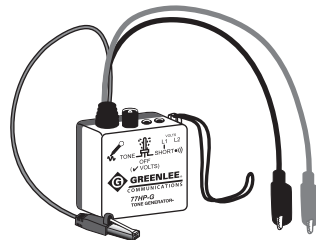



INSTRUCTION MANUAL



77M-G, 77HP-G, and 77HP-G/6A Tone Generators

	<p>⚠ WARNING</p> <p>Read and understand this material before operating or servicing this equipment. Failure to understand how to safely operate this tool could result in an accident causing serious injury or death.</p>
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SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

DANGER

Immediate hazards which, if not avoided, **WILL** result in severe injury or death.

WARNING

Hazards which, if not avoided, **COULD** result in severe injury or death.

CAUTION


Hazards or unsafe practices which, if not avoided, **MAY** result in injury or property damage.



Do not discard this product or throw away!

All specifications are nominal and may change as design improvements occur. Greenlee Textron Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

KEEP THIS MANUAL

	⚠ WARNING
	<p>Electric shock hazard:</p> <ul style="list-style-type: none">• Do not expose this unit to rain or moisture. Contact with live circuits could result in severe injury or death.• Use this unit for the manufacturer's intended purpose only, as described in this manual. Any other use can impair the protection provided by the unit.• Use test leads or accessories that are appropriate for the application. Refer to the category and voltage rating of the test lead or accessory.• Inspect the test leads or accessory before use. The item(s) must be clean and dry, and the insulation must be in good condition.• Before opening the case, remove the test leads from the circuit and shut off the unit. <p>Failure to observe these warnings could result in severe injury or death.</p>

⚠ CAUTION
<p>Electric shock hazard:</p> <ul style="list-style-type: none">• Do not attempt to repair this unit. It contains no user-serviceable parts.• Do not expose the unit to extreme temperatures or high humidity. Refer to "Specifications." <p>Failure to observe these precautions may result in injury and can damage the instrument.</p>

⚠ CAT 0 100V MAX.

Description

The 77M-G, 77HP-G, and 77HP-G/6A Tone Generators are intended to identify the conductor within a bundle, at a cross-connect point, or at the remote end. These testers are housed in high impact plastic cases, and each is powered by one 9 volt battery. Standard test leads include red and black rubber insulated test clips and a snag-proof, four-conductor modular cord and plug. (77HP-G/6A offers angled bed-of-nails clips.)

A three-position toggle switch controls the modes of operation, and bi-colored Light Emitting Diodes (LEDs) display line polarity for Lines 1 and 2 (Line 1 only for 77M-G). When a short circuit is detected, an audible signal will be heard (77HP only). The tone and short circuit test functions are only applied to Line 1 using the modular plug.

A tone selector switch (Figure 3), located inside each unit and accessible from the outside using a slender tool, may be used to select a fast or slow warble tone output.

The test sets are compatible with all common Central Office Switching Systems, and the output tone is isolated from DC voltages.

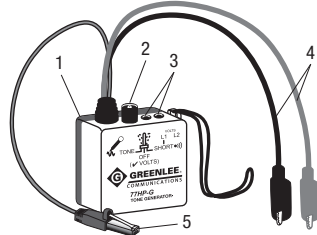


Figure 1. Features

Features include:

1. Battery compartment
2. Toggle switch
3. LEDs
4. Test leads
5. Modular cord

Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

Purpose of this Manual

This instruction manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the Greenlee 77M-G, 77HP-G, and 77HP-G/6A Tone Generators. Keep this manual available to all personnel.

Operation

WARNING

Electric shock hazard:

- When the tone generator is plugged into a modular jack, potentially hazardous voltage from the telephone line is present on the alligator test leads.
- Before opening the case, remove the test leads from the circuit and shut off the unit.

Failure to observe this warning could result in injury and can damage the instrument.

All of the following tests can be performed by using the red and black test leads (as described) or the modular plug.

*Note: When using the modular test plug, the polarity test function applies to Lines 1 and 2 USOC (Line 1 only for 77M-G). The continuity and tone functions **only** apply to Line 1.*

Identifying Tip and Ring (Polarity Test)

Telephone service must be present to perform this test.

In the OFF (✓ VOLTS) position, connect the black test lead to ground and the red test lead to each side of the line to be tested.

- A green LED indicates correct polarity. [The red test lead is connected to the ring (negative) side of the circuit.]
- A red LED indicates reversed polarity.
- A red and green flickering LED (appears yellow) indicates the presence of AC, or a ringing line.

Note: If independent ground is not available, connect the test leads across the pair. The LED will be green when the red test lead is connected to the ring (negative) side of the circuit and the black lead is connected to the tip (positive).

Indicating Line Condition

Telephone service must be present to perform this test.

In the OFF (✓ VOLTS) position, connect the red test lead to the ring side of the circuit and the black lead to the tip.

- A bright green LED indicates a clear working line with correct polarity.
- A bright red LED indicates a clear working line with reversed polarity.
- A dim green LED indicates a busy (off hook) line or faulted line condition (with correct polarity).
- A dim red LED indicates a busy (off hook) line or faulted line condition (with reversed polarity).
- A brightly flickering green and red LED indicates a ringing line.

Verifying Lines

To perform this test, the test sets must be in the OFF (✓ VOLTS) position. Dial the line to be verified. Connect the red lead to the ring side of the circuit and the black lead to tip. The LED will flicker red and green. To confirm identification, monitor the line and switch the tester (briefly) to the SHORT position. This will terminate the call.

Supplying Talk Power

Connect the test leads in series with a telephone test set (buttset) and the inactive wire pair (Figure 2). Move the toggle switch to the SHORT position to supply the "dead" line with talk power.

Additional test sets may be added, in series (red clip to black clip), to increase talk power supply when needed (Figure 2).

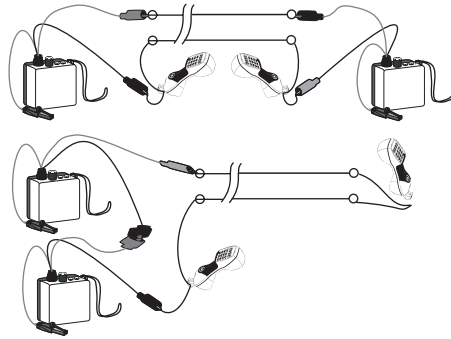


Figure 2. Supplying Talk Power

Sending Tone

With the test set in the TONE position, connect the modular plug or the red/black leads to the subject wire(s). An internal slide switch (accessible from the outside using a slender tool) allows the selection of either a fast or slow warble tone output (Figure 3).

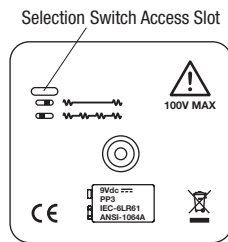


Figure 3.

With multiple signal connection methods, experiment to find the methods that work best with your applications.

Optional connections include:

- Connect the modular plug to a six-position jack to apply signal to the center two pins (USOC pair 1 only).
- Connect the red and black leads to the tip and ring conductors of a twisted pair circuit.
- For high twist wires (e.g. LAN cat-5/6) connect the leads to conductors of two different pairs. Example: red to tip of pair 1, black to tip of pair 2.
- Connect the red lead to the subject wire and the black lead to an independent earth ground.
- Connect the red lead to the shield and the black lead to ground of a shielded or coaxial cable.
- Connect the red lead to the shield and black lead to center conductor of a coaxial cable.

Trace the wire(s) with any Greenlee tone probe (Figure 4). When pair tracing, in order to confirm that the correct pair has been

identified, separate the two wires. The signal will be as loud on each of the pair wires and will NULL halfway between the two wires.

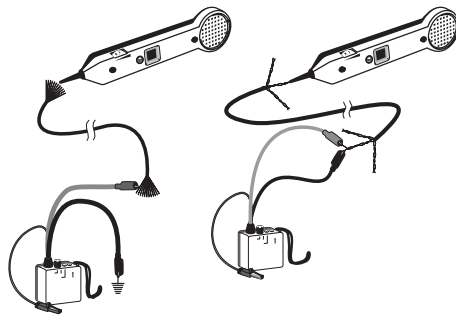


Figure 4a. Cable Tracing

Figure 4b. Pair Tracing

Reception of tone will be strongest on the subject wire(s). Shorting the leads of a tone carrying wire pair will cancel the tone signal and also confirm that the pair has been identified. If you have ready access to bare conductors, a handset or headset may be used to locate the tone.

CAUTION: Do not connect to an active DC circuit exceeding 52 volts when the test set is in the TONE or OFF position. Ringing AC voltage will not affect operation.

Testing for Continuity/Shorts Using SHORT Position

Connect the test leads to the subject wire pair. Move the toggle switch to the SHORT position and note the condition of the (Line 1) LED. A green LED indicates circuit continuity. The LED will not illuminate if the circuit resistance exceeds 10 k Ω .

77HP-G only: For resistive shorts of less than 200 Ω , a sounder will also alert the user of such condition to a short circuit.

CAUTION: Do not connect to any active AC or DC circuit when the test set is in the SHORT position.

Specifications

Electrical

Talk Battery (into 600 Ω): 4.6 VDC
Output Power (into 600 Ω): +10 dBm
Resistive Short Visual Indication: <10 k Ω
Resistive Short Audio Indication
(77HP-G and 77HP-G/6A only): <200 Ω
Output Frequency (nominal):
Tone: Alternating 890/960 Hz
Warble Rate:
Slow: 1.3 Hz
Fast: 6 Hz

Voltage Protection (into a 600 Ω circuit): 52 VDC
Battery: 9 VDC (NEDA 1604, JIS 006P or IEC 6LR61)
Battery Life: 50 hours

Physical

Length: 32 mm (1.25")
Width: 64 mm (2.5")
Height: 57 mm (2.25")
Weight (max): 128 g (4.5 oz)

Operating/Storage Conditions

Operating Temperature: 0 $^{\circ}$ C to 50 $^{\circ}$ C (32 $^{\circ}$ F to 122 $^{\circ}$ F)
Storage Temperature: -50 $^{\circ}$ C to 75 $^{\circ}$ C (-58 $^{\circ}$ F to 167 $^{\circ}$ F)

Maintenance

WARNING

Electric shock hazard:

Before opening the case, remove the test leads from the circuit and shut off the unit.

Failure to observe this warning could result in injury and can damage the instrument.

Battery Replacement

1. Remove screw from rear of set holding back cover.
2. Remove back cover.
3. Remove and replace battery.
4. Replace back cover and screw. **DO NOT OVERTIGHTEN SCREW.**

Cleaning

Periodically wipe with a damp cloth and mild detergent; do not use abrasives or solvents.