AT&T 363-205-500
Issue 4, July 1989

SLC® SERIES 5 CARRIER SYSTEM
MAINTENANCE AND TROUBLE CLEARING
LOOP TRANSMISSION SYSTEMS

Task Oriented Practice (TOP)

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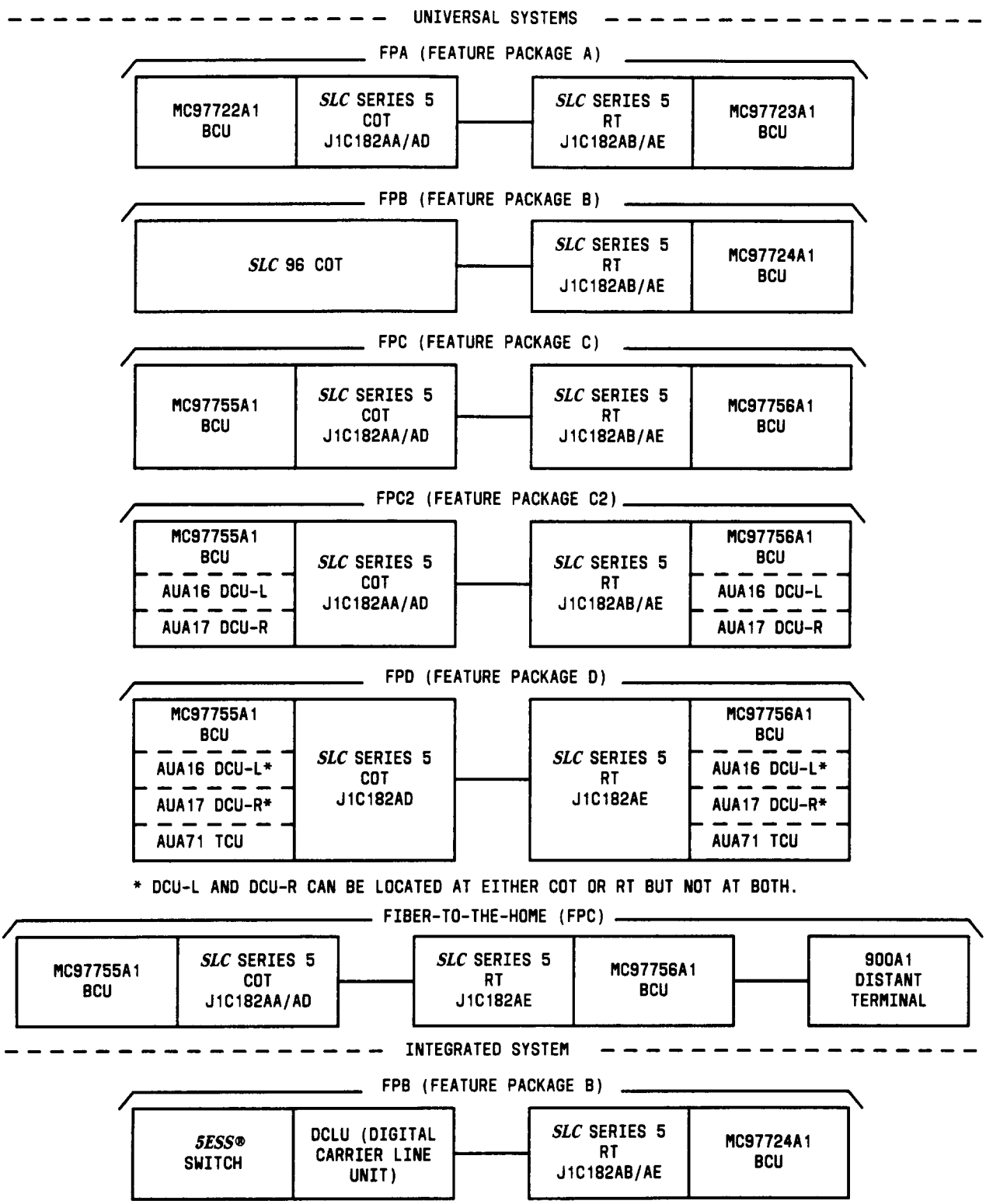


Fig. 1—Feature Package Arrangements

MAINTENANCE PHILOSOPHY

GENERAL

The *SLC*® Series 5 carrier system (Series 5) is composed of a Series 5 COT (central office terminal) with T1 carrier or optical fiber connection to a Series 5 RT (remote terminal). The basic building block for Series 5 is a 96-line system. Series 5 uses two independent 96-line systems that are physically packaged into one 5-shelf dual bank assembly. The COT is usually located in a telephone company office. A remote terminal may be located in the outside plant or inside a communication user's premises. A Series 5 RT equipped with FPB (Feature Package B) can interface with a *SLC* 96 carrier system COT, a SLIM (subscriber loop interface module), an LM12 Multiplex, or a *5ESS*® switch DCLU (digital carrier line unit). This is designated as a Mode 96 System. The Series 5 System may be equipped for FPA (Feature Package A), FPB, FPC, or FPD operation. Refer to AT&T Practice 363-205-100 for a description of these feature packages.

If trouble isolation is being performed on a Mode 96 system, the craft located at the CO terminal opposite the RT should use the maintenance document applicable for that equipment. This document should be used when the trouble has been isolated to the RT or when trouble clearing begins at the RT.

ALARMS

Together, the **BCU** (bank control unit) and **ADU** (alarm display unit) monitor failure modes within the system and monitor external conditions that may affect operation of the system. The **ADU** initiates alarm signals for office and remote alarms through the **AIU** (alarm interface unit). Office alarms guide repair technicians to the system in trouble. Some system troubles are not alarmed and are detected by customer trouble reports. When trouble has been determined to be with the Series 5 system, trouble analysis begins with an examination of alarm and status indicators on the system plug-ins or customer trouble reports. When depressed, the **ACO** switch on the **AIU** will turn off audible and visual office and remote (except ID) alarms and light the **ACO** LED on the **ADU**. The **ACO** LED will remain on until the trouble is cleared. Subsequent failures that cause new alarms automatically override the **ACO**.

CAUTION

Fan operation is essential to prevent system failures in those Series 5 RTs engineered and installed with fans. At the conclusion of all installation and maintenance activities, check that the FCUs (fan control units) for both systems in the dual channel bank are installed and that the fans operate properly. Press the FAN TEST pushbutton on each FCU to assure proper operation.

TROUBLE ANALYSIS PROCEDURES

A general knowledge of how the Series 5 system functions and what alarm LED indications mean will aid in performing TAPs (trouble analysis procedures). TAPs in this volume generally assume the following:

- The system is equipped with the plug-ins required to make an operating system
- There may be a single cause for multiple trouble indications
- Only a single trouble is assumed to exist.

In case of an alarmed system failure, the craft is first directed to the proper terminal (COT or RT) by an examination of **NE** (near end), **CLF** (carrier line failure), **FE** (far end), **PMN** (power minor), **MISC1**, and

MISC2 bank indicators. At the appropriate terminal the craft determines if the system alarm is **MJ** (major) or **MN** (minor) by examining **MJ** and **MN** indicators on the **ADU**. A further analysis of bank indicators results in the craft accessing a particular TAP to begin trouble clearing.

When maintenance for the system is the responsibility of a remote maintenance center, the center will respond to the initial system alarm and dispatch personnel to the appropriate location to clear trouble.

If an alarm indicates a specific trouble location such as minor, far end (**MN** and **FE** LEDs lighted), or minor, near end (**MN** and **NE** LEDs lighted), the remote maintenance center will dispatch personnel accordingly. At the trouble location, an analysis will be made of the trouble indicator LEDs. The IXL-100 will indicate the proper TAP for trouble clearing.

If an alarm at the RT indicates trouble on a digital line, personnel will be dispatched to the COT first to analyze alarm indicators and use trouble locating procedures to isolate the trouble.

If an alarm indication or trouble report at the remote center does not denote a specific trouble location, it is recommended that trouble analysis procedures begin at the COT.

Trouble clearing is based on replacement of plug-ins. Any options on replacement plug-ins must be set per the appropriate facility record. Whenever replacement of a plug-in does not cure the trouble, the original plug-in should be returned to operation.

Some codes of *SLC* Series 5 carrier system circuit packs have been discontinued and superseded by newer codes of circuit packs. Whenever a discontinued circuit pack that is installed in an RT or COT assembly must be replaced and an identical replacement circuit pack is not available, then the new circuit pack code should be used. The following list will assist in identifying the discontinued Series 5 circuit pack codes plus the circuit pack codes that supersede them:

- **AUA61**, **AUA62**, and **AUA64 LIUs** (line interface units) have been superseded by **AUA61B** or **AUA61C**, **AUA62B** or **AUA62C**, and **AUA64B** or **AUA64C LIUs**, respectively.
- The **AUA13 LSU** (line switch unit) has been superseded by the **AUA73 LSU**.
- The **MC97725A1 BCU** has been superseded by the **MC97755A1 BCU**.
- The **MC97726A1 BCU** has been superseded by the **MC97756A1 BCU**.
- The **AUA11 PCU** (power converter unit) has been superseded by the **AUA11B PCU**.
- The **AUB2 CTU** (channel test unit) has been superseded by the **AUB2B CTU**.
- The **3A RINGING GENERATOR** has been superseded by the **3C RINGING GENERATOR**.

If a COT or RT bank assembly is equipped with the DCU (digital connectivity unit) feature, all channel unit circuit packs in a digroup are replaced with one **DCU-L** (**AUA16**) and one **DCU-R** (**AUA17**) circuit pack, providing a DS1 port on the Series 5 system. The DCU detects incoming loss of signal, loss of frame, and excess line errors (yellow alarm and blue signal) on its DS1 input and provides the ability to transmit these yellow alarms and blue signals either upstream or downstream to notify other equipment on the DS1 facility that an alarm condition exists. The **DCU-L** and **DCU-R** circuit packs also contain LED indicators (**FAIL**, **FAILED INPUT**, and **INC**) that indicate when an internal DCU failure exists or when an alarm condition exists due to a failure external to the bank assembly.

The time interval between when a trouble is cleared and when the alarm LEDs go off is usually less than 35 seconds. When any combination of the **BCU** and the **ADU** at the COT and the **BCU** at the RT is

removed, the time interval may increase to 10 minutes on Series 5 systems equipped with FPC (Feature Package C) or FPD.

CAUTION:

Caution must be exercised in removal of plug-ins, initiation of loopbacks, and performance of other tests. Removal of a plug-in or activation of the wrong manual protection switch controls may cause service interruption.

With the introduction of additional features for the Series 5 system, it becomes imperative that maintenance personnel use care when making settings on replacement CPs (circuit packs) and ensure that the correct codes of replacement CPs are installed into the proper bay position at each end of the system. Failure to observe these cautions may result in immediate or future loss of service or may introduce errors into the digital bitstream. Accurate facility records should be used to determine correct CP code and bay position, and to make all CP option switch settings.

There are several indications that the craft may use to determine whether an error has been made during system maintenance:

When a new CP is installed at turnup or during maintenance, the CP's FAIL indicator (LED) should be observed to insure that it comes on momentarily, then goes off. The absence of this JPU (just powered up) indication should cause the craft to check for proper CP type, option settings, and location.

A misplaced or mis-set CP should always cause the associated digroup indicator (on the BCU) to light.

If the FAIL LED stays on following the replacement of a common unit (including DCU), the CP is probably failed, in the wrong position, or contains incorrectly set options. When the ADU LED TEST switch is depressed, if the FAIL LED on the unit goes off then the unit is installed in the wrong position or is failed. If the FAIL LED on the unit does not go off then the unit has been optioned incorrectly.

The following procedure may be used when a problem is indicated (as above) following replacement of a unit. A simple verification of craft error may be made as follows: While observing the FAIL LED on the unit just replaced, depress the ADU LED TEST switch. With the exception of a CTU and DTU, if the FAIL LED on the replaced CP does not light, a craft error of the type listed above is indicated. With the exception of a CTU, DTU, and mis-set ADU option switch, the FAIL LED on the CP that is mis-set will be off.

If, however, the ADU has just been replaced and a switch is mis-set so that the COT and RT ADU's are not in agreement, the FAIL LED on CPs other than the ADU may go off when the ADU LED TEST switch is depressed. This is because the ADU establishes the configuration for the local controller, so the local bank controller must take the ADU setting as correct. In any event, an extinguished FAIL LED tells the craft to recheck the last CP replaced for CP code, option switch settings, and for location.

WARNING

An electrostatic discharge wrist strap, with a minimum resistance of 250K Ohms, should be worn and connected to a suitable ground when handling Series 5 circuit packs to prevent possible damage to the circuit packs. Before using the wrist strap, check it for opens, shorts, and minimum resistance value. If the strap does not pass these checks it should not be used. To avoid possible personal injury while

using the wrist strap, do not connect it to the power shelf or adjacent portions of the RT frame. The RT fan unit has an ESD GRD jack for wrist strap connection.

CUSTOMER TROUBLE REPORTS

A customer trouble report is generally an unalarmed trouble and usually indicates a channel unit problem or distribution facility problem.

Single-party, multiparty, and coin service trouble reports are first received at the RSB (repair service bureau). The RSB uses MLT (mechanized loop testing) or a local test desk to test the circuit. The PGTC (pair gain test controller) can test channel unit pairs and report its results to the RSB while the MLT or local test desk provides access, via the dc test pair, to distribution cable for tests. If the PGTC reports a channel unit problem, a channel unit trouble report is initiated to the proper repair force and trouble analysis procedures begin at the COT. Unless further tests at the COT indicate otherwise, a replacement of the COT channel unit is performed first. Then if the trouble is still present, a replacement of the RT channel unit is made.

Special service trouble reports are received at the SSC (special services center). FPA and FPB provide 2-wire locally switched special services and coin service. In addition to FPA service features, FPC and FPD provide 4-wire special services and data service. A Series 5 bank may also be equipped for DCU (digital connectivity unit) capabilities and a Series 5 bank equipped with FPD provides LBRV (low bit rate voice) capabilities. The CIU (craft interface unit) is used to provision the special service channel units. The PGTC can be used for testing systems equipped with FPA, FPB, FPC, or FPD. In addition to the test features of the PGTC, the XTC (extended test controller) allows enhanced testing capabilities including remote testing of special service channels. Trouble reports on *SPOTS*® channel unit served circuits should be referred to the RSB for testing and dispatch. The SSC would retain responsibility for tracking and clearing the trouble.

When a *SPOTS* channel unit trouble is isolated by the PGTC to channel unit pairs, further testing is required from the COT. Further testing may indicate a dispatch to the RT is required. TAPs in this section detail tests required on *SPOTS* channel units.

The *SLC* Series 5 carrier system Channel Unit Installation AT&T TOP Practice 363-205-402 contains procedures to install and test channel units. These procedures can be used to clear in-service special service troubles by performing the tasks to add channel service for the type of channel unit that has trouble. These procedures will clear the trouble conditions if the *SLC* Series 5 carrier system is causing the problem. Customer equipment, drop pairs, or central office (or network) equipment can also cause the trouble condition.

CONCLUSION

When procedures of this volume do not locate the trouble, an obscure trouble or multiple troubles are assumed to exist. The necessary SDs, CDs, etc. should be available to assist in locating an obscure wiring problem.

CLEAR SYSTEM ALARM AT COT OR RT

1. Are you at the RT?

   If **YES,** then proceed to Step **5.**
   If **NO,** then continue with Step **2.**

2. ***Note:*** A Mode 96 system has a Series 5 RT equipped with FPB (Feature Package B) at one end and a *SLC* 96 carrier system COT, SLIM, LM12, or *5ESS* switch DCLU at the CO end.

   Are you clearing trouble in a mode 96 system?

   If **YES,** then continue with Step **3.**
   If **NO,** then proceed to Step **4.**

3. You have completed this procedure. Clear trouble using *SLC* 96 carrier system maintenance document.

4. At the COT, depress **ACO** pushbutton on COT **AIU.**

   Response: At **ADU, ACO** LED is lighted and all audible and visual CO alarms and all remote alarms (except ID) are cleared.

5. Is **NE** LED on **ADU** lighted?

   If **YES,** then proceed to Step **21.**
   If **NO,** then continue with Step **6.**

6. Are any **CLF** LEDs lighted on **LIUs**?

   If **YES,** then continue with Step **8.**
   If **NO,** then proceed to Step **7.**

7. Are any **TRU ON PROT** indicators lighted?

   If **YES,** then proceed to **TAP-103.**
   If **NO,** then proceed to Step **23.**

8. Are you at the RT?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **21.**

9. ***Note:*** A Mode 96 system has a Series 5 RT equipped with FPB at one end and a *SLC* 96 carrier system COT, SLIM, LM12, or *5ESS* switch DCLU at the CO end.

   Is RT a Mode 96 (FPB) RT?

   If **YES,** then **Clear trouble using *SLC* 96 carrier system maintenance documentation.**
   If **NO,** then continue with Step **10.**

10. If you do not have a protection line, proceed to Step **12.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the lighted **CLF** LED.

11. Operate the **f** switch to the **ON** position.

12. ***Caution: Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** with the lighted **CLF** LED.

    Reference: **DLP-518**

13. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **18.**

14. Depress **ADU LED TEST** pushbutton.

15. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **16.**
    If **YES,** then proceed to Step **17.**

16. Replace **LIU** and repeat from Step **13.**

    Reference: **DLP-518**

17. Option switch (**32/64**) on **LIU** set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU** and repeat from Step **13.**

18. If you do not have a protection line, proceed to Step **19.** Operate appropriate **f** switch on **LSU** to off.

19. Did the trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **20.**

20. Go to COT and repeat from Step **4.**

21. Is **MJ** LED on **ADU** lighted?

    If **YES,** then do **TAP-102.**
    If **NO,** then continue with Step **22.**

22. Is **MN** LED on **ADU** lighted?

    If **YES,** then do **TAP-103.**
    If **NO,** then do **TAP-110.**

23. Is **FE** LED on **ADU** lighted?

    If **YES,** then continue with Step **24.**
    If **NO,** then proceed to Step **25.**

24. Go to other end of system and repeat from Step **1.**

25. Are any **FAIL** LEDs lighted?

    If **YES,** then continue with Step **26.**
    If **NO,** then proceed to Step **40.**

26. Is **FAIL** LED lighted on any **LIU**?

    If **YES,** then continue with Step **27.**
    If **NO,** then proceed to Step **38.**

27. If you do not have a protection line, proceed to Step **29.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with **FAIL** indicator lighted.

28. Operate the **f** switch to the **ON** position.

29. ***Caution: Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** with **FAIL** indicator lighted.

    Reference: **DLP-518**

30. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **31.**
    If **NO,** then proceed to Step **35.**

31. Depress **ADU LED TEST** pushbutton.

32. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **33.**
    If **YES,** then proceed to Step **34.**

33. Replace **LIU** and repeat from Step **30.**

    Reference: **DLP-518**

34. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **30.**

35. If you do not have a protection line, proceed to Step **36.** Operate appropriate **f** switch on **LSU** to OFF.

36. Did system alarms clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **37.**

37. Are any other **FAIL** LEDs lighted?

    If **YES,** then continue with Step **38.**
    If **NO,** then proceed to Step **40.**

38. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a SLC 96 carrier system COT.***

Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LIU, or LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced, up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

Replace circuit pack with lighted **FAIL** LED.

Reference: **DLP-515 (LSU)**

Reference: **DLP-516 (ADU)**

Reference: **DLP-517 (AIU)**

39. Did system alarms clear?

If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO,** then continue with Step **40.**

40. Are you clearing trouble in Mode 96 system?

If **YES,** then **at COT, clear trouble using *SLC* 96 carrier system maintenance documentation.**
If **NO,** then continue with Step **41.**

41. At **ADU** depress **LED TEST** pushbutton.

42. Did **FAIL** indicator on all **LIUs** light?

If **YES,** then proceed to Step **54.**
If **NO,** then continue with Step **43.**

43. If you do not have a protection line, proceed to Step **45.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the **FAIL** indicator that did not light.

44. Operate the **f** switch to the **ON** position.

45. ***Caution: Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

Replace **LIU** with **FAIL** indicator that did not light.

Reference: **DLP-518**

46. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **47.**
    If **NO,** then proceed to Step **51.**

47. Depress **ADU LED TEST** pushbutton.

48. Does **FAIL** LED on **LIU** go off?

    If **YES,** then proceed to Step **50.**
    If **NO,** then continue with Step **49.**

49. Replace **LIU** and repeat from Step **46.**

    Reference: **DLP-518**

50. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **46.**

51. If you do not have a protection line, proceed to Step **52.** Operate appropriate **f** switch on **LSU** to OFF.

52. Did system alarms clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **53.**

53. At **ADU** depress **LED TEST** pushbutton.

54. Are **FAIL** indicators on **ADU**, **BCU**, **TRU**, **LSU**, and **TCUs** (if present) lighted?

    If **YES,** then proceed to Step **57.**
    If **NO,** then continue with Step **55.**

55. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a* SLC *96 COT.***

Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LIU, or LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced, up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

With the exception of a **CTU** and **DTU** circuit pack, replace circuit pack(s) that have **FAIL** indicators that do not light.

Reference: **DLP-515 (LSU)**

Reference: **DLP-516 (ADU)**

56. Did system alarms clear?

If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO,** then continue with Step **57.**

57. ***Caution: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record.***

Replace **AIU** at COT.

Reference: **DLP-517**

58. Did system alarms clear?

If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO,** then continue with Step **59.**

59. Use SD-7C115 and SD-7C116 at COT or SD-7C117 and SD-7C118 at RT to locate trouble.

CLEAR MAJOR ALARMS

1. ***Note:*** A Mode 96 system has a Series 5 RT equipped with FPB (feature package B) at one end and a SLC 96 carrier system COT, SLIM, LM12, or 5ESS switch DCLU at the CO end.

   Are you clearing trouble in a Mode 96 system?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **4.**

2. Are you at the RT?

   If **YES,** then proceed to Step **4.**
   If **NO,** then continue with Step **3.**

3. You have completed this procedure. Clear trouble using applicable SLC 96 carrier system maintenance document.

4. Is **FAIL** LED on both **BCU** and **ADU** lighted?

   If **YES,** then do **TAP-104.**
   If **NO,** then continue with Step **5.**

5. Is **FAIL** LED on **ADU** lighted?

   If **YES,** then do **TAP-105.**
   If **NO,** then continue with Step **6.**

6. Are you at the RT?

   If **YES,** then continue with Step **7.**
   If **NO,** then proceed to Step **9.**

7. Are **NE** and all **DIGROUP** LEDs lighted?

   If **YES,** then do **TAP-113.**
   If **NO,** then continue with Step **8.**

8. Are all **DIGROUP** and all **CLF** LEDs lighted?

   If **YES,** then do **TAP-114.**
   If **NO,** then continue with Step **9.**

9. Is **DIGROUP A, B, C,** or **D** and **CLF** lighted?

   If **YES,** then proceed to Step **11.**
   If **NO,** then continue with Step **10.**

10. Is **DIGROUP A, B, C,** or **D** lighted?

    If **YES,** then do **TAP-106.**
    If **NO,** then proceed to Step **12.**

11. Are you at a Mode 96 (FPB) RT?

    If **YES,** then **at COT, clear trouble using applicable SLC 96 carrier system documentation.**
    If **NO,** then do **TAP-107.**

12. Is **MISC 1** or **MISC 2** LED lighted?

    If **YES,** then do **TAP-111.**
    If **NO,** then continue with Step **13.**

13. Is **NE** LED lighted?

    If **YES,** then do **TAP-124.**
    If **NO,** then continue with Step **14.**

14. Is any digroup in this bank equipped with **DCU-L (AUA16)** and **DCU-R (AUA17)** circuit packs?

    If **YES,** then continue with Step **15.**
    If **NO,** then proceed to Step **17.**

15. Is **FAIL** indicator on **DCU-L** or **DCU-R** lighted?

    If **YES,** then do **TAP-125.**
    If **NO,** then continue with Step **16.**

16. Is **INC** indicator on **DCU-R** or **FAILED INPUT** indicator on **DCU-L** lighted?

    If **YES,** then do **TAP-126.**
    If **NO,** then continue with Step **17.**

17. ***Note:*** If LEDs at COT indicate PMN, FE alarm condition; suspect loss of AC power and dead batteries at RT.

    Use local procedures to clear condition(s) that caused alarm to activate.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MINOR ALARMS

1. Is **PMN** LED lighted on **BCU**?

   If **YES,** then do **TAP-110.**
   If **NO,** then continue with Step **2.**

2. ***Note:*** A Mode 96 system has a Series 5 RT equipped with FPB (Feature Package B) at one end and a *SLC* 96 carrier system COT, SLIM, LM12, or *5ESS* switch DCLU at the CO end.

   Are you clearing trouble in a Mode 96 system?

   If **YES,** then continue with Step **3.**
   If **NO,** then proceed to Step **5.**

3. Are you at RT end of system?

   If **YES,** then proceed to Step **5.**
   If **NO,** then continue with Step **4.**

4. You have completed this procedure. Clear trouble using *SLC* 96 carrier system maintenance document.

5. Is **FAIL** LED on both **BCU** and **ADU** lighted?

   If **YES,** then do **TAP-104.**
   If **NO,** then continue with Step **6.**

6. Is **FAIL** LED on **ADU** lighted?

   If **YES,** then do **TAP-105.**
   If **NO,** then continue with Step **7.**

7. Is **ON PROT** LED on any **TRU** lighted?

   If **YES,** then continue with Step **8.**
   If **NO,** then proceed to Step **10.**

8. Is **CLF** LED on any **LIU** lighted?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **10.**

9. Are you at a Mode 96 (FPB) RT?

   If **YES,** then **at COT, clear trouble using *SLC* 96 carrier system maintenance documentation.**
   If **NO,** then do **TAP-107.**

10. Are **MISC 1** or **MISC 2** LEDs lighted?

    If **YES,** then do **TAP-111.**
    If **NO,** then continue with Step **11.**

11. Are you at the COT?

    If **YES,** then continue with Step **12.**
    If **NO,** then proceed to Step **13.**

12. Which COT indicators are lighted?

    If **MN AND NE (ON PROT LEDS NOT LIGHTED),** then do **TAP-124.**
    If **MN AND FE (ON PROT LEDS NOT LIGHTED),** then do **TAP-109.**
    If **MN, NE, AND ON PROT,** then do **TAP-108.**
    If **MN AND ON PROT,** then do **TAP-119.**
    If **NONE LIGHTED,** then proceed to Step **14.**

13. Which RT indicators are lighted?

    If **MN AND NE (ON PROT LEDS NOT LIGHTED),** then do **TAP-109.**
    If **MN, NE, AND ON PROT,** then do **TAP-108.**
    If **MN AND ON PROT,** then do **TAP-118.**
    If **NONE LIGHTED,** then continue with Step **14.**

14. Use local procedures to clear condition(s) that caused alarm to activate.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR OR MINOR ALARM AT COT OR RT - MJ OR MN, BCU FAIL AND ADU FAIL LEDS LIGHTED

1. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a SLC 96 carrier system COT.***

   Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record.

   Note: In systems equipped with FPC (Feature Package C), FPC2, or FPD; if the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced, up to 10 minutes may be required for fail and status indicators to return to normal. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

   Remove **BCU** and install replacement **BCU**.

2. Did **BCU FAIL** LED extinguish?

   If **YES,** then continue with Step **3.**
   If **NO,** then proceed to Step **4.**

3. Did alarm clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **4.**

4. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a SLC 96 carrier system COT.***

   Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

   Note: In systems equipped with FPC, FPC2, or FPD; if the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced, up to 10 minutes may be required for fail and status indicators to return to normal. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU. However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

   Remove **ADU** and install a replacement **ADU**.

   Reference: **DLP-516**

5. Did alarm clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **6.**

6. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated.

   Use SD-7C115 and SD-7C116 if at COT or SD-7C117 and 7C118 if at RT to locate trouble.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR OR MINOR ALARM AT COT OR RT - MJ OR MN, AND ADU FAIL LEDS LIGHTED

1. Is fuse blown on **CFU**, **LFU**, or **BFU** (RT bulk power or FTTH)?

   If **YES**, then continue with Step **2.**
   If **NO**, then proceed to Step **5.**

2. ***Caution:*** ***Removal of CFU or LFU can cause loss of service. When the blown fuse is removed, replace with a good fuse within 20 seconds or alarms will be indicated again.***

   Replace blown fuse.

3. Did trouble indicators extinguish within 35 seconds?

   If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO**, then continue with Step **4.**

4. Did fuse blow again?

   If **YES**, then continue with Step **5.**
   If **NO**, then proceed to Step **7.**

5. Are you performing maintenance at a Mode 96 (FPB) RT?

   If **YES**, then proceed to Step **11.**
   If **NO**, then continue with Step **6.**

6. ***Note:*** Disregard option switches **7** and **8.**

   Remove **ADU** and check position of option switches on **S2** against **ADU** option switches at far end location (COT or RT).

7. Are **ADU** option settings at both locations the same?

   If **YES**, then proceed to Step **11.**
   If **NO**, then continue with Step **8.**

8. ***Caution:*** ***Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

   Set option switches on both **ADU**s to the same position per office records.

9. Reinstall **ADU**s at each end of system.

10. ***Note:*** When the system is equipped with FPC (Feature Package C), FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated.

    Did trouble indicators extinguish within 35 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **11.**

11. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a* SLC *96 carrier system COT.***

    Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to those on circuit pack that was removed. Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

    Note: In systems equipped with FPC, FPC2, or FPD; if the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced, up to 10 minutes may be required for fail and status indicators to return to normal.

    Remove **ADU** and install a replacement **ADU.**

12. Replace blown fuse, if necessary.

13. ***Note:*** When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated.

    Did trouble indicators extinguish within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **14.**

14. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated.

    Use SD-7C115 and SD-7C116 if at COT or SD-7C117 and SD-7C118 if at RT to locate trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR ALARM AT COT OR RT - MJ, NE, AND ANY DIGROUP LED LIGHTED

1. ***Note:*** If you have Mode 96 system (FPB), this procedure can only be done at the RT. Use applicable *SLC* 96 carrier documentation to clear COT trouble.

   At **CFU**, **LFU**, or **BFU** (RT bulk power or FTTH) are any fuses blown?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **4.**

2. ***Caution: Removal of CFU or LFU can cause loss of service. When the blown fuse is removed, replace with a good fuse within 20 seconds or alarms will be indicated again.***

   Replace blown fuse.

3. Did alarm clear within 20 seconds?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **4.**

4. Is **FAIL** LED lighted on any **LIU**?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **16.**

5. If you do not have a protection line, proceed to Step **7.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with **FAIL** indicator lighted.

6. Operate the **f** switch to the **ON** position.

7. Replace **LIU** with **FAIL** indicator lighted.

   Reference: **DLP-518**

8. Does **FAIL** LED on **LIU** light and remain lighted?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **13.**

9. Depress **ADU LED TEST** pushbutton.

10. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **11.**
    If **YES,** then proceed to Step **12.**

11. Replace **LIU** and repeat from Step **8.**

    Reference: **DLP-518**

12. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **8.**

13. If you do not have a protection line, proceed to Step **14.** Operate appropriate **f** switch on **LSU** to OFF.

14. Replace fuse if blown again.

15. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **16.**

16. Are any **FAIL** LEDs lighted on **TRUs, PCUs,** or **TCUs** (if present)?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **20.**

17. ***Caution 1: Before removing a PCU from an RT shelf, locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the –20 HZ/AB (if PCU is in AB shelf) or the –20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.***

    Caution 2: On this TAP and all subsequent TAPs, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

    Replace circuit pack(s) that has **FAIL** LED lighted.

18. Replace fuse if blown again.

19. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **20.**

20. At **ADU** depress **LED TEST** pushbutton.

21. Are **FAIL** LEDs on all **LIUs** lighted?

    If **YES,** then proceed to Step **34.**
    If **NO,** then continue with Step **22.**

22. If you do not have a protection line, proceed to Step **24.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the **FAIL** indicator that did not light.

23. Operate the **f** switch to the **ON** position.

24. Replace **LIU** with **FAIL** indicator that did not light.

    Reference: **DLP-518**

25. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **26.**
    If **NO,** then proceed to Step **30.**

26. Depress **ADU LED TEST** pushbutton.

27. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **28.**
    If **YES,** then proceed to Step **29.**

28. Replace **LIU** and repeat from Step **25.**

    Reference: **DLP-518**

29. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **25.**

30. If you do not have a protection line, proceed to Step **31.** Operate appropriate **f** switch on **LSU** to OFF.

31. Replace fuse if blown again.

32. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **33.**

33. At **ADU** depress **LED TEST** pushbutton.

34. Are all **FAIL** LEDs on **ADU**, **BCU**, **TRU**, **LSU**, and **TCU**s (if present) lighted?

    If **YES,** then proceed to Step **38.**
    If **NO,** then continue with Step **35.**

35. ***Caution 1: Removal of the ADU or BCU at a Mode 96 (FPB) RT will result in loss of service on the A digroup if the far end is a* SLC *96 carrier system COT.***

Caution 2: On this TAP and on all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

Replace circuit pack(s) that have **FAIL** LEDs that do not light (excluding **CTU** and **DTU** circuit packs).

Reference: **DLP-515 (LSU)**

Reference: **DLP-516 (ADU)**

36. Replace fuse if blown again.

37. Did alarm clear?

If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO,** then continue with Step **38.**

38. ***Caution 1: Before removing a PCU from an RT shelf, locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the –20 HZ/AB (if PCU is in AB shelf) or the –20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.***

Caution 2: On this TAP and all subsequent TAPs, insure that any option switches are set identical to the data on the facility record.

Replace **PCU** associated with failed digroup(s).

39. Replace fuse if blown again.

40. Did alarm clear?

If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
If **NO,** then continue with Step **41.**

41. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated.

If replacement fuse blows, unseat all channel units and reseat them, one at a time, until channel unit that causes fuse to blow is found. If trouble was not with a channel unit, use SD-7C115 and SD-7C116 if at COT or SD-7C117 and SD-7C118 if at RT to locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR CLF ALARM AT COT OR RT - MJ OR MN, DIGROUPS A, B, C, OR D, AND CLF LEDS LIGHTED

1. ***Note:*** If you have Mode 96 system (FPB), this procedure can only be done at the RT. Use applicable *SLC* 96 carrier documentation to clear COT trouble.

   If you do not have a protection line, proceed to Step **3.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the lighted **CLF** LED.

2. Operate the **f** switch to the **ON** position.

3. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

   Replace **LIU** with the lighted **CLF** LED.

   Reference: **DLP-518**

4. Does **FAIL** LED on **LIU** light and remain lighted?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **9.**

5. Depress **ADU LED TEST** pushbutton.

6. Does **FAIL** LED on **LIU** go off?

   If **NO,** then continue with Step **7.**
   If **YES,** then proceed to Step **8.**

7. Replace **LIU** and repeat from Step **4.**

   Reference: **DLP-518**

8. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **4.**

9. If you do not have a protection line, proceed to Step **10.** Operate appropriate **f** switch on **LSU** to off.

10. Did **CLF** indicator on **LIU** go off?

    If **YES,** then continue with Step **11.**
    If **NO,** then proceed to Step **14.**

11. Unplug and reinsert the **ADU**.

12. Is **CLF** indicator on **LIU** lighted?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **13.**

13. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **14.**

14. Is transmission facility T1 line or other carrier facility?

    If **T1 LINE,** then proceed to Step **16.**
    If **OTHER CARRIER FACILITY,** then continue with Step **15.**

15. Refer to trouble clearing documentation for that facility.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

16. ***Note:*** Alarm indicator pattern indicates a failed carrier line.

    Is fault locating to be performed on T1 lines at this time?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **21.**

17. Are single-ended fault-locating procedures to be performed from COT on lines with line-powering LIUs?

    If **YES,** then do **TAP-115.**
    If **NO,** then continue with Step **18.**

18. Are double-ended fault-locating procedures to be performed from COT on Side 1 with line-powering LIUs?

    If **YES,** then do **TAP-115.**
    If **NO,** then continue with Step **19.**

19. Are double-ended fault-locating procedures to be performed from RT on Side 2?

    If **YES,** then do **TAP-118.**
    If **NO,** then continue with Step **20.**

20. Are fault-locating procedures to be performed from a DSX Cross-Connect?

    If **YES,** then do **TAP-119.**
    If **NO,** then continue with Step **21.**

21. If you do not have a protection line, proceed to Step **23.** At RT **LSU** faceplate, locate **f** switch that is associated with digroup in alarm.

22. Operate the **f** switch to the **ON** position.

23. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** associated with digroup in alarm.

    Reference: **DLP-518**

24. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **25.**
    If **NO,** then proceed to Step **29.**

25. Depress **ADU LED TEST** pushbutton.

26. Does **FAIL** LED on **LIU** go off?

    If **YES,** then proceed to Step **28.**
    If **NO,** then continue with Step **27.**

27. Replace **LIU** and repeat from Step **24.**

    Reference: **DLP-518**

28. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **24.**

29. If you do not have a protection line, proceed to Step **30.** Operate appropriate f switch on **LSU** to off.

30. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **31.**

31. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated. Fault location procedures should be performed on T1 line unless performed previously.

    Use SD-7C115 and SD-7C116 to locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MINOR ALARM AT COT OR RT - MN AND ANY DIGROUP ON PROT LED LIGHTED

1. Is **FAIL** LED lighted on any **LIU**?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **12.**

2. At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with **FAIL** indicator lighted.

3. Operate the **f** switch to the **ON** position.

4. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

   Replace **LIU** with **FAIL** indicator lighted.

   Reference: **DLP-518**

5. Does **FAIL** LED on **LIU** light and remain lighted?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **10.**

6. Depress **ADU LED TEST** pushbutton.

7. Does **FAIL** LED on **LIU** go off?

   If **NO,** then continue with Step **8.**
   If **YES,** then proceed to Step **9.**

8. Replace **LIU** and repeat from Step **5.**

   Reference: **DLP-518**

9. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **5.**

10. Operate appropriate **f** switch on **LSU** to OFF.

11. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **12.**

12. Is **FAIL** LED lighted on either **TRU**?

    If **YES,** then continue with Step **13.**
    If **NO,** then proceed to Step **15.**

13. Replace **TRU** that has **FAIL** LED lighted.

14. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **15.**

15. Are any force (**f**) or deny (**d**) switches on **LSU** set to **ON** (left) position?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **18.**

16. ***Caution: Changing position of force and deny switches can cause service interruption on a digroup. Make sure that force or deny is no longer needed before returning switch to the normal position.***

    Return force and deny switches to their OFF (right) positions.

17. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **18.**

18. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LSU.**

    Reference: **DLP-515**

19. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **20.**

20. At **ADU** depress **LED TEST** pushbutton.

21. Are **FAIL** LEDs on all **LIUs** lighted?

    If **YES,** then proceed to Step **33.**
    If **NO,** then continue with Step **22.**

22. At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the **FAIL** indicator that did not light.

23. Operate the **f** switch to the **ON** position.

24. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** with **FAIL** indicator that did not light.

    Reference: **DLP-518**

25. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **26.**
    If **NO,** then proceed to Step **30.**

26. Depress **ADU LED TEST** pushbutton.

27. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **28.**
    If **YES,** then proceed to Step **29.**

28. Replace **LIU** and repeat from Step **25.**

    Reference: **DLP-518**

29. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **25.**

30. Operate appropriate **f** switch on **LSU** to OFF.

31. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **32.**

32. At **ADU** depress **LED TEST** pushbutton.

33. Are all **FAIL** LEDs on **ADU**, **BCU**, **TRU**, and **TCUs** (if present) lighted?

    If **YES,** then proceed to Step **36.**
    If **NO,** then continue with Step **34.**

34. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

    Replace circuit pack(s) that have **FAIL** LEDs that do not light (excluding **CTU** and **DTU** circuit packs).

    Reference: **DLP-516**

35. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **36.**

36. At **LSU** faceplate, locate **f** switch that is associated with digroup on protection.

37. Operate the **f** switch to the **ON** position.

38. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** that is associated with digroup on protection.

    Reference: **DLP-518**

39. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **40.**
    If **NO,** then proceed to Step **44.**

40. Depress **ADU LED TEST** pushbutton.

41. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **42.**
    If **YES,** then proceed to Step **43.**

42. Replace **LIU** and repeat from Step **39.**

    Reference: **DLP-518**

43. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **39.**

44. Operate appropriate **f** switch on **LSU** to OFF.

45. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **46.**

46. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated.

    Use SD-7C115 and SD-7C116 at the COT or SD-7C117 and SD-7C118 at the RT to locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MINOR ALARM AT RT - MN AND NE LEDS LIGHTED, ON PROT LEDS NOT LIGHTED

1. What type of RT configuration do you have?

   If **DISTRIBUTED POWER SHELF (J1C182BA),** then continue with Step **2.**
   If **80E CABINET WITH BULK POWER PLANT,** then proceed to Step **3.**
   If **FRAME TYPE BULK POWER SHELF (J1C182BB),** then proceed to Step **4.**

2. ***Note:*** **OPEN BATT**, main **RINGING GENERATOR FAIL**, **RECTIFIER** failure, and **FAN ALARM** are the only items from RT power plant that can cause a minor alarm.

   Is **OPEN BATT** LED on the **337A BATTERY CHARGER**, **FAIL** LED on the main **3C** or **3A RINGING GENERATOR**, or **FAN ALARM** LED on the fan assembly lighted?

   If **YES,** then do **TAP-112.**
   If **NO,** then proceed to Step **5.**

3. Is **RMN** LED on the **AUG3 RINGING CONTROL UNIT**, **FAIL** LED on either **3C** or **3A RINGING GENERATOR**, or **FAN ALARM** LED on the fan unit lighted or is **NORMAL** LED on control and distribution panel off?

   If **YES,** then do **TAP-130.**
   If **NO,** then proceed to Step **5.**

4. Is **FAIL** LED on either **3C** or **3A RINGING GENERATORs** or **FAN ALARM** LED on the fan unit lighted?

   If **YES,** then do **TAP-112.**
   If **NO,** then continue with Step **5.**

5. Are **FAIL** LEDs lighted on protection **LIU, LSU**, or the facility shelf **PCU**?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **8.**

6. ***Caution 1: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

   Caution 2: If it is necessary to replace a PCU at an RT location, the PCU should not be removed from the shelf until the correct CFU fuse has been removed. Locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.

   Replace circuit pack that has **FAIL** LED lighted.

   Reference: **DLP-515 (LSU)**

   Reference: **DLP-518 (LIU)**

7. ***Note:*** If protection **LIU FAIL** LED is lighted, and replacing **LIU** does not clear the alarm, reinstall original **LIU** and replace the **LSU**.

   Did alarm clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **8.**

8. Is **BCU FAIL** LED lighted?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **11.**

9. ***Note:*** When the system is equipped with FPC or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

   Replace **BCU**.

10. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **13.**

11. ***Note:*** When the system is equipped with FPC or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU (craft interface unit). However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

    Reinsert original **BCU** (if removed) and replace **TRU**-AB circuit pack.

12. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **13.**

13. If you do not have a protection line, proceed to Step **16.** Are any force (**f**) or deny (**d**) switches set to **ON** (left) position on **LSU**?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **16.**

14. ***Caution: Changing position of force and deny switches can cause service interruption on a digroup. Make sure that force or deny is no longer needed before returning switch to the normal position.***

    Return option switches to their OFF (right) positions.

15. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **16.**

16. At **ADU,** depress the **LED TEST** pushbutton.

17. Are **FAIL** LEDs on all **LIUs** lighted?

    If **YES,** then proceed to Step **29.**
    If **NO,** then continue with Step **18.**

18. If you do not have a protection line or if protection LIU FAIL is lighted, proceed to Step **20.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with the **FAIL** indicator that did not light.

19. Operate the **f** switch to the **ON** position.

20. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LIU** with **FAIL** indicator that did not light.

    Reference: **DLP-518**

21. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **22.**
    If **NO,** then proceed to Step **26.**

22. Depress **ADU LED TEST** pushbutton.

23. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **24.**
    If **YES,** then proceed to Step **25.**

24. Replace **LIU** and repeat from Step **21.**

    Reference: **DLP-518**

25. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **21.**

26. If you do not have a protection line or if protection LIU was replaced, proceed to Step **27.** Operate appropriate **f** switch on **LSU** to OFF.

27. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **28.**

28. At **ADU**, depress the **LED TEST** pushbutton.

29. Are all **FAIL** LEDs on **ADU**, **BCU**, **TRU**, **LSU**, and **TCUs** (if present) lighted?

    If **YES,** then proceed to Step **32.**
    If **NO,** then continue with Step **30.**

30. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Note: When the system is equipped with FPC or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU/ADU** at the COT or **BCU** at the RT), it is recommended that all three plug-ins be replaced and the system reinitialized using the CIU. However, when the system is reinitialized, all channel units in the COT and RT dual bank assemblies must be reprovisioned.

    Replace circuit pack(s) that has **FAIL** LED that does not light (excluding **CTU** and **DTU** circuit packs).

    Reference: **DLP-515 (LSU)**

    Reference: **DLP-516 (ADU)**

31. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **32.**

32. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace **LSU**.

    Reference: **DLP-515**

33. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **34.**

34. ***Caution 1: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record.***

    Caution 2: If it is necessary to replace a PCU at an RT location, the PCU should not be removed from the shelf until the correct CFU fuse has been removed. Locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.

    Replace facility shelf **PCU.**

35. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **36.**

36. Is RT located in an 80E cabinet with bulk power plant?

    If **YES,** then do **TAP-130.**
    If **NO,** then continue with Step **37.**

37. Perform CLEAR MINOR ALARM procedure using **TAP-112.**

CLEAR POWER MINOR ALARM AT RT - PMN LED LIGHTED

1. What type of RT configuration do you have?

   If **80E CABINET WITH BULK POWER PLANT,** then do **TAP-129.**
   If **FTTH OR BULK POWER SHELF (J1C182BB),** then continue with Step **2.**
   If **DISTRIBUTED POWER SHELF (J1C182BA),** then proceed to Step **3.**

2. Use documentation for your bulk power to clear trouble. Check ac circuit breakers, and verify ac power is present at the RT enclosure.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE.

3. Using DMM (digital multimeter), measure incoming AC voltage by using **AC** and **GND** jacks on **LDU** faceplate.

4. Is measured AC voltage between 105 and 129 volts?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **13.**

5. Is **FAIL** LED lighted on any **336A RECTIFIER**s at RT?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **8.**

6. Replace **336A RECTIFIER**s that have **FAIL** LED lighted.

7. Did alarm clear within 20 seconds?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then proceed to Step **20.**

8. Is **BAT DISCHG** LED lighted on any **337A BATTERY CHARGER**(s)?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **20.**

9. Replace one **336A RECTIFIER**.

10. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **11.**

11. Replace another **336A RECTIFIER**.

12. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

If **NO,** then proceed to Step **20.**

13. Is fuse blown or circuit breaker tripped at RT main AC circuit breaker box?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **17.**

14. Replace blown fuse or reset circuit breaker.

15. Does fuse blow or circuit breaker trip again?

    If **YES,** then proceed to Step **20.**
    If **NO,** then continue with Step **16.**

16. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **20.**

17. Contact local power company if loss of AC power has occurred or if there is overvoltage or undervoltage condition.

18. Does local power company verify abnormal power condition?

    If **YES,** then continue with Step **19.**
    If **NO,** then proceed to Step **20.**

19. Estimate restoration time for AC power. If necessary, equip RT with fully charged batteries or other power source to maintain power until AC power is restored.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

20. ***Note:*** If alarms remain, multiple troubles exist and trouble analysis must be repeated.

Use SD-7C117 and SD-7C118 to locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR OR MINOR ALARM - MJ OR MN, MISC 1 OR MISC 2 LEDS LIGHTED AT RT

1. From system records, determine type of alarm that is reported to **MISC 1** or **MISC 2** at COT.
2. Use local procedures to clear condition(s) that caused alarm to activate at RT.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MINOR ALARM - MN AND NE LEDS LIGHTED AT RT - NO DIGROUP LEDS LIGHTED

1. Are there any blown fuses on battery shelf or **BFU** (for bulk powering or FTTH)?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **4.**

2. Replace blown fuse(s).

3. Does alarm clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **4.**

4. Is bulk power (J1C182BB bulk power shelf or FTTH) being used?

   If **YES,** then proceed to Step **25.**
   If **NO,** then continue with Step **5.**

5. Is **OPEN BATT** LED on **337A BATTERY CHARGER** lighted at RT battery shelf?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **25.**

6. Condition DMM (digital multimeter) to measure voltage.

7. Measure voltage at **-48B** and **GND** and **-48L** and **GND** jacks on the **LDU** faceplate.

8. Does voltage measure between -42 and -58 volts?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **18.**

9. Use SD-7C119 to check wiring between **337A BATTERY CHARGER** and batteries.

10. Was a problem found in wiring?

    If **YES,** then continue with Step **11.**
    If **NO,** then proceed to Step **12.**

11. Correct wiring problem and proceed to Step **17.**

12. Is fuse blown on **337A BATTERY CHARGER**?

    If **YES,** then continue with Step **13.**
    If **NO,** then proceed to Step **14.**

13. Replace **337A BATTERY CHARGER** and proceed to Step **17.**

14. Is **BAT DISCHG** LED on **337A BATTERY CHARGER** lighted?

    If **YES,** then continue with Step **15.**
    If **NO,** then proceed to Step **13.**

15. Depress and hold **HIGH RATE CHG ACTIVATE** pushbutton on **337A BATTERY CHARGER**. Is **BAT DISCHG** LED lighted?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **13.**

16. ***Note:*** **HIGH RATE CHG ON** LED will remain lighted until batteries reach approximately –58 volts. If batteries are completely discharged, it may take approximately one day for **HIGH RATE CHG ON** LED to go out.

    Release **HIGH RATE CHG ACTIVATE** pushbutton. Does **BAT DISCHG** LED go off and is **HIGH RATE CHG ON** LED lighted?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **13.**

17. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **23.**

18. Use DMM to measure voltage at battery shelf jacks **J5** (**+BAT**) and **J6** (**-BAT**).

19. Does voltage measure between –42 and –58 volts?

    If **YES,** then proceed to Step **9.**
    If **NO,** then continue with Step **20.**

20. Is **197A BATTERY LOAD TEST SET** available for use in testing batteries?

    If **YES,** then continue with Step **21.**
    If **NO,** then proceed to Step **23.**

21. Test batteries using **197A** test set.

    Reference: **DLP-520**

22. Replace any failed battery pack(s) and reconnect battery leads to battery shelf and proceed to Step **24.**

23. Replace battery packs one at a time until –48 volts is present at output jacks on battery shelf.

24. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **25.**

25. Is **FAN ALARM** LED lighted on a fan assembly?

    If **YES,** then continue with Step **26.**
    If **NO,** then proceed to Step **39.**

26. Remove **FAN H** and **FAN L** fuses on corresponding **BFU** on power shelf. Are fuses blown?

    If **YES,** then continue with Step **27.**
    If **NO,** then proceed to Step **30.**

27. Replace **FAN H** and **FAN L** fuses on corresponding **BFU.**

28. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **29.**

29. Is **FAN ALARM** LED lighted on fan assembly?

    If **YES,** then continue with Step **30.**
    If **NO,** then proceed to Step **39.**

30. ***Caution: To avoid possible damage, do not over extend fan assembly power cable.***

    Remove fan assembly from bay.

31. Examine fan assembly for anything that will prevent fan from operating properly.

32. Remove any blockages and reinstall fan assembly and fuses.

33. Operate corresponding **FAN TEST** pushbutton on **FCU** (**A/FCU** for FTTH).

34. Are fans on and is fan assembly **FAN ALARM** LED off?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **35.**

35. Remove **FAN H** and **FAN L** fuses on corresponding **BFU.**

36. Replace fan assembly with new fan assembly.

37. Reinstall fuses and depress **FAN TEST** pushbutton on **FCU.**

38. Are fans on and is fan assembly **FAN ALARM** LED off?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **39.**

39. Is **FAIL** LED lighted on either **3A RINGING GENERATOR** on power shelf?

    If **YES,** then continue with Step **40.**
    If **NO,** then proceed to Step **43.**

40. Replace failed **3A RINGING GENERATOR**.

41. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **42.**

42. Reinstall original **3A RINGING GENERATOR**.

43. Replace one of the **336 RECTIFIER**s.

44. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **45.**

45. Reinstall original **336A RECTIFIER**.

46. Replace second **336A RECTIFIER**.

47. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **48.**

48. Reinstall original **336A RECTIFIER**.

49. Is bulk power being used?

    If **YES,** then continue with Step **50.**
    If **NO,** then do **TAP-124.**

50. Use SD-7C130 (J1C182BB bulk power shelf) or SD-7C150-01 (FTTH) to check wiring and repeat from Step **10.**

CLEAR MAJOR ALARM AT RT - MJ AND ALL DIGROUP INDICATORS LIGHTED

1. Do you have Fiber-To-The-Home RT configuration?

   If **NO,** then continue with Step **2.**
   If **YES,** then proceed to Step **15.**

2. Is RT located in an 80E cabinet with bulk power plant?

   If **YES,** then continue with Step **3.**
   If **NO,** then proceed to Step **11.**

3. At ring shelf, is **FAIL** LED lighted on both **3C** or **3A RINGING GENERATORs** on either **GROUP 1, GROUP 2,** or both?

   If **YES,** then continue with Step **4.**
   If **NO,** then proceed to Step **7.**

4. Replace both **RINGING GENERATORs.**

5. Does alarm clear within 5 minutes?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **6.**

6. At ring shelf, is **FAIL** LED lighted on both **3C** or **3A RINGING GENERATORs** on either **GROUP 1, GROUP 2,** or both?

   If **YES,** then proceed to Step **10.**
   If **NO,** then continue with Step **7.**

7. Is **RMJ** indicator on **RING CONTROL UNIT**(s) lighted?

   If **YES,** then continue with Step **8.**
   If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

8. Replace **RING CONTROL UNIT**(s) with **RMJ** indicator lighted.

9. Does alarm clear within 5 minutes?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **10.**

10. Use SD-7C155-01 to locate and clear trouble.

11. Is **FAIL** indicator lighted on both **3C** or **3A RINGING GENERATORs** at the RT power shelf?

If **YES,** then continue with Step **12.**
If **NO,** then proceed to Step **14.**

12. ***Note:*** Failure of the protection **3C** or **3A RINGING GENERATOR** will not cause an alarm until after failure of the main **3C** or **3A RINGING GENERATOR**. The protection **3C** or **3A RINGING GENERATOR** can be tested by depressing the **TEST PROT RG** pushbutton on **LDU**. It is recommended that the protection **3C** or **3A RINGING GENERATOR** be tested on a per opportunity basis.

    Replace both **3C** or **3A RINGING GENERATOR**s.

13. Did the alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **14.**

14. Use SD-7C117 and SD-7C118 to locate trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

15. ***Note:*** For FTTH configuration, failed optics equipment will cause **ADU MJ** and all **BCU DIGROUP** indicators to light. When this happens, all affected channel unit **OOF** indicators will light.

    At optics power shelf, are any fuses blown?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **18.**

16. Replace blown fuse.

17. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **18.**

18. Replace **PCU** associated with failed optics shelf. Replace fuse if necessary.

    Reference: DLP-522

19. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **20.**

20. Use SD-7C150-01, SD-7C118-02, and SD-7C117-02 to locate trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR ALARM AT RT - MJ, ALL DIGROUP, AND ALL CLF LEDS LIGHTED

1. Are any fuses blown on **BFU** at RT power shelf?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **7.**

2. Replace any blown fuses.

3. Does alarm clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **4.**

4. Does fuse blow again?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **7.**

5. Is bulk powering (J1C182BB bulk power shelf or FTTH) being used?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **7.**

6. Use SD-7C130 (J1C182BB bulk power shelf) or SD-7C150-01 (FTTH) to check wiring and proceed to Step **13.**

7. Is –48V present at **-48B** and **GND** pin jacks on the **LDU**?

   If **YES,** then continue with Step **8.**
   If **NO,** then proceed to Step **11.**

8. Is –48V present at **-48L** and **GND** pin jacks on the **LDU**?

   If **YES,** then proceed to Step **21.**
   If **NO,** then continue with Step **9.**

9. Replace **LDU.**

10. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **21.**

11. Using DMM (digital multimeter), measure incoming AC voltage by using **AC** and **GND** jacks on **LDU** faceplate.

12. Is measured AC voltage between 105 and 129 volts?

    If **YES,** then proceed to Step **21.**
    If **NO,** then proceed to Step **15.**

13. Was problem found?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **15.**

14. Correct problem.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

15. Is fuse blown or circuit breaker tripped at RT main AC circuit breaker box?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **19.**

16. Replace blown fuse or reset circuit breaker.

17. Does fuse blow or circuit breaker trip again?

    If **YES,** then proceed to Step **20.**
    If **NO,** then continue with Step **18.**

18. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **21.**

19. Contact local power company if loss of power has occurred or if there is overvoltage or undervoltage condition.

20. Does local power company verify abnormal power condition?

    If **YES,** then proceed to Step **22.**
    If **NO,** then continue with Step **21.**

21. Use SD-7C119 (RT power shelf) and SD-7C118 (RT enclosure) to examine AC wiring for shorts, opens, or incorrectly terminated wiring.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

22. Estimate restoration time for AC power. If necessary, equip RT with fully charged batteries or other power source to maintain power until AC power is restored.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

ISOLATE DIGITAL LINE TROUBLE USING FAULT-LOCATING PROCEDURES FROM COT - SINGLE ENDED OR DOUBLE ENDED (SIDE 1)

1. Has fault-locating line and system been checked for proper operation?

   If **YES,** then proceed to Step **4.**
   If **NO,** then continue with Step **2.**

2. Check fault-locating line and system for proper operation.

   Reference: **DLP-501**

3. ***Note:*** Trouble on fault-locating line must be cleared before performing fault-locating procedures.

   Was any trouble found?

   If **YES,** then do **TAP-117.**
   If **NO,** then continue with Step **4.**

4. ***Caution: If other test sets are used, do not send properly framed or unframed all 1s signal.***

   Perform transmission test on digital line(s) using Sierra **315B (415A-2)** or **J98725AD** (25AD) test set.

   Reference: **DLP-502**

5. Was any trouble found?

   If **YES,** then do **TAP-116.**
   If **NO,** then continue with Step **6.**

6. Which test set will be used to perform obscure trouble tests?

   If **315B OR 415A-2,** then continue with Step **7.**
   If **J98725AD (25AD),** then proceed to Step **8.**

7. Perform obscure trouble test on digital line(s) using **315B** or **415A-2** test set and proceed to Step **9.**

   Reference: **DLP-505**

8. Perform obscure trouble test on digital line(s) using **J98725AD** test set and proceed to Step **10.**

   Reference: **DLP-506**

9. Analyze obscure trouble test results obtained and proceed to Step **11.**

   Reference: **DLP-510**

10. Analyze obscure trouble test results obtained and proceed to Step **11.**

    Reference: **DLP-511**

11. Was any trouble found?

    If **YES,** then do **TAP-116.**
    If **NO,** then continue with Step **12.**

12. Could both Side 1 and Side 2 of digital line(s) be tested from COT?

    If **YES,** then continue with Step **13.**
    If **NO,** then do **TAP-118.**

13. Report no trouble found on digital line(s).

STOP. YOU HAVE COMPLETED THIS PROCEDURE

ISOLATE TROUBLE TO DIGITAL LINE SECTION OR REPEATER

1. See Table A. Determine test equipment to be used at apparatus case location and test location [COT (central office terminal), RT (remote terminal), or DSX Cross-Connect].

TABLE A

EQUIPMENT REQUIRED AT TEST LOCATION	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B, Sierra 415A-2, or J98725AD (25AD)
(2) P3-type Patch Cords	P3BH
AT APPARATUS CASE	**AT APPARATUS CASE**
Line and Repeater Test Set	Sierra 317B, 417A-2, or J98725AB Bipolar Violation Detector
Sierra Test Set Insert	C02979601
Test Set Probe	Sierra 240B-3 (317B), 244A-3 (417A-2), ED3C564-30,G1 or G4 (25AB)

2. Establish communication between test location and apparatus case location suspected of causing trouble.

3. ***Note:*** Single-ended fault-locating is performed from COT or DSX Cross-Connect.

   Is fault locating to be performed from COT, RT, or a DSX Cross-Connect?

   If **COT,** then continue with Step **4.**
   If **RT,** then proceed to Step **5.**
   If **DSX CROSS-CONNECT,** then proceed to Step **6.**

4. Prepare COT for fault locating and proceed to Step **7.**

   Reference: **DLP-509**

5. Prepare RT for fault locating and proceed to Step **7.**

   Reference: **DLP-514**

6. Prepare DSX Cross-Connect for fault locating.

   Reference: **DLP-512**

7. Is **317B**, **417A-2** or 25AB test set being used at apparatus case?

   If **317B OR 417A-2,** then proceed to Step **25.**
   If **25AB,** then continue with Step **8.**

8. At rear of 25AB test set, set **RPTR TYPE** switch to **BI-DIRECTIONAL.**

9. ***Note:*** If **BAT CHK** lamp does not light, low test set battery voltage is indicated. Replacement batteries are (4) KS-14368 type or equivalent AA size batteries.

   Depress spring loaded **BAT CHK** switch.

   Response: **BAT CHK** lamp lights.

10. ***Caution: Removal of wrong repeater will cause service interruption.***

    Determine which repeater is associated with digital line being tested, then remove repeater.

11. Insert test set probe into apparatus case slot, then insert repeater into test set.

12. At apparatus case location, set both 25AB **100**-ohm **TERM/LINE** switches to **LINE.**

13. On 25AB, position **TEST** switch to side (**SIDE 1** or **SIDE 2**) of digital line being tested.

14. On 25AB, is **SIG LOSS** lamp lighted?

    If **YES,** then proceed to Step **20.**
    If **NO,** then continue with Step **15.**

15. On 25AB, is **BV** lamp lighted?

    If **YES,** then proceed to Step **17.**
    If **NO,** then continue with Step **16.**

16. ***Note:*** If **Side 1** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward test location on **Side 2.** If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX Cross-Connect on **Side 2.**

    Tests indicate that digital line is good at this location. If further tests are to be performed, disconnect the test equipment, remove repeater from test set and reinsert into apparatus case, and move to next repeater location in direction of trouble indication and repeat from Step **10.**

17. On 25AB for side being tested, set **100**-ohm **TERM/LINE** switch to **100** ohms.

18. On 25AB, is **BV** lamp lighted?

    If **YES,** then proceed to Step **20.**
    If **NO,** then continue with Step **19.**

19. A faulty output cable pair is incorrectly terminating repeater at this location. Locate and repair trouble using local procedures. Check cable for bridged taps, build-out capacitors, bad splices, opens, or shorts.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

20. Has repeater been replaced?

    If **YES,** then proceed to Step **22.**
    If **NO,** then continue with Step **21.**

21. On replacement repeater, set options same as on the original and replace repeater and repeat from Step **12.**

22. Did results of fault-locating tests (transmission and obscure trouble tests) indicate more than one trouble location?

    If **YES,** then continue with Step **23.**
    If **NO,** then proceed to Step **24.**

23. Move to other repeater location that indicates trouble and repeat from Step **10.**

24. ***Note:*** If **Side 1** is being tested from COT or DSX Cross-Connect, trouble is at a location toward COT or DSX Cross-Connect on **Side 1.** If **Side 2** is being tested from COT or DSX Cross-Connect, trouble may be between this location and RT on **Side 2** or anywhere on **Side 1** if not previously tested. If **Side 2** is being tested from RT, the trouble is at a location toward RT on **Side 2.**

    Indications are that trouble is at another location. Move to next repeater location in direction of trouble or to a repeater location in direction of trouble halfway between this location and test location and repeat from Step **10.**

25. ***Note:*** If meter does not read above green mark **(417A-2)** or in **BATT GOOD** area **(317B),** low battery voltage is indicated. Replacement batteries are eight D-size 1.5 Vdc carbon type.

    Check the batteries of the **317B** test set by setting **POWER** switch to **ON,** operate the **ERRORS/PULSES** switch to either position, and turn the **METER** switch to **BATT.** For the **417A-2** test set, set **POWER** switch to **BATT CHK.**

26. Return test set controls to **OFF.**

27. Equip **317B** or **417A-2** test set with appropriate probe per Table A.

28. Equip test set with **C02979601** insert.

29. ***Caution: Removal of wrong repeater will cause service interruption.***

    Determine which repeater is associated with digital line being tested, then remove repeater.

30. Insert test set probe into repeater slot.

31. Insert repeater into test set insert.

32. Is **317B** or **417A-2** test set being used?

If **317B,** then continue with Step **33.**
If **417A-2,** then proceed to Step **34.**

33. ***Note:*** **REPEATER** switch is set to **SIDE** (**SIDE 1** or **SIDE 2**) of digital line being tested.

Set controls per Table B and proceed to Step **35.**

TABLE B
317B TEST SET

CONTROL/SWITCH	POSITION
RPTR POWER LOOP control	60 mA
TERMINATION	NORMAL
METER	NORM
REPEATER	BI-DIR (A) SIDE 1 or SIDE 2
RPTR POWER LOOP (toggle)	OFF
POWER	ON

34. ***Note:*** **REPEATER** switch is set to **SIDE** (**SIDE 1** or **SIDE 2**) of digital line being tested.

Set controls per Table C.

TABLE C
417A-2 TEST SET

CONTROL/SWITCH	POSITION (NOTE 1)
SYSTEM Mb/s	1.544
RPTR POWER LOOP control	30 mA
TERMINATION	NORM
METER	NORM
REPEATER	BI-DIR (A) SIDE 1 or SIDE 2
RPTR POWER LOOP (toggle)	OFF

NOTE:
1. After power is applied to the line, adjust line current to 60 mA ±3 mA.

35. Is **PULSES** lamp lighted?

If **YES,** then continue with Step **36.**
If **NO,** then proceed to Step **43.**

36. Are you using **317B** test set?

    If **YES,** then continue with Step **37.**
    If **NO,** then proceed to Step **38.**

37. Set **ERRORS/PULSES** switch to **ERRORS.**

38. Is **ERRORS** lamp lighted or flashing?

    If **YES,** then continue with Step **39.**
    If **NO,** then proceed to Step **40.**

39. ***Note:*** If **Side 1** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward test location on **Side 2.** If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX Cross-Connect on **Side 2.**

    Tests indicate that digital line is good at this location. If further tests are to be performed, disconnect the test equipment and move to next repeater location in the direction of trouble indication and repeat from Step **25.**

40. If using **317B** test set, position **TERMINATION** switch to **100-ohms SIDE** ( ). If using **417A-2** test set, position **TERMINATION** switch to **SIDE** ( ).

41. Is **ERRORS** lamp lighted or flashing?

    If **YES,** then proceed to Step **43.**
    If **NO,** then continue with Step **42.**

42. Test indicates a faulty output cable pair incorrectly terminating repeater at this location. Locate and repair the fault using local procedures. Check cable pair for bridged taps, build-out capacitors, bad splices, opens, or shorts.

43. Has repeater been replaced?

    If **YES,** then proceed to Step **45.**
    If **NO,** then continue with Step **44.**

44. On replacement repeater, set options same as on the original. Replace repeater and repeat from Step **32.**

45. Did results of fault-locating tests (transmission and obscure trouble tests) indicate more than one trouble location?

    If **YES,** then continue with Step **46.**
    If **NO,** then proceed to Step **47.**

46. Move to other repeater location that indicates trouble and repeat from Step **25.**

47. ***Note:*** If **Side 1** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward RT. If **Side 2** is being tested from COT or DSX Cross-Connect, trouble may be at another location toward test location on **Side 2.** If **Side 2** is being tested from RT, trouble may be on **Side 1** or at another location toward COT or DSX Cross-Connect on **Side 2.**

Indications are that trouble is at another location. Move to next repeater location in direction of trouble or to a repeater location in direction of trouble halfway between this location and test location.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR FAULT LOCATE LINE AND SYSTEM TROUBLE

1. Condition DMM (digital multimeter) to measure dc volts.

2. Is fault line or system trouble being cleared from COT or a DSX Cross-Connect?

   If **COT,** then continue with Step **3.**
   If **DSX CROSS-CONNECT,** then proceed to Step **6.**

3. Is trouble on fault-locate (FL) line, or does fault-locate line **READY** LED not light?

   If **FL LINE,** then proceed to Step **35.**
   If **READY LAMP,** then continue with Step **4.**

4. Is **BUSY** LED lighted on FL panel?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **10.**

5. On **TS2** at rear of FL panel (FIG. 1), connect DMM leads to **T** (tip) and **R** (ring) of **FL LINE** pins associated with FL line being tested and proceed to Step **9.**

6. At rear of DSX Cross-Connect at maintenance panel, connect DMM leads to **T** (tip) and **R** (ring) pins associated with FL line being tested.

7. Does DMM indicate voltage greater than 12 Vdc?

   If **YES,** then proceed to Step **26.**
   If **NO,** then continue with Step **8.**

8. Use DSX-1, DSX-1C, and DSX-2 Patch and Cross-Connect General Description (AT&T Practice 365-301-101) to clear trouble.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

9. Does DMM indicate voltage greater than 12 Vdc, (reverse meter leads if necessary)?

   If **YES,** then proceed to Step **26.**
   If **NO,** then proceed to Step **11.**

10. Does **READY** LED light for other **FL LINE** switch positions?

    If **YES,** then continue with Step **11.**
    If **NO,** then proceed to Step **14.**

11. Replace **FLT LOC CONT** unit in FL panel. Insert P3-type patch cord into **FL LINE OUT** jack.

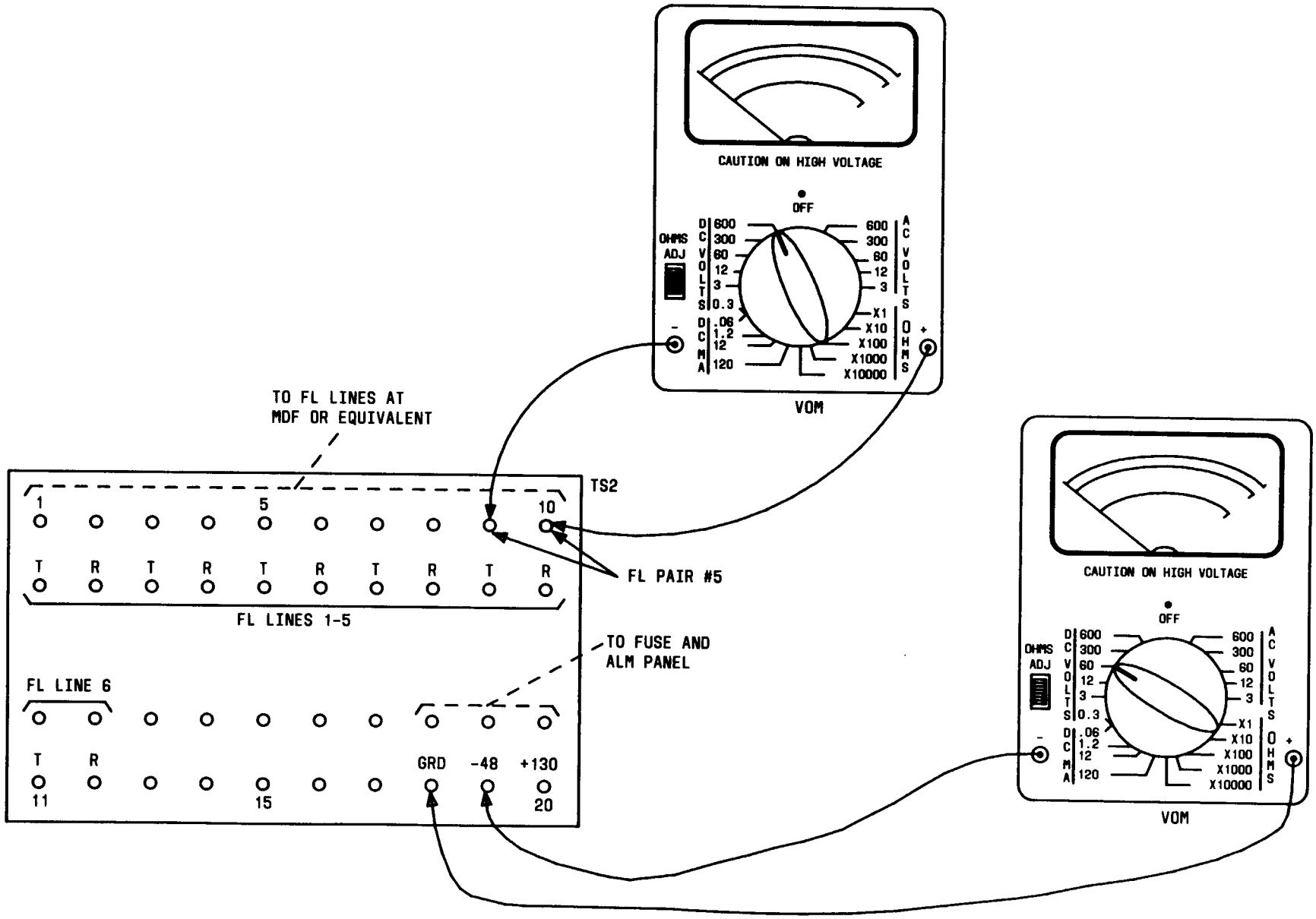


Fig. 1—Rear of Fault Locate Panel

12. Does **READY** LED light?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **13.**

13. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

14. Condition DMM to measure dc volts.

15. On **TS2**, at rear of FL panel (FIG. 1), connect DMM negative (–) black lead to pin 19 (**-48**) and positive (+) red lead to pin 18 (**GRD**).

16. Does DMM indicate between 43 and 53 Vdc?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **19.**

17. Replace **FLT LOC CONT** unit in FL panel. Reinsert P3 patch cord into **FL LINE OUT** jack.

18. Does **READY** LED light?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **24.**

19. Is –48V fuse blown on Group 4 heat baffle?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **20.**

20. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

21. Replace blown fuse.

22. Does fuse blow again?

    If **YES,** then continue with Step **23.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

23. Replace **FLT LOC CONT** unit in FL Panel and replace fuse. Insert a P3 patch cord into **FL LINE OUT** jack.

24. Does fuse blow again?

    If **YES,** then continue with Step **25.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

25. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

26. Is another FL panel installed at other end of FL line?

If **YES,** then continue with Step **27.**
If **NO,** then proceed to Step **34.**

27. Is other end being used to perform fault-locating procedures?

If **YES,** then proceed to Step **33.**
If **NO,** then continue with Step **28.**

28. At other end, remove any plug in FL panel **FL LINE OUT** jack.

29. Is trouble still present?

If **YES,** then continue with Step **30.**
If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

30. Replace **FLT LOC CONT** unit in FL panel at other end.

31. Is trouble still present?

If **YES,** then continue with Step **32.**
If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

32. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

33. Other end is in use causing **BUSY** lamp at this end. Wait for line to clear.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

34. Foreign voltage is present on FL pair. Locate source of foreign voltage and repair trouble using local procedures.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

35. Remove cord from FL Panel **FL LINE OUT** jack on **FLT LOC CONT** unit (FLCU).

36. At Main Distributing Frame (MDF), check protection units for FL line being tested. Also check MDF connections and jumpers.

37. Is any trouble found?

If **YES,** then continue with Step **38.**
If **NO,** then proceed to Step **40.**

38. Replace protection units, repair connections, or replace jumpers as required.

39. Is FL line still bad?

    If **YES,** then do Step **34.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

40. Open FL pair at MDF by installing a 262C-type (900-ohm terminating) plug across office side of FL pair (FIG. 2).

41. Insert P3 patch cord into FL Panel **FL LINE OUT** jack.

42. Is FL line still bad?

    If **YES,** then continue with Step **43.**
    If **NO,** then proceed to Step **47.**

43. Replace **FLT LOC CONT** unit in FL panel.

44. Is FL line still bad?

    If **YES,** then proceed to Step **46.**
    If **NO,** then continue with Step **45.**

45. Remove test termination (FIG. 2) , reconnect FL pair at MDF.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

46. Trouble is in office wiring, FL Panel, or bay wiring. Use SD-3C423-01 (Fault Locate and Order Wire Panel), SD-7C115 and SD-7C116 (Series 5 COT and Bay), SD-7C117 and SD-7C118 (Series 5 RT and Bay) to check wiring and clear trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

47. Trouble is on outside FL pair. Refer trouble to maintenance of outside pair.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

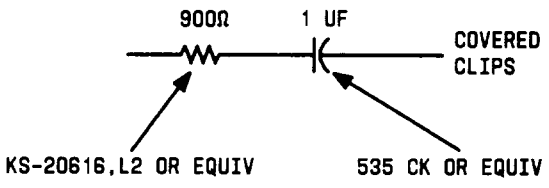


Fig. 2—900 Ohm Test Termination

ISOLATE SIDE 2 DIGITAL LINE TROUBLE USING FAULT-LOCATING PROCEDURES FROM RT

1. ***Note:*** Fault-locating tests on Side 2 (RT to COT) of digital line(s) require cooperation with COT personnel.

   Obtain original FLR (fault-locating record) forms for system and prepare fault-locating system and test equipment for fault-locating.

   Reference: **DLP-514**

2. Perform transmission test on digital line(s) using Sierra **315B, 415A-2**, or **J98725AD** (25AD) test set.

   Reference: **DLP-503**

3. Was any trouble found?

   If **YES,** then do **TAP-116.**
   If **NO,** then continue with Step **4.**

4. Which test set is being used?

   If **315B OR 415A-2,** then continue with Step **5.**
   If **J98725AD,** then proceed to Step **6.**

5. Perform obscure trouble test on digital line(s) using **315B** or **415A-2** test set and proceed to Step **7.**

   Reference: **DLP-508**

6. Perform obscure trouble test on digital line(s) using **J98725AD** test set and proceed to Step **8.**

   Reference: **DLP-507**

7. Analyze obscure trouble test results obtained. and proceed to Step **9.**

   Reference: **DLP-510**

8. Analyze obscure trouble test results obtained and proceed to Step **9.**

   Reference: **DLP-511**

9. Was any trouble found?

   If **YES,** then do **TAP-116.**
   If **NO,** then continue with Step **10.**

10. Report no trouble found on Side 2 of digital line(s).

STOP. YOU HAVE COMPLETED THIS PROCEDURE

PERFORM SINGLE-ENDED FAULT-LOCATING PROCEDURES ON T1 LINES FROM DSX CROSS-CONNECT

1. Has fault-locating line and system been checked for proper operation?

   If **YES,** then proceed to Step **4.**
   If **NO,** then continue with Step **2.**

2. Check fault-locating line and system for proper operation.

   Reference: **DLP-501**

3. ***Note:*** Trouble on the fault-locate line must be cleared before performing fault-locating procedures.

   Was any trouble found?

   If **YES,** then do **TAP-117.**
   If **NO,** then continue with Step **4.**

4. Prepare the test equipment for fault locating.

   Reference: **DLP-512**

5. Perform transmission tests on digital line(s) using the Sierra **315B, 415A-2,** or the **J98725AD** (25AD) test set.

   Reference: **DLP-504**

6. Was any trouble found?

   If **YES,** then do **TAP-116.**
   If **NO,** then continue with Step **7.**

7. Perform obscure trouble tests on line(s).

   Reference: **DLP-513**

8. Which test set is being used?

   If **315A OR 415A-2,** then continue with Step **9.**
   If **J98725AD (25AD),** then proceed to Step **10.**

9. Analyze obscure trouble test results obtained and proceed to Step **11.**

   Reference: **DLP-510**

10. Analyze obscure trouble test results obtained.

    Reference: **DLP-511**

11. Was any trouble found?

    If **YES,** then do **TAP-116.**
    If **NO,** then continue with Step **12.**

12. Report no trouble found on digital line(s).

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR CHANNEL FAILURE - SINGLE CHANNEL - SIGNALING TROUBLE

1. Are you at a Mode 96 (FPB) RT?

   If **YES,** then **at COT clear trouble using applicable SLC 96 documentation.**
   If **NO,** then continue with Step **2.**

2. At the COT, replace the failed **CU** (channel unit).

3. ***Note:*** If the Maintenance Center or Test Desk cannot access failed channel via PGTC (pair gain test controller) or the XTC (extended test controller), check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

   Request the Maintenance Center or Test Desk to perform tests on the **CU** with trouble.

4. Can Maintenance Center or Test Desk access failed channel for testing?

   If **YES,** then proceed to Step **28.**
   If **NO,** then continue with Step **5.**

5. ***Note:*** Verify that Maintenance Center or Test Desk is not using PGTC or XTC to perform tests on any CU in bank assembly containing failed CU.

   Obtain a **SLC Series 5 Craft Interface Unit**.

6. Condition CIU (craft interface unit) for testing. Refer to CIU Users Guide if necessary.

7. Insert connector on end of CIU cable into **TEST ACC** jack on channel test unit (**CTU**).

8. The CIU will perform a 15-second self-test when first powered up and then will display the following OPERATIONS MENU: **1. CKT ACTIVITIES 2. SYSTEM TURN-UP 3. TEST BUS ACCESS COMMAND [CKT ACTIVITIES] =**

9. At the CIU keyboard, enter **3** or **T**.

10. The CIU display will show: **SYSTEM ID =**

11. At the CIU keyboard, enter system identification (SYSTEM ID) number for system. The CIU display will show: **CLEAR TEST BUS ACCESS**

12. Get DMM (digital multimeter) and condition to measure dc volts.

13. Connect DMM test leads to **LINE T/R** jack on CIU.

14. Does meter indicate 0 Vdc?

    If **YES,** then proceed to Step **18.**
    If **NO,** then continue with Step **15.**

15. At the CIU keyboard, press **BREAK** key.

16. Remove DMM test leads from CIU.

17. Replace CU associated with channel experiencing trouble and repeat from Step **9.**

18. Condition DMM to measure ohms.

19. With DMM test leads connected to **LINE T/R** jack on CIU, does DMM indicate infinite resistance (open circuit)?

    If **YES,** then proceed to Step **23.**
    If **NO,** then continue with Step **20.**

20. At the CIU keyboard, press **BREAK** key.

21. Remove DMM test leads from CIU.

22. Replace CU associated with channel experiencing trouble and repeat from Step **9.**

23. Remove DMM test leads from CIU.

24. Repeat Steps **12** through **23** with DMM leads connected to **LINE T1/R1** jack on CIU.

25. At the CIU keyboard, enter **YES**.

26. Remove CIU cable from **TEST ACC** jack on (**CTU**).

27. Request the Maintenance Center or Test Desk to perform tests on the **CU** with trouble.

28. Did the trouble clear?

    If **YES,** then continue with Step **29.**
    If **NO,** then proceed to Step **30.**

29. Restore the channel to service.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

30. At the COT, reinstall the original **CU**.

31. At the RT, replace the failed **CU**.

32. Request the Maintenance Center or Test Desk to perform tests on the **CU** with trouble.

33. Can Maintenance Center or Test Desk access failed channel for testing?

    If **YES,** then proceed to Step **35.**
    If **NO,** then continue with Step **34.**

34. Perform Steps **5** through **27.**

35. Did the trouble clear?

    If **YES,** then do Step **29.**
    If **NO,** then continue with Step **36.**

36. At the RT reinstall the original **CU.**

37. Remove service from shelf containing the channel with trouble.

38. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record.***

    At the COT, replace the **TRU** associated with the shelf with trouble.

39. Request the Maintenance Center or Test Desk to perform tests on the **CU** with trouble.

40. Did the trouble clear?

    If **YES,** then continue with Step **41.**
    If **NO,** then proceed to Step **42.**

41. Restore service.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

42. At the COT, unplug all **CUs** except one on the shelf being tested. (The channel units do not need to be removed from the shelf.)

43. Request the Maintenance Center or Test Desk to perform tests on the equipped channel.

44. Did the trouble clear?

    If **YES,** then continue with Step **45.**
    If **NO,** then proceed to Step **48.**

45. Reinsert the **CUs** one at a time and have the Maintenance Center or Test Desk repeat tests after each insertion.

46. Replace the **CU** that causes the test to fail.

47. Reinsert the remaining **CUs** and restore service.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

48. At the RT, replace the **TRU** associated with the shelf being tested.

49. Request the Maintenance Center or Test Desk to perform tests.

50. Did the trouble clear?

    If **YES,** then proceed to Step **55.**
    If **NO,** then continue with Step **51.**

51. At the RT, unplug all **CU**s except one matching the equipped channel at the COT on shelf being tested. (The channel units do not need to be removed from the shelf.)

52. Request the Maintenance Center or Test Desk to perform tests.

53. Did the trouble clear?

    If **YES,** then proceed to Step **55.**
    If **NO,** then continue with Step **54.**

54. Use the COT and RT schematic drawings to locate and clear trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

55. Were **CU**s unplugged?

    If **YES,** then proceed to Step **57.**
    If **NO,** then continue with Step **56.**

56. Restore service.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

57. Reinsert the **CU**s one at a time and have the Maintenance Center or Test Desk repeat tests after each insertion.

58. Replace the **CU** that causes the test to fail.

59. Reinsert the remaining **CU**s and restore service.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR CHANNEL FAILURE - MULTIPLE CHANNELS - SIGNALING TROUBLE

1. At COT, remove service from shelf containing **CU**s (channel units) with trouble.

2. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record.***

   Replace **TRU** associated with **CU**s with trouble.

3. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC (pair gain test controller) or XTC (extended test controller), check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

   Request Maintenance Center or Test Desk to perform tests.

4. Did trouble clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **5.**

5. Is bank equipped with FPD capability?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **9.**

6. Replace Transcoder Unit (**TCU**).

7. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

   Request Maintenance Center or Test Desk to perform tests.

8. Did trouble clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **9.**

9. Is shelf equipped with **DCU-L** (**AUA16**) and **DCU-R** (**AUA17**) circuit packs?

   If **YES,** then continue with Step **10.**
   If **NO,** then proceed to Step **13.**

10. Replace **DCU-L** and **DCU-R** circuit packs.

    Reference: **DLP-519**

11. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

    Request Maintenance Center or Test Desk to perform tests.

12. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **13.**

13. At COT, unplug all **CU**s on shelf being tested. (The **CU**s do not need to be removed from shelf.)

14. Reinsert one **CU** and have Maintenance Center or Test Desk to perform tests.

15. Did trouble clear?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **19.**

16. Reinsert **CU**s one at a time and have Maintenance Center or Test Desk repeat tests after each insertion.

17. Replace **CU** that causes test to fail.

18. Reinsert remaining **CU**s and restore service.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

19. At RT, replace **TRU** associated with shelf being tested.

20. Request Maintenance Center or Test Desk to repeat tests.

21. Did trouble clear?

    If **YES,** then proceed to Step **34.**
    If **NO,** then continue with Step **22.**

22. Is bank equipped with FPD capability?

    If **YES,** then continue with Step **23.**
    If **NO,** then proceed to Step **26.**

23. Replace Transcoder Unit (**TCU**).

24. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

    Request Maintenance Center or Test Desk to perform tests.

25. Did trouble clear?

    If **YES,** then proceed to Step **34.**
    If **NO,** then continue with Step **26.**

26. Is shelf equipped with **DCU-L** (**AUA16**) and **DCU-R** (**AUA17**) circuit packs?

    If **YES,** then continue with Step **27.**
    If **NO,** then proceed to Step **30.**

27. Replace **DCU-L** and **DCU-R** circuit packs.

    Reference: **DLP-519**

28. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

    Request Maintenance Center or Test Desk to perform tests.

29. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **30.**

30. At RT, unplug all **CU**s on shelf being tested. (The **CU**s do not need to be removed from shelf.)

31. Reinsert one **CU** that matches the equipped channel at the COT and have Maintenance Center or Test Desk to perform tests on that channel.

32. Did trouble clear?

    If **YES,** then proceed to Step **34.**
    If **NO,** then continue with Step **33.**

33. Use COT and RT schematic drawings to locate and clear trouble.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

34. Were channel units unplugged?

    If **YES,** then proceed to Step **36.**
    If **NO,** then continue with Step **35.**

35. Restore service.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

36. Reinsert **CU**s one at a time and have Maintenance Center or Test Desk repeat tests after each insertion.

37. Replace **CU** that causes test to fail.

38. Reinsert remaining **CU**s and restore service.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR CHANNEL FAILURE - SINGLE CHANNEL - SINGLE PARTY, MULTIPARTY

1. ***Note:*** Most channel units serve two lines.

   Verify that **BUSY** LED is **not lighted** on failed channel unit (**CU**).

2. At COT, replace **CU** with reported trouble.

3. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC (pair gain test controller) or XTC (extended test controller), check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

   Request Maintenance Center or Test Desk to perform tests on new **CU**.

4. Can Maintenance Center or Test Desk access failed channel for testing?

   If **YES,** then proceed to Step **28.**
   If **NO,** then continue with Step **5.**

5. ***Note:*** Verify that Maintenance Center or Test Desk is not using PGTC or XTC to perform tests on any CU in bank assembly containing failed CU.

   Obtain a **SLC Series 5 Craft Interface Unit**.

6. Condition CIU (craft interface unit) for testing. Refer to CIU Users Guide if necessary.

7. Insert connector on end of CIU cable into **TEST ACC** jack on **CTU** (channel test unit).

8. The CIU will perform a 15-second self-test when first powered up and then will display the following OPERATIONS MENU: **1. CKT ACTIVITIES 2. SYSTEM TURN-UP 3. TEST BUS ACCESS COMMAND [CKT ACTIVITIES] =**

9. At the CIU keyboard, enter **3** or **T**.

10. The CIU display will show: **SYSTEM ID =**

11. At the CIU keyboard, enter system identification (SYSTEM ID) number for system being turned up. The CIU display will show: **CLEAR TEST BUS ACCESS**

12. Get DMM (digital multimeter) and condition to measure dc volts.

13. Connect DMM test leads to **LINE T/R** jack on CIU.

14. Does meter indicate 0 Vdc?

    If **YES,** then proceed to Step **18.**
    If **NO,** then continue with Step **15.**

15. At the CIU keyboard, press **BREAK** key.

16. Remove DMM test leads from CIU.

17. Replace CU associated with channel experiencing trouble and repeat from Step **9.**

18. Condition DMM to measure ohms.

19. With DMM test leads connected to **LINE T/R** jack on CIU, does DMM indicate infinite resistance (open circuit)?

    If **YES,** then proceed to Step **23.**
    If **NO,** then continue with Step **20.**

20. At the CIU keyboard, press **BREAK** key.

21. Remove DMM test leads from CIU.

22. Replace CU associated with channel experiencing trouble and repeat from Step **9.**

23. Remove DMM test leads from CIU.

24. Repeat Steps **12** through **23** with DMM leads connected to **LINE T1/R1** jack on CIU.

25. At the CIU keyboard, enter **YES.**

26. Remove CIU cable from **TEST ACC** jack on **CTU.**

27. Request the Maintenance Center or Test Desk to perform tests on the **CU** with trouble.

28. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **29.**

29. Replace **CTU** and repeat Steps **6** through **27.**

30. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **31.**

31. Replace **CTU** with **CTU** removed previously.

32. At RT, replace **CU** with reported trouble.

33. Request Maintenance Center or Test Desk to perform tests on new **CU.**

34. Can Maintenance Center or Test Desk access failed channel for testing?

    If **YES,** then proceed to Step **36.**
    If **NO,** then continue with Step **35.**

35. Perform Steps **5** through **29.**

36. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **37.**

37. Check **COT** and **RT** wiring for tip and ring reversals or shorts. Use COT and RT schematic drawings to check wiring.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR CHANNEL FAILURE - MULTIPLE CHANNELS - SINGLE PARTY, MULTIPARTY

1. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC (pair gain test controller) or XTC (extended test controller), check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit).

   Request Maintenance Center or Test Desk to perform tests on all channels on all shelves and determine extent of trouble.

2. Is trouble on a single digroup (A, B, C, or D) or on a shelf (AB or CD)?

   If **SINGLE DIGROUP,** then continue with Step **3.**
   If **SHELF,** then proceed to Step **63.**

3. Remove service from digroup containing channels with trouble.

4. ***Note:*** Approximately 20 seconds must be allowed for alarm lamps to clear.

   At COT, replace **TRU** on shelf with trouble.

5. Request Maintenance Center or Test Desk to repeat channel tests.

6. Did trouble clear?

   If **YES,** then proceed to Step **17.**
   If **NO,** then continue with Step **7.**

7. If you do not have a protection line, proceed to Step **9.** At **LSU** faceplate, locate **f** switch that is associated with digroup experiencing trouble.

8. Operate the **f** switch to the **ON** position.

9. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

   Replace **LIU** for digroup with trouble.

   Reference: **DLP-518**

10. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **11.**
    If **NO,** then proceed to Step **15.**

11. Depress **ADU LED TEST** pushbutton.

12. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **13.**
    If **YES,** then proceed to Step **14.**

13. Replace **LIU** and repeat from Step **10.**

    Reference: **DLP-518**

14. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **10.**

15. If you do not have a protection line, proceed to Step **16.** Operate appropriate **f** switch on **LSU** to OFF.

16. Did trouble clear?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **18.**

17. Restore service to digroup.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

18. Is bank equipped with FPD capability?

    If **YES,** then continue with Step **19.**
    If **NO,** then proceed to Step **22.**

19. Replace **TCU** (transcoder unit).

20. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU.**

    Request Maintenance Center or Test Desk to perform tests.

21. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **22.**

22. Is shelf equipped with **DCU-L** (**AUA16**) and **DCU-R** (**AUA17**) circuit packs?

    If **YES,** then continue with Step **23.**
    If **NO,** then proceed to Step **26.**

23. Replace **DCU-L** and **DCU-R** circuit packs.

    Reference: **DLP-519**

24. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU.**

    Request Maintenance Center or Test Desk to perform tests.

25. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **26.**

26. Unseat all **CU**s (channel units) in digroup being tested. (The **CU**s do not need to be removed from shelf.)

27. Reinsert one **CU** and have Maintenance Center or Test Desk to perform test on that channel.

28. Did trouble clear?

    If **YES,** then continue with Step **29.**
    If **NO,** then proceed to Step **32.**

29. Reinsert **CU**s one at a time and have Maintenance Center or Test Desk repeat tests after each insertion.

30. Replace **CU** that causes test to fail.

31. Reinsert remaining **CU**s and restore service.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

32. ***Note:*** Approximately 20 seconds must be allowed for alarm lamps to clear.

    At RT, replace **TRU** on shelf with trouble.

33. Request Maintenance Center or Test Desk to repeat channel test.

34. Did trouble clear?

    If **YES,** then proceed to Step **46.**
    If **NO,** then continue with Step **35.**

35. If you do not have a protection line, proceed to Step **37.** At RT **LSU** faceplate, locate **f** switch that is associated with digroup(s) experiencing trouble.

36. Operate the **f** switch to the **ON** position.

37. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace RT **LIU** in digroup(s) with trouble.

    Reference: **DLP-518**

38. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **39.**
    If **NO,** then proceed to Step **43.**

39. Depress **ADU LED TEST** pushbutton.

40. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **41.**
    If **YES,** then proceed to Step **42.**

41. Replace **LIU** and repeat from Step **38.**

    Reference: **DLP-518**

42. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **38.**

43. If you do not have a protection line, proceed to Step **43.** Operate appropriate **f** switch on **LSU** to OFF.

44. Request Maintenance Center or Test Desk to repeat channel test.

45. Did trouble clear?

    If **YES,** then continue with Step **46.**
    If **NO,** then proceed to Step **47.**

46. Reinstall all channel units and restore service to digroup.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

47. Is bank equipped with FPD capability?

    If **YES,** then continue with Step **48.**
    If **NO,** then proceed to Step **51.**

48. Replace (**TCU**).

49. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

    Request Maintenance Center or Test Desk to perform tests.

50. Did trouble clear?

    If **YES,** then proceed to Step **59.**
    If **NO,** then continue with Step **51.**

51. Is shelf equipped with **DCU-L** (**AUA16**) and **DCU-R** (**AUA17**) circuit packs?

    If **YES,** then continue with Step **52.**
    If **NO,** then proceed to Step **55.**

52. Replace **DCU-L** and **DCU-R** circuit packs.

    Reference: **DLP-519**

53. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC or XTC, check to ensure that no fuses are blown in lower (blue) bank **CFU**.

    Request Maintenance Center or Test Desk to perform tests.

54. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **55.**

55. At RT, unseat all **CU**s in digroup being tested. (The **CU**s do not need to be removed from shelf.)

56. Reinsert one **CU** and have Maintenance Center or Test Desk to perform tests on that channel.

57. Did channel trouble clear?

    If **YES,** then continue with Step **58.**
    If **NO,** then proceed to Step **60.**

58. Reinsert next **CU** and have Maintenance Center or Test Desk repeat test.

59. Did channel trouble clear?

    If **YES,** then proceed to Step **58.**
    If **NO,** then continue with Step **60.**

60. Replace **CU** that causes test to fail.

61. Reinsert remaining **CU**s and restore service.

62. Did channel failure clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **63.**

63. ***Note:*** Approximately 20 seconds must be allowed for alarm lamps to clear.

    At COT, replace **TRU** on shelf with trouble.

64. Request Maintenance Center or Test Desk to repeat channel tests.

65. Did trouble clear?

    If **YES,** then proceed to Step **76.**
    If **NO,** then continue with Step **66.**

66. If you do not have a protection line, proceed to Step **68.** At **LSU** faceplate, locate **f** switch that is associated with first **LIU** for shelf with trouble.

67. Operate the **f** switch to the **ON** position.

68. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace first **LIU** for shelf with trouble.

    Reference: **DLP-518**

69. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **70.**
    If **NO,** then proceed to Step **74.**

70. Depress **ADU LED TEST** pushbutton.

71. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **72.**
    If **YES,** then proceed to Step **73.**

72. Replace **LIU** and repeat from Step **69.**

    Reference: **DLP-518**

73. Option switch (**32/64**) on **LIU** set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU** and repeat from Step **69.**

74. If you do not have a protection line, proceed to Step **75.** Operate appropriate **f** switch on **LSU** to OFF.

75. Did trouble clear?

    If **YES,** then continue with Step **76.**
    If **NO,** then proceed to Step **77.**

76. Restore service to shelf.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

77. If you do not have a protection line, proceed to Step **79.** At **LSU** faceplate, locate **f** switch that is associated with next **LIU** for shelf with trouble.

78. Operate the **f** switch to the **ON** position.

79. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    Replace next **LIU** for shelf with trouble.

    Reference: **DLP-518**

80. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **81.**
    If **NO,** then proceed to Step **85.**

81. Depress **ADU LED TEST** pushbutton.

82. Does **FAIL** LED on **LIU** go off?

    If **NO,** then continue with Step **83.**
    If **YES,** then proceed to Step **84.**

83. Replace **LIU** and repeat from Step **80.**

    Reference: **DLP-518**

84. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU,** set option switch correctly, reinstall **LIU,** and repeat from Step **80.**

85. If you do not have a protection line, proceed to Step **86.** Operate appropriate **f** switch on **LSU** to OFF.

86. Did trouble clear?

    If **YES,** then continue with Step **87.**
    If **NO,** then proceed to Step **88.**

87. Restore service to shelf.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

88. Have all **LIUs** for shelf with trouble been replaced?

    If **YES,** then continue with Step **89.**
    If **NO,** then proceed to Step **77.**

89. Did trouble clear?

    If **YES,** then continue with Step **90.**
    If **NO,** then proceed to Step **91.**

90. Restore service to shelf.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

91. At COT, unseat all **CUs** on shelf being tested. (The **CUs** do not need to be removed from shelf.)

92. Reinsert one **CU** and have Maintenance Center or Test Desk to perform channel test on that channel.

93. Did channel trouble clear?

    If **YES,** then continue with Step **94.**
    If **NO,** then proceed to Step **96.**

94. Reinsert next **CU** and have Maintenance Center or Test Desk repeat test.

95. Did channel trouble clear?

    If **YES,** then proceed to Step **94.**
    If **NO,** then continue with Step **96.**

96. Replace **CU** that causes test to fail.

97. Reinsert remaining **CUs** and restore service.

98. Did channel failure clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **99.**

99. ***Note:*** Approximately 20 seconds must be allowed for alarm lamps to clear.

    At RT, replace **TRU** on shelf with trouble.

100. Request Maintenance Center or Test Desk to repeat channel test.

101. Did trouble clear?

    If **YES,** then proceed to Step **112.**
    If **NO,** then continue with Step **102.**

102. If you do not have a protection line, proceed to Step **104.** At RT **LSU** faceplate, locate **f** switch that is associated with first **LIU** for shelf with trouble.

103. Operate the **f** switch to the **ON** position.

104. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

    At RT, replace first **LIU** for shelf with trouble.

    Reference: **DLP-518**

105. Does **FAIL** LED on **LIU** light and remain lighted?

    If **YES,** then continue with Step **106.**
    If **NO,** then proceed to Step **110.**

106. Depress **ADU LED TEST** pushbutton.

107. Does **FAIL** LED on **LIU** go off?

If **NO,** then continue with Step **108.**
If **YES,** then proceed to Step **109.**

108. Replace **LIU** and repeat from Step **105.**

Reference: **DLP-518**

109. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **105.**

110. If you do not have a protection line, proceed to Step **111.** Operate appropriate **f** switch on **LSU** to OFF.

111. Did trouble clear?

If **YES,** then continue with Step **112.**
If **NO,** then proceed to Step **113.**

112. Restore service to shelf.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

113. If you do not have a protection line, proceed to Step **115.** At RT **LSU** faceplate, locate **f** switch that is associated with next **LIU** for shelf with trouble.

114. Operate the **f** switch to the **ON** position.

115. ***Caution: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

At RT, replace next **LIU** for shelf with trouble.

Reference: **DLP-518**

116. Does **FAIL** LED on **LIU** light and remain lighted?

If **YES,** then continue with Step **117.**
If **NO,** then proceed to Step **121.**

117. Depress **ADU LED TEST** pushbutton.

118. Does **FAIL** LED on **LIU** go off?

If **NO,** then continue with Step **119.**
If **YES,** then proceed to Step **120.**

119. Replace **LIU** and repeat from Step **116.**

Reference: **DLP-518**

120. Option switch (**32/64**) on **LIU** set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU** and repeat from Step **116.**

121. If you do not have a protection line, proceed to Step **122.** Operate appropriate **f** switch on **LSU** to off.

122. Did trouble clear?

If **YES,** then continue with Step **123.**
If **NO,** then proceed to Step **124.**

123. Restore service to shelf.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

124. Have all **LIUs** for shelf with trouble been replaced?

If **YES,** then continue with Step **125.**
If **NO,** then repeat from Step **113.**

125. Did trouble clear?

If **YES,** then continue with Step **126.**
If **NO,** then proceed to Step **127.**

126. Restore service to shelf.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

127. Unseat all **CUs** on shelf being tested. (The **CUs** do not need to be removed from shelf.)

128. Reinsert one **CU** and have Maintenance Center or Test Desk to perform tests.

129. Did trouble clear?

If **YES,** then continue with Step **130.**
If **NO,** then proceed to Step **133.**

130. Reinsert **CUs** one at a time and have Maintenance Center or Test Desk repeat tests after each insertion.

131. Replace **CU** that causes test to fail.

132. Reinsert remaining **CUs** and restore service.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

133. Use COT and RT schematic drawings to locate and clear trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR OR MINOR ALARM AT COT OR RT - MJ OR MN AND NE LEDS LIGHTED (ON PROT. NOT LIGHTED)

1. Is **FAIL** LED lighted on any **LIU**?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **12.**

2. If you do not have a protection line, proceed to Step **4.** At **LSU** faceplate, locate **f** switch that is associated with the same digroup as the **LIU** with **FAIL** indicator lighted.

3. Operate the **f** switch to the **ON** position.

4. ***Caution 1: Removal of the ADU or BCU at a Mode 96 RT will result in loss of service on the A digroup.***

   Caution 2: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

   Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU** and **ADU** at the COT or **BCU** at the RT), replace all three plug-ins and reinitialize the system.

   Replace **LIU** with **FAIL** indicator lighted.

   Reference: **DLP-518**

5. Does **FAIL** LED on **LIU** light and remain lighted?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **10.**

6. Depress **ADU LED TEST** pushbutton.

7. Does **FAIL** LED on **LIU** go off?

   If **NO,** then continue with Step **8.**
   If **YES,** then proceed to Step **9.**

8. Replace **LIU** and repeat from Step **5.**

   Reference: **DLP-518**

9. Option switch (**32/64**) on **LIU** is set incorrectly. Remove **LIU**, set option switch correctly, reinstall **LIU**, and repeat from Step **5.**

10. If you do not have a protection line, proceed to Step **11.** Operate appropriate **f** switch on **LSU** to OFF.

11. Did system alarms clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **12.**

12. Are any other **FAIL** LEDs lighted?

    If **YES,** then continue with Step **13.**
    If **NO,** then proceed to Step **20.**

13. ***Caution 1: Removal of the ADU or BCU at a Mode 96 RT will result in loss of service on the A digroup.***

    Caution 2: On this TAP and all subsequent TAPs, any time a circuit pack is replaced, insure that any option switches are set identical to the data on the facility record. Incorrectly set ADU, LSU, or LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.

    Note: When the system is equipped with FPC, FPC2, or FPD and the **BCU** or **ADU** at the COT or the **BCU** at the RT is replaced; up to 10 minutes may be required for the fail and status indicators to return to normal if the memory of the **BCU** at the RT has to be updated. If any two plug-ins fail (**BCU** and **ADU** at the COT or **BCU** at the RT), replace all three plug-ins and reinitialize the system.

    Replace circuit pack(s) that has **FAIL** LED lighted.

    Reference: **DLP-515 (LSU)**

    Reference: **DLP-516 (ADU)**

    Reference: **DLP-517 (AIU)**

14. Did alarm clear within 20 seconds?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **15.**

15. At **ADU** depress **LED TEST** pushbutton.

16. Are all **FAIL** LEDs lighted?

    If **YES,** then proceed to Step **20.**
    If **NO,** then continue with Step **17.**

17. At **PCU -48V** and **GND** pin jacks, is -48V present?

    If **YES,** then continue with Step **18.**
    If **NO,** then proceed to Step **21.**

18. ***Caution 1: Before removing a PCU from an RT shelf, locate the CFU that is housed in the same bank as the PCU to be replaced and remove either the -20 HZ/AB (if PCU is in AB shelf) or the -20 HZ/CD (if PCU is in CD shelf) fuse. Replace the fuse after the PCU has been replaced.***

    Caution 2: On this TAP and all subsequent TAPs, insure that any option switches are set identical to the data on the facility record.

    Replace the **PCU.**

19. Did alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to Step **23.**

20. Check option switch settings on **ADU.**

21. Are **ADU** option switch settings correct?

    If **YES,** then proceed to Step **23.**
    If **NO,** then continue with Step **22.**

22. Correct **ADU** option switch settings and repeat from Step **19.**

23. ***Note:*** Multiple troubles may exist.

    At the COT, is (yellow) **OFFICE CLOCK** LED on the **OTU** lighted?

    If **YES,** then Main office clock failed, use appropriate schematic for maintenance and repeat from Step **19.**
    If **NO,** then continue with Step **24.**

24. Use SD-7C115 and SD-7C116 at COT or SD-7C117, SD-7C118, and SD-7C119 at the RT to locate trouble.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MAJOR ALARM AT COT OR RT - MJ, NE, AND DCU FAIL LEDS LIGHTED

1. Remove **DCU** with **FAIL** LED lighted and install replacement **DCU**.

   Reference: **DLP-519**

2. Did **DCU FAIL** LED(s) extinguish?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **3.**

3. Use SD-7C115-02 and SD-7C116-02 if at COT or SD-7C117-02 if at RT to locate trouble.

CLEAR MAJOR ALARM AT COT OR RT - INC OR FAILED INPUT LED ON DCU LIGHTED

1. Replace **DCU-L (AUA16)** circuit pack.

   Reference: **DLP-519**

2. Is **INC** indicator on **DCU-R** or **FAILED INPUT** indicator on **DCU-L** lighted?

   If **YES,** then continue with Step **3.**
   If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

3. Replace **DCU-L** circuit pack with original **DCU-L** circuit pack.

4. Is **INC** indicator on **DCU-R** lighted?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **6.**

5. Failure in equipment or facility downstream from RT. Continue trouble isolation procedures contained in documents pertaining to equipment or facility in question.

6. Failure in equipment or facility connecting to **DCU-L** at RT. If DSX-1 is present at RT location, check for good DS1 signal at "OUT" jacks feeding **DCU-L.** If signal is good, check wiring between DSX-1 and **DCU-L.** If signal is faulty check DS1 facility feeding DSX-1. If DSX-1 is not present at RT, continue trouble isolation using procedures contained in documents pertaining to equipment or facility in question.

FIBER-TO-THE-HOME MAINTENANCE PHILOSOPHY

GENERAL

The FTTH (Fiber-To-The-Home) capability is provided by the *SLC*® Series 5 Carrier System (Series 5) configured with FPC (Feature Package C). The basic system is composed of a Series 5 COT (central office terminal) connected via a fiber multiplex system or T1 carrier to a Series 5 RT (remote terminal). Additional RT equipment and apparatus provide the optical interface to the DT (Distant Terminal) located at the customer premises.

FTTH REMOTE TERMINAL DESCRIPTION

The FTTH equipment is mounted on 7-foot frames in an RT enclosure [e.g., CEV (controlled environmental vault)]. The frame can be equipped with 2 RT channel bank assemblies, 4 optical shelves, two 2A fan units, and an optics power shelf. This arrangement will support 4 *SLC* Series 5 carrier RT systems. Another 7-foot frame is used as an optical interconnect facility to make the interconnections from the optical shelf to the fiber distribution cable.

Three new channel units are used in a FTTH RT channel bank. The **AUA400** and **AUA401** CUs provide the electrical interface to the optical shelf **AYB1(B)** plug-in for 2 or 4 single-party channels, respectively. The **AUA403** test CU is used only for system testing purposes.

WARNING

The use of any RT channel unit except the AUA400, AUA401, or AUA403 CUs will result in permanent damage to the AYB1(B) OU in the optical shelf.

DISTANT TERMINAL DESCRIPTION

A single fiber carries up to four VF channels from the AYB1(B) optical unit in the RT optical shelf to an AYB1(B) in the DT. The AYB1(B) splits the transmit and receive optical signals and performs the electrical to optical conversion. The electrical signal from the DT AYB1(B) is passed to the ASJ1 channel unit which provides up to four VF lines depending on which channel unit is used at the RT. The ASJ1 channel unit provides the BORSCH (battery feed; overvoltage protection; ringing; supervision; CODEC; hybrid) functions for the four POTS lines.

The DT is powered from customer premises ac power. The ASH1 power converter unit maintains backup battery power, provides DT circuit pack power, and ringing current.

SYSTEM MAINTENANCE

Trouble clearing for FTTH is based on LED alarm indicators and circuit pack replacement. Basic *SLC* Series 5 carrier system trouble clearing activities, as described in TAD-100, is the same for a FTTH system with one main difference. The alarms that indicate failed RT ringing generators (non-FTTH) are used to report failed optical shelf or optics power shelf troubles (***ADU*** and ***BCU*** indicators light for the digroups).

FTTH CUSTOMER TROUBLE REPORTS

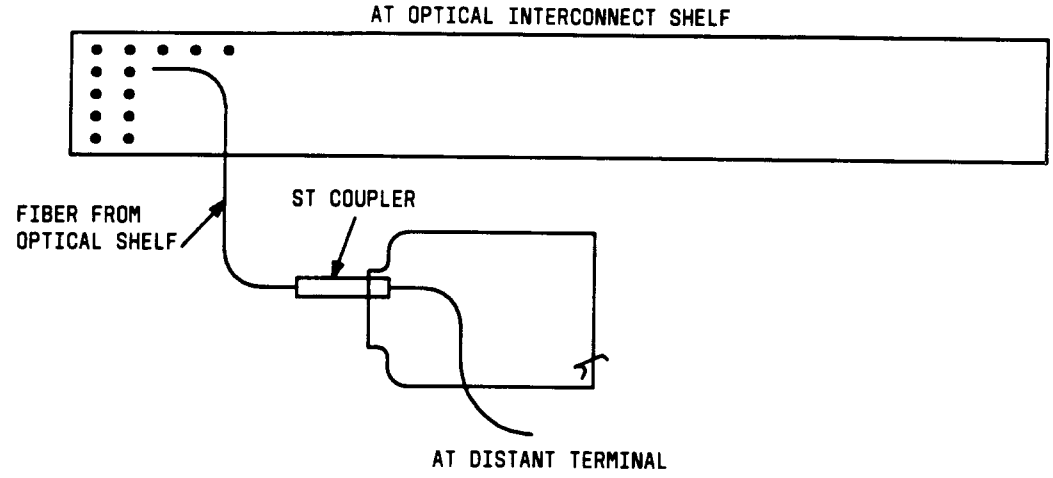
A FTTH customer trouble report is generally an unalarmed trouble (i.e., not a system trouble) that can be caused by failed COT or RT channel units, failed AYB1(B) optical unit, failed DT equipment, or bad fiber distribution cable.

When a customer reports a trouble to the RSA (repair service administrator), the RSA can perform MLT (generic 5 issues 6 or later) tests, via XTC, that will give a good/bad COT channel unit indication and a dc signature for the RT channel unit. If the COT channel unit is good and the RT channel unit dc signature is good, craftsperson should be dispatched to the DT.

A J99407TA-1,L1 analyzer (a self-contained portable DT) can be used at the RT or DT to sectionalize troubles to RT equipment, fiber distribution cable, or DT equipment (See Fig. 1). The RT channel units AUA400 and AUA401 have an OOS (out of service) indicator that lights when the signal from the DT is lost. The analyzer can be connected at the optical interconnect shelf to verify RT equipment. An AUA403 channel unit, included with the analyzer, can be used to isolate trouble between the COT and RT by replacing the AUA400 or AUA401 channel unit.

When trouble clearing at the DT, first verify ac power and ASH1 power converter voltages are present. Then observe ASJ1 channel unit alarm indicators to determine the cause of the trouble. The analyzer can be used to quickly identify if trouble is associated with the fiber distribution cable or DT equipment.

TAPs in this section provide detailed procedures required to clear Fiber-To-The-Home customer trouble reports.



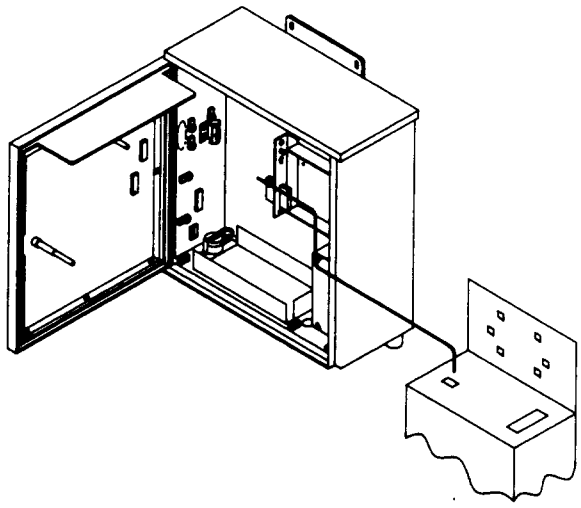


Fig. 1—Fiber Connections With J99407TA Analyzer

CLEAR FIBER-TO-THE-HOME CHANNEL TROUBLE

General This procedure is used to clear customer trouble reports when the *SLC* Series 5 carrier system is unalarmed. Customer trouble conditions can be caused by system failures or RT optical power failures. These troubles will activate system alarms. If the *SLC* system is alarmed, refer to **IXL-001** to clear trouble condition.

Multiple channel troubles can be caused by faulty common units (TRUs or LIUs), or a faulty channel unit (killer channel unit) at the COT or RT channel bank. These types of failures generally cause trouble on all channels associated with the digroup(s).

This procedure is intended to clear channel trouble reports for customers served by a single DT. Each DT can provide four POTS channels. If more than one channel is used and only one has trouble, customer premises wiring, MDF-to-COT wiring, COT, RT, or DT channel units is a likely cause or trouble. Channel tests via the MLT can give a GOOD/BAD dc signature that indicates if the RT channel unit is out of frame (OOF). MLT testing (generic 5 issue 6 or later) via the XTC can give a PASS/FAIL indication for COT channel units. The RT channel will always fail but the GOOD/BAD dc signature will indicate an OOF condition.

1. Is trouble on a single DT, or associated with a shelf (AB or CD) or single digroup?

   If **DT,** then continue with Step **2.**
   If **SHELF or DIGROUP,** then do **TAP-123.**

2. ***Note:*** If Maintenance Center or Test Desk cannot access failed channel via PGTC (pair gain test controller) or XTC (extended test controller), check to ensure that no fuses are blown in lower (blue) bank **CFU** (channel fuse unit). The results will be a GOOD/BAD RT channel unit dc signature and possibly a PASS/FAIL COT channel unit result (if MLT with generic 5.1 or later and the XTC is used). If the channel is busy test access will be denied. See Maintenance and Testing section in AT&T Practice 363-205-002 for more details on channel testing.

   Request Maintenance Center to perform tests on failed **CU**s.

   Reference: **DLP-526**

3. What were the test results?

   If **GOOD dc signature for RT CU**, proceed to DT and continue with Step **15.**
   If **BAD dc signature for RT CU**, proceed to RT and continue with Step **7.**
   If **BAD COT CU** or no test done, proceed to COT and continue with Step **4.**

4. Replace COT **AUA38** channel unit.

5. Request Maintenance Center to perform tests on new **CU**s.

   Comment: If testing is not available, call customer and verify normal talk and dialing capabilities.

6. Did trouble clear?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then proceed to RT and continue with Step **7.**

7. At RT, determine **AYB1(B)** and optical interconnect fiber associated with the trouble.

   Reference: **DLP-522**

8. Connect **J990407TA** analyzer to fiber appearance at the optical interconnect bay and perform normal talk tests.

   Reference: **DLP-523**

   Comment: The analyzer must be replaced if **FAIL or BUSY** indicators remain on after fiber connection is made.

9. Was call completed with normal transmission quality in both directions?

   If **YES,** then proceed to Step **11.**
   If **NO,** then continue with Step **10.**

10. Check COT and RT wiring for tip and ring reversals. Use COT and RT schematic drawings to check wiring.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

11. Disconnect analyzer test connections. Clean and reconnect fiber distribution cable at optical interconnect bay.

12. Is **OOS** indicator light on **AUA400** or **AUA401** RT channel unit?

    If **YES,** then proceed to DT and continue with Step **15.**
    If **NO,** then continue with Step **13.**

13. Call customer and verify normal talk and dialing capabilities.

14. Did trouble clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then proceed to DT and continue with Step **15.**

15. At DT site, disconnect customer line from NAU and connect a test set to the RJ11 jack. Perform normal talk tests.

16. Was call completed with normal transmission quality in both directions?

    If **YES,** then **STOP. Trouble is with customer premises wiring. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **17.**

17. ***Note:*** The **ASH1 PCU** has two **GND** jacks. One is used with **BAT** and **20HZ** on one side of the board, and **+5, -5,** and **-37** Vdc on the other side of the board.

A quick DT power test is to turn off the ac power and verify the ON BAT indicator lights.

At DT site, open cabinet and measure **ASH1 PCU** faceplate test jack voltages.

Requirements: **BAT** and **GND** -10 to -15 Vdc
20HZ and **GND** -18.4 to -21.6 Vdc
20HZ and **GND** 69 to 81 Vac
+5 and **GND** +4.6 to +5.4 Vdc
-5 and **GND** -4.6 to -5.4 Vdc
-37 and **GND** -34 to -40 Vdc.

Comment: The **20HZ and GND** voltages will not be present if **OOF** indicator is lighted or the ASJ1 is failed.

18. ***Note:*** The DT power will shut down if ac power is lost and the battery voltage drops below 10 Vdc. Ac power must be restored before the DT will be powered.

If **ASH1 PCU** voltage requirements were not present, replace ASH1 PCU. If voltage requirements are still not present, proceed to Step **29.**

Reference: **DLP-524**

19. At DT observe any LED indicators on **ASJ1** channel unit.

- **FAIL**: Power down (turn off ac power and disconnect battery power cable J104-P104) and restore DT power. If FAIL is still on, replace **ASJ1** and repeat this procedure if necessary.

Reference: **DLP-524**

- **OOF**: Likely cause is in DT electronics, proceed to Step **30.**
- **BUSY**: Likely cause is a short in **NIU** wiring, proceed to Step **20.**
- **ON BAT**: Likely cause is a loss of ac power. Verify ac power is present at ac outlet and circuit breaker is on. If ON BAT is still on proceed to Step **27.**
- **No LED Lighted and No Dial Tone**: Replace DT (See AT&T Practice 363-205-002).

20. For **BUSY** indicator, verify no channels are in use and remove connections at the NIU. At 108 connect block (Fig. 1) remove Tip-Ring pairs to NIU and observe **BUSY** indicator.

21. Did **BUSY** indicator go off?

If **YES**, then continue with Step **22.**
If **NO**, then proceed to Step **23.**

22. Trouble is in voice-frequency pairs. Use SD drawing to correct wiring trouble. Clear customer premises wiring trouble and reconnect VF pairs to 108 block. Check NAU protectors. If dial tone cannot be established at the NAU, replace DT.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

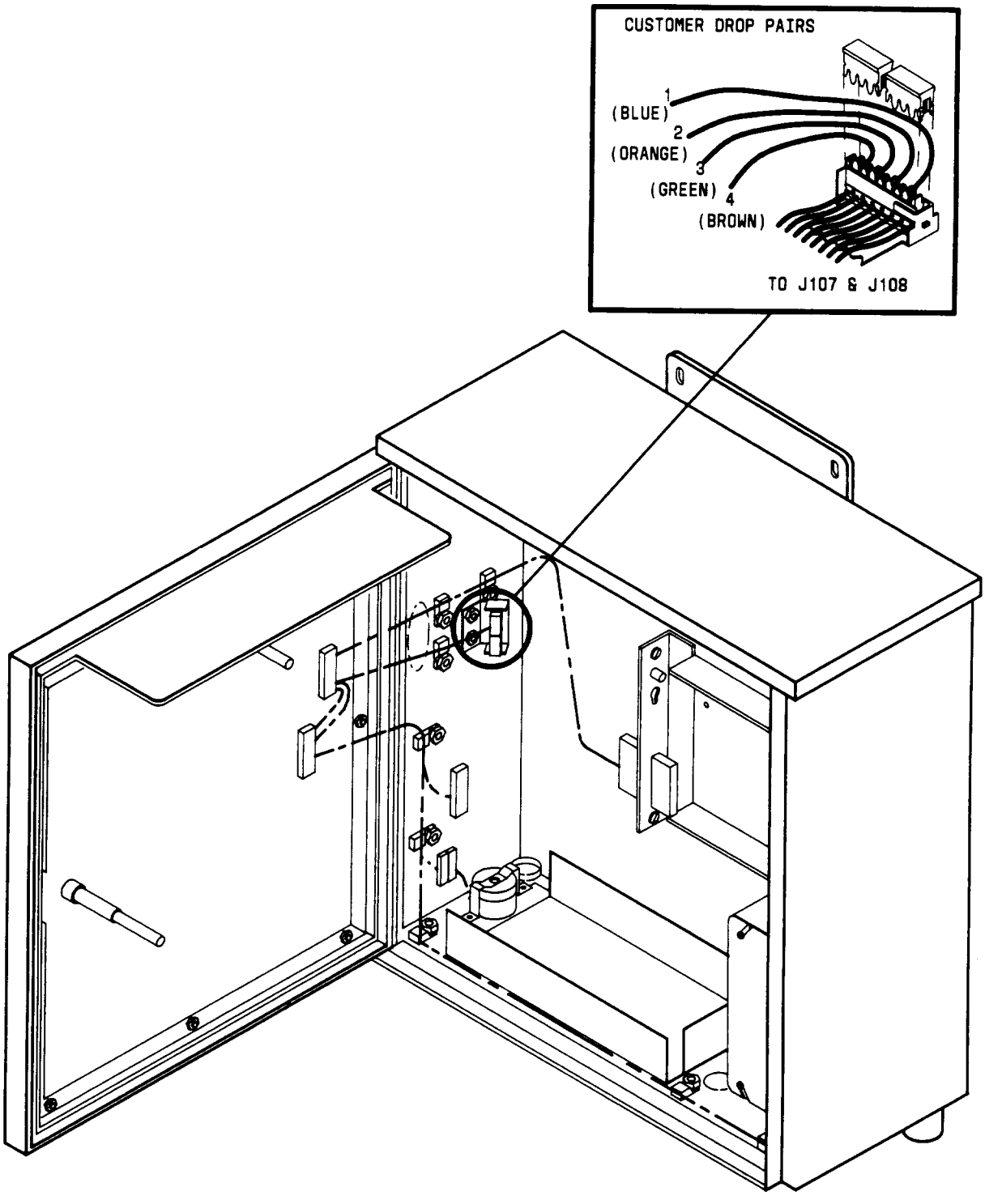


Fig. 1—Customer Drop Pairs Access in DT Cabinet

23. Replace **ASJ1** channel unit.

    Reference: **DLP-524**

24. On replacement **ASJ1**, is **BUSY** indicator off?

    If **NO**, then continue with Step **25.**
    If **YES**, then proceed to Step **26.**

25. Trouble is in DT wiring. Use SD drawing to correct wiring trouble. Replace DT if trouble is not found (See AT&T Practice 363-205-002).

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

26. Connect NAU Tip-Ring pairs on 108 connector block. Perform normal transmission tests from NAU RJ11 jack and proceed to Step **28.**

27. ***Note:*** If **ON BAT** indicator is lighted, verify ac power is present before continuing.

    For **power trouble**, replace **ASH1 PCU** and perform normal transmission tests.

    Reference: **DLP-524**

28. Is normal transmission quality good in both directions?

    If **YES**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO**, then proceed to Step **29.**

29. Trouble is in DT circuitry. Use SD drawing to correct wiring trouble. Check secondary ac power to ASH1 PCU at J101 (17 volts ac between brown and brown wires). Replace DT if power trouble is not cleared (See AT&T Practice 363-205-002).

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

30. For **OOF**, unplug **AYB1(B)** optical unit and connect J99407TA test card into AYB1(B) slot. You must remove *ST*® lightguide cable connector cover and clean the *ST* connectors before inserting the test card. Perform normal transmission tests from J99407TA Analyzer channel jacks.

31. Is normal transmission quality good in both directions?

    If **YES**, then proceed to Step **33.**
    If **OOF** is lighted on Analyzer, then continue with Step **32.**

32. If RT equipment has not been checked out, proceed to RT site and continue with **Step 7.** If trouble is not found at RT, dispatch craftsperson responsible for locating and repairing optical distribution cable troubles.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

33. Replace **AYB1(B)** optical unit in DT and remove Analyzer connections.

34. Perform normal transmission tests from NIU.

35. Is normal transmission quality good in both directions?

    If **YES, THEN STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO**, then continue with Step **36.**

36. Trouble is in wiring between **AYB1(B)** and **ASJ1**. Use SD drawing to correct wiring trouble. Replace DT if trouble is not cleared (See AT&T Practice 363-205-002).

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

CLEAR POWER MINOR ALARM AT 80E CABINET (BULK POWER PLANT) RT - PMN LED LIGHTED

1. At control and distribution panel, is **BAT2** or **VS** circuit breaker on AYK2 circuit pack tripped or is **FRB** fuse blown?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **8.**

2. Reset tripped circuit breaker or replace blown fuse.

3. Does circuit breaker trip or fuse blow again?

   If **YES,** then continue with Step **4.**
   If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

4. If **FRB** fuse blown?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **6.**

5. Wiring problem present on control and distribution panel. Use SD-83109-01 to locate and clear trouble.

6. Replace AYK2 circuit pack.

7. Does circuit breaker trip again?

   If **YES,** then proceed to Step **5.**
   If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

8. On OLS rectifier shelf, is **FAIL** indicator on either CS787B540 power unit (rectifier) lighted?

   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **14.**

9. At ac power panel, locate circuit breaker (**CB6**, **CB7**, or **CB8**) providing ac power to rectifier with **FAIL** indicator lighted.

10. Operate circuit breaker **OFF** and then back **ON**.

11. Does **FAIL** indicator on rectifier remain lighted?

    If **YES,** then continue with Step **12.**
    If **NO,** then proceed to Step **13.**

12. Replace CS787B540 rectifier.

13. After 5 minutes, is **PMN** or **P/M** indicator on **BCU** lighted?

If **YES,** then continue with Step **14.**
If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

14. Use a millivoltmeter to measure output current of each rectifier at test points on control and distribution panel (refer to Table A for test point locations).

TABLE A

RECTIFIER	TEST POINTS
1	RR - RC1
2	RR - RC2
3	RR - RC3

15. Is output current absent from all rectifiers?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **23.**

16. At control and distribution panel, operate **UTILITY** circuit breaker **OFF** then back **ON** again.

17. Is output current still absent from all rectifiers?

    If **YES,** then continue with Step **18.**
    If **NO,** then proceed to Step **22.**

18. Contact local power company if loss of ac power has occurred.

19. Does power company verify loss of ac power?

    If **YES,** then continue with Step **20.**
    If **NO,** then proceed to Step **21.**

20. Estimate restoration time for ac power. If necessary, provide auxiliary source of ac power until ac power is restored.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

21. Check wiring at control and distribution panel using SD-83109-01.

22. Is output current present from all rectifiers?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **23.**

23. Check wiring and appropriate circuit breakers on control and distribution panel using SD-83109-01.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

CLEAR MINOR ALARM - MN AND NE LEDS LIGHTED AT 80E CABINET RT - NO DIGROUP LEDS LIGHTED

1. At ring shelf, is **RMN** indicator on **AUG3 RING CONTROL UNIT** and/or **FAIL** indicator on **3C** or **3A RINGING GENERATOR** lighted?

   If **YES,** then continue with Step **2.**
   If **NO,** then proceed to Step **9.**

2. Is **FAIL** indicator on **RINGING GENERATOR** lighted?

   If **YES,** then continue with Step **3.**
   If **NO,** then proceed to Step **7.**

3. Replace **RINGING GENERATOR.**

4. Is **FAIL** indicator on **RINGING GENERATOR** lighted?

   If **YES,** then continue with Step **5.**
   If **NO,** then proceed to Step **6.**

5. Use SD-7C155-01 to locate and clear trouble.

6. Does alarm clear within 5 minutes?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then proceed to Step **1.**

7. Replace **RING CONTROL UNIT** with lighted **RMN** indicator.

8. Is **RMN** indicator on **RING CONTROL UNIT** lighted?

   If **YES,** then proceed to Step **5.**
   If **NO,** then proceed to Step **6.**

9. Is **FAN ALARM** LED lighted on any 2B fan unit?

   If **YES,** then continue with Step **10.**
   If **NO,** then proceed to Step **16.**

10. ***Caution: To avoid possible damage, do not over extend fan assembly power cable.***

    Disconnect **J114** from **P114** on fan assembly and remove fan assembly from bay.

11. Examine fan assembly for any mechanical blockage that will prevent fan from operating properly.

12. Is any mechanical blockage present?

    If **YES,** then continue with Step **13.**
    If **NO,** then proceed to Step **15.**

13. Remove any blockages, reconnect **J114** to **P114** on fan unit, and reinstall fan unit in bay.

14. Is **FAN ALARM** indicator on 2B fan unit off?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **15.**

15. Replace 2B fan unit with new fan unit.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

16. Remove cover from control and distribution panel. Is circuit breaker **RB1**, **RB2**, **RB3**, or **BAT1** on AYK1 circuit pack tripped or **FBAT** fuse blown?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **32.**

17. Reset tripped circuit breaker or replace blown fuse.

18. Does circuit breaker trip or fuse blow again?

    If **YES,** then continue with Step **19.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

19. Is **FBAT** fuse blown?

    If **YES,** then proceed to Step **23.**
    If **NO,** then continue with Step **20.**

20. Is **BAT1** breaker tripped?

    If **YES,** then continue with Step **21.**
    If **NO,** then proceed to Step **24.**

21. Replace AYK1 circuit pack.

22. Does breaker trip again?

    If **YES,** then continue with Step **23.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

23. Wiring problem present on control and distribution panel. Use SD-83109-01 to locate and clear trouble.

24. At AYK1 circuit pack, disconnect plug **P1** (**RB1**), **P2** (**RB2**), or **P3** (**RB3**) associated with tripped breaker (FIG. 1).

25. Reset tripped circuit breaker.

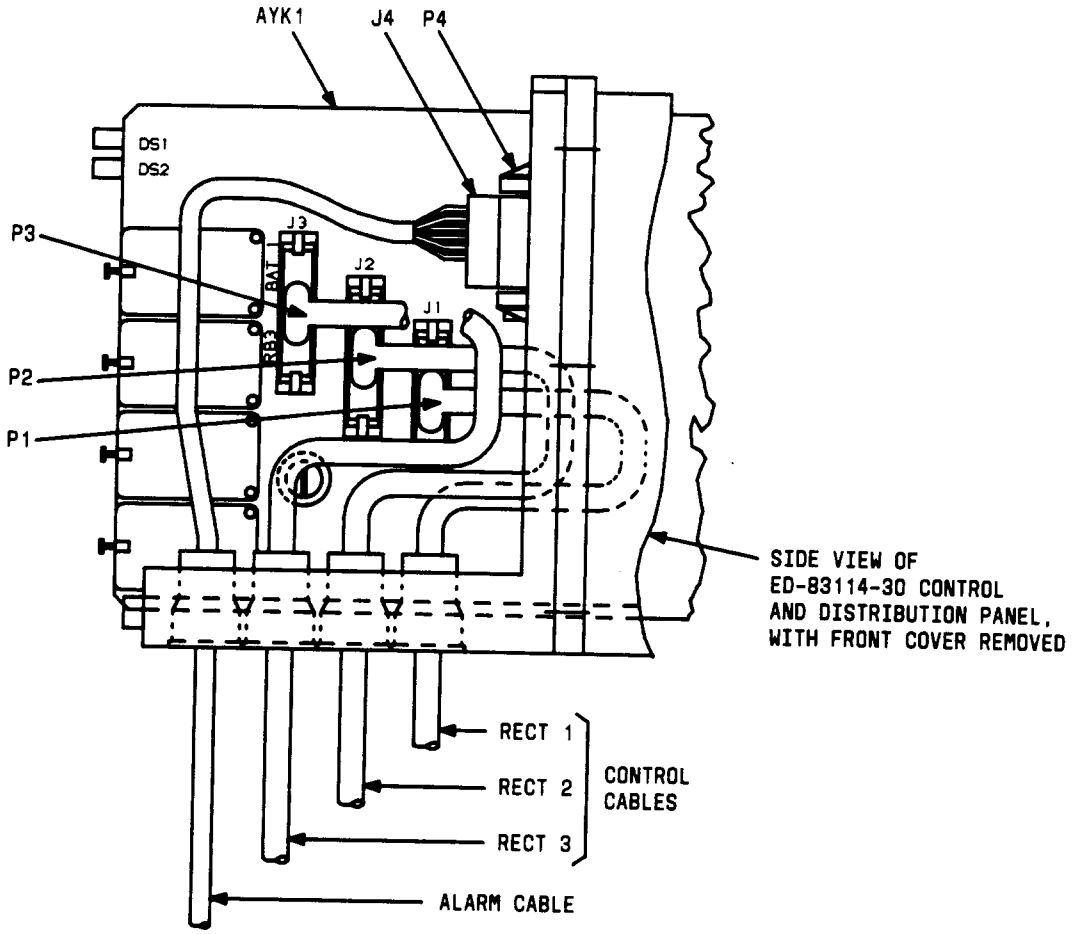


Fig. 1—Location of Rectifier Cable Plugs at AYK1 Circuit Pack

26. Does breaker trip again?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **27.**

27. At OLS rectifier shelf, locate and disconnect appropriate **P906-**_ connector that is attached to end of cable that was disconnected in Step **24.**

28. Reconnect plug **P1**, **P2**, or **P3** that was disconnected in Step **24** and reset tripped circuit breaker.

29. Does breaker trip again?

    If **YES,** then proceed to Step **31.**
    If **NO,** then continue with Step **30.**

30. Replace appropriate CS787B540 power unit (rectifier), reconnect **906-_** connector, and proceed to Step **22.**

31. Defective control cable between circuit breaker and rectifier. Replace control cable and proceed to Step **22.**

32. At control and distribution panel, is **LOW VOLT DISCONNECT** indicator lighted?

    If **YES,** then continue with Step **33.**
    If **NO,** then proceed to Step **44.**

33. Use DMM (digital multimeter) to measure voltage between test points **PVR** and **PV** on control and distribution panel.

34. Is voltage reading greater than 42.5 Vdc?

    If **YES,** then continue with Step **35.**
    If **NO,** then proceed to Step **39.**

35. At control and distribution panel, remove AYK1 circuit pack and measure voltage between test points **BATC** and **RR**.

36. Is voltage reading greater than 0.2 Vdc?

    If **YES,** then continue with Step **37.**
    If **NO,** then proceed to Step **38.**

37. Replace control and distribution panel.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

38. Replace AYK1 circuit pack.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE.

39. Output of rectifiers is low, check wiring at OLS rectifier shelf and wiring between rectifier shelf and ac control panel.

40. Is wiring correct and connectors securely attached?

    If **YES,** then proceed to Step **43.**
    If **NO,** then continue with Step **41.**

41. Correct wiring problem.

42. Does alarm clear?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **43.**

43. Trouble in wiring at control and distribution panel or rectifier shelf. Use SD-83109-01 and SD-7C118 to clear trouble.

44. Is **FBAT** fuse on control and distribution panel blown?

If **YES,** then continue with Step **45.**
If **NO,** then proceed to Step **43.**

45. Replace blown fuse and proceed to Step **42.**

ABBREVIATED SYSTEM MAINTENANCE

General

This procedure is intended for craft personnel familiar with *SLC* Series 5 carrier system maintenance. It is assumed that the craft personnel are familiar with the system architecture and understand the functions of the plug-in circuit packs. The basis of this procedure is that one failure condition can cause multiple alarm indications. Detailed steps are not provided. If a circuit pack is replaced, all options must be set correctly on the replacement pack.

The following list provides the order that should be followed when clearing system trouble. Alarm symptoms are given for a failure that can cause multiple alarm indicators to light. The NE/FE LED indicates the probable location of the trouble. It is best to start at the end with NE lighted (if indicator in lighted). When a list of circuit packs to replace is given, replace them at both ends before doing the next pack. Reinstall original packs if trouble does not clear.

I. **POWER;** symptoms MJ,MN,CLF,PMN,DIGROUPS
- A.) Replace Fuse
  - 1.) If fuse blows,
    - a.) Replace PCU.
    - b.) Unseat all associated packs and replace fuse.
      - 1.) If fuse blows use SDs to correct wiring trouble.
      - 2.) Install, one at a time, until pack that blows fuse is found. Start with PCU, Common Units, then Channel units.
- B.) RT ac power.

II. **FAIL** on circuit pack; symptoms MJ,MN,CLF,DIGROUPS
- A.) Replace circuit pack.
- B.) If MJ and all DIGROUPS (no CLFs), Replace RT ringing generators or FTTH optics shelf failure.

III. **CLF on LIU;** MJ/MN,DIGROUPS
- A.) on AB or CD LIUs, replace TRUs, TCUs, PCUs.
- B.) Single digroup.
  - 1.) Replace LIUs.
    - a.) Measure line voltage and current, compare with office records.
    - b.) Fault locate.

IV. **MJ;** symptom only MJ is lighted
- A.) Replace DCUs.

V. **MN:** symptom only MN is lighted
- A.) RT fan.
- B.) LSU f/d switch set.

VI. **Channel Trouble;** No alarms
- A.) Single channel, replace COT and RT CUs. Check wiring, then do B. For FTTH, check optics using analyzer, replace AYB1(B) and DT circuit packs.
- B.) Multiple Channel, replace TRUs, LIUs, TCUs, DCU-L and DCU-R

If the guidelines above do not clear/find the trouble, refer to **IXL-001** or **TAP-101** for detailed procedures.

CHECK FAULT-LOCATE LINE AND SYSTEM

1. Obtain test equipment per Table A.

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B, 415A-2, or J98725AD
Two P3-type Patch Cords	P3BH

2. ***Note:*** Passive FL lines use 598- or 1068-type filters. Active FL lines use 1114- or 1115-type filters.

   From office records, determine type of FL (fault-locating) filters that are used on fault-locating line.

3. ***Note:*** Location of authorized tip and ring reversal determines which **POLARITY** setting on FL panel will activate 1114-type filters. A tip and ring reversal will exist if more than twelve 1114-type filters are on same FL line.

   From office records, determine location of authorized tip and ring reversal (if any) on FL line.

4. Is fault locating to be performed from COT or DSX Cross-Connect?

   If **COT,** then continue with Step **5.**
   If **DSX CROSS-CONNECT,** then proceed to Step **6.**

5. Prepare COT for fault locating and proceed to Step **7.**

   Reference: **DLP-509**

6. Prepare DSX Cross-Connect for fault locating.

   Reference: **DLP-512**

7. Which test set is being used?

   If **315B OR 415A-2,** then continue with Step **8.**
   If **25AD,** then proceed to Step **9.**

8. If using **315B** test set, set controls per Table B; if using **415A-2** test set, set controls per Table C and proceed to Step **10.**

TABLE B 315B TEST SET	
CONTROL/SWITCH	**POSITION**
POWER	POWER
FUNCTION	QRW GEN
NORM	NORM
PULSE PERIOD	REF 11
RCV LEVEL dBm	-90 with red center vernier knob rotated fully clockwise
LINE FILTER	Set to letter code of first filter out from COT

TABLE C 415A-2 TEST SET	
CONTROL/SWITCH	**POSITION**
POWER	ON
FUNCTION	QRSS
NORM	NORM
RECEIVE FAULT LINE LEVEL dBm	-90 with red center vernier knob rotated fully clockwise
SYSTEM Mb/s	1.544
LINE FILTER	Set to letter code of first filter out from COT

9. Set controls per Table D.

10. Is fault locating being performed from COT or DSX Cross-Connect?

    If **COT,** then continue with Step **11.**
    If **DSX CROSS-CONNECT,** then proceed to Step **15.**

11. At FL panel, set **FL LINE** switch to number of fault-locate line being used (FIG. 1).

12. Make test connections as shown in FIG. 1.

TABLE D 25AD TEST SET	
CONTROL/SWITCH	**POSITION**
CLOCK RATE	T1
FUNCTION	BI-POLAR SIGNAL
PULSE DENSITY	11 REF
RECEIVER SENSITIVITY	-80
FILTER	Set to letter code of first filter out from COT

13. ***Note:*** **READY** LED may be delayed for several seconds by **BUSY** lamp.

    Does **READY** LED light?

    If **YES,** then proceed to Step **16.**
    If **NO,** then continue with Step **14.**

14. Do troubles exist on FL panel?

    If **YES,** then do **TAP-117.**
    If **NO,** then continue with Step **16.**

15. Make maintenance panel test connections as shown in FIG. 2.

16. Is FL line equipped with 1114-type or 1115-type filters?

    If **1114-TYPE,** then continue with Step **17.**
    If **1115-TYPE,** then proceed to Step **18.**

17. ***Note:*** When 1115-type filters are used, **POLARITY 1** will activate filter group for **Side 1** of digital line and **POLARITY 2** will activate filter group for **Side 2**. When 1114-type filters are used, **POLARITY 2** activates filter group closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filter group after authorized tip and ring reversal.

    At FL panel, set **POLARITY** switch to **2** for 1114-type filters and proceed to Step **19.**

18. At FL panel, set **POLARITY** switch to **1** for 1115-type filters.

19. Verify that fault-locating pair is properly terminated with a 262C-type (900-ohm terminating) plug in the fault locate jack on each branch of FL pair at the last RT.

20. If using **315B** test set, adjust **RCV LEVEL dBm** control for on-scale reading; if using **415A-2** test set, adjust **RECEIVE FAULT LINE LEVEL dBm** for on-scale reading; if using 25AD test set, adjust **RECEIVER SENSITIVITY** for on-scale reading.

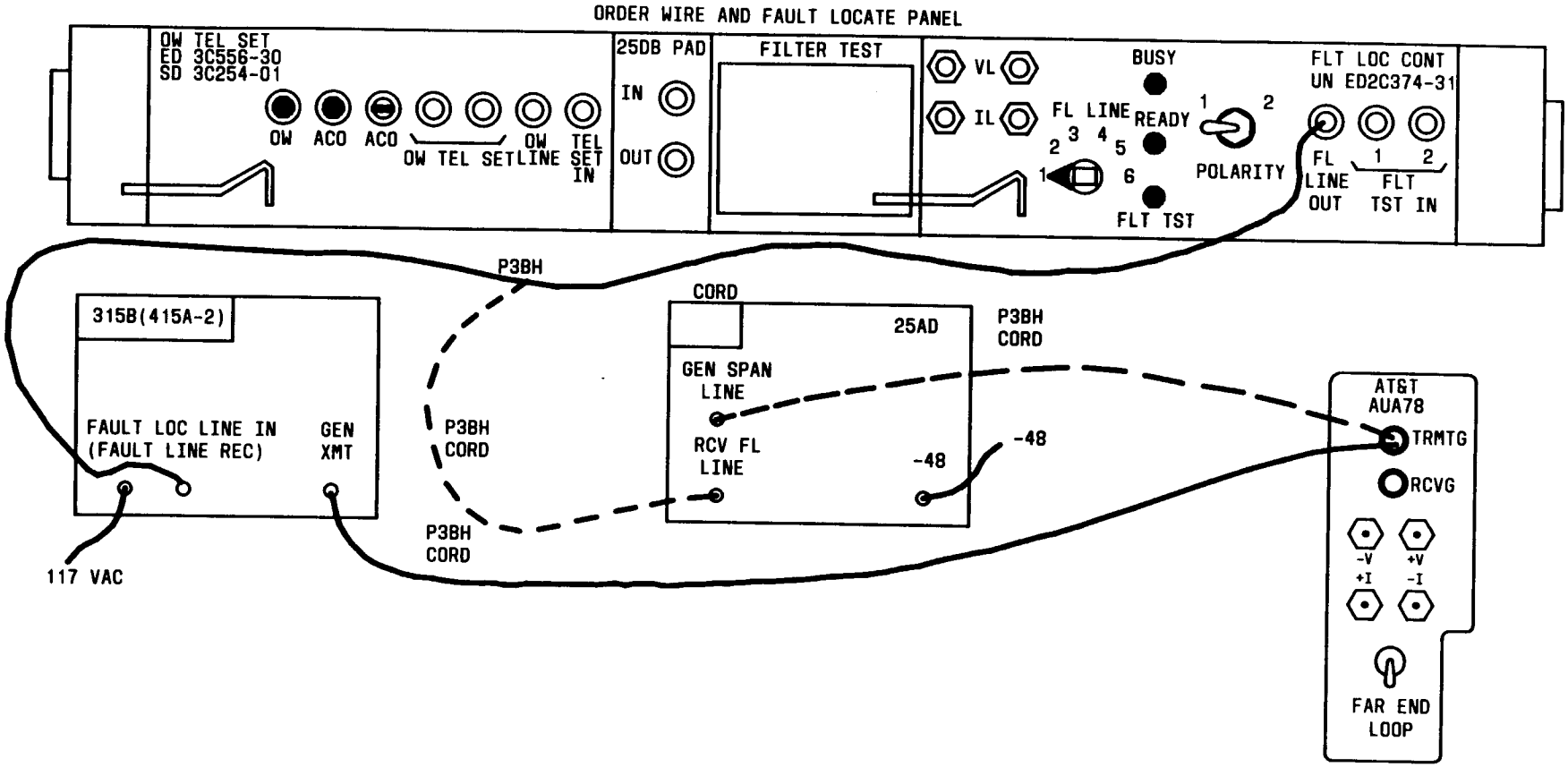


Fig. 1—COT Fault-Locating Configuration

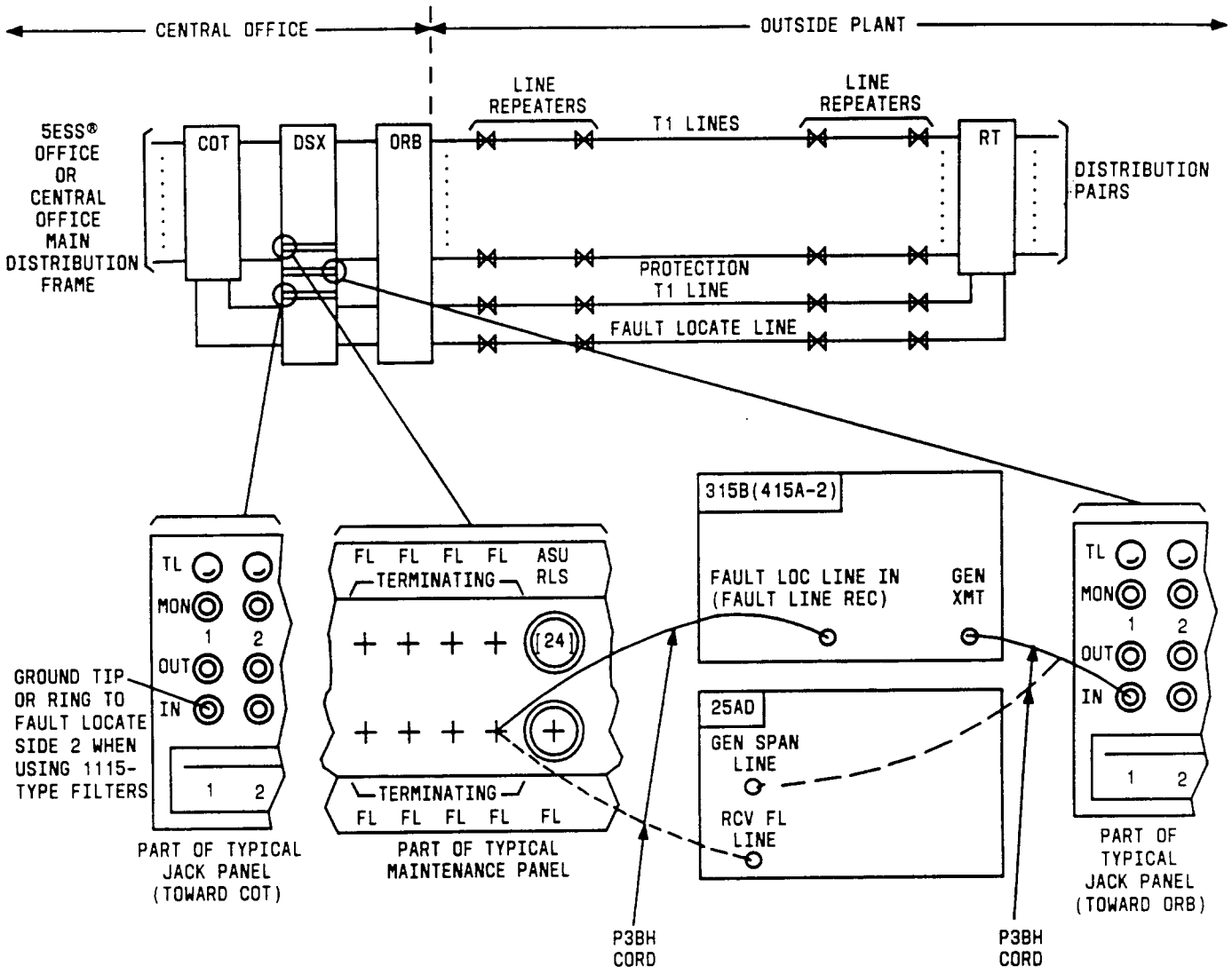


Fig. 2—Typical DSX Cross-Connect Fault-Locating Configuration

21. Does meter on test set indicate less than –90 dBm (0dBrn), (–92 dBm is less than –90 dBm)?

    If **YES**, then continue with Step **22.**
    If **NO**, then proceed to Step **24.**

22. Have all filter codes (A through M) in this group been tested?

    If **YES**, then proceed to Step **25.**
    If **NO**, then continue with Step **23.**

23. Set test set **FILTER** switch to next filter code to be tested and repeat from Step **20.**

24. FL line is bad, note trouble indication and repair per local procedures.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

25. Is FL line equipped with 1114-type or 1115-type filters?

    If **1114-TYPE**, then continue with Step **26.**
    If **1115-TYPE**, then proceed to Step **30.**

26. Are more than 12 filters on FL line?

    If **YES**, then continue with Step **27.**
    If **NO**, then proceed to Step **31.**

27. After tip and ring reversal (**POLARITY 1** switch setting), have all filters for **Side 1** been tested?

    If **YES**, then proceed to Step **31.**
    If **NO**, then continue with Step **28.**

28. Set FL panel **POLARITY** switch to **1**.

29. Set test set **FILTER** switch to code letter of next filter on FL line and repeat from Step **20.**

30. Have filters for **Side 2** been tested (**POLARITY 2** switch setting)?

    If **YES**, then continue with Step **31.**
    If **NO**, then proceed to Step **32.**

31. Leave test connections set up if more fault locating tests are to be performed. Otherwise, proceed to Step **34**.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

32. Set FL panel **POLARITY** switch to **2**.

33. Set test set **FILTER** switch to code letter of first filter back from RT and repeat from Step **20.**

34. Disconnect fault-locate and test connections (FIG. 1 and FIG. 2).

35. Is fault locating being performed from COT or DSX Cross-Connect?

    If **COT**, then continue with Step **36.**
    If **DSX CROSS-CONNECT**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

36. At **AUA78 FLTA**, remove far end loop by positioning toggle switch opposite **FAR END LOOP** position.

37. Remove **AUA78 FLTA**.

38. Replace **AUA78 FLTA** with **LIU** circuit pack.

39. ***Caution: If option switches on LIU are not set correctly, service could be affected at the present time and also at some future time.***

    Insure that option switches on **LIU** are set identical to those on FLTA circuit pack.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

PERFORM TRANSMISSION TEST FROM THE COT USING FAULT-LOCATE TEST SET

1. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   Are 1115-type, 1114-type, or passive filters installed on FL line?

   If **1115-TYPE,** then proceed to Step **4.**
   If **1114-TYPE OR PASSIVE,** then continue with Step **2.**

2. Is direction of transmission trouble on **Side 1** (COT to RT), **Side 2** (RT to COT), or unknown?

   If **SIDE 1 OR UNKNOWN,** then proceed to Step **4.**
   If **SIDE 2,** then continue with Step **3.**

3. Transmission tests on **Side 2** of digital line cannot be performed from COT. Move to RT to test.

   Reference: **DLP-503**

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

4. Prepare COT for fault locating (FIG. 1).

   Reference: **DLP-509**

5. Which test set is being used?

   If **315B,** then continue with Step **6.**
   If **415A-2,** then proceed to Step **7.**
   If **25AD,** then proceed to Step **8.**

6. Set controls per Table A and proceed to Step **9.**

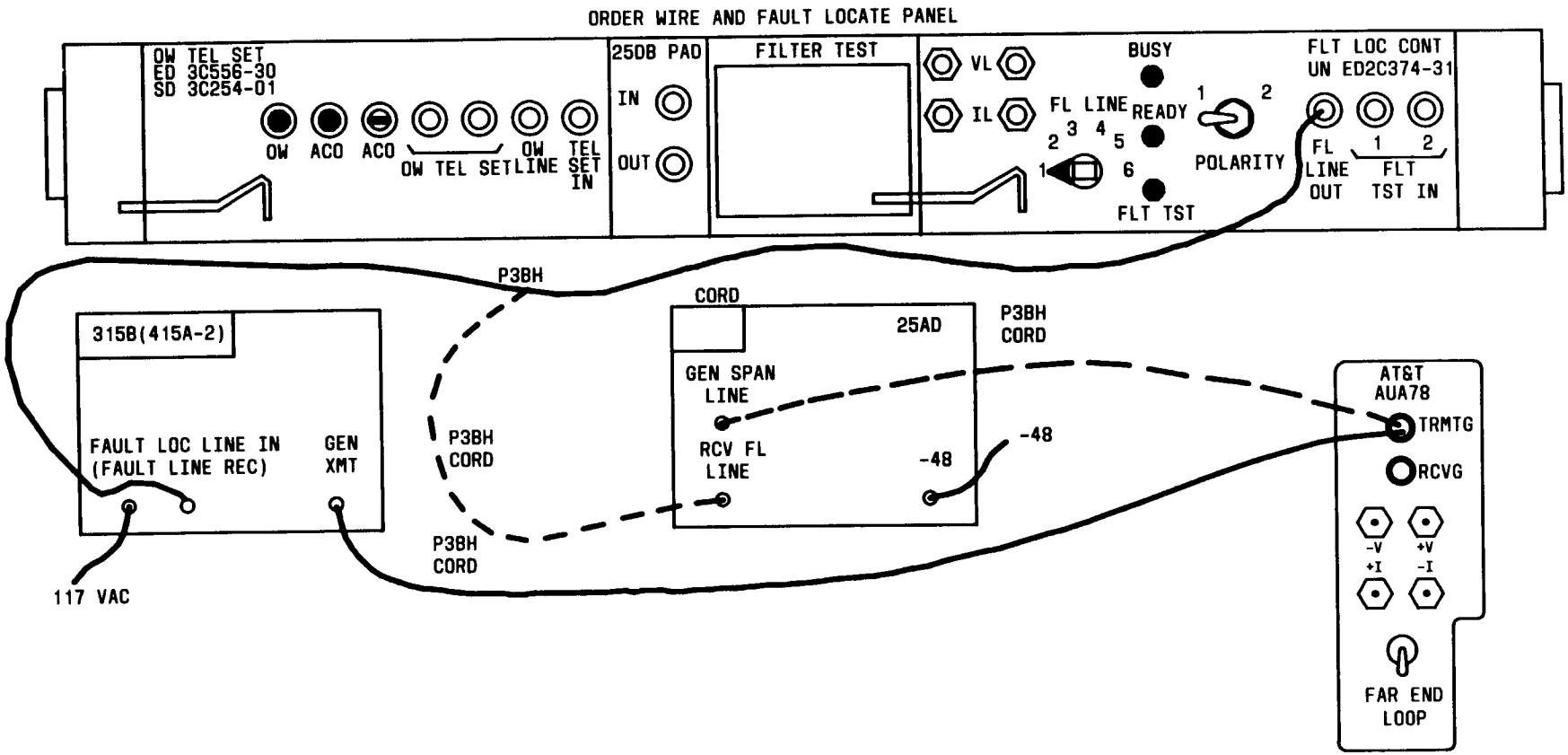


Fig. 1—COT Fault-Locating Configuration

TABLE A 315B TEST SET	
CONTROL/SWITCH	POSITION
POWER	POWER
RCV LEVEL dBm	Set for an on-scale reading
LINE FILTER	Set to letter code of first filter out from COT

7. Set controls per Table B and proceed to Step **9.**

TABLE B 415A-2 TEST SET	
CONTROL/SWITCH	POSITION
POWER	ON
RECEIVE FAULT LINE LEVEL dBm	Set for an on-scale reading
LINE FILTER	Set to letter code of first filter out from COT

8. Set controls per Table C.

TABLE C 25AD TEST SET	
CONTROL/SWITCH	POSITION
CLOCK RATE	T1
RECEIVER SENSITIVITY	Set for an on-scale reading
FILTER	Set to letter code of first filter out from COT

9. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   On FL panel, set **POLARITY** switch to activate first filter out from COT.

10. Record reading on FLR (fault-locating record) form (FIG. 2).

FAULT-LOCATING RECORD

ROUTE_____

OFFICE_____

FILTER TYPE_____

TEST LOCATION

☐ COT ☐ RT

LINE & SYSTEM_____

TESTER_____

DATE_____

FAULT-LOCATE LINE NUMBER_____

FAULT-LOCATING PAIR TEST

☐ NEW SYSTEM TEST

☐ TROUBLE TEST

FAULT-LOCATE SET

☐ SIERRA 315B (415A-2)

☐ WE 25AD

RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

Fig. 2—FLR (Fault-Locating Record) Form

11. Does meter indicate greater than –74 dBm (–72 dBm is greater than –74 dBm) and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then proceed to Step **29.**
    If **NO,** then continue with Step **12.**

12. Is this last filter on digital line to be tested?

    If **YES,** then proceed to Step **18.**
    If **NO,** then continue with Step **13.**

13. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

14. Record meter indication on FLR form.

15. Does meter indicate greater than –74 dBm and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **17.**

16. Previously tested filter is faulty; note location of filter and clear fault using local procedures and proceed to Step **29.**

17. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

18. Are you performing tests on **Side 1** or **Side 2**?

    If **SIDE 1,** then proceed to Step **20.**
    If **SIDE 2,** then continue with Step **19.**

19. Faulty filter is at this location, or digital line section is faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

20. Are 1115-type, 1114-type, or passive filters installed?

    If **1114-TYPE OR PASSIVE,** then continue with Step **21.**
    If **1115-TYPE,** then proceed to Step **22.**

21. Faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

22. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

    On FL panel, set **POLARITY** switch to **2**.

23. ***Note:*** Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

    Set FLTS **FILTER** switch to code letter of first filter back from RT.

24. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.

25. Record meter indication on FLR form.

26. Does meter indicate greater than −74 dBm and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then proceed to Step **28.**
    If **NO,** then continue with Step **27.**

27. Digital line section or repeater at previously tested filter location (last filter on **Side 1**) has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

28. Previously tested filter (last filter on **Side 1**) is faulty. Note location of faulty filter for future replacement.

29. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.

30. Record meter indication on FLR form.

31. If using **315B** or **415A-2** test set, does meter indicate 4 dB to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within ±2 dB of **MEAS 1** value?

    If **YES,** then continue with Step **32.**
    If **NO,** then proceed to Step **35.**

32. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.

33. Record meter indication on FLR form.

34. Does meter indicate within ±1 dB of **MEAS 2** value?

    If **YES,** then proceed to Step **36.**
    If **NO,** then continue with Step **35.**

35. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

36. Is this last filter on digital line side being tested?

    If **YES,** then proceed to Step **38.**
    If **NO,** then continue with Step **37.**

37. Set FLTS **FILTER** switch to code letter of next filter on line. Ensure that FL panel **POLARITY** switch is set correctly (if required) and repeat from Step **5.**

38. Are 1115-type, 1114-type, or passive filters installed?

    If **1115-TYPE,** then proceed to Step **40.**
    If **1114-TYPE OR PASSIVE,** then continue with Step **39.**

39. Note no trouble found on **Side 1** of this digital line. Fault locating procedures on **Side 2** must be performed from RT.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

40. Has **Side 2** of digital line been tested (if necessary)?

    If **YES,** then continue with Step **41.**
    If **NO,** then proceed to Step **42.**

41. Report no trouble found on digital line.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

42. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** position on FL panel activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** position on FL panel activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

    On FL panel, set **POLARITY** switch to **2.**

43. On test adapter (**AUA78**), insure that Far End Loop switch is set to **FAR END LOOP** position.

44. ***Note:*** Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

    Set FLTS **FILTER** switch to code letter of first filter back from RT and repeat from Step **5.**

PERFORM TRANSMISSION TEST FROM RT USING FAULT-LOCATE TEST SET

1. ***Note:*** Active FL (fault locate) lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   Is FL line active or passive?

   If **ACTIVE,** then continue with Step **2.**
   If **PASSIVE,** then proceed to Step **5.**

2. ***Note:*** If 1114-type filters are used, **POLARITY 1** activates filters closest to RT between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and COT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

   Request COT personnel to set **POLARITY** switch on FL panel to activate first filter out from RT.

3. Ensure that COT FL panel **FL LINE** switch is set to correct number (**1, 2, 3, 4, 5,** or **6**) to access FL line being used.

4. Prepare for transmission test from RT and proceed to Step **5.**

   Reference: **DLP-514**

5. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of first filter out from RT, if using 25AD test set, set **FILTER** switch to code letter of first filter out from RT.

6. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL.**

7. If using **315B** test set, set **REC LEVEL dBm** switch for on-scale reading; if using **415A-2** test set, set **RECEIVE FAULT LINE LEVEL dBm** switch for on-scale reading; if using 25AD test set, set **SENSITIVITY** switch to obtain on-scale reading.

8. Record reading on FLR (fault-locating record) form.

9. Does meter indicate greater than –74 dBm (–72 dBm is greater than –74 dBm) and within ±6 dBm of that recorded on original FLR form?

   If **YES,** then proceed to Step **17.**
   If **NO,** then continue with Step **10.**

10. Is this last filter on digital line side being tested?

    If **YES,** then continue with Step **11.**
    If **NO,** then proceed to Step **12.**

11. A faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

12. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

13. Record meter indication. (Ensure that FL panel **POLARITY** switch is positioned to proper setting.)

14. Does meter indicate greater than −74 dBm and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then continue with Step **15.**
    If **NO,** then proceed to Step **16.**

15. Previously tested filter is faulty. Note location of filter for future replacement and proceed to Step **17.**

16. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and use local procedures to clear fault.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

17. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.

18. Record meter indication on FLR form.

19. If using **315B** or **415A-2** test set, does meter indicate 4 dB to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within ±2 dB of **MEAS 1** value?

    If **YES,** then continue with Step **20.**
    If **NO,** then proceed to Step **23.**

20. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.

21. Record meter indication on FLR form.

22. Does meter indicate within ±1 dB of **MEAS 2** value?

    If **YES,** then proceed to Step **24.**
    If **NO,** then continue with Step **23.**

23. Digital line section or repeater at this location has been identified as faulty. Note location of trouble and clear fault using local procedures.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

24. Is this last filter on digital line side being tested?

    If **YES,** then proceed to Step **26.**
    If **NO,** then continue with Step **25.**

25. Set FLTS **FILTER** switch to code letter of next filter on line. (Ensure that FL panel **POLARITY** switch is set correctly if required) and repeat from Step **6.**

26. Report no trouble found on digital line.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

PERFORM TRANSMISSION TEST FROM DSX CROSS-CONNECT USING FAULT-LOCATE TEST SET

1. Prepare for transmission test from DSX cross-connect and proceed to Step **2.**

   Reference: **DLP-512**

2. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   Are 1115-type, 1114-type, or passive filters installed on FL line?

   If **1115-TYPE,** then proceed to Step **5.**
   If **1114-TYPE OR PASSIVE,** then continue with Step **3.**

3. Is direction of transmission trouble on **Side 1** (COT to RT), **Side 2** (RT to COT), or unknown?

   If **SIDE 1 OR UNKNOWN,** then proceed to Step **5.**
   If **SIDE 2,** then continue with Step **4.**

4. Transmission tests on **Side 2** of digital line cannot be performed from COT; move to RT to test.

   Reference: **DLP-503**

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

5. Which test set is being used?

   If **315B,** then continue with Step **6.**
   If **415A-2,** then proceed to Step **7.**
   If **25AD,** then proceed to Step **8.**

6. Set controls per Table A and proceed to Step **9.**

7. Set controls per Table B and proceed to Step **9.**

TABLE A 315B TEST SET	
CONTROL/SWITCH	**POSITION**
POWER	POWER
RCV LEVEL dBm	Set for an on-scale reading
LINE FILTER	Set to letter code of first filter out from COT

TABLE B 415A-2 TEST SET	
CONTROL/SWITCH	**POSITION**
POWER	ON
RECEIVE FAULT LINE LEVEL dBm	Set for an on-scale reading
LINE FILTER	Set to letter code of first filter out from COT

8. Set controls per Table C.

TABLE C 25AD TEST SET	
CONTROL/SWITCH	**POSITION**
CLOCK RATE	T1
RECEIVER SENSITIVITY	Set for an on-scale reading
FILTER	Set to letter code of first filter out from COT

9. ***Note:*** Active lines use 1114-type or 1115-type filters. If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   On FL panel, set **POLARITY** switch to activate first filter out from COT.

10. Record reading on FLR (fault-locating record) form (FIG. 1).

FAULT-LOCATING RECORD

ROUTE_____

OFFICE_____

FILTER TYPE_____

TEST LOCATION

☐ COT ☐ RT

LINE & SYSTEM_____

TESTER_____

DATE_____

FAULT-LOCATE LINE NUMBER_____

FAULT-LOCATING PAIR TEST

☐ NEW SYSTEM TEST

☐ TROUBLE TEST

FAULT-LOCATE SET

☐ SIERRA 3150 (415A-2)

☐ WE 25AD

RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L . POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

Fig. 1—FLR (Fault-Locating Record) Form

11. Does meter indicate greater than −74 dBm (−72 dBm is greater than −74 dBm) and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then proceed to Step **31.**
    If **NO,** then continue with Step **12.**

12. Is this last filter on digital line side being tested?

    If **YES,** then proceed to Step **18.**
    If **NO,** then continue with Step **13.**

13. If using **315B** or **415A-2** test set, set **LINE FILTER** switch to code letter of next filter on line; if using 25AD test set, set **FILTER** switch to code letter of next filter on line.

14. Record meter indication on FLR form.

15. Does meter indicate greater than −74 dBm and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **17.**

16. Previously tested filter is faulty; note location of filter and clear fault using local procedures and proceed to Step **31.**

17. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

18. Are you performing tests on **Side 1** or **Side 2**?

    If **SIDE 1,** then proceed to Step **20.**
    If **SIDE 2,** then continue with Step **19.**

19. Faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

20. Are 1115-type, 1114-type, or passive filters installed?

    If **1114-TYPE OR PASSIVE,** then continue with Step **21.**
    If **1115-TYPE,** then proceed to Step **22.**

21. Faulty filter is at this location, or digital line section or repeater is faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

22. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** for digroup A is off, a far end loop cannot be done for line being tested.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

    If **YES,** then do Step **21.**
    If **NO,** then continue with Step **23.**

23. On FL panel, set **POLARITY** switch to **2.**

24. At DSX Cross-Connect **IN** jack toward COT, ground tip or ring lead of digital line being tested.

25. ***Note:*** Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

    Set FLTS **FILTER** switch to code letter of first filter back from RT.

26. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.

27. Record meter indication on FLR form.

28. Does meter indicate greater than –74 dBm and within ±6 dBm of that recorded on original FLR form?

    If **YES,** then proceed to Step **30.**
    If **NO,** then continue with Step **29.**

29. Digital line section or repeater at previously tested filter location (last filter on **Side 1**) has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

30. Previously tested filter (last filter on **Side 1**) is faulty. Note location of faulty filter for future replacement.

31. If using **315B** test set, set **FUNCTION** switch to **MEAS 2**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 2**; if using 25AD test set, set **FUNCTION** switch to **MEAS 2 SIGNAL**.

32. Record meter indication on FLR form.

33. If using **315B** or **415A-2** test set, does meter indicate 4 dB to 8 dB lower than **MEAS 1** value; or, if using 25AD test set, does meter indicate within ±2 dB of **MEAS 1** value?

    If **YES,** then continue with Step **34.**
    If **NO,** then proceed to Step **37.**

34. If using **315B** test set, set **FUNCTION** switch to **MEAS 3**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 3**; if using 25AD test set, set **FUNCTION** switch to **MEAS 3 SIGNAL**.

35. Record meter indication on FLR form.

36. Does meter indicate within ±1dB of **MEAS 2** value?

    If **YES,** then proceed to Step **38.**
    If **NO,** then continue with Step **37.**

37. Digital line section or repeater at previously tested location has been identified as faulty. Note location of trouble and clear fault using local procedures.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

38. Is this last filter on digital line side being tested?

    If **YES,** then proceed to Step **41.**
    If **NO,** then continue with Step **39.**

39. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL.**

40. Set FLTS **FILTER** switch to code letter of next filter on line, ensuring that FL panel **POLARITY** switch is set correctly, if required, and repeat from Step **10.**

41. Are 1115-type, 1114-type, or passive filters installed?

    If **1115-TYPE,** then proceed to Step **43.**
    If **1114-TYPE OR PASSIVE,** then continue with Step **42.**

42. Note no trouble found on **Side 1** of this digital line. Fault locating procedures on **Side 2** must be performed from RT.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

43. Has **Side 2** of digital line been tested (if necessary)?

    If **YES,** then continue with Step **44.**
    If **NO,** then proceed to Step **45.**

44. Report no trouble found on digital line.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

45. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** for digroup A is off, a far end loop cannot be done for line being tested.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

    If **YES,** then continue with Step **46.**
    If **NO,** then proceed to Step **47.**

46. Fault-locating procedures on **Side 2** cannot be performed from COT until A digroup failure has been cleared.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

47. ***Note:*** **POLARITY 1** activates 1115-type filters on **Side 1** (COT to RT) and **POLARITY 2** activates filters on **Side 2** (RT to COT) with loop at RT.

On FL panel, set **POLARITY** switch to **2**.

48. If using **315B** test set, set **FUNCTION** switch to **MEAS 1**; if using **415A-2** test set, set **FUNCTION** switch to **MEASURE 1**; if using 25AD test set, set **FUNCTION** switch to **MEAS 1 SIGNAL**.

49. At DSX Cross-Connect **IN** jack toward COT, ground tip or ring lead of digital line being tested.

50. ***Note:*** Fault-locating tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT.

Set FLTS **FILTER** switch to code letter of first filter back from RT and repeat from Step **10.**

PERFORM OBSCURE TROUBLE TEST FROM COT USING 315B OR 415A-2 FAULT-LOCATE TEST SET

1. Ensure that COT FL (fault locate) panel **FL LINE** switch is set to correct number (**1, 2, 3, 4, 5,** or **6**) to access FL line being tested (FIG. 1).

2. ***Note:*** If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

   On FL panel, set **POLARITY** switch to activate first filter out from COT on **Side 1** (if required).

3. Prepare COT for fault locating.

   Reference: **DLP-509**

4. Which test set is being used?

   If **315B,** then continue with Step **5.**
   If **415A-2,** then proceed to Step **6.**

5. Set test set controls per Table A and proceed to Step **7.**

TABLE A
315B TEST SET

CONTROL/SWITCH	POSITION
FUNCTION	MEAS 1
PULSE PERIOD	11 REF
RCV LEVEL dBm	Adjust for meter indication of −2.0 dB
LINE FILTER	Set to letter code of filter being tested

6. Set test set controls per Table B.

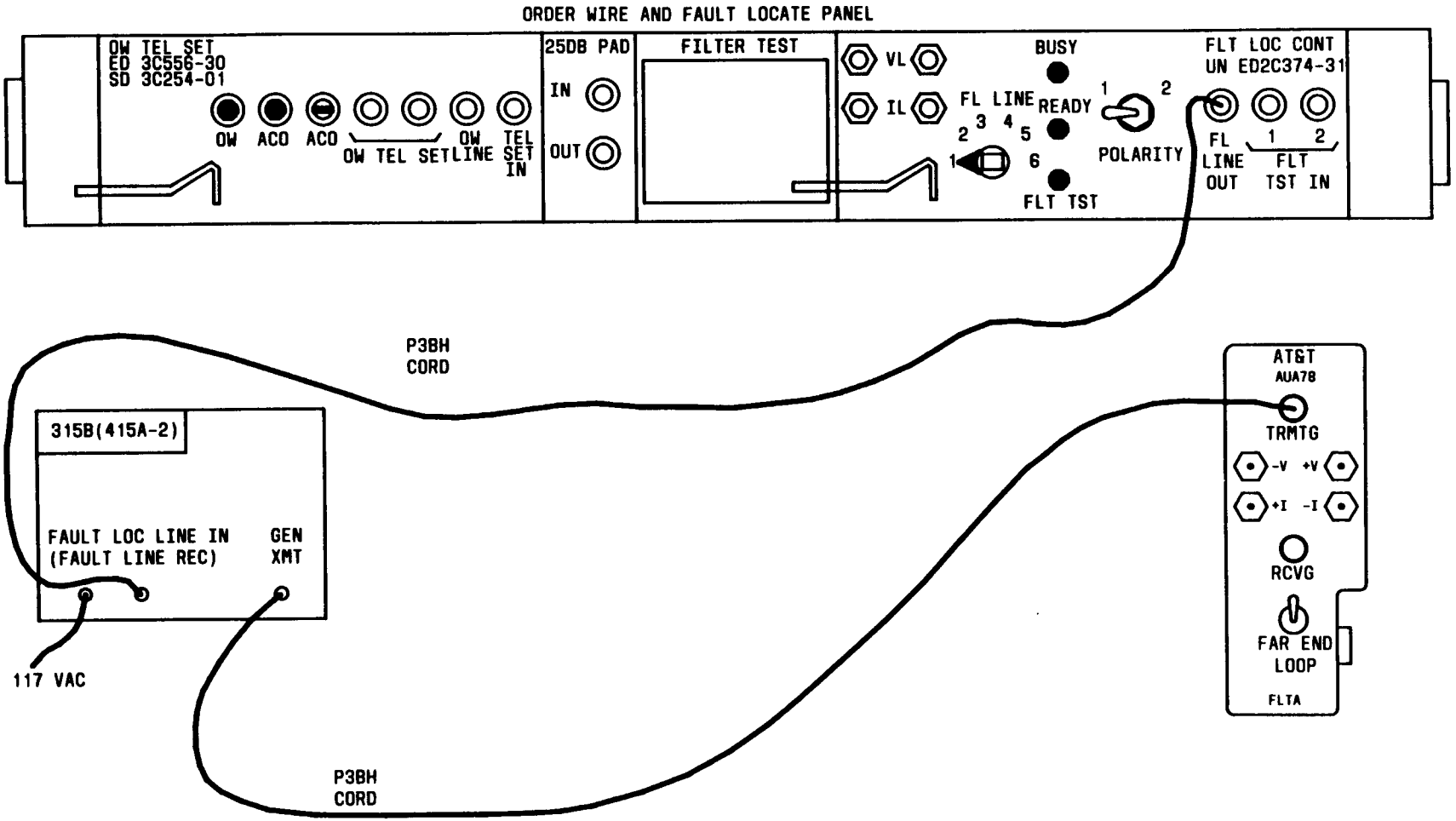


Fig. 1—COT Fault-Locating Configuration Using 315B or 415A-2 Test Set

TABLE B 415A-2 TEST SET	
CONTROL/SWITCH	POSITION
FUNCTION	MEASURE 1
PULSE PERIOD	REF (Pulse period 11 LED will be lighted)
RECEIVE FAULT LINE LEVEL dBm	Adjust for meter indication of 0 dB
LINE FILTER	Set to letter code of filter being tested

7. ***Note:*** When using **415A-2** test set, if **PULSE PERIOD** switch is set to **AUTO**, **PULSE PERIOD** lamps will automatically advance in approximately 2-second intervals. The **HOLD** position is used to stop lighted lamp at desired position.

   If using **315B** test set, set **PULSE PERIOD** control to next lower number (10, 9, etc.); if using **415A-2** test set, advance **PULSE PERIOD** to light next lower numbered LED (10, 9, etc.).

8. ***Note:*** If meter deviation from reference value is not more than ±0.5 dB, a zero is entered. If deviation is greater than +0.5 dB, **deviation amount** preceded by a plus (+) sign is recorded (e.g., +0.6). If deviation is less than reference level by more than -0.5 dB, **deviation amount** preceded by minus (-) is recorded (e.g., -0.6).

   On FLR form (FIG. 2), record meter deviation from reference level (-2.0 dB if using **315B** test set or 0 dB if using or **415A-2** test set).

9. Was last measurement made at **PULSE PERIOD 4**?

   If **YES,** then continue with Step **10.**
   If **NO,** then repeat from Step **7.**

10. Have measurements been made at all filter locations on side being tested?

    If **YES,** then proceed to Step **12.**
    If **NO,** then continue with Step **11.**

11. Go to next filter location to be tested, ensuring that FL **POLARITY** switch is set correctly, and repeat from Step **5.**

12. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?

    If **SIDE 1,** then continue with Step **13.**
    If **SIDE 2,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

13. Are 1115-type, 1114-type, or passive filters installed?

    If **1115-TYPE,** then proceed to Step **15.**
    If **1114-TYPE OR PASSIVE,** then continue with Step **14.**

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A #2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1
FAULT-LOCATING PAIR TEST
[ ] NEW SYSTEM TEST
[X] TROUBLE TEST

FAULT-LOCATE SET
[X] SIERRA 3158 (415A-2)
[ ] WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

* 6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1 — TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	38.3	32.3	32.1	-100	0	0	+.7	+1.0	+1.5	+1.7	+2.1		
B		38.0	32.0	31.9	-98	0	0	0	+.8	+1.2	+1.9	+1.8		
C		39.4	32.3	32.5	-96	0	0	0	+.6	+.9	+1.2	+.9		
D		39.7	34.7	34.0	-100	0	0	0	+.8	+1.0	+1.1	+.7		
E		40.3	33.8	33.2	-98	0	0	+.7	+.6	+1.2	+.9	+.3		
F		41.6	36.5	36.0	-96	0	0	-.6	0	0	-.7	-.9		
G		42.0	36.2	36.1	-94	0	+.6	+.9	+1.6	+.7	-.6	-1.3		
H		42.4	36.4	37.0	-94	-.9	-1.3	-2.6	-3.4	-3.9	-5.6	-9.1		
J		44.4	38.3	38.0	-96	-1.6	-1.7	-1.9	-3.8	-4.5	-8.1	-10.1		

ACTIVE POLARITY SW POS _____ — TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 2—Partially Completed FLR (Fault-Locating Record) Form

14. Test on **Side 2** must be made from RT.

    Reference: **DLP-507 (J98725AD FLTS)**

    Reference: **DLP-508 (315B or 415A-2 FLTS)**

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

15. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done for line being tested.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **TRU ON PROT** LED for A digroup off?

    If **YES,** then do Step **14.**
    If **NO,** then continue with Step **16.**

16. ***Note:*** Obscure trouble tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT. The **POLARITY 2** switch setting on the FL panel activates filters on **Side 2** of FL line.

    On FL Panel, set **POLARITY** switch to activate first filter back from RT and repeat from Step **4.**

PERFORM OBSCURE TROUBLE TEST FROM COT USING J98725AD (25AD) FLTS (FAULT-LOCATE TEST SET)

1. Ensure that COT FL panel FL LINE switch is set to correct number (**1, 2, 3, 4, 5,** or **6**) to access FL line being tested.

2. ***Note:*** If 1115-type filters are used, **POLARITY 1** activates filters on **Side 1** (COT to RT). If 1114-type filters are used, **POLARITY 2** activates filters nearest to COT before authorized tip and ring reversal and **POLARITY 1** activates filters between tip and ring reversal and RT. Passive filters require no **POLARITY** switch setting.

   On FL panel, set **POLARITY** switch to activate first filter out from COT on **Side 1** (if required).

3. Prepare COT for fault locating.

   Reference: **DLP-509**

4. Set controls of 25AD test set per Table A.

TABLE A
25AD TEST SET

CONTROL/SWITCH	POSITION
CLOCK RATE	T1
FUNCTION	MEAS 1 SIGNAL
PULSE DENSITY	10
FILTER	Set to letter code of filter being tested
RECEIVER SENSITIVITY	Adjust control for an on-scale indication on the meter

5. On FLR form (FIG. 1) , record meter indication in space marked **PULSE PERIOD** (**10, 9,** etc.).

6. Was last measurement made at **PULSE DENSITY 4**?

   If **YES,** then proceed to Step **8.**
   If **NO,** then continue with Step **7.**

7. Set **PULSE DENSITY** switch to next lower number (**9, 8, 7,** etc.) and repeat from Step **5.**

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER 1
FAULT-LOCATING PAIR TEST
[ ] NEW SYSTEM TEST
[ ] TROUBLE TEST

FAULT-LOCATE SET
[ ] SIERRA 315B (415A-2)
[X] WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1 — TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	27	26.5	26.5	-120	27	27	27	27	27	27	27		
B		27	26.5	26.5	-120	27	27	27	27	27	27	27		
C		27	27	27	-120	27	27	27	27	27.2	27	26.5		
D		37	37.5	37	-124	37	36.5	36.5	37.2	36.5	37	35.5		
E		29.5	29	29	-120	29.5	29.5	30	30	30	29.5	29.5		
F		31	31.5	31.5	-118	31	31	31.5	31.5	31	31	30.5		

ACTIVE POLARITY SW POS _____ — TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

8. Have measurements been made at all filter locations on side being tested?

   If **YES,** then proceed to Step **10.**
   If **NO,** then continue with Step **9.**

9. Set 25AD **FILTER** switch to next filter to be tested. Ensure that FL **POLARITY** switch is set correctly and repeat from Step **5.**

10. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?

    If **SIDE 1,** then continue with Step **11.**
    If **SIDE 2,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

11. Are 1115-type, 1114-type, or passive filters installed?

    If **1115-TYPE,** then proceed to Step **13.**
    If **1114-TYPE OR PASSIVE,** then continue with Step **12.**

12. Test on **Side 2** must be made from RT.

    Reference: **DLP-507 (J98725AD FLTS)**

    Reference: **DLP-508 (315B or 415A-2 FLTS)**

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

13. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **TRU ON PROT** LED for A digroup off?

    If **YES,** then do Step **12.**
    If **NO,** then continue with Step **14.**

14. ***Note:*** Obscure trouble tests on **Side 2** (RT to COT) start with filter nearest to RT and work toward COT. **POLARITY 2** switch setting activates filters on **Side 2** of digital line.

    On FL Panel, set **POLARITY** switch to activate first filter back from RT and repeat from Step **5.**

PERFORM OBSCURE TROUBLE TEST FROM RT USING J98725AD (25AD) FLTS (FAULT-LOCATE TEST SET)

1. Obtain test equipment per Table A.

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	J98725AD (25AD)
Two P3-type Patch Cords	P3BH

2. ***Note:*** Active FL lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   From office records determine type of fault-locating (FL) filters that are used on fault-locating line.

3. Is fault locate line active or passive?

   If **ACTIVE,** then continue with Step **4.**
   If **PASSIVE,** then proceed to Step **6.**

4. ***Note:*** If 1114-type filters are used, **POLARITY 1** activates filters nearest to RT between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and COT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

   Have personnel at COT FL panel set **POLARITY** switch to activate first filter out from RT (FIG. 1).

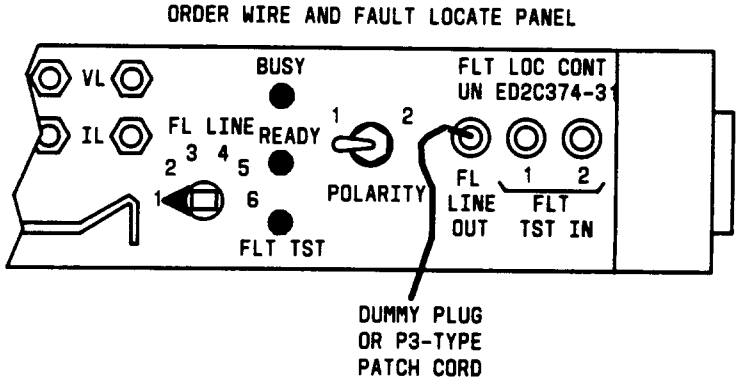


Fig. 1—Part of Order Wire and Fault Locate Panel

5. At COT FL panel, set **FL LINE** switch to correct number (**1, 2, 3, 4, 5,** or **6**) to access FL line being used.

6. At COT FL panel, insert dummy plug or one end of P3-type patch cord into **FL LINE OUT** jack.

7. Prepare RT for fault locating.

   Reference: **DLP-514**

8. Set Test Set controls per Table B.

TABLE B
25AD TEST SET

CONTROL/SWITCH	POSITION
FUNCTION	MEAS 1 SIGNAL
CLOCK RATE	T1
FILTER	Set to letter code of first filter out from COT
PULSE DENSITY	10
RECEIVER SENSITIVITY	Set for an on-scale reading

9. Record reading on Fault-Locating Record (FLR) form in space marked **PULSE PERIOD** (**10, 9,** etc.) (FIG. 2).

10. Was last measurement made at **PULSE DENSITY 4**?

    If **YES,** then proceed to Step **12.**
    If **NO,** then continue with Step **11.**

11. Set **PULSE DENSITY** switch to next lower number (**9, 8, 7,** etc.) and read meter indication and repeat from Step **9.**

12. Have measurements been made at all filter locations on side being tested?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **13.**

13. Set test set controls to test next filter and repeat from Step **9.**

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE PARKWAY
FILTER TYPE 1114

TEST LOCATION
☐ COT ☒ RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER 1
FAULT-LOCATING PAIR TEST
☐ NEW SYSTEM TEST
☒ TROUBLE TEST

FAULT-LOCATE SET
☐ SIERRA 315B (415A-2)
☒ WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

ACTIVE POLARITY SW POS 2 TEST DIRECTION ☐ SIDE 1 ☒ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
F	239A	27	26.5	26.5	-120	27	27	27	27	27	27	27		
E		27	26.5	26.5	-120	27	27	27	27	27	27	27		
D		27	27	27	-120	27	27	27	27	27.2	27	26.5		
C		37	37.5	37	-124	37	36.5	36.5	37.2	36.5	37	35.5		
B		29.5	29	29	-120	29.5	29.5	30	30	30	29.5	29.5		
A		31	31.5	31.5	-118	31	31	31.5	31.5	31	31	30.5		

Fig. 2—Partially Completed FLR (Fault-Locating Record) Form

PERFORM OBSCURE TROUBLE TEST FROM RT USING 315B OR 415A-2 FLTS (FAULT-LOCATE TEST SET)

1. Obtain test equipment per Table A.

TABLE A	
EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B or 415A-2
Two P3-type Patch Cords	P3BH

2. ***Note:*** Active FL lines use 1114-type filters. Passive FL lines use 598- or 1068-type filters and require no **POLARITY** switch settings.

   From office records determine type of fault-locating (FL) filters that are used on fault-locating line.

3. Is Fault Locate line active or passive?

   If **ACTIVE,** then continue with Step **4.**
   If **PASSIVE,** then proceed to Step **6.**

4. ***Note:*** For 1114-type filters, **POLARITY 1** activates filters closest to RT between authorized tip and ring reversal and RT. **POLARITY 2** activates filters between tip and ring reversal and COT. If there is no tip and ring reversal, **POLARITY 2** is used to activate filters.

   Have personnel at COT FL panel set **POLARITY** switch to activate first filter out from RT (FIG. 1).

5. On COT FL panel, set **FL LINE** switch to correct number to access FL line being used.

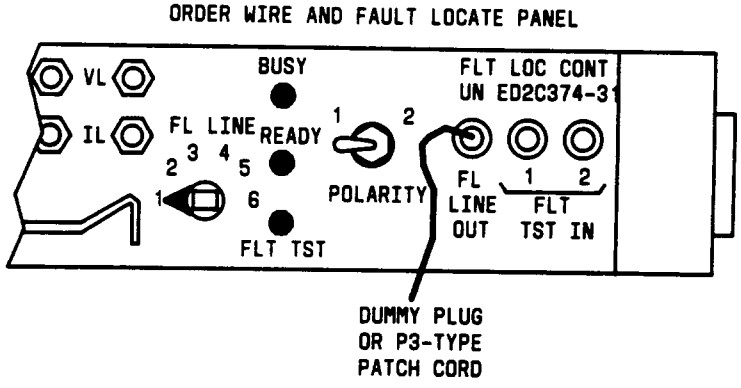


Fig. 1—Part of Order Wire and Fault Locate Panel

6. At COT FL Panel, insert dummy plug or one end of P3-type patch cord into **FL LINE OUT** jack.

7. Prepare RT for fault locating.

   Reference: **DLP-514**

8. Which test set is being used?

   If **315B,** then continue with Step **9.**
   If **415A-2,** then proceed to Step **10.**

9. Set test set controls per Table B and proceed to Step **11.**

TABLE B
315B TEST SET

CONTROL/SWITCH	POSITION
FUNCTION	MEAS 1
PULSE PERIOD	11 REF
LINE FILTER	Set to letter code of filter being tested
RCV LEVEL dBm	Adjust for meter indication of –2.0 dB

10. Set test set controls per Table C.

TABLE C
415A-2 TEST SET

CONTROL/SWITCH	POSITION
POWER	ON
FUNCTION	MEASURE 1
PULSE PERIOD	REF
NORM	NORM
LINE FILTER	Set to letter code of filter to be tested
RECEIVE FAULT LINE LEVEL dBm	Adjust for a meter indication of 0 dB

11. ***Note:*** On **415A-2** Test Set, if **PULSE PERIOD** switch is set to **AUTO**, **PULSE PERIOD** LEDs will automatically advance in approximately 2-second intervals. The **HOLD** position is used to stop lighted lamp at desired position.

    If using **315B** test set, set **PULSE PERIOD** switch to next lower number, if using **415A-2** test set, operate **PULSE PERIOD AUTO HOLD** switch to advance **PULSE PERIOD** LED to next lower numbered LED (**10, 9**, etc.).

12. ***Note:*** If meter deviation from reference value is not more than ±0.5 dB, a zero is entered; if deviation is more than reference level (more than 0.5 dB to right of reference level), deviation amount preceded by plus (+) sign is recorded (e.g., +0.6); if deviation is less than reference level (more than 0.5 dB to left of reference level), deviation amount preceded by a minus (–) sign is recorded (e.g., –0.6).

    Record meter deviation from reference level (–2 dB for **315B** Test Set or 0 dB for **415A-2** Test Set) on Fault-Locating Record (FLR) form in space marked **PULSE PERIOD** (**10, 9,** etc.) (FIG. 2) .

13. Was last measurement made at **PULSE DENSITY 4**?

    If **YES,** then continue with Step **14.**
    If **NO,** then repeat from Step **11.**

14. Have measurements been made at all filter locations on side being tested?

    If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
    If **NO,** then continue with Step **15.**

15. Set test set controls to test next filter and repeat from Step **8.**

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE PARKWAY
FILTER TYPE 1114

TEST LOCATION
☐ COT ☒ RT
LINE & SYSTEM A #2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1
FAULT-LOCATING PAIR TEST
☐ NEW SYSTEM TEST
☒ TROUBLE TEST

FAULT-LOCATE SET
☒ SIERRA 3158 (415A-2)
☐ WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

ACTIVE POLARITY SW POS 2 TEST DIRECTION ☐ SIDE 1 ☒ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
J	239A	38.3	32.3	32.1	-100	0	0	+.7	+1.0	+1.5	+1.7	+2.1		
H		38.0	32.0	31.9	-98	0	0	0	+.8	+1.2	+1.9	+1.8		
G		39.4	32.3	32.5	-96	0	0	0	+.6	+.9	+1.2	+.9		
F		39.7	34.7	34.0	-100	0	0	0	+.8	+1.0	+1.1	+.7		
E		40.3	33.8	33.2	-98	0	0	+.7	+.6	+1.2	+.9	+.3		
D		41.6	36.5	36.0	-96	0	0	-.6	0	0	-.7	-.9		
C		42.0	36.2	36.1	-94	0	+.6	+.9	+1.6	+.7	-.6	-1.3		
A		42.4	36.4	37.0	-94	-.9	-1.3	-2.6	-3.4	-3.9	-5.6	-9.1		
B		44.4	38.3	38.0	-96	-1.6	-1.7	-1.9	-3.8	-4.5	-8.1	-10.1		

Fig. 2—Partially Completed FLR (Fault-Locating Record) Form

OBTAIN FLR (FAULT-LOCATING RECORD) FORMS AND PREPARE FOR FAULT-LOCATING AT THE COT

1. Obtain test equipment (Table A).

TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B, Sierra 415A-2, or J98725AD (25AD)
Two P3-type Patch Cords	P3BH

2. Obtain original FLR form(s) for system being tested (FIG. 1).

3. Obtain blank FLR forms (FIG. 2).

4. Which test set is being used?

   If **315B OR 415A-2,** then continue with Step **5.**
   If **25AD,** then proceed to Step **10.**

5. Plug power cord into 117 Vac outlet.

6. Set **POWER** switch to **LAMP TEST** position.

   Response: All lamps lighted.

7. Is **315B** or **415A-2** test set being used?

   If **315B,** then continue with Step **8.**
   If **415A-2,** then proceed to Step **9.**

8. Set controls per Table B and proceed to Step **23.**

FAULT-LOCATING RECORD

ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1

FAULT-LOCATING PAIR TEST
[X] NEW SYSTEM TEST
[ ] TROUBLE TEST

FAULT-LOCATE SET
[X] SIERRA 315B (415A-2)
[ ] WE 25AD

RESISTANCE 3000 OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1 — TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	38.3	32.3	32.1	-100	0	0	0	+.7	+.9	+1.4	+1.6		
B		38.0	32.0	31.9	-98	0	0	0	+.6	+.7	+1.0	+1.4		
C		39.4	32.3	32.5	-96	0	0	0	+.5	+.6	+1.1	+1.5		
D		39.7	34.7	34.0	-100	0	0	0	+.6	+.9	+1.3	+1.4		
E		40.3	33.8	33.2	-98	0	0	0	+.7	+.9	+1.4	+1.5		
F		41.6	36.5	36.0	-96	0	0	+.6	+.8	+.9	+1.5	+1.6		
G		42.0	36.2	36.1	-94	0	0	+.7	+.8	+1.0	+1.4	+1.6		

ACTIVE POLARITY SW POS _____ — TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

FAULT-LOCATING RECORD

ROUTE_____
OFFICE_____
FILTER TYPE_____

TEST LOCATION

☐ COT ☐ RT

LINE & SYSTEM_____
TESTER_____
DATE_____

FAULT-LOCATE LINE NUMBER_____

FAULT-LOCATING PAIR TEST

☐ NEW SYSTEM TEST
☐ TROUBLE TEST

FAULT-LOCATE SET

☐ SIERRA 3158 (415A-2)
☐ WE 25AD

RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

Fig. 2—FLR (Fault-Locating Record) Form

TABLE B 315B TEST SET	
CONTROL/SWITCH	POSITION
POWER	POWER
FUNCTION	MEAS 1
NORM	NORM
PULSE PERIOD	REF 11
RCV LEVEL dBm	-90 with red counter vernier knob fully clockwise

9. Set controls per Table C and proceed to Step **23.**

TABLE C 415A-2 TEST SET	
CONTROL/SWITCH	POSITION
POWER	ON
FUNCTION	MEASURE 1
NORM	NORM
RECEIVE FAULT LINE LEVEL dBm	-90 with red center vernier knob rotated fully clockwise
SYSTEM Mb/s	1.544
PULSE PERIOD	REF 11

10. Plug power cord into -48V source (FIG. 3).

11. Set **FUNCTION** switch to **SPAN TERMINATE**.

12. Set **CLOCK RATE** switch to **T1**.

13. Set **PULSE DENSITY** switch to **11 REF**.

14. Set **FILTER** switch to **A**.

15. Set **RECEIVER SENSITIVITY** switch to **-60**.

16. Depress and hold **RCV CAL** pushbutton.

17. Does meter indicate 0 on **DBM** scale?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **18.**

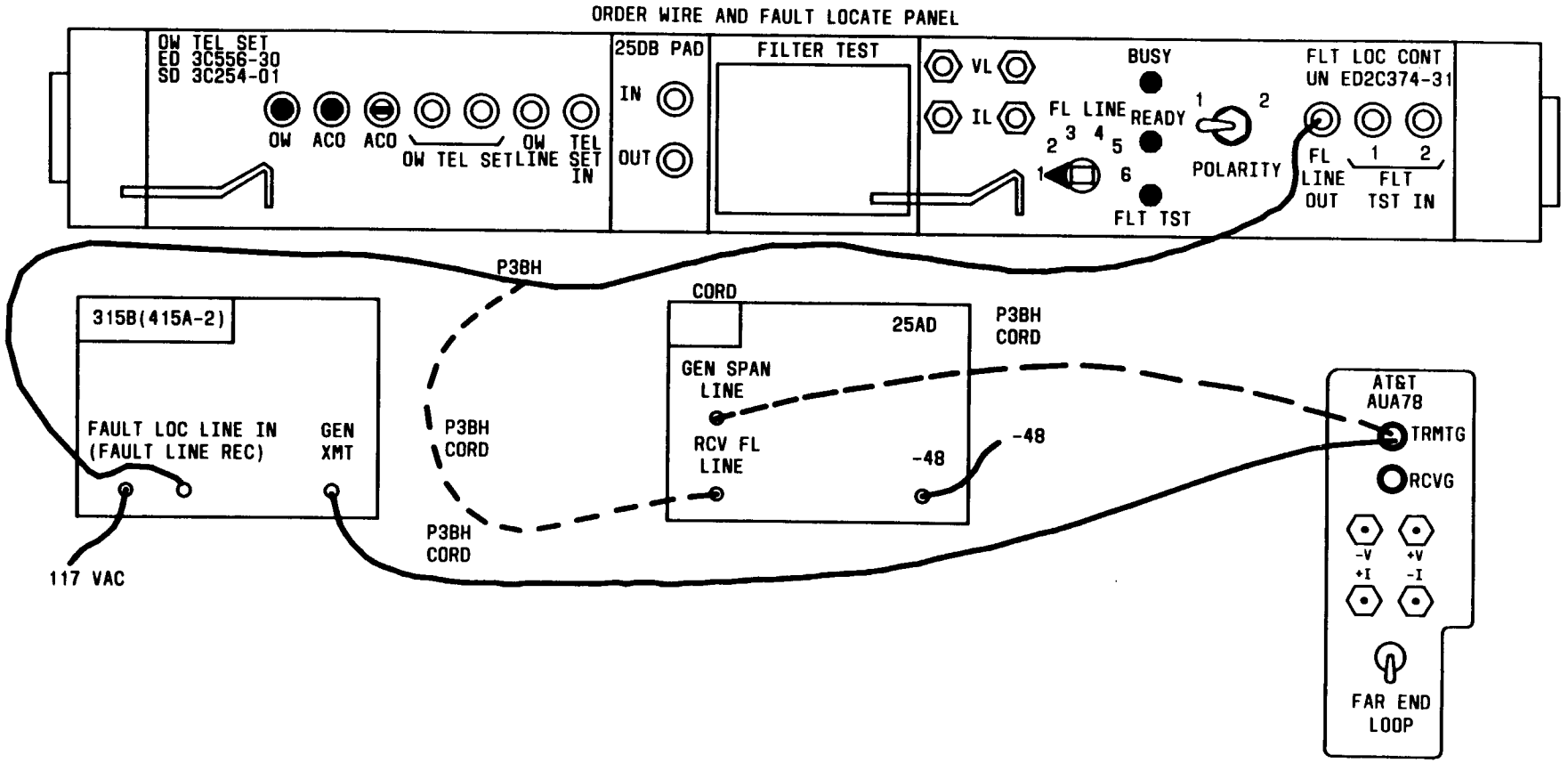


Fig. 3—COT Fault-Locating Configuration

18. Adjust **RCV CAL** potentiometer for 0 indication.

19. Does meter indicate 0 on **DBM** scale?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **20.**

20. Release **RCV CAL** pushbutton and return test set for repair. Obtain new test set and repeat from Step **10.**

21. Release **RCV CAL** pushbutton.

22. Set controls per Table D.

TABLE D
25AD TEST SET

CONTROL/SWITCH	POSITION
CLOCK RATE	T1
FUNCTION	MEAS 1 SIGNAL
PULSE DENSITY	11 REF
RECEIVER SENSITIVITY	-80

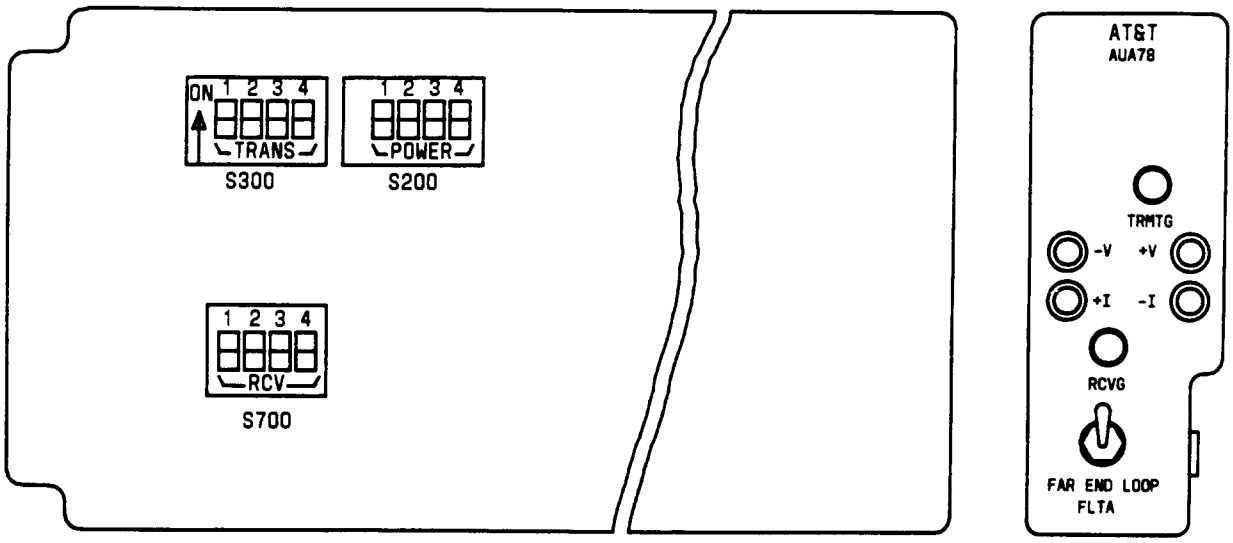
23. ***Note:*** Positioning an **LSU A, B, C,** or **D** switch to **f** position will force digroup **A, B, C,** or **D** onto protection line.

    If you do not have a protection line, proceed to Step **24.** At **LSU,** position faceplate switch for digroup being tested (**A, B, C,** or **D**) to (**f**) position.

24. Remove **LIU** associated with line being tested.

25. Use **AUA78** T1 line fault-locate test adapter (**FLTA**) to perform tests.

26. On FLTA (FIG. 4), set switches **S300** (Table E) to agree with switch settings on either **S1/S2** or **S400** on **LIU** removed in Step **24.** Set switches **S700** (Table F) to agree with switch settings on **S100** and either **S4** or **S200** on **LIU.** Set switches **S200** (Table G) to line powering if the FLTA powers the T1 line or to power loop if the FLTA loops the received line-powering current.



NOTE: THE AUA78 HAS A DAUGHTER BOARD. HOWEVER, S300 AND S700 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD. S200 IS ACCESSIBLE FROM THE EDGE OF THE BOARD.

Fig. 4—AUA78 FLTA Option Switches

TABLE E
OPTION SWITCH S300 SETTINGS

	POLE 1	POLE 2	POLE 3	POLE 4
0 dB	ON	OFF	OFF	OFF
7.5 dB	OFF	ON	OFF	OFF
15 dB	OFF	OFF	ON	OFF
22.5 dB	OFF	OFF	OFF	ON

TABLE F
OPTION SWITCH S700 SETTINGS

	POLE 1	POLE 2	POLE 3	POLE 4
0 dB	CLOSED	OPEN	---	---
7.5 dB	OPEN	CLOSED	---	---
32	---	---	OPEN	---
64	---	---	CLOSED	---

TABLE G OPTION SWITCH S200 SETTINGS		
POLE	LINE POWERING	POWER LOOPING
1	OPEN	CLOSED
2	OPEN	CLOSED
3	CLOSED	OPEN
4	CLOSED	OPEN

27. Insert **AUA78** into **LIU** slot for line under test.

28. On FL panel, set **FL LINE** switch to appropriate line number (FIG. 3).

29. ***Note:*** For 1115-type filters, **POLARITY 1** will activate filter group for **Side 1** (COT to RT) of digital line and **POLARITY 2** will activate filter group for **Side 2** (RT to COT). For 1114-type filters, **POLARITY 2** activates filter group closest to COT before authorized tip and ring reversal and **POLARITY 1** activates filter group after authorized tip and ring reversal.

    At FL Panel, set **POLARITY** switch to **1** for 1115-type filters or to **2** for 1114-type filters.

30. Connect test set to **FLTA** and Order Wire and Fault Locate Panel as shown in FIG. 3.

31. Are 1115-type filters installed on fault line?

    If **YES,** then continue with Step **32.**
    If **NO,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

32. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED for A digroup is off, a far-end loop cannot be done for line being tested.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and **TRU ON PROT** LED for A digroup off?

    If **YES,** then continue with Step **33.**
    If **NO,** then proceed to Step **34.**

33. Fault-locating procedures on **Side 2** cannot be performed from COT until A digroup failure has been cleared.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

34. On **FLTA**, loop far-end (RT) by positioning toggle switch to **FAR END LOOP.**

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

ANALYZE OBSCURE TROUBLE TEST RESULTS OBTAINED USING 315B OR 415A-2 FAULT LOCATE TEST SET

1. ***Note:*** On FLR form in FIG. 1 for filter code **B**, first point in row that fails to show **positive** increase is at **PULSE PERIOD 4**. For filter code **E** first point is at **PULSE PERIOD 7**. Only one mark should appear in each row.

   On FLR (Fault-Locating Record) form (FIG. 1), search each row of **PULSE PERIOD** data from left to right for a point where recorded data fails to show **positive** increase.

2. Ignore zero entries until a non-zero entry is encountered, then mark first point in each row of data that fails to show positive increase.

3. In FLR **MAX SHIFT** column for each row of data, note **PULSE PERIOD** setting in which a mark was made.

4. ***Note:*** On FLR form in FIG. 1 in **MAX SHIFT** column, **PULSE PERIOD** setting increased from **6** to **10** (increase of 4) between filter code **G** and **H** making trouble section at filter **H**. Between filters **D** and **E** increase was from **PULSE PERIOD 4** to **7** (increase of 3) making a second trouble section candidate at filter code **E**.

   In FLR **MAX SHIFT** column, locate row of data having largest **positive** increase in **PULSE PERIOD** setting with respect to previous row.

5. In FLR **NOTES** column, mark row with largest positive increase in **PULSE PERIOD** setting as **trouble section**.

6. Mark other rows with next largest positive increase in **PULSE PERIOD** setting as likely candidates for trouble.

7. Can suspected trouble section be identified?

   If **YES,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**
   If **NO,** then continue with Step **8.**

8. Are there any marks on FLR form where **PULSE PERIOD** data failed to show positive increase?

   If **YES,** then proceed to Step **10.**
   If **NO,** then continue with Step **9.**

9. Report no trouble found.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A #2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1
FAULT-LOCATING PAIR TEST
[ ] NEW SYSTEM TEST
[X] TROUBLE TEST

FAULT-LOCATE SET
[X] SIERRA 3158 (415A-2)
[ ] WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1 — TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	38.3	32.3	32.1	-100	0	0	+.7	+1.0	+1.5	+1.7	+2.1		
B		38.0	32.0	31.9	-98	0	0	0	+.8	+1.2	+1.9	+1.8	4	
C		39.4	32.3	32.5	-96	0	0	0	+.6	+.9	+1.2	+.9	4	
D		39.7	34.7	34.0	-100	0	0	0	+.8	+1.0	+1.1	+.7	4	
E		40.3	33.8	33.2	-98	0	0	+.7	+.6	+1.2	+.9	+.3	7	2ND CANDIDATE
F		41.6	36.5	36.0	-96	0	0	-.6	0	0	-.7	-.9	8	
G		42.0	36.2	36.1	-94	0	0	+.9	+1.6	+.7	-.6	-1.3	6	
H		42.4	36.4	37.0	-94	-.9	+.6	-2.6	-3.4	-3.9	-5.6	-9.1	10	TROUBLE SECTION
J		44.4	38.3	38.0	-96	-1.6	-1.7	-1.9	-3.8	-4.5	-8.1	-10.1	10	

ACTIVE POLARITY SW POS _____ — TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

10. ***Note:*** On FLR form in FIG. 1, first mark encountered in highest **PULSE PERIOD** column is at filter code **H, PULSE PERIOD 10**.

Mark as trouble section filter code at first mark encountered in highest **PULSE PERIOD** column working from top down.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

ANALYZE OBSCURE TROUBLE TEST RESULTS OBTAINED USING J98725AD (25AD) FAULT-LOCATE TEST SET

1. ***Note:*** On FLR form in FIG. 1, in filter row **D**, value recorded in **MAX SHIFT** column is **1.7**. This value is the difference between **37.2** (at **PULSE PERIOD 7**) and **35.5** (at **PULSE PERIOD 4**).

   On FLR (Fault-Locating Record) form (FIG. 1), for each row of **PULSE PERIOD** data determine lowest and highest reading for **PULSE PERIOD** setting **10** through **4**.

2. Calculate difference between highest and lowest reading for each row of data.

3. Record difference calculated in Step 2 in **MAX SHIFT** column of FLR form for each row of data.

4. In **MAX SHIFT** column, note any value greater than 1.0.

5. Is any value greater than 1.0 recorded in **MAX SHIFT** column?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **7.**

6. In **NOTES** column, mark row with largest number greater than 1.0 as **trouble section**.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

7. Report no trouble found.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER 1
FAULT-LOCATING PAIR TEST
[ ] NEW SYSTEM TEST
[X] TROUBLE TEST

FAULT-LOCATE SET
[ ] SIERRA 315B (415A-2)
[X] ME 25AD
RESISTANCE _____ OHMS

ACTIVE POLARITY SW POS 1

TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	27	26.5	26.5	-120	27	27	27	27	27	27	27	0	
B		27	26.5	26.5	-120	27	27	27	27	27	27	27	0	
C		27	27	27	-120	27	27	27	27	27.2	27	26.5	.7	
D		37	37.5	37	-124	37	36.5	36.5	37.2	36.5	37	35.5	1.7	TROUBLE SECTION
E		29.5	29	29	-120	29.5	29.5	30	30	30	29.5	29.5	.5	
F		31	31.5	31.5	-118	31	31	31.5	31.5	31	31	30.5	1.0	

ACTIVE POLARITY SW POS _____

TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

. DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

PREPARE FOR FAULT-LOCATING AT DSX CROSS-CONNECT

1. Obtain test equipment per Table A.

TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B, Sierra 415A-2, or J98725AD (25AD)
Two P3-type Patch Cords	P3BH

2. Obtain original FLR form(s) for system being tested (FIG. 1).

3. Obtain blank FLR forms (FIG. 2).

4. Which test set is being used?

   If **315B OR 415A-2,** then continue with Step **5.**
   If **25AD,** then proceed to Step **10.**

5. Plug power cord into 117 Vac convenience outlet.

6. Set **POWER** switch to **LAMP TEST** position.

   Response: All lamps lighted.

7. Is **315B** or **415A-2** test set being used?

   If **315B,** then continue with Step **8.**
   If **415A-2,** then proceed to Step **9.**

8. Set controls per Table B and proceed to Step **23.**

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1
FAULT-LOCATING PAIR TEST
[X] NEW SYSTEM TEST
[ ] TROUBLE TEST

FAULT-LOCATE SET
[X] SIERRA 315B (415A-2)
[ ] WE 25AD
RESISTANCE 3000 OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1 — TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	38.3	32.3	32.1	-100	0	0	0	+.7	+.9	+1.4	+1.6		
B		38.0	32.0	31.9	-98	0	0	0	+.6	+.7	+1.0	+1.4		
C		39.4	32.3	32.5	-96	0	0	0	+.5	+.6	+1.1	+1.5		
D		39.7	34.7	34.0	-100	0	0	0	+.6	+.9	+1.3	+1.4		
E		40.3	33.8	33.2	-98	0	0	0	+.7	+.9	+1.4	+1.5		
F		41.6	36.5	36.0	-96	0	0	+.6	+.8	+.9	+1.5	+1.6		
G		42.0	36.2	36.1	-94	0	0	+.7	+.8	+1.0	+1.4	+1.6		

ACTIVE POLARITY SW POS_____ — TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

FAULT-LOCATING RECORD

ROUTE_____
OFFICE_____
FILTER TYPE_____

TEST LOCATION

☐ COT ☐ RT

LINE & SYSTEM_____
TESTER_____
DATE_____

FAULT-LOCATE LINE NUMBER_____

FAULT-LOCATING PAIR TEST

☐ NEW SYSTEM TEST
☐ TROUBLE TEST

FAULT-LOCATE SET

☐ SIERRA 315B (415A-2)
☐ WE 25AD

RESISTANCE _____ OHMS

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

Fig. 2—FLR (Fault-Locating Record) Form

TABLE B 315B TEST SET	
CONTROL/SWITCH	POSITION
POWER	POWER
FUNCTION	MEAS 1
NORM	NORM
PULSE PERIOD	REF 11
RCV LEVEL dBm	-90 with red center vernier knob fully clockwise

9. Set controls per Table C and proceed to Step **23.**

TABLE C 415A-2 TEST SET	
CONTROL/SWITCH	POSITION
POWER	ON
FUNCTION	MEASURE 1
NORM	NORM
RECEIVE FAULT LINE LEVEL dBm	-90 with red center vernier knob rotated fully clockwise
SYSTEM Mb/s	1.544
PULSE PERIOD	REF 11

10. Plug power cord into -48V source (FIG. 3).

11. Set **FUNCTION** switch to **SPAN TERMINATE.**

12. Set **CLOCK RATE** switch to **T1.**

13. Set **PULSE DENSITY** switch to **11 REF.**

14. Set **FILTER** switch to **A.**

15. Set **RECEIVER SENSITIVITY** switch to **-60.**

16. Depress and hold **RCV CAL** pushbutton.

17. Does meter indicate 0 on **DBM** scale?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **18.**

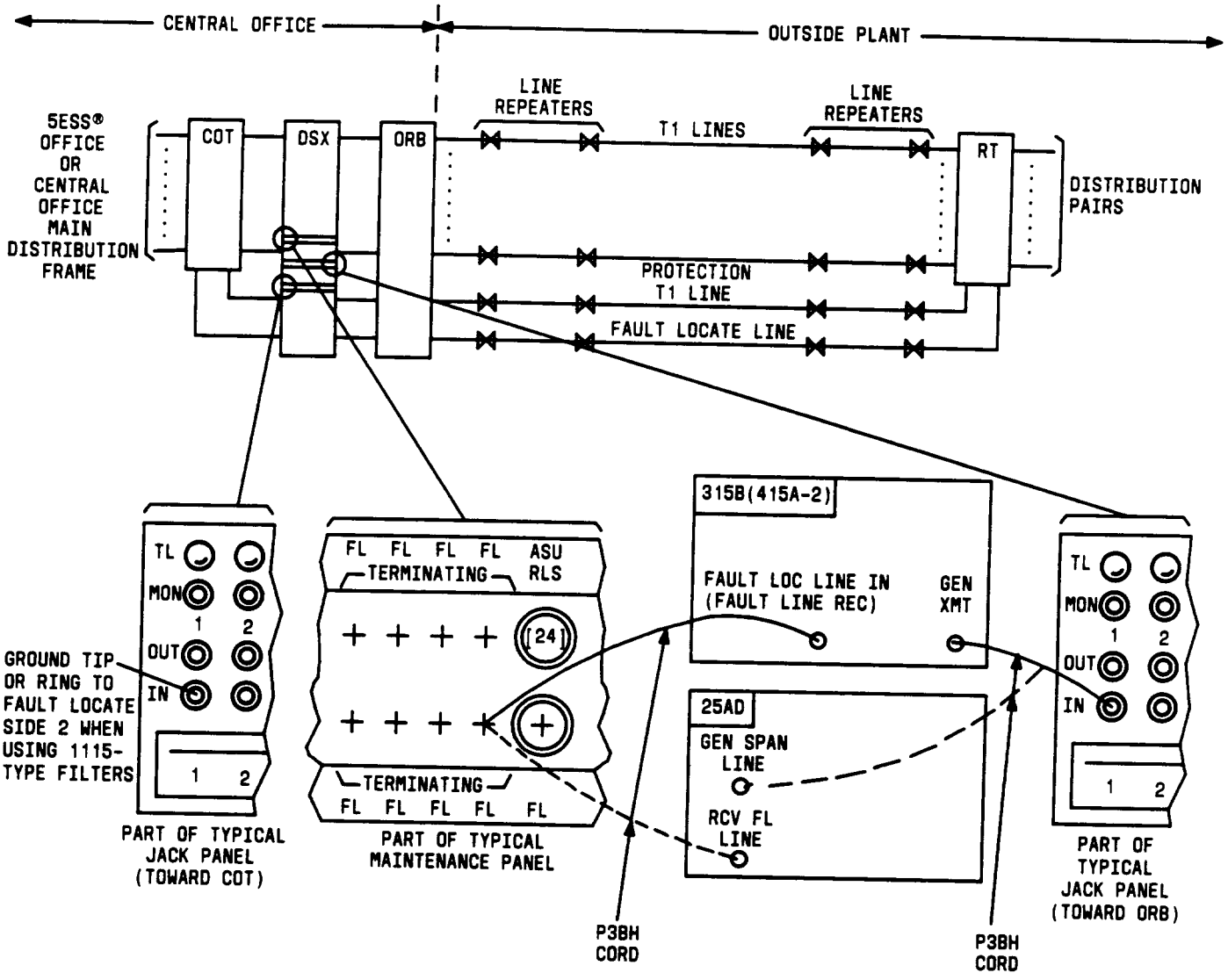


Fig. 3—Typical DSX Cross-Connect Fault-Locating Configuration

18. Adjust **RCV CAL** potentiometer for 0 indication.

19. Does meter indicate 0 on **DBM** scale?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **20.**

20. Release **RCV CAL** pushbutton and return test set for repair. Obtain new test set and repeat from Step **10.**

21. Release **RCV CAL** pushbutton.

22. Set controls per Table D.

TABLE D 25AD TEST SET	
CONTROL/SWITCH	POSITION
CLOCK RATE	T1
FUNCTION	MEAS 1 SIGNAL
PULSE DENSITY	11 REF
RECEIVER SENSITIVITY	–80

23. ***Note:*** At COT, positioning an **LSU A, B, C,** or **D** switch to **f** position forces digroup associated with that switch onto protection line.

    If you do not have a protection line, proceed to Step **2.** At COT **LSU** associated with lines being tested, position faceplate switch for line being tested (**A, B, C,** or **D**) to (**f**) position.

24. Connect DSX Cross-Connect and test equipment per FIG. 3.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

PERFORM OBSCURE TROUBLE TEST FROM DSX CROSS-CONNECT USING FAULT-LOCATE TEST SET

1. Which test set is being used?

   If **315B**, then continue with Step **2.**
   If **415A-2**, then proceed to Step **3.**
   If **J98725AD**, then proceed to Step **4.**

2. Set test set controls per Table A and proceed to Step **5.**

TABLE A
315B TEST SET

CONTROL/SWITCH	POSITION
FUNCTION	MEAS 1
PULSE PERIOD	REF 11
LINE FILTER	Set to letter code of filter being tested
RCV LEVEL dBm	Adjust for meter indication of –2.0 dB

3. Set test set controls per Table B and proceed to Step **5.**

TABLE B
415A-2 TEST SET

CONTROL/SWITCH	POSITION
FUNCTION	MEASURE 1
PULSE PERIOD	REF (Pulse period 11 LED will be lighted)
LINE FILTER	Set to letter code of filter being tested
RECEIVE FAULT LINE	
LEVEL dBm	Adjust for meter indication of 0 dB

4. Set test set controls per Table C.

TABLE C
25AD TEST SET

CONTROL/SWITCH	POSITION
CLOCK RATE	T1
FUNCTION	MEAS 1 SIGNAL
PULSE DENSITY	11 REF
FILTER	Set to letter code of filter being tested
RECEIVER SENSITIVITY	Adjust control for an on-scale indication on the meter

5. ***Note:*** When using **415A-2** test set, if **PULSE PERIOD** switch is set to **AUTO**, **PULSE PERIOD** lamps will automatically advance in approximately 2-second intervals. The **HOLD** position is used to stop lighted lamp at desired position.

   If using **315B** test set, set **PULSE PERIOD** control to **10**; if using **415A-2** test set, advance **PULSE PERIOD** to light LED **10**; if using 25AD test set, set **PULSE DENSITY** control to **10**.

6. ***Note:*** If meter deviation from reference value is not more than ±0.5 dB, a zero is entered. If deviation is greater than +0.5 dB, **deviation amount** preceded by a plus (+) sign is recorded (e.g., +0.6). If deviation is less than reference level by more than −0.5 dB, **deviation amount** preceded by minus (−) is recorded (e.g., −0.6).

   On FLR form (FIG. 1), record meter deviation from reference level (−2.0 dB if using **315B** test set or 0 dB if using **J98725AD** (25AD) or **415A-2** test set).

7. Was last measurement made at **PULSE PERIOD 4**?

   If **YES,** then proceed to Step **9.**
   If **NO,** then continue with Step **8.**

8. If using **315B** test set, set **PULSE PERIOD** switch to next lower number (9, 8, etc.); if using **415A-2** test set, advance **PULSE PERIOD** to light next lower numbered LED (9, 8, etc.); if using 25AD test set, set **PULSE DENSITY** switch to next lower number (9, 8, etc.).

9. Have measurements been made at all filter locations on side being tested?

   If **YES,** then proceed to Step **11.**
   If **NO,** then continue with Step **10.**

10. Go to next filter location to be tested.

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE MAIN
FILTER TYPE 1115

TEST LOCATION
[X] COT [ ] RT
LINE & SYSTEM A #2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER #1

FAULT-LOCATING PAIR TEST
[ ] NEW SYSTEM TEST
[X] TROUBLE TEST

FAULT-LOCATE SET
[X] SIERRA 3158 (415A-2)
[ ] WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS 1

TEST DIRECTION [X] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
A	239A	38.3	32.3	32.1	-100	0	0	+.7	+1.0	+1.5	+1.7	+2.1		
B		38.0	32.0	31.9	-98	0	0	0	+.8	+1.2	+1.9	+1.8		
C		39.4	32.3	32.5	-96	0	0	0	+.6	+.9	+1.2	+.9		
D		39.7	34.7	34.0	-100	0	0	0	+.8	+1.0	+1.1	+.7		
E		40.3	33.8	33.2	-98	0	0	+.7	+.6	+1.2	+.9	+.3		
F		41.6	36.5	36.0	-96	0	0	-.6	0	0	-.7	-.9		
G		42.0	36.2	36.1	-94	0	+.6	+.9	+1.6	+.7	-.6	-1.3		
H		42.4	36.4	37.0	-94	-.9	-1.3	-2.6	-3.4	-3.9	-5.6	-9.1		
J		44.4	38.3	38.0	-96	-1.6	-1.7	-1.9	-3.8	-4.5	-8.1	-10.1		

ACTIVE POLARITY SW POS_____

TEST DIRECTION [ ] SIDE 1 [ ] SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

11. Is **Side 1** (COT to RT) or **Side 2** (RT to COT) being tested?

    If **SIDE 1,** then continue with Step **12.**
    If **SIDE 2,** then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

12. Are 1115-type, 1114-type, or passive filters installed?

    If **1115-TYPE,** then proceed to Step **14.**
    If **1114-TYPE OR PASSIVE,** then continue with Step **13.**

13. Test on **Side 2** must be made from RT.

    Reference: **DLP-507 (J98725AD FLTS)**

    Reference: **DLP-508 (315B or 415A-2 FLTS)**

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

14. ***Note:*** If **ADU MJ** and **BCU A DIGROUP** LEDs are lighted and **TRU ON PROT** LED (only if you have a protection line) for A digroup is off, a far-end loop cannot be done for line being tested.

    Are **ADU MJ** and **BCU A DIGROUP** LEDs lighted and is **LSU ON PROT** LED for A digroup off?

    If **YES,** then proceed to Step **13.**
    If **NO,** then continue with Step **15.**

15. ***Note:*** Obscure trouble tests on **Side 2** (RT to COT) start with filter closest to RT and work toward COT. The **POLARITY 2** switch setting on the FL panel activates filters on **Side 2** of FL line.

    On FL Panel, set **POLARITY** switch to activate first filter back from RT.

16. On test adapter (**AUA78**) being used at the COT, insure that Far-End Loop switch is set to **FAR-END LOOP** position and repeat from Step **1.**

OBTAIN FLR (FAULT-LOCATING RECORD) FORMS AND PREPARE FOR FAULT-LOCATING AT RT

1. Obtain test equipment listed in Table A.

TABLE A

EQUIPMENT REQUIRED	RECOMMENDED TYPE
FLTS (Fault Locate Test Set)	Sierra 315B, Sierra 415A-2, or J98725AD (25AD)
Two P3-type Patch Cords	P3BH

2. Obtain original FLR (Fault-Locating Record) forms (FIG. 1).

3. Obtain blank FLR forms for system being tested (FIG. 2).

4. Which fault-locate test set is being used?

   If **315A OR 415A-2,** then continue with Step **5.**
   If **25AD,** then proceed to Step **13.**

5. Plug power cord into 117 Vac convenience outlet.

6. Set **POWER** switch to **LAMP TEST** position.

   Response: All lamps lighted.

7. Set **POWER** switch to **POWER** position.

   Response: **POWER** lamp lighted.

8. Set **PULSE PERIOD** switch to **REF 11.**

9. Is **315B** or **415A-2** test set being used?

   If **315B,** then continue with Step **10.**
   If **415A-2,** then proceed to Step **11.**

10. Set **RCV LEVEL dBm** center vernier control fully clockwise.

11. Set **RECEIVE FAULT LINE LEVEL dBm** center vernier control fully clockwise.

12. Set **SYSTEM Mb/s** control to **1.544** and proceed to Step **25.**

13. Plug power cord into –48V source (FIG. 3).

FAULT-LOCATING RECORD
ROUTE MAIN-PARKWAY
OFFICE PARKWAY
FILTER TYPE 1114

TEST LOCATION
☐ COT ☒ RT
LINE & SYSTEM A # 2
TESTER KEB
DATE 3-25-80

FAULT-LOCATE LINE NUMBER 1
FAULT-LOCATING PAIR TEST
☐ NEW SYSTEM TEST
☒ TROUBLE TEST

FAULT-LOCATE SET
☐ SIERRA 3158 (415A-2)
☒ WE 25AD
RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES

ACTIVE POLARITY SW POS 2 TEST DIRECTION ☐ SIDE 1 ☒ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST MEASURE 1	2	3	(NB NOISE) BIPOLAR	PULSE PERIOD 10	9	8	7	6	5	4	MAX SHIFT	NOTES
F	239A	27	26.5	26.5	-120	27	27	27	27	27	27	27		
E	|	27	26.5	26.5	-120	27	27	27	27	27	27	27		
D	|	27	27	27	-120	27	27	27	27	27.2	27	26.5		
C	|	37	37.5	37	-124	37	36.5	36.5	37.2	36.5	37	35.5		
B	|	29.5	29	29	-120	29.5	29.5	30	30	30	29.5	29.5		
A	|	31	31.5	31.5	-118	31	31	31.5	31.5	31	31	30.5		

Fig. 1—Partially Completed FLR (Fault-Locating Record) Form

FAULT-LOCATING RECORD

ROUTE_____

OFFICE_____

FILTER TYPE_____

TEST LOCATION

☐ COT ☐ RT

LINE & SYSTEM_____

TESTER_____

DATE_____

FAULT-LOCATE LINE NUMBER_____

FAULT-LOCATING PAIR TEST

☐ NEW SYSTEM TEST

☐ TROUBLE TEST

FAULT-LOCATE SET

☐ SIERRA 315B (415A-2)

☐ WE 25AD

RESISTANCE _____ OHMS

DC TESTS FOR ACTIVE FL LINE

FL LINE VOLTAGE
117 TO 121 VDC
MEAS V_L _____
I_L POLARITY 1__MA
POLARITY 2__MA

POWER LOOP TESTS

COT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

POWER LOOP TESTS

RT	
+V TO -V	V
+V TO -I	V*
REG/+I TO +V	V

*.6 VOLTS EQUALS 60MA

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

ACTIVE POLARITY SW POS_____ TEST DIRECTION ☐ SIDE 1 ☐ SIDE 2

FILTER CODE	RPTR CODE	TRANSMISSION TEST				PULSE PERIOD							MAX SHIFT	NOTES
		MEASURE			(NB NOISE) BIPOLAR	10	9	8	7	6	5	4		
		1	2	3										

Fig. 2—FLR (Fault-Locating Record) Form

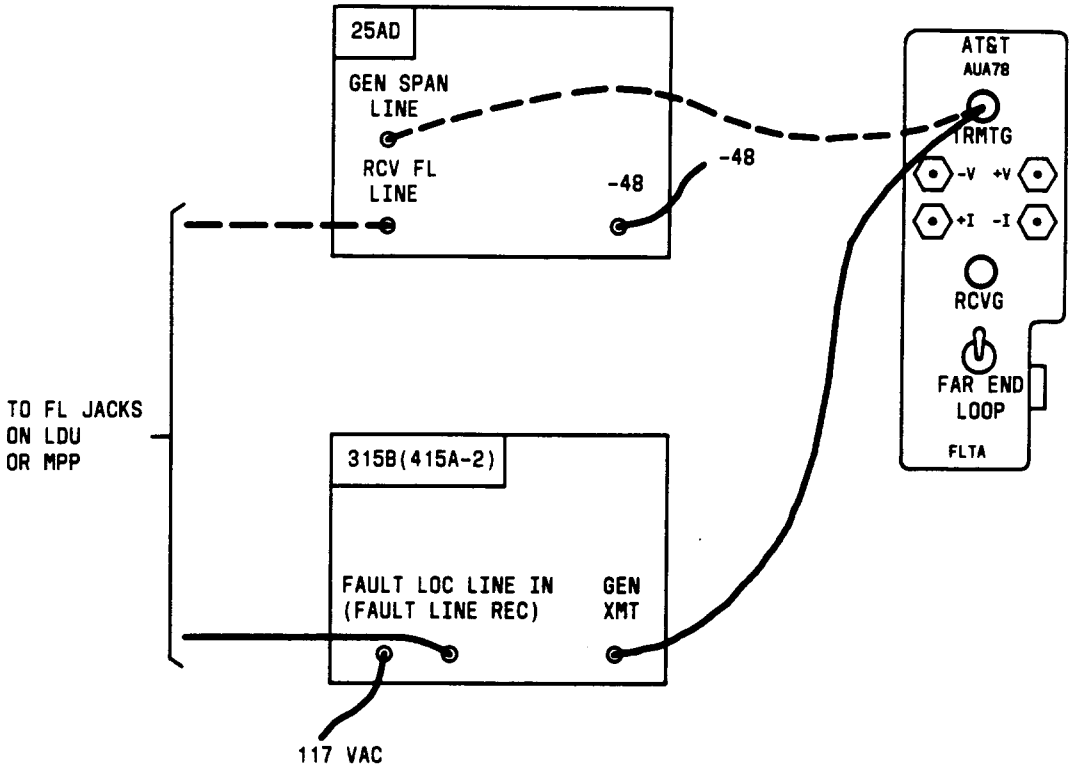


Fig. 3—RT (Remote Terminal) Fault-Locating Configuration

14. Set **FUNCTION** switch to **SPAN TERMINATE**.

15. Set **CLOCK RATE** switch to **T1**.

16. Set **PULSE DENSITY** switch to **11 REF**.

17. Set **FILTER** switch to **A**.

18. Set **RECEIVER SENSITIVITY** switch to **-60**.

19. Depress and hold **RCV CAL** pushbutton.

20. Does meter indicate 0 on **DBM** scale?

    If **YES**, then proceed to Step **24**.
    If **NO**, then continue with Step **21**.

21. Adjust **RCV CAL** potentiometer for 0 indication.

22. Does meter indicate 0 on **DBM** scale?

    If **YES**, then proceed to Step **24**.
    If **NO**, then continue with Step **23**.

23. Release **RCV CAL** pushbutton and return test set for repair. Obtain new test set and repeat from Step **13.**

24. Release **RCV CAL** pushbutton.

25. ***Note:*** Passive FL lines use 598- or 1068-type filters. Active FL lines use 1114-type filters.

    Determine type of fault-locating filters that are installed on FL (fault-locating) line.

26. Are 1114-type filters installed on FL line?

    If **YES,** then continue with Step **27.**
    If **NO,** then proceed to Step **31.**

27. ***Note:*** Location of authorized tip and ring reversal determines which **POLARITY** setting on COT FL Panel will activate 1114-type filters. Tip and ring reversal will exist if more than twelve 1114-type filters are on same FL line.

    Determine location of authorized tip and ring reversal (if any) on FL line.

28. Request COT personnel at FL panel to set **FL LINE** switch to access FL line being used.

29. Request COT personnel at FL Panel to set **FL LINE** switch to appropriate number and insert a dummy plug (258G or equivalent) or one end of P3-type patch cord into **FL LINE OUT** jack.

30. If you do not have a protection line, proceed to Step **31.** At **LSU**, position switch associated with line being tested to **f** position.

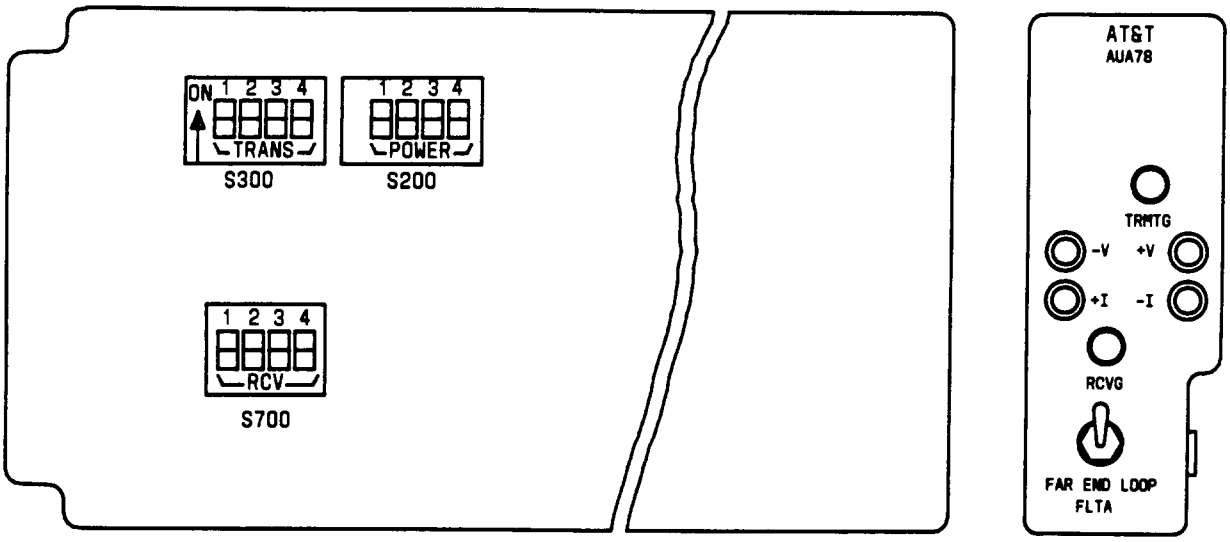
31. At RT, remove **LIU** associated with line being tested.

32. Use **AUA78** T1 line fault-locate test adapter (**FLTA**) to perform tests.

33. On FLTA (FIG. 4), set switches **S300** (Table B) to agree with switch settings on either **S1/S2** or **S400** on **LIU** removed in Step **31.** Set switches **S700** (Table C) to agree with switch settings on **S100** and either **S4** or **S200** on **LIU.** Set switches **S200** (Table D) to line powering if the FLTA powers the T1 line or to power loop if the FLTA loops the received line-powering current.

TABLE B
OPTION SWITCH S300 SETTINGS

	POLE 1	POLE 2	POLE 3	POLE 4
0 dB	ON	OFF	OFF	OFF
7.5 dB	OFF	ON	OFF	OFF
15 dB	OFF	OFF	ON	OFF
22.5 dB	OFF	OFF	OFF	ON



NOTE: THE AUA78 HAS A DAUGHTER BOARD. HOWEVER, S300 AND S700 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD. S200 IS ACCESSIBLE FROM THE EDGE OF THE BOARD.

Fig. 4—AUA78 FLTA Option Switches

TABLE C
OPTION SWITCH S700 SETTINGS

	POLE 1	POLE 2	POLE 3	POLE 4
0 dB	CLOSED	OPEN	—	—
7.5 dB	OPEN	CLOSED	—	—
32	—	—	OPEN	—
64	—	—	CLOSED	—

TABLE D
OPTION SWITCH S200 SETTINGS

POLE	LINE POWERING	POWER LOOPING
1	OPEN	CLOSED
2	OPEN	CLOSED
3	CLOSED	OPEN
4	CLOSED	OPEN

34. Insert **FLTA** into **LIU** slot for line under test.

35. Connect test set to **FLTA** and fault locate jacks located on either the **LDU** (Load Distribution Unit) or on the Miscellaneous Pair Panel (MPP) as shown in FIG. 3.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

SET LSU (LINE SWITCH UNIT) OPTION SWITCH SETTINGS

1. ***Note:*** An **AUA13 LSU** cannot be used in a COT channel bank assembly equipped for FPD operation.

   Get one **AUA13** or **AUA73 LSU** (Line Switch Unit) and inspect for possible damage.

2. Is **LSU** an **AUA73**?

   If **YES**, then continue with Step **3**.
   If **NO**, then proceed to Step **6**.

3. Is **LSU** being installed in channel bank assembly equipped for FPD capability?

   If **YES**, then continue with Step **4**.
   If **NO**, then proceed to Step **5**.

4. Set switch **S2** located on the side of the **LSU** circuit pack (FIG. 1) to position **32** and proceed to Step **6**.

5. Set switch **S2** located on the side of the **LSU** circuit pack (FIG. 1) to position **64**.

6. Set all eight switches on **LSU** faceplate to OFF (right-hand side) position.

7. ***Caution: Incorrectly set LSU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

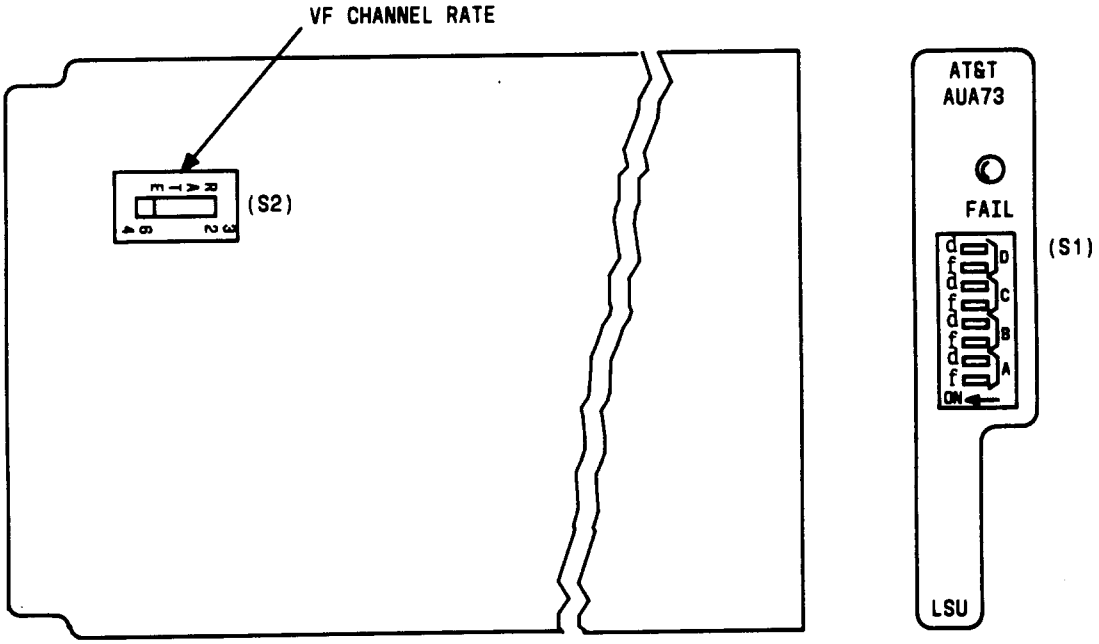


Fig. 1—AUA73 LSU Option Switches

Insert **LSU** into appropriate **LSU** slot in facility shelf.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

SET ADU (ALARM DISPLAY UNIT) OPTION SWITCH SETTINGS

1. Get one **ADU** circuit pack with correct code and inspect for possible damage.

2. Is **ADU** being installed in RT or COT?

   If **RT,** then proceed to Step **7.**
   If **COT,** then continue with Step **3.**

3. Is **ADU** an **AUB1**?

   If **YES,** then continue with Step **4.**
   If **NO,** then proceed to Step **5.**

4. On **ADU** (**AUB1**) option switch **S2** (FIG. 1) set switch positions **1** through **6** to agree with data on facility record and proceed to Step **11.**

5. ***Caution: If the bank is equipped for FPD capability, switch position 2 should be depressed toward 32 (left side of switch), otherwise, it should be depressed toward 64 (right side of switch).***

   On **ADU** (**AUB6**) option switch **S1** (FIG. 2) set switch positions **1** through **6** to agree with data on facility record.

6. Set system switches **S3**, **S4**, **S5**, and **S6** on **ADU** per facility record (e.g., for system number 0123 or 123, set **S3** to **0**, **S4** to **1**, **S5** to **2**, and **S6** to **3**) and proceed to Step **11.**

7. Verify that fuse on **ADU** is not blown. If fuse is blown, get another **ADU** that contains good fuse.

8. Is **ADU** an **AUB26**?

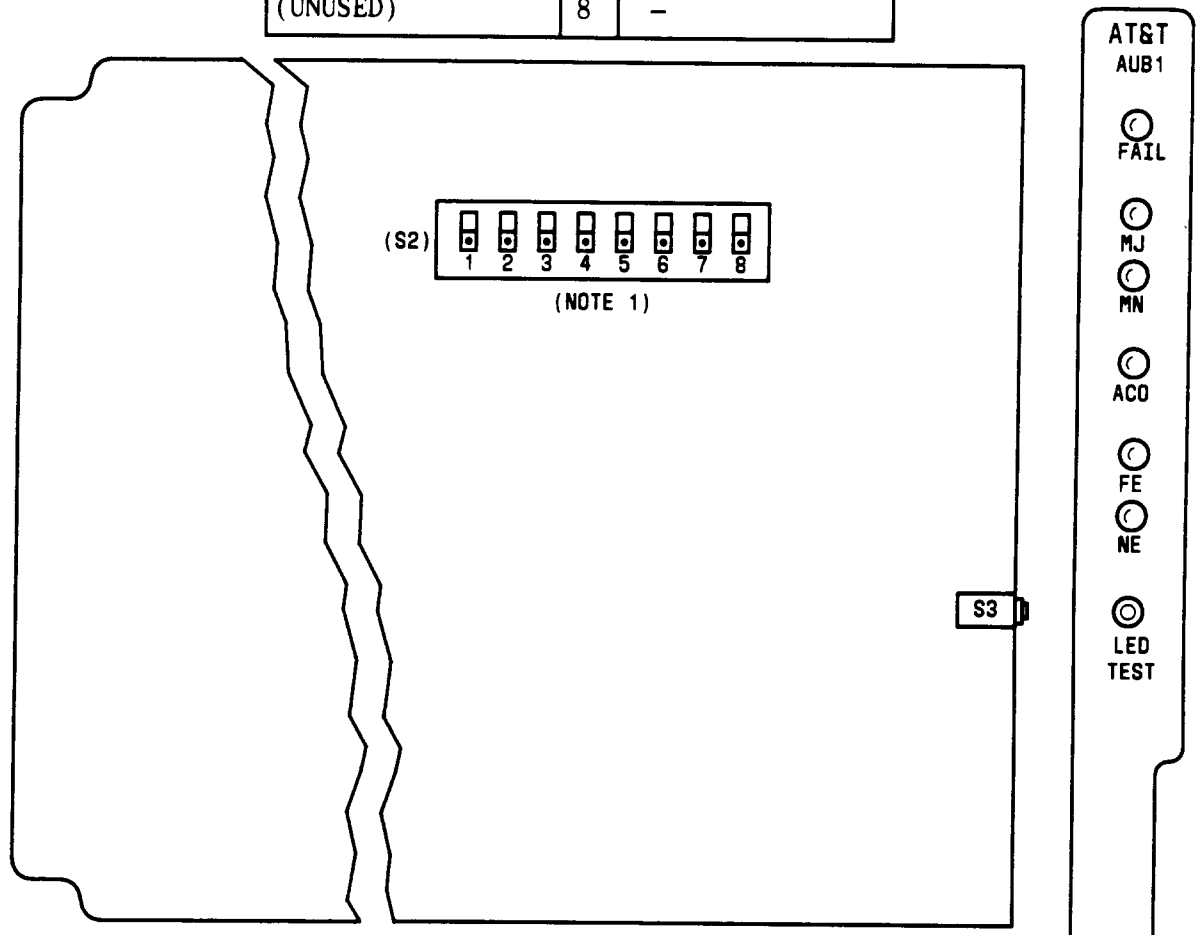
   If **YES,** then continue with Step **9.**
   If **NO,** then proceed to Step **10.**

9. ***Caution: If the bank is equipped for FPD capability, switch position 2 should be depressed toward 32 (left side of switch); otherwise, it should be depressed toward 64 (right side of switch). Depress switch position 9 toward D4 if the bank is equipped with FPC, FPC2, or FPD capability; otherwise, depress switch position 9 toward D1D.***

   On **ADU** (**AUB26**) option switch **S1** (FIG. 3), set switch positions **1** through **9** to agree with data on facility record and proceed to Step **11.**

10. On **ADU** (**AUB21** or **AUB24**) option switch **S2** (FIG. 4), set switch positions **1** through **8** to agree with data on facility record.

SWITCH SETTINGS		
CLOSED	S2	OPEN
NO PROTECTION LINE	1	PROTECTION LINE
–	2	DS1
AB IN-SERVICE	3	AB PRE-SERVICE
CD IN-SERVICE	4	CD PRE-SERVICE
AB EQUIPPED	5	AB UNEQUIPPED
CD EQUIPPED	6	CD UNEQUIPPED
(UNUSED)	7	–
(UNUSED)	8	–



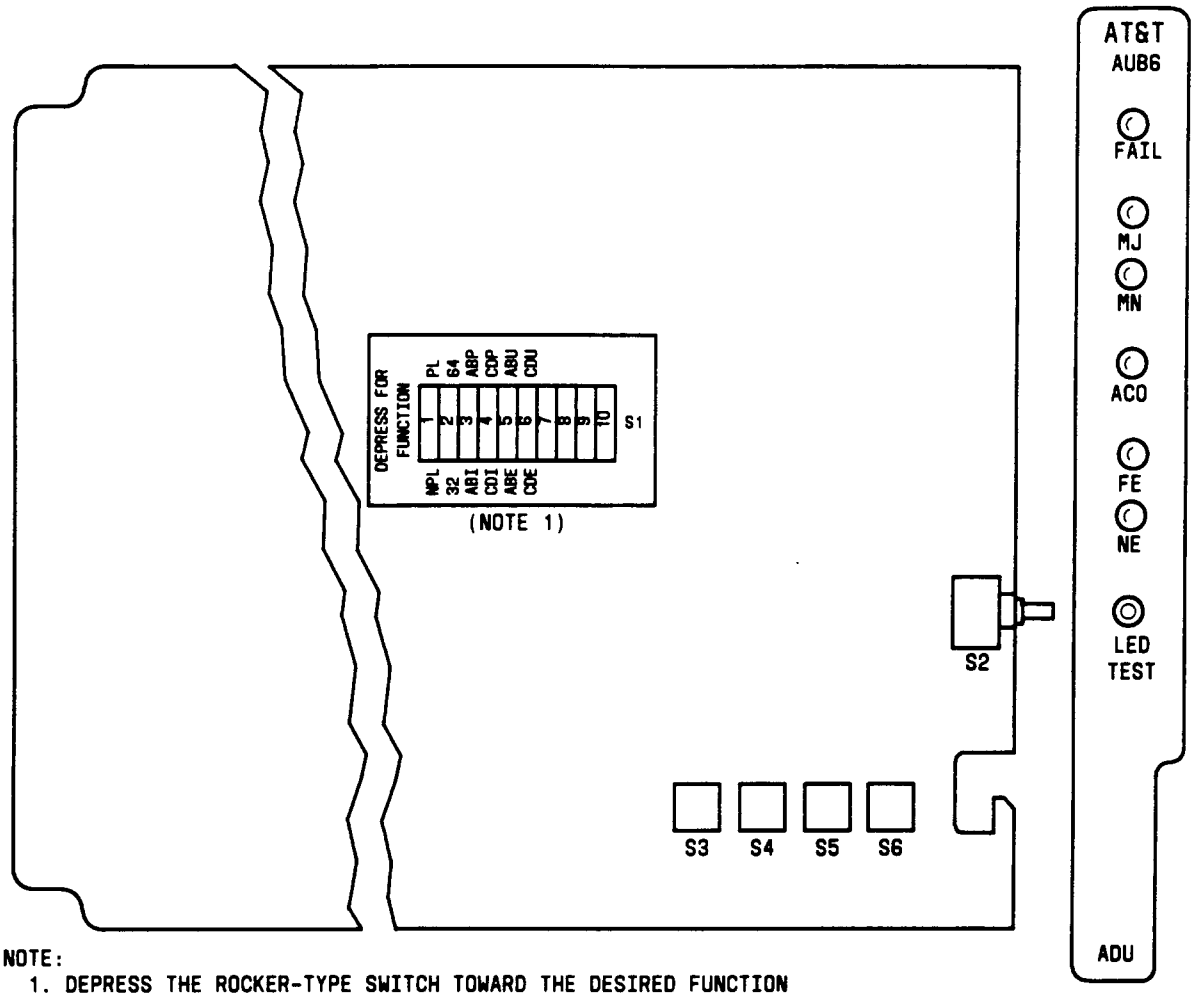
NOTE:
1. OPEN WHEN DEPRESSED AWAY FROM THE NUMBER
   CLOSED WHEN DEPRESSED TOWARDS THE NUMBER

Fig. 1—COT ADU Options

11. ***Caution:*** ***Incorrectly set ADU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream.***

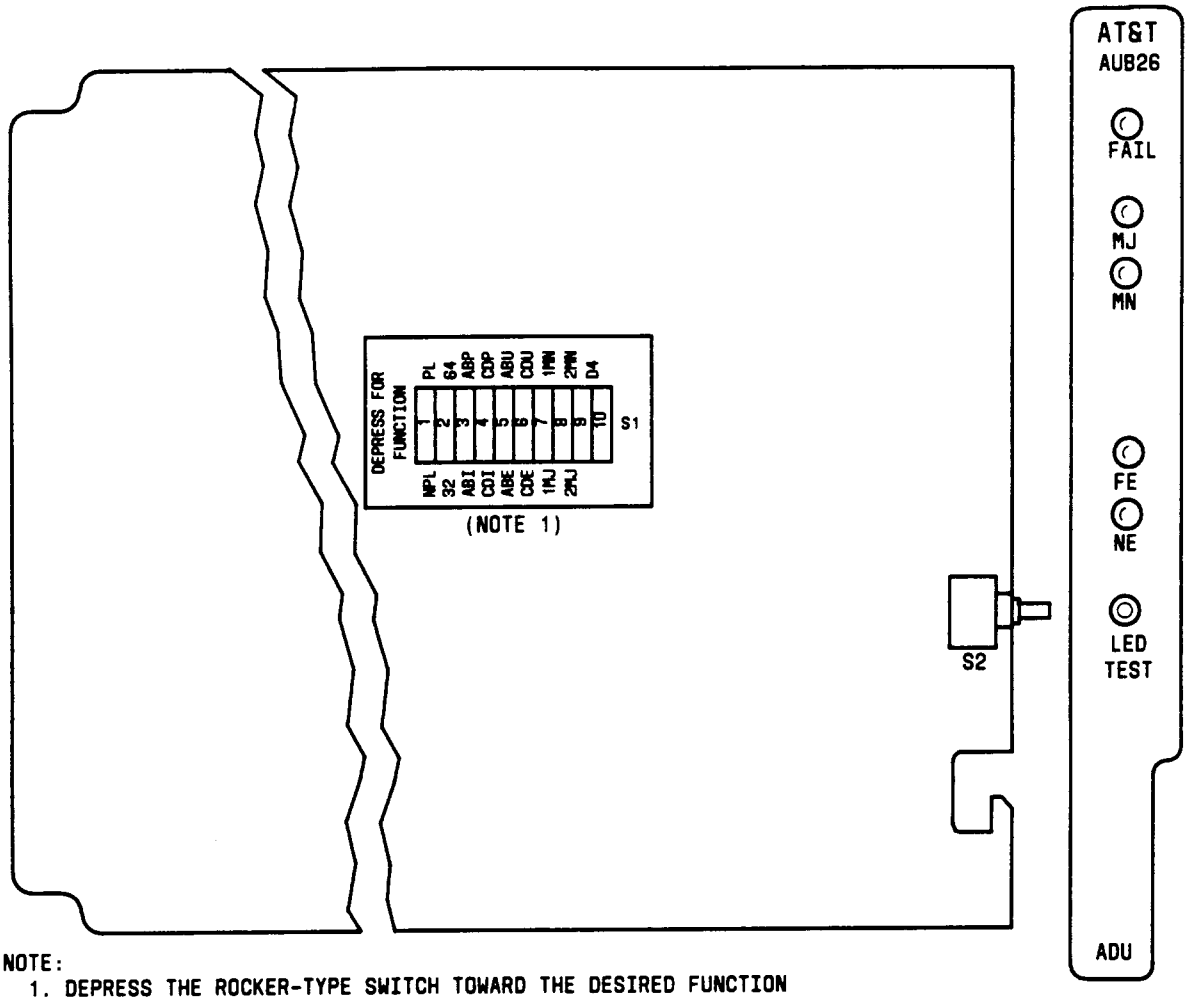
    Insert **ADU** into **ADU** slot.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE



NOTE:
1. DEPRESS THE ROCKER-TYPE SWITCH TOWARD THE DESIRED FUNCTION

Fig. 2—AUB6 ADU Option Switch Settings

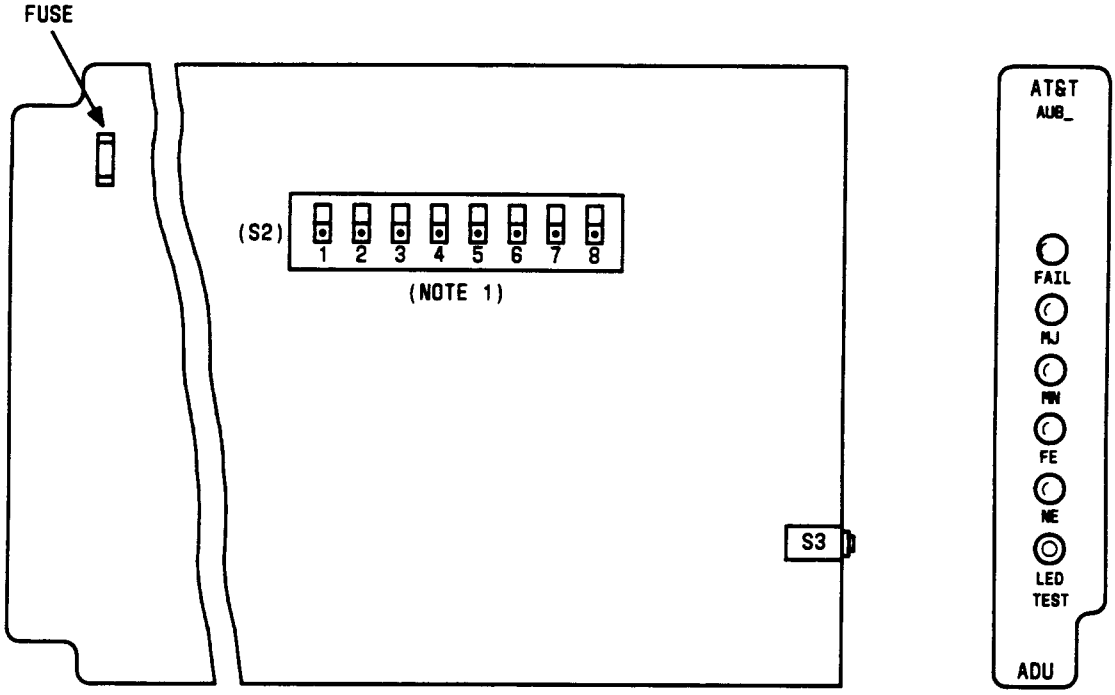


NOTE:
1. DEPRESS THE ROCKER-TYPE SWITCH TOWARD THE DESIRED FUNCTION

Fig. 3—AUB26 ADU Option Switch Settings

SWITCH SETTINGS		
CLOSED	S2	OPEN
NO PROTECTION LINE	1	PROTECTION LINE
–	2	DS1
AB IN-SERVICE	3	AB PRE-SERVICE
CD IN-SERVICE	4	CD PRE-SERVICE
AB EQUIPPED	5	AB UNEQUIPPED
CD EQUIPPED	6	CD UNEQUIPPED
MJ ALARM-RT MISC1 (AUB21)	7	MN ALARM-RT MISC1 (AUB21)
16 BIT ALARM FIELD (AUB24)*		13 BIT ALARM FIELD (AUB24)†
MJ ALARM-RT MISC2 (AUB21)	8	MN ALARM-RT MISC2 (AUB21)
UNUSED (AUB24)		–

* Reserved for future use.
† Always set switch 7 on AUB24 to OPEN.



NOTE:
1. OPEN WHEN DEPRESSED AWAY FROM THE NUMBER
   CLOSED WHEN DEPRESSED TOWARDS THE NUMBER

Fig. 4—AUB21 and AUB24 ADU Option Switch Settings

SET AIU (ALARM INTERFACE UNIT) OPTION SWITCH SETTINGS

1. Get one **AIU** (**AUB3**) and inspect for possible damage.

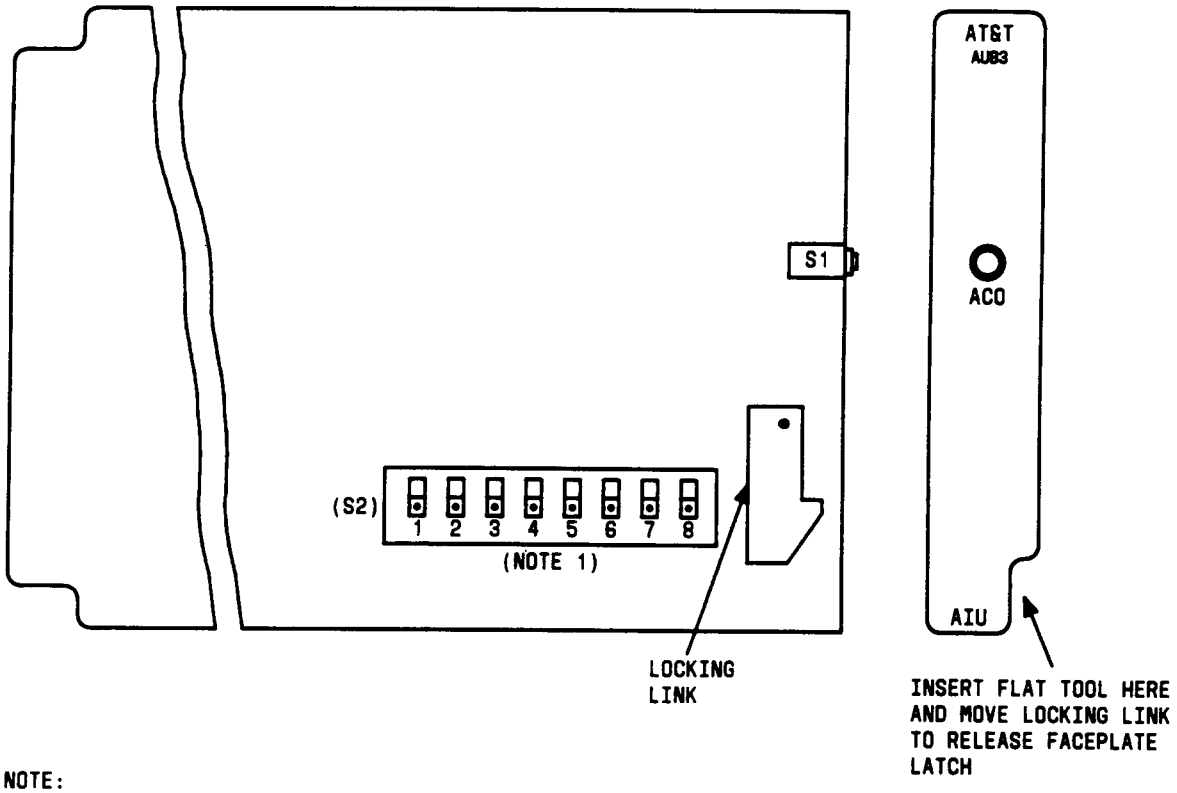
2. On **AIU** option switch **S2** (FIG. 1), set option switches **2** and **3** to closed position (depress rockers toward numbers) and switches **4** and **5** to open (depress rockers away from numbers). Set option switches **6** and **8** to agree with facility record.

3. Insert **AIU** into **AIU** slot in white (upper) channel bank.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

SWITCH SUMMARY		
CLOSED	S2	OPEN
(UNUSED)	1	–
ALWAYS CLOSED	2	–
ALWAYS CLOSED	3	–
–	4	ALWAYS OPEN
–	5	ALWAYS OPEN
CO PMN FOR RT PMN	6*	CO MN FOR RT PMN
(UNUSED)	7	–
CO MN FOR RT PMN	8*	CO PMN FOR RT PMN

* Switches 6 and 8 should not be set to the same position.



NOTE:
1. OPEN WHEN DEPRESSED AWAY FROM THE NUMBERS, CLOSED WHEN DEPRESSED TOWARDS THE NUMBERS.

Fig. 1—AIU Option Switch

SET LIU (LINE INTERFACE UNIT) OPTION SWITCH SETTINGS

1. ***Caution: Incorrectly set LIU option switches may result in immediate or future loss of service or may introduce errors into the digital bitstream. All LIUs in the same bank should have identical option switch settings.***

   Get one **LIU** (FIG. 1, FIG. 2, or FIG. 3) and inspect for possible damage.

2. Is **LIU AUA61**, **AUA61B**, or **AUA61C** being installed in bank assembly?

   If **YES**, then continue with Step **3.**
   If **NO**, then proceed to Step **6.**

3. Set equalizer switches **S400** on **LIU AUA61/AUA61B** or **S2** on **LIU AUA61C** per facility record (Table A).

4. Is **LIU** an **AUA61B** or **AUA61C**?

   If **YES**, then continue with Step **5.**
   If **NO**, then proceed to Step **7.**

5. Set loopback enable/disable switch **S700** on **AUA61B** or **S3** on **AUA61C** to **ENB** if the bank assembly is connected to a DDM-1000 Multiplexer. Otherwise, set it to the **DIS** position and proceed to Step **7.**

6. Set transmit and receive pad switches on **LIU** per facility record (Table B).

7. Set line coding and framing format switches on **LIU** per work order or engineering records (Table C).

8. Is **LIU AUA61B**, **AUA61C**, **AUA62B**, **AUA62C**, **AUA64B**, or **AUA64C** being installed in bank assembly?

   If **YES**, then continue with Step **9.**
   If **NO**, then proceed to Step **11.**

9. Is **LIU** being installed in channel bank assembly equipped for FPD capability?

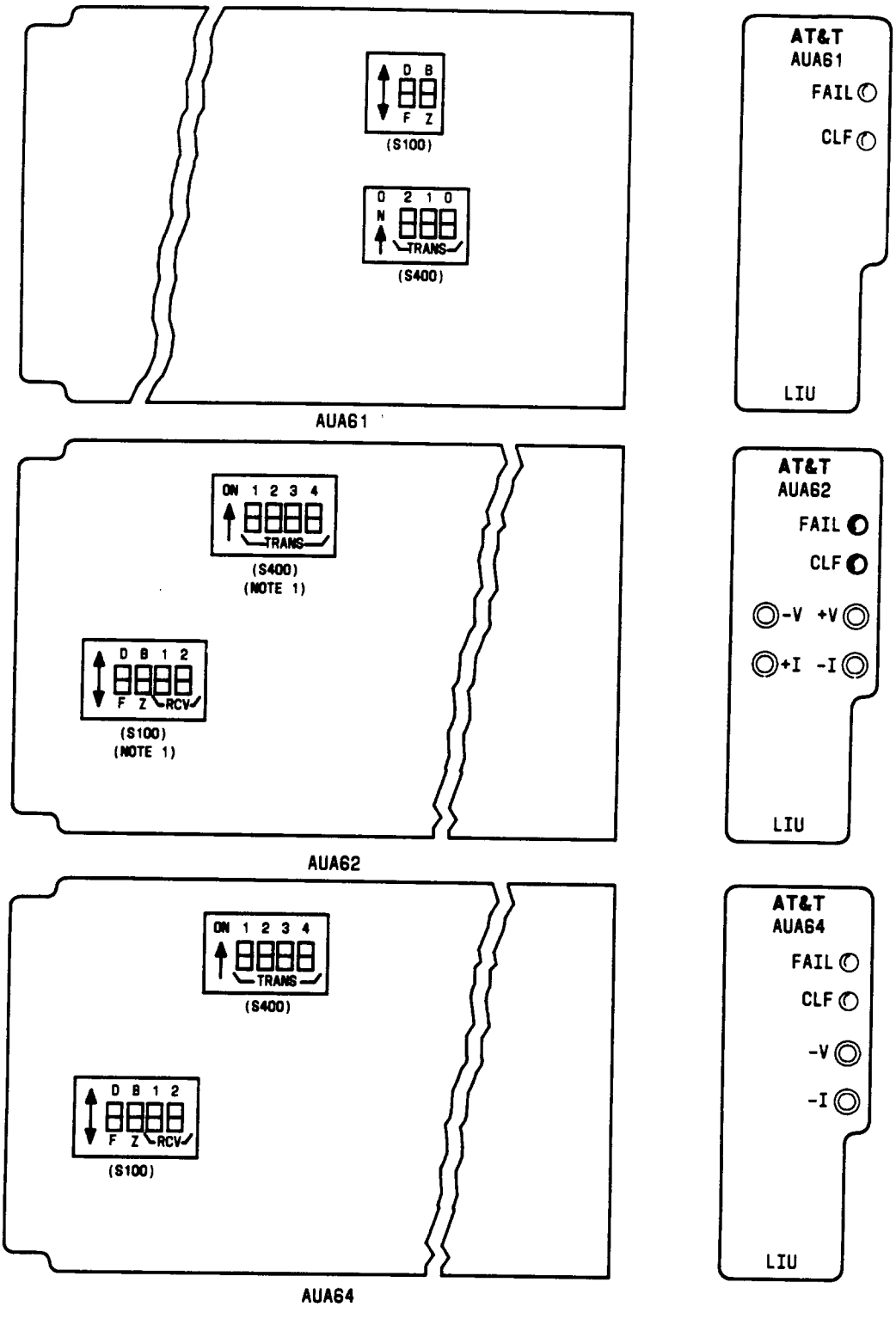
   If **YES**, then proceed to Step **11.**
   If **NO**, then continue with Step **10.**

10. Set channel PCM-rate switch (**S200** or **S4**) to **64** and proceed to Step **12.**

11. Set channel PCM-rate switch (**S200** or **S4**) to **32.**

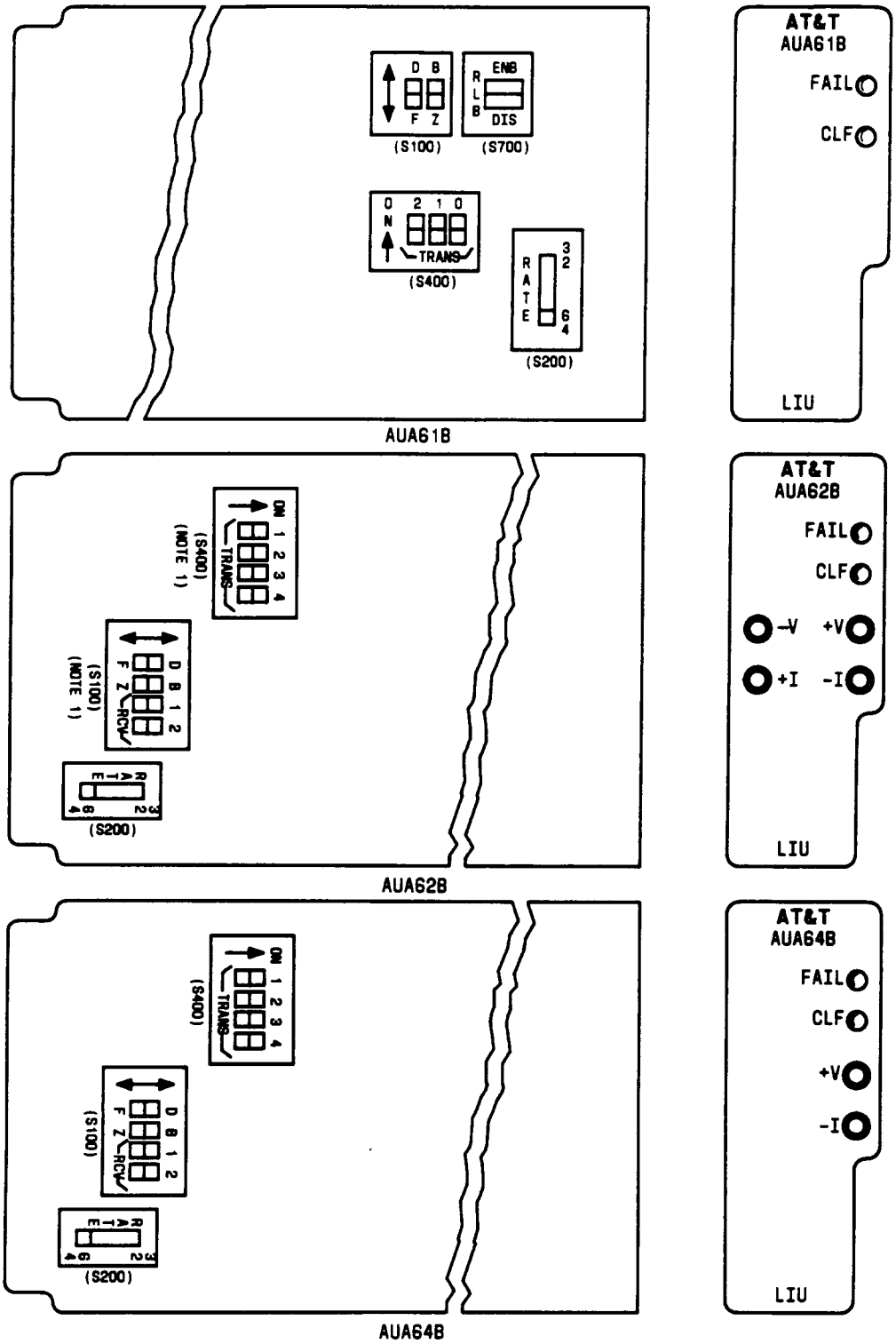
12. Insert **LIU** into appropriate **LIU** slot in facility shelf.

STOP. YOU HAVE COMPLETED THIS PROCEDURE



NOTE: 1. AUA62 HAS A DAUGHTER BOARD. HOWEVER, S100 AND S400 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD.

Fig. 1—AUA61, AUA62, and AUA64 LIU Option Switches



NOTE 1: AUA62B HAS A DAUGHTER BOARD. HOWEVER, S100 AND S400 ARE ACCESSIBLE THROUGH HOLES IN THE DAUGHTER BOARD.

Fig. 2—AUA61B, AUA62B, and AUA64B LIU Option Switches

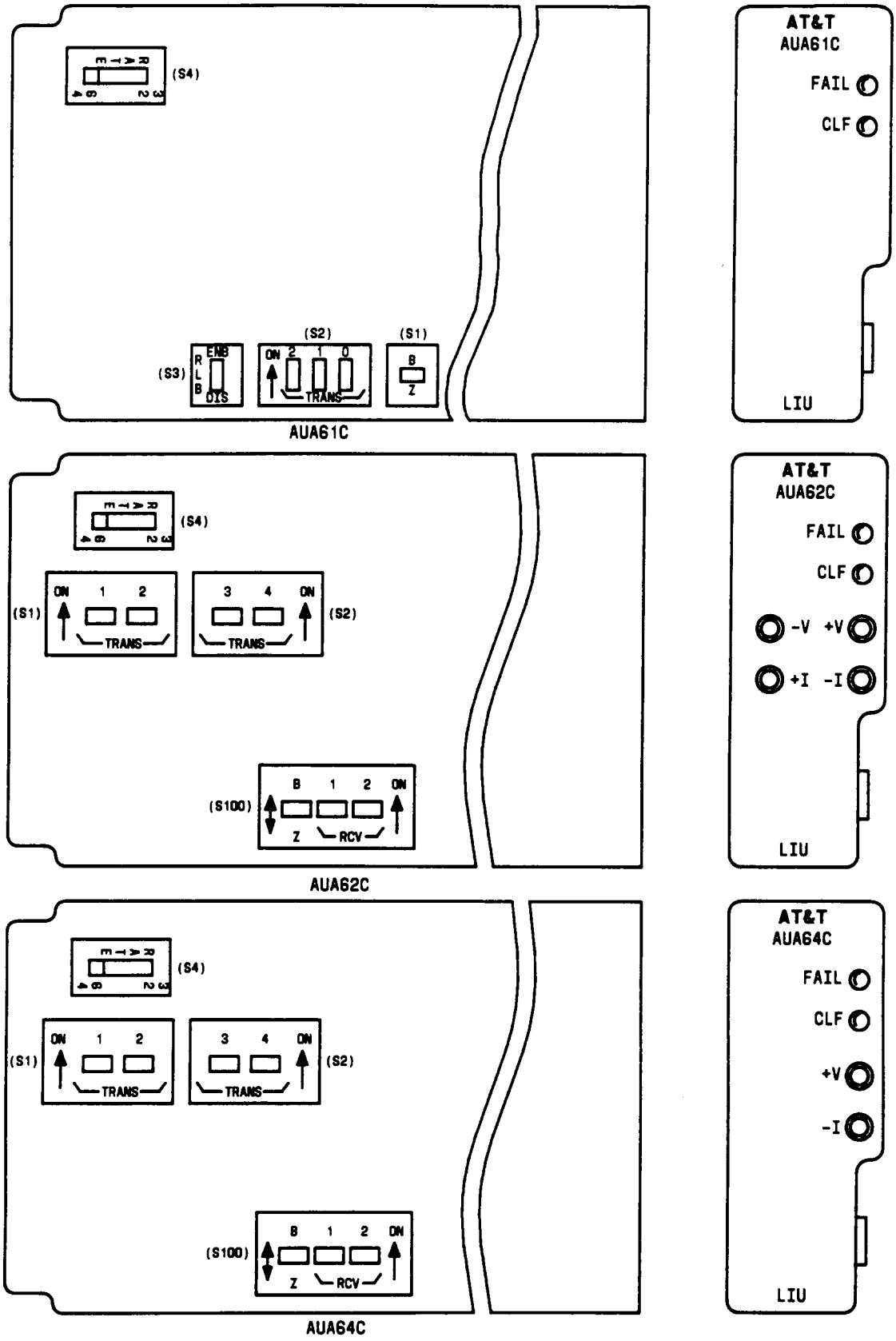


Fig. 3—AUA61C, AUA62C, and AUA64C LIU Option Switches

TABLE A

AUA61, AUA61B, AND AUA61C LIU EQUALIZER SETTINGS

DISTANCE TO DSX-1 (FEET)	EQUALIZER SWITCH (S400/S2) SETTINGS		
	2	1	0
0-132	OFF	OFF	ON
133-265	OFF	ON	OFF
266-398	OFF	ON	ON
399-532	ON	OFF	OFF
533-655	ON	OFF	ON

TABLE B

AUA62, AUA62B, AUA62C, AUA64, AUA64B, AND AUA64C TRANSMIT/RECEIVE PAD SETTINGS

INSERTED LOSS (dB)	TRANSMIT PAD (S400/S1, S2) SWITCH SETTINGS				RECEIVE PAD (S100) SWITCH SETTINGS	
	1	2	3	4	1	2
22.5	OFF	OFF	OFF	ON	—	—
15.0	OFF	OFF	ON	OFF	—	—
7.5	OFF	ON	OFF	OFF	OFF	ON*
0	ON	OFF	OFF	OFF	ON*	OFF

* ON when depressed toward the numbers.

TABLE C

LIU LINE CODING AND FRAMING FORMAT SWITCH SETTINGS

OPTION DESCRIPTION	LIU SWITCH (S100) SETTINGS
B8ZS CODING	B
ZCS CODING	Z
ESF (Fe) FRAMING FORMAT	F
Fs FRAMING FORMAT	D*

* SLC Series 5 Mode 96 use only.

SET DCU (DIGITAL CONNECTIVITY UNIT) OPTION SWITCH SETTINGS

1. Get one **DCU-L** (**AUA16**) and inspect for possible damage.

2. On **DCU-L** option switch **S100** (FIG. 1), set option switch **D/F** to the **D** position and option switch **B/Z** to the **Z** position.

3. On **DCU-L** option switch **S400** (FIG. 1), set switches **0**, **1**, and **2** to agree with facility record.

4. Insert **DCU-L** into the sixth channel unit slot position in the digroup.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

EQUALIZER SETTING			DISTANCE TO DSX-1
2	1	0	(FEET)
OFF	OFF	ON	0 TO 132
OFF	ON	OFF	133 TO 265
OFF	ON	ON	266 TO 398
ON	OFF	OFF	399 TO 532
ON	OFF	ON	533 TO 655

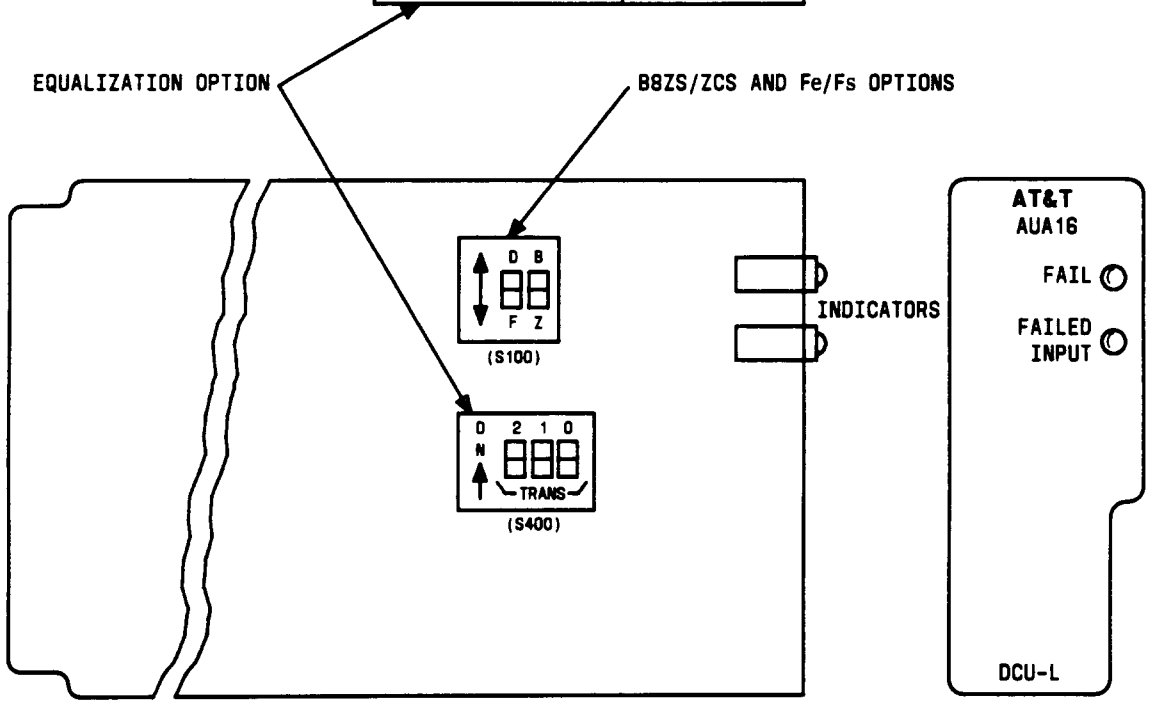


Fig. 1—AUA16 DCU-L Option Switches

PERFORM TEST OF RT BATTERIES USING 197A BATTERY LOAD TEST SET

1. ***Caution: Service interruption will occur if batteries are disconnected and ac power is not available.***

   Obtain **197A BATTERY LOAD TEST SET (197A)** and place near batteries to be tested (FIG. 1).

2. ***Note:*** The 197A test set is intended to test batteries that are fully charged. A minimum of two days must be allowed between the time the batteries (new or replacement) are put on high rate charge and this test is made. After testing is completed, the batteries must be put on high rate charge using the **337A BATTERY CHARGER**.

   Remove cover from **197A** test set.

3. Check **197A** test set for proper operation (if not already performed).

   Reference: **DLP-521**

4. Ensure that system(s) associated with batteries to be tested has ac power available (**PMN** or **P/M** indicator on **BCU** circuit pack not lighted).

5. On **337A BATTERY CHARGER** associated with batteries to be tested, is **HIGH RATE CHG/ON** indicator lighted?

   If **YES,** then continue with Step **6.**
   If **NO,** then proceed to Step **7.**

6. Batteries are on high charge and may require up to 24 hours to charge. Do not perform this procedure until **HIGH RATE CHG/ON** indicator on **BATTERY CHARGER** goes off.

7. ***Caution: Service interruption will occur if batteries are disconnected and ac power is not available.***

   Disconnect battery leads of batteries to be tested from battery shelf.

8. ***Note:*** Under normal conditions, when the first battery is connected, the following occurs: (a) The test set **TIME** display indicates **00 MIN:00 SEC**; (b) The status display indicates which test set **BATT** plug the battery is connected to, status of the battery (**GOOD** or **REPLACE**), and the **READY** indicator lights; (c) Test set fan operates.

   At test set connector head (FIG. 1), connect battery leads (up to four) to **BATT 1, 2, 3,** and **4** plugs.

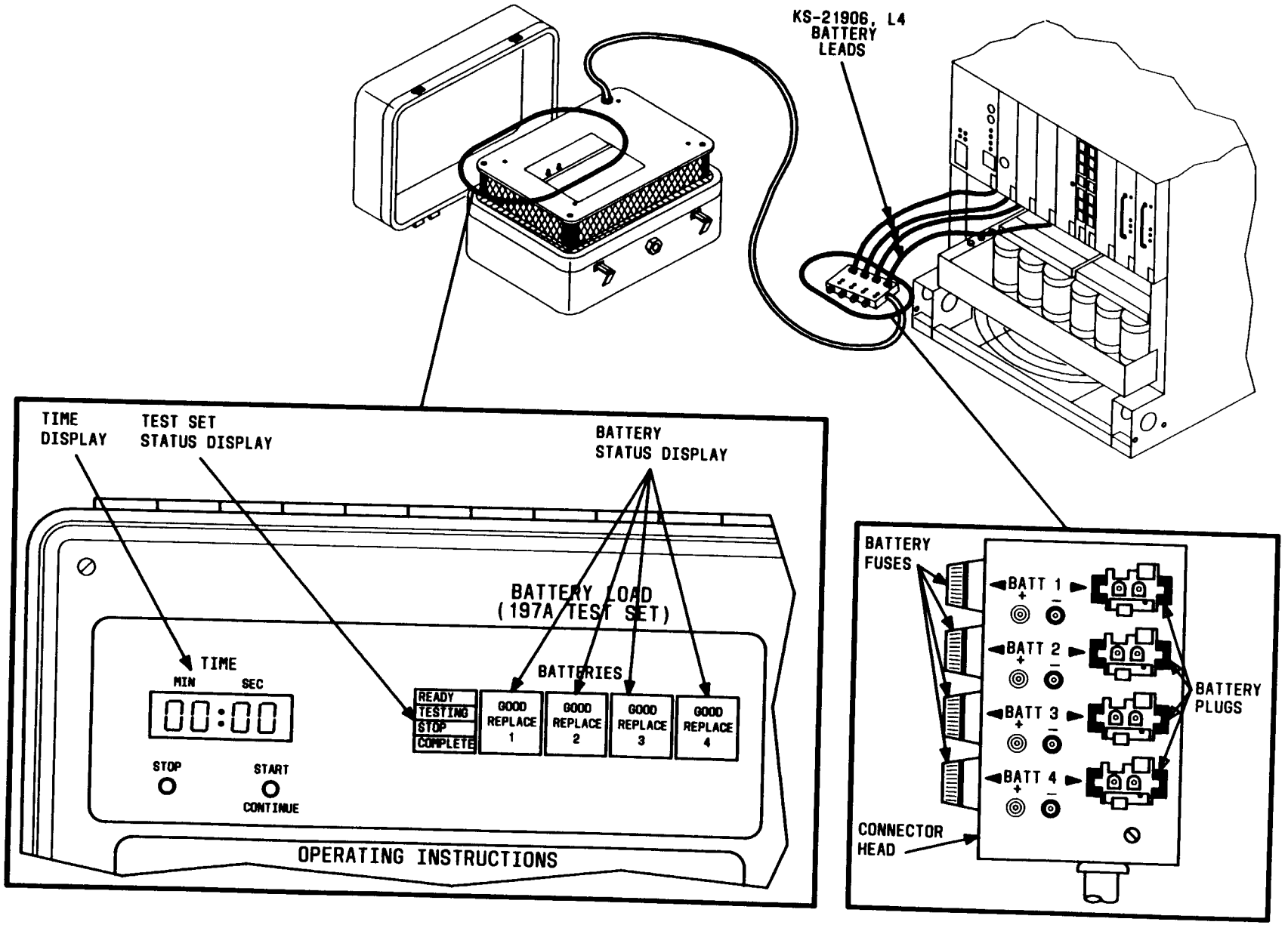


Fig. 1—197A Battery Load Test Set Test Connections

9. ***Note:*** If status display does not indicate battery number of battery status, **BATT** fuse may be blown, connector head or test set defective, or battery pack is defective.

   Does test set display indicate **REPLACE** for all batteries being tested?

   If **YES,** then continue with Step **10.**
   If **NO,** then proceed to Step **12.**

10. Replace all batteries and connect good batteries to battery shelf.

11. Place batteries on high charge by depressing **HIGH RATE CHG/ACTIVATE** pushbutton on **BATTERY CHARGER** and repeat from Step **6.**

12. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Note: This test must run for a full 15 minutes to be valid or until all batteries indicate **REPLACE**. The **STOP** button should only be used if a problem occurs during the test, if the test is to be terminated early because of loss of ac power, or all batteries indicate **REPLACE**. The **START/CONTINUE** button is used to continue the test if no problem is found.

    Depress **197A** test set **START/CONTINUE** button.

    Response: At **197A** test set, **TESTING** indicator is lighted, **READY** indicator is off, and **TIME** display is counting time.

13. ***Note:*** If one, two, or three, but not all, batteries show **REPLACE** during the test period, the remaining batteries still must be tested for the full 15 minutes.

    Does test set show **REPLACE** for all batteries within the 15-minute test period shown on **TIME** display?

    If **YES,** then continue with Step **14.**
    If **NO,** then proceed to Step **15.**

14. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Depress test set **STOP** button.

    Response: **STOP** indicator on test set lights

    Proceed to Step **17.**

15. After 15 minutes, the test set **COMPLETE** indicator lights.

16. Is any **REPLACE** indicator on test set lighted?

    If **YES**, then continue with Step **17.**
    If **NO**, then **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

17. Unplug and set aside all defective batteries.

18. Install and connect replacement batteries to battery shelf. Reconnect any remaining good batteries to battery shelf.

19. Place batteries on high charge by depressing **HIGH RATE CHG ACTIVATE** pushbutton on **BATTERY CHARGER** and repeat from Step **6.**

CHECK 197A BATTERY LOAD TEST SET FOR PROPER OPERATION

1. Obtain **197A BATTERY LOAD TEST SET** (FIG. 1).

2. Remove cover from test set.

3. At test connector head, verify battery fuse holders each contain a 20 Amp fast-blow fuse.

4. Obtain one KS-21906, L4 battery.

5. ***Note:*** Under normal conditions, when the first battery is connected, the following occurs: (a) Test set **TIME** display indicates **00 MIN: 00 SEC**; (b) Status display indicates which test set **BATT** plug that battery is connected to, status of the battery (**GOOD** or **REPLACE**), and the **READY** indicator lights; (c) Test set fan operates.

   At test set connector head, connect battery lead to **BATT 1, 2, 3**, or **4** plug being tested.

6. ***Warning: Damage will occur if test set is operated without fan operating.***

   Does test set fan operate?

   If **YES,** then proceed to Step **15.**
   If **NO,** then continue with Step **7.**

7. Connect battery lead to remaining **BATT** plugs, one at a time, and note if fan operates.

8. Did test set fan operate for any **BATT** plug connection?

   If **YES,** then proceed to Step **11.**
   If **NO,** then continue with Step **9.**

9. ***Note:*** The test set is intended to test fully charged batteries. Before new batteries or replacement batteries are tested, a minimum of two days must have passed between the time the batteries are put on high rate charge and this test is made.

   Disconnect lead. Using a different battery pack, connect battery lead to any **BATT** plug.

10. Does test set fan operate?

    If **YES,** then proceed to Step **15.**
    If **NO,** then proceed to Step **35.**

11. On test set connector head, remove battery lead and check for blown fuse(s).

12. Is fuse(s) blown?

    If **YES,** then continue with Step **13.**
    If **NO,** then proceed to Step **14.**

13. Replace fuse(s) and repeat from Step **5.**

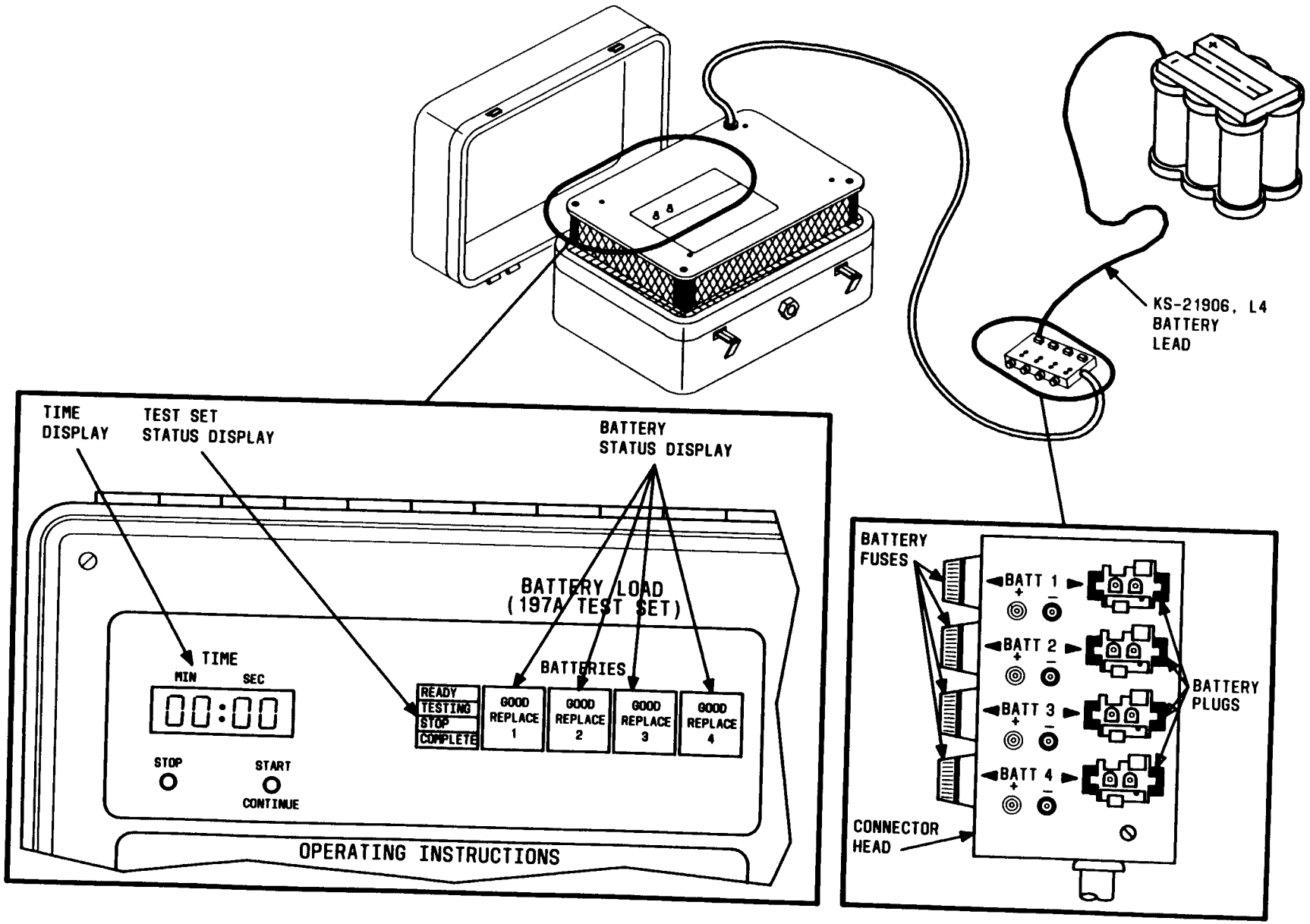


Fig. 1—197A Battery Load Test Set Arrangement

14. ***Note:*** Test set may be used for testing using one, two, three or all four **BATT** plug positions.

    Defective test set or connector head. Note defective **BATT** plug position(s). Continue with test procedures using remaining **BATT** plugs.

15. Does test set **TIME** display indicate **00 MIN:00 SEC** without blinking?

    If **YES,** then continue with Step **16.**
    If **NO,** then proceed to Step **35.**

16. Does status display indicate which battery was connected, status (**GOOD** or **REPLACE**) of the battery, and is **READY** indicator lighted?

    If **YES,** then continue with Step **17.**
    If **NO,** then proceed to Step **35.**

17. Does status display indicate **GOOD** or **REPLACE**?

    If **YES,** then proceed to Step **19.**
    If **NO,** then continue with Step **18.**

18. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Battery pack is defective. Ensure that **TESTING** indicator is not lighted (**READY** indicator lighted) unplug and set aside defective battery pack and repeat from Step **5.**

19. Have **TIME** display and **STATUS** indicators been tested for each good **BATT** plug position?

    If **YES,** then proceed to Step **21.**
    If **NO,** then continue with Step **20.**

20. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Ensure that TESTING indicator is not lighted. (READY indicator lighted). Unplug battery pack and repeat from Step 5.

21. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Depress test set **START/CONTINUE** button.

22. Does test set **TESTING** indicator light, **READY** indicator go off, and **TIME** display start counting time?

    If **YES,** then proceed to Step **24.**
    If **NO,** then continue with Step **23.**

23. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Defective test set. Depress **STOP** button, unplug battery. Return test set for repair.

24. Depress test set **STOP** button.

25. Does test set **STOP** indicator light and **TIME** display stop counting time?

    If **YES,** then proceed to Step **27.**
    If **NO,** then continue with Step **26.**

26. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Defective test set. Allow test to run for 15 minutes as shown on **TIME** display. When **COMPLETE** indicator lights, unplug battery. Return test set for repair.

27. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Depress test set **START/CONTINUE** button.

28. Does test set **TESTING** indicator light, **STOP** indicator go off, and **TIME** display start counting time?

    If **YES,** then continue with Step **29.**
    If **NO,** then proceed to Step **34.**

29. Allow test set to run for 15 minutes as shown on **TIME** display.

30. During 15-minute test period, does test set show **REPLACE**?

    If **YES,** then continue with Step **31.**
    If **NO,** then proceed to Step **32.**

31. Note that battery being used is defective.

32. After 15 minutes, does **COMPLETE** indicator light?

    If **YES,** then continue with Step **33.**
    If **NO,** then proceed to Step **34.**

33. Unplug battery. Store connector head in test set cover. Reinstall cover.

    STOP. YOU HAVE COMPLETED THIS PROCEDURE

34. ***DANGER: A high discharge current is present at connector head if TESTING indicator is lighted. Batteries must not be connected or disconnected when TESTING indicator is lighted.***

    Defective test set. Depress **STOP** button, unplug battery. Return test set for repair.

35. Defective test set. Return for repair.

CHECK FIBER-TO-THE-HOME CIRCUIT ARRANGEMENT

SUMMARY: These Steps can be used to find the relationships between RT digroup channel positions and the associated Fiber-to-the-Home equipment. Powering arrangements and circuit pack locations are also covered. All this information should be available in the word order, but is included here for convenience. Use TABLE A to find the RT circuit of interest, then see the figures to find the location of these circuit packs in the shelf assemblies.

1. Use TABLE A to find RT and digroups of interest, then see FIG. 1 through 6 for more details about the individual equipment shelves.

2. See TABLE B for bay fusing arrangements.

3. See TABLE C and FIG. 2 for bay connections from the Power Shelf Assembly.

4. See Table D and FIG. 2 for intershelf cabling arrangements.

5. Figure 1 shows the Fiber-to-the-Home 7-foot frame equipment bay arrangement. Note that the connections between the dual channel bank 1 and optical shelves 1 and 2 are not shown, but are connected in a similar arrangement as the connections for the dual channel bank 2. Figure 2 shows all the required connections for the 7-foot Fiber-to-the-Home equipment frame. Each optical shelf serves one of the RT systems in the dual RT channel bank assembly.

6. The optical shelf provides slots for 48 AYB1(B) optical units, one for each channel unit slot in the RT. Each RT digroup has 12 channel unit slots and each channel unit slot is labeled with the channel count served by the slot (e.g., 43/44). To find the AYB1(B) slot associated with a channel unit slot, simply find the AYB1(B) slot with the same channel count number. The **AUA401** channel unit occupies two channel unit slots in the RT, but requires only one AYB1(B) optical unit to be installed in the optical shelf. The AYB1(B) position corresponds with the RT channel unit slot of the first two channels. To find the AYB1(B) slot associated with an AUA401 channel unit, use the same method as above with the lower channel count slot (e.g., an AUA401 occupying RT slots 43/44 and 45/46 is AYB1(B) slot 43/44; AYB1(B) slot 45/46 is not used).

7. When a trouble condition is present, use TABLEs B and C to trace fusing and power cable connections troubles. Use TABLE D to trace intershelf cabling trouble.

8. The appearance of an optical fiber associated with a channel unit slot should be supplied with the work order. The fiber cables are connected from the optical shelf to the optical interconnect frame in bundles of 12 fibers. These bundles are identified by the RT SID (system identification number) and the odd numbered channels (P number) of the digroup. For example, an AUA400 in channel slot 21/22 of RT system 1234 would have a optical interconnect frame appearance *1234 P21*. An AUA401 in channel slots 33/34 and 35/36 of the same RT system would have a fiber interconnect appearance *1234 P33*.

9. When the J99407TA Analyzer is connected to the optical cable (FIG. 7), the *ST*-type connectors should be cleaned using reagent grade isopropyl alcohol and blown dry with canned air. The same should be done when connections to the distribution cables are made. See *"Instruction Manual" "1032A TOOL KIT With D-181610 KIT" "***ST** *CONNECTORS" "SINGLE MODE LIGHTGUIDE CABLE"* for procedures to make cable splice and clean *ST* connectors.

10. The Analyzer has an optical cable attached to a blank card that is used to replace the AYB1(B) in the DT cabinet. This connection can only be used at the DT cabinet. When the Analyzer is used at the RT location, an *ST* coupler is connected to the Analyzer cable end *ST* connector. Then the optical cable from the RT optical shelf AYB1(B) circuit pack can be coupled at the fiber interconnect to the Analyzer.

11. When the **AYB1(B)** is removed at the RT optical shelf, the backplane connector must be cleaned before the circuit pack is replaced. The following step outlines this cleaning procedure.

12. Using a J99409OB, L1 OBMK (optical backplane maintenance kit) clean the optical shelf backplane couplings for **AYB1(B)** slot before installing the **AYB1(B)** as follows:

    - Insert miniswab into chuck of OBMK extension handle and tighten chuck into extension handle.
    - Insert extension handle, with miniswab, into tube of OBMK basic unit.
    - Moisten tip of miniswab by dipping it into alcohol.
    - Dab tip of miniswab with an alcohol moistened Kimwipe wiper or equivalent.
    - Insert basic unit into slot of optical shelf while keeping extension handle inside guide tube. Latch basic unit into place.
    - Push extension handle with miniswab into guide tube until knob of extension handle contacts guide tube.
    - Rotate knob of extension handle three turns clockwise then three turns counterclockwise.
    - Remove extension handle with miniswab from guide tube.
    - Assemble air director tube from OBMK over nozzle on can of compressed air.
    - Insert air director tube, attached to can of compressed air, into guide tube of basic unit until tube stops forward progress.
    - Using can of compressed air, blow three short blasts of air into coupling.
    - Remove air director tube with canned air from guide tube.
    - Remove basic unit.

- Remove air director tube from can of compressed air and store tube in J99409OB case.
- Store basic unit in J99409OB case.
- Remove miniswab from extension handle and store handle in J99409OB case.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

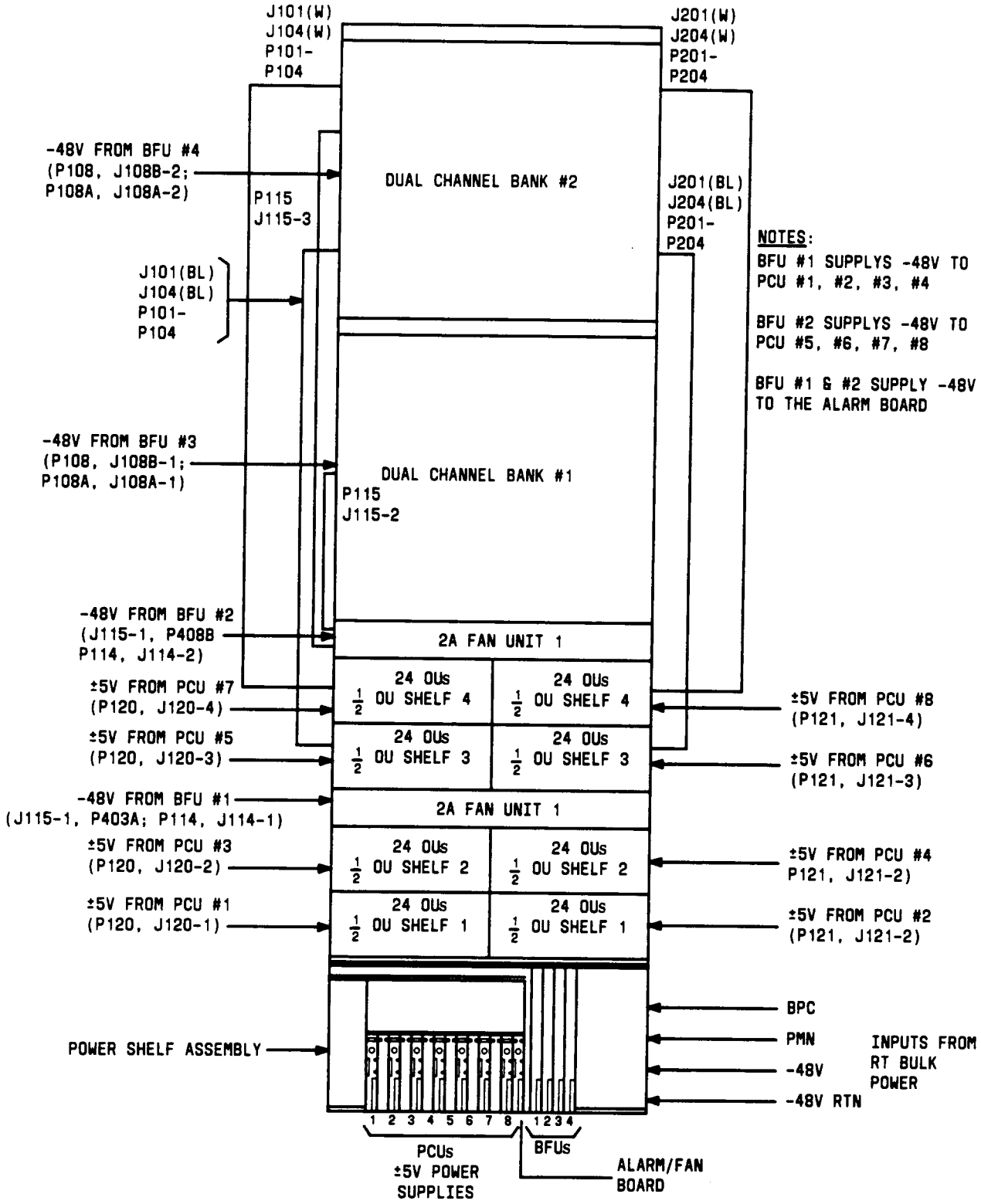


Fig. 1—Fiber-To-The-Home 7-Foot Bay Arrangement

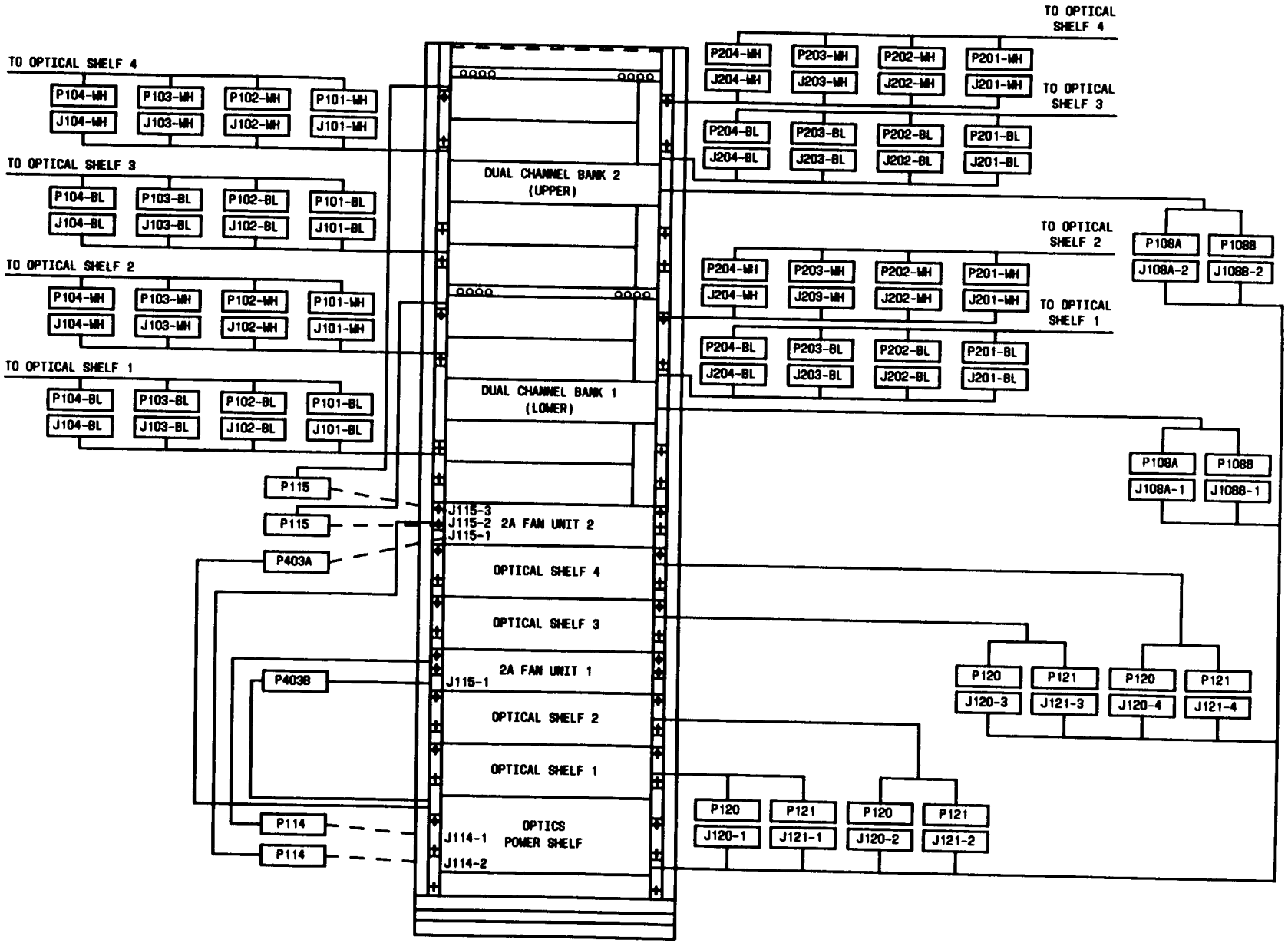


Fig. 2—Fiber-To-The-Home 7-Foot Bay Cabling Connections

TABLE A

FIBER-TO-THE-HOME EQUIPMENT OVERVIEW

RT	Digroup	RT Power	Optical Shelf	OS Power	AYB1 OUs	Optical Interconnect (Note)
Lower Blue	A	BFU #3	1	BFU #1,PCU-1	1/2—23/24	SID#, Fibers 1-12
	B	BFU #3	1	BFU #1,PCU-1	25/26—47/48	SID#, Fibers 13-24
	C	BFU #3	1	BFU #1,PCU-2	49/50—71/72	SID#, Fibers 25-36
	D	BFU #3	1	BFU #1,PCU-2	73/74—95/96	SID#, Fibers 37-48
Lower White	A	BFU #3	2	BFU #1,PCU-3	1/2—23/24	SID#, Fibers 1-12
	B	BFU #3	2	BFU #1,PCU-3	25/26—47/48	SID#, Fibers 13-24
	C	BFU #3	2	BFU #1,PCU-4	49/50—71/72	SID#, Fibers 25-36
	D	BFU #3	2	BFU #1,PCU-4	73/74—95/96	SID#, Fibers 37-48
Upper Blue	A	BFU #4	3	BFU #2,PCU-5	1/2—23/24	SID#, Fibers 1-12
	B	BFU #4	3	BFU #2,PCU-5	25/26—47/48	SID#, Fibers 13-24
	C	BFU #4	3	BFU #2,PCU-6	49/50—71/72	SID#, Fibers 25-36
	D	BFU #4	3	BFU #2,PCU-6	73/74—95/96	SID#, Fibers 37-48
Upper White	A	BFU #4	4	BFU #2,PCU-7	1/2—23/24	SID#, Fibers 1-12
	B	BFU #4	4	BFU #2,PCU-7	25/26—47/48	SID#, Fibers 13-24
	C	BFU #4	4	BFU #2,PCU-8	49/50—71/72	SID#, Fibers 25-36
	D	BFU #4	4	BFU #2,PCU-8	73/74—95/96	SID#, Fibers 37-48

Note: The fibers at the optical interconnect are labeled with the system identification number (SID) and the letter **P** followed by the odd channel number of the RT channel unit slot. For example, the fiber for RT **1234**, channel unit slot **23/24**, should be labeled **1234, P23**.

TABLE B

FIBER-TO-THE-HOME BAY FUSING

	BFU Slot in Power Shelf Assembly				
40D BFU	**1**	**2**	**3**	**4**	**Fuse Type**
WHX	Not Used	Not Used	Not Used	Not Used	Dummy
BLX	Not Used	Not Used	Not Used	Not Used	Dummy
CMN	A/FCU	A/FCU	Lower RT Common	Upper RT Common	80D
WHITE	PCUs 3, 4	PCU 7, 8	Lower RT White	Upper RT White	81D
BLUE	PCUs 1, 2	PCU 5, 6	Lower RT Blue	Upper RT Blue	81D
FAN H	Lower 2A Fan	Upper 2A Fan	Not Used	Not Used	80D
FAN L	Lower 2A Fan	Upper 2A Fan	Not Used	Not Used	80D

TABLE C
CONNECTIONS FROM THE POWER SHELF ASSEMBLY

Power Shelf Assembly Connector Cable	J107	J114-1	P403A	J114-2	P403B	J108B-1	J108A-1	J108B-2	J108A-2
MISC Pair Panel	P107								
2A Fan Unit 1		P114							
2A Fan Unit 1			J115-1						
2A Fan Unit 2				P114					
2A Fan Unit 2					J115-1				
Lower RT Channel Bank						P108B			
Lower RT Channel Bank							P108A		
Upper RT Channel Bank								P108B	
Upper RT Channel Bank									P108A

CONNECTIONS FROM THE POWER SHELF ASSEMBLY

Power Shelf Assembly Connector Cable	J120-4	J121-4	J120-3	J121-3	J120-2	J121-2	J120-1	J121-1	
Optical Unit 4	P120								
Optical Unit 4		P121							
Optical Unit 3			P120						
Optical Unit 3				P121					
Optical Unit 2					P120				
Optical Unit 2						P121			
Optical Unit 1							P120		
Optical Unit 1								P121	

TABLE D
INTER SHELF CABLING

	2A Fan Unit 1 J115-2	Optical Shelf 1 P201-P204	Optical Shelf 1 P101-P104	Optical Shelf 2 P201-P204	Optical Shelf 2 P101-P104
Lower RT Channel Bank	P115	J201(W)-J204(W)	J101(W)-J104(W)	J201(BL)-J204(BL)	J101(BL)-J104(BL)

INTER SHELF CABLING

	2A Fan Unit 2 J115-3	Optical Shelf 3 P201-P204	Optical Shelf 3 P101-P104	Optical Shelf 4 P201-P204	Optical Shelf 4 P101-P104
Upper RT channel Bank	P115 *	J201(W)-J204(W)	J101(W)-J104(W)	J201(BL)-J204(BL)	J101(BL)-J104(BL)

* Requires a patch cord with J115 and P115 ends

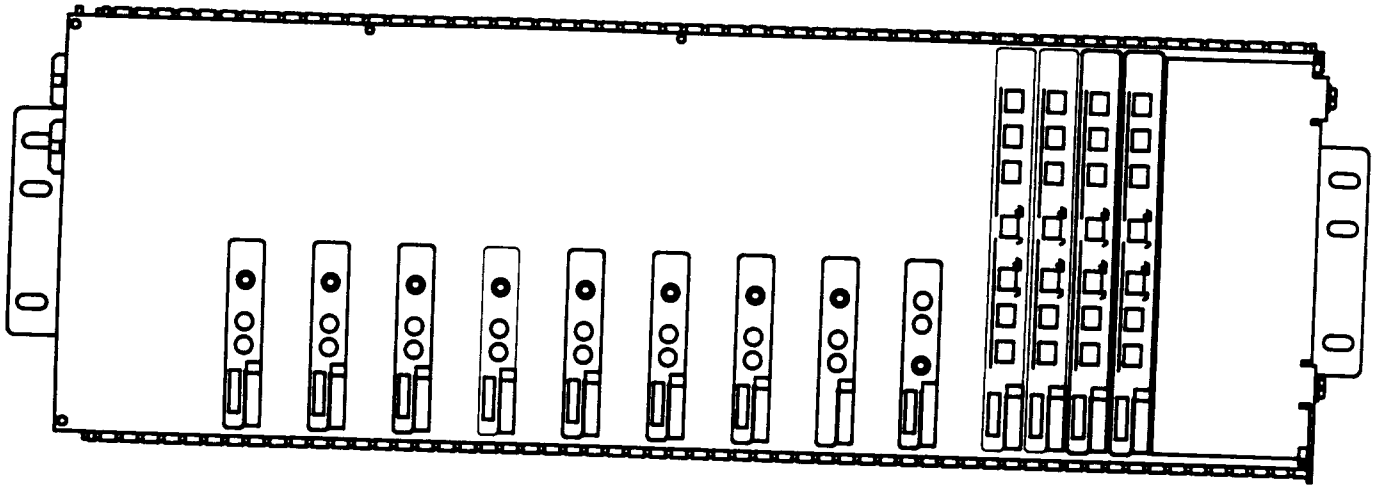


Fig. 3—J1C182PB-1 Optics Power Shelf

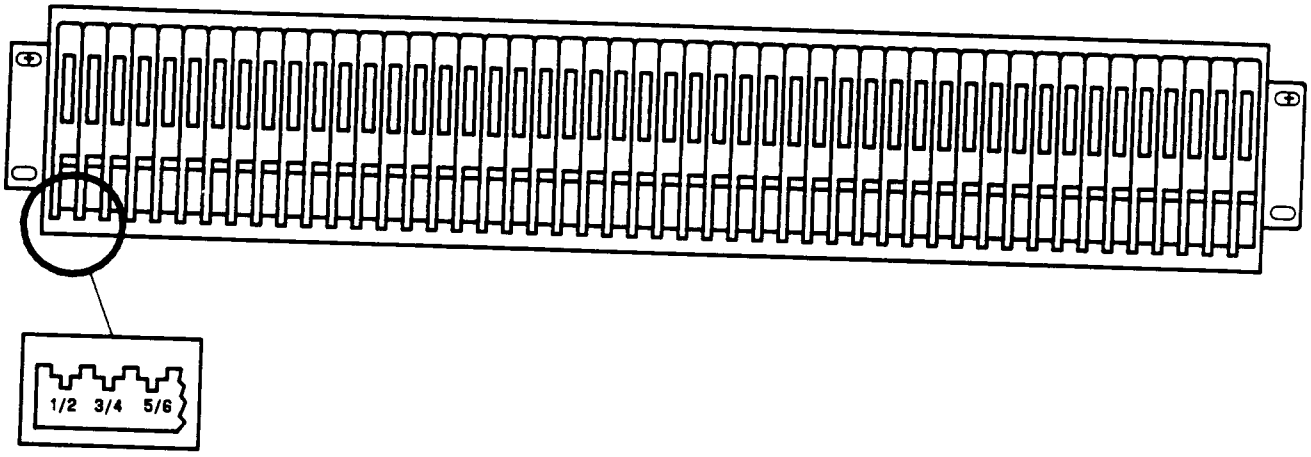


Fig. 4—J1C182PA-1 *SLC* Series 5 Optical Shelf

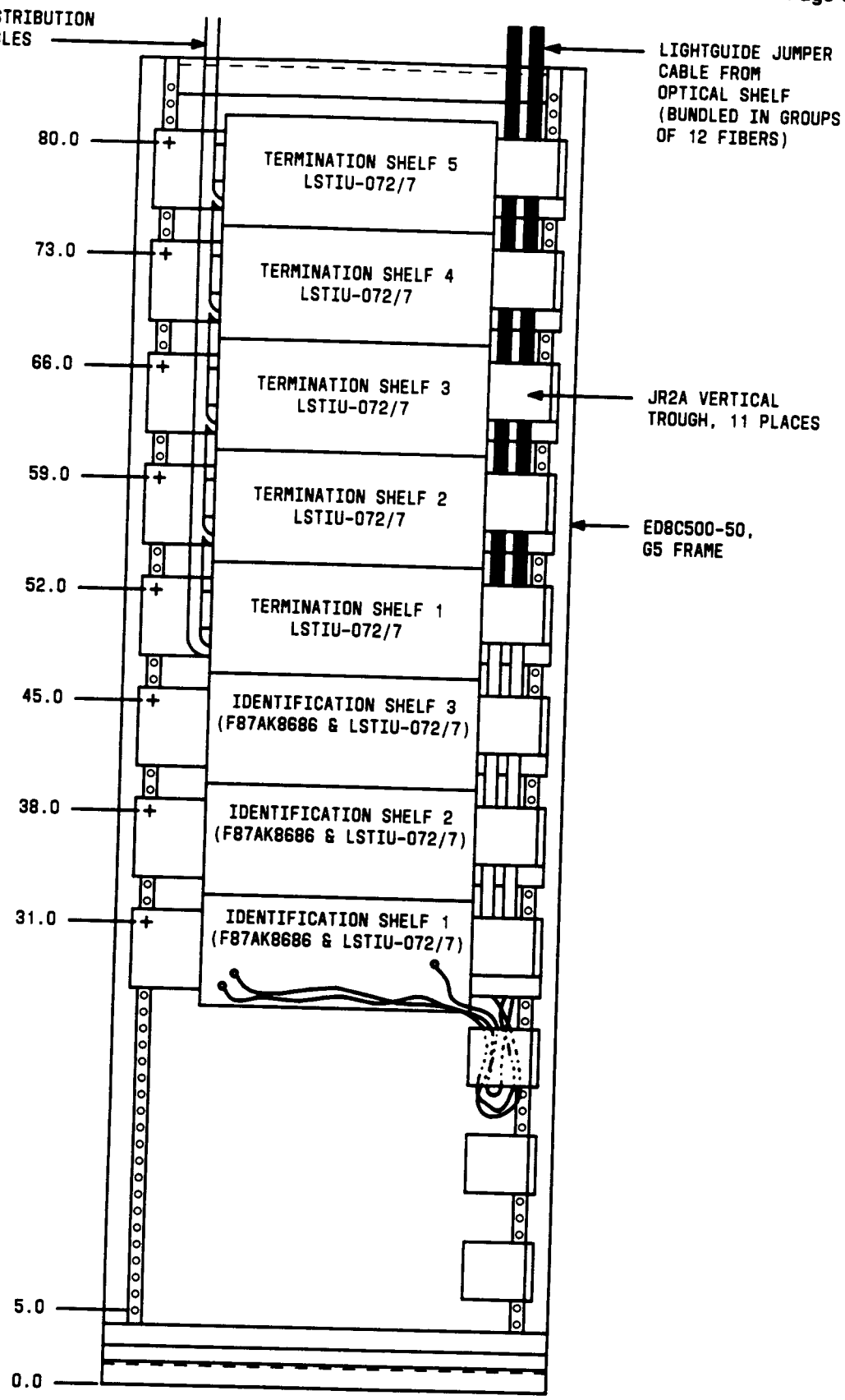


Fig. 5—LGX Optical Interconnect Bay

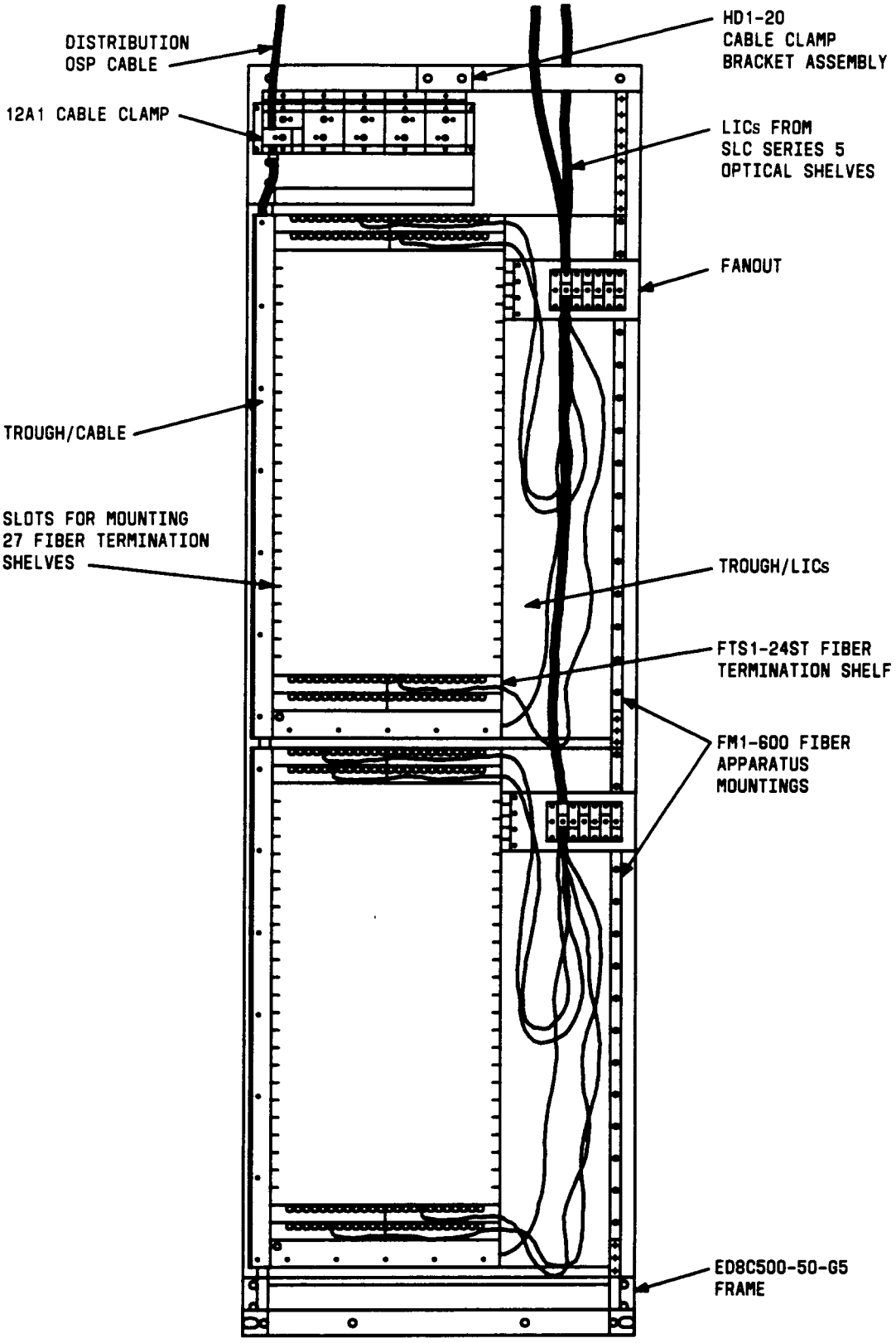
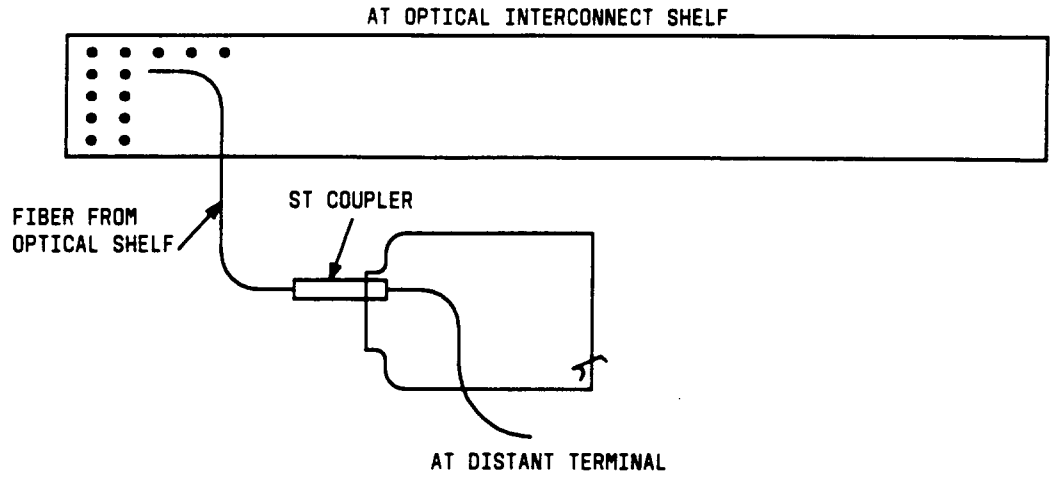


Fig. 6—FIC (Fiber Interconnect) With FM1-600 Fiber Apparatus Mounting



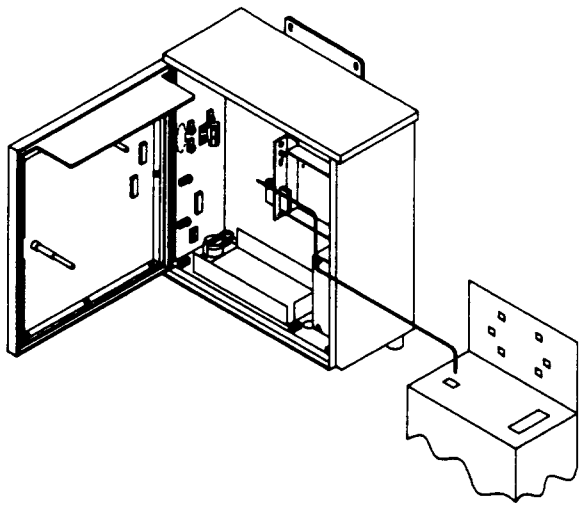


Fig. 7—Fiber Connections With J99407TA Analyzer

PERFORM SINGLE-PARTY POTS CHANNEL TEST FIBER-TO-THE-HOME COT-TO-RT

SUMMARY: At RT, determine optical interconnect fiber appearance for channel being tested. Connect analyzer to jumper fiber from AYB1(B) in optical shelf. Replace AYB1(B) and RT channel unit if DT has an OOF alarm. Clean optical connection and then use AUA403 to perform system test if replacement does not clear alarm. Make talking, dialing, ringing, and ring-trip tests for each channel from analyzer RJ11 jacks.

1. Establish communication between RT and COT.

2. Connect J99407TA Analyzer to jumper fiber from the appropiate optical shelf AYB1(B) (for channel unit being tested) at optical interconnect frame.

   Reference: **DLP-522**

   Response: When channel unit is installed, **OOS** indicator lights.
   When **J99407TA Analyzer** is connected, channel unit **OOS** indicator and the Analyzer **OOF** indicators goes off.

   Comment: The analyzer must be replaced if the **FAIL or BUSY** indicators remain lighted after the fiber connection is made.

3. Were the above responses noted and **OOS** and **OOF** indicators off?

   If **YES,** then continue with Step **7.**
   If **NO,** then proceed to Step **4.**

4. Verify the proper test connections have been made (check that channel unit has an associated AYB1(B) circuit pack in the optical shelf) and J99407TA Analyzer has power (the batteries must be charged).

   Reference: **DLP-522**

5. Did correcting test connections clear trouble?

   If **YES,** then continue with Step **7.**
   If **NO,** then proceed to Step **6.**

6. Replace, one at a time, **AUA400** or **AUA401** channel unit and check access. Then if necessary replace **AYB1(B)** optical unit. If trouble is still present check optical shelf power and cabling between RT and optical shelf. Then clean and check fiber optical cable between the optical shelf, the optical interconnect frame, and the J99407TA. If system tests using **AUA403** have not been done proceed to Step **20.** Else if trouble is still present use office drawings and RT schematic drawing to clear wiring trouble. Check for tip-ring reversal between RT and optical shelf.

   Reference: **DLP-522**

7. Connect the test telephone into #1 RJ11 modular jack of the J99407TA Analyzer (Use the modular jack adaptor, provided with the Analyzer, to connect a butt set).

8. At J99407TA, lift handset and check for dial tone.

9. Is dial tone present at J99407TA test telephone?

   If **YES,** then proceed to Step **11.**
   If **NO,** then continue with Step **10.**

10. Replace, one at a time, **AUA400** (or AUA401) and **AYB1(B)** as needed and check for dial tone. If dial tone is not present after the AYB1(B) was replaced, repeat from Step **4.**

11. At J99407TA, dial the local MDF or CO number and make normal talk tests and monitor the call progress.

12. Was call completed with normal transmission quality in both directions?

    If **YES,** then proceed to Step **13.**
    If **NO,** then continue with Step **10.**

13. At COT dial the test line to ring the telephone at jack 1 of J99407TA. At the RT, if a test telephone is used the phone will ring normally. If the 1015B Butt Set is employed, use the **TEST** mode switch position and monitor the polarity indicators and/or earpiece to evaluate ringing.

14. At J99407TA, does the test phone ring normally?

    If **YES,** then continue with Step **15.**
    If **NO,** then proceed to Step **16.**

15. At J99407TA, does the test phone trip ringing when hand set is lifted?

    If **YES,** then proceed to Step **17.**
    If **NO,** then continue with Step **16.**

16. Change RT channel unit and repeat this procedure from Step **2.**

17. Is this the last channel unit slot (digroup) to be tested?

    If **YES,** then continue with Step **18.**
    If **NO,** then repeat this procedure from Step **2** for next channel unit slot.

18. Repeat this procedure from Step **8** for other RJ11 modular jacks of the J99407TA analyzer (#2; and #3 and #4 for AUA401) as required. Then continue with Step **19.**

19. Remove channel test equipment and reconnect jumper fiber to distribution fiber at optical interconnect frame.

STOP. YOU HAVE COMPLETED THIS PROCEDURE

20. ***Warning: Installing any channel unit besides the test channel unit AUA403, AUA400, or AUA401 will result in permanent damage to the optical shelf AYB1(B) optical unit.***

    Note: Test telephone set should be connected for bridged ringing. Test telephone is connected to the faceplate jack of the AUA403 test channel unit using the WP91067-L6 test cable provided in the J99407TA Analyzer.

    At RT, install a single-party test **AUA403** channel unit into the channel unit slot that coincides with the channel being tested and temporarily connect a test telephone set to the channel via the faceplate jack.

21. At RT, lift handset and check for dial tone.

22. Is dial tone present at RT?

    If **YES,** then proceed to Step **26.**
    If **NO,** then continue with Step **23.**

23. Check test connections and correct if needed. Replace COT channel unit and check for dial tone. If still not present, replace RT channel unit (**AUA403**) and check for dial tone.

24. Is dial tone present at RT?

    If **YES,** then proceed to Step **26.**
    If **NO,** then continue with Step **25.**

25. Use COT schematic drawings to check channel bank wiring. Use office drawings to check central office wiring. Look for tip and ring reversal between COT channel appearance and office equipment. Correct wiring until dial tone is present at RT and proceed to Step **26.**

26. At RT, dial local MDF or CO number and make normal talk tests.

27. Was call completed with normal transmission quality in both directions?

    If **YES,** then proceed to Step **33.**
    If **NO,** then continue with Step **28.**

28. Replace COT channel unit and repeat normal talk tests.

29. Was call completed with normal transmission quality in both directions?

    If **YES,** then proceed to Step **33.**
    If **NO,** then continue with Step **30.**

30. Replace RT channel unit and repeat normal talk tests.

31. Was call completed with normal transmission quality in both directions?

    If **YES,** then proceed to Step **33.**
    If **NO,** then continue with Step **32.**

32. Use COT and RT schematic drawings to check wiring. Check for tip and ring reversal between COT channel appearance and office equipment. Correct wiring and repeat from Step **32** until talk quality is good in both directions.

33. ***Note:*** The RT test channel unit **AUA403** does not supply ringing to the test telephone. COT personnel must verify audible ringing tones after the test line has been dialed and request RT personnel to lift handset after ringing tones are present.

    At COT, dial test line number to ring telephone at RT.

34. At COT do you hear audible ringing tones after dialing?

    If **YES,** then proceed to Step **38.**
    If **NO,** then continue with Step **35.**

35. At COT, has tip and ring reversal been checked?

    If **YES,** then continue with Step **36.**
    If **NO,** then proceed to Step **37.**

36. Replace, one at a time; COT channel unit first and then RT channel unit. Repeat this procedure from Step **20** after each replacement.

37. Look for tip and ring reversal at COT and repeat from Step **33.**

38. At RT, lift telephone handset when requested by COT personnel (during ringing).

39. At RT, does ringing trip normally and is normal transmission established?

    If **YES,** then proceed to Step **41.**
    If **NO,** then continue with Step **40.**

40. Replace, one at a time; COT channel unit first and then RT channel unit. Repeat this procedure from Step **20** after each replacement.

41. Is this the last designated channel unit slot to be tested?

    If **YES,** then continue with Step **42.**
    If **NO,** then repeat from Step **20.**

42. Remove **AUA403** and install **AUA400** or **AUA401** channel unit. Then repeat from Step **2.**

REPLACE DISTANT TERMINAL CIRCUIT PACK

SUMMARY: To replace DT circuit packs, turn off the ac power circuit breaker. Then remove battery power by disconnecting P104-J104 power lead. To replace the ASJ1 channel unit or ASH1 power converter unit, remove the two cotter pins on the side of the channel unit and power unit. Slide the channel unit and PCU out. At the back of circuit pack being replaced, disconnect backplane cable (ASJ1 channel unit, J107 and J103 assembly; ASH1 PCU, J101 and J102 assembly). Slide the PCU and channel unit back in place and replace the two cotter pins on the side of the channel unit. Make backplane cable connections on replacement circuit pack. The AYB1(B) optical circuit pack can be replaced without removing the cotter pins simply by unlatching the circuit back and carefully removing the board. Turn ac power circuit breaker on and reconnect battery lead P104 to J104.

1. See FIG 1. Turn off ac power circuit breaker and unplug J104-P104 battery power cable connection.

2. Is AYB1(B) circuit pack being replaced?

   If **YES**, then continue with Step **3.**
   If **NO**, then proceed to Step **6.**

3. Unlatch and remove AYB1(B) optical unit.

4. On replacement AYB1(B) remove *ST* connector cover and clean *ST* connector with reagent grade isopropyl alcohol and blow dry with canned air.

5. Install and latch replacement AYB1(B) and place *ST* cover over old AYB1(B) *ST* connector. Then proceed to Step **11.**

6. At back of circuit pack being replaced (**ASH1** or **ASJ1**), unplug cable jack assembly.

7. Remove cotter pins on circuit board standoff at side of ASJ1 channel unit and slide both circuit packs out.

8. Slide ASH1 (first) and ASJ1 circuit packs onto circuit board standoff.

9. Replace cotter pins on circuit board standoff at side of ASJ1 channel unit.

10. Connect cable just unplugged to replacement circuit pack.

11. Turn ac power circuit breaker on. Then reconnect J104-P104 battery power cable.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

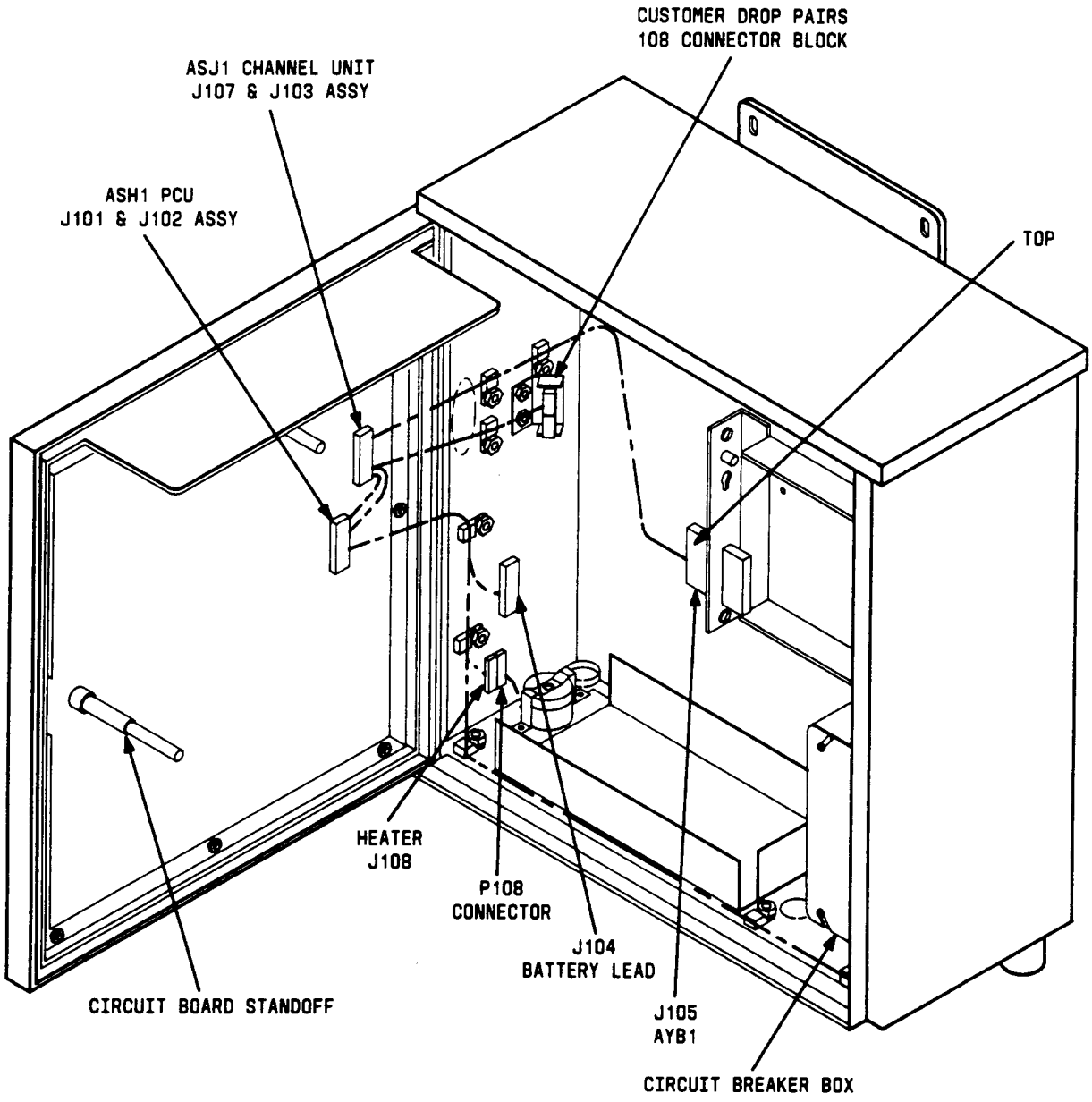


Fig. 1—DT Circuit Pack Wiring Diagram

CONNECT FAULT LOCATING TEST SETS FOR 80D OR 80E CABINET T1 EXTENSIONS

SUMMARY: Access to the T1 extension digital lines in 80-type cabinets are provided at 307-type protector block connectors. Each T1 extension line has protector appearances on the DDM-1000 side of the repeater shelf (4C12C protectors) and the T1 side of the repeater shelf (3C3C protectors) for side 1 (transmit) and side 2 (receive). Access to the Fault Locate line and miscellaneous pairs are provided at the 3B1E protectors. These protectors are located at the frame side 2 (back side) of the 80-type cabinet in 307-type blocks located between the two equipment frames.

Three test cords are supplied with the cabinet. The W2HR bridging test access cord connects to the protectors and allows bridging or monitoring of the pair. This cord cannot be used to monitor DS1 signals unless the test set has built-in monitor level input impedance (440 ohms on both tip and ring plus 110 ohm test set impedance). The T-Berd 209A test set can be used to monitor DS1 signals with the W2HR cord. The W4DE test cord replaces the 3C3E or 4C12C (DDM-1000 side) protector. These cords have two 310-type jacks for access to the facility or DDM-1000 directions of the digital line (one side only, e.g., transmit or receive side). The 6W3A cord has a protector block on one end and a plug that replaces a protector and another plug that bridges onto a protector. The optional W4DF test cord (Comcode 105414973) can be used to loop the line by replacing the digital line transmit and receive side protectors.

Fault locating T1 extensions from an 80-type cabinet requires both the 6W3A and W4DE test cords, a J98725AJ Fault Line Powering Module and a 3W14A test cord (310 jack on one end and alligator clips on the other end), a fault locate test set (315B, 415A-2, 25AD, or equivalent), and a 107B digital line powering module if connecting to the T1 side (a second W4DE test cord is needed if the 107B is used). The W4DE cord connects between the signal generator jack of the fault locate test set and the 4C12C protector position. The 6W3A replaces the 3B1E protector for the fault locate pair and the 3W14A cord connects the 6W3A protector block to the fault line powering module to power the fault locate pair.

A simple method would be to do single ended fault locating from the equipment at the other end of the T1 line. The W4DF test cord is used at the 4C12C protectors to loop back the digital line and a 262C terminating plug is inserted in the appropriate FL jack on the LDU.

This procedure provides steps that should be taken to connect fault locating test equipment at an 80D type cabinet for groups 90 and 91 or group 92 equipment arrangement, or an 80E group 91 cabinet.

1. Before connecting fault locating test equipment, replace blown fuse; measure line voltage (+V and -V) and current (I and +V) and compare with records; and replace repeater in SXSS (small cross-section office repeater shelf) if trouble is found.

   Comment: 0 current reading indicates bad T1 line power loop. To find trouble loop digital line at apparatus cases, one at a time until, bad section is found.

   Comment: High voltage reading indicates an open on TIP or RING of T1 pairs.

Comment: Low voltage reading indicates short between TIP and RING of T1 pairs.

2. At frame side-2 of the 80-type cabinet, find the protectors associated with the digital line. See Table A for 80D group 90 or 91 equipment arrangement. See Table B for 80D group 92 equipment arrangement. See Table C for 80E group 91 equipment arrangement.

3. Fault locating can be done single ended from far end connecting equipment, from the 3C3E protectors for T1 line access using the 107B digital line powering set, or from the 4C12C protectors for DS1 level (through the repeater) access. See FIG. 1 for a block diagram of T1 line arrangement. What type of fault locating do you want?

   If **DS1 LINE ACCESS** , then continue with Step **4.**
   If **T1 LINE ACCESS**, then proceed to Step **7.**
   If **FAR ENDED**, then proceed to Step **10.**

4. Make connection from J98725AJ fault line powering module to 6W3A and 3W14A test cords. (See FIG. 2.)

5. Make connections from fault locate test set (315D, 415A-2, 25AD) to W4DE test cord. (See FIG. 3.)

6. Make fault locating test equipment connections to protectors positions of 307 block on 80-type cabinet frame side 2 as shown in FIG. 4. Refer to Table A, B, or C for protector appearances. Replace fault locate pair 3B1E protector with 6W3A test cord and connect 3W14A cord to FLPM. Remove transmit pair 4C12C protector and connect output of fault locate test set. Then continue with Step **11.**

7. Make connection from J98725AJ fault line powering module to 6W3A and 3W14A test cords. (See FIG. 2.)

8. Make connections from 107B test set (315D, 415A-2, 25AD) to W4DE test cords. (See FIG. 5.)

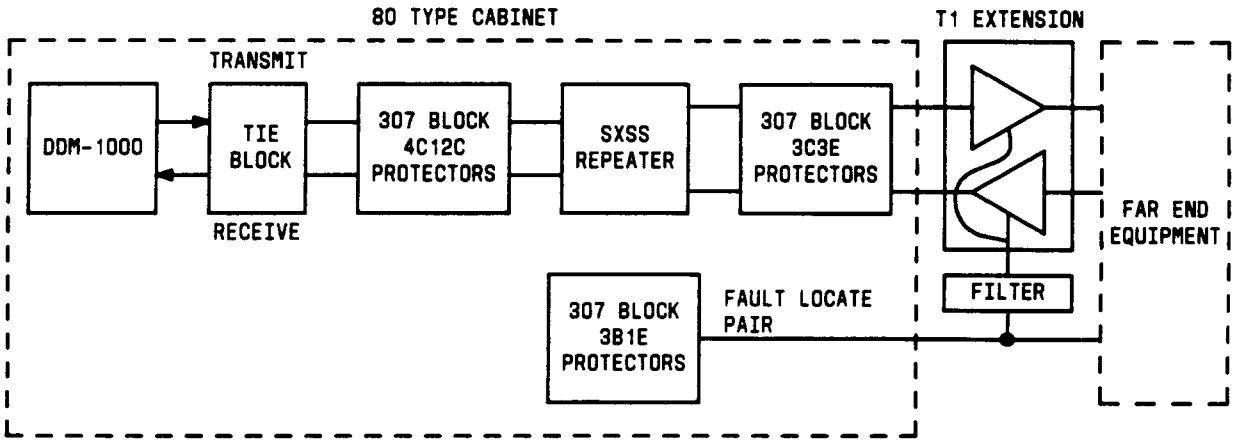


Fig. 1—80-type Cabinet T1 Extension Digital Line Configuration

TABLE A
T1 EXTENSION LINE PROTECTOR POSITIONS FOR GROUP 90/91 80D CABINET FOR 307 BLOCKS ON FRAME SIDE 2

SXSS REPEATER SLOT	Protector Type and Positions			
	3rd 307 Block DS1 Access		4th 307 Block T1 Line Access	
	Transmit 4C12C	Receive 4C12C	Transmit 3C3E	Receive 3C3E
1	81	11	51	1
2	82	12	52	2
3	83	13	53	3
4	84	14	54	4
5	85	15	55	5
6	86	16	56	6
7	87	17	57	7
8	88	18	58	8
9	89	19	59	9
10	90	20	60	10
11	91	21	61	11
12	92	22	62	12
13	93	23	63	13

MISCELLANEOUS PAIRS ON 3rd 307 BLOCK	
FUNCTION	3B1E PROTECTOR POSITION
DC Test	51
Order Wire	52
Fault Locate In 1	53
Fault Locate In 2	54

9. Make fault locating test equipment connections to protectors positions of 307 block on 80-type cabinet frame side 2 as shown in FIG. 6. Refer to Table A, B, or C for protector appearances. Replace fault locate pair 3B1E protector with 6W3A test cord and connect 3W14A cord to FLPM. Remove 3C3E transmit pair protector and connect output of the 107B test set. Remove 3C3E receive pair protector and connect input of the 107B test set. Then continue with Step **11.**

10. Use Table A, B, or C to find 4C12C (DSX-1 level) protectors for digital line to be looped. Replace 4C12C protectors with W4DF looping test cord (See FIG. 7). Insert 262C fault line terminating plug into appropriate **FL** jack on **LDU** unit.

11. Perform fault locating procedures after test set connections have been made (use local procedure or TAP-115 for guide line noting test connections have already been made). After clearing T1 extension line trouble, remove test connections and replace protectors in 307 block.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

TABLE B
T1 EXTENSION LINE PROTECTOR
POSITIONS FOR GROUP 92 80D CABINET
FOR 307 BLOCKS ON FRAME SIDE 2

SXSS SHELF NUMBER	REPEATER SLOTS	Protector Type and Positions			
		DS1 Access		T1 Line Access	
		4th 307 Block Transmit 4C12C	3rd 307 Block Receive 4C12C	2nd 307 Block Transmit 3C3E	1st 307 Block Receive 3C3E
1	1-5 6-10 11-13	1-5 6-10 11-13	1-5 6-10 11-13	1-5 6-10 11-13	1-5 6-10 11-13
2	1-5 6-10 11-13	26-30 31-35 36-38	26-30 31-35 36-38	26-30 31-35 36-38	26-30 31-35 36-38
3	1-5 6-10 11-13	51-55 56-60 61-63	51-55 56-60 61-63	51-55 56-60 61-63	51-55 56-60 61-63
4	1-5 6-10 11-13	76-80 81-85 86-88	76-80 81-85 86-88	76-80 81-85 86-88	76-80 81-85 86-88

MISCELLANEOUS PAIRS ON 5th 307 BLOCK	
FUNCTION	**3B1E PROTECTOR POSITION**
Order Wire	2
Fault Locate In 1	3
Fault Locate In 2	4

TABLE C
T1 EXTENSION LINE PROTECTOR
POSITIONS FOR GROUP 91 80E CABINET
FOR 307 BLOCKS ON FRAME SIDE 2

SXSS SHELF NUMBER	REPEATER SLOTS	Protector Type and Positions			
		DS1 Access		T1 Line Access	
		DS1-A 307 Block Transmit 4C12C	DS1-B 307 Block Receive 4C12C	T1 307 Block Transmit 3C3E	T1 307 Block Receive 3C3E
1	1-5	51-55	51-55	51-55	1-5
	6-10	56-60	56-60	56-60	6-10
	11-13	61-63	61-63	61-63	11-13
2	14-15	64-65	64-65	64-65	14-15
	16-20	66-70	66-70	66-70	16-20
	21-25	71-75	71-75	71-75	21-25

MISCELLANEOUS PAIRS ON DS1-A 307 BLOCK	
FUNCTION	3B1E PROTECTOR POSITION
Order Wire	81
Fault Locate In 1	82
Fault Locate In 2	83

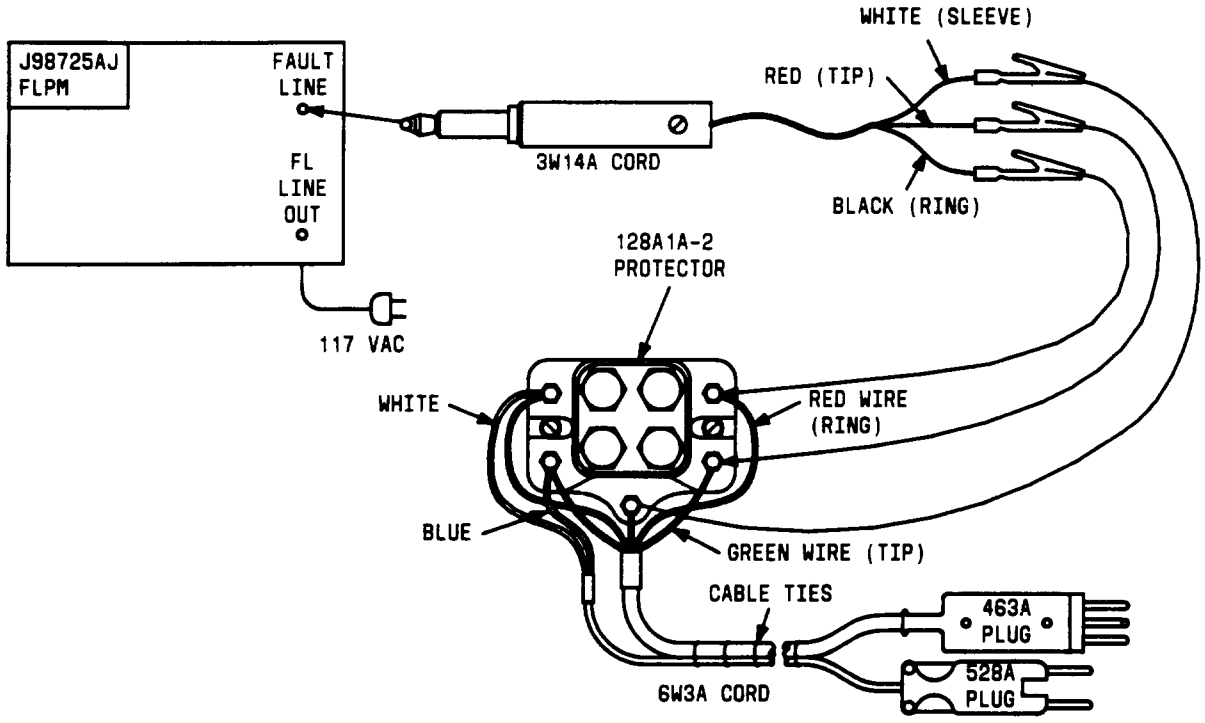


Fig. 2—Fault Line Powering Module Connections to 6W3A and 3W14A Test Cords

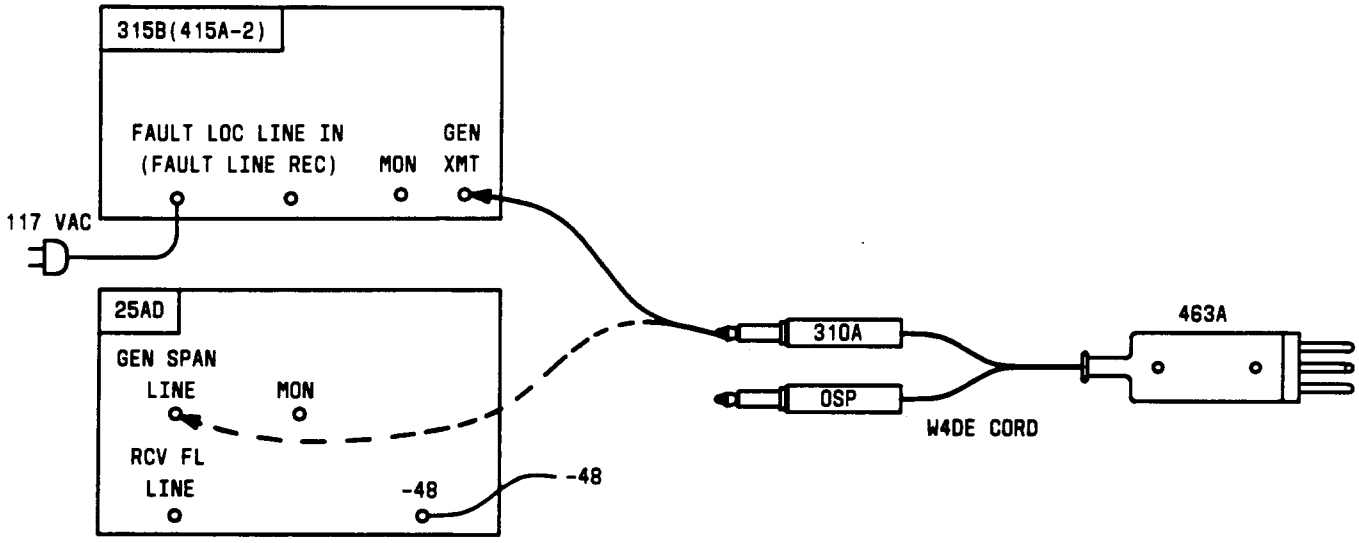


Fig. 3—Fault Locating Equipment Connections to W4DE Test Cord For DSX-1 Level Access

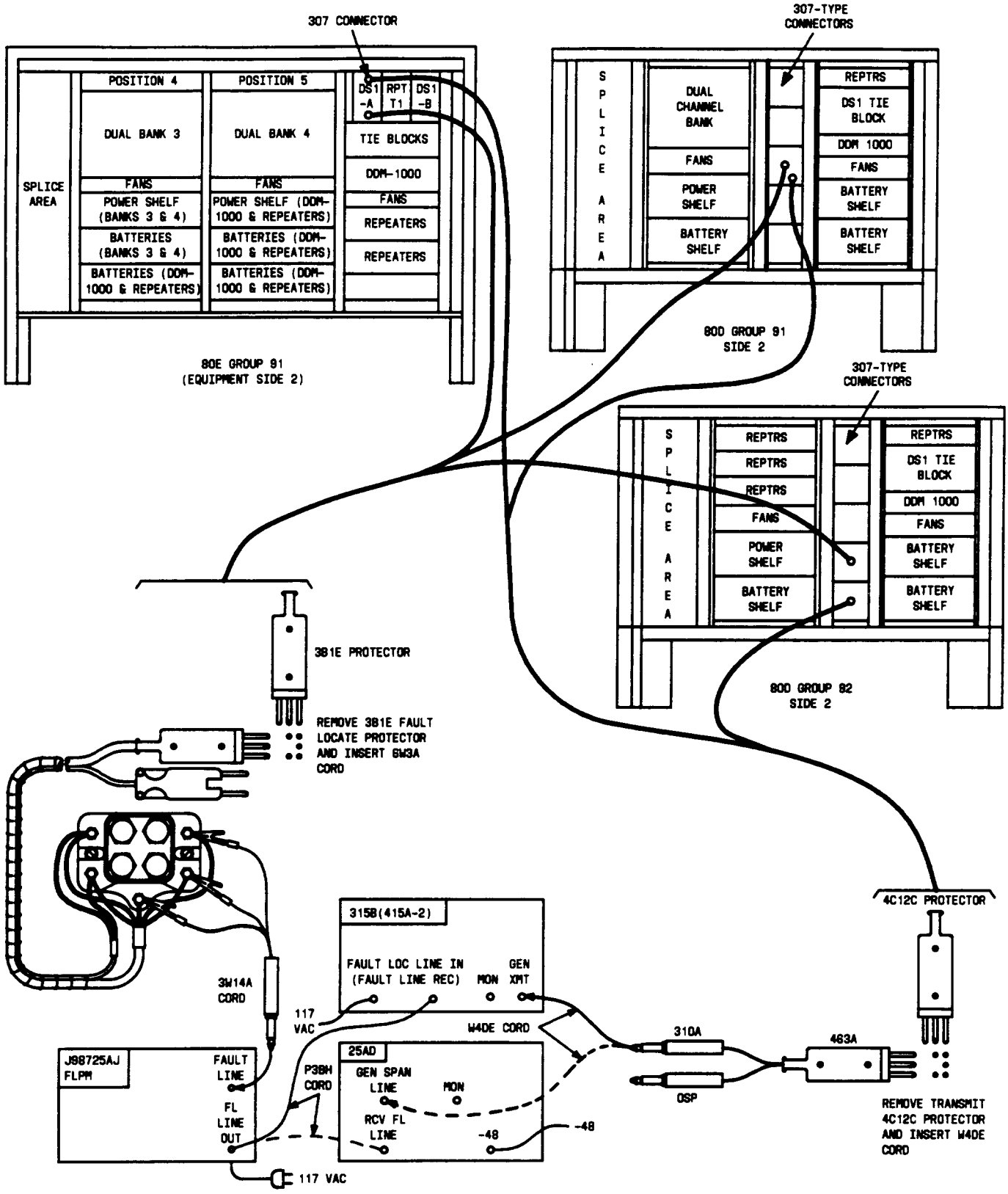


Fig. 4—Typical Fault Locating Equipment Test Connections For DSX-1 Level Access

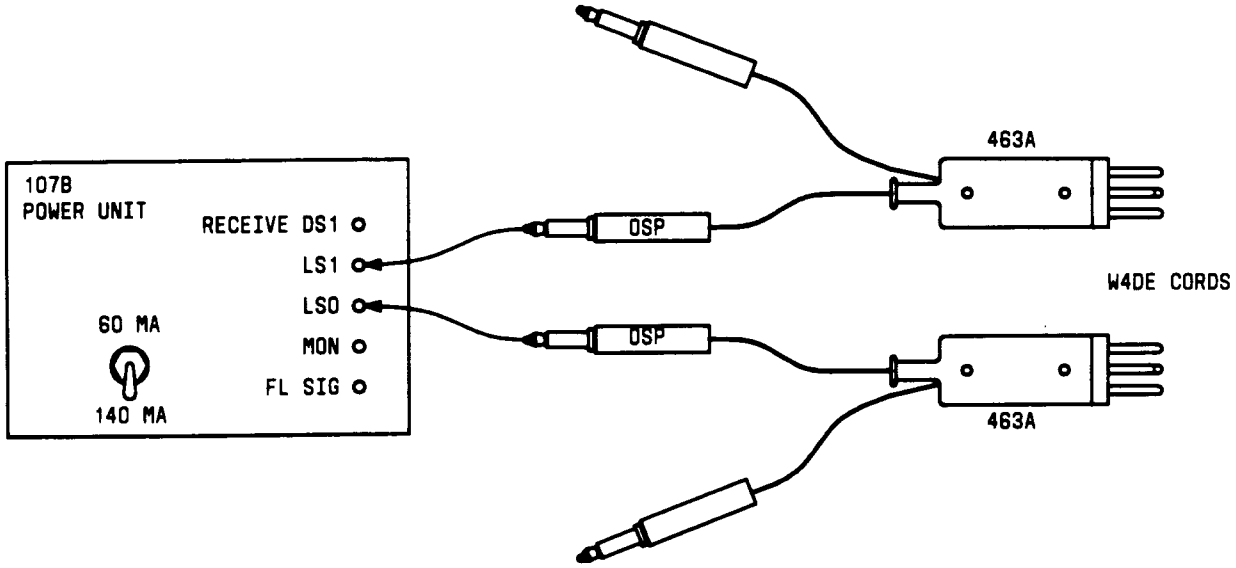


Fig. 5—Fault Locating Equipment Connections to Test W4DE Cords For T1 Line Access

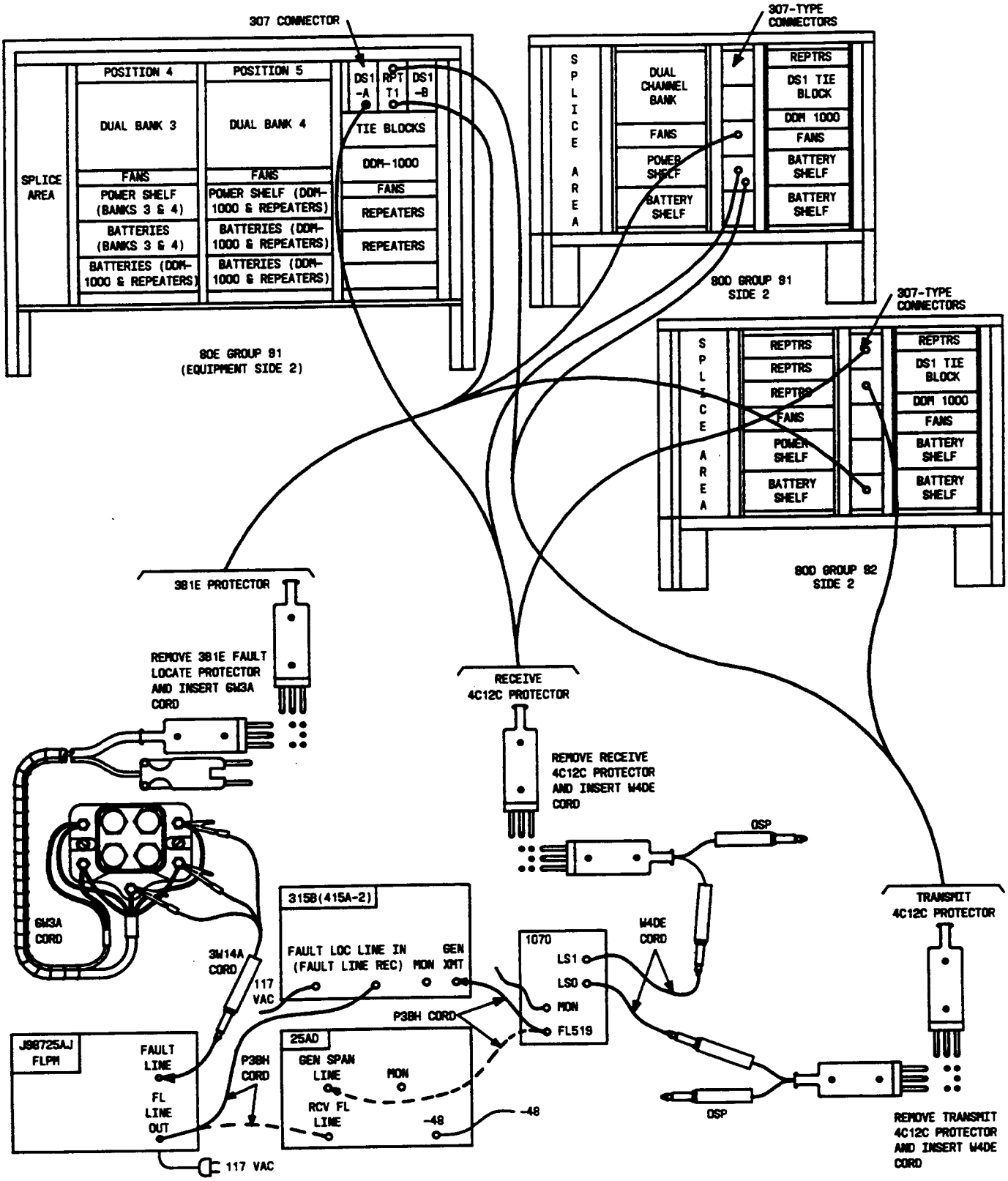


Fig. 6—Typical Fault Locating Equipment Test Connections For T1 Line Access

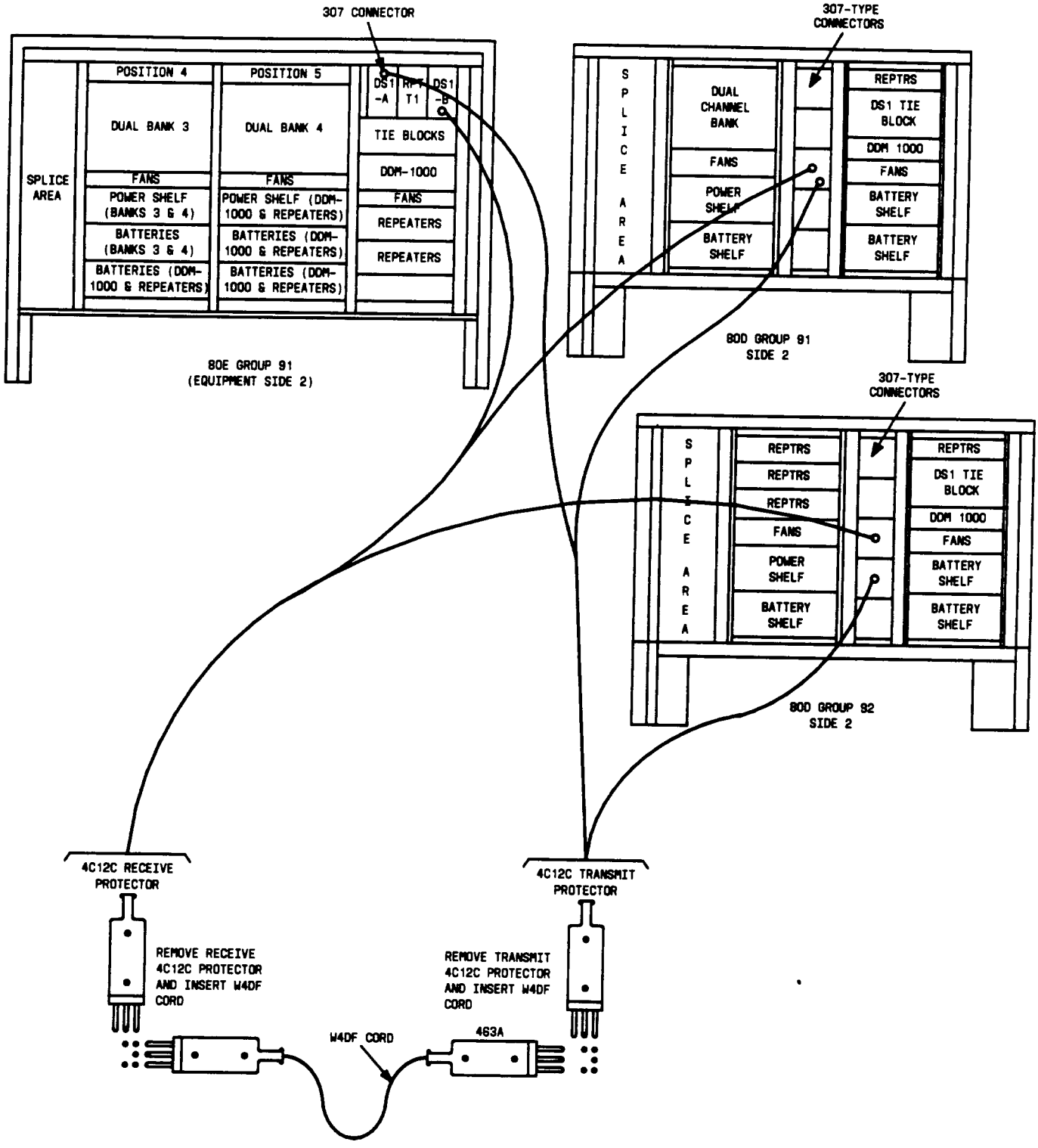


Fig. 7—DSX-1 Level Access T1 Line Loopback For Far Ended Fault Locating

PERFORM FIBER-TO-THE-HOME MLT CHANNEL TEST

SUMMARY: Channel testing for FTTH circuits is supported by MLT via PGTC or XTC interface to the *SLC* Series 5 carrier system. The XTC must use MLT-2 LTS generic 5 issue 6 or later to support channel unit isolation tests.

When a channel test is performed, the MLT identifies the circuit as being served by a *SLC* carrier system. Then two tests are initiated. The first test performs channel unit functional tests and the second test bypasses the carrier system (via a dc test pair or RMU) and performs drop tests for the pairs extending from the RT. For FTTH circuits, the RT channel unit will always fail the channel unit functional test because these channel units do not contain the proper VF interface required to pass the test. If MLT-2 LTS (with generic 5 issue 6 or later) is used, further tests can determine if the COT channel unit is functioning properly. This additional test is not available with the PGTC.

Then the second *loop test* is performed. But since a copper loop does not exist, the RT channel unit returns one of two *dc signatures* to the MLT via the dc test pair. One signature (85 to 95 Kohms Tip-to-Ring) indicates a good fiber. The other signature indicates a failure condition associated with the fiber loop (typically more than 3000 Kohms Tip-to-Ring). A failed dc signature indicates the RT unit has failed or the signal between the RT and DT is bad.

1. ***Note:*** ***After a full or loop test a channel test from STV should be performed.***

   Perform MLT test on FTTH circuit reported to have trouble.

   Comment: The channel unit test will indicate different results depending on the MLT generic version and whether the XTC or PGTC is used. The RT channel unit will always fail and both COT and RT channel unit will fail if the PGTC is used.

   Comment: You should note the results of the *dc tests* during the loop test phase of the channel test.

2. What was the result of the dc signature?

   Comment: A good dc signature will have 85 to 95 Kohms between tip-ring, tip-ground, and ring-ground.
   A bad dc signature will have more than 3000 Kohms between tip and ring.

   Comment: MLT test may give a SAM or TV mask with a *VER 1X* for a passed or *VER 2X* for a failed dc test and indicate where to dispatch craft personnel (RT or DT) if the COT channel unit functional test passed.

   If **GOOD DC SIGNATURE**, then proceed to **Step 7.**
   If **BAD DC SIGNATURE**, then continue with **Step 3.**

3. Do you have MLT generic 5 issue 6 or later?

   If **YES**, then continue with **Step 4.**
   If **NO**, then proceed to **Step 5.**

4. Did COT channel unit pass channel test?

   If **YES**, then proceed to **Step 6.**
   If **NO**, then continue with **Step 5.**

5. Dispatch craft to COT.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE.

6. Dispatch craft to RT.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE.

7. Dispatch craft to DT.

   STOP. YOU HAVE COMPLETED THIS PROCEDURE.

CHECKLIST

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
• TPG-000		DLP-507					
• IXL-001		DLP-508					
• TAD-100		• DLP-509					
• TAP-101		DLP-510					
• TAP-102		DLP-511					
• TAP-103		• DLP-512					
TAP-104		• DLP-513					
• TAP-105		• DLP-514					
• TAP-106		DLP-515					
• TAP-107		DLP-516					
• TAP-108		DLP-517					
• TAP-109		• DLP-518					
• TAP-110		DLP-519					
TAP-111		DLP-520					
• TAP-112		DLP-521					
• TAP-113		• DLP-522					
• TAP-114		• DLP-523					
TAP-115		• DLP-524					
TAP-116		• DLP-525					
TAP-117		• DLP-526					
TAP-118		• CKL-891					
TAP-119		TNG-893					
TAP-120		DPL-895					
TAP-121							
TAP-122							
• TAP-123							
• TAP-124							
• TAP-125							
TAP-126							
• TAD-127							
• TAP-128							
• TAP-129							
• TAP-130							
• DLP-500							
• DLP-501							
DLP-502							
DLP-503							
• DLP-504							
DLP-505							
DLP-506							

• Revised or added item
□ Canceled item

HOW TO USE TOP

This book is a Task Oriented Practice which is called a "TOP". It gives you all the step-by-step instructions you need to do your job (task). These instructions are given in the order that they ***must*** be done. Failure to follow the instructions in the order given may cause service interruptions.

Regardless of your work experience, TOP can be a useful tool in doing your job. If you have done a particular job many times, or if you do it frequently, TOP gives you "memory joggers" for those instructions you cannot recall. If you have never done a particular job, or if you do it infrequently, TOP gives you the detailed step-by-step instructions you need to do the job.

The work that you do can be divided into two broad job functions – work to clear troubles and work other than to clear troubles.

Work to Clear Troubles: This is the work you do to fix troubles in the equipment. You may be doing this work in response to a customer's complaint, an office alarm, a trouble report, an abnormal printout, or any other equipment fault indication.

Work Other Than to Clear Troubles: This is the work you do to install equipment, to test equipment after it is installed, to place equipment in service, to operate and maintain equipment, or anything else required to establish, to change, or to discontinue service to the customer.

Now, look at the front cover of this book. In the upper right corner is the 9-digit volume number. Near the center is the title, which tells you something about the contents such as the name of the equipment and maybe what types of jobs are included. Below the title is a flow diagram which uses logic symbols to direct you either to 893 or to 001 depending on your understanding of how to use TOP. Do you wonder what those numbers mean? Okay, a TOP is divided into parts called procedures. Each procedure is given a 3-digit number. These numbers range from 001 through 899. Procedures are arranged in this book in numerical order beginning with 001.

AT&T 123-456-789
Issue 2

IXL-001
Page 1 of 2

TASK INDEX LIST

FIND YOUR JOB IN THE LIST BELOW . . . . . THEN GO TO

Alert; External – Horn, Ringer, Etc. – Remove NTP-028
Amplifiers; Channel – Recorded Announcement Frame – Test NTP-009

BRDG LED – Does Not Light – Correct TAP-117
Bridging Controller; Trunk – J1C015MB – Replace DLP-572

Channel Amplifiers – Recorded Announcement Frame – Test NTP-009

Drum Wiper – Common Systems Recorded Announcement Frame – Inspect NTP-010

Extended Station Capability – Nonkey Set Only – Reported Failure TAP-123
External Alert – Horn, Ringer, Etc. – Remove NTP-028

Interchange Two Working Station Numbers NTP-081

LED: BRDG – Does Not Light – Correct TAP-117
Loudspeaker Paging – Add NTP-059

New International Trunk, R1 Signaling – Incoming – Establish NTP-010
New Tandem Trunk – T-Carrier and Digroup Terminal – Establish NTP-008

Station Capability; Extended – Nonkey Set Only – Reported Failure TAP-123
System Test – Perform NTP-016

Trunk Bridging Controller – J1C015MB – Replace DLP-572

Fig. 1 – Typical List of Jobs You May Have to Do

Now, look at Fig. 1. It is a typical 001 procedure and is always called a "Task Index List." It is an alphabetical listing of the jobs that you may have to do. To use a 001, just find the job you need to do in the "FIND YOUR JOB IN THE LIST BELOW" column. Next, follow the dotted line to the procedure number for that job in the "THEN GO TO" column. Then turn to that procedure number and begin the task.

For example, suppose you are given the job of doing a system test. On the 001 as shown in Fig. 1, find your job. Note that it is listed in the "FIND YOUR JOB IN THE LIST BELOW " column as "System Test-Perform." Now find the procedure number for that job. Note that it is listed in the "THEN GO TO" column as "NTP-016." It could have been any other 3-digit number. Now what does this procedure give you? Turn to next page.

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Issue 2

NTP-016
Page 1 of 2

PERFORM SYSTEM TEST

DO ITEMS BELOW IN ORDER LISTED . .	FOR DETAILS, GO TO
1 Test Local Maintenance Terminal	DLP-531
2 Place SEC/SEB in Off-Line Mode	
A. If in On-Line Mode, Change System From On-Line to Off-Line	DLP-509
B. If Powered Down, Condition System for Off-Line Operation as Follows	
1. Power up Minicomputer	DLP-503
2. Power up Line Printer	DLP-528
3. Power up Maintenance Terminal	DLP-510
7 Run Computer Display Terminal Test For All Positions	DLP-513
8 Mount Tape	DLP-500
9 Test Computer Display	DLP-522

Fig. 2 – Typical List of Specific Instructions for Doing a Job

Look at Fig. 2. It consists of numbered items (or steps) listed in the order that you must do them to complete your job. To use this procedure, you must start with item 1 in the "DO ITEMS BELOW IN THE ORDER LISTED" column and continue until all items have been done. When you get to an item that you do not know how to do, look for the procedure number for that item under the "FOR DETAILS, GO TO" column. This is the number of the procedure that will give you detailed step-by-step instructions to do that item. Note that item 2 in Fig. 2 uses lettered (A, B) entries. This means that there are alternate ways of doing item 2 depending on equipment options or equipment conditions. You do only the one that fits your equipment options or equipment conditions.

For example, suppose you are doing a system test. The 001 as shown in Fig. 1 has directed you to 016 as shown in Fig. 2 and you are on item 8 "Mount Tape" in the "DO ITEMS BELOW IN ORDER LISTED" column. If you know how to mount the tape, do it. If you do not know how to mount the tape, go to the procedure number listed in the "FOR DETAILS, GO TO" column for the detailed step-by-step instructions. In this case, it happens to be 500. In either case, you must continue with the next item listed in 016 until you complete the job.

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Issue 2

DLP-500
Page 1 of 2

MOUNT TAPE

SUMMARY: Install tape with or without write enable ring, as required. Thread tape and position tape at beginning of tape (BOT) marker.

1. Get file reel and empty take-up reel.
2. Set ***START/STOP*** switch to ***STOP***.
3. Set ***ON LINE/OFF LINE*** switch to ***OFF LINE***.
4. Set ***LOAD/BR REL*** switch to center position.
5. Is data to be written on tape?

   If **YES**, then install write enable ring on file reel and go to Step **7**.
   If **NO**, then do Step **6**.
6. Ensure that write enable ring is not installed on file reel

   Reference: **DLP-563**
7. Open tape transport door.

Fig. 3 – Typical List of Detailed Instructions for Doing a Job

Now, lets look at 500 as shown in Fig. 3. It is a typical page of a procedure that gives numbered step-by-step instructions. To use this procedure, you must start with Step 1 and proceed as directed by the instructions until you complete this procedure. Note that Step 1 of this procedure is preceded by a statement called a "SUMMARY." A summary is used as a "memory jogger," and briefly tells you how to do the procedure and what measurements or results you can observe. If you can do the procedure after reading the "SUMMARY", go ahead and do it without reading any further. Not all procedures have a "SUMMARY" statement.

Now, look at Step 6 of the 500 as shown in Fig. 3. Note that following the action statement there is the word "Reference" followed by "DLP-563" (Detailed Level Procedure). When you see a reference like this, it means that additional step-by-step instructions for doing just that step are given in the referenced procedure. In this case, 563 gives you the details on how to "Ensure that the write-enable ring is not installed on the file reel." If you, in this case, can do Step 6 without going to 563, go ahead and do it. If you do not know how to do Step 6, then go to 563. In either case, you must continue with Step 7 until you have completed the procedure. In some cases, you may be directed to a procedure where the procedure number is preceded by the letters "TAP" (Trouble Analysis Procedure), for example, TAP-109. This means that you have trouble in the equipment and in this case TAP-109 will give you step-by-step instructions to fix the trouble. After you have fixed the trouble, you must return to Step 1 of the procedure that sent you to TAP-109.

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Issue 2

IXL-001
Page 1 of 2

TASK INDEX LIST

FIND YOUR JOB IN THE LIST BELOW . .	. . THEN GO TO
Alert; External – Horn, Ringer, Etc. – Remove	. . . . . NTP-028
Alarm – Major – Clear	. . . . . TAP-109

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Issue 2

TAP-109
Page 1 of 2

CLEAR MAJOR ALARM AT TERMINAL

1. The following ISD is available for support

   Reference: ISD-108

2. Is PWR ALM alarm lamp lighted on power regulator in terminal?

   If YES, then do Step 3
   If NO, then do Step 4

ISD-108
Page 1 of 1

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Issue 2

MAJOR ALARM STR

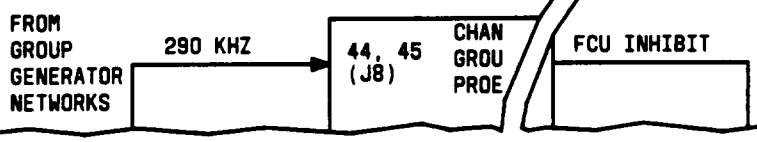

Fig. 4 – Typical Data Accessing for Trouble-Clearing Work

However, if you came directly from 001 to 109 as shown in Fig. 4, then your job is completed when you have fixed the trouble.

Note that Step 1 in TAP-109 as shown in Fig. 4 gives you a reference to "ISD-108." This is a block diagram of the trouble area and gives you support information for the 109 procedure.

Safety: Always do your job safely. Three safety notices are used in TOP as follows:

> ***DANGER: This means there is a possibility of personal injury.***

Caution: This means there is a possibility of service interruption.

Warning: This means there is a possibility of equipment damage.

Important Items: Look at Table A. It lists the more important items used in TOP.

Reporting TOP Errors: If, while using TOP you find errors, call the "TOP HOTLINE" number located on the front cover in the lower right corner. You can also report errors by using comment form E-3973. Details on how to fill out this form are in AT&T 000-010-015. Your comments are needed to provide useful and accurate TOP coverage.

TABLE A

IMPORTANT TOP ITEMS AND DEFINITIONS

ITEM	DEFINITION
Acceptance (NTP-002)	Provides information and identifies jobs to be done to accept equipment after it is installed.
Maintenance Philosophy (TAD-100)	The maintenance philosophy, when provided, gives an overview of the considerations designed into the trouble-clearing procedures.
Checklist (CKL-891)	The checklist reflects the content (inventory) at any given time.
Documentation Plan (DPL-895)	The documentation plan gives a bird's-eye view of all the TOP books covering a system. This plan can help you to quickly determine the correct books to use.
DLP (Detailed Level Procedure)	Detailed step-by-step instructions.
ISD (Isolation Diagram)	A functional block diagram defining the trouble universe
TAD (Trouble Analysis Data)	A trouble-clearing aid other than instructions. It may be a functional schematic, text, trouble-locating chart, etc.
TAP (Trouble Analysis Procedure)	Step-by-step trouble-clearing instructions to locate and/or fix troubles.
NTP (Non Trouble-Clearing Procedure)	A list of items to perform normal work other than trouble-clearing.

DOCUMENTATION PLAN

GENERAL

The Documentation plan for Series 5 systems is shown in FIG. 1.

SLC SERIES 5 CARRIER SYSTEM
TOP DOCUMENTATION PLAN

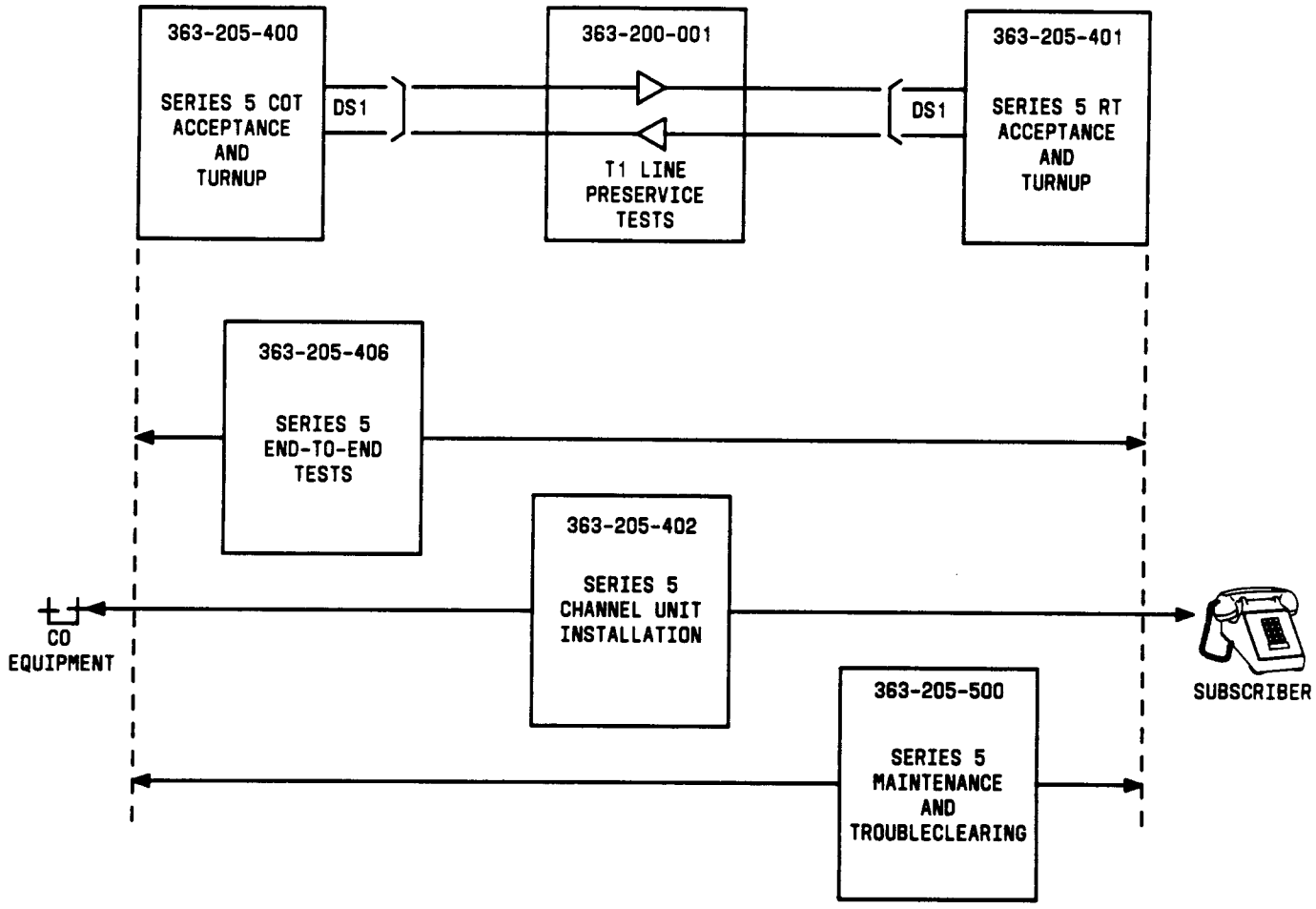

Fig. 1