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

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).
Section CMC 7770
Issue A

CMC 0030 and CMC 0030-L1 *
Spike, Insulation Piercing

CMC 0031 and CMC 0031-L1 *
Alligator Clip Terminations

* An -L1 designation indicates that the cord is equipped with a slide switch which provides for tip party identification and 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:

<table>
<thead>
<tr>
<th>POSITION</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>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.</td>
</tr>
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</table>

Figure 5 Trub-L-Shooter Showing Location of Controls and Parts Referred to in the Text.
POSITION | FUNCTION |
--- | --- |
HM (High Level Monitoring) | 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. |

D (Dial) | 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 routine 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. |

LK (Leak Pulsing Test) | EXAMPLE: Borderline singing repeater and amplifier troubles. |

LP (Loop Pulsing Test) | 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. |

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 (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 TK 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. |

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 ± 2 dB when terminated to an open circuit, and -10 dBm ± 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,
functions:

M  Meets regular monitoring requirements:

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

M (Monitoring)  9.5 dB loss; 6 k ohm impedance.

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 CMC Trub-L-Shooter allows for convenience of carrying.

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