

Model HL-550FX

Theory of Operation (How It Works/ RF Signal Flow)

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)

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 at the IN and OUT terminals of the amplifier. Consequently the amplifier is ready to work with the designed amplification gain.

RF Drive signal from the transceiver reaches RF IN (J504) of DET (Detector) Unit, PC1821, where input power level is measured. If the in drive power is over 100W, the protection circuit will issue a command of "Over-Drive", to shut down the amplifier. DET UNIT also measures the amplified output level of the amplifier. When the ratio of output and input (drive) powers is much lower than the designed value, CONT UNIT (PC1818) will judge that final amplifier is out of order and/or that output LPF (low pass filter) is band miss-set.

Drive signal having passed INPUT DET part will be lead to PC1733, Freq. DET UNIT, where the frequency of the drive signal is counted by IC. If the frequency is between 26.0 and 28.0 MHz, CONT (ROL) UNIT issues the command to shut down the amplifier, according to FCC rule.

Then drive signal reaches the input of PA UNIT, PC1662V. Signal is attenuated by 6 dB attenuator before entering the gates of FET's. Four FET's (VRF150's) form a broad-band parallel push-pull linear amp with a gain of approx. forty (40) times.

Next, the amplified signal will pass through LPF (low pass filter) UNIT, PC1817, where the harmonics are filtered and removed.

Filtered output signal will then go through the OUT DET (output power detector) of DET UNIT, PC1821 to reach RF OUT, J505 (ANT) terminal. OUT DET measures the output power level of the signal. This power level is shown on the analog multi-meter, PF scale (forward power).

This amplifier has two sets of built-in DC power supply units. They are commercially made switching mode DC P.S. that work over the wide AC voltage range, i.e. AC 85V ~ 264V.

The DC power supply section is solidly shielded and filtered to avoid the leakage of switching noises over the wide frequency range. ADF1000F48 provides DC42V/20A to the drains of final power FET's. KWD15-1212 provides +12V and -12V to the various low voltage circuits and control circuits.

