



## 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

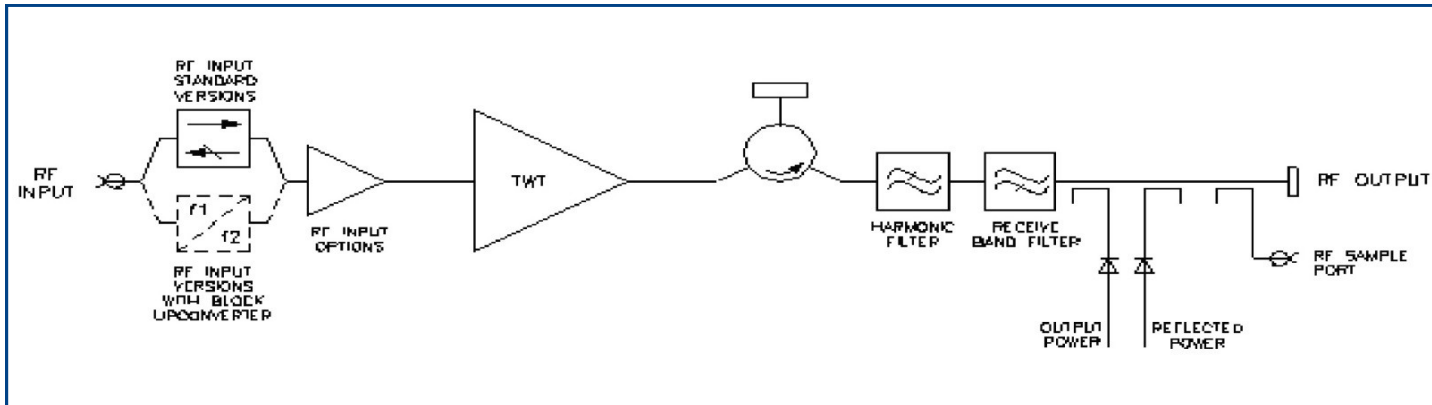
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### 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
dB max	<b>Note:</b> Mating connectors for the mains supply and control interface are supplied.	
dB max		
dB/MHz max		

### ENVIRONMENTAL

	For operation outside these parameters, refer to Spacepath Communications for guidance.	
dB max	Operating temperature .....	-40 to +55 °C
dB max	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:	
	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
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		

### CE CERTIFIED

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

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

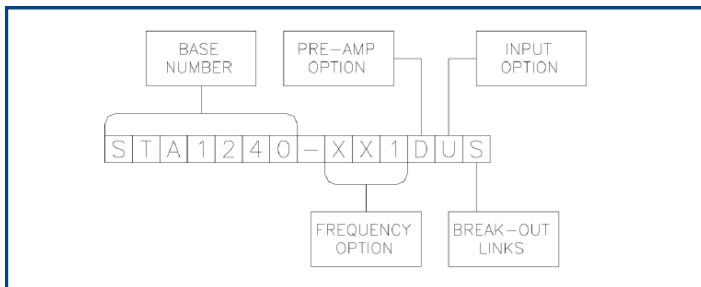
## CONTROLS

Type	Function
<b>REMOTE CONTROL</b>	Off Standby Transmit RF inhibit  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*
<b>REMOTE STATUS/MONITOR</b>	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)  Output Power Monitor* Reflected Power Monitor* Helix Current Monitor* Helix Voltage* Collector Voltages* Heater Voltage* Heater Current* Elapsed Hours*
<b>INTERFACES</b>	Serial User
<b>Other Features</b>	RS-422/485, Optional Ethernet Dry Relay Contact  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 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 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	GHz
L-band input:		
frequency range .....	950 to 1450	MHz
level .....	10	dBm max
LO frequency .....	6.95	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
ASG Prated -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 A, D .....	-18	dBc max
performance with linearised option, Z .....	-24	dBc max
Harmonic output .....	-60	dBc max
AM to PM conversion at Prated -6 dB .....	2.5	$^{\circ}$ /dB
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	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.

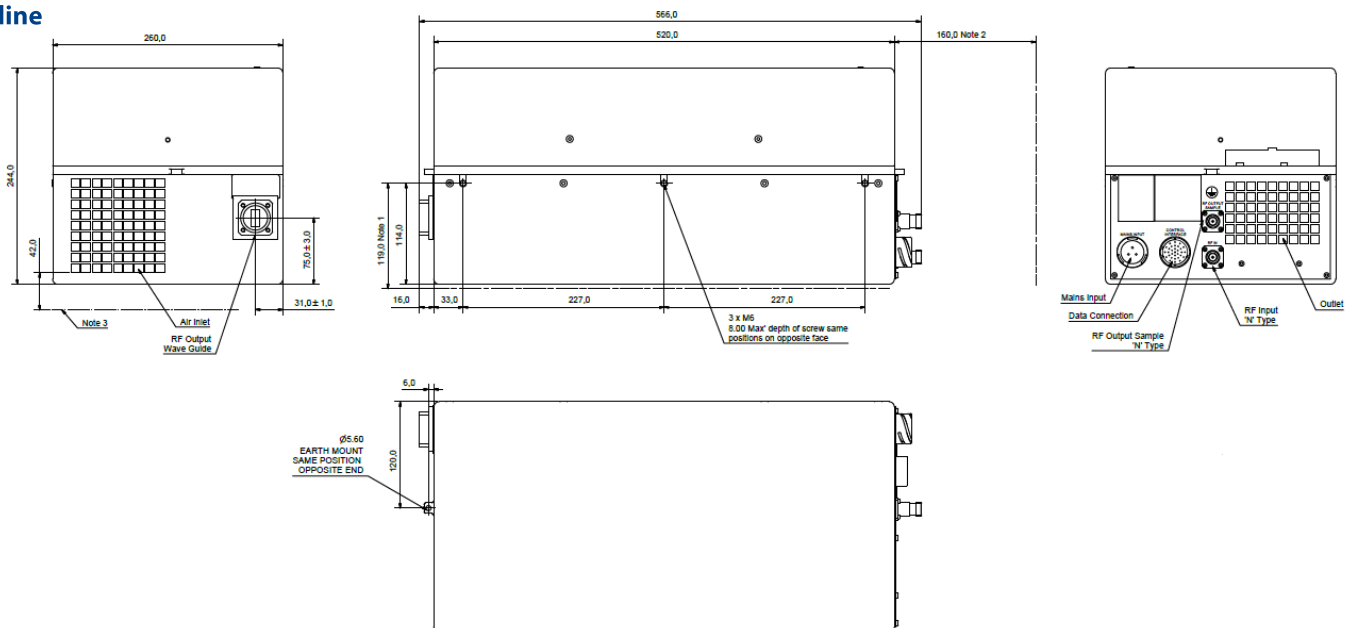
### RF Radiation

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



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.