INSTALLATION INSTRUCTIONS

MicroComm DXI

VBS-420 Visitor Booth Station

1 Intent & Scope

This document describes the installation procedure for the VBS-420 Visitor Booth Station. The visitor booth application uses one VBS-420 primary station and one or two VBS-420 secondary stations.

Both the VBS-420 primary and secondary stations can be ordered with optional hook switch contacts (two form C relays) that can be used in various applications. In this case only one secondary station can be connected to the primary station. An application is described where a primary and secondary are connected and the hook switches are used to turn on a buzzer when one of the handsets is lifted off-hook, and turned off when both handsets are off-hook. The audio connection is not enabled until both handsets are off hook

An optional stand alone VSB-420 primary station can also be ordered with optional hook switch contacts (one form C relay and one form A relay). In this case the two primaries use line levels to transmit audio between primaries.

2 Visitor Booth Station

Typical operation of the VBS-420 is as a Visitor Booth Station that provides an audio connection between a handset station with electronics, called the primary, and one or two remote handsets called secondary (there can only be one remote station if the primary is ordered with hook switch contacts). The VBS-420 has auxiliary line level audio input and output ports for connection to other equipment. Figure 1 shows a block diagram of a VBS-420 used as a primary visitor booth station connected to one or two secondary stations.

The VBS-420 requires a dc power supply that can vary from +12 Vdc to +24 Vdc, and provide a minimum of 50 mA of current.

Each station may have an optional volume switch. This switch steps through 4 different volume levels. The Primary Station must have the volume control option to connect to secondary stations with a volume switch.

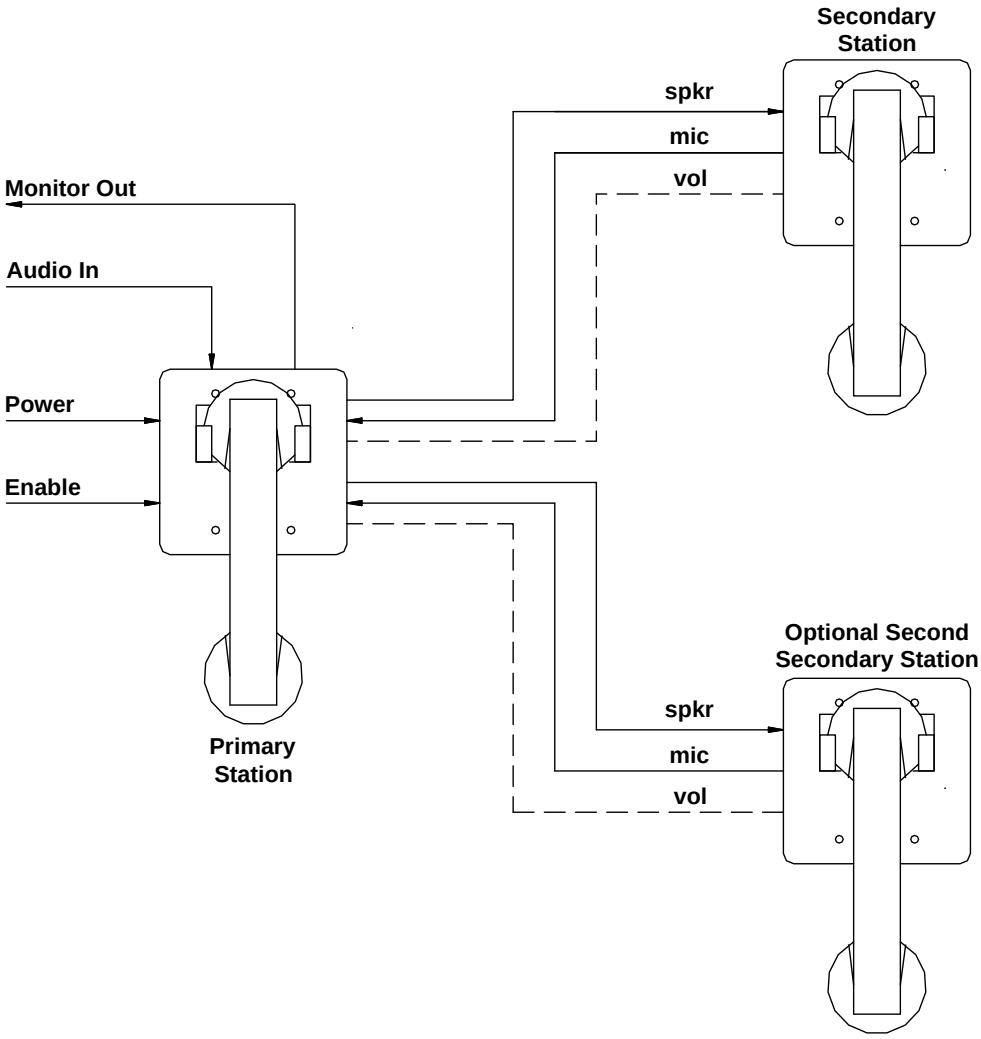

Figure 1 Block Diagram of a VBS-420 Visitor Booth Station

2.1 Installation

Electrical connections to the Primary VBS-420 are made with four AMP MTA-100 series connectors mated to headers located on the primary station printed circuit board. Figure 2 shows the view from the back of the primary with the printed circuit board and the location of the four MTA connectors.

The wires to the MTA connectors should be placed so that they run toward the inside, as shown in the diagram. This will prevent the wires from binding against the electrical box.

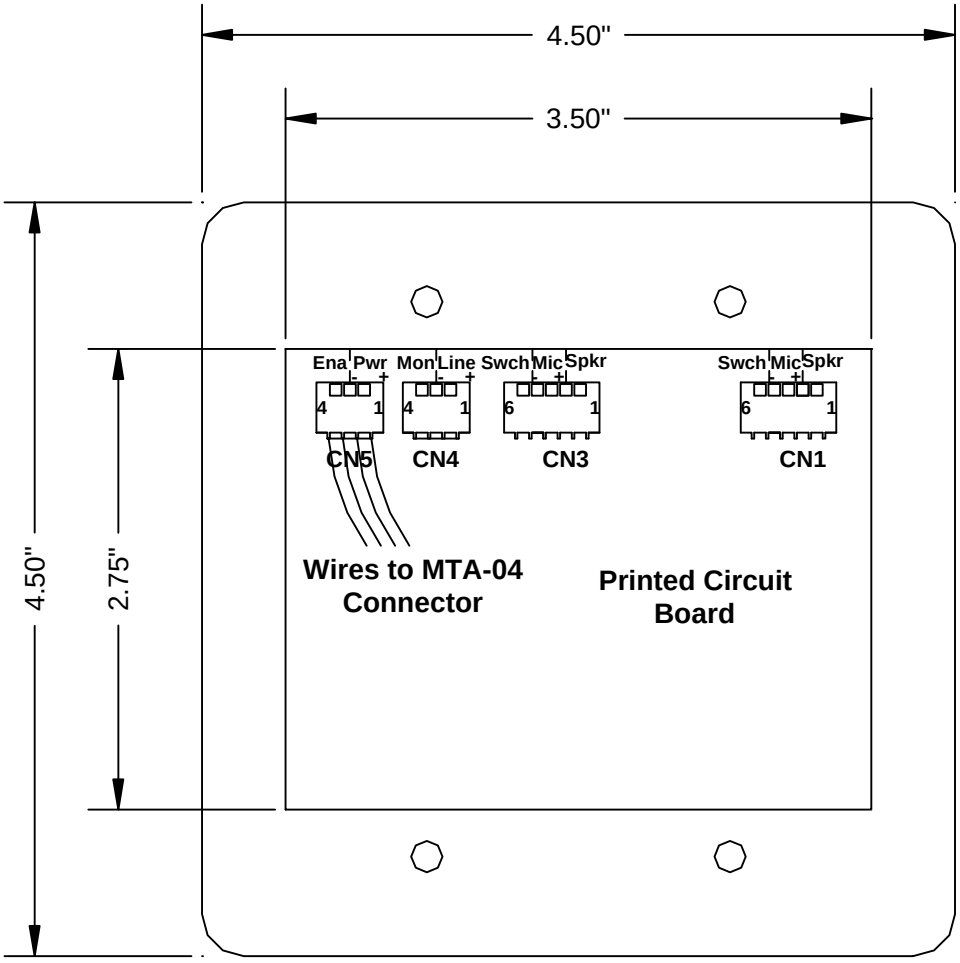

Figure 2 Connector Locations on PC Board of a Primary VBS-420

2.2 Power Connection and Enable Switch

The VBS-420 requires a +12 Vdc to +24 Vdc and Gnd connection. The pin terminals for the MTA connector, labeled CN 5 on the printed circuit board, is shown below.

The Enable switch is connected between pins 3 and 4 of the MTA-4 connector. To enable the station the switch and line resistance must be less than 200 ohms. If an external Enable switch is not required a jumper should be placed between pins 3 and 4. To make a jumper cut a wire 3 inches long, connect one end to pin 4 and the other end to pin 3 of the MTA-4 connector. (See Section 2.4 on how to make connections to MTA connectors.)

MTA-4 Pin	Function
1	+12 Vdc to +24 Vdc
2	Gnd
3	Enable Switch +
4	Enable Switch – (Gnd)

2.3 Audio Connections

The VBS-420 supports two secondary handsets. Each secondary handset is connected to the handset primary station printed circuit board by a two (or three with the volume option) 22 gauge twisted pair cable. The cable is connected to wire pigtails at the secondary end. The other end is terminated with an MTA connector on the printed circuit board of the primary station.

2.4 Connecting the First Secondary Handset to the Primary

The first secondary station connects to the male connector labeled CN3 on the primary printed circuit board. Each secondary station has four wire pigtails (six if it also has volume control). There are two standard color codes used for the handsets. A pigtail connection is made to the two pair interconnecting cable at the secondary, using a wire nut or crimp splice, while an MTA connector terminates the cable at the primary end of the cable.

Wire Colour #1 (at Secondary)	Wire Color #2 (at Secondary)	MTA-6 Pin (at primary station)	Function
Green	White	1	Spkr +
Yellow	White	2	Spkr -
Red	Red	3	Mic +
Black	Black	4	Mic -
Green	Green	5	Volume Switch
Green	Green	6	Volume Switch

Note that the polarity of the speaker connection is not critical but the microphone connection must maintain the specified polarity.

The connections to the primary station are made with a 4-pin AMP MTA-100 series connector (or 6-pin MTA-100 connector if the optional volume control is included). The speaker pair is connected to pins 1 and 2 and the microphone pair is connected to pins 3 and 4. To make these connections you should use an AMP tool Handle Assy 58074-1 with a 58246-1 head. The cable should be cut to length and the outer jacket should be trimmed back about 1/2 inch.

To insert the signal wires into the connector you remove the white cover from the connector, insert the connector into the tool from the left side (it will travel through the tool in the direction indicated by the arrow), pull the trigger once to load the connector. Next insert the signal wire for pin 4 (do not strip the wire) into the hole on the top of the tool and pull the trigger to insert the wire into the connector. (You should start with pin 4 in this case to have the wires run inward.) Next repeat the procedure for the signal wire for pin 3. Repeat this procedure to install the remaining signal wires. Finally, remove the connector from the tool, replace the cover, and then slide the connector onto the header pins on the primary station printed circuit board (labeled CN3).

2.5 Connecting Secondary Handsets with Optional Volume Control

If the VBS-420 is ordered with the optional volume control, the secondary station connectors are 6 pin MTA connectors (If the VBS-420 does not have the optional volume control a 4 pin MTA connector can be used). The pin functions of the MTA connectors are as follows:

MTA-6 Pin (at primary station)	Function
1	Spkr+
2	Spkr-
3	Mic+
4	Mic-
5	Volume +
6	Volume – (Gnd)

The audio connections are made as described above, the switch connections are made to pins 5 and 6 of the MTA connector. Each closure of the volume switch will change the volume received at the secondary handset to a new setting. Four preset volume levels are available.

2.6 Connecting a Second Secondary Handset to the Primary Station.

If an optional second secondary station is used, the connection details are identical to those described above except the connections are made to the MTA connector labeled CN 1.

2.7 Monitoring and Line Connections

The VBS-420 has provisions for monitoring the audio signals in a visiting booth, and to make announcements over the visiting booth audio circuits. These audio connections are made through an MTA-4 connector (labeled CN4). The pin numbers and function of the MTA-4 CN4 connector are shown below. The monitor output is often terminated on terminal blocks in an equipment room where the audio is available for recording when needed.

MTA-4 Pin (at primary station)	Function
1	Line +
2	Line -
3	Mon +
4	Mon -

The monitor and line inputs are transformer coupled and polarity is not critical. The input and output audio line signals are standard level (1 Vp) balanced signals.

3 Stand Alone VBS-420 Primary Stations

The stand alone VBS-420 primary stations are designed to work in pairs using the line level inputs and outputs to make the audio connections between the two units. A stand alone VSB-420 has connectors CN5, CN4 and CN1. CN3 in not required and is not installed on the circuit board. The stand alone station has hook switch contacts (one form C and one form A relay), the connector CN1 is reserved to bring out the on/off hook relay contacts.

3.1 Power Connection and Enable Switch

The stand alone VBS-420 requires a +12 Vdc to +24 Vdc and Gnd connection. The pin configuration for the MTA connector, labeled CN 5 on the printed circuit board, is shown below.

The Enable switch is connected between pins 3 and 4 of the MTA-4 connector. To enable the station the switch and line resistance must be less than 200 ohms.

MTA-4 Pin	Function
1	+12 Vdc to +24 Vdc
2	Gnd
3	Enable Switch +
4	Enable Switch – (Gnd)

3.2 Audio Connections

The audio connections between the two stand alone VBS-420 primary stations are made to CN4. The pin functions of the 4-pin MTA connector are as follows:

MTA-4 Pin (at primary station)	Function
1	Line +
2	Line -
3	Mon +
4	Mon -

The audio connection requires 2 shielded twisted pair, one pair connecting Line + (Line -) from the first stand alone VBS-420 to the Mon+ (Mon -) terminals on the second stand alone VBS-420. The second pair should connect Mon + (Mon -) from the first stand alone VBS-420 to the terminals Line + (Line -) on the second stand alone VBS-420.

3.3 Stand Alone VBS-420 Primary Station Hook switch contacts

The stand alone VBS-420 primary station has a form-C and a form-A relay hook switch contact.

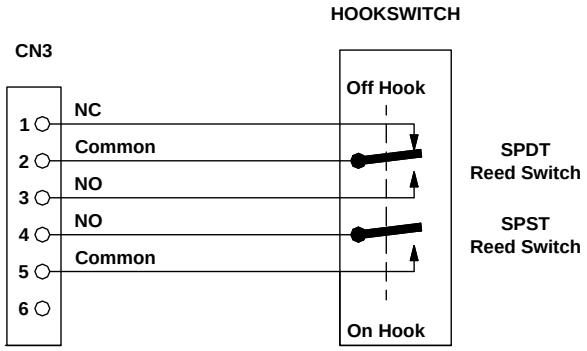

Figure 3 VBS-420 Hookswitch relay contacts with one form-C and one form-A relay switch

The pin functions of the 6-pin MTA connector are as follows:

MTA-6 Pin (at primary station)	Function
1	Relay #1 NC
2	Relay #1 Common
3	Relay #1 NO
4	Relay #2 NO
5	Relay #2 Common
6	No Connection

The normal position is the off-hook state.

4 Primary Stations and Secondary Stations with Hook Switch Contacts

The VBS-420 primary and secondary stations can be ordered with hook switch contacts. All pinouts are as described previously in Section 2 except the primary reserves CN1 to bring out the on/off hook relay contacts. The secondary station has pigtail terminations for both the audio and on/off footswitch relay contacts.

4.1 Hook Switch Contacts on Primary Station

The following diagram for a primary with the optional two form-C relay shows the reed relay connections from the hook switch to the header on the primary board.

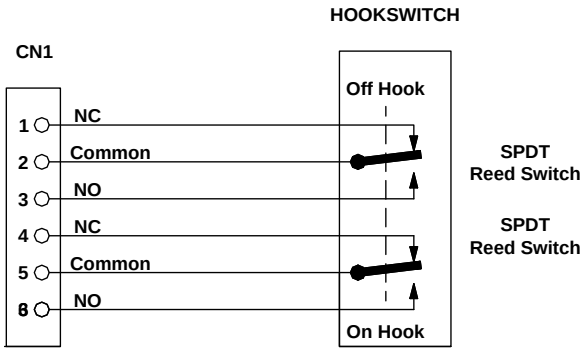

Figure 4 Hookswitch relay contacts with two form-C relay switches.

The pin functions of the 6-pin MTA connector are as follows:

MTA-6 Pin (at primary station)	Function
1	Relay #1 NC
2	Relay #1 Common
3	Relay #1 NO
4	Relay #2 NC
5	Relay #2 Common
6	Relay #2 NO

The normal position is the off-hook state i.e. the relays are energized when the handset is resting on the cradle.

4.1.1 Secondary Station with Hook Switch Contacts (Pigtail Terminations)

Both the audio pairs and relay outputs are left as pigtail terminations in VBS-420 secondary station. The following table gives the wire colors used for the relay outputs.

Wire Color (at secondary station)	Function
Yellow	Relay #1 NC
Green	Relay #1 Common
Orange	Relay #1 NO
Yellow	Relay #2 NC
Green	Relay #2 Common
Orange	Relay #2 NO

4.2 Application Example

The following is an example of an application where a phone connection between a secure room and an outside hallway is required. The room is secure in that no audio is transmitted to the outside handset when the secure room handset is in the on hook state. Both handsets must be off-hook before the primary is enabled and a communications channel is established.

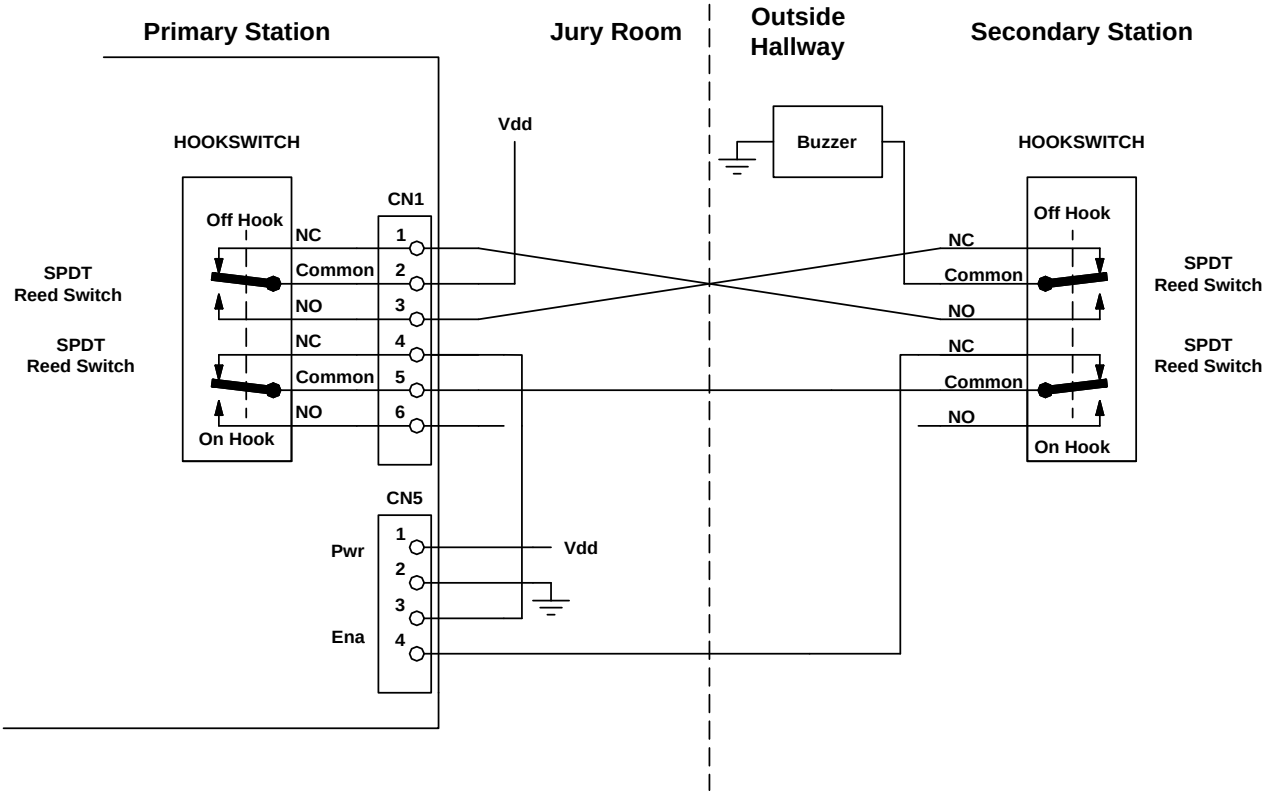

Figure 5 Application example with a secure room

4.3 Mounting Details

VBS-420 stations are designed to mount in a standard two-gang electrical box. The units should be mounted with four #6-32 machine screws. The mounting hole spacing is shown on the following diagram.

The box opening must be large enough to insert the printed circuit board (3.50 inches by 2.75 inches) and have sufficient depth (2.50 inches) to have space for the MTA connectors.

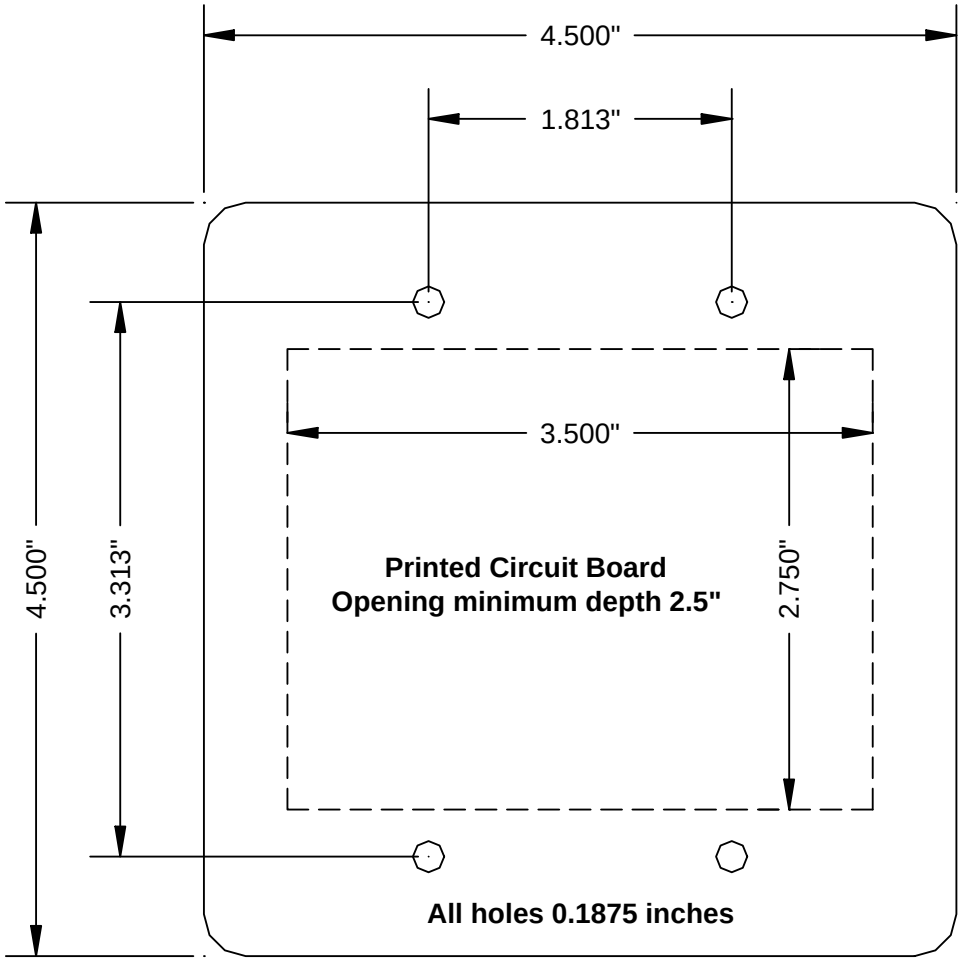

Figure 6 Mounting Details for VBS-420