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# **BavSonic™ E&M Telephone Audio**

## **Installation and Service Manual**

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Patent Number US 6,670,419 B1

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# BavSonic™ E&M Telephone Audio

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# Important Safety Instructions

1. READ THESE INSTRUCTIONS
2. KEEP THESE INSTRUCTIONS
3. HEED ALL WARNINGS
4. FOLLOW ALL INSTRUCTIONS
5. DO NOT 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 NOT 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 PARTICULARLY 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.

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## Additional Safety Instructions

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

## **BavSonic™ E&M Telephone Audio Features**

The BavSonic™ E&M telephone intercom interface module connects the intercom system of the two outside remote drive-thru pharmacy lanes to the telephone system. This is a full duplex audio system for maximum intelligibility. The incoming audio levels are adjustable at each telephone station.

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 a 110v power cord and is protected by a 1-amp breaker. The Purchaser of this Telephone Interface system is responsible for providing the connections from the telephone system to an area under the counter adjacent to the drive-thru window.

**Note** – The test plug is located either inside or wire tied to the outside of the Telephone Interface box; if you cannot find the test plug or it has been removed, please call the manufacturer for assistance.

## **Telephone Connections**

This system is configured for a “TIE LINE” connection to a Norstar 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 Norstar system are referenced to the system ground and system battery. These reference levels are included in the RJ45 connection. There are color-coded 14’ patch cables supplied to make the connection from the RJ45 jack to the telephone interface.

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 at TB1 & TB2**

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.

## Norstar E&M Trunk Cartridge Wiring Chart For 568A

<b>SLOT 1 PORT 1 LANE 1</b>			<b>SLOT 1 PORT 2 LANE 2</b>		
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
<b>SLOT 2 PORT 3 LANE 1</b>			<b>SLOT 2 PORT 4 LANE 2</b>		
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
<b>SLOT 3 PORT 5 LANE 1</b>			<b>SLOT 3 PORT 6 LANE 2</b>		
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



## Norstar 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

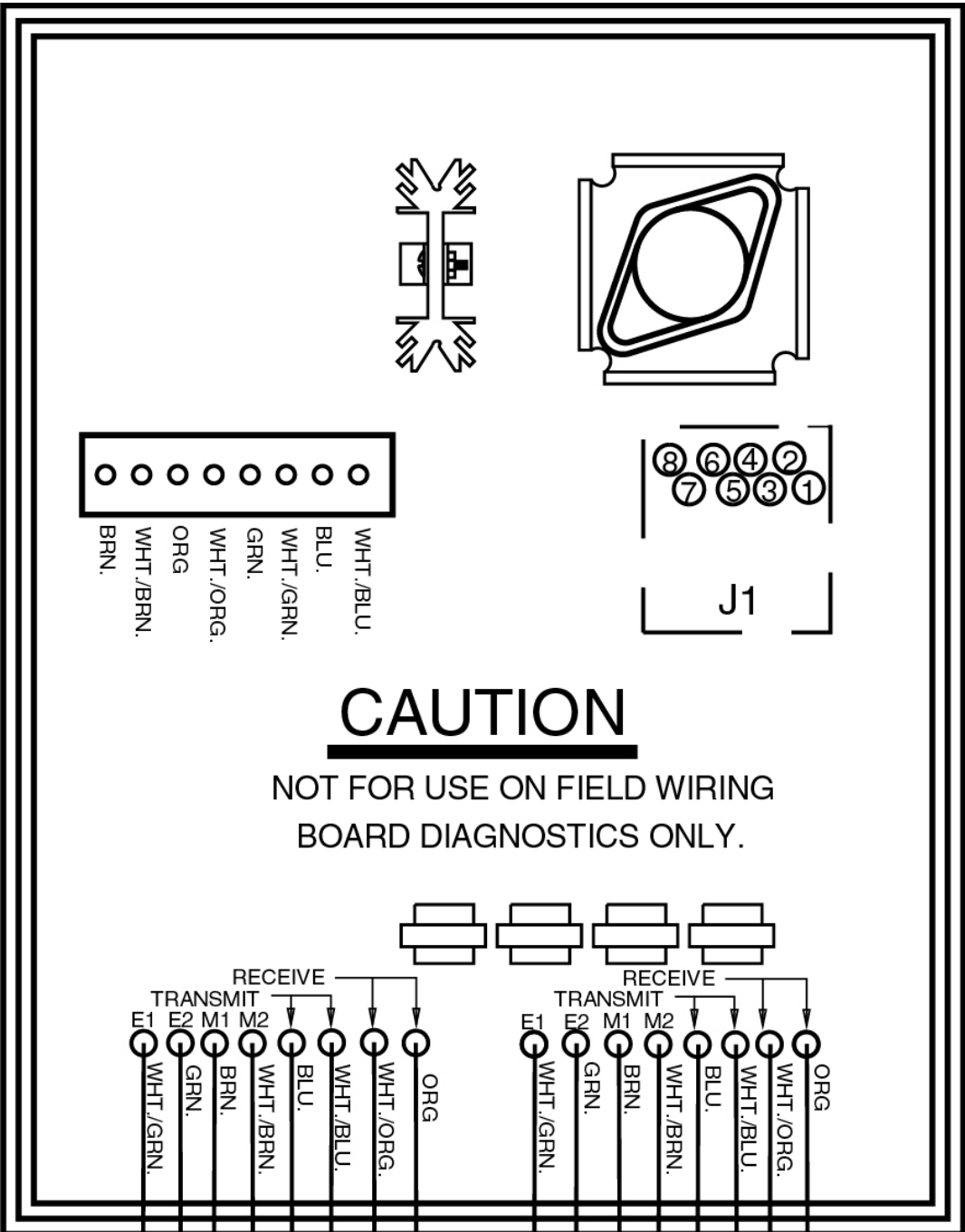
There are intercom boards located in both the window lane and remote lane. These boards are connected to the telephone interface via standard CAT 5 wiring. The termination is a type 568B. The red connector is RJ45. The blue is phoenix terminal barrier plug. Red cabling designates lane one. Blue cabling designates lane two. Each intercom board has a LED, which indicates that it is receiving power.

The outgoing audio levels are adjusted at the intercom audio board. The intercom audio board for the window is attached to the black laminated filler panel under the transaction drawer. 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.

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.

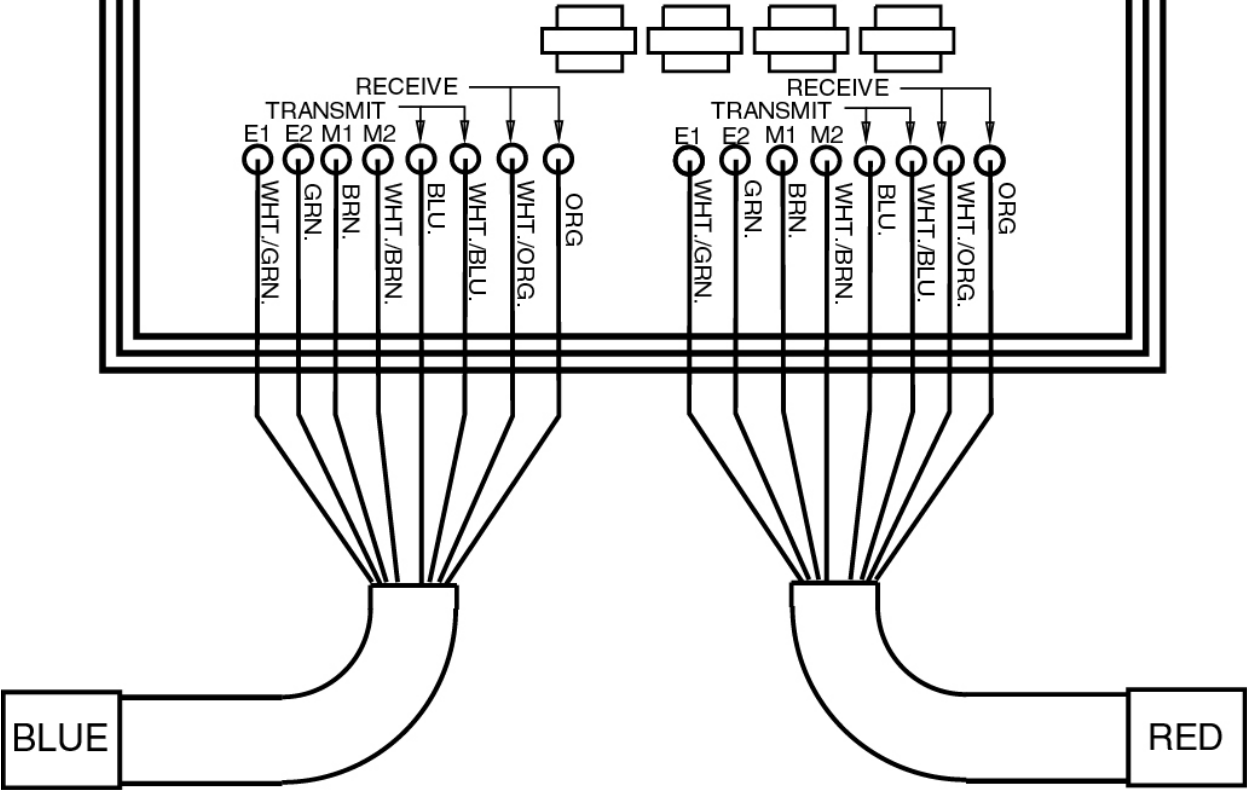
Please see page 7 for an overall wiring diagram of the intercom section. Note that the wire tie on the case is for strain relief for the Lane 2 connection.





# CAUTION

NOT FOR USE ON FIELD WIRING BOARD DIAGNOSTICS ONLY.



## Intercom Diagnostics at J1 & J3 (Lead Side)

Please see page 8 for the location of the test points for these diagnostics.

Positions 4 & 5 at the J1 connector are for 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. For the terminal connector, the wire colors are BLUE and WHITE/BLUE.

Positions 3 & 6 at the J1 connector are for the signal from the call button to the interface. The normal voltage is 19Vdc with 6 being positive. When the call button is depressed the voltage should be near zero. For the terminal connector, the wire colors are GREEN and WHITE/GREEN.

Positions 1 & 2 at the J1 connector are for 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. For the terminal connector, the wire colors are ORANGE and WHITE/ORANGE.

Positions 7 & 8 at the J1 connector are for the power to the audio board. This is 19Vdc with 8 being positive. For the terminal connector, the wire colors are BROWN and WHITE/BROWN.

**Note:** See Telephone Audio Retrofit manual for details concerning installation of the Bavsonic™ Telephone Audio System

## **Telephone Audio Interface Test Procedure**

1. With none of the LED's on, insert the test plug into the lane to be tested.
2. Press the call button on the lane under test.
3. Both "connected" LED's should come on.
4. Talk into the outside microphone, sound should come out the outside speaker.
5. Remove the test plug to reset the lane.
6. Use this same procedure for both lanes.

This is a complete test of the intercom and interface.

For more information, refer to the Testing and Debugging BavSonic E&M Telephone Audio Manual part #00619011.

Note: This is not to be used for adjusting the audio levels. Audio power is cut in half to help prevent feedback in the system and will reduce the signal.

If you have any problems or questions, call the factory for assistance.

Note: If experiencing audio problems with the Captive Carrier TransTrax, check to see if a TT connector board (Part # 04112011) is present. If so, it is recommended that this board be removed, and the wires connected color to color using crimp style pigtail connectors. If you have any questions regarding this procedure, contact the factory at 1-800-937-3322.

### **Shorting Test**

#### **Testing at wall jack:**

Connect White/Green to Green

If the telephone rings after connecting the wires the system is ok.

If the telephone doesn't ring there is a problem with the telephone system.

#### **Testing at Telephone Interface:**

Connect Brown to White/Brown

If both LED's light up on the Interface, the Interface is ok.

If they do not light up, the Interface is bad.

This test assumes that the phone system is wired as a 568B. If your system is wired as a 568A, consult the factory for assistance.

#### **Testing using an Amplified Butt Set:**

While the wires are connected to test the Interface you can also listen to the incoming signal from the outside microphone by connecting the Butt Set to the White/Orange & Orange wires.

**Testing using a Toner:**

While the wires are connected to test the Interface you can check the outside speaker by connecting a Toner to the White/Blue & Blue wires, and listening for the outside speaker.

## **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  
Volt Meter  
Electric Drill  
Drill Bits  
Level  
7/8" Unibit  
Fish Tape  
Loctite



