CIRCUIT DESCTIPTION

TITAN LOW BAND BASE/REPEATER

RECEIVER PART

1) RF section

An incoming signal is fed to pre-selector (BPF-1), and amplified by Q101,
Then fed to post-selector (BPF-2). The balanced mixer, consisting of T101,
T102, D107 and D108, produces 48.5mhZ by injection from the 1st local signal
provided by Rx VCO (the 1st local of the 30MHz bands KG510 radios are 21.6MHz).

2) Noise Blanking Section

A noise blanking circuit consists of Q102 (1st noise amplifier), Q121 (buffer amplifier),
Q122 (2nd noise amplifier), Q123 (3rd noise amplifier), Q125 (1st pulse amplifier), Q104
(2nd pulse amplifier) and blanker switch formed by D103 though D106.
An incoming signal is divided by the 1st RF amplifier (Q101) to feed the 2nd BPF and
to feed 1st noise amplifier. A noise is amplified by Q102, Q121, Q122, Q123, Q125 and
Q104. Then amplified pulse triggers the blanker switch to eliminate the noise
within the RF signal.

3) IF section

The output signal from the balanced mixer is fed to the crystal filters (XF101),
then amplified by Q103. Again, this signal is fed to the 4-pole crystal filters
and amplified by Q113. After amplified by Q113, signal is fed to 2nd processor
IC (IC106). The 2nd local crystal oscillator signal is fed to IC106 to produce
the 2nd local signal (455KHz). IV106 amplifies the 2nd local signal and becomes
an audio signal by detector circuit inclusive within the IC106. Then, the audio
signal is fed to the low-pass filter inclusive in IC107, and fed to audio processor
IC (IC3).

4) VCO section

The oscillator circuit formed by L303, D303, D305 and Q301 produces the 1st local
signal (Rx frequency minus 48.5MHz). The 1st local signal is amplified by buffer
amplifier Q302, and again amplified by pre-amplifier IC301m and post amplifier
Q303. The amplified signal is fed to the balanced mixer.

5) PLL section

PLL IC inclusive with pre-scaller IC101 compares the phase between the VCO

frequency and reference oscillator frequency (12.00MHz) by method of dividing the frequency, and produces VCO control signal. Then, this control signal is fed to the charge pump, consisting of Q108, Q109 and Q110, and fed to the LPF. The supply voltage of charge pump is multiplied by IC102 (approx. 15V) to achieve greater C/N ratio.

TRANASMITTER PART

1) VCO section

The oscillator circuit formed by L303, D305 and D306 generates transmitter Frequencies. Then this signal is fed to the 3-stage of amplifiers, buffer amplifier Q302, pre-amplifier IC301 and post amplifier Q303 and lead to the final amplifier.

2) PLL section

Basically, the circuit description is the same as Rx. PLL IC inclusive with pre-scaller IC205 compares the phase between the VCO signal and reference oscillator frequency (12.00MHz) by method of dividing the frequency, and produces VCO control signal. Then this VCO control signal is fed to the charge pump, consisting of Q206, Q207 and Q208, and fed to the LPF. The supply voltage of charge pump is amplified by IC206 (approx. 15V) to achieve greater C/N ratio.

3) Modulator section

The modulation signal is fed to both VCO and the reference oscillator (TCVXO), this permits a very flat modulation characteristics against low frequency (DC). This is the advantage when KG510 is used for POCSAG transmitter.

4) Tx younger section

The VCO signal is amplified by Q215 and Q216 to achieve 250mW. But VHF bands (136-174MHz) has only stage of amplifier Q215 to achieve 100mW.

5) PA section

The signal from younger stage is fed to Q501 (semi-driver), Q506 (driver) and Q454 (final amplifier) to achieve 50W output power. Then, signal is fed to the LPF to eliminate the harmonics spurious frequencies. An APC circuit formed by IC502, IC503, Q504 and Q505 stabilizes the output power at the set level. An IC501 protects PM501 and Q501 from the reverse power caused by the un-matched aerials.

LOGIC PART

1) Microcomputer (CPU) section

A CPU, IC-1, uPD78F005 is the 8-bit processor contained 60K flash memory and 2K RAM inside. This CPU controls all functions of KG510. A flash memory permits ON-BOARD-UP-GRADE when the new software is released.

2) EE ROM section

An IC7 is the 64kbit EEROM. This IC contains all channel parameters

3) Audio processor section

An IC2 is for Tx and an IC3 is for Rx audio processor. These IC's control all audio processing and encode/decode CTCSS tones by commanded by CPU. These IC's are also inclusive with 2400bps MODEM to enable to form MPT1327 trunking protocols by using an external MPT control software.

FRONT CONTROL PANEL PART

1) LCD display section

LCD display is constructed by 128 x 32 dot matrix. This allows to indicate not only characters but also graphics and symbols as you design.

2) LED display section

The 4 LED's are indicating each mode of operation KG510 now works.

3) Audio amplifier section

An IC404 has 2w audio power to drive 8 ohm speaker mounted on the panel

4) Microphone pre-amplifier section

An IC401 is the voice pre-amplifier having –34dBm output to feed Tx modulater.