ensure the receiver and transmitter are in the same channel, and check if the input/output video signals are connected correctly to the signal integration module OSD.

The aircraft was debugged once more. With the hand controller in manual mode, the electronic governor was unlocked by pushing the throttle down the right side for about 3s, and releasing it when the lights on the flight control board stopped flashing (an indicator of successful unlocking and the readiness of the aircraft). If unlocking fails, efforts should be made to check if the throttle stroke of the remote controller is too small or the compass is not accurate enough.

If so, the throttle needs to be reset and the compass requires readjustment. After that, the throttle was pushed, turning on the motor, and controlled so that the aircraft was about to leave the ground. Next, the remote direction stick on the left was turned to check if the remote direction channel is normal. If the arm feels a force from the right, the stick should be pushed forward to see if a force will come from the back. If so, the aircraft operates in a normal procedure and can be used for trial flight. Otherwise, the system should be modified and further debugged.

7. CONCLUSIONS

This paper designs a fire detection system based on four-rotor aircraft. The system design covers both software and hardware, and the parameters of each channel were determined by PID control model and trial and error. The proposed system was debugged module by module simulation. Then, the crucial values of temperature in fire and smoke concentration in secondary disaster were determined through simulation. Compared with the actual data, the system was proved as capable of monitoring the fire scene in real time, and warning the occurrence of secondary disasters.

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