CIRCUIT DESCRIPTIONS

EXHIBIT 4A – MEANS FOR FREQUENCY STABILIZATION

Frequency stabilization is achieved with a temperature compensated crystal oscillator ,u712. Temperature stabilization is accomplished with a compensating network included in an integrated circuit. The resistors in the compensating network are lasers trimmed to the value determined by the specific value required in the temperature run. The reference oscillator frequency is 16.8Mhz.

EXHIBIT 4B – MEANS FOR LIMITING MODULATION

Electronic attenuator that located in the synthesizer IC u251 is controlled by the radio microprocessor, u717, To limit the deviation and to keep the deviation constant over the RF frequency range & channel bandwidth, the microcomputer adds the proper correction factor to the attenuator.

EXHIBIT 4C – MEANS FOR ATTENUATION OF HIGHER AUDIO FREQUENCIES

The output of the limiter is applied to a low-pass filter. This filter corner located at 6000 Hz. The output of the low-pass filter is applied to the modulator located in the synthesizer VCO and driving a varactor cr255.

EXHIBIT 4D – MEANS FOR ATTENUATION OF SPURIOUS EMISSIONS

The final stage of the RF power amplifier circuit feeds a low-pass filter in order to attenuate Harmonics of the carrier frequency as well as any spurious signals. The filter is a seven-pole Elliptic design using LC elements.
A cast metal compartmentalized shielded enclosure is placed over the main circuit RF board and secured to the chassis with screws.
This technique provides very effective and reliable shielding of the various circuits on the main board from each other and from the external environment, minimizing spurious RF radiated emissions.

EXHIBIT 4E – MEANS FOR LIMITING OUTPUT POWER

Output power is regulated through the use of a current sensing ALC loop. The voltage across voltage sensing coupler u714 provides a feedback signal to the Power Control IC
U715. This signal is then compared to the preprogrammed voltage reference and the error Signal is amplified and used to generate a control voltage to control the bias of the PA Stage U713.

EXHIBIT 4F – MODULATION TECHNIQUES

The transmitter is capable of the following types of modulation:

1. DPSK 1200 BPS
2. FSK 2400 BPS
3. DFM 4800 BPS
4. Dual Binary (COS) 9600 BPS

The modulation signal is processed through the limited attenuator and low pass filter. The
The microcomputer adjusts the attenuator to compensate for modulation sensitivity variations of the synthesizer.

EXHIBIT 4G – MEANS FOR CONTROLLING TRANSIENT FREQUENCY BEHAVIOR

The effects of VCO frequency shifts due to transmitter key-up and de-key impedance variations are minimized through the use of a multiple-stage transmitter lineup with resistive isolation pads between various stages, including a pad between the output of the VCO buffer amplifier circuit and the input of the transmitter circuit.
Additionally, the value of the reference voltage which controls output power is gradually raised during transmitter key-up and lowered during de-key, shaping the transmitter attack and decay characteristics by gradually changing the power control voltage.