

CA1500-2M

1500 Watt, 100% Duty Cycle, Solid State, 144 MHz, Linear Amplifier

Communication Amplifiers, LLC. 15731 Nike Drive, Terrell, Texas 75160

The Communication Amplifiers, LLC (Comm Amps) CA1500HF-2M is a 1500W Output, Solid State, 144 MHz, self contained, RF amplifier that is Unlike any other "Solid State" Amateur Radio amplifier in the world...

Features:

- The CA1500-2M Is Delivered Completely Self Contained (except for T/R Relays).
- Instant On! All Solid State Circuitry Eliminates The Need To Warm The Unit Up Before Operation.
- Full 1500w Operation On CW, SSB, FM, AM, RTTY, JT65, FSK441A, PSK31, Etc... With No Power Derating!
- True 100% Duty Cycle Design Based On 40+ Years Building Amplifiers For The Military & Broadcast Industry.
- Solid State 50VDC "Laterally Diffused MOSFET" Devices Which Are Capable Of Easily Handling A 10-1 Mismatch!
- If The Units Temperature Ever Becomes Too High For Any Reason, Control Circuitry Will automatically Throttle It Back To A Safe Level, Protecting & Yet Never Interrupting Operation So... You Stay On The Air!!
- Anytime 200W Of Reflected Power Is Detected, A Relay Trips Putting The Unit Into "Standby Mode". This Lights A Front Panel Reset Button. A Simple "Push" Eliminates The Fault & Your Off & Going Again... No Muss, No Fuss!
- The Main Power Switch Is Also The Main Double Pole Circuit Breaker (240VAC 20A). Placing It Up Front Eliminates The Need To Ever Reach Behind The Amplifier Again As AC, Control, & Rf Cables Are Back There.
- Back-Lit Digital Display Provides Heat-Sink Temperatures, DC Voltage, DC Current, Forward Power & VSWR Data All In A Large "Easy To Read" Format. The Display Encoded With Your Personal Callsign At Time Of Purchase.
- Front Panel LED Bar-Graphs Show Fwd Power, Ref Power, & Temp Data In A Way You Can Quickly Absorb.
- RCA Female Phono Jack Located On Rear Panel Provides "Ground on transmit" PTT control.
- Internal CPU Monitors All Of The Amplifiers Status & Only Drives The Displays. If it Fails, The Amplifier Remains 100% Operational W/Forward Power, Reverse Power, & Temperature Data via the LED Bar-graph Displays.
- Internal 3000W Switching Supply Provides 62.5A of Quiet, Stable, & very Dependable 50VDC Power.

Nominal Specifications:

- 144-148 MHz Operating Range (Two Meters).
- 1500W Nominal Output.
- 35W Typical Drive Level.
- 100% Duty Cycle Regardless Of Mode (CW/SSB/AM/FM/WSJT/etc...).
- 60% to 70% Efficiency typical.
- IMD's @ 1500W PEP SSB = -35dBc.
- All Harmonics measured at -70dBc or less.
- -20C to +50C Operating Temperature.
- 50VDC @ 49.1A = 1500W Output.
- 180VAC – 260VAC @ 20A Max Line Voltage Input Via Power Receptacle On Outside Rear Panel.
- RF Spectrum Cleanliness Meets & Exceeds FCC Requirements.
- Amphenol Teflon "N" Female RF Input & Output Connectors On Outside Rear Panel.
- RCA Female Phono Jack for "Ground On Transmit" PTT Control Is Located On The Outside Rear Panel.
- 17.0" Wide X 10.25" High X 18.0" Deep.
- Self Contained Amplifier Weighs In At 65 Lbs.

Devices

The CA1500-2M uses a pair of 1KW 50V RF LDMOSFET "Pallet RF Amplifiers". Each PCB is mounted on a 1/4" thick copper heat spreader which disperses the heat generated over a wider area than the typical aluminum base-plate used by other manufacturers. The completed "Pallet" is then mounted to a very efficient aluminum heat-sink, each of which has two fans keeping them cool while providing built in cooling redundancy. Running a pair of "Pallets" into a 2 port combiner will easily achieve 1500W output while not stressing the transistors to do so. All of which leads to greater linearity and longer device life.

Duty Cycle

This Amplifier is rated for 1500W Output while maintaining a true "100% Duty Cycle". This literally means you can transmit 1500W Output, hour after hour after hour (as long as the cooling fans are turning), and it will keep working. If for any reason the transistors begin to get dangerously warm (VSWR changes, High ambient air temperature, etc..) A sensor will trip a relay and throttle back the power, preventing any damage to the amplifier or it's 3000W 50V power supply... while more importantly, never skipping a beat as you remain ON THE AIR!

VSWR Fault

The only time this amplifier is designed to stop operating is when it detects 200W or more of Reflected power. This causes a fault condition which then places the unit into standby mode, illuminating a Red "VSWR Fault" Indicator located in the center of the Front Panel. Once the source of the high VSWR condition is corrected, a simple "Push" of the lit button will clear the fault condition, allowing operation to resume.

Microprocessor Control - Not!

Unlike other manufacturers on the market, we deliberately choose not to employ any "Central Microprocessor Control" of the amplifier. While we have designed into the unit a robust CPU that is more than capable of supervising every aspect of the amplifiers operation, We chose to have it only display the sensor data & nothing more. "Why?" you would ask... I can't even begin to tell you the number of times folks have shared with us their horror stories of an amplifier failing to operate properly because "its microprocessor control circuitry has either malfunctioned or died completely, making everything else cease to function". Imagine the frustration of being on a remote operation with an amplifier that has a perfectly functional RF deck that is rendered USELESS by glitched or inoperative digital control circuitry. Doesn't sound very enjoyable to me!

Rugged "Field Proven" Amplifiers

Our design completely eliminates any CPU driven issues by allowing the on-board controls that are already a part of each Pallet RF Amplifier to manage it's own "housekeeping duties". These are the same circuits that have performed flawlessly for thousands and thousands of hours in the broadcast industry, an area in which we have over 35 yrs of experience. Included within is a robust 3000W 50V DC supply that is more than up to the challenge of delivering the power needed. It is this attention to detail that makes it possible to operate digital modes such as JT65, FSK441A, & RTTY at Legal Limit power all day long without any worry of the amplifier failing. No Other 1500W Solid State Amplifier Out There Can Make This Claim!

Dual Data Displays

Another unique feature is that the sensor data is displayed a couple of ways. One is via a comprehensive digital display that provides the status of various parameters such as the Total Power Out, VSWR, Temperature of ea 1KW RF Pallet Amplifier, DC voltage, & Total DC Current. In addition there are Vertical LED Bar-graphs designed to, with only a quick glance, inform you about the amplifiers Forward Power, Reverse Power and Temperature, freeing you to concentrate on operating which is a great help when running pileups in a contest, on a DX-pedition, or just Rag-chewing with an old friend.

Driving Power

With a measured system gain of roughly 16 dB, the typical driving power for the CA1500-2M will be approximately 35W in order to achieve 1500W of output power.

Extremely Rugged Cabinet

This distinctive, self contained 1500W amplifier is housed into a very rugged, custom made, equipment cabinet that is reinforced with an integral aluminum roll cage made from 3/4" square hardened aluminum bar stock. Designed to not only support the robust circuitry & heat sinks within, but to provide plenty of protection from rough handling on the outside. Measuring in at only 17.0" wide x 10.25" high x 18.0" deep, it should fit neatly into any station regardless if in your home, portable on Field Day, or a DX-pedition to a far away land. Weighing in at 65 pounds, it comes equipped with "Heavy Duty" folding carrying handles on each side as well as front panel equipment handles, all of which are designed to make transporting the unit both easier & safer. The bottom cover comes installed with four large, very durable, rubber feet to absorb any vibration while protecting your operating position. We have also thought ahead and have provided threaded holes in the corners of each side of the cabinet for the option of your adding rubber feet during times of transit. Optional Rack Mounting brackets will be available in the future for securing the unit into a standard 19" rack.

T/R Switching

At this time, all T/R Switching is to be done outside the amplifier cabinet allowing for greater flexibility of each stations individual needs. While not included in the initial offering on this unit, an optional T/R assembly built into its own small enclosure is available to provide that function while mounted on the outside rear panel.

PTT Control

(If the optional T/R module is factory installed) PTT control to the radio of your choice is available via a RCA Female "Ground to key" Jack located on the rear panel.

DC Supplies

The Amplifier Has Two DC Power supplies enclosed within making it a completely self contained unit that's very easy to install & operate. It needs only a single phase 220VAC circuit W/20A minimum capacity to operate to its fullest potential.

Description Of Overall Operation

Once The Amplifier Is Put Into Transmit Mode By Grounding The Center Conductor Of The Female RCA Jack On The Rear panel, Exciter power May Be applied to the N Female RF input connector. From there it is split equally between the inputs of the two 1KW RF Pallet Amplifiers, raising the total RF output to a total of 1500W regardless of mode or duty cycle. The combined output of both 1KW Pallet RF Amplifiers is fed into a 9 pole elliptical low pass filter which has been designed to further reduce harmonic levels significantly below that mandated by FCC rules governing amateur radio service. Built into the low pass filter board is a pair of sampling line sections that constantly monitor both the Forward and Reverse Power levels, sending the data to both front panel displays via a pair of RF detectors. The Output of the Low Pass Filter is then routed to the N Female RF Output Connector located on the rear panel.

Pallet RF Amplifier Operation

Each 1KW Pallet RF Amplifier has its own heat sensor as well that is designed to provide feedback to the on-board controller which in turns adjusts the bias to keep the transistor quiescent current stable. The single LD MOSFET on each RF pallet is mounted on a substantial copper heat spreader which disperses the heat into a very efficient forced-air cooled aluminum heat-sink.

Cooling Operation/Requirements

Two High Volume fans per heat-sink provide abundant forced air cooling while a heat sensor on each heat-sink provides data to the front panel displays. The fans will have two speeds, A quiet mode when idling or in intermittent duty and full power mode once the heat sink temperature warrants it. When Installing The amplifier select a spot that that has a clear area to both sides as well as the rear to ensure proper cooling. It is especially important to avoid blocking the air intakes located near the front on both sides. Allow typically Four to Six inches of clearance for adequate ventilation. Be sure to keep any loose papers, or other objects that might impede the airflow, away from the air intakes and exhausts.

Operating Location

While on the subject of the amplifier location, it would be best to keep it from being placed directly next to microphones, audio interfaces, or other sensitive equipment. Bypassing all interconnecting Audio & Control lines in the station with ferrite chokes is always a sure way to keep everything free of unwanted RF. A good ground is extremely important to keeping stray RF from being a problem.

Legal Description

The CA1500-2M Is A Mono-Band Amateur Radio Legal Limit Solid State Radio Frequency Linear Power Amplifier That Is Not Required To Pass FCC Certification. As it operates at 144 MHz, It is however required To Comply With The Technical Standards Of CFR Title 47 Part 97.307(A) And (B). This Solid State Linear Power Amplifier Provides 1500W Output Throughout The 2 Meter Amateur Radio Band While Meeting/Exceeding The Requirements As Stated Above.

Please Feel Free To Contact Us Anytime At 775-224-7888 During Normal Business Hours For The USA Central Time Zone.

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Commamps.com- "The ONLY 1500W, 100% Duty Cycle, Solid State, Amateur Radio Amplifiers Out There"