

HP 5254A/B/C FREQUENCY CONVERTER MODIFICATIONS

For use as...

- ☐ HI-Q TUNEABLE BANDPASS FILTER
- ☐ HARMONIC GENERATOR / FREQUENCY MULTIPLIER

Frequency range: 300 MHz to 3000 MHz

Harmonic generation:

Cavity filter selects one harmonic every 50 MHz .

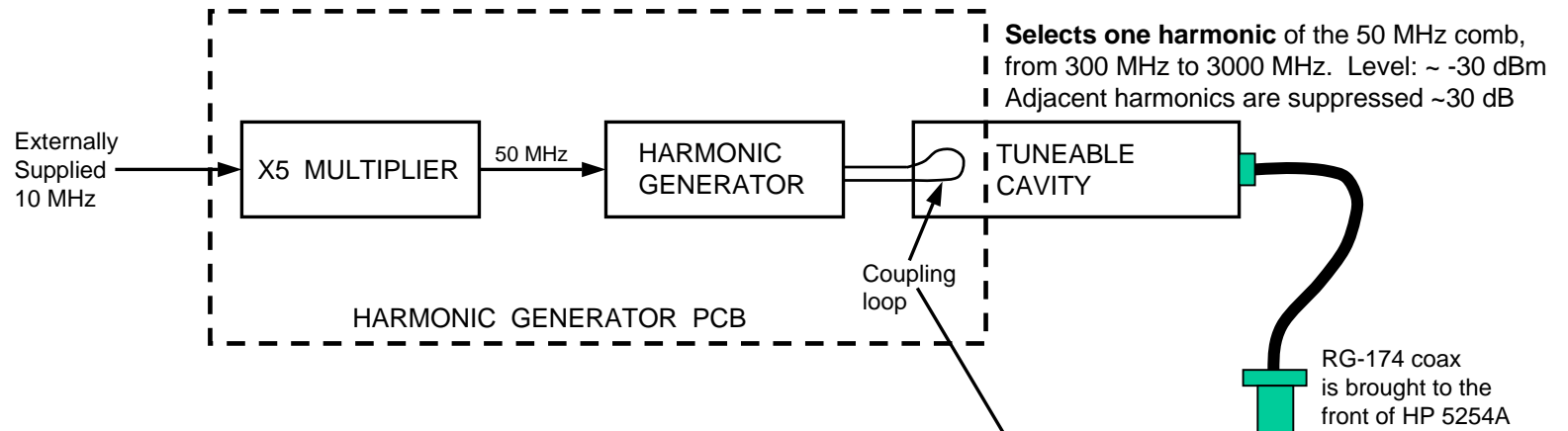
Level: -30 dBm nominal,

Adjacent harmonic suppression: ~ 30 dB

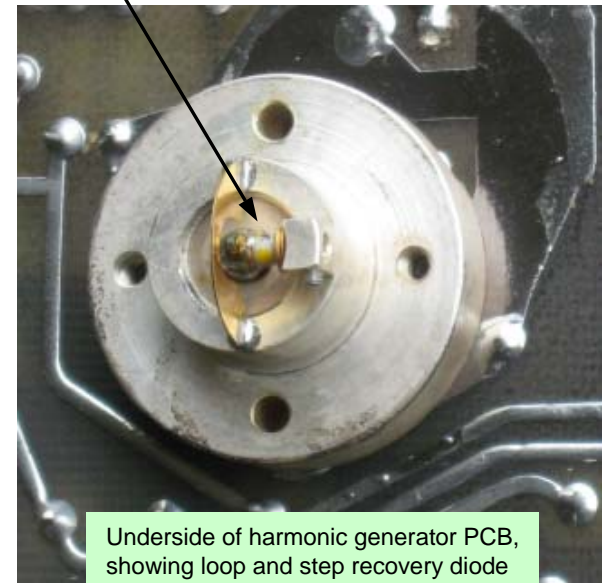
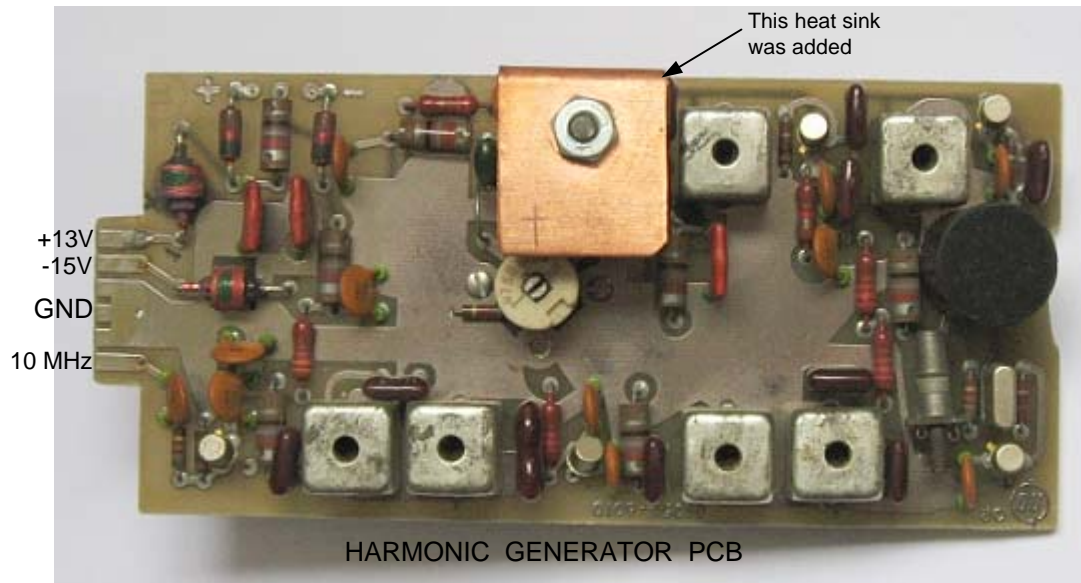
**Use to magnify phase noise on low noise 10 MHz clocks, since
it adds little noise of its own.**

Added phase noise = $20 * \log(N)$ where N is the frequency multiplication factor

BLOC DIAGRAM



Keep the harmonic generator PCB. The other PCB assemblies may be discarded.



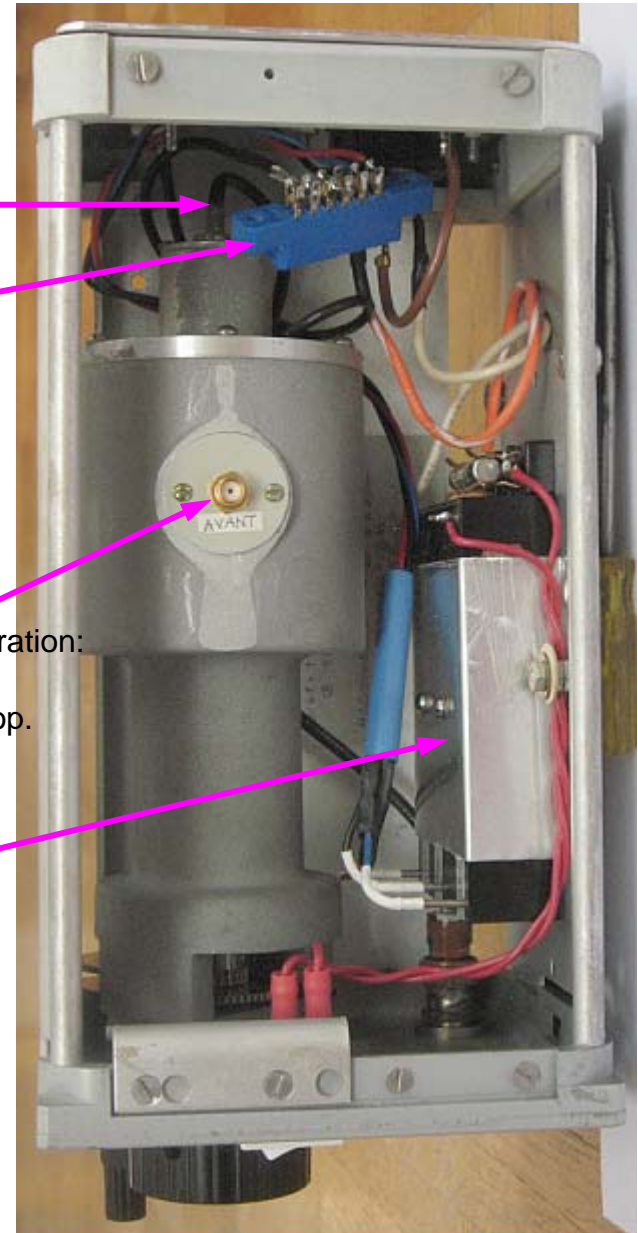
This is the cavity output coax
that is connected to the front BNC

In the harmonic generator configuration, the blue
edge connector applies power and 10 MHz
reference to the multiplier assembly / harmonic
generator pcb, located on top. The pcb is held in
place by the two screws on each side of the loop.
The other modules are discarded.

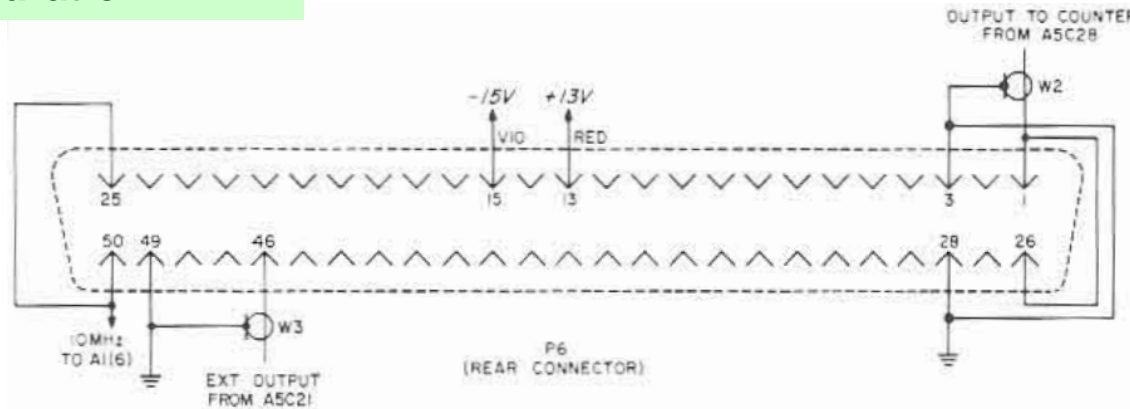
For bandpass filter configuration:
Remove the harmonic
generator PCB and add loop.

Added
power supply
for harmonic
generator

Filter IN / OUT **or**
Harmonic Generator
Output.



Harmonic generator Configuration

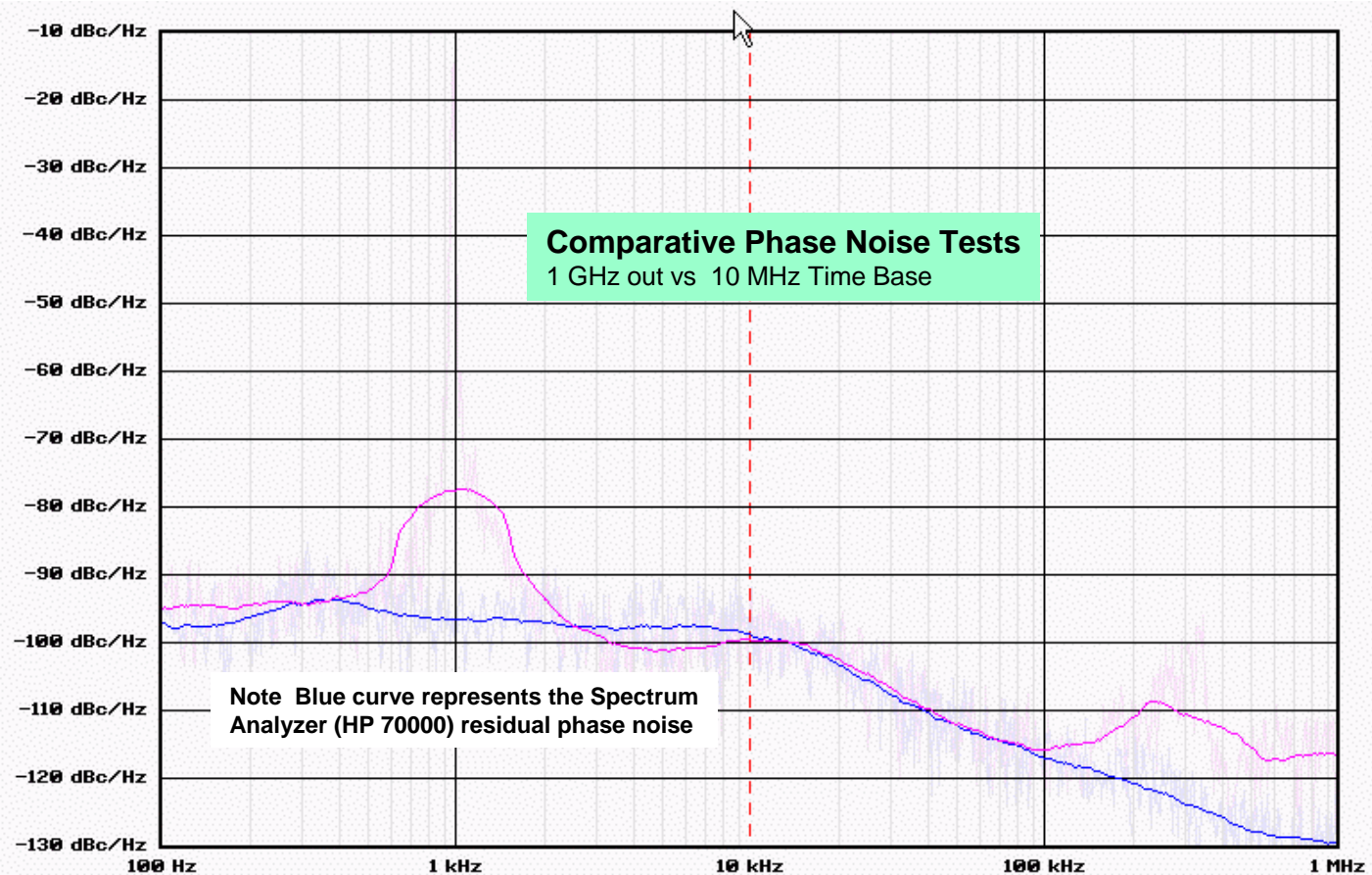


Power Supply and 10 MHz Connections on the 50 pin rear connector as required in the harmonic generator configuration.

The 10 MHz level should be +5 to +10 dBm.

This connector has been discarded. Power and 10 MHz is now brought directly to the harmonic generator PCB, via a 2x6 pin double side connector.

Harmonic generator Configuration

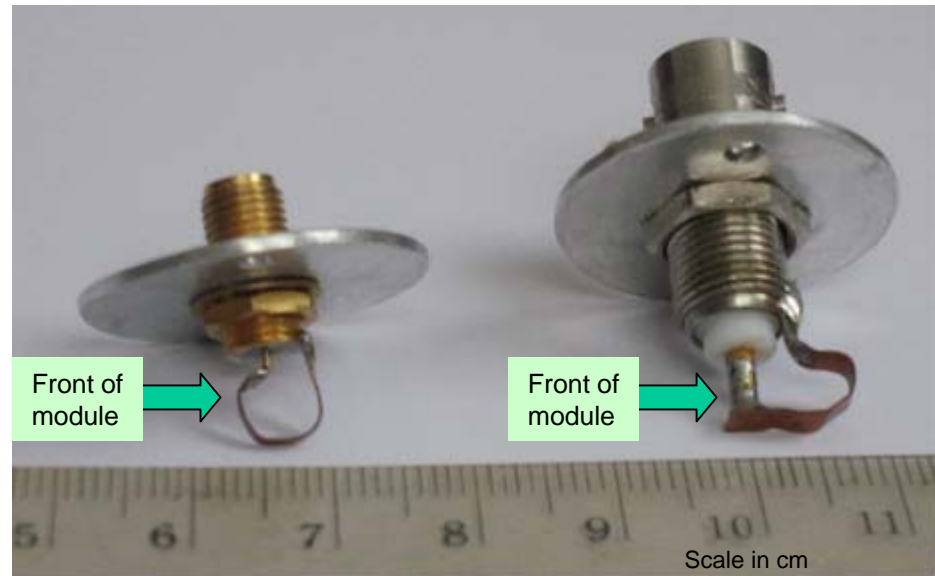


Trace	Carrier Hz	Carrier dBm	dBc/Hz at 10000 Hz	RF Atten dB	Instrument
HP 8924C TIME BASE OUT 10 MHz	10 000 000	-8.00	-98.9	0	HP70900A
HP 5254A 1 GHz OUT	1 000 000 000	-7.00	-99.5	0	HP70900A

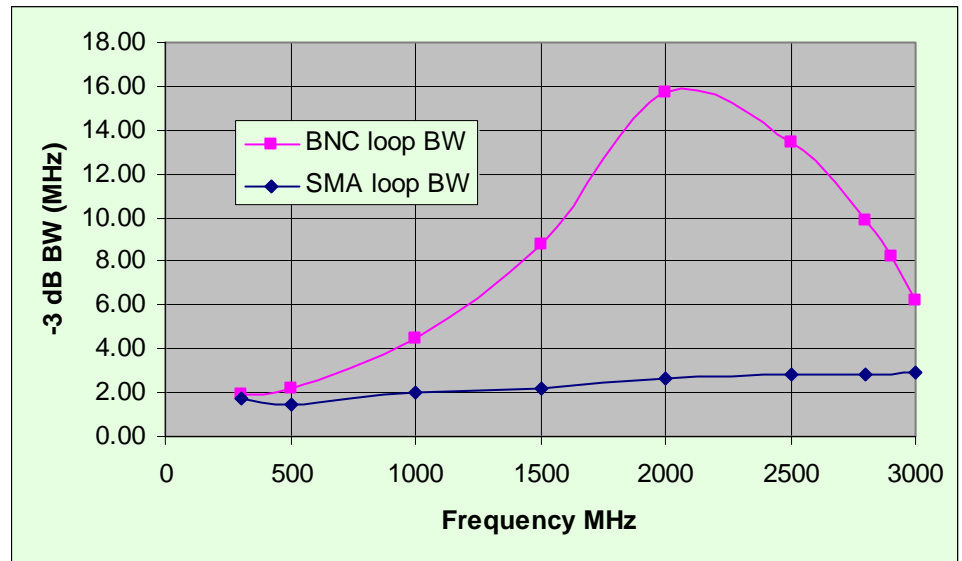
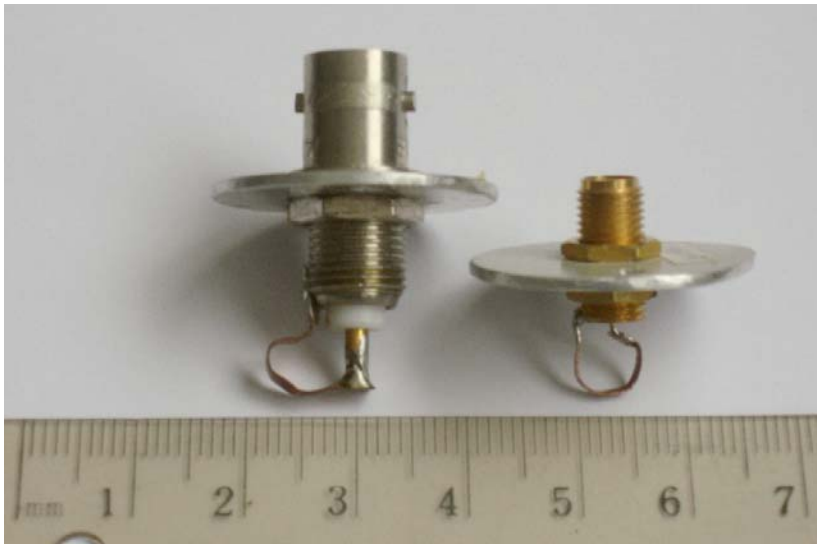
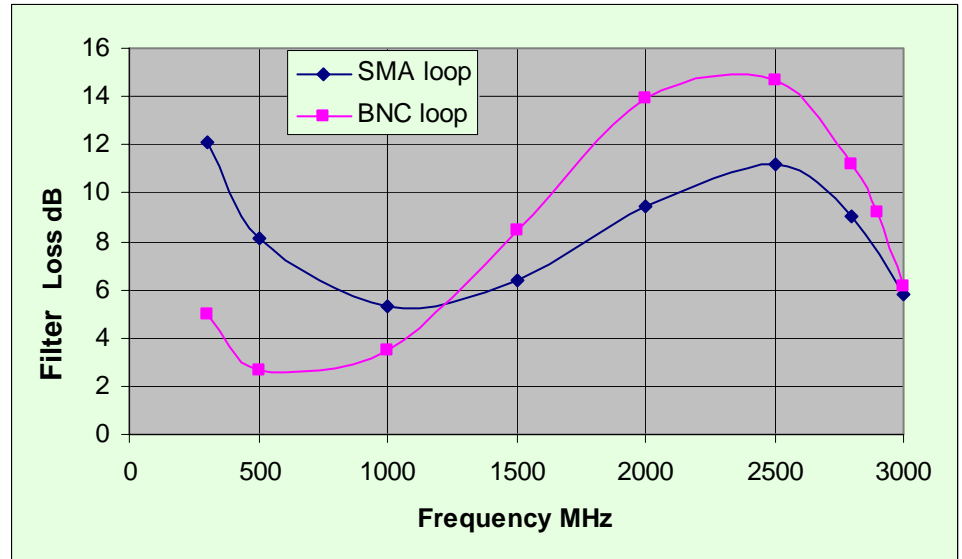
Bandpass Filter Configuration

BNC and SMA loops

Note the loop alignment w/r to front of module



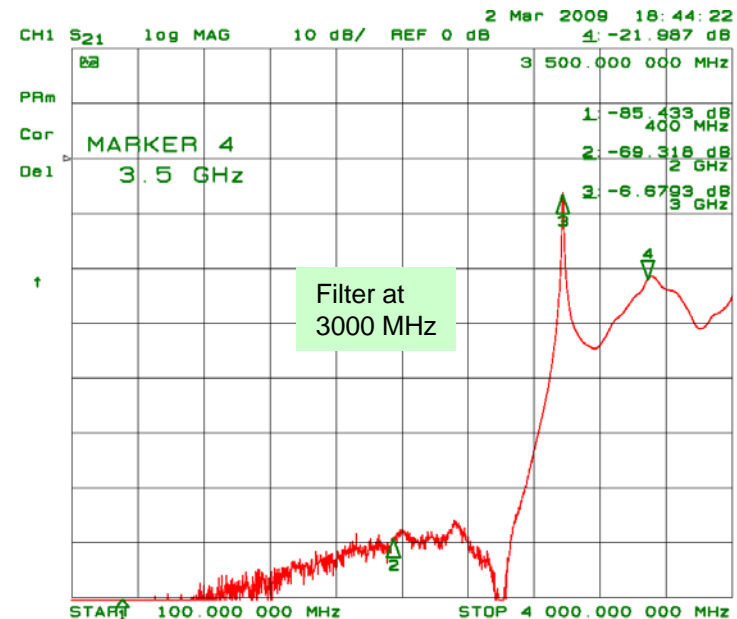
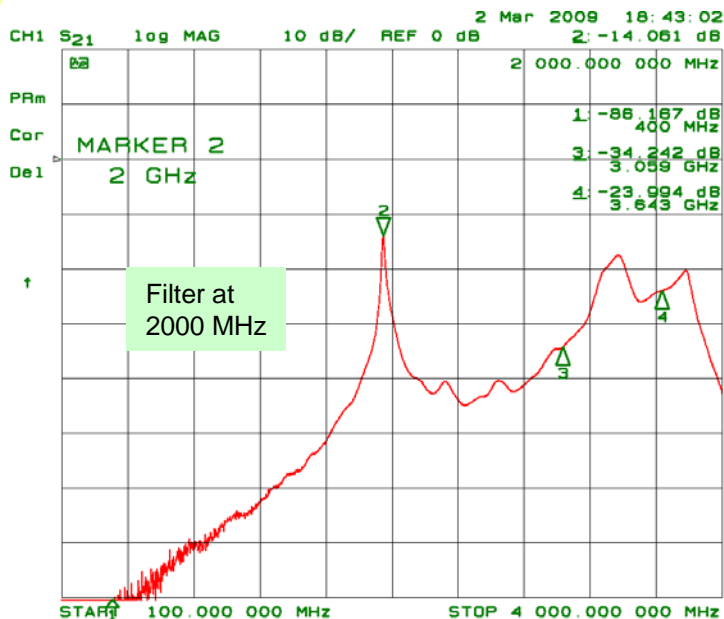
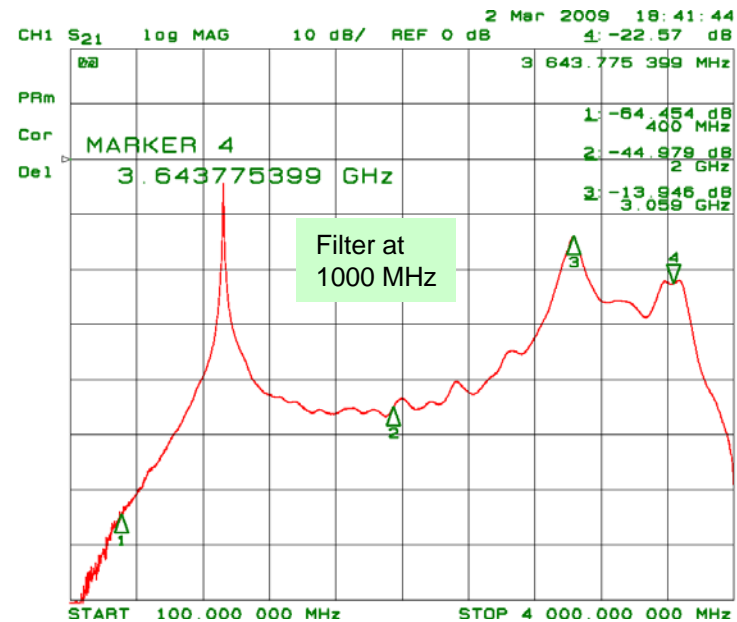
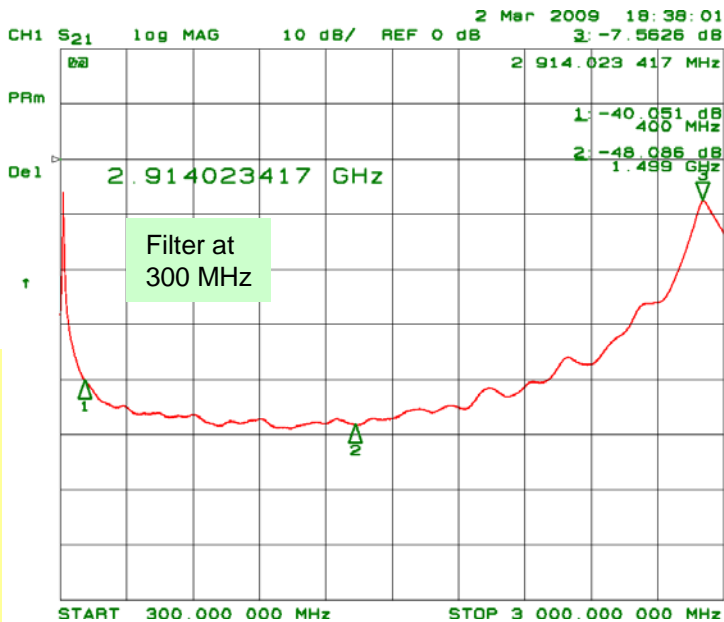
BANDPASS FILTER CHARACTERIZATION



BNC and SMA loops

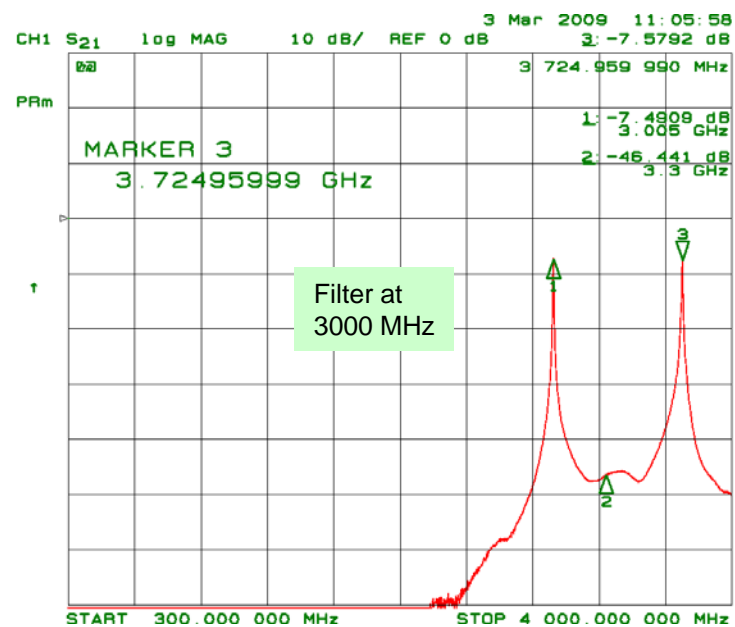
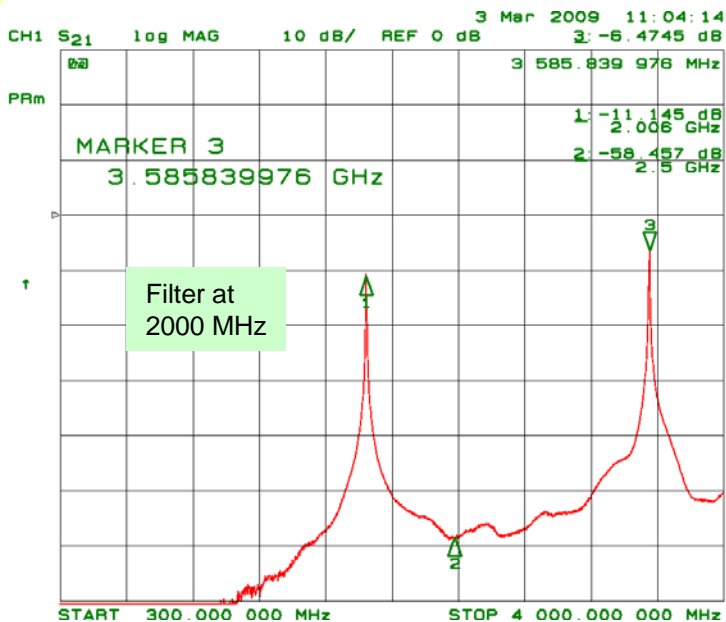
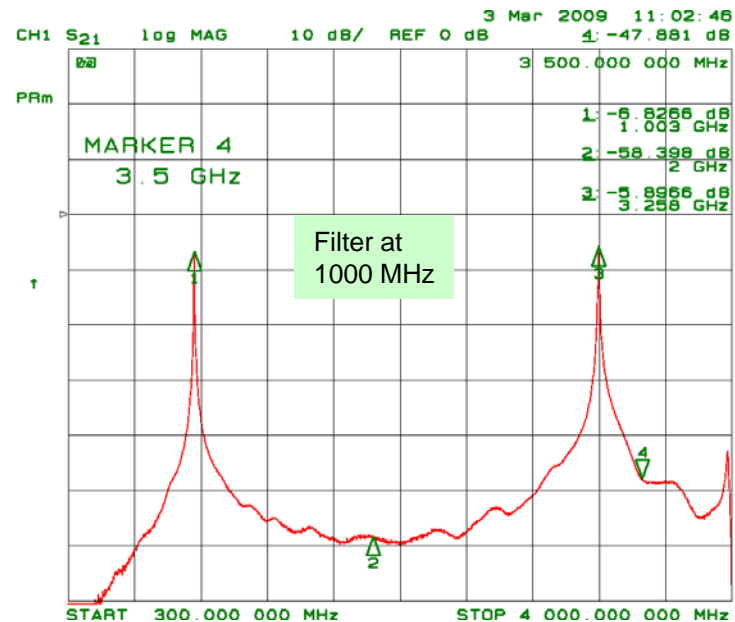
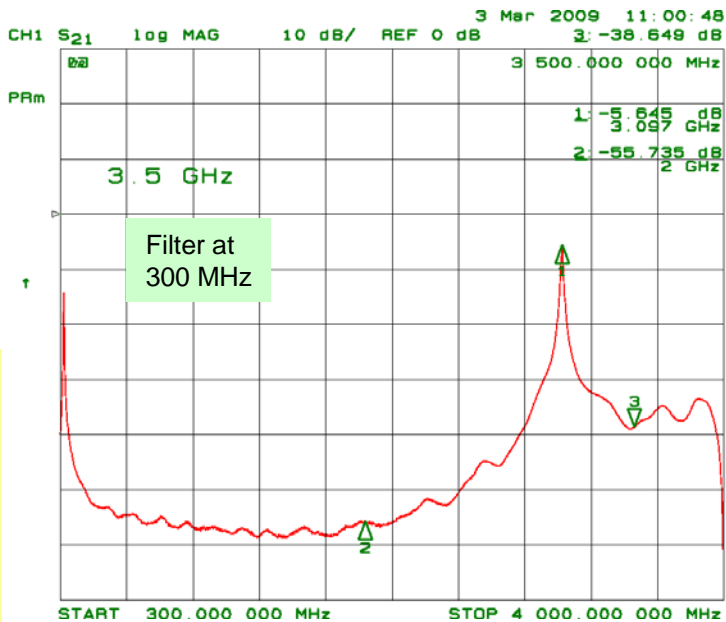
Overall
Response

BNC
loop



Overall
Response

SMA
loop



HP 5254A/B/C FREQUENCY CONVERTER – BLOCK DIAGRAM

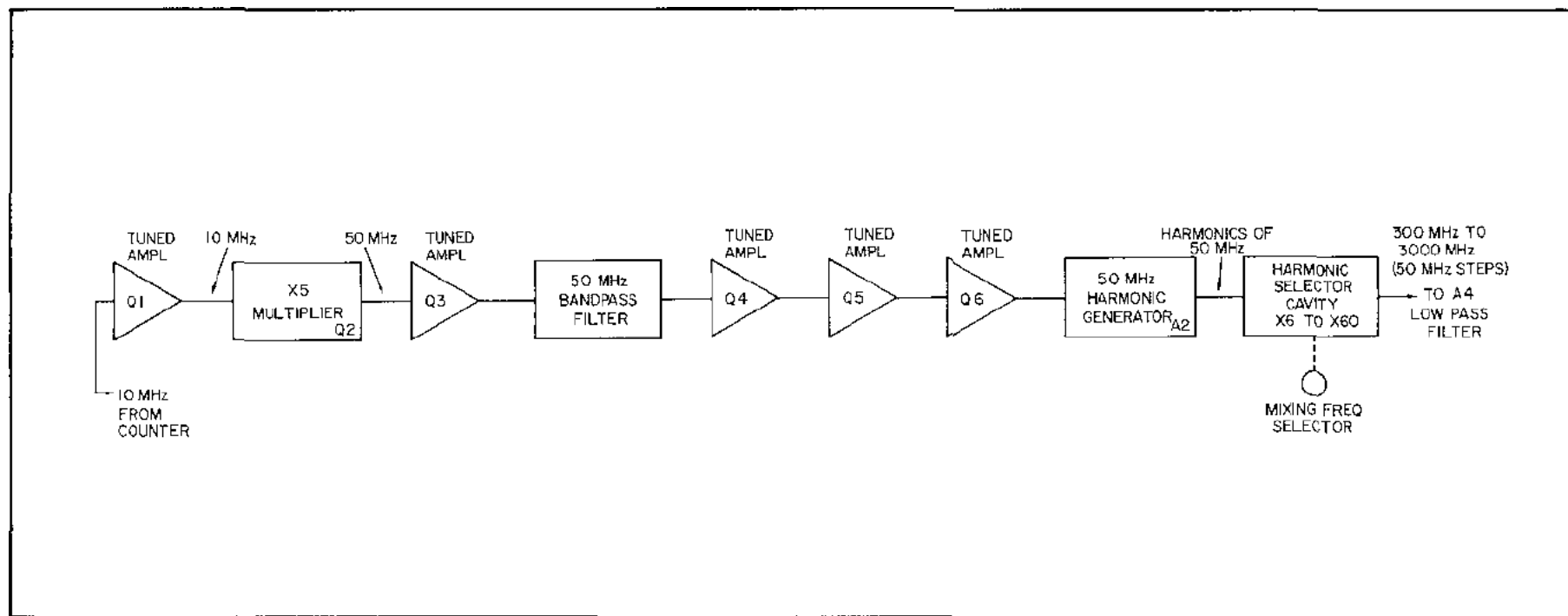
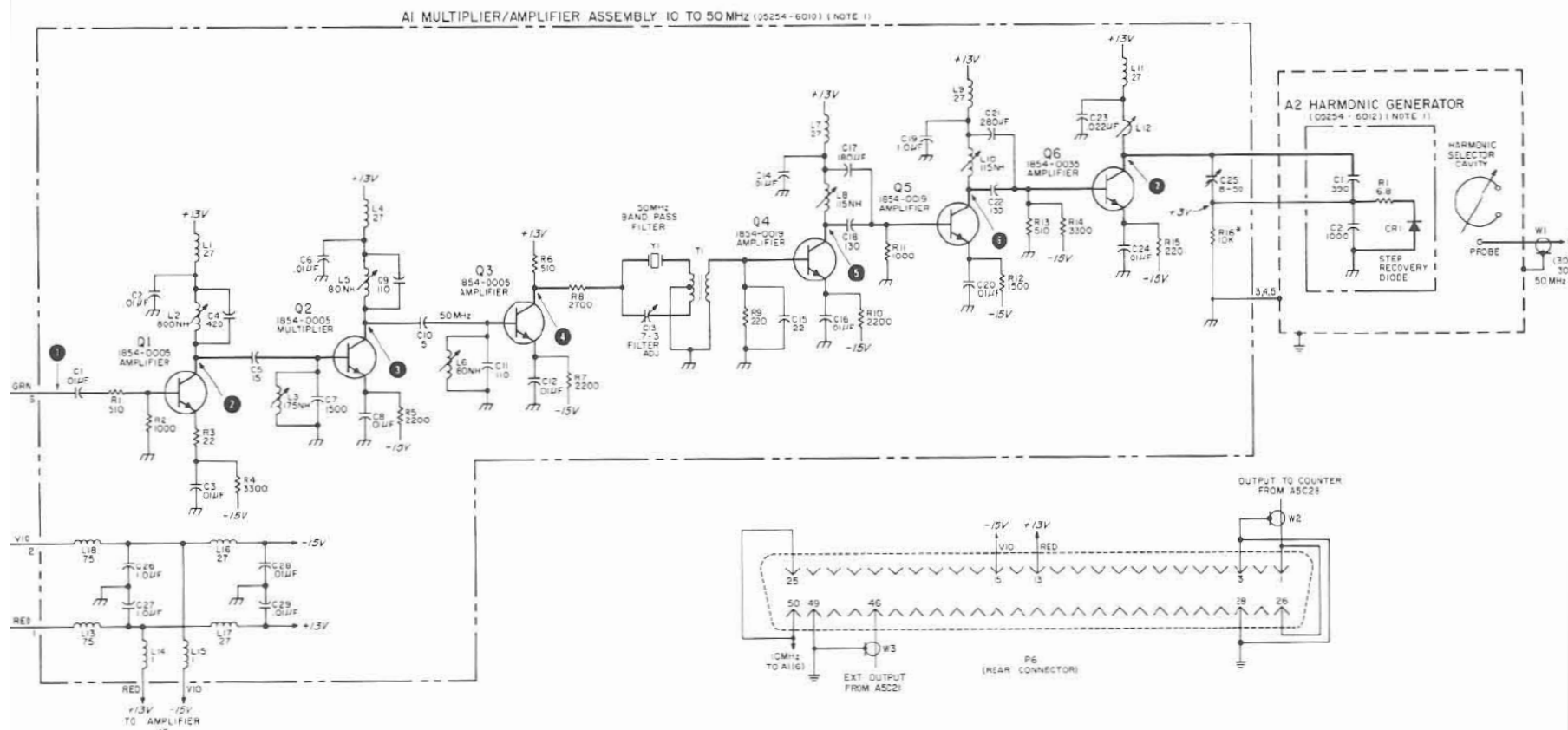


Figure 4-2. Multiplier Amplifier Assembly A1, Harmonic Generator Assembly A2, and Harmonic Selector Cavity, Block Diagram (5254C)

HP 5254A/B/C FREQUENCY CONVERTER – SCHEMATIC



HP 5254A/B/C FREQUENCY CONVERTER – PART LOCATION

