**DESCRIPTION**

**MODEL TLO OUTDOOR SPEAKER/MICROPHONE**

Model TLO is a two-way speaker and microphone and re-entry horn for high volume penetration. Weatherized for outdoor applications, the microphone and speaker horn are all within one housing. In operation, the TLO together with the AOP-SP70 provides hands-free bi-directional audio communication with the audio receiving device (DVR, IP Camera, etc.).

**MODEL AOP-SP70 AUDIO CONVERSION UNIT**

Model AOP-SP70 converts the signals of Model TLO for compatibility with the receiving device for providing two-way audio. The AOP-SP70 drives the audio signals into the audio input of the IP Camera, etc, for transmission over the network and to an existing computer (or other devices) at the receiving site. Person at the receiving site hears the audio through the computer speaker or through a headphone. For talkback to the remote site (TLO location), the computer’s microphone is used to transmit audio back through the network to the AOP-SP70. It is then amplified and sent out to the speaker portion of the remote TLO. Mounted in an ABS Housing the AOP-SP70 provides power to the TLO and contains adjustments for microphone gain and speaker volume. A 120Vac/12Vdc power supply is included with the AOP-SP70.

**WIRING REQUIREMENTS**

**FOR TLO**

- 2 Conductor **shielded**, 20 gauge with 22 gauge drain (microphone connection)
- 2 Conductor **unshielded**, 18 gauge (speaker connection)

All in the same jacket

**West Penn 356 or equivalent**

**FOR AOP-SP70**

- 2 Conductor **shielded**, 20 gauge with 22 gauge drain
- 1 Conductor **unshielded**, 20 gauge

All in the same jacket

**West Penn 358 or equivalent**
WIRING CONNECTIONS TO MODEL TLO

**WIRING REQUIREMENTS**

4 Conductor consisting of:
- 2 Conductor **shielded**, 20 gauge with 22 gauge drain (microphone connection)
- 2 Conductor **unshielded**, 18 gauge (speaker connection)

All in the same jacket

**West Penn 356 or equivalent**

**COLOR CODE FOR RECOMMENDED CABLE**

- Red - 12Vdc Power
- Black - Audio Output
- Bare - Ground

- Green - Speaker Positive
- White - Speaker Ground

Color code may vary if using wiring from other manufacturers

**MICROPHONE CONNECTION OF TLO**

The short cable extending from the back of the TLO is the microphone connection and consists of three wires: **red**, **black** and **bare**. Using recommended wiring (West Penn 356 or equivalent), make microphone connections using 20 gauge wire nuts and matching **red** wire with **red**, **black** with **black** and **bare** wire with **bare** wire. See diagram next page.

**SPEAKER CONNECTION OF TLO**

Speaker connection is located near the rear of the TLO and has a plexiglass window. Remove window and connect the speaker portion of West Penn 356 (**green** and **white** wires) to the two terminal screws marked 1 and 2.

- **Green** speaker wire goes to position 1 (positive)
- **White** speaker wire goes to position 2 (negative)

See diagram below

**POWER TAP SETTINGS OF TLO**

Located above the speaker connection of TLO is a set screw with a dial numbered 1 through 7. Using a small screw driver, adjust the set screw to correspond to the proper power tap as shown below.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Wattage</th>
</tr>
</thead>
<tbody>
<tr>
<td>#2</td>
<td>3.8W</td>
</tr>
</tbody>
</table>

Louroe™ Model TLO connected to Louroe AOP-SP70 conversion unit for interfacing with a DVR or IP Network Camera, use:
POSITIONING TLO
After TLO has been mounted to desired structure (wall, pole, etc.), horn should be tilted in a downward position. This will protect the microphone element from water damage.

WIRING DIAGRAM OF MODEL TLO OUTDOOR SPEAKER/MICROPHONE

Speaker terminal screws
- Green wire to #1 (positive)
- White wire to #2 (ground)

Microphone connection using three wire nuts
- Red wire to red = 12Vdc
- Black wire to black = Audio Output
- Bare wire to bare = Ground

Microphone connection
- Green = speaker (positive)
- White = speaker (negative)
- To Louroe™ AOP-SP70 Audio Conversion Unit

See page 5 for connection diagram

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Page 3 of 8
CONNECTING TLO TO AOP-SP70 UNIT AND TO RECEIVING DEVICE (DVR, IP NETWORK CAMERA, ETC.)

(Refer to Diagram on page 5)

MICROPHONE CONNECTION OF AOP-SP70
On the AOP-SP70 PC board locate the 3-pin terminal block marked A, B, C. This is the microphone connection.

1) Connect RED wire to pin A (12Vdc)
2) Connect BLACK wire to pin B (Audio Output)
3) Connect BARE wire to pin C (Ground)

SPEAKER CONNECTION OF AOP-SP70
Located on the AOP-SP70 Transformer are two wires, Green and Black.

1) Connect Green wire of AOP-SP70 Transformer to Green wire from TLO (speaker positive) using a wire nut.
2) Connect Black wire of AOP-SP70 Transformer to White wire from TLO (speaker ground) using a wire nut.

WIRING CONNECTION FROM AOP-SP70 TO THE AUDIO RECEIVING DEVICE (DVR, IP NETWORK CAMERA, VIDEO SERVER, SOUNDCARD, ETC.)

WIRING REQUIREMENTS
3 Conductor consisting of:
- 2 Conductor shielded, 20 gauge with 22 gauge drain
- 1 Conductor unshielded, 20 gauge
All in the same jacket

West Penn 358 or equivalent

CONNECTION TO AOP-SP70
Locate the 4-pin terminal block (marked A, B, C, SP) and connect as follows:

1) Red wire goes to Pin B Audio Output
2) Black wire goes to Pin C Ground (audio)
3) Bare wire goes to Pin C Ground (speaker)
4) White wire goes to Pin SP Speaker Output

NOTE: Pin “A” is not used. Both black and bare wire connect to Pin C.

CONNECTION FROM AOP-SP70 TO DVR, IP NETWORK CAMERA, ETC.
After wiring connection has been applied to the 4-pin terminal block of the AOP-SP70, run other end of cable to the audio receiving device’s audio Input/Output (usually either RCA, 3.5mm mono or 3.5mm stereo). If Audio In/Out of DVR, IP Camera, etc. is 3.5mm type, refer to the specific instructions to determine if mono or stereo. Solder on the appropriate plugs to match the “Audio In” and “Audio Out” of the DVR, etc. as shown on page 5.
INTERCONNECTION DIAGRAM

LOUROE MODEL AOP-SP70 SPEAKERPHONE CONVERSION UNIT, AND LOUROE MODEL TLO SPEAKER/MICROPHONE CONNECTION TO DVR, IP NETWORK CAMERAS OR VIDEO SERVER (BI-DIRECTIONAL AUDIO)

4-PIN TERMINAL BLOCK IDENTIFIER OF AOP-SP70 (A,B,C,SP)

- **A** = not used with this application
- **B** = Audio Output
- **C** = Ground (audio) and Ground (speaker) (black wire)
- **SP** = Speaker output

**WIRING REQUIREMENTS FOR TLO**

- 4 Conductor shielded cable
- 2 shielded 20 gauge and 2 unshielded 18 gauge, 20 gauge drain wire
- West Penn 356 or equivalent

Using power supply (included), connect as follows:
- Positive 12Vdc connects to terminal marked “+”
- Negative 12Vdc or ground connects to terminal marked “GND” (wire with white stripes)

**MICROPHONE CABLE**

- Red = 12Vdc
- Black = Audio Output
- Bare = Ground

**WHITE SPEAKER (GROUND)**
- GREEN SPEAKER (POSITIVE)

**FOR TALKBACK ADJUST**

- MIC ADJUST
- SP ADJUST

Using power supply (included), connect as follows:
- Positive 12Vdc connects to terminal marked “+”
- Negative 12Vdc or ground connects to terminal marked “GND” (wire with white stripes)

**3.5mm STEREO CONNECTION**

- Red Wire
- Black Wire
- White Wire

**3.5mm MONO CONNECTION**

- Red Wire
- Black Wire
- White Wire

**RCA CONNECTION**

- Red Wire
- Black Wire
- White Wire

**WIRING REQUIREMENTS**

- 3 Conductor cable consisting of:
  - 2 Conductor shielded, 20 gauge with a 22 gauge drain wire
  - 1 Conductor unshielded, 20 gauge
- West Penn 358 or equivalent

For connection to DVR, IP Network Camera, etc., solder the appropriate plug (RCA, 3.5mm mono or 3.5mm stereo) to match the audio inputs of the receiving device as shown below. Refer to IP Camera’s instruction to determine if 3.5mm audio is mono or stereo.
APPLYING POWER TO AOP-SP70

AOP-SP70 requires 12Vdc, 500mA power. A 12Vdc power supply is included. Connect the stripped ends of the power supply to the 2-pin terminal block located in the far right of the pc board marked “12Vdc”. Positive 12Vdc connects to the terminal marked “+” and negative 12Vdc or ground connects to the terminal marked “GND”.

TLO SPECIFICATIONS

SPECIFICATIONS (MICROPHONE)

<table>
<thead>
<tr>
<th>Type</th>
<th>Electret Condenser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>line level (0dB @ 1KΩ), unbalanced</td>
</tr>
<tr>
<td>Frequency response</td>
<td>40 Hz to 15 kHz ± 1 dB</td>
</tr>
<tr>
<td>Current drain</td>
<td>4 mA</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>12 Vdc</td>
</tr>
<tr>
<td>Output impedance (mic only)</td>
<td>600Ω unbalanced</td>
</tr>
</tbody>
</table>

SPECIFICATIONS (SPEAKER)

| Power rating             | 30W                |
| Overall length of horn   | 11 ½”              |
| Flare of bell            | 10 7/8”Hx6 ½”W     |
| Frequency response       | 300Hz to 10 kHz    |
| Sound pressure level     | 115 dB at 4’ on axis with 5W input |
| Input                    | 70V constant       |
| Voice coil impedance     | 8Ω                 |
| Weight (net)             | 6 Lb (2.7 Kg)      |

AOP-SP70 SPECIFICATIONS

SPECIFICATIONS FOR AOP-SP70

| Monitor output impedance | 600Ω               |
| Talkback input impedance | 600Ω               |
| Talkback power output    | 1W @ 70V            |
| Power Input              | 12 Vdc, 500 mA      |
| Dimensions               | 8 3/8”L x 7 3/8”W x 2 3/4”H |
MANUFACTURED IN THE USA

IMPORTANT NOTICE

When this equipment is used as part of an audio monitoring system, the law requires that the public be given notice of AUDIO MONITORING ON THE PREMISES. To protect the installing dealer and his customers, when this equipment is used as part of an audio monitoring system, a decal stating AUDIO MONITORING ON THESE PREMISES (provided by Louroe Electronics) must be installed in a visible location at the entrances and exits of both private and public buildings and vehicles.

This is to comply with United States Code, Title 18, Section 2510(2) regarding rights of privacy, it states:

"Oral communication means any "oral communication" uttered by a person exhibiting an expectation that such communication is not subject to interception under circumstances justifying such expectation."

By definition of the code section, a person cannot have an expectation of privacy, nor can he or she expect that communication will not be intercepted. THIS IS THE CASE ONLY IF THERE ARE PUBLIC SIGNS POSTED, INDICATING THAT THE COMMUNICATION IS BEING MONITORED.

These laws vary from state to state. If you are not informed on these matters, consult a qualified attorney or contact the appropriate state agency.

A decal notice is included with each microphone shipped from Louroe Electronics.

EXTRA DECALS ARE AVAILABLE FOR FREE

Call (818) 994-6498 or email sales@louroe.com

WARRANTY

LOUROE ELECTRONICS® warrants that at the time of shipment products manufactured by LOUROE ELECTRONICS® to be free of defects in material and workmanship. Should a defect appear within one year (12 months) from date of shipment, LOUROE ELECTRONICS® will, at its sole discretion, repair or replace the defective equipment. This equipment shall not be accepted for repair or return without prior notification by LOUROE ELECTRONICS®.

This warranty does not extend to any Louroe product that has been subjected to improper or incorrect installation, misuse, accident, or in violation of installation instructions provided by LOUROE ELECTRONICS®.

Returned shipments to LOUROE ELECTRONICS® shall be at customer’s expense. LOUROE ELECTRONICS® will return the equipment prepaid via best way.