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Agilent Technologies Noise Sources:
346A, 346B, N4000A, and N4001A
(All Serial Numbers)

Installation Note

Instructions for Setting Bias Current



Agilent Technologies

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Agilent Technologies Noise Sources: 346A, 346B, N4000A, and N4001A

A. Introduction

Due to a change of manufacturer of the noise diodes, adjustment of bias current is now necessary to ensure that the noise source performs within its specified ENR range. This document is supplied with all the following replacement parts.

CAUTION: Repair or parts replacement of noise sources should NOT be attempted without full calibration capability and official field calibration software.

This Installation Note applies to the installation of the following replacement parts:

Table 1 Replacement Parts List

Model	Replacement Bulkhead	Replacement Noise Cartridge
346A Std.	00346-60022	00346-60154
346A Opt. 001	00346-60023	00346-60154
346A Opt. 002	00346-60024	00346-60154
346A Opt. 004	00346-60025	00346-60154
346B Std.	00346-60026	00346-60154
346B Opt. 001	00346-60018	00346-60154
346B Opt. 002	00346-60019	00346-60154
346B Opt. 004	00346-60020	00346-60154
N4000A Std.	N4000-60014	00346-60154
N4000A Opt 001	N4000-60015	00346-60154
N4001A Std.	N4001-60003	00346-60154
N4001A Opt 001	N4001-60004	00346-60154

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NOTE: This Installation Note also applies to the replacement of the 00346-60001 and N4000-60001 printed circuit boards. To replace the PC board, please order the 00346-60157 (for 346A/B) or N4000-60016 (for N4000A/1A) Replacement PC Board Kit.

The replacement parts listed in Table 1 are tested in the factory to determine the bias current level necessary to ensure that it meets ENR specification.

For the 346A and 346B, bias levels are determined by installing the appropriate resistor value for R7 on the printed circuit board (Figure 1- 00346-60001). The appropriate resistor is supplied with the part.

Replacement Bulkheads for the 346A and 346B have the recommended bias level written on the part. The appropriate resistor is enclosed in a small envelope. The resistor value and part number are written on the envelope. The N4000/1A bulkheads are not supplied with an envelope and resistor. However, the value of the current is marked on the part.

00346-60154 Replacement Noise Cartridges are used in all the listed models. These parts are labeled with a tracking number. The appropriate resistor is enclosed in an envelope which is marked with the tracking number of the cartridge, resistor value, part number and recommended bias current level. Also, the cartridges are shipped with Installation Note 00346-90024, Attenuator Replacement, in case attenuator tuning is necessary to bring the unit to within specification. It may be necessary, in rare cases, to replace the attenuator to meet specification.

On the N4000A and N4001A models, the bias is set electronically by using field calibration software to calibrate the Noise Source and re-burn the EEPROM. The bias value of current supplied with the Replacement Noise Cartridge is to be used to program the sensor. The enclosed resistor can be discarded.

A.1 346A/B Replacement Noise Cartridge Installation Instructions:

1. Ensure that the cartridge was shipped with a resistor contained in a small envelope.
2. Ensure that the tracking number on the cartridge matches the number on the envelope.
3. Ensure that the value of the current marked on the envelope corresponds to the resistor value and part number provided (refer to Table 2).
4. Ensure that the resistor value on the envelope matches the resistor supplied.
5. Ensure that Installation Note 00346-90024 has been provided.
6. Disassemble the Noise Source by removing the two flat head screws near the output connector and slide the bulkhead out of the housing.
7. Next, remove the two flat head screws near the BNC connector and slide out the printed circuit board assembly.
8. Remove the old cartridge from the bulkhead and install the replacement cartridge.
   Ensure that the tiny bellows remains on the attenuator pin.
9. Check the resistor installed in position R7 on the 00346-60001 printed circuit board; please refer to Figure 1- 00346-60001. If it matches the resistor supplied, it is not necessary to install it in the printed circuit board.
10. Install the supplied resistor in R7 position (refer to Figure 1- 00346-60001).
11. Reassemble the unit and do a preliminary ENR measurement.

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12. For the 346B, if the ENR is not within specification, refer to the supplied 00346-90024 Installation Note for instructions on how to tune the attenuator to meet the ENR specification at frequencies above 12 GHz. The 346A should not require polyiron tuning.
13. Retest ENR after tuning the attenuator.
14. If the ENR is still out of specification, substitute another resistor for R7 from Table 2. Decreasing the bias current by 10% increases the ENR response by 0.5dB at 10MHz.
15. Retest ENR.

A.2 346A/B Replacement Bulkhead Assembly Installation Instructions:

1. Ensure that the bulkhead was shipped with a small envelope containing a resistor.
2. Ensure that the value of the current marked on the bulkhead matches the value on the envelope.
3. Ensure that the value of the current marked on the envelope corresponds to the resistor value and part number provided (refer to Table 2).
4. Ensure that the resistor value on the envelope matches the resistor supplied.
5. Disassemble the Noise Source by removing the two flat head screws near the output connector and slide the bulkhead out of the housing.
6. Remove the two flat head screws near the BNC connector and slide out the printed circuit board assembly.
7. Install the replacement bulkhead.
8. Check the resistor installed (if any) in position R7 on the 00346-60001 printed circuit board; refer to Figure 1- 00346-60001. If it matches the resistor supplied, it is not necessary to install it in the printed circuit board.
9. Install the supplied resistor in R7 position (refer to Figure 1- 00346-60001).
10. Reassemble the unit and perform a preliminary ENR measurement.
11. If the ENR is not meeting specification, substitute another resistor for R7 from Table 2. Decreasing the bias current by 10% increases the ENR response by 0.5dB at 10MHz.
12. Retest ENR.

A.3 346A/B Replacement Printed Circuit Board Assembly Installation Instructions:

1. Disassemble the Noise Source by removing the two flat head screws near the BNC connector, and slide out the printed circuit board assembly.
2. R7 is not loaded in the replacement printed circuit board assembly. Install the same value of R7 as in the printed circuit board being replaced.
3. Install the replacement printed circuit board, reassemble the unit and do a preliminary ENR measurement.
4. If the ENR is not meeting specification, substitute another resistor for R7 from Table 2. Decreasing the bias current by 10% increases the ENR response by 0.5dB at 10MHz.
5. Retest ENR.

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A.4 N4000A/ N4001A Replacement Noise Cartridge Installation Instructions:

1. Ensure that the cartridge was shipped with a small envelope.
2. Ensure that the value of the current is marked on the envelope (the resistor will not be used).
3. Ensure that Installation Note 00346-90024 has been provided.
4. Disassemble the Noise Source using the procedure in the SNS Series Operating and Service Guide, N4000-90001.
5. Remove the old cartridge and install the replacement cartridge.
6. Using the field calibration software, set the bias current to the value on the envelope (in mA). Discard the resistor enclosed.
7. Reassemble the unit and do a preliminary ENR measurement.
8. If the ENR is not within specification, refer to the supplied 00346-90024 Installation Note for instructions on how to tune the attenuator to meet the ENR specification at frequencies above 12 GHz.
9. Retest ENR after tuning the attenuator.
10. If the ENR is not meeting specification, use the field calibration software to reprogram the bias current using the values from Table 2.
    Decreasing the bias current by 10% increases the ENR response by 0.5dB at 10MHz.
11. Retest ENR.

A.5 N4000A/ N4001A Replacement Bulkhead Assembly Installation Instructions:

1. Ensure that the value of the current is marked on the replacement bulkhead.
2. Disassemble the Noise Source using the procedure in the SNS Series Operating and Service Guide, N4000-90001.
3. Remove the old bulkhead and install the replacement bulkhead.
4. Using the field calibration software, set the bias current to the value on the bulkhead (in mA).
5. Reassemble the unit and do a preliminary ENR measurement.
6. If the ENR is not meeting specification, use the field calibration software to reprogram the bias current using the values from Table 2.
    Decreasing the bias current by 10% increases the ENR response by 0.5dB at 10MHz.
7. Retest ENR.

A.6 N4000A/ N4001A Replacement Printed Circuit Board Assembly Installation Instructions:

1. Using the field calibration software, determine the bias current applied to the noise diode or use the bias current value written on the bulkhead.
2. Disassemble the Noise Source using the procedure in the SNS Series Operating and Service Guide, N4000-90001.
3. Install the replacement printed circuit board.

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4. Reassemble the unit.
5. Using the field calibration software, set the bias current to the original value
6. Perform a preliminary ENR measurement.
7. If the ENR is not meeting specification, use the field calibration software to change the bias setting. Refer to Table 2 for bias current values. Decreasing the bias current increases the ENR response.
8. Retest ENR.

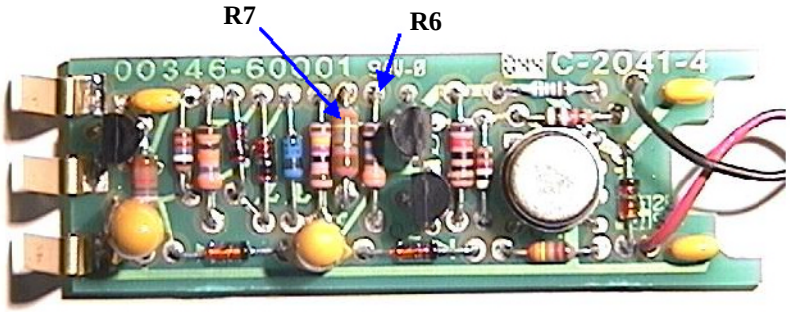
A.7 Printed Circuit Board Assembly Graphic and Resistor List

Table 2 Parts List

Current (mA)	R7 Ohms	R7 Part Number
11	237	0698-3442
12	200	0698-6377
13	162	0757-0405
14	133	0698-7215
15	100	0757-0401
16	75	0698-7209
17	51.1	0757-0394
18	28.7	0698-7199
19	10	0757-0346
20	162[1]	0698-7217

1. In addition, replace R6 with 0698-7216 (147 Ohms)

Figure 1- 00346-60001



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Manufacturing Part Number

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