

# Title: DIGITAL JEWELLERY

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**Abstract:** Mobile computing is beginning to break the chains that tie us to our desks, but many of today's mobile devices can still be a bit awkward to carry around. In the next age of computing, there will be an explosion of computer parts across our bodies, rather than across our desktops. Basically, jewelry adorns the body, and has very little practical purpose. However, researchers are looking to change the way we think about the beads and bobbles we wear. The combination of microcomputer devices and increasing computer power has allowed several companies to begin producing fashion jewelry with embedded intelligence i.e., Digital jewelry. Digital jewelry can best be defined as wireless, wearable computers that allow you to communicate by ways of e-mail, voicemail, and voice communication.

## I. INTRODUCTION

May not be today, may not be tomorrow, but it will definitely come. The latest computer craze has been to be able to wear wireless computers. The Computer Fashion Wave, "Digital Jewelry" looks to be the next sizzling fashion trend of the technological wave. The combination of shrinking computer devices and increasing computer power has allowed several companies to begin producing fashion jewelry with embedded intelligence. Today, manufacturers place millions of transistors on a microchip, which can be used to make small devices that store tons of digital data. The whole concept behind this is to be able to communicate to others by means of wireless appliances. The other key

factor of this concept market is to stay fashionable at the same time.

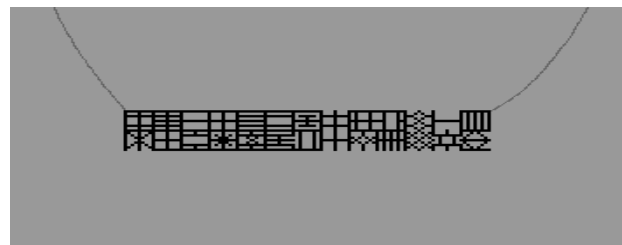


Fig.1 Prototype of Digital Jewellery



Fig.2 By the end of the decade, we could be wearing our computers instead of sitting in front of them.

In the next wave of mobile computing devices, our jewelry might double as our cell phones, personal digital assistants(PDAs) and GPS receivers.

## II. HOW DIGITAL JEWELLERY WORKS?

Soon, cell phones will take a totally new form, appearing to have no form at all. Instead of one single

device, cell phones will be broken up into their basic components and packaged as various pieces of digital jewelry. Each piece of jewelry will contain a fraction of the components found in a conventional mobile phone. Together, the digital-jewelry cell phone should work just like a conventional cell phone.

The various components that are inside a cell phone:

- Microphone,
- Receiver,
- Touch pad,
- Display,
- Circuit board,
- Antenna,
- Battery.

IBM has developed a prototype of a cell phone that consists of several pieces of digital jewelry that will work together wirelessly, possibly with Bluetooth wireless technology, to perform the functions of the above components.

Here are the pieces of computerized-jewelry phone and their functions:

**Earrings** - Speakers embedded into these earrings will be the phone's receiver.

**Necklace** - Users will talk into the necklace's embedded microphone.

**Ring** - Perhaps the most interesting piece of the phone, this "magic decoder ring" is equipped with light-emitting diodes (LEDs) that flash to indicate an incoming call. It can also be programmed to flash different colors to identify a particular caller or indicate the importance of a call.

**Bracelet** - Equipped with a video graphics array (VGA) display, this wrist display could also be used as a caller identifier that flashes the name and phone number of the caller.

With a jewelry phone, the keypad and dialing function could be integrated into the bracelet, or else dumped altogether -- it's likely that voice-recognition software will be used to make calls, a capability that is already commonplace in many of today's cell phones. Simply say the name of the person you want to call and the phone will dial that person. IBM is also working on a miniature rechargeable battery to power these components.



Fig.3 Cell phones will one day be comprised of digital accessories that work together through wireless connections.



In addition to changing the way we make phone calls, digital jewelry will also affect how we deal with the ever-increasing bombardment of e-mail. Imagine that the same ring that flashes for phone calls could also

inform you that e-mail is piling up in your inbox. This flashing alert could also indicate the urgency of the e-mail. Two of the most identifiable components of a personal computer are the mouse and monitor. These devices are as familiar to us today as a television.



**Fig.4.**The eyepiece above displays images and data received wirelessly from the Communicator's belt module.

The mouse-ring that IBM is developing will use the company's Track Point technology to wirelessly move the cursor on a computer-monitor display. You're probably most familiar with Track Point as the little button embedded in the keyboard of some laptops. IBM Researchers have transferred Track Point technology to a ring, which looks something like a black-pearl ring. On top of the ring is a little black ball that users will swivel to move the cursor, in the same way that the Track Point button on a laptop is used.

This Track Point ring will be very valuable when monitors shrink to the size of watch face. In the coming age of ubiquitous computing, displays will no longer be tied to desktops or wall screens. Instead, you'll wear the display like a pair of sunglasses or a bracelet. Researchers are overcoming several obstacles facing these new wearable displays, the most important of which is the readability of information displayed on these tiny devices.



**Fig 5..** IBM has displayed a prototype bracelet display.

Charmed Technology is already marketing its digital jewelry, including a futuristic-looking eyepiece display. The eyepiece is the display component of the company's Charmed Communicator, a wearable, wireless, broadband-Internet device that can be controlled by voice, pen or handheld keypad. The Communicator can be used as an MP3 player, video player and cell phone. The Communicator runs on the company's Linux-based Nanix operating system.

#### **OTHER DESIGNS AVAILABLE**

##### **GARNET\_RING:**



The picture above is of a ring containing a microprocessor. It vibrates to let you know that you have received a message from someone.

**GARNET\_BROACH:**



Above is a picture of a garnet brooch containing a microphone. This enables you to record messages just by pressing a small button on the side.

**RED RUBY NECKLACE:**



The necklace to the left would have a microphone built in. All you would need to do to use it press a small button in the back. Then you can proceed to record your message.

**THE JAVA RING:**

It seems that everything we access today is under lock and key. Even the devices we use are protected by passwords. It can be frustrating trying to keep with all of the passwords and keys needed to access any door or computer program. Dallas Semiconductor is developing a new Java-based, computerized ring that will automatically unlock doors and log on to computers.



The Java Ring can be programmed to give you access to every door and device.

The Java Ring, first introduced at Java One Conference, has been tested at Celebration School, an innovative K-12 school just outside Orlando, FL. The rings given to students are programmed with Java applets that communicate with host applications on networked systems. Applets are small applications that are designed to be run within another application. The Java Ring is snapped into a reader, called a Blue Dot receptor, to allow communication between a host system and the Java Ring.

The Java Ring is a stainless-steel ring, 16-millimeters (0.6 inches) in diameter, which houses a 1-million-transistor processor, called an iButton. The ring has 134 KB of RAM, 32 KB of ROM, a real-time clock and a Java virtual machine, which is a piece of software that recognizes the Java language and translates it for the user's computer system.

Digital jewelry, designed to supplement the personal computer, will be the evolution in digital technology that makes computer elements entirely compatible with the human form.

### III. TECHNICAL SPECIFICATIONS:

Digital jewelry devices consist of a screen or display for information, most likely consisting of 7-16-segment, or dot matrix LEDs, LCDs, or other technologies such as electroluminescent material (EL) or others, which could become an optional display. So too, an audiovisual or other 'display' could consist of a speaker, a single flashing light, a sensor of some kind (such as a temperature driven EL display), or other informational aesthetic. The display layer (d) sits on a face of the device, which is enclosed in some material such as plastic, metal, crystal, or other material. It has external switches and buttons on its side and a data-port for accessing the programmable electronic circuit inside. A microcontroller that is a surface mounted device (SMD) on a printed circuit board (PCB) with resistors (R) and capacitors (C) are the internal 'guts' of the jewelry.

### IV. DISPLAY TECHNOLOGIES:

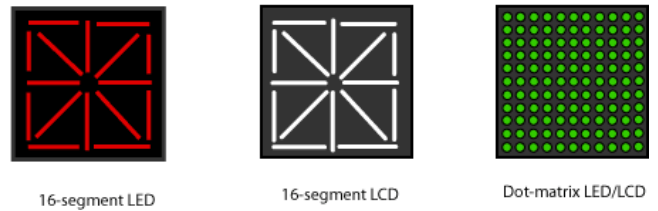
The digital jewelry display, for instance, every alphabet and number system has found representation within the electronics realm and 'dot-matrix' (a matrix of single LEDs) is used to display Chinese and Japanese and other character sets, as can the alternative display for LCDs (liquid-crystal-displays) also be used, as often found in watches, given the specifications and uses for the EMJ device and its design parameters.

The digital jewelry display itself can be both an illuminated symbol and an information device, or one or another conception and form factor. For educational purposes though, a device, which can display alpha numeric, is of prime importance to basic literacy of how numbers, letters, code, and electronics find their integration in a cultural device.

Digital Jewelry can be made in many different sizes and shapes with a variety of materials ranging from plastic and metal to rubber and glass. They utilize electromagnetic properties and electronics to display

information through a screen or display of some kind. This could range from LED 7-segment, 16-segment, dot matrix, and other programmable LEDs devices to LCDs, OLEDs, and other displays, which are all driven by the self-contained jewelry devices themselves.

alphanumeric or graphic Display Types



The Digital jewelry devices can also have multiple-functions as both wearable art and even as a type of communication device with infrared (IR) transmission and reception displays.

### V. PROTOTYPES OF DIGITAL JEWELRY

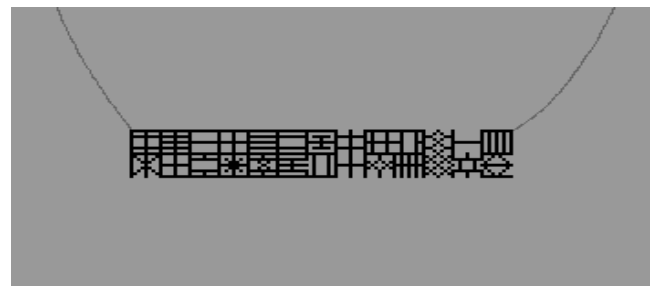


Fig 6. Complete HIOX necklace showing all 26 letters of the Roman alphabet extended in 4-dimensional space-time. Metal with leather cord.



Fig 7. Programmable HIOX ring with 16-segment LED display.

## VI. REMARKS

### A. Advantages

- 1) It furnishes security.
- 2) It can be used as computing machines.
- 3) Freedom from desks: A wearable computer is a wireless device. Of Course, it may have connection or similar, but it should not depend on external devices.
- 4) Always connected to the Internet and/or reference materials.
- 5) Immediately useable. No need to get it from bag or pocket and /or turn it on.

### B. Disadvantages

- 1) It has the issue of charging capabilities.
- 2) It is exorbitantly expensive. It possesses high cost.

## VII. CONCLUSION

Digital jewelry can best be defined as wireless, wearable computers that allow you to communicate by ways of e-mail, voicemail, and voice communication. The jewelry pieces work as a set. For example, imagine that your set consists of earrings, a necklace, and a watch. You can pick-up your messages and display them on your watch. In order to hear the message, if it's a voice message, you can listen to it in your earrings. If you want to send out a message, you can talk into your necklace and it will allow you send a voice message. The works much like that of a cellular phone. It does almost all the same functions but looks nicer. Each piece has a small button on the backside of the accessory that when pressed activates the piece. You then use each piece accordingly. You may also, once marketed, choose to buy extra pieces for the set. This may include a ring that has a vibrating chip in it. The ring would vibrate to inform you of any

incoming messages.

The basic idea behind the digital jewelry concept is to have the convenience of wireless, wearable computers while remaining fashionably sound. It is hoped to be marketable soon, however, several bugs remain. Charging capabilities and cost are just a sample of the problems that lurk.

## IX. REFERENCES

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