**Gemini HF-1K**

Solid State HF Linear Amplifier

- **460KHz to 50MHz all bands**
- **1kW** output
- **High spectral purity**
- **Fully automatic band selection**

**FULL TOUCH SCREEN CONTROL**

- **Full QSK**
- **Multiple antenna outputs**
- **Touch screen full colour display**
- **Linearisation feedback output for SDRs**
- **Full protection for overdrive/ SWR/temperature**
- **Aluminium main chassis**
- **90-260V 50-60Hz power input**
- **Weight 15Kg**
- **Dimensions 370w x 360d x 180h mm**

*200W+ output on 460-475KHz when used with external accessory filter unit*

**Extensive Low Pass Filter network**

**Fully optimised high linearity RF circuitry**

**Real time linearity display!**

Warns you when you are about to overdrive!
The Gemini HF-1K is a solid-state 1kW 1.8MHz – 50MHz power amplifier with additional capability at 472kHz. It uses a single dual-LDMOS power device for reliability, and has an internal highly reliable low-noise switching power supply, in order to reduce the overall weight. The thermal design is very conservative with a large heatsink, and OFHC heatspreader. This, assisted by several fans and a sophisticated thermal management system, allows the channel temperature of the LDMOS device to remain within limits which should ensure extended life, even with heavy usage.

A major objective of the RF design has been to significantly exceed the spurious signal generation requirements of the international approvals standard (ETS 300 783 pts 1 and 2) for amateur radio equipment. To this end the Gemini HF-1K has more extensive filtering than is usual in HF PAs.

While LDMOS power FETs are amongst the most rugged RF power amplifier devices currently available, they are sensitive to RF overdrive. The Gemini HF-1K has both extensive monitoring to minimise the risk of damage by overdrive and a conservatively designed input circuit.

Following modern industrial practice, the Gemini HF-1K employs full touch-screen control using a 480 x 272 pixel 4 ¼ inch full colour TFT display. A wide range of monitoring functions can be displayed, including power output, PA drain current, VSWR, heatsink temperature, and linearity. The latter parameter provides a graphic indication of when the amplifier power output enters the region where ‘splatter’ will be generated.

As with other Linear Amp UK designs, there is no provision for ALC, as this is a major cause of bad signals.

While the control system provides for manual band selection, it will interface seamlessly with standard CAT systems. The presence of valid in-band RF signals is also detected and will initiate switching automatically to that band.

A high-speed, very low distortion, PIN diode, solid-state switching circuit allows very fast full break-in operation.

A single input and three selectable antenna output connectors are provided. The latter can be preset on a band by band basis.

A 0dBm SMA feedback output is provided to allow connection to transmitters with linearisation capabilities.

The amplifier is built in a very robust all aluminium case. A modular assembly approach has been adopted with non-RF and high current DC interconnects being distributed as a single bus.

Outline specification.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Operating frequencies</td>
<td>460 – 479kHz*</td>
</tr>
<tr>
<td></td>
<td>1.8 – 2.0MHz</td>
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<tr>
<td></td>
<td>3.5 – 4MHz</td>
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<tr>
<td></td>
<td>5.0 – 5.5MHz</td>
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<tr>
<td></td>
<td>7.0 – 7.3MHz</td>
</tr>
<tr>
<td></td>
<td>10.1 – 10.2MHz</td>
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<td>14.0 – 14.4MHz</td>
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<td></td>
<td>18.0 – 18.2MHz</td>
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<tr>
<td></td>
<td>21.0 – 21.5MHz</td>
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<td></td>
<td>24.8 – 25.0MHz</td>
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<td></td>
<td>28.0 – 29.7MHz</td>
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<td>50.0 – 54.0MHz</td>
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</table>

Power output: >1 kW** at 1dB gain compression

Power input: 5, 10, 25W, 100W, customer specified

3rd order IMD distortion: better than -30dB at 1kW

11th order IMD distortion: better than -70dB at 1kW

Harmonic suppression: better than 70dB (all harmonic products)

Input VSWR: better than 1.5:1

Load VSWR: <1.5:1 for best performance

tolerance: 2:1 high VSWR trip.

Note: the specifications given above should be achieved in production units, but cannot be guaranteed at this time. Linear Amp UK has spent a great deal of money on purchasing accurate high-end test equipment – which we know how to use – and does its utmost to ensure that the equipment we manufacture exceeds our claims for its performance.

* when used with an external accessory low pass filter unit
** 200W+ output on 460-479KHz when used with external accessory filter unit

TYPICAL FILTER RESPONSE PLOT

showing harmonic suppression >70dB on all harmonics

10MHz Low Pass Filter S21

Insertion loss: 10dB/dB (y-axis) Frequency 100KHz - 80MHz (x-axis)
Agilent B7523ES vector network analyser