

CATV

Telephony Premise wiring Installation and Repair

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Megger

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Introduction

- Brief History of premise wiring
- Basic telephone circuit
- Tip and Ring
- Voltages
- Polarity

Brief History of Premise Wire

- Telephone Companies controlled wiring end to end
- 1984 Break-up of Bell System
- Owner-ship transferred to Customer as a result of break-up

Basic Telephone Circuit

- Three elements to a basic telephone circuit
 - Voltage Source
 - Conductors
 - Load

Basic Telephone Circuit

- Three characteristics of a telephone circuit
 - Voltage.....expressed as “E” measured in volts
 - Current.....expressed as “I” measured in amps
 - Resistance....expressed as “R” measured in ohms

Voltage Source

- Central Office supplies voltage to power the telephone circuit
- - 48vDC
- Negative battery used to reduce noise in voice band frequencies

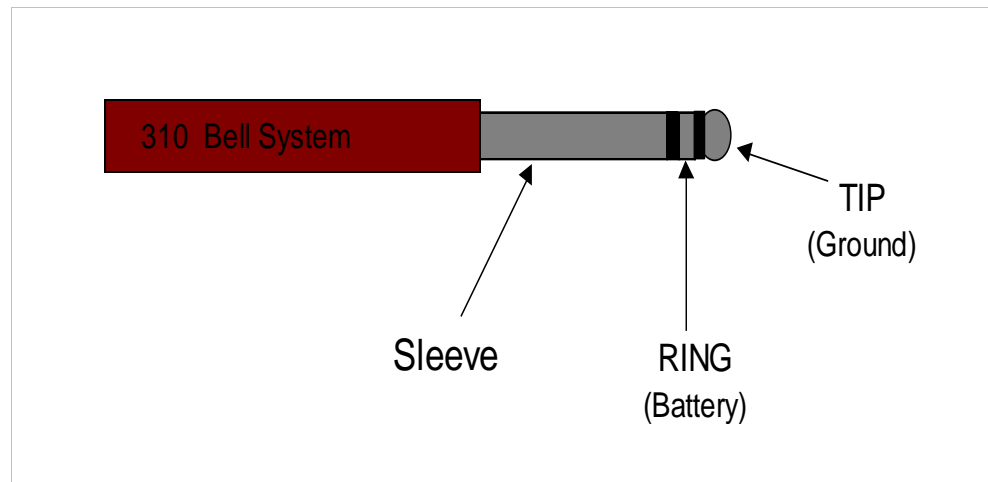
Conductors

- Made of non-stranded copper wire
- AWG sizes of 19ga, 22ga, 24ga, 26ga
- Telephone circuit uses 2 conductors or a “pair”
- Tip and Ring

WHAT IS TIP & RING?

TIP & RING

- Tip and Ring comes from the connector points of the “310” plug used on an operators cord board.



Load

- The load of the circuit consists of the CPE equipment supplied by the customer

Voltages

- Tip is the ground side of the circuit
- Ring is the battery side of the circuit
- Idle or on-hook voltage is – 48vDC
- Off-hook voltage is – 6 to – 10vDC “talk battery”
- Signaling voltage is 70 to 110vAC

Current & Resistance

- Current will flow only when the circuit is closed.. ie .. “Off – Hook”
- Resistance is opposition to current flow ..ie.. The higher the resistance, the lower the current flow, the lower the resistance, the higher the current flow

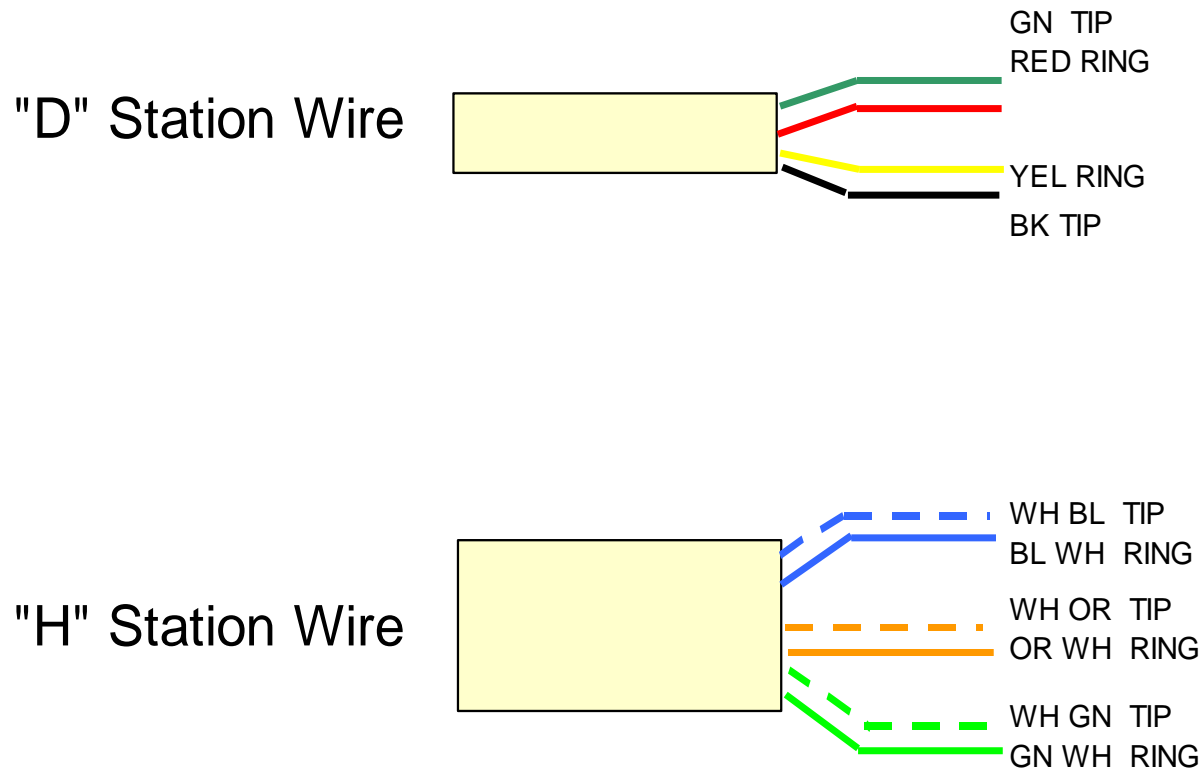
Polarity

- Proper polarity of the telephone circuit ensures:
 - Proper operation of circuit
 - Capability to dial out on sets without polarity guards
 - Faster connect speeds for dial-up modems

Types of Premise Wire

- Single conductor – Rubberized Insulation
- Quad – type, four conductor
- “Trip” wire (three conductors)
- Twisted pair 2, 4, 6, 8, etc.
- Category 3, 5, 5e, 6, etc.

Station Wire Inside Wire (IW)



COLOR CODE TWISTED PAIR

		RING				
		BLUE	Orange	Green	Brown	Slate
T I P	WHITE	1 26 51 76 101 126	2 27 52 77 102 127	3 28 53 78 103 128	4 29 54 79 104 129	5 30 55 80 105 130
	RED	6 31 56 81 106 131	7 32 57 82 107 132	8 33 58 83 108 133	9 34 59 84 109 134	10 35 60 85 110 135
	BLACK	11 36 61 86 111 136	12 37 62 87 112 137	13 38 63 88 113 138	14 39 64 89 114 139	15 40 65 90 115 140
	Yellow	16 41 66 91 116 141	17 42 67 92 117 142	18 43 68 93 118 143	19 44 69 94 119 144	20 45 70 95 120 145
	Violet	21 46 71 96 121 146	22 47 72 97 122 147	23 48 73 98 123 148	24 49 74 99 124 149	25 50 75 100 125 150

Premise Wire Configurations

- Series or “Daisy Chain”
- Star
- Home Runs
- Combinations

Premise Wire Trouble Conditions

■ Metallic vs. Resistive Faults

- Shorts
- Grounds
- Crosses
- Opens
- Induction

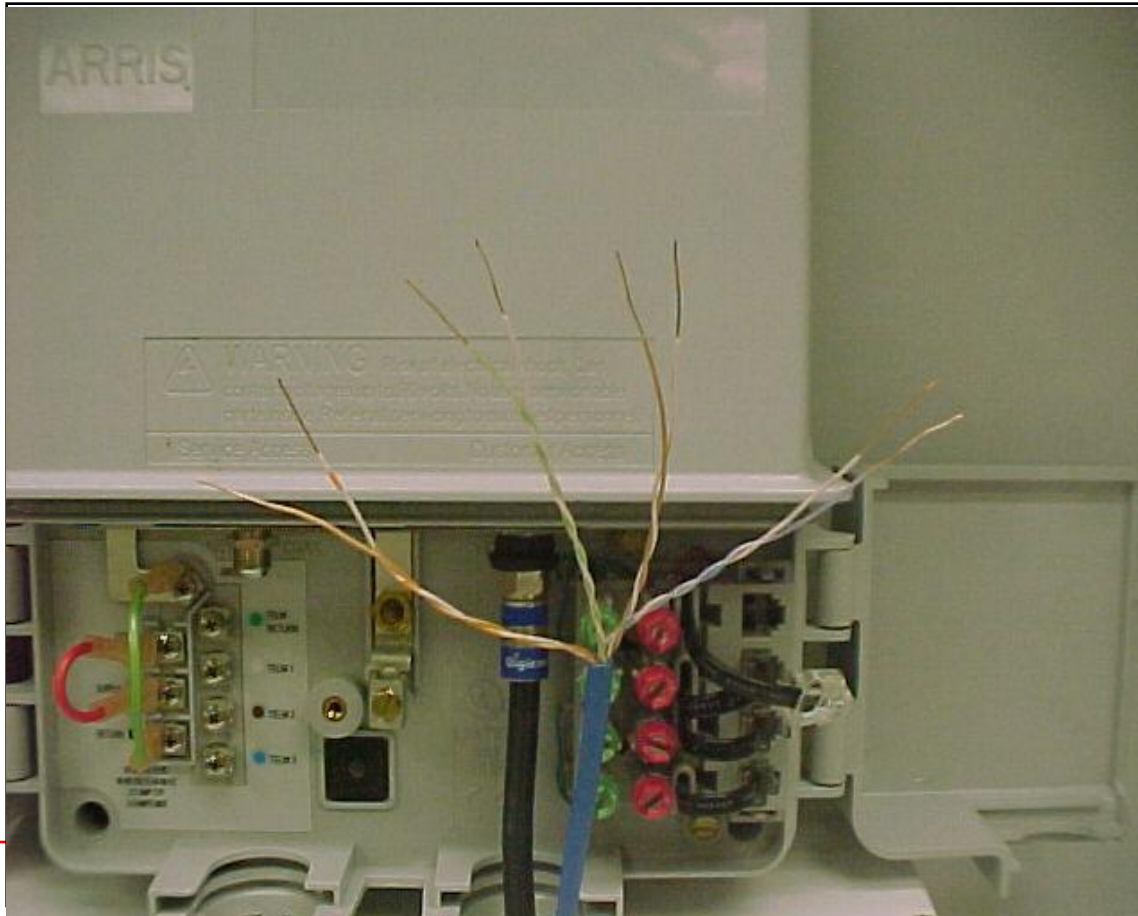
Trouble Shooting Techniques

■ Test Equipment

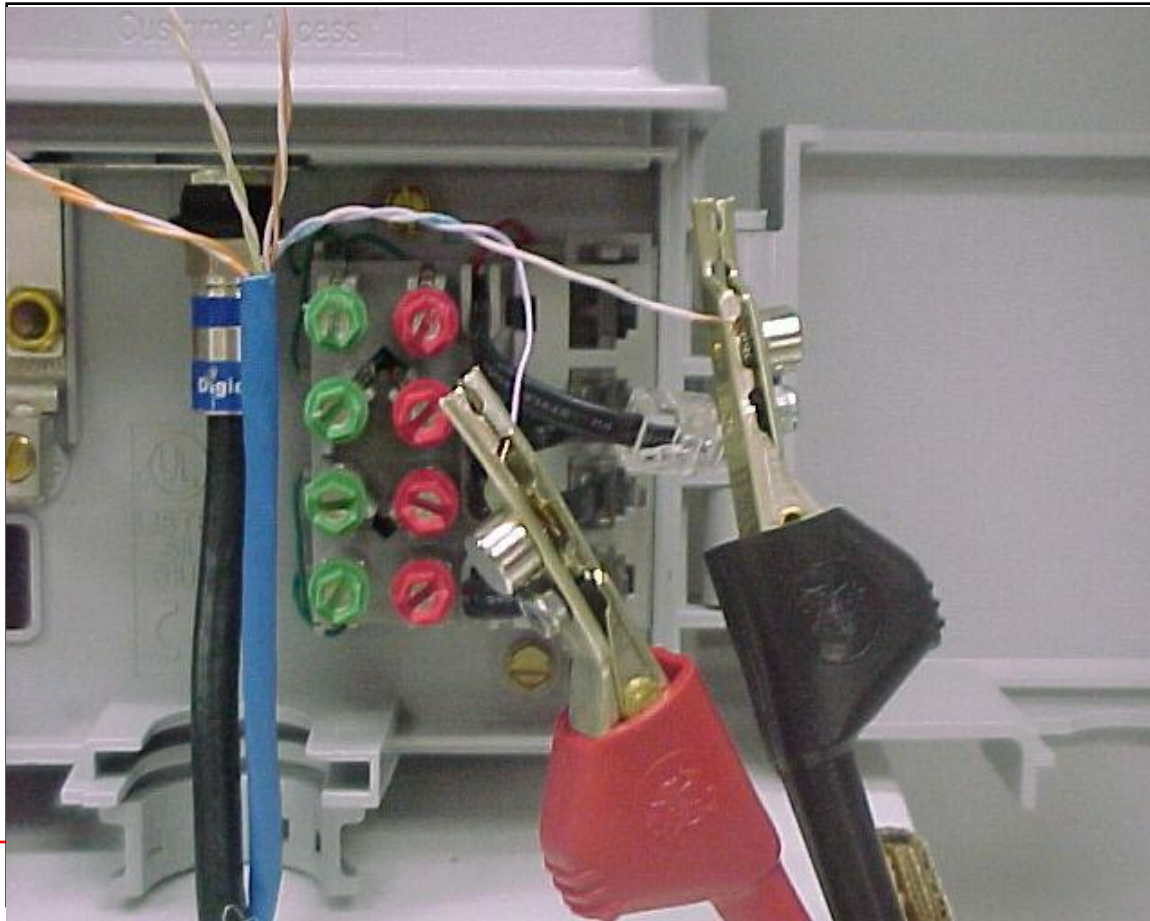
- Telephone Test Set (Butt Set)
- VOM (volt/ohm meter)
- Tone Generator and Probe
- Hand Tools
- Impact Tool (66 and 110 type connections)

Trouble Shooting Model

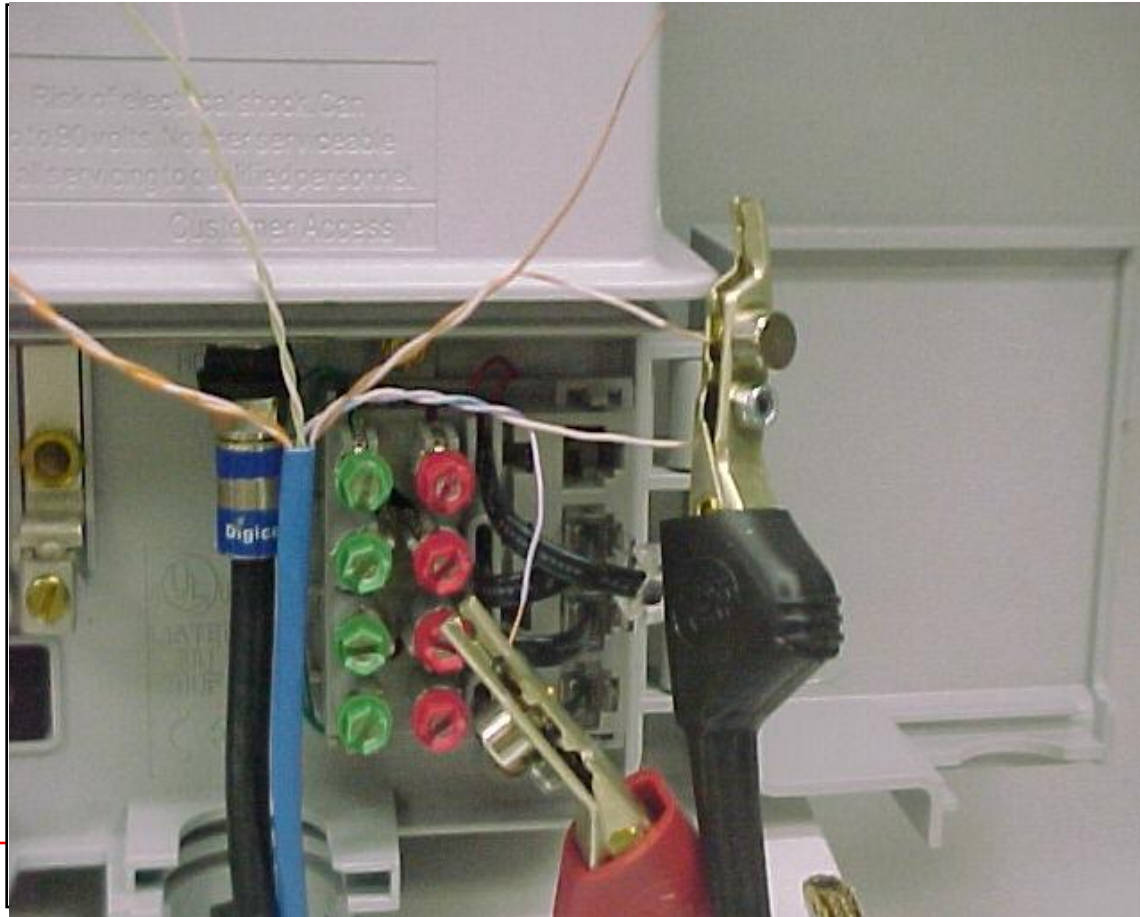
- Verify (that a problem exists)
- Analyze (what is causing the problem)
- Isolate (the problem)
- Repair (the problem)
- Re-Verify (that the problem is resolved)



Now, let's check the IW (inside wire). It is best to disconnect the IW from the connecting block in order to have room and flexibility to connect the test leads to the wire. Connect the tip and ring leads to the first pair.

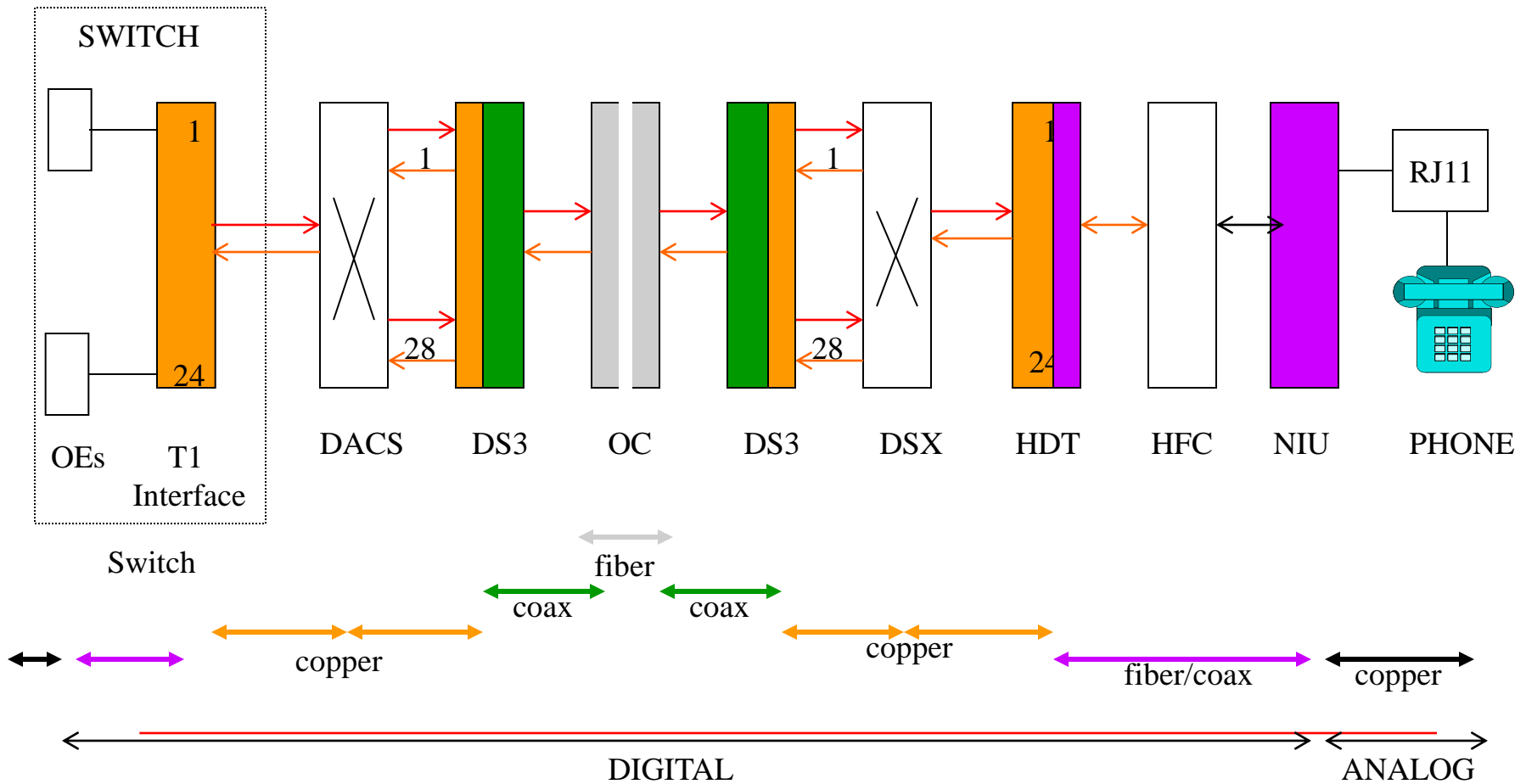


Test leads are connected, tip to tip and ring to ring.



But, you are not finished testing. Leave one test lead connected to the tip or ring of the first pair and connect the other lead to each of the remaining conductors to check for cross conditions

HFC TRANSPORT FOR TELEPHONY



End-To-End Cable Telephony System

