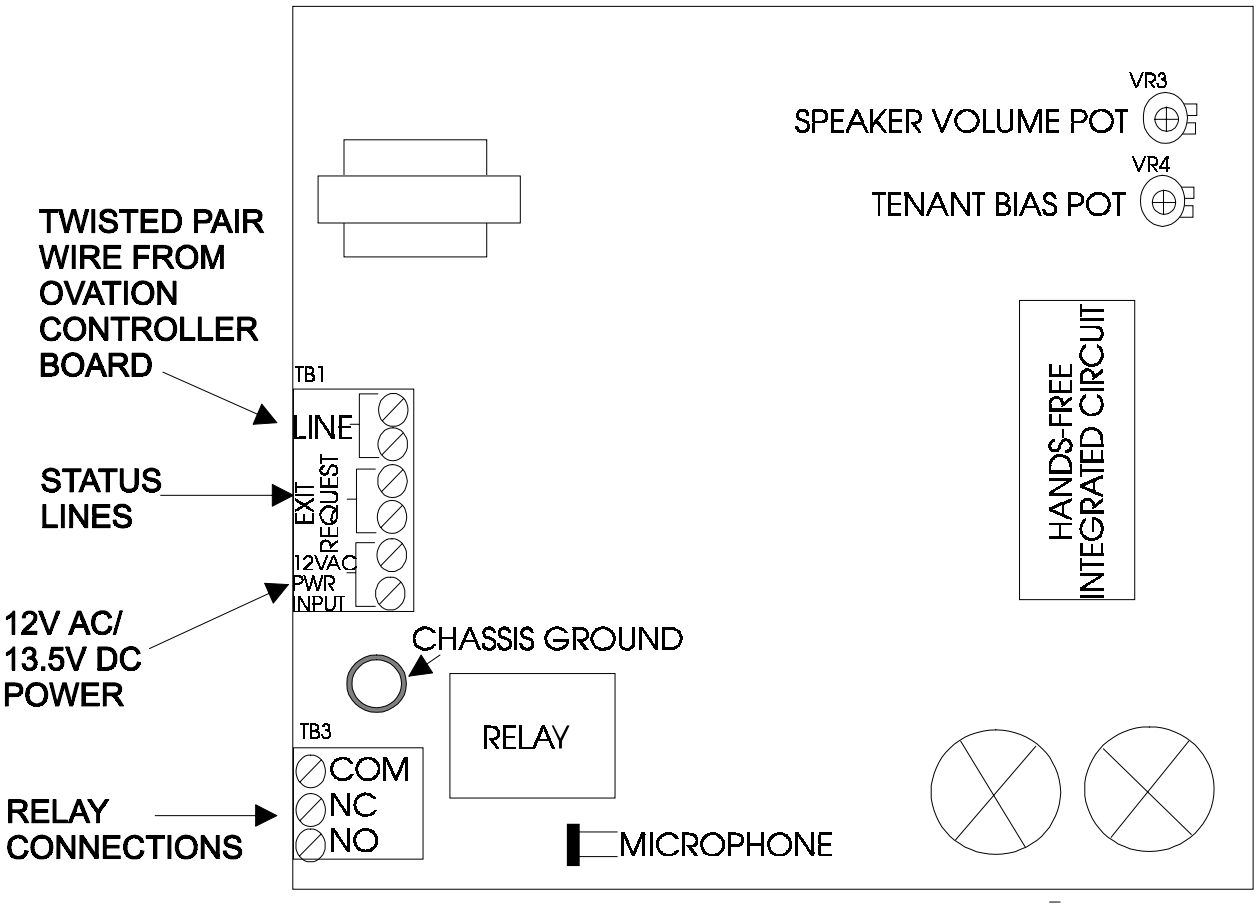
(Located in "LP" Housing)



(1073F1.CDR)

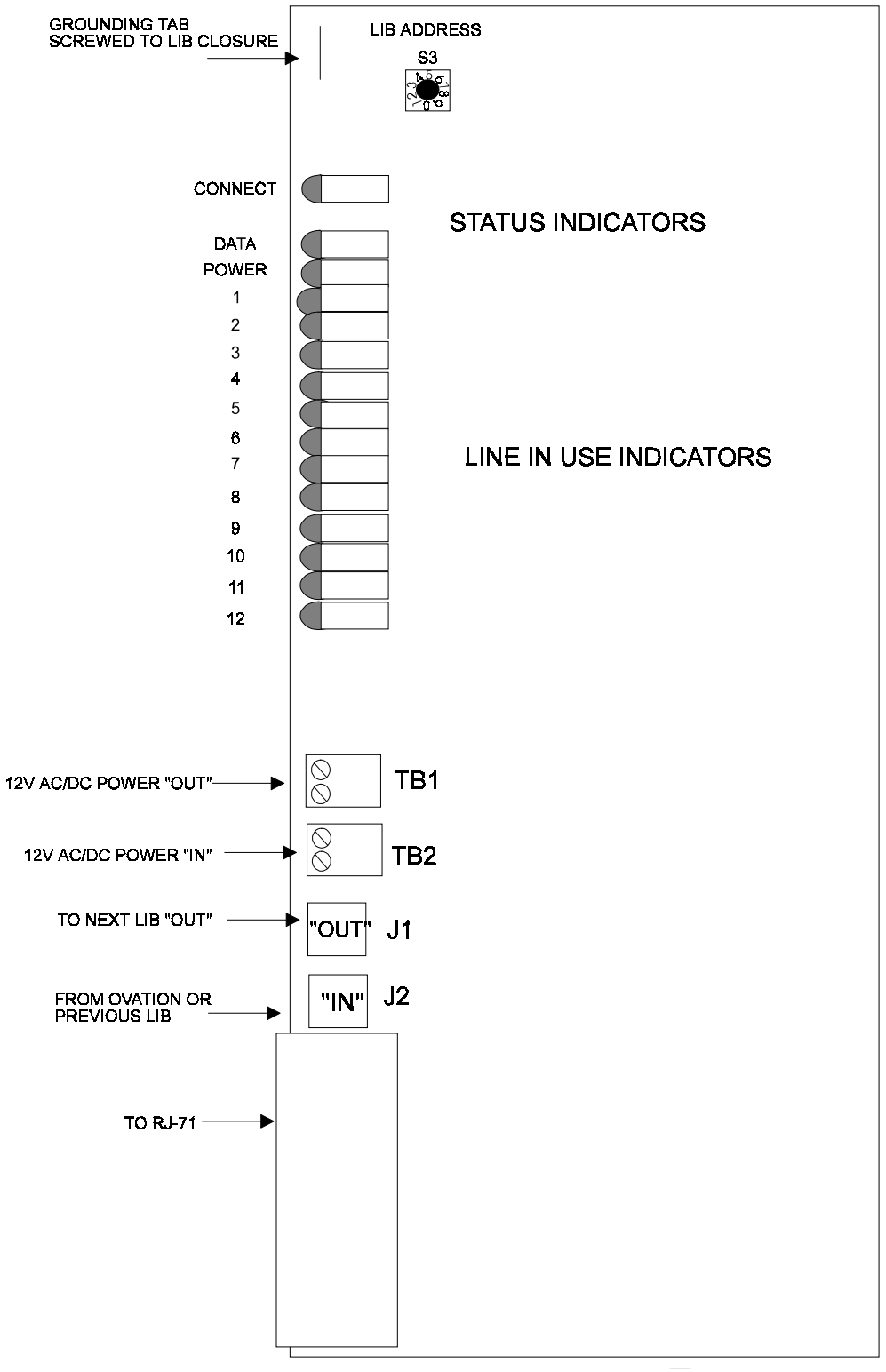
VANDAL-PROOF LOBBY PANEL BOARD

(Located in Vandal-Proof Lobby Panel)



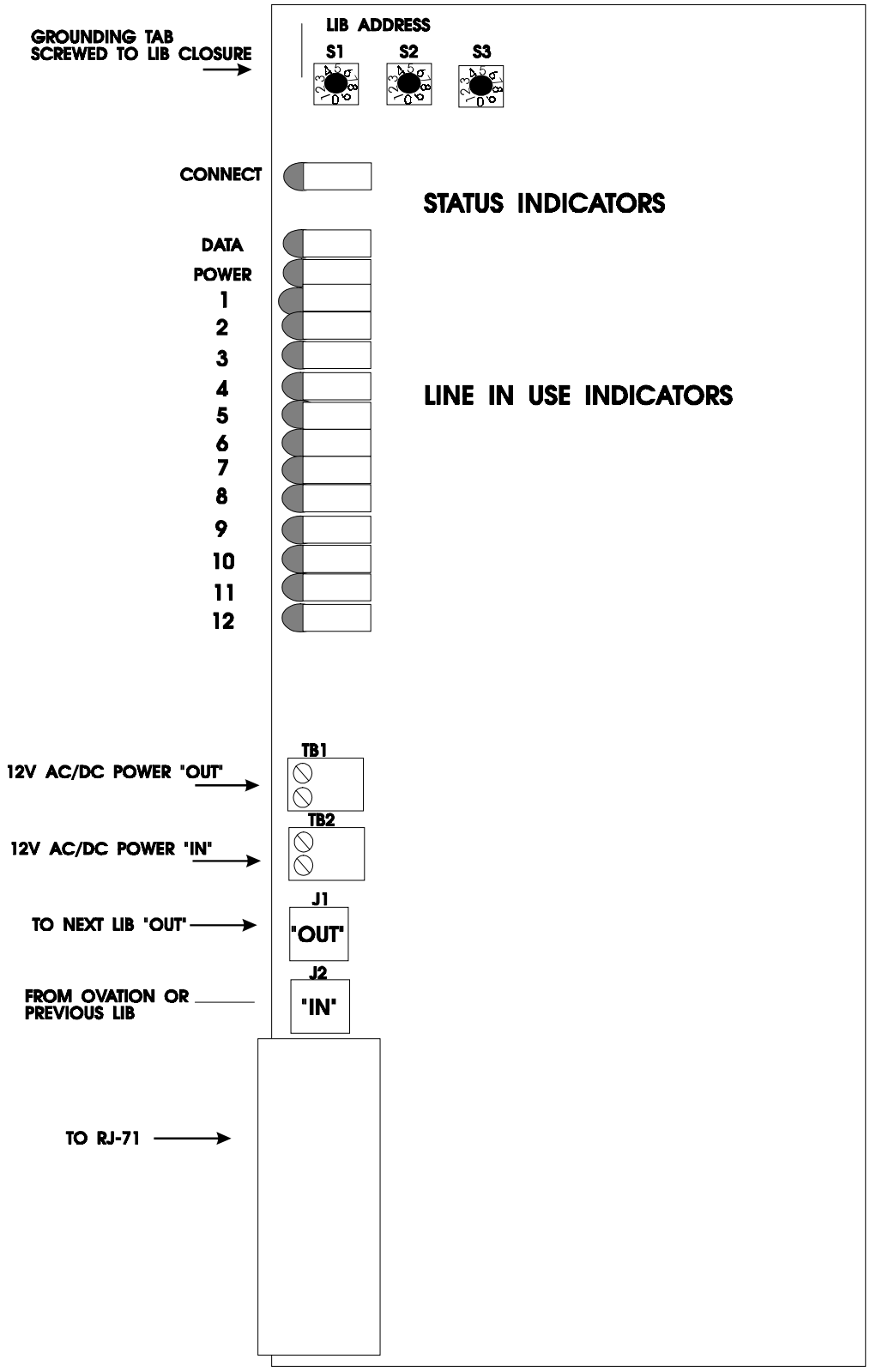
LINE INTERFACE BOARD (LIB)
WITH A SINGLE DECADE SWITCH

(Located in LIB Housing)



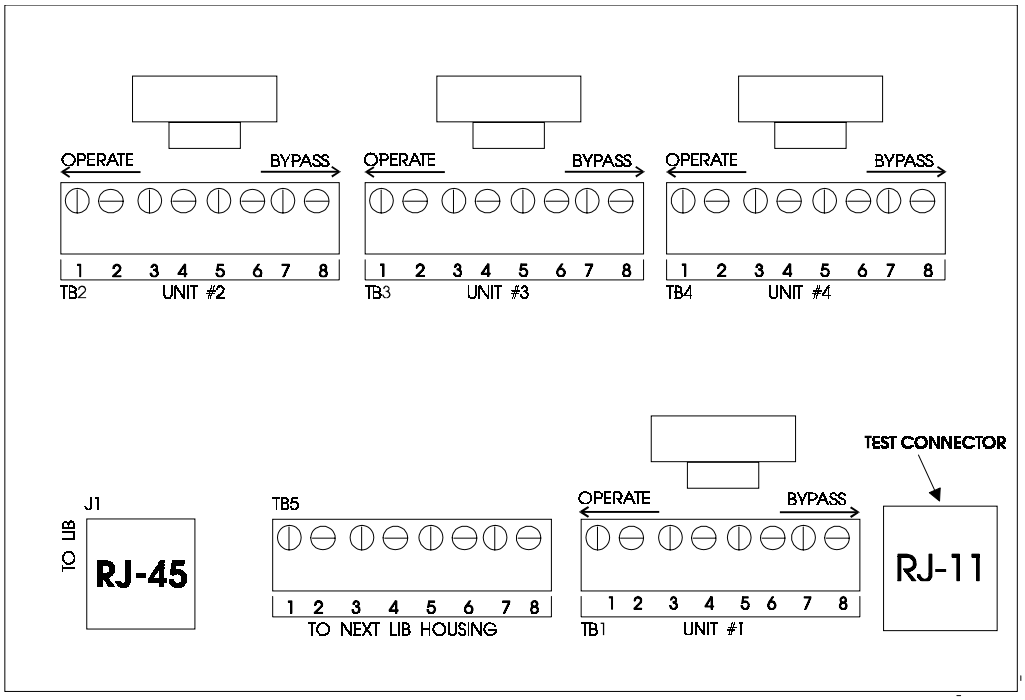
LINE INTERFACE BOARD (LIB) WITH THREE DECADE SWITCHES

(Located in LIB housing)



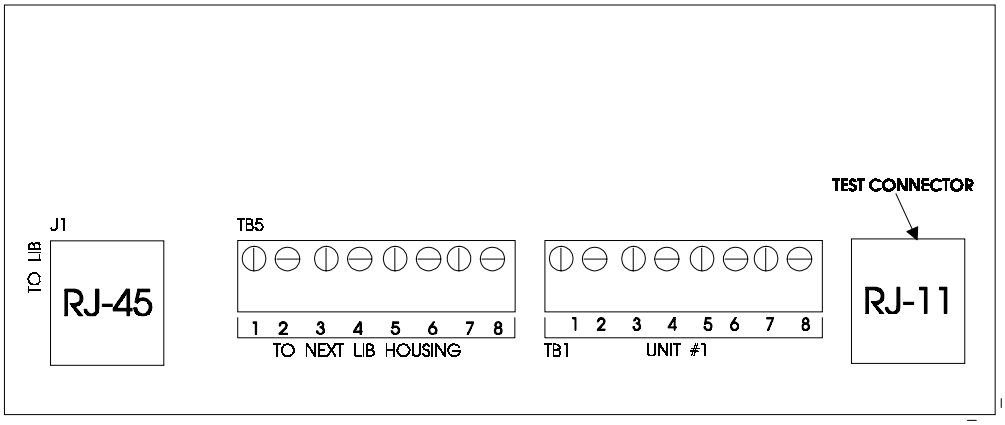
MULTIPLE UNIT INTERFACE (MUI)

LOCATED IN LIB HOUSING FOR MULTIPLE UNIT INSTALLATIONS ONLY



CONNECTOR BOARD

LOCATED IN THE LIB HOUSING FOR SINGLE UNIT INSTALLATIONS ONLY

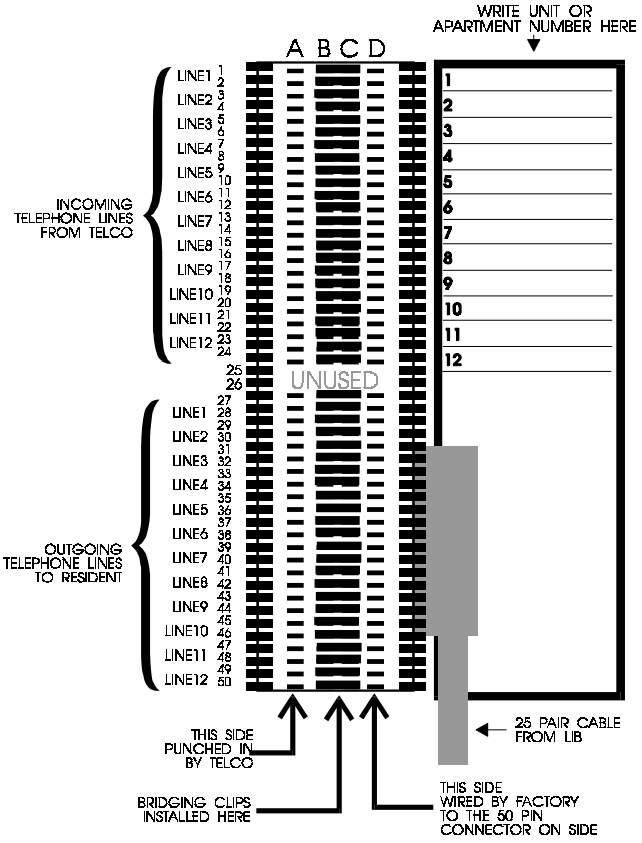


INSTALLING AND USING THE RJ71C

The RJ71C jack is placed in series with incoming telephone lines and enables the Ovation to "intercept" the telephone lines when a visitor wants to contact a resident. The following describes the installation and function of this jack.

Each RJ71C jack can handle up to 12 telephone lines, so if you have a 55 unit building, only 5 RJ71C jacks will need to be installed. If the apartment or unit has more than one phone, only connect the primary (main) telephone line through the RJ71C.

The RJ71C jack is wired by connecting the first incoming line to pins 1 and 2 on column A ("tip" is connected to pin 1 and the "ring" is connected to pin 2). This telephone line is then routed through the RJ71C to pins 27 and 28 (where pin 27 is the "tip" and pin 28 is the "ring"). The polarity must be maintained to ensure each resident's telephone equipment functions properly. The second incoming line is connected to pins 3 and 4 and exit the jack on pins 29 and 30. All 12 line are wired in the same fashion. **IMPORTANT NOTE:** All connections made by the installer must be made on column A. However, bridging clips must then be installed between column B and C or the incoming and outgoing lines will not be connected to the 50 conductor cable.



LIB PLANNING FORM

Use this form to plan how your RJ71C jacks are to be installed. After this form is completed, you should retain a copy since it will be required when making up a directory or programming user definable directory codes. Copy this page if additional terms are needed.

To simplify programming and troubleshooting, we recommend you use the LIB address as the jack number. The jack number should be written by the installer on the front cover of each RJ71C jack.

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

JACK NUMBER/LIB ADDRESS =		
RELAY	UNIT NO.	USER DIR CODE
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		

FCC REQUIREMENTS

INSTALLATION

This equipment complies with part 68 of the FCC rules on the front inside of the cabinet is a label which contains the following information:

1. The FCC registration number for the system, which is DS8 USA-18617-OT-E.
2. The ringer equivalence number (REN) which is 0.1B.

This system connects to the telephone lines by means of a standard jack called the USOC RJ71C. This jack would be installed by the telephone company.

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN's on the telephone line may result in devices not ringing in response to an incoming call. The sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN's, contact the telephone company to determine the maximum REN's for the calling area.

TYPE OF SERVICE

Your Sentex Ovation system is designed to be used on a standard device telephone lines. The system should not be connected to coin service or party lines. If you have any questions about your telephone line, such as how many pieces of equipment may be connected to it, the telephone company will provide this information upon request.

TELEPHONE COMPANY PROCEDURES

The goal of the telephone company is to provide you with the best service it can. In order to do this, it may occasionally be necessary for them to make changes in their equipment, operations, or procedures. If these changes might affect your service the operation of your equipment, the telephone company will give notice, in writing, to allow you to make changes necessary to maintain uninterrupted service.

IF PROBLEMS ARISE

If your telephone equipment is not operating properly, you should immediately remove it from the telephone lines, as it may cause harm to the network. If the telephone company notes a problem, they may temporarily discontinue service. When practical they will notify you in advance of the discontinuation. If advance notice is not feasible, you will be notified as soon as possible. When you are notified, you will be given the opportunity to correct the problem and informed of your right to file complaint with the FCC.

In the event any repairs are ever needed on your system, they should be performed only by an authorized representative of Sentex Systems, Inc.

RADIO FREQUENCY

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operates in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful: "How to Identify and Resolve Radio Television Interference Problems". This booklet is available from the United States Government Printing Office, Washington, DC, 20402, Stock No. 004-000-00345-4.

DOC REQUIREMENTS

NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100. The Load Number for the Ovation system is 4.