

8101 Ringing Generator

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1. description and application

1.01 The 8101 Ringing Generator (figure 1) provides 100Vac (nominal) quasi-sine-wave ringing voltage, at 30Hz, from nominal 117Vac, 60Hz input power. The 8101's 5-watt ringing output can drive up to five high-impedance telephone ringers simultaneously.

1.02 This practice section is revised to correct the unit's fuse specification in section 5 and to update the text portion of section 6.

1.03 The 8101 offers the following features:

- Low-noise continuous output.
- Floating output that allows the unit to be connected in series with a dc voltage source for biased (superimposed) ringing.
- An overload and short-circuit protection circuit that decreases the unit's output voltage when excessive load current begins to flow and restores the unit's output voltage automatically when the overload or short is removed.
- KTU-type apparatus-case mounting or, via mounting bars, relay-rack mounting.
- A 1.5-ampere input protection fuse.
- An 8-foot grounded (three-prong) input power cord.
- An unfused duplex convenience outlet (grounded) on the rear panel for power supplies or other associated equipment requiring 117Vac, 60Hz input power.

1.04 The 8101 is normally used in customer-premises and other applications where 30Hz ringing is required and larger ringing generators are impractical. Typically, ringing must be supplied in applications involving foreign-exchange station-end (FXS) signaling modules and in off-premises-station (OPS) applications where loop signaling repeaters (LSR's) are used. Because its output is floating, i.e., not referenced to ground, the 8101 can be used in circuits requiring biased ringing. In such applications, either a positive or negative dc source, as needed, is connected in series with the 8101's 30Hz ac ringing output.

Note: Tuned ringers other than 30Hz will not operate properly with the 8101.

1.05 Integral mounting ears at the top and bottom of the 8101's steel case allow direct mounting in KTU-type apparatus cases. The unit can also be

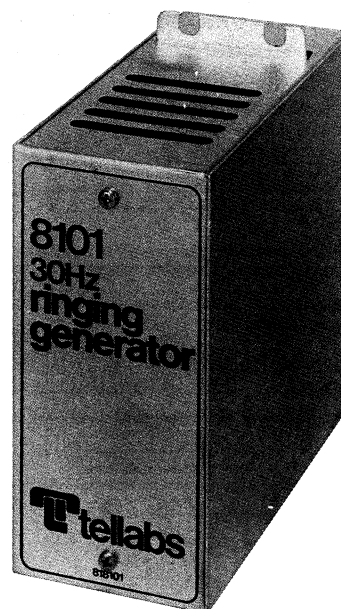


figure 1. 8101 Ring Generator

mounted in conventional relay racks if mounting bars are provided. In relay-rack applications, up to six 8101's can be mounted across a 19-inch rack, and up to seven 8101's can be mounted across a 23-inch rack. In either case, four standard rack-mounting spaces (7 vertical inches) are required.

2. installation

inspection

2.01 The 8101 Ringing Generator 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.

mounting

2.02 The 8101 is designed for mounting in standard KTU-type apparatus cases. Use the four screws supplied with the unit to secure its top and bottom mounting ears to the apparatus-case mounting framework. To install the 8101 in a standard relay rack, top and bottom mounting bars must be provided. Use the four screws provided with the unit to secure its mounting ears to the mounting bars.

installer connections

Warning: Before making any connections to the 8101, ensure that the unit's input-power line cord is **unplugged**. This will prevent exposure to hazardous voltages at the unit's output terminals.

Caution: Do not attempt to connect two or more 8101's in parallel to achieve higher power output, or damage to the units will result.

2.03 Output connections to the 8101 are made to two barrier-type screw terminals on the rear of the unit (see figure 2). Use 20AWG or heavier wire to make these connections. Because the 8101's output is floating, polarity need not be considered: Either ringer lead can be connected to either screw terminal on the unit. After the output connections are made, plug the unit's line cord into a grounded (three-prong) nominal 117Vac, 60Hz wall-type outlet.

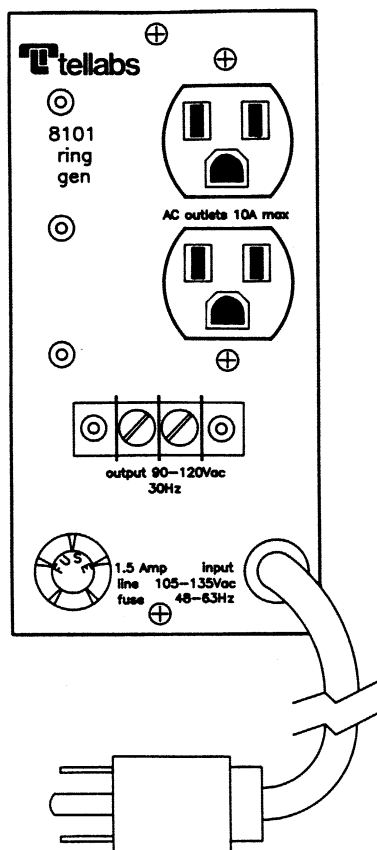


figure 2. Rear view of 8101

fuse replacement

2.04 If the 8101's 1.5-ampere input protection fuse must be replaced, use only an equivalent 1.5-ampere AGC-type fuse. The fuse is located in a cartridge-type fuse holder on the rear of the unit.

3. circuit description

3.01 This circuit description is intended to familiarize you with the 8101 Ringing Generator for engineering and application purposes only. Attempts to troubleshoot the 8101 internally are not recommended and may void its warranty. Troubleshooting

procedures should be limited to those prescribed in section 6 of this practice. Please refer to the 8101 **functional schematic**, section 4 of this practice, as an aid in following the circuit description.

3.02 The 8101 uses a ferroresonant circuit to develop its 30Hz output from 60Hz input. The tuned, saturable 30Hz reactor consists of a transfluxor transformer, a diode-resistor starting network, and a tuning capacitor.

3.03 The capacitor and the transformer's secondary winding resonate at 30Hz and constitute the magnetic flux source for alternately saturating the core of each of the transformer's two primary windings. The two primary windings and a diode are series-connected to the 60Hz line voltage. The diode provides unidirectional current (once for each cycle of the 60Hz line frequency) that serves as the source of transformer-core magnetic flux in the non-saturated primary winding.

3.04 The transformer's primary windings and secondary winding are arranged so that the primary flux sources couple to the secondary winding in a manner that causes the capacitor on the secondary winding to charge in the opposite direction with each alternate cycle of ac input. Thus, the secondary circuit requires two primary current cycles to complete a full sine-wave cycle, i.e., two cycles of primary 60Hz line voltage result in a 30Hz secondary frequency.

5. specifications

input power requirements

105 to 135Vac at 59 to 61Hz, 25VA (plus any power drawn at duplex convenience receptacle)

ringing output

85 to 110Vac (output voltage varies inversely with input voltage), 30Hz nominal (one-half of input frequency), 5 watts maximum, 200 ohms maximum internal dc resistance

ringing capacity

drives up to 5 standard high-impedance ringers simultaneously

duplex convenience receptacle

two standard grounded (three-prong) outlets, unfused, 840VA maximum

input fusing

1.5-ampere Bussman AGC-type (or equivalent) fuse in cartridge-type fuse holder on rear of unit

output polarity

floating output, which can be connected in series with an external positive or negative dc source for biased (superimposed) ringing, if required

line cord

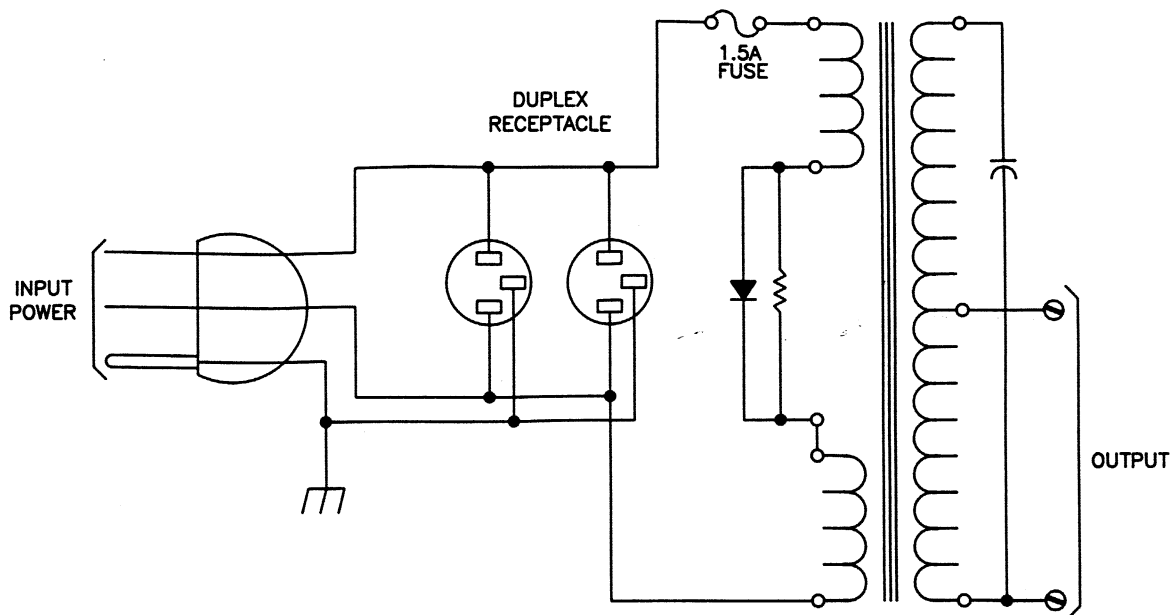
8 foot, 3-conductor, 18AWG

operating environment

10° to 120°F (−12° to +49°C), humidity to 95% (no condensation)

dimensions

6.90 inches (17.6cm) high, including mounting ears
2.75 inches (7.0cm) wide
7.00 inches (17.8cm) deep



8101 30Hz Ringing Generator 818101

4. functional schematic

weight

5 pounds 4 ounces (2.4kg)

mounting

KTU-type apparatus case or, via mounting bars, 19 or 23-inch relay rack

6. testing and troubleshooting

6.01 The **testing guide checklist** in this section may be used to assist in the installation, testing, or troubleshooting of the 8101 30Hz Ringing Generator. The checklist 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 **testing guide checklist**, contact Tellabs Customer Service as follows:

USA customers: Contact your Tellabs Regional Office listed below.

| region | telephone | office location |
|--------------|---------------|-------------------|
| US Atlantic | (203)798-0506 | Danbury, CT |
| US Capital | (703)478-0468 | Washington, DC |
| US Central | (312)357-7400 | Chicago, IL |
| US Southeast | (305)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)624-0052.

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
telephone (312) 969-8800

in Canada:

Tellabs Communications Canada, Ltd.
1200 Aerowood Drive, Unit 39
Mississauga, Ontario, Canada L4W 2S7
telephone (416) 624-0052

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. When we receive the defective equipment (within 30 days of our issuing the replacement), the invoice will be adjusted to reflect only service charges (if applicable). Please note that OEM, modified, and manufacture-discontinued equipment is not available via overnight express service.

testing guide checklist

| test | test procedure | normal result | if normal conditions are not met, verify: |
|----------------------------|--|---|---|
| output voltage (no load) | Unplug 8101 from ac outlet. Arrange VOM to measure up to 250Vac and connect it across 8101's output terminals. Plug 8101 back into outlet. | VOM indicates 85 to 110Vac <input type="checkbox"/> . | Input voltage correct <input type="checkbox"/> . Fuse not blown <input type="checkbox"/> . Output not shorted <input type="checkbox"/> . VOM properly set and connected <input type="checkbox"/> . Replace 8101 and retest <input type="checkbox"/> . |
| output voltage (full load) | Unplug 8101 from ac outlet. Connect 2-kilohm, 5-watt resistor across VOM leads. Plug 8101 back into ac outlet. | VOM indicates 85 to 110Vac <input type="checkbox"/> . | Same as above <input type="checkbox"/> . |