

**HP5065A**  
**10MHz option H10 installation**  
Document version 2.00

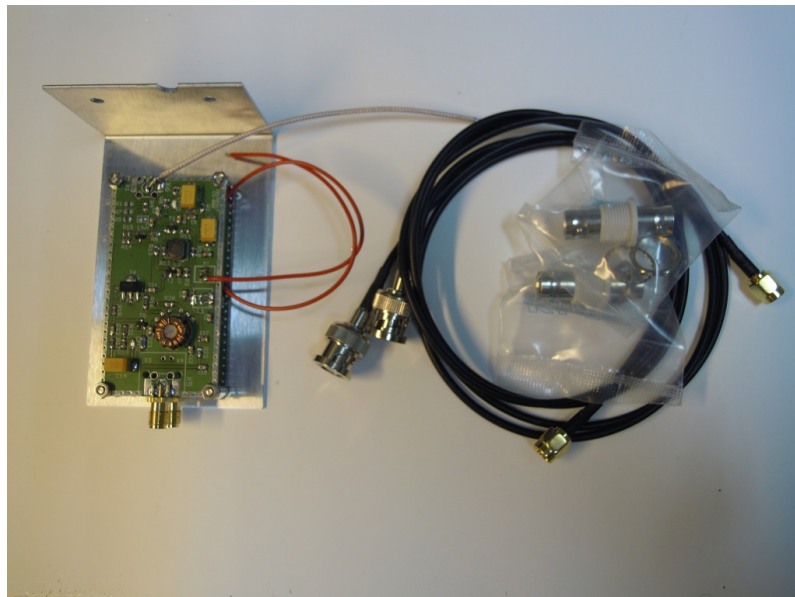
H10 options 1 and 2, allow you to add one or two 10 MHz outputs to an HP5065A rubidium frequency standard.

These options are only applicable to models that are fitted with the HP10811 as the internal OCXO oscillator.

To avoid any external disturbance to the internal OCXO, the Buffer stage requirements must have a very good reverse isolation. The H10 option perform better than 100dB. The output level on a 50 Ohm load is +15dBm as the others outputs.

This option use the internal +20 Volt power already exists on the HP10811 buffer/divider board. The installation, as well as modest mechanical activity needs only three solders.

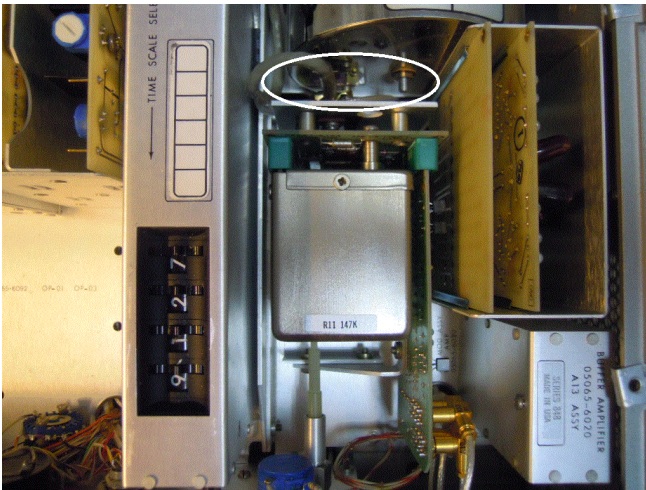
H10-1 option allows you to have a single sinusoidal output at 10 MHz 50 Ohm isolated from GND; the H10-2 provides two independent outputs with the same characteristics. Have 2 outputs allows you to use one for distribution and one for gernal use or tests, these latest without disrupting the other output port.



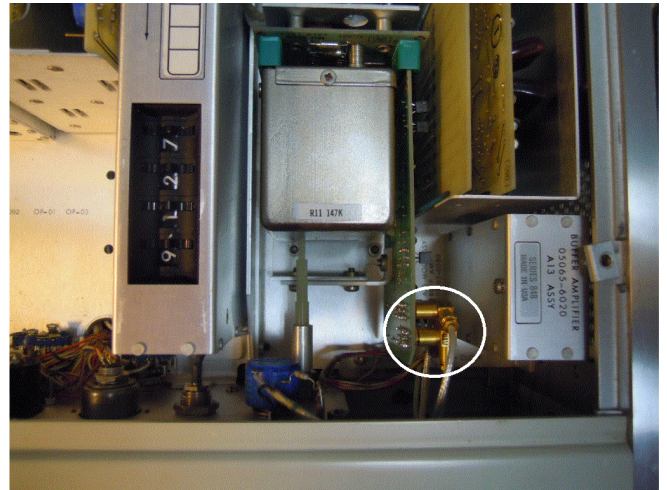
H10-2 kit

## Installation

- First open the top and bottom cover of the HP5065A.
- Unplug J15 (9 Pin), just back the 10811 module, to gain more room during the 10811 assembly removing.
- Disconnect the four coaxial connectors on the buffer/divider board.

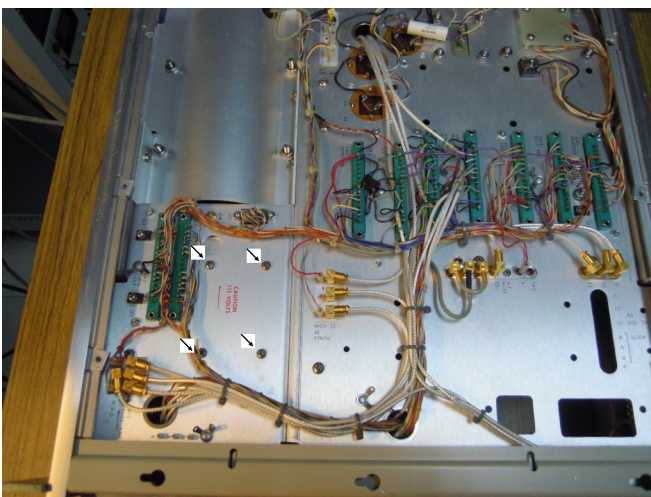


J15 location

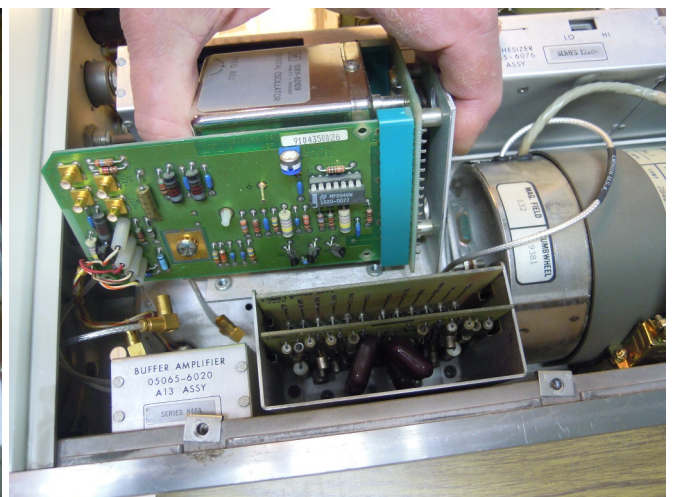


I/O coaxial connectors

- Unscrew the four screws holding the module gently. Take care of the screw driver extension spring loaded used for the Frequency Coarse adjustment.
- Disconnect the four power supply and signal wires from the Buffer Divider board.



Holding screws



Four wire connections



- Remove the two top screw on the top back of the OCXO module and install the mount of the H10 Option, then replace the two screws to hold the option.

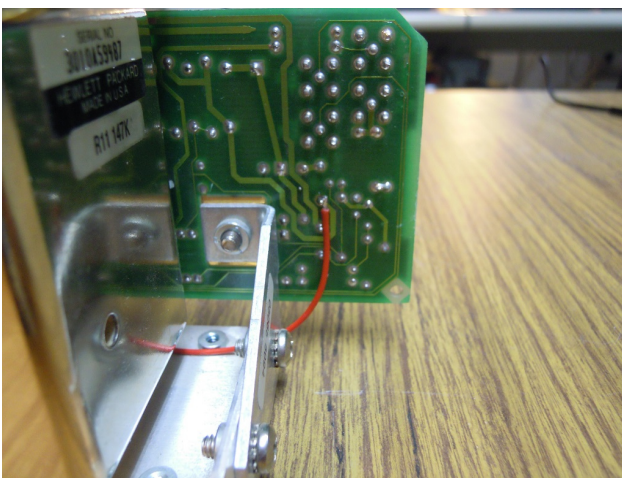


Back view

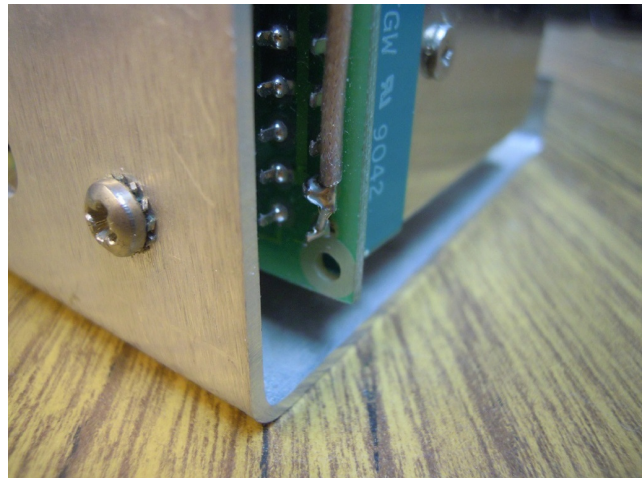


Front view H10-2 version

- Solder the red wire on the Buffer Divider board. Solder side on the back of the +20V pin.
- Solder the coaxial cable on pin 1 (Rf) and 2 (Gnd) of the 10811 socket as in the picture.



+20V connection point

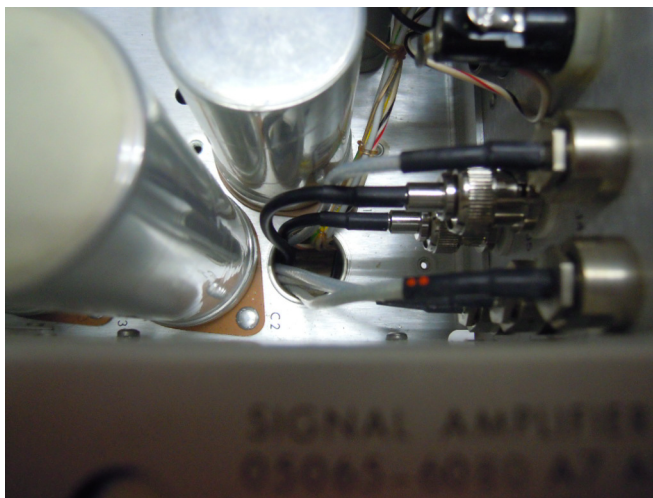


10MHz connection points (pin 1 and 2)

- Mount it back, first wire pins, than the four screw, the coaxial cables and reconnect J15.
- Remove the BNC hole cover from the back panel of the HP5065A and install the insulated BNC-BNC adapter. For the H10-2 option use also the "Sync Input" hole if the clock options is not installed.



H10-2 output connectors



Internal view

- Connect the BNC side of the coaxial cable to the internal side of the adapter and slips into the slot of the chassis the SMA side and the remaining cable.



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- A photograph of the internal components of a radio receiver, showing a metal chassis with various electronic components, including vacuum tubes, capacitors, resistors, and a complex wiring harness. The components are labeled with part numbers and names.

- Connect the SMA connectors to the H10 boards.



## Performance test

After the power on it is possible to do the Level and Harmonic distortion tests.

Note: The option H10 uses two LEDs for polarization control of amplifiers. These Red LEDs will be visible once you have turned on the HP5065A.

- Connect a power meter to the 10MHz output and measure the level have to be +15dBm +/- 1dB. Remove the power meter.
- Set a spectrum analyzer:
  - Ref level +30dBm
  - Start frequency 0MHz
  - Stop frequency 50MHz
- Connect the spectrum analyzer to the 10MHz output, verify the third harmonic is lower than -35dBc (more than 35dB lower of the carrier). Typical value is -40dBc.

Mount back the top and bottom cover. Your 10MHz option is now installed.

Note:

When you dismount and replace the OCXO unit, the frequency coarse adjustment need to be adjusted. This happen because the mechanical actions moves slightly the capacitive trimmer inside the 10811.

After 1 hour from the Power-on, set the fine frequency control on the front panel to 2.50, set the function rotary switch to Control, than adjust the Coarse screw to Zero reading of the meter. This tuning have to be repeated after 24/48 hours from the Power-on.

## Amplifier technical specification

Zin: higher than 1.5k Ohm. 3k Ohm for the H10-1 version  
Zout: 50 Ohm low frequency ground loop isolation  
Gain: 3dB (measured on 50 Ohm input termination)  
Reverse isolation: 100dB or more  
Channel to Channel isolation(H10-2 version): 97dB

### Residual Phase noise:

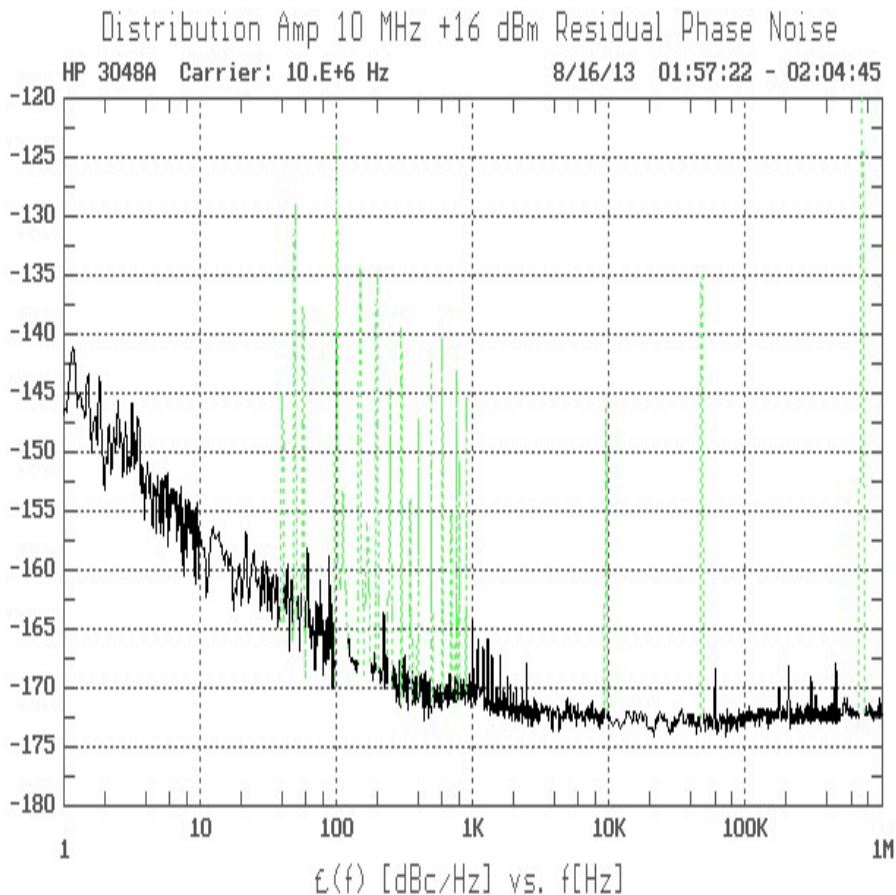
1Hz -145 dB  
10Hz -158 dB  
100Hz -166 dB  
1kHz -170 dB  
10kHz -170 dB  
100kHz -170 dB

Pout: +15 dBm +/- 1db

Power supply: 20V 70mA max. for the H10-1, 140mA max. for the H10-2 version

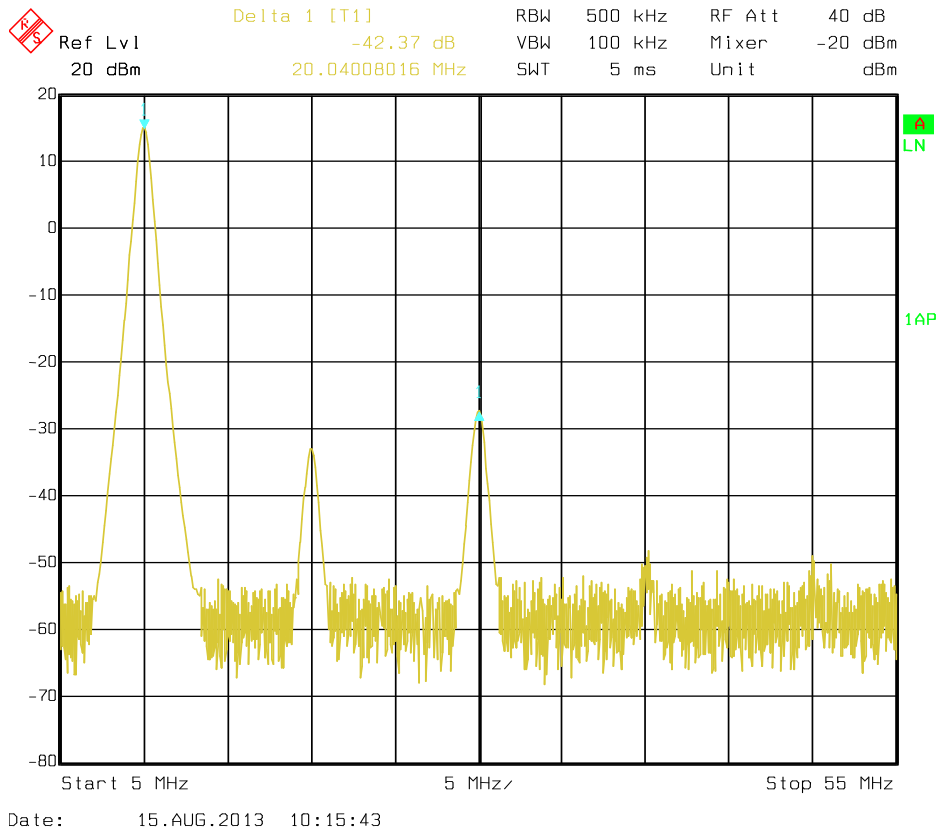
The output can drive load from 50 to infinite Ohm without significant sinewave distortion.

### Typical Residual Phase noise



measured on 50 Ohm input termination

## Residual Harmonic Distortion



measured on 50 Ohm input termination

Note: The Harmonic distortion measured at the H10-1/2 output is the sum of the Residual Distortion of the amplifier and the Harmonic Distortion generated by the 10811.

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