



STA2375 Series, 750 W, Ku-Band, Antenna Mount TWTA

The STA2375 range of Ku-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 STA2375 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

OPTIONS

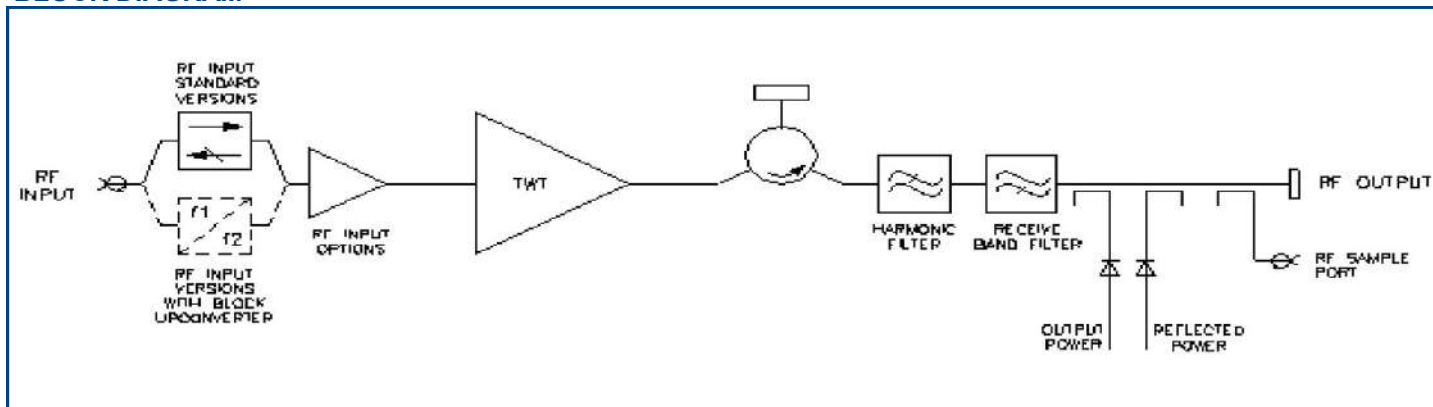
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

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:	
KU1	13.75 to 14.50GHz
KU2	12.75 to 14.50GHz
KU3	13.75 to 14.8 GHz
KU4	12.75 to 13.25GHz
KU6	12.75 to 14.8 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 80 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	
10.95 – 12.75 GHz - standard	-150 dBW/4 kHz max
10.70 – 11.70 GHz - extended	-150 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 ²
ripple	0.5 ns p-p
Phase noise:	
continuous	10 dB 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

RF input	N-type female
RF output	PBR120 with 6-32 UNC 2B threaded holes
RF sample port	N-type female
Prime power	ITT Cannon - CGL02A20-3P-E1B-B
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 ²
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.

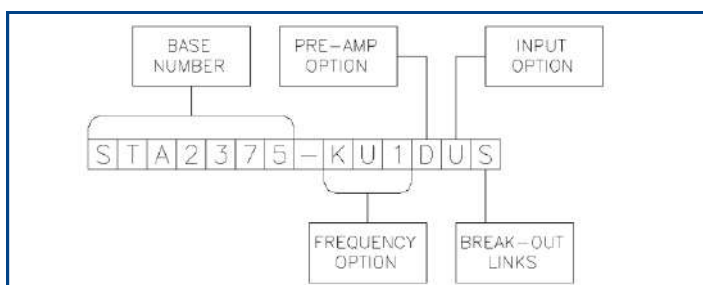
CONTROLS

Type	Function
REMOTE CONTROL	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*
REMOTE STATUS/MONITOR	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*
INTERFACES	Serial User
Other Features	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 STA2375 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 STA2375 is offered in a number of frequency bands:

- KU1 - 13.75 – 14.50 GHz
- KU2 - 12.75 – 14.50 GHz
- KU3 - 13.75 – 14.80 GHz
- KU4 - 12.75 – 14.80 GHz
- KU5 - 12.75 – 14.50 GHz (BUC 12.75-13.25/13.75-14.50GHz)
- KU6 - 12.75 – 14.80 GHz
- KU7 - 12.75 – 14.80 GHz (BUC 14.30-14.80GHz)

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 – Ku-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 STA2375 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.

- **SPC1U01 1:1 Control Unit**

Provides control of 2 HPA's in 1:1 switch configuration. (The waveguide switch network can also be supplied).

- **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 contact SpacePath Communications

PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range:

option KU1	13.75 to 14.5
option KU5	12.75 to 14.5

L-band input:

frequency range option KU1	950 to 1700
frequency range option KU5	950 to 1700
frequency range option KU7	950 to 1700
level	10

LO frequency:

option KU1	12.8
option KU5	13.05
option KU7	13.35

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 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
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Gain stability over full operating temperature.....

.....	2.0
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Intermodulation (two equal carriers) with total output = P_{rated}-4 dB:

options A, D	-18
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performance with linearised option, Z

.....	-24
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Harmonic output

.....	-60
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AM to PM conversion at P_{rated}-6 dB

.....	2.5
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Noise power:

transmit band	-70
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receive band (10.95 - 12.75 GHz)

.....	-150
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Residual AM >100 kHz from carrier

.....	-60
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Group delay:		
GHz linear	0.01	ns/MHz
GHz parabolic	0.005	ns/MHz ²
ripple	0.5	ns p-p
Phase noise:		
MHz Continuous	meets IESS phase noise profile	
MHz AC fundamental	-50	dBc
MHz Sum of all spurs	-47	dBc
dBm max Input VSWR (non-operating)	1.6:1	max
GHz Output VSWR (non-operating)	1.3:1	max
GHz Load VSWR, no damage	2.0:1	max

Note: the BUC can be operated without the external reference, typical frequency stability ±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.

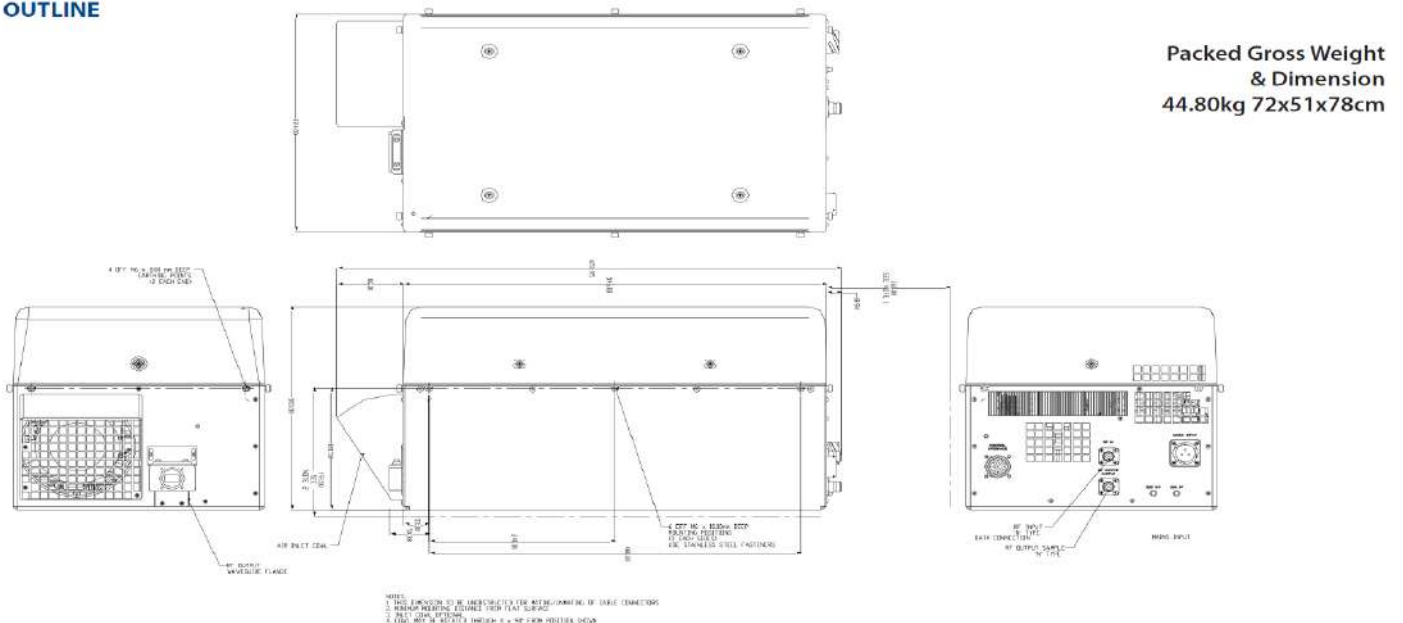
RF Radiation

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.