S E R V I C E N O T E

SUPERSEDES 3577A-11

HP 3577A Network Analyzer

Serial Numbers: 0000A00000/9999Z99999

Duplicate Service Notes: 3577B-06

Ratio phase improved with padding capacitors after receiver board repair.

Situation:

Some instruments may fail to meet the ratio phase flatness specification after changing parts on the receiver board. (A1 or A9) (Buffer Amplifier, first mixer, or replacing the receiver board)

Solution:

Adding a capacitor to the Buffer Amplifier should improve the instruments ratio phase flatness. Phase flatness is measured as a ratio of the phase response of two receivers, assuming ideal inputs. To determine the receiver board that needs a padding capacitor, you must measure the absolute value for each of the three ratio flatness responses (receiver ratios A/B, A/R, B/R) from 200 kHz to 200 MHz. The receiver common to the largest two ratios, is the receiver you should compensate. Use the phase measurement procedure to find the ratios.

Continued

DATE: 24 September 1993

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

INFORMATION ONLY

AUTHOR:	ENTITY:	ADDITIONAL INFORMATION:
DWH	A100	

HEWLETT PACKARD

Section A: Phase measurement procedure

1. Connect the source to the inputs using a three way power splitter and type-N cables.

NOTE

The type-N cables connected to the inputs must be the same length for proper phase match.

2. Press the following keys on the HP3577A.

INSTR PRESET
SWEEP TYPE . . . . . Log Freq Sweep
SWEEP MODE . . . . . Single
SWEEP TIME . . . . . 25 Sec
FREQ . . . . . Start Freq 200 kHz
AMPTD . . . . . -20 dBm
RES BW . . . . . 100 Hz
DISPLY FCTN . . . . . Phase
SCALE . . . . . /Div 5 deg
INPUT . . . . . A/R

3. Press ATTEN and select the attenuator setting that failed in the performance test. The attenuator setting must be the same for all receivers.

4. Press TRIG/RESET and wait for the instrument to complete a sweep.

5. Press the following keys on the HP3577A.

MKR -> . . . . . Mkr -> Min
MKR . . . . . Zero Marker
MKR -> . . . . . Mkr -> Max

6. Record the phase reading and whether the slope of the ratio is increasing or decreasing from left to right.

7. Repeat steps 5 and 6 to determine the B/R and A/B ratios. To select input B/R press the following keys:

INPUT . . . . . B/R

To select input A/B press the following keys:

INPUT . . . . . User Def Input
. . . . . A
. . . . . /
. . . . . B
. . . . . Enter

An example of typical results is shown in Table 1.

Table 1. Typical Phase Flatness Ratios

Input Ratio	Phase Reading	Slope
A/R	11 degrees	(+)
B/R	9 degrees	(+)
A/B	2 degrees	(-)

The receiver common to the two largest ratios is the receiver to compensate. For the example shown in table 1, you would add a padding capacitor to receiver R. See Table 2 to determine if you should add C200 or C201. For the example shown in table 1, you would add C200 to receiver R.

Table 2. Selecting Compensation Capacitors

Receiver to Compensate	Input Ratio	Slope	Add Padding Capacitor ...
R	A/R	(+)	C200
R	A/R	(-)	C201
A	A/R	(+)	C201
A	A/R	(-)	C200
B	A/B	(+)	C200
B	A/B	(-)	C201

Now refer to Table 3 and select the value of capacitor that would bring the affected phase ratios closest to zero degrees. Two part numbers are given because the A1 board uses radial parts and the A9 board uses surface mount parts. For the example in Table 1, you would select a capacitor value of 3.3 pF.

Table 3. Selecting Capacitor Value

Capacitor Value	HP part number (radial)	HP part number (surface mount)	Approximate Phase Change
1.5 pf	0160-4381	0160-7593	5.5 degrees
2.2 pf	0160-3872	0160-7594	8.5 degrees
3.3 pf	0160-4382	0160-7460	11.0 degrees

Section B: Capacitor Installation

WARNING

The following procedure requires the instrument's top cover be removed. Energy available at many points can, if contacted, result in serious personal injury.

CAUTION

The following steps must be performed at a static protected site to prevent static discharge damage during the handling of the PC assembly.

1. Turn off the instruments power switch, and remove the power cord.

2. Remove the receiver board to be compensated.

3. Install the capacitor selected for compensation. Refer to the service manual for the location of C200 and C201 in the buffer amplifier circuit.

NOTE

If a receiver is already padded with C200 or C201, and you determined that the other padding capacitor is needed, remove the existing padding capacitor and retest. A receiver should not be padded with both C200 and C201.

NOTE

If the receiver to be compensated is revision A or B of the A1 board then install the capacitor in parallel with R115 for C200 or R117 for C201.

4. Return the instrument to its original state.

5. Perform the Input Level Flatness adjustment before retesting the ratio phase flatness.