1. GENERAL

1.01 This section describes methods for testing channels, which are composed of line links, junctors, and trunk links. A procedure is provided for isolating trouble conditions. Figure 1 is also provided as a reference for the No. 5 Crossbar network.

1.02 The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes. Equipment Test Lists are not affected.

(a) To revise step 26e.

(b) To make minor corrections and changes as required.

1.03 The tests covered are:

A. Channel Test—Line Links ("A" Links): This test provides a method for testing continuity and polarity on tip, ring, and sleeve leads of all line links on all line link frames.

B. Channel Test—Junctors ("B" Links): This test provides a method for testing continuity and polarity on tip, ring and sleeve leads of all junctors in all junctor groups.

C. Channel Test—Trunk Links ("C" Links): This test provides a method for testing continuity and polarity of tip, ring, and sleeve leads of all trunk links on all trunk link frames.

D. Isolation of Channel Troubles:
This test provides a method for isolating continuity, polarity, and sleeve-lead troubles in the line links, junctors, and trunk links by means of substituting other links and junctors.

1.04 Lettered Steps: A letter, a, b, c, etc, added to a step number in Parts 3 and 4 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

1.05 The manner of selecting some circuits and test conditions at the master test frame (MTF) and its associated circuits varies depending on the apparatus options furnished with these circuits. Therefore, where variable means of selection are provided, precise instructions for selection of circuits and test conditions are not given. Precise instructions for the use of these variable means are given in Section 218-106-301.

1.06 The location statement, At MTF—, is used to refer to all apparatus located on the four basic bays of the MTF.

1.07 The statement between the asterisks (*) after action or verification statements is
added to clarify the function being simulated in the test procedures of Part 4.

2. APPARATUS

All Tests

2.01 Master test control circuit, SD-25800-01.

3. PREPARATION

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>At MTF— Restore all keys and switches.</td>
<td>All lamps extinguished.</td>
</tr>
<tr>
<td>2</td>
<td>Momentarily operate RL key.</td>
<td>Note: Local office records must be consulted to determine the equipment, originating register or trunk circuit, assigned to the trunk link frame termination required for each test.</td>
</tr>
</tbody>
</table>

Test A

3 Select any originating register or trunk circuit on any trunk link frame.

Test B

4 Select an originating register or trunk circuit in trunk link frame (TLF) 0, and on any trunk switch.

Test C

5 Select an originating register or trunk circuit in trunk link frame (TLF) 0, and on trunk switch 0.
STEP ACTION

Test D

6 Select an originating register or trunk circuit according to information derived from trouble record perforations.

Tests A, B, C, D

When Selection of an Originating Register on a Particular Trunk Switch Is Required:

7 Select DT class of test.

8 Select dial tone marker.

Note: When office is arranged for graded dial tone markers, consult local office records to determine marker that is associated with LLFs and TLFs being used.

9 Select originating register group.

10 Select originating register.

11a If office is arranged for range extension for unigauge cabling and selected line location is a long loop line—Operate NOLL key.

12 Select trunk link frame associated with selected originating register.

13b If a trouble record is required—Operate REC key.

14 Operate FS, CHT, NTC, TLK, CRV keys.

When Selection of Outgoing or IAO Trunk On A Particular Trunk Switch Is Required:

15 Select ORIG class of test.

16 Select completing marker.

17 Select originating class of call and associated translator indication.

18 Select class of service, rate treatment having access to selected route.
### SECTION 218-107-501

#### STEP ACTION

19. Select A_ through K_ digits as required to direct call to selected trunk.

20. Select outgoing or IAO trunk.

21. Select route advance as required for selected route.

22c. If trunk is in an allotted group—
Operate GPA/GPB key.

23d. If selected trunk furnishes ground on the tip lead—
Operate CRV key.
*Reverses tip and ring leads in SD-25918-01 to the PK relay.*

24b. If a trouble record is required—
Operate REC key.

25. Operate FS, TS, NTC, CHT, TLK keys.

26e. If IAO trunk is selected—
Operate IAO key or TSTB_ switch (IAO).

**Note:** Insure that the no-test vertical and the terminating test line are not on the same line link frame.

### 4. METHOD

#### STEP ACTION

**REGULAR NETWORK**

**A. Channel Test—Line Links ("A" Links)**

27. Select junctor sequence 0.

28. Operate STP1 key.
*Steps 27 and 28 select junctor group 0.*

29. Select a line location on line link frame 0, horizontal group 0.

30. Select channel 0.

31. Momentarily operate ST key.

**VERIFICATION**

MRL, AS, PK lamps lighted.
*Verifies continuity, polarity, and absence of crosses on tip, ring, and sleeve leads.*
If trouble record is requested—
STP1, JGO, CH_ designation perforated.
### B. Channel Test—Junctors ("B" Links)

#### Junctor Group 0

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Select any working line location on line link frame (LLF) 0.</td>
<td>MRL, AS, PK lamps lighted.</td>
</tr>
<tr>
<td>28</td>
<td>Select junctor sequence 0.</td>
<td><em>Verifies continuity, polarity, and absence of crosses on tip, ring, and sleeve leads of selected channel.</em></td>
</tr>
<tr>
<td>29</td>
<td>Operate STP1 key.</td>
<td>If trouble record is requested—STP, JF, CH designations perforated agree with selected information.</td>
</tr>
<tr>
<td></td>
<td><em>Steps 27 and 28 select junctor group 0.</em></td>
<td>If IAO trunk is selected—FLG or SCB designation perforated.</td>
</tr>
<tr>
<td>30</td>
<td>Select channel 0.</td>
<td>All lamps extinguished.</td>
</tr>
<tr>
<td>31</td>
<td>Momentarily operate ST key.</td>
<td><em>Verifies juncctors between selected LLF and selected (TLF0) in junctor group 0.</em></td>
</tr>
<tr>
<td>32</td>
<td>Momentarily operate RL key.</td>
<td>All lamps extinguished.</td>
</tr>
<tr>
<td>33</td>
<td>Repeat Steps 30, 31, and 32 selecting channels 1 through 9.</td>
<td><em>Verifies juncctors between selected LLF and all TLFs in junctor group 0.</em></td>
</tr>
<tr>
<td>34</td>
<td>Repeat Steps 4 through 26e, 30 through 33, making selection of originating registers or trunk circuits in all remaining TLFs.</td>
<td><em>Verifies juncctors between selected LLF and all TLFs in junctor group 0.</em></td>
</tr>
</tbody>
</table>
## SECTION 218-107-501

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Repeat Steps 27, 30 through 34, selecting line locations on each of the remaining LLFs.</td>
<td><em>Verifies all junctors between all LLFs and TLFs in junctor group 0.</em></td>
</tr>
<tr>
<td>36</td>
<td>Restore all keys and switches not required in next test.</td>
<td></td>
</tr>
</tbody>
</table>

### Junctor Groups 1 through 4

37 Select junctor sequence and STP1/STP2 key for junctor group 1.
(Refer to Table A.)

38 Select any working line location on LLF 0.

39 Using the junctor distribution charts (Fig. 4 through 33) for the size of office, determine and select the first channel available between LLF 0 and TLF 0 in the selected junctor group.
(In a Size 8LL—4TL office (Fig. 6), channels 0 through 9 are available in junctor group 1 while there are no channels available in junctor group 2.)

40 Momentarily operate ST key.

41 Momentarily operate RL key.

42 Repeat Steps 39, 40 and 41 selecting all remaining available channels.

43 Repeat Steps 4 through 26e, 37 through 42, making selection of originating registers or trunk circuits in all remaining TLFs.

44 Repeat Steps 38 through 43, selecting line locations of each of the remaining LLFs.

45 Repeat Steps 37 through 44, for all remaining junctor groups.

46 Restore all keys and switches not required in next test.

* MRL, AS, PK lamps lighted.
  * Verifies continuity, polarity, and absence of crosses on tip, ring, and sleeve leads of selected channel.*
  * If trouble record is requested—
    * STP_, JG_, CH_ designations perforated agree with selected information.
    * If IAO trunk is selected—
      * FLG or SCB designation perforated.
  * All lamps extinguished.

*Verifies all junctors between all LLFs and TLFs in selected junctor group.*

*Verifies available junctors between selected LLF and selected TLF in selected junctor group.*

*Verifies available junctors between selected LLF and all remaining TLFs in selected junctor group.*

*Verifies all available junctors between all LLFs and all TLFs in selected junctor group.*

*Verifies all junctors in all junctor groups.*
### C. Channel Test—Trunk Links ("C" Links)

<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Select any working line location on an even-numbered line link frame.</td>
</tr>
<tr>
<td>28</td>
<td>Select junctor sequence 0.</td>
</tr>
</tbody>
</table>
| 29   | Operate STPI key.  
*Steps 27 and 28 select junctor group 0.* |
| 30   | Select channel 0. |
| 31   | Momentarily operate ST key. |
| 32   | Momentarily operate RL key. |
| 33   | Repeat Steps 30, 31, and 32, selecting channels 1 through 9. |
| 34   | Select any line location on an odd-numbered line link frame. |
| 35   | Repeat Steps 30, 31, and 32 for channels 0 through 9. |
| 36   | Repeat Steps 5 through 35, making selection of an originating register or trunk circuit on trunk switches 1 through 9. |
| 37   | Repeat Steps 5 through 36, for each remaining trunk link frame. |
| 38   | Restore all keys and switches not required in next test. |

### D. Isolation of Channel Troubles

**Note:** Refer to Fig. 2 for typical 2-wire test linkage and to Fig. 3 for typical link substitutions used in the following test.

**VERIFICATION**

- MRL, AS, PK lamps lighted.
  - *Verifies continuity, polarity, and absence of crosses on tip, ring, and sleeve leads of selected channel.*
- If trouble record is requested—  
  - STPI, JGO, CH_ designations perforated agree with selected information.
  - If IAO trunk is selected—  
    - FLB or SCB designation perforated.
- All lamps extinguished.
  - *Verifies links from left trunk switch to each left trunk junctor switch in one trunk link frame.*
- *Verifies links from right trunk switch to each right trunk junctor switch in one trunk link frame.*
- *Verifies all links between trunk switches on one trunk link frame and associated trunk junctor switches.*
- *Verifies all links between all trunk switches and all trunk junctor switches on all trunk link frames.*
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**STEP** | **ACTION** | **VERIFICATION**
---|---|---
**Trouble Record Verification**
27 | Select line location per trouble record perforations (FTT, FUT, VGT, HGT, VFT). 
28 | Select junctor sequence and operate STP1/STP2 key per trouble record perforations (JG, STP). 
(Refer to Table A.)
29 | Select channel per trouble record perforations (CH). 
30 | Momentarily operate ST key. 
31 | Momentarily operate RL key. 
32 | Select another marker. 
33 | Momentarily operate ST key. 
34 | Momentarily operate RL key. 
**Marker Substitution**
35 | Select another channel. 
36 | Momentarily operate ST key. 
37 | Momentarily operate RL key. 
38 | Select original channel, Step 29. 
**Channel Substitution**
39 | Select a line location in another horizontal group on the same line link frame. 
40 | Momentarily operate ST key. 

MRL, AS, PK lamps lighted indicate a satisfactory test call. 
If trouble condition exists— 
TRL lamp lighted. 
Trouble record taken. 
*Trouble duplicated.*

All lamps extinguished. 
TRL lamp lighted. 
*Verifies that trouble condition is not caused by marker.*

All lamps extinguished. 
MRL, AS, PK lamps lighted. 
*Verifies trouble condition is in original channel.*

All lamps extinguished. 
MRL, AS, PK lamps lighted. 
*Verifies trouble condition exists in the original line link.*

Page 8
<table>
<thead>
<tr>
<th>STEP</th>
<th>ACTION</th>
<th>VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Momentarily operate RL key.</td>
<td>All lamps extinguished.</td>
</tr>
<tr>
<td>42f</td>
<td>If trouble condition still exists— Select original line location.</td>
<td></td>
</tr>
</tbody>
</table>

**Trunk Link Substitution**

43 Select an originating register or trunk circuit on another trunk switch in the same trunk link frame.

44 Momentarily operate ST key.

45 Momentarily operate RL key.

46f If trouble condition still exists— Select original trunk or originating register. All lamps extinguished.

**Junctior Substitution**

*Note:* The junctor may be substituted *only* when another junctor group provides the same channel between the selected line link frame and the selected trunk link frame.

47 Select junctor sequence and operate STP1/2 key to select another junctor group. (Refer to Table A and junctor distribution charts for size of office.)

48 Momentarily operate ST key. MRL, AS, PK lamps lighted.

49 Momentarily operate RL key.

50 Restore all keys and switches not required in next test. All lamps extinguished.
### TABLE A
**JUNCTOR SUBGROUP SELECTED (JG- DESIGNATION PERFORATED)**

<table>
<thead>
<tr>
<th>NUMBER OF TRUNKS LINK FRAMES*</th>
<th>JUNCTOR STEP POSITION (STP1 OR STP2)</th>
<th>JUNCTOR SEQUENCE (JSQ-)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>SINGLE</strong></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Paired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>JG3</td>
</tr>
<tr>
<td>2-3</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>JG1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>JG3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>JG2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>JG1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>JG0/1/2‡</td>
<td>JG0/1/1‡</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>JG1</td>
<td>JG1/2‡</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>JG1</td>
<td>JG1</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>JG0</td>
</tr>
<tr>
<td>2</td>
<td>JG1</td>
<td>JG1</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>JG0</td>
</tr>
</tbody>
</table>

* Two- or 4-wire frames.
† JGO designation perforated if three junctor subgroups exist between line link and trunk link frames.
‡ JG1 designation perforated if two junctor subgroups exist between line link and trunk link frames.
‡‡ Lower-numbered JG- designation perforated if two junctor subgroups exist between line link and trunk link frames.
§ Higher-numbered JG- designation perforated if three junctor subgroups exist between line link and trunk link frames.
A channel consists of one of the possible associations of links on a line link frame (LLF), a junctor, and a link on a trunk link frame (TLF). The channel number used on a particular connection thereby identifies the path through the switches. The junctor switch number, taken from the Junctor Distribution Chart, used is determined by the size of the office in terms of the number of LLF's and TLF's. The particular junctor is determined from the junctor distribution for the size of the office in question.

For purposes of illustration, Fig. 1A (Typical Channels) are used to show a typical connection between a customer on LLF 00, HG 03, VG 01, VF 04, and a trunk circuit appearing on TLF 04. The channel switch, SS 04R, using channel 4 for the connection. Junctor groups for the size of the office are also shown in Fig. 1, taking information from the Junctor Distribution Chart, Fig. 6. An shown in Fig. 1, the distribution of the channel between the line switches and line junctor switches (the "A" portion of the channel) involves a channel number, a horizontal (HG), a vertical (VG), and a vertical (VF). The junctor name (or numbers) is derived from the hex switch location through the junctor switch location in the example above, channel 4.

The line link framejunctor switches are electrically divided into two parts, left and right, by splitting the horizontal multiple between the left and right vertical units.

The distribution of trunk links between the trunk junctor switches and the trunk switches (the "C" portion of a channel) follows a standard pattern and may be used to determine the channel number. As shown by the heavy line in Fig. 1, the horizontal of the trunk switch, vertical of the trunk link, and the horizontal of the trunk switch. Thus, the horizontal fraction of the channel is seen from the line switch location and the junctor switch number, in the example above, channel 4.

Looking first at Junctor Group 0, the junctor distribution chart shows that for LLF 00, channel 4, the junctor ("B" link) will be from line junctor switch 4, vertical 1 (LLV 4L) to trunk switch 4, horizontal 0L (TLH 4L). The trunk link ("C" link) will then be from trunk switch 4, vertical 5 to trunk switch 5, horizontal 4. This completes one possible path between a customer's line appearance and a trunk or register via channel 4, junctor group 0.
When a 12-level miniature crossbar switch is used in conjunction with the regular 10-level crossbar switch correlation of the 10-level must be made from local office records.

Figure 1B combines the use of the 12-level miniature crossbar switch with the permanent junctor distribution plan for a size 4 - 2 TL office.

Figures 31, 32, and 33 have been prepared for the three basic permanent junctor distribution plans. The plans provide for three basic patterns that will accommodate all sizes of offices plus require only a small transition from one size to the next when additional trunk link frames are necessary.

Figure 31 covers the junctor distribution plan for a 2 - 3 TL office size. It utilizes three junctor groups. When only 2 TL frames are provided, LLVs 0, 1, 5, 6, 7, and 8 are used. When a third TL frame is added, the remaining LLVs are used with the exception of LLV 3.

Figure 32 covers the junctor distribution plan for 4 to 10 TL frame office. When an office expands from a 3 TL frame size, 5 TL frame plan will be used until the expansion exceeds 10 TL frames. Two junctor groups are provided.

Figure 33 covers the plan for a size 10 TL frame office which may be expanded to a 15 paired or 15 tripled office with the addition of only an additional 5junctor frame. When the size of the office is increased, LLVs 0, 1, 5, 6, 7, and 8 are used. The remaining LLVs are used with the exception of LLV 3.
<table>
<thead>
<tr>
<th>Junctor Group 0</th>
<th>Junctor Group 1</th>
<th>Junctor Group 2</th>
<th>Junctor Group 3</th>
<th>Junctor Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LLV, TLFr</strong></td>
<td><strong>0, 1, or 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
</tr>
<tr>
<td>TLH</td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
</tr>
<tr>
<td>JC</td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
</tr>
<tr>
<td>LLV</td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
<td><strong>0, 1, 2</strong></td>
</tr>
</tbody>
</table>

**Figure 4**
(A&M Only for 2-Wire)
Junctors Distribution
Crossbar System No. 5
**SIZE 4LL-2TL**

**Figure 5**
(A&M Only for 2-Wire)
Junctors Distribution
Crossbar System No. 5
**SIZE 6LL-3TL**

**LEGEND**
- **TLFr**—Trunk Link Frame
- **TLH**—Trunk Link Horizontal on Junctor Switches
- **JC**—JC Relay on Trunk Link Frame
- **LLFr**—Line Link Frame
- **LLV**—Line Link Vertical on Junctor Switches
- **Ch**—Channel
- **L**—Left
- **R**—Right
### Junctor Group 0

<table>
<thead>
<tr>
<th>TLH</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLF</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

**Legend:**
- TLH: Trunk Link Horizontal on Junctor Switches
- TLF: Trunk Link Frame
- JC: JC Relay on Trunk Link Frame
- LLV: Line Link Vertical on Junctor Switches
- LLFr: Line Link Frame
- Ch: Channel
- L: Left
- R: Right
- ( ): Junctors in Junctor Group 2

### Junctor Group 1 and Junctor Group 2

<table>
<thead>
<tr>
<th>TLH</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<tbody>
<tr>
<td>TLF</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

**Legend:**
- TLH: Trunk Link Horizontal on Junctor Switches
- TLF: Trunk Link Frame
- JC: JC Relay on Trunk Link Frame
- LLV: Line Link Vertical on Junctor Switches
- LLFr: Line Link Frame
- Ch: Channel
- L: Left
- R: Right
- ( ): Junctors in Junctor Group 2

### Figure 8

(A&M Only for 2-Wire)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
</table>

**Crossbar System No. 5**

**Size:** 12LL-9TL

**Legend:**
- TLH: Trunk Link Horizontal on Junctor Switches
- TLF: Trunk Link Frame
- JC: JC Relay on Trunk Link Frame
- LLV: Line Link Vertical on Junctor Switches
- LLFr: Line Link Frame
- Ch: Channel
- L: Left
- R: Right
- ( ): Junctors in Junctor Group 2
### Junctor Group 0

<table>
<thead>
<tr>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
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<th>LLV</th>
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<tbody>
<tr>
<td>9</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

### Junctor Group 1 and Junctor Group 2

<table>
<thead>
<tr>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
<th>TLH</th>
<th>LLV</th>
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</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

### LEGEND

- TLH - Trunk Link Frame
- TLV - Trunk Link Vertical on Junctor Switches
- JC - JC Relay on Trunk Link Frame
- LLH - Line Link Frame
- LLV - Line Link Vertical on Junctor Switches
- CH - Channel
- L - Left
- R - Right

---

**Figure 9**

(A&M Only for 2-Wire)

(Junter Distribution)

(Crossbar System No. 5)

**SIZE** 14LL-7TL

---

**ISS 2, SECTION 218-107-501**

Page 18
### Junctory Group 0

| TLFr | LLV | TLH | LLV | JC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|-----|-----|-----|----|---|---|---|---|---|---|---|---|---|
| Ch 9 | 0.6 | 2 | 2 | 4 | 0.7 | 0.9 | 10 | 11 | 12 | 13 | 14 | 15 |
| L/H  | 1 1 | 2 2 | 3 | 4 | 5 5 | 6 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

### Junctory Group 1

| TLFr | LLV | TLH | LLV | JC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|-----|-----|-----|----|---|---|---|---|---|---|---|---|---|
| Ch 9 | 0.6 | 2 | 2 | 4 | 0.7 | 0.9 | 10 | 11 | 12 | 13 | 14 | 15 |
| L/H  | 1 1 | 2 2 | 3 | 4 | 5 5 | 6 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

**Figure 10**  
(A&M Only for 2-Wire)  
Crossbar System No. 5  
Size: 16Ll-8TL

---

### Junctory Group 0

| TLFr | LLV | TLH | LLV | JC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|-----|-----|-----|----|---|---|---|---|---|---|---|---|---|
| Ch 9 | 0.6 | 2 | 2 | 4 | 0.7 | 0.9 | 10 | 11 | 12 | 13 | 14 | 15 |
| L/H  | 1 1 | 2 2 | 3 | 4 | 5 5 | 6 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

**Figure 11**  
(A&M Only for 2-Wire)  
Crossbar System No. 5  
Size: 18Ll-9TL

---

**LEGEND**

TLFr—Trunk Link Frame  
TLH—Trunk Link Horizontal on Junctor Switches  
LLV—Line Link Vertical on Trunk Link Frame  
LLV—Line Link Vertical on Junctor Switches  
JD—Junctor Distribution  
R—Right
### Junctor Group 0

<table>
<thead>
<tr>
<th>TLFr</th>
<th>TLH</th>
<th>JC Rel</th>
<th>LLFr</th>
<th>LLV</th>
<th>Ch</th>
</tr>
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<tr>
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<td>21</td>
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<td>23</td>
</tr>
</tbody>
</table>

**TLFr**—Trunk Link Frame  
**TLH**—Trunk Link Horizontal on Junctor Switches  
**JC Rel**—JC Relay on Trunk Link Frame  
**LLFr**—Line Link Frame  
**LLV**—Line Link Vertical on Junctor Switches  
**Ch**—Channel  
**L**—Left  
**R**—Right

### Junctor Group 1

<table>
<thead>
<tr>
<th>TLPr</th>
<th>TLH</th>
<th>JC Rel</th>
<th>LLFr</th>
<th>LLV</th>
<th>Ch</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
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<td>3</td>
<td>4</td>
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<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>

**TLPr**—Trunk Link Pair  
**TLH**—Trunk Link Horizontal on Junctor Switches  
**JC Rel**—JC Relay on Trunk Link Frame  
**LLFr**—Line Link Frame  
**LLV**—Line Link Vertical on Junctor Switches  
**Ch**—Channel  
**L**—Left  
**R**—Right

### Junctor Group 2

<table>
<thead>
<tr>
<th>TLFr</th>
<th>TLH</th>
<th>JC Rel</th>
<th>LLFr</th>
<th>LLV</th>
<th>Ch</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3</td>
<td>4</td>
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<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>

**TLFr**—Trunk Link Frame  
**TLH**—Trunk Link Horizontal on Junctor Switches  
**JC Rel**—JC Relay on Trunk Link Frame  
**LLFr**—Line Link Frame  
**LLV**—Line Link Vertical on Junctor Switches  
**Ch**—Channel  
**L**—Left  
**R**—Right

### Junctor Group 3

<table>
<thead>
<tr>
<th>TLPr</th>
<th>TLH</th>
<th>JC Rel</th>
<th>LLFr</th>
<th>LLV</th>
<th>Ch</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
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<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>

**TLPr**—Trunk Link Pair  
**TLH**—Trunk Link Horizontal on Junctor Switches  
**JC Rel**—JC Relay on Trunk Link Frame  
**LLFr**—Line Link Frame  
**LLV**—Line Link Vertical on Junctor Switches  
**Ch**—Channel  
**L**—Left  
**R**—Right

### Junctor Group 4

<table>
<thead>
<tr>
<th>TLFr</th>
<th>TLH</th>
<th>JC Rel</th>
<th>LLFr</th>
<th>LLV</th>
<th>Ch</th>
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<tbody>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td>19</td>
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<td>21</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>

**TLFr**—Trunk Link Frame  
**TLH**—Trunk Link Horizontal on Junctor Switches  
**JC Rel**—JC Relay on Trunk Link Frame  
**LLFr**—Line Link Frame  
**LLV**—Line Link Vertical on Junctor Switches  
**Ch**—Channel  
**L**—Left  
**R**—Right

### Figure 12
(A&M Only for 2-Wire)  
Junctor Distribution  
Crossbar System No. 5  
SIZE 20LL-10TL

### Figure 13
(A&M Only for 2-Wire)  
Junctor Distribution  
Crossbar System No. 5  
SIZE 30LL-10TL
### Junctor Group 0

<table>
<thead>
<tr>
<th>TLPr</th>
<th>LIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLH</td>
<td>6L, 6R, 7L, 7R, 8L, 8R, 9L, 9R, 10L, 10R, 11L, 11R</td>
</tr>
<tr>
<td>JC Rel</td>
<td>0, 1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>LIV</td>
<td>0, 1, 2, 3, 4, 5</td>
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</table>

### Junctor Group 1

<table>
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<tr>
<th>TLPr</th>
<th>LIV</th>
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</thead>
<tbody>
<tr>
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<td>7L, 7R, 9L, 9R, 10L, 10R, 11L, 11R</td>
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<tr>
<td>JC Rel</td>
<td>7, 8, 9, 10, 11, 12, 13, 14</td>
</tr>
<tr>
<td>LIV</td>
<td>0, 1, 2, 3, 4, 5</td>
</tr>
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### Junctor Group 2

<table>
<thead>
<tr>
<th>TLPr</th>
<th>LIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLH</td>
<td>7L, 7R, 8L, 8R, 9L, 9R, 10L, 10R, 11L, 11R</td>
</tr>
<tr>
<td>JC Rel</td>
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### Junctor Group 3

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<tbody>
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<td>JC Rel</td>
<td>0, 1, 2, 3, 4, 5</td>
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<tr>
<td>LIV</td>
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</tbody>
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---

**LEGEND**

- **TLPr**—Track Link Pair
- **TLH**—Track Link Horizontal on Junctor Switches
- **LLV**—Line Link Vertical on Junctor Switches
- **Ch**—Channel
- **L**—Left
- **R**—Right

---

**Figure 14**

(ExM Only for 2-Wire)

**Junctors Distribution Crossbar System No. 5**

**SIZE** 12LL-3TLPr

---

* Even Ch only

---

**Page 21**
Figure 15

(A&M Only for 2-Wire)

Junction Distribution
Crossbar System No. 5
SIZE 16LL-4TLPr

--- LEGEND ---
TLPr—Trunk Link Pair
TLH—Trunk Link Horizontal on Junctor Switches
JC—JC Relay on Trunk Link Frame
LLV—Line Link Vertical on Junctor Switches
LLFr—Line Link Frame
L—Left
R—Right
Figure 16
(A&M Only for 2-Wire)
Junctor Distribution
Crossbar System No. 5
SIZE 20L1-TLP
### Junctor Group 0

**TLPr, LLV** 0, 1, 2, 3, 4, 5, or 6

**TLH** OL OR 1L 1R 2L 2R 3L 3R 4L 4R 5L 5R 6L 6R 7L 7R 8L 8R 9L 9R OL OR 1L 1R 2L 2R 3L 3R 4L 4R 5L 5R 6L 6R 7L 7R 8L 8R 9L 9R

**JC Rel** 0 2 3 4 5 6 7 8 9 10 11 12 13

**Ch** 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

**LLFr**

### Junctor Group 1 and Junctor Group 2

**TLPr-Trunk Link Pair**

**LLV-Trunk Link Vertical on Junctor Switches**

**TLH-Trunk Link Horizontal on Junctor Switches**

**JC-JC Relay on Trunk Link Frame**

**LLFr-Line Link Frame**

**Ch-Channel**

**L-Left**

**R-Right**

### Figure 18

(A&M Only for 2-Wire)

### Junctor Distribution

Crossbar System No. 5

**SIZE** 28LL-7TLPr

---

**Page 25**
Figure 22
(A&M Only)
Juncstor Distribution
Crossbar System No. 5
SIZE 122L-2TLT

---

LEGEND

TLT—Trunk Link Triple
TLH—Trunk Link Horizontal on Juncstor Switches
LC—LC Relay on Trunk Link Frame
LLV—Line Link Vertical on Juncstor Switches
Ch—Channel
L—Left
R—Right
### Junctor Group 0

<table>
<thead>
<tr>
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<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
<th>TLH</th>
<th>LLV</th>
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<td>1</td>
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<td>9</td>
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<td>3</td>
<td>4</td>
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#### Junctor Group 1

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<th>LLV</th>
<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
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<th>LLV</th>
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<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
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<td>9</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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### Figure 20

(A&M Only for 2-Wire)

**Junctor Distribution**

**Crossbar System No. 5**

**SIZE 36LL-VTLPr**

<table>
<thead>
<tr>
<th>TLH</th>
<th>LLV</th>
<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
<th>TLH</th>
<th>LLV</th>
<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
</tr>
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<tbody>
<tr>
<td>5</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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### Figure 21

(A&M Only for 2-Wire)

**Junctor Distribution**

**Crossbar System No. 5**

**SIZE 40LL-10TLPr**

<table>
<thead>
<tr>
<th>TLH</th>
<th>LLV</th>
<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
<th>TLH</th>
<th>LLV</th>
<th>TLPr</th>
<th>LLFr</th>
<th>Ch</th>
<th>JC</th>
</tr>
</thead>
<tbody>
<tr>
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<td>9</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>

**LEGEND**

- TLH = Trunk Link Horizontal on Junctor Switches
- LLV = Line Link Vertical on Junctor Switches
- LLPr = Line Link Pair
- TLPr = Trunk Link Pair
- JC = JC Relay on Trunk Link Frame
- Ch = Channel
- R = Right
- L = Left

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Page 27
### Junctor Group 0

<table>
<thead>
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<th>LLV, TLT</th>
<th>0 or 1</th>
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<tr>
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</tbody>
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**Figure 22**

(A&M Only)

Juncto Distribution

Crossbar System No. 5

SIZE 12LL-2TLT

---

**Legend**

- **TLT**—Trunk Link Triple
- **TLH**—Trunk Link Horizontal on Junctor Switches
- **JC**—JC Relay on Trunk Link Frame
- **LLFr**—Line Link Frame
- **LLV**—Line Link Vertical on Junctor Switches
- **Ch**—Channel
- **L**—Left
- **R**—Right
<table>
<thead>
<tr>
<th>Junctor Group 1</th>
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</thead>
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<tr>
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<td><strong>TLF, TLT, LLI, LRT, LRV, or LLL</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Channel</strong></td>
<td><strong>Channel</strong></td>
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<tr>
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<td><strong>Crossbar System No.</strong></td>
</tr>
<tr>
<td><strong>Revision</strong></td>
<td><strong>Revision</strong></td>
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<tr>
<td><strong>Legend</strong></td>
<td><strong>Legend</strong></td>
</tr>
</tbody>
</table>

**Figure 24**

(A&M Only)

Junctor Distribution

crossbar System No. 5

SIZE 244L-4TLT

---

**LEGEND**

TLF—Trunk Link Triple
TLH—Trunk Link Horizontal on Junctor Switches
TLT—Trunk Link Triple
LLF-Line Link Frame
LLV-Line Link Vertical on Junctor Switches
Ch-Channels
O-Left
R-Right
Figure 25 (A&M Only)
Junction Distribution
Crossbar System No. 5
SIZE 30LL-STLT

Junction Group 0

Junction Group 1

Legend
TLT—Trunk Link Triple
TLH—Trunk Link Horizontal on Junctor Switches
JC—JC Ring on Trunk Link Frame
LLV—Line Link Vertical on Junctor Switches
Ch—Channel
L—Left
R—Right
Junctor Group 0

Junctor Group 1 and Junctor Group 2

LEGEND

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Page 32
<table>
<thead>
<tr>
<th>Junctor Group 0</th>
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<tr>
<td>TLH, 01, 02, 03, 20, 30, 40, 50, 60, 70, 80, 90</td>
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</tbody>
</table>

**Legend:**
- **TLT:** Trunk Link Triple
- **TLH:** Trunk Link Horizontal on Junctor Switches
- **JC:** Relay on Trunk Link Frame
- **LLV:** Link Link Vertical on Junctor Switches
- **Ch:** Channel
- **L:** Left
- **R:** Right

**Junctor Group 0 (contd):**

<table>
<thead>
<tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>JC-01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15</td>
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</table>

**Figure 30 (A&M Only):**
- **Crossbar System No. 5**
- **Size:** 60LL-10TLT

**Legend:**
- **TLT:** Trunk Link Triple
- **TLH:** Trunk Link Horizontal on Junctor Switches
- **JC:** Relay on Trunk Link Frame
- **LLV:** Link Link Vertical on Junctor Switches
- **Ch:** Channel
- **L:** Left
- **R:** Right
### Junctor Group 0

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<td>2</td>
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<td>LL, LR</td>
<td>2, DR</td>
</tr>
<tr>
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<td>A0</td>
<td>A1</td>
<td>A2</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>LLFr</td>
<td>J, J</td>
<td></td>
<td></td>
</tr>
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</table>

### Junctor Group 1

<table>
<thead>
<tr>
<th>LLVF</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>TLVF</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>TLH</td>
<td>0, SL</td>
<td>LL, GL</td>
<td>LR, TL</td>
</tr>
<tr>
<td>JC Rel</td>
<td>B5</td>
<td>B6</td>
<td>B7</td>
</tr>
<tr>
<td>Ch</td>
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<td>8</td>
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</tr>
<tr>
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### Junctor Group 2

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<td>TLVF</td>
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<td>2</td>
</tr>
<tr>
<td>TLH</td>
<td>0, LR</td>
<td>LL, RL</td>
<td>LR, RL</td>
</tr>
<tr>
<td>JC Rel</td>
<td>B8</td>
<td>B9</td>
<td>A4</td>
</tr>
<tr>
<td>Ch</td>
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</tr>
<tr>
<td>LLFr</td>
<td>J, J</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend**

- **TLVF**—Trunk Link Frame
- **TLH**—Trunk Link Horizontal on Junctor Switches
- **JC Rel**—JC Relay on Trunk Link Circuit
- **LLVF**—Line Link Frame
- **LLH**—Line Link Vertical on Junctor Switch
- **Ch**—Channel
- **R**—Right
- **L**—Left

**Figure 31**

Permanent Junctor Distribution—2-Wire
2-3 Size Convertible to 5 Size Per Fig. 32
### Junctor Group 0

<table>
<thead>
<tr>
<th>LLV</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLH</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
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</tbody>
</table>

### Junctor Group 1

<table>
<thead>
<tr>
<th>LLV</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
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<td>TLH</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<td>9</td>
</tr>
</tbody>
</table>

---

**Figure 32**

Permanent Junctor Distribution—2-Wire

5 Size Convertible To

10 Size Per Fig. 33

---

**LEGEND**

TLFr—Trunk Link Frame
TLH—Trunk Link Horizontal on Junctor Switches
JL H—JL Heter of Trunk Link Circuit
LLFr—Line Link Frame
LLV—Line Link Vertical on Junctor Switch
Ch—Channel
L—Left
R—Right
### Junctor Group 0

<table>
<thead>
<tr>
<th>LLV 0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>JMG 0</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>TLV/ 0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>TLV/ 10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
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<td>19</td>
</tr>
</tbody>
</table>

#### TLH TL Fr Trunk Link Horizontal on Junctor Switches

### LLV LL Fr Line Link Vertical on Junctor Switch

### JMG Junctor Multiple Grouping (pairs or triples)

#### LL Fr J Line Link Frame

**Figure 33**

Permanent Junctor Distribution—2-Wire 10 Size

---

**LEGEND**

- **TLF**—Trunk Link Frame
- **TLH**—Trunk Link Horizontal on Junctor Switches
- **JMG**—Junctor Multiple Grouping (pairs or triples)