



STA1340 Series, 400W, Ku-Band, Antenna Mount TWTA

The STA1340 range of Ku-Band TWT provide over 350 W of output power in a compact, lightweight, rugged, weather-proof, 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 STA1340 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

Options

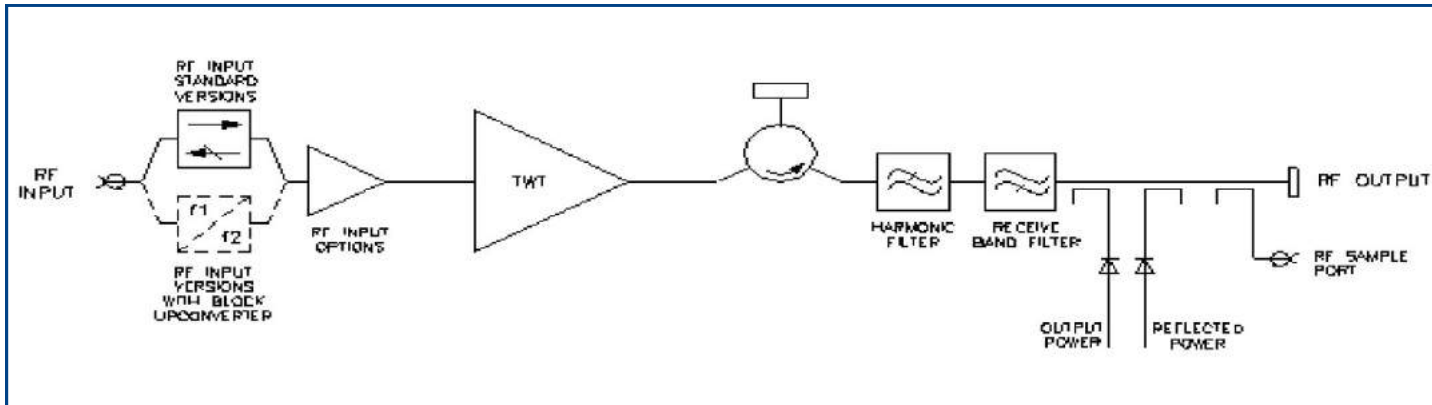
- Integral solid-state amplifier (SSA)
- L-band block upconverter
- Gain control (requires SSA)
- Lineariser
- Break-out link for upconverter

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.
- Wide input voltage range – can operate from mains supplies worldwide.
- 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 14.50 GHz
KU2	12.75 to 14.50 GHz
KU3	13.75 to 14.80 GHz
KU4	12.75 to 13.25 GHz
KU6	12.75 to 14.80 GHz

Output power:

TWT output	400 W min
HPA rated output flange	350 W min

Gain:

at rated power (C option)	45 dB min
at rated power (A, D, Z option)	70 dB min
SSG Prated -10 dB (C option)	50 dB min
SSG Prated -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 = Prated -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 Prated -6 dB	2.5 %/dB

Noise power:

transmit band

receive band	-70 dBW/4 kHz max
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10.95 – 12.75 GHz - standard

10.70 – 11.70 GHz - extended	-150 dBW/4 kHz max
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Residual AM:

<10 kHz

10 kHz < f < 500 kHz	-50 dBc max
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10 kHz < f < 500 kHz

>500 kHz	-20(1.5+log f) dBc max
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>500 kHz

Group delay:	-85 dBc max
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linear

parabolic	0.01 ns/MHz
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parabolic

ripple	0.005 ns/MHz ²
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ripple

Phase noise:	0.5 ns p-p
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continuous

AC fundamental	10 dB lower than IESS phase noise profile
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AC fundamental

sum of all spurs	-50 dBc
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sum of all spurs

Input VSWR (operating)	-47 dBc
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Input VSWR (operating)

Output VSWR (non-operating)	1.3:1 max
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Output VSWR (non-operating)

Load VSWR, no damage	1.3:1 max
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Load VSWR, no damage

	2.0:1 max
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ELECTRICAL

Prime power single phase, line-neutral or line-line

Frequency 47 to 63 Hz

Power requirement 1500 VA max

Power factor 0.95 min

Voltage..... 99 to 265 V

MECHANICAL

Weight 25.0 kg (55 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 (see note 1) -40 to +55 °C

Derating 2 °C/300 m above sea level
(3.6 °F/1000 ft)

Solar gain 1120 W/m²

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.

NOTES

1. +55 °C applies when the input supply voltage is between 180 and 265 V. Below 180 V, the maximum operating temperature is +50 °C.

2. Safety applies for operating altitude up.

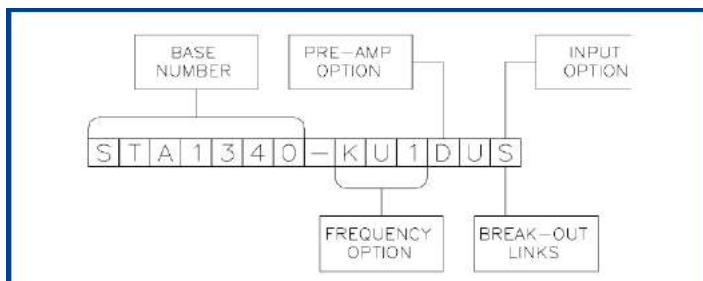
CONTROLS

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 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 STA1340 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 STA1340 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 25dB (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 STA1340 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 STA1340 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 STA1340 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:	
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	400
HPA rated output	350
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
Gain stability over full operating temperature.....	2.0
Intermodulation (two equal carriers) with total output = Prated -4 dB:	
options A, D	-18
performance with linearised option, Z	-24
Harmonic output	-60
AM to PM conversion at Prated -6 dB	2.5
Noise power:	
transmit band	-70 dBW/4 kHz max
receive band (10.95 – 12.75 GHz)	-150 dBW/4 kHz max

Residual AM >100 kHz from carrier	-60 dBc max
GHz	
Group delay:	
GHz linear	0.01 ns/MHz
GHz parabolic	0.005 ns/MHz ²
MHz ripple	0.5 ns p-p
MHz Phase noise:	
Continuous	meets IESS phase noise profile
dBm max	
AC fundamental	-50 dBc
Sum of all spurs	-47 dBc
GHz 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.

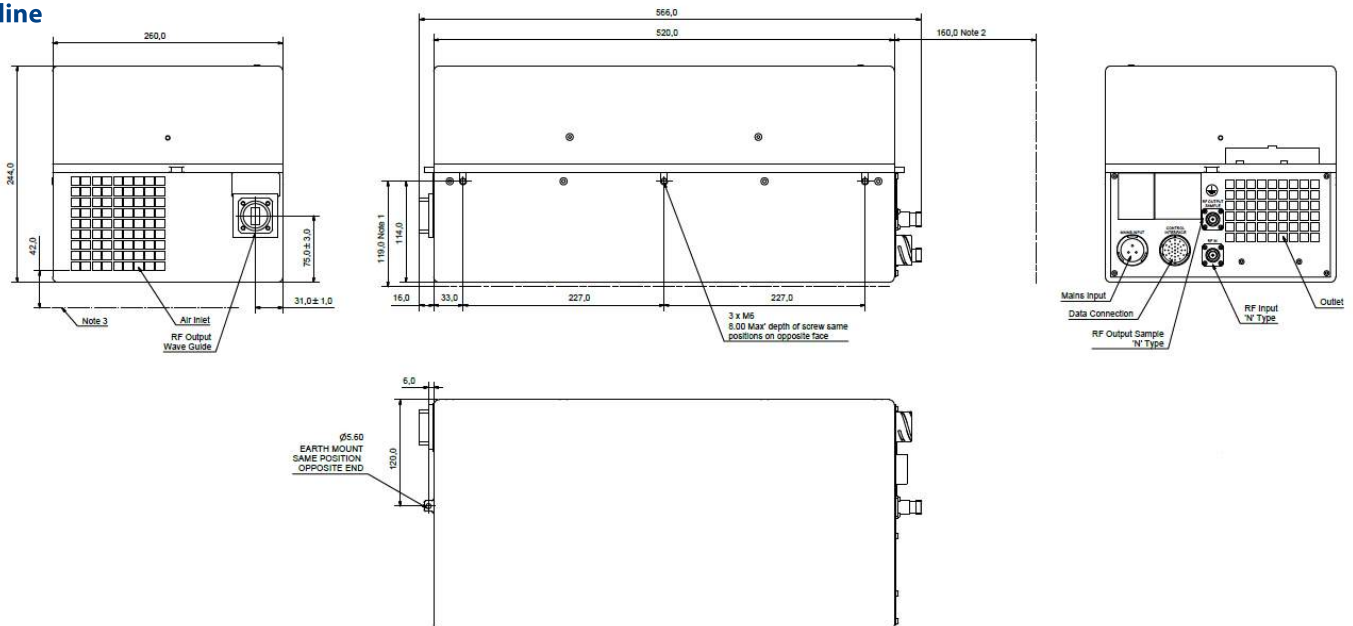
RF Radiation

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.