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BavSonic^{TM} Single Lane E&M Telephone Audio with BEAM Installation and Service Manual

BavSonic™ E&M Telephone Audio

Table of Contents

Revisions:

ECN   **Date**

Important Safety Instructions

1. READ THESE INSTRUCTIONS

2. KEEP THESE INSTRUCTIONS

3. HEED ALL WARNINGS

4. FOLLOW ALL INSTRUCTIONS

5. DO <u>NOT</u> USE THIS APPARATUS NEAR WATER

6. CLEAN ONLY WITH A DRY CLOTH

7. DO NOT BLOCK ANY VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS

8. DO <u>NOT</u> INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT

9. PROTECT THE POWER CORD FROM BEING WALKED ON OR PINCHED PARTICULARY AT PLUGS, CONVENIENCE RECEPTACLES AND THE POINT WHERE THEY EXIT THE APPARATUS

10. ONLY USE ATTACHMENTS/ ACCESSORIES SPECIFIED BY THE MANUFACTURER

11. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. SERVICING IS REQUIRED WHEN THE APPARATUS HAS BEEN DAMAGED IN ANY WAY, SUCH AS POWER-SUPPLY CORD OR PLUG IS DAMAGED, LIQUID HAS BEEN SPILLED OR OBJECTS FALLEN INTO THE APPARATUS, THE APPARATUS HAS BEEN EXPOSED TO RAIN OR MOISTURE, DOES NOT OPERATE NORMALLY OR HAS BEEN DROPPED.

Additional Safety Instructions

WARNING – TO REDUCE THE RISK OF FIRE OR ELECTRONIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

WARNING – AN APPARATUS WITH CLASS I CONSTRUCTION SHALL BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE CONNECTION.

THE MAINS PLUG IS USED AS A DISCONNECT DEVICE AND SHALL STAY READILY OPERABLE.

APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES SHALL BE PLACED ON THE APPRATUS.

BavSonic™ E&M Telephone Audio Features

The BavSonic™ E&M telephone intercom interface module connects the intercom system of the drive-thru pharmacy lane to the telephone system. This is a full duplex audio system for maximum intelligibility. The incoming and outgoing audio levels are adjustable inside the interface.

The customers at the remote-drive-thru locations can call the pharmacy by depressing the CALL BUTTON on either lane. This initiates a call to the telephones in the pharmacy that are programmed to receive them. The pharmacy employees can access each remote lane from the telephones that are given access. If a customer presses the call button, and the call is not answered in approximately one minute, the call is terminated for 10 seconds then another attempt is made. This will happen five times at which point the interface will reset itself awaiting the next activation of the call button.

Telephone Interface

Power is supplied to the interface through an 110v power cord and is protected by a non-replaceable 1 amp fuse. The customer will supply the 110v power outlet as well as the connections from the telephone system to an area under the counter adjacent to the drive-thru window.

Telephone system requires an E&M port for each lane, and the phone system to be programmed to connect to the interface. This also is the customer's responsibility.

These items should be in place, and the phone system programed, before installing the BavSonic^{TM} E&M Telephone Interface.

Telephone Connections

This system is configured for a "TIE LINE" connection to a *Nortel/Avaya* telephone system. The telephone system is supplied and installed by those other than E.F. Bavis and Associates. There will be an E&M Tie Line Card in the telephone system, which is located in the electrical equipment room. The connections to the telephone use standard CAT 5 wiring. The termination is a type 568B. The connectors are RJ45. The E&M connections to the *Nortel/Avaya* system are referenced to the system ground and system battery. These reference levels are included in the RJ45 connection

In the programming for the "TIE LINES" the following settings are required by the BavSonic™ system. Line type = E&M, Answer = Manual, Answer DISA = NO, Signal = IMMEDIATE, Gain = NORMAL, Dial Mode = TONE.

Telephone Diagnostics

The WHITE /GREEN STRIPE (E1) wire is referenced to the GREEN (E2) wire. The normal voltage is 56Vdc with the BROWN wire being positive. After the call button is depressed the voltage will be less than 1Vdc. This indicates that the intercom is connected to the interface. This is the "E Lead" sensing. There is a LED for each lane to indicate that the intercom is connected to the interface.

The BROWN (M1) wire is referenced to the WHITE/BROWN STRIPE (M2) wire. The normal voltage is 5Vdc with the BROWN wire being negative. The voltage is less than 1Vdc when the telephone is connected to the interface. This is the "M Lead" sensing. There is a LED for each lane to indicate that the telephone is connected to the interface.

The BLUE, WHITE/BLUE STRIPE (TRANSMIT) wires are the audio signal coming from the telephone transmitter going to the intercom speaker. With the lane selected and someone talking the audio signal is approximately .848Vp-p as measured on an oscilloscope or .3Vrms as measured on a true rms digital multimeter.

The ORANGE, WHITE/ORANGE STRIPE (RECEIVE) wires are the audio signal coming from the intercom microphone to the telephone receiver. With the lane selected and someone talking the audio signal is approximately .848Vp-p as measured on an oscilloscope or .3Vrms as measured on a true rms digital multimeter.

When connecting to a Cisco phone system, the E&M Telephone Interface system requires one (1) Transfer or A/B Cat5 patch cable. This cable can be at either at the Interface box or at the phone server. If there not a Transfer cable, or if there are two cables, the symptom would be that as soon as the Cat5 cable is connected to the Interface box and the phone server, the phone server will react as though the call button has been pressed, and/or the line is "Busy".

Nortel/Avaya E&M Trunk Cartridge Wiring Chart
For 568A

SLOT 1 PORT 1 LANE 1			SLOT 1 PORT 2 LANE 2		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
White-Blue	T	White-Blue	White-Slate	T	White-Blue
Blue-White	R	Blue	Slate-White	R	Blue
White-Orange	T1	White-Green	Red-Blue	T1	White-Green
Orange-White	R1	Green	Blue-Red	R1	Green
White-Green	E	White-Orange	Red-Orange	E	White-Orange
Green-White	SG	Orange	Orange-Red	SG	Orange
White-Brown	M	White-Brown	Red-Green	M	White-Brown
Brown-White	SB	Brown	Green-Red	SB	Brown
SLOT 2 PORT 3 LANE 1			**SLOT 2 PORT 4 LANE 2**		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
Red-Brown	T	White-Blue	Black-Green	T	White-Blue
Brown-Red	R	Blue	Green-Black	R	Blue
Red-Slate	T1	White-Green	Black-Brown	T1	White-Green
Slate-Red	R1	Green	Brown-Black	R1	Green
Black-Blue	E	White-Orange	Black-Slate	E	White-Orange
Blue-Black	SG	Orange	Slate-Black	SG	Orange
Black-Orange	M	White-Brown	Yellow-Blue	M	White-Brown
Orange-Black	SB	Brown	Blue-Yellow	SB	Brown
SLOT 3 PORT 5 LANE 1			**SLOT 3 PORT 6 LANE 2**		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
Yellow-Orange	T	White-Blue	Violet-Blue	T	White-Blue
Orange-Yellow	R	Blue	Blue-Violet	R	Blue
Yellow-Green	T1	White-Green	Violet-Orange	T1	White-Green
Green-Yellow	R1	Green	Orange-Violet	R1	Green
Yellow-Brown	E	White-Orange	Violet-Green	E	White-Orange
Brown-Yellow	SG	Orange	Green-Violet	SG	Orange
Yellow-Slate	M	White-Brown	Violet-Brown	M	White-Brown
Slate-Yellow	SB	Brown	Brown-Violet	SB	Brown

Nortel/Avaya E&M Trunk Cartridge Wiring Chart
For 568B

SLOT 1 PORT 1 LANE 1			SLOT 1 PORT 2 LANE 2		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
White-Blue	T	White-Blue	White-Slate	T	White-Blue
Blue-White	R	Blue	Slate-White	R	Blue
White-Orange	T1	White-Orange	Red-Blue	T1	White-Orange
Orange-White	R1	Orange	Blue-Red	R1	Orange
White-Green	E	White-Green	Red-Orange	E	White-Green
Green-White	SG	Green	Orange-Red	SG	Green
White-Brown	M	White-Brown	Red-Green	M	White-Brown
Brown-White	SB	Brown	Green-Red	SB	Brown
SLOT 2 PORT 3 LANE 1			**SLOT 2 PORT 4 LANE 2**		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
Red-Brown	T	White-Blue	Black-Green	T	White-Blue
Brown-Red	R	Blue	Green-Black	R	Blue
Red-Slate	T1	White-Orange	Black-Brown	T1	White-Orange
Slate-Red	R1	Orange	Brown-Black	R1	Orange
Black-Blue	E	White-Green	Black-Slate	E	White-Green
Blue-Black	SG	Green	Slate-Black	SG	Green
Black-Orange	M	White-Brown	Yellow-Blue	M	White-Brown
Orange-Black	SB	Brown	Blue-Yellow	SB	Brown
SLOT 3 PORT 5 LANE 1			**SLOT 3 PORT 6 LANE 2**		
FROM E&M	Service	To RJ45 Jack	FROM E&M	Service	To RJ45 Jack
Yellow-Orange	T	White-Blue	Violet-Blue	T	White-Blue
Orange-Yellow	R	Blue	Blue-Violet	R	Blue
Yellow-Green	T1	White-Orange	Violet-Orange	T1	White-Orange
Green-Yellow	R1	Orange	Orange-Violet	R1	Orange
Yellow-Brown	E	White-Green	Violet-Green	E	White-Green
Brown-Yellow	SG	Green	Green-Violet	SG	Green
Yellow-Slate	M	White-Brown	Violet-Brown	M	White-Brown
Slate-Yellow	SB	Brown	Brown-Violet	SB	Brown

Intercom Connections

Note: **If there is a separate Incoming Volume Control assembly installed onto the old system, that Volume Control assembly must be removed.**

There is an intercom board (base audio board) located at each of the drive-thru lanes. Note that the base audio must be calibrated for BEAM use. There will be a label on the base audio board specifying beam calibration. This board is connected to the telephone interface via standard CAT 5 wiring. Remote lanes have a Microfit connector for improved weather resistance. First lanes use a RJ45 plug which is terminated 568B. Each remote intercom board has a LED, which indicates that it is receiving power. The audio level adjustments on the base audio board are sealed after they are calibrated. The audio levels are adjusted inside of the interface.

The intercom audio board for the 64" All-In-One window with the E.F. Bavis counter system is attached to the black laminated or Stainless Steel filler panel under the transaction drawer. For other window/drawer installations, it will be inside of a 2-1/8" x 3-1/4" x 5-1/4", Stainless Steel enclosure. The intercom audio board for the TransTrax is located inside a weatherproof enclosure, on the customer speaker panel, of the customer unit located on the outside island.

The base audio component connections are as follows: Plug J1 is for the speaker connection. The connector is a 3-position with positions 1 & 3 being the speaker. For the outside board, plug J2 is an 8-position Microfit, for the inside board, plug J2 is an 8-position RJ45. Plug J3 is for the call button connections. The connector is a 4-position with positions 2 & 3 being the button. Note that positions 1 & 4 are 19vdc power with position 4 being positive. Plug J4 is for the microphone connection. This connector is a 2-position.

Please see page 11 for an overall wiring diagram of the intercom section.

It is recommended to install the RJ45 connector directly onto the end of the CAT5 cable for the drive-thru lane. For situations where tooling is not available to attach the RJ45 to the end of the CAT5 cable for the remote lane(s), we have included a Cat5 Audio Connection Kit, (P/N 22316991) that can be added onto the cable for plug-in connection capability.

Troubleshooting

1. Is the RED LED, near the Intercom Connection port, on the face of the enclosure blinking? If not, check that there is 110 Vac at the outlet.

2. Try the "Loop Back" Testing function described below.

3. If the Call/Help button is pressed, does the "Ringing" LED at the Phone System connection port come ON? If not, check that the button is working correctly and the wiring is good.

4. When the lane is picked-up or selected on the buildings phone system, does the "Off Hook" LED come on? If not, does the phone's display give you a message, (Unavailable, or Busy, etc.), or a "Busy" signal? If so the problem is likely to be in the buildings phone system or programming.

5. Is there no audio for just one direction, or poor quality? If so, check the audio components for that direction, (Mic, Speaker & wiring).

Testing

The single lane E&M Telephone Audio Interface has a built in test feature. The test feature works with the system connected to a telephone or not. Pressing the audio test activates the test mode. Pressing the call button causes the outside microphone to be connected to the outside speaker at half volume. This mode stays active for 5 minutes or until the call button is pressed again or the interface is powered down and back up.
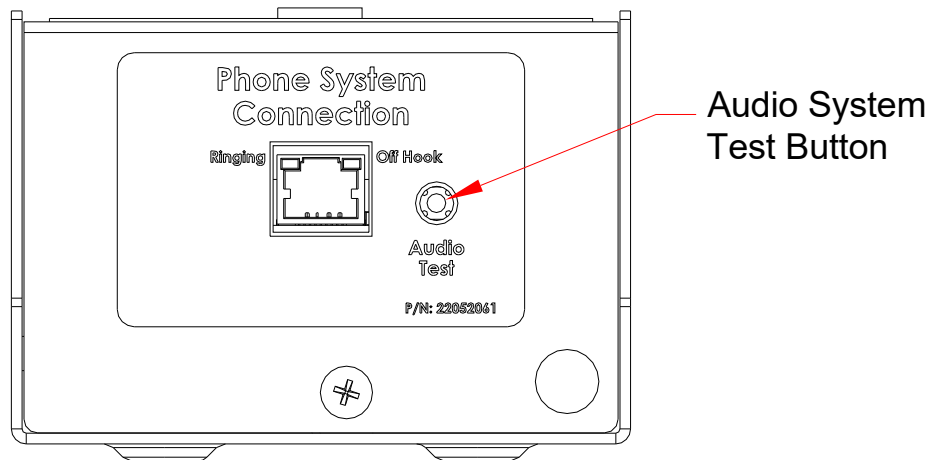
If you have any problems or questions, call the factory for assistance at **1-800-937-3322** and ask for Audio Technical Support**.**

Adjusting the Audio Levels

This interface has an integral BEAM (Bavis Enhanced Audio Module) module which is a very powerful voice processing system. This system has both echo cancellation and background noise suppression.

There are adjustments for both incoming and outgoing audio levels inside the interface. A small screwdriver is *included,* to make this adjustment. The adjusters are ¾ turn.

The adjustment procedure is to have someone in a running vehicle in the drive-thru talking to the technician on the telephone. With the outgoing audio adjusted down, in small increments, turn the incoming audio level down. Normally there will not be any appreciable reduction in the sound level at the handset coming from the drive-thru lane. The AGC (automatic gain system) of the telephone system is automatically reducing the signal to an acceptable level. When the incoming sound level does decrease, increase the level slightly until the sound comes back up to the normal level. This setting will give the echo cancellation system maximum range. Then adjust the outgoing level for usable audio, not excessively loud. Excessive outgoing audio levels may cause distortion in the incoming audio.

In the interface, there are four (4) configurations available. Selecting the configuration is performed by moving the jumpers on the headers marked as JP1 & JP2, (See the BEAM Jumper Configurations illustration). To determine which configuration is currently programmed in, without opening the enclosure, watch the flashes of the LED near the Intercom Connection port.

Configuration 1: One flash then pause. Each jumper is on only one pin of the JP1 and JP2 headers.
Bypass – Only used for Factory calibration. No alteration of the audio signal.

Configuration 2: Two flashes then pause. JP1 jumper is on both pins and JP2 jumper is on only one pin.
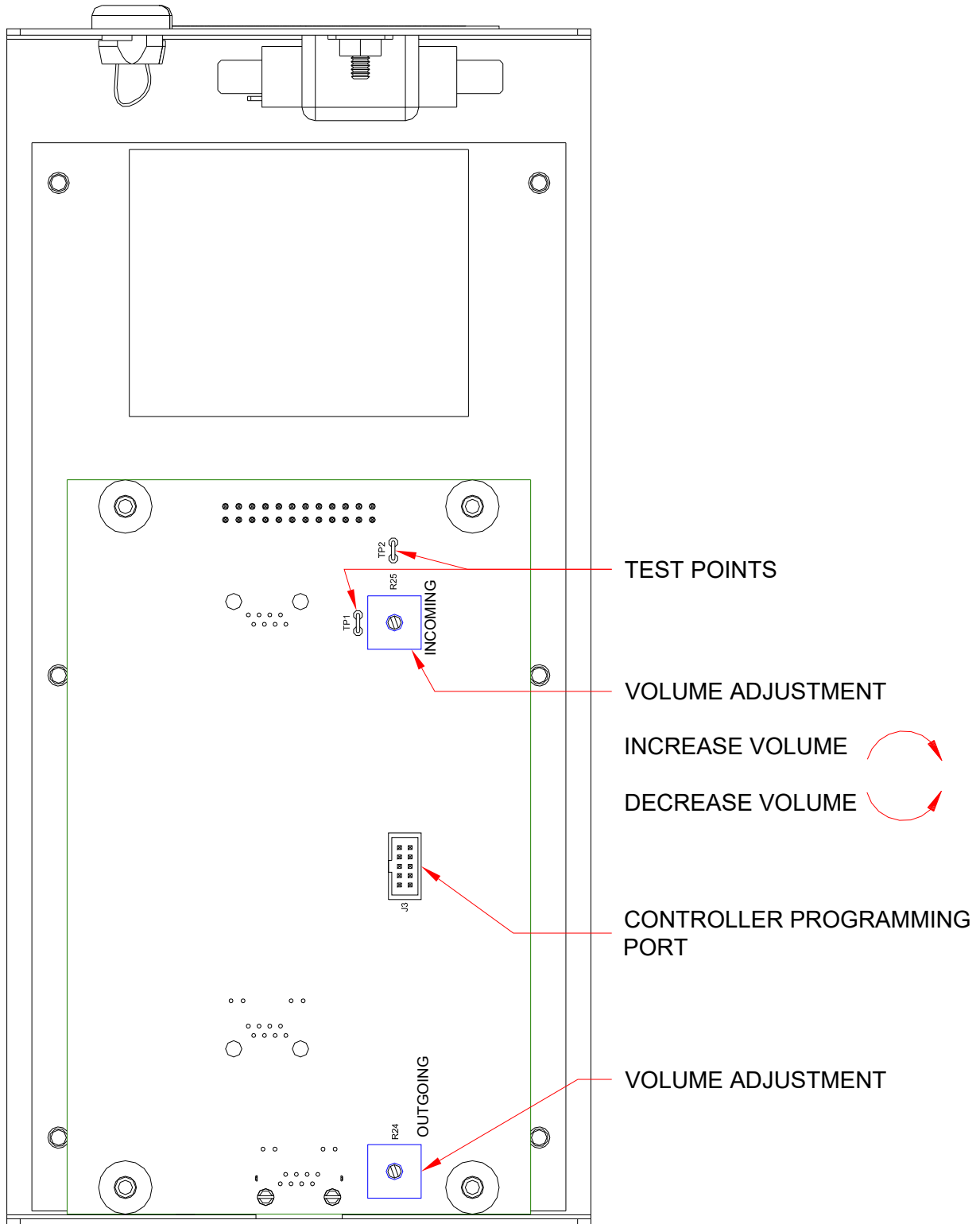Normal – Echo Cancellation & Noise reduction.

Configuration 3: Three flashes then pause. JP1 jumper is on only one pin and JP2 jumper is on both pins.
Extra Magic – Echo Cancellation, Noise reduction, & Speech boost.

Configuration 4: Four flashes and pause. JP1 jumper is on both pins and JP2 jumper is on both pins.
Reduced Outgoing Audio – There is Echo cancellation and noise reduction with the outgoing audio volume level reduced.

The volume adjustments are located on the controller board as shown in the illustration below.

TEST POINTS

VOLUME ADJUSTMENT

INCREASE VOLUME

DECREASE VOLUME

CONTROLLER PROGRAMMING PORT

VOLUME ADJUSTMENT

INCOMING

OUTGOING

If the audio cannot be adjusted satisfactorily please consult with the factory.

BEAM Jumper Configurations

Jumpers

991481C
BAVIS AEC
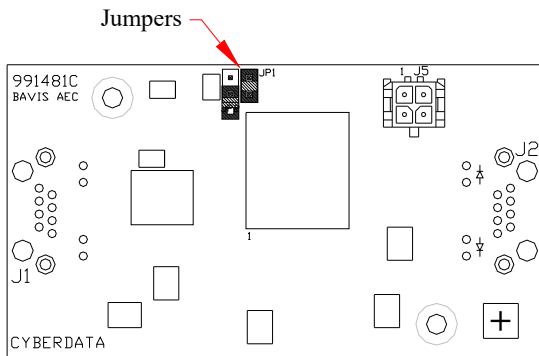
J1

CYBERDATA
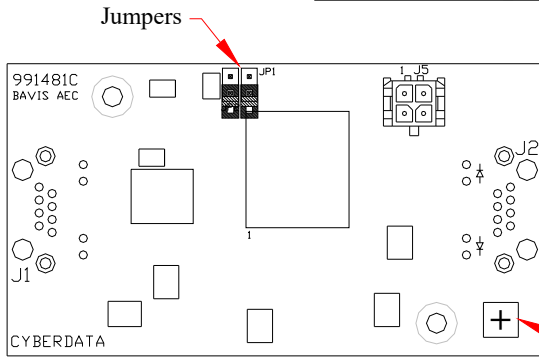
+ or - Sticker

Configuration 1
One flash then pause.

With Plus (+) Sign Sticker:
Bypass - only used for factory calibration. No Magic.

With Minus (-) Sign Sticker:
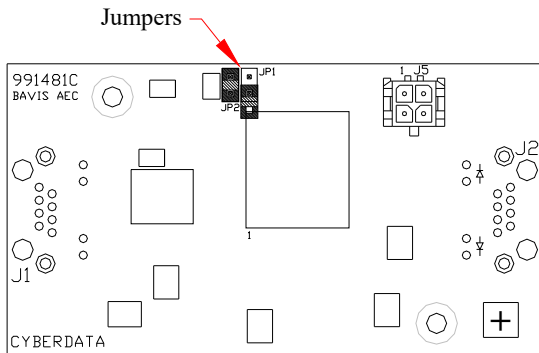BavSonic 3/2 Mode

Jumpers

991481C
BAVIS AEC

J1

CYBERDATA

Configuration 2
Two flashes then pause.

Normal - Echo cancellation & noise reduction.

Jumpers

991481C
BAVIS AEC

J1

CYBERDATA

Configuration 3
Three flashes then pause.

Extra Magic - Echo cancellation, noise reduction & speech boost.

Jumpers
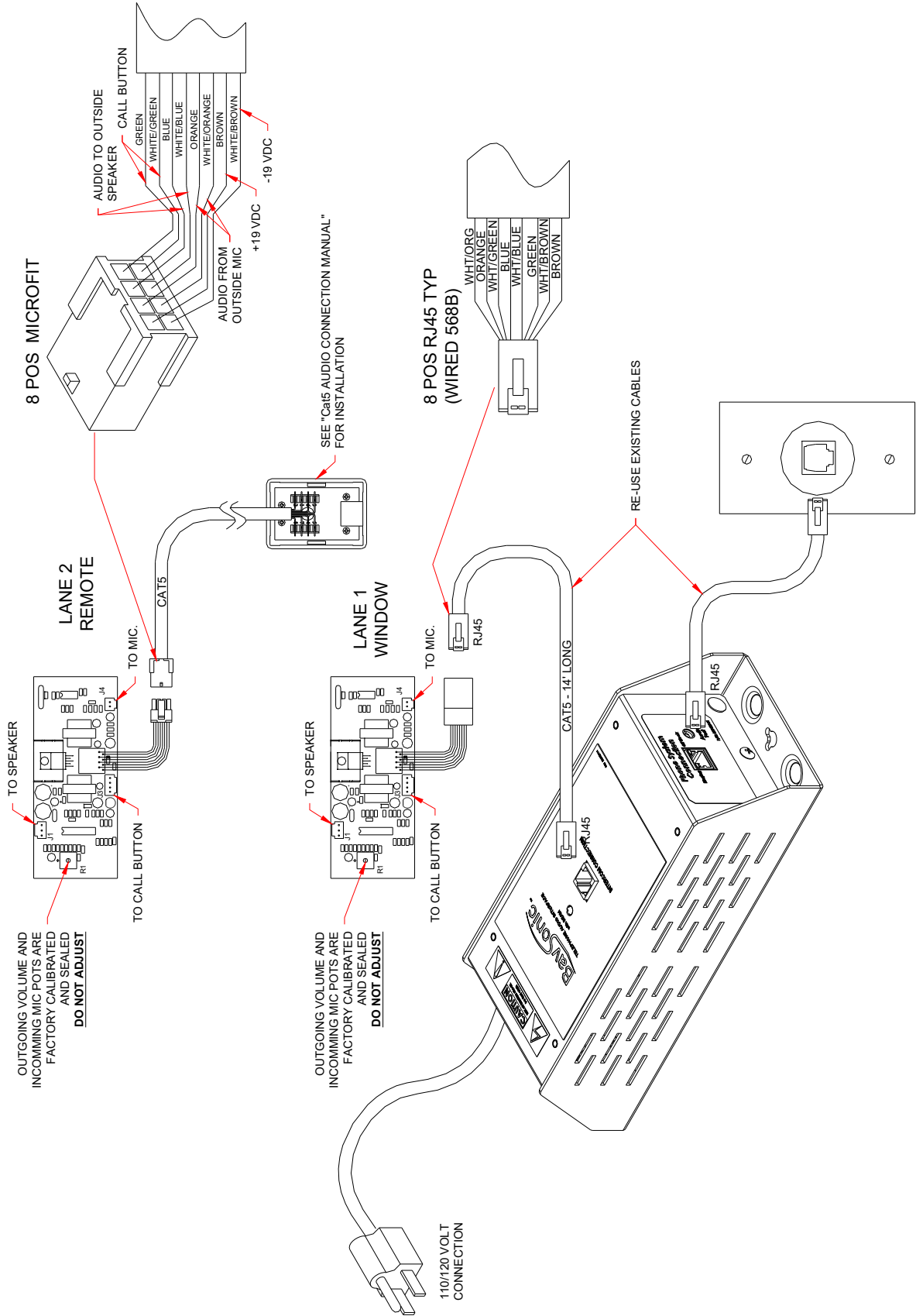
991481C
BAVIS AEC

J1

CYBERDATA
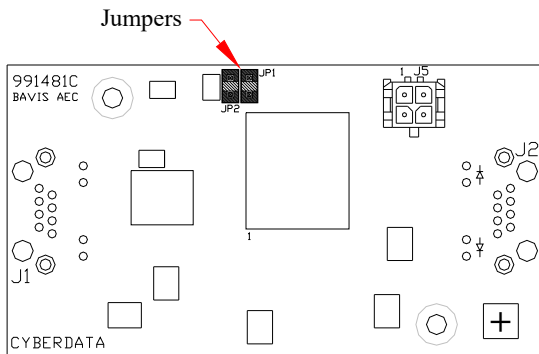
Configuration 4
Four flashes then pause.

Reduced Outgoing Audio - Echo cancellation, noise reduction & low outgoing audio.

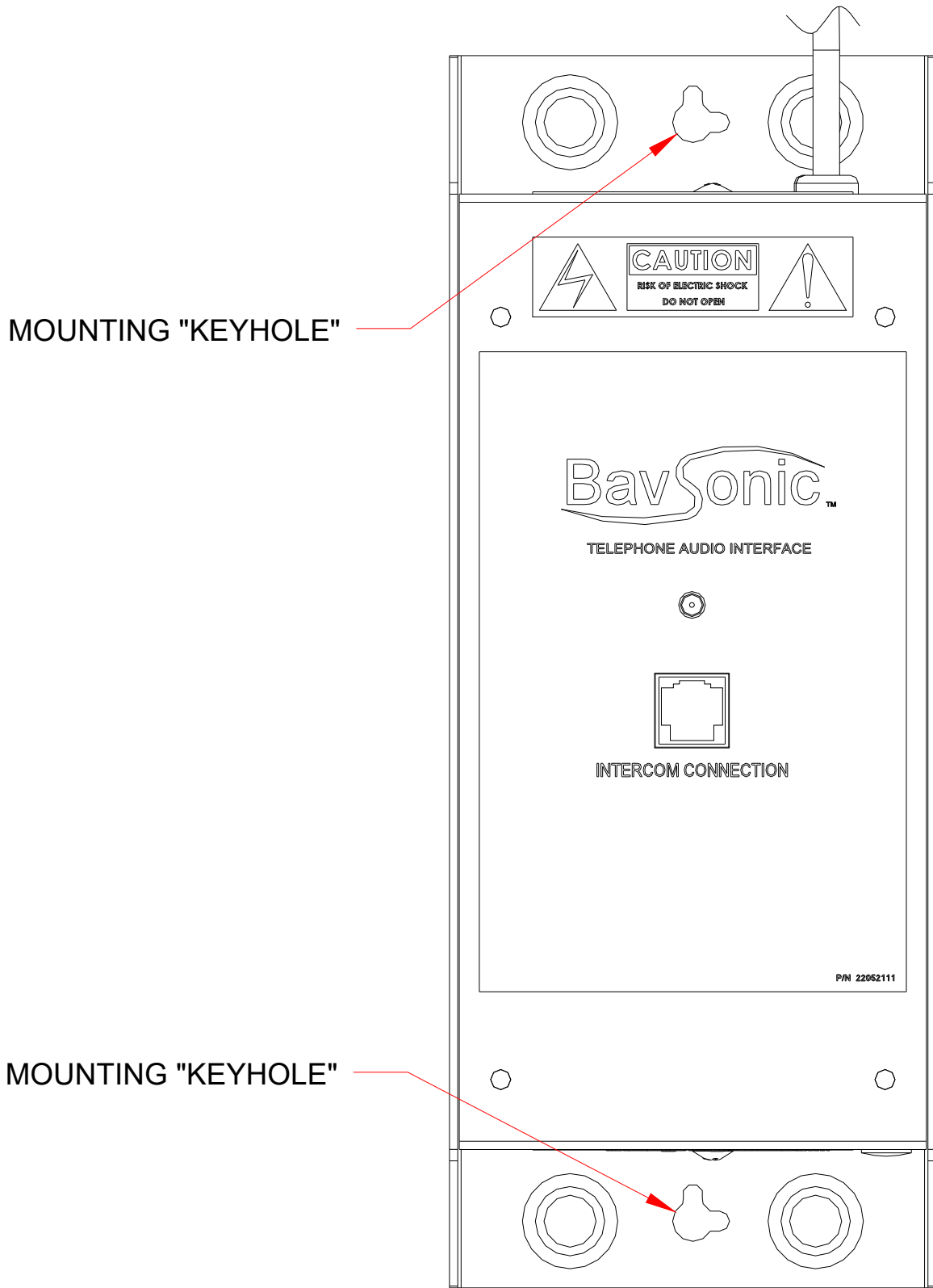If the audio cannot be adjusted satisfactorily please consult with the factory.

Intercom Wiring Diagram

GREEN
WHITE/GREEN
BLUE
WHITE/BLUE
ORANGE
WHITE/ORANGE
BROWN
WHITE/BROWN

AUDIO TO OUTSIDE SPEAKER — CALL BUTTON
-19 VDC
+19 VDC
AUDIO FROM OUTSIDE MIC

8 POS MICROFIT

SEE "Cat5 AUDIO CONNECTION MANUAL" FOR INSTALLATION

WHT/ORG
ORANGE
WHT/GREEN
BLUE
WHT/BLUE
GREEN
WHT/BROWN
BROWN

8 POS RJ45 TYP (WIRED 568B)

RE-USE EXISTING CABLES

LANE 2 REMOTE
CAT5
TO MIC.
TO SPEAKER
J4
TO CALL BUTTON
R1
J1

OUTGOING VOLUME AND INCOMMING MIC POTS ARE FACTORY CALIBRATED AND SEALED DO NOT ADJUST

LANE 1 WINDOW
TO MIC.
RJ45
TO SPEAKER
J4
TO CALL BUTTON
R1
J1

OUTGOING VOLUME AND INCOMMING MIC POTS ARE FACTORY CALIBRATED AND SEALED DO NOT ADJUST

CAT5 - 14' LONG
RJ45
RJ45

110/120 VOLT CONNECTION

11

Mounting the Interface

There are two "Keyhole" slots in the base of the assembly's housing to mount the interface.

MOUNTING "KEYHOLE"

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

BavSonic ™

TELEPHONE AUDIO INTERFACE

INTERCOM CONNECTION

P/N 22052111

MOUNTING "KEYHOLE"

Installation and Service Tool List for Audio

1/8" And 3/8" Flathead Screwdrivers
#0 And #2 Phillips Screwdrivers
1/16" And 3/32" Allen Wrenches
1/2" Open-End Wrench
1/4", 5/16", 11/32", 3/8", And 1/2" Nut Drivers
Wire Cutters
Wire Strippers
Wire Crimpers
RJ45 Connector Crimpers & Connectors
Volt Meter
Electric Drill
Drill Bits
Level
7/8" Unibit
Fish Tape
Loctite