

8502-00 and 8503-00 20Hz Ringing Generators

CONTENTS	PAGE
Part 1. GENERAL	2
Part 2. INSPECTION	2
Part 3. APPLICATION GUIDELINES	2
Part 4. CIRCUIT DESCRIPTION	3
Part 5. MOUNTING	4
Part 6. INSTALLER CONNECTIONS	6
Part 7. TESTING	6
Part 8. TECHNICAL ASSISTANCE	6
Part 9. WARRANTY & CUSTOMER SERVICE	6
Part 10. SPECIFICATIONS	7

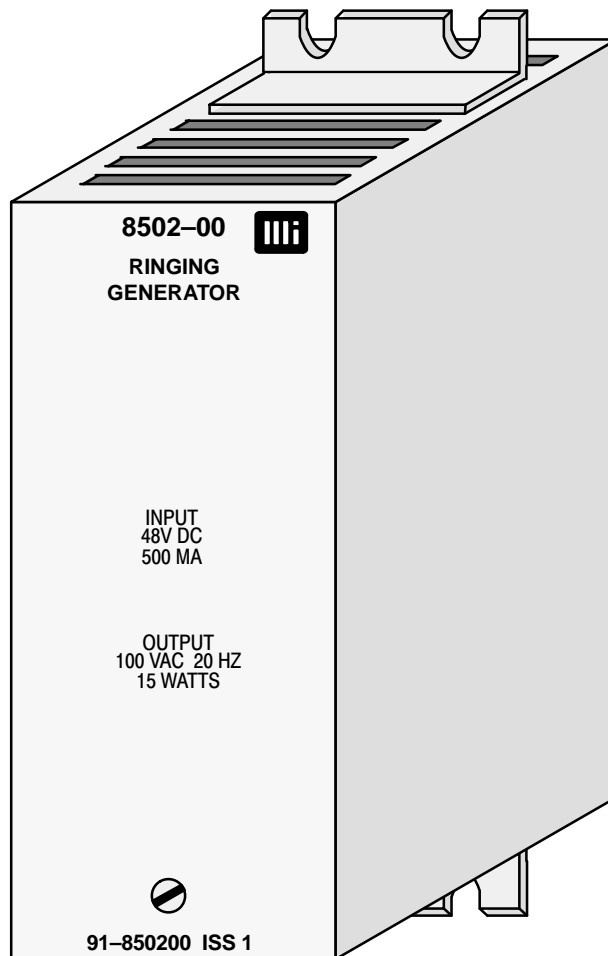


Figure 1. 8502-00 Ringing Generator

1. GENERAL

1.1 Document Purpose

This document provides a circuit description and installation procedures for the Charles Industries 8502–00 and 8508–00 20Hz Ringing Generator units.

1.2 Document Status

This document is reprinted to include a general editorial update.

1.3 Equipment Function

The 8502–00 (shown in Figure 1) provides a continuous 100Vac output at 20Hz +/-2Hz with a maximum current of 150mA or 15W.

The 8503–00 is identical to the 8502–00, except for the additional feature of an interrupted output of two seconds on, four seconds off, or continuous output. Also, the 8503–00 has provisions for remote control of the output, and provides an alarm function by opening a relay contact after the output ceases.

The 8502–00 and 8503–00 both require input from a –48Vdc source.

1.4 Equipment Location/Mounting

The 8502–00 and 8503–00 Ringing Generators are designed for a key telephone unit (KTU) type mounting.

1.5 Equipment Features

No initial alignment or adjustments are required to place either the 8502–00 or 8503–00 in service.

2. INSPECTION

2.1 Inspect for Damages

Inspect the equipment thoroughly upon delivery. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company.

2.2 Equipment Identification

Charles Industries' equipment is identified by a model and issue number imprinted on the front panel or located elsewhere on the equipment. Each time a major engineering design change is made on the equipment, the issue number is advanced by 1 and imprinted on subsequent units manufactured. Therefore, be sure to include both the model number and its issue number when making inquiries about the equipment.

3. APPLICATION GUIDELINES

The three most common methods of connecting a ringing generator into a system are described as follows (see Figure 2):

- FLOATING has no bias and is connected to the tip and ring.
- GROUNDED RINGING has one output terminal wired to ground.
- SUPERIMPOSED RINGING has the ring generator connected to the negative battery (–21 to –84Vdc supply).

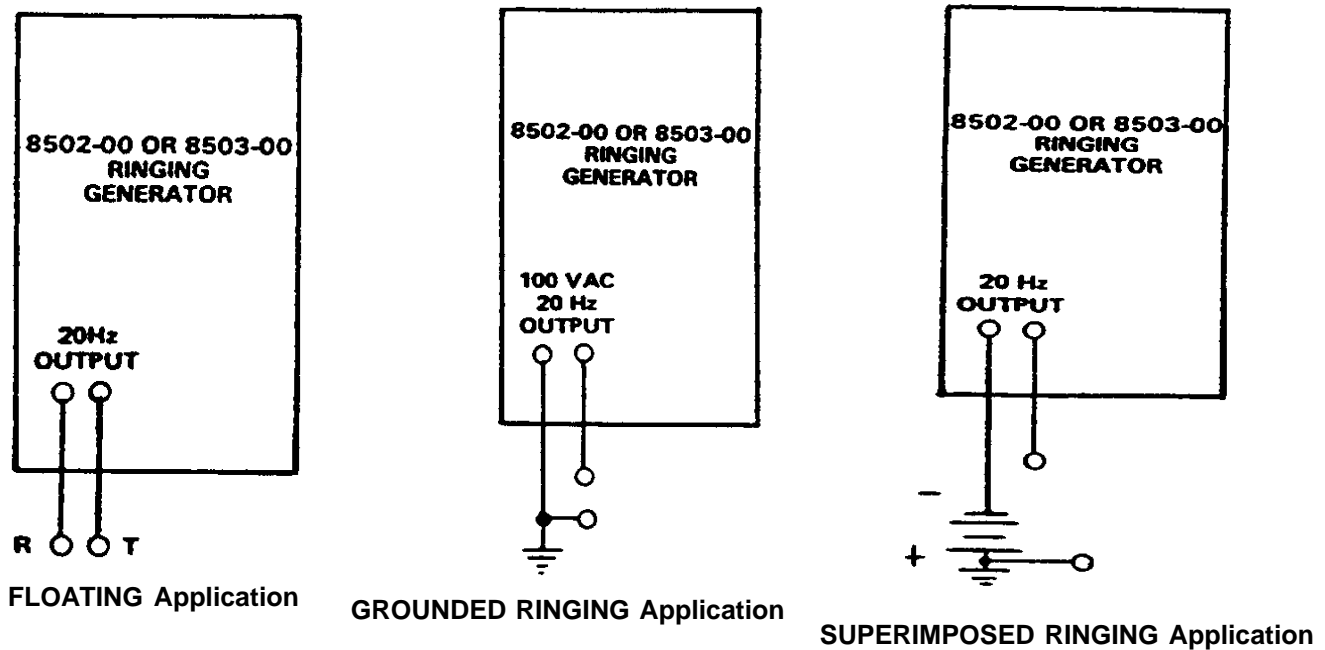


Figure 2. 8502-00 or 8503-00 Typical Applications

4. CIRCUIT DESCRIPTION

4.1 8502-00 Ringing Generator

Refer to Figure 3, the 8502-00 Schematic Diagram, while reading the following paragraphs.

Input power (-48V) and ground are applied at TB1 on the rear panel of the 8502-00. Fuse F1 provides circuit protection for the 20HZ OSCILLATOR.

The fused -48V is applied to a solid-state free-running multivibrator whose output frequency is $20\text{Hz} \pm 2\text{Hz}$. The square wave output of the multivibrator is applied as a 180° out-of-phase signal to two driver circuits, which amplify the signal and drive the two output transistors, Q1 and Q2.

The output transistors are utilized in a push-pull configuration through the common transformer T1. Transient spikes and high frequencies are filtered by R1 and C1 across the secondary of T1. The 100Vac 20Hz output then appears at pins 1 and 2 of TB1.

4.2 8503-00 Ringing Generator

Refer to Figure 4, the 8503-00 Schematic Diagram, while reading the following paragraphs.

Operation of the 20HZ OSCILLATOR is essentially the same as for the 8502-00, with two basic differences: Ground for the oscillator circuit in an 8503-00 configuration is applied from one of two sources; and the 8503-00 can be equipped with an optional INTERRUPTER subassembly (A81-000120). Application of a ground on the enable input, pin 5 of TB1, allows the INTERRUPTER to be bypassed. In this mode, the oscillator will free-run and the 20Hz output at pins 1 and 2 of TB1 will be continuous. The INTERRUPTER functions as an on-off switch for ground when an external enable is not provided. When the interrupter circuit is used, the 20Hz OSCILLATOR will be turned on for two seconds and off for four seconds repeatedly.

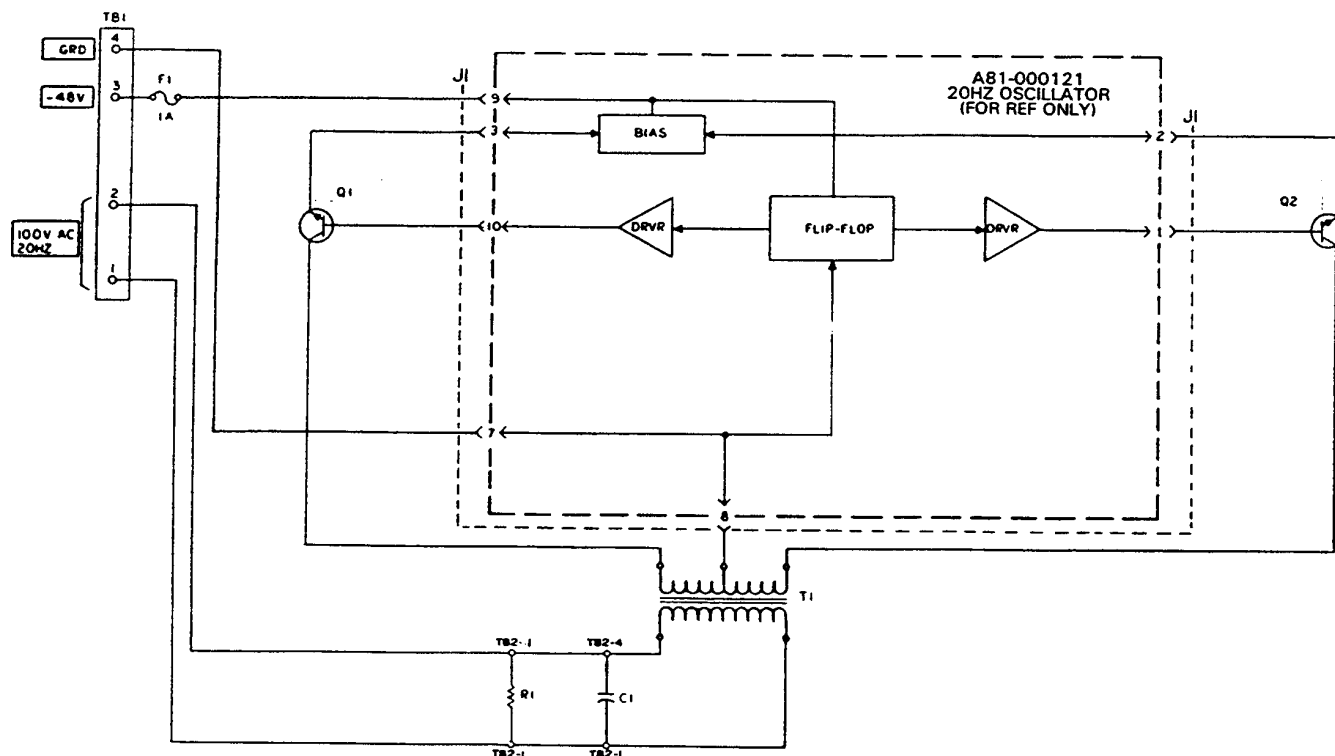
Input power for the INTERRUPTER is applied from the fused -48V line to a VOLTAGE REGULATOR circuit. The VOLTAGE REGULATOR supplies -20Vdc to the INTERRUPTER circuitry.

Timing for the INTERRUPTER is determined by two programmable unijunction transistors which serve as the input to the power amplifier (PWR AMPL) circuit. The output of the PWR AMPL is a ground signal, two seconds on and four seconds off, for the 20Hz OSCILLATOR.

The output circuitry of the 8503-00 is the same as that of the 8502-00 except for a diode in the resistive leg of the filter. This diode serves as a 1V pick-off point for the alarm circuitry. The 1V 20Hz signal is applied through an optical isolator to the alarm amplifier (ALM AMPL). The presence of the 1V signal causes the ALARM RELAY K1

to remain energized during normal operation. If the 1V 20Hz signal is lost for more than ten seconds, the ALARM RELAY (K1) will release causing the alarm relay contacts to open as seen at pins 7 and 8 of TB1.

When a ground is applied to the inhibit input, pin 6 on TB1, the INTERRUPTER is disabled and the 20Hz output from the 20HZ OSCILLATOR can be controlled by the enable input, pin 5 of TB1. This allows for remote control of the on-off time of the ringing generator output.



NOTE:

1. FOR REMOTE CONTROL, THE GROUND TERMINAL MAY BE CONNECTED THROUGH RELAY CONTACTS TO GROUND.

Figure 3. 8502-00 20Hz Ringing Generator (Issue 1) Schematic Diagram

5. MOUNTING

The 8502-00 and 8503-00 are designed to mount in any standard KTU apparatus case, such as the Charles Industries 15A (equivalent to WESTERN ELECTRIC 31B) or the Charles Industries 16C (equivalent to WESTERN ELECTRIC 16C). These ringing generators may also be installed on mounting bars in either a 19-, 23-, 27.5- or 36-inch relay rack. When the power supply is installed on mounting bars for relay-rack mounting, 7 inches of vertical rack space (four 1.75-inch mounting spaces) are required. To order the required mounting bar kit order one of the following part numbers; 19-inch, 8923-19; 23-inch, 8923-23; 27.5-inch, 8923-27; or 36-inch, 8924-00.

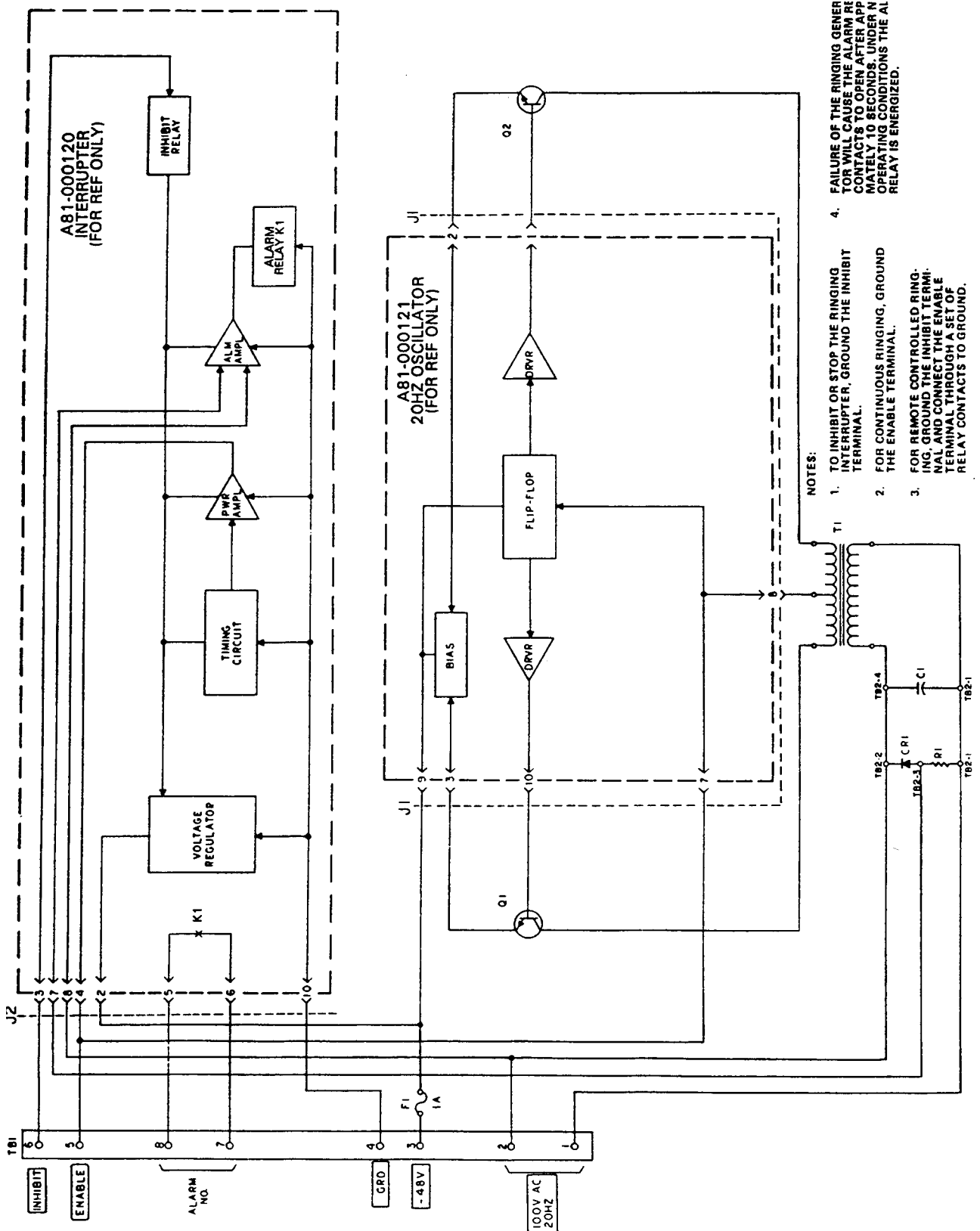


Figure 4. 8503-00 20Hz Ringing Generator (Issue 1) Schematic Diagram

6. INSTALLER CONNECTIONS

When the 8502–00 or 8503–00 unit is installed in a KTU-type mounting, it makes electrical connection to associated equipment through a terminal block, TB1, mounted on the rear panel of the unit. Make all installer connections to this terminal block as indicated in Table 1 for the 8502–00 or Table 2 for the 8503–00.

Table 1. 8502–00 Installer Connections

Connect	Schematic Designation	TB1 Connection Number
Battery	–48V	3
Ground	GRD	4
Output	100Vac 20Hz	1 and 2

Table 2. 8503–00 Installer Connections

Connect	Schematic Designation	TB1 Connection Number
Battery	–48V	3
Ground	GRD	4
Alarm indicator	Alarm N.O.	7 and 8
Output	100Vac 20Hz	1 and 2
Enable	Enable	5
Inhibit	Inhibit	6

7. TESTING

If trouble is encountered with the operation of the 8502–00 or 8503–00, verify that all installer connections have been properly made in accordance with Table 1. Check for an open fuse. Replace with a unit known to be in working condition.

8. TECHNICAL ASSISTANCE

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847–806–8500
 847–806–8556 (FAX)
 800–607–8500
 techserv@charlesindustries.com (e-mail)

9. WARRANTY & CUSTOMER SERVICE

9.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
 5600 Apollo Drive
 Rolling Meadows, Illinois 60008–4049
 847–806–6300 (Main Office)
 847–806–6231 (FAX)

9.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

9.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an “advanced replacement” service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the pre-addressed shipping label provided. Call your customer service representative at the telephone number above for more details.

9.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217–932–5288 (FAX 217–932–2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.
2. Include the following information:
 - Company name and address
 - Contact name and phone number
 - Inventory of equipment being shipped
 - Particulars as to the nature of the failure
 - Return shipping address
3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

CI Service Center
Route 40 East
Casey, IL 62420–2054
4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.

10. SPECIFICATIONS

The electrical and physical characteristics of the 8502–00 and 8503–00 are as follows:

10.1 Electrical

- (a) INPUT VOLTAGE: –44Vdc minimum, –48Vdc nominal, – 56Vdc maximum.
- (b) INPUT CURRENT: 500mA maximum.
- (c) INPUT POWER CONSUMPTION: 28W.
- (d) INPUT TRANSIENT OR SURGE PROTECTION: 1A Slo-Blo fuse.
- (e) INPUT REFLECTED NOISE (TO THE SOURCE): Less than 32dBnC. See note.

Note: Some noise resulting from the operation of these ringing generators is reflected back into the battery supply. Therefore, it is preferable to power the 8502–00 or 8503–00 from a signal battery source. If the 8502–00 or 8503–00 must be powered from a talk battery source, suitable isolation (filtering) must be provided. An alternative would be to disable the 8502–00 or 8503–00 except during ringing intervals and thereby eliminate noise from the talk path during speech intervals.

- (f) OUTPUT VOLTAGE: 80Vac minimum, 115Vac maximum at 48Vdc input.
- (g) OUTPUT CURRENT: 150mA maximum.
- (h) OUTPUT POLARITY: Floating.
- (i) OUTPUT FREQUENCY: 20Hz +/-2Hz.
- (j) OUTPUT OVERLOAD PROTECTION: .Current limiting inherent in design.
- (k) INTERRUPTED RATE (8503–00 ONLY): Two seconds on, four seconds off, or as required when under remote control.

10.2 Physical

See Table 3 for the physical characteristics of the unit.

Table 3. Physical Specifications

Feature	U.S.	Metric
Height	5.85 inches	14.9 centimeters
Height including mounting brackets	6.85 inches	17.5 centimeters
Width	2.81 inches	7.1 centimeters
Depth	6.81 inches	17.3 centimeters
Weight	6 pounds, 6 ounces	3 kilograms
Operating temperature	32° to 120°F	0° to 50°C
Operating humidity	to 95%	

