



## STA1340 Series, 400 W, Ku-Band, Antenna Mount TWTA

The STA1340 range of Ku-Band TWT provide over 350 W of output power in a compact, lightweight, rugged, weatherproof, antenna mount enclosure. The advanced packaging and cooling techniques (Stellar Cool™, patent pending) enable the unit to operate in extreme environmental conditions from direct rain to direct sunlight. The amplifiers can be simply deployed anywhere in the world, are user-friendly, and incorporate a comprehensive remote control facility as standard, including RS485 and Ethernet options.

The HPA incorporates a high efficiency multi-collector TWT powered by an advanced power supply built on over 30 years of experience in the design and manufacture of satellite amplifiers. The company's products have an enviable reputation for performance, robust quality and reliable service.

The STA1340 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

### OPTIONS

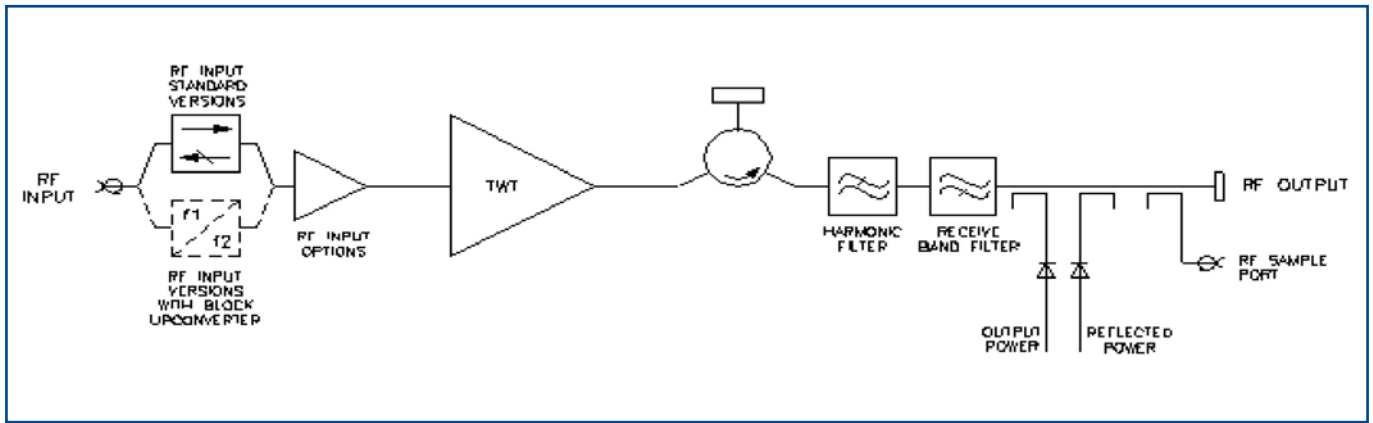
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### FEATURES

- Advanced cooling design (Stellar Cool™, patent pending) enables operation at +55 °C and in direct sunlight.
- Weatherproof antenna mount construction allows exposed mounting.

- CE compliant.
- cETLus listed.
- CB certified.
- Wide input voltage range – can operate from mains supplies worldwide.
- Redundant control – contains control and drive circuits for 1:1 redundancy.
- Stand-alone setting – automatically sequences to transmit mode.
- Round-the-clock hotline support.
- Wide range of accessories including: controllers, waveguide networks, cable assemblies.

**BLOCK DIAGRAM**



**PERFORMANCE** (Without Upconverter)

Frequency range:			
standard – KU1	13.75 to 14.5	GHz	
extended – KU2	12.75 to 14.5	GHz	
Output power:			
TWT output flange	400	W min	
HPA rated output	350	W min	
Gain:			
at rated power (C option)	45	dB min	
at rated power (A, D, Z option)	70	dB min	
SSG $P_{rated}$ –10 dB (C option)	50	dB min	
SSG $P_{rated}$ –10 dB (A, D, Z option)	75	dB min	
Attenuation range (D, Z option)	25	dB min	
Gain variation:			
full band	2.5	dB max	
over any 80 MHz band	1.0	dB max	
slope	0.08	dB/MHz max	
Gain stability 24hrs (constant drive, temperature and load)	0.5	dB max	
Gain stability over full operating temperature	2.0	dB max	
Intermodulation (two equal carriers) with total output = $P_{rated}$ –4 dB:			
options A, D	-18 dBc	max	
performance with linearised option, Z	-24 dBc	max	
Harmonic output	-60 dBc	max	
AM to PM conversion at $P_{rated}$ –6 dB	2.5	%/dB	
Noise power:			
transmit band	-70	dBW/4 kHz max	
receive band			
10.95 – 12.75 GHz - standard	-150	dBW/4 kHz max	
10.70 – 11.70 GHz - extended	-150	dBW/4 kHz max	
Residual AM:			
<10 kHz	-50	dBc max	
10 kHz < f < 500 kHz	-20(1.5+log f)	dBc max	
>500 kHz	-85	dBc max	
Group delay:			
linear	0.01	ns/MHz	
parabolic	0.005	ns/MHz <sup>2</sup>	
ripple	0.5	ns p-p	
Phase noise:			
continuous	10 dB lower than IESS phase noise profile		
AC fundamental	-50	dBc	
sum of all spurs	-47	dBc	
Input VSWR (operating)	1.3:1	max	
Output VSWR (non-operating)	1.3:1	max	
Load VSWR, no damage	2.0:1	max	

Frequency	47 to 63	Hz
Power requirement	1500 VA	max
Power factor	0.95	min

**MECHANICAL**

Weight	25.0 kg (55 lb)	typ
Dimensions	see outline	
Cooling	integral forced-air	

**CONNECTORS**

RF input	N-type female
RF output	PBR120 with 6-32 UNC 2B threaded holes
RF sample port	N-type female
Prime power	ITT Cannon - CGL02A20-3P-E1B-B
Control interface	62GB-12E-2041-PN

**Note:** Mating connectors for the mains supply and control interface are supplied.

**ENVIRONMENTAL**

For operation outside these parameters, refer to Spacepath Communications for guidance.

Operating temperature (see note 1)	-40 to +55	°C
Derating	2 °C/300 m above sea level (3.6 °F/1000 ft)	
Solar gain	1120	W/m <sup>2</sup>
Storage temperature	-40 to +80	°C
Relative humidity (condensing)	100	%
Altitude:		
operating	4.5 km (15,000 ft)	max
non-operating	12 km (40,000 ft)	max
Vibration	BS EN 60068-2-64 test Fh, Transportation	
Shock	IEC Publication 68-2-27 Part 2 Test Ea, 25 g	
EMC:		
EN61000-6-3:2001 (Emissions)		
EN61000-6-2:2001 (Immunity)		
FCC CFR47 Part 15B		

**CE CERTIFIED**

EMC Directive 89/336/EEC, Low Voltage Directive 73/23/EEC.

**NOTES**

- +55 °C applies when the input supply voltage is between 180 and 265 V. Below 180 V, the maximum operating temperature is +50 °C.
- Safety applies for operating altitude up

**ELECTRICAL**

Prime power	single phase, line-neutral or line-line
Voltage	99 to 265 V

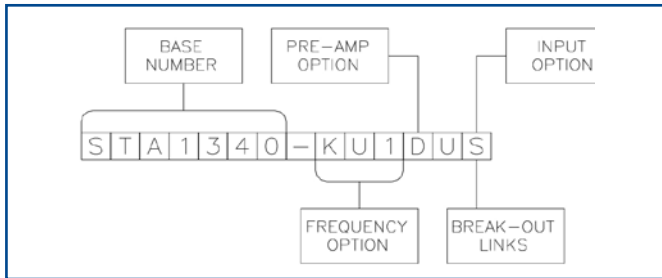
## CONTROLS

TYPE	FUNCTION	
REMOTE CONTROL	Off Standby Transmit RF Inhibit	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)
REMOTE STATUS/MONITOR	Off Warm-Up Standby Transmit Fault Summary Reflected Power External Interlock TWT Too Hot Mean Helix Current Peak Helix Current High Power Alarm* Low Power Alarm*	Output Power Monitor* Reflected Power Monitor* Helix Current Monitor* Helix Voltage* Collector Voltages* Heater Voltage* Heater Current* Elapsed Hours*
INTERFACES: Serial User	RS-422/485 Dry Relay Contact	
Other Features	Auxiliary Output Voltage Redundant system & waveguide switch drive 'Stand Alone' setting for automatic power-up	

**Note:** Controls/Monitoring marked\* are only available via Serial Interface.

### OPTIONS

Extensive options are offered with the STA1340 and include: integral pre-amplifiers, gain control, linearisers and block upconverters. The options are defined by adding to the base number as shown below:



(Consult Spacepath Communications for availability of options).

### Frequency Options

The STA1340 is offered in two frequency bands:

KU1 - 13.75 – 14.50 GHz

KU2 - 12.75 – 14.50 GHz

KU3 - 14.00 – 14.50 GHz (upconverter option only)

### Pre-Amp Option

The pre-amp option can be selected from any of the following:

- C - No pre-amp (typical SSG 52 dB).
- A - Integral solid-state amplifier (typical SSG 78 dB).
- D - As option 'A' but includes an attenuator to provide 25 dB (min.) of gain control.
- Z - Integral lineariser that improves the linearity of the HPA, providing a C/I of typically -26 dBc at 4 dB OPBO. The lineariser also incorporates the pre-amp and gain control options. (Consult Spacepath Communications for availability).

### Input Option

The STA1340 can be offered with an L-Band Block Upconverter. Specify:

N - Standard RF

U - L – Ku-Band Block Upconverter (see page 4)

**Note:** the upconverter requires the inclusion of either the 'D' or 'Z' options. (Consult Spacepath Communications for availability).

### Break-Out Links

Available only with the upconverter option, this enables bypassing of the upconverter and can be used for monitoring, set-up, redundant switching etc. Specify 'S' for Break-Out Links (leave blank if not required).

### ACCESSORIES

The STA1340 is supplied with an operation manual, prime power connector mating part, interface connector mating part and air cowls. Additional accessories include:

- **N6080 Override Controller**  
Provides automatic power-up for 'emergency' situations.
- **N6143 1:1 Control Unit**  
Provides control of 2 HPA's in 1:1 switch configuration. (The waveguide switch network can also be supplied). Refer to data sheet A1A-N6143.
- **Cable Assemblies**  
For connecting STA1340 to controllers and waveguide switches. Refer to data sheet A1A-Stellar\_Cables.
- **DAS563750AA**  
Additional mains connector parts.
- **DAS563751AA**  
Additional interface connector parts.

For more information on accessories, contact Spacepath Communications.

**PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER**

Output frequency range:		
option KU1 .....	13.75 to 14.5	GHz
option KU3 .....	14.0 to 14.5	GHz
L-band input:		
frequency range option KU1 .....	950 to 1700	MHz
frequency range option KU3 .....	950 to 1450	MHz
level .....	10 dBm	max
LO frequency:		
option KU1 .....	12.8	GHz
option KU3 .....	13.05	GHz
External reference (see note):		
frequency .....	10 MHz	
level .....	-3 to +7	dBm
impedance .....	50	$\Omega$
Output power:		
TWT output flange .....	400	W min
HPA rated output .....	350	W min
Gain:		
at rated power (D, Z option) .....	70	dB min
SSG $P_{rated} - 10$ dB (D, Z option) .....	75	dB min
Attenuation range (D, Z option) .....	25	dB min
Gain variation:		
full band .....	4.0	dB max
over any 40 MHz band .....	1.5	dB max
slope .....	0.08	dB/MHz max
Gain stability 24hrs (constant drive, temperature and load).....	0.5	dB max
Gain stability over full operating temperature.....	2.0	dB max
Intermodulation (two equal carriers) with total output = $P_{rated} - 4$ dB:		
options C, A, D .....	-18	dBc max
performance with linearised option, Z .....	-24	dBc max
Harmonic output .....	-60	dBc max
AM to PM conversion at $P_{rated} - 6$ dB .....	2.5	%/dB
Noise power:		
transmit band .....	-70	dBW/4 kHz max
receive band (10.95 – 12.75 GHz) .....	-150	dBW/4 kHz max

Residual AM >100 kHz from carrier .....	-60	dBc max
Group delay:		
linear .....	0.01	ns/MHz
parabolic .....	0.005	ns/MHz <sup>2</sup>
ripple .....	0.5 ns p-p	
Phase noise:		
Continuous .....	meets IESS phase noise profile	
AC fundamental .....	-50	dBc
Sum of all spurs .....	-47	dBc
Input VSWR (non-operating) .....	1.6:1	max
Output VSWR (non-operating) .....	1.3:1	max
Load VSWR, no damage .....	2.0:1	max

**Note:** the BUC can be operated without the external reference, typical frequency stability  $\pm 0.25$  ppm.

**HEALTH AND SAFETY HAZARDS**

Stellar satellite amplifiers are safe to handle and operate provided that the relevant precautions are observed. Spacepath Communications does not accept responsibility for damage or injury resulting from the use of electronic devices it produces.

**High Voltage**

Dangerous voltages are present within the TWT amplifier when operating normally. However, the equipment is designed so that personnel cannot come into contact with high voltage circuits unless covers are removed.

**RF Radiation**

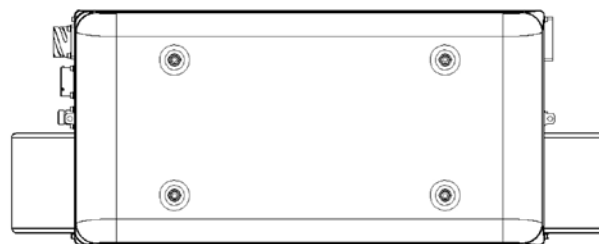
All RF connectors must be correctly fitted before operation.

**Beryllia**

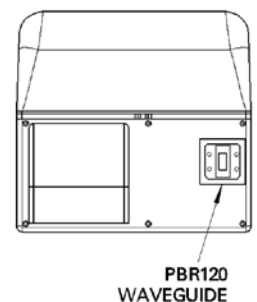
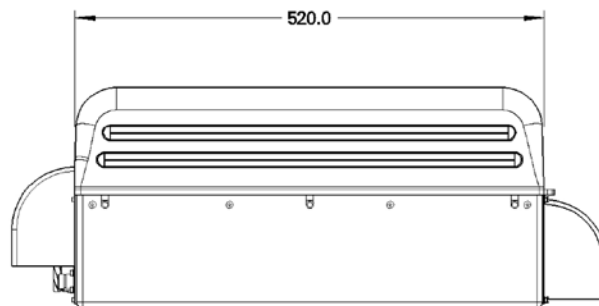
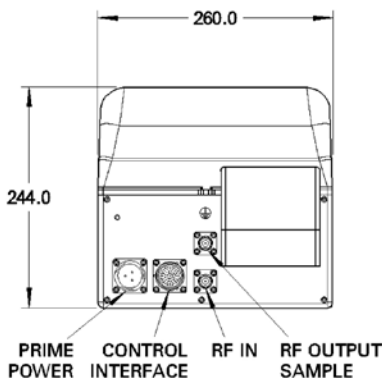
The TWT in the amplifier contains beryllium oxide ceramic parts. These are not accessible unless the TWT casing is damaged. Consult Spacepath Communications regarding the disposal of damaged or life-expired tubes.

**OUTLINE**

8230A



**Packed Gross Weight & Dimension**  
30.00kg 70x42x51cm



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