

## E8285A – Version 2.04 Firmware Notes

By Chris Day – ZL1CVD – Oamaru, New Zealand (zl1cvd@gmail.com)

Downgrading the firmware on an E8285A to version 2.04 adds:

- operation below 800MHz - coverage is 400kHz to 1GHz & 1.7GHz to 2.0GHz
- demodulate SSB signals
- demodulate AM signals
- modulate AM signals

Applying this firmware to a E8285A will remove the frequency limitations but calibration below 800MHz will not be correct. Because of this, some RF self tests will fail due to the lack of factory calibration data.

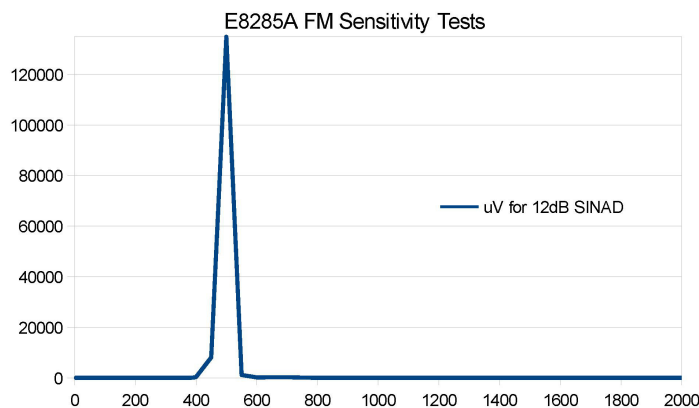
Once this firmware is loaded and applied, there is no going back to the original firmware version.

To confirm calibration is out, I set up an E8285A to measure 12dB SINAD sensitivity across a range of frequencies.

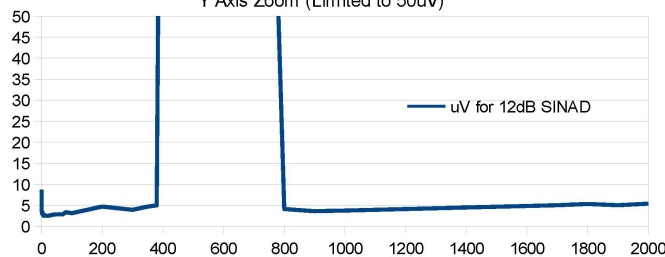
MHz	uV for 12dB SINAD
2000	5.36
1900	5.01
1800	5.30
1700	5.01
1000	3.73
900	3.60
800	4.09
700	243.00
600	191.00
550	1132.00
500	134896.00
450	8093.00
400	360.00
395	205.00
390	108.00
380	4.94
350	4.66
300	3.90
200	4.69
100	3.10
80	3.31
70	2.82
60	2.85
50	2.82
40	2.79
30	2.60
20	2.45
10	2.63
9	2.48
8	2.45
7	2.54
6	2.54
5	2.85
4	3.31
3	2.88
2	3.13
1	3.76
0.4	8.71

E8285A FM Sensitivity Test

Firmware downgraded to v2.04  
Duplex Out connected to Antenna In



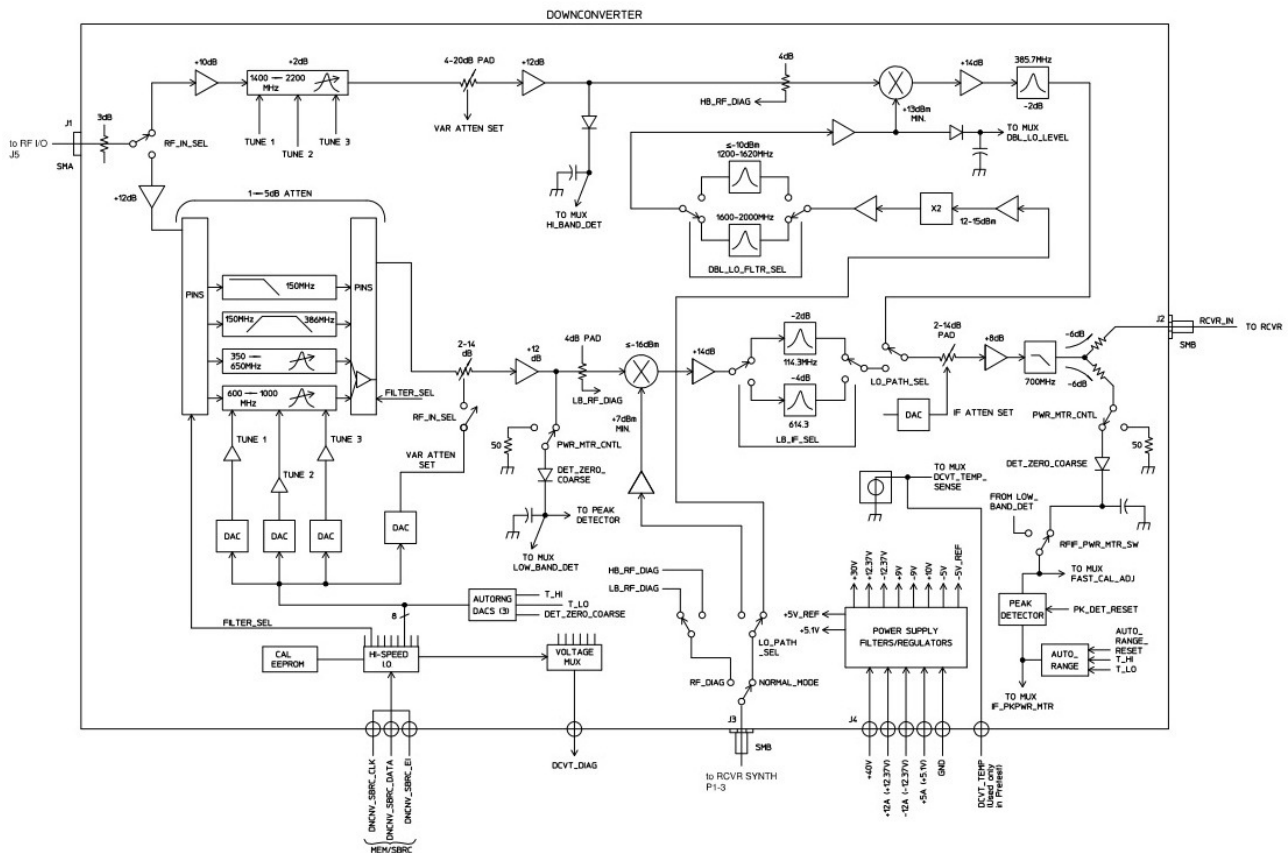
E8285A FM Sensitivity Tests 2  
Y Axis Zoom (Limited to 50uV)



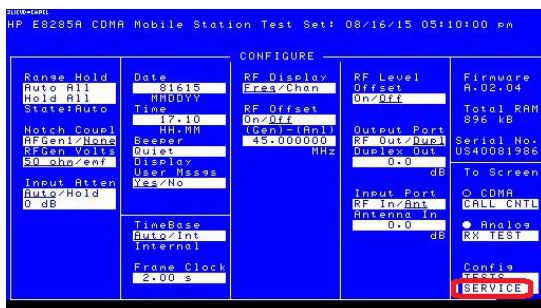
As can be seen, 390~700MHz is way out for this particular analyser. Taking into consideration that HP never intended this particular unit to cover this frequency range and they specifically don't recommend their PIN diode tuned input filters for use below 30~40MHz, the sensitivity is still quite useful. The set is now OK for basic HF, 6m, 2m & 32cm servicing. But what about 70cm?

# Manual Filter Adjustment

I have yet to find any circuit diagrams of the E8285 but on the following page is a block diagram of the down converter taken from the E8285A Assembly Level Repair Guide.



Looking at the diagram we can see 3x DAC's controlling the voltage to PIN diodes in the input filter – TUNE 1, TUNE 2 & TUNE 3. The E8285A supports a service screen which allows the user to manually adjust specific register values. It is primarily used by service personal to fault find the equipment. To enter that screen press the **Config** button in the **Utilities** button group toward the top right of the front panel.



Select the **Service** screen option...

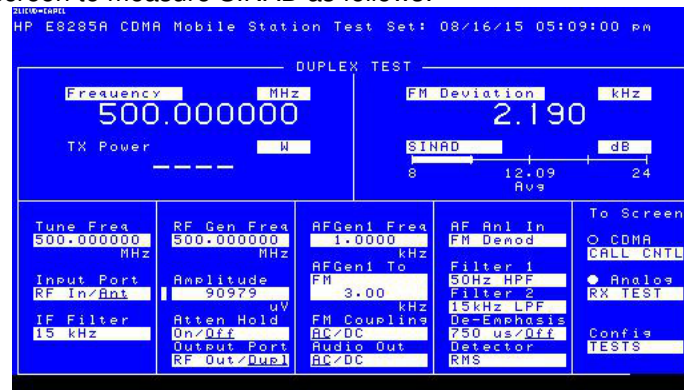


The **Service** screen is displayed..

- In the **Module** field, select DownConverter
- In the **Latch** field, select dcvt\_filter\_3\_tune, dcvt\_filter\_2\_tune or dcvt\_filter\_1\_tune
- Adjust the **Value** field, to adjust the DAC value which in turn adjusts the voltage on the PIN diode.

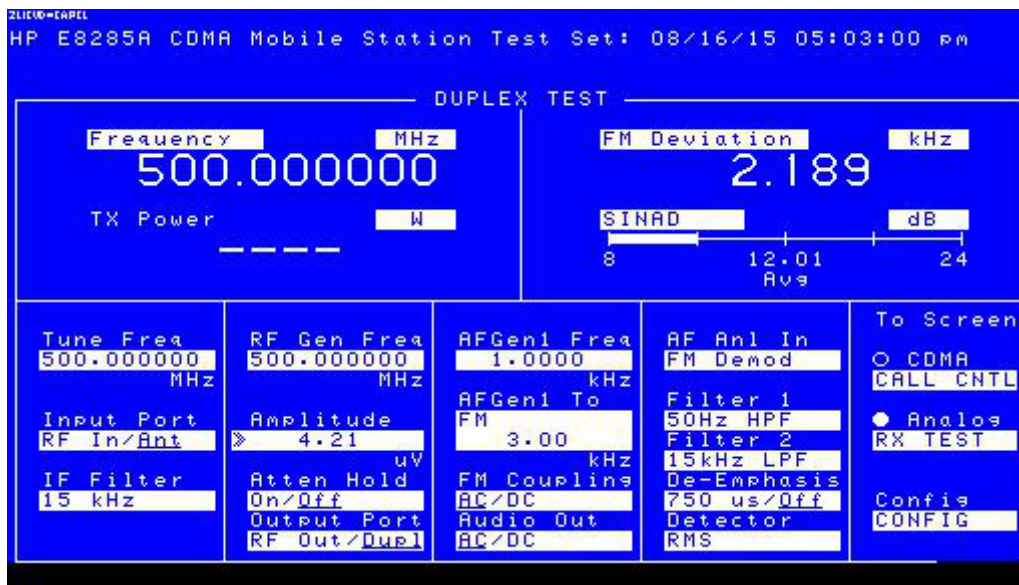
## Measuring SINAD

I used the **Duplex Test** screen to measure SINAD as follows:



- As you can see, at 500MHz, its a woeful 90979uV for 12dB SINAD. Note when making SINAD or any other measurements that vary a bit, it makes life easier to average the meter readings.
- I then reduced the output level to the point where the squelch just opens.
- Navigate to the **service** screen and start adjusting dcvt\_filter\_3\_tune until you can hear the signal become clear.
- When you can't hear any more improvement, go back to the Duplex Test screen and further reduce the RF generator amplitude.
- Keep repeating this until you can't hear any improvements with dcvt\_filter\_3\_tune.
- Repeat the process for dcvt\_filter\_2\_tune and then dcvt\_filter\_1\_tune.

After a while, I managed to get 4.21uV sensitivity at 500MHz for 12dB SINAD.

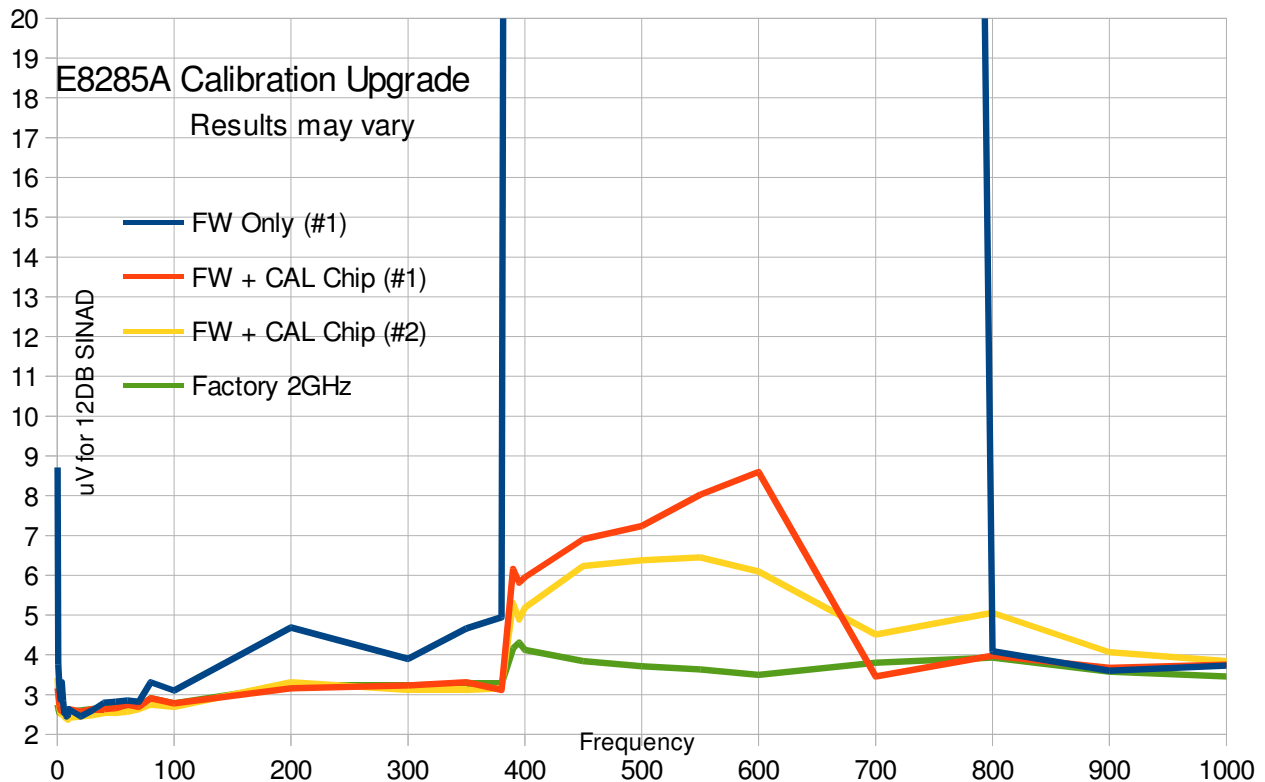


Now record the value for 500MHz and when you need to use the analyser at that frequency again, re-enter the value into the service screen.

The Calibration data for the down converter (DAC filter values for TUNE 1, TUNE 2 & TUNE 3 at various frequencies) is created at time of manufacture and stored in U304 (Xicor X25128 128K serial E2PROM).

## Calibration Chip Replacement

A generic U304 replacement is now available. It will not give a perfectly flat response like a factory calibrated down-converter. But it is a huge improvement. The following shows the responses I measured for a number of different down-converters.



- **Blue trace** – Down-converter #1, from 800MHz up E8285, response with original U304.
- **Orange trace** - Down-converter #1, from 800MHz up E8285, response with U304 replaced.
- **Yellow trace** - Down-converter #2, from 800MHz up E8285, response with U304 replaced.
- **Green trace** - Down-converter #3 measured response of factory calibrated 40MHz up E8285

## Ordering Information

The following limited stock is available:

- US\$ 50.00 - 1x pre-programmed Xicor X25128 128K serial E2PROM
- US\$ 130.00 - 2x PCMCIA Cards (E8285A Version 2.04 Firmware)
- All payments and refunds by PayPal
- Buyer responsible for all freight – depending on parcel size & weight outgoing freight charges are from US\$13 standard 10 to 25 day not tracked air mail by NZ Post. EMS courier is also available which is tracked.
- Email your requirements to: [zl1cvd@gmail.com](mailto:zl1cvd@gmail.com)

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