INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Automatic Home /Office Appliances Controlling With Voice Announcement

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Abstract -- This project provides automatization of home appliances control based on person voice recognition. In this we use Bluetooth module from Bluetooth module collects the data from the mobile through the android application voice home sends this data to the controller. The AT89S52, A 8-bit micro controller collects the data from the Bluetooth module. If voice instruction detects through Bluetooth module then it automatically switches on the 220VAC load by passing a control signal to relay and that particular message (like light-on, light-off) the voice that which we give through the mobile using a android application . The hardware components used in this are microcontroller (AT89S52), Bluetooth module, power supply, relay and bulb.
Keywords: Automation, AT89S52 micro controller, relays, Blue tooth, Keil compiler.

I.   INTRODUCTION

In this we were interfacing a Bluetooth module with the main switch box supply. The AT89S51, an 8-bit micro controller collects the data from the Bluetooth which sent from an application from android and based on the command it operates devices/appliances. If any sensed parameter is according to command then it automatically switches on the 220VAC Load by passing a control signal to Relay and then announces that particular message (like Light –on, Light-off) from voice IC through the speaker attached to Bluetooth device.

II.   WHAT IS HOME AUTOMATION?

Home/office automation is the control of any or all Electrical devices in our home or office, whether we are there or away.
Home/office automation is one of the most exciting developments in technology for the home that has come along in decades. There are hundreds of products available today that allow us control over the devices automatically, either by remote control or even by voice command.

III.   BLOCK DIAGRAM
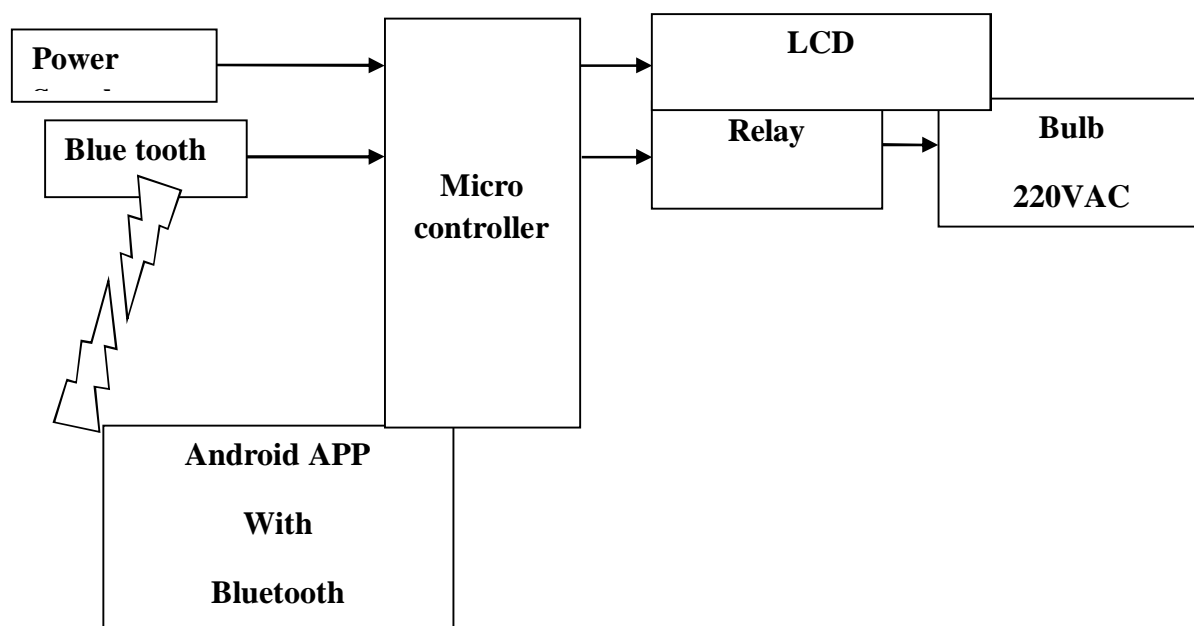
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A. Power Supply

The input to the circuit is applied from the regulated power supply. The a.c. input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating d.c voltage. So in order to get a pure d.c voltage, the output voltage from the rectifier is fed to a filter to remove any a.c components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant dc voltage.
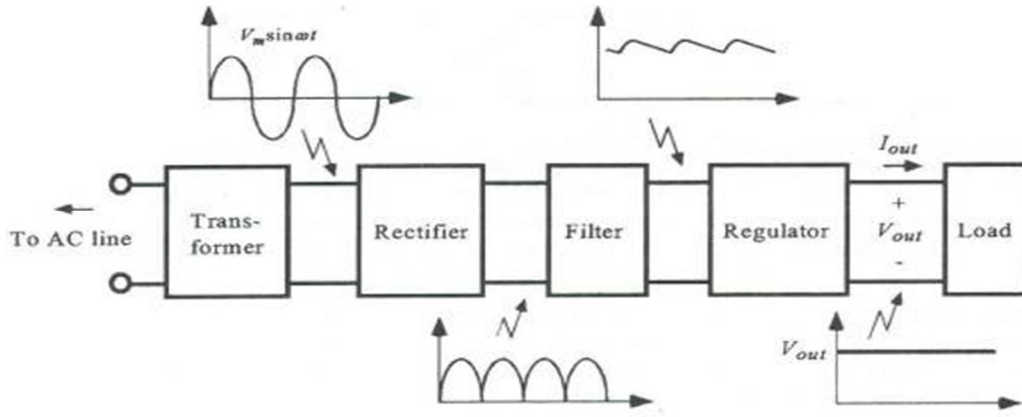

Fig 1.2 components of power supply

1) *Transformer:* Usually, DC voltages are required to operate various electronic equipment and these voltages are 5V, 9V or 12V. But these voltages cannot be obtained directly. Thus the a.c input available at the mains supply i.e., 230V is to be brought down to the required voltage level. This is done by a transformer. Thus, a step down transformer is employed to decrease the voltage to a required level.

2) *Rectifier:* The output from the transformer is fed to the rectifier. It converts A.C. into pulsating D.C. The rectifier may be a half wave or a full wave rectifier. In this project, a bridge rectifier is used because of its merits like good stability and full wave rectification.

3) *Filter:* Capacitive filter is used in this project. It removes the ripples from the output of rectifier and smoothens the D.C. Output received from this filter is constant until the mains voltage and load is maintained constant. However, if either of the two is varied, D.C. voltage received at this point changes. Therefore a regulator is applied at the output stage.

4) *Voltage regulator:* As the name itself implies, it regulates the input applied to it. A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. In this project, power supply of 5V and 12V are required. In order to obtain these voltage levels, 7805 and 7812 voltage regulators are to be used. The first number 78 represents positive supply and the numbers 05, 12 represent the required output voltage levels.

B. Micro Controller Block

In this project we displaying the time on LCD using timer's concept and simultaneously motor is rotating. Here motor is generating back e.m.f., to avoid back e.m.f. we are using l293d IC . The other name for l293d is motor driving IC. Here solar panel is converting light energy into electrical energy. It is providing the electrical energy to led load.
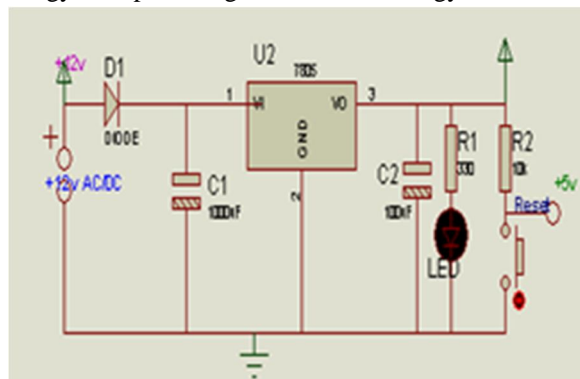
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IV.   BLUTOOTH

A.   What is Bluetooth?

Bluetooth is a wireless technology used to transfer data between different electronic devices. The distance of data transmission is small in comparison to other modes of wireless communication. This technology eradicates the use of cords, cables, adapters and permits the electronic devices to communicate wirelessly among each other.

Bluetooth is a standard used in links of radio of short scope, destined to replace wired connections between electronic devices like cellular telephones, Personal Digital Assistants (PDA), computers, and many other devices. Bluetooth technology can be used at home, in the office, in the car, etc. This technology allows to the users instantaneous connections of voice and information between several devices in real time. The way of transmission used assures protection against interferences and safety in the sending of information. Between the principal characteristics, must be named the hardiness, low complexity, low consume and low cost. The Bluetooth is a small microchip that operates in a band of available

1)   The key features of Bluetooth technology

a)   Less complication

b)   Less power consumption

c)   Available at cheaper rates

d)   Robustness

V.   CIRCUIT DIAGRAM
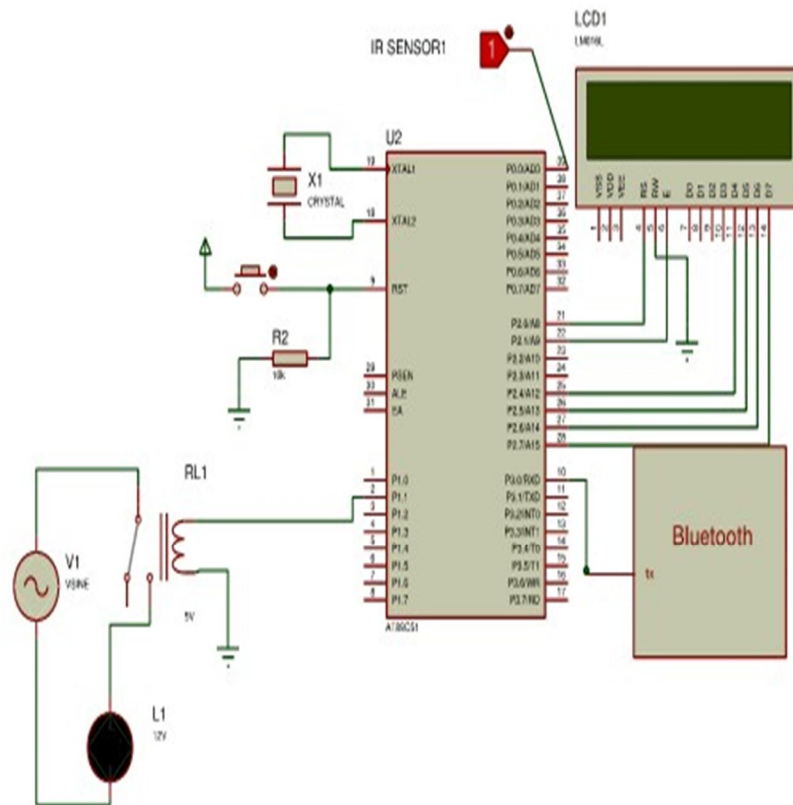
A.   Embedded Systems

A system can be defined as a group of devices or artificial objects or an organization forming a network especially for distributing something or serving a common purpose. To embed a system into some object means to make that system an Integral part of the object. When an engineer talks about an embedded system, he or she is usually referring to a system that satisfies a well-defined need at a specific instant in time. The system is usually dedicated to that need, and its operational limits are clearly defined: lifetime, power consumption, performance, and so on. The system usually has limited capabilities for future development, simply because it

42

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is permanently installed in a device that provides a certain service to its user. Examples include DSP processors in hand-held communication devices, programmable controllers installed in robots or cars, and video signal processors in television sets. Because these systems cannot be redesigned or removed easily once the device that incorporates the embedded system is built, the development procedure must produce a correct system that meets all of its operational requirements.

B. Program Memory

The first models of the 8051 microcontroller family did not have internal program memory. It was added as an external separate chip. These models are recognizable by their label beginning with 803 (for example 8031 or 8032). All later models have a few Kbyte ROM embedded. Even though such an amount of memory is sufficient for writing most of the programs, there are situations when it is necessary to use additional memory as well. Typical examples are so called lookup tables. They are used in cases when equations describing some processes are too complicated or when there is no time for solving them. In such cases all necessary estimates and approximates are executed in advance and the final results are put in the tables (similar to logarithmic tables).
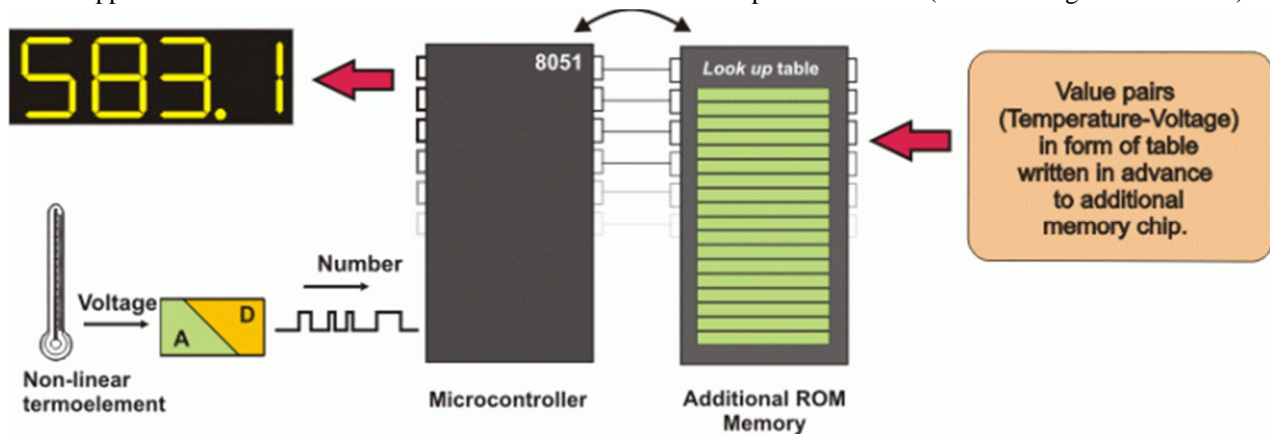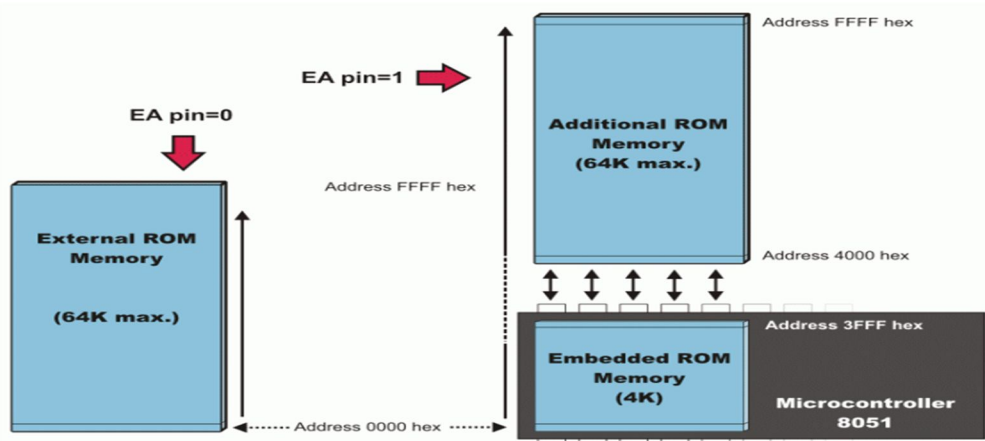

Fig.3.4.Program Memory

How does the microcontroller handle external memory depend on the EA pin logic state?

External Memory Handling

EA=0 In this case, the microcontroller completely ignores internal program memory and executes only the program stored in external memory.

EA=1 In this case, the microcontroller executes first the program from built-in ROM, then the program stored in external memory.

In both cases, P0 and P2 are not available for use since being used for data and address transmission. Besides, the ALE and PSEN pins are also used.

C. Data Memory

As already mentioned, Data Memory is used for temporarily storing data and intermediate results created and used during the

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operation of the microcontroller. Besides, RAM memory built in the 8051 family includes many registers such as hardware counters and timers, input/output ports, serial data buffers etc. The previous models had 256 RAM locations, while for the later models this number was incremented by additional 128 registers. However, the first 256 memory locations (addresses 0-FFh) are the heart of memory common to all the models belonging to the 8051 family. Locations available to the user occupy memory space with addresses 0-7Fh, i.e. first 128 registers. This part of RAM is divided in several blocks.

The first block consists of 4 banks each including 8 registers denoted by R0-R7. Prior to accessing any of these registers, it is necessary to select the bank containing it. The next memory block (address 20h-2Fh) is bit- addressable, which means that each bit has its own address (0-7Fh). Since there are 16 such registers, this block contains in total of 128 bits with separate addresses (address of bit 0 of the 20h byte is 0, while address of bit 7 of the 2Fh byte is 7Fh). The third group of registers occupies addresses 2Fh-7Fh, i.e. 80 locations, and does not have any special functions or features.

D. Additional RAM

In order to satisfy the programmers' constant hunger for Data Memory, the manufacturers decided to embed an additional memory block of 128 locations into the latest versions of the 8051 microcontrollers. However, it's not as simple as it seems to be… The problem is that electronics performing addressing has 1 byte (8 bits) on disposal and is capable of reaching only the first 256 locations, therefore. In order to keep already existing 8-bit architecture and compatibility with other existing models a small trick was done.

What does it mean? It means that additional memory block shares the same addresses with locations intended for the SFRs (80h-FFh). In order to differentiate between these two physically separated memory spaces, different ways of addressing are used. The SFRs memory locations are accessed by direct addressing, while additional RAM memory locations are accessed by indirect addressing.

VI. MICROCONTROLLER

A. Definition Of Microcontroller

Microcontroller, as the name suggests, are small controllers. They are like single chip computers that are often embedded into other systems to function as processing/controlling unit. For example, the remote control you are using probably has microcontrollers inside that do decoding and other controlling functions. They are also used in automobiles, washing machines, microwave ovens, toys ... etc., where automation is needed.

1) The key features of microcontrollers include

a) High Integration of Functionality

b) Microcontrollers sometimes are called single-chip computers because they have on-chip memory and I/O circuitry and other circuitries that enable them to function as small standalone computers without other supporting circuitry.

c) Field Programmability, Flexibility

d) Microcontrollers often use EEPROM or EPROM as their storage device to allow field programmability so they are flexible to use. Once the program is tested to be correct then large quantities of microcontrollers can be programmed to be used in embedded systems.

e) Easy to Use

f) Assembly language is often used in microcontrollers and since they usually follow RISC architecture, the instruction set is small. The development package of microcontrollers often includes an assembler, a simulator, a programmer to "burn" the chip and a demonstration board. Some packages include a high level language compiler such as a C compiler and more sophisticated libraries.

g) Micro controller has inbuilt central processing unit ,arithmetic logical unit(ALU) and stack pointer(sp),program counter(pc) and timing and synchronous timers .RAM and ROM available fixed and other peripherals on a single chip. it is also known as minicomputer or computer on a single chip.

h) Ex: ATMEL , Free scale ,Microchip , Philips, TI ,MOTOROLA

i) Reduces the cost and size complexity

j) A controller has a clock speed which is operate at range of 30 to 50 MHz.

k) When compared with microprocessor it is a "Stand alone condition".

l) Micro controller is heart of the embedded system .ex; it is used in MP3 players. Power consumption is high in processors .No

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power saving features but a controller has it basically there are 2 types of structures for processors Harvard and Von-Neumann architectures. It has a Harvard structure of architecture. it has 32 number of pins of address lines 3 pins of control signals 2 pins of synchronous timers 2 pins for oscillators 1 reset pin There are four alternate functions which are named as Port 0 ,Port 1,Port 2, Port3.

B.   KEIL IDE

An integrated development environment (IDE) or interactive development environment is a software application that provides comprehensive facilities to computer programmers for software development.

An IDE normally consists of a source code editor, build automation tools and debugger. Several modern IDEs integrate with Intelli-sense coding features.

IDEs present a single program in which all development is done.

1)   *Introduction to Keil:* µVision, the popular IDE from Keil Software, combines Project Management, Source Code Editing, Program Debugging, and Flash Programming in a single, powerful environment.
a)   Project Management, Device Setup, and Tool Configuration.
b)   Editor facilities for Creating, Modifying, and Correcting Programs
c)   Target Debugging or CPU & Peripheral Simulation.

PROGISP
FLASH PROGRAMMING
PROGISP is a way for, in system programming of micro controllers in controlled way.
Its development credit goes to Chi Feng Technology Co., Ltd, which engages in the design of embedded systems products, sharing and free software developing.
PROGISP ver1.68 supports for nearly 110 CPUs with on board by default fuse bits selection for every controller. Friendly user interface with required graphics.
LCD: 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.
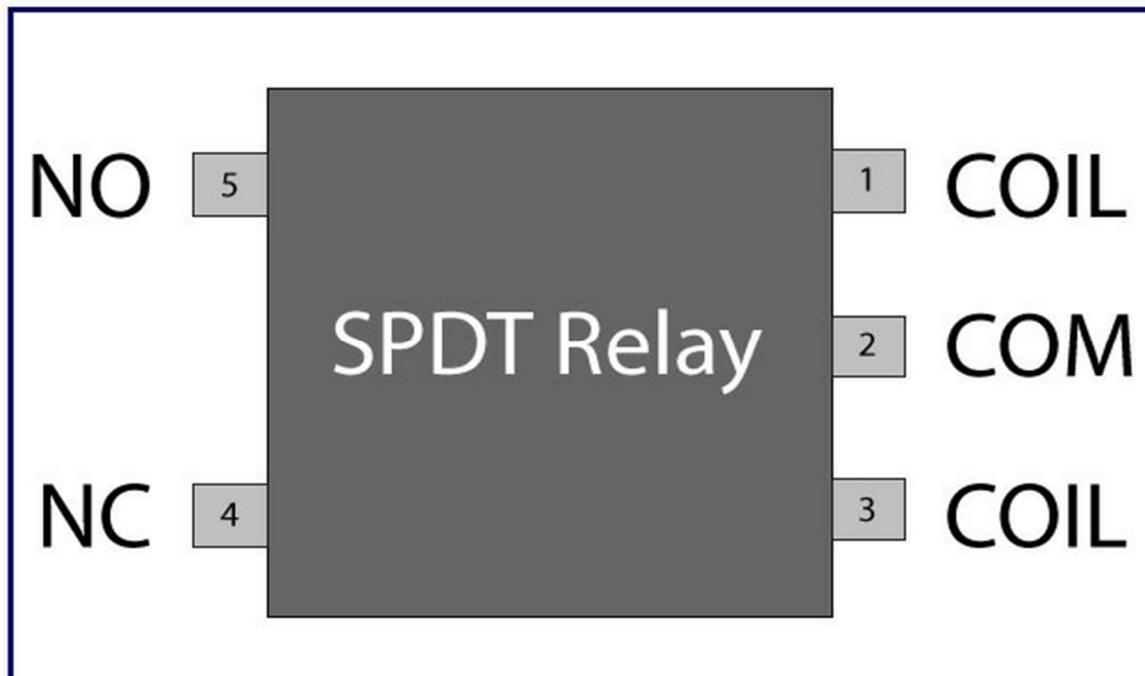
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VII. ADVANTAGES

A. Used for physically challenged and disabled people

B. Smart home

C. Wireless control

VIII. APPLICATIONS

A. Turning lights down /off at night

B. Operating outside lights

C. Operating any kind of electronic devices

D. Replacement to the remote

IX. CONCLUSION

A. This system make the home environment automated people can control their electrical devices via these home automation devices and set up controlling actions through mobile.

B. In future this product may have potential for marketing.

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