# 9791 Loudspeaker

## contents

## 1.    general description

1.01    The Tellabs 9791 Loudspeaker (figure 1) is an enclosed 5-inch speaker with an integral 0.5-watt amplifier. Featuring automatic-gain-control (AGC) circuitry, the 9791 is equivalent to the industry-standard Type 106B loudspeaker.

1.02    This practice section is revised to correct the *input current requirement* specification in sections 1 and 4 of the practice and to update the text portion of section 6.

1.03    The 9791 is housed in an attractive, neutral-green metal enclosure with a brushed aluminum front screen and bezel. Four rubber feet (removable) are provided on the 9791 for desktop use.

1.04    Telephone line input impedances of 2400, 600, and 1.5 ohms are available as user-installed wiring options on the 9791 Loudspeaker. The 2400 and 600-ohm impedance inputs are capacitively coupled, while the 1.5-ohm input is directly coupled.

1.05    Three controls for amplifier gain are provided on the 9791 Loudspeaker. Two are accessed internally, while the other is front-panel-adjustable. One of the internal controls, the *output level* control, sets a maximum speaker output level (even during overload conditions). The other, the *chassis gain* control, sets the minimum and maximum volume levels that define the range over which the third amplifier-gain control — the front-panel volume control — can be adjusted. This volume control varies the level of audio input before the AGC circuitry and can be optionally disabled to allow volume adjustment from an external control.

1.06    Incorporated into the front-panel volume control is a switch that allows the unit to be turned on and off at the user's convenience. The on/off function can be optionally disabled to provide continuous operation. A front-panel pilot lamp lights when the 9791 is on.

1.07    The 9791 operates on ±20 to ±56Vdc input power and requires a steady-state maximum of 75mA at 24Vdc operation and 100mA at 48Vdc operation.

## 2.    application

2.01    The 9791 Loudspeaker can be used to provide amplification and voice broadcasting in a wide
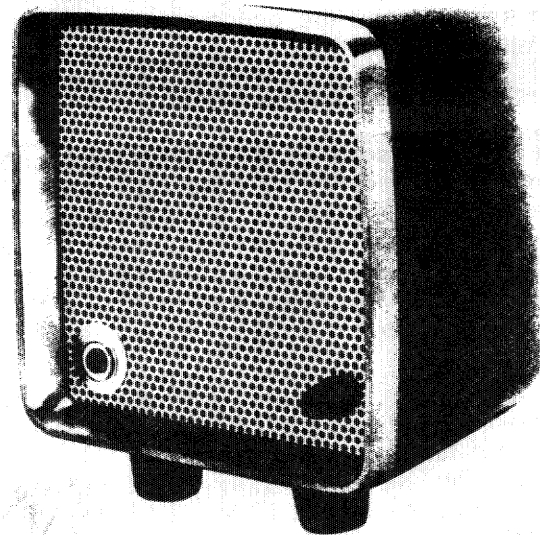


*figure 1. 9791 Loudspeaker*

variety of applications. It is commonly used with the Tellabs 265A Voice Signaling System as the loudspeaker for a voice-paging network. In this "hoot 'n' holler" system, any system telephone going off-hook seizes the network and broadcasts a message through loudspeakers at all other locations. For more detailed information, refer to the Tellabs 265A Voice Signaling System practice.

2.02    The 9791's internal speaker can be optionally disabled and the amplifier's output used to drive an external speaker or other device whose impedance is approximately 3.2 ohms.

## 3.    installation

### inspection
3.01    The 9791 Loudspeaker should be visually inspected upon arrival to find possible damage incurred during shipment. If damage is noted, a claim should immediately be filed with the carrier. If stored, the unit should be visually inspected again prior to installation.

### desk mounting
3.02    The 9791 is equipped with four rubber feet for desktop use. Select a location that is free from excessive noise. If the loudspeaker is used on a telephone line, allow a minimum separation of 3 feet between the unit and the telephone set to minimize feedback.

### cover removal
3.03    Before installer connections and internal level adjustments to the 9791 are made, the rear cover must be removed. Loosen the two screws on the rear of the unit and remove the cover. An

access hole is provided in the cover for cable entry. Make sure that all external leads to the 9791 Loudspeaker pass through this opening.

### installer connections (overview)

3.04   All installer connections are made to screw terminals on the two printed circuit boards inside the 9791. Make the installer connections in accordance with the functional wiring diagram (section 5 of this practice) and the optioning instructions in paragraphs 3.05 through 3.11.

### telephone line input connections

3.05   Three line-input impedances are available on the 9791 Loudspeaker: 2400 ohms to common, 600 ohms to common, or 1.5 ohms to common. The appropriate impedance for a particular application is selected by connecting one telephone line input lead to the line input common terminal and connecting the other line input lead to one of three additional line input terminals. This is done as follows:

- For 2400-ohm impedance, connect the telephone line input leads to the COM and 2400 terminals on the 9791.
- For 600-ohm impedance, connect the telephone line input leads to the COM and 600 terminals on the 9791.
- For 1.5-ohm impedance, connect the telephone line input leads to the COM and 1.5 terminals on the 9791.

### input power connections

3.06   The 9791 Loudspeaker operates from filtered 20 to 56Vdc input power. Make the input power connections to the 9791 as follows:

A.  If the power supply is **not** negatively or positively grounded (to external ground), connect the negative side of the power supply to the −V terminal and the positive side of the power supply to the +V1 terminal. Leave both ends of the green jumper connected to the chassis ground terminal.

B.  If the power supply is **negatively** grounded, connect the positive side of the power supply to the +V1 terminal. Then remove one end of the green jumper from the chassis ground terminal and connect it to the −V terminal.

C.  If the power supply is **positively** grounded, connect the negative side of the power supply to the −V terminal. Then remove one end of the green jumper from the chassis ground terminal and connect it to the +V1 terminal.

### on/off/volume control options

3.07   The 9791 is factory-wired so that the front-panel on/off/volume control is functional and so that the integral speaker is functional but cut off at the minimum volume setting. This is the arrangement shown for terminals A through F in the **functional wiring diagram,** section 5 of this practice. Other optional arrangements are covered below.

3.08   **Minimum Volume Limit.** If it is desired that the integral speaker be audible (i.e., not totally cut off) at the minimum volume setting, disconnect the white wire from terminal D and connect it to terminal E.

3.09   **Volume Control Disable.** To disable the volume-adjustment function of the 9791's on/off/volume control, disconnect the white wire from terminal D and connect it to terminal B.

3.10   **On/Off Switch Disable.** To disable the on/off-switch function of the 9791's on/off/volume control for continuous operation, connect the positive side of the power supply to the +V2 terminal.
**Note:** If one end of the green chassis ground jumper wire is connected to the +V1 terminal, disconnect it and reconnect it to the +V2 terminal.

3.11   **Remote Volume Control.** If a remote volume control is to be used instead of the 9791's front-panel control, disconnect, tape, and store the 9791's red, blue, and white panel-volume-control wires. Then connect the leads from the remote volume control (whose impedance should be approximately 10 kilohms) to the appropriate terminals on the 9791 (see the functional wiring diagram, section 5 of this practice).

### external loudspeaker option

3.12   As stated above, the 9791 is factory-wired so that its integral speaker is functional. If an external speaker or other device is to be used instead of the integral speaker, disconnect, tape, and store the wires connected to the LS1 terminals. Then connect the external speaker or device (whose impedance should be approximately 3.2 ohms) to the LS1 terminals.

### level adjustments

3.13   Two internal level adjustments are required for proper loudspeaker operation. The chassis gain control (located near the top of the 9791's printed circuit board) sets the minimum and maximum volume levels that define the range over which the loudspeaker's volume can be adjusted. The output level control (also located near the top of the printed circuit board) prevents output signals from exceeding a predetermined level, even during overload conditions. To adjust the 9791's level controls, proceed as follows:

A.  Initiate a call to activate the 9791.

B.  Adjust the chassis gain control 5 turns from its full clockwise setting. (The chassis gain control is a 20-turn potentiometer.)

C.  Adjust the front-panel on/off/volume control fully clockwise.

D.  Adjust the output level control 5 turns from its full counterclockwise setting. (The output level control is a 20-turn potentiometer.)

E.  Have the called party talk. Adjust the chassis gain control to reduce the gain to a point where no audible distortion, noise, and/or crosstalk are present.

F.  Adjust the output level control to increase the loudness to the desired level.

G.  When all installer connections and level adjustments are completed, replace the 9791's rear cover.

## 4.  specifications

*power requirements*
**input power: ±20 to ±56Vdc**
**input current (steady-state): 50mA idle, 75mA maximum
  at 24Vdc; 70mA idle, 100mA maximum at 48Vdc**

*input impedance*
**2400, 600, or 1.5 ohms, wire-optional**

*acoustic power output*
**97.5dBA at 18 inches**

*acoustic response (amplifier and speaker)*
**±5dB, 350 to 5000Hz**

*frequency response (amplifier)*
**±3dB, 200 to 5000Hz**

*input sensitivity (600 ohms)*
**minimum required for full output: —60dBm**
**maximum allowable for less than 5% distortion:
  —5dBm at 1000Hz**

*operating environment*
**32° to 120°F (0° to 49°C), humidity to 95%
(no condensation)**

*dimensions*
**5.5 inches (14.0cm) wide**
**6.20 inches (15.7cm) high**
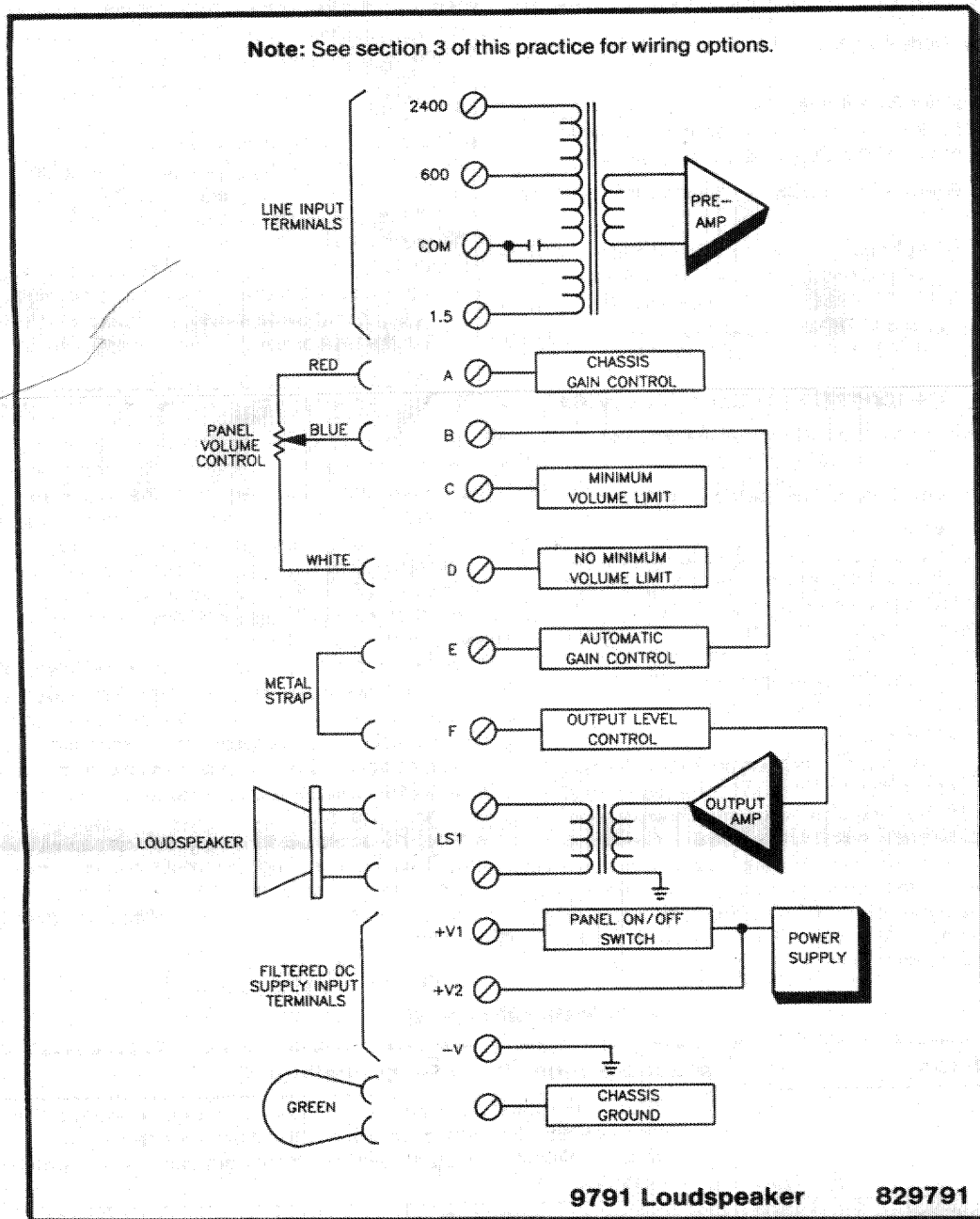**4.75 inches (11.7cm) deep**

*weight*
**5.5 pounds (2.5kg)**

*mounting*
**desktop**



**Note:** See section 3 of this practice for wiring options.

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## 5.  functional wiring diagram (shown factory-wired as shipped from Tellabs)

## 6. testing and troubleshooting

6.01 The **troubleshooting guide** in this section may be used to assist in the installation, testing, or troubleshooting of the 9791 Loudspeaker. The guide is intended as an aid in the localization of trouble to this specific equipment. If the equipment is suspected of being defective, substitute new equipment (if possible) and conduct the test again. If the substitute operates correctly, the original should be considered defective and returned to Tellabs for repair or replacement as directed below. We strongly recommend that no internal (component-level) testing or repairs be attempted on the equipment. Unauthorized testing or repairs may void its warranty. Also, if the equipment is part of a registered system, unauthorized repairs will result in noncompliance with Parts 15 and/or 68 of the FCC Rules and Regulations.

*Note: Although repair service always includes an attempt to remove any permanent markings made by customers on Tellabs equipment, the success of such attempts cannot be guaranteed. Therefore, if equipment must be marked* **defective** *or* **bad**, *we recommend that it be done on a piece of tape or on a removable stick-on label.*

### technical assistance via telephone

6.02 If a situation arises that is not covered in the **troubleshooting guide**, contact Tellabs Customer Service as follows:

**USA customers:** Contact your Tellabs Regional Office listed below.

| region | telephone | office location |
|---|---|---|
| US Northeast | (203) 798-0506 | Danbury, CT |
| US Capital | (703) 359-9166 | Washington, DC |
| US Central | (708) 505-7800 | Chicago, IL |
| US Southeast | (407) 834-8311 | Orlando, FL |
| US Southwest | (214) 869-4114 | Dallas, TX |
| US Western | (714) 850-1300 | Orange County, CA |

**Canadian customers:** Contact our Canadian headquarters in Mississauga, Ontario. Telephone (416) 858-2058.

**International customers:** Contact your Tellabs distributor.

### selecting correct product service procedure

6.03 If equipment is diagnosed as defective or if in-service equipment needs repair, follow the **product return procedure** in paragraph 6.04 in all cases except those where a critical service outage exists (e.g., where a system or a critical circuit is down and no spares are available). In critical situations, or if you wish to return equipment for reasons other than repair, follow the **product replacement procedure** in paragraph 6.05.

### product return procedure (for repair)

6.04 To return equipment for repair, first contact Tellabs Product Services (see addresses and numbers below) to obtain a Material Return Authorization (MRA). A service representative will request key data (your company's name and address, the equipment's model and issue numbers and warranty date code, and the purchase order number for the repair transaction). The service representative will then give you an MRA number that identifies your particular transaction. After you obtain the MRA number, send the equipment prepaid to Tellabs (attn: Product Services).

**in the USA:**
Tellabs, Inc.
4951 Indiana Avenue
Lisle, Illinois 60532-1698
telephone (708) 969-8800

**in Canada:**
Tellabs Communications Canada, Ltd.
2433 Meadowvale Boulevard
Mississauga, Ontario, Canada L5N 5S2
telephone (416) 858-2058

Enclose an explanation of the malfunction, your company's name and address, the name of a person to contact for further information, and the purchase order number for the transaction. Be sure to write the MRA number clearly on the outside of the carton being returned. Tellabs will inspect, repair, and retest the equipment so that it meets its original performance specifications and then ship the equipment back to you. If the equipment is in warranty, no invoice will be issued. Should you need to contact Tellabs regarding the status of a repair, call or write the Product Services department at our Lisle or Mississauga headquarters as directed above.

### product replacement procedure

6.05 For critical service outages, Tellabs offers a choice of two replacement services (if the product is in replacement stock) in lieu of the 15-day repair and return service described above. These are **overnight express service** (at extra cost) anywhere in the USA and **five-day expedited delivery** (at no extra cost) anywhere in the USA and Canada. To obtain replacement equipment via either of these services, contact your Tellabs Regional Office in the USA or our Canadian headquarters in Mississauga, Ontario, for details, costs (if applicable), and instructions. Telephone numbers are given in paragraph 6.02. A service representative will request key data (your company's name and address, the equipment's model and issue numbers and warranty date code, and the purchase order number for the replacement transaction). Tellabs will then ship the replacement to you in accordance with the replacement service you request. An invoice in the amount of the replacement's current price plus any applicable service charges will be issued after the replacement is shipped. When you receive the replacement, pack the equipment to be returned in the replacement's carton, sign and enclose the packing list, affix to the carton the preaddressed label provided, and ship the carton prepaid to Tellabs at our USA or Canadian headquarters. The defective equipment must be received within 30 days of the replacement's ship date. When we receive the defective equipment, a credit will be issued, leaving a balance due on the replacement's invoice that reflects only the express service and/or out-of-warranty charges, if any. Returns received more than 30 days after the replacement's ship date **will not be accepted for credit** but instead will be returned to you, thereby rendering the replacement's invoice due and payable. Please note that OEM, modified, and manufacture-discontinued equipment is not available via overnight express service.

### troubleshooting guide

| trouble condition | probable cause (in order of likelihood) |
|---|---|
| unit dead | 1) Power connection faulty and/or wiring of on/off switch incorrect. Verify presence of input power by measuring voltage between terminals +V1 and −V (if front panel on/off switch is used) or +V2 (if front panel on/off switch is bypassed) □. |
| no output from speaker | 1) Incorrect input wiring □.<br>2) Volume-control wiring incorrect □. |