

80020048 “RF TRANSMITTER BOARD”

S1, S2, and S3 are an addition to the button switch array on the processor board through J2.

C7, C8, C10, and C11 are VCC filter capacitors, they are actually located close to U1, and U2 so that any noise generated by these chips can be filtered before radiating.

Communications between the processor board, and the transmitter board are established through J2 of the processor board, this connector is connected to J1 of the transmitter board. The communication line is called TXD. As stated above J1 of the transmitter board also is where the transmitter board is supplied with the 3.3v(RF).

The TXD modulated with the 28.322Mhz Reference Oscillator, which is composed of X1, D1, L1 and their surrounding circuitry. The Modulated Reference Oscillator signal is then fed into U2, which is the transmitter synthesizer.

U2 multiplies the modulated Reference Oscillator signal by 32.0006 resulting in a modulated 906.322Mhz transmit frequency

U1 and its surrounding circuitry are the differential “loop filter”. The loop filter corrects any error in the output frequency, and the frequency determined by the Reference Oscillator times 32.0006. U1 creates an error voltage at pin 6 of U2, which then internally makes the correction to the Current Controlled Oscillator.

The Current Controlled Oscillator is a simple Tank circuit made up of L2, C9, and C3. This Tank circuit could also be referred to as the “Phase Lock Loop”.

Once a stable modulated 906.322Mhz transmit frequency has been established, the signal then is slightly amplified through Q1 and its surrounding circuitry, the gain of Q1 is fixed but adjusting C23 can reduce the signal strength to the desired output.

After the amplification the signal then passes through a number of Harmonic filter circuits which consist of C24, C25, C26, C27, and C28. The signal then is radiated from the antenna, and transmitted.

GROUNDING SYSTEM:

The 80020048 circuit board has a bottom layer copper pour that is connected directly to ground in reference to VCC. This “ground plane” is connected to necessary ground points on the top layer through plated through holes with thermal relives.

The 80020068 circuit board, is a 4-layer board, with one of the inner layers being a “ground plane”. The ground plane is connected to the appropriate points through plated through holes with thermal relives.

ANTENNA:

The antenna that is attached to the 80020048 circuit board is approximately 2.5” in length, which is near ¼ wavelength of 906.322Mhz.

TSK-2100, and CCK-2100 Circuit Descriptions

80020068 “RF KEYPAD BOARD”

Power is supplied to the Keypad processor board through two different connectors, J1, & J3, depending on if the keypad is going to be used in “hardwire”, or “RF” mode. In “RF” mode J1 is connected to two AA batteries which supply V+ on the 01006805 schematic. The V+ is the input for both U7, and U8. U8 and its circuitry provide the keypad board with regulated 5v. U7 and its surrounding circuitry provide the regulated 3.3 volts. The 3.3v is fed through Q8, and Q9, with Q8 turned on by the CMD_EN line from U2, which is the processor. The CMD_EN line pulses between 0v, and 5v. Thus providing a pulsing 3.3v (RF) to the transmitter board via J2 when a button is depressed.

When the keypad is being operated in “hardwired” mode a 6 pin Telco cable is plugged into J3 supplying U10 with +12v. U10 supplies the keypad board with 5v that then is applied to the input of U7, and U8. The HW_DET line is attached directly to the output of U10 so it gets pulled high, and the processor then switches the CMD_EN line disabling the transmitter board completely by dropping the ^SHDN^ line low, disabling U7s output.

U9 is the RS-485 level communication transceiver. R40, R41, R42 set up the levels with a typical voltage divider circuit. Communications to the camera are carried on the Telco cable through J3. The information to be transmitted through the hardwire is carried on the TXD line from the processor U2.

Addressing is established by setting S23, which determines the state of address lines P32, P33, P34, and P35. Which are connected directly to pins 13 through 17 of the keypad processor U2. Each line is pulled high through a 100K ohm resistor when the switch setting is open. The processor then interprets the logic levels of these pins, and adjusts the destination packet of the data output accordingly.

U6 is the processor power supervisor, it provides the processor with a reset state, a low power warning (^LOW_BAT^) which if low the processor set the BUZZER line high, and Q6, and Q7 drive BZ1 to inform the user that the batteries will soon be dead. This voltage is determined by the voltage divider set up with R15, and R16.

U4 is the processors external NVRAM, which retains the settings of the processor U2.

U1 converts a 3 wire binary counter from the processor to seven lines that toggle, these seven lines make up the columns in the button switch grid array that connect to the processors inputs.