

ARRANGING FOR PHONE LINE INSTALLATION

You or your customer should have the telephone company install a line as close as possible to the location of the Sentex telephone entry system. The telephone company will require the following information to install the line:

FCC REGISTRATION NUMBER:	DS86W6-70754-AL
RINGER EQUIVALENCE NUMBER (REN):	0.0B
TYPE OF CONNECTOR (JACK):	USOC RJ11C

PULLING WIRES

The following cabling must be run to the location at which the telephone entry system will be mounted:

1. A 2 conductor, 20 to 24 awg cable from the jack installed by the telephone company.
2. A 2 conductor, 12 to 18 awg cable from the location of the 120 VAC outlet into which you will plug either the 12 VAC, 20 VA transformer supplied by Sentex or a 13.5 VDC, 700mA power supply that you supply. See the table below for wire sizes and distances.

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

3. A 2 conductor cable from the door strike, magnetic lock, or gate operator. You may also run power for the door strike or magnetic lock into the system if you desire (see selection on page 3 on 'MAKING BASIC CONNECTIONS" for details on how these wires will be connected) or connect power to the strike/lock outside of the cabinet.
4. A 12 to 18 awg cable from the door strike power supply to the main processor board.

MOUNTING THE CABINET

1. Determine which of the two "knock-outs" that provide access into the box (back or bottom) you will use.
2. Carefully remove the plug from the opening to be used. You may wish to remove the circuit board(s) from the cabinet before knocking out the plug, but it is not always necessary to do so. If you do remove the circuit boards, you will have to disconnect the keypad from the circuit board.
IMPORTANT NOTE: Do not grab the keypad connector directly when trying to remove it from the socket on the main board or you may break one of the pins on the connector. Instead, grab the ribbon cable just below the connector, put your thumb over the connector and rock it from side to side while pulling the cable away from the board.
3. Mount the unit on the wall. Put the top two screws/bolts into the wall, but leave them loose. Hang the cabinet on them by inserting them into the larger part of the top two openings and then lowering the cabinet. Then put the bottom two screws/bolts into the wall through the bottom two openings. Tighten down all four screws/bolts.
4. Pull all of your wires into the cabinet (if you are using the bottom opening, first attach your conduit securely) and remount the circuit board(s) if you removed them while mounting the cabinet.
5. Ground the enclosure in accordance with local codes. As shown in Exhibit 1, the lower left stanchion holding the main circuit board is also the grounding point. **IMPORTANT NOTE:** Static discharge can damage electronic components. Proper grounding of the system reduces this risk substantially.

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. Even if you have a good earth ground, you should still try to discharge any static electricity before handling the circuit boards.

MAKING BASIC CONNECTIONS

ALL CONNECTIONS AND "POTS" ON THE CIRCUIT BOARD(S) HAVE BEEN LABELED. READ THE LABELING BEFORE YOU MAKE ANY CONNECTIONS OR ADJUSTMENTS.

1. **TELEPHONE LINE:** Connect the wires from your telephone line to the "PHONE LINE" contacts on the terminal block (TB6) (see Exhibit 1).
2. **DOOR /GATE CONTROL:** Connect the wires from your door strike or from your gate operator to the "RELAY CONTACTS" on TB3 (for door 1) and TB4 (for door 2), as shown below:
 - A. For normally locked strikes: Connect one of the strike wires to the "N.O." pin on TB3 (or TB4 for door 2). Then, connect the other wire from the strike to the door strike power supply. Next, connect the opposite strike power supply wire to the "COM" pin on TB3 (for door 1) or TB4 (for door 2).
 - B. For magnetic strikes or normally unlocked strikes: Connect one of the strike wires to the "N.C." pin on TB3 for door 1 (or TB4 for door 2). Then, connect the other wire from the strike to the door strike power supply. Next, connect the opposite strike power supply wire to the "COM" pin on TB3 (for door 1) or TB4 (for door 2).

WARNING: In order to prevent voltage spikes generated by magnetic locks or DC powered strikes from being induced into the system, it is strongly recommended that a IN4001 diode is installed across the magnetic lock coil, so that 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 end of the coil.

C. For dry contact closure (most gate operators): Connect to the "N.O." and "COM" terminals.

IMPORTANT NOTE: The transformer supplied by Sentex should only be used to power the system. Strike or lock power must be provided separately. Also, do not hook any voltages up to the "DOOR OPEN SENSE" terminals since this will destroy the microprocessor and void your warranty.

3. **SYSTEM POWER:** The system operates on 12 volts AC or 13.5 volts DC. Connect the wires from the 12 VAC transformer provided with the system to the "MAIN POWER" terminals on TB5 as shown in Exhibit 1. Alternatively, you may power the system with a 13.5 VDC power supply by connecting the power supply to the same terminals (the system does not charge a battery, so your DC power supply must have its own charging circuit).

Once you have connected the power to the main processor board, the "high" and "low" LEDs in the power monitor will be lit. The power monitor is located in the lower right-hand corner of the board and consists of two red LEDs in areas DS2 and DS4 (marked "high" and "low") and one green LED in area DS3 (marked "in"). To ensure that you are providing enough voltage to the system, press the programming button in the upper right-hand corner marked "PGRM". If the "in" LED is the only LED lit after pressing this button, there is an adequate amount of voltage being provided to the board. If either the "high" or "low" LEDs are lit, the amount of voltage being provided to the board is either excessive or inadequate and the power connections, wiring, and transformer need to be checked. If at any time in the future the input power rises above or falls below the acceptable range, the "high" or "low" LEDs will light and will stay lit until the "PGRM" button is pressed. This feature allows continuous monitoring of the power condition and captures any power transients.

IMPORTANT NOTES:

- A. Do not plug the transformer or power supply until you have connected the other end of the cable to the system. The transformer should only be plugged into a 120 VAC outlet.
- B. A long run of wire between the system and the transformer or power supply can result in inadequate voltage being delivered to the system due to line loss. The best way to check that you have adequate voltage is to measure the DC voltage at TP3 at the bottom of the main board. It should read between 11.5 to 16.5 VDC.
- C. When you press the "PGRM" button to receive a power monitor reading, you will also be in the programming mode. To get out of the programming mode, simply press the "PGRM" button again.

INSTALLING OPTIONAL FEATURES

EACH SENTEX SYSTEM COMES WITH SEVERAL OPTIONAL FEATURES BUILT-IN. THESE CAN BE ACTIVATED AS FOLLOWS:

1. **POSTAL LOCK:** A kit of parts for hooking up the postal lock option is provided with the unit, if requested. Specific directions for connecting these parts and installing the postal lock itself are included in the package. Your customer will need to request the required lock from the post office. When it is installed along with the kit provided, the postman turns his key in the lock and the control relay will activate for the programmed period of time. The tone and display will also come on to indicate that access is allowed.
2. **AUXILIARY OPEN SWITCH:** Any auxiliary open device (e.g., key switch, exit button, PIR) that provides contact closure can be hooked up to the "AUX. OPEN DEVICE" terminals on the main circuit board. When the system gets a contact closure across these terminals, it will activate the relay for the programmed period of time. The tone and display will also come on to indicate that access is allowed.
3. **DOOR OPEN SENSING:** A switched circuit prevents "tailgating" by deactivating the control relay when the door is opened, instead of waiting for the user-set time out. Mount a NORMALLY CLOSED switch recessed in the door frame. A closed door opens the contacts, allowing the strike circuit to unlock the door. When the door opens, the switch contacts close, deactivating the strike circuit, so the door relocks when it closes.
4. **SETTING THE TYPE OF DIALING:** New systems are set at the factory for DTMF (or tone) dialing. If you wish your system to dial by using rotary (or pulse) dialing, set the jumper in area J3 on the main processor board across the pulse and common pins (see Exhibit 1). If you decide to return your system to tone dialing, simply set the jumper in area J3 on the main processor board across the DTMF and common pins.
5. **REMOTE PROGRAMMING:** The Remote Programming feature allows you to program your system from a tone dialing telephone. For systems that were purchased after July, 1995, the Remote Programming feature comes standard on every system - you just need to enable it in the system's firmware.

To enable the Remote Programming feature, press and hold the "PGRM" button and enter "072" on the keypad. If you want to enable the Remote Programming feature as well as the Multiple Entry feature, press and hold the "PGRM" button and enter "076" on the keypad (for more information regarding the Multiple Entry feature, please refer to step 6 on the following page). For instructions on how to remotely program your system, please refer to section 5 of the manual titled "Programming Instructions for the Spectrum and Vista Telephone Entry Systems".

If you want to disable the Remote Programming feature, press and hold the "PGRM" button and enter "070" on the keypad. **Please Note:** If you have the Multiple Entry feature enabled in addition to the Remote Programming feature and you only want to disable the Remote Programming feature, press and hold the "PGRM" button and enter "074" on the keypad.



IMPORTANT NOTE: If the Remote Programming feature is enabled, the Door Position Sense feature will become disabled.

6. **MULTIPLE ENTRY:** The Multiple Entry feature allows you to install more than one Spectrum/Vista system to a single telephone line. When a visitor presses the “#” key on one system and another system is in use, a “b” will be shown on the seven-segment display and five beeps (one per second) will be emitted from the system’s speaker. For systems that were purchased after July, 1995, the Multiple Entry feature comes standard on every system - you just need to install and enable it. To install and enable the Multiple Entry feature, follow the steps below:
- A. Have the telephone company install a USOC RJ11C jack installed near where each unit is to be installed. All jacks should connect to the same telephone line.
 - B. Install each system as described on the previous pages. You will not need to run any wires between the systems.
 - C. At each system, press and hold the “PGRM” button and enter “074” on the keypad. This will enable the Multiple Entry feature in the system’s firmware. If you want to enable the Multiple Entry feature as well as the Remote Programming feature, press and hold the “PGRM” button and enter “076” on the keypad (see step 5 above for more information regarding the Remote Programming feature).
 - D. Each unit will need to be programmed separately (as described in the manual titled “Programming Instructions for the Spectrum and Vista Telephone Entry Systems”), unless each unit has the remote programming feature activated. If each unit has the remote programming feature enabled, you can program the units simultaneously.
 - E. If you wish to disable the Multiple Entry feature, at each system, press and hold the “PGRM” button and enter “070” on the keypad. **Please Note:** If you have the Remote Programming feature enabled in addition to the Multiple Entry feature and you only want to disable the Multiple Entry feature, press and hold the “PGRM” button and enter “072” on the keypad.

TESTING AND ADJUSTING THE UNIT

1. Program the system according to the "PROGRAMMING INSTRUCTIONS" provided with this unit. The display should show each number as it is pressed on the keypad (the "*" will be shown as an "A" and the "#" will be shown as a "b"). If this does not happen, check the keypad cable connector to make sure that it was reinstalled correctly and that no damage was done to it during installation. Also, check to make sure that the nuts holding down the keypad retainer plate are only on at "finger tightness".
2. When you have finished programming a few entries, place a call. You should hear the dial tone immediately after you press the "# " button on the keypad. If you do not get a dial tone, check to make sure that the telephone connection has been made correctly. You should also check to see whether the telephone line has a dial tone by hooking a handset to the line at the Sentex terminal block. When you hear the dial tone, enter one of the directory codes which you have programmed. The system should now dial the number associated with this code.
3. Check the communications with the called party. The system has been adjusted at the factory for normal conditions and, in most cases, should need no further adjustments in the field. However, if your conditions are unusual, one or more of the following adjustments may be necessary:
 - A. VOLUME: If the volume on the unit is too loud or too soft, you can adjust it by turning the "HANDSET VOLUME" pot shown in Exhibit 1 (for handset models) or the "SPEAKER VOLUME" pot shown in Exhibit 2 (for hands-free models).
 - B. MUFFLED VOICE/CLIPPING: If the communication in either direction is muffled or the voices are being "clipped" in the middle of words, start by making sure that the "SIDETONE BALANCE" pot (shown in Exhibit 1) is set properly. If this pot is not set properly, you may also experience feedback from the unit. To adjust the "SIDETONE BALANCE", place the positive voltage meter lead across TP1 (+) and the negative voltage meter lead across TP2 (-). Next, go into the programming mode and enter step 02. This will cause the system to generate a 30 second DTMF tone. Adjust the "SIDETONE BALANCE" pot until you minimize the voltage reading on the voltage meter. Next, dial a tenant's number to test that the "clipping" has stopped. If there is still "clipping", determine which person's voice is being clipped. If it is the calling party, turn the "TENANT BIAS" pot (shown in Exhibit 2) counter-clockwise until the clipping stops. If it is the tenant, turn the pot in a clockwise direction.
 - C. ROTARY PHONES NOT ACTIVATING RELAY: Adjust the "CLICK LEVEL" pot (shown in Exhibit 1) until the click LED (located at the lower right corner of the board) lights up bright, distinct flashes whenever a click is heard. If the LED flashes between clicks or if the LED does not flash every time a click is heard, the pot is not adjusted correctly. **IMPORTANT NOTE**: If you cannot get the click LED to illuminate every time a click is heard, make sure that there is a jumper installed in area J2.

Any situation where the rotary clicks or tones from the tenant's phones are completely muted after the call is made between the visitor and the tenant will result in the relays not activating. This may be the case with certain PBX systems that mute tones after the connection is made or certain DSS exchanges that mute rotary clicks after the connection is made.

DO NOT ADJUST OR ALTER ANOTHER COMPONENT ON ANY OF THE CIRCUIT BOARD ASSEMBLIES OR YOU MAY VOID THE SYSTEM'S WARRANTY.

MAIN PROCESSOR BOARD

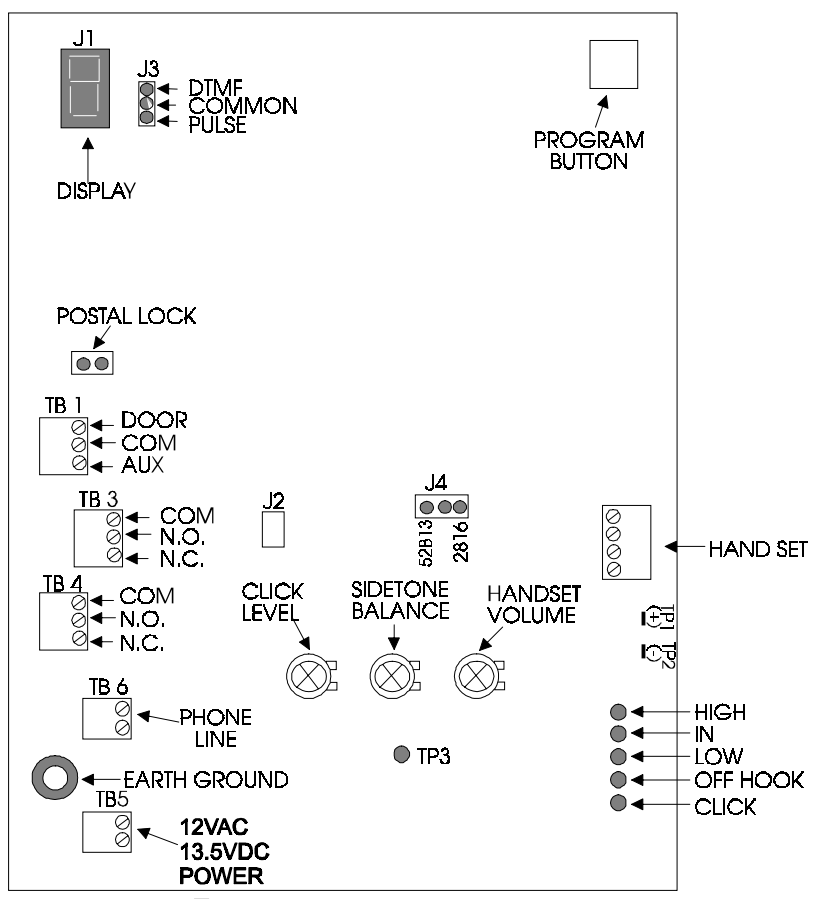
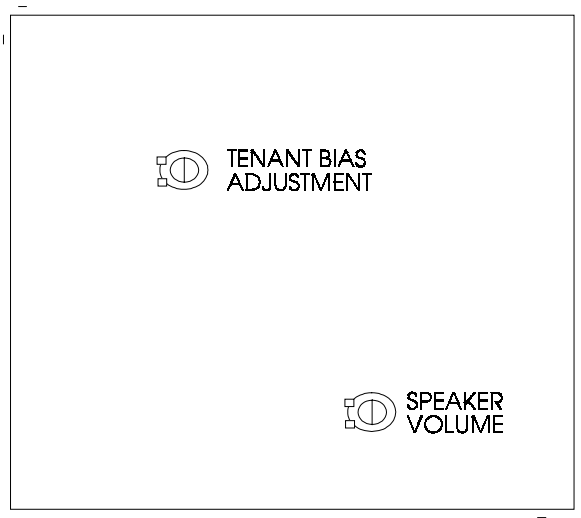


EXHIBIT 2

HANDS-FREE BOARD



FCC REQUIREMENTS

INSTALLATION

When you are ready to install this system, call your telephone company and give them the following information:

1. The telephone number of the line to which you will connect the system.
2. The FCC registration number for the system, which is **DS86W6-70754-ALR**.
3. The ringer equivalence number (REN) which is **0.0B**

This system connects to the telephone line by means of a standard jack called the USOC RJ11C. If this type of jack is not available where you want to install the system, you will need to order it from the telephone company.

TYPE OF SERVICE

Your Spectrum or Vista system is designed to be used on standard-device telephone lines. They should not be used on coin service or party lines. If you have any questions about your telephone line, such as how many pieces of equipment you can connect 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 or operation of your equipment, the telephone company will give you notice, in writing, to allow you to make any changes necessary to maintain uninterrupted service.

IF PROBLEMS ARISE

If your telephone equipment is not operating properly, you should immediately remove it from your telephone line, as it may cause harm to the telephone network. If the telephone company notes a problem, they may temporarily discontinue service. When practical, they will notify you in advance of this 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 a complaint with the FCC.

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

DISCONNECTION

If you should ever decide to permanently disconnect your Spectrum or Vista system from its present line, please call the telephone company and let them know of this change.

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 operated 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, D.C., 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, user's 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.

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

Caution: User's should not attempt to make such connections themselves, but should contact the appropriate electric inspections 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 Spectrum/Vista system is 38.