250W PA for DATV via QO-100

level adjustment

One of the most important jobs with this PA is the level plan and the resulting adjustments. After a few failed attempts, a working configuration was finally found:

SSB operation

desired output power … +37dBm (5 Watt)

gain PA = +31dB

required driver power of PA … +6dBm (4 mW)

Preamplifier CN0417 = +20dB

Bias-T decoupling = -2dB

required power at PA box input … -12dBm

cable attenuation = -30dB

required power in shack … +18dBm, with reserve +20dBm (100 mW)

Attenuator = -15dB

Power at the output of the Amsat-DL upconverter … +35 dBm (3,2 Watt)

this power can be generated very well with the UpConv from Amsat-DL and you still have a small control range and sufficient reserves.

DATV operation

desired output power … +47dBm (50 Watt)

Amplification PA = +31dB

required driver power of PA … +16dBm (40 mW)

Preamplifier CN0417 = +20dB

Bias-T decoupling = -2dB

required power at PA box input … -2dBm

cable attenuation = -30dB

required power in shack … +28dBm, with reserve +30dBm (1 W)

this power can be generated very well with a second UpConv from Amsat-DL. With this second Upconverter I removed the input attenuator. Its pass-through gain is then so large that it can be driven directly by the Pluto without any further preamplifier. The Pluto transmits on 1290 MHz and the upconverter outputs the amplified signal on 2.4 GHz.

Of course one could transmit with the Pluto also directly on 2.4 GHz. However, the effort by using the Amsat-DL upconverter is much lower, because here already all amplifiers and especially filters are available.