Spacepath STR2175 750W C Band Rack Mounted TWTA

STR2175 Series, 750W, C-Band, Rack Mount TWTA

The new generation of STR Series rack mount TWTAs provide an easy to operate, colour touch screen interface with a multi-functional selector wheel. The colour touch screen display provides clear, easy to read status of the amplifier's operation, including: RF output power monitoring, heater, helix monitoring, & TWT temperature. Set up screens are intuitive and simple to manage and the touch panel allows full local control and monitoring of all amplifier parameters, including automatic level control, system event logging and graphical trend analysis. Remote control operation can be made via RS485 or through an Ethernet interface, and a web page interface is also available. If a redundancy system is required, this can be set up and controlled via the touch screen. Changes to operating parameters can be locked and password protected if required.

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 STR2175 is available with a wide range of options and accessories, backed by worldwide technical support.

Options

- Integral solid-state amplifier (SSA)
- L-Band Block upconverter
- 10MHz reference
- Lineariser
- Redundant system control
- Quick connect waveguide options

Features

- Compact 4RU enclosure
- Touch screen control
- Ethernet interface
- Remote diagnostics
- Forward and reverse power monitoring
- TWTA performance Data and Event logging

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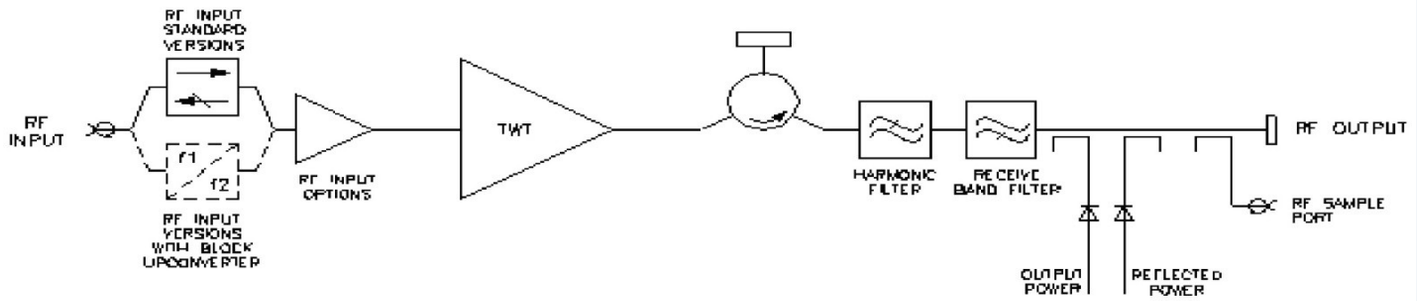
BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Frequency range:		
Standard - CC1	5.85 to 6.425	GHz
Extended - CC2	5.85 to 6.65	GHz
Extended - CC3	5.85 to 7.025	GHz
Output Power:		
TWT output flange (peak)	750	W min
HPA rated output (CW)	650	W min
Gain:		
At rated power (A,D, Z option)	70	dB min
SSG P rated - 10dB (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 40 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 –4dB:		
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 –6dB	2.5	°/dB
Noise Power:		
Transmit band	–70	dBW/4 kHz max
Receive band (below 21.2GHz)	-150	dBW/4 kHz max
Residual AM:		
<10kHz	–50	dBc max
10kHz< f <500kHz	–20 (1.5+ log f)	dBc max
>500kHz	-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	10dB lower than IESS phase noise profile	
AC fundamental	-50	dBc max
Sum of all spurs	-47	dBc max
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	
Voltage	180 to 265	V
Frequency	47 to 63	Hz
Power requirement	2600	VA max
Power factor	0.95	min

MECHANICAL

Weight	34Kg (75lb) typ
Dimensions	see outline
Cooling	integral forced-air

CONNECTORS

RF input	N-type female
RF output	CPR137G with 10-32 UNC 2B threaded holes
RF Sample port	N-type female
Prime Power	C20 Male IEC

Note: Mating connector for the mains supply is included.

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/1000ft)	
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 600668-2-64 test Fh, transportation	
Shock	IEC Publication 68-2-27 Part 2 test Ea, 25g	
EMC:		
EN61000-6-3:2001 (Emissions)		
EN61000-6-2:2001 (Immunity)		
FCC CFR47 Part 15B		
Acoustic Noise	68 dBa typ	
Heat Dissipation	1500W to duct 350W to room	

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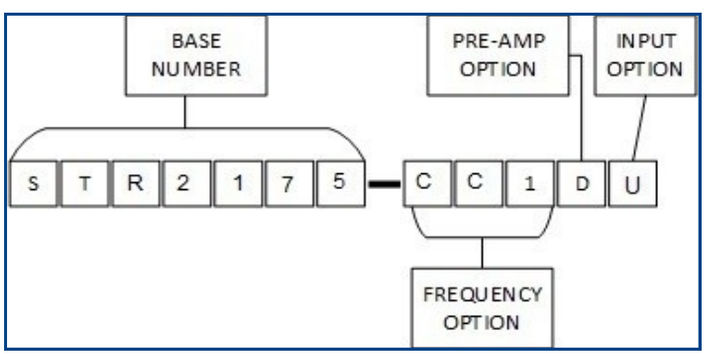
CONTROLS

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 / Ethernet Dry Relay Contact	
Other Features	Auxiliary Output Voltage Redundant system & waveguide switch drive	

OPTIONS

Extensive options are offered with the STR2175 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 STR2175 is offered in four frequency bands:
CCI - 5.85 - 6.425 GHz
CC2 - 5.85 - 6.65 GHz
CC3 - 5.85 - 7.025 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 4dB OPBO. The linearliser also incorporates the pre-amp and gain control options. (Consult SpacePath Communications for availability)

Input Option

The STR2175 can be offered with an L-Band Block Upconverter. Specify:
N - Standard RF
U - L to C-Band Block Upconverter (see page 4)

Note:

The upconverter requires the inclusion of the 'D' option. (Consult Spacepath Communications for availability)

For more information contact Spacepath Communications.

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PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range:		
Option CC1	5.85 to 6.425	GHz
Option CC2	5.85 to 6.65	GHz
Option CC3	5.85 to 7.025	GHz
L-Band input:		
Frequency range option CC1	950 to 1525	MHz
Frequency range option CC2	950 to 1750	MHz
Level	10 dBm	max
LO frequency (option CC1/CC2)	4.9	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 option)	70	dB min
SSG P_{rated} –10dB (D option)	75	dB min
Attenuation range (D option)	25	dB min
Gain Variation:		
Full 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	dBm
Gain stability over full operating temperature	2.0	dB max
Intermodulation (two equal carriers) with total output = P_{rated} –4dB:		
Options C,A,D	-18	dBc max
Performance with linearised option Z	-26	dBc max
Harmonic output	–60	dBc max
AM to PM conversion at Prated –6dB	2.5	°/dB
Noise Power:		
Transmit band	-70	dBW/4 KHz max
Receive band (3.2-4.2GHz)	-150	dBW/4 KHz max
Residual AM >100MHz 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

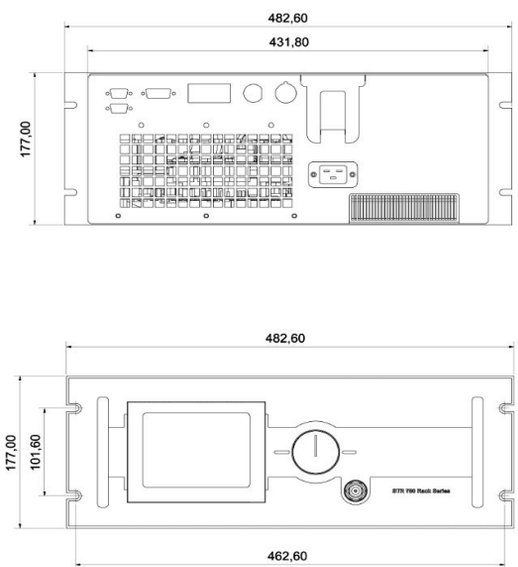
Dangerous voltages are present within the TWT amplifier when operating normally. However, the equipment is designed so that personnel cannot come into contact with high voltage circuits unless covers are removed.

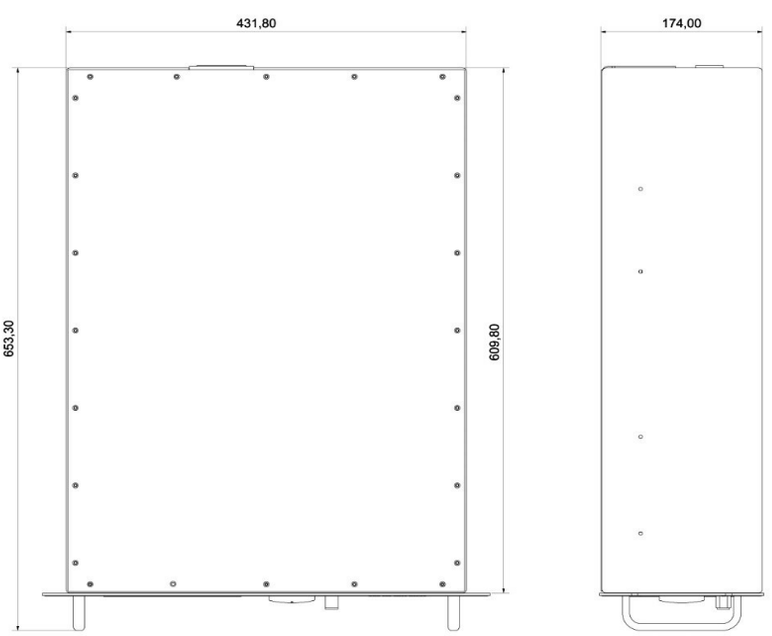
RF Radiation

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.





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