# LEF-5 & LEF-10 Intercom Connections

The following are instructions for connecting PTI Remote Keypad with Intercom, CodeXpress with Intercom and APEX Access Devices with intercom to the Aiphone LEF-5 or LEF-10 Open Voice Selective Call Intercom Base Station.  There are two options for this connection (Single LEF Intercom Base Station and LEF Dual Intercom Base Station).  Planning and installing the wiring of a site is a process that requires a high degree of technical knowledge, PTI recommends that this be done by a knowledgeable, trained professional.  Please read this entire document before proceeding.  Follow these steps in order.  If you have questions about installing or troubleshooting the LEF, contact Aiphone technical support by telephone at (800) 692-0200, by email at Tech-Serv@aiphone.com or on the web at www.aiphone.com.  If you have questions about PTI access devices, please contact our Technical Support Department by telephone at (480) 941-1513 or by email at support@ptiaccess.com.

> **Warning – Incorrect installation of electrical components can result in damage to electronics as well as personal injury.**
> **Warning – Failure to follow prudent installation guidelines and concepts can result in long-term problems.**
> **Warning – Crosswiring DC+ to DC– or to common (E) will damage the electronics.**
> **Warning – Crosswiring Intercom + to Intercom – or to common (E) will damage the electronics.**
> **Warning – Introducing AC power into the LEF Intercom Base Station will damage the electronics.**
> **Warning – Running Intercom wires in the same conduit as high voltage will generate noise on the intercom.**

## Option I – Single LEF Intercom Base Station

This is the most common LEF Installation with 1 – 10 remote intercoms and one LEF 5 or 10 Base Station Unit in the office.  Please note, the LEF-5 and LEF-10 look very similar, differing only in the number of screw terminals on the terminal block.

1.  Run a separate 18awg, 2 conductor, shielded cable from the LEF Intercom Base Station to each remote intercom location.  Strip back the outside insulation and inner foil layer of the cable approximately 2" from each end, being careful not to damage the bare shield wire or the insulation around either conductor.   2 spade connectors and 2 wire nuts/crimp connectors are required for each remote.  Spade connectors, wire nuts, and/or 3M crimp connectors must be provided by the installer.  The maximum distance per Aiphone is 1600' with 18 awg wire.

2.  At each Keypad with Intercom or CodeXpress with LEF Intercom, connect the Intercom + (generally the Red wire) to the Red + wire coming from the intercom button in the Keypad or CodeXpress.  Connect the Common (E) wire to the Black/Green wires coming from the speaker and intercom button in the Keypad or CodeXpress.  Use a wire nut or 3M UY2 connector for to make these splices.  Wrap the splice connection with electrical tape to seal it.  See Correct Splicing Techniques document.

3.  At each APEX Series Access Device with LEF Intercom, connect Intercom + and Intercom – wires to the tan intercom terminal block.  This terminal block is located in the Upper left hand corner of the circuit board, next to the speaker, directly below the black terminal block containing all of the speaker and intercom button wire connections.  Strip the Intercom + and Common (E) wires back ¼".  Insert the Intercom + wire in the top (1) position on the tan terminal block and tighten down the screw connection.  Insert the Common (E) in the center (E) position on the tan terminal block and tighten down the screw connection.  On the APEX circuit board, slightly above the tan terminal block and to the right of the black terminal block is a jumper.  Verify that the jumper is set to "LEF Single Station".

4.  At each Remote (APEX, Keypad with Intercom, CodeXpress with Intercom), fold back the bare shield wire even with the insulation on the cable and wrap electrical tape around the end of the insulation to make sure that the bare shield wire and foil insulation cannot touch the components inside the remote. If the intercom is receiving interference or has noise on it, one or both ends of this bare shield wire can be tied to the Common (E) to help reduce interference.
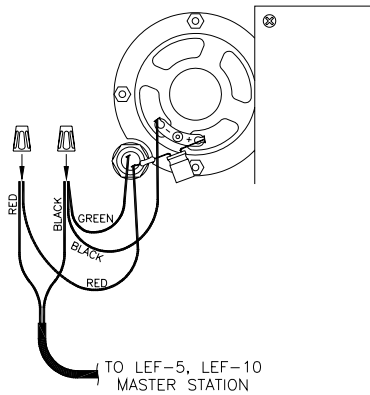
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5.  At the LEF Intercom Base Station, connect the Common (E) from all of the remotes to the (E) terminal on the terminal strip using spade connectors.  Connect the Intercom + wire from the first remote to the (1) terminal on the terminal strip using a spade connector.  Connect the Intercom + wire from the second remote to the (2) terminal on the terminal strip using a spade connector.  Connect the Intercom + wire from the third remote to the (3) terminal on the terminal strip using a spade connector.  Continue connecting the Intercom + wires from each remote to the next numbered terminal in line until all remotes are connected.  Fold back the bare shield wire even with the insulation on the cable and wrap electrical tape around the end of the insulation to make sure that the bare shield wire and foil insulation cannot touch the components inside the remote.  If the intercom is receiving interference or has noise on it, one or both ends of this bare shield wire can be tied to the Common (E) to help reduce interference.  Do not wrap wires around the terminal screws.  Warning – There is a jumper between Intercom – and common (E) that must remain in place.  Do not remove this.

6.  Verify that there aren't any stray wires touching the terminal strip connections and verify that all of the connections are made correctly.  If any connections are miswired or crosswired, the electronics will be damaged when power is connected.  This is NOT a warranty issue.

7.  Do NOT plug the transformer into 120V power until all connections are made.  At the LEF Intercom Base Station, connect the DC– wire from the transformer power plug cord to the (–) terminal on the terminal strip using a spade connector. Then, connect the  DC+ wire from the transformer power plug cord to the (+) terminal on the terminal strip using a spade connector.  Do not wrap wires around the terminal screws.

8.  Close the LEF case and test the intercoms.  Refer to the LEF Instruction Manual that accompanies the LEF 5 or LEF 10 for instructions on mounting, troubleshooting, and operating the LEF Intercom Base Station.
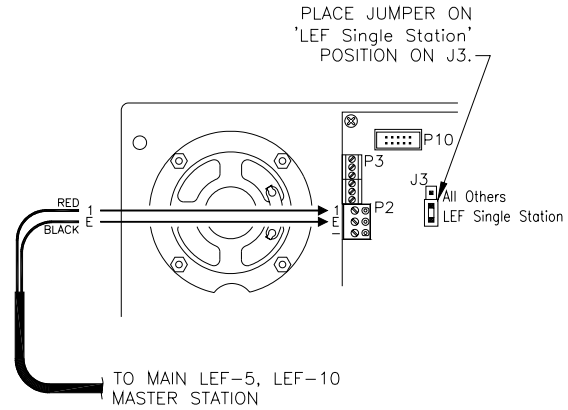
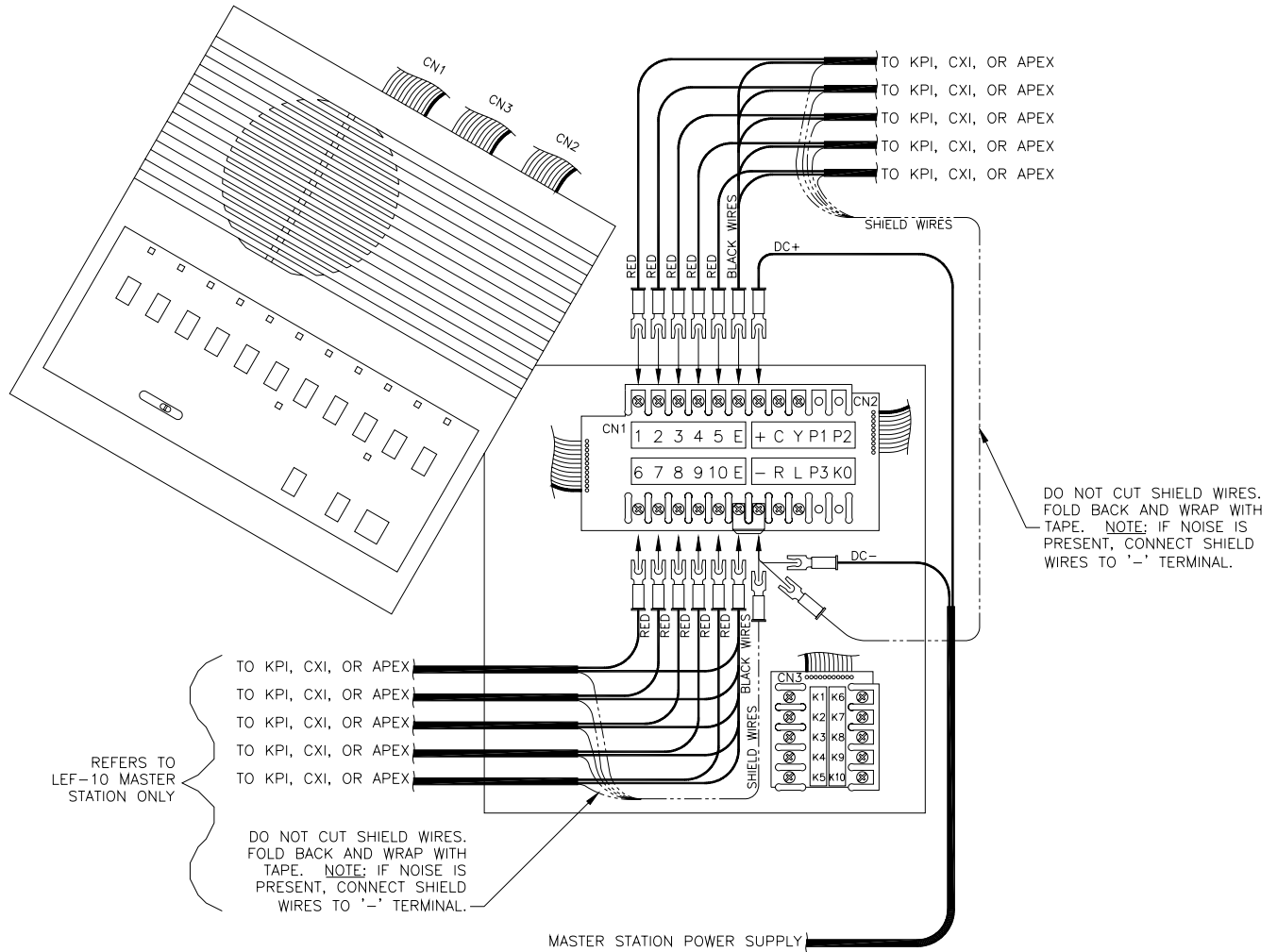# LEF-5 & LEF-10 Intercom Connections  (Page 3)



KPI OR CXI

APEX

NOTE:  WIRE COLORS ARE SHOWN FOR POINT-TO-POINT WIRING
REFERENCE ONLY.  ACTUAL COLORS MAY VARY.

# LEF-5 & LEF-10 Intercom Connections  (Page 4)



TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX

SHIELD WIRES

RED RED RED RED  BLACK WIRES    DC+

CN1    1 2 3 4 5 E    + C Y P1 P2    CN2
       6 7 8 9 10 E   − R L P3 K0

DO NOT CUT SHIELD WIRES. FOLD BACK AND WRAP WITH TAPE.  NOTE: IF NOISE IS PRESENT, CONNECT SHIELD WIRES TO '−' TERMINAL.

DC−

RED RED RED RED RED  BLACK WIRES

CN3
K1 K6
K2 K7
K3 K8
K4 K9
K5 K10

TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX
TO KPI, CXI, OR APEX

REFERS TO LEF−10 MASTER STATION ONLY

DO NOT CUT SHIELD WIRES. FOLD BACK AND WRAP WITH TAPE.  NOTE: IF NOISE IS PRESENT, CONNECT SHIELD WIRES TO '−' TERMINAL.

SHIELD WIRES

MASTER STATION POWER SUPPLY

## LEF−5, LEF−10  MASTER  STATION

NOTE:  WIRE COLORS ARE SHOWN FOR POINT−TO−POINT WIRING REFERENCE ONLY.  ACTUAL COLORS MAY VARY.

# LEF-5 & LEF-10 Intercom Connections  (Page 5)

## Option II – Dual LEF Intercom Base Station

This installation allows there to be two LEF Intercom Base Stations (one in the office and another in a guard station or apartment) and two or more remote intercoms.  Please note, the LEF-5 and LEF-10 look very similar, differing only in the number of screw terminals on the terminal block.

1. Run a single 18awg, 10 conductor, shielded cable from the Main LEF Intercom Base Station to the Secondary LEF Intercom Base station.  Run an additional set of cable with three conductors from the Secondary LEF to each remote intercom (APEX, Keypad with Intercom or CodeXpress with Intercom).  This can be an additional length of 18awg, 10 conductor, shielded cable splitting three conductors out to each remote intercom or multiple 18awg, 3 conductor, shielded cables, each run to a separate remote intercom.  Strip back the outside insulation and inner foil layer of the cable approximately 2" from each end, being careful not to damage the bare shield wire or the insulation around either conductor.   Spade connectors and wire nuts/crimp connectors are required for each remote and LEF Intercom Base Station.  Spade connectors, wire nuts, and/or 3M crimp connectors must be provided by the installer.  The maximum length per Aiphone is 1600' with 18 awg wire.

2. At each Keypad with Intercom or CodeXpress with Intercom, connect the Intercom + to the Red Intercom + wire coming from the intercom button in the Keypad or CodeXpress.  Cut the soldered end off of the Black/Green wires to separate them into two wires.  Connect the Intercom – wire to the Black wire coming from the speaker in the Keypad or CodeXpress.  Connect the common wire (E) to the Green wire coming from the intercom button in the Keypad or CodeXpress.  Use a wire nut or 3M UY2 connector for to make these splices.  Wrap the splice connection with electrical tape to seal it.  See Correct Splicing Techniques document.

3. At each APEX Series Access Device with LEF Intercom, connect Intercom +, Intercom –, and common (E) wires to the tan intercom terminal block.  This terminal block is located in the Upper left hand corner of the circuit board, next to the speaker, directly below the black terminal block containing all of the speaker and intercom button wire connections.  Strip the Intercom +, Intercom –, and common (E) wires back ¼".  Insert the Intercom + wire in the top (1) position on the tan terminal block and tighten down the screw connection.  Insert the common (E) wire in the center (E) position on the tan terminal block and tighten down the screw connection.  Insert the Intercom – in the bottom (–) position on the tan terminal block and tighten down the screw connection.  On the APEX circuit board, slightly above the tan terminal block and to the right of the black terminal block is a jumper.  Verify that the jumper is set to "All Others".

4. At the Secondary LEF Intercom Base Station, remove the Shorting jumper link from the  (–) and (E) terminals.  Connect the Intercom – from all of the remotes to the (–) terminal on the terminal strip using spade connectors.  Connect the common (E) wire from each remote to the (E) terminal on the terminal strip using spade connectors.  Connect the Intercom + wire from the first remote to the (1) terminal on the terminal strip using a spade connector.  Connect the Intercom + wire from the second remote to the (2) terminal on the terminal strip using a spade connector.  Do not wrap wires around the terminal screws.

5. Connect the Main LEF Intercom Base Station to the Secondary LEF Intercom Base Station using the 10 conductor wire.  Connect 1 conductor from (1) on the Main LEF to the (1) on the Secondary LEF.  Connect another conductor from (2) on the Main LEF to the (2) on the Secondary LEF.  Connect another conductor from (3) on the Main LEF to the (C) on the Secondary LEF.  Connect another conductor from (C) on the Main LEF to the (3) on the Secondary LEF.  Connect another conductor from (E) on the Main LEF to the (E) on the Secondary LEF.  Connect another conductor from (R) on the Main LEF to the (R) on the Secondary LEF.  Connect another conductor from (Y) on the Main LEF to the (Y) on the Secondary LEF.  Connect another conductor from (+) on the Main LEF to the (+) on the Secondary LEF.  Connect another conductor from (–) on the Main LEF to the (–) on the Secondary LEF.  Use Spade connectors; do not wrap wires around the terminal screws.
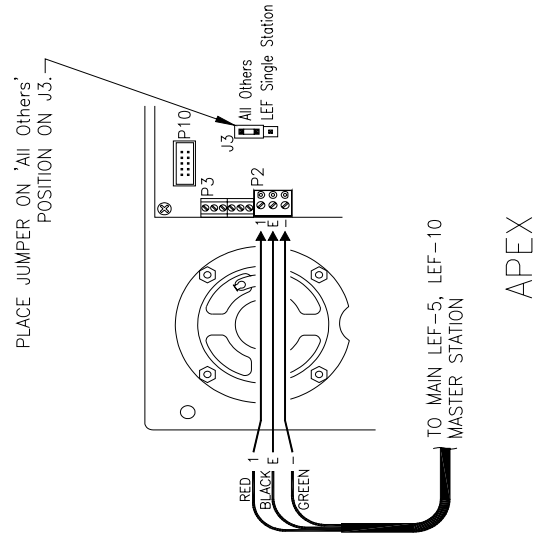
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6.  At the Main LEF Intercom Base Station, remove the Shorting jumper link from the (–) and (E) terminals.  Do NOT plug the transformer into 120V power until all connections are made.  Connect the DC– wire from the transformer power plug cord to the (–) terminal on the terminal strip using a spade connector.  Then, connect the   DC+ wire from the transformer power plug cord to the (+) terminal on the terminal strip using a spade connector.  Do not wrap wires around the terminal screws.

7.  Verify that there is not any stray wires touching the terminal strip connections and verify that all of the connections are made correctly on each LEF and at each remote.  If any connections are miswired or crosswired, the electronics will be damaged when power is connected.  This is NOT a warranty issue.

8.  Close the LEF cases and test the intercoms.  Refer to the LEF Instruction Manual that accompanies the LEF for instructions on mounting, troubleshooting, and operating the LEF Intercom Base Station.

# LEF-5 & LEF-10 Intercom Connections  (Page 7)

PLACE JUMPER ON 'All Others' POSITION ON J3.

All Others
LEF Single Station
J3
P10
P3
P2

RED
BLACK
GREEN

TO MAIN LEF-5, LEF-10 MASTER STATION

APEX

TO MAIN LEF-5, LEF-10 MASTER STATION
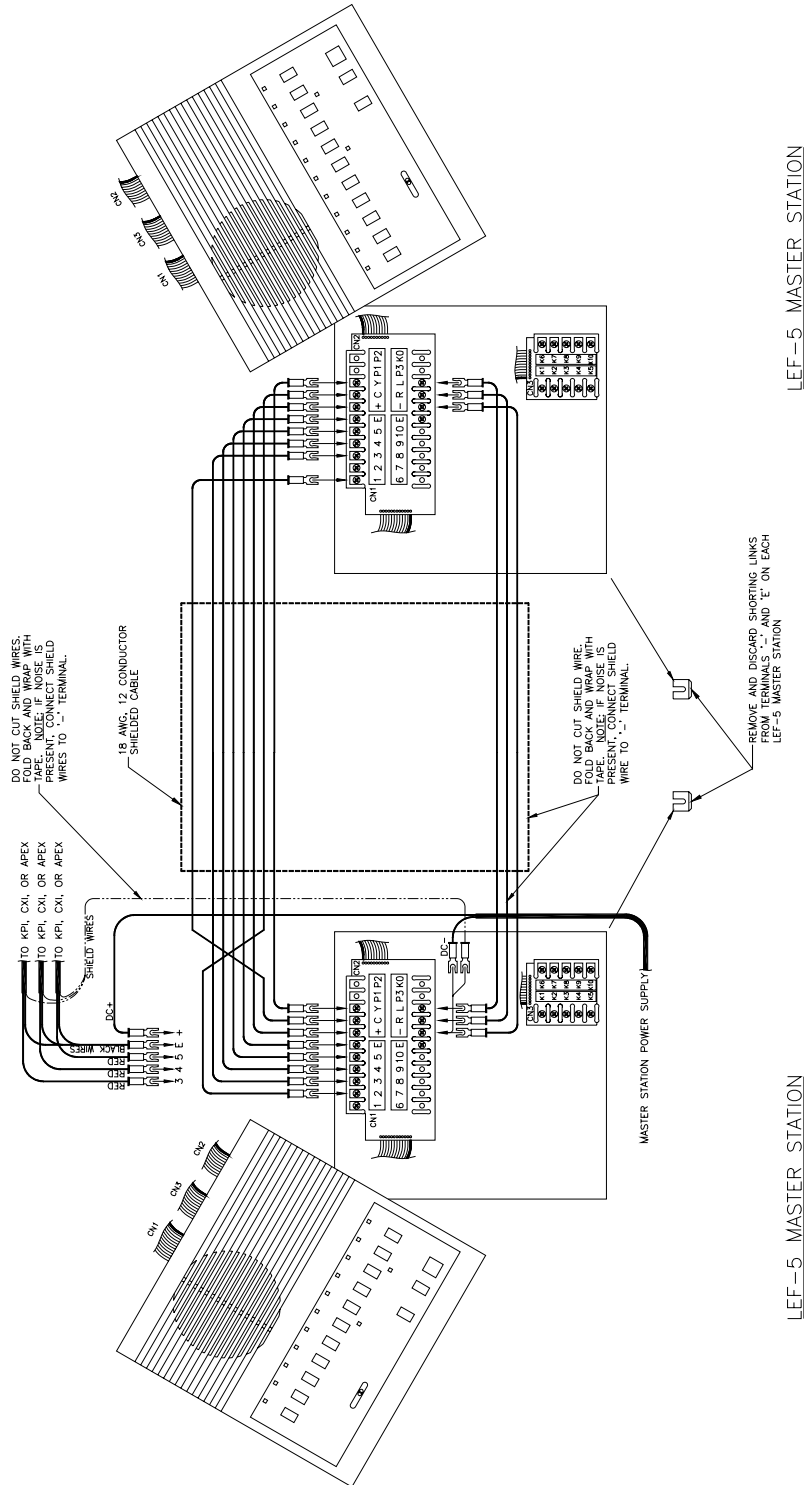
GREEN
RED
BLACK

KPI OR CXI

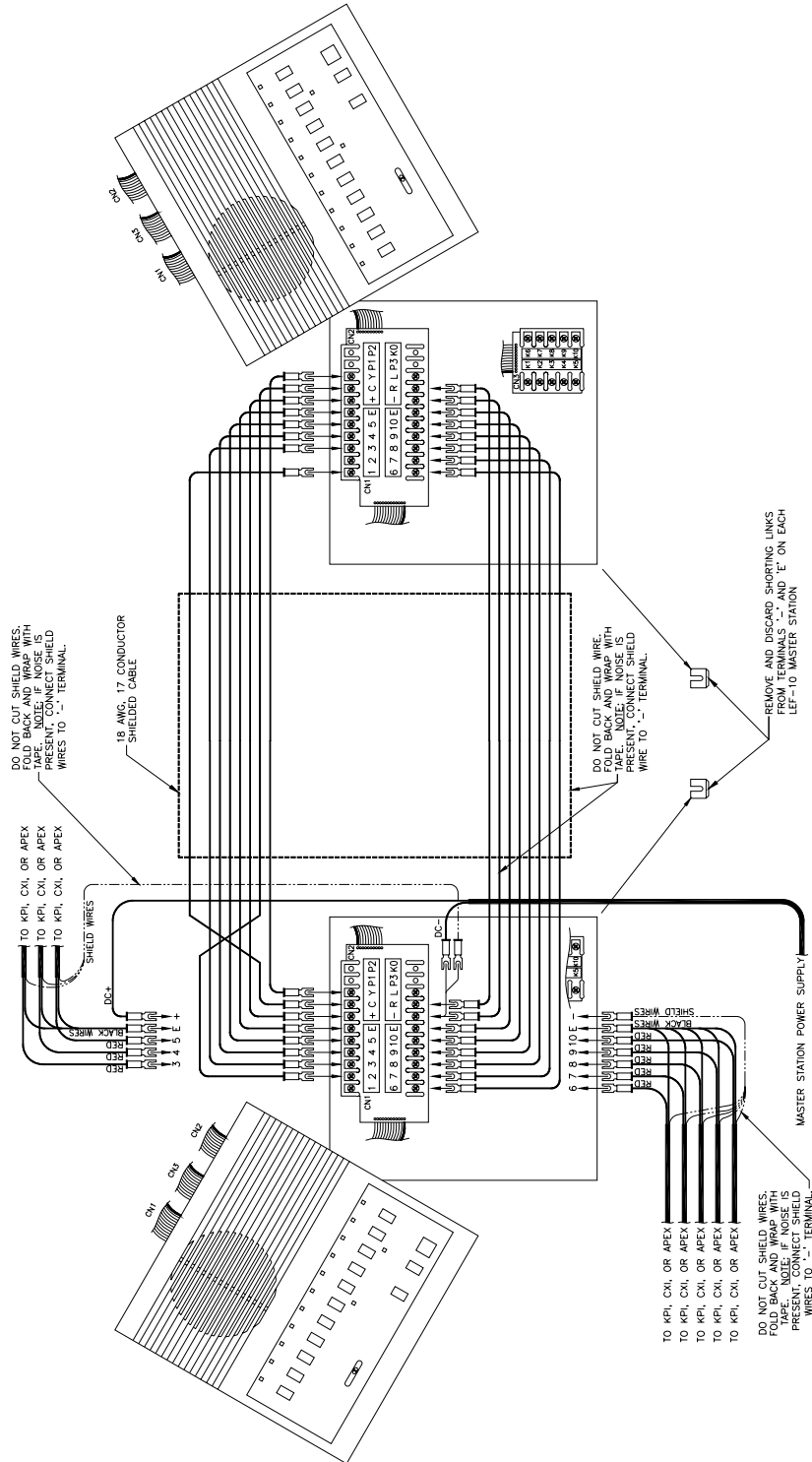NOTE: WIRE COLORS ARE SHOWN FOR POINT-TO-POINT WIRING REFERENCE ONLY. ACTUAL COLORS MAY VARY.

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