



Via di Monte Verde 33 – 00152 Rome – Italy.
Website www.linear-amplifier.com

Tel. (39-6) 58209429
e_mail info@linear-amplifier.com

Fax (39-6) 58209647

Exhibit 8: Operational Description

External Radio Frequency Linear Amplifier Model Expert 2K-FA



Operational Description

The SPE Expert 2K-FA solid state linear amplifier is small, powerful and completely automatic, it provides a full legal power output and covers the radio amateur band range from 1.8 to 50 MHz,

All operating conditions (frequency, antenna and tuner) may be controlled from the transceiver.

The linear amplifier has two inputs (INPUT 1, INPUT 2) to which it is possible to connect two transceivers of any brand or type.

These inputs are selected with the [INPUT] key or automatically.

It can manage up to six antennas (ANT 1, ANT 2, ANT 3, ANT 4, ANT 5, ANT 6).

The amplifier selects antennas automatically when they have been programmed.

The amplifier is composed of six push-pull of MRF151 G (mosfets) in class AB paralleled with a passive combiner.

The modern transceivers have CAT control, thanks to this link the linear amplifier detects the operating frequency of the transceiver and then automatically changes band, antenna and automatic tuner.

The power supply of the SPE Expert 2K-FA, unique in its category, is switching with a PFC (Power Factor Correction) that allows a drastic reduction of the harmonic components in the mains in accordance with IEC555-2.

It consists of two separate elements:

The first powers all the electronic circuits for command and control.

The second powers only the PA, its output voltages are 48 Vdc (MAX Pout), 35 Vdc (MID Pout), and 30 Vdc (LOW Pout).

The power supply meets also the followings rules: UL60950-1, TUV EN60950-1, EN55022, EN61000-3-2,-3, EN61000-4-2,3,4,5,6,8,11; ENV50204, EN5502.

The amplifier has an automatic tuner that handles load mismatches up to 3:1 VSWR (2,5:1 for 50 MHz). A unique feature of this linear is that it not only measures the SWR after the matching, but also the SWR of the system antenna / cable, this allows to always evaluate the antenna system despite the matching and the power applied.

The amplifier contains a look-up table with the permitted amateur bands only (continuous coverage is inhibited, including CB band).

In the tuner management, antenna data and other working data are stored.

Every band has a sub-band set, and for each of those, data related to the antenna and auto-ATU tuning is stored.

The CAT information and the frequency counter inside the linear detect the operating frequency and set the correct sub-band.

Thanks to the stored data, the tuner and the antenna are automatically set correctly.

Setting of the match data to write in the tables is performed automatically by pressing the [TUNE] key, the system will then find the correct match for minimum SWR.



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The SPE Expert 2K-FA has a sophisticated protection system that constantly controls the amplifier's most important parameters.

These parameters are:

Temperature of the heatsink; max. / min. voltage on the PA; max. PA current; SWR; max voltage RF on the tuner; input power; power combiner balance.

The protection system is effected in two different ways:

- 1) Through hardware circuits to guarantee minimum intervention time.
- 2) Through software, with one of the two CPU's, to guarantee the maximum precision.

The two results are always compared, every difference produces a protection trip and consequent alarm.

Several new features are provided:

- Tuneable antennas control.
- Setting up a separate receiving antenna.
- Command of BPF external filters.
- Remotable ATU (optz.).