



## STA2475 Series, 750 W, DBS, Antenna Mount TWTA

The STA2475 range of DBS 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. 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 STA2475 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

### OPTIONS

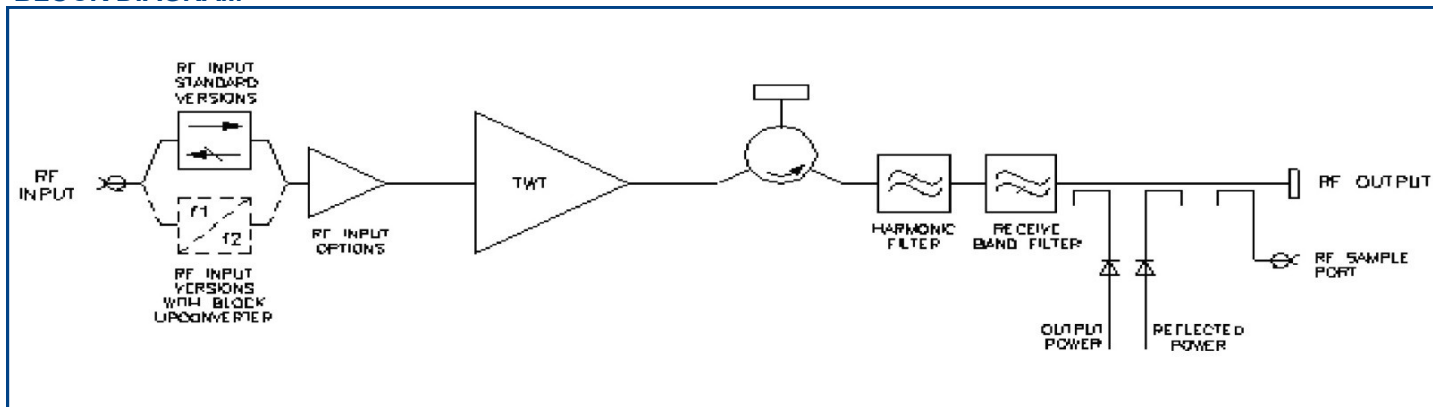
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### FEATURES

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

- Redundant control – contains control and drive circuits for 1:1 redundancy.
- Stand-alone setting – automatically sequences to transmit mode.
- Round-the-clock support.
- Wide range of accessories including: controllers, waveguide networks, cable assemblies.

## BLOCK DIAGRAM



### PERFORMANCE (Without Upconverter)

Frequency range (DB1) .....	17.3 to 18.1
Frequency range (DB2) .....	17.3 to 18.4
Output power:	
TWT output flange .....	750
HPA rated output .....	650
Gain:	
at rated power (A, D, Z option) .....	70
SSG $P_{rated} - 10$ dB (A, D, Z option) .....	75
Attenuation range (D, Z option) .....	25
Gain variation:	
full band .....	4.0
over any 500 MHz band .....	2.5
over any 80 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
receive band (10.95 – 12.75 GHz) .....	-150
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 .....	180 to 265
Frequency .....	47 to 63
Power requirement .....	2000
Power factor .....	0.95

### MECHANICAL

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

W min  
W min

### CONNECTORS

RF input .....	N-type female
dB min RF output .....	PBR140 with 6-32 UNC 2B threaded holes
dB min RF sample port .....	N-type female
dB min Prime power .....	ITT Cannon - CGL02A20-3P-E1B-B
Control interface .....	62GB-12E-2041-PN

dB max  
dB max  
dB max  
dB max  
dB/MHz max

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

### ENVIRONMENTAL

dB max	For operation outside these parameters, refer to Spacepath Communications for guidance.		
dB max	Operating temperature .....	-40 to +55	°C
	Derating .....	2°C/300 m above sea level	
		(3.6 °F/1000 ft)	
dBc max	Storage temperature .....	-40 to +80	°C
dBc max	Relative humidity (condensing) .....	100	%
%dB	Altitude:		
	operating .....	4.5 km (15,000 ft)	max
	non-operating .....	12 km (40,000 ft)	max
dBW/4 kHz max	Vibration .....	BS EN 60068-2-64 test Fh, Transportation	
dBW/4 kHz max	Shock .....	IEC Publication 68-2-27 Part 2 Test Ea, 25 g	
dBc max	EMC:		
dBc max	EN61000-6-3:2001 (Emissions)		
dBc max	EN61000-6-2:2001 (Immunity)		
	FCC CFR47 Part 15B		
ns/MHz	CE CERTIFIED		
ns/MHz <sup>2</sup>	EMC Directive 89/336/EEC, Low Voltage Directive		
ns p-p	73/23/EEC.		

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

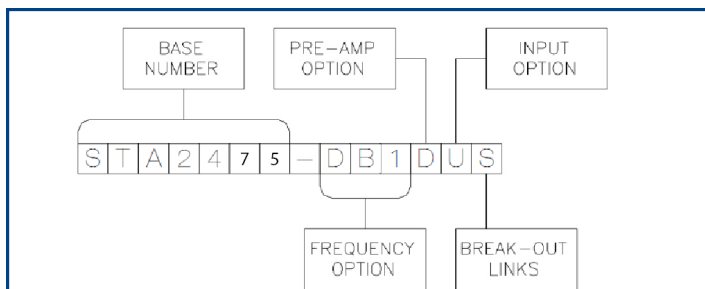
## CONTROLS

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 STA2475 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 STA2475 is offered in two frequency bands:

- DB1 - 17.3 – 18.1 GHz
- DB2 - 17.3 – 18.4 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 STA2475 can be offered with an L-Band Block Upconverter. Specify:

N - Standard RF

U - L – DBS 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 STA2475 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 STA2475 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 (DB1) .....	17.3 to 18.1
Output frequency range (DB2) .....	17.3 to 18.4
L-band input: (Optional 17.3 to 18.4 GHz)	
frequency range .....	950 to 1750
level .....	10
LO frequency .....	16.35
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:	
over any 500 MHz 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 (10.95 – 12.75 GHz) .....	130
Residual AM >100 kHz from carrier .....	-60
Group delay:	
linear .....	0.01
parabolic .....	0.005
ripple .....	0.5

GHz	Phase noise:	
GHz	Continuous .....	meets IESS phase noise profile
MHz	AC fundamental .....	-50 dBc
dBm max	Sum of all spurs .....	-47 dBc
GHz	Input VSWR (non-operating) .....	1.6:1 max
MHz	Output VSWR (non-operating) .....	1.3:1 max
dBm	Load VSWR, no damage .....	2.0:1 max
$\Omega$		

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

W min  
W min

## 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.

dB min  
dB min  
dB min

## 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.

dB max  
dB max  
dB/MHz max

## RF Radiation

All RF connectors must be correctly fitted before operation.

dB max  
dB max  
dB max  
°/dB

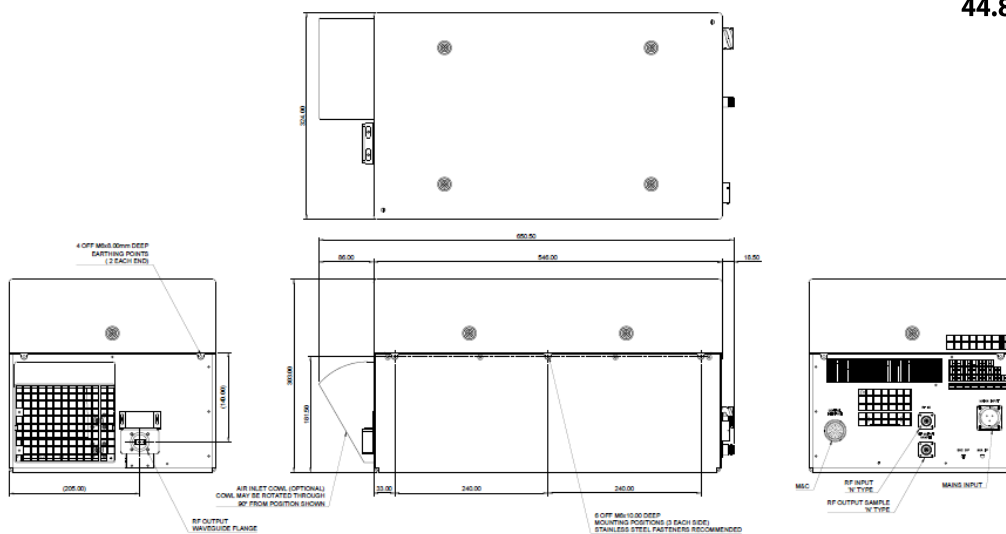
## Beryllia

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.

dBW/4 kHz max  
dBW/4 kHz max  
dBc max

ns/MHz  
ns/MHz<sup>2</sup>  
ns p-p

## OUTLINE



**Packed Gross Weight & Dimension**  
**44.80kg 72x51x78cm**

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