U600 series of
70MHz and/or 140MHz to X-band Upconverters

INPUT SPECIFICATION		Options
1. Frequency range:	70MHz, 140MHz or 70MHz plus 140MHz	(see model table)
	IF B/W: ±20MHz, ±40MHz (other values available)	
2. Connector:	BNC	
3. Impedance:	50Ω	
4. Return loss:	≥15dB	

OUTPUT SPECIFICATION		
5. Frequency range:	7 to 9GHz	
	in bands of 500MHz to 2GHz	(see model table)
6. Connector:	N-type	
7. Impedance:	50Ω	
8. Return loss:	≥20dB	
9. 1dB compression point:	+10dBm	
10. Third order intercept::	+20dBm	

TRANSFER CHARACTERISTICS		
11. Gain:	0 to 30dB, adjustable in 0.1dB steps	
12. Gain ripple: over ±20MHz:	≤1dB p.t.p.	
over output band, 1GHz:	≤3dB p.t.p	
over output band, 2GHz:	≤4dB p.t.p	
13. Group delay distortion: ripple, ±20MHz	<2ns ptp	
linear, ±20MHz	<0.03ns/MHz	
parabolic, ±20MHz	$<0.01ns/MHz^2$	
14. Gain stability, 0°C to 50°C:	±1dB	
24hr. at constant temperature:	±0.1dB	
15. Frequency stability, 0°C to +50°C:	5×10^{-8}	
16. External reference:	10MHz, 0dBm	5MHz, 0dBm
17. Synthesiser step size:	1kHz	
18. Noise figure (full gain):	<20dB	

Spurii	
19. Image rejection:	> 60dB
20. In-band spurii (at 0dBm output):	< -60dBc typical [1]

PHASE NOISE	
21. 10Hz:	<-45dBc/Hz
22. 100Hz:	<-70dBc/Hz
23. 1kHz:	<-80dBc/Hz
24. 10kHz:	<-85dBc/Hz
25. 100kHz:	<-95dBc/Hz
26. 1MHz:	<-110dBc/Hz
27. Mains related:	<-60dBc

MISCELLANEOUS		
28. Power supply:	115V/230V ±10%	
	50/60Hz ±10%, 40VA	
29. Mechanical:	1U 19" frame, 400, 500 or 520mm deep (depends on model)	
30. Temperature: Operating:	0° to 50°C	
Storage:	-40° to 85°C	
31. Relative humidity: Operating:	0 to 90%	
Storage:	0 to 95%	
32. Summary alarm:	NO and NC dry relay contacts via rear mounted connector	
33. Summary alarm indication:	Front panel LED	
34. Remote control:	● RS232 or RS422/RS485, connector D-type 9P F	
	● Serial emulation over TCP/IP, connector RJ45	
	● SNMP and HTTP over TCP/IP Ethernet, connector RJ45	

[1] Measured at maximum gain.

MODEL TABLE ^(a)

MODEL TABLE (a)

Model	Input (c)	Output
U651-1	70 ± 20MHz	7.9 - 8.4GHz (b)
U651-2	70 ± 20MHz	8.4 - 8.5GHz (b)
U656-1	140 ± 40MHz	7.9 - 8.4GHz (b)
U656-2	140 ± 40MHz	8.4 - 8.5GHz (b)
U671-1	70 ± 20MHz plus 140 ± 40MHz (d)	7.9 - 8.4GHz (b)
U671-2	70 ± 20MHz plus 140 ± 40MHz (d)	8.4 - 8.5GHz (b)

(a) This specification covers ALL frequency agile upconverters with 70MHz and/or 140MHz IF and RF output from 7GHz to 9GHz. This table lists ONLY more common models.
Consult out office for other models configurations.

(b) Output frequencies are an illustrative sample.
Any other values from 7GHz to 9GHz, in 50MHz steps, are possible.
RF coverage different from 500MHz or 1GHz is also possible.

(c) Other input IF and bandwidths possible.

(d) IF input selectable via front panel and remote interface.

NOTE

All Novella's frequency converter synthesisers are of the conventional phase-locked type. No DDS techniques or ICs are used. DDS synthesisers suffer from an inherent phase uncertainty (due to the inevitable residual frequency error) rendering them unsuitable for differential phase measurements used typically in satellite ranging and monopulse tracking systems which rely on differential phase measurements between two coherent signals processed by two downlink chains.

Design and manufacture of Satellite Earth Station RF equipment