



## 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

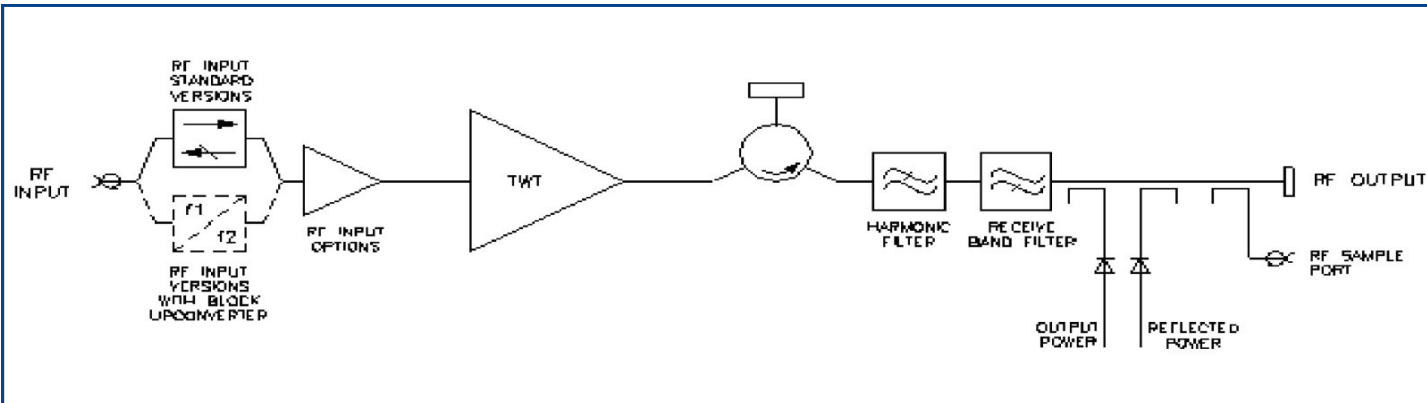
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

### 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                               |
| 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  | 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   | 10dB 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 V                            |
| Frequency         | 47 to 63 Hz                             |
| Power requirement | 2600 VA max                             |
| Power factor      | 0.95 min                                |

### MECHANICAL

|       |            |                     |
|-------|------------|---------------------|
| GHz   | Weight     | 34.0 kg (75 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                        |
|        | Prime power       | ITT Cannon - CGL02A20-3P-E1B-B       |
| dB max | Control interface | 62GB-12E-2041-PN                     |
| dB max |                   |                                      |

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

### ENVIRONMENTAL

|                     |   |  |                  |
|---------------------|---|--|------------------|
| 4 dB:               | For operation outside these parameters, refer to Spacepath Communications for guidance. |  |                  |
| dBc max             | Operating temperature .....   | -40 to +55                                   | °C               |
| dBc max             | Derating .....  | 2°C/300 m above sea level                    |                  |
| /dB                 |   | (3.6 °F/1000 ft)                             |                  |
|                     | Solar gain .....  | 1120   | W/m <sup>2</sup> |
| kHz max             | Storage temperature .....   | -40 to +80                                   | °C               |
| kHz max             | Relative humidity (condensing) .....  | 100  | %                |
|                     | Altitude:   |  |                  |
| dBc max             | operating .....   | 4.5 km (15,000 ft)                           | max              |
| dBc max             | non-operating .....   | 12 km (40,000 ft)                            | max              |
| dBc max             | Vibration: .....  | BS EN 60068-2-64 test Fh, Transportation     |                  |
|                     | Shock: .....  | IEC Publication 68-2-27 Part 2 Test Ea, 25 g |                  |
| ns/MHz              | EMC:  |  |                  |
| ns/MHz <sup>2</sup> | EN61000-6-3:2001 (Emissions)  |  |                  |
| ns p-p              | 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.

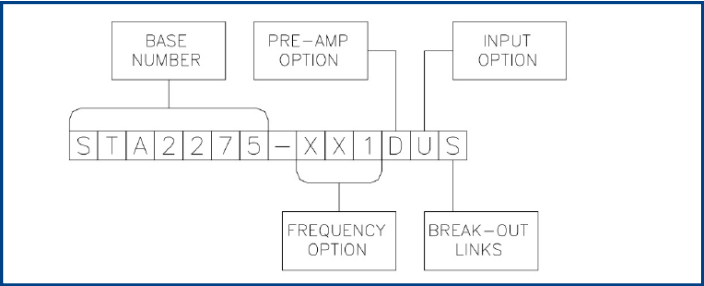
CONTROLS

| Type                  | Function  |
|-----------------------|---|
| REMOTE CONTROL        | Off<br>Standby<br>Transmit<br>RF inhibit  |
| REMOTE STATUS/MONITOR | High Power Alarm Set*<br>Low Power Alarm Set*<br>Auto Redundancy Control*<br>RF Switch Control*<br>Gain Control* (when fitted)<br><br>Off<br>Warm-up<br>Standby<br>Transmit<br>Fault Summary<br>Reflected Power<br>External interlock<br>TWT too hot<br>Mean Helix Current<br>Peak Helix Current<br>High Power Alarm*<br>Low Power Alarm* |
| INTERFACES            |   |
| Serial                | RS-422/485, Optional Ethernet   |
| User                  | Dry Relay Contact   |
| Other Features        | Auxiliary Output Voltage<br>Redundant system & waveguide switch drive<br>'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.

|   |             |           |
|---|-------------|-----------|
| Output frequency range .....  | 7.9 to 8.4  |           |
| L-band input:   |             |           |
| frequency range .....   | 950 to 1450 |           |
| level .....   | 10          | dB        |
| 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         | dB/M      |
| over any 40 MHz band .....  | 1.5         |           |
| slope .....   | 0.08        |           |
| Gain stability 24hrs (constant drive,<br>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         | dB        |
| performance with linearised option, Z .....                                 | -24         | dB        |
| Harmonic output .....   | -60         | dB        |
| AM to PM conversion at $P_{rated} - 6$ dB .....                             | 2.5         |           |
| Noise power:  |             |           |
| transmit band .....   | -70         | dBW/4 kHz |
| receive band (7.25 – 7.75 GHz) .....  | -70         | dBW/4 kHz |
| Residual AM >100 kHz from carrier .....                                     | -60         | dB        |

**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

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All RF connectors must be correctly fitted before operation.

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**

4 DIT 16.5 x 8.00 mm DEEP FASTENING POINTS OF EACH END

48V OUTPUT WAVEGUIDE FLANGE

AIR INLET COIL

2.320m 23.20

6.00 60

1.320m 13.20

72 72

51 51

78 78

4 DIT 16.5 x 8.00 mm DEEP FASTENING POINTS OF EACH END USE STAINLESS STEEL FASTENERS

NOTES:  
 1. THIS DIMENSION TO BE UNRESTRICTED FOR MOUNTING/UMOUNTING OF CABLE CONNECTORS  
 2. MINIMUM MOUNTING DISTANCE FROM FLAT SURFACE  
 3. INLET COIL FLATTENING  
 4. COIL INLET FLATTENING SURFACE 4 x 40 mm POSITION SHOWN

RF INPUT TYPE  
 DATA CONNECTION  
 RF OUTPUT SAMPLE  
 RF TYPE

WINDING INPUT

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