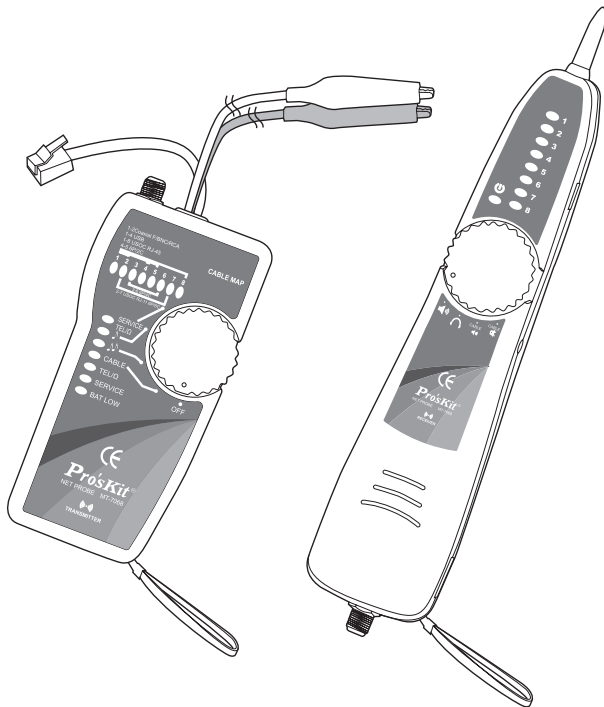


Pro'sKit®

All-in-one Toner & Probe Kit



User's Manual

MT-7068 Maintenance Kit

Congratulations on your purchase of MT-7068 Pro'sKit All-in-one Toner & Probe Kit. The Toner and Probe set is used to quickly trace and identify cables or wires within a group and also check the operation of phone lines. With proper use and care, this meter will provide many years of reliable service.

Index

Features.....	3
Applications.....	3
Advanced Features.....	3
Unpacking.....	4
Safety Information.....	4
MT-7068-T Toner.....	5
MT-7068-R Probe.....	6
Locating and Isolating Cables.....	7
Locating Individual Wire Pairs with the MT-7068 Analog Function.....	8
Isolating Cables.....	9
Cable Map Testing.....	10
Validating the Cable's Shield and Continuity Test.....	13
Validating Telephone Service and Polarity.....	14
Powering a Telephone Test Set.....	15
Validating Ethernet Service.....	16
Battery Life and Replacement.....	17
Replacing the Fuse.....	18
Maintenance.....	19
Trouble shooting.....	19
Specifications.....	20

Overview

The MT-7068 All-in-one Toner & Probe Kit let you locate, isolate, and validate twisted pair (UTP, STP, Cat 5e, Cat 6), coax cables (RG6, RG58, RG59, and others for CATV/CCTV), USB and A/V signal, bare wire (such as speaker wire and security network wire), and Cat 3 telephone cabling. The Toner also lets you validate voice and data services.

The MT-7068 All-in-one Toner & Probe Kit features let you use the Toner and Probe to validate and trouble-shoot wiring on RJ11 /RJ45 cables and connectors, USB, F, BNC, and RCA connectors, and it also supplied with alligator clips to work with. The MT-7068 Toner detects telephone and Ethernet service, indicates polarity and active line numbers on voice circuits, and indicates active pair number on Ethernet circuits. The MT-7068 Toner and Probe also provide standard functions such as visual and audible signal strength indication, analog toning/detection, and continuity testing.

The MT-7068 All-in-one Toner & Probe Kit is ideal for all maintenance fields of telecommunication, network-ing, datacom, Audio/Video, cable TV, and all weather cabling, etc.

Features:

- Locates cables quickly and easily
- Locates hidden cables
- Isolates the right cable or pair fast
- Overcome noise and save time
- Tone on live networks safely and effectively
- Verify conductor continuity with Cable Map
- Identify and troubleshoot cable services

Applications:

- Copper cabling media, including shielded (STP) and UTP cable
- 75 or 50 Ohm coaxial cable
- Two conductor control, security, generic cabling
- 10 Base-T or 10/100 Base-T datacom networks
- POTS telecom serviceAdvanced Features

Advanced Features

- MT-7068 Toner generates 1 KHz compatible legacy analog tones that analog audio Probe can detect.
- MT-7068 Toner provides two 1 KHz analog toning modes, one-note and two-note tones, for location and isolating cables.
- MT-7068 Toner's multiple-level LEDs simplify signal interpretation in noisy environments.
- In locating mode, the Probe's LEDs light up from 1 to 8 as the signal strength increases. The higher the number, the stronger the signal.
- MT-7068 Probe also beeps in different tones to indicate good wiring, miswires, shorts, and opens in an efficient area between 10 to 30 centimeters.
- The 1 KHz analog toning mode is available at all connectors on the MT-7068-T Toner.
- The MT-7068 feature also lets you use the Toner and Probe to validate and troubleshoot wiring on RJ11 /RJ45 cables and connectors, USB, F, BNC, and RCA connectors, and it also supplied with alligator clips to work with.
- MT-7068 Toner detects telephone and Ethernet service, indicates polarity and active line numbers on voice circuits, and indicates active pair number on Ethernet circuits.
- MT-7068 Toner and Probe also provide standard functions such as visual and audible signal strength indication, digital toning/detection, analog toning/detection, and continuity testing.
- MT-7068 Toner features LED indicators for detecting the common wire resistance ($>300\Omega$) for bad connections.
- MT-7068 Toner identifies and diagnoses POTS with multi-line Telco detect polarity and ring indication (Line 1 and Line 2).
- MT-7068 Toner detects telephone service and circuit polarity on its RJ11 and RJ45 jacks (Hand set and Butt set).
- MT-7068 Toner identifies and diagnoses Ethernet link connectivity with NIC/hub indication.
- MT-7068 Probe equipped with composite tip to reduce the risk of getting shock.
- MT-7068 Toner and Probe equipped with easy tip replacement, and lanyards attachment point for hands-free operation.

Unpacking

The MT-7068 products come with the accessories listed below. If an accessory is damaged or missing, contact the place of purchase immediately.

MT-7068 Maintenance Kit

- MT-7068-T Toner with 9V battery and wrist strap
- MT-7068-R Probe with 9V battery and wrist strap
- 1 RJ45 (8 Pin) to RJ11 (6 Pin) patch cords
- 2 RJ45 (8 Pin) to RJ45 (8 Pin) patch cords
- F connector to BNC adapter, male to female
- F connector to RCA adapter, male to female
- Storage tool bag
- User's manual

Safety Information

Table 1 describes the international electrical symbols used on the tester and in this manual.

Table 1. International Electrical Symbols

	Warning: Risk of personal injury. See explanations in the manual. Caution: Risk of damage or destruction to equipment or software. See explanations in the manual.
	Warning: Risk of electric shock.
	Please keep eye on the status or function of the equipment while operating.
	This equipment not for connection to public communications networks, such as active telephone systems.



Warning

- Never use the Toner or Probe on circuits of more than 100V.
- Never use the Toner, Probe, or test leads if they are damaged. Inspect the cases and test leads for damage before use.
- Disconnect unused test leads and connectors from the Toner when testing telephone circuits.
- Never open the case except to change the battery or the fuse; no user-serviceable parts are inside.
- Turn off the Toner or Probe and disconnect all test leads before replacing the battery.
- Use only a 9V battery, properly installed in the case, to power the Toner and Probe.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



Caution

- Avoid touching the Probe tip to patch panel connections and using the tip to dig into cable bundles. Doing so regularly may damage the Probe tip over time.
- To avoid unreliable test results, replace the battery as soon as the low battery indication appears.

MT-7068-T Toner

1. RJ-45 (8Pin) / RJ-11 (6/4/2pin) adaptor
2. RJ-11patch cord
3. Red/Black alligator clips
4. F connector
5. USB adapter
6. Wrist strap
7. Battery cap
8. 5-level function switch
9. Multiple-level LEDs CABLE MAP
10. **SERVICE/TEL/Ω** : Ethernet service status (open/closed circuit) indication; Line voltage (power) detecting, telephone service and polarity validating; continuity (>300Ω) testing.
11. 🎵 : One-note tone LED indicator: 1KHz, one-note toning for Probe to detect.
12. 🎵🎵 : Two-note tone LED indicator: 1KHz, two-note toning for Probe to detect.
13. **CABLE**: Cable mode. Works with ⑨ Multiple-level Cable Map for showing LED lights and tones to indicate shorts, opens, and twisted pair cabling.
14. **TEL/Ω**: Line voltage (power) detecting, telephone service and polarity validating; continuity (>300Ω) testing
15. **SERVICE**: Ethernet service status (open/closed circuit) indication.
16. **BAT LOW**: Battery Low indication
17. **Power OFF**

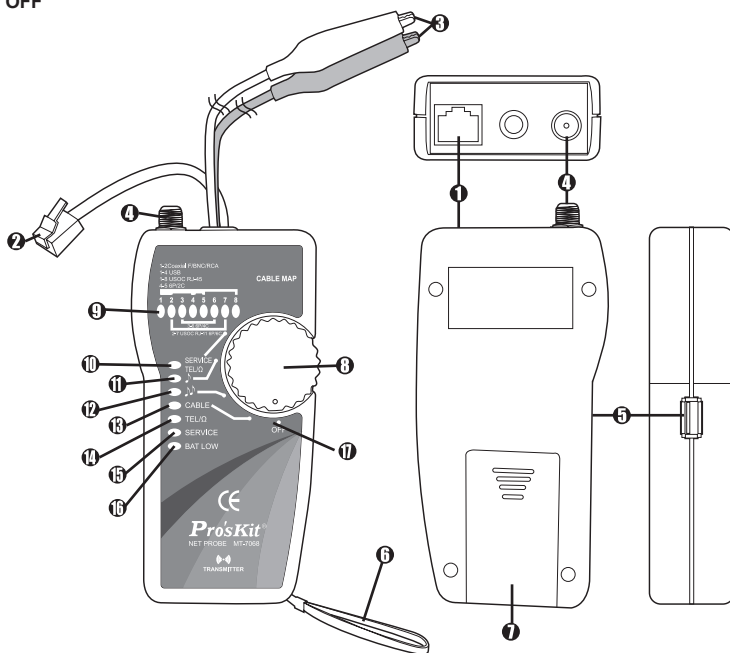


Figure 1 MT-7068-T Toner Diagram

MT-7068-R Probe

1. Probe
2. USB adapter
3. F connector
4. Wrist strap
5. RJ-45(8Pin) / RJ-11(6/4/2pin) adapter
6. ø2.5mm ear jack
7. Volume control
8. Battery cover
9.  Indicates detection of MT-7068 signal and shows battery status at power-up
10. Multiple-level LED CABLE MAP, 1KHz analog tone signal indication
11. 5-level function switch
12. Power OFF
13.  1KHz legacy a nalog signals detecting with audio indicator from speaker.
14.  1KHz legacy analog signals detecting with audio indicator from earphone.
15.  Identifies signals like shorts, opens, and twisted pair cabling with audio and this LED visual indicators.
(Refer to 10 LED Cable Map)
16.  Identifies signals like shorts, opens, and twisted pair cabling with this LED visual indicator.
(Refer to 10 LED Cable Map)

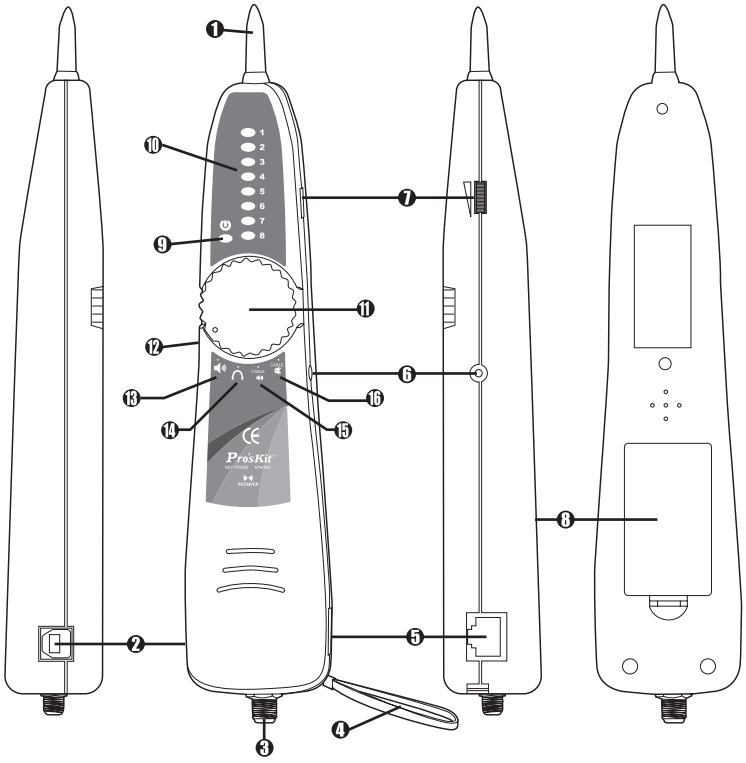


Figure 2 MT-7068-R Probe Diagram

Locating and Isolating Cables

Locating and Isolating Terminated UTP/STP Cables with MT-7068



Warning

- It is not intended to be used on live wires with a DC power source (e.g., live telephone lines), nor will it work on wire pairs that are carrying AC signals.



Caution

- To locate and isolate cables using the 1KHz analog toning mode, please avoid interference sources like electronic devices with adapter, induction coil, and motors nearby. White noise from MT-7068-R Probe is normal when your Toner is near any of the interference. If you cannot locate the signal on 2-conductor cables, the cable may be shorted. Please away from or turn off the electronic devices.
- The  position on the MT-7068 Toner and Probe lets you use the Probe to trace using an analog 1KHz tone. Use the Probe to isolate the tone source in the cable bundle or at the patch panel.
- It is not necessary to touch the Probe's tip to the cabling or patch panel when searching for the Toner's signal.
- Make sure the black alligator clip of the Toner is connecting to the ground before use.

MT-7068 Toner provides two 1 KHz analog toning modes, one-note tone and two-note tone, for location and isolating cables. Both toning signals are available at all connectors on the Toner.

Locating Individual Wire Pairs with the MT-7068 Analog Function

To locate cables, do the following (Figure 3):

1. Connect the black alligator clip of the Toner to the ground, and then connect the red clip to a jack or punch-down block as shown in Figure 3.
2. Turn the Toner's rotary switch to  for a one-note tone or  for a two-note tone.
3. Turn the Probe's rotary switch to  ". Turn the rotary to  position when the **POWER** LED flickers.
4. Use the Probe to find the general location of the tone at a cable rack, patch panel, or behind a wall. In locating mode, the Probe's LEDs light up in red from 1 to 8, then wrap back and light up from 1 to 8 again as the signal strength increases.
5. Adjust the Volume Control on the Probe to locate the wire pairs from 10cm to 30cm.

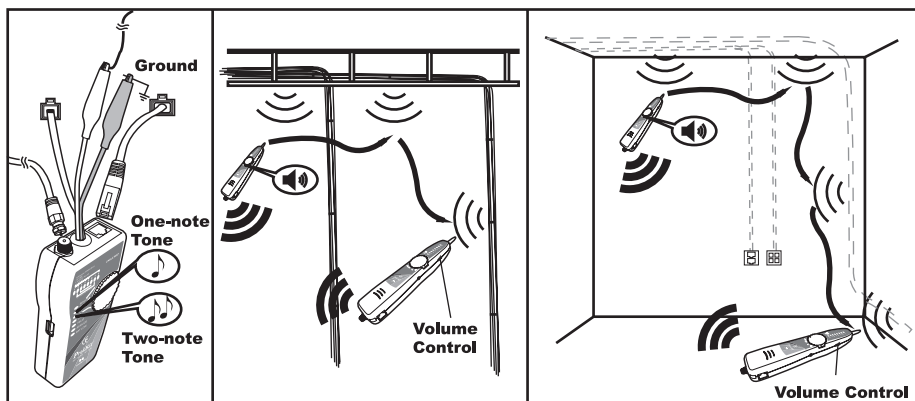


Figure 3 Locating Cables

Isolating Cables

To isolate the tone source in the cable bundle or at the patch panel, do the steps as described in the previous section of "Locating Cables".

6. Strip the cable's shield to a length of between 30 to 45 centimeters and divide the wires into two parts.
Do the wire dichotomy to isolate the cables to verify the signal of each part. If the beeper gets louder and LED lights up, you have located the position you are looking for.
7. Adjust the volume control from high to low to enable looking for a more difficult to identify wire. Narrowing the length from 30 to 10 centimeters will help to more accurately identify the wire pairs.
8. Repeat the steps of 6 and 7 to isolate the bundled cables.

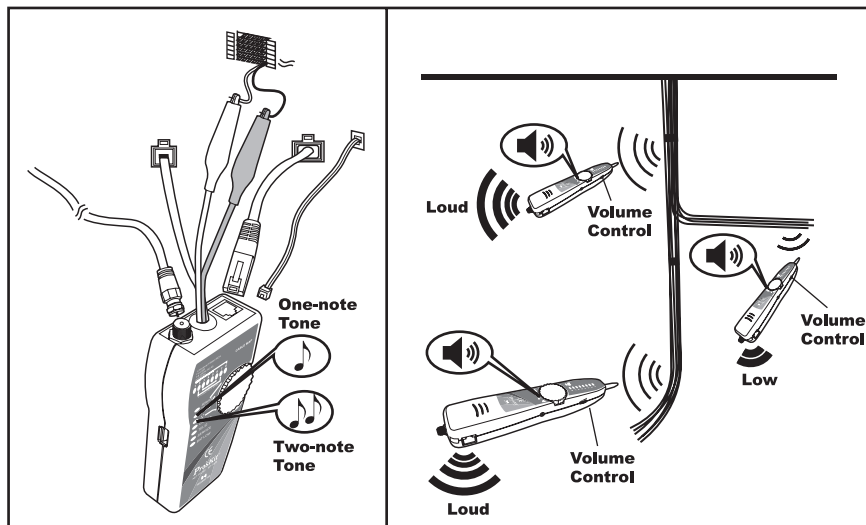


Figure 4 Isolating Cables



Caution

- If you cannot locate the MT-7068 signal on 2-conductor cables, the cable may be shorted or opened. Use the Cable Map Testing (Fig. 5) to test for shorts or opens on cables with RJ11 and RJ45 connectors. Use the Continuity Test (Fig. 8) to check for shorts or opens on coax and non-terminated cables.

Cable Map Testing:

You can use the MT-7068 Toner or Probe to validate the cable map on RJ45, RJ11 (6P/6C, 6P/4C, 6P/2C) jacks, USB, F(BNC, RCA) adapters and connectors. The cable map function finds the most common wiring faults on twisted pair cabling: shorts, opens, and crossed pairs.

1. Connect the MT-7068 Toner or Probe to RJ45 (8P/8C), RJ11 (6P/6C, 6P/4C, 6P/2C) jacks, or USB, F (BNC, RCA) connectors.
2. Turn the Toner's rotary switch to **CABLE** and wait until the LED flickers; then turn the Probe's switch to **CABLE** for beeper alarm or  for mute indication. The Probe's LEDs and beeper indicate the cable map.



Caution

- Each LED that corresponding to an active pin flashes briefly, and then should light for about 1 second. The brief flash shows which LED is next in the sequence.
- The Probe also beeps in different tones to indicate good wiring, miswires, shorts, and opens.
- While testing Cable Map from 2 wires or less, the on and off tones may occur even if the LED lights normally.
- Before Cable Map testing, repeat the procedures of "Locating Cables" on page 7 to identify the correct connector or wires on the other end of the cable if necessary.

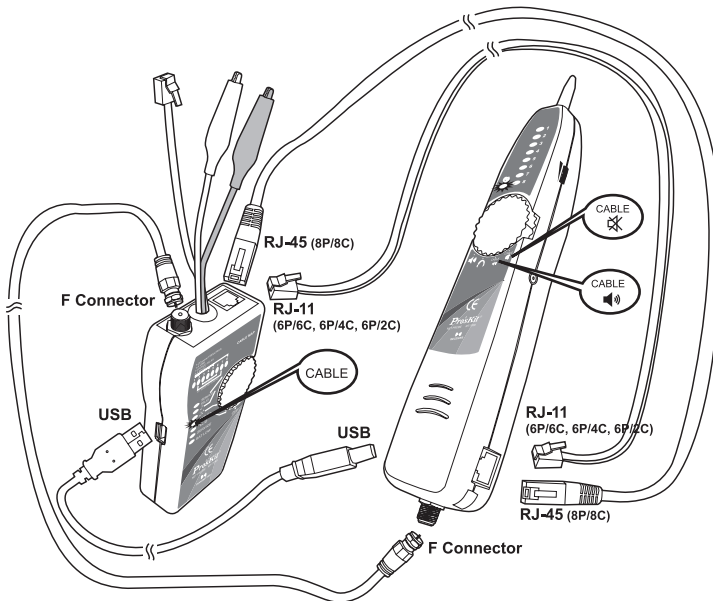


Figure 5 Validating Cable Maps

3. Different connectors generate different LED and sound indications as shown in Figure 6.

- **RJ-45(8P/8C) LED indication:** the MT-7068 Toner (from 1-8 seconds in sequence) is synchronized with the MT-7068 Probe CABLE MAP.
- **RJ-11(6P/6C, 6P/4C, 6P/2C) LED indication:** MT-7068 Toner CABLE MAP, 6P/6C each second from 2 to 7 in sequence, 6P/4C each second from 3 to 6 in sequence, 6P/2C each second from 4 to 5 in sequence is synchronized with the MT-7068 Probe CABLE MAP. If it encounters an empty line, the indication will cease.
- **USB LED indication:** the MT-7068 Toner (each second from 1-4 seconds) is synchronized with the LED on the MT-7068 Probe. Each LED indicator counts for one second. The USB indication will skip and pause for 4 seconds from LED #5 - #8.
- **F (BNC, RCA) LED indication:** the MT-7068 Toner (each second from 1-2 seconds) is synchronized with the LED on the MT-7068 Probe. Each LED indicator counts for one second. The F connector indication will skip and pause for 6 seconds from LED #3 - #8.

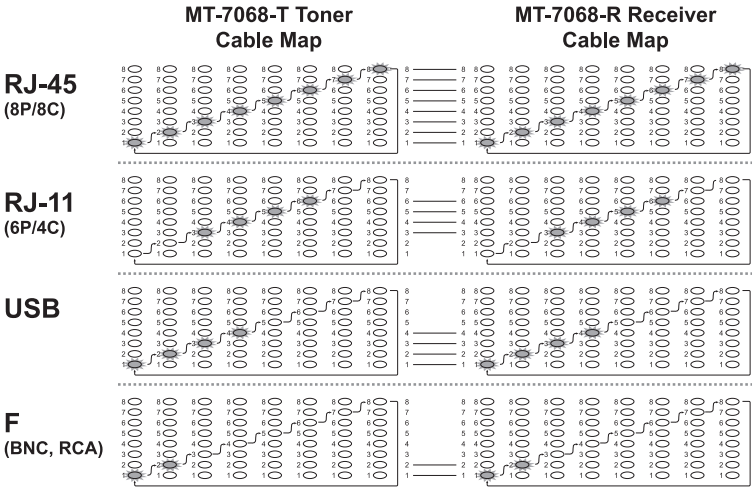


Figure 6 Different Connector's Cable Map

4. You can use the MT-7068 Toner and Probe to validate the cable map on RJ11 and RJ45 connectors. The cable map function finds the most common wiring status on twisted pair cabling: good, shorts, opens, and crossed pairs as shown in Figure 7.
- **Good wiring:** Each LED that corresponding to an active pin flashes briefly and in a stairway order.
 - **Shorts:** If two LEDs turn on for 1 second at the same time, those two pins are shorted together. If more than 2 wires are shorted together, the LEDs for the shorted pins indicate opens.
 - **Opens:** If an LED flashes briefly, then no LEDs turn on, that pin is open.
 - **Crossed pairs:** If one LED flashes briefly, then another LED lights for one second, the wire for the first LED is crossed pairs to the pin for the second LED.
5. Each LED that corresponding to an active pin flashes briefly, it should light for about 1 second. The brief flash shows which LED is next in the sequence.

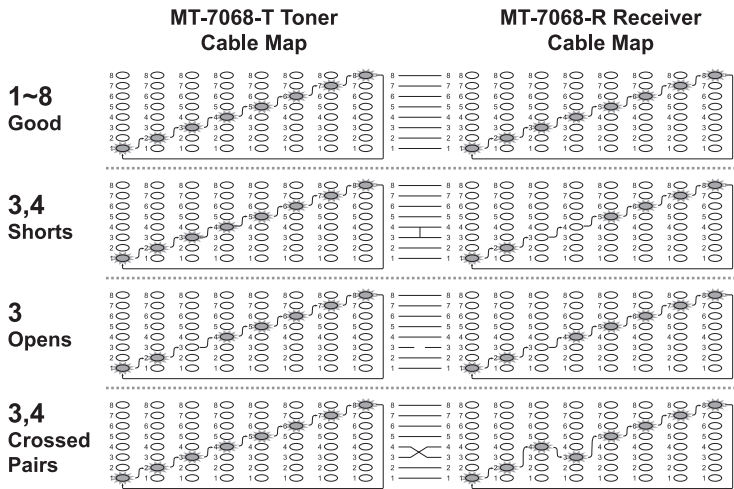


Figure 7 Good Wiring, Shorts, Opens, Crossed Pairs

Validating the Cable's Shield and Continuity Test



DANGER

- Remove the battery door and disconnect the battery from the Probe.

To validate cable shield during cable map tests, do the following as shown in Figure 8:

1. Connect the Toner to the circuit as shown in Figure 8. Connect the test leads to the telephone punch-down blocks, RJ11, and RJ45 jacks.
2. Turn the Toner's rotary switch to **SERVICE/TEL/Ω**.
3. The **TEL/Ω** LEDs of the Toner indicates the status as below:
Green light: cable shielded and connected (Resistance<300Ω).
No light: no shield and no service (Resistance>300Ω).

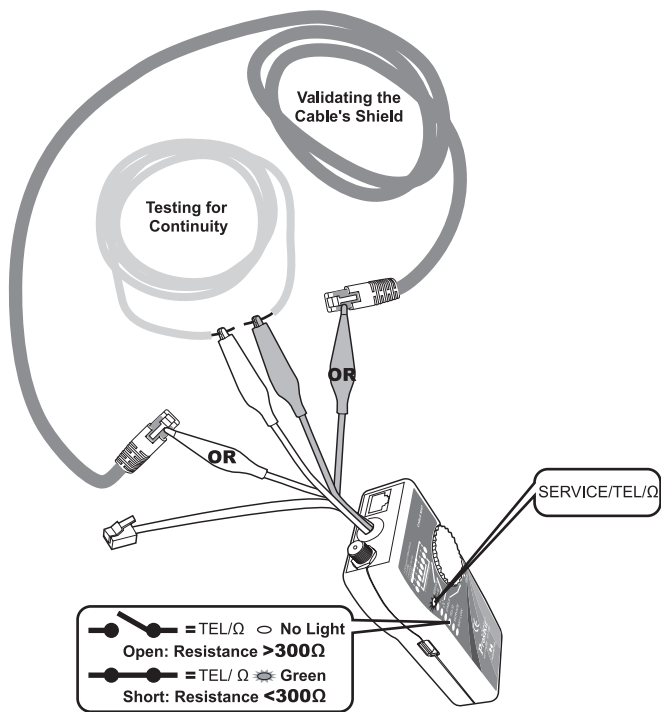


Figure 8 Continuity Test

Validating Telephone Service and Polarity

The Toner detects telephone service and circuit polarity on its banana, RJ11 and RJ45 jacks.

To validate telephone service and polarity, do the following as Figure 9 shown below.

1. Connect the Toner to the circuit as shown in Figure 9. Connect the test leads to the telephone punch-down blocks, RJ11, and RJ45 jacks.
2. Turn the Toner's switch to **SERVICE/TEL/Ω**.
3. The **TEL/Ω** LEDs of the Toner indicates the status as below:

Green light: Red test lead at positive (+) polarity
Black test lead at negative (-) polarity

Red light: Red test lead at negative (-) polarity
Black test lead at positive (+) polarity

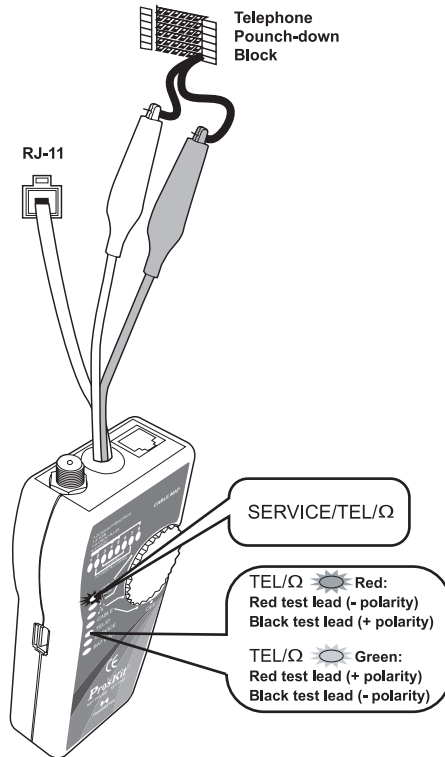


Figure 9 Validating Telephone Service and Po

Powering a Telephone Test Set



Caution

When powering the telephone test sets, the toner needs more power consumption to generate the device. 9V alkaline battery (NEDA 1604A or IEC6LR61) is recommended for this operation.

The Toner can supply 6V into a 600 Ω circuit to power telephone test sets (Hand set/Butt set) when Central Office battery power is not present. (Fig 10)

1. Connect the Toner to the voice circuit as shown in Figure 10.
2. Turn the Toner's rotary switch to **SERVICE/TEL/ Ω** .
3. The LED indicator **TEL/ Ω** lights green; the Toner is supplying 6V into a 600 Ω circuit to power telephone test sets (Hand set/Butt set).

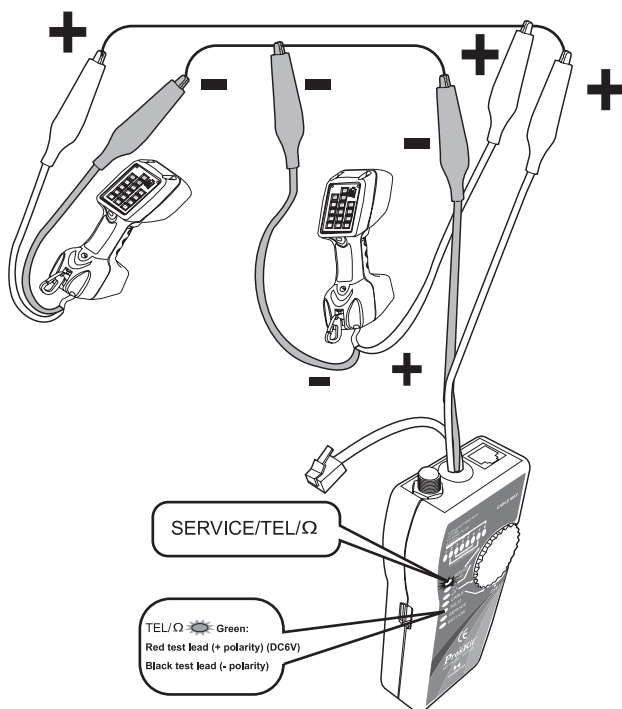


Figure 10 Powering a Telephone Test Set

Validating Ethernet Service

The Toner detects link pulses for Ethernet service. To validate the Ethernet service, do the following as Figure 11 shown below.

1. Connect the Toner to the circuit of RJ45 Ethernet jack. Or using RJ45 (8 pin to 8 pin) plug to connect the Ethernet jack.
2. Turn the Toner's rotary switch to **SERVICE/TEL/Ω**.
3. The **SERVICE** LEDs of the Toner indicates the status as below:

Green lights (10HD) or flashes (100HD) indicate the Toner is connected to a network.

No light indicate non-Ethernet voltage.

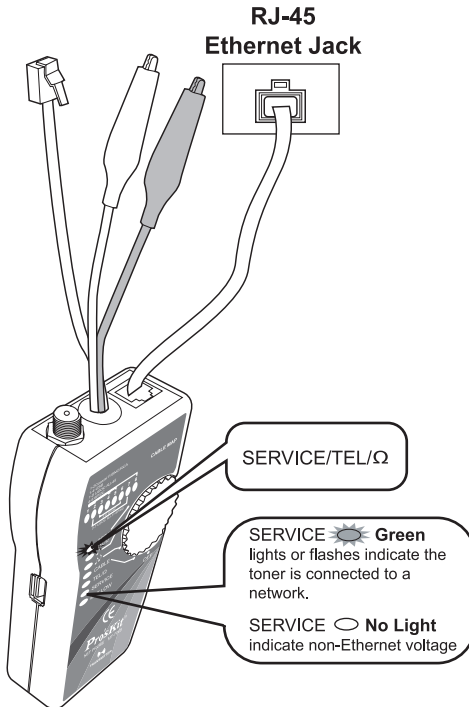


Figure 11 Validating Ethernet Service

Battery Life and Replacement



Caution

- To avoid unreliable test results, replace the battery as soon as the low battery indication appears.



Warning

- To avoid possible electric shock or personal injury, turn off the Toner or Probe and disconnect all test leads before replacing the battery.

To avoid unreliable test results, replace the battery as soon as the low battery indication appears.

Battery Status: "BAT LOW" LED lights up on the Toner, or "⏻" LED turns red on the Probe indicate the voltage is under 6.5V for powering up the device.

To replace the battery, do the following (Fig 12):

1. Turn off the Toner or Probe and disconnect all test leads before replacing the battery.
2. Properly installed in the case to power the Toner and Probe.
3. Use only a 9V (6FF22) battery.

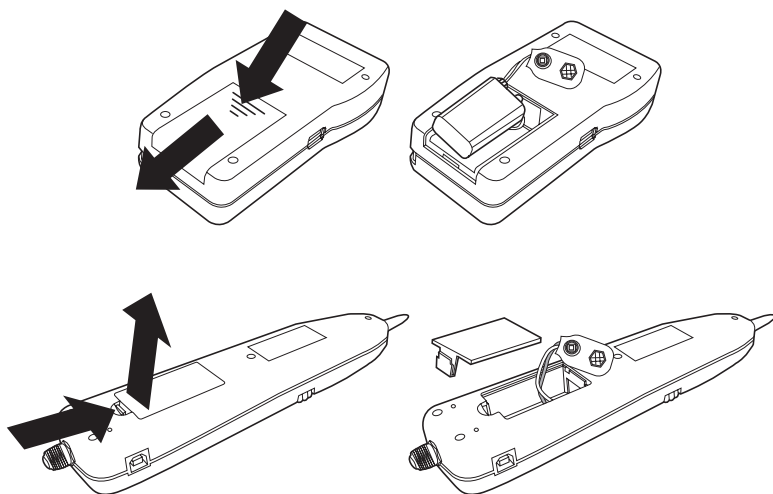


Figure 12 Replacing the Battery

Replacing the Fuse



Warning

- To avoid possible electric shock or personal injury, turn off the Toner or Probe and disconnect all test leads before replacing the fuse.

The fuse is located in the battery compartment and is used to protect the tester if the leads are connected to a "live circuit" when the continuity/resistance ranges are selected. The condition of the fuse can be checked by selecting the continuity range, with the test leads disconnected.

To replace the fuse, do the following steps as shown in Figure 13:

1. Turn off the Toner or Probe and disconnect all test leads before replacing the fuse.
2. Open the cover to remove the battery carefully as Figure 13 shown below.
3. Use tip #0 screwdriver to unscrew the battery compartment.
4. Remove the blown fuse and replace with a fuse of the correct type and rating ($\varnothing 5 \times L20\text{mm}$ 250V/250mA).
5. Re-screw the battery compartment, place the battery back, and finally close the cover.
6. Turn the Toner's rotary switch to **SERVICE/TEL/Ω** position to detect Ethernet service status and telephone service.

Turn the Toner's rotary switch to **TEL/Ω** position to detect line voltage and to test continuity.

Turn the Probe's rotary switch to "🎵" to detect 1KHz, two-note toning for Probe.

Turn the Probe's rotary switch to "🔊" to detect 1KHz legacy analog signals with audio indicator from speaker.

All above LED indicators should light up as it did after replacing the fuse properly.

7. If the Toner and/or Probe are still not functional by following step 6 after replacing the fuse, please contact the original store for arranging an RMA through our technical support department.

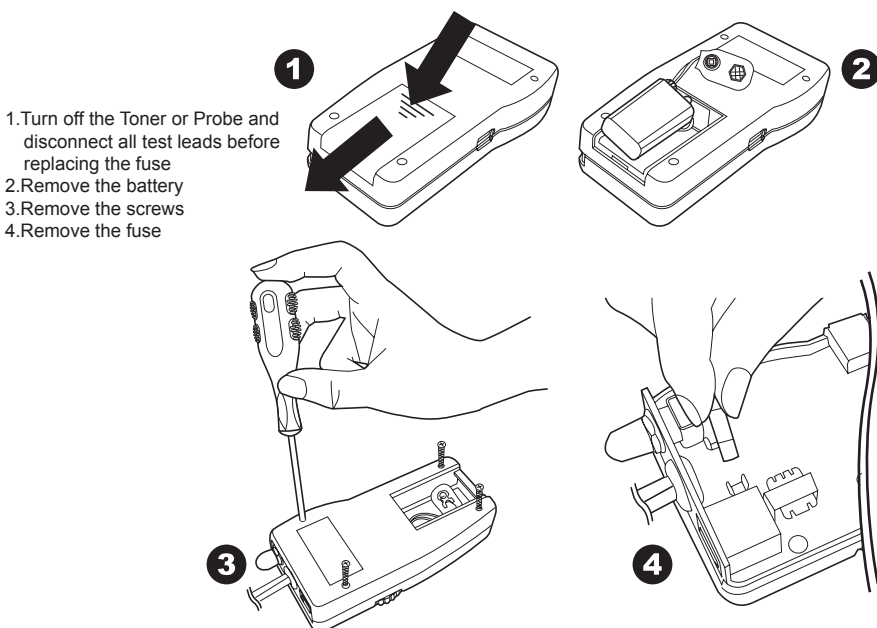


Figure 13 Replacing the Fuse

Maintenance



Warning

- Turn off the Toner or Probe and disconnect all test leads before replacing the battery.



Caution

- To avoid damaging the case, do not use solvents or abrasive cleansers.
- Clean the case with a soft cloth dampened with water or a mild soap solution.

Trouble shooting

- If the MT-7068 Probe volume is too low when using the 1KHz signal to validate and isolate electric wires:
 1. Check to see that the Probe rotary switch is properly positioned and that there is no low battery indication.
 2. Turn the Probe volume to Maximum.
 3. Check to ensure the Toner rotary switch is properly positioned and that there is no low battery indication.
 4. Check if the Toner black alligator clip is connected to the ground and the red alligator clip is properly connected to the testing wire, the adapter or the patch panel.
- If the light displays incorrectly when using the CABLE MAP to test:
 1. Re-check that the Toner and Probe rotary switches are properly positioned and that there is no low battery indication.
 2. Use the RJ-45(8Pin) to RJ-45(8Pin) patch cord that provided with the package to run a simulated test.
 3. Connect the testing wire with both end connectors and then reconnect it properly.

Specifications

Environmental and Regulatory Specifications

Operating temperature	0°C ~ 40°C (32°F ~ 104°F)
Operating relative humidity (% RH without condensation)	95% (10°C ~ 35°C ; 50°F ~ 95°F) 75% (35°C ~ 40°C ; 95°F ~ 104°F) uncontrolled < 50°F (10°C)
Altitude	3000 m
EMC	EN 55022, EN 55024

MT-7068-T Toner

Tone frequency	1KHz
Tone mode	One-note / Two-note
Output power	15.5Vp-p
Compatible connectors	RJ-45/RJ-11/USB/F/BNC/RCA/Alligator Clips
Continuity test	<300Ω
Talk battery voltage	6V into 600Ω
Function selection	5-position rotary switch
Cable Map indication	8 LED indicators
Voltage protection	100V
Low battery display	6.5V
Battery type	9V (6F22)
Dimension (LxWxD)	140x70x30mm
Weight	203g (with battery)

MT-7068-R Probe

Frequency	1KHz
Compatible connectors	RJ-45/RJ-11/USB/F/BNC/RCA
Ear jack	1
Signal status indication	8 LED indicators
Cable map indication	8 LED indicators
Low battery display	6.5V
Battery type	9V (6F22)
Dimension (LxWxD)	250x52x33mm
Weight	180g (with battery)

MT-7068 音頻/網路測試器

感謝您選購 **Pro'sKit®** MT-7068音頻/網路測試器。使用音頻/網路測試器前請詳閱本使用說明書，閱後請妥為收存，以備日後查閱。

目錄

特點概述.....	21
產品特點.....	22
包裝內容.....	22
安全資訊.....	23
MT-7068-T 音頻產生器外觀圖.....	24
MT-7068-R 接收器外觀圖.....	25
使用1KHz音頻信號找、分離電線.....	26
查找電線.....	27
分離電線.....	28
線對表 (Cable Map) 測試.....	29
電纜遮蔽和電線連通測試.....	32
電話正負極性測試.....	33
提供電話線路電力.....	34
測試乙太網路信號、工作中或斷訊.....	35
電池狀態與電池更換.....	36
更換保險絲.....	37
規格表.....	38
維護.....	39
簡易故障排除.....	39

特點概述

MT-7068音頻/網路測試器一能定位、分離、導通、查找雙絞線 (UTP、STP、Cat 5e、Cat 6)、同軸線 (RG6、RG58、RG59和其他CATV/CCTV同軸線纜)、USB信號線、影音 (Audio & Video) 信號線、一般電線 (各種單芯線和多芯線)、以及Cat 3電話線。且能使用戶確認並診斷電纜，佈線的通路、短路、斷路、交叉…等現象，並確認接線順序線號 (線對表CABLE MAP) 和電話線的接線極性。還提供視覺和音頻信號強度指示，使測試距離與精確度更容易精準掌握。並提供偵測乙太網路訊號，工作中或斷訊的功能。和提供電話線路電力 (Power) 的功能，使在兩端使用不含電力的兩台話機 (Hand set/Test set) 可以順利通話。和測試一般電線接觸不良所產生的阻抗過大 (>300Ω) 的問題。

MT-7068音頻/網路測試器一提供了完整的接頭和配件，讓用戶可以輕易的檢測RJ-45插座、RJ-45連接線、RJ-11插座、RJ-11連接線、USB連接線、F連接線、BNC連接線、RCA連接線、並具有鱷魚夾，可應用於測試一般電線和電信/網路接線板。

適用於電信、網路、數據通信、影音視聽、有線電視、室內外配線…等專業的裝配、查線、維修工程人員使用。

產品特點

- 使用1KHz的音頻信號傳導。
- MT-7068-T音頻產生器具有產生1KHz的音頻信號和提供單音調、雙音調兩種音色可以選擇；配合MT-7068-R接收器的音量大小調整功能，可經由音量大小控制，精確控制查找斷線位置在10~30cm範圍內；MT-7068-R接收器具有8段LED信號強度指示燈號，使測試距離與精確度更容易精準掌握。MT-7068-R接收器具有耳機插座，提供給任何吵雜環境使用。
- MT-7068-T音頻產生器所產生1KHz的音頻信號，可以配合下列連接介面和配件，應用於各種插座和線材：
 1. 具有鱷魚夾可連接測試一般電線和各種接線板。
 2. 具有RJ-45/RJ-11兩用插座，可測試RJ-45網路線和各種RJ-11電話線；另附有8Pin公對8Pin公轉換線205mm長，可測試各種RJ-45資訊插座；8Pin公對6Pin公轉換線205mm長，可測試各種RJ-11電話插座。
 3. 具有F插座和BNC轉換頭，可測試各種同軸電纜線；另有RCA轉換頭，可測試各種影像、聲音傳輸線。
 4. 具有USB插座，可測試各種USB線。
- MT-7068-T音頻產生器—配合MT-7068-R接收器的兩端LED燈號顯示線對表(CABLE MAP)，可測試一般電線、RJ-45網路線、USB連接線、同軸電纜線、影音線…各種線材的通路、短路、斷路、交叉的現象；並可以在測試時選擇MT-7068-R接收器有無聲音同步輸出，更方便使用。
- MT-7068-T音頻產生器—具有測試一般電線阻抗(>300Ω)的LED燈號指示，可輕易檢出電線接觸不良的問題。
- MT-7068-T音頻產生器—具LED燈號顯示，可辨識電話線路的正負極性。
- MT-7068-T音頻產生器—具有提供電話線路電力(Power)的功能，使在兩端使用不含電力的兩台話機(Hand set/Butt set)可以順利通話。
- MT-7068-T音頻產生器—具有測試乙太網路訊號，工作中或斷訊的功能。
- MT-7068-R接收器—使用銅線內置於塑膠感應探頭(Tip)中，除了有效加強探頭的接收靈敏度外，並可防止操作時的意外短路。
- MT-7068-T音頻產生器和MT-7068-R接收器—均具有低電壓指示功能和具有手繫帶，方便使用者離手(Hands-free)使用。

包裝內容

MT-7068音頻/網路測試器的附件如下。若發現有東西損壞或缺少，請立即與購買處聯繫。

- MT-7068-T音頻產生器(附9V電池和手繫帶)。
- MT-7068-R接收器(附9V電池和手繫帶)。
- RJ-45(8 Pin)至RJ-11(6 Pin)轉接線x1條。
- RJ-45(8 Pin)至RJ-45(8 Pin)轉接線x2條。
- F(公)-BNC(母)轉接頭x2個。
- F(公)-RCA(母)轉接頭x2個。
- 攜存袋。
- 使用手冊。

安全資訊

表1.描述測試儀上或本手冊中，所使用的國際電氣符號。

	警告：有人身傷害危險。請參閱手冊中的解釋。 小心：有損害或損壞裝置或軟體的危險。請參閱手冊中的解釋。
	警告：有觸電危險。
	注意：須注意操作時的狀態或功能。
	本設備不可連接至公用通信網路，如帶電的電話系統。

表1.國際電氣符號

警告

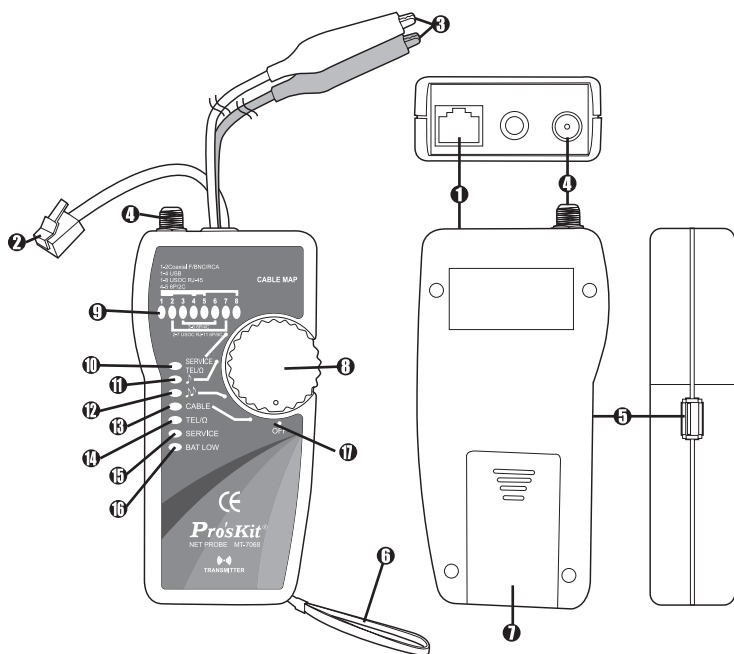
- 不得在超過100V的帶電電路上使用本產品。
- 不得使用已破損的MT-7068音頻/網路測試器測試導線。使用以前，請檢查機殼和測試導線是否有破損。
- 在測試電話電路時，將不使用的測試導線和連接器從MT-7068音頻/網路測試器上斷開連接。
- 除非要更換電池或保險絲，否則不得打開機殼；其中沒有任何用戶可維修的零件。
- 在更換電池以前，請關機！並斷開所有測試導線的連接。
- 僅使用9V電池，正確安裝在機殼內以提供電源。
- 如果不遵照指定方式使用本設備，則可能影響本產品提供的保護。

小心

- 避免將接收器的探頭觸及接線板的連接端；避免使用探頭插入捆綁在一起的電纜。如果經常這樣做，過段時間會損壞探頭。
- 為避免測試結果不可靠，一旦出現電池不足的指示燈亮時，請立即更換新電池

MT-7068-T音頻產生器 外觀圖

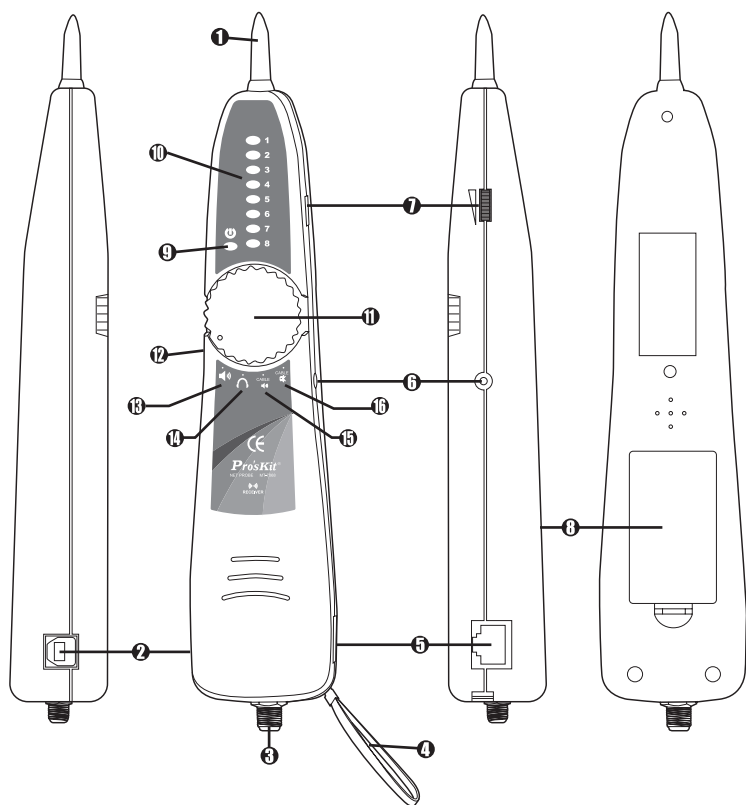
1. RJ-45(8Pin)/RJ-11(6/4/2pin)兩用插座。
2. RJ-11連接線。
3. 紅、黑色鱷魚夾線。
4. F插座。
5. USB插座。
6. 手繫帶。
7. 電池蓋。
8. 5段指輪檔位選擇旋鈕。
9. 8個LED線對表(CABLE MAP)指示。
10. 檔位選擇“SERVICE/TEL/Q” LED顯示：乙太網路訊號，工作中或斷訊測試、提供電話線路電力(Power)和辨識電話線路的正負極性、一般電線阻抗(>300Ω)的線路連通測試。
11. 檔位選擇“”LED顯示：單音調、1KHz音頻信號產生測試。
12. 檔位選擇“”LED顯示：雙音調、1KHz音頻信號產生測試。
13. 檔位選擇“CABLE” LED顯示：線對表(CABLE MAP)測試(各種線材的通路、短路、斷路、交叉測試，需配合⑨的線對表CABLE MAP的LED指示)。
14. TEL/Q 測試結果雙色LED顯示：電話線路電力(Power)提供指示、電話線路的正負極性指示、一般電線阻抗(>300Ω)的線路連通指示。
15. SERVICE 測試結果LED顯示：乙太網路訊號，工作中或斷訊指示。
16. BAT LOW 低壓指示。
17. OFF：關機。



(圖一) MT-7068-T 音頻產生器 外觀圖

MT-7068-R接收器 外觀圖

1. 探頭。
2. USB插座。
3. F插座。
4. 手繫帶。
5. RJ-45(8Pin)/RJ-11(6/4/2pin)兩用插座。
6. $\varnothing 2.5\text{mm}$ 耳機座。
7. 音量旋扭。
8. 電池蓋。
9.  電源開關指示、低壓指示LED。
10. 8個LED線對表 (CABLE MAP) 指示、1KHz信號強弱指示。
11. 5段指輪檔位選擇旋鈕。
12. OFF：關機。
13. 檔位選擇“”：1KHz音頻信號接收，喇叭有聲音輸出。
14. 檔位選擇“”：1KHz音頻信號接收，喇叭有聲音；插入耳機後喇叭無聲音輸出，聲音由耳機輸出。
15. 檔位選擇“ CABLE ”：各種線材的通路、短路、斷路、交叉測試 (配合 10 的線對表CABLE MAP的LED指示)，喇叭有聲音輸出。
16. 檔位選擇“ CABLE ”：各種線材的通路、短路、斷路、交叉測試 (配合 10 的線對表CABLE MAP的LED指示)，喇叭無聲音輸出。



(圖二) MT-7068-R 接收器 外觀圖

使用1KHz音頻信號查找、分離電線：



警告

- 使用MT-7068音頻/網路測試器不可以使用在帶電的線路上，操作前應確實關閉所有電源。



注意

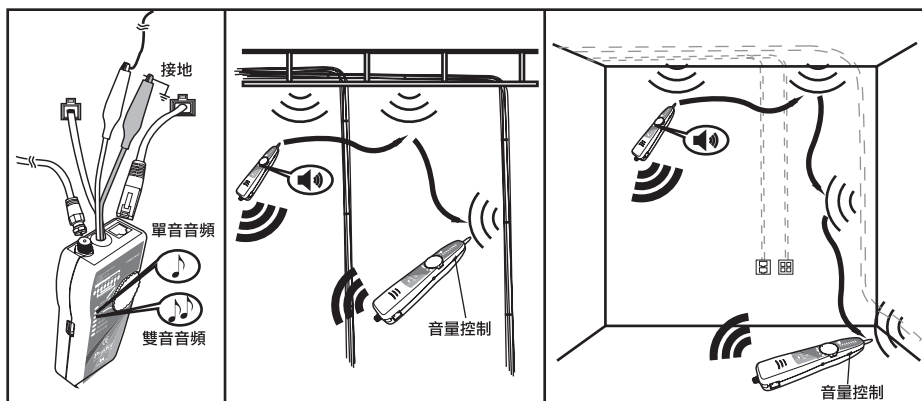
- 使用MT-7068音頻/網路測試器的1KHz查找線路時，應儘量遠離或關閉干擾源。如：具有變壓器、電感線圈、馬達的電器設備…等；如果接近干擾源，而MT-7068-R接收器產生接收的雜訊聲音，屬於正常狀態；但如果影響操作判斷時，應予遠離或關閉干擾源。
- MT-7068音頻/網路測試器的1KHz音頻信號，通過電路機板或分岔線路或整捆電線(絞線)時，會有相互感應傳遞和信號強度的衰減的現象。且無法穿透金屬配線管。
- 在搜索MT-7068-T音頻產生器的信號時，沒有必要將MT-7068-R接收器的探頭觸及線纜或接線板。
- 在使用MT-7068音頻/網路測試器前，應確實檢查MT-7068-T發射器的黑色鱷魚夾，確實接地妥善。

MT-7068音頻/網路測試器的MT-7068-T音頻產生器所產生1KHz的音頻信號，具有單音調、雙音調兩種音色可以選擇，並可以配合所有連接介面和配件，提供這兩種音頻信號。

查找電線

當你需要查找電線佈線位置或查找電線斷路位置時，請依照下列步驟（如圖三）進行：

1. 如（圖三）所示，先將MT-7068-T音頻產生器 的黑色鱷魚夾確實接地，再將紅色鱷魚夾與待測線路的連接線或插座或接線板連接妥善。
2. 如（圖一）所示，要得到單音調音頻信號，將MT-7068-T音頻產生器的檔位選擇旋鈕轉到” 🎵 ” 處，檔位指示LED亮起；旋轉到” 🎵🎵 ”，檔位指示LED亮起，則為雙音調音頻信號。
3. 如（圖三）所示，要接收1KHz且有聲音輸出，將MT-7068-R接收器的檔位選擇旋鈕到” 🔊 ”，POWER指示LED亮起；旋轉到” 🔊 ”，POWER指示LED亮起，未插上耳機前喇叭有聲音輸出，插上耳機後則喇叭無聲音輸出，聲音由耳機輸出。
4. 使用MT-7068-R接收器將音量旋鈕轉到最大，沿著塑膠配線管、走線架、接線板或牆壁，查找佈線線路的大致位置。接近時，MT-7068-R接收器的喇叭響起音頻信號聲音，喇叭聲音越大，表示信號越強；同時LED指示燈亮紅色，LED指示燈會隨信號強度的增加，依次從1到8亮起。亮的指示燈越多，表示信號越強。
5. 旋轉音量旋鈕，控制音量由大到小，則可以改變查找電線的靈敏度，將搜尋位置由30cm縮小到10cm以內，精確查找到電線。

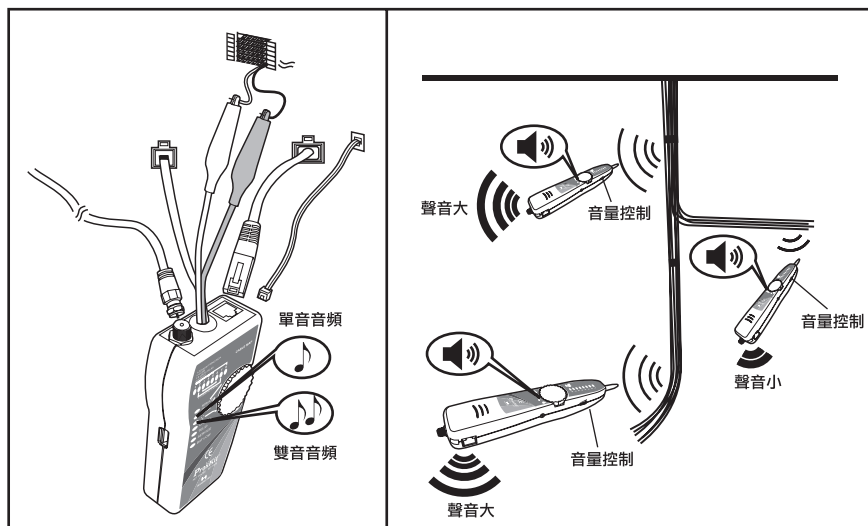


（圖三） 查找電線

分離電線

當你需要尋找綑綁在一起的電纜其中一條電線，或多芯電纜中的其中一條芯線時，請依照前面查找電線的步驟(1.)到(4.)進行(如圖三)，然後再依照下列步驟(如圖四)繼續進行：

5. 將電纜撥開約30~45cm長，採用二分法，將電纜的芯線概略分為左右各一半，使用MT-7068-R接收器尋找目標芯線的位置，喇叭聲音較大和LED燈亮較多(信號較強)的一邊，代表其中包含了你所要尋找的目標芯線。
6. 旋轉音量旋鈕，控制音量由大到小，則可以改變查找電線的靈敏度，將搜尋位置由30cm縮小到10cm以內，精確找到目標芯線的位置。
7. 重複前面二分法的(5.)、(6.)步驟，則可輕易找到目標芯線。



(圖四) 分離電線



注意

如果不能正確分辨兩導線電纜上的音頻信號，可能電纜已短路或斷路。請使用線對表(CABLE MAP)測試或連通測試，檢查接電纜是否短路或斷路。

線對表(CABLE MAP)測試：

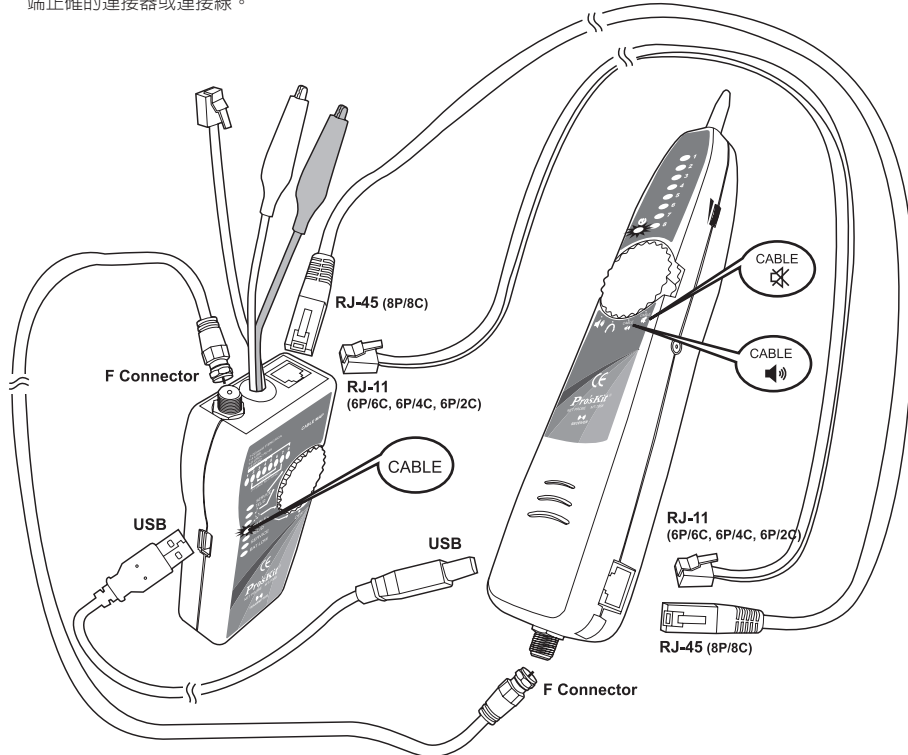
可以使用MT-7068-T音頻產生器和MT-7068-R接收器來測試RJ-45插座和連接線、RJ-11(6P/6C、6P/4C、6P/2C)插座和連接線、USB連接線、F連接線、BNC連接線(需配合BNC轉換頭)、RCA連接線(需配合RCA轉換頭)的線對表(CABLE MAP)。線對表(CABLE MAP)的功能可查找各種電纜佈線上常見的：通路、短路、斷路、交叉的情況。

1. 依(圖五)所示，將MT-7068-T音頻產生器和MT-7068-R接收器妥善連接RJ-45(8P/8C)、RJ-11(6P/6C、6P/4C、6P/2C)、USB、F(BNC、RCA)的待測線路的連接線或插座。
2. 將MT-7068-T音頻產生器的檔位選擇旋鈕轉到"CABLE"處，檔位指示LED亮起；將MT-7068-R接收器的檔位選擇旋鈕轉到" "處，電源指示LED亮起，線對表(CABLE MAP)的綠色LED開始掃描顯示，並發出"滴"聲音；如果旋轉到" "處，線對表(CABLE MAP)的LED開始掃描顯示，則無聲音輸出。



注意

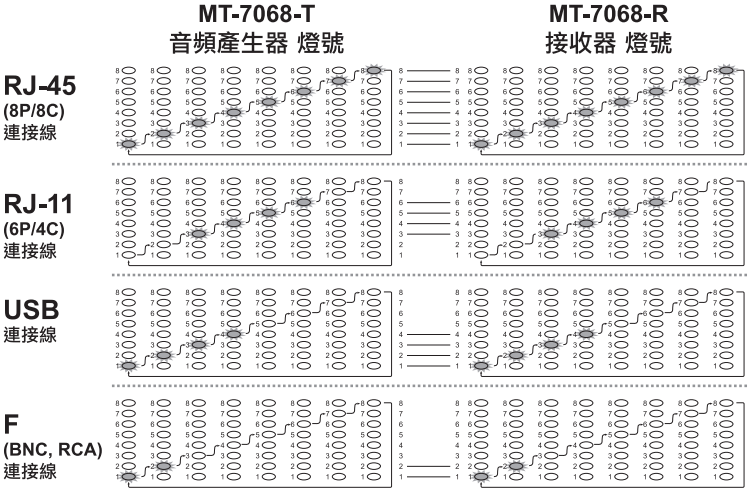
- 線對表(CABLE MAP)測試時，LED掃描顯示間隔約1秒鐘，每次由1到8順序掃描顯示。如果遇到2條空線時，會有間歇2秒的現象…依此類推。
- 線對表(CABLE MAP)測試時，MT-7068-R接收器的檔位選擇旋鈕轉到 " "處，LED掃描顯示連通、交叉現象時，喇叭的"滴"聲音會同步輸出；如果遇到短路、斷路現象時，則無聲音輸出。
- 線對表(Cable Map)測試時，如果少於2條線(含)以下時，聲音可能會有斷續的現象，但燈號顯示正常。
- 線對表(CABLE MAP)測試前，如有必要，可依前面所述方式，使用"查找電線"的方法，先進行查找另一端正確的連接器或連接線。



(圖五) 線對表(Cable Map)測試

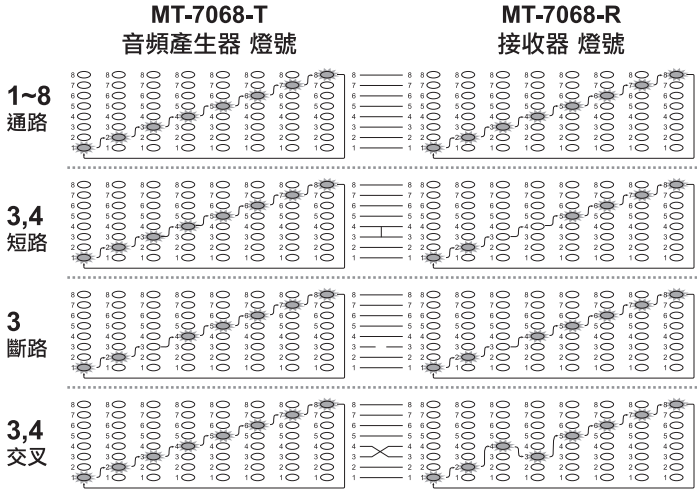
3. MT-7068-T音頻產生器和MT-7068-R接收器上的LED和聲音輸出，不同線材的線對表(CABLE MAP)顯示方式如下：

- RJ-45 (8P/8C) 的LED燈號顯示：MT-7068-T音頻產生器的線對表(CABLE MAP)LED，每1秒由1~8的順序，逐步顯示；並依接線順序，對應MT-7068-R接收器上的線對表(CABLE MAP)LED同步顯示。(如圖六)
- RJ-11 (6P/6C、6P/4C、6P/2C) 的LED燈號顯示：MT-7068-T音頻產生器的線對表(CABLE MAP)LED，6P/6C每1秒由2~7的順序；6P/4C每1秒由3~6的順序；6P/2C每1秒由4~5的順序，逐步顯示；並依接線順序，對應MT-7068-R接收器上的線對表(CABLE MAP)LED同步顯示。如果遇到空線時，會有間歇的現象。(如圖六)
- USB的LED燈號顯示：MT-7068-T音頻產生器的線對表(CABLE MAP)LED，每1秒由1~4的順序，逐步顯示，並依接線順序，對應MT-7068-R接收器上的LED同步顯示。其中4條空線，會有間歇4秒的現象。(如圖六)
- F (BNC、RCA) 的LED燈號顯示：MT-7068-T音頻產生器的線對表(CABLE MAP)LED，每1秒由1~2的順序，逐步顯示；並依接線順序，對應MT-7068-R接收器上的LED同步顯示。其中6條空線，會有間歇6秒的現象。(如圖六)



(圖六) 不同線材的線對表(Cable Map)

4. MT-7068-T音頻產生器和MT-7068-R接收器上的線對表(CABLE MAP)LED和聲音輸出，通路、短路、斷路、交叉表示的方式如下：
- 「通路」的LED燈號顯示：MT-7068-T音頻產生器的LED，第1~8個LED亮燈，對應MT-7068-R接收器上的LED，第1~8個LED同步顯示。(如圖七)
 - 「短路」的LED燈號顯示：MT-7068-T音頻產生器的LED，第3個和第4個LED依序亮燈，對應MT-7068-R接收器上的LED，第3個和第4個LED不顯示。(如圖七)
 - 「斷路」的LED燈號顯示：MT-7068-T音頻產生器的LED，第3個LED亮燈，對應MT-7068-R接收器上的LED，沒有LED同步顯示。(如圖七)
 - 「交叉」的LED燈號顯示：MT-7068-T音頻產生器的LED，第3個LED亮燈，對應MT-7068-R接收器上的LED，第4個LED同步顯示；MT-7068-T音頻產生器的LED，第4個LED亮燈，對應MT-7068-R接收器上的LED，第3個LED同步顯示。(如圖七)
5. 依照MT-7068-T音頻產生器和MT-7068-R接收器上的線對表(CABLE MAP)LED和聲音輸出，反覆測試；並以LED顯示的線對表(CABLE MAP)確認接線順序的正確性。



(圖七) 通路、短路、斷路、交叉

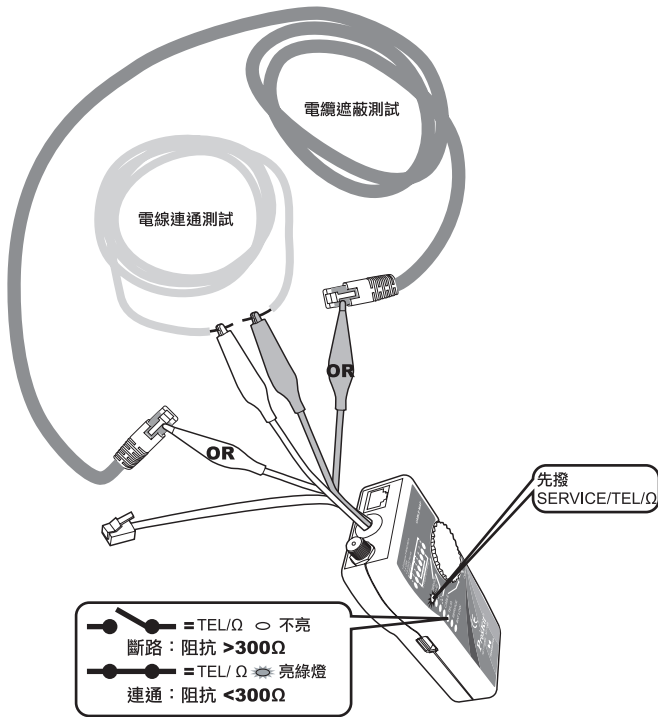
電纜遮蔽和電線連通測試：



- 測試前，應先確認並關閉電源。

當你需要確認電纜遮蔽的效果和電線連通是否有接觸不良時，請依照下列步驟 (如圖八) 進行：

1. 如 (圖八) 所示，先將MT-7068-T音頻產生器的黑色鱷魚夾，確實與待測電纜的一端接頭、金屬部分連接妥善，再將紅色鱷魚夾，與待測電纜的另一端接頭、金屬部分連接妥善。
2. 將MT-7068-T音頻產生器 的檔位選擇旋鈕轉到 “SERVICE/TEL/Ω”處，檔位指示LED亮起。
3. 確認“TEL/Ω”的LED燈號顯示，綠燈——表示遮蔽和連通 (阻抗<300Ω)；LED不亮——代表無遮蔽和無連通，或是遮蔽不良和連通不良 (阻抗>300Ω)。

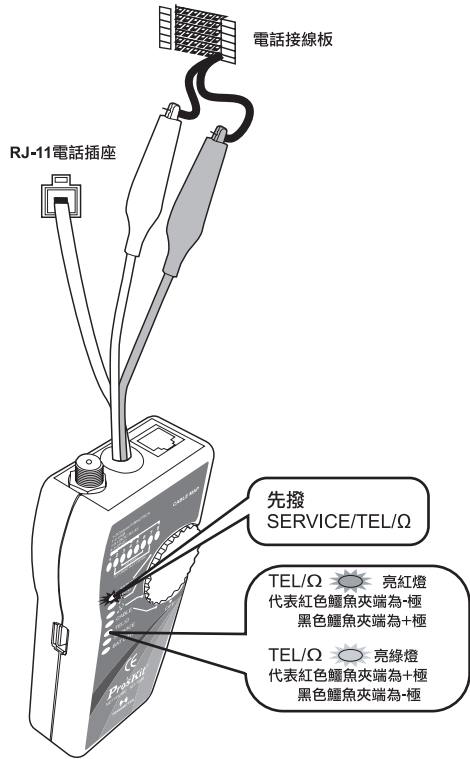


(圖八) 電纜遮蔽測試

電話正負極性測試：

當你需要確認電話線路的正負極性時，請依照下列步驟(如圖九)進行：

1. 如(圖九)所示，先將MT-7068-T音頻產生器的紅、黑色鱷魚夾，分別與待測電話線路的連接線或插座或接線板的兩端連接妥善。
2. 將MT-7068-T音頻產生器的檔位選擇旋鈕轉到 "SERVICE/TEL/Ω" 處，檔位指示LED亮起。
3. 確認"TEL/Ω"的LED燈號顯示，綠燈——表示紅色鱷魚夾端為電話局線的"十"極，黑色鱷魚夾端為電話局線的"一"極；紅燈——表示紅色鱷魚夾端為電話局線的"一"極，黑色鱷魚夾端為電話局線的"十"極。



(圖九) 電話正負極性測試

提供電話線路電力(Power)：

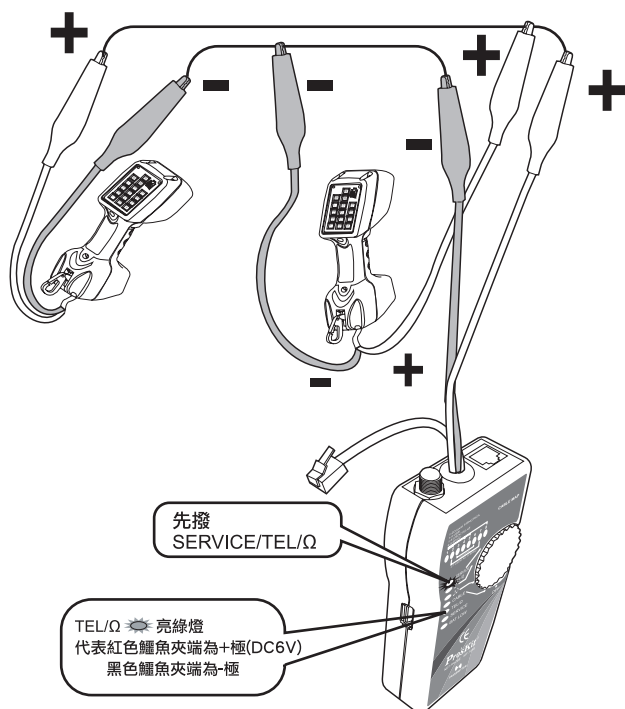


注意

操作本項功能時，需具備足夠電力，且電力消耗較大，建議將電池更換為 9 V 鹼性電池（NEDA 1604A或 IEC6LR61）

進行電話測試時，當電信局或線路因故無法提供電源供應時，MT-7068-T音頻產生器可以提供600Ω的電路6V的電壓，使兩端不含電力的兩台話機 (Hand set/Butt set) 可以順利通話，請依照下列步驟 (如圖十) 進行：

1. 如 (圖十) 所示，先將MT-7068-T音頻產生器的紅、黑色鱷魚夾，分別與待測電話或線路連接妥善。
2. 將MT-7068-T音頻產生器 的檔位選擇旋鈕轉到 "SERVICE/TEL/Ω" 處，檔位指示LED亮起。
3. 確認"TEL/Ω"的LED燈號顯示，綠燈——表示紅、黑色鱷魚夾兩端正在輸出6V電壓，這時你可以順利使兩台話機 (Hand set/Butt set) 通話。

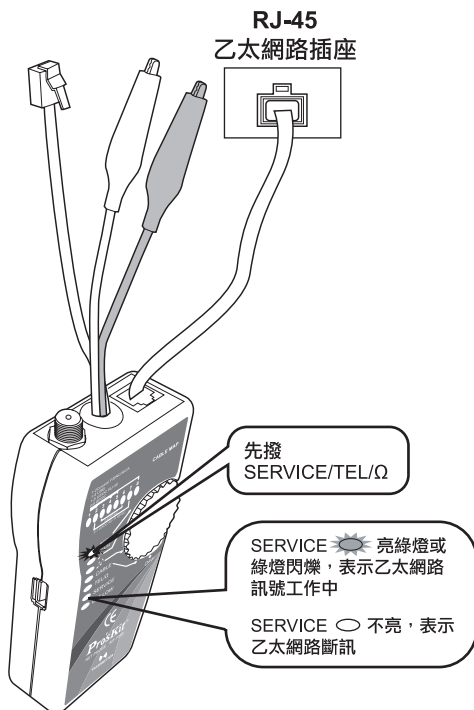


(圖十) 提供電話線路電力(Power)接線圖

測試乙太網路訊號，工作中或斷訊：

這項功能提供你快速準確的判斷乙太網路訊號工作中或斷訊，請依照下列步驟 (如圖十一) 進行：

1. 如 (圖十一) 所示，先將MT-7068-T音頻產生器上的RJ-45插座，插入待測乙太網路線：或用RJ-45 (8 Pin) 至 RJ-45 (8 Pin) 轉接線，轉接插入待測的乙太網路插座中，連接妥善。
2. 將MT-7068-T音頻產生器的檔位選擇旋鈕轉到 "SERVICE/TEL/Ω" 處。
3. 確認"SERVICE"的LED燈號顯示，綠燈長亮是10HD或綠燈閃爍是100HD——表示乙太網路訊號工作中，不亮——表示斷訊



(圖十一) 測試乙太網路訊號，工作中或斷訊

電池狀態與電池更換：



小心

- 為避免測試結果不可靠，一旦出現電池不足的指示，請立即更換電池。

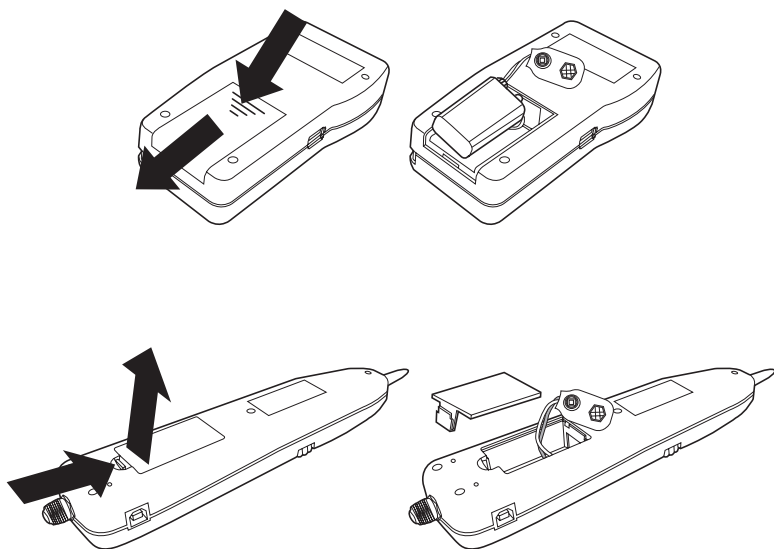


警告

- 為避免可能發生的電擊或人體傷害，更換電池前，應關機並斷開所有測試導線的連接。

當MT-7068-T音頻產生器的“BAT LOW”指示燈亮起時，和MT-7068-R接收器上的電源指示燈由綠燈變成紅燈時，代表電壓已低於6.5V，為了確保測試器處於最佳工作狀態和提供準確的測試，應立即更換新電池。更換電池請依下列步驟進行：（如圖十二）

1. 關機並斷開所有測試導線的連接。
2. 如（圖十二）所示，輕輕打開電池盒蓋，取出電池，並輕力取下電池扣。
3. 換上新的9V電池（6FF22），輕力扣上電池扣，放入電池，蓋上電池盒蓋。



（圖十二）電池更換

更換保險絲：



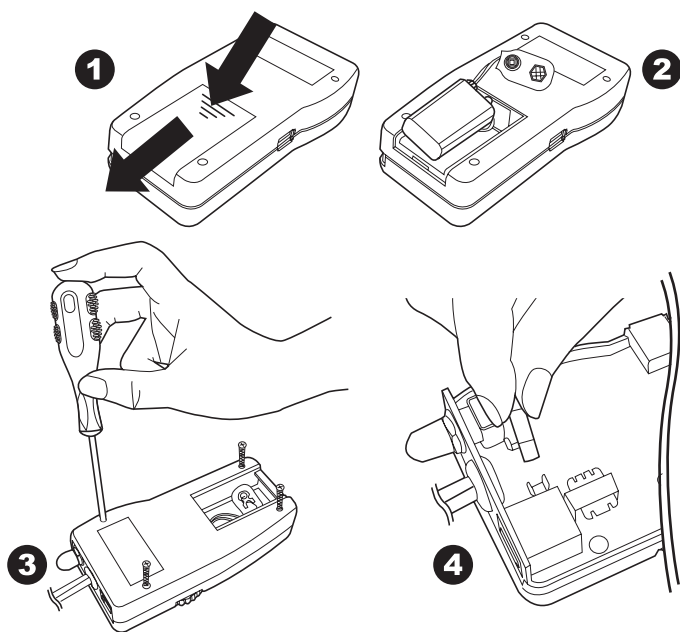
- 為避免可能發生的電擊或人體傷害，更換保險絲前，應關機並斷開所有測試導線的連接。

當MT-7068-T音頻產生器轉動5段指輪檔位選擇旋扭，所有檔位指示LED顯示正常；1KHz的音頻訊號無輸出或將檔位選擇於“SERVICE/TEL/Ω”時，檔位指示LED顯示正常，將紅、黑鱷魚夾短路後，“TEL/Ω”指示燈不亮時，可能是保險絲已燒毀。更換保險絲時，請依照下列步驟進行：（如圖十三）

1. 關機並斷開所有測試導線的連接。
2. 如(圖十三.)所示，輕輕打開電池盒蓋，取出電池，並輕力取下電池扣，取下電池。
3. 用#0的螺絲起子，取下背面4支螺絲。
4. 取下保險絲(ø5xL20mm 250V/250mA)，換上新的保險絲。
5. 鎖上背面4支螺絲，裝上電池。
6. 將MT-7068-T音頻產生器檔位選擇於“SERVICE/TEL/Ω”，檔位指示LED亮起，將紅、黑鱷魚夾短路後，“TEL/Ω”指示燈亮綠燈；再將檔位選擇於“”，檔位指示LED亮起，將MT-7068-R接收器的檔位選擇旋扭到“”，POWER指示LED亮起，1KHz的音頻接收正常。
7. 如果保險絲更換後，執行步驟6. 的功能測試，仍無法正常工作時，代表尚有其他部分故障，請將MT-7068音頻/網路測試器送回購買處，由本公司專業人員進行維修。

更換保險絲步驟：

1. 斷開測試導線連接
2. 取下電池
3. 取下4支螺絲
4. 取下保險絲



(圖十三) 保險絲更換

規格表：

環境指標

項 目	指 標 值
工作溫度	0°C 至 40°C (32°F 至 104°F)
工作相對濕度(% RH無冷凝)	95% (10°C 至 35°C ; 50°F 至 95°F) 75% (35°C 至 40°C ; 95°F 至 104°F) 無控制 < 50°F (10°C)
海拔高度	3000 米
EMC	EN 55022, EN 55024

MT-7068-T 音頻發射器

項 目	規 格
發射頻率	1KHz
音色	兩種(單音調/雙音調)
輸出電壓	15.5Vp-p
可測試連接埠	RJ-45/RJ-11/USB/F/BNC/RCA/鱷魚夾
一般線路導通測試	<300Ω
電話線路供電功能	6V/600Ω電路
功能選擇	5段指輪檔位選擇旋鈕
線對表(CABLE MAP)燈號顯示	8個LED顯示
電壓保護	100V
電池低壓顯示	6.5V
電池	9V (6F22)
尺寸(LxWxD)	140x70x30mm
重量	203g (含電池)

MT-7068-R 接收器

項 目	規 格
接收頻率	1KHz
可測試連接埠	RJ-45/RJ-11/USB/F/BNC/RCA
耳機孔	1個
信號強弱燈號顯示	8段LED顯示
線對表(CABLE MAP)燈號顯示	8個LED顯示
電池低壓顯示	6.5V
電池	9V (6F22)
尺寸(LxWxD)	250x52x33mm
重量	180g (含電池)

維護：



- 為避免可能發生的電擊或人體傷害，維護前，應關機並斷開所有測試導線的連接。



- 為避免損壞機殼，不要使用溶劑或磨蝕性去污粉。
用柔性軟布沾水後擰乾、或柔性軟布沾柔性皂液後擰乾，輕輕的擦拭機殼。

簡易故障排除：

- 使用1KHz音頻信號查找、分離電線時，MT-7068-R接收器的喇叭音量太小：
 1. 重新確認MT-7068-R接收器檔位選擇旋鈕、檔位選擇正確，且電池電力充足。
 2. 將MT-7068-R接收器 音量旋扭轉到最大。
 3. 重新確認MT-7068-T音頻產生器檔位選擇旋鈕、檔位選擇正確，且電池電力充足。
 4. 重新確認MT-7068-T音頻產生器的黑色鱷魚夾確實接地，紅色鱷魚夾與待測線路的連接線或插座或接線板連接妥善。
- 使用線對表 (CABLE MAP) 測試時，燈號顯示不正確
 1. 重新確認MT-7068-T音頻產生器和MT-7068-R接收器檔位選擇旋鈕、檔位選擇正確，且電池電力充足。
 2. 取配件中的RJ-45 (8 Pin) 至RJ-45 (8 Pin) 轉接線，先進行模擬測試。
 3. 將待測線路的連接線或插座的兩端，重新連接妥善。

制造商：宝工实业股份有限公司

地 址：台湾新北市新店区民权路130巷7号5楼

电 话：886-2-22183233

E-mail：pk@mail.prokits.com.tw

销售/生产商：上海宝工工具有限公司

地址：上海市浦东新区康桥东路1365弄25号

原产地：中国.上海

服务热线：021-68183050



Certificate Number : TW98/12323QA

Pro'sKit®

寶工實業股份有限公司
PROKIT'S INDUSTRIES CO., LTD.

<http://www.prokits.com.tw>

E-mail : pk@mail.prokits.com.tw