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Technical Practice

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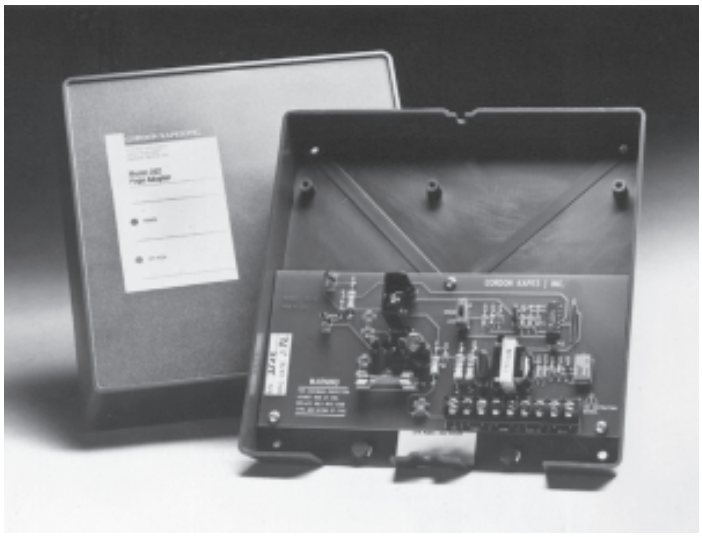
MODEL 262 PAGE ADAPTER

Contents



1. General Description

1.1 PRACTICE Issue 7 of the Model 262 Technical Practice is released to document changes in the physical characteristics of the Model 262. The unit is now 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 262 is now housed in a blue plastic box, but otherwise remains the same!)

1.2 PRODUCT OVERVIEW The Model 262 is designed to provide a voice paging connection between a telephone system and one zone of a voice paging/background music system. The unit is compatible with a wide variety of telephone and paging systems.

1.3 PAGE OUTPUT The audio output is designed to directly connect to most audio amplifiers and/or amplified speakers. The output circuit uses a transformer, helping to minimize the chance of hum and noise pickup between the Model 262 and associated paging equipment.

1.4 ANTI-NOISE CIRCUITRY A special circuit eliminates the extraneous clicks and pops commonly associated with accessing a paging system from a telephone system.

Please Note: The Model 262 provides a quiet beginning to all pages. A "pop" or "thump" may still be heard at the end of a page. This is a technical limitation that is common to most page adapter products.

1.5 RELAY CONTACT A normally open (not shorted) relay contact is provided for installer-selected applications. The relay contact closes (shorts) whenever a page is taking place. The most frequent use of the relay contact is to supply the paging equipment with a "page enable" contact closure.

1.6 LED STATUS INDICATORS Two LED status indicators are located on the Model 262 circuit board and are visible with the cover on or off. These LEDs are of great assistance in determining the operating status of the Model 262 during installation and maintenance.

1.7 CONNECTIONS All interconnections are made via a 9-position screw terminal strip.

1.8 POWERING The Model 262 requires an external source of 24Vac, –24Vdc, or –48Vdc for operation. There are no straps or switches to set; the unit automatically configures for the applied power. An inexpensive, high quality 24Vac transformer is available from Gordon Kapes, Inc.

1.9 PHYSICAL DESCRIPTION The Model 262 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 262 measures 8.8 inches (22.2cm) square, 3.3 inches (8.3cm) deep, and weighs approximately 1 pound (0.5kg). It wall mounts with four screws.

2. Applications

2.1 RANGE OF APPLICATIONS The primary application for the Model 262 is as a single-zone page adapter associated with a PBX or key telephone system. The Model 262 interfaces with a PBX system via a loop start or ground start trunk port, or with a key system via a central office line position.

The Model 262's audio output and, if required, relay contact are connected to the paging system's inputs. When the Model 262 is accessed via the telephone system, audio and a contact closure are provided to the paging system.

2.2 COST-EFFECTIVE SOLUTION The Model 262 addresses the needs of simple, cost-sensitive installations. The unit performs very well under the restrictions of its design.

3. Installation

3.1 WORDS OF CAUTION As with any product, installing the Model 262 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 262 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 262 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.

3.5 INTERCONNECTIONS All interconnections are made via a 9-position terminal strip, TS1. A complete, albeit cryptic, description of their functions is located adjacent to the terminal strip positions. Refer to Figure 1 for detailed connection information.

3.6 TRUNK CONNECTION The Model 262 links to a PBX system via a loop start or ground start trunk port. It connects to a key system via a CO line position.

3.7 MODEL 262 TO A PBX SYSTEM Connect the Model 262's trunk connections to the PBX port that is designated for paging use. Terminal strip pin 4 should be connected to the trunk port tip lead; pin 5 to the ring lead. Set the trunk select switch on the Model 262's circuit board to the LOOP position if the trunk port is set for loop start; set it to the GROUND position if the PBX trunk is set for ground start.

Figure 1 Model 262 Connection Chart

Terminal	Description	
1	Earth Ground (see Note)	
2	AC Common	Ground
3	±24Vac	–24Vdc or –48Vdc
4	T	PBX or Key System Trunk Port
5	R	
6	+	Audio Output
7	–	
8	Normally Open Relay Contact	
9		

Note

Earth ground connection required only if Model 262 is set to the ground start position.

Note: If the switch is set to the GROUND position, you'll have to connect earth ground to pin 1 of the terminal strip. More details are provided in section 3.11.

3.8 MODEL 262 TO A KEY SYSTEM Connect the Model 262's trunk connections to the key system central office line position that is designated for paging use. Terminal strip pin 4 should be connected to the tip lead; pin 5 to the ring lead. Set the trunk select switch on the Model 262's circuit board to the LOOP position.

3.9 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. Using amplified speakers has become a popular method of providing a public address/background music system. The Model 262's audio output can be connected directly to up to ten amplified speakers. If more than ten amplified speakers are required in any one zone, signal boosters can be obtained from the manufacturers of amplified speakers. Do not connect the audio output to an audio amplifier microphone level input. Connecting a line level signal, such as provided by the Model 262, to a microphone input will result in distorted sound being heard over the speakers. If absolutely necessary, an audio attenuator, or "pad" can be used to reduce the Model 262's audio output level to correctly match a microphone input. The pad is installed between the audio output and the microphone input.

3.10 RELAY A normally open (not shorted) relay contact is provided. This contact closes (shorts) whenever the page mode is activated by seizing (going off-hook) on the trunk. The most frequent use of the relay contact is with an audio amplifier or paging system that requires a contact closure during page operation. Some paging equipment refers to this as a "page enable" contact.

3.11 CONNECTING POWER The Model 262 requires 24Vac, –24Vdc or –48Vdc, 120mA maximum for operation. Power is connected via pins 2 and 3 of the terminal strip. No straps or switches need to be cut; the unit automatically configures for the power source connected.

Powering with 24Vac: Connect one lead of the 24Vac to pin 2 of the terminal strip; the other 24Vac lead to terminal 3. When using the Model 262 with 24Vac, it is important that both sides of the 24Vac be floating (isolated) from earth ground. Failure to maintain this condition may cause the fuse to "blow" and/or damage the Model 262.

Powering with –24Vdc: Connect power supply ground to pin 2 of the terminal strip; –24Vdc to pin 3.

Powering with –48Vdc: Connect power supply ground to pin 2 of the terminal strip; –48Vdc to pin 3.

3.12 CONNECTING EARTH GROUND The Model 262 requires a separate earth ground connection for operation in the ground start setting. Connect earth ground to pin 1 of the terminal strip.

When using the Model 262 with –24Vdc or –48Vdc: Two separate ground connections are necessary—one for earth ground and one for power supply ground. Even if the power supply ground is electrically at earth ground, it must still be connected to BOTH pins 1 and 2.

4. Configuration and Operation

4.1 LED STATUS INDICATORS Two LED status indicators are located on the Model 262 circuit board and are visible with the cover on or off. The power LED is lit when power is applied to the Model 262. The off-hook LED is lit whenever, you guessed it, the trunk is off-hook!

4.2 CONFIRM SWITCH SETTING Confirm that the switch on the Model 262 is set to the desired position, whether it be LOOP or GROUND.

4.3 INITIAL OPERATION The Model 262 can now be checked for correct operation. The power source should be connected; only the power LED should be lit. Continue by following the appropriate paragraph for your installation.

Model 262 Connected to a PBX: Begin testing by using a PBX extension to dial select the trunk that connects the PBX to the Model 262. The Model 262's off-hook LED should light, after which you are connected to the paging system. If the off-hook LED does not light, the connection to the trunk, the Model 262's switch, and the earth ground (if required) must be checked. A simple means of checking the Model 262 is to connect a lineperson's handset across the trunk T and R terminals. Go off-hook with the lineperson's handset. If the Model 262 is set for loop start, the off-hook LED should light. If the unit is set for ground start, momentarily ground the ring lead with a piece of wire. The off-hook LED should then light. Talk into the mouthpiece, you'll be heard over the paging system. Go back on-hook to end your test page. The off-hook LED should stop lighting.

Model 262 Connected to a Key System: Begin testing by using one of the key telephones to select the CO line button that connects the key system to the Model 262. The Model 262's off-hook LED should light, after which you are connected to the paging system. If the off-hook LED does not light, the connection to the key system, and the Model 262's switch setting, should be checked. A simple means of checking the Model 262 is to connect a line-person's handset across the Model 262's trunk connections. Go off-hook with the lineperson's handset; the off-hook LED should light. Talk into the mouthpiece, you'll be heard over the paging system. Go back on-hook to end your test page. The off-hook LED should stop lighting.

5. Circuit Description

5.1 GENERAL DESCRIPTION The circuit description is intended to familiarize you with the Model 262 for engineering, application, and curiosity purposes.

5.2 POWER SUPPLY The incoming 24Vac, –24Vdc, or –48Vdc is rectified, filtered and then fed, via a fuse, to a –24Vdc pre-regulator section. The pre-regulator keeps the circuitry from seeing voltage more negative than –24Vdc. The –24Vdc is used by the LEDs, off-hook relay, comparator integrated circuit, and 3-terminal voltage regulator. The voltage regulator produces "clean" –18Vdc, which is used by the trunk interface.

5.3 TRUNK INTERFACE A conventional battery feed circuit with a split primary, 600 ohm to 600 ohm transformer is used. In the loop start mode, two power resistors couple –18Vdc and Model 262 ground to the transformer center taps, and then via the transformer windings to the tip and ring leads. One section of integrated circuit comparator is used to detect trunk off-hook status.

In the ground start mode, a power resistor couples –18Vdc to one of the transformer's center taps, and then via the transformer winding to the ring lead. The tip lead is left "floating" with respect to ground. One section of integrated circuit comparator is used to detect current in the ring lead. A time delay starts upon detection of ring current, after which a transistor connects the tip lead, via a power resistor and the transformer winding, to earth ground.

5.4 AUDIO OUTPUT The secondary of the transformer, via 330 ohm resistors in each leg of the audio output, connects audio to the audio output terminals. One of the off-hook relay contacts is connected directly across the transformer secondary to mute the audio output when the unit is in the on-hook (non-page) state. The impedance of the audio output is 660 ohms in the on-hook state, and 1260 ohms in the off-hook state. The resistors are included to allow passive mixing of other audio signals. This is useful in obscure situations.

5.5 ANTI-CLICK CIRCUIT A time delay circuit is activated upon detection of current in the ring lead. At the end of the time delay, the relay coil is energized and if the unit is in the ground start mode, the tip lead is grounded. This circuit limits the transmission of unwanted audio signals over the paging system when going off-hook. The sad fact is that upon returning to the on-hook state, a significant "click" or "pop" may still be heard in the audio output. This problem is inherent in this type of product.

5.6 RELAY CONTACT A sealed, bifurcated contact is provided for use in installer-selected applications. The relay is controlled by the time delay circuitry, by way of a relay driver circuit.

5.7 LED INDICATORS Two LED indicator lights are provided to display the power and off-hook state.

6. Specifications

POWER REQUIREMENT
24Vac, –24Vdc, or –48Vdc, +10%/–5%, 120mA maximum

FUSING
One 2 amp, 3AG Glass Body Fast-Acting type, equivalent to Littelfuse 312 series, field replaceable

FCC REGISTRATION
The Model 262 does not require FCC registration as it is not intended for connection to the public switched telephone network

RELIABILITY
MTBF 87.0 years, per Method 1 of Bellcore TS-TSY-000332, Issue 2, July 1988

INTERCONNECTIONS
One 9-position screw terminal strip

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

TRUNK INTERFACE PARAMETERS
Intended for connection to loop start or ground start PBX trunk port or key system central office line position
Impedance: 600 ohms
Loop Supply Voltage: –18Vdc
Loop Supply Current: 32mA with 200 ohm loop, 50mA with shorted tip and ring

AUDIO OUTPUT LEVEL (NOMINAL)
2dB less than trunk audio level

OUTPUT IMPEDANCE
Idle (on-hook) State: 660 ohms
Active (off-hook) State: 1260 ohms

RELAY CONTACT
Normally Open (not shorted), bifurcated contact,
1A maximum at 30Vdc or 100Vac (resistive)

DIMENSIONS
8.6 inches high (22.2cm)
8.6 inches wide (22.2cm)
3.3 inches deep (8.3cm)

WEIGHT
Approximately 1 pound (0.5kg)

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 262, please review Section 3—Installation of this practice. Ensure that all connections have been made properly. If another Model 262 is available, substitute and retest.

7.2 LED INDICATORS The two LED indicators located on the Model 262's circuit board can provide assistance in locating the source of trouble. The power LED should always be lit. The off-hook LED will help in determining whether a functioning PBX trunk or key system line position is actually connected to the Model 262.

7.3 FUSE A fuse protects the Model 262 and the power source from damage. It is a 2 amp, 3AG type and is field replaceable. If the fuse blows and you are using an AC power source, check to ensure that neither side of the AC power source is floating (not grounded).

7.4 SWITCH SETTING Ensure that the LOOP/GROUND switch has been set to the desired position.

7.5 EARTH GROUND CONNECTION If the Model 262's switch has been set to the ground start position, earth ground must be connected to pin 1 of the terminal strip.

7.6 MODEL 262 TESTING A simple means of checking the Model 262 is to connect a lineperson's handset across the trunk connections and setting the trunk switch to LOOP. You can draw loop current and connect to the paging system by going off-hook with the lineperson's handset. The lineperson's handset will simulate the operation of a loop start PBX trunk, or a key system line position. Upon completion of testing, return the switch to the ground start position if appropriate.

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 262 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 262, 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.