

CITATION 8 CIRCUIT DESCRIPTION

BLOCK #1 (Battery Charger, On/Off, Shut off)

Applying AC power to the Citation 8 the internal 12 volt battery will begin to charge. Q1 monitors the current flowing into the battery, when the current drops to 100 ma, Q2 turns off stopping the charge current flow. The battery can be measured at any time by pressing the switch on the panel meter, the graph on the receiver cover will show the battery condition. To turn on the Citation 8 press the red power switch, if the battery is greater than 9.7 volts but less than 11 volts the LED above the power switch will flash. R101 sets the power LED flash voltage, U12 the voltage comparator turns on/off U13 the flash timer which controls the LED. If the battery was less than 9.7 volts, VD1 a voltage detector will turn off and not allow the unit to turn on.

BLOCK #2 (Keypad, Switches, Digital Circuitry, LED's)

The digital circuitry has an internal battery which supplies power to the switch latches U1 - U6 all the time. This enables the user to turn on/off the unit and not have to reset the receivers functions. Q12 (P-channel FET) latches when the power switch is pressed if the battery is above 9.7 volts thus applying power to the rest of the electronics.

BLOCK #3 (Microcontroller)

The 4 x 4 switch matrix send data to the microcontroller U11. The microcontroller has pre-programmed instructions which takes the switch data information and outputs the data to the liquid crystal display a EE Prom U14 stores up to 100 channels in memory. The receiver operates from 150 MHZ to 174 MHZ in 2500 Hz steps. Any frequencies greater than 174 MHZ will not be valid or any frequencies less than 150 MHZ will not be valid.

BLOCK #4 (Phase Lock Loop)

When a frequency is entered U11 sends data to the phase lock loop U7 which sends a voltage from the loop filter U2 to the local oscillator Q3 and Q2. The oscillator frequency is divided down through U3 and feed back to the phase lock loop.

BLOCK #5 (Receiver)

The local oscillator output is -7 DBM which is injected to the mixer TUF-1, the varactor voltage if fed to the band pass filters and tuned with the varactors V1 - V6, Q1 the RF amplifier amplifies the receive signal and feed into the RF port of the mixer. The IF mixer output is 21.4 MHZ, the IF signal goes through the 8 pole crystal filter and gets amplified by Q7 and injected into the IF detector U4.

BLOCK #6 (Audio Switching)

The audio, COR, squelch, and RSSI are all outputs from U4. The RSSI signal connects in to the panel meter. The de-emphasised audio goes into a switch matrix U8 and U9 which switches the audio to the audio amplifier U10 which drives the speaker or earphone. Or the de-emphasised audio can go into the equalizer U8 and U9 and back out to the audio amplifier. The Audio Line Amplifier U12 drives the recorder. The recorder gets power from the P-Channel FET from the COR circuitry U6 and U10 which is controlled by the squelch of the IF Detector U4.