MARS EXPLORATION ROVER

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ABSTRACT- Planet exploration is a very important part of modern science and exploration Rovers are important for conducting in-situ scientific analysis of objectives that are separated by many meters to tens of kilometers. Current mobility designs are Complex using many wheels or legs. They are open to mechanical failure caused by the harsh environment on Mars. This thesis describes Solar Rover, a four wheeled rover capable of traversing rough terrain using an efficient high degree of mobility And control by using RF based communication and collecting data in form of audio and Video and overall rover system command by computer The primary mechanical feature of the rover design is its drive train simplicity, which is accomplished by using only four motors for mobility. Both motors are located inside the body where thermal variation is kept to a minimum, increasing reliability and efficiency. Four wheels are used because there are few Obstacles on natural terrain that require both front wheels of the rover to climb simultaneously. These type of rover are used in various sector including astronomy, mining, industries, And un-man places.

I. INTRODUCTION

A rover (or sometimes planetary rover) is a space exploration vehicle designed to move across the surface of a planet or other celestial body. Some rovers have been designed to transport members of a human spaceflight crew; others have been partially or fully autonomous robots. Rovers usually arrive at the planetary surface on a lander-style spacecraft. Landed spacecraft can make detailed observations of a planet's surface. However, these observations are restricted to a small area. To obtain coverage over a wider area, spacecraft can carry robots that are able to rove over the surface. Crewed missions or robotic rovers provide not only mobility but also the capability to do complex tasks and make intelligent and selective observations.   They can collect dust, rocks, and even take pictures.

II. LITERATUREREVIEW

According to Kalyanee N. Kapadnis and her team a spy robot is made to reduce the human victims in the terrorist's attacks such as 26/11. So, they said that this problem can be overcomes with the help the help of a RF based spy robot which involves wireless camera.

According to Mr Lokesh Mehta and Mr Pawan Sharma a spy robot can also be controlled by a computer system using its keyboard. They basically said that it will be used for the transmission of audio and video signals from the destination to the source and also it can sense the darkness of its surroundings.

According to Wai Mo MoKhaing and Kyaw Thiha a spy robot is used to transmit video data to the intervention troop. They are made to easily move and transport. It is made up of wireless camera and antenna and wheels for movement.

According Kunj Gudhka, Aishwarya Kadam and their team nowadays as there are technological advancements these advancements are used by the military forces for reducing the risk of their casualties and to defeat their enemies. With the development of sophisticated technology, it mostly relies on the high tech weapons or machinery being used. Robotics is one of the hot fields of modern age in which the nations are concentrating upon for military purposes in the state of war and peace.

According to Dheeraj Singh Patel and his team a spy robot can be used for the security purposes to avoid attacks like 9/11. They proposed a robot which can be controlled by a cell phone using its buttons to see the live telecast of the target place by a camera attached on the robot.

According to Chiranjivi M. Deshpande and his team a phone can be used as a controlling device to operate external devices using android system. Android is widely used in mobile phones nowadays. So using a android system robot operation can be controlled.

III. BLOCK DIAGRAM

Here in the system block diagram shown the Radio Frequency controlled a rover with collecting Audio/Video data from long distance. Here we are using RF transmitter and RF receiver for their interfacing communication. A rover is used a solar panel with a battery unit for self-power. A computer generated signal to control the rover at far distance by using RF transmitter. At the end of rover side the received signal by using a RF receiver, as per the command rover will be work.

Microsoft visual studio 6.0 used to generate user handling computer application is used. For their interfacing. This system is used for finding a path or taking an image by A/V camera. This system is mostly used for planet exploration, mining area and to work in harmful environment for human being, like UV radiated environment or a military purpose and also work as a spy rover.

Transmitter:-
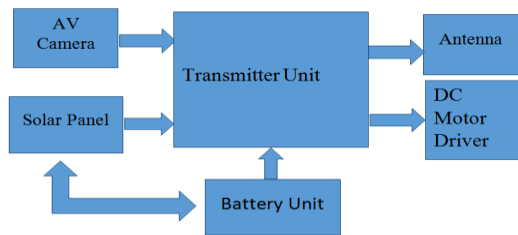
Block of Transmitter

Receiver:-
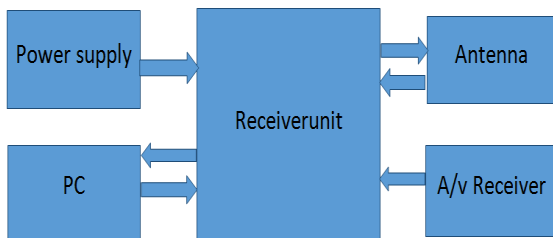
Block Diagram of Receiver

IV.   Specifications:

Transmitter :-

- Transmitter: JMR-TX1

- Operating voltage: 3-12V

- Operating frequency: 433MHZ

- Transmission distance: 300-500m

- Operating temperature:-20℃~60℃

- Dimensions: 11*16*5.5mm

- Input signal: TTL level

- Modulation system: ASK

- modulate rate: 3KB/S

- Frequency stability: ±75KHZ

- Transmitted Power : ≥10mw

Receiver:

- Receiver: RXB6

- working voltage: 5.0VDC +0.5V

- Working current: ≤2.5mA (5.0VDC)

- Working principle: super heterodyne

- Working method: OOK/ASK

- Operating frequency: 433MHz

V. Wireless A/V camera

Fig. Wireless A/V camera

VI. Feature:

- Output power: - 50 mw
- Frequency control: - 0.9G / 1.2G
- Transmission signal: - Picture, sound
- Voltage: - Dc +9V
- Current: - 200mA / 300mA

VII. DC Gear Motor

- DC Motors convert electrical energy (voltage or power source) to mechanical energy (produce rotational motion). They run on direct current. The Dc motor works on the principle of Lorentz force which states that when a wire carrying current is placed in a region having magnetic field, than the wire experiences a force. This Lorentz force provides a torque to the coil to rotate Geared

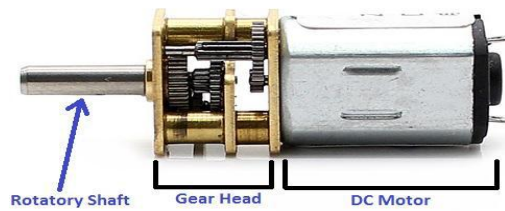DC motors can be defined as an extension of DC motor.

Fig: DC Gear Motor

VIII. Solar plate:

- Solar cells :- Poly Crystalline
- Frame :- Anodized Aluminum Alloy
- Front Glass (Thickness) mm :- 3.2 mm
- Standard test condition: - 1000W/ Met.
- Temp. coefficient of current 0.04% /°C
- Temp. coefficient of voltage :- -0.32%/°C
- Temp. coefficient of power :- - 0.45% /°C
- Module temperature :- - 40°C To + 85°C

IX. Advantages

- Charge through solar

- large distance communication

- observations to a microscopic level

- work in radiated area

- It requires low power

- It is simple to operate and is very reliable.

- Sustainable in harmonic environment

X .CONCLUSION

Hence our system has become more efficient in the exploration of object; our system helps to user, trough wireless control to the rover & collecting data in form of video

XI. REFERENCES

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