



## STA2275 Series, 750 W, X-Band, Antenna Mount TWTA

The STA2275 range of X-Band TWT amplifiers from Spacepath Communications provide over 650W 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 STA2275 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

### OPTIONS

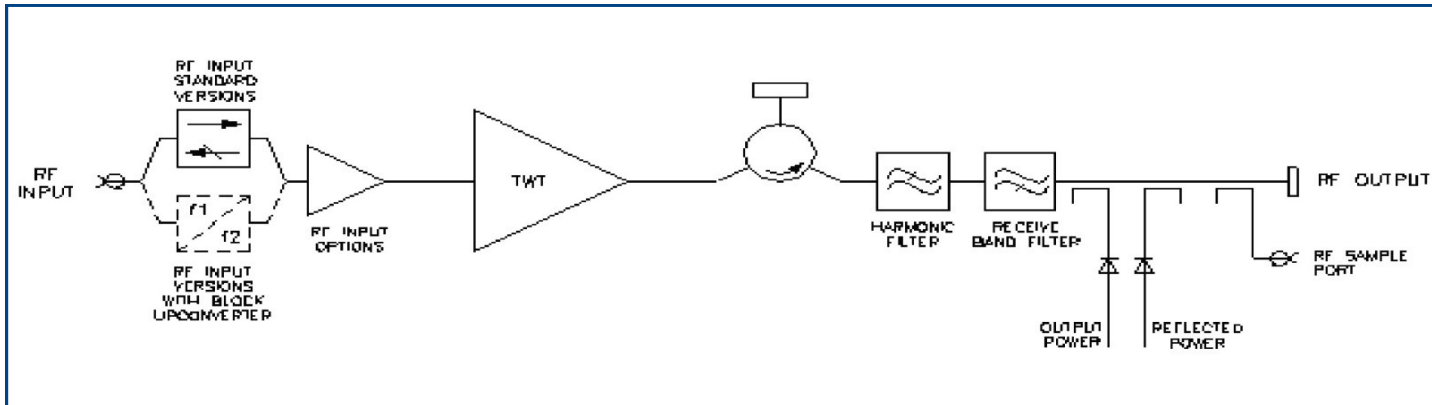
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### 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.
- 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	GHz
Output power:		
TWT output flange .....	750	W min
HPA rated output .....	650	W min
Gain:		
at rated power (A, D, Z option) .....	70	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 40 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 (7.25 – 7.75 GHz) .....	-70 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 .....	10dB 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

### ELECTRICAL

Prime power .....	single phase, line-neutral or line-line
Voltage.....	180 to 265 V
Frequency .....	47 to 63 Hz
Power requirement .....	2600 VA max
Power factor .....	0.95 min

### MECHANICAL

Weight .....	34.0 kg (75 lb) typ
Dimensions .....	see outline
Cooling .....	integral forced-air

### 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 max	Prime power .....	ITT Cannon - CGL02A20-3P-E1B-B
dB max	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 .....	-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.  
**Note:** Safety applies for operating altitude up to 2000 m.

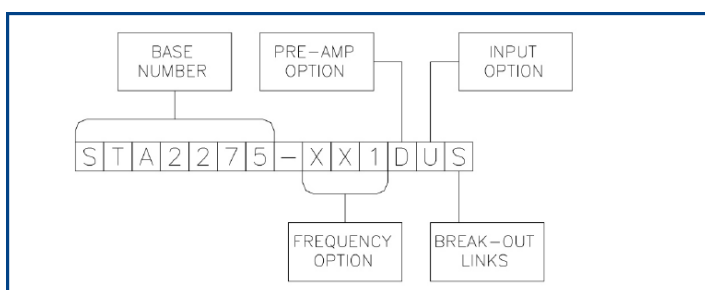
## CONTROLS

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 STA2275 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 STA2275 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:

- 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 STA2275 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 STA2275 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 STA2175 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 UP CONVERTER

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 .....	750
HPA rated output .....	650
Gain:	
at rated power (D, Z option) .....	70
SSG $P_{rated} - 10$ 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 $P_{rated} - 6$ dB .....	2.5
Noise power:	
transmit band .....	-70
receive band (7.25 – 7.75 GHz) .....	-70
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		

**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.

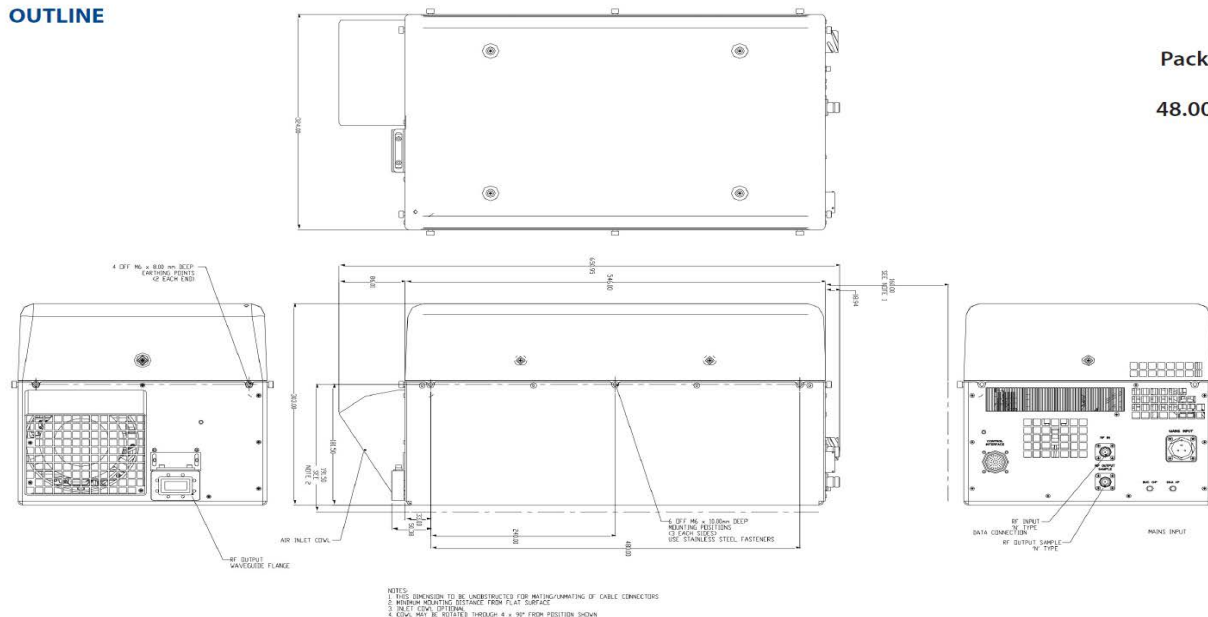
### RF Radiation

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



**Packed Gross Weight & Dimension**  
48.00kg 72x51x78cm

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.