tellabs
technical manual
76-828102
rev B

practice section 828102

8102 Ringing Generator

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1. general description

1.01 The 8102 Ringing Generator, figure 1, is a 20Hz ringing source in a mounting case suitable for key telephone unit (ktu) applications. The 8102 operates from either a 24Vdc or 48Vdc input and provides a nominal 100Vac, 20Hz sine wave output. The output will operate up to five standard telephone ringers simultaneously.

The 8102 Ringing generator is similar in many respects to Tellabs' 8101 Ringing Generator. Two major differences separate the 8101 and 8102. First, the 8101's output is 30Hz, while the 8102 output is 20Hz. Second, the 8101 operates from a nominal 117 Vac input power source, while the 8102 operates on 24 or 48Vdc input. See practice section 8X8101 for details.

1.02 A 20Hz sine wave oscillator driving a high power, class B "push-push" amplifier assures minimum distortion of the 20Hz output. High level noise transients are eliminated by this type of circuitry.

1.03 The output of the 8102 is floating and may be positively or negatively biased, allowing the generator to be connected in series with a dc-voltage source for superimposed (biased) ringing.

1.04 The 8102 may be equipped with an optional 9903 Ringing Interruptor subassembly. When so equipped, a nominal 2 second on / 4 second off interrupted output is obtained. (Without the 9903, the 8102 provides continuous ringing.) The 8102 may be equipped from the factory with a 9903 subassembly, or the 9903 may be easily field-installed at a later date. See paragraph 3.05.

1.05 The 8102 Ringing Generator is supplied in a cadmium-plated steel case designed for either apparatus case mounting or relay rack (by means of mounting bars) installation. In relay rack applications, seven vertical inches (4 mounting spaces) are required. Up to six 8102's may be mounted across this 7" space in a 19" rack, while a 23" rack accommodates up to seven 8102's across.

1.06 Features of the 8102 include sine wave output, switch-selectable 24 or 48Vdc input, input polarity protection diode, input protection fuse, and optional use of the 9903 Ringing Interruptor subassembly.

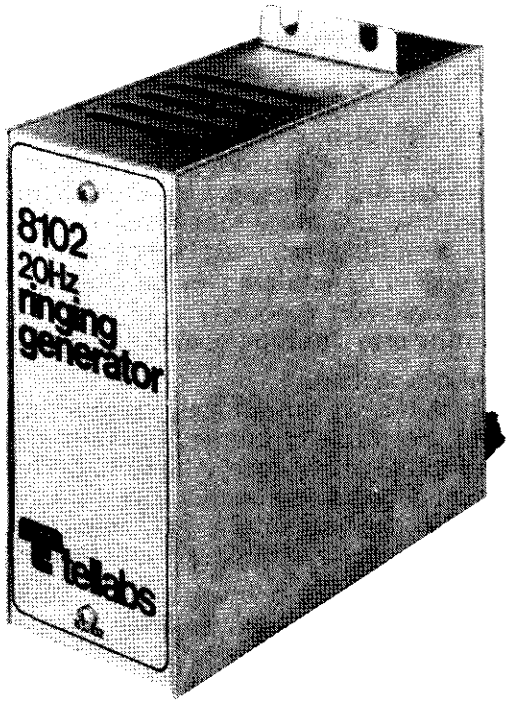


figure 1. 8102 Ringing Generator

2. application

2.01 The 8102 Ringing Generator is a general purpose ringing source designed with specific relevance to telephone applications. The supply is generally used in customer premise or other applications where larger generators are not practical. Its switchable dc input permits the 8102 to be used at standby battery (battery backup) installation sites where ac power is not readily available.

2.02 The 20Hz sine wave output of the 8102 makes it particularly useful in circuits requiring 20Hz ringing, such as those employing Western Electric FLA and FPA signaling units.

2.03 The 8102 provides up to 5 watts of ringing power, which is enough to operate up to 5 high impedance telephone ringers simultaneously.

2.04 The floating output of the 8102 allows its use with circuits requiring biased ringing. Either positive or negative dc voltage may be superimposed on the 20Hz ac output, as required.

2.05 When equipped with the optional 9903 subassembly, the 8102 provides 2sec on / 4sec

off, interrupted ringing, eliminating the need in many applications for an external interrupter.

3. installation

inspection

3.01 The 8102 Ringing Generator should be visually inspected upon arrival in order 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

3.02 The 8102 Ringing Generator is designed to mount in standard apparatus cases. Mounting ears at the top and bottom of the unit are secured to the mounting framework of the apparatus case by four screws. In relay rack installations, top and bottom mounting bars must be provided. Up to six 8102 Ringing Generators may be mounted in four vertical mounting spaces (7") of a 19" rack and seven units may be accomodated across a 23" rack.

installer connections

3.03 All input, output and ring interrupter connections are made to barrier type screw terminal blocks located at the rear of the 8102. The supply voltage selection switch and a 1 ampere input fuse are also on the rear of the unit. Make all connections in accordance with table 1 and figure 2.

CAUTION: Before connecting any leads to the 8102, position the input selector switch to the center OFF position. This will prevent exposure to hazardous voltages on the output of the 8102.

operation

3.04 After all wiring has been completed, position the input selector switch to either 24V or 48V, as required.

CAUTION: Do not attempt to connect two or more 8102's in parallel to achieve higher power output, as damage to the units will result.

3.05 If a 9903 Ringing Interrupter subassembly is to be installed in the field, it is necessary to remove the backplate of the 8102 Ringing Generator (via two screws), being careful not to break any internal connections made to terminals mounted on that plate. *CAUTION: If the 8102 is already in service at the time the 9903 is added, be sure to disconnect all external power from the 8102 before removing the backplate. Otherwise, damage to equipment or personnel (up to and including death) could result.* With the backplate off, the 9903 may be plugged into the printed circuit board of the 8102. Installation is accomplished via two 4-pin connectors that provide electrical as well as mechanical connection. One connector is male and the other female. Proper orientation of the 9903 subassembly should be obvious. Make sure that the two connectors are completely mated. All necessary external leads for the 9903 are prewired to terminals on the rear of the 8102.

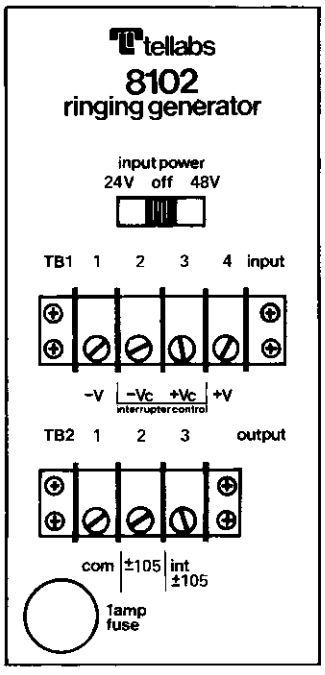


figure 2. 8102 terminal side

4. circuit description

4.01 The 8102 Ringing Generator utilizes dual integrated circuit operational amplifiers wired in a gyrator configuration to produce a 20Hz sine wave signal. This signal is routed through another operational amplifier used as a buffer to isolate the high power, class B "push-push" output stage from the oscillator. The buffer also drives a third operational amplifier that provides the 180° phase shift to drive one half of the complementary output stage.

4.02 The primary of the output transformer is tapped (selected by a slide switch located on the rear panel of the 8102 case) to provide the correct turns ratio for use on either 24 or 48Vdc input.

4.03 Provision has been made to allow the use of the 9903 Ringing Interrupter Subassembly as an optional accessory to the 8102 Ringing Generator. As the 9903 is designed to operate on 24V power, an automatic voltage regulator is designed into the 8102 Ringing Generator to allow the 9903 to operate on any input voltage specified for the 8102.

connect	terminal designation (location)
input – 24 or 48Vdc source	–V (TB1, terminal 1)
ground	+V (TB1, terminal 4)
*interrupter input	
–24 or 48Vdc source	–Vc (TB1, terminal 2)
ground	+Vc (TB1, terminal 3)
output (common)	com (TB2, terminal 1)
output (continuous ringing)	±105 (TB2, terminal 2)
*output (interrupted ring)	int ±105 (TB2, terminal 3)

*use only when 8102 is equipped with a 9903 Ringing Interrupter.

table 1. Installer connections to 8102

4.04 The control relay on the 9903 Ringing Interrupter connects the interrupted ring output terminal to the continuous ring output during the 2-second-on period and connects it to the common output terminal during the 4-second-off period. Therefore, dc continuity is maintained for the dc superimposed or bias voltage necessary for ring trip during the silent period.

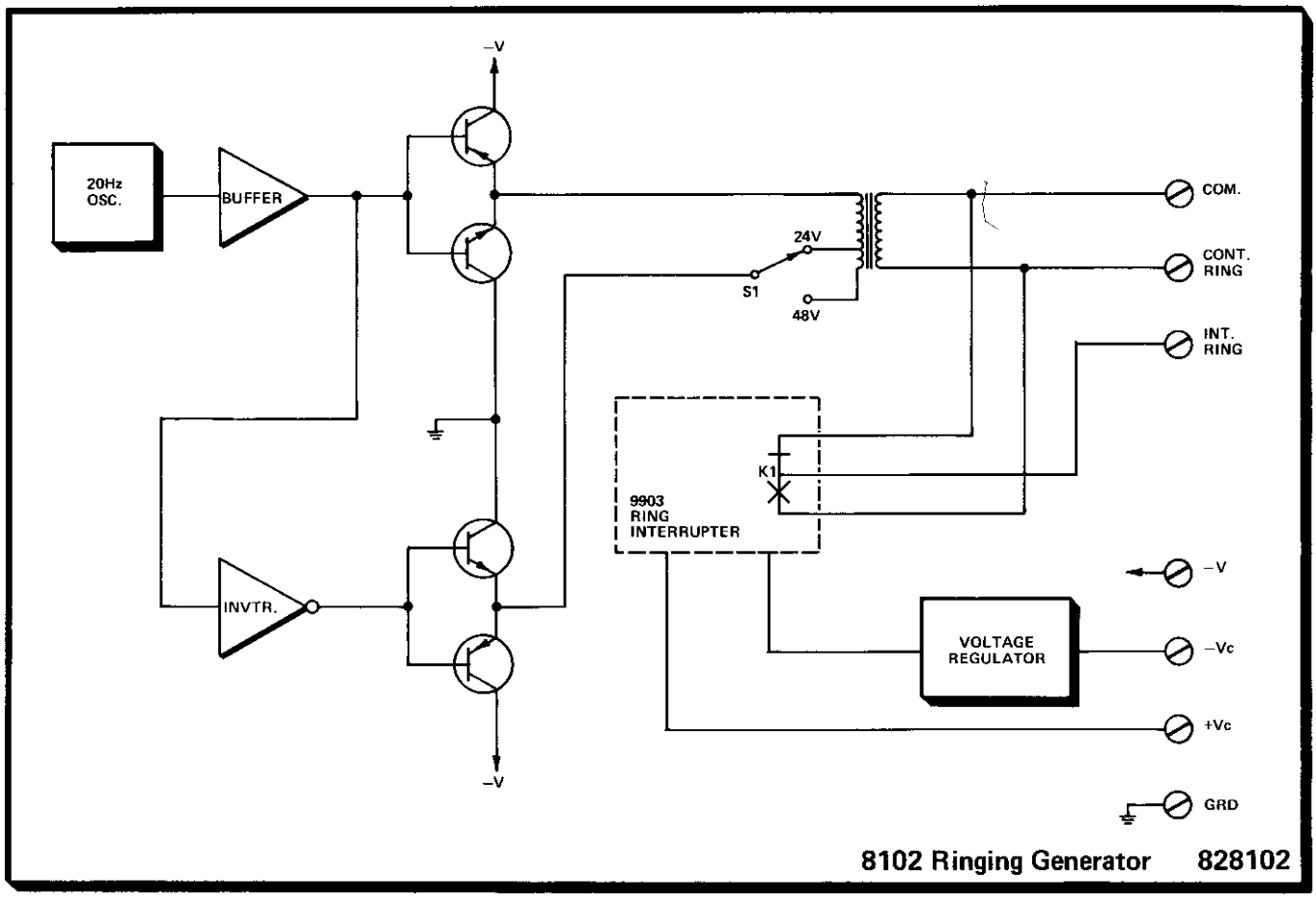
4.05 For additional information relative to the 9903 see practice section 819903.

6. specifications

input voltage
22 to 26Vdc or 44 to 56Vdc, switch selectable

input current
at 24Vdc: 100mA idle, 450mA full load
at 48Vdc: 75mA idle, 250mA full load

output
85 to 135Vac, 20Hz, 5 watts maximum



5. block diagram

ringing capacity
up to 5 high impedance ringers simultaneously

ringing interruption
2 seconds on/4 seconds off, when equipped with plug-in 9903 Ringing Interrupter subassembly

fusing
input to ringing generator: 1 amp slow-blow cartridge type (Bussmann 3AG or equivalent)

polarity
floating output may be biased positively or negatively

mounting
ktu apparatus case (or relay rack via mounting bars)

dimensions
6.90 inches (17.58cm) high (including mounting ears)
2.88 inches (7.30cm) wide
7.00 inches (17.78cm) deep

weight
5lbs. 10oz. (2.55kg)

operating environment
20° to 130° F (–7° to 54° C), humidity to 95%, no condensation

7. testing and troubleshooting

7.01 The Testing Guide Checklist in this section may be used to assist in the installation, testing, or troubleshooting of the 8102 Ringing Generator. The Checklist is intended as an aid in the localization of trouble to a specific unit. If an 8102 is suspected of being defective, a new one should be substituted and the test conducted again. If the substitute 8102 operates correctly, the original 8102 should be considered defective and returned to Tellabs for repair or replacement. We strongly recommend that no internal (component-level) testing or repairs be attempted on the 8102. Unauthorized testing or repairs may void the 8102's warranty.

7.02 If a situation arises that is not covered in the Checklist, contact Tellabs Customer Service at your Tellabs Regional Office or at our Lisle or Mississauga Headquarters. Telephone numbers of the regional offices are as follows:

central: (314) 625-8800
northeast: (412) 787-7860
southeast: (305) 645-5888
western: (213) 595-7071

7.03 If an 8102 is diagnosed as defective, the situation may be remedied by either *replacement* or *repair and return*. Because it is more expedient, the *replacement* procedure should be followed whenever time is a critical factor (e.g., service outages, etc.).

replacement

7.04 To obtain a replacement 8102, notify Tellabs via letter (see below), telephone ((312) 969-8800 in the USA, (416) 624-0052 in Canada), or twx (910-695-3530). Be sure to provide all relevant information, including the 8X8102 part number that

indicates the issue of the unit in question. Upon notification, we shall ship a replacement 8102 to you. If the 8102 in question is in warranty, the replacement will be shipped at no charge. Pack the defective 8102 in the replacement unit's carton, sign the packing slip included with the replacement 8102, and enclose it with the defective 8102 (this is your return authorization). Affix the preaddressed label provided with the replacement 8102 to the carton being returned, and ship the 8102 prepaid to Tellabs.

repair and return

7.05 Return the defective 8102, shipment prepaid, to Tellabs (attn: repair and return).

in the USA: Tellabs Incorporated
4951 Indiana Avenue
Lisle, Illinois 60532

in Canada: Tellabs Communications Canada, Ltd.
1200 Aerowood Drive, Unit 39
Mississauga, Ontario, Canada L4W 2S7

Enclose an explanation of the unit's malfunction. Follow your company's standard procedure with regard to administrative paperwork. Tellabs will repair the unit and ship it back to you. If the unit is in warranty, no invoice will be issued.

8102 testing guide checklist

test	procedure	normal result	if normal conditions are not met, verify:
Output Voltage (no load)	Position **input power** switch to **off**. Apply negative battery to **−V** terminal (TB1-1). Apply battery ground to **+V** terminal (TB1-4). Connect multimeter set for 250Vac range to **com** and **±105** (terminals TB2-1 and TB2-2). Position switch to correct input voltage.	Meter reads 85 to 135Vac ☐.	Input voltage normal ☐. Fuse not blown ☐. Output not shorted ☐. Switch on correct voltage ☐.
Output Voltage (full load)	Connect 2K ohm, 5 watt resistor across meter leads.	Meter reads 85 to 135Vac ☐.	Input voltage normal ☐. Fuse not blown ☐. Output not shorted ☐. Switch on correct voltage ☐.
Interrupted Output Voltage (valid only when equipped with a 9903 Ringing Interrupter.)	Position switch to **off**. Jumper **−Vc** to **−V** (TB1-1 to TB1-2) and **+Vc** to **+V** (TB1-3 to TB1-4). Connect meter to **com** and **int ± 105** (TB2-1 and TB2-3). Reposition switch to correct voltage.	Meter indicates interrupted output of approximately 2 seconds on, 4 seconds off ☐. Cycle continues ☐.	Replace 9903 subassembly and recheck ☐.