

MODIFICATION RECOMMENDED –
CORRECTS MANUFACTURING OR DESIGN DEFECTS

E5070B-06D

S E R V I C E N O T E

Supersedes:
E5070B-06C

E5070B ENA Series Network Analyzer, 300 kHz to 3 GHz

Serial Numbers: **JP1KKxxxxx**
 MY421xxxxx

Change the RF signal path configuration and update firmware to 5.02 or later to improve the input damage level tolerance

To Be Performed By: Agilent-Qualified Personnel

Parts Required:
See Solution/Action

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:		
MODIFICATION RECOMMENDED		
ACTION CATEGORY:	☐ IMMEDIATELY ☒ ON SPECIFIED FAILURE ☐ AGREEABLE TIME	STANDARDS: LABOR: 3.0 Hours
LOCATION CATEGORY:	☐ CUSTOMER INSTALLABLE ☐ ON-SITE ☒ SERVICE CENTER	SERVICE INVENTORY: ☐ RETURN ☐ SCRAP ☒ SEE TEXT
AVAILABILITY:	PRODUCT'S SUPPORT LIFE	USED PARTS: ☐ RETURN ☒ SCRAP ☐ SEE TEXT
AGILENT RESPONSIBLE UNTIL: March, 2007		
AUTHOR: jm PRODUCT LINE: WN		
ADDITIONAL INFORMATION:		

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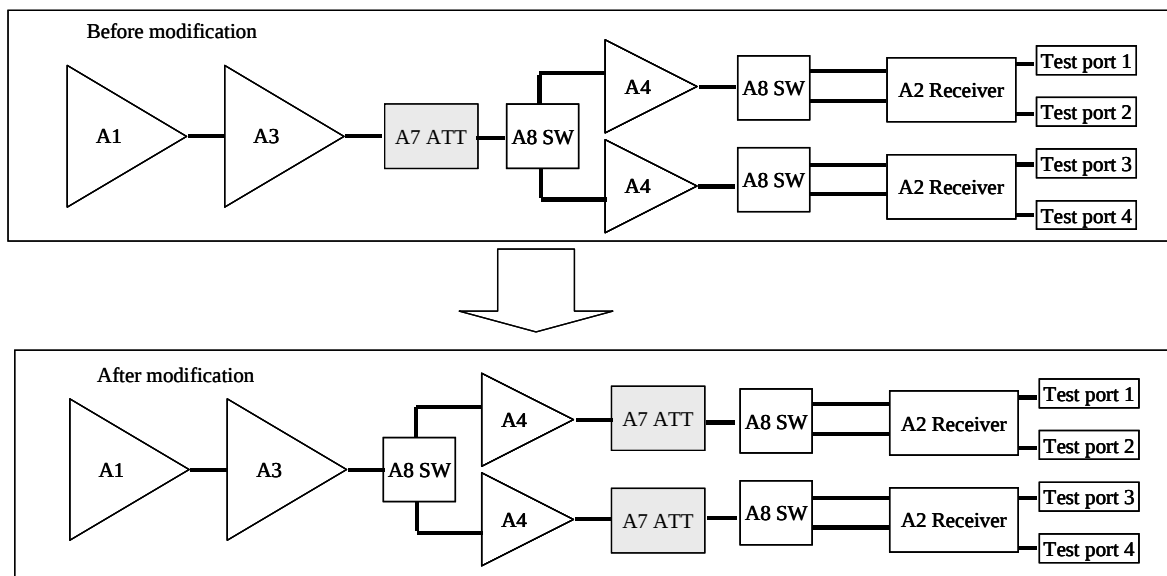
March 16, 2006

Situation:

The A4 Power amp module that is located after receiver is very sensitive for electrostatic discharge (ESD) or DC transient voltage applied to test ports. If the A4 amplifier has been broken, the E5070B cannot output proper power from its test ports.

Solution/Action:

When the A4 Power amp module is replaced, change the RF signal path configuration by the following procedure, and update its firmware to Rev A.05.02 or later. The purpose of this modification is to insert A7 attenuator module between test ports and the A4 amplifier. This modification improves the tolerance of input damage level.



* Option 414. Some assemblies are not installed according to an option configuration.

To insert A7 attenuator module, additional attenuators are required except option 214 configurations. Please refer to the following parts list and procedures for each option.

The changes from E5070B-06A to E5070B-06B are as the followings:

- Service parts number of A4 power amp module was changed from E5071-61004/5 to E5071-65008/9
- Service program requirement versions are updated.

The changes from E5070B-06B to E5070B-06C are as the followings:

- Service parts number of A7 attenuator was changed from 33321-60059 to 33321-60068 with E5070-61698.
- Service programs and firmware required versions are updated.

The change from E5070B-06C to E5070B-06D is as the followings:

- Agilent responsible period expands to March, 2007.

Detail procedure:

- 1 Do hardware modification: See next page according to the current option.
- 2 Update its firmware to the latest one. (At least **Rev A.05.02** or later). Do not forget to update Internal/External VBA program at the same time. Refer to E5070B/E5071B Service manual appendix C for details. For the additional features that are added by this update, refer to the latest E5070B/E5071B user's guide that is available in <http://www.agilent.com/find/ena>
- 3 Do adjustment program. (**Rev A.02.40** or higher is required)
 - 3.1 For option –213, -313, -413 units, change its option to –214, -314, -414 respectively with Write ID program, using “Analog Interface” in Spot Adjustment.
 - 3.2 Run “Power Amp Module” in Spot Adjustment of the program.
- 4 Do Internal test (Internal.vba Rev. **A.05.00** or later is required), External test (External.vba Rev.**A.03.60** or later)
- 5 Do performance test (Rev **A.02.30** or higher is required). “RF level accuracy and flatness” and “RF output level linearity” test are required.

Retrofit Time

Assembly Time:	1.5 hour.
Adjustment Time:	0.5 hour.
Performance Tests Time:	1.0 hour.
Total Time:	3.0 hour.

For option 213 (2 port, without A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65213*	Service modification kit for E507xB-213	1

* Available in May 2004.

Below is the contents list of E5070-65213 service kit. Order these parts if necessary.

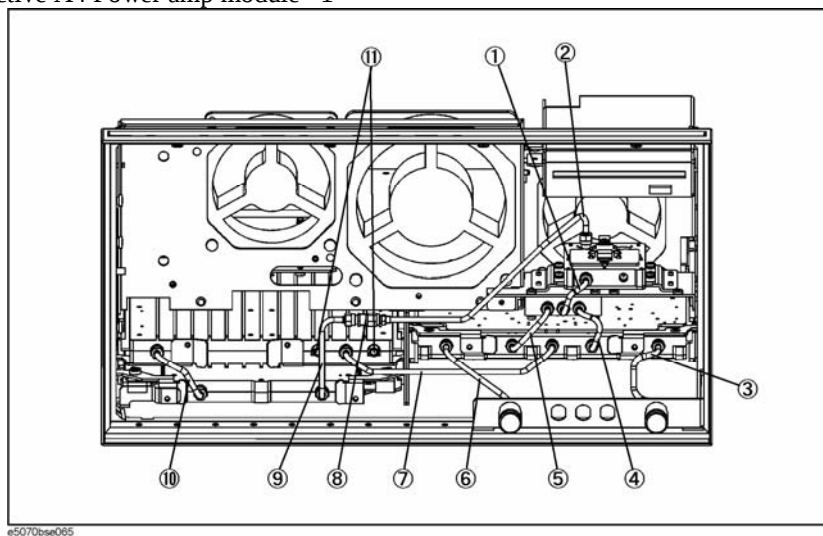
Part number	Description	Qty.
E5071-65009*	A4 power amp module, single, service parts	1
33321-60068	A7 step attenuator	1
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	1
E5070-01213	plate for A7	1
0515-0372	Screw M3.0*8 PN T10	4
E5070-61617	Flat cable assy for A7	1
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1
5185-3714	Label for option 214	1

* Service part number of A4 power amp module was changed from E5071-61005 to E5071-65009

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove A28 Floppy Disk Drive (FDD) unit. *1
4. Remove semi-rigid cables in figure 1 No. 1 (E5070-61685) and No. 2 (E5070-61672)
5. Remove defective A4 Power amp module *1

*1: Refer to E5070B/E5071B Service manual chapter 6 for details

**Figure 1 Front View (Semi-rigid Cables Opt. 213 before modification)**

6. Make A7 step attenuator assembly by 33321-60068 (1ea), E5070-61698 (1ea), E5070-01213 (1ea), 0515-0372 (2ea) and E5070-61617 (1ea). E5070-61698 is the cable between 33321-60068 and E5070-61617.

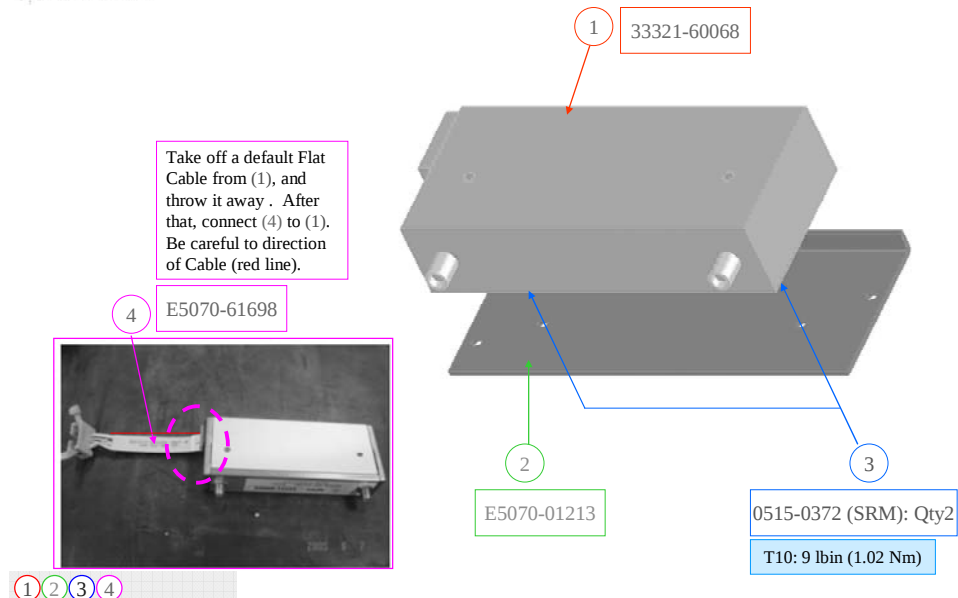


Figure 2 Make A7 attenuator assembly (for option 213)

7. Install A7 assembly with 0515-0372 2 ea. Be careful to flat cable direction and its connectivity.

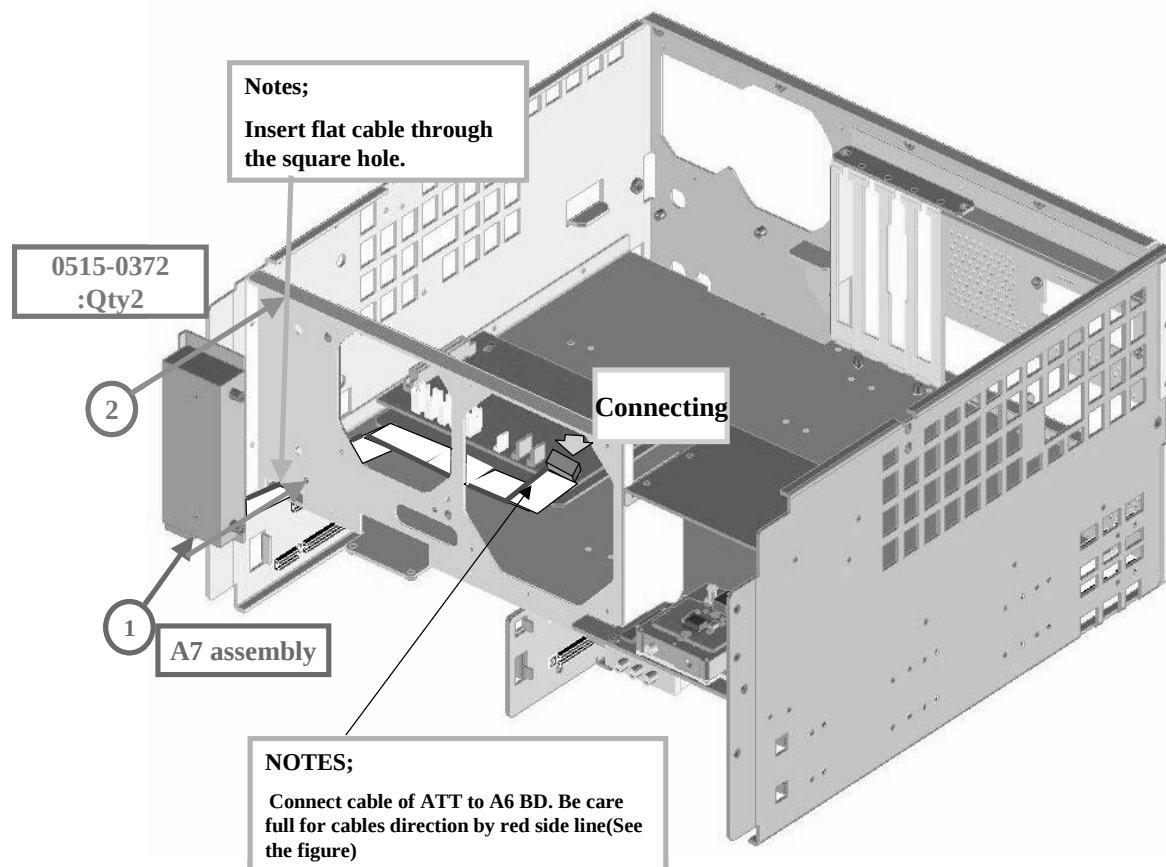


Figure 3 Install A7 attenuator assembly (for option 213)

8. Install new A4 power amp module to an original place.
9. Connect uW attenuator 0955-0208 (No 2 in Figure4) and A4 with E5070-61672 semi-rigid cable (No 3 in Figure 4)
10. Connect A4 and A7 ATT with E5070-61633 semi-rigid cable (No 5 in Figure 4)
11. Connect A7 ATT and A8 with E5070-61634 semi-rigid cable (No 4 in Figure 4)

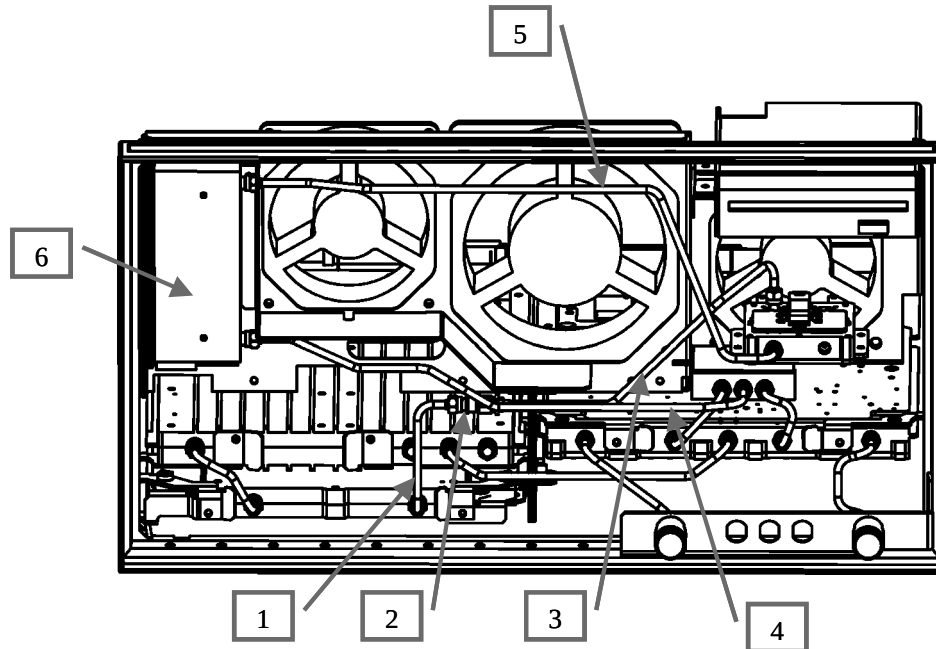


Figure 4 Front View (Semirigid Cables Opt. 213, 214 after modification)

12. Set FDD unit
13. Set front panel
14. Set outer cover
15. Remove “option 213” label from back panel, and stick 5185-3714, “option 214” label instead of it.

For option 214 (2 port with A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65214*	Service modification kit for E507xB-214	1

* Available in May 2004.

Below is the contents list of E5070-65214 service kit. Order these parts separately if necessary.

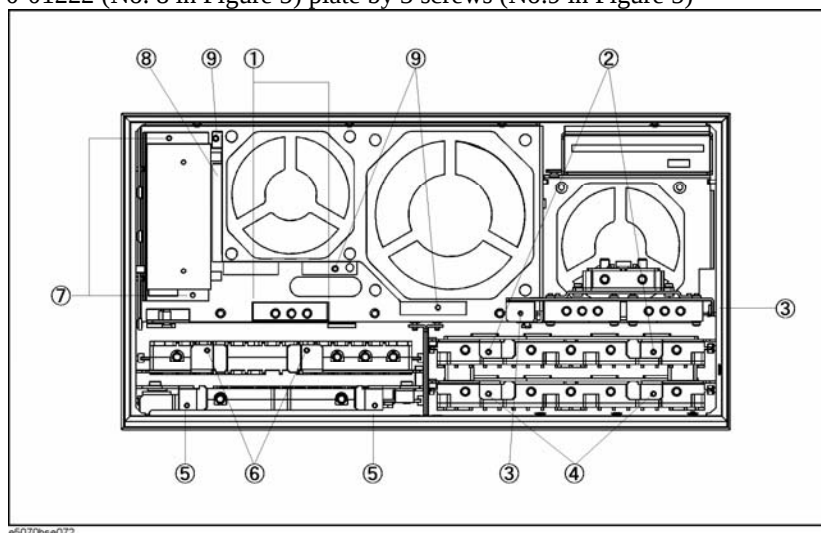
Part number	Description	Qty.
E5071-65009*	A4 power amp module, single, service parts	1
33321-60068	A7 step attenuator	1
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	1
E5070-61671	RF semi-rigid cable	1
E5070-61672	RF semi-rigid cable	1
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1

* Service part number of A4 power amp module was changed from E5071-61005 to E5071-65009

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove A28 Floppy Disk Drive (FDD) unit. *1
4. Remove E5070-01222 (No. 8 in Figure 5) plate by 3 screws (No.9 in Figure 5)

*1: Refer to E5070B/E5071B Service manual chapter 6 for details



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Figure 5 Front View (Miscellaneous Parts)

5. Remove E5070-61673 (No. 8 in Figure 6) semi-rigid cable from A3 and 0955-0208 (No 10 in Figure 6) attenuator
6. Remove 0955-0208 (No 10 in Figure 6) attenuator from A7 ATT module
7. Remove E5070-61674 (No 2 in Figure 6) semi-rigid cable from ATT and A4 amp
8. Remove E5070-61685 (No 1 in Figure 6) semi-rigid cable from A4 and A8 switch.

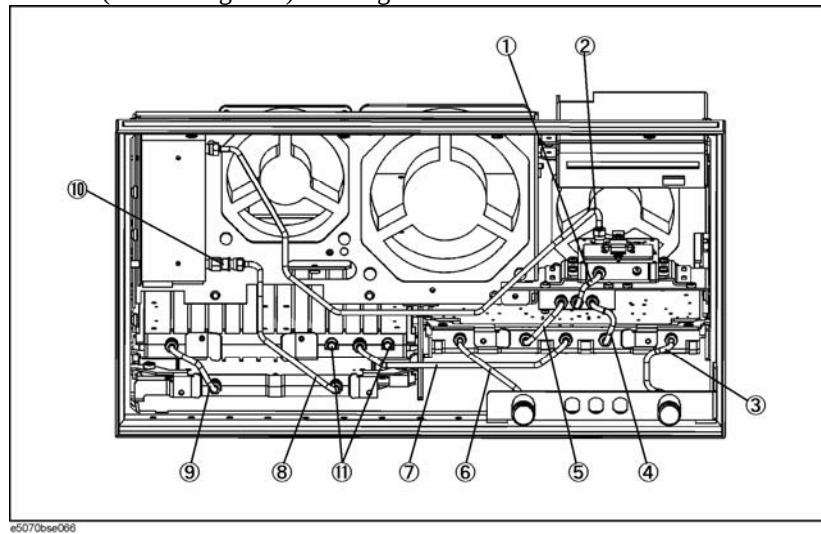
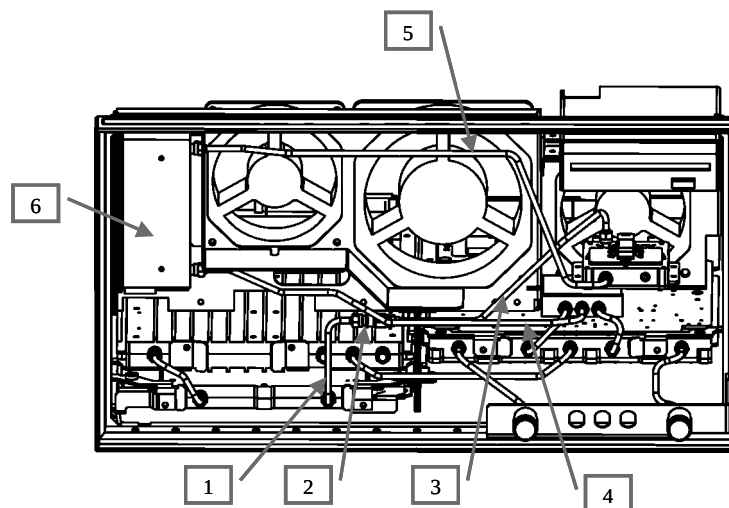


Figure 6 Front View (Semirigid Cables Opt. 214 before modification)

9. Remove defective A4 Power amp module *1
10. Remove A7 attenuator module by 2 screws.
11. Make new A7 attenuator module by 33321-60068 (1ea), E5070-61698 (1ea), E5070-61617 (1ea), 0515-0372 (2ea) and E5070-01213 (1ea). Scrap 33321-60059.
12. Install new A7 attenuator with 0515-0372 (2ea).
13. Install new A4 power amp module to an original place.
14. Connect A3 and 0955-0208 (No 2 in Figure 4, see below) attenuator with E5070-61671 (No 1 in Figure 4) semi-rigid cable
15. Connect 0955-0208 (No 2 in Figure 4) and A4 with E5070-61672 (No 3 in figure 4) semi-rigid cable
16. Connect A4 and ATT with E5070-61633 (No 5 in Figure 4) semi-rigid cable
17. Connect ATT and A8 with E5070-61634 (No 4 in Figure 4) semi-rigid cable
18. Screw E5070-01222 plate to the original place.
19. Set FDD unit.
20. Set front panel
21. Set outer cover



Copy of Figure 4 in page 5

For option 313 (3 port, without A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65313*	Service modification kit for E507xB-313	1

* Available in May 2004.

Below is the contents list of E5070-65313 service kit. Order these parts separately if necessary.

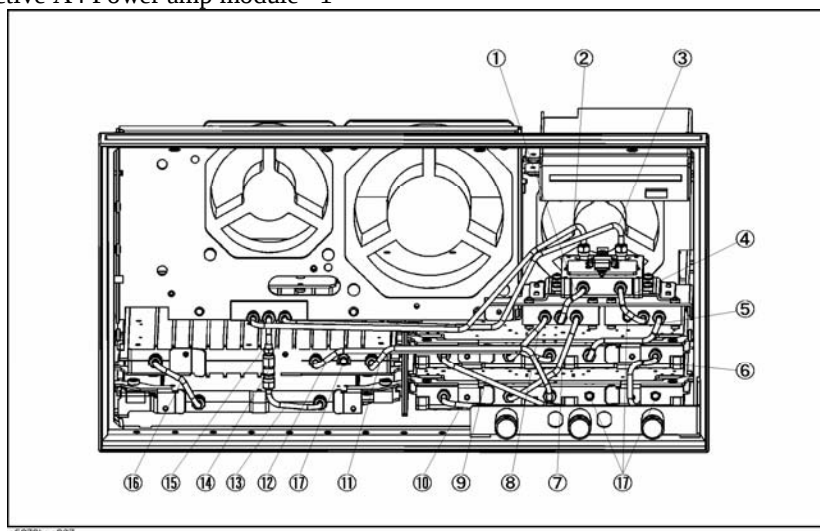
Part number	Description	Qty.
E5071-65008*	A4 power amp module, Dual, Service parts	1
33321-60068	A7 step attenuator	2
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	2
E5070-61618	Flat Cable Assy for -314, -414	1
E5070-01214	Plate for A7 for -314, -414	1
0515-0372	Screw M3.0*8 PN T10	6
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1
E5070-61635	RF semi-rigid cable	1
E5070-61636	RF semi-rigid cable	1
E5070-01223	Plate for -314, -414	1
1400-0611	Cable clamp	2
5185-3716	Label for option 314	1

* Service part number of A4 power amp module was changed from E5071-61004 to E5071-65008

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove A28 Floppy Disk Drive (FDD) unit. *1
4. Remove E5070-01222 (No. 8 in Figure 5) plate by 3 screws (No.9 in Figure 5)
5. Remove E5070-61685 (No 1 and No 4 in Figure 7) semi-rigid cables from A4 and A8 (receiver side)
6. Remove E5070-61677 (No 2 in Figure 7) and E5070-61678 (No 3 in Figure 7) semi-rigid cables from A4 and A8 (source side)
7. Remove defective A4 Power amp module *1

*1: Refer to E5070B/E5071B Service manual chapter 6 for details

**Figure 7****Front View (Semi-rigid Cables Opt. 313 before modification)**

8. Make A7 step attenuator assembly by 33321-60068 (2ea), E5070-61698 (2ea), E5070-01214 (1ea), 0515-0372 (4ea) and E5070-61618 (1ea). 2ea of E5070-61698 is the cable between 33321-60068 and E5070-61618.

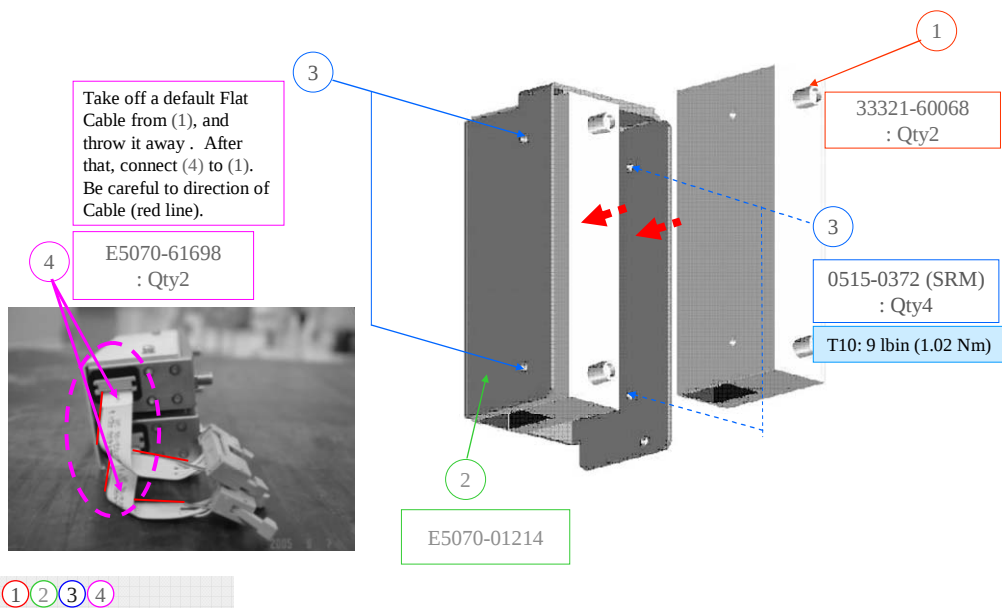


Figure 8 Make A7 attenuator assembly (for option 313, 314, 413, 414)

9. Install A7 assembly with 0515-0372 2 ea. Be careful to the flat cable's direction and connection.

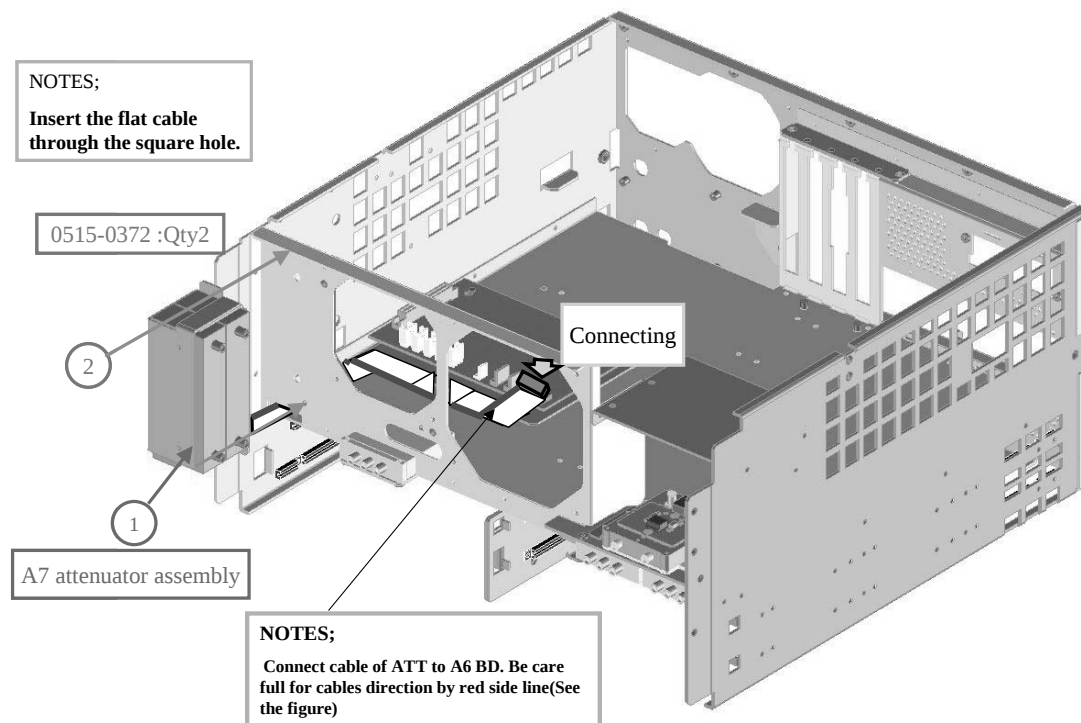


Figure 9 Install A7 attenuator assembly (for option 313, 314, 413, 414)

10. Install new A4 power amp module to an original place.
11. Connect A8 (source side) and A4 with E5070-61677 and E5070-61678 that is removed in step 6.
12. Connect A4 and A7 ATT with E5070-61633 (No 4 in Figure10) semi-rigid cable
13. Connect A4 and A7 ATT with E5070-61635 (No 5 in Figure 10) semi-rigid cable
14. Connect ATT and A8 with E5070-61634 (No 6 in Figure 10) semi-rigid cable
15. Connect ATT and A8 with E5070-61636 (No 7 in Figure 10) semi-rigid cable

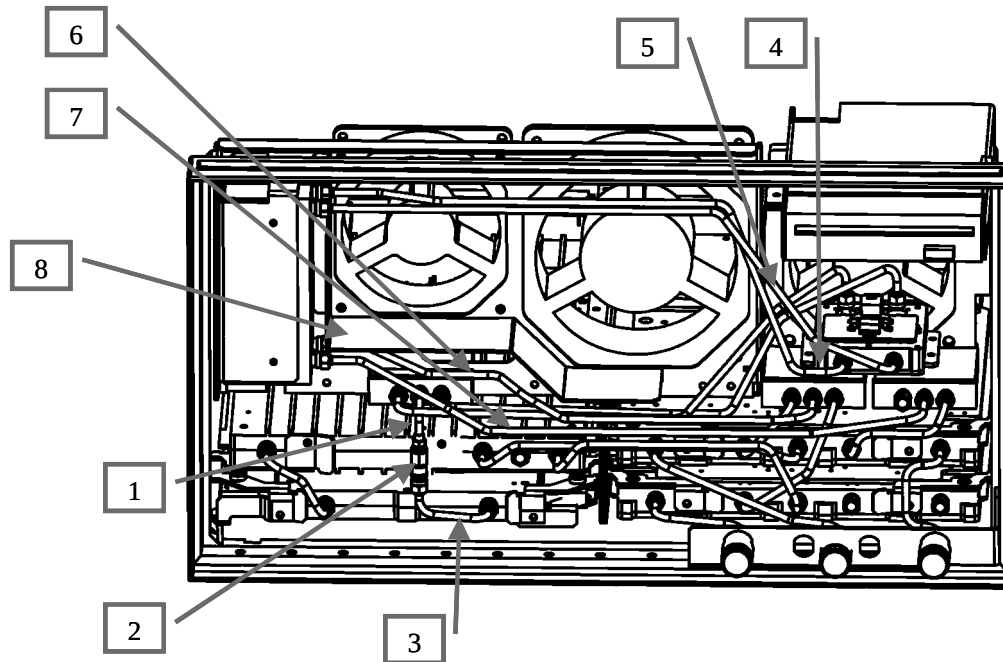


Figure 10 Front View (Semirigid Cables Opt. 313, 314 after modification)

16. Screw E5070-01223 plate (No 8 in figure 10) instead of E5070-01222
17. To avoid the friction between new semi-rigid cables and front panel's cable clamp, remove two 1400-0611, cable clamp, from original place, then stick two new 1400-0611, cable clamp, as shown in Figure 11 lower. Then change a bending position of LCD flat cable (white one) according to Figure 11 upper.

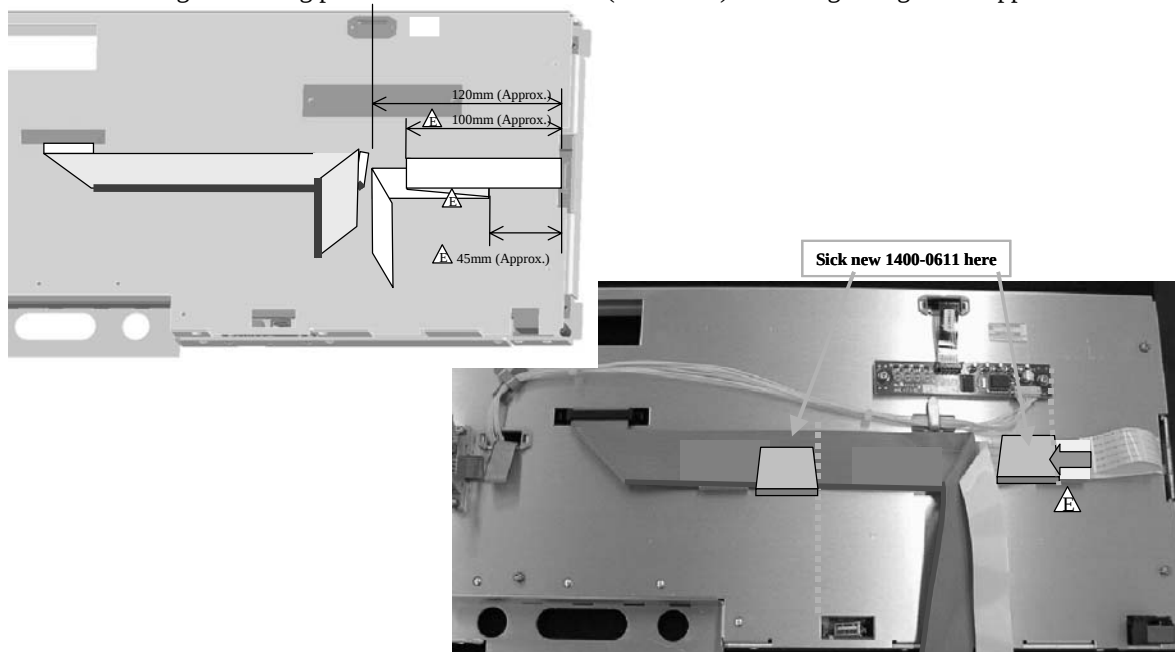


Figure 11 New cable clamp position and cable bending reference

18. Set FDD units.

19. Set front panel. Be careful not to jam cables between front panel and front frame.
20. Set outer cover.
21. Remove “option 313” label from back panel, and stick 5185-3716, “option 314” label instead of it.

For option 314 (3 port with A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65314*	Service modification kit for E507xB-314	1

* Available in May 2004.

Below is the contents list of E5070-65314 service kit. Order these parts separately if necessary.

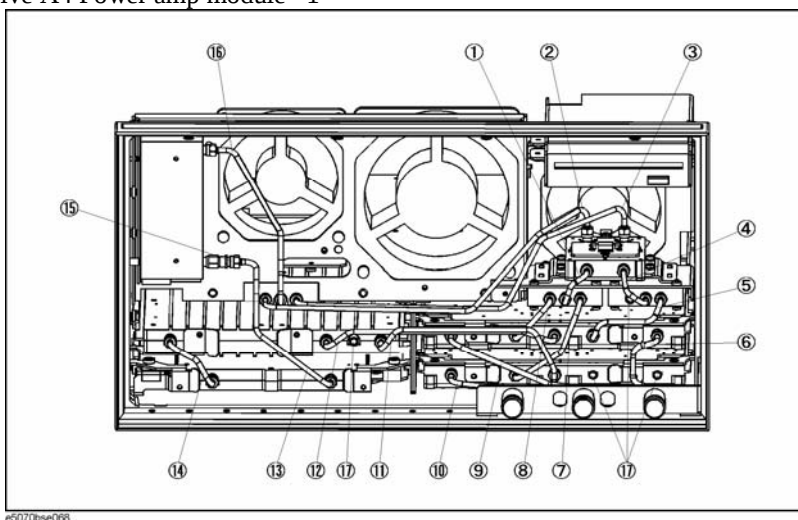
Part number	Description	Qty.
E5071-65008*	A4 power amp module, Dual, Service parts	1
33321-60068	A7 step attenuator	2
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	2
E5070-61618	Flat Cable Assy for -314, -414	1
E5070-01214	Plate for A7 for -314, -414	1
0515-0372	Screw M3.0*8 PN T10	2
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1
E5070-61635	RF semi-rigid cable	1
E5070-61636	RF semi-rigid cable	1
E5070-61675	RF semi-rigid cable	1
E5070-61676	RF semi-rigid cable	1
E5070-01223	Plate for -314, -414	1
1400-0611	Cable cramp	2

* Service part number of A4 power amp module was changed from E5071-61004 to E5071-65008

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove A28 Floppy Disk Drive (FDD) unit. *1
4. Remove E5070-01222 (No. 8 in Figure 5) plate by 3 screws (No.9 in Figure 5)
5. Remove E5070-61685 (No 1 and No 4 in Figure 12) semi-rigid cables from A4 and A8 (receiver side)
6. Remove E5070-61677 (No 2 in Figure 12) and E5070-61678 (No 3 in Figure 12) from A4 and A8 (source side)
7. Remove E5070-61673 (No 13 in Figure 12) semi-rigid cable from A3 and 0955-0301 (No 15 in Figure 12).
8. Remove 0955-0301 (No 15 in Figure 12) uW attenuator from A7 ATT
9. Remove E5070-61656 (No 16 in Figure 12) semi-rigid cable from A7 and A8
10. Remove defective A4 Power amp module *1

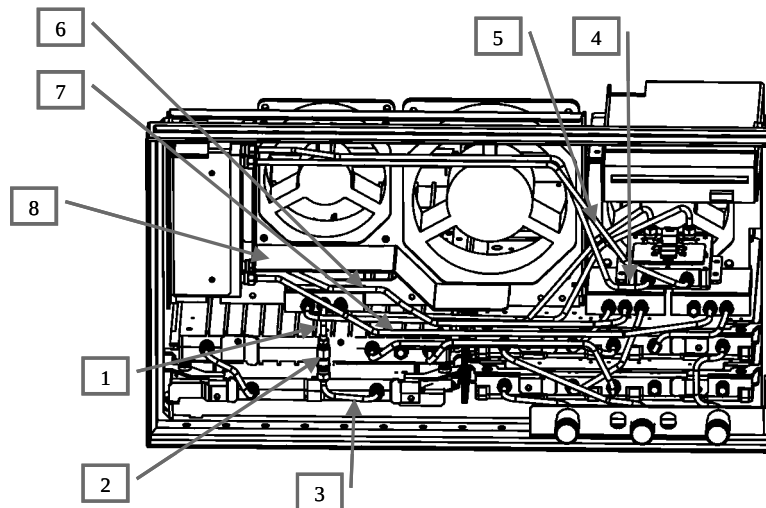
*1: Refer to E5070B/E507B Service manual chapter 6 for details



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Figure 12 Front View (Semirigid Cables Opt. 314 before modification)

11. Remove A7 attenuator module by 2 screws (No. 7 in Figure 5).
12. Make new A7 attenuator module by 33321-60068 (2ea), E5070-61698 (2ea), E5070-61618 (1ea), 0515-0372 (2ea) and E5070-01214 (1ea). Scrap 33321-60059, E5070-01213 and E5070-61617. Refer to Figure 8 for the detail.
13. Install new A7 attenuator with 0515-0372 2 ea. Refer to Figure 9 for the detail.
14. Install new A4 power amp module to an original place
15. Connect A3 and 0955-0301 (removed in step 8) with E5070-61675 (No 3 in Figure 10, see below) semi-rigid cable
16. Connect 0955-0301 and A8 (source side) with E5070-61676 (No 1 in Figure 10)
17. Connect A8 (source side) and A4 with E5070-61677 and E5070-61678 that are removed in step 6
18. Connect A4 and A7 ATT with E5070-61633 (No 4 in Figure 10) semi-rigid cable
19. Connect A4 and A7 ATT with E5070-61635 (No 5 in Figure 10) semi-rigid cable
20. Connect ATT and A8 with E5070-61634 (No 6 in Figure 10) semi-rigid cable
21. Connect ATT and A8 with E5070-61636 (No 7 in Figure 10) semi-rigid cable
22. Screw E5070-01223 plate (No 8 in figure 10) instead of E5070-01222
23. To avoid the friction between new semi-rigid cables and front panel's cable clamp, remove two 1400-0611, cable clamp, from original place, then stick two new 1400-0611, cable clamp, as shown in Figure 11 lower. Then change a bending position of LCD flat cable (white one) according to Figure 11 upper
24. Set FDD unit.
25. Set front panel. Be careful not to jam cables between front panel and front frame
26. Set outer cover



Copy of Figure 10 in page 11

For option 413 (4 port, without A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65413*	Service modification kit for E507xB-413	1

* Available in May 2004.

Below is the contents list of E5070-65413 service kit. Order these parts separately if necessary.

Part number	Description	Qty.
E5071-65008*	A4 power amp module, Dual, Service parts	1
33321-60068	A7 step attenuator	2
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	2
E5070-61618	Flat Cable Assy for -314, -414	1
E5070-01214	Plate for A7 for -314, -414	1
0515-0372	Screw M3.0*8 PN T10	6
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1
E5070-61635	RF semi-rigid cable	1
E5070-61636	RF semi-rigid cable	1
E5070-01223	Plate for -314, -414	1
1400-0611	Cable cramp	2
5185-3718	Label for option 414	1

* Service part number of A4 power amp module was changed from E5071-61004 to E5071-65008

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove A28 Floppy Disk Drive (FDD) unit. *1
4. Remove E5070-01222 (No. 8 in Figure 5) plate by 3 screws (No.9 in Figure 5)
5. Remove E5070-61685 (No 1 and No 4 in Figure 13) semi-rigid cables from A4 and A8 (receiver side)
6. Remove E5070-61677 (No 2 in Figure 13) and E5070-61678 (No 3 in Figure 13) from A4 and A8 (source side)

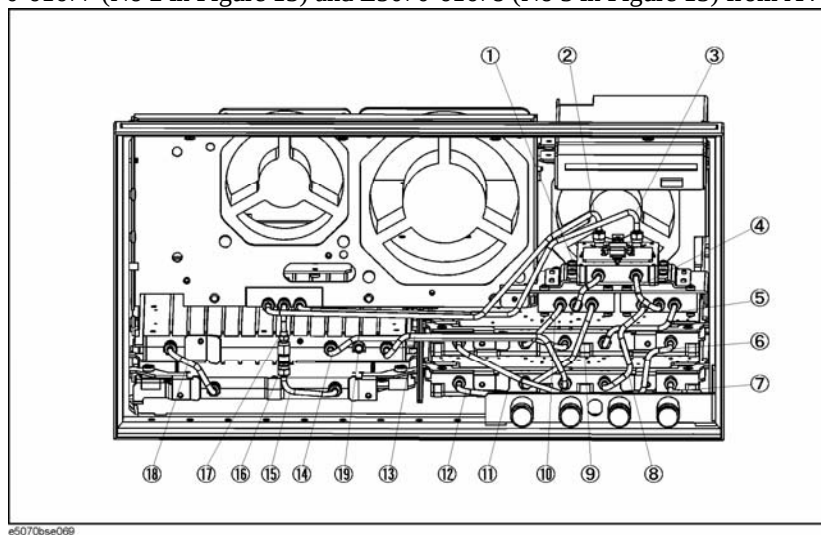


Figure 13 Front View (Semirigid Cables Opt. 413 before modification)

7. Remove defective A4 Power amp module *1

8. Make A7 step attenuator assembly by 33321-60068 (2ea), E5070-61698 (2ea), E5070-01214 (1ea), 0515-0372 (4ea), and E5070-61618 (1ea). Refer to Figure 8 for the detail.
9. Install A7 assembly with 0515-0372 2 ea. Be careful to the flat cable's direction and connection. Refer to Figure 9 for the detail.
10. Install new A4 power amp module to an original place
11. Connect A8 (source side) and A4 with E5070-61677 and E5070-61678 that are removed in step 6
12. Connect A4 and A7 ATT with E5070-61633 (No 4 in Figure14) semi-rigid cable
13. Connect A4 and A7 ATT with E5070-61635 (No 5 in Figure 14) semi-rigid cable
14. Connect ATT and A8 with E5070-61634 (No 6 in Figure 14) semi-rigid cable
15. Connect ATT and A8 with E5070-61636 (No 7 in Figure 14) semi-rigid cable
16. Screw E5070-01223 plate (No 8 in figure 14) instead of E5070-01222

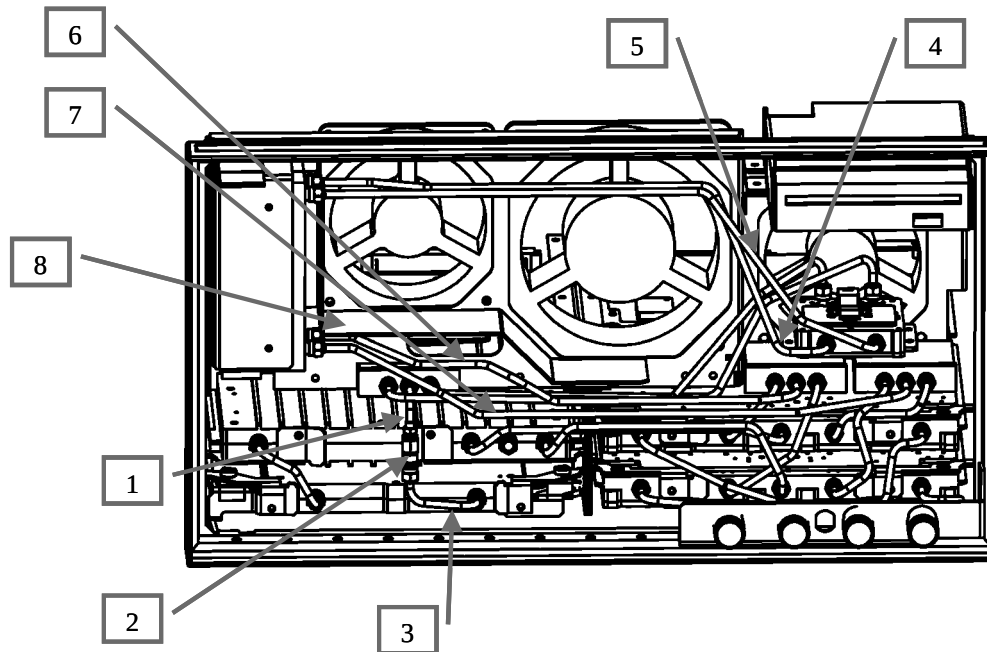


Figure 14 Front View (Semirigid Cables Opt. 413, 414 after modification)

17. To avoid the friction between new semi-rigid cables and front panel's cable clamp, remove two 1400-0611, cable clamp, from original place, then stick two new 1400-0611, cable clamp, as shown in Figure 11 lower. Then change a bending position of LCD flat cable (white one) according to Figure 11 upper
18. Set FDD unit.
19. Set front panel. Be careful not to jam cables between front panel and front frame
20. Set outer cover.
21. Remove "option 413" label from back panel, and stick 5185-3718, "option 414" label instead of it.

For option 414 (4 port with A7 attenuator)**Parts Required:**

Part number	Description	Qty.
E5070-65414*	Service modification kit for E507xB-414	1

* Available in May 2004.

Below is the contents list of E5070-65414 service kit. Order these parts separately if necessary.

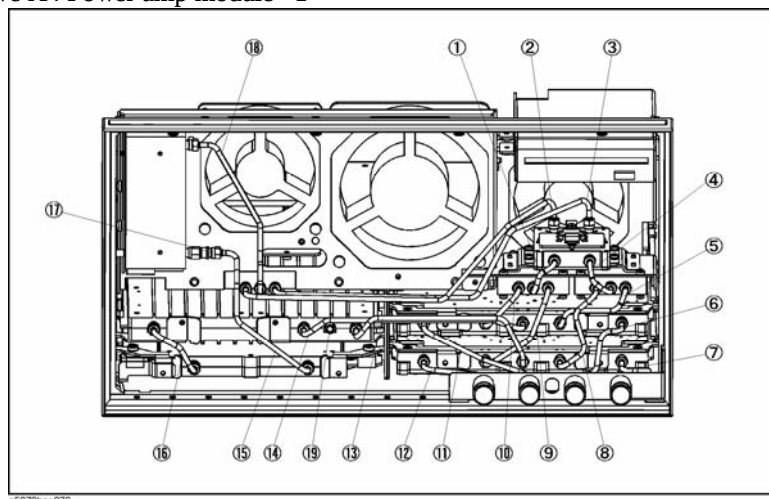
Part number	Description	Qty.
E5071-65008*	A4 power amp module, Dual, Service parts	1
33321-60068	A7 step attenuator	2
E5070-61698	Flat cable assy for A7 ATT and E5070-61617/8	2
E5070-61618	Flat Cable Assy for -314, -414	1
E5070-01214	Plate for A7 for -314, -414	1
0515-0372	Screw M3.0*8 PN T10	2
E5070-61633	RF semi-rigid cable	1
E5070-61634	RF semi-rigid cable	1
E5070-61635	RF semi-rigid cable	1
E5070-61636	RF semi-rigid cable	1
E5070-61675	RF semi-rigid cable	1
E5070-61676	RF semi-rigid cable	1
E5070-01223	Plate for -314, -414	1
1400-0611	Cable cramp	2

* Service part number of A4 power amp module was changed from E5071-61004 to E5071-65008

Modification procedure

1. Remove outer cover. *1
2. Remove front panel. *1
3. Remove floppy disk drive unit. *1
4. Remove E5070-01222 (No. 8 in Figure 5) plate by 3 screws (No.9 in Figure 5)
5. Remove E5070-61685 (No 1 and No 4 in Figure 15) semi-rigid cables from A4 and A8
6. Remove E5070-61677 (No 2 in Figure 15) and E5070-61678 (No 3 in Figure 15) from A4 and A8 (source side)
7. Remove E5070-61673 (No 15 in Figure 15) semi-rigid cable from A3 and 0955-0301 (No 17 in Figure 15).
8. Remove 0955-0301 (No 17 in Figure 15) uW attenuator from A7 ATT
9. Remove E5070-61656 (No 18 in Figure 15) semi-rigid cable from A7 and A8
10. Remove defective A4 Power amp module *1

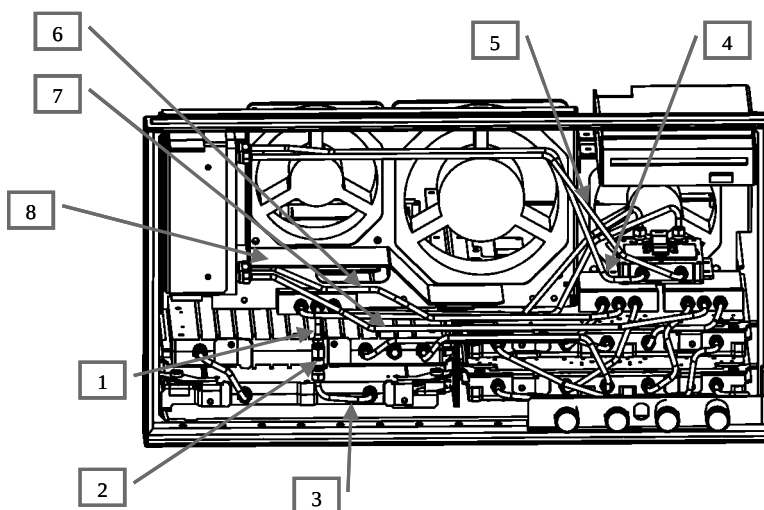
*1: Refer to E5070B/E507B Service manual chapter 6 for details



e5070bse070

Figure 15 Front View (Semirigid Cables Opt. 414 before modification)

11. Remove A7 attenuator module by 2 screws (No. 7 in Figure 5).
12. Make new A7 attenuator module by 33321-60068 (2ea), E5070-61698 (2ea), E5070-61618 (1ea), 0515-0372 (2ea) and E5070-01214 (1ea). Scrap 33321-60059, E5070-01213 and E5070-61617. Refer to Figure 8 for the detail.
13. Install new A7 attenuator with 0515-0372 2 ea. Refer to Figure 9 for the detail.
14. Install new A4 power amp module to an original place
15. Connect A3 and 0955-0301 (removed in step 8) with E5070-61675 (No 3 in Figure 14, see below) semi-rigid cable
16. Connect 0955-0301 and A8 (source side) with E5070-61676 (No 1 in Figure 14)
17. Connect A8 (source side) and A4 with E5070-61677 and E5070-61678 that are removed in step 6
18. Connect A4 and A7 ATT with E5070-61633 (No 4 in Figure 14) semi-rigid cable
19. Connect A4 and A7 ATT with E5070-61635 (No 5 in Figure 14) semi-rigid cable
20. Connect ATT and A8 with E5070-61634 (No 6 in Figure 14) semi-rigid cable
21. Connect ATT and A8 with E5070-61636 (No 7 in Figure 14) semi-rigid cable
22. Screw E5070-01223 plate (No 8 in figure 14) instead of E5070-01222
23. To avoid the friction between new semi-rigid cables and front panel's cable clamp, remove two 1400-0611, cable clamp, from original place, then stick two new 1400-0611, cable clamp, as shown in Figure 11 lower. Then change a bending position of LCD flat cable (white one) according to Figure 11 upper
24. Set FDD unit
25. Set front panel. Be careful not to jam cables between front panel and front frame
26. Set outer cover



Copy of Figure 14 in page 16