ANTI SLEEP ALARM
INTRODUCTION

In this project we present an anti sleep alarm that starts after a specific allotted time and keeps buzzing until it is reset. This circuit not only helps save time but also can be a life saver as used when a person is driving. It helps prevent people doze off while studying, or driving by sounding a beep at a fixed time interval.

If it is used in reference to students then the time fixed can be 30 minutes. If the student is awake during the beep, he can reset the circuit to beep in the next 30 minutes. If the timer is not reset during this time, it means the student is in deep sleep or not in the room, and the circuit switches off the light and fan in the room, thus also preventing the wastage of electricity.

But if it is used in reference to car drivers the time fixed should be very lee that is may be 15 seconds otherwise the result could be fatal. For this to take place we will need an optical sensor. An optical sensor senses the movement of the eye lids of the driver and if the eye lids are closed for a longer time it buzzes off the alarm and hence warns the driver of the calamity that can take place. Also instead of the optical sensors we can use Bluetooth like machines fitted behind the ear that detects the angle of your neck and sounds an alert if it is more than the specified angle.

The timer in the circuit is timed according to the purpose required. It thus is a very useful application as it saves time, electricity and most importantly lives.
CIRCUIT DIAGRAM FOR THE ANTI SLEEP ALARM

CIRCUIT DESCRIPTION

The circuit is built around Schmitt-trigger NAND gate IC CD4093 (IC1), timer IC CD4020 (IC2), transistors BC547, relay RL1 and buzzer.

The most important component i.e. the Schmitt-trigger NAND gate (IC1) is configured as an Astable multi vibrator to generate a clock for the timer (IC2). The time period can be calculated as \( T = 1.38 \times R \times C \).

Timer IC CD4020 (IC2) is a 14-stage ripple counter. After the time set for the
alarm to beep is exceeded, the reset of IC1, transistors T1, T2 and T3 drive the
buzzer to sound an intermediate beep. If IC2 is not reset through S1 at that time,
around one minute later the output of gate N4 goes high and transistor T4
conducts. As the output of gate N4 is connected to the clock input (pin 10) of IC2
through diode D3, further counting stops and relay RL1 energizes to deactivate all
the appliances. This state changes only when IC1 is reset by pressing switch S1.

But when the circuit is used in the application of driving an optical sensor is
connected to the multi vibrator in the beginning. As soon as the time fixed is
exceeded the alarm starts ringing and it has to be reset. Also in this circuit we do
not need the fourth transistor to deactivate any appliances.

In general, a 12V battery is used for powering the circuit. In place of the battery,
we can also use a 12V DC adaptor.

APPLICATION OF THE PROJECT

Anti sleep alarm has the major advantage that it has a timer and it helps us in many
fields and can be used widely according to the need.

It can be used by the students while studying late at night. It is a usual phenomenon
that students tend to sleep while studying but it can be hazardous sometimes like
during exams. In such cases an anti sleep alarm can be used. It can be programmed
accordingly and used as per student requirement.
Similarly it can be used for car drivers in long drives or early morning drives when people tend to fall asleep while a monotonous drive. This helps prevent accidents.

Further it can be expanded by connecting systems that switches off the appliances if the alarm is not reset. In the field of driving it can be further expanded by adding some voice mails or warning signs in the car whose driver has fallen asleep to warn other car drivers that proximity of such a car should be avoided.

**PLAN OF THE PROJECT**

We will proceed systematically as per the circuit diagram. First we will collect the components and most importantly the Schmitt trigger and the optical sensor if required. Then we will set the Schmitt trigger according to the application it is performing. If it is used for students it can be set at a time interval of 30 minutes otherwise if used for driving purposes it has to be less around 15-20 seconds. Then by soldering and further connecting the components we will present the anti sleep alarm.