

Test of IC7300 under low voltage operation nominally 11.9V at supply and using a standard power cable supplied.

Power supply was set to 11.9V and receive current measured at 0.850 A. enabling NR and AN functions did not cause any noticeable long term changes in the receive current.

Measured RF Power using my Revex power meter as the reference. Output power was measured firstly in RTTY both at a set level to provide 100W on the lower bands and also at 100% RF which provides about 130W on 80Mtrs and then in SSB using the meters PeP function. Yes agree I need better test equipment.

Frequency	RTTW 11.9V	Total I 11.9V	PEP 11.9V	100% RF 13.8V	Tot I 13.8V	
1.8	100W	16A	90W	120W	17A	
3.6	100W	16A	90W	130W	18A	
7.2	95W	17A	80W	125W	19A	
14.2	90W	17A	80W	120W	19A	
21.1	80W	17A	70W	110W	19A	
28.6	80W	16A	70W	110W	18A	
52.1	80W	14A	70W	105W	18A	

Receiver testing, as expected there was no meaningful change in receiver performance at 11.9V with tests for 10db Signal to Signal + Noise. Not using preamps. (Standard Receiver configuration)

Band	11.9V	13.8V
3.600Mhz LSB	-115dbm	-115dbm
7.200Mhz LSB	-115dbm	-115dbm
14.200Mhz USB	-117dbm	-117dbm
28.550Mhz USB	-116dbm	-116dbm
52.100Mhz USB	-115dbm	-115dbm

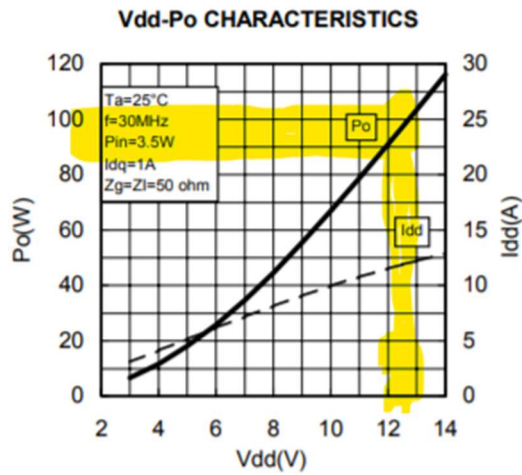
The S meter units where tested against a serries run late last year for comparison slight variation odd db or so is not unexpected given the hysteresis of the S meter function and rounding to whole db units, I will leave arguing over decimal portions of a db to marketing.

S Units	14.2Mhz 11.9V	14.2Mhz 13.8V	28.550Mhz 11.9V	28.600Mhz 13.8V
S1	-96dbm	-97dbm	-94dbm	-95dbm
S2	-93dbm	-94dbm	-92dbm	-92dbm
S3	-91dbm	-91dbm	-89dbm	-89dbm
S4	-88dbm	-88dbm	-86dbm	-87dbm
S5	-85dbm	-85dbm	-83dbm	-84dbm
S6	-82dbm	-82dbm	-70dbm	-81dbm
S7	-78dbm	-79dbm	-77dbm	-77dbm
S8	-75dbm	-76dbm	-74dbm	-74dbm
S9	-72dbm	72dbm	-71dbm	-71dbm
S9+10	-53dbm	-52dbm	-51dbm	-52dbm

It should be noted that the only use of supply volts in the receive path is for the bypassing of the preamp element and Attenuator and TX-RX switching using diodes on the RF unit.

Conclusion.

Whilst there is a tangible reduction in Full Power RF output which of course could be improved with consideration given to voltage drop on the DC power cable as the lower supply voltage makes any voltage drop that much more important to manage. Looking at the RD70HHF1 power out vs Vdd observed differences in output verses supply tend to agree with what it observed in practice. Not saying these are absolutes just observed trends. The other observation is a trend in lowering output power as the operating frequency increases which is again a normal operation mode and again not that much of an issue. Operating the transceiver with RF % set to 50W on 6mtrs and RF% set to 70W on HF worked very well so operating inside of that power envelope would be also satisfactory.



RF output power versus supply voltage for the PA transistors.

see <https://www.mitsubishielectric-mesh.com/products/pdf/rd70hhf1.pdf>

However in a very practical way there is probably negligible difference being in the order of only 1 db or so down in power towards the higher frequency bands.