

CMC 7770 SERIES TRUB-L-SHOOTER®
DESCRIPTION AND OPERATION

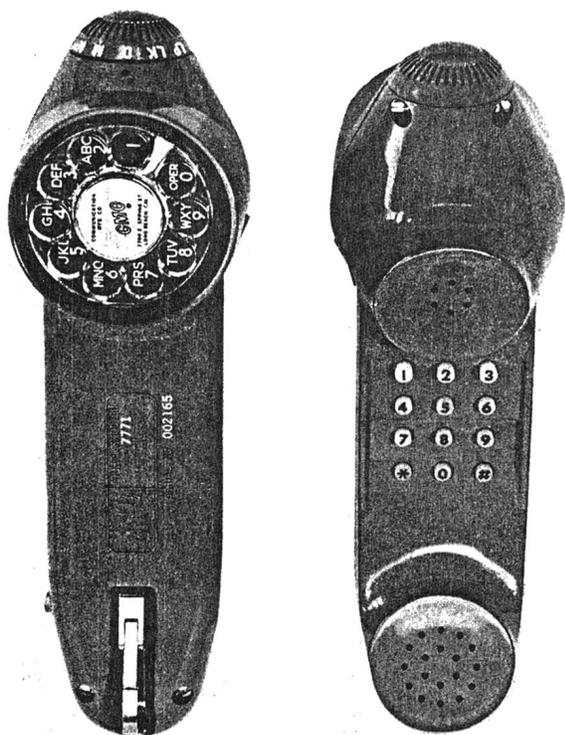


Figure 1 CMC Trub-L-Shooter Front and Back Views

1. GENERAL

1.01 This Section is issued to present the description and operating procedures for the CMC 7770, CMC 7771, CMC 7774, CMC 7775, CMC 7776, and CMC 7777 TRUB-L-SHOOTER® Hand Test Telephones (see Figure 1).

1.02 The CMC Trub-L-Shooters are used by central office and outside plant maintenance, PBX and installer-repair personnel to transmit and receive voice frequencies and to test telephone trunking and subscriber line circuits.

1.03 By selection of the appropriate quick-connect test cord (see Figure 2), the Trub-L-Shooter can be connected to any central office and PBX equipment.

2. DESCRIPTION

2.01 The high-impact plastic case affords a rugged unit for inside and outside maintenance forces. A heavy-duty belt snap clip allows easy carrying (see Figure 3).

2.02 A hanger bracket is available to hold the Trub-L-Shooter and extra quick-connect test cords (see Figure 4). It mounts on a wall or at the end of an equipment bay.

2.03 The Trub-L-Shooters allow for rotary or tone dialing and have transmission qualities that are equivalent or superior to those of the 500-type telephone set.

2.04 The CMC 7770 and CMC 7771 Trub-L-Shooters allow for rotary or tone dialing. A six-position function switch permits selection for special tests. A full-time polarity tester with a light-emitting diode indicator is incorporated, as well as a side-mounted Push-to-Talk and Release rocker switch. The case is sky blue colored high-impact plastic.

2.05 The Bell System model, CMC 7770, incorporates a standard Western Electric Dial, Tone Pad, Transmitter and Receiver. The Independent Telephone Company model, CMC 7771, uses equivalent component parts. Each Trub-L-Shooter is serialized for inventory purposes.

2.06 The CMC 7774 and CMC 7775 models are equipped with rotary dials only (no tone pad). Their application and features are the same as the CMC 7770 and CMC 7771, with the exception of tone dialing. The Bell System model is the CMC 7774 Trub-L-Shooter, while the Independent Company model is the CMC 7775 Trub-L-Shooter.

2.07 The CMC 7776 and CMC 7777 Trub-L-Shooters have a two-position Function Switch, a full-time Polarity Monitor with two light-emitting diode indicators and a side-mounted Push-to-Talk and Release rocker switch. The case is made of yellow colored high-impact plastic. A high impedance bridge that will not interfere with data transmission or conversation is provided. The Trub-L-Shooters may be connected to a station carrier circuit with an operating frequency of 80 kHz or above without causing any distortion. Another feature permits the seizure of dial tone on ground start circuits.

2.08 The Bell System model, CMC 7776, uses a standard Western Electric dial, tone pad, transmitter and receiver. The Independent Companies' model, CMC 7777, uses equivalent components. Each Trub-L-Shooter is serialized for inventory purposes.

2.09 All CMC quick-connect test cords are interchangeable with all of the CMC Trub-L-Shooters. Each 5-foot, three-conductor (TIP — white; RING — black or blue; GROUND — red) test cord is equipped on one end with a special plug which is inserted into the jack on the transmitter end of the handset. The other end is equipped with a termination as described in the following list. (An-L1 suffix indicates that the test cord is equipped with a three-position slide switch which permits tip party identification and utilizes the Trub-L-Shooter's ground start circuitry for seizure of ground start circuits).

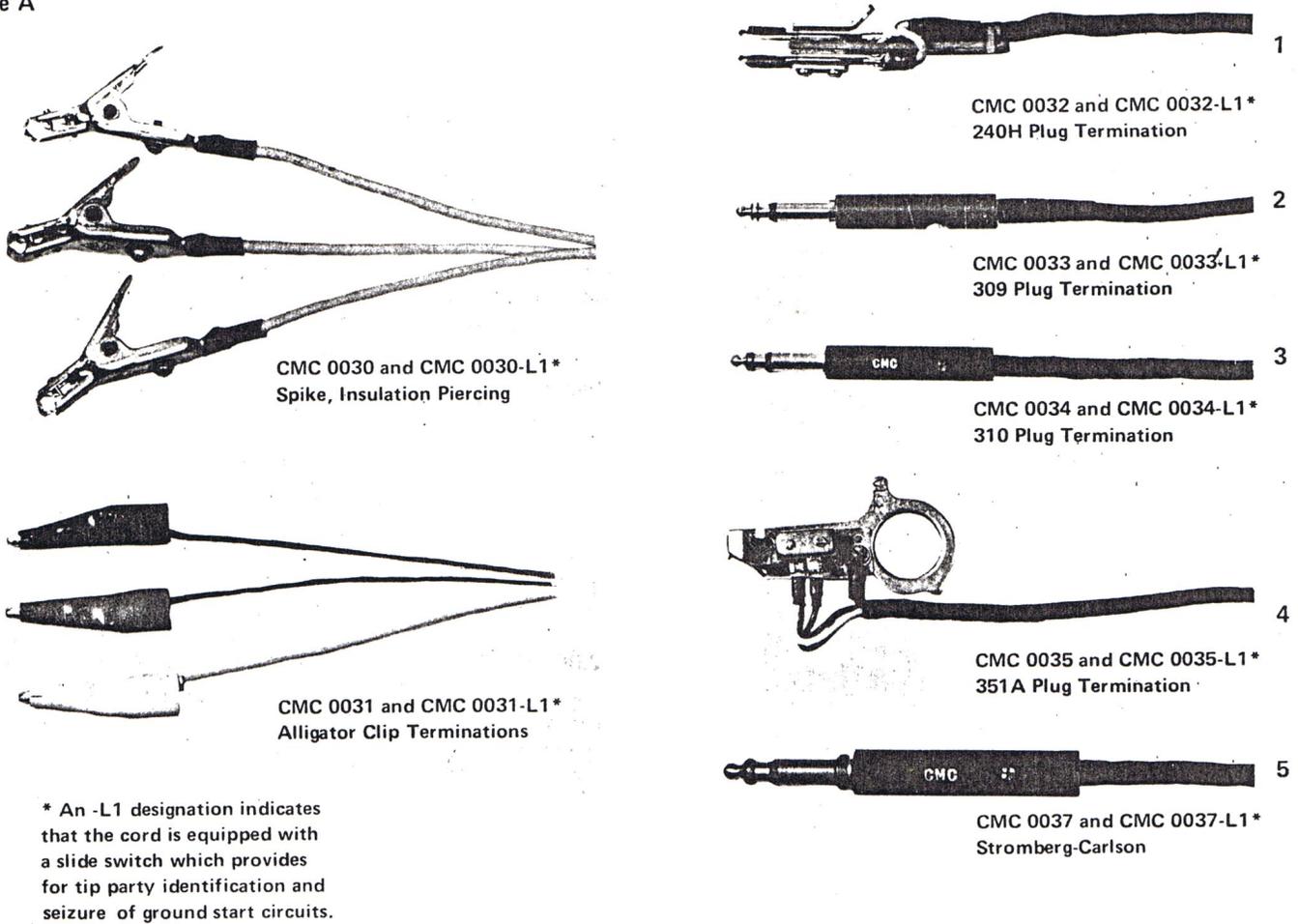


Figure 2 Cord Terminations for Trub-L-Shooter Quik-Connect Test Cords

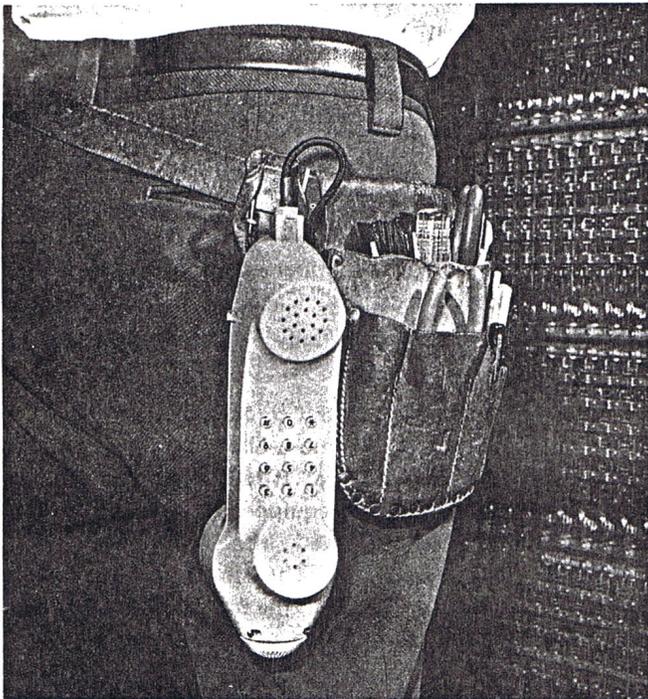


Figure 3 Trub-L-Shooter Suspended from Belt Snap Clip

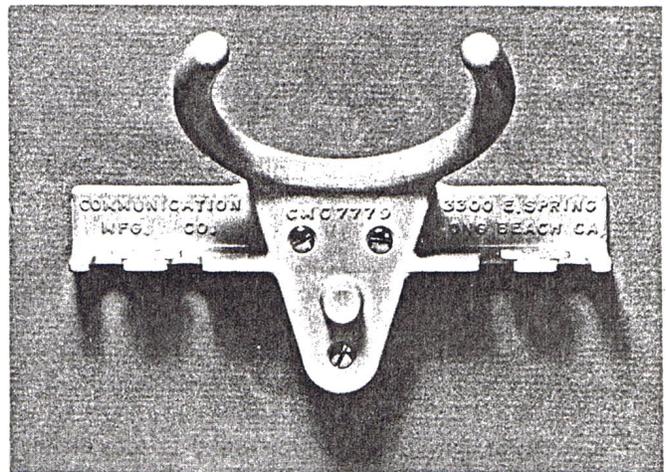


Figure 4 CMC 7779 Hanger Bracket

NOTE: The third conductor (GROUND – red) is only required when the rotary function switch is set to the T (tone) position on CMC 7770, CMC 7771, CMC 7774 and CMC 7775 models.

- CMC 0030 Test Cord – Spike, insulation-piercing terminations
- CMC 0030-L1 Test Cord – Same as CMC 0030, plus slide switch
- CMC 0031 Test Cord – Alligator clip terminations
- CMC 0031-L1 Test Cord – Same as CMC 0031, plus slide switch
- CMC 0032 Test Cord – 240H plug termination
- CMC 0032-L1 Test Cord – Same as CMC 0032, plus slide switch
- CMC 0033 Test Cord – 309 plug termination
- CMC 0033-L1 Test Cord – Same as CMC 0033, plus slide switch
- CMC 0034 Test Cord – 310 plug termination
- CMC 0034-L1 Test Cord – Same as CMC 0034, plus slide switch
- CMC 0035 Test Cord – 351A plug termination
- CMC 0035-L1 Test Cord – Same as CMC 0035, plus slide switch
- CMC 0037 Test Cord – Stromberg-Carlson equipment
- CMC 0037-L1 Test Cord – Same as CMC plus slide switch

3. OPERATION

CMC 7770, CMC 7771, CMC 7774 and CMC 7775 Models

3.01 The CMC 7770, CMC 7771, CMC 7774 and CMC 7775, Trub-L-Shooter operation is controlled by a six-position function switch on the receiver end; a side-mounted Push-to-Talk and Release switch and the rotary or tone dials (see Figure 5).

3.02 The TLK/RLS (Push-to-Talk/Release) rocker switch is located on the side, at the receiver end of the Trub-L-Shooter. When the switch is depressed to the TLK position, with the function switch set to the LP, LK or M position, it permits the user to talk on a working telephone circuit. When the switch is depressed to the RLS position, the Trub-L-Shooter is open to the line. (It is NOT NECESSARY to depress the TLK switch when the function switch is set to the D position).

3.03 The six-position switch is rotated either clockwise or counterclockwise, providing the following functions:

<u>POSITION</u>	<u>FUNCTION</u>
M (Monitoring)	Provides for regular monitoring of telephone circuits. A 3 dB loss with a frequency response of 600 to 3900 Hz with a 900-ohm termination.

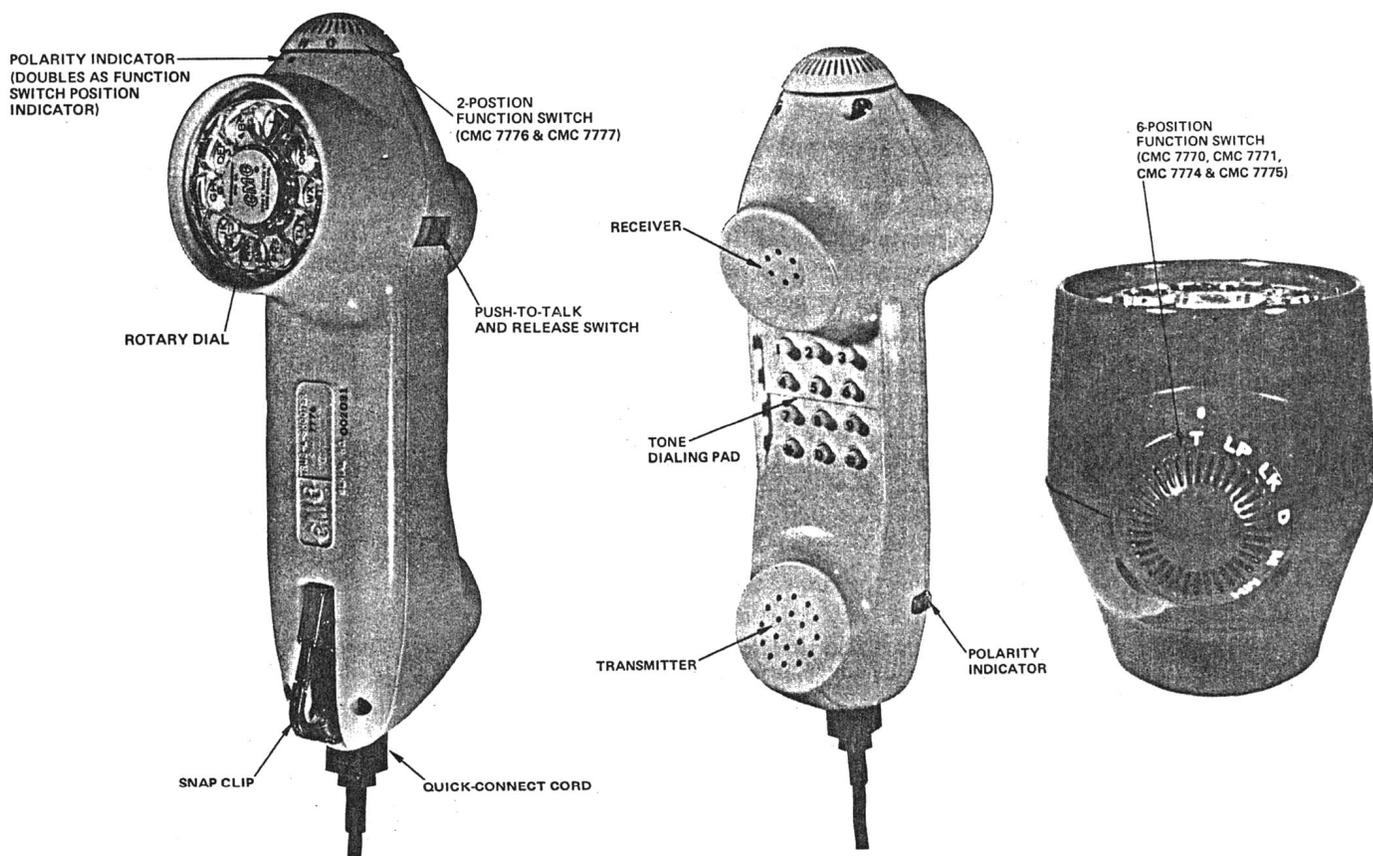


Figure 5 Trub-L-Shooter Showing Location of Controls and Parts Referred to in the Text.

POSITION

FUNCTION

A line seizure (off-hook) condition is provided, and the transmitter is cut in by depressing the rocker switch (side-mounted) to the TLK position. With the TLK operated the polarity monitor light-emitting diode illumination increases in brilliance if a reversal is detected. The rotary and tone dial are not in the circuit. The CMC Trub-L-Shooter's 23k ohm high impedance bridge will not affect data transmission lines.

HM
(High Level
Monitoring)

The CMC Trub-L-Shooter's amplifier provides a 10 dB gain with a frequency response of 600 to 3900 Hz, with a 900-ohm source. This enables monitoring and detecting background noise, cross-talk and distortion when routing or trouble shooting circuit noise problems; or any monitoring condition where 10 dB gain is advantageous. The rotary function switch can be switched from the HM to M to HM position to detect background noise, cross-talk and distortion that would normally be inaudible in the M position.

EXAMPLE: Borderline singing repeater and amplifier troubles.

The CMC Trub-L-Shooter's 23k ohm high impedance bridge will not affect data transmission lines; and to ensure further protection, the TLK switch is disabled in the HM position. The polarity monitor light-emitting diode illumination is barely visible.

D
(Dial)

In this position the CMC Trub-L-Shooter is used as a standard hand test telephone set. It provides an "off-hook" condition and allows for rotary or tone dialing. The polarity monitor, light-emitting diode provides an indication of a reverse battery condition when it illuminates. When the rocker switch is depressed to the RLS position the Trub-L-Shooter is open to the circuit. Upon release of the rocker switch (RLS position) the circuit is re-seized.

LK
(Leak Pulsing
Test)

Simulates a leak A test, using the rotary dial. The test is not designed for relay adjusting application, but is a quick method to detect borderline, subscriber dialing failures. The transmitter and receiver are disabled unless the rocker switch is depressed to the TLK position. A slight reduction in the transmission level will be noticed in relation to the D position. The polarity monitor light-emitting diode (if illuminated) will also show a slight reduction in brilliance.

POSITION

FUNCTION

LP
(Loop Pulsing
Test)

Simulates a 1400-ohm loop test using the rotary dial. The test is not designed for relay adjusting application, but is a quick method to detect borderline subscriber dialing failures. The transmitter and receiver are disabled unless the rocker switch (side-mounted) is depressed to the TLK position. Because of the additional dc resistance, a further reduction of transmission level will be noticed in relation to the LK position. The polarity monitor light-emitting diode illumination is barely visible.

NOTE: Most SXS switching equipment is tested at 12 pps with 1400-ohm loop and leak A conditions. The Trub-L-Shooter is designed to closely simulate these tests. The Trub-L-Shooter uses a standard dial with fixed percent break and a nominal 10 pps speed, therefore, the required resistance values for loop and leak tests are different than those usually encountered. The Trub-L-Shooter uses 2270 ohms for the loop test and 9000 ohms for the leak tests. Using these values with the standard 10 pps dial results in a loop test slightly less stringent than the standard test at 12 pps at 1400 ohms but more stringent than a 1200-ohm test. With the 9000-ohm leak resistance the tests will be less stringent than leak A but more stringent than leak B.

A relays requiring up to 17 mA to operate will affect service. Standard loop and leak test sets will not detect them unless an additional test is made for proper operating current. The values selected for the Trub-L-Shooter loop and leak tests (previously mentioned) will detect A relays operating in the 17 mA range without an additional current flow test. Identification of probable A relay loop failures during normal subscriber use is indicated by the Trub-L-Shooter without additional tests.

T
(Tone)

Applies 1000 Hz interrupted tone (120 IPM) to the TIP and RING of test cord. This allows the CMC Trub-L-Shooter to be used for continuity testing and circuit tracing. The level is -2 dBm \pm 2 dB when terminated to an open circuit, and -10 dBm \pm 2 dB when terminated to a 600- or 900-ohm circuit. The tone oscillator operates on a wet loop (battery and ground), requiring the GND lead (red) to be connected to C.O. ground. Outside installation personnel should use the most convenient source available, such as protector ground,

POSITION

FUNCTION

cold water pipe, cable sheath ground, etc. When the CMC Trub-L-Shooter is connected and set to the T position, the 1000 Hz interrupted tone can be heard in the receiver, but the transmitter is disabled. A line seizure (off-hook) condition exists, and if required, the tone can be removed momentarily by depressing the rocker switch to the RLS position.

CMC 7776 and CMC 7777 Models

3.04 The CMC 7776 and CMC 7777 Trub-L-Shooter operation is controlled by a two-position function switch on the receiver end; a side-mounted Push-to-Talk and Release switch and the rotary or tone dials (see Figure 5).

3.05 The TLK/RLS (Push-to-Talk/Release) rocker switch is located on the side of the receiver end of the Trub-L-Shooter. When the switch is depressed to the TLK position with the function switch in the M position, it permits the user to talk on a working telephone circuit. When the switch is depressed to the RLS position, the Trub-L-Shooter is open to the line. (It is NOT NECESSARY to depress the TLK switch when the function switch is set to the D position).

3.06 The two-position function switch is rotated clockwise or counterclockwise to provide the following functions:

M Meets regular monitoring requirements: (Monitoring) 9.5 dB loss; 6 k ohm impedance.

A line seizure (off-hook) condition is provided, and the transmitter is cut in by depressing the rocker switch to the TLK position. With the TLK operated, the polarity monitor light-emitting diodes' illumination increase in brilliance if a polarity reversal is present. The rotary and tone dials are not in the circuit. As an added precaution against affecting transmission while monitoring data circuits, before the test cord is connected to the circuit, the rocker switch is depressed to the RLS position providing an additional 47k ohm resistance. After connection, the rocker switch may be returned to normal.

In this position the CMC Trub-L-Shooter is used as a standard hand test telephone set. It provides an "off-hook" condition and allows for rotary or tone dialing. Ground start circuits are seized by momentarily depressing the rocker switch to the TLK position

POSITION

FUNCTION

(or setting the slide switch to the GND ST position if the Trub-L-Shooter is equipped with an -L1 model test cord). The polarity monitor light-emitting diodes provide an indication of a reverse battery condition when they illuminate. When the rocker switch is depressed to the RLS position, the Trub-L-Shooter is open to the circuit. Upon release of the rocker switch (RLS position) the circuit is resealed (the rocker switch is momentarily depressed to the TLK position to resealed a ground start circuit or, if equipped with an -L1 model test cord, the slide switch can be momentarily set to the GND ST position).

When the user wishes to appear as a subscriber for ANI (Automatic Number Identification) purposes, the quick-connect test cord with the desired termination and an -L1 designation is utilized. The slide switch is set to the TIP ID (tip party identification) position and the number of the line to be tested is dialed. A resistance-to-ground condition is established on the line.

All Models

3.07 The Polarity Monitor (two locations) provides a visual indication of a circuit's current polarity. One is side-mounted at the transmitter end of the Unit. The other, for convenience is located at the end below the function switch doubling as a function switch position indicator. The polarity indicator provides continuous polarity monitoring when the function switch is set to the D, T, M or HM position. Because of the high impedance bridge across the circuit when the function switch is set to the M or HM position, the light-emitting diode is barely visible. If required, the polarity can be observed in the LK or LP position by depressing the rocker switch to the TLK position.

3.08 A standard 10-digit rotary dial, with a transparent fingerwheel is mounted opposite the receiver unit. The lexan plastic case is extended around it to provide protection.

3.09 The tone pad is located on the handgrip section between the transmitter and receiver units. The pad consists of twelve push-type buttons. Buttons labeled 0 through 9 are for tone dialing of telephone calls. The buttons labeled * and # are reserved for sophisticated services of the future.

3.10 The heavy-duty belt snap clip located at the transmitter end of the Trub-L-Shooter allows for convenience of carrying.

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