

Technical Practice

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MODEL 265 TONE GENERATOR/RING DETECTOR

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1. General Description

1.1 PRACTICE Issue 7 of the Model 265 Technical Practice is released to document changes in the physical characteristics of the Model 265. The unit now is mounted in a larger thermoplastic enclosure; an enclosure standard to Gordon Kapes, Inc. products. All installation and operational parameters remain the same. (In English: the Model 265 is now housed in a blue plastic box, but otherwise remains the same!)

1.2 PRODUCT OVERVIEW The Model 265 Tone Generator/Ring Detector is designed to produce an audio signal and cause a relay to change state when a standard telephone line ringing signal is present on the input terminals. Input ringing signal is defined as standard telephone line ringing voltage: 90 volts AC, 20/30Hz (nominal). The audio signal is selectable between a warble tone or a steady tone. The warble tone—similar in character to the ringing signal produced by electronic telephone sets—consists of two alternating tones. The steady tone is a constant pitch square wave signal. The audio signal is produced in cadence with the telephone line ringing signal. The audio signal connects to a line level input channel of an audio amplifier associated with a public address system. Controls are provided to adjust the audio signal's pitch and level. A normally closed, common, and normally open contact is provided for use in installer-selected applications. The contacts change state in cadence with the telephone line ringing signal.

1.3 POWERING The Model 265 is powered by the telephone line ringing signal. No external power source is required.

1.4 CONNECTIONS All interconnections are made via a 7-position screw terminal strip.

1.5 PHYSICAL DESCRIPTION The Model 265 consists of a precision fabricated printed circuit board and an injection molded base and cover. The thermoplastic material used for the housing conforms to industry recognized flame retardant standards. The Model 265 measures 8.75 inches (22.2cm) square, 3.25 inches (8.3cm) deep, and weighs approximately 1 pound (0.45kg). It wall mounts with four screws.

2. Application

2.1 PRIMARY APPLICATION The primary application for the Model 265 is for use with a Universal Night Answer (UNA) telephone line (trunk) associated with a Private Branch Exchange (PBX) telephone system. The tip and ring leads of the UNA trunk are connected to the Model 265's tip and ring terminals. The Model 265's "audio" terminals are connected to the line level input terminals of an audio amplifier associated with a public address system. When a ringing signal appears on the UNA trunk, an audio signal is produced by the Model 265. That signal is heard over the public address system. The relay contacts can be used to control audible or visual indicators. The indicators alert personnel whenever the telephone line is ringing.

2.2 GENERAL PURPOSE RING DETECTION The Model 265 is useful where detection of standard 20/30Hz bridged ringing is required. With both a normally closed and normally open contact, interfacing with other equipment is quite simple.

3. Installation

3.1 WORDS OF CAUTION As with any product, installing the Model 265 requires a safety first approach.

Warning: Never install telephone wiring during a lightning storm. Use caution when installing or modifying telephone lines.

3.2 CHECKING FOR DAMAGE The Model 265 should be inspected for damage immediately upon receipt. A claim should be filed with the shipper if damage is found. A replacement should be ordered if necessary.

3.3 THE COVER The cover is secured via two clamp screws located on the top and bottom of the cover. Remove the cover at this time.

3.4 MOUNTING The Model 265 wall mounts using four #8 screws appropriate for the wall material. Four #8 pan head screws are contained in the installation kit. Use these if suitable.

Table 1 Model 265 Connection Chart

Terminal	Description
1	Tip Telephone Line (or UNA)
2	Ring
3	+ Audio Output
4	-
5	Normally Closed
6	Common Relay Contact
7	Normally Open

3.5 INTERCONNECTIONS All interconnections are made via a 7-position terminal strip, TS1. A complete, albeit cryptic, description of their functions is located adjacent to the terminal strip positions. Refer to Table 1 for detailed connection information.

3.6 TELEPHONE LINE CONNECTION The Model 265 will work correctly with any two-wire telephone line that provides standard bridged ringing. Standard ringing voltage is considered nominally 90Vac, 20/30Hz. The usual connection is to a universal night answer (UNA) line associated with a PBX telephone system.

3.7 AUDIO OUTPUT CONNECTION The audio output can be connected to all types of audio amplifier line level input channels: low or high impedance, balanced or unbalanced. A coupling transformer is used to ensure that hum or noise is not induced into the audio amplifier. Do not connect the audio output to an audio amplifier microphone level input. Connecting a line level signal, such as that provided by the Model 265, to a microphone input will result in distorted sound being heard over the speakers. If absolutely necessary, use an audio attenuator or "pad" to reduce the Model 265's audio output level to correctly match a microphone input. The pad is installed between the audio output and the microphone input.

3.8 RELAY CONTACT A full form-C relay provides normally closed (shorted), common, and normally open (not shorted) contacts for connection in installer-selected applications. The relay changes states whenever ringing voltage is detected. A sample application would be to use the normally open and common connections to control an indicator light. The indicator light would be active whenever ringing voltage is detected.

4. Configuration and Operation

4.1 AUDIO TONE SELECTION The audio output can be set to produce either a warble tone or a steady tone. Use the switch located on the 265's circuit board to select the desired sound. The warble tone has the characteristics of an electronic telephone set's ringer. The steady tone is more of a pure tone. Although the warble tone may be more pleasing to the ear, the steady tone is useful to differentiate the output of the Model 265 from a ringing telephone instrument.

4.2 PITCH The pitch of the audio signal can be adjusted over a fairly wide range. The pitch control, located on the left side of the Model 265's circuit board, is used to get the desired "sound." A lower pitch is more pleasant to the ear, but less attention getting than a higher one.

4.3 AUDIO LEVEL The audio output level is adjustable. The level control is located on the right side of the Model 265's circuit board.

5. Circuit Description

5.1 GENERAL DESCRIPTION The circuit description is intended to familiarize you with the Model 265 for engineering, application, and curiosity purposes.

5.2 POWER SUPPLY The incoming ringing voltage is rectified, filtered and voltage limited to 27Vdc. This provides power for the entire circuit.

5.3 RELAY The 27Vdc is fed to the coil of a relay via a time delay circuit. The relay has two form-C contacts. One contact controls the application of 27Vdc to the audio generator integrated circuit. The time delay ensures a sharp "turn-on" of the audio signal. The second relay contact provides the normally closed, common, and normally open contacts to the terminal strip.

5.4 AUDIO GENERATOR An integrated circuit (IC) generates the audio signal. A switch connected to the IC selects warble tone or steady tone operation. A potentiometer adjusts the pitch of the signal. The output of the IC is fed, via the level potentiometer, to a 600 ohm to 600 ohm coupling transformer. The output of the transformer connects to the audio output terminals via 330 ohm isolation resistors. These resistors raise the output impedance so that multiple audio signals (such as the Model 265 and a Gordon Kapes, Inc. Model 262 page adapter) can be bridged (connected in parallel) into one audio input. While passive bridging of audio signals is not a great idea—it may be the only way in special cases!

6. Specifications

POWER REQUIREMENTS

Power is provided by the telephone line. No external power is required.

TELEPHONE LINE CONNECTION

Compatible with two-wire telephone lines that provide bridged ringing

Ringing Voltage Requirement: 60-150Vac, 16-68Hz

Ringer Load: 1.5B

AUDIO OUTPUT

Level: 0dBu (0.775Vac) maximum, adjustable
Impedance: 1260 ohms (nominal), transformer coupled
Type: Selectable, warble or steady tone
Pitch: Adjustable, 500-1500Hz (nominal)

RELAY CONTACTS

Normally closed (shorted), common, and normally open (not shorted), bifurcated contact, 1A maximum at 30Vdc or 100Vac (resistive)

FCC REGISTRATION

The Model 265 does not require FCC registration as it is not intended for connection to the public switched telephone network

RELIABILITY

MTBF 136.9 years, per Method 1 of Bellcore
TS-TSY-000332, Issue 2, July 1988

INTERCONNECTIONS

One 7-position screw terminal strip

ENVIRONMENT

0 to 50 degrees C, humidity to 95% (no condensation)

DIMENSIONS

8.75 inches high (22.2cm)
8.75 inches wide (22.2cm)
3.25 inches deep (8.3cm)

WEIGHT

Approximately 1 pound (0.45kg)

MOUNTING

Wall mounts with four #8 pan head screws

7. Incorrect Operation

7.1 REVIEW PRACTICE Should problems arise in the operation of the Model 265, please review Section 3— Installation of this practice. Ensure that all connections have been made properly. If another Model 265 is available, substitute and retest.

7.2 SWITCH SETTING Ensure that the WARBLE/STEADY select switch has been set to the desired position.

7.3 LEVEL CONTROL The audio output level control must be set to provide sufficient level to the audio amplifier. When the level control is in the fully counterclockwise position, no audio output is present on the output terminals.

8. Repair and Replacement

8.1 NOT SO FAST Statistically, most equipment returned to Gordon Kapes, Inc. for repair actually has nothing wrong with it. A telephone call to Gordon Kapes, Inc. technical support can often help to get the equipment operating correctly. We don't mind spending time with our customers getting a site up and running.

8.2 SEND IT BACK If you determine that the Model 265 is defective, return for repair or replacement according to the Gordon Kapes, Inc. Warranty/Repair and Return policy.

8.3 ONLY WE FIX IT In the event repairs are ever needed on your Model 265, they should be performed by Gordon Kapes, Inc. or an authorized representative. For further information, contact Gordon Kapes, Inc.

Specifications and information contained in this technical practice subject to change without notice.

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Figure 1 Model 265 Tone Generator/Ring Detector Block Diagram

