Electromagnetic Pulse Weapon Technology For Damaging Of Electronic Equipments

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ABSTRACT: This Paper presents about the EMP destructive of Electronic devices. In order with continuous development, use & dependability of modern day electronics, it is almost impossible for us go back from the current microelectronic generation. An EMP (Electromagnetic Pulse) has the destructive tendency to devastate any electronic equipment in its specified path range. It is known that the misuse of electronic gadgets in various places is increasing. The cameras are utilized for unwanted video capturing in trial rooms. To overcome this drawback we propose a system which is capable of damaging such electronic gadgets by generating electromagnetic pulse.

Keywords: EMP(Electromagnetic Pulse), destructive, tendency, electronic equipment.

INTRODUCTION

Electromagnetic pulse (EMP) is a short burst of electromagnetic energy which causes a transient electromagnetic disturbance to the electronic devices. The interference caused by the EMP is generally disruptive or damaging to the electronic equipment. The damaging effect of high energy EMP can be developed into weapons for military purposes. In the field of electronics, microelectronics has become a major scope due to its miniature size and low cost. Microelectronics has become a part of human life. It is impossible to imagine a life without electronics. Hence damaging of an electronic equipment will have a great impact when used as a weapon.

EMP energy can be transferred in four forms such as Electric Field, Magnetic Field, Electromagnetic Radiation, Electrical Conduction. Here, Electric field and Magnetic field acts over a short distance. Electromagnetic radiation can cover a long range of distance. This makes the Electromagnetic Pulse one of the most deadliest & Terrifying weapon in the world causing huge collateral & infrastructural damage to any nation & her interests.
This paper includes all the basses of Electromagnetic Pulse generation & its possible causes & effects on the nearby electronic components within its specified range capability. Along with miniature prototypes that are developed, so as to demonstrate the effect of Electromagnetic Pulse on various smart & dumb devices & their consecutive role in Modern Warfare as Directed Energy Weapons (DEW's). Currently, there is a lot of research going on the Electromagnetic Pulse phenomenon. Scientists in military & defense organizations around the world are working on the EMP Technology & its application as a weapon in Military Warfare.

There is even subsequent research going on in the shielding of crucial electrical & electronic components against an EMP attack. The current EMP shields developed can only prevent a small amount of Electromagnetic Pulse. However, a perfect shield against an EMP attack of huge intensity is still not devised, although Ferro-Magnetic cages provide a protective shield against an EMP strike. However it's nearly impossible to realize every structure, building, Electronic gadget or vehicle shielded by Ferro-magnetic Cages. As it doesn't only cause inconvenience in its installation but even has a huge initial capital coast for its total installation, hence doesn't make it economically viable to construct.

SYSTEM CONFIGURATION

I System Design

The system consists of an EMP device which acts as a source of high power electromagnetic pulse generator. The generated electromagnetic pulse has the capacity to damage electronic equipment within the range. In this sophisticated world, the role of microelectronics has been increasing day by day due to its light weight and portability. But there are several cases where electronic equipment is misused. In such places a weapon is necessary to destroy electronic equipment to prevent it from carrying any confidential information. This system is used to damage hidden electronic equipment like trial room cameras, any form of electronic device that is placed without knowledge in highly confidential areas. The EMP device produces pulse which causes electromagnetic interference in the electronic device when placed near it. This Interference in turn induces emf in the victim unit thus temporarily disrupting its function or permanently damaging it. The EMP damages the transistors and ICs present inside the device and also erase the programmed memory in IC. Hence the device fails to function normally.

Electronic equipment is damaged within the range of pulse. With the increase in the electromagnetic frequency, the
distance between the EMP generator and the device to be damaged can be increased. At higher voltage levels, EMP produces spark. EMP will not cause any damage to humans. However, high voltage generator should be handled carefully.

II Methodology

PIC Microcontroller acts as the control unit to the system. EMP module can be operated in two modes as manual mode and automatic mode. In automatic mode RF transmitter and receiver are used to switch on the EMP device. The RF receiver is placed at the module section. The RF transmitter is provided to the user. So whenever the user transmits a signal, then the receiver receives the signal and sends it as the input to the microcontroller. Now the microcontroller switches on the EMP module using the driver circuit (Relay). In manual mode EMP module is switched on manually. An electromagnetic pulse is generated and is present in certain range near the system.

Fig. 1.2 Control unit of Automatic mode

Fig 1.2 represents the transmitter section in automatic mode of the system. The power supply to the RF transmitter is provided by the battery. When data pins in RF transmitter are made high, the radio frequency will be transmitted.

The power supply unit in fig 1.1 consists of a step down transformer, voltage regulator, and bridge rectifier. The transformer will step
down the power supply voltage (0-230V) to (0-6V) AC. The bridge rectifier converts the AC into DC which is regulated using an IC voltage regulator. The DC Voltage sensor senses the voltage level of the battery connected to the EMP module. The analog signal is then passed to the microcontroller which converts the analog signal into digital using ADC. Then the value is displayed in LCD. This helps the user to charge the battery when it runs low.

LCD is used to display whether the EMP device is switched on or not. It also displays the voltage value sensed by the voltage sensor.

When the EMP device is switched on (manual mode or automatic mode) then there is a sudden electrical discharge from the capacitor. The capacitor has a sudden discharging capacity. The capacitor is charged by the high voltage level which is discharged all at once. This sudden discharge acts as a source of high frequency electrical pulse. The magnetic field generated by toroid comes under electrical influence produces electromagnetic field in the spark gap between the two terminals. The voltage level of the battery is monitored continuously by using an analog voltage sensor which can sense up to 20V.

When the device which is to be damaged is placed very close to the EMP spark, the operation of the device fails hence it gets damaged. When the devices are placed closer damaging effect will be higher. Such EMP module can be easily carried by the user easily. The proposed system generates a high frequency but does not cause any harm to users or other people in its range.

Trial room hidden cameras can be destroyed easily by using this system. It can also be used as a weapon in confidential rooms to avoid the leakage of any secret information that can be transferred via electronic devices. The EMP generator affects the basic functional unit of any electronic device such as ICs and transistors. So the device will be damaged and our information will be protected against misusing people.

**HARDWARE DESCRIPTION**

**PIC MICROCONTROLLER**

PIC16F877A is an 8-bit microcontroller which has 40 pin DIP and is based on Harvard Architecture. PIC stands for
Peripheral Interface Controller and F for flash memory.

Program memory contains the programs that are written by the user. The program counter (PC) executes these stored commands one by one. Usually PIC16F877 devices have a 13 bit wide program counter that is capable of addressing bit memory space.

The data memory of PIC16F877 is separated into multiple banks which contain the general purpose registers (GPR) and special function registers (SPR). According to the type of the microcontroller, these banks may vary. The PIC16F877 chip only has four banks (BANK 0, BANK 1, BANK 2, and BANK4). Each bank holds 128 bytes of addressable memory.

VOLTAGE SENSOR

Sensors are basically a device which can sense or identify and react to certain types of electrical or some optical signals. A voltage sensor can in fact determine, monitor and can measure the supply of voltage. It can measure AC level or/and DC voltage level. The input to the voltage sensor is the voltage itself and the output can be analog voltage signals, switches, audible signals, analog current level, frequency modulated signals.

INVERTER

Inverter is an electronic device that converts low voltage DC to high voltage AC power. Direct current is created by devices such as batteries and solar panels. When connected, an inverter allows these devices to provide electric power for small household devices. By conversion process of electrical adjustment AC electric power is produced. This form of electricity can be used to power an electric light, a microwave oven, or some other electric machine. An inverter usually also increases the voltage. In order to increase the voltage, the current must be decreased, so an inverter will use a lot of current on the DC side when only a small amount is being used on the AC side. Inverters are made in many different sizes. They can be as small as 150 watts, or as large as 1 megawatt.
RF TRANSMITTER

The TWS-434 transmitter accepts both linear and digital inputs can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very easy. The P2_0, P2_1, P2_2 and P2_3 pin of controller is assumed as data transmit pins. The DATA_OUT pin of encoder is connected to the DATA_IN pin of RF Transmitter and then the RF Transmitter transmits the data to the receiver.

RELAY

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The relay also has two pins namely normally closed and normally opened (NC and NO), the normally closed pin is connected to the armature or the common terminal whereas the normally opened pin is left free (when the coil is not energized). When the coil is energized the armature moves and is get connected to the normally opened contact till there exists flow of current through the coil. When it is de-energized it goes to its initial position.

CAPACITOR

A capacitor is a passive two-terminal electrical component that stores potential energy in an electric field. The effect of a capacitor is known as capacitance. While some capacitance exists between any two electrical conductors in proximity in a circuit, a capacitor is a component designed to add capacitance to a circuit. The capacitor was originally known as a condenser. In its simplest form, a capacitor consists of two conducting plates
separated by an insulating material called the dielectric. The capacitance is directly proportional to the surface areas of the plates, and is inversely proportional to the separation between the plates. Capacitance also depends on the dielectric constant of the substance separating the plates.

SOFTWARE DESCRIPTION

**MPLAB** is a proprietary freeware integrated development environment for the development of PIC and dsPIC microcontrollers, and is developed by Microchip Technology. MPLAB is designed to work with MPLAB-certified devices such as the MPLAB ICD 3 and MPLAB REAL ICE, for programming and debugging PIC microcontrollers using a personal computer. Pic kit programmers are also supported by MPLAB. MPLAB 8.X is the last version of the legacy MPLAB IDE technology, custom built by Microchip Technology in Microsoft Visual C++. MPLAB supports project management, editing, debugging and programming of Microchip 8-bit, 16-bit and 32-bit PIC microcontrollers.

Embedded C is designed to bridge the performance mismatch between Standard C and the embedded hardware and application architecture. It extends the C language with the primitives that are needed by signal-processing applications and that are commonly provided by DSP processors.

Embedded C coding for LCD display to show whether emp is on or off, mode of emp as manual or wireless, Voltage sensed value by the microcontroller from the battery and the charging status.

There is also a ADC programming to convert analog voltage value into digital. It is also compiled using mplab compiler.

```c
Iledmd[0x00];
Iledet("ELECMAGNETIC ");
Iledmd[0x03];
Iledet("PULSE 
V VAR ");
Ioddelay(65000);Ioddelay(65000);Ioddelay(65000);Ioddelay(65000);Ioddelay
(65000);Ioddelay(65000);Ioddelay(65000);
while(1)
{
Iledmd[0x00];
Iledet("VOLTAGE: ");
```

Fig represents coding of PIC microcontroller

RESULTS
Switch 2 acts as a mode switch for manual mode and wireless mode which are displayed on the LCD screen as a ML and WL respectively. Switch 3 acts as a charging switch (EMP) which is used to charge the capacitor directly from AC supply. It is displayed on the LCD as N/C to demonstrate its charging status. Voltage sensor values are also displayed on the screen.

When the device is switched on, if the terminal gap is less than 2mm, then a electromagnetic spark is generated as seen in fig6.1.

A calculator in a good working condition is placed directly under the spark for about 5-10 seconds continuously. Then the calculator did not work.

We tried using another battery in the damaged calculator but it does not show any output.

The system first damaged the display part of calculator.

A mobile phone placed under the spark. The display part of the mobile phone got damaged. Even when it is switched on again the phone did not work.

**CONCLUSION**

Thus, the proposed system provides safety to the public by destroying any kind of misused electronic devices such as cameras in confidential rooms. The system can be handled by humans safely. It damages devices within a small range. This new technology can be used like a weapon in commercial areas and can be easily carried by user.

**FUTURE WORK**

The power consumed for producing emp can be reduced by using power boosters in the system which produce high output voltage. This increases the range of coverage to produce powerful emp. Metal detectors can be added to the system.

The power source
can be made as solar batteries to reduce cost and save power. Different wireless technologies can be adopted to increase the wireless range.

REFERENCES


