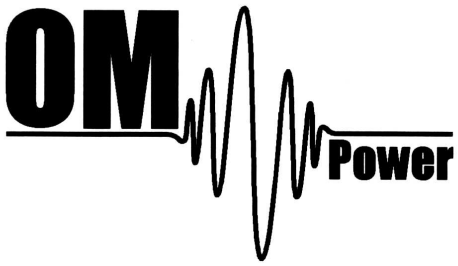

OM Power

Exhibit 8: Operation Description

External Radio Frequency Power Amplifier OM2000A+

Model OM2000A+

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Operational Description

The OM2000A+ is a complete and self-contained linear amplifier that covers the amateur band 1.8-54 MHz and provides 1500W output power with typically 60W exciter drive.

The amplifier's tuning is simplified by a TUNE Indicator which helps the operator to quickly and precisely match antennas and eliminates probability of inadvertent mistune. The antenna impedance matching capability is up to VSWR 3:1. A fixed matching circuit to the tubes input is employed which results in a very good load to the exciter over the entire frequency band from 1.8 to 54 MHz, yielding a good linearity.

Look at the schematic diagram (Exhibit 3). The high-performance ceramic tetrode type FU-728F with a plate dissipation of 1200W is grid driven. The input signal is 50 Ohm/250 W RF swamping resistor in the INPUT PCB. This circuit tunes out the input capacitance of the tubes. The swamping resistor is not an attenuator but it is a termination load for the input matching circuit. It could not be eliminated since a severe impedance mismatch to the driver would prevent using the amplifier at all.

The Surge arrester (located on Screen board PCB) in the screen grid circuit protects the tubes screen grid and the voltage regulator in the events of dynatron effect or a tube internal flashover.

The nominal voltages and current of the tubes at rated output power are as follows:

DC plate voltage: 3200V
DC plate current: 1.2A
DC screen voltage: 330V
DC screen current: max 60mA
DC grid basis: 60V

The combination L1-R2 in the plate circuit is a VHF/UHF parasitic suppressor. DC plate voltage is fed through chokes L2,L3,L9 and the capacitor C4 blocks it from the output. The output circuit comprises L7, L8, C7-C13 which form a classic Pi-L network and suppress the harmonic frequency emissions. This tank is switched and tuned over the bands by ceramic switch SW1 and the air variable divided capacitors C8,C12 and C10,C13. The output signal is fed through an additional VHF low-pass filter for frequencies above 55MHz (L10, L11, and C2 ,C14 ,C15 C16 and C17). Then it is passed through the vacuum antenna relay GS, wattmeter current transformer to the antenna output. The choke L5 keep track of the antenna relay contact conditions and prevent the plate supply from reaching the antenna. L5 shunts the high voltage to ground should the DC blocking capacitor C4 fail.

All supply voltages are delivered from Switch-On Board (small supply for control circuits, supply for control grid) and HV Supply Board (screen grid and plate voltage). The control grid, screen grid, and plate voltages and currents, plate cooling airflow temperature, forwarded and

reflected power etc. are permanently monitored. Many software-derived protections are based on this information (Exhibit 6, part 1.2.2).

The output signal is fed through a piece of coaxial cable,, to the “RF OUTPUT” connector through the wattmeter PCB.
The amplifier is controlled by a microprocessor system, based on the Microchip Technology micro-controller , It uses a 80 MHz clock, stabilized by a piezo-ceramic resonator.

All supply voltages are delivered from conventional rectifiers and linear regulators and no switching supplies are used. The currents of the tubes control grids, screen grids, and plates as well as the forward and reflected power and etc are continuously monitored by the uP controller. Many software-derived protections are based on this information in order to insure normal tubes regime and antenna tuning, thus drastically reducing the probability of any inadvertent operator’s mistakes or apparatus irregularities that could arise during exploitation of the amplifier.