**PC BASED COLLEGE PREMISES POSITION LOCATOR**

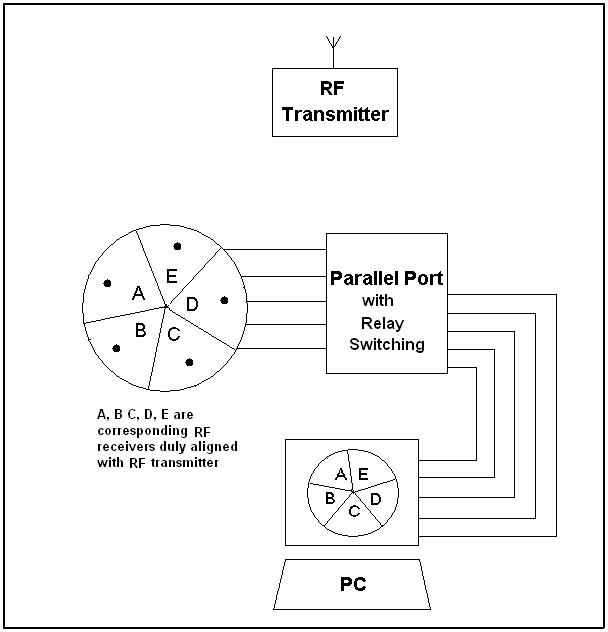
**INTRODUCTION**

The project of the position locator can be used in different infrastructures where we can get the information about a person where is he/she currently is and their current location. The project being described here shows the applicability of a position locator in the college premises. The aim of the project is to identify the location of a teacher/student who carries an RFID (Radio frequency controlled identification transmitter). The receiver used here is an again an Rf receiver which can be kept in multiple areas and spreading all around the premises of the college like library, ground, canteen, building, reception etc. Thus when you have to identify the presence of a particular teacher, just enter his/her password (transmitter code) and check his presence on computer.

The software support the hardware interfaced with it and also gives time/date etc. on display screen. So we can get the clear location of the teacher where they presently are that is under which receiver’s range are they available adjudging the actual location of the teacher. The project uses a relay driver card interface with the PC through the parallel port of the PC to establish connectivity to provide the display. Thus this interface provides the essential display of the positions of the teachers where they are present.

**OBJECTIVES**

1. To construct an RF transmitter with its aligned RF receiver (1 to 5 nos. optional).
2. To design a relay driver card interfaced with RF receiver duly connected to pc parallel port.
3. To write a program in ‘C’ to display the different positions of students/teacher in the college premises with time.



**Fig 1 BLOCK DIAGRAM**

**RF TRANSMITTER**

Radio frequency (RF) transmitters are widely used in radio frequency communications systems. With the increasing availability of efficient, low cost electronic modules, mobile communication systems are becoming more and more widespread. Wireless communications systems, including cellular phones, paging devices, personal communication services (PCS) systems, and wireless data networks, have become ubiquitous in society. A mobile terminal apparatus used in the cellular radio communications system receives a radio frequency signal transmitted from a base station, by an antenna, inputs the signal to a receiving radio-frequency unit via an antenna duplexer, high frequency amplifies the signal, removes unnecessary waves outside the receiving band from the signal, converts the signal to an intermediate frequency signal, demodulates the intermediate frequency signal by a demodulator, and converts the signal into a baseband signal.

The transmitter includes a data modulation stage, one or more intermediate frequency stages, and a power amplifier. The RF transmitter receives a baseband signal from a baseband processor, converts the baseband signal to an RF signal, and couples the RF signal to an antenna for transmission. In most RF transmitters, the baseband signal is first converted to an intermediate frequency (IF) signal and then the IF signal is converted to the RF signal. The data modulation stage converts raw data into baseband signals in accordance with the particular wireless communication standard. The one or more intermediate frequency stages mix the baseband signals with one or more local oscillations to produce RF signals. The power amplifier amplifies the RF signals prior to transmission via an antenna.Power amplifiers are required in radio telecommunication systems to amplify signals before transmitting, because a radio signal attenuates on the radio path. For efficiency, the amplifier is often a non-linear amplifier operated near its peak capacity. To avoid distortion of the transmitted signals due to the non-linearity, the signals are pre-distorted by a pre-distorter before they are transmitted. The pre-distortion is required to prevent transmitter from transmitting signals on channel bands other than the band assigned to the transmitter. Digital pre-distortion may be performed by multiplying the modulated signals prepared for transmission by a set of pre-distortion values. The pre-distortion values are chosen such that the product values entering the power amplifier will be distorted by the power amplifier to return to a substantially linear amplification of the modulated signals.

In the project the RF remote transmitter contain an oscillator comprises one BF-194 (radio frequency modulator transistor). This transistor is coupled with CE configuration with other NPN 548 transistor for biasing. The basic oscillator is formed by transistor T3 working under CE configuration. From the collector an LC circuit is generating the source oscillation that super imposes to the T-2 base from its emitter follower circuit. R2 provides biasing Vcc to T3. R1 and LED indicate the power ‘on’ while pressing the key. The basic modulation circuit comprises T-1, R-6, C-2 and a trimmer variable capacitor. By changing the IFT at the T3 collector (LC circuit) we can change frequency for transmission. Varying trimmer at collector of T-1 can do the range and alignment between transmitter and receiver. A 9V portable battery powers the whole unit.

**COMPONENTS USED**

RESISTANCE:-

R1 - 100Ω

R2 - 330K

R3, R4, R5 - 2K7

R6 - 47K

CAPACITORS:-

C1 - .022

C2, C3 - .001

TRANSISTOR:-

T1 - BF494

T2 - BC548

R1

R4

R3

R2

C1

C3

C21

T21

T11

T31

R5

R5



# Fig. No. 1 TRANSMITTER

**RF RECIEVER**

A RF receiver is an electronic circuit that receives its input from an antenna, uses electronic filters to separate a wanted radio signal from all other signals picked up by this antenna, amplifies it to a level suitable for further processing, and finally converts through demodulation and decoding the signal into a form usable for the consumer, such as sound, pictures, digital data, measurement values, navigational positions, etc.

RF receivers generally either convert an input RF signal to an intermediate frequency, or directly mix an input signal to a direct current (DC) signal. The function of the receiver is to detect signals in the presence of noise and interference, and provide amplification, downconversion and demodulation of the detected the signal such that it can be displayed or used in a data processor. The RF receiver receives an RF signal, converts the RF signal to an IF signal, and then converts the IF signal to a baseband signal, which it then provides to the baseband processor. As is also known, RF transceivers typically include sensitive components susceptible to noise and interference with one another and with external sources. The RF receiver is coupled to the antenna and includes a low noise amplifier, one or more intermediate frequency stages, a filtering stage, and a data recovery stage. The low noise amplifier receives an inbound RF signal via the antenna and amplifies it. The one or more intermediate frequency stages mix the amplified RF signal with one or more local oscillations to convert the amplified RF signal into a baseband signal or an intermediate frequency (IF) signal.

**RF REMOTE RECEIVER CIRCUIT**

In the receiver circuit the transmitter Q1 also working as LC tank circuit basic oscillator that receives the variable frequencies Q2, Q3 are two basic low power amplifier provides amplification to all frequencies. L2 coil (IFT) selects the specific frequency to further amplifiers and fed at the base of Q4 via R-14 resistor. The power amplification is provided by Q5 transistor. In the circuit R2 and R3 provides biasing Vcc to Q1 same as R10 provides biasing Vcc+ to Q2 transistors. C1 and R5 give CE follower circuit for Q1 and same as for Q2 as R8 and C6 doing the same function. Rest other resistor and capacitor provides necessary basing Vc and frequency cut off function at different stages of the circuit. Finally from Q5 the driver unit given output to the buzzer or any other connected device to operate that unit.

**COMPONENTS USED:**

**RESISTANCE:-**

R1, R5 - 2K7

R2 - 38K

R3 - 100K

R4 - 22K

R6, R7, R9 - 1K5

R8 - 10K

R10 - 470K

R11, R12 - 1M

R13 - 1K2 (VR2 20K)

R14 - 47K

R15 - 1K

R16 - 10K

R17 - 4K7

R18 - 1.5K

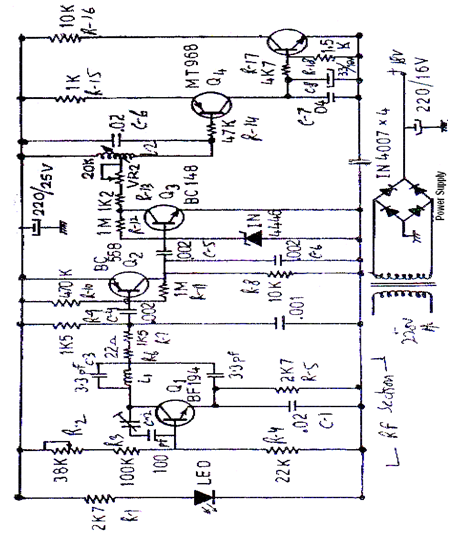
**CAPACITORS:-**

C1 - .02

C2 - 100Pf

C3 - 3.3Pf

0C4 - .002



F**ig No. 3 Receiver Circuit**

**RELAY CARD DRIVER**

A relay driver circuit is disclosed in which a relay coil is operated by enabling the collector-emitter path of a switching transistor. In order to avoid damage to the transistor from voltages induced in the relay coil when the relay is turned off, an isolating semiconductor device is inserted between the transistor and the relay coil. This semiconductor device is operated in synchronism with the driving transistor and thus isolates the driving transistor from transients during the de-energization of the relay. The RD-8 reed relay card is designed for general purpose use. The reed relays have high life expectancy contacts which operate for millions of cycles in low current applications. These cards will allow input of information along with relay control. Relay interfaces provide software control of 8 reed relays which are provided on the card. Control of the relays are accomplished by transmitting a single byte code (0 thru 15 binary) from the RS-232 port to energize or de-energize the relay Contacts are single pole, single throw with screw terminals. Connects directly to the AR-16 or EX-16 cards with ribbon cable provided. The RD-8 ribbon cable is available in custom lengths, contact technical support for more information. The RD-8 is also available with optional LED indicator lamps for each relay and/or a Trans Zorb/self-resetting fuse (specify the /L or /T options when ordering). Requires 12 VDC power supply, 200 ma.

**RD-8 SPECIFICATIONS:**

8 Reed Relays (with drivers, TTL level input)  
Contacts: SPST  
Contact Rating: 10 VA  (½ amp maximum)  
Maximum Voltage: 200 volts DC or AC  
Dimensions: 2.5" by 4.75"  
Ribbon Cable Length: 15 inches

The relay card drivers are connected to the pc’s using PC Parallel port. A parallel port is a type of interface found on computers (personal and otherwise) for connecting various peripherals. In computing, a parallel port is a parallel communication physical interface. It is also known as a printer port or Centronics port. The IEEE 1284 standard defines the bi-directional version of the port. This transmits particular amount of bits in parallel at the same time. This is opposite to serial transition where one bit will be transmitted at a time.

**CONCLUSION**

The project will be helpful in many forefronts and in many administrative areas. The system helps in locating and detecting the place of the person who is needed at the particular juncture in an organization. The project helped in understanding deeply the concepts of RF transmitter and receiver. The project uses relay control card through which pc interface is established. The pc interface with the system has also helped us gain regarding the knowledge of interfacing any device with the pc using the pc parallel port. Due to the usage of pc based system it is clearly visible for the user where actually at present a person is. Thus the project shall be quite useful if implemented in educational institutions and many areas.