



The STA2450 range of DBS TWT amplifiers from e2v technologies provide over 420 W 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.

The HPA incorporates high efficiency dual collector TWTs powered by an advanced power supply that further advances e2v technologies reputation for robust, reliable product.

The STA2450 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

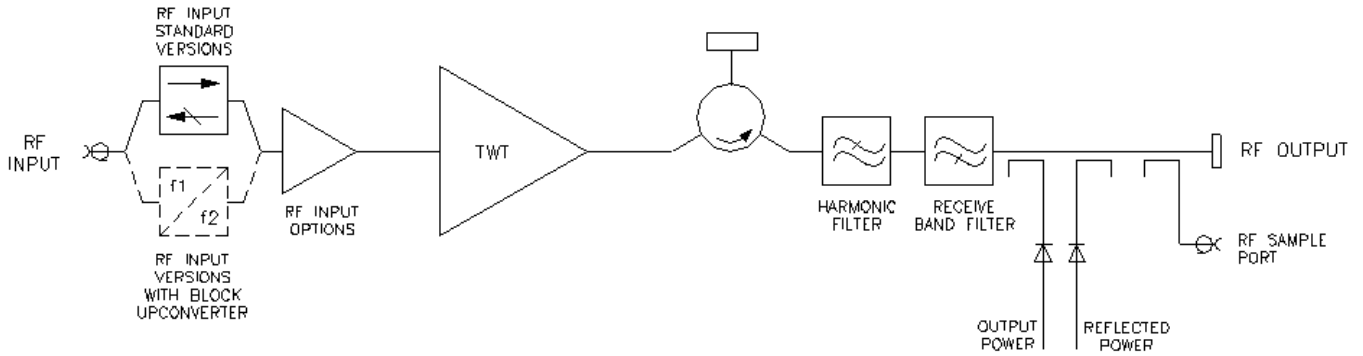
OPTIONS

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

FEATURES

- Advanced cooling design (Stellar Cool™, patent pending) enables operation at +50 °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 (DB1)	17.3 to 18.4	GHz
Output power:		
TWT output flange	500	W min
HPA rated output	420	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).....	-130 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 e2v technologies for guidance.

Operating temperature	-40 to +50 °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.

SAFETY (see note)

cETLus Listed to ANSI/UL 60950-1-2002 and CAN/CAS-C22.2 No 60950-1-3.

CB Certified to IEC 60950-1:2001

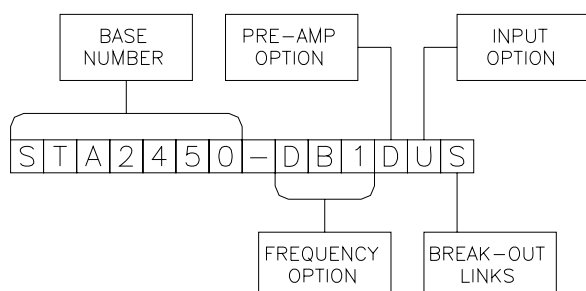
Note: Safety applies for operating altitude up to 2000 m.

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 User	RS-422/485 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 STA2450 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 e2v technologies for availability of options).

Frequency Options

The STA2450 is offered in two frequency bands:

DB1 - 17.3 – 18.4 GHz

DB2 - 17.3 – 18.1 GHz (upconverter option only)

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 e2v technologies for availability).

Input Option

The STA2450 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 e2v technologies 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 STA2450 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 STA2450 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 e2v technologies.

PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range (DB2).....	17.3 to 18.1	GHz
L-band input:		
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	500	W min
HPA rated output	420	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	$^{\circ}$ /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

e2v technologies electronic devices are safe to handle and operate provided that the relevant precautions are observed. e2v technologies 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.

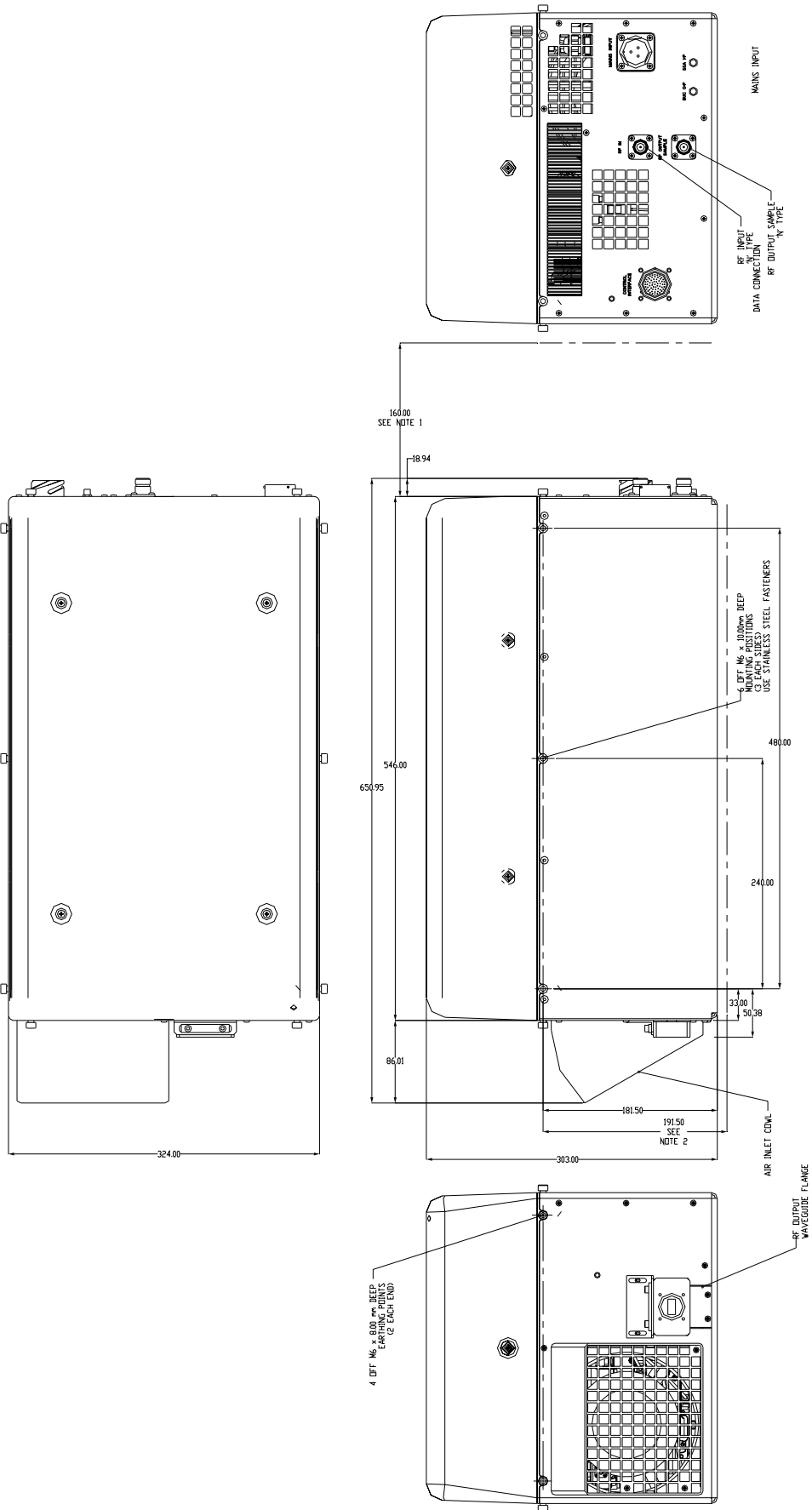
RF Radiation

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 e2v technologies regarding the disposal of damaged or life-expired tubes.

OUTLINE



NOTES
 1. THIS DIMENSION IS UNRESTRICTED FOR MOUNTING OF CABLE CONNECTORS
 2. THIS DIMENSION IS UNRESTRICTED FOR MOUNTING OF CABLE CONNECTORS
 3. INLET COWL OPTIONAL
 4. COWL MAY BE ROTATED THROUGH 4 x 90° FROM POSITION SHOWN

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