ABSTRACT

The project Hi-tech runway is an implementation of advanced technology in airport control systems. As the existing system is manually operated, here we introduce an automatic system to detect runway where the aircraft has to land with the help of coloured runway lights using electronic devices.

As we know that pollution is a main problem in some runways, we here introduce the runway dust alarm system multivibrator, and an alarm. This section enables the track cleaning department to get periodic information about dust conditions with the help of an alarm, thus enabling concerned department to clean the track.

Many plane crashes occurs at the runways while landing due to sudden engine failures or other problems. Thus we introduce a fire and safety system using LDR and other circuitry which senses fire and smoke evolved from planes due to crash on runway .This gives a starting pulse to the foam pumps fitted along the two sides of runway and here by preventing further explosion due to fire. Since fire spreads rapidly this system reduces time gap for fire engines which are normally kept at a distance of 100 meters from runway to reach the spot and also to reduce the casualties due to crashes.

The arrester barrier which we may not see in most of the civilian airports is mainly used in military airports and rarely in some of the civilian airports where supersonic aircrafts and high speed jet engines use to land. This is actually a speed breaker or as the name a barrier. Here we automize the operation of arrester by using the circuits involving using LDR, Monostable & relay unit .The LDR senses the aircraft when it crosses over it which is placed at the maximum limit of the runway. As it crosses this limit it activates the arrester barrier system. This prevents the craft from crashing.

INTRODUCTION

The high-tech runway controllers are autonomous systems which functions as an Air Traffic Controller. Usually most of the autonomous systems work on the basis of microcontroller or microprocessor or PICs, but here these are constructed without these components and is mere a game of sensors, control circuits and related equipments. Here we have introduced four different control systems using these components.

The first segment introduced here is automatic wind direction detector which we call it as automatic runway light selector here; it detects wind direction and selects the runway end where aircraft has to land. The end is chosen according to the direction of wind that is, when wind is in SOUTH to NORTH direction, then the plane has to land in North end of runway and vice versa. The direction is detected with the help of an IR transmitter and receiver circuitry connected in a particular manner such that it detects the direction of wind paddle of wind sock. When the direction is detected the output is transmitted to a timer section and to a relay circuit

with the help of which we glow green lights at landing end and red at other end and if the direction of wind changes then the runway lights get reversed .The red and green lights [LED here] are arranged on the sides of the runway.

The next section is the fire and safety system. This system is to extinguish fire and explosions due to plane crashes in runway .The LDR used in this system are implanted on the sides of the runway in order to detect fire and smoke .Once they detect it provide information to the control circuits and the final output is given to the foam pump fitted along the sides of the runway so as to get the pump started automatically and pump foam to the spot within few seconds.

Some places in earth have dry and dusty atmosphere. The airports in that area also in same atmospheric conditions prevail for a short duration (Few months).It is essential that track cleaning should be done more frequently. So we introduce a runway dust alarm system. This system consist of an LDR which is placed near the runway, when the dust from runway get deposited over it ,the timer circuit get activated and the final out put is given to the dust alarm fitted at the track cleaning section office and this informs them to clean the track .

The arrester barrier system is used to prevent the aircraft from running out of the runway due to break failure after landing .Once the aircraft crosses the minimum limit of runway the LDR kept in runway receives it and makes the other control circuits operational and the final output from it is given to the Arrester barrier system.

BLOCK DIAGRAMS

2.1RUNWAY CHANGE OVER CIRCUIT:

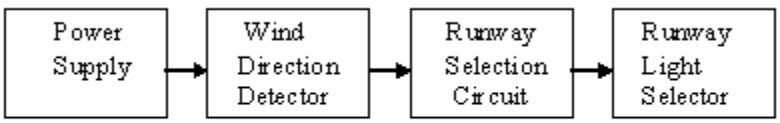

FIG 2.1

2.2 FIRE AND SAFETY:

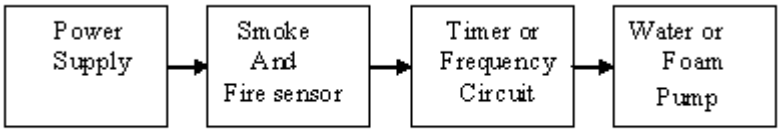

FIG 2.2

2.3 RUNWAY DUST ALARM:

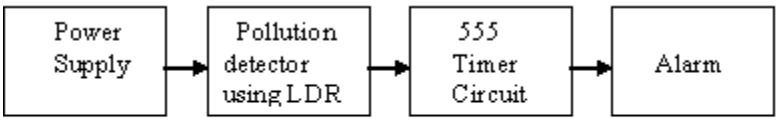

FIG 2.3

2.4 ARRESTER BARRIER SYSTEM: