

Description of Product Operation

Quantum Instruments Inc.'s FW7Q, FW8R and FW9T comprise a RF remote control system for trigger and control of photographic devices. FW7Q, FW8R are the receiver units. FW9T is a transmitter unit. FW7Q is dedicated for Quantum Qflash 4d and 5d series flashes.

The FW7Q and FW8R receiver circuits consist of an antenna, a RF receiver, a micro-controller, function selector switch, driver circuit and DC-DC converter.

The FW9T transmitter circuit consists of an antenna, a RF transmitter, a micro-controller, function selector switch, trigger circuit and DC-DC converter.

The antenna is a 1 / 4 – wave whip with a ground plane (PCB). The antenna is permanently installed to the product. The antenna can be swirled from the case about 180 degree to optimizing the performance when the product mounted at different position.

The RF receiver on FW7Q, 8 is a monolithic chip (MAX1473) made by Maxim Integrated Products. A crystal oscillator sets the receiving frequency to 433.92MHZ.

The RF transmitter on FW9T is a monolith chip (MAX1472) made by Maxim Integrated Products. A crystal oscillator sets the transmitter frequency to 433.92MHZ

The micro-controller is the "brain" of the system. It is connected to the RF receiver or transmitter and the other circuits. The Channel and Zone codes are programmed into micro-controller by setting function selector switches.

The function selector switches are channel selector switch and zone selector switch. The system channel selector switch provides a unique ID for the system to avoid interference with other system if 2 or more systems are to work together. The transmitter and receiver(s) working under same system have to be set to same channel. The zone selector switch enables the transmitter to individually control remote receivers, operating in the same channel.

The trigger circuit provides an interface between a trigger signal and the micro-controller. The trigger signal comes from the photographic device or a test button. After receiving a trigger signal, the micro-controller will generate a coded sequenced pulse train, which is transmitted as radio signals.

The driver circuit is connected to the micro-controller for control of photographic equipment. It can be used to activate the photographic devices such as flash and camera.

The DC-DC converter provides the proper voltage level from the battery source to the circuits.

When FW9T transmitter is triggered by a photographic device such as a camera, it sends the Manchester encoded digital radio signals with amplitude-shift keyed (ASK) modulation. The Manchester encoded digital radio signal contains channel and zone codes, which are programmed by selector switches on the transmitter.

The remote FW7Q or FW8R receiver(s) receive the radio signals from the transmitter. It decodes the Manchester code and detects the system channel and zone codes. If received system channel and zone codes match the system channel and zone codes that are programmed into the receiver, the receiver will activate a photographic device such as a flash or a camera.

The crystal oscillator sets the radio frequency of FW7Q, FW8R and FW9T to 433.92Mhz. Its temperature stability is +/- 50ppm over -40C to +85C.

Block Diagram

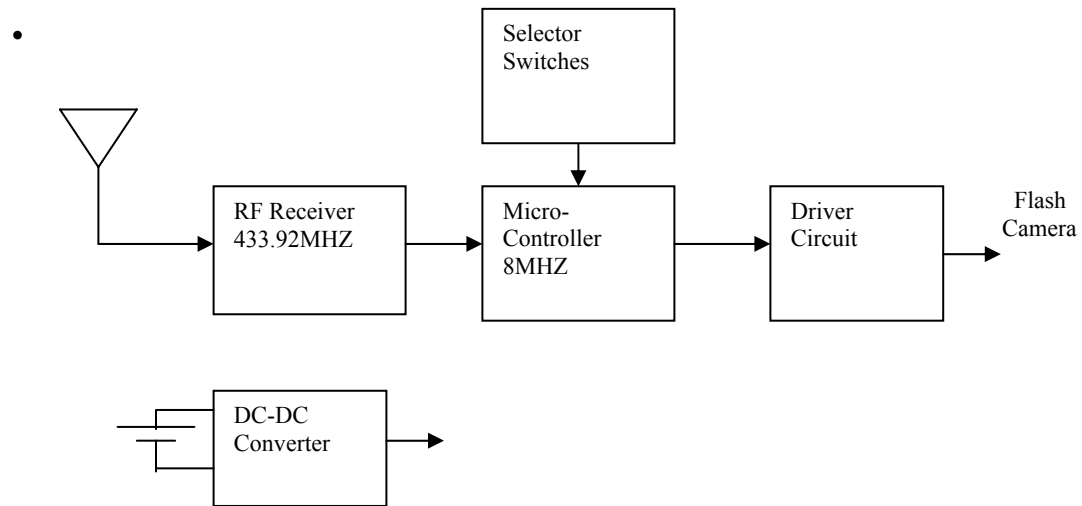


Fig 1. FW7Q and FW8R Circuit Block Diagram

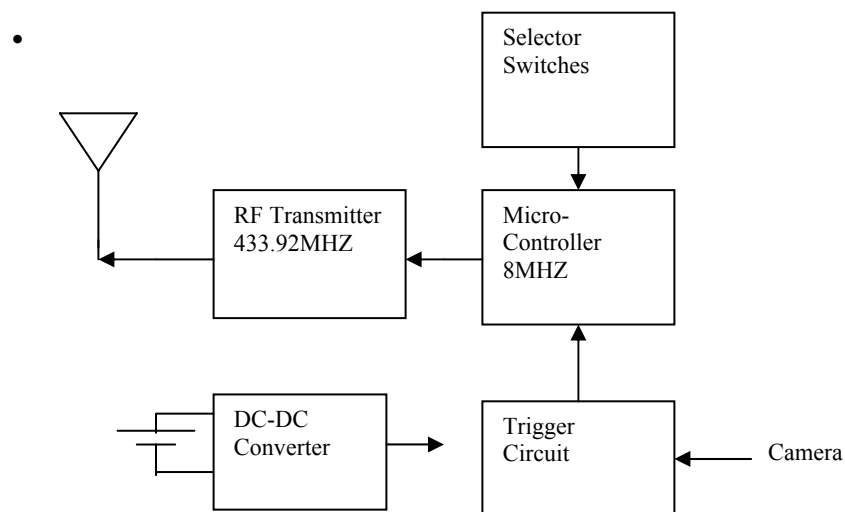
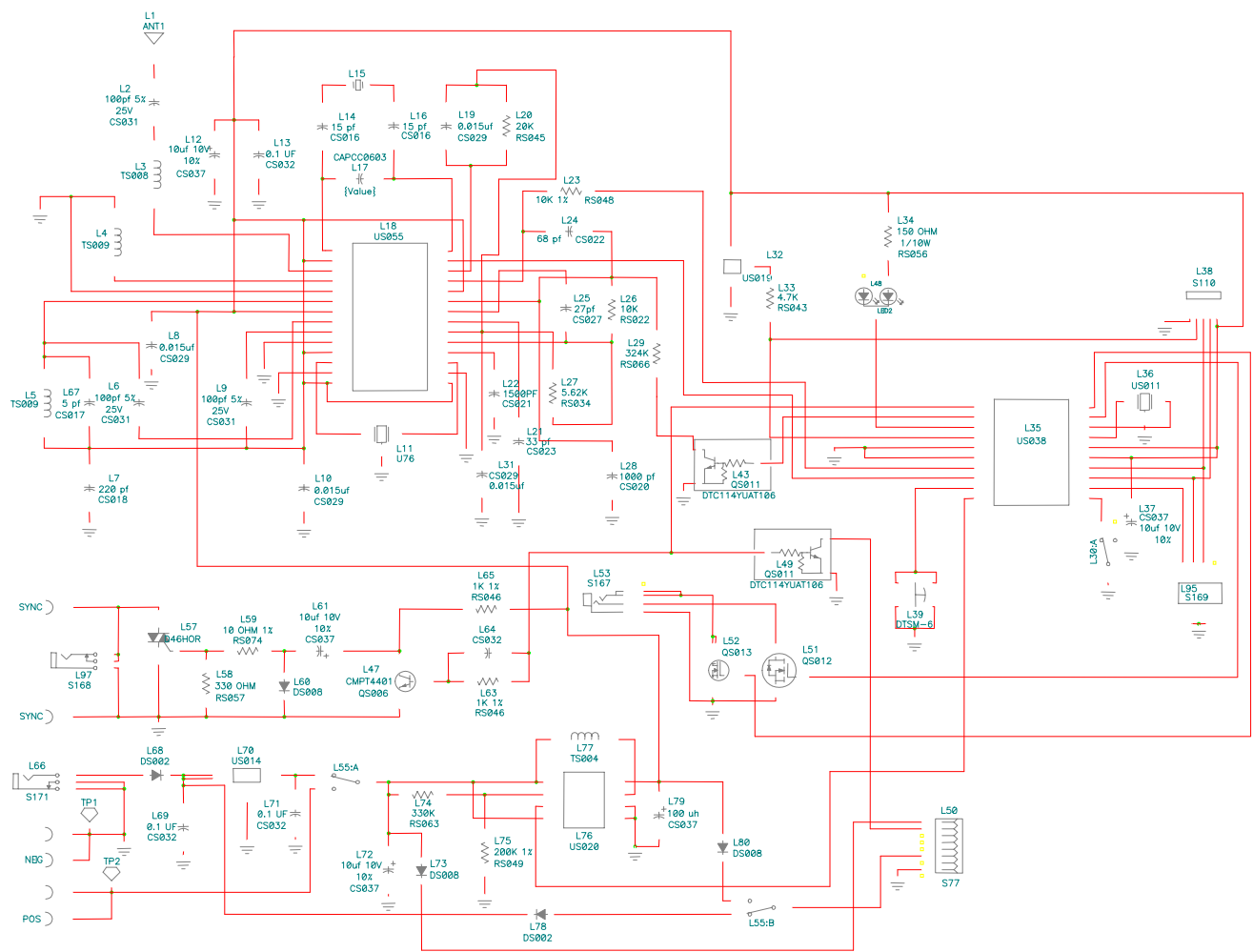
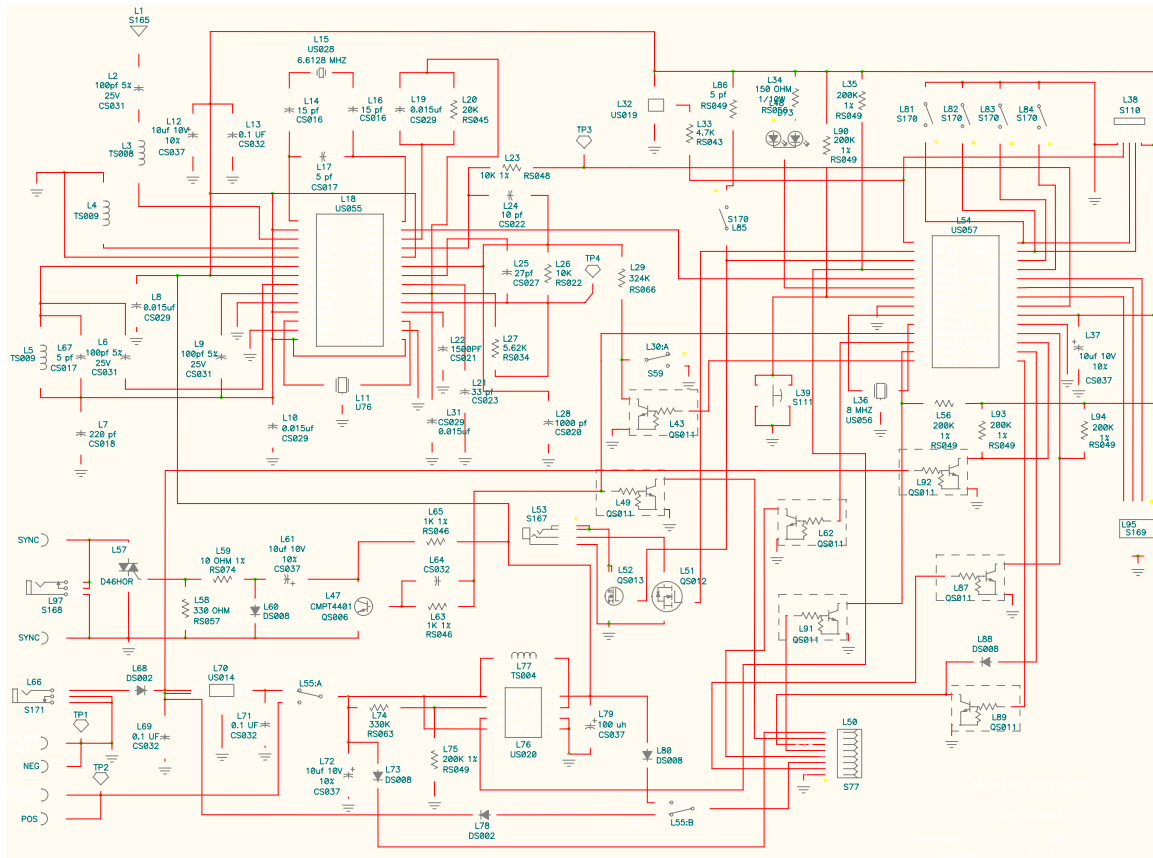


Fig 1. FW 9 Circuit Block Diagram



FW7Q Schematic



FW8R Schematic



FW9T Schematic