

# 6.78MHz Tester with 433MHz Cut-band

## Circuit Function and Device Operation

### 1. Circuit functions:

The 6.78MHz Tester uses a PIC18F887 microprocessor running with a crystal frequency of 4.0MHz to control the functioning of the device. This processor is used to control the LCD display, 16 key membrane keypad, clock/calendar circuit and necessary RF circuitry for receiving and transmitting 6.78MHz and transmitting 433.92MHz for testing purposes.

The low frequency transmit section of the Tester circuitry uses a 6.78MHz crystal, transistor amplifier and ferrite antenna for generating the 6.78MHz carrier. On/off keyed modulation is controlled by the microcontroller.

The low frequency 6.78MHz receive circuit uses a ferrite antenna, a tuned tank circuit and transistor amplifier for the active receiver. Incoming signals are decoded by the microcontroller.

The high frequency 433.92MHz “cut-band” signal is generated by and RF module and broadcast via a PCB trace antenna. The microcontroller keys this module to produce the cut-band RF signal.

The 6.78MHz Tester has a switching power supply to provide a usable supply voltage from the 9V battery. This switching power supply provides a more efficient means to produce the 5V from the 9V battery that powers the device. The Tester's 5V power supply is monitored to determine if it ever falls to an unacceptable level by a special voltage monitoring circuit.

### 2. Device Operations:

The Tester is used to test the 6.78MHz transmitters by RF link. When the Tester is used to test a transmitter, the ID code that the transmitter is broadcasting is received by a passive RF circuit, decoded in the micro, and displayed on the LCD of the tester, indicating that the received signal is correct and within specifications.

The Tester is also used to put the 6.78MHz transmitters to sleep (powered down). This is done with two way communication via 6.78MHz between the tester and transmitter. If the transmitter receives this code successfully, it will go to sleep.

The Tester also has provisions to test ID Exit Panels and the 433.92MHz Cutband receivers used in the 6.78MHz system. To use these features, the appropriate key is pressed on the membrane keypad and the Tester will perform the required test by broadcasting the 6.78MHz ID signal to test an ID Exit Panel or the 433.92MHz Cutband signal to test a Cutband receiver.

The tester also has an active 40.68 MHz receiver that will be used as a sniffer to locate misplaced transmitters.