



## STA1240 Series, 400 W, X-Band, Antenna Mount TWTA

The STA1240 range of X-Band TWT amplifiers from Spacepath Communications provide over 350W 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 STA1240 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

### OPTIONS

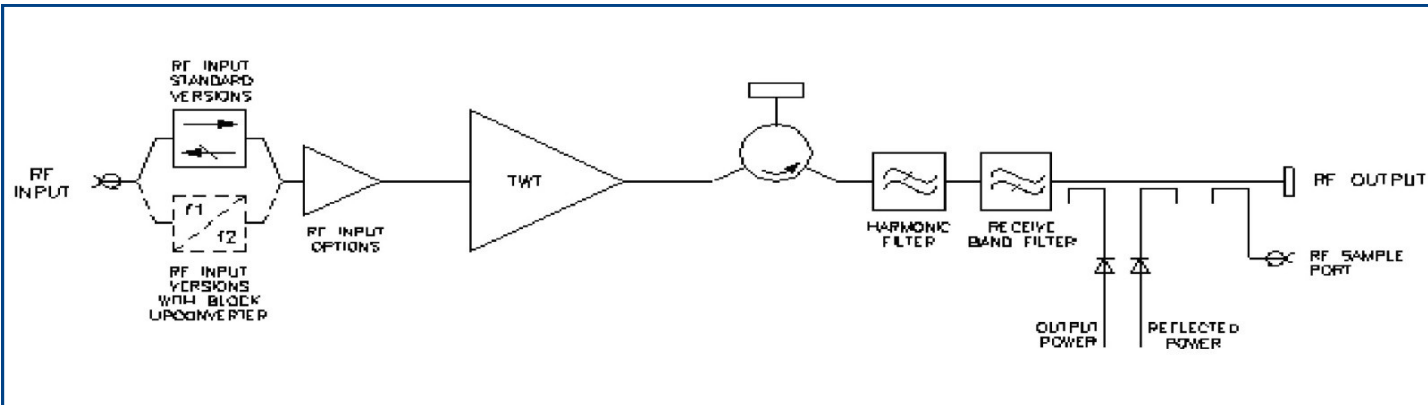
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### 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 (XX1)	7.9 to 8.4
Output power:	
TWT output flange	400
HPA rated output	350
Gain:	
at rated power (C option)	45
at rated power (A, D, Z option)	70
SSG $P_{rated}$ -10 dB (C option)	50
SSG $P_{rated}$ -10 dB (A, D, Z option)	75
Attenuation range (D, Z option)	25
Gain variation:	
full band	2.5
over any 40 MHz band	1.0
slope	0.08
Gain stability 24hrs (constant drive, temperature and load)	0.5
Gain stability over full operating temperature	2.0
Intermodulation (two equal carriers) with total output = $P_{rated}$ -4 dB:	
options A, D	-18
performance with linearised option, Z	-24
Harmonic output	-60
AM to PM conversion at $P_{rated}$ -6 dB	2.5
Noise power:	
transmit band	-70 dBW/4 kHz max
receive band (7.25 – 7.75 GHz)	-70 dBW/4 kHz max
Residual AM:	
<10 kHz	-50
10 kHz < f < 500 kHz	-20(1.5+log f)
>500 kHz	-85
Group delay:	
linear	0.01
parabolic	0.005
ripple	0.5
Phase noise:	
continuous	10 dB lower than IESS phase noise profile
AC fundamental	-50
sum of all spurs	-47
Input VSWR (operating)	1.3:1
Output VSWR (non-operating)	1.3:1
Load VSWR, no damage	2.0:1

### ELECTRICAL

Prime power	single phase, line-neutral or line-line
Voltage	99 to 265 V
Frequency	47 to 63 Hz
Power requirement	1500 VA max
Power factor	0.95 min

### MECHANICAL

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

### CONNECTORS

dB min	RF input	N-type female
dB min	RF output	CPR112G with 8-32 UNF threaded holes
dB min	RF sample port	N-type female
dB min	Prime power	TT Cannon - CGL02A20-3P-E1B-B
dB min	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	
dB max	Communications for guidance.	
dB max	Operating temperature .....	-40 to +55 °C
ated -4 dB:	Derating .....	2°C/300 m above sea level
dBc max	(3.6 °F/1000 ft)	
dBc max	Solar gain .....	1120 W/m <sup>2</sup>
dBc max	Storage temperature .....	-40 to +80 °C
°dB	Relative humidity (condensing) .....	100 %
	Altitude:	
W/4 kHz max	operating .....	4.5 km (15,000 ft) max
W/4 kHz max	non-operating .....	12 km (40,000 ft) max
	Vibration .....	BS EN 60068-2-64 test Fh, Transportation
dBc max	Shock .....	IEC Publication 68-2-27 Part 2 Test Ea, 25 g
dBc max	EMC:	
dBc max	EN61000-6-3:2001 (Emissions)	
	EN61000-6-2:2001 (Immunity)	
ns/MHz	FCC CFR47 Part 15B	
ns/MHz <sup>2</sup>		
ns p-p	<b>CE CERTIFIED</b>	

### CE CERTIFIED

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

**Note:** Safety applies for operating altitude up to 2000 m.

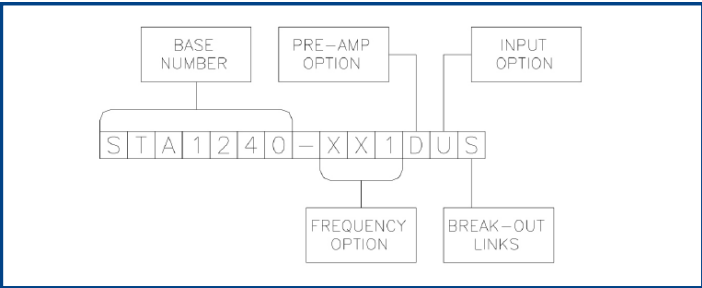
CONTROLS

Type	Function
REMOTE CONTROL	Off Standby Transmit RF inhibit
REMOTE STATUS/MONITOR	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)  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*
INTERFACES	RS-422/485, Optional Ethernet 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 STA1240 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 STA1240 is offered in one frequency band:  
XX1 - 7.9 – 8.4 GHz

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.

Input Option

The STA1240 can be offered with an L-Band Block Upconverter. Specify:  
N - Standard RF  
U - L – X-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 STA1240 is supplied with an operation manual, prime power connector mating part, interface connector mating part and air cowl. 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 STA1240 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 .....	7.9 to 8.4
L-band input:	
frequency range .....	950 to 1450
level .....	10
LO frequency .....	6.95
External reference (see note):	
frequency .....	10
level .....	-3 to +7
impedance .....	50
Output power:	
TWT output flange .....	400
HPA rated output .....	350
Gain:	
at rated power (D, Z option) .....	70
SSG Prated -10 dB (D, Z option) .....	75
Attenuation range (D, Z option) .....	25
Gain variation:	
full band .....	4.0
over any 40 MHz band .....	1.5
slope .....	0.08
Gain stability 24hrs (constant drive, temperature and load).....	0.5
Gain stability over full operating temperature...	2.0
Intermodulation (two equal carriers) with total output = $P_{rated} - 4$ dB:	
options A, D .....	-18
performance with linearised option, Z .....	-24
Harmonic output .....	-60
AM to PM conversion at Prated -6 dB .....	2.5
Noise power:	
transmit band .....	-70 dBW/4 kHz max
receive band (7.25 – 7.75 GHz) .....	-70 dBW/4 kHz max
Residual AM >100 kHz from carrier .....	-60

GHz	Group delay:	
	linear .....	0.01 ns/MHz
MHz	parabolic .....	0.005 ns/MHz <sup>2</sup>
dBm max	ripple .....	0.5 ns p-p
GHz	Phase noise:	
	Continuous .....	meets IESS phase noise profile
MHz	AC fundamental .....	-50 dBc
dBm	Sum of all spurs .....	-47 dBc
Ω	Input VSWR (non-operating) .....	1.6:1 max
	Output VSWR (non-operating) .....	1.3:1 max
W min	Load VSWR, no damage .....	2.0:1 max
W min		
dB min		
dB min		
dB min		
dB max		
dB max		
dB/MHz max		
dB max		
dB max		
dBc max		
dBc max		
dBc max		
°/dB		
dBc 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.

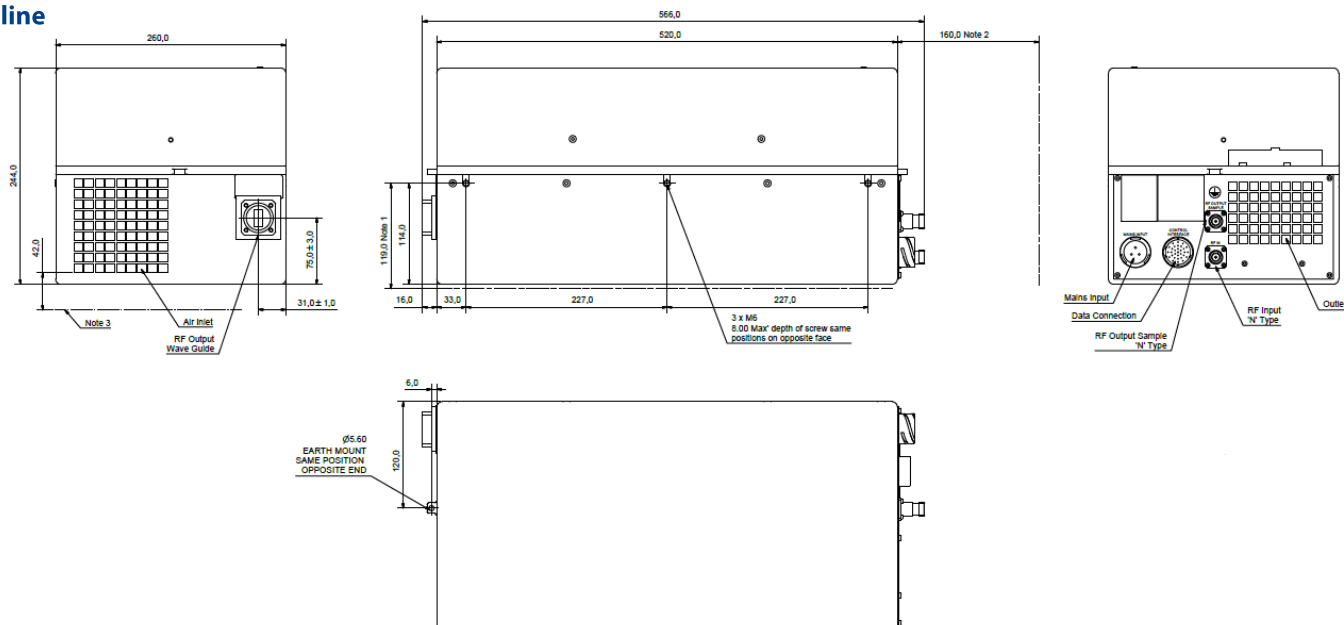
### RF Radiation

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



Whilst SpacePath Communications has taken care to ensure the accuracy of the information contained herein it accepts no responsibility for the consequences of any use thereof and also reserves the right to change the specification of goods without notice. SpacePath Communications accepts no liability beyond the set out in its standard conditions of sale in respect of infringement of third party patents arising from the use of tubes or other devices in accordance with information contained herein.