Model HL-45B

Theory of Operation

(How It Works/ RF Signal Flow)

① When the amplifier is in a stand-by (STBY) mode, gate bias (voltage) to the final FET's are cut off. Also input (TX) relay and output (ANT) relay are free(open) from the amplifier. Therefore the signals from the transceiver and/or from the antenna will all by-pass the amplifier. (By-Pass/ Stand-By Mode)

② When the amplifier is in an OPER. (operate) mode and keyed by the transceiver, forward gate bias is applied to the final power FET's and at the same time input and output relays are closed to the IN and OUT of the amplifier. Consequently the amplifier is ready to work with the designed amplification gain.

③ When RF Drive signal from the transceiver reaches TX (IN) (Input terminal of amplifier), input power level is measured by Power Detector. If the drive power is over 5W, the protection circuit will issue a command of "Over-Drive", to shut down the amplifier.

④ A part of drive signal is lead to IC3, micro-computer, where the frequency of the drive signal is counted by PIC IC. If the frequency is between 26.0 and 28.0 MHz, micro-controller issues the command to shut down the amplifier, according to FCC rule.

⑤ Then drive signal reaches the input of PA stage. Signal is attenuated by 3dB attenuator before entering the gates of FET's. Two FET's (RD30FVF1) form a broad-band parallel push-pull linear amp with a gain of approx. nine times.

⑥ Next, the amplified signal will pass through LPF (low pass filter) stage, where the harmonics are filtered and removed.

⑦ Filtered output signal will then go through the OUT DET (output power detector) to reach ANT/RF OUT, J2 (ANT) terminal. Power Detector measures the output power level of the signal. This power level is shown on the LED indicator on the front panel.