STA2475 Series 750 W, DBS Antenna Mount TWTA

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)
- Linearisers
- 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.

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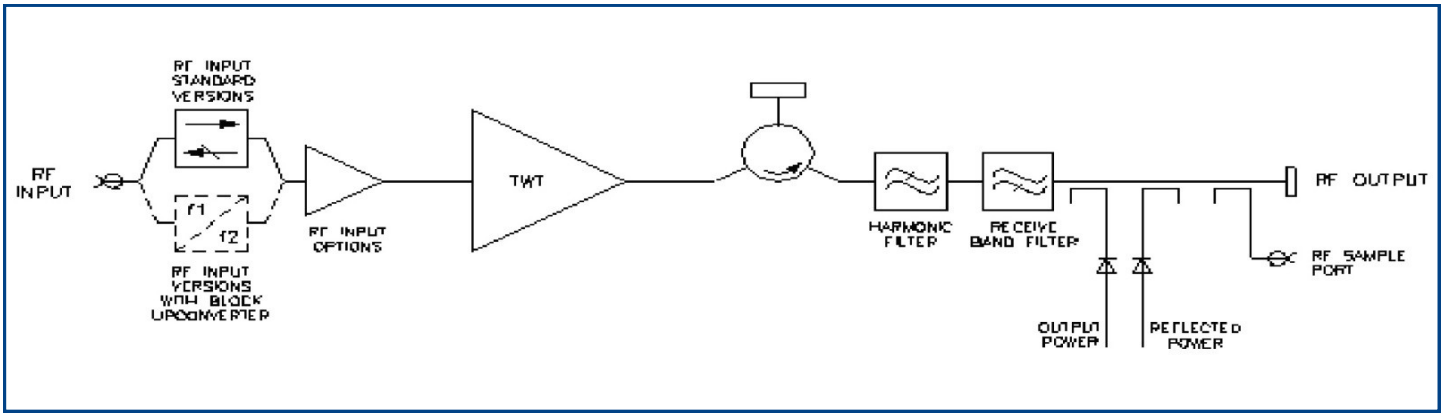
BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Frequency range (DB1)	17.3 to 18.1	GHz
Frequency range (DB2)	17.3 to 18.4	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	4.0	dB max
over any 500 MHz 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)	–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	2000	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	PBR140 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)	
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.

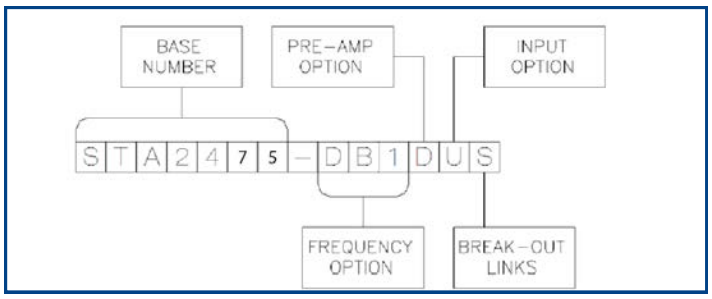
CONTROLS

Type	Function	
REMOTE CONTROL	Off Standby Transmit RF inhibit	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)
REMOTE STATUS/MONITOR	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*	Output Power Monitor* Reflected Power Monitor* Helix Current Monitor* Helix Voltage* Collector Voltages* Heater Voltage* Heater Current* Elapsed Hours*
INTERFACES		
Serial	RS-422/485, Optional Ethernet	
User	Dry Relay Contact	
Other Features	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	GHz
Output frequency range (DB2)	17.3 to 18.4	GHz
L-band input: (Optional 17.3 to 18.4 GHz)		
frequency range	950 to 1750	MHz
level	10	dBm max
LO frequency	16.35	GHz
External reference (see note):		
frequency	10	MHz
level	-3 to +7	dBm
impedance	50	Ω
Output power:		
TWT output flange	750	W min
HPA rated output	650	W min
Gain:		
at rated power (D, Z option)	70	dB min
SSG P_{rated} –10 dB (D, Z option)	75	dB min
Attenuation range (D, Z option)	25	dB min
Gain variation:		
over any 500 MHz 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 P_{rated} –6 dB	2.5	°/dB
Noise power:		
transmit band	-70	dBW/4 kHz max
receive band (10.95 – 12.75 GHz)	130	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^2
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 ±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
44.80kg 72x51x78cm