RADITEK

Amplifier
HF 1.5-30MHz

Amplifier, Broadband HF 1.5-30 MHz
Adjustable 0 – 100%, Models up to 15KW CW

RoHS COMPLIANT

Higher powers achieved by combining multiple Amps

Features

- Full color touchscreen display
- Linear solid state design
- Ultra efficient switching power supply
- Built in monitoring and control (remote port, Ethernet, SNMP)
- Field proven reliability
- High efficiency gain stages
- CW, pulsed, and modulated applications
- 2 Year Warranty

Order Examples:
RAMP-HF-1.5-30M-60d-1kW-S-t15 *(HF Band Amplifier, 1.5-30MHz, 60dB Power Gain, 1 kilowatts CW*
RAMP-HF-1.5-30M-60d-1kW-B-t15 *(HF Band Amplifier, 1.5-30MHz, 60dB Power Gain, 1 kilowatts CW (-B options included 2 amplifiers combining),-30 to 65°C operating temp)*
Option Frequency **1.6-30M, 2-30M, 3-30M, 6-30M** **Higher power models available, 2, 5, 8,15KW (following pages)**

Basic 1KW Amp

RF CHARACTERISTICS			
model	**-S std 1 x 1000W**	**-B model 2x 500W Combine to 1KW**	
Frequency Range	Broadband HF 1.5 - 30 MHz (others available upon request) ie 2-30MHz, 3-30MHz		
Input Power	0 dBm (for rated output power) (others available upon request)		
Power Level	Adjustable 0 – 100% up to 1,000-watts CW (+60dBm)		
Power Gain	60 dB		
Power output	1000W CW and PEP		adjusts 1-1000W
Power output redundancy		Two amplifiers combining to give 1000W	
Gain Flatness across BW	+/- 0.8 dB AGC on +/- 3.0 dB AGC off,		
Input Impedance	50 Ω into amplifier, BNC female	50 Ω into amplifier, BNC female (	(Nf and others available)
Input Return Loss	> 20 dB typical		
Output Impedance	50 Ω, 7-16 DIN female		Nf and others available)
RF Sample	50 Ω, BNC female		
Modulation	CW, FM, QAM, pulse, etc.		
Harmonics (with switched Low Pass Filters to cover full band	> 50 dBc typical	> 60 dBc typical	
Spurious Emissions	> 60 dBc typical		

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MECHANICAL FEATURES		
Minimal Rack Space	1KW Power Amplifier with internal Power Supply	3U (5.25") x 25"D x 19"W
Weight	30Kg	
Lightweight Enclosures	Aluminum	
Operating Temperature	-10 to +50° C Other options Available	
Storage Temperature	-40 to +85° C	
Humidity	95%, non-condensing	
Cooling	Integrated forced air cooling (optional liquid cooling)	

ELECTRICAL CHARACTERISTICS	
Flexible AC Input	90-264Vac single-phase, 208Vac nominal (others available upon request) 47-63Hz
AC Consumption	1,800 V-A typical (at 1 kW CW) single phase

INTERFACE		
DB25 Remote Port	Control:	RF carrier on/off, RF power up/down, reset
	Monitor:	Forward/reflected RF level, control PCB Vcc
	Flags:	Amplifier overdrive, VSWR (adjustable trip point), high temperature
Ethernet	Control:	RF carrier on/off, RF power up/down, AGC/manual mode, change VSWR trip point, reset
	Monitor:	Forward/reflected RF level, DC pallet voltage, RF input level, temperature, VSWR trip point, model/serial number
	Flags:	Carrier on/off, amplifier overdrive, DC pallet voltage, VSWR, RF input level, temperature, AGC/manual status
SNMP	Control:	RF carrier on/off, RF power up/down, AGC/manual mode, change VSWR trip point, reset
	Monitor:	Forward/reflected RF level, DC pallet voltage, RF input level, temperature, pallet current, attenuation, run time, RF fault, model/serial number
	Flags:	Amplifier overdrive, VSWR, temperature, SNMP error

ENVIROMENTAL	Optional	(Designed to Meet)
Temperature Range		MIL-STD-810F, method 501.4 & 502.4
Operating Temperature		-30°C to +65°C
Humidity		MIL-STD-810F, method 507.4
Fungus		MIL-STD-810F, method 508.5
Salt Fog		MIL-STD-810F, method 509.4
Altitude		MIL-STD-810F, method 500.4
Shock		MIL-STD-810F, method 516.5
Vibration		MIL-STD-810F, method 514.5
EMI/EMC		MIL-STD-461E or Later

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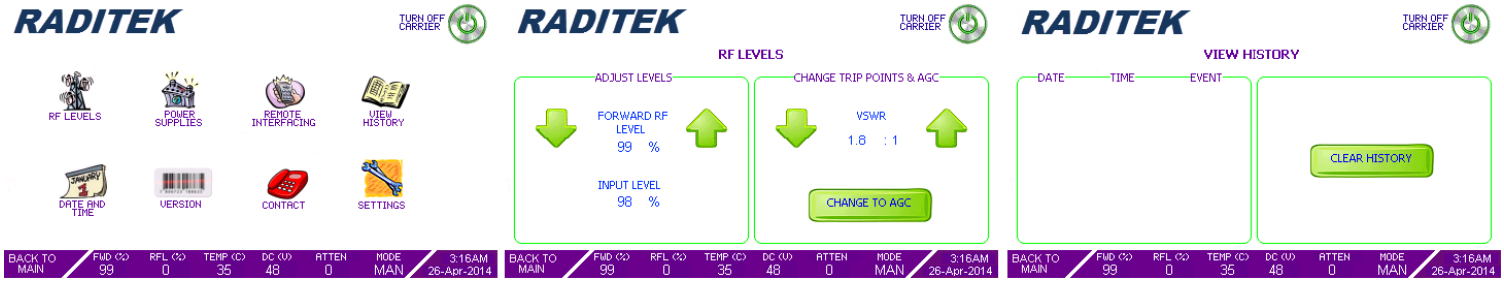
Additional Specs

Load VSWR for 1000W Power Output		(Less than 1.5:1
VSWR Power Reduction		1. Operates at reduced power up to 3:1 VSWR
		2. Protection up to infinite VSWR
		3. Power output >100W for ∞VSWR.
Third Order Intermodulation at 1000W		(≥ 36dB Below PEP)
Fault Protection		1. Infinite VSWR Protection
		2.Temperature Protection
		3.Short/Open RF output Protection
		4. Input overdrive Protection
		5.Over current Protection
		6.Over Voltage Protectio
Indicators/ Monitoring		Power On, VSWR Fault Over Temperature Fault Indications
MTBF		> 6500 Hrs
MTTR		< 25 Minutes

Screenshots off Touchscreen Interface



These High Power Amplifiers are a family of highly efficient, linear Class A/AB that uses the latest, state of the art LDMOS and latest GaN (Gallium Nitride) technology. They are capable of delivering pulsed or continuous (CW) operation, at up to 15KW output.

They comprise multiple air cooled 5 or 6RU chassis each with 4 1KW amplifiers combining to deliver the rated output power. Water Cooled options are available. All of the PSUs are constantly monitored, and all critical data is available on the front panel touch screen color monitor and via internet or by interactive USB link locally.

The SSPA/PSUs are controlled by a microcontroller that monitors all the critical functions.. The microcontroller also enables *BITE* (Built In Test Equipment) functions, providing continuous SSPA monitoring of all critical operating parameters that can be read with an Ethernet connection. Monitoring of the amplifier may be done by the customer over the Internet. In addition, it incorporates front panel metering for the SSPA voltages and current for each of the 8 x SSPA modules.

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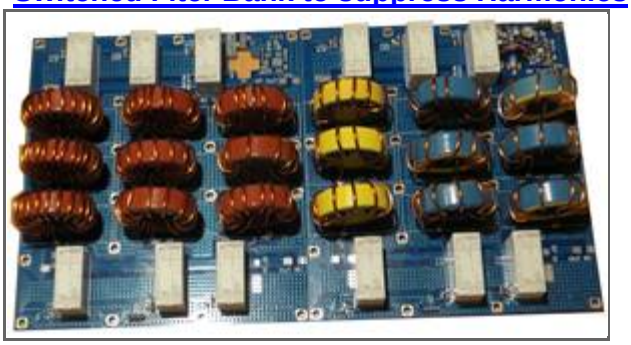
The amplifier may be driven to full power with 0dBm from the host exciter. It has a built in Automatic Level Control (ALC) for producing a level output as well as a controlled rollback of power due to rising VSWR,

Switched Fiter Bank to suppress Harmonics



"Due to the multi-octave bandwidth of this 1.5 to 30MHz amplifier, the harmonics of any signal up to 15MHz will be in band. Improved harmonic performance is realized with a relay controlled, switchable filter bank.
The filter bank breaks the band down into several low loss pass bands (each with less than 0.2dB loss and better than 25dB return loss): 1.5 to 2MHz, 3.5 to 3.8MHz, 7 to 7.2MHz, 10 to 14.5MHz, 18 to 21.5MHz and 24.5 to 30MHz."

HF Power Amplifier 1.6-30M 2KW CW Power

2KW Model FEATURES		
Minimal Rack Space	Power Amplifier:	6U (10.5") x 25"D x 19"W
	Power Supply:	3U (5.25") x 25"D x 19"W
Input Power	0 dBm (for rated output power)	(others available upon request)
Power Level	Adjustable 0 – 100%	up to 2,000-watts CW (+63dBm)
Power Gain	63 dB	
Power output	2000W CW and PEP	

Rack / Cabinet optional

HF Power Amplifier 1.6-30M 5KW CW Power

Height	Stack up
1x6ru	**Combiner:** combines 2 x 4Kw to 8KW backed off to 5 KW

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Higher powers achieved by combining

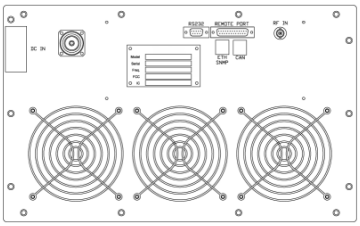
2x5ru	**HPA 4x1KW** **combines 4 x 1Kw to 4KW**
1x3ru	**Master Controller**
1x3ru	**Power Supply**
22ru	**Total**

- Remote monitoring with BITE (Built-In Test Equipment)

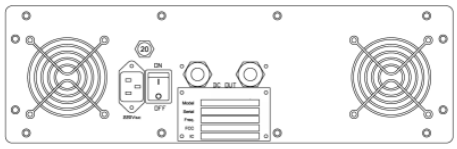
Order Examples: **RAMP-R-1.6-30M-180-264V AC single Phase-5KW-opt-t15**
Description: *(SSPA, Rack, HF 1.5-30MHz, BNCf IP to 1 7/8 EIA connector 180-264VAC single Phase*
Options: **Rack not inc)**

Specifications	**RAMP-R-1.6-30M-180-264V AC single Phase-5KW-opt-t15**
1	Input connectors : N (f), 50 Ω
2	Output connectors : 1 7/8" EIA flange ,50 Ω (others available)
3	Operating Frequency Range: 1.6-30MHz
4	Max. Output Power Level : 5 kW. Nominal Output Power level: 100 W to 5KW.
5	Nominal drive power: 0 dBm for 5 kW
6	Cooling Parameters: Forced Air built in
7	AC mains input:230 V, ± 10% (single phase) / 400 V, ± 10% (3 phase) , @ 50 Hz
8	Storage temperature -30 to +50°C & humidity level: 40%
9	Environment for operation: temperature: 30 to 40°C Humidity level: 45 to 95 % Non Condensing

```HPA 4x1KW Draw



Power Supply draw





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Rack / Cabinet optional

Power Amplifier 1.6-30MHz 15KW CW Power

Height	Stack up	Shipping cu Ft	Weight Kg
1x6ru	**Combiner:** combines 4 x 4Kw to 13KW (with combining losses)	6.5	
4x5ru	**HPA 4x1KW** combines 4 x 1Kw	22	
1x3ru	**Master Controller**	3.75	
1x3ru	**Power Supply**	3.75	
32ru	**Total**	36	350

- Remote monitoring with BITE (Built-In Test Equipment)

The amplifier may be driven to full power with 0dBm from the host exciter. It has a built in Automatic Level Control (ALC) for producing a level output as well as a controlled rollback of power due to rising VSWR,

Order Examples: RAMP-R-33-65M-3 1/8 con-(400V 3Ph AC)-15KWCW-opt-t15
Description: *(SSPA, Rack, HF1.5-30MHz, BNCf IP to 3 1/8 EIA connector 400V AC 3 Phase 15KW Continuous)*
Options: **100W, 500W, 1KW CW, 1KW Pulsed, 5KW Pulsed, (Rack not inc)**

AC1 180-264 VAC Single Phase, AC2 342-418 VAC 3 Phase, AC3 375-456 VAC 3 Phase
55dBa Low Noise fans High Frequency Switch time: 20ms

RADITEK Power Amplifier Product line:

Driven by customer demand, Raditek is rapidly growing a high power SSPA product line. We include various special options, such as different power supply options (1 phase, 3 phase etc) and even fan noise options.
We can offer either a} Air cooled or b) Water cooled options also. Water cooling allows the amplifier to sit in an non air conditioned (cooled) room, even a very small room, with the water to air heat exchanger at some other close-by location.
There are optional housings (see below), depending on output power and cooling options: Smaller housing is to 200W for example, middle sized one to 1KW and the largest size is to 15KW, typically. For water cooled versions, the fan units at the top will not be needed, of course.
Note that there are data access options, including front panel keypad option. LCD display showing Output power is standard.

1. **Ethernet only (2 way)**
2. **Ethernet (Read only) and SNMP**

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Specifications	RAMP-R-33-65M-3 1/8 con-(400V 3Ph AC)-15KWCW-opt-t15
1	Input connectors : N (f), 50 Ω
2	Output connectors : 3 1/8" EIA flange ,50 Ω
3	Operating Frequency Range: 1.6-30MHz
4	Max. Output Power Level : 15 kW. Nominal Output Power level: 100 W to 15kW.
5	Nominal drive power: 0 dBm for 15 kW
6	Nominal Gain: 70 dB+/- 1 dB gain for 35-65 MHz 70dB+/- 0.3dB for 100W to 15 kW output power
7	Duration of operation: 3600 sec "ON" time with 25% duty cycle
8	Input & output impedance: 50 ohm
9	Harmonic and Spurious : Nominal: -20 dBc Max : -15 dBc Optional additional Filtering
10	Self-Protection and indicator on front panel for following faults: • Output VSWR limit to 3:1, Over current , Overheating, Over input drive, Internal fault; • Power supply fault, Cooling fault
11	Fast ON/OFF1 with external trip signal: RF OFF: < 10 µs RF ON: < 50 µs (BNC/SMA type connector)
12	RF samples: Forward power & reflected power (N Type female)
13	RF leakage : < 1mW / cm2 at the distance of 10 cm
14	Local operation using front panel display & control: System controls Metering (5% accuracy) • Indication of fault condition Fault reset button
15	Interface for Remote1 operation (TTL signal preferable) : Start/stop command** (100 ms) • SSPA ready status (100 ms) Trip signal against Sr no 10 (10 µs) • 0-3.5 V DC according to 0-15 kW RF forward and reflected power • Fault reset command (BNC/SMA type connector) ** Significance for command/status: Start/stop: Enable power supply, control system, etc.
16	Cooling water Parameters: Type & quality of the water: DMDI water Inlet pressure: 5 bar max (73 PSI) • Water inlet temperature: 45 °C pressure drop: flow monitoring 5 gal min • Water inlet/outlet cooling connectors provided by vendor: ¾" Male & female
17	AC mains input:230 V, ± 10% (single phase) / 400 V, ± 10% (3 phase) , @ 50 Hz
18	Maximum input power (no damage level): 8 dBm I/P power max
19	Overall Size of the unit Max. dimension: 1m X 1m with height of 2m max
20	Weight: <500 Kg. (estimate 300Kg.)
21	Storage temperature -30 to +50°C & humidity level: 40%
22	Environment for operation: temperature: 30 to 40°C Humidity level: 45 to 95 % (non Condensing)
25	Installation manual in English
26	Operation & service manuals with trouble shooting, in English
27	Factory Test report
28	QMP documentation : Test procedure and test condition Detailed Technical Datasheet - Quality & Safety plan along with implementation procedure

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