



MADE FOR LIFE®



CM-100

CABLE MAPPER PRO

INSTRUCTION MANUAL

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1. Introduction

- The CM-100 Cable Mapper Pro maps and analyzes wiring for telephones, computer network cables and coax cables in one easy step.
- Large backlit LCD displays mapped out connections and describes any wiring faults.
- Built-in tone generator and included Video and Data remote identifiers can be used to quickly locate cables in wiring closets, patch panels, and other locations.

WARNINGS

- Do not connect the tester to a live circuit. Exposure to voltage can damage the tester.
- Do not attempt to modify or repair the tester. No serviceable parts are inside.
- Do not use the tester in a wet or damp environment or during electrical storms.
- Visually inspect any RJ11/12/45 plug before inserting it into the tester. Poorly terminated plugs may damage the jacks on the tester.
- Plugging an RJ11 or RJ12 connector into the RJ45 jack on the tester may damage the RJ45 jack.

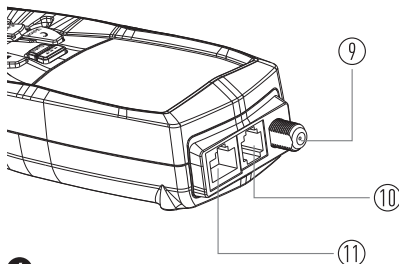
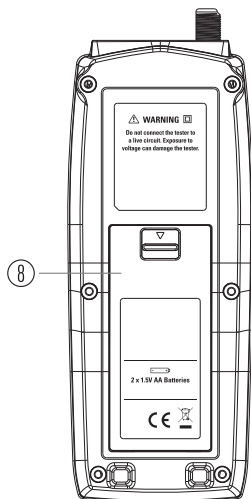
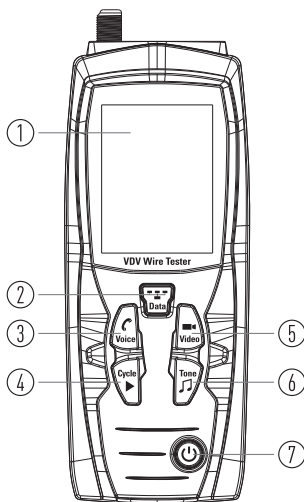
2. General Specifications

Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)
Humidity	10% to 90%, non-condensing
Maximum Voltage Between any two Pins Without Damage	60V DC or 55V AC
Batteries	2 x AA Battery
Cable Types	Shielded or Unshielded: Cat 7, Cat 7a, Cat 6a, Cat 6, Cat 5e, Cat 5, Cat 4, Cat 3, Coax
Maximum Coax Cable Length	1000 feet (305m)
Minimum Cable Length for Split Pair Detection	1.6 feet (0.5m)
Maximum Coax Cable Resistance	100 ohms maximum DC
Dimensions	152 x 61 x 34 mm
Weight	230g

3.Description

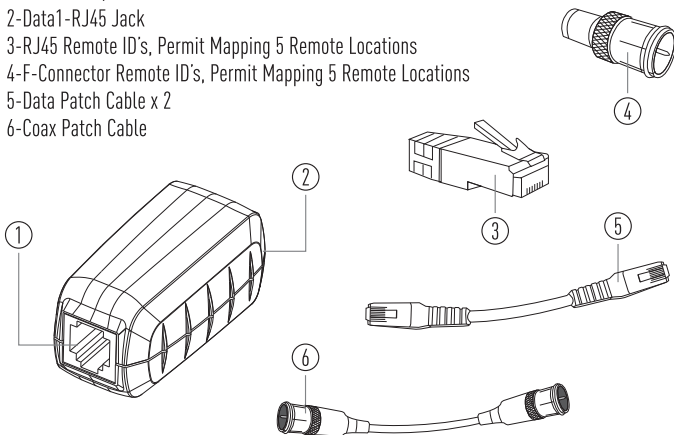
3-1.Meter Description

- | | | |
|----------------|-----------------|-------------------------|
| 1-LCD Display | 5-Video Button | 9-Video-F-Connector |
| 2-Data Button | 6-Tone Button | 10-Voice-RJ11/RJ12 Jack |
| 3-Voice Button | 7-ON/OFF Button | 11-Data-RJ45 Jack |
| 4-Cycle Button | 8-Battery Cover | |



3-2.Remote & ID's

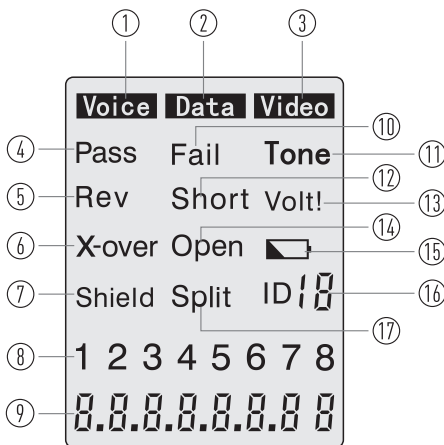
- 1-Voice-RJ11/RJ12 Jack
- 2-Data1-RJ45 Jack
- 3-RJ45 Remote ID's, Permit Mapping 5 Remote Locations
- 4-F-Connector Remote ID's, Permit Mapping 5 Remote Locations
- 5-Data Patch Cable x 2
- 6-Coax Patch Cable



3-3.Symbols Used on LCD Display

- 1-Appears when testing or toning a phone cable.
- 2-Appears when testing or toning a network cable.
- 3-Appears when testing or toning a coax cable.
- 4-Indicates proper wiring on cable being tested.
- 5-Indicates the connections on one or more pairs is reversed at one of the cable.
- 6-Appears when the tester detects a properly wired cross over cable.
- 7-Appears when the cable being tested has a shield that is connected at both ends, the Shield indicator will flash if there is a short between the shield and any wire within the cable.
- 8-Wire Map Near End: The top row of numbers displays the connector pins on the tester end of the cable in numerical order. These pins are mapped to the pins shown directly below on the bottom row of numbers.
- 9-Wire Map Remote End: The bottom row of numbers displays the corresponding pin numbers on the remote end of the cable. Dashed lines indicate shorted pins, and no pin numbers indicate an open pair.

- 10-Indicates a wiring error on cable being tested.
- 11-Appears when the tone generator is activated.
- 12-Indicates that two or more wires are shorted to each other.
- 13-Flashes when the tester is connected to a live cable. Note that exposure to voltage can damage the tester, and if this warning appears, IMMEDIATELY DISCONNECT THE CABLE FROM THE TESTER.
- 14-Appears when one or more pairs are open.
- 15-Low battery indicator. When this symbol appears, results from the tester may not be reliable and the battery should be replaced immediately.
- 16-Appears when the tester detects a Remote ID. The number that appears corresponds to the number on the Remote ID.
- 17-Appears when the tester detects the signal is split between two or more pairs.



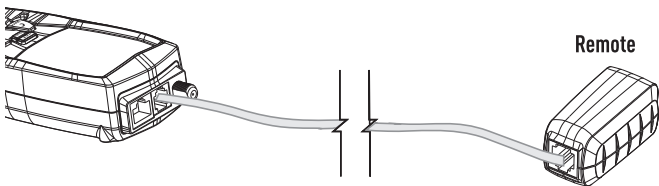
4. Operation

4-1. Voice

WARNING: Exposure to voltage can damage the tester. If the Voltage Warning appears on the display, immediately disconnect the cable. Ensure the cable is not connected to any device that can supply voltage before retesting. Do not connect two different cables into the Voice (RJ11/12) and Data (RJ45) test ports at the same time. The cables will interact with each other and alter test results.

1. Press the **ON/OFF** Button to turn on the tester
2. Press the **Voice**  Button to select the voice wire test function.
3. Connect one end the cable being tested to the RJ11/RJ12 port on the tester.
4. Connect the other end of the cable to the RJ11/RJ12 port on the remote.
5. Interpret the results using the wiring and display examples on Page 13.

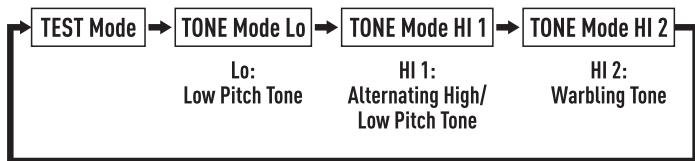
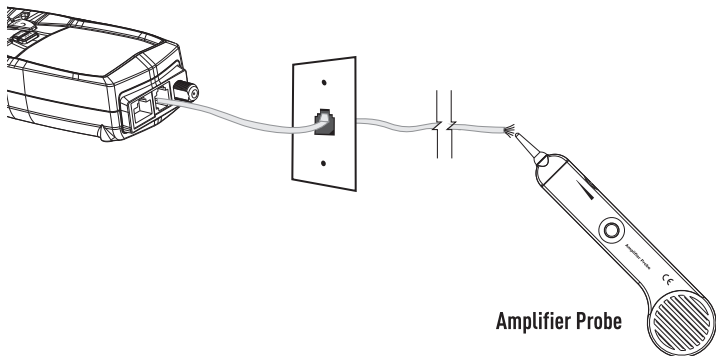
Note: "Split" may appear on the display when testing cables that have no twisting on the pairs



4-1-1. Using the Tone Generator to Trace a Phone Line

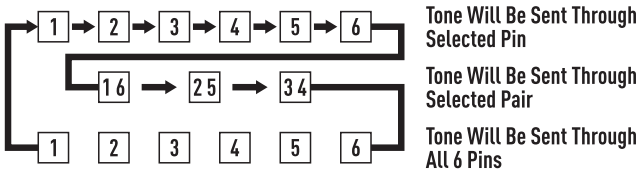
Note: It is necessary to use a separate amplifier probe.

1. Connect the cable under test to the RJ11/RJ12 port on the tester.
2. Press **ON/OFF**  Button to turn on the tester and then press **Voice**  Button to select the voice wire test function.
3. Press the **Tone**  Button to activate the Tone Generator.
4. Repeatedly press the **Tone**  Button to select the desired tone, Refer to sequence chart for explanation of tone selection.



4-1-2. Using the Tone Generator to Trace a Phone Line Cont

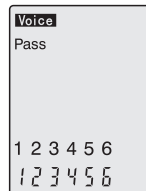
- The connector pins being toned will be shown on the bottom of the display.
- Repeatedly press the **Cycle ▶** Button to select the desired pins.
- Refer to sequence chart below for explanation of the pin selection.



Note: When tracing a cable run from the tone generator to the end of the cable, applying the tone on a single pin will allow the tone to be detected at a greater distance. When trying to locate a cable in an equipment room or patch panel, sending the tone through all 8 pins or a single pair will limit the tone signal from spreading to other nearby cables. The tone will be loudest when the probe tip is placed directly on the wires the tone is being sent through at the end of the cable. When sending a tone through a single pair, verification can be made by shorting the suspected pair. The tone will be very faint when travelling through the shorted pair.

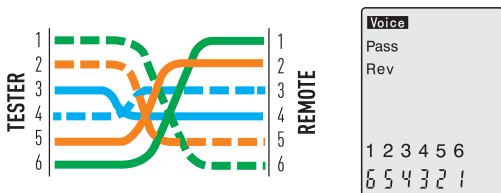
4-1-3. Wiring and Display Examples for Voice Cable USOC Phone Cable Properly Wired

- Pass appears on the display indicating a properly wired cable.
- The pin numbers on the top row and bottom row are the same, indicating proper continuity.



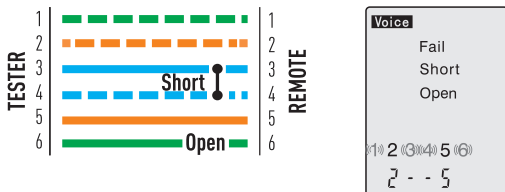
USOC Cross Wired Phone Cable Properly Wired

- A cross wired cable reverses the connection at one end of the cable.
- Pins 1 & 6 cross over to pins 6 & 1, Pins 2 & 5 cross over to pins 5 & 2, and pins 3 & 4 cross over to pins 4 & 3.
- Pass and Rev appear on the display indicating a properly wired cross wired cable.
- The pin numbers on the bottom row indicate the corresponding reversal to the pin members on the top row.



USOC Phone Cable with Shorted and Open Pair

- The pair on pins 3 & 4 is shorted and the pair on pins 1 & 6 is open.
- Fail, Short, and Open appear on the display if the cable is defective.
- The pins with wiring errors will flash.
- The dashed lines below pins 3 & 4 indicate a shorted pair.
- The blank space under pins 1 & 6 indicate an open pair.

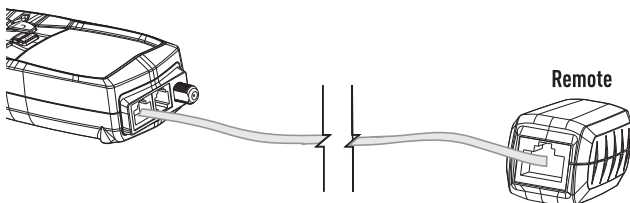


4-2.Data

WARNING: Exposure to voltage can damage the tester. If the Voltage Warning appears on the display, immediately disconnect the cable. Ensure the cable is not connected to any device that can supply voltage before retesting. Do not connect two different cables into the Voice (RJ11/RJ12) and Data (RJ45) test ports at the same time. The cables will interact with each other and alter test results.

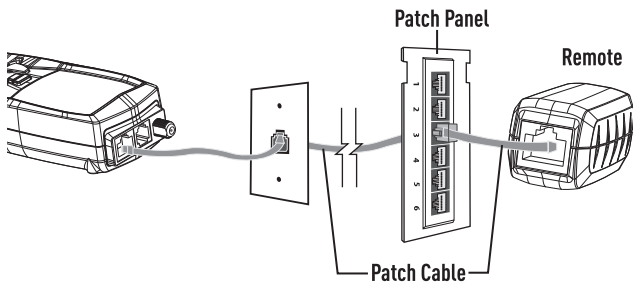
4-2-1. Testing a Data Patch Cable Terminated with RJ45 Connectors

1. Press **ON/OFF**  Button to turn on the tester and then press **Data**  Button to select the data wire test function.
2. Connect one end the cable under test to the RJ45 port on the tester.
3. Connect the other end of the cable to the RJ45 port on the remote.
4. Interpret the results using the wiring and display examples on page 14.



4-2-2. Testing an Installed Data Cable

1. Connect a known good patch cable to the wall port or patch panel of the cable being tested.
2. Connect the other end of the patch cable to the RJ45 port on the tester.
3. Connect another known good patch cable to the RJ45 port on the remote.
4. Connect the other end of the patch cable to the wall port or patch panel at the other end of the cable being tested.
5. Press **ON/OFF**  Button to turn on the tester and then press **Data**  Button to select the data wire test function.
6. Interpret the results of the test using the display and wiring examples shown on page 19 and 20.

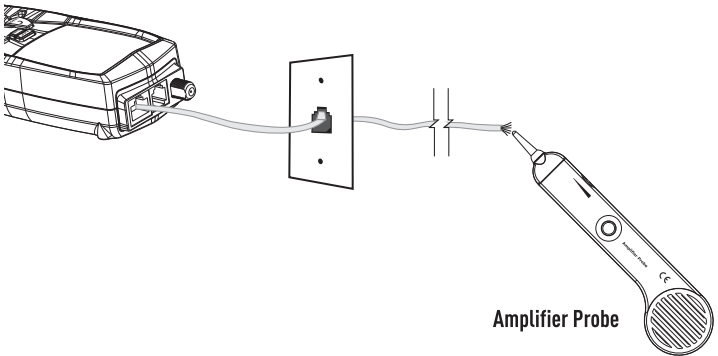


4-3. Testing Shielded Cable

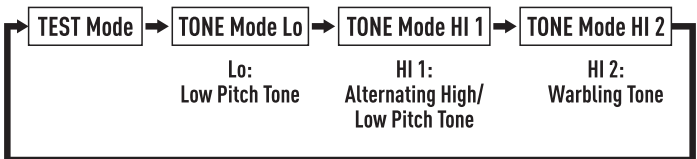
- When testing a shielded cable, the Shield indicator will appear on the display if the shield is connected at both ends of the cable.
- If the shield is shorted to a wire within the cable, the Shield indicator and the corresponding shorted pin will flash.
- A dash mark under the flashing pin will appear indicating a short.

4-3-1. Using the Tone Generator to Trace a Data Cable

1. Connect the cable under test to the RJ45 port on the tester.
2. Press **ON/OFF**  Button to turn on the tester, then press **Data**  Button to select the data wire test function.
3. Press the **Tone**  Button to switch to the Tone Generator.
4. Repeatedly press the **Tone**  Button to select the desired tone, Refer to sequence chart for explanation tone selection.

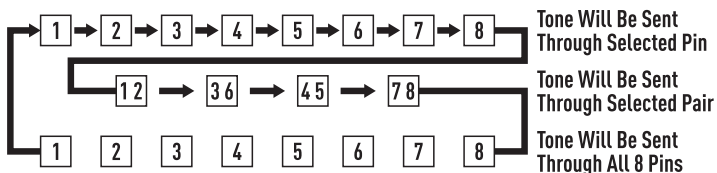


Amplifier Probe



4-3-2. Using the Tone Generator to Trace a Data Cable Continued

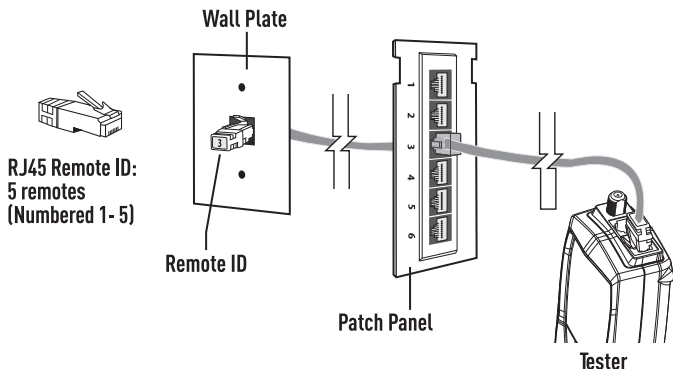
- The pins the tone is being sent through will be shown on the bottom of the display.
- Repeatedly press the **Cycle ▶** Button to select the desired pins.
- Refer to sequence chart below for explanation of pin selection.



Note: When tracing a cable run from the tone generator to the end of the cable, applying the tone on a single pin will allow the tone to be detected at a greater distance from the cable. When trying to locate a cable in an equipment room or patch panel, sending the tone through all 8 pins or a single pair will limit the tone signal from spreading to other nearby cables. The tone will be loudest when the probe tip is placed directly on the wires the tone is being sent through at the end of the cable. When sending a tone through a single pair, verification can be made by shorting the suspected pair. The tone will be very faint when the pair the tone is being sent through is shorted.

4-3-3. Cable Identification on Installed Data Cable

- The remote ID's can be used to identify cable runs from the patch panel to a wall port.
 - Each identifier has a labeled ID number.
 - When the tester is connected to a cable that has an identifier attached at the other end, the tester will display the ID number that is marked on the identifier.
1. Connect the numbered remote ID's to the port for each cable that needs to be identified.
 2. At the wiring closet or patch panel, connect the unknown cable to the RJ45 port on the tester.
 3. Press **ON/OFF**  Button to turn on the tester and then press **Data**  Button to select the data wire test function.
 4. If the cable being tested is connected to one of the remote ID's, the display will indicate the number that corresponds to the remote.



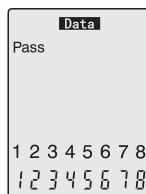
Note: The RJ45 remote ID's do not test the wiring on the cable. Only the remote can identify wiring faults. The remote may not identify the cable if the cable is miswired.

4-3-4. Wiring and Display Examples for Data Cable

Properly Wired T568B Network Cable

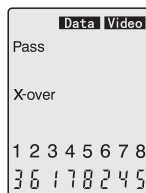
- Pass will appear on the display indicating a properly wired cable.
- The pin numbers on the top row will be the same as pin numbers on the bottom row, indicating proper continuity.

Notes: Both the T568A and T568B wiring standards are the same as long as the same standard is used on both ends of the cable.



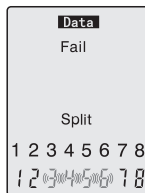
T568B Cross Over Data Cable Properly Wired

- The pairs cross over (transmit to receive and receive to transmit).
- Pass and X-over appear on the display and the pin numbers on the bottom row indicate the corresponding cross over to the pin numbers on the top row.



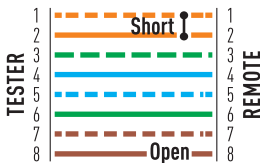
T568B Data Cable With Split Pairs

- If there are split pairs, Fail and Split will appear on the display, and the corresponding pin numbers will flash.
- For example, if there is a split between the pairs on pins 3, 4 and 5, 6, Fail and Split will appear and pins 3, 4 and 5, 6 will flash.



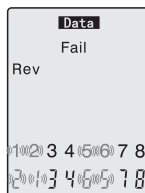
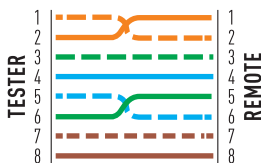
T568B Data Cable With a Shorted and Open Pair

- If there are any wiring errors, Fail, Short and Open will appear on the display and corresponding pins will flash.
- In the example below, pins 1 and 2 are shorted and pins 7 and 8 have an open pair.
- Dashed lines will appear below the shorted pins and a blank space will appear below the open pair



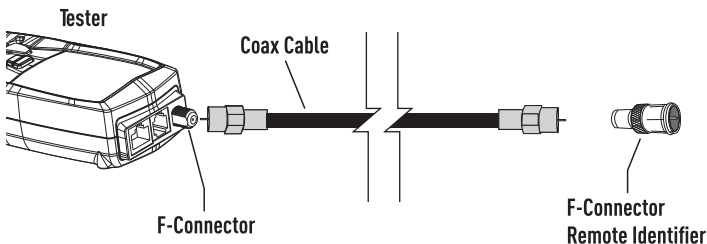
T568B Data Cable With Reversed Pair and Crossed Connection

- If the data cable is defective, Fail will appear on the display, and the pins with wiring errors will flash.
- In the example below, the pair on pins 1 and 2 are reversed and the wires on pins 5 and 6 are crossed at one end of the cable.
- Pins 2 and 1 are shown below pins 1 and 2, which indicate the orange wire pair is reversed.
- Pins 6 and 5 are shown below pins 5 and 6, which indicate the green and blue wire pairs are crossed.



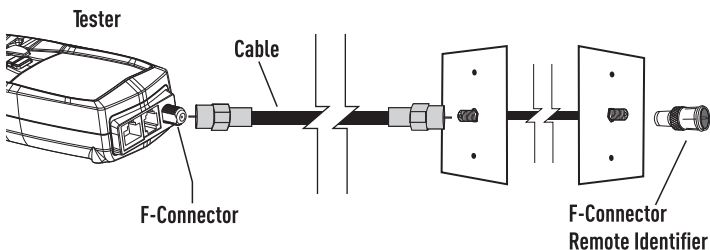
4-4.Video ■■ Testing Wiring on Coax Cables Terminated with F Connectors

Note: Test signals in the Video mode may not pass through a splitter. Only one remote ID can be connected at a time when testing cables connected to a common splitter.



4-4-1. Testing Wiring on Installed Coax Cable

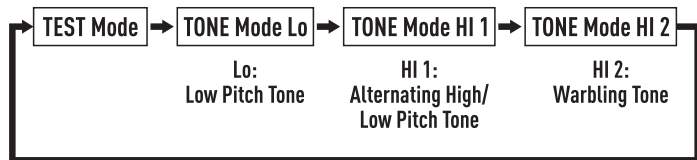
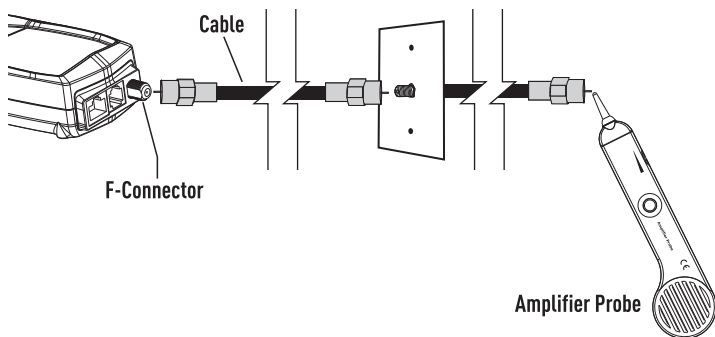
1. Connect a known good patch cable to the F connector on the tester.
2. Connect the other end of the patch cable to the wall port or patch panel connected to the cable under test.
3. Connect a numbered coax remote to the wall port at the other end of the cable under test.
4. Press **ON/OFF**  Button to turn on the tester and then press **Video** ■■ Button to select the video cable test function.
5. Interpret the results of the test by looking at the wiring and display example.



4-4-2. Tone Tracing on Coax Cable

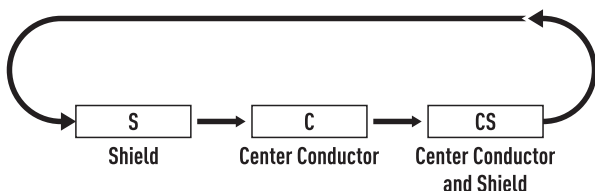
Note: It is necessary to use a separate tracing probe, such as our TEP-100 or TEP-200. Certain cable splitters used on Coaxi cables will prevent the tone from passing and may not work properly

1. Connect the cable you want to test to the F connector on the tester.
2. Press the **ON/OFF**  Button to turn on the tester, and then press **Video**  Button to select the video cable test function.
3. Press the **Tone** Button to activate the Tone Generator.
4. Repeatedly press the **Tone**  Button to select the desired tone. See below sequence for reference



4-4-3. Tone Tracing on Coax Cable Continued

- The tone can be sent through the center conductor, the shield or both.
- Repeatedly press the **Cycle ►** Button to select the desired conductors.
- The selection will be shown on the bottom of the display, refer to sequence chart below for explanation.



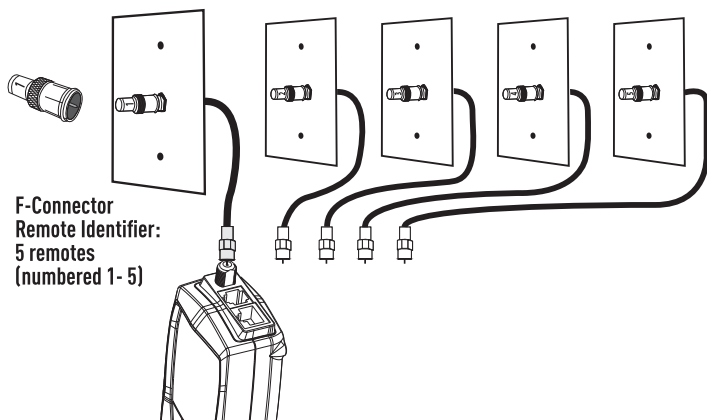
Note: Applying the tone on the center conductor and the shield or just the shield will allow the tone to be detected at a greater distance from the cable. When trying to identify a cable in the presence of multiple cables, sending the tone through just the center conductor will limit the signal spreading to other cables. The cable that is being toned can be identified by touching the probe tip to the center conductor at the end of the cable.

4-4-4. Cable Identification on Installed Video Cable

- The remote ID's can be used to identify cable runs from the patch panel to a wall port, with each identifier having a labeled ID number.
- When the tester is connected to a cable that has an identifier attached at the other end, the tester will display the ID number that is marked on the identifier.

1. Connect the numbered remote ID's to the F connector wall outlet port for each location that needs identification.
2. At the patch panel, connect the unknown cable to the F connector port on the tester.
3. Press the **ON/OFF**  Button to turn on the tester, and then press **Video**  Button to select the video cable test function.
4. If the cable being tested is connected to one of the remote ID's, the display will indicate the ID number that corresponds to the remote.

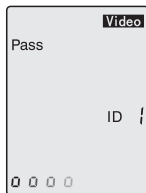
Note: The open or short indicator will appear if the cable is defective.



4-4-5. Wiring and Display Examples for Coax Cable

Coax Cable with Proper Continuity

- The cable is good and passes the test, ID 1 signifies that Remote Identifier number 1 is being used to terminate the cable.
- The flashing "o"s on the bottom of the display indicate the tester is running a continuous test.



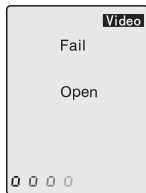
Coax Cable with a Short

- The center conductor is shorted to the shield.
- The cable fails the test and the Remote Identifier cannot be detected.



Coax Cable with an Open

- There is a break in the cable causing an open circuit. A broken connection in the center conductor or shield will trigger a fault.
- The cable fails the test and the Remote Identifier cannot be detected.



4-5. Battery Replacement

1. Pull down locking tab, and open the battery door.
2. Replace the 2 x AA battery.
3. Re-assemble the meter.

Note: Do not operate the tester with the battery door removed.

