Model HL-2.5KFX

Theory of Operation

① 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 RF Drive signal from the transceiver reaches RF IN of DET(Detector) & T/R Relay Unit, PC1398B (Unit 5), where input power level is measured. If the in drive power is over 100W, the protection circuit commanded by micro computer (CPU) installed in PCS1677 (Unit 1) 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(PC1698) will judge that final amplifier is out of order and/or that output LPF (low pass filter) is band miss-set.

④ Drive signal having passed INPUT DET part is sampled by Unit 12, 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.

⑤ Then drive signal reaches the input of POWER AMP UNIT 6, PC1661. Signal is attenuated by 2 dB attenuator before entering the gates of

FET's. Two FET's (ARF1500's) form a broad-band push-pull linear amp with a gain of approximately sixteen times.

Next, the amplified signal will pass through LPF(low pass filter) UNIT (Unit 9), PC1681, where the harmonics are filtered and removed.

⑥ Filtered output signal will then go through the OUT DET(output power detector) of DET UNIT, PC1398B to reach RF OUT, J3(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).