

APPENDIX 4

A Description of Circuits for Determining & Stabilizing Frequency

The transmitter frequency is determined and stabilized by using a Frequency Synthesizer IC, LMX2332A (U14 on RF Receiver Board, installed in the Command Unit element of the Base Station).

The LMX2332A employs a digital phase-lock loop technique. This, combined with a high-quality 40 MHz OCXO as Reference Oscillator and a loop filter, provides the tuning voltages for a voltage-controlled oscillator (U12 on RF Receiver Board) which generates a very stable low-noise RF.

B Description of Circuits and Devices employed for Suppression of Spurious Radiation, for Limiting Modulation and for Limiting Power

Suppression of Spurious Radiation

A 5-element Chebychev low-pass filter is employed to attenuate spurious radiation. This filter is placed at the RF output of the transmitter and comprises L4, L5, C29, C30, C31 and C32.

Limiting Modulation

A Cartesian Lineariser circuit is employed not only to provide linearization, but also to limit modulation.

The I and Q signals from the baseband board and the feedback I and Q signals from the Cartesian loop are fed into Combining Amplifiers (U11A and U11B). A subtraction process is performed in order to generate error signals, which are fed to the I/Q Modulator (UC1), ensuring that the RF signal input to the amplifier stages is at the correct level.

Limiting Power

For limiting power, the gain of the final power amplifier is held at a relatively constant level by Zener Diode D4 and Thermistor TH1.

D5 maintains a constant bias voltage for the final power amplifier over a drain voltage range of 25 V to 30 V.

TH1 maintains a constant gain for the power amplifier over a temperature range of -30° to +50° C.