YellowJacket Pro Radio Control System Specifications:
Transmitter:

- Size: 4.5 x 2.75 x 1.4 in.
- Weight: 4.25 oz
- Frequency 434 MHz
- RF Power: 4-10mW
- RF Range: 300—500 ft. LOS
- Operating Temperature -30 to +70 Deg. C
- Battery Life: 100+ Hours on single charge
- Antenna: Internal PCB or Whip
- Controls: 3 industrial grade pushbuttons
- Battery Power: AA standard or rechargeable
- Enclosure material: High impact resistant ABS Plastic

Image 1 below shows the face and pushbutton locations.
Image 2 below show the FCC ID Label and the battery compartment.

Image 1: Transmitter front view

Battery compartment

Image 2: Transmitter rear view

3.0 Block Diagram and Theory of operation:

The YellowJacket transmitter system is comprised of 6 main areas of functionality. A block diagram and schematic are attached to allow better understanding of the system and its functionality.

1. **Microprocessor-** The Microchip ™ 16F819 series processor using a 4 MHz crystal oscillator is responsible for all housekeeping functions such as: battery management, sleep times, button input wake up and validation, Transmit data format and timing. The 16F819 has a long history of exceptional reliability, low power and industrialized capacity to work through harsh environmental conditions while being a able to maintain the radio control, data serial number, and diagnostic LEDs.
2. **Power Supply–** Using a Diodes, Inc. ™ AP1603 series power boost system the YellowJacket power control is always a steady 3.3V. The unit can operate from 3.3V down to 1.9V at which time a low battery warning will be issued by the processor in the form of a slow beat of red pulses.
3. **Data Conditioner–** This circuit is a simple set of RC components that removes the square edges on the data train to allow a more smooth and exacting FM transition in the TDA7100 transmitter chip. Data going into the conditioner is nominally 9600 baud and simply is just slightly delayed to allow the FM circuitry to properly shift key.
4. **RF Amplifier-** A Class C type of RF transistor suited to the low power demands of the Yellow-Jacket system is used to provide a buffer and power control between the TDA 7100 and the RF Filter circuitry. By biasing the signal properly along with associated balance component the harmonics and other noise factors are significantly reduced by applying the RF Transistor in the manner shown.
5. **RF Filter and Harmonic Suppressor–** A ceramic filter specifically designed for this application was chosen to optimize center frequency response while diminishing any unwanted signals.
6. **Antenna–** The simple wire type antenna was chose for its ease of manufacturing and ability to be folded in the same pattern each time the unit is manufactured. Testing has shown that proper antenna length, type of wire and good solder practices will yield a superior integrated antenna in this design.