JUICE

Electricity
for Pleasure
and Pain

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by "Uncle Abdul"

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Table Of Contents

"Electricity is neutral. It doesn't want to kill you, but it will if you give it a chance. Electricity wants to go home, and to find a quick way to get there – and it will.

"... Anything that gives it an escape route. Anything – iron, wire, water, flesh, ganglia – that will take it where it must go, with the efficiency of gravity or the imperative of salmon swimming upriver.... And it wants the shortest route – which is not around a corner and through a muscle mass in the middle of your back, but it will go that way if it has to."

Hunter S. Thompson, 1989, Songs of the Doomed

Glossary of Terms Used in This Book

+ (plus sign): In current, the terminal from which conventional current flows (see chapter 2). In static electricity it is a positive charge, i.e., an atom that has 1 less electron in it than it should have (see chapter 6)

- (minus sign): In current, the terminal to which conventional current flows (see chapter 2). In static electricity it is a negative charge, i.e., an electron not connected with an atom (see chapter 6).

AC: Abbreviation for Alternating Current (see chapter 2).

alternating current: Current that first flows in one direction and then reverses. It then repeats this action (see chapter 2).

ammeter: A meter that measures current (see chapter 2 and Appendix 1).

ampere: The basic unit of current. One ampere equals the flow of about 6-billion-billion electrons past a point in 1 second (see chapter 2).

amp: Abbreviation for ampere (see chapter 2).

anus: The mouth of the rectum – in popular parlance, the asshole.

atom: In chemistry the smallest unit of matter. It is composed of a central nucleus and surrounded by electrons moving in orbits like the planets around the sun.

battery: An electrochemical device that produces direct current.

BDSM: An umbrella term that encompasses B&D (bondage and discipline), D&S (dominance and submission) and S/M (sadomasochism).

bladder: Part of the body's waste elimination system – the bag that collects the urine and passes it out through the urethra (see chapter 9).

blowing a fuse: When a certain level of current passes through a fuse, the metal conductor inside the fuse melts, thereby interrupting the flow of current (see chapter 7).

cardiopulmonary resuscitation: An emergency method, taught by the Red Cross and other agencies, to provide for assisted breathing and pumping of blood for victims of heart failure (see chapter 10). It only provides temporary assistance until Emergency Medical Responders can provide medical care for the patient. It is highly recommended that it be learned by people who do electrical play.

cell: A basic unit of living matter. Human beings have billions of cells (see chapter 9).

circuit breaker: A device that will interrupt the flow of current. Circuit breakers can respond to many things, but almost always will act when the current through it is too high. Circuit breakers can be reset (see chapter 7).

circuit protection device: Any device such as a circuit breaker or a fuse that will interrupt the flow of current under certain conditions – usually when there is too much current (see chapter 7).

conductor: Any material that has a low resistance (see chapter 2).

conventional current: Current that by convention flows from + to - (see chapter 2).

CPR: Abbreviation for cardiopulmonary resuscitation (see chapter 10).

current: The flow of electrons, ions, or positive charges (see chapter 2).

current density: The current that flows across a unit area of material (see chapter 2).

DC: Abbreviation for Direct Current (see chapter 2).

DC adapter: A device that converts 120 volts AC from a household outlet to a low voltage DC (see chapter 8). It is often used to substitute for batteries in portable electronic equipment.

Dermis: The layer of skin that is below the epidermis (see chapter 9). This often has a low resistance – 50 to 2,000 ohms.

diaphragm: The muscle at the bottom of the chest cavity that helps operate the lungs, i.e., breathing (see chapter 12).

Diathermy machine: A machine used in the medical treatment of arthritis and muscular pain sufferers. It uses radio waves to produce a heating effect inside the body (see chapter 14).

direct current: Current that flows in only one direction (see chapter 2).

disassociation: The chemical process that happens when molecules are placed in water or other material which causes the molecule to separate into ions (see chapter 11).

displacement current: The temporary current that exists when charges move because of being attracted or repelled in a material but not continuously (see chapter 8).

E: Abbreviation for voltage (see chapter 2).

electric field: In physics a "field" is an area or volume of physical space where a phenomenon can be measured. In an electric field the phenomenon would generally be a voltage (see chapter 2).

electrocution: What happens to a human or animal when subjected to dangerous currents (see chapter 12).

electron: The part(s) of an atom that orbit(s) the atom's nucleus. Electrons can free themselves from some atoms to become negative charges.

electromagnetic interference: The interference to broadcast radio and TV signals due to faulty high frequency transmitters such as diathermy machines, automobile ignition systems, or high voltage sparking generators (see chapter 6).

electron current: The physical flow of electrons (see chapter 2). Electron current flows in the opposite direction as conventional current, i.e., from - to +.

EMI: Abbreviation for electromagnetic interference (see chapter 6).

epidermis: The name for the outer layer of skin (see chapter 9). The epidermis generally has high resistance of from 10,000 to 1,000,000 ohms.

equivalent circuit: A simpler circuit that can replace a more complex one and yet still measures the same value(s) for current(s) or voltage(s) as the more complex circuit (see chapter 2).

fault current: The current that results when there is a short or other fault in an electric or electronic circuit (see chapter 7).

frequency: The number of instances per unit time – such as 1 second – that an AC current or voltage will change from the start of one direction through a reversal and then back to the start of the first direction (see chapter 2).

fuse: A device that will interrupt the flow of current. Fuses blow when the current through it is too high. Fuses cannot be reset, they must be replaced (see chapter 7).

GFI circuit breaker: Abbreviation for Ground Fault Interrupt circuit breaker (see below and chapter 7).

ground: A current path through the earth. It is often used to provide electrical safety protection (see chapter 7).

ground (wire): The wire that is connected to ground. In the US the color of this wire is often green (see chapter 7).

Ground Fault Interruptor: A circuit breaker that interrupts the flow of current through it not only by having too much current flow through it but also by having more than 5 ma (milliamps) flowing in the ground wire. GFI circuit breakers can be reset and also tested (see chapter 7).

grounding: To ground one side of an electrical or electronic circuit. It also applies to connecting a metal electrical box (normally not having current flow through it) to ground for purposes of electrical safety (see chapter 7).

heart: The extremely important organ in the human body that pumps blood through the circulatory system. The heart is especially sensitive to dangerous currents inside the body that may result from poorly done electrical play (see chapter 9).

Hertz: The basic unit of measuring frequency (see chapter 2).

horny layer: Another name for the skin's epidermis layer (see chapter 9).

hot (wire): The wire that is connected to the "hot" (ungrounded) side of a power company's line (see chapter 7). In the US, this wire is usually black (or red if it goes through a switch) in color.

Hz: Abbreviation for Hertz (see chapter 2).

I: Abbreviation for current (see chapter 2).

insulator: Any material that has a high resistance (see chapter 2).

interrupted DC: A DC current that is periodically or randomly interrupted, but never reversed (see chapter 2).

ion: An atom that has either an excess or a deficiency of electrons.

isolation transformer: A transformer that can isolate the circuit on the secondary side from the circuit on the primary side. This generally applies to grounds but not always (see chapter 8).

Jacob's Ladder: A high voltage, AC device that looks like two metal rods arranged thus: \ /. A spark starts at the bottom, narrower section of the rods and travels up the rods until it's extinguished.

Kirchhoff's Law: One of the two important electrical laws needed to understand electric circuits and electrical play (see chapter 2).

lactic acid: A common name for the waste product produced by working muscle cells. It is responsible for "aching" muscles (see chapter 9) Also known as pyruvic acid.

let-go current: The value of current whereby the subject cannot release his or her grasp from the conductor. The muscles are in tetany (see chapter 12).

model: An approximation of an actual, real world phenomenon used to study or understand that phenomenon. Because it is an approximation, it has limits as to its usefulness.

molecule: A combination of two or more atoms that makes up a chemical substance.

mucous membrane: A membrane found inside the body in such areas as inside the nose, the vaginal sheath, the anal sheath, etc. Its purpose is as a protective defense against disease organisms getting inside the body (see chapter 9).

multi meter: A multipurpose meter that combines the functions of a voltmeter, an ammeter, and an ohmeter (see Appendix 1).

muscle: A collective structure of muscle cells used to move a limb or an organ in the human body (see chapter 9).

muscle cell: A cell whose function is to contract when receiving a nerve or chemical signal (see chapter 9).

negative ions: Ions that carry a negative charge, i.e., they have an excess of electrons.

nerve: A continuous string of nerve cells that runs along a specific path in the body and serves a specific neural function.

nerve cell: A cell whose function is to electrochemically transmit a signal (see chapter 9).

neutral (wire): The wire that is connected to the grounded side of a power company's line (see chapter 7). In the US this wire is usually white in color.

Ohm's Law: One of the two important electrical laws needed to understand electric circuits and electrical play (see chapter 2).Often cited as E=IR.

ohmmeter: A meter that measures resistance (see chapter 2 and Appendix 1).

ohm: The unit of resistance (see chapter 2).

opening a circuit: The act of interrupting the current flowing in an electric or electronic circuit by physically breaking or "opening" a conductor in the circuit (see chapter 7). This is what a fuse or a circuit breaker does.

pacemaker: Those several collections of nerve cells whose function it is to regulate the beating of the heart (see chapter 10). It also applies to the electronic device that is implanted in some patients that have heart problems. Pacemakers can be affected by electrical play.

physics: The study of physical phenomena such as electricity, mechanics, nuclear energy, etc. (see chapter 1).

physiology: The study of the functions and processes in living organisms (see chapter 1).

pole: Another name given to the terminals of a battery or a DC power supply. They can be positive or negative poles.

positive ions: Ions that carry a positive charge, i.e., that have a deficiency of electrons.

primary (winding/side [of a transformer]): The side or winding of a transformer that is usually connected to a voltage source such as an AC generator (see chapter 8).

psychology: The study of the mental and/or emotional processes in a human being or other animal (see chapter 1).

pulse: A signal (usually DC) where the current is at first allowed to flow and then it is interrupted. This can be done as a single pulse or repeated (see chapter 10).

pulsed DC: A DC signal where the current is periodically interrupted (see chapter 2).

R: Abbreviation for resistance (see chapter 2).

rectifier: An electrical or electronic device that converts AC to DC or to pulsed DC (see chapter 8).

rectum: Part of the body's waste elimination system. A tube approximately six inches long, it is the final organ through which fecal waste passes out of the body (see chapter 9).

resistance: The property of a material that restricts the amount of current that will flow through it for any given voltage (see chapter 2).

secondary (winding/side [of a transformer]): The side or winding of a transformer that is usually connected to a load such as a resistance, light bulb, motor, etc. (see chapter 8).

sensory nerve: Those nerves that sense pain, light touch, pressure, heat, cold, and position (see chapter 9).

short: Another name for a short circuit (see chapter 7).

short circuit: The condition when there is an accidental low resistance between a power wire and the return wire or ground (see chapter 7). This usually results in abnormally high currents that will blow fuses or trip circuit breakers.

signal threshold: The minimum amount of signal – pressure, heat, pain, electrical, chemical – that a nerve cell needs in order to send a signal down its length (see chapter 9).

skin cell: Those cells that comprise the dermis or epidermis of human skin (see chapter 9).

static electricity: That form of electricity that is usually associated with the accumulation or deficiency of electrons and positive charges (see chapter 5).

stepdown transformer: A transformer where the secondary voltage is less than the primary voltage (see chapter 8).

stepup transformer: A transformer where the secondary voltage is greater than the primary voltage (see chapter 8).

synapse: The gap that exists between connecting nerve cells. They are often an important part of the functioning of the nerve. Transmission of nerve signals across the synapse is chemical (see chapter 9).

TENS Units: The electronic device that is used as a Trans Epidermal Neural Stimulator (see below and chapter 14)

terminal: One of the connections to a battery, generator, or other electrical device.

tetany: A condition in which muscles contract tightly and cannot spontaneously relax.

three prong plug/outlet: The plug and outlet used in more modern household wiring. It contains a conductor for the hot wire, the neutral wire, and the ground wire (see chapter 7).

Trans Epidermal Neural Stimulator (TENS): An electronic device that sends currents through the epidermis of the skin for the purpose of stimulating the sensory nerves in the skin (see chapter 4).

transformer: An electro-magnetic device used for AC that can transform a voltage on the primary side to a different voltage on the secondary side (see chapter 8).

transformer ratio: The ratio of the secondary voltage to the primary voltage or the primary current to the secondary current (see chapter 8).

tripping a circuit breaker: When a certain level of current passes through a circuit breaker, the switch inside the fuse opens thereby interrupting the flow of current (see chapter 7).

urethra: That sheath in the penis or between the labia that allows the urine to be expelled from the bladder to the outside of the body (see chapter 9).Known in casual conversation as the peehole or pisshole. In men the urethra also conducts the sperm from the testes to outside the body.

vagina: The sheath in the female that is part (often a delightful one) of the reproductive system (see chapter 9, p. 69, fig. 27).

Van DeGraff generator: A high voltage generator that generates static electricity by stripping electrons off a mechanically moving belt.

volt-ohm-milliammeter: A multi purpose meter that combines the functions of a voltmeter, an ammeter, and an ohmmeter (see Appendix 1).

voltage: A mechanical force that has the potential to move electrical charges (see chapter 2).

voltage gradient: The different voltages that can be found at different places in an electric field. Voltage gradients are often non linear (see chapter 2).

voltmeter: A meter that measures voltage (see chapter 2 and Appendix 1)

volts: The unit of voltage (see chapter 2).

VOM: Abbreviation for volt-ohm-milliammeter (see Appendix 1).

Vulva: The female genitals, including the mons veneris, clitoris, labia majora and minora, and vagina.Familiarly, the cunt or pussy.

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Readers should be aware that electricity play is an activity which carries an inherent risk of injury or even death. While we believe that following the guidelines set forth in this book will minimize that potential, the writer and publisher encourage you to be aware that you are taking some risk when you decide to engage in electricity play, and to accept personal responsibility for that risk. The writer and publisher have endeavored to present the most comprehensive and up-to-date information available, including having the book reviewed by a selection of experts in the field; however, in spite of our best efforts, the book may still contain errors and/or omissions. Neither the author, the publisher, nor anyone else associated with the creation or sale of this book is responsible for any injury sustained.

Until You've Read This Book

Once you've read and understood this book, you'll have enough information to make your own educated decisions about electricity play.

But until you have that information, here are some guidelines you can follow that should keep you out of serious trouble. Once you've read the book, come back to this page and take a second look. Think about the following questions: Why is electricity play safer if I follow these guidelines? Do these guidelines make it completely safe? Would I consider bending these guidelines, and, if so, under what circumstances?

For now, though, here you go:

- No electricity above the waist
- No electricity on broken skin
- No electricity on or near piercings
- No electricity with anyone who has, or has ever had, a heart condition, or who has a pacemaker
- No electricity with anyone who has ever been nonconsensually tortured with electricity.

Chapter One — *About This Book*

Electrical play is increasing in popularity. Even though electrical toys often cost $200 or more, you see more and more people playing with electricity. Certainly the thought of an attractive submissive writhing at the turn of a knob or the zap of a violet wand is very intriguing indeed.

One nice thing about S/M folk can be our commitment to safety – both our own and our partners'. We attend classes and workshops on bondage, whipping, and more. All this is done for the purpose of making our play safe. Yet I see many electricity players who seem unaware of the risks of this style of play.

Yes, there are electricity workshops and many people willing to share their knowledge about it, but there seems to be little emphasis on understanding the basic physics, physiology and psychology needed in order to play with relative safety. I liken the state of electrical play for many players to someone who plays with a loaded pistol – without being told that people can die or get hurt if someone pulls the trigger.

Let's face it, nieces and nephews:

Electrical play is edge play.

I mean by this that not fully understanding the basics of electricity and electrical play ***can cause serious injury and/or death***, and that ***accidents can happen faster than you can respond to them.***

Assessing Risk

The big question in the mind of everyone who plays with electricity – including the casual and less-trained player – is, "Is it safe?"

What they're looking for is a "yes" or "no" answer or some sort of number like, "there's a 98.7% chance of someone dying using this toy." Here I'm going to have to disappoint you: there are no answers like this.

A lot of what BDSM people do is risky. There is a chance for injury or death in anything we do. A lot of times we use common items in uncommon ways. A TENS (Transdermal Electrical Neural Stimulator) unit was designed for the purpose of pain management for patients in chronic pain – not as a play toy to be used with a vaginal or butt plug. No medical TENS manufacturer in their right mind would sanction, let alone guarantee, the safety of the way we use their units. The specifications and test results on these units only apply to the way they're supposed to be used, and may not have much to do with the way we actually use them.

The toys we use for electricity play were almost never designed or tested for recreational use. When we use them this way, we're on our own.

No hard data are available on the risks of our kind of play, and no one would be willing to fund the necessary millions to gather such data. (Although I'd be willing to work on such a project if such money – and some cute, masochistic volunteers – become available.)

Anecdotal information is available from BDSM folk who are willing to share their personal experience, and that is of some help. For example, we know that not every single person who ever tried nipple-to-nipple electrical play died doing it, so we can deduce that the risk of fatality from that practice is not 100%. But then we hear other, incomplete anecdotes that indicate it's not completely safe – 0% fatality risk – either.

So in the area of hard data or relative risk, we're on our own.

Two things that we do have going for us are 1) willingness to share information about our play, and 2) being willing to train, practice, understand, and hone our play skills. Both of these advantages are motivated by our quest for safety. We want to enjoy our play with and protect our partners, and we want to do this more than once. For this, we'll go to program meetings and workshops and watch demonstrations and go to parties to watch other players and on and on. Our commitment to safety is paramount.

The more we understand about our play the better players we are and the safer players we are. And that's what this book is all about.

Will this book or all your accumulated workshop information or all or your experience in electrical play ensure that you'll never have an injury? Alas, no! There is no such guarantee. What you will have, however, will be an information base that will help you make informed choices about electrical play.

The more you understand about electrical play, the better prepared you are to assess your and your partners' situations. You'll need to have a sense of the mechanics of an electrical scene. In the event that something does go wrong, you'll have a better chance to recover from it.

This increased understanding, this commitment to safety, will enhance the enjoyment that you and your partner will get from your electrical play.

A Funny Thing Happened on the Way to Writing this Book

As an author trained in electrical engineering, as well as a kinky male het dominant who plays with electricity, I originally thought writing this book was going to be a piece of cake. Boy, was I ever wrong.

My first draft went over some readers' heads, and many of them wondered why they should learn the material I found necessary to include.

I guess this is a problem faced by many experts trying to write to a general yet motivated audience. Not everyone has a degree in electrical engineering or physiology. Things that seem easy to me aren't so easily understood by others. Yet I don't want to talk down to my reader. I want you to understand what's going on, but not feel put off by someone mocking your intelligence.

Unlike many other kinds of BDSM play, electricity has the potential to kill. It's not a good playstyle for anybody who hasn't done a lot of hands-on play of other kinds.

The challenge for me is to write with a combination of levity and seriousness so that you will be motivated (and possibly entertained) while getting your understanding.

Who Should or Shouldn't Play with Electricity?

Because of the edgy nature of electrical play, and especially because of the lack of obvious danger signals before injury and/or death can occur, I would have to say that ***electrical play is for the experienced player. It is not for the newcomer or novice player***. If you're still learning about things like negotiations and safewords, if you've never even used a paddle on anyone before, then ***this kind of play is definitely not for you***.

If you are a newcomer to the scene, welcome – but you're still learning the basics. You still have to understand the basic psychology of playing with someone, of watching for body responses (or being aware of your own if you're a bottom), of actually doing some play that requires learning a skill like bondage or whipping. Here I would wholeheartedly suggest reading some of the books and joining some of the clubs mentioned in the Resource Guide in the back of this book. Then you can become a novice player.

Being a novice player is a bit like being a novice driver, someone who's finished driving school and passed the licensing test, but not spent much time on the road. You may do everything right and safely, but your mind is still

Making Connie Relax

Before she moved to New England I often did electrical play with a transsexual named Connie and her transsexual lover, Becky.

Connie loved my relaxicisor. Becky and I would tie her face down to a bondage bench with her bare ass exposed. I'd place the pads on the outer side of her ass cheeks, on the fronts of each of her thighs, and one pad resting up against her cock. I'd use ordinary water to ensure good electrical contact with the pads.

With four channels on my relaxicisor and by rewiring the pads, I could arrange for many delightful stimulation paths.

During our earlly negotiations I had taken an extensive health inquiry about the state of her heart, so I knew that her health was sound.

During our scene I would man the relaxicisor, and Becky would "person" the riding crops and floggers. Becky and I coordinated our timing to send Connie deeper and deeper into her experience.

As an example, Becky would lightly flog Connie's ass to lightly redden the skin and make it more sensitive. Seeing as I only had intensity control on each of the *relaxicisor channels, I would start with each one at zero. Then I'd slowly move up the intensity on one channel until Connie noticed and moaned with the stimulation. I'd then back off and after a short delay would increase the intensity to slightly beyond that range. Again I'd notice Connie's new reactions. In this manner, I determined the best range for each channel.*

Connie would be generating her own endorphins all during this time, and we'd pace our play based on Connie's reactions.

Becky would sometimes do a flogging – gradually increasing in intensity. As Becky would finish a series of strokes, I would hit one of the Channels to the maximum on the range. Connie would wiggle and scream and laugh and enjoy it. We'd then back off to a lighter flogging to build her back up again.

Sometimes I would gradually do on-off increasing intensities on one or different channels, thus building Connie up, and Becky would finish the series off with a couple of heavy strokes of the whip on Connie's ass.

We played this way as often as we could. I miss those two now that they've moved. I hope to see them again sometime. These were some of the most enjoyable scenes I've ever done.

occupied with things like "brake or accelerator?" or "when do I look at the speedometer, the road, the passing traffic?" When you've developed all the confidence and safe driving habits that don't require active thinking, and you concentrate on the trip and any road and vehicle exceptions that do require your active attention, then you're ready to consider yourself more than a novice driver.

I'm afraid that I'll have to exclude "cyber-scenes" as your sole claim to calling yourself an experienced or even a novice player. Because of the responsibility on the part of both the top and bottom in electrical play and because of the need to understand the physical mechanics and details of the play, you need experience in doing real world, intimate-proximity (right next to each other and not via a computer link) play – what I'll call hands-on play.

Even if you already have a little hands-on play experience, you should get more. A way to see if you're ready for any edge play, let alone electrical play, is to ask yourself the question, "Have I achieved enough skill in bondage or whipping that I am consistently aware of my partner and his responses, recognize the slips I've made and make corrections for them, and still do an enjoyable, flowing scene without being bogged down by the minutiae?" I want you to honestly consider yourself more than a novice player before you start playing with electricity.

What This Book Will and Will Not Do

Let me start with what I ***won't*** be doing in this book.

1) As I've said, I won't try to make you an electrical engineer or a physiologist. You don't really need to study the entirety of these subjects. You only need to know only a few basic but necessary concepts of each. Once you learn them, however, please don't expect to repair your TV, rewire your house, or do brain surgery. OK? OK.

2) In keeping with the above, I won't hit you with complex formulas and calculations. You'll need to know the simple ones, but to understand basic electrical play, you don't need complex math. On the couple of occasions that are presented in the book, I'll discuss the results without the math.

3) This book will not be an encyclopedia of all known techniques and devices that have been used, are being used, or will be used in electrical play. This book is more a primer – something to give you a basic understanding of what's happening when you play with someone with your favorite electrical toy.

4) This will not be a step-by-step cookbook. Safe electrical play depends on your understanding, not on how well you can memorize "the ten steps of electrical safety."

What I ***will*** want to do with this book is...

1) If you haven't gotten the main idea that I'm pushing, let me make it clear. I want you to understand what is happening when you do electrical play. Thank you.

2) This basic understanding results from looking at specific points in what I call the "3 P's" – Physics, Physiology, and Psychology.

3) I will also cover descriptions of some of the basic toys and play techniques to illustrate the understanding approach.

Above all, let's have some fun while we learn. You ready?

Oh! A Word About Death and Injury in This Book

You'll notice many references in this book about death and injury. In the BDSM world of electrical play, we almost never hear about a death, and very rarely about an injury. This is largely due to our commitment to playing safely. However, let me tell you a little story as to why I mention these subjects in the book.

When I was studying scuba diving, we had a very safety-conscious diving instructor. The second sentence out of his mouth after "Hello" was, "This is a sport where if you hold your breath underwater and raise 18 inches without exhaling, ***you can die***." He repeated this warning many times throughout the class, and actually taught us why that is so. This warning struck the fear of the almighty in us. We were motivated! We listened attentively to every word he said as if it were the word of God. And that's what was necessary. We learned and we learned well.

So it is to get you and keep you motivated, gentle reader, that I talk so much about injury and death. Such things can and do happen, and I'll explain why in the book. I know almost all of you are safe players and committed to learning and understanding electrical play for that safety.

Understanding means grasping fundamental concepts well enough that you can actually solve problems for yourself rather than relying on formulas.

Hey, Unc, What do You Mean by Understanding?

Understanding is a key concept.

When I was an engineering student there were some times when, to pass a test, I had to just memorize the procedures by rote. Fortunately when I began to work in the profession I began to understand my lessons at the University. I saw their relevance. I could swim through engineering problems with ease because the basic lessons were now a part of my very being. I became a happy engineer.

My classmates that never understood the concepts had a harder time solving engineering problems. They left engineering early in their careers to become engineering managers. They became rich. Figures!

Let me expand by mentioning the two ways people successfully get things accomplished. One is to follow a set procedure – like a cookbook. Under optimal circumstances, you can prepare great-tasting food this way. However, if you're missing one ingredient, you won't know what to do next or how to compensate.

You can also cook a meal by understanding what you're doing. You have a mental picture or model in your head of the process you're working on. That way, if something is missing or you start off on the wrong track, you know what went wrong and how to compensate.

This is something you already know about. Consider a complex task that you're good at, like flogging. If you're a skilled flogger, you know the areas of the body not to hit and why, and how to make adjustments to your strokes if the tips are landing in the wrong place or your bottom is getting sensations you didn't intend.

You already have a useful mental picture in your head of what to do. This is the kind of basic understanding I want you to have in understanding electrical play. OK? OK.

part
one

PHYSICS

Chapter Two

What Electricity Is and Isn't

"Electricity and electrical phenomena," intoned the physics professor to a group of college students, "have not been really explained despite all our scientific sophistication. We can describe its effects, but we really don't know what it is," he concluded.

*Seeing a student dozing in the back row the professor roared, "Perhaps that young man back there can tell us what electricity is." The student, not wanting to admit his inattention, stammered, "Gosh, professor, I did know it, but I seem to have forgotten." The professor throwing up his hands in mock frustration bellowed, "The **only** man in the universe who knows what electricity is... and he **forgets**!"*

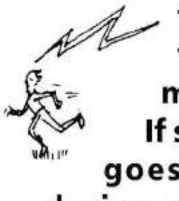
This little story was told to me by one of my professors in engineering school. It illustrates what we both know and don't know about electricity. We really don't know what electricity is or what magnetism is and why electrical and magnetic fields interact. (Modern physicists will start talking about subatomic physics and quarks and the like, but you don't need to go that deep.) All we do know about electricity are the effects, and we can describe these with a high degree of accuracy. That's enough for our purposes.

What scientists and engineers know about electrical play is even less than what they know about electricity. Why? Because many of the electrical devices we pervs use for play were never designed for play. Often – owing to our creativity – the way we use standard electrical devices would void warranties if these uses were known.

To play with electricity, however, you really don't need to be a rocket scientist. You do have to be aware of a few basic and simple rules. Someone's life depends on your knowing and understanding these rules.

A Physics Experiment that Illustrates a Point

Remember what I said in Chapter 1 about electricity being edge play because "***accidents can happen faster than you can respond to them***"? Let me now illustrate this point with a simple physics experiment. You'll need to work with a friend on this.



Electricity travels faster than human reflex. If something goes wrong during electricity play, it'll probably happen too fast for you to stop it.

Have your friend take one of your pieces of currency. (Make it a $100 bill – a fresh one – so that both of you will really be motivated.) Have your friend hold the bill between your open thumb and forefinger as shown in fig. 1.

Your challenge is to catch the bill with your fingers as soon as your friend releases the bill from her fingers. (Don't cheat and try to grab it while it's still in your friend's fingers.) To add some extra incentive for both of you, let your friend keep any bills that fall to the floor.

Now let me be the Great Carnak. I predict that despite how fast you are, all bills will drop to the floor. (I can't predict, however, whether your friend will remain a friend.)

Why is this so? Physics – well, really, physiology and physics.

The bill is affected by gravity, and its falling acts in accordance with a well-known formula developed by Sir Isaac Newton more than 300 years ago. (Consult a high school physics text for the formula.) This formula tells us that it takes about 180/1000ths of a second (that's 180 milliseconds) for the bill to completely clear your fingers.

Experiments in physiology, however, show that the time for a person to respond from eyeball sighting to finger clamp is about 250 milliseconds. Not even close. If you don't believe me, try it for yourself. Really, I'd strongly suggest you try this with a friend. (Can I be your friend?)

This simple experiment will give you a physical sense of the times involved and give you some confidence that I, Uncle Abdul, know whereof I speak.

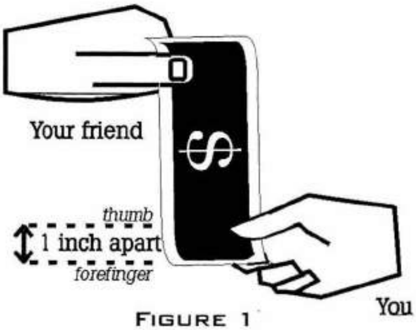


FIGURE 1

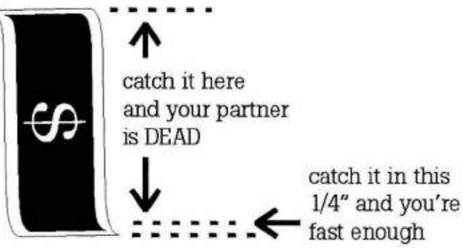


FIGURE 2

So what does this game have to do with electrical play? Well, gentle reader, other physiological experiments and studies have shown that it can take 10 milliseconds (msecs.) or less to cause death in a human being due to electrical damage. You might be able to train yourself to be able to catch the bill, but even that won't be fast enough (unless you can catch it in the first quarter-inch). You ***can't react fast enough to prevent injury or death in electrical play*** (see figure 2).

So much for gruesome illustrations; how about some practical physics?

Voltage, Current, and Resistance

To start your understanding of the physics of electricity, let's look at the concepts of Voltage, Current, and Resistance and how they are related.

Let's start with voltage. Voltage is usually represented in electrical formulas by the letter "E" (or, in some texts, "V") and is measured in (oddly enough) volts by (odder still) a thing called a voltmeter.

To find out what voltage is, let's do a "thought experiment" – the best way to do this one.

Think about taking your clothes iron, and holding it directly over your head as high as you can reach. Your iron has the "potential" of giving you a very bad headache (or even death under certain circumstances) if you let it go. Nothing happens if nothing moves.

It's not voltage that kills, but it helps. You have to know where it is and where and how things will move.

The "thing that moves" is called current, represented by the letter "I." It is measured in amperes or amps by something called an ammeter.

Voltage is the "potential" of electricity: how much power it will have if it starts to move. Imagine water in a bucket – the height you hold it above the ground is voltage.

Current is the "stuff" of electricity. If that closed container of water were connected to a pipe so it could flow, the flow of the "water" would be current.

What is current? Current is the "stuff" – usually electrons – that moves through a conductor when a potential, voltage, is applied across that conductor. By the convention we use in this book, conventional current flows (moves) from a higher voltage to a lower voltage. In a battery that would be from the positive, "+," terminal, through the conductor to the negative, "-," terminal.

R, now, stands for resistance measured in ohms. You can use an ohmmeter if you want to measure it, but you'll learn that you don't really need one.

Resistance is how hard or easy it is for current to flow through a given substance. The diameter of the pipes through which the "water" flows is resistance. (The bigger the pipe, the lower the resistance.)

What is resistance? Resistance is the resistance to the flow of current. To illustrate, consider driving a nice open freeway. With the traffic moving well you can go 55 (unless the cops aren't around). But have an obstruction – like rubberneckers at an accident – and your speed or "flow" is reduced.

Current will flow through any material – copper wire, electrical resistors, seawater, wood, plastic, even skin, muscle, and blood. We can say then that all materials have a resistance. Those with low resistance – say copper wire – are generally called conductors. Those materials with high resistance – say such as wood, air, fresh water or skin – are called insulators. What about those materials whose resistance is between those two – like carbon, muscles, etc.? Well, they're called conductors or insulators, depending on what they're being compared to.

Understand all the above? Good!

Now let me give you two laws that we'll frequently use to understand electrical play.

Voltage is measured in volts, represented by the letter E. Current is measured in amps, represented by the letter I. Resistance is measured in ohms, represented by the letter R.

Ohm's Law and Kirchhoff's Law

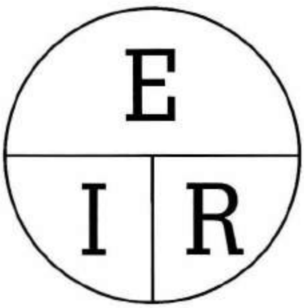


FIG. 3 – THE OHM'S LAW CIRCLE

The first of these laws is called Ohm's Law. Ohm's Law says that $E = IR$, or that voltage is equal to the product of current and resistance. Remember that from high school physics? No? Well, an easier way to remember and use it is by looking at figure 3. As shown in the figure, cover any one of the letters, and you'll be told how to find it in terms of the other two. This is really the most important formula in electricity because it's so very useful. For any linear material like copper wire, Ohm's Law holds.

Let's try an example. Go back to figure 3. If you have a 9-volt battery ($E = 9$ volts) connected across a 100,000 ohm conductor ($R = 100{,}000$ ohms), what would be the current, I, in amps?

You're looking for I in the circle in figure 3. Cover it with your finger. You see that E is over the R. That means that you find I by taking the value for E (9 volts) and dividing it by the value for R (100,000 ohms). The value you get for I is 9/100,000 amperes (or amps). It's a lot easier to say 90 microamps (μa) [1 microamp (μa) = a millionth of an amp] or 0.09 ma (milliamps).

Ohm's Law says that you can calculate voltage, current or resistance if you know the other two.

As an interesting historical footnote, Gregg Ohm, the German physicist who developed the law, wrote in the very same scientific paper a complaint about his impoverished state as a physicist. I guess he was saying, "Will Discover Electrical Laws For Food."

The other law is called Kirchhoff's Law. Kirchhoff's Law tells us about some conventions for looking at currents and voltages in circuits so you can calculate them mathematically. Since I'll be doing some simple math examples in this book, you'll need to understand the law a little bit.

Kirchhoff's law says that "what goes in comes out" – that the sum of currents leaving one part of a circuit is equal to the sum of currents coming into another part.

There are many ways to state Kirchhoff's Law. For this book, the first important thing to know is that the current that goes out of one terminal of a voltage source (such as a battery's + terminal) is the same as the current coming in at the other end (the - terminal). This is true even if you have more than one voltage source and/or more than one resistor: the total current that goes into the system is the same as the total current that comes out.

There are two spinoffs of Kirchhoff's Law.

Take a look at figure 4. It shows a voltage source (in this case a 9-volt battery) connected across two conductors. This type of connection is called a parallel resistance circuit. One conductor (R_1) has a resistance of 2,000 ohms, the other (R_2) 1,000 ohms. Using figure 3, we calculate that the current through conductor R_1 is 9/2000 amps or 4.5 ma. The current through conductor R_2 is 9/1000 amps or 9 ma. The battery and the two resistances are connected at a junction. Since the current

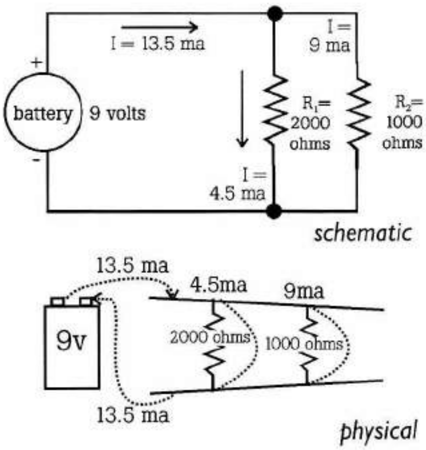


Figure 4: Two Views of Parallel Circuit

going into the junction is the same as the current going out of the junction, the voltage source is delivering 4.5 + 9 ma or 13.5 ma., the sum of the two currents.

Now take a look at figure 5. The same two conductors, R_1 = 2,000 ohms and R_2 = 1,000 ohms, are connected end-to-end and both are across the battery (E = 9-volts). We call this connection a series connection.

Kirchhoff's Law, "current out equals current in," means that you can't have a different current through R_1 than you do R_2. Since the current has to be the same (in this case we'll call it some unknown value, I) figure 3 would show that the voltage across R_1 would be 2000 x I. The voltage across R_2 would be 1000 x I. The two voltages would have to equal the battery's voltage of 9 volts. They would have to add up. So,

9-volts (battery) = (2000 x I)[across R_1] + (1000 x I)[across R_2]

If you do the math right, you get:

9-volts (battery) = (2000 + 1000) x I [across both R_1 and R_2]

In other words the resistances of the conductors in a series connection are added together. So, the total resistance of the conductors connected in series, R(total), is

R(total) = R_1 + R_2

R(total) = (2000 ohms + 1000 ohms) = 3000 ohms.

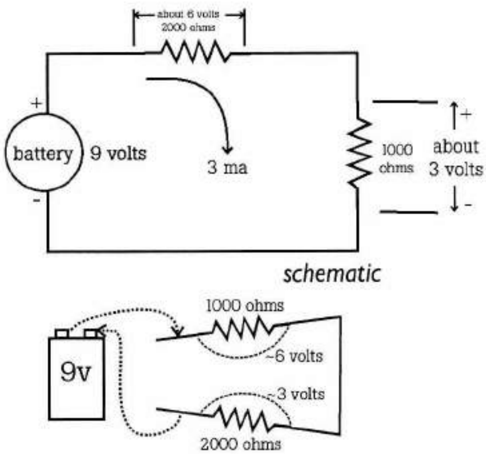
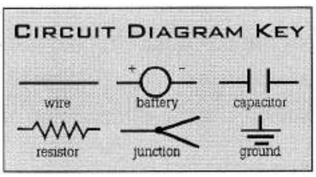


Figure 5: Two Views of Series Circuit



Using figure 3 again, we find the current, I, to be 9/3000 amps or 3 ma.

Let's use figure 3 again. With $R_1 = 2000$ ohms and $I = 3$ ma, we find that the voltage across R_1 (what you would measure if you put a voltmeter across R_1) is 6 volts. Similarly, the voltage across R_2 is 3 volts. 6 volts + 3 volts is 9 volts – the same as the battery voltage. Wow! That was lucky. Not luck really, just physics.

Kirchhoff's Law is the second most used law in electricity. It's used to study and design electrical circuits – circuits like the one that runs across a nipple, or through an electrical toy.

Let's Expand the Concept of Voltage and Current a Little

The concepts of voltage and current are fine when you're dealing with electrical circuits such as you find in a toaster, an electrical toy, or house wiring. But what if you're dealing with a block of material like a block of carbon or even a human body?

If you're looking at the material as a single lump with one wire going into it and one coming out, then you can think of the material as a single resistor with a resistance. But if you're wondering what the voltage or current is like inside the material, you need to expand the concepts of voltage and current a little. You'll understand the need for this when we look at currents and voltages inside the human body in later chapters.

Let's start with current first.

If I connect a battery across two opposite corners of a cube of carbon (see fig. 6), the current going into and out of the battery and through the wires will be the same. But inside the carbon cube, the current can take any number of paths from one corner to the other.

Current density is defined as "the current flowing per unit area." Its units are usually measured as amps per cubic centimeter (or some other standard three-dimensional measurement). An

If current is running through something three-dimensional, the greatest amount of current will run through the most direct route, but smaller amounts will run through other routes.

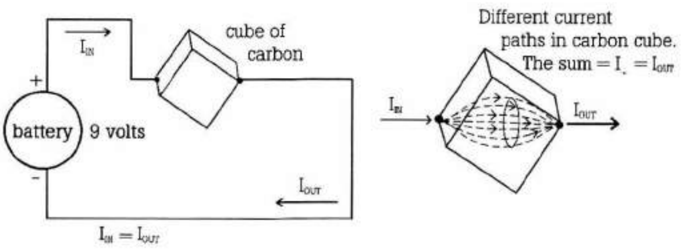


FIGURE 6: CURRENT THROUGH A CARBON CUBE

easy way to think about this is to imagine dividing your material up into evenly sized "chunks" and measuring how much current flows across each one.

Another way to think of this concept is to envision that the electrons coming out of the wire can now take any path inside the material, but that they generally go from the point of input to the point of output. Thus, if you take any one or a group of these paths and count the number of electrons going through it in one second, you'll have current density. Current density is usually consistent throughout a linear material – a solid chunk of a single substance.

We'll be using current density concept when we look at what happens when current flows inside a body during electrical play, so this is more than a "me genius, you student" exercise.

Now, let's take a look at a concept extension for voltage.

This new concept is called voltage gradient. You can best see it by looking at figure 7.

If I had a battery sitting out in the air and had a sensitive enough voltmeter, I could measure the voltage across the battery terminals (of course). But I could also measure voltage anywhere in the air close to or far away from the battery. This is called an electric field.

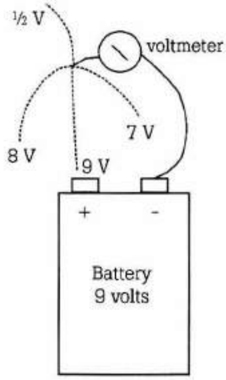


FIGURE 7: VOLTAGE GRADIENT

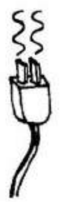
Again – like with current density – you can generate a complex resistance circuit to model a voltage gradient or an electric field for mathematical analysis. But the general concept is especially useful when we discuss static electricity.

Hey, Wait a Minute, What About Alternating Current?

This is a question you may be asking now. After all it seems the whole world runs on household AC voltage. Why, even some of our play toys get plugged into the wall. What about it, Unc?

I'm not forgetting it. AC or alternating current does indeed run the whole world. When you have a network of power stations, AC provides a means of easily distributing the power.

DC or direct current is what you get from batteries or DC power supplies. In DC the current only flows in one direction – "+" to "-". If the current flows, then stops, then flows, but still in one direction, this would be called pulsed or interrupted DC current.



Alternating current, the kind found in household wiring in the U.S., switches rapidly back and forth from one direction to the other.

AC simply means that in a circuit, current first flows in one direction, then it reverses and flows in the opposite direction. This of course means that the voltage changes polarity (+ and -) at the same time. If the circuit devices can store current (a flow of electrons, remember), then the math becomes more complicated. However, all the definitions and laws I talked about above still apply. It's just that the math gets to be more fun.

Does this mean we pack it in? No. Fortunately, the human body acts almost entirely like a resistor and hardly stores any current, so we can treat AC on the body the same as if it were DC. Whew! That's lucky.

In the book there will be some places where I'll have to give you some information that is unique to AC. I'll leave out the math, yet try to be clear enough that you can understand the concepts presented.

One important thing about AC is the term Hertz (or Hz). This isn't what electricity does when you run it across a scrotum – it's the number of times per second or frequency that the voltage (and thus the current) changes in one second. Household AC current has a frequency of 60 Hz (Hertz). Here we mean that the voltage changes 60 times in a second. Television signals are at 100,000,000 (or 100 mega) Hz (Hertz).

This completes our discussion of the electrical definitions and laws that we'll need in this book.

Oooops...

Sorry – One More Law: the Final One

You've probably heard of the wise man's saying, "All rules, including this one, are false." The final law is a little like that. We can say it as follows: "There is no such thing as 'linear' in nature."

Remember earlier in this Chapter when I said that, "For any linear material like copper wire or an electric heater, Ohm's Law holds"? Well, no material in nature is ***completely*** linear, not even a good conductor like copper wire. There are always impurities, variations in breadth, or something else that makes your calculations just a little bit less reliable. (That's kind of the way life is – no sooner do you think you understand the rules when someone comes up with new information.)

Does that mean we pack it in – again? No, it just means you have to be careful in how you use these laws. You have to know and understand what the limits of the law are and when and where they can be applied. Most S/M players have developed a basic understanding of what "limit" means.

The next chapter will take a look at some of these limits.

Chapter Three

Nature is Perverse but Kind

"Constants aren't and variables won't."
from Murphy's Laws and Other Reasons Why Things Go Wrong, by Arthur Block

In this chapter we'll take a look at what "limits" mean for all the "3-P" laws and models that we'll study in this book.

The study of electricity isn't all that complicated. Really, I'm serious. All you have to remember is that everything is variable and nothing is linear.

"What a minute!" I can hear you say. "How can I study something that's always changing?"

Here nature is kind. Within the limits of the questions we're asking here, things are constant and linear enough that you can apply a few simple laws and formulas to get very accurate results.

What does "accurate results" mean? This means that if you calculate that a voltage across a conductor is supposed to be a certain value, then if you actually measure the voltage on the real conductor, it will be the same. The trick is to come up with a convenient model of the actual physical system to which you can apply the laws and come up with accurate results. But remember, the model is not the real system. It is just a convenient way of looking at things so that you can do some work with it. This is the key to understanding.

A "model" is an approximation you set up in your head or on paper so that you can calculate the outcome of your electricity play without actually doing it.

An example: copper wire for all intents and purposes is considered a linear material. If you double the voltage across it the current will double – generally. This means that the resistance of the conductor is constant. Right?

Enter temperature, stage left. The resistance of a conductor varies with temperature. For instance, a copper wire at 150°F has 28% more resistance than the same wire at 32°F. For a limited range of temperature (about several hundred degrees Fahrenheit) these temperature effects are linear.

Now comes the kicker. As current flows through a conductor, the resistance of that conductor to that current makes the wire heat up, i.e., raise its temperature. This is a process known as power loss.

Back to the wire which is heating up. The temperature that the wire reaches depends on many factors. This temperature limit, by the way, is how the National Electrical Code determines the current limit for various size wires. The temperature reaches a plateau; the level of the plateau depends largely on the type of conductor, where it is, and on the current. At this new higher temperature the conductor has a higher resistance than when you first start putting current through it.

"OK," you say, "temperature can make the resistance of a conductor non-linear, but at least it comes to rest for a given conductor and current." This is true, and these temperature/current points are predictable by long equations which we don't need to go into here. But lower the temperature of the conductor below a certain temperature, and all of a sudden the conductor has zero resistance (or damn near zero). We say the

Molly and the Professor

Molly was a modern, emancipated woman of 1900. Unlike her Victorian-minded female relatives, she appreciated these new, modern inventions. She wore bloomers when she bicycled in the park. Heck, she even smoked – in secret of course.

All of these things swirled dizzyingly in Molly's mind as her naked body struggled against the heavy, restraining straps in this stoutly constructed wooden chair. But she was helpless. They were too strong for her.

In an effort to regain her now rapidly diminishing composure, she tried to recount the events that led her to being in this vulnerable position and... with a wet pussy.

It was the Professor. He was lecturing in town on "Electricity is Life." She attended with some of her friends, and she was especially impressed with the Professor – his knowledge, his dedication to the human body, the bulge in his pants. She readily accepted the Professor's invitation after the lecture to privately experience the "healing powers of electricity."

Once in his traveling surgery, she responded quickly to the order to "strip!" Now she was in her helpless position in this dim, candle-lit room, having been secured thus by the Professor's strong will as well as his powerful hands.

Molly detected movement in the shadows. It was the Professor. He was wearing a black leather outfit. His hands fondled her body. Her pussy was getting wetter by the minute.

She heard the hissing crackle of an electrical device and saw a glowing gas tube in the Professor's hand. The violet glow cast a demonic and exciting light on the Professor's leathers. She struggled even more, but to no avail.

The glowing tube felt like ants crawling over her skin as it got closer. Finally sparks jumped to her bare arm. She tried to pull away but couldn't. All she could do was helplessly experience the tingling sparks on her skin. She was terrified – but, undeniably, excited. Despite her weak protestations and encouraged by her low moans, the Professor continued.

The cruel instrument was run across her breasts, her arms, her chest, her belly, and... oh no... he was moving it slowly down to her pussy.

Molly arched her body and let out a long, deep, almost gargling exhale as the sparks danced across her clit.

In the temporary respite the Professor, in the process of running his hands across her fingers, asked, "And what are the code words, Molly?"

"Red, Yellow, and Green, Professor," she was able to answer.

Molly knew that Tom was checking in with her without breaking the energy of the scene. She appreciated his skill and loved him for that. That's why she did electrical play with him for years.

Molly and Tom, the Professor, continued on with their scene for about another half hour before spending the rest of the night in bed cuddling and fucking and loving each other.

conductor is now a superconductor – a thing that modern scientists and engineers get all excited about (imagine batteries that last forever!).

The purpose of this little digression is to show you that when you have a picture in your mind – a model – about some electrical phenomenon, you have to know what the limits of this model are. In this case Ohm's Law works gives really great answers when E, I and R don't vary. (It also works when they vary, but it becomes a lot more complicated to figure out – kind of like herding cats.)

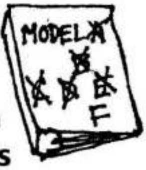
Now we kinky folks know a thing or two about limits – or at least we should. Limits guide our play and make it safe. "No whipping on the tailbone" and "the bottom doesn't want any bruises... tonight" are limits that are familiar to us.

Also with other complex things you're good at, you know that the models you have in your head have limits. In doing a bathroom remodeling job, for example, you know that gold faucets would look damn nice, but they'd be too expensive. Brass might look just as good, the costs are right, but there's a cleaning problem. You get the idea.

Understanding the limits of the models helps you understand what you're working with. It can also help you be more creative in design and play. You can also fit the right model to the situation – like using "current" for thinking about wires and "current density" for thinking about body parts. Understanding the models and their limits helps make you a safer player.

Now you can forget about temperature effects on a conductor and superconductors – I just used them as an example of how limits can change according to circumstances. We won't need these to understand electrical play (unless you're a cute blond masochist; then there'll be a difficult test with severe punishments – ***when*** you fail).

Models work pretty well – except when they don't. Part of what you can learn from this book is how to set up good models, yet understand their limitations.



Chapter Four — Getting Some Static

Q: What did one atom say to the other atom?

A: It's Electron Time – time to go to the poles and volt.

Some of you probably remember studying static electricity in high school physics. Electrical Engineering students study it too – about a year and a half's worth. The interesting thing is that once we learn it, we never use it in our careers, unless we get involved in high-voltage transmission lines and the like. Too bad – there's some pretty interesting stuff there, including static electricity motors and such.

The reason why I include static electricity in this book is that for electrical play toys, like violet wands and rubbing your feet across the carpet on a dry day, we need to take a look at some basic principles of static electricity.

In teaching us about static electricity, engineering schools teach a lot of theory with fairly complex math. We also do a lot of experiments with pith balls. Believe me, if your balls were made of this extremely lightweight material from trees, you'd be "pith"-ed too.

Understanding basic electrical play doesn't depend a lot on understanding the models and mathematics of static electricity, so I'll present it to you in a more simplified manner. Whew!

Static Electricity Rule #1: There are two kinds of static electricity charges: positive, "+", and negative, "-".

Generally the negative charges are electrons and have been stripped off the atoms in the material. This is actually very easy to do in many materials. Atoms with an extra one or two electrons can also be negatively charged.

If an atom loses an electron, then the atom becomes positively charged. Atoms with more or fewer electrons than they normally should have are called ions.

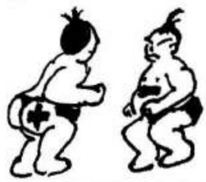
Static Electricity Rule #2: Like charges repel each other. Unlike charges attract each other.

You've probably heard this one before, and some people have even applied it to non-electrical things like relationships. But as far as static electricity is concerned, look at figure 8 to have a picture in your head of the concept.

Static Electricity Rule #3: It is fairly easy to generate a static electrical charge.

Static electrical charges are fairly easy to generate. You can even generate them mechanically. Shuffling your feet across the floor, taking off a wool sweater, or sliding nylon panties off a vinyl-covered stool are all ways that can generate static electrical charges.

Static electricity, in which positive charges on one side and negative ones on the other try to equalize one another, is pretty easy to generate.



Static Electricity Rule #4: Static electric charges are always trying to equalize the charge.

If you have two bodies having opposite electric charges and a gap separates them, they will always try to equalize or cancel each other out. This means that whatever positive "+" charge is out there, it will try to capture an electron or negative "-" charge. This phenomenon is a consequence of Rule No. 2. Because of this it is possible to generate great forces ("great" as compared to the weight of an electron) that can move very light objects like bits of paper or pith balls.

Static Electricity Rule #5: Static electric charges can produce high voltages.

Even though it's only electrons, static electricity can produce very high voltages – from thousands to millions of volts. We'll study high voltage effects in the next chapter, but for now I'll just say that in electrical toys, like violet wands and other

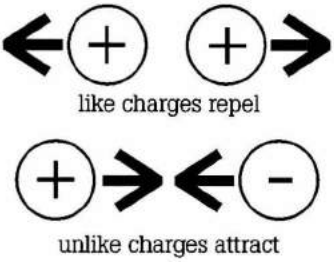


FIGURE 8

high voltage toys, you can get a good idea of the toy's effect by using the principles of static electricity.

If you shuffle your feet across the carpet in a warm, dry room inside the house on a cold winter day, the voltage from your finger to the doorknob can be 25,000 volts or more.

Static Electricity Rule #6: Static electrical charges move whenever they can.

Because of Rule No. 4, static electrical charges will move whenever they can. They can't move across an insulator, but they can and will move across any conductor. The spark from your finger to the doorknob in the "carpet shuffle zap" proves this principle. Here the spark is the conductor allowing the charges to equalize (Rule No. 4). These moving charges – generally the electrons – are the same as current. However, because of the limited number of electrons involved, even though the current may be momentarily high, the jump will only last for the short period of time that it takes to equalize the charges. Thus, the "carpet shuffle zap" gives you only one short duration spark rather than a continuous spark.

Chapter Five — *Using Models for Four Cases*

Old Vaudeville Joke about Cases –

A man sees a lawyer walking down the street carrying a brand new brief case. The lawyer says, "I'm taking my case to court."

The following week, the man sees the same lawyer carrying the same briefcase and a ladder. The lawyer now says, "I'm taking my case to a higher court."

Before we leave Messrs. Ohm and Kirchhoff and definitions, lets go through four special circuit cases. More than just practice exercises, these cases will closely approximate real-world situations you'll run across in electrical play.

Model 1: The Skin As Savior

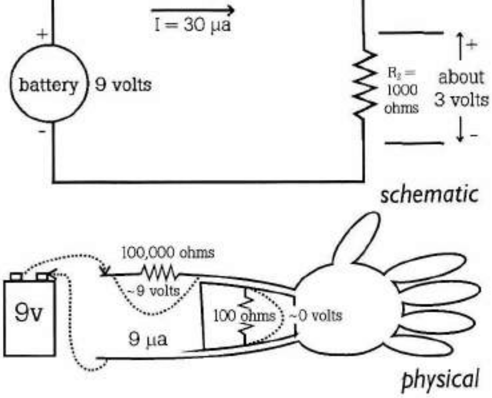


FIGURE 9: TWO VIEWS OF ELECTRICITY, OUTSIDE & IN

In the first model we show a series circuit in which $R_1 = 100$ ohms, $R_2 = 100{,}000$ ohms, and $E = 9$ volts.

Take a look back at figure 5 on page 17. In that figure, you can see that $R_{total} = R_1 + R_2$: $100 + 100{,}000 = 100{,}100$ ohms. If you go back to figure 3 (p. 15), the Ohm's Law Circle, you can see that $I = 9/100{,}100$ or 8.991008991 microamps (μa) or damn near 9μa.

Use Ohm's Law again to find the voltage across R_1: 0.008991008991 volts, or damn near 0 volts. Similarly, the voltage across R2 is 8.991008991 volts – that's 9 volts to you (or to me).

Apart from a re-confirmation of the first special case, what does this case mean?

Well, here we are dealing with typical values found in electrical play. Nine-volt batteries are used in such electrical toys such as TENS units. 100,000 ohms is usually considered a good safe value for the resistance of human skin. Note that unbroken skin resistance can vary from 10,000 to 1,000,000 ohms, but 100,000 ohms is considered to be a good dry, unbroken skin resistance value for toy design and safety design purposes. (Remember limits to models?) 100 ohms is a general value that is used for the resistance of body stuff – muscles, blood, etc. – that lie below the skin. Again this varies, but 100 ohms is commonly accepted.

Now, let me ask you a question. Why is unbroken skin so important?

tah-dah-dum-de-de-de-dum-dum-dum...

Got your answer? Good, let's check it.

In a circuit with several different resistances in series, the highest determines the current. Since unbroken skin has high resistance, it often determines the current in electricity play.

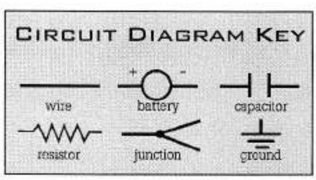
From the first case we see that the largest resistance in a series circuit determines the current in that circuit. In Figure 9, R_1 represents dry, unbroken skin, which dictates the current that runs through the bottom's body. Thanks skin! We'll get back to this later, but I hope you'll understand a very important idea here.

And you thought that studying electricity was going to be dull, uninteresting, or too much over your head.

Model 2: What If the Skin Is Sweaty?

Let's look at other skin resistance values.

Now look at the circuit shown in figure 11. This is yet another series connection circuit where E = 9 volts, but R_1 = 10,000 ohms and R_2 = 100 ohms. Using Ohm's Law, we find the current, I = 891 microamps (μa). The voltage reduction across R_1 is 8.9 volts. The voltage reduction across R_2 is 0.1 volts.



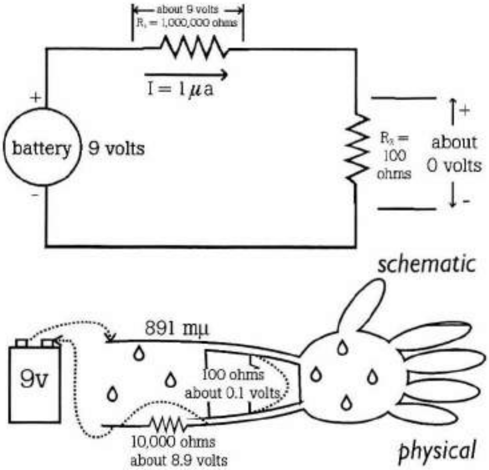


FIGURE 10: TWO VIEWS OF CIRCUIT WITH SWEATY SKIN

Here we notice again that the current is limited by the skin resistance, but that the lower the skin resistance gets, the higher the current in the body gets. Skin resistance lowers when a person gets sweaty. But also note that the current in case 4 is near 1,000 microamps (μa) or about 1 milliamp (ma). We'll see later that this is about 1/10th the usual danger value of current. So we can see that we can usually – but not always – depend on the protection of skin during electrical play.

Model 3: Inside the Body

Take a look at the circuit shown in figure 11. Once again another series connection circuit where E = 9 volts, but R_1 = 100 ohms and R_2 = 100 ohms. Using Ohm's Law, we find the current, I = 45 ma. The voltage drop across R_1 is 4.5 volts. The voltage drop across R_2 is 4.5 volts.

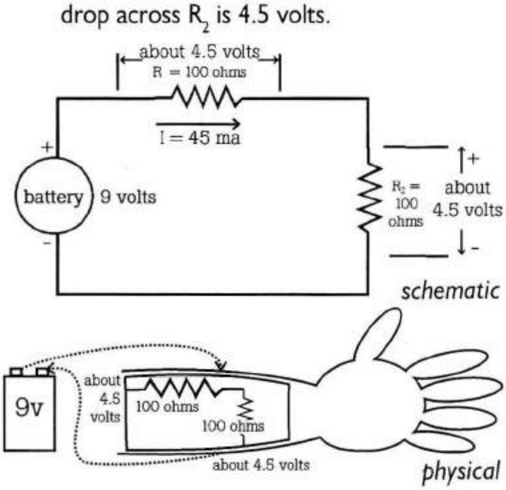


FIGURE 11: TWO VIEWS OF CIRCUIT INSIDE BODY

Sweaty skin has lower resistance

than dry skin. Broken skin has lower resistance than intact skin. The interior of the body has lower resistance than any skin.

This figure, of course, represents what would happen if the probe of an electrical toy ever got below the surface of the skin and inside the body. A current of 45 ma inside the body is definitely dangerous. Again we see the importance of skin.

Model 4: Safety "Shunting" Resistances

Figure 13 looks at what happens when you put a low parallel resistance, R_2, across a high resistance, $R_3 + R_4$. If you have a good understanding of Ohm's and Kirchhoff's Laws, you should get the same results I show in the figure.

Why is this important? Well, in upcoming chapters on electrical safety, you'll see that many safety devices use a low-resistance "shunt" (represented by R_2) across "you" (represented by R_3 and R_4). This allows most of the current to go through the lower resistance – so that much less of it goes through "you."

I'm trying to demonstrate that you can solve many of the practical problems of electrical play by using relatively simple models. You also begin to see, I hope, that these models can help with explanations as long as you understand that they have limits.

Now, let's move on.

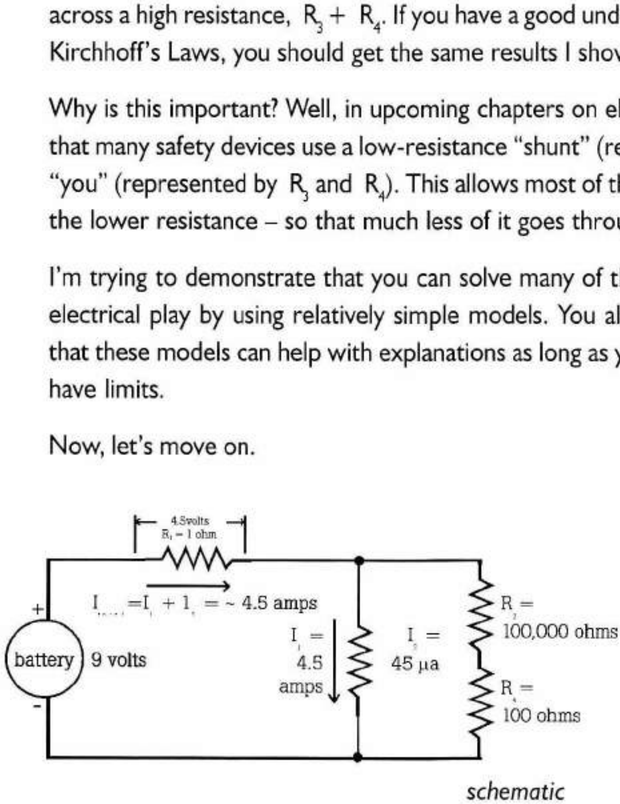
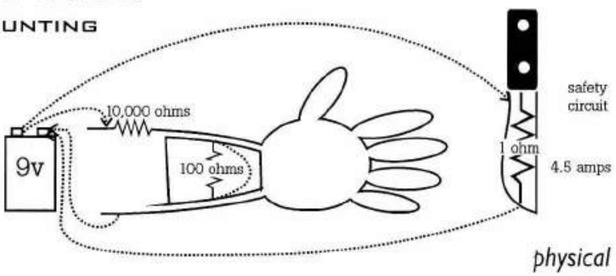


FIGURE 12: TWO VIEWS OF SAFETY SHUNTING



Chapter Six — *Special Effects: High Voltages*

Here is your first quiz on electricity. Answer the following question. Where is the safest place to be during a lightning storm? Is it:

A.) In an airplane flying through the middle of the storm?

B.) In a dungeon giving/taking a whipping?

or

C.) Spread-eagled naked at the summit of a barren hill with a hard-on that won't quit?

If you chose either A or B, you'd be correct. If you answered C, boy, are you ever into serious kink!

Remember the part about voltage? I said that, "It's not voltage that kills, but it helps." Let's take a look at that a little more closely for high voltages – like the voltages in a violet wand.

Something strange happens to air when the voltages start getting high enough. As the voltage gets higher – say around 10,000 to 20,000 volts or more – the gas molecules in the air start breaking down. The voltage is high enough to tear electrons out of the atoms and molecules. With all those electrons and ions floating around, you can now start moving them when they have some place to go. The same thing happens when the positively charged parts of molecules (called positive ions – atoms with less than their needed supply of electrons) move. Humm! Moving electrons – that's current, isn't it? Why, yes, it is.

When voltage gets high enough, it can break down the molecules in air and move through open space – thus creating a spark.

When gas molecule breakdown occurs, you usually see a luminous color in the gas. Air, for instance, turns blue. Neon turns orange-red. Mercury vapor turns violet. This is what happens in a neon sign and a fluorescent light. (Fluorescent lights, which often use mercury vapor as the gas, glow white because of the coating on the inside of the glass tube. Without the coating, you would see the bluish-violet of the mercury.) It's also what happens in a violet wand.

"OK," you say. "But when do we get current?"

Your start getting an actual current flow when you have a sufficient voltage difference across the intervening gaseous space and a potential of zero within the localized electric field.

"Huh?" you ask.

Oh, sorry! You actually get a current, i.e., electrons moving, when the conditions of voltage, distance, and gas are correct. The gas molecules will start breaking down and you'll get a spark. For dry air it takes about 10,000 volts to spark across 1/8th of an inch.

A real experiment now. On a winter day when it's nice and dry inside, shuffle your feet across the carpet and then touch the doorknob. Nasty shock, eh?

When the air is dry enough, just walking across a rug causes an excess of electrons to collect on your body. This activity can generate a potential of 25,000 volts on your body. You don't feel anything as you have all these electrons crawling over the surface of your body – there's only a billion or so of them. If I put a static voltmeter (an expensive, special voltmeter) from you to a grounded object (more about grounding later) like a doorknob, you'd show a voltage of about 25,000 volts. When you touch the doorknob, all those little electrons rush across your skin and concentrate at the finger closest to the doorknob. When you have that 25,000 volts of potential a quarter-inch from the doorknob, the air breaks down – becoming a conductor – and all the electrons on your body now have a conducting path to ground. Result – z-a-AP (with a pretty blue spark) followed by the words, "Ouch! Shit!," if you're a top, or "Ouch! Ahhh!," if you're a bottom. The static voltmeter will now show that there is 0 volts between you and the doorknob.

What have we learned from this experiment?

1) You're still alive (I hope. If not, we don't give your estate refunds.)

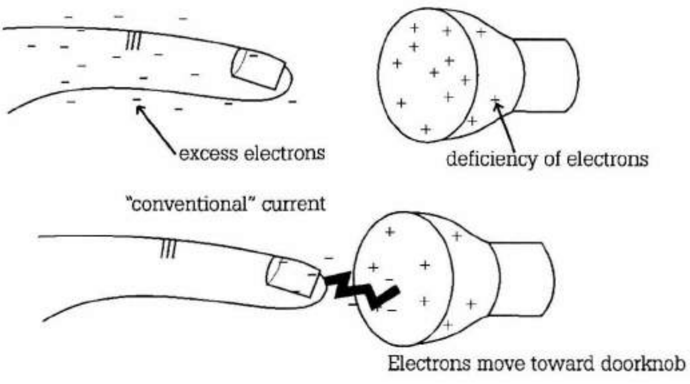


FIGURE 13: THE CARPET-SHUFFLE ZAP

2.) High voltages to show such effects are relatively easy to produce.

3.) Doing it in the way I've suggested doesn't produce enough current to be dangerous.

4.) You've increased your understanding – and that's important. (You can now win some bar bets explaining the phenomenon to your friends.)

5.) You now have your first electrical toy – and it's free. If you turn off the lights in the dungeon, shuffle your feet across the carpet, and then zap your submissive on the nipple or genitals, the effect will be (uh-hum) electrifying.

Is it ever dangerous to do this? Yes, under certain circumstances. Some years ago hospitals wondered why some patients, who were on external (outside the body) cardiac monitors and pacemakers, were dying. Sometimes the answer was that the nurses wearing nylon uniforms or panties would slide off plastic-covered stools and touch the electrical wires that were connected to the patient's heart. (If the nurse was cute, what a way to go – but a little extreme.) That is why special electrical precautions are taken for cardiac patients now. Special thought, therefore, should be also given if you plan on doing this to someone with heart problems – especially if they are wearing piercing jewelry. (More about this in Chapter 10.)

Lightning is a supreme example of this high voltage phenomenon. Here voltages are in the millions of volts, and we're talking about billions and billions and billions (e.g., a helluva lot) of electrons. When the spark happens, shit happens. Thousands of amps of current are generated. There is enough heat generated that trees explode, houses catch fire, and sand melts into glass. Very few people survive a direct lightning strike. The ones who survived either had the bolt strike next to them, or something else (like a nearby tree) got most of the current.

Some of the more astute of you are asking, "But what about the sparking I see in a switch or a motor of an electric (child's) toy?" "That's only 1-1/2 or 2 volts."

Good question! I'm glad you're thinking.

Remember I told you that sparking happens if the conditions of gas, voltage, and distance are met? As a switch – even a low-voltage one – opens or closes, the contacts bounce several times (for about 5/1000ths of a second). The distances the contacts bounce are about 1/1000th to 2/1000ths of an inch. If current flows through them, it generates enough heat to temporarily melt some of the contact material and turn it into a gas – a contact gas, if you will. Since the contact material is already a conductor, it has a lower breakdown voltage. For small toy motors, the same idea holds.

Some electrical devices, such as household switches, work by generating enough heat to break down the contact material and turn it into a low-resistance gas.

Practically all of the switches in your home do the same thing. So for God's sake, if you smell gas, don't turn on or off any lights or other switches.

I hope some of you are asking, "Why am I safe in an airplane, car, train, metal ship, or properly protected building if it gets hit by lightning?" The answer is that all of that current will go through the low-resistance conductor that surrounds or protects you rather than through you. (Aha – Model Four on p. 34 now makes sense.)

Lightning and the static spark from the rug follow the same physical rules. The big difference is the number of electrons available for the current. In both cases only enough electrons flow from the body, with the excess of them heading toward the deficiency of them (just as if a conventional current flowed from the doorknob to your finger), until there are an equal number in both bodies. Then the voltage difference goes to 0 volts and the current stops. See figure 13 to see what's happening.

Before we leave it for now (we shall look at it again in the "toys" discussion), there is one final thought about high voltage in general. You might be able to do S/M with the lightning-like discharges and high voltages generated by such things as Winshurst machines, Van DeGraff generators, and Jacob Ladders, but here you ***would*** need to be a rocket scientist. All electrical engineers have studied a little about sparks in school, but only those who have received special training really know how to work with it safely. Most electrical engineers do not.

As a matter of historical interest (with some kink content), Nikola Tesla, the pioneering electrical scientist who performed most of the early experiments on the phenomenon, did invite friends to step on his apparatus for entertainment. His friend Mark Twain said he enjoyed the experience, but he had to go to the potty afterward.

Unless you can show me that you work for some company that deals with high voltage phenomena, stick with violet wands, TENS units, and the other toys I recommend in Chapter 14 for play. Otherwise I'll not be nice.

Some Special Electrical Effects – High Frequencies

All of us have heard about radio and television and radar and microwaves. You can send small amounts of AC electricity through the air or far out into space without wires or other conductors. Heinrich Hertz first experimented with this phenomenon more than 100 years ago. Using a spark generator (opening and closing a high voltage contact – like in the electrical system of your automobile), he could induce sparks in the gaps of small metal rings at various distances from the generator without wires to the rings.

Hummm! Let's see – small metal rings (like piercing jewelry) with gaps in them, and sparks jumping across the gaps. I wonder if that could be done in a scene?... Sorry, I digressed there.

What Hertz was doing was setting up high frequency AC voltages with the generator. The generator was a transmitter, and the rings were radio receivers.

This action at a distance is characteristic of high frequencies. Here when we talk about high frequencies, we generally mean anything over 100,000 Hz (Hertz).

Some S/M players use high frequencies in interesting ways. I particularly like the one about the radio controlled shocking dog training collar strapped to the inner thigh of an otherwise "at loose" submissive. A variant on this was the radio-controlled, clitoral vibrator on another submissive. (Now that was fun to watch.) Some players use diathermy machines, medical machines used for the treatment of arthritis and physical therapy: a direct use of high frequencies for electrical play.

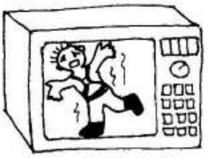
> **Radio and other "long distance" phenomena work by creating a spark, which generates electromagnetic waves (radio waves) that can travel over long distances and induce currents and voltages in wires (antennae) some distance away.**

We shall look in more detail at the physiology of this phenomenon later, but there are a few cautions about high frequencies. People who work around radio transmitters, radars, and microwave transmitters are particularly concerned about safety – and for good reason. For one, there is the cooking effect. Enough power at high frequencies can cause severe internal heating in humans and other water-containing material. (We'll look more at this in the Physiology section.) Also, if any part of your body comes in direct contact with a high frequency conductor of sufficient voltage, a severe, deep, penetrating burn can occur. Such burns take a long time to heal.

A special caution for electricity players has to do with the possible effects of high frequencies – such as those generated by violet wands – in close proximity to cardiac pacemakers. In general, I'd avoid using a violet wand on the upper body of anyone wearing a pacemaker.

One other thing you should concern yourself about with working with high frequencies is EMI or Electro-Magnetic Interference – especially if you're using older radio gear or diathermy machines. This equipment can generate signals that interfere with radio or television broadcasts or navigation radio. Pay attention when

Enough power at high frequency can "cook" water-containing material (like human flesh). This is the principle behind microwave ovens.



your neighbor tells you, "You know, I don't mind the sounds of screaming and the slapping of leather coming from your basement at night, but I do mind when I get wavy lines on my TV during the 'Christian Gospel Hour'." EMI is one of the things that federal law enforcement people are interested in, too.

You can also ask about the link between cellular phones and brain cancer. That link has not been proven either, and I haven't felt compelled to rush out and buy the copper hair net that one ripoff artist is selling to cash in on these fears.

Chapter Seven

Making Electricity Safer

Did you know that blown fuses are caused by horny electrons?

You might now be asking the questions, "Companies build equipment to meet electrical safety codes, don't they? Wouldn't this be adequate to guarantee the safety of players doing electrical play? Do these electrical safety measures protect players?"

This answer to this, dear readers – like other times in this book – is yes and no.

Here again we deal with the limits of models. It's important, therefore, to look at electrical safety measures and see how they protect and not protect people doing electrical play.

Electrical Safety

What do manufacturers of electrical equipment do to provide electrical safety for their equipment? This can be the subject of several books alone, but here I'll just cover a few of the most common ones and the ones that we'll see in electrical play and toys.

Take a look at one of your home appliances. You'll notice that if it's designed correctly, not damaged, and if you haven't broken it open, it is designed so that you can't get your fingers or any part of your or anyone else's body in direct contact with the "live" electrical circuits – where you can touch a part that's at household voltage (if you live in the U.S.) of 120 volts. Usually this is done by putting electrical parts inside boxes or the appliance, with insulation, with circuit protection (fuses and circuit breakers), and with grounding.

Electrical parts have been placed inside boxes for as long as appliances have been designed. Almost always such boxes are fireproof. Appliances are designed this way because when something goes wrong, electrical parts overheat – hot enough to start a fire. When these boxes are metal, special care is taken that the electrical parts inside are insulated and not in direct contact with the box. Finally, when the box's cover is closed, you can't touch anything inside.

The other contributor to electrical safety is insulation. You're already familiar with insulators. There's the rubber or plastic covering on wires, the plastic case on a television, etc. Such materials as plastics, wood, pressboard, wax, paper, oil, air and other gases, are used. Designers consider how the materials react to the heat generated in an accident when selecting an insulator.

As you remember about what was said about insulation in Chapter 2, insulators have high resistance – generally above 1,000,000 ohms. But if you remember too, not all is skittles and beer. Under voltages that are higher than the insulator can stand, the material will break down just like air. Thus the resistance becomes lower, and the insulator no longer acts as an insulator. Also, insulators can break down due to exposure to weather, sunlight, heat, or mechanical wear and abuse.

Insulation is high-resistance material that keeps lower-resistance material – like you – from coming in contact with live wires.

With these ideas of containment and insulation, let's look at some everyday examples.

Let's take the television, for example. Your television is inside a plastic, metal, or wooden box. Even though there are ventilating holes or slots in this box so that the electronics can be cooled, these air vents are such that you can't readily stick your fingers inside. It is possible to poke a screwdriver or a hairpin into these vents, but almost all of us over the age of five know not to.

Inside the television there are voltages ranging from 5 to 25,000 volts or more. If you take a peek inside, you can see there are various types of insulation on the wires. The ones going to the picture tube that are at 25,000 volts (or more) have thick insulation. Because of the high voltages, the picture tube circuits are often the first to break down. When they do, they make the characteristic "burning insulation" smell that we are all familiar with.

House wiring is another example. Here, insulated wires are behind the wall. They're either in metal pipes, called conduits, or in insulating jackets. Boxes are provided for outlets, switches and ceiling lights. Generally, wires inside the wall, if designed and installed correctly, do not overheat – but if you have seen old house wiring, you know that the insulation can get brittle and flake off easily if you handle it a lot.

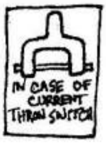
Problems with house wiring usually start in the cords that connect with lamps and appliances. Extension cords also have the same problems. Because they are exposed, they are subject to water damage and mechanical abuse. Also, many people use too light an extension cord for heavy-current appliances. You sometimes see old lamps whose cords are frayed. I have also seen people running extension cords under heavily trafficked rugs and running them across wet lawns or even inside sink cabinets that can get wet. This would not be my choice of the ideal way to die, and I don't think it would be yours either... You don't use frayed or damaged cords, do you?... No, no, just asking.

Fuses, Circuit Breakers and Other Circuit Protection

One feature of house wiring, as well as many appliances, is circuit protection. These are usually either fuses or circuit breakers.

Fuses "blow" and circuit breakers "trip" when they detect too much current flowing through a circuit that they're protecting – the fuse or circuit breaker "opens up," thus preventing any current from flowing in the circuit. They are designed so that they will operate properly for the maximum possible current flow and voltage that can be expected if there is a failure or "short" (actually a path of least resistance like you saw in Case 4 in Chapter 5) anywhere in the circuit, downstream of the fuse or circuit breaker. They are generally designed to act fast. "Fast" is considered to be one cycle of AC (Alternating Current) current – that's about 16 milliseconds or 16/1,000th of a second. In this way, even though your toaster has a "dead short" in it (0 ohms across a 120 volt line), the fuse will blow or the circuit breaker will trip without causing a fire in the house wiring, having the toaster explode, having the fuse or

Fuses and circuit breakers are designed to open up and prevent the flow of current when they detect too much current.



breaker explode, or exposing you to a large enough voltage long enough to be a safety hazard to you.

You probably sort of already know about this. "So what?" you ask.

The reason I bring it up is that this is one of the things that people tend to cheat on.

In the old days people would sometimes put pennies behind fuses because they didn't want to bother with them. They then wondered why they had electrical fires that burned the house down.

Fuses and circuit breakers are there for your safety. Even though modern fuses and breakers are hard to override or defeat, people still sometimes try. I remember one electrician I worked with who wanted to put a 2-amp fuse in an electronic circuit that was protected by a 1/2 amp fuse. Why? Because he had the 2-amp ones. They were the same size, and he didn't want to walk all the way back to the supply room. Fortunately I saved the company the cost of some damaged equipment – and perhaps the cost of hiring and training a replacement electrician.

If a fuse blows or a breaker trips, find out why it did. Then repair the cause before replacing the fuse or resetting the circuit breaker. Finally, in replacing any fuses, use an exact replacement.

Grounding

The final safety topic I'll talk about is grounding. Grounding is really a simple concept to understand, but it can be confusing to consider the many ways it's done electrically. Even electrical engineers only know about the particular grounding practices in their own fields; I wouldn't want an engineer who solves grounding problems for computers to design a grounding system for a power plant. Each field has its own practices and ways of doing things – even though they are all doing "grounding."

Grounding essentially means that one side of a circuit runs through the earth. Earth – you know, ground, dirt, salt of, etc. Power companies do this with almost all their power lines, generators, and transformers. The idea is that if for some reason you have a short (one of the wires touches the metal box that it's in), then

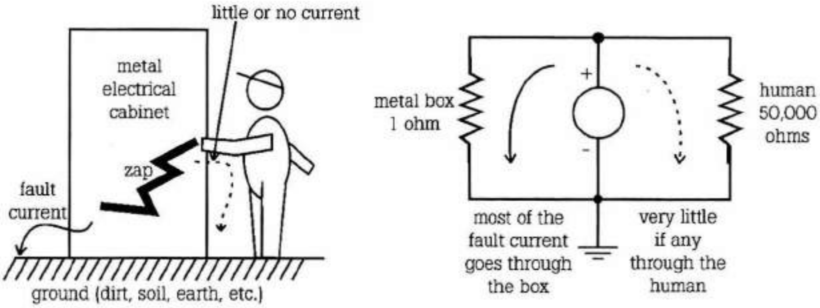


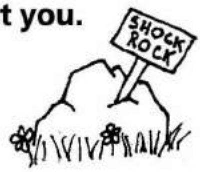
Figure 14: Grounding Safety

the fault current goes directly to the earth for as long as it takes to blow the fuse or trip the circuit breaker. Anyone touching the box during this time will not be shocked because, even though they may be standing in a puddle of water at the time, the resistance from the box to the ground is much much lower than it is through the person (see fig. 14).

One important offshoot of this idea – not only for electrical engineers, power companies, but you too – is that the walls, ceilings, floors, pipes, electric conduit, and other things in a house or building are also considered ground.

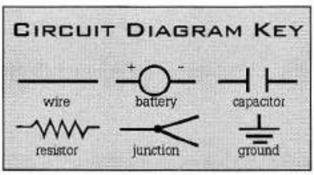
"How can that be?" you ask. "I can see where pipes and electrical conduit can be grounds, but walls, ceilings, and floors are made of wood, and plasterboard, and other kinds of insulators. What's going on, Unc?"

Grounding means that one side of the circuit goes through the ground. Since the wire running into the ground has lower resistance than you do, shocks go through it, not you.



Well, it's precisely because pipes and electrical conduit are buried in the walls, etc. of a building, that engineers get extra safe and say that all of this stuff is "ground" or "at ground." Besides, if a wall or floor gets wet (like in an old bathroom, say), then they do act more like conductors than insulators.

Grounding is also used to prevent static electricity from



building up, i.e., to prevent too many excess charges accumulating (ahhh – static electricity again). This too is a safety matter. For instance, on gasoline and oil tank trucks, a chain or strap dangles from the truck to the road so that any static electricity that accumulates on the tank is conducted by the chain to the road. Also at tank truck and railcar loading terminals, special grounding wires are attached to the tank to conduct away this static charge before loading or unloading the tank.

Lightning rods are another example of static electricity protection. The static charge that builds up on the ground due to the winds is conducted by the lightning rod wire to the lightning rod itself. That means that if a lightning bolt does strike, it will strike the lightning rod rather than try to go through the house or barn to get to the ground charge (see fig. 15).

In household wiring the power company already grounds one side of the power line coming into the house. This side is called the neutral side and the other side is called the hot side. Even if you have a two-prong outlet, one side of it will measure 0 volts to ground. The other prong will measure 120 volts. The neutral prong is usually wider so that the cord won't be plugged in the wrong way. Also light sockets are wired so that threads of the light socket are connected to neutral so that if you touch the threads when screwing in a light bulb, you won't get a shock. In house wiring, the white wire is the neutral, and the black wire is hot.

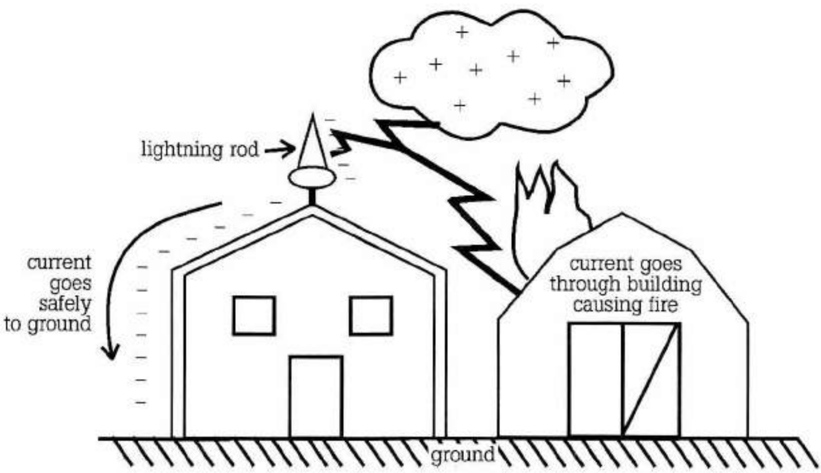


FIGURE 15: LIGHTNING ROD

In more modern house wiring, for additional safety, a third green (or bare copper) wire is only connected to ground. This wire provides extra protection from shock by providing a dedicated ground path for any fault currents.

In modern house wiring there are usually three-pronged outlets in the walls. The third, half-moon shaped prong is the ground wire. There are also three-pronged plugs that match the outlet. Some people cut this ground prong off their plugs because they want to plug the plug into a two prong outlet. I get ***mighty upset*** when I see this. The grounding prong is there for a safety reason. Don't defeat it by cutting it off. In fact, you run the risk of destroying some electrically sensitive equipment like computers if you run them without a grounded circuit.

It's also worth remembering that many household outlets are miswired – the hole for the third prong may not actually be grounded, or the "hot" and "neutral" wires may be switched. You can check this with an inexpensive gadget from the hardware store.

Also in modern house wiring they're starting to require the use of Ground Fault Interrupters or GFI circuit breakers. This special circuit breaker measures the

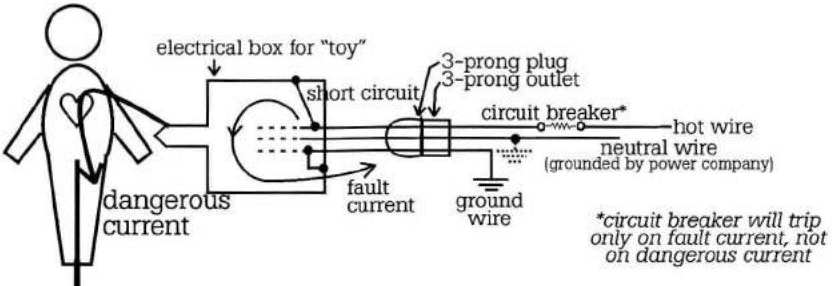


FIGURE 16

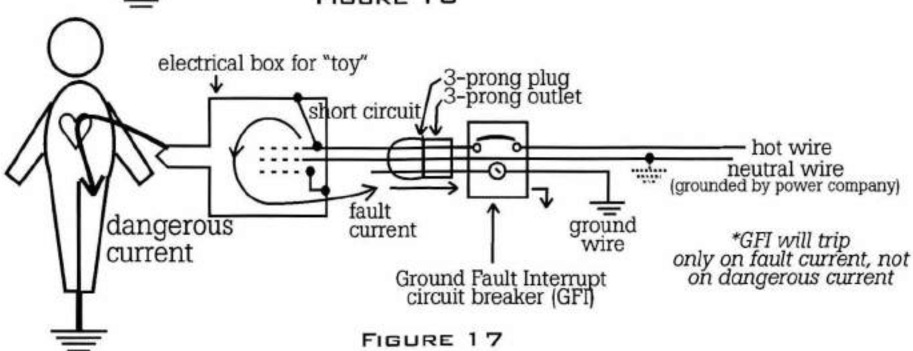


FIGURE 17

current flowing through the ground wire. The GFI circuit breaker is designed to trip at anything above 5 ma (milliamps) in the ground wire.

Sometimes the specific question is asked, "Will the use of 3-prong plugs or GFI circuit breakers make play toys safe?"

Well, yes and no. (Are you getting used to this yet?)

Take a look at figures 18 and 19 for the use of a 3-prong plug and a GFI circuit breaker respectively. In each case, the ground wire helps protect you from a short circuit of high voltage inside the protective box of the toy. It is, however, possible to still have dangerous currents coming from the toy and going to ground through the bottom.In other words, even these safer wiring strategies are not foolproof. Depending on where you receive the shock and how your body is grounded, a shock may still be harmful or fatal.

Oh! Sure you can go check your power cords and that light socket you rewired. I'll wait.

Electrical Codes

Because electrical safety is a big issue, many cities and even the Federal Government have issued electrical building codes. The National Electrical Code (NEC) is the most commonly used. In these codes are specified all the rules and regulation about electrical wiring and equipment. But the NEC is not the only set of codes available. Electrical manufacturers also use the Underwriters' Laboratory (UL) codes for making safe electrical equipment and appliances; you can see it in Chapter 12. There are hundreds of other codes.

The one thing that the NEC, UL and other code books don't cover is electrical play.

Safety of Equipment and Toys in Electrical Play

If you look at your electrical toys from the standpoint of electrical safety, you'll see insulated or metal boxes, insulated wire, grounding plugs on household current powered devices, etc. But is the equipment safe for use in play?

Electrical safety, as defined in the code books and as manufacturers build into their equipment, is only concerned with preventing electric shocks and fires when used with household wiring. This is important enough, but they're not really concerned with their use as toys. Indeed, they may not even know about such uses. So when it comes to the safety issues that are of concern for us, we need to understand the limits of the existing electrical safety codes, understand the safety issues that are important to us, and understand that we need to be extra vigilant. In other words, we need to cover our own asses.

Understanding the play and the toys is the key to this safety. You need to learn from this book and other sources about the theory of the play and the toys you'll use. You'll also have to inspect your toys and make sure that they're in good operating condition. This is especially true of the used toys you may find at an antique shop or a flea market. Frayed wires and damaged plugs can be dangerous and need to be replaced. Damaged circuits also need to be replaced properly. As a responsible, safe player, this burden is entirely on you. I also hope that the section on risk in Chapter 1 becomes clearer now in your understanding.

Chapter Eight

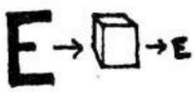
Your Own Devices

Now we can close our investigation of the physics aspects of electrical play with a short look at some basic electrical devices – transformers and capacitors. You'll find both such devices in many of our favorite electrical toys such as TENS units, violet wands, and relaxacisors. Looking at the theory of capacitors can help us understand the operation of toys like the Carpet Shuffle Zap and the violet wand.

Transformers

You'll find transformers all over the place. They're in televisions, in your doorbell, all over the electrical power company, etc. To study them and understand them as electrical engineers do takes a study of electromagnetism and a lot of math. Understanding transformers for electrical play just takes the following five rules.

Transformers take a voltage at one end (the "primary") and trans-



form it to a higher or lower voltage at the other end (the "secondary").

Transformer Rule #1:

All transformers do is to take a voltage in at one side of the transformer, called the primary, and change it to a higher or lower or sometimes even the same voltage at the other side of the transformer, called the secondary.

Transformer Rule #2:

Transformers work by changing primary voltage. Transformers are generally used with AC (alternating current). But this change can even be done with DC – like from a battery – as long as something changes, i.e., when the battery is switched from OFF to ON or from ON to OFF when connected to the primary. In this case what you'll get at the secondary is a little blip of (higher, lower, the same) voltage. A blip, but a voltage nonetheless.

Transformer Rule #3:

The ratio of a transformer's secondary voltage to primary voltage is called the transformer ratio, or

$$\text{transformer ratio} = \frac{\text{secondary voltage}}{\text{primary voltage}}$$

$$\text{or, transformer ratio} = \frac{\text{primary current}}{\text{secondary current}}$$

If the transformer ratio is greater than one, then the transformer is called a stepup transformer.

If the transformer ratio is less than one, then the transformer is called a stepdown transformer.

Transformer Rule #4:

If you have a transformer where the secondary voltage is greater than the primary voltage, then the secondary currents are less than the primary currents. This follows from the transformer ratio in Transformer Rule No. 3. For example if you have such a transformer with a transformer ratio of 10, then 10 volts at 10 amps at the primary will show 100 volts at 1 amp at the secondary. If the transformer ratio is 0.1, then 100 volts and 1 amp at the primary will show 10 volts and 10 amps at the secondary.

Transformer Rule #5:

Sometimes transformers are used to isolate circuits. This means that with some transformers, the circuit connected to the secondary side is not wired to the circuit on the primary side. All the rules still apply, but – as an example – if the primary side were grounded, the secondary side wouldn't be. Note, however, that not all transformers work like this – and even with isolation transformers, this isolation may only be for certain frequencies (like the household frequency of 60 Hz).

If you're interested in finding out more about transformers, you should consult some of the books on electricity or electronics in the Bibliography.

In electrical toys, transformers are used mostly for providing power to the toy. This is what the transformer is used for in a relaxicisor. In a violet wand, however, the transformer is a special type called a Tesla coil that produces the high voltages needed to make the gas bulbs – and subsequently the bottom – glow.

Hey, Unc, What About Those "Transformers" I Get to Power my Portable Tape Player?

This is one question you're probably asking yourself. You're probably thinking about the adapter that you can get to plug into a household outlet and provide a low voltage DC so that you can run your portable electronic gear without using batteries. You say, "You convert from high voltage to low voltage – a stepdown transformer, right? But isn't a transformer only supposed to be for AC?"

Well, you're partly right and partly wrong.

Most DC adapters sold in electronic stores do convert 120 volt AC to low voltage DC. There are two kinds of DC adapters. The kind that uses a transformer converts 120-volt AC to low-voltage AC, then passes that through an electronic device called a rectifier (or a diode) that changes AC to DC (but not the other way around). The changing of a high voltage to a low voltage can also be done with electronic circuits, rather than with a transformer. It's just that for large amounts of AC power, transformers are more convenient.

Capacitors

I'm going to have to take a little of your time to explain the theory behind capacitors. Bear with me, please, because this theory will also help you understand how a violet wand works.

First off, a capacitor consists of two or more conducting plates on opposite sides of an insulator. The insulator can be a sheet of insulating material such as plastic or wax, or a space of gas such as air, or even a vacuum. You'll see the basic parts in figure 18A.

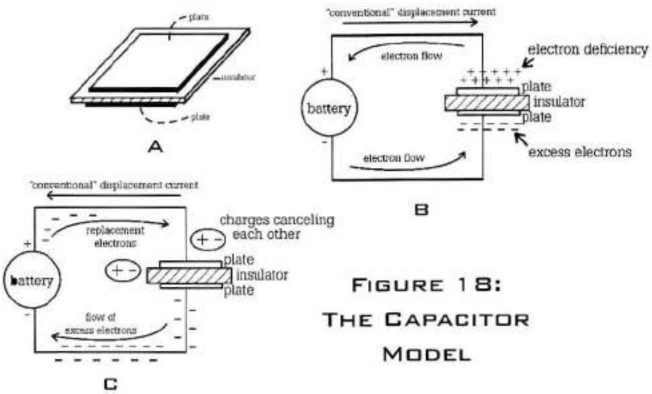
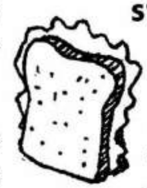


FIGURE 18: THE CAPACITOR MODEL

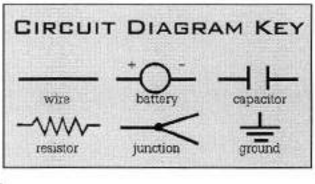
If you connect one side of a battery (say the negative,"-") to one of the plates and the other side of the battery to the other plate – as in fig. 18B – then the battery will try to push electrons through the capacitor. Since it's not a complete circuit – because of the insulator – there will be no continuous current. But (...what! You're surprised?...) a few (hundred, thousand, million, billion, etc., depending on the size of the plates) elecrons manage to get pushed in by the battery. These will eventually accumulate on the plate of the capacitor. We remember from Chapter 4, Static Electricity, that when you have an excess of charge – in this case electrons – then this forces electrons from the other plate (like charges repel, remember). So momentarily there is a brief current flowing. See figure 18C. Such a current is called a displacement current.

A capacitor is a "sandwich" that stores electrons on one piece of "bread." The "filling" is the insulator.



If these excess electrons go away, then electrons will rush back into the other plate. Yes, you'll have another momentary current flowing in the opposite direction. See figure 18C.

You can see that if you connect the capacitor to an AC voltage – even though there is an insulator in the circuit – you'll get a continuous AC current flowing in the circuit. See figures 18B and 18C. Notice here that the capacitor plates "store" excess electrons in an alternate fashion.



Capacitors have many uses in both DC and AC circuits. You use them, for example, if you want to block DC currents but pass AC currents. (Why is that so? You have all the information above to explain this. Think about it for a few moments.) But unless you're designing electronic circuits, you needn't concern yourself about the math involved in such design. This level of detailed knowledge of capacitors won't be needed in understanding basic electrical play. Of course you may study this on your own.

Using the Capacitor Model to Study the Violet Wand

Let's expand the capacitor model a little bit.

If you have a high-voltage toy like a violet wand, there is a transformer called a Tesla coil that generates a high voltage that goes to the metal part inside the gas tube. This high voltage is AC in nature.

Now think of this metal part inside the gas tube as one plate of the capacitor. One side of the Tesla coil power supply in the violet wand is connected to ground (see figure 19). Now wouldn't you agree that the air surrounding the gas tube is an insulator? Yes? Good! But what would be the other plate of our extended capacitor model?

Remember in our study of electrical safety (Chapter 7) that things like walls, tables, the sidewalk, whipping benches, etc. can be considered as ground. From the same chapter we remember that the power companies usually ground one side of their power system. This is the same ground to which the one side of the violet wand's power supply, as well as the walls, etc., is connected.

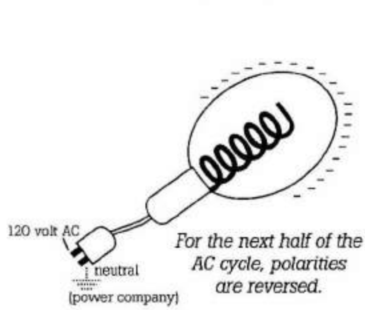


FIGURE 19: CAPACITOR MODEL OF VIOLET WAND

Wallah! There is a complete AC circuit with the capacitor... excuse me... high voltage gas tube, air insulator, and wall/floor/ceiling as the major circuit element. See figure 20.

Now, what happens if you put a conducting body in the insulating air between the high voltage gas tube and the walls/floor/ceiling? The conducting body could be some bottom suspended by really good insulating ropes (most ropes, however, aren't that good).

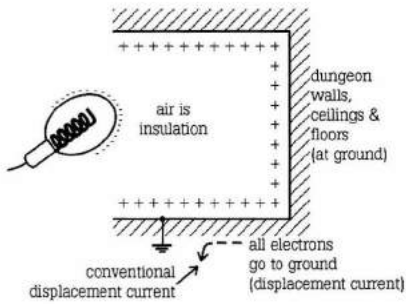


FIGURE 20

The resistance of the air is about 10,000,000-100,000,000 ohms. The resistance of the suspended bottom is, say, about 1,000,000 ohms, but because of the insulation of the ropes, the bottom is still part of the insulation of the capacitor. Therefore no current will be running through the bottom.

But what about high frequencies, you ask? In other words is there action at a distance (see Chapter 6)?

The violet wand can generate very weak radio frequencies, especially when it sparks – but even at best, it's not a very good radio transmitter. At the household frequency of 60 Hz (Hertz), there is very weak action-at-a-distance. So there will be hardly any high (or even low) frequency currents through the bottom – way below harmful levels.

So under these conditions, in figure 21, the bottom is not subjected to currents.

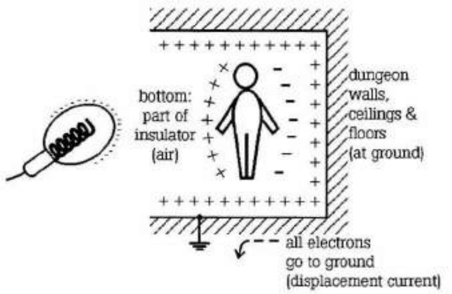


FIGURE 21

Now let's take a more realistic situation. In this case the bottom is suspended with real-world ropes, or is lying on a bondage table. For the purposes of this discussion, the bottom is connected to ground. In reality, because of the high voltages and the use of AC, you can consider the bottom to be connected to ground through many small capacitors (table legs, cuffs, etc.). This model is significant for violet wands, but not for considering currents through the bottom using TENS units or relaxicisers.

The bottom is now part of one plate of a giant capacitor.

Will there be a current through the bottom? Yes, but very, very slight – almost nothing if the violet wand is far away.

Now let's bring the violet wand close to the bottom's skin – about a half inch, but not close enough to send out sparks. What the bottom feels is a sensation of ants crawling over his skin. We'll discuss this feeling in more detail later, but for now let's just say that it's the result of electrons rushing to and fro over the surface of the bottom's skin in an AC displacement current. See figure 22. Here the capacitor's insulation is now the half inch of air, the glass tube, and the glowing gas inside the tube. This half inch of air is just beginning to reach the point where the air starts breaking down (see Chapter 6). The bottom can notice the displacement currents at this point.

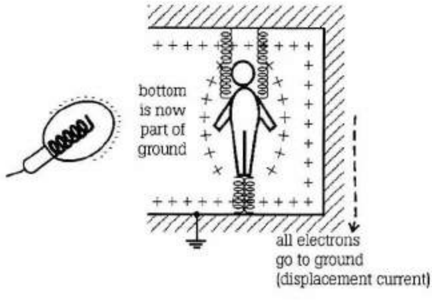


FIGURE 22

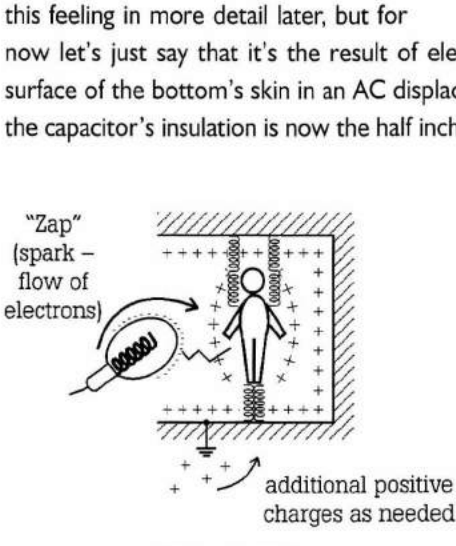
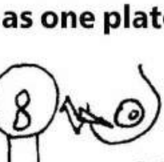


FIGURE 23

As soon as you bring the violet wand's gas tube to about 1/4 inch of the bottom's skin, a spark will jump between the outer surface of the glass tube to the skin (see fig. 23). The air has now been converted to a conductor, and is carrying current to the bottom's skin. The voltage difference from the glass surface at one end of the spark to the skin at the other end of the spark is about 25,000 volts. Because AC is used, this voltage and current is alternating – however, in this model it works fine to think of it as DC. The insulation of our extended capacitor model is now only the glass of the tube and the gas inside.

A violet wand acts as one plate of a capacitor, with the air around it as the "filling" and the bottom's body as the other piece of "bread."



The spark through the air meets a very high resistance – not as high as normal air, but still high. The other high resistances in the circuit are the skin, the gas in the tube, and the tiny capacitors connecting the table to the ground. Thus, the current inside the bottom's body is very limited even though the voltages from the violet wand's Tesla coil is high. Note that this very small current is continuous because of the equivalent capacitor model we're using and because of the AC voltage that is involved.

One consequence of this continuous current in the spark is that there is some minute heat produced. It's not a lot of heat, but heat energy can accumulate or build up.

If this low heat energy spark were allowed to remain on one spot of skin for several minutes, you'd notice a small burn on the skin where the spark would touch. Depending on the body area you touch, this burn can be only an annoyance (if it were on the arm, for example) or quite painful (if it were on the clit or tip of the penis).

You also need to exercise caution with the heat from a violet wand spark as it has been known to set fire to flammable clothing. It is sometimes used to ignite 70% alcohol vapors for fire play.

Cyber-Sex with Dave and Ann

Dave is an electrical engineer who designs computer hardware. Ann is a computer programmer. Dave and Ann are married. They have played together – including with electricity – for four years now. Dave bottoms to Ann and loves electrical cock and ball torture.

Dave and Ann are both busy professionals and do extensive business travel. When they're separated, they miss each other and their play together.

Seeing as they were both computer professionals, they worked for a year on developing what they call their "travel kit." Dave designed the actual hardware. It was based on a TENS unit and a special penis and testicle stimulator in a rubber cock and ball sheath. But it is more. It can be controlled from the output of a laptop computer, and there are special safety features built in.

No one manufactures such a toy, so great care needed to be exercised in its design and construction. The major concern here was safety. There were special circuits to limit the current applied to the cock and balls. The question of what happened with the unit if the computer signal was lost had to be addressed.

They were successful with the device. Now Dave takes it with him whenever he or Ann are on a business trip.

First they agree – sometimes by E-mail – when they will play. Then using the internet and computer cameras and microphones on their laptops, Ann can watch Dave as he follows her orders to strip naked. He can see her in her leather corset, boots, and riding crop – just as if they were together.

Dave's cock is already hard when Ann orders him to put on the device and to put his hands in the restraints. (He can quickly get out of these if necessary.) Now he is her slave, and she can watch it in real time.

With her syrupy voice cajoling him, Ann now manipulates a joy stick to control the location, intensity, frequency, and duration of the series of shocks that Dave gets on his cock and balls.

Ann works Dave a couple of times to the point of cumming, but doesn't give him the coup de grace. "She's such a sadist," Dave thinks happily as he moans and begs for release.

Another build up by Ann again. This time Dave knows that she'll let him cum.

"Goodbye," comes the mechanical voice from the computer.

"Loss of Carrier Signal," is the error message his computer reports as to why his computer was disconnected from the server.

"No, NO... Shit," Dave cries. A few choice curses about the server come from his mouth as he struggles to re-establish a connection. He's still horny and wants Ann to get him off.

"Damn, she's actually smiling. The little sadist must be enjoying this," Dave thinks as the connection is reestablished and Ann's image and voice come on the screen. He humbly begs her to make him cum. This time she obliges and enjoys the sight of his spurting cum.

When they get together they'll relive the experience, laugh, and possibly change servers. Then again, maybe they'll replay it in their bedroom.

For those of you who've played with violet wands, sometimes – if the bulb's metal socket gets too near the bottom's skin – a spark will jump from the socket to the bottom's skin. The bottom will immediately notice that this spark seems more intense. It is. You've eliminated the high resistance of the gas and glass tube, but you still have the high resistances of the skin and the table capacitors. The current through the bottom's body is higher because of this, but it's still limited by the remaining high resistances.

Generally this more intense spark is still within safe levels, but consider the current path that may exist through the bottom's body. Also consider what things might be compromising the remaining high resistances. Is the bottom sweating profusely? Is the bottom bound in chains connected directly to a grounded wall? Is the grounding through a water pipe, which may cause lower resistance in the ground and higher resistance in the bottom's body? If two or more of these compromises exist, you might have a hazardous current level in the body – particularly if the current path is near the heart area.

Now you can see how models can help you understand the play that you're dealing with?

Using the Capacitor Model to Study the Carpet Shuffle Zap

We already talked about the carpet shuffle zap in Chapter 6, but you can see that we can use the capacitor model again to take a look at it.

The person with the excess of electrons can be considered one plate of the capacitor, the intervening air the insulator, and the doorknob the other plate.

The electrons in this case are generated by simple friction of rubbing your feet across a carpet. This generates about a million or so electrons in your body. As you reach for the doorknob, the electrons in the doorknob are repelled away to ground because of like charges. This leaves you with two charged plates of a capacitor.

Again as your hand gets to about 1/4 inch of the doorknob, the voltage is high enough (25,000 volts) to break down the air. A spark results. In this case, however, it's only a million or so electrons that constitute the current. Once they are gone, the current stops. This is not a continuous current like the sparking from a violet wand. It is strictly displacement currents.

Also, the extra electrons tend to accumulate on the surface of the skin. Thus the current that results from the spark would only be on the skin's surface. The skin's resistance and the limited number of electrons would be enough to prevent a hazardous current inside the body.

Lessons Learned?

What started off as a description of a couple of useful electrical devices ended up as another demonstration of how models can be useful in understanding the things you can play with. In fact we now have two models to be able to understand a simple electrical phenomenon – the carpet shuffle zap.

Let's now take a look at some information you should know about human physiology.

part
two

PHYSIOLOGY

Chapter Nine

About Cells

Electrical engineers and physicists know a lot about electricity (or as much as they can know in their particular subspecialty), but often they don't know squat about physiology, the study of the processes that occur within living matter such as the human body. Those who study biology in high school get some of this, but not much. In understanding basic electrical play you need to be familiar with some simple concepts of physiology.

Understand that I'm not trying to teach you enough physiology to be a paramedic, nurse, or doctor. The physiology will be limited to the very simple models needed to understand electrical play. If you're interested in studying this subject further, please consult other books (some good ones are listed in the Bibliography).

Cells

A cell is essentially a tiny bag of salt water, swimming in more salt water.

In biology you study a lot about cells: cytoplasm, nuclei, energy processes, cell membranes, and the like. To understand electrical play you only need to know the following about cells:

1) A convenient and useful model for our purposes is to think of cells in the human body as a cell membrane containing a fluid that is very much like salt water. Furthermore, all of these cells for the most part are swimming in fluid that again is very much like salt water.

2) Cells are definitely living things. They take in nourishment, they breathe, they exude waste products, they grow, and they die.

and

3) Cells in the body serve specific purposes and are specially designed to serve those purposes.

The types of cells that we'll take a look at in this book are

- Skin cells
- Muscle cells
- Nerve cells

In the next chapter we'll also take a look at a specific body organ system, the heart. That system is comprised of muscle cells and nerve cells working together.

Skin Cells

As mentioned before, skin is a critical safety system in electrical play. It is basically an insulator, with a typical resistance of anywhere from 10,000 to 1,000,000 ohms. If you recall from Chapter 3, when current is applied to the body, it is limited mostly by the resistance of the skin. So skin is very important, and understanding it is an important part of understanding electrical play.

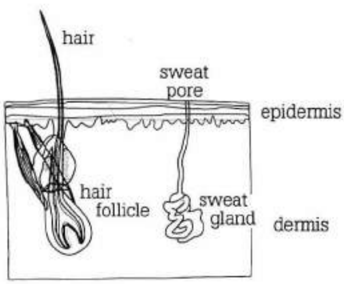


FIGURE 24: HUMAN SKIN

Take a look at figure 24. This shows a typical cross section of human skin. You'll notice that there are two major components: the epidermis and the dermis.

The epidermis is the important outer layer. It is often called the horny layer. (Most of you reading this book probably have other horny parts as well.) The cells of the epidermis are still skin cells, but they have lost most of their fluid both inside and outside, so they're very dry and thick. They're manufactured just beneath the epidermis and slowly rise to the outer surface. A person continually loses the outermost layer of skin cells; as these cells rise to the outer surface of the skin, they die and get sloughed off. But they're quickly replaced by the new ones coming up.

The thickness of the epidermis varies tremendously, ranging up to a couple of millimeters. It's also an important defense for the body for other things besides electrical play. It keeps out dirt and bacteria, and keeps in the body's organs and fluids. So skin is important for more than one thing.

The next layer is the dermis. This usually has fat and other cells. The important consideration here is that it has less resistance than epidermis cells, anywhere from 50 to 2,000 ohms depending on the cell's function.

Therefore it is important to remember for electrical play that

> **epidermis skin cells = high resistance** (10,000 to 1,000,000 ohms)
>
> **dermis skin cells = low resistance** (50 to 2,000 ohms).

"OK," you ask, "what about all those things shown in figure 24 like the hair shafts and sweat pores? Aren't these things electrical paths that make the epidermis useless?"

Epidermis, the top layer of unbroken skin, has a very high resistance. The dermis that lies underneath it has a much lower resistance.

Well, yes and no. If ***all*** the current from, say, a TENS unit could go through a single sweat gland and out another, then you could have a potentially dangerous current inside the body. But in electrical play – unless you're using very narrow needles and sticking them directly into the sweat glands – the current is usually spread out over an area of skin. (Remember current density from Chapter 2?) Sometimes some of the electrons (flow of electrons is current, remember) do go down the sweat glands, but most don't, and the number of electrons going into the body are limited by the epidermis cells which are insulators. Therefore the current going into the body is limited by the epidermis.

Notice the implications. If you are sweating hard, you have a lot of salt water available to conduct more current to the inside of your body. Usually, however, the overall resistance of sweaty skin is about 10,000 ohms.

I want to make a note here about "conducting creams." These are special creams and gels used by medical professionals during procedures such as electrocardiograms. Their function is to help make sure that electricity gets conducted evenly, smoothing out all the little wrinkles and bumps in order to help prevent surface burns and ensure a good recording. Electrical players sometimes use them to even out the surface so that electricity can be conducted smoothly with no annoying sparks or unwanted shocks. The choice of whether or not to use one depends on what sensations you want to accomplish in your play.

What about piercings? What do you think? If I take a needle – a low-resistance conductor – and pass it through the epidermal layer, then you have a direct connection to the low-resistance interior of the body. This can lead to dangerous levels of current inside the body. Electrical play on fresh piercings is not recommended. The same applies to open and bleeding cuts. ***Anything that breaches the epidermis makes electrical play more dangerous.***

You mean you can't play with nipple rings or cock piercing jewelry?

Well, yes and no. If they're fresh, I'd definitely recommend against it. However, if they are ***completely*** healed and there are no nicks or cuts inside the piercing hole, then there may be a qualified yes. The reason I say that is that in a completely healed piercing, the piercing hole grows a layer of epidermis-like cells on the inside of the hole. As time goes on, this layer becomes thicker, but not as much thickness as on regular skin.

You know of course that it usually takes about six months or more to heal a piercing, depending on its location. Also sometimes there are occasional tears on this hole's "epidermis" that you may not see or be aware of. So because of these risks associated with "complete healing," the risks of electrical play on healed piercings may not be worth it. Besides, there's so much other skin to play with.

And what about electrical play with body orifices?

Of course we're talking about mouth, nose, eyes, ears, urethra, cunt, and asshole. Some people do play with these orifices, particularly the last two.

Let me dispose of the first five first. In the mouth the saliva and constantly wet tissues make electrical play there a bad idea. Such play can conduct very dangerous currents to sensitive and important parts of your body such as the throat, tongue and even possibly the brain. So no electrical play in the mouth. (There

Mucous membranes have lower resistance than regular epidermis. Thus, special caution is required when using electricity on or in areas like the vulva and rectum.

may also be fillings in the mouth, and an electric current to one of these – even from an aluminum spoon – is exceedingly painful.)

Noses and ears aren't such a good idea either. Current can be hazardous in the important nerves in these organs. Unless you want to chance deafness or loss of smell, no electrical play here.

Eyes are a special no-no. Not only are they coated with salty tears, but eye parts like the cornea, tear ducts, etc., can easily be seriously damaged by current going through them or by the heat generated by nearby currents on the face.

People have played with electricity inside the urethra (usually the male urethra, since the female urethra is extremely short and doesn't lend itself to such play). In fact, at the turn of the century, special probes were made for the urethra so that violet wand-like machines could cure venereal diseases. Ouch! And considering these probes were made of glass – that could break – double ouch! (This is probably the one time when both men and women cross their legs at such a mention.)

A urethra is made of very soft tissue that can be easily damaged by trying to insert something into it. The insertion of a catheter into the urethra is a medical procedure. Electrical play in the urethra is highly risky since urine is a good fluid conductor. It's also very easy to damage the urethra or the bladder. If you are interested in this kind of play, I recommend that you get extensive training in catheterization from a medical professional, that you use only sterile toys designed for urethral insertion, and that you follow the manufacturer's instructions precisely. (I haven't read all the user's manuals that come with these toys, so I can't vouch for the instructions.).

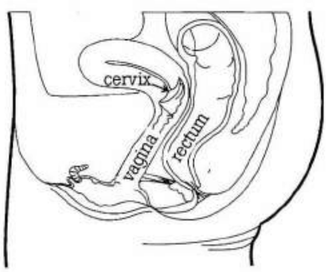


FIGURE 25

This leaves us with the cunt and the asshole. These are two body orifices that are not in-frequently played with. In fact there are special probes sold so that TENS units can be used there. In Larry Townsend's Leatherman's Handbook, he mentions electrical play using a metal butt plug and a cock ring. Each is connected to a separate cattle prod terminal. This is ***really*** intense.

In both the cunt and the asshole, or more specifically the vagina and the rectum (see fig. 25), the tissues are skin-like. These parts also have a lot of nerve cells there, which is why they're fun to play with. This tissue is like the epidermis in some ways, but not in others; its main difference is that it contains a coating of mucous membrane.

The mucous membrane has some insulating qualities, but its resistance is much lower than that of skin. There are other mucous membranes throughout the body, and they could all be connected. It's best not to use heavy current devices like relaxicisors or cattle prods on these parts. If you choose to ignore this advice, for heaven's sake, don't insert anything into the cervix or beyond the first few inches of the rectum. As a final thought, if the anus or the vagina has tears in the walls – or even small, invisible cuts or nicks – these breaks in the tissue offer a more direct current path for dangerous currents to the inside of the body and the lower organs. Be especially careful of doing electrical play soon after any kind of play that might abrade, nick or tear these tissues, such as enthusiastic penetration with a penis, sex toy or hand.

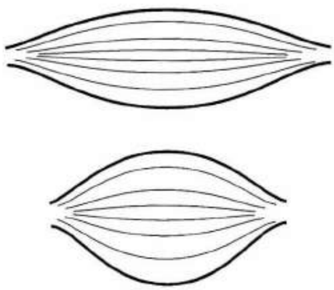


FIGURE 26: MUSCLE FIBER, EXTENDED & CONTRACTED

Muscle Cells

Muscle cells are found in your muscles. Is that a surprise? They're found in all sorts of muscle bodies in your body. They're what you use when you move your arms, legs, whatever.

The heart is a muscle – a extremely important one. There are also muscles in the arteries, the anus, at the base of the bladder, the cunt, and many other places you may have not been aware of. No matter how much evidence you may see to the contrary in some people, there is no such thing, however, as a muscle head.

Most muscle cells are designed to contract when an electrical impulse hits them.

The kind of muscle cells shown in figure 26 basically do one thing. They contract when a nerve impulse hits them. Nerve impulses are primarily electrical in nature.

We have to thank an Italian, Luigi Galvani, for showing us how muscles work. He found that applying a small electrical current to a dissected frog leg caused the leg to twitch. "Ah-ha!" he said, "Electricity is the key to muscle movement." The entire course of muscle physiology would be different today if, instead, Galvani was a hungry Frenchman with lunch on his mind and thoughts of frog legs in drawn butter and garlic sauce.

There are a couple of additional things you need to know about muscles. One is that they can ache. If you repeatedly try to flex a muscle many times, you'll find that after a few flexures the muscle aches. Since muscle cells are living things, they generate as waste lactic acid. It is lactic acid that causes the burning sensation in hard-working muscles. The body normally takes care of this excess concentration, but it does take a little bit of time to do so.

The final thing about muscle cells is that they can cramp up – contract so tightly that the individual can no longer will them to loosen. This is a condition known as tetany.

In understanding muscles and their relation to electrical play, be aware that electrical currents from toys can be strong enough to contract muscles. (We'll look at the necessary current levels later.) Relaxicisors are designed for this specific purpose. Be aware of the probable current path through the muscle from the electrical play toy you're using. You'll also need to check for muscle aches and cramping (tetany).

Nerve Cells

You may have heard that the body's nerves are like an electric wiring and signaling system. That's not too bad a model, but it's like saying that BDSM is only about whips and chains.

Nerve systems and nerve cells are very complex. Nerve signals have electrical charges, but are really chemical in nature. Nerve cells are the longest in the body, but they really don't go directly from the cut in your finger to the "ouch" cell in your brain.

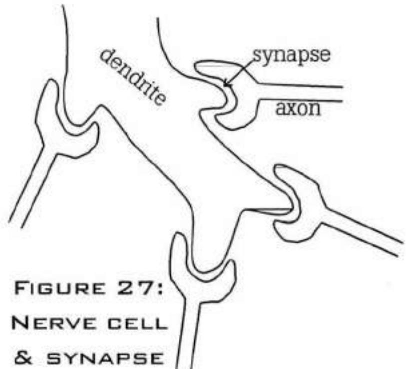


FIGURE 27: NERVE CELL & SYNAPSE

There are many nerve cells in series carrying the signal, and they are not directly connected. They have gaps, called synapses, between the end of one nerve and the start of the next one. These synapses in fact are the key components of making nerves do their job. The important thing here to remember is that as the chemical/electrical signal travels down an individual nerve cell, when it gets to the synapse, the signal releases a chemical molecule (called a neurotransmitter) so it can be transferred across the synapse to the next nerve cell. The signal then creates the chemical/electrical signal in that nerve cell.

If you want to find out about how nerves and synapses work together in sending and processing signals in the body's nervous system, refer to textbooks on physiology. What you need to know about nerves in understanding electrical play is much less than the broad field of neurophysiology.

First, let's take a look at figure 27. This shows a typical nerve cell and synapse.

Nerve cell signals can be started in many ways: electrical, chemical, heat energy, and mechanical pressure. One important thing about nerves is, however, that it takes a minimum amount of sensation (heat, pressure, etc.) before a nerve cell will fire. This minimum sensation is called signal threshold. Once started by whatever means, the signal takes the usual chemical/electrical form to travel down the nerve cell.

Nerve cells, although they operate in the same basic way, serve several different purposes. In the skin there are those nerve cells, called sensory nerves, that detect mechanical pressure, heat, cold, and pain. In the muscles, there are nerve cells that send the signals from the brain and/or the spinal cord to fire the muscle cells, and specific nerve cells to tell the brain how much force the muscle is exerting as it moves. These specific uses depend on how the nerve cells and synapses are connected. These connections are not random and, once established, are not changed. If they are damaged and cannot be repaired, the brain can often (but not always) reconfigure the remaining nerves to bypass the damaged area. This is a key mechanism that stroke victims use to retrain themselves.

In electrical play, nerves are our main playthings. The electricity from the toys we use cause various sensory nerves – especially the ones near the epidermis – to fire. These nerve signals are processed and routed along the nerve cells and synapses and interpreted by the brain as the various sensations we feel. The intensity of these sensations depends on the number of nerve endings involved.

Electricity causes the sensory nerves in the skin to set off signals which are routed along the nerve cells and interpreted by the brain as pain, heat, pressure and other sensations.

If the current from the toy is physically concentrated on a small skin area, then there is a more intense feeling of sensation (generally interpreted by the brain as pain). The more nerves involved, i.e., the wider the physical area, for the same current, the milder a sensation we feel. It is possible that if too many nerves are involved, none will fire and no sensation will be felt.

Consider the example of the violet wand. Here you have a spark – and let's assume just one spark – jumping to some part of the skin. The current from the spark continues through to the ground via the back, buttocks, calves, heels, and the back of the head if the bottom is reclining or spreadeagled to a table. The spark jumps to a small area of the skin. The current is concentrated to a few nerve endings. The current's return path to ground is spread out over a much wider area of skin and, hence, involves many more nerve endings. By the principle described above you would expect to feel the spark (because of the small number of nerves involved) and not the return current on your backside (because of signal threshold). This should agree with your personal experience.

Toys like relaxicisors release enough current to pass through the epidermis and affect the deeper nerves that transmit firing signals to the muscles. These currents will then cause the muscles to flex. Of course, the current on its way through to the muscle nerves will pass through the sensory nerves near the epidermis, causing sensations along the way. With relaxicisors, however, you generally use conducting pads that have a wide area so that only the muscles are affected. Bottoms' opinions vary as to the amount of sensation they feel when relaxicisors are used on them.

Now lets take a look at an important body system that combines both nerves and muscles – the heart.

Chapter Ten — *Some Heartfelt Advice*

You're a man after my own heart... I just wish you'd put down that scalpel!

The heart is a very important organ in the human body. It pumps life-giving blood throughout the body and does this continuously – day in, day out, year in, year out – for your entire life. On the average that's about 2 billion beats in a lifetime.

The body has only one heart. You can live without a kidney and other organs. The brain can reroute (somewhat) around damaged nerves. But you can't live when your one heart stops.

In engineering you can design something to last a long time either by making parts redundant (if one fails then there are others to take its place) or by using parts that are very, very reliable. This latter case describes the one heart in our body.

I'm not trying to make a case for diet, exercise, and no smoking; I'm more interested in pointing out the importance of keeping your heart beating during electrical play. Many folks rely on simplistic formulas like "no electrical play above the belt" – which may be too conservative a rule for some situations and too liberal a rule for others – rather than learning the principles behind the relationship between the heart and electricity. I'd rather further your understanding of those principles so that you can make your own, informed decisions. To that end, let's take a look at the heart in its relationship to electrical play.

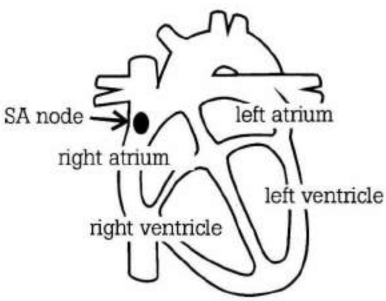


FIGURE 28: THE HEART

Figure 28 shows a typical heart. It's a very simple pump with four pumping chambers. And the heart body is made of muscle cells that contract when they receive the correct signal from the nerves that control the heart. Rather than go through a detailed description of the pumping action of the heart, here I just want you to understand that the heart muscle and its controlling nerves are made of cells that can be affected by electricity.

The nerves that control the heart actually provide the necessary timing for the signals that make the heart muscles pump properly – first the upper portion of the heart, then the lower part. This timing is usually provided collaboratively by the cells of the heart itself, by the brain (via the vagus nerve), and by the sinoatrial (SA) node, at the upper right "corner" of the heart. If any one of these stimuli fails, the heart is missing part of the information it needs to keep on beating normally, and will start beating abnormally – or stop beating altogether.

The heart is made of muscle cells which, like other muscle cells, contract when they encounter an electrical signal.

These signals can be affected by external stimuli. If you get excited, for example, chemicals like adrenaline floating around your bloodstream send a stimulus that speed up your heartbeat. If you become very relaxed, the heartbeat slows down.

If a person has heart problems bad enough that this normal nerve signal mechanism doesn't work, he sometimes gets a pacemaker implanted that provides the necessary timing signals to the heart. Modern pacemakers are designed so that the heart rate can be increased or slowed down in response to the wearer's activities. This pacemaker modification, however, is done by other signals than the brain signals and the chemical signals used by the body.

Remember that I said that these heart rate modifications can be caused by nerve signals (electrical) ***and*** chemical signals. So there are two heart-related matters that you have to concern yourself with when doing electrical play.

It could be possible that using a TENS unit on, say, a bottom's feet might suppress the impulses from the vagus nerve, slowing the heart to the point of stopping it. I've never heard this happening, but it is theoretically possible.

Actually, I did hear of one anecdotal case where someone was playing with a relaxicisor across his nipples for an extended period of time. He was really grooving on the experience, but he noticed that his heart was really slowing down. There was no additional data available as to whether this slowdown was due to electrical action or chemical action, but he was concerned enough about it that he stopped that play session.

So far, what do we know about the heart and electrical play?

We know that the heart is an extremely important organ in the body. There's only one, and when it stops, you're dead. We also know that the timing of the heartbeat is governed by a variety of factors which must work in combination to keep the heart beating in rhythm. We know from the previous chapter that both muscle cells and nerve cells can be affected by externally applied electric currents. Muscle and nerve cells are major parts of the heart system – and we know from personal experience that many people have heart problems of various kinds.

So what does this all mean for electrical play?

One of the first things you'll need to find out about your partner who wants to receive electrical stimulation is: what is the condition of her heart? In particular, ask her if she has, or has ever had:

- a heart attack
- a diagnosis of heart rhythm irregularities (arrythmia or dysrythmia), or episodes of atrial or ventricular fibrillation
- an enlarged heart
- a pacemaker

If you are going to do electrical play with someone, these questions should be included in your negotiations – and if you've gotten a "yes" answer to any of these questions, I'd counsel extreme caution, or perhaps that you consider another form of play altogether.

As you play with your partner, be aware of his body signs and responses. In particular, it would be wise to ***check his pulse*** periodically. Even if you used an electronic pulse monitor, it still would be wise to take the pulse manually from time to time. Don't know how to check a pulse? – ***find out!***

That leads me to my next point. ***Learn CPR!*** Don't do it from a book. Take a certified course from the Red Cross, American Heart Association or National Safety Council, and recertify every year.

Remember I told you that electrical play is edge play because you can't react fast enough to prevent injury or death? If you are going to play with electricity, you should have an answer to the question, "The bottom's heart stopped. What do I do now?" CPR is very important – but since CPR is simply a technique to maintain life until the paramedics arrive, don't be reluctant to call 911. Embarrassment is a far easier penalty than 25 to life in the pen being butt-fucked by hard piped cons who don't stop when you scream "red."

Ending with that thought, let's go on to the next chapter where we'll learn the shocking truths about electrobiology.

Chapter Eleven

The Shocking Truths About Electrobiology

There was this student in my electronics lab at college. In those days electronics was the study of vacuum tubes, with voltages ranging from 150-750 volts DC. This student was less than cautious around the lab experiments and would often brush his arm or hand onto one of these voltages. There would be a yelp, and the rest of us would know he'd done it to himself again.

He got so he could tell by the shock he received what the voltage was. "That was 350 volts," he'd say as he rubbed his hand. We'd measure, and sure enough, he'd be within 50 volts of the right voltage. He certainly earned his title, "the Human Voltmeter," a.k.a. "The Stupid Klutz."

Let's talk a little bit more about electricity and how it interacts with biological systems – cells, nerves, muscles and stuff. This is really important in order to understand electrical play. This is also where things get interesting.

For understanding electrical play you'll need some useful models about how electricity operates in biological material.

The important thing to remember about biological systems and their components – cells – is that they basically consist of something like salt water – even the very important epidermis cells of the skin, except of course this fluid is almost dried out. Our bodies are made up mostly of this water. The thing you'll remember about salt water from our previous discussions is that it is an electrical conductor.

Now, as we have seen, it is important to remember that biological systems are more than just salt water, and we have to study these other aspects to understand electrical play. But right now let's take a look at how electricity affects pure water and salt water to build up an accurate model of our cells.

The Effect of Electricity on Water and Other Insulators

Some of you may have heard that water is an insulator – at least pure water. This is true, sort of.

If you throw a flashlight battery into pure water, it will not short out or even have any current flowing from the positive (+) to the negative (-) pole. It'll be wet, of course. That's why we say water is an insulator.

First we should review what an insulator is (see Chapter 2). An (electrical) insulator is a material through which no (or very, very little) current flows when you apply a voltage across it. We can say that such a material has a very high resistance – generally 10 million ohms or more. Pure water, glass, paper, wood, insulation on electrical wires, many plastics, and many other things are considered good insulators.

Water, as most people know from chemistry, is a molecule composed of one atom of oxygen (O) and two atoms of hydrogen (H) or H_2O. The way these atoms arrange themselves in the molecule is that the two hydrogen atoms tend to be on one side of the water molecule. If you look at a cock and two balls you get a good model of a water molecule (see fig. 29). The cock (doesn't matter if it's flaccid or erect) is the oxygen atom and the two balls are the hydrogen atoms. In this arrangement the "balls" (hydrogen atoms) of the molecule have more of a positive(+) charge on that side of the molecule.

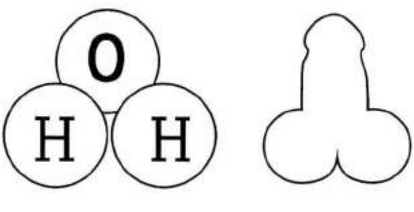


FIGURE 29: WATER

Water is a very stable molecule. There are no excess electrons or ions which can be the "stuff" that can move as a current. So if you take a DC voltage (say from a battery) and put the positive (+) wire into some pure water and the negative (-) wire a little away into the same water, you will read 0 amps flowing. You'd see the same thing happen with AC too.

What happens to the molecules, though, is that all the little "cocks" of the molecule tend to point to the battery's positive (+) wire and the "balls" of the molecule tend to point to the negative (-) wire. However, because molecules are not as free to move as easily as electrons, no current can flow. Some water molecules do break down, just like the air molecules we studied in Chapter 6 on high voltage. With a high enough voltage, of course, enough water molecules can break down to become a whole other story.

With an AC voltage from your household outlet in place of the battery, the wires alternate (+) to (-) as the voltage alternates. The water molecules in this case still don't rush back and forth between one wire or the other (they're still not free to move), but the little "cocks" and "balls" of the molecule do tend to follow the alternations. This is a very small mechanical movement of a large molecule, not the "stuff" of current.

What is interesting is that when you apply an AC voltage or an electrical field with a high enough frequency across water, the mechanical rotation of the water molecules trying to follow the alternating +'s and -'s of the voltage produces heat in the water. This is why high frequency radio waves can heat up the inside of a human body – which has a large amount of water in it. It is also the principle of the diathermy machine, which is sometimes used in electrical play, or of the microwave oven, which should never be used in electrical play (unless you want to heat up some cold coffee for yourself).

When you apply electricity with certain frequencies across water – including the water inside a human body – the water heats up.

A very similar analysis applies for other insulators as well. Here, however, you have many variations in heating effects and molecular motion.

The Effect of Electricity on Salt Water

When you add some salt – that's sodium chloride, NaCl, for you chemistry students – to pure water, an interesting thing happens. The salt, as the chemists say, "disassociates" into sodium ions, which are (+), and chloride ions, which are (-). Ions – atoms with more or fewer electrons than usual – are one of the kinds of "stuff" of which current is made. So when you put a DC or an AC voltage across some salt water, you will see a current flowing. Most of the motion comes from the electrons from the chloride ions, and very little from the ions themselves. How much current is dependent on how many ions are available (and therefore the number of free electrons), i.e., how much salt is in the water (within limits – water can only take so much salt). If you actually measure it with an ohmmeter you'll read about 2,000 ohms in water with as much salt as it can take. The little "cocks" and "balls" of the water molecule are also trying to follow the voltage, but that's unimportant in this case.

Since much of our biological systems are made of fluids like salt water, this is an important process to understand. This is particularly true of things like blood, piss, sweat, semen, vaginal fluid, etc. – all of which are freely available and accessible in a human body.

By adding salt to water, you lower its resis-tance so current can flow across it. The water in-side the human body is salt water.

The Effect of Electricity on Biological Material

So far, in developing our understanding of electricity in the body, we've looked at the effect of electricity in pure water and then in salt water. Salt water is supposed to be very similar to the fluids inside our bodies. Notice I said "very similar." Let's see where the limits of this model are.

We learned (or at least we're supposed to have learned) from Chapter 9 that cells are made up of more than just the fluids that are inside and outside them. Also there are many cell parts that are inside the cells that are not similar to salt water. Remember?

The thing is that these non-salt-water-like parts of the cells are neither all conductors nor all insulators. Some are more like conductors. Others are more like insulators.

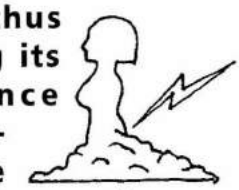
The cell membrane, for example, is designed to let fluids from outside the cell flow into the cell and vice-versa under certain conditions. Cell membranes are also complex chemical molecules that can be pierced, attacked, and destroyed. One of the things that can destroy cell membranes is too much electrical current.

The best example to look at here is the weenie. No, I'm not talking about someone's cock (although if you have consensual permission to try this on somebody's cock, be my guest – even though you'd be into real serious kink). I'm talking here about a hot dog.

A hot dog is made of meat – muscle and other animal cells. (I won't get into an argument here about what else it contains or the quality of it.) I can measure the resistance of the hot dog with an ohmmeter. An ohmmeter has a battery that sends a small current through the resistor (hot dog). This small current is really the electrons that are free to move and some ions that are in the fluids inside and outside the cells. The cell walls in the meat really don't impede this current a lot. When I measure the hot dog, I'll read about 2,000 ohms – the same as salt water.

However, if I raise the voltage, thereby sending more current through the hot dog, something different happens. This higher current still flows through the fluids and cells of the meat, but it is also high enough to start breaking down the cell membranes and even breaking down the fluids (which if you remember are only similar to salt water, not exactly salt water). Now you have something different than an electrical current going through salt water – you may even have a resistance that is less than that of salt water.

High voltages can break down the cells in human flesh, thus lowering its resistance even further. The broken-down cells carry current and heat up even better than salt water.



Another thing also happens. You'll notice that the hot dog starts getting hot. It gets so hot that it can get fully cooked in a matter of minutes.

What happens to your hot dog can happen to **your** weenie, or to any part of the inside or even the skin of your body when you have a high enough voltage to start breaking down the cells and the fluids of the body. Severe burns are the result of too much current flowing through the body. You can produce such burns by applying a high voltage in a circuit which contains both a body part and the epidermis trying to protect it (yes, a high enough voltage can burn through the epidermis), or a lower voltage if you get under the epidermis or if resistance is reduced in some other way. Think electric chair. In reality, an electric chair is just like an electric hot dog cooker. It may also be something to think about as you're strapped into one as a result of playing carelessly with electricity.

Burns are just one of the results of electrical accidents where too much current is involved. You can also have trouble with lower currents (you'll see a chart about this next chapter).

When we studied nerve cells in Chapter 9, we saw that enough stimulation by electricity to enough nerves can cause intense pain to the recipient. Since muscles are commanded to move by electrical nerve signals, enough current can not only move the muscles but also cause them to cramp up. The heart also being a muscle – and a very important one at that – is especially sensitive to stray electric currents.

We need to now take a look more closely at what happens to current inside the body.

A More Detailed Look at Currents Inside the Body

Let's do another "thought experiment." If you took a flashlight battery – 1.5 volts – and placed it in your hand, you would feel nothing except the weight of the battery. The air around the battery is a good insulator so almost no current would flow – maybe 0.01 to 2 microamps (μa).

If I took the same battery and dropped it into a bucket of pure water, what would happen? Well, we know from this chapter that pure water is much like an insulator if the voltage is not too high. You would expect that the battery would act just like it would in air, i.e., hardly any current would flow.

The closer an object (like the heart) is to the path of a current, the more likely it is to be affected by the current.

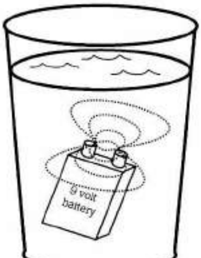


FIGURE 30: BATTERY IN SALT WATER

Think of taking the same battery and throwing it into a bucket of very salty water. Now also in this chapter we've seen that salt water is a conductor of electric current and why that's so. What you would see is that the battery would draw so much current that it might even get hot enough to explode. No surprises here, even if this isn't what scientists mean when they talk about the "Big Bang."

But now we need to take a closer look at what a "conductor" means. If the salt water were a copper wire, we could easily imagine all of the current being totally confined within the wire. However, in our thought experiment the salt water totally surrounds the battery (see fig. 30). What confines the current now? What paths can all those electrons and ions that are part of current take? Where can you expect to see the current?

Remember my talking about current density in Chapter 2? There I used a block of carbon as the conductor in question. The current in the carbon block has many paths to travel, and we can imagine a model of a lattice connection of resistances that allows us to use Ohm's and Kirchhoff's Laws to calculate the current and current density through the carbon block. What we would calculate we'd actually be able to measure.

What happens in the carbon block is the same thing that happens in the salt water thought experiment. There are many current paths available (see fig. 30). But, let's say that we dropped the battery – or better yet a high voltage power line – into the ocean.

Fun at Camp

Ike and Mikial have been lovers and have played heavy S/M scenes for two years now. Both are physically well built, and overpowering is an essential element in their scenes. Often they wrestle to determine who will be top that night, but if the bottom can overpower the other, the scene can and does change.

Ike was a Navy Seal and has studied Escape and Evasion techniques. His lover, Mikial, came from Russia. Mikial was an athlete in Russia, but when they became lovers, he became intrigued by military interrogation scenes that Ike enjoyed. Both were now experienced with this kind of scene.

To start the scene each would put some military-type secret on a slip of paper inside an envelope. The bottom's envelope would only be opened by the top when the top/bottom determination would be made. This would be done by the outcome of a wrestling match. Since both were of equal ability, the outcome was not predetermined.

Ike, the captured American Seal, was now standing at attention, his manacled hands behind him, in front of Captain Mikial Nechenko in a secret prison camp somewhere in Siberia.

"Carson... Ike... Lieutenant...789324, and that's all you'll get out of me, Captain."

"Thank you Lieutenant," Mikial replied as he moved his hand to Ike's face as if to examine a cut. But then Mikial quickly brought his other hand in a stinging slap across Ike's face. Then he pushed Ike to the ground. (The hand that was there first was actually in position to steady the face so that there would be no

That's salt water too. If we did this in the Pacific near San Francisco, would a swimmer in Sydney harbor in Australia get electrocuted?

The answer is no. This is fortunate because undersea high voltage power lines break in the ocean all the time. Only fish and people near the break get electrocuted. People and fish far away don't. (See Appendix 2 for a more detailed discussion of this question.)

We saw in Chapter 3 that current divides itself among the resistances according to the resistances. The higher the resistance in a parallel circuit, the lower the current. The lower the resistance the higher the current. This is Ohm's Law. The current will in essence take the easier path, but it can also take other paths. Most of the current will concentrate in the easiest path (the lowest resistance). The harder the path (higher resistances), the less the current. Another way of saying this is that electricity will take an easy path of a 1/4 inch to avoid a hard path of 100 miles. Yay science!

However, the human body is not all that huge. We've seen that we can think of the inside of the body (under the epidermis) as salt water. Here the terms "near" and "far away" have life-affecting importance. This is often the

neck or jaw injury from the slap. In an actual interrogation such care would not be observed, but this was a scene. Ike appreciated the close reality of it.)

With the manacled Ike on the floor, Mikial carefully bent over him.

"What is the strength of your team and what is the objective?" Mikial screamed.

"Carson... Ike... Lieutenant... 7893... AHHHHA." Ike's response was cut short as Mikial's heavy leather strap cut across Ike's ass.

Several more blows of that damn strap rained down on Ike's ass; punctuated with, "...strength... objective... Carson... 789324..." screamed by each man.

Mikial moved away from Ike. A rest was needed. It was real enough.

Mikial smiled as he thought of how Ike was making this a real challenge for him.

Not giving too much time for Ike to rest up, Mikial quickly brought the manacles together in a hog-tie position. Just as quickly, he expertly cut off Ike's clothing. Ike was hog-tied and naked now.

Moving away to examine his handiwork, Mikial slowly took off his clothes. He stroked his hard-on in view of Ike.

Ike staring at Mikial's hard cock screamed, "Carson... Ike... Lieutenant... 789324, and I'll never tell you anything fucker!"

Mikial smiled. "Oh you will, Lieutenant, you will." He pulled out a heavy duty cattle prod. "Yes, Lieutenant, you will talk."

Ike's heart sank at the sight of the implement. He hated it. He felt his resolve weaken every so slightly, but he quickly overcame that – or so he thought.

For the next five minutes Mikial's procedure was to calmly intone, "What is the strength of your team and what is your objective? You need only tell me the truth and this torture will stop," followed by a zap of the cattle prod applied to Ike's ass or thigh or back of the calves. He did this despite Ike's screamed answers. He wanted to show him that Ike was at his mercy now.

Ike thrashed about and tried to avoid the shocks, but he couldn't. They were too intense and too fast and too expertly delivered. He could only do one thing – cry and go limp.

Mikial satisfied at this victory took the manacles off Ike's wrists and ankles. He then started to reposition Ike in a spread-eagle pose to have even more fun.

That's when it happened.

Ike quickly spun around and wrestled Mikial to the ground. Grabbing some convenient rope, he quickly and expertly overpowered and hog-tied Mikial. Now it was Ike who was standing over Mikial's naked body stroking his cock.

Smiling while he fingered their cattle prod, he said, "Now, Captain, how do I escape from this camp?"

crux of the debate between people who say "Never play with electricity above the waist," and those who want to do electrical play across the nipples.

The heart is the most sensitive part of a human body to electrical play. In some cases as little as 1 microamp applied directly to the heart can cause it to start misfiring (ventricular fibrillation). If I use a TENS unit across someone's feet, what will the current from that TENS unit be at the location of the heart? What about if I use a TENS unit across the genitals? What if I used a cattle prod (higher voltage) instead of a TENS unit? Where is it safe to play with electricity and where is it not safe? Where's my mommy? (Ooops, sorry!)

The simple answer to these questions is that there is no simple answer to these questions. Very little scientific study has been done about electrical play – particularly about currents inside the body. (Although, as I've said before, if somebody wants to spend several million to fund one and I can get some cute volunteers, I'd be willing to try.) There is no exact or calculable answer to these questions.

So we can make some deductions based on the battery in salt water thought experiment, but it doesn't give exact answers for the body. The resistances inside the body may not be uniform throughout the body. The 100 or 2,000 ohms is a reasonable approximation (100 ohms as a very conservative estimate, 2000 ohms as a level you're actually likely to measure). The heart's main pacemaker usuallly regulates heart rhythms. The heart is also regulated by chemicals in the bloodstream. Maybe the current through the heart is safe, but the bottom can still go into cardiac arrest if the play is too frightening and too much adrenaline is secreted.

What we do have is observations that some people do play with electricity across the nipples with apparently no or little harm to the heart. But we don't know if "some" is "all," and we don't know if "all" instances have been reported. Maybe in Wrenched Knee, Kansas, there is one bottom who wasn't lucky, and the top hasn't been caught yet.

Until someone is willing to give me the several million dollars for the study to answer the question, perhaps the better questions to ask are those I've suggested in Chapter 10, during your negotiation.

In the next chapter, we'll examine some more aspects of how the body reacts to electricity.

Chapter Twelve

The "Official" Limits

As BDSM players we always ask the question, "What is safe?" In electricity there is an "official" answer as to what currents are safe. But – as I'm sure you know by now – you need to know the limits of these "official" answers in order to understand what it means for you as an electrical player, and how to use it.

For purposes of designing electrical equipment and safety systems, electrical engineers and designers use the current values from the following table prepared and published by the Underwriters' Laboratory.

You should know enough by now to recognize that while this table is extremely useful, it has its own limits.

When scientists developed this table many years ago, they actually used college volunteers and applied electricity to their bodies (at least for the lower, "safer" values). The subjects were seated on a chair and their hands gripped conducting metal bars in two separate trays. Their forearms were also immersed in salt water. (They really wanted a good contact, you see.) This was electrical play above the waist, but then the University's health and life insurance was better.

One of the first things to understand is that this table really sets current values for the average person. Some people may be more sensitive and some less sensitive than this.

The next thing to understand is that these values are generally good for household power frequencies (25 to 60 Hz). Some researchers, by the way, are concerned about the long-term health effects of 60 Hz magnetic and electrical fields, which are emitted by any electrical device – not just toys, but things like electrical clocks, computers, microwave ovens and electric blankets. While the data on this subject are still unclear, you might want to do your own homework so that you can make informed decisions. See the Resource Guide for how to get more information on EMF (electric and magnetic fields).

UNDERWRITERS' LABORATORY TABLE FOR ELECTRICITY PLAYERS	
Current	**Body Reaction**
1 μa (microamp)	Ventricular fibrillation to the heart when applied directly to the heart.
1 ma (milliamp)	Perception level. Just a faint tingling. This is also the minimum operating point of many TENS units.
5 ma	Slight shock felt; not painful but disturbing. Average individual can let go. However, strong involuntary reactions to shocks (or being surprised by them) in this range can lead to injuries. This is generally the maximum operating point of many TENS units.
6-25 ma (women)	Painful shock, muscular control is lost. This is the usual operating range of relaxicisors.
9-30 ma (men)	This is called the freezing current or "let-go" range. A person grasping a conductor may not be able to let it go.
50-150 ma	Extreme pain, respiratory arrest, severe muscular contractions (see chapter 9, page 71). Individual cannot let go. Death is possible.
1-4.3 amps (applied externally)	Ventricular fibrillation. Muscular contraction and nerve damage occur. Death most likely. This is the range of electric chairs.
10 amps (applied externally)	Cardiac arrest, severe burns, and probable death. This is the range of lightning deaths.

A further explanation is needed here about the let-go current mentioned. At around this current level, the hand muscles gripped the bar so tightly that the student volunteer could not force it to open. This is the point, also known as tetany (Chapter 9), where muscle effects become extreme.

Muscles typically work in pairs, with one muscle opposing the other. People who are electrocuted with sufficient current often have their stronger muscles affected most. The limbs and torso get contorted by tetany, with the spine and head arched backwards, the legs extended, and the arms and hands twisted upward toward the face. To give you a better idea of where the stronger muscles are, look at figure 33. This will be useful if you are going to do electrical play on muscles.

FIGURE 31: STRONGER MUSCLES SHADED

Understand that in electrocution, all the victim's muscles are affected. The muscle trying to flex the forearm out is being contracted as is the muscle trying to extend it, except the flexor muscle – being the stronger – wins. Not only the limb muscles are affected; the diaphragm and chest muscles also contract, preventing the lungs from working.

In electrical play with muscles, you ***may*** be only affecting one muscle set, but you will need to be aware of where that limb is trying to go. A cattle prod to the thigh muscle is fun only up until the time that the bottom's heel kicks you in the genitalia. Ouch! Also there has been at least one anecdote in which electrical play on a bound bottom resulted in the muscle contracting so hard agains the bondage that the bottom broke a bone. So be mindful of where that muscle is going to try to move.

The other aspects of the table we have discussed before – the tingling, the burning, etc. The nice thing, as I said before, is that the table provides a handy guide for some current values when you are designing equipment or wanting to take a look at safety issues. All these things too have their limits.

Now we can take a look at the last "P," Psychology.

part three

PSYCHOLOGY

Chapter Thirteen

Be Afraid. Be Very Afraid.

The woman is totally naked with her wrists secured to a suspension bar high above her head. This poses her body in a manner that displays her delicious features – those pouting breasts with nipples erect, those long, lovely legs that drive me wild, that divine cunt which even now displays small beads of lubrication. I've enjoyed fondling her to get her excited, but now I reach into my toy bag to pull out – the cattle prod.

Her eyes open wide in a moment of terror. She starts to squirm and tremble. Yes, she remembers. She negotiated this with me, but this is the real thing. She knows about the convulsing shock it can produce in her body. She can't help letting a soft "No! Please!" escape from her lips. She could say the safeword, but there is excitement for her there too.

I let the vicious brass tips of the cruel instrument run across her breasts... her nipples... her inner thighs... her smooth ass. She follows these movements with soft moans and a pleading look on her face. She has to wait for that moment – that moment of shock.

I then stand directly in front of her. We look into each other's eyes. Within this field of view, I place the instrument so we can both look upon it as we look at each other. I then unscrew the back end to show her that – there are no batteries inside!

The Basic Emotions Used in Electrical Play

From time to time I've been heard to say, "The mind is a wonderful thing to waste." To an extent this sums up the psychology of electrical play.

Even though electricity has been with us for more than 120 years and even though it is important in our daily lives, electricity still frightens us. Now I've worked with electricity for all of my professional career and have done really stupid things like working with live wires, but despite all my knowledge and experience and, yes, luck, I still jerk back when I see an unexpected spark. My anxiety level also goes up when I smell that characteristic smell of burning insulation. I'm experienced; I can only imagine how frightening electricity is for someone who has little knowledge about it.

And for many people electricity is terrifying. I remember playing with one submissive with a violet wand – a beginner's toy by many people's standards. Even though she agreed to play with me, she trembled when we started. During our play I purposely did a light electrical scene and explained what I was doing with her. I even demonstrated how if I touched the gas bulb directly to her skin, she would feel nothing. Despite all of this gentleness and explanation, she was frightened and trembled to the end of the scene.

This fear of electricity is the one of the two major things we play with or must concern ourselves with in electrical play. Even though we may have been doing electrical play for a long time, we never get blasé about it.

Fear is part of the fun of electricity play – but if the bottom gets *too* fearful, the scene will end badly. The trick is to walk right along the edge of the bottom's fear.

The second major psychological factor in electrical play is the sensation. Many people play with electricity as often as they can because the sensations they get from it to them are pleasant (or at least desirable). Some people enjoy everything from the light, tingling sensations they get from a TENS unit to the moderate, muscle-jumping sensation of a relaxicisor to the intense sensation that comes from a cattle prod or a telephone magneto. Some people get almost addicted to it, like some people get to a good flogging.

Before starting with any play, the play partners need to have some level of trust in each other. This is especially true with electrical play. An important component here is ***negotiation***.

In negotiation a bottom should have some sense that the top knows what he's doing. The bottom should also be scrupulously honest about her health matters such as heart conditions, prior experience, etc. She should also let her prospective top know what she would like to get from the scene.

The top should also get a sense of the prospective bottom's fear level and fascination with electrical play. The bottom may be frightened out of his wits, but he is so fascinated by the prospective play that it will contribute to the scene's energy.

Experienced tops and bottoms who do any kind of edge play are well aware of this aspect of negotiation. If you are new you should become familiar with the 16-point negotiation technique in Jay Wiseman's SM 101. Because you'll be dealing with electrical play, the specific health questions shown in Chapter 10 should be incorporated in your discussion. I would also highly recommend that you determine who in the room (besides the bottom, of course) has CPR training, and whether that person will be available to lend such assistance in the scene in the relatively unlikely event that it's needed.

For an intense sensation electrical play scene, the FEAR – FASCINATION – TRUST aspects work like a triangle (see fig. 32). The pleasure of the scene will be broken if any of the three legs of the triangle is broken.

FIGURE 32

To get the maximum pleasure out of the scene, the top must balance the fear against the fascination to maintain the bottom's trust. That means that the top must put his full attention on the bottom and the scene. The top needs to know and understand what she is doing, where the current is going, how the current is likely to affect the bottom's body, and how the bottom is responding – physically and mentally. The top also needs to be prepared to immediately notice and take care of any physical and/or psychological emergencies that may develop.

The bottom is equally responsible for letting the top know what's going on with him. The bottom should communicate, through safewords and other codes he agreed on during negotiation, anything that seems wrong or not working for him.

Even with highly experienced and long term heavy play partners who do so-called "no-safeword" scenes, there is always some mode of communication that prevents serious injury.

This communication and attention between the top and bottom is very important. When done properly, such a scene is a beauty to behold. It is also something that rarely happens for newcomers in the scene. This intimacy is something that you need to learn through experience and by making mistakes – preferably non-serious ones.

Notes for New Tops and Bottoms in Electrical Play

Sometimes the question comes up for tops, especially for newcomer tops: "How do I keep all of these factors – the three "P's," paying attention to my partner's responses, where is the current likely to go, how do I use this toy – in mind when I play with my partner and still let the scene flow?" There just seem to be too many things to keep track of.

Consider how you learned how to drive (assuming you're an average, reasonable, and responsible driver). When you started out, everything seemed overwhelming – watching traffic, shifting, listening to the driver's-ed teacher... and your driving showed it. There were the jerky starts and stops, gunning the engine, driving over curbs and flowerbeds and the like. But as you gained skill, proficiency, and confidence, the braking became smoother, the turns more easy, etc. The location of the shift lever and the brake pedal and the headlamp knob became less conscious and more reflexive. Now you're at a point where all you need think about consciously is your route; the actual mechanical skills of braking, turning, and even responding to stop lights and speed limits seems automatic. Actually your mind is still working on these skills, but not on a conscious level, unless there is a problem – like the overheat warning light going on. Then your attention focuses consciously on how to solve the problem.

This is what happens as you become more proficient in any play, including electrical play. That is why I want you to have a good understanding of what you're playing with.

It is for this reason that I recommend that all new tops starting to play with electricity start slowly. There are fewer factors to deal with, and you get more enjoyment out of your early scenes. Soon enough you'll be amazing your friends with the fantastic scenes you'll be doing. Of course, you'll be too busy concentrating on your partner and the scene to concern yourself about being a showoff.

For the newcomer bottom to electrical play, don't get the idea that all you need to do is be a receiver. Electrical play is edge play. You have a great deal of responsibility too. Having done some non-electrical scenes would help you understand the negotiation, play, and communication process. You can then watch experienced players do electrical play and see what fascinates you. You should also be aware of your fears about electrical play and talk about them with your prospective top. Ask yourself the general question, "Do I trust this prospective top?" (If you don't, look elsewhere.) Also, know your health situation – particularly about your heart.

Since electricity carries higher physical and psychological risks than most other kinds of play, it's best to start slowly and work your way up to more intense play over several sessions.

During a scene if you don't feel that the top you're playing with knows what he's doing, call your safeword. It's not just a case of being "better safe than sorry;" it's a case of being "better safe than dead."

Responses

The following is a reasonably detailed, but not exhaustive, list of responses that bottoms experience when playing with electricity. (You can also refer to the table on P. 90.) This serves as a rough guide for tops and bottoms as to what can be expected. If you have a different experience, you should not feel that you've failed your top; what's important is whether you like the sensations and the experience, not how you compare to some other bottom. Tops, recognize that your bottom's peculiar responses may be different that what is shown here. That is why you need to pay attention to your bottom.

The most typical response of a bottom to electrical play is the sensation. As we've seen in Chapter 9, the sensation depends on nerve stimulation. It also depends on the current available and the number of nerves stimulated.

One of the first sensations some people report from something like a violet wand is a feeling like ants crawling over the surface of the skin when the gas bulb is close enough yet a spark to the skin is not drawn. (You can feel a similar sensation by holding your forearm close to the front of your TV's picture tube.) Many people report this to be a pleasant sensation, but a few find it annoying and don't like it.

Moving up the sensation scale is the continual skin tingling you get when a violet wand bulb has sparks jumping to the skin, or from a TENS unit. Typically the tingling sensation for lower currents is characteristic of alternating currents; DC currents typically give more of a burning sensation. TENS units are DC pulses; even though they don't actually go negative like AC currents, they feel like AC currents.

TENS units often have controls that control the intensity, the duration, and the frequency of the stimulation. Thus the top has more control of the stimulation. Thus by intensifying and easing off the stimulation, he can "play" the bottom like a musical instrument.

The sensations of electricity play range from very mild, pleasant tingling through intense and disabling pain.

Next you move up to the higher currents where you get muscle involvement. This level of stimulation most often comes from relaxicisors and the more intense telephone magnetos. The bottom is aware of twitching muscles that are under someone else's control. Depending on the size of the contact pads (see Chapter 9) the feeling of the sensory nerves being stimulated can vary anywhere from a pleasant tingle to intense pain. Typically relaxicisors use large area electrode pads, thereby producing more of a tingle. Telephone magnetos generally use small area electrodes and thus produce more intense pain.

When you get to the really intense sensation toys like cattle prods and tensor units, the sensation is really one of sharp, intense, localized pain. With a cattle prod the duration of this is brief as the bottom (if he can) jumps away from the prod. The cattle prod is often used in bursts, but it can be continuous.

With tensors or stun guns (personal defense shockers) the application is usually continuous. The bottom will very often be disabled and collapse for five to 15 minutes when she receives a five-second jolt. That's what stun guns are designed for.

At an entirely different sensation, there is the warming sensations experienced by those bottoms being subjected to diathermy equipment. These machines were designed for heating the interior tissues of arthritis sufferers. As such, properly used, operating, and maintained machines will not cause damage. A gentle warmth will be felt by the bottom. Such warmth can be pleasurable or anxiety-producing, depending on other things happening in a scene.

Almost all bottoms feel some level of fear response during electrical play. For the experienced electrical play bottom, the fear may have been overcome; he's more interested in the sensation. If a bottom, however, is especially fearful, the top needs to work at that fear edge to keep the bottom's trust and hence the scene going. Working at such an edge requires special diligence in paying attention to the bottom's responses. Usually at such an attention level, the intimacy becomes very close.

Fear from a new bottom is often something a top must deal with. A top can start off with simple, lower intensity scenes to build up a bottom's trust level so that she can handle successively heavier scenes. Clear negotiations are especially important at the early stages.

For some bottoms the fear of electrical play stems from an early childhood trauma such as child abuse by electrical torture. This can also be the case of former prisoners who have been electrically tortured or by recent electrocution victims. Often such people don't want to participate in electrical play. For them the fear far outweighs the fascination. However, if some repressed memories of such traumas come up during electrical play, the top must be prepared to abort the scene and bring the bottom down from his psychological crisis.

Trust is a big issue during any edge play. This is especially true of electrical play. As with any trust issues, it depends largely on the communications between the partners rather than the top impressing the bottom with her skills. The bottom must always communicate with the top about what's happening with him. He should let his top know that a limit is either reached or slightly exceeded. The top should be very responsive to this information. Intensity and/or pace should be varied as needed. If the scene-ending safeword is called, of course, the whole scene should be ended and the bottom brought down from the scene.

If trust is lost it will be hard for those partners to play again.

Another psychological factor in any play but especially in electrical play is intimacy. Because of the concentration and attention the top has on the bottom, and because of the high level of communication between them during a rather intense scene, a deep intimacy develops between the top and bottom – if just only for the duration of the scene. After all, these two are sharing some pretty heavy feelings with each other even during "light" play. Such level of intimacy also requires that the top stay with the bottom after the scene is completed to assure that the bottom is definitely out of scene space.

Chapter Fourteen

The Toys

*"The world is so full of a number of things,
I'm sure we must all be as happy as kings."*

– R.L. Stevenson, A Child's Garden of Verse

So far in this book we've examined the background and theory you need to understand basic electrical play. This is all very well and good and damned important too, but there is the real world out there. This is the world that has all the good toys that we can play with. Now I've mentioned the names of some electrical play toys in the course of the theory discussions. Generally these were ones that most of you had already heard of, thus providing you with a concrete picture to illustrate the theory. But in this chapter I will describe a wider range of electrical play toys that have been used in the scene.

The way I'll be doing this is in the form of tables showing the characteristics of each toy. In this way you'll be able to compare the different toys on the different points and can choose one or more best suited to your particular play. These tables will also give you a familiarity with the different types of toys and the kind of results you can expect from them. Using your understanding based on the theory you now know, you can plan their appropriate use.

The different categories show in the following pages are defined as follows:

Toy – The commonly known name of the electrical play toy. No manufacturer's names are used here, as several manufacturers may make the same kind of toy. Sometimes a manufacturer will use a brand name to describe their toy, but the general operating principle of their toy will fall under the common toy name.

Operating principle – A description of the general operating principles or theory by which the toy operates.

Voltage(s) – Identifies the generally expected output voltage(s) from the toy as applied to the body. Where appropriate it will also identify the input voltage requirements of the toy.

Current(s) – Identifies the generally expected output current(s) from the toy as applied to the body.

Frequency(ies) – Identifies the generally expected output frequency(ies) from the toy as applied to the body.

Body effect(s) – Describes the generally expected body effect(s) that users (bottoms) typically report. This is not a comprehensive list but only those most commonly reported.

Intensity – Describes the generally expected intensity(ies) that users (bottoms) typically report. These intensities are only qualitative and relative, and the ones most commonly reported. Individual users may vary.

Psychological Aspects – Describes the visual, auditory, and sensory cues available from the toy which may affect the psychological perceptions of the players in a scene using this toy.

Caution(s) – Lists the caution(s) in the use of the particular toy. Apart from the understanding of the theory contents of this book regarding general cautions during electrical play, the caution(s) listed are those generally to be observed for that particular toy. A complete and comprehensive list is not attempted here since that may vary with particular manufacturers and the age and condition of the toy.

Toy: Carpet Shuffle Zap

Operating Principle: Rubbing your shoes across the carpet or taking off a wool or synthetic sweater inside on a cold day with very low relative humidity. This mechanical action strips off electrons (static electricity – see Chapter 4) that accumulate on the surface of your skin. You can then discharge these electrons onto a bottom's sensitive body parts except for the eyes.

Voltage(s): High voltage static electricity discharge – about 25,000 to 100,000 volts.

Current(s): Low due to high resistance of the air and skin

Frequency(ies): DC of very short duration.

Body Effect(s): Electrons accumulate on top's skin surface and get discharged onto bottom's body on the way to ground.

Intensity: Sharp, and mildly intense for a very short duration. Not very painful

Psychological Aspects: Blue spark and mildly audible zap. Spark especially effective in the dark.

Caution(s): Relatively few. Don't do it when you smell gas. Don't do it on bottoms with heart problems.

Toy: (Piezoelectric) Acupuncture Zapper

Operating Principle: This is a moderately high voltage device used for acupuncture purposes. It works on the same principle as the burner sparker on some gas stoves, which is piezoelectricity. Piezoelectricity is the principle that if you hit certain crystals the right way the crystal will generate a voltage. In the case of the acupuncture zapper the voltage will not generate a spark. In the gas stove burner starter it will.

An acupuncture zapper behaves about the same as the carpet shuffle zap.

Voltage(s): High voltage static electricity discharge – about 10,000 volts

Current(s): Low due to high resistance of the air and skin

Frequency(ies): DC of very short duration.

Body Effect(s): Here the electrons generated from the piezoelectric crystal will transfer to the bottom's skin. Since the zapper will contact the skin before discharging, there will be a small brief current that will affect the skin's sensory nerves as it travels through the body to ground.

Intensity: Sharp, and mildly intense for a very short duration. Not very painful.

Psychological Aspects: There's an audible "click" as the charge is generated.

Caution(s): Relatively few. Don't do it when you smell gas. Don't do it on bottoms with heart problems.

Toy: TENS Unit (Transdermal Electric Neural Stimulator) *Also comes under other names such as Neural Stimulator, Bio-Stimulator, Titillator, et al.*

Operating Principle: Basically a DC pulse generator. The TENS unit creates a pulse from direct current, using a variety of methods ranging from transistors to computer chips. Even though the unit generates pulses, it is not true AC; the voltage never goes negative. The pulses do, however, provide excellent stimulation of the nerves at the skin. Medical TENS units were originally designed for pain management of patients suffering from chronic pain.

The electrodes normally supplied with medical TENS units are about the size of dimes. They can also come with adhesive strips to attach to the skin for use. Toy variations of TENS units come with a variety of electrodes including clips, vaginal plugs, anal plugs, and penis electrodes.

Controls on the TENS units allow control of intensity, pulse frequency, and duration of stimulation application (one second of pulses followed by one second of no stimulation, for example).

Voltage(s): Pulsed output voltages (to the bottom) are variable by control from 0 to about 10 volts. The units are usually powered by 9-volt batteries.

Current(s): Pulsed currents (to the bottom) of around 1 ma (milliamp). Current depends on voltage setting and skin resistance.

Frequency(ies): Pulse frequencies are settable from 1 to 30 or so pulses per second. Stimulation duration settings vary from instrument to instrument.

Body Effect(s): Bottoms mostly report tingling sensations.

Intensity: Bottoms mostly report mild to heavy sensations depending on where the electrodes are placed and the contact area of the electrodes. Milder sensations are felt using dime size electrodes on the skin. Heavier sensations are reported when using orifice plugs.

Psychological Aspects: Only the nerve stimulation is present, but the intensity, timing, and pacing of them is under the top's control. This contributes to a feeling of helplessness, especially if the bottom is restrained.

Caution(s): Even though it is considered a mild device, tops and bottoms should concern themselves with the possible current paths within the body. There are generally very modest muscular effects from the unit, but the bottom may writhe in response to the stimulation being controlled by the top. There have also been cases reported of urethral inflammations such as cystitis or non-specific urethritis in women because of extended TENS stimulation in their genital area during a play scene.

Toy: Electric Fly Swatter

Operating Principle: The elctric fly swatter looks like a small plastic tennis racquet, but with wires that are charged to a high voltage by an electronic circuit. The circuit uses a capacitor (for storage) and a small transformer – just like the flash unit on your camera. The swatter may or may not be effective on flies, but it's very effective on body parts accessible through flies.

Voltage(s): High voltage – about 200 volts. It uses a 9-volt battery.

Current(s): High currents – 2 to 20 ma – but it only lasts as long as the capacitor is discharging (about 1 second). If you hold it against the skin, the electronic circuit will not have a chance to charge and the current will only be about 1 ma.

Frequency(ies): DC.

Body Effect(s): Since the metal grid of the swatter is applied in either a slapping motion or a brief touch, the higher current goes through a relatively small skin area.

Intensity: Sharp and intense for the brief duration that the circuit discharges and/or the swatter is applied.

Psychological Aspects: Initially it looks like a toy, but once the bottom has been zapped it may become an object of fear.

Caution(s): With the high voltages and currents in the fly swatter, you probably want to use it only on the lower extremities. The ass is the obvious and most desirable target for the swatter. In most cases, properly used, it can be almost as effective as a cattle prod, but slightly less intense and slightly safer.

Toy: Shocking Animal Collar

Operating Principle: This device is designed to keep a pet in the backyard without a fence or to discourage barking. A small electronic low voltage shocking device is placed in a pet collar. There is also a small radio receiver and a battery in the collar. When placed around the neck of the pet, a radio signal either from the master or from some sort of automatic sensor will deliver a mild shock to the pet. These collars have been used in scenes by placing them around the bottom's thigh or adapting them for placement around the bottoms scrotum, so the top can deliver a shock at any time from anywhere in the house. A few models offer voltage control, but most don't.

Voltage(s): Pulsed output voltages (to the bottom) are 9 volts – the same voltage as the battery.

Current(s): Pulsed currents (to the bottom) of around 1 ma (milliamp). Current depends on skin resistance.

Frequency(ies): Pulse frequency depends on the manufacturer's design. Usually it's 30 Hz or less.

Body Effect(s): Bottoms mostly report tingling sensations.

Intensity: Bottoms mostly report mild sensations.

Psychological Aspects: Only the nerve stimulation is present, but the delivery is under the top's control. This contributes to a feeling of helplessness even if the bottom is not restrained.

Caution(s): Even though it is considered a mild device, tops and bottoms should concern themselves with the possible current paths within the body. There are generally no direct muscular effects from the unit, but the bottom may be startled and jump in response to the stimulation being controlled by the top.

Toy: Relaxacisor

Operating Principle: A higher voltage unit than the TENS unit. It can be either DC (pulsed) or AC. The voltages and currents are sufficient to directly cause muscle movement. There are usually only controls for intensity, not frequency or duration, although some relaxacisors have been modified by others to include such controls.

Originally relaxacisors were developed for submarine crewmen to exercise their muscles during underwater journeys. From time to time you'll see commercial versions of such units advertised on TV for effortless exercise or muscle toning.

A relaxacisor unit usually comes equipped with four independent output channels and a variety of pad electrodes so that several muscle groups can be "exercised." The electrode pad generally requires a electrode contact cream or even salt water to make a good electrical contact with the skin.

Voltage(s): Output voltages (either AC or pulsed DC) to the bottom are settable from 0 to about 15 volts. Relaxacisor units are generally powered from household outlets (120 volt AC).

Current(s): Currents to the bottom are dependent on the voltage applied and the skin resistance. Generally they're less than 5 ma (milliamps).

Frequency(ies): Most models are AC, so there will be 60 Hz (Hertz) applied to the bottom.

Body Effect(s): Muscle flexing is the primary action of the relaxacisor. The amount of muscle flexing depends on the voltage applied, the electrode pad placement, and the quality of contact of the electrode to the skin. Generally tingling sensations are also reported.

Intensity: As for the tingling sensation of the sensory nerves of the skin, the intensity depends on the contact area of the electrode. For large contact areas a mild sensation is reported. For smaller contact areas more intense sensations are reported. The involuntary muscle flexures usually don't cause cramping, but some bottoms report anxiety over the muscle movements.

Psychological Aspects: As with the TENS unit, bottoms feel that they are at the mercy of the top controlling the unit. Bottoms are subjected to tingling sensations and involuntary muscle flexures.

Caution(s): Because of the higher voltages involved the use of orifice plugs with relaxacisors is not recommended. Extended single play session stimualtion in the genital area of women is also contraindicated because of the reports of urethral infections. Also, since used relaxacisors are available from antique dealers and at flea markets, the unit may have insulation problems and transformer problems that could cause dangerous current levels to flow inside the body. Seeing as most relaxacisors are plugged into household outlets, there may be the opportunity for stray household AC voltages to be applied to the bottom under certain adverse circumstances.If you buy a used relaxacisor, have it inspected by an electrical professional before you use it.

Toy: Toy train, doorbell, and other low voltage transformers.

Operating Principle: These are just ordinary low voltage transformers (see Chapter 7) that you can buy from an electrical supply house or hardware store. The outlet is applied directly to the bottom's skin.

Voltage(s): The transformer secondary is usually a fixed voltage, generally around 6 to 30 volts. Train transformers in particular vary widely, with older models tending to be stronger. The primary is plugged into a household outlet (120 volts AC).

Current(s): The currents applied to the bottom depend on the voltages and the skin resistance. This can be anywhere from 1 to 10 ma (milliamps).

Frequency(ies): Household frequency (60 Hz).

Body Effect(s): Varies with the voltage, current, electrodes used, and points of contact. Bottoms can experience anything from tingling to muscle flexures to intense burning pain.

Intensity: Moderate to intense depending on what is used and how it is used. Some types of transformer offer no control over voltages, so those are an all-or-nothing sensation.

Psychological Aspects: There are not visual or auditory cues. There are just the sensations. For the uninformed user, they experience the same feelings as they do with a relaxacisor or TENS unit, but for an informed user there would be real fear from knowing about the dangers of using such devices.

Caution(s): It is highly recommended that you avoid orifice probes with low voltage transformers because of the lack of control. There are also dangers from excessive currents or even stray voltages from transformers – especially older ones which may be damaged. With so many other toys out there, the cheap price of a low voltage transformer is not worth the safety you lose.

Toy: Violet Wand

Operating Principle: A high voltage toy that uses a Tesla coil to generate the high voltages. Violet wands come equipped with a variety of gas-filled bulbs that glow when the high voltage is present. When the bulbs are in close proximity to the bottom's skin, a spark can jump. There are no contact electrodes that come with violet wands. Action is usually through the gas filled bulbs or by special attachments that allow the top to use his own body as an electrode. There is a control on the unit for the voltage.

Originally the violet wand was used as a medical device to treat everything from baldness to vaginal complaints to venereal disease. No cures were ever reported, but it did produce an interesting variety of gas filled probes, including one for the vagina and another one for the urethra.

Voltage(s): Generally 25,000 volts or more are generated by the Tesla coil. The violet wand is powered from a household outlet (120 volts AC).

Current(s): Generally around 1ma (milliamp).

Frequency(ies): Household frequencies (60 Hz (Hertz)) are present because the violet wand is plugged into an outlet, but the tesla coil and the spark can generate weak frequencies in the megahertz range.

Body Effect(s): Skin sensory nerve stimulation is the object here. This can vary from the ants-all-over feeling as the gas bulb gets close to tingling at the point where the sparks jump to the skin. There is a small amount of heat in the spark, and burns can result from prolonged, continuous exposure of the spark to the same area of skin.

Intensity: Generally reported by bottoms as mild and sometimes pleasant. It can be up to moderate if a spark jumps to a particularly sensitive part of the body.

Psychological Aspects: With a violet wand you do have visual and auditory cues. There's the glow of the gas in the gas-filled bulb and the blue color of the spark as it jumps to the skin. There is also a persistent buzzing from the Tesla coil mechanism as well as the hissing of the jumping sparks.

Caution(s): Violet wands should not be used around the eyes, as the sparks can cause severe damage. Also, the ultraviolet light given off can cause a sumburn or damage to the eyes. It has been reported that this heat from the spark is enough to set fire to flammable clothing and material such as rayon. Used violet wands are available in antique stores and flea markets, but they should be carefully inspected and tested by a qualified electrician or other technician before using. Some players combine violet wand and fire play by letting the sparks ignite small qualities of isopropyl rubbing alcohol (a 70% solution of alcohol in water) spread over the bottom's skin which is then immediately extinguished to prevent burning of the skin.

Since violet wands break down the air between the instrument and the bottom's body, they generate ozone – a toxic gas. Be sure the room in which you're playing is adequately vented.

Be careful to set up your violet wand play so that the bottom is not connected directly to your playroom's grounding system – for example, with metal handcuffs attached to a water pipe. It's best to use bondage equipment and materials of leather, rope, wood and other insulators for violet wand play.

Occasionally a spark will jump to the skin from the exposed metal of the gas bulb's socket. Because of the lower resistance of the spark path the sensation from this spark is much more intense – possibly to the point of danger.

Most violet wands use a grounded plug. They should only be plugged into properly grounded household outlets.

Also DO NOT SUBSTITUTE ordinary bathroom plug chain for the special chain that some manufacturers supply with their violet wands. These special chains have high resistances built into them. Using ordinary chain would create a direct path through which 25,000 or more volts could pass directly to the body.

Toy: Cattle Prod

Operating Principle: The cattle prod is an electronic device that generates a high voltage to the tips using a transformer. The unit is self-contained and has only a trigger to initiate the shock. There is no control on the voltage. It's all-or-nothing. The trigger can be held down for continuous shocking. The original purpose of cattle prods was to control a ton and a half of angry pot roast, in other words, livestock. The high voltage was to be able to shock the animal through its thick hide.

Voltage(s): Output voltages at the tips of 25,000 volts or more. The voltage depends on the size of the cattle prod. Three or more high capacity batteries power the unit.

Current(s): Output currents of about 30 ma (milliamps).

Frequency(ies): Generally a single DC pulse when used to deliver single shocks.

Body Effect(s): Intense muscle flexures are reported by bottoms using cattle prods. Because of the small contact area of the electrodes there is also sharp and intense nerve stimulation. They have also been reported in a few cases to have burned skin, even to the point of scarring.

Intensity: Sharp and severe together with involuntary muscle jerking.

Psychological Aspects: Fear and anticipation of a painful shock is predominant here. Just waving one around without batteries causes people to shy away, and buzzing it can frighten someone quite a bit.

Caution(s): Heavy duty play toy which should ONLY BE USED on large muscle masses like the buttocks or the thigh muscles. A top using the cattle prod should be aware of potential muscle movement. Avoid using cattle prods in orifices because of the voltages involved. Also, the chest should be avoided due to the potential of cracked or broken ribs.

Toy: Stun Gun (e.g., Tensor, Electroshocker, and other names from various manufacturers)

Operating Principle: A personal defense device that generates a high voltage to the electrodes by an electronic generator. The device is self-contained and includes a set of electrodes. It is intended to disable an attacker by pressing the electrodes to the attacker's body and shocking him. When the device is held in the air, a spark will jump across the electrodes. A five second shock with the device will generally disable an attacker for from 5 to 15 minutes. There is no control over the voltage. The unit will deliver a shock as long as the trigger is held down.

Voltage(s): Output voltage across the electrodes is anywhere from 25,000 to 125,000 volts depending on the size of the units. The units are generally powered by 9-volt batteries.

Current(s): Output currents are about 30 ma (milliamps).

Frequency(ies): The frequencies of the delivered shock depends on the circuit used in the electronics of the unit.

Body Effect(s): Intense sensation and general muscular weakness. Once shocked a bottom will be unable to move for 5 to 15 minutes. There will also be soreness around the point of contact.Muscular contractions may be strong enough to crack bones.

Intensity: Severe and intense.

Psychological Aspects: The very visible spark and loud hissing sound of the spark will generally cause much anxiety and fear to a potential bottom. Tops using tensors often only use them to threaten rather than to actually shock.

Caution(s): Extremely high voltages are involved here with potentially intense body damage. If used for shocking during intense play scenes, top should be prepared to render assistance to the bottom as necessary. Do not use if you smell gas. Be especially careful where you point the unit if you don't intend to shock someone. Some jurisdictions allow tensors only to be in the hands of law enforcement agencies. You need to check you local laws before getting one.

Toy: Taser and other names from different manufacturers.

Operating Principle: A personal at-a-distance defense device like a tensor that also generates a high voltage to the electrodes by an electronic generator. The device is self-contained and includes a set of electrodes that are fired into the attacker by a spring loaded gun on the main body of the weapon. Metal wires connect the sharp pin electrodes to the main body of the unit. It is intended to disable an attacker by shooting the electrodes into the attacker's body and shocking them. A five second shock with the device will generally disable an attacker for from 5 to 15 minutes. There is no control over the voltage. The unit will deliver a shock as long as the trigger is held down.

Voltage(s): Output voltage across the electrodes is anywhere from 25,000 to 125,000 volts depending on the size of the units. The units are generally powered by 9-volt batteries.

Current(s): Output currents are about 30 ma (milliamps).

Frequency(ies): The frequencies of the delivered shock depends on the circuit used in the electronics of the unit.

Body Effect(s): Intense sensation and general muscular weakness. Once shocked a bottom will be unable to move for 5 to 15 minutes. There will also be soreness around the point of contact.Muscular contractions may be strong enough to crack bones.

Intensity: Severe and intense.

Psychological Aspects: There are no audible cues, but the sight of the weapon will be enough to cause fear. Tops using tasers will often only use them to threaten rather than to actually shock.

Caution(s): Extremely high voltages are involved here with potentially intense body damage. Avoid using on the chest due to the potential of cracked or broken ribs. If used for shocking during extremelly intense play scenes, the top should be prepared to render assistance to the bottom as necessary. Be especially careful where you point the unit if you don't intend to shock someone. Some jurisdictions allow tasers only in the hands of law enforcement agencies. You need to check your local laws before getting one.

Toy: Telephone Magnetos

Operating Principle: A telephone magneto was used in old hand-cranked telephones to ring a bell at the operator's switchboard. It has the mystique of being the classic torture device of military interrogators and South American dictators.

Voltage(s): Output voltage varies on how fast you crank the handle. You can get up to 100 volts AC.

Current(s): Depends on the voltage and the skin resistance, but you can easily get 10 ma (milliamps).

Frequency(ies): Depends on how fast you can crank the handle. Generally you generate around 25 Hz (Hertz).

Body Effect(s): The currents generated are generally enough to cause involuntary muscle flexures. When used over a long period of time, can cause muscle damage and deterioration.

Intensity: Severe sensory nerve sensations as well as intense muscle jumping.

Psychological Aspects: When done in the context of an interrogation torture scene, the mere sight of the device usually raises the bottom's anxiety level. Also, in scenes where telephone magnetos are used, the bottom is generally restrained and has a feeling of helplessness when tortured with the device.

Caution(s): Telephone magnetos can be found in antique shops and flea markets, but are generally not in working condition. Very often the problem is an electrical wire break in the magneto. This is difficult to repair. A telephone magneto is a heavy-duty toy. A top using the it should be aware of potential muscle movement, and should only be used on large muscle masses like the buttocks, the thigh muscles, or the soles of the feet. **Do not use** telephone magnetos in orifices because of the voltages involved. Also, the chest and nipples should be avoided due to the potential of cracked or broken ribs and possible heart problems. Special care should be exercised in using telephone magnetos on the feet as the strong muscle flexures may be enough to break the small bones in the feet and ankles.

Toy: Household AC (from a wall outlet).

Operating Principle: I've written many words in this book about how dangerous household AC is and how engineers and electrical codes design for and regulate it for reasons of safety. Yet some people insist on using it as a play toy.

There is a reported case of where a couple wanting to enhance their sex life inserted anal probes which were connected to the wires of a plugged in extension cord. One of them had the hot wire in their asshole; the other the neutral. They then fucked. Their corpses could not reveal whether there was even a momentary thrill in it.

Caution(s): For God's sake, **DO NOT USE THIS AS A PLAY TOY!**

Toy: Automobile spark plug ignition system

Operating Principle: All gasoline-burning automobiles, whether they're fuel injected or not, use a spark plug system for igniting the fuel in the cylinders. As part of the ignition system there is a transformer-like device called a coil that is used to generate extremely high voltages so that the spark plug can fire. There have been popular entertainment movies that show the good guy being tortured by being connected to one of the spark plug wires. As the motor revs up, the good guy screams in pain as this high voltage shocks him. Fortunately this is only a movie and the actor doesn't really get shocked, but this method has been used during some interrogation tortures. I won't even list the characteristics of this toy. It is simply too dangerous.

Caution(s): DO NOT USE THIS AS A PLAY TOY!

Toy: Neon Sign Transformer

Operating Principle: A high-voltage 60 Hz device which can be deadly if you make contact with its metal electrodes.

Caution(s): DO NOT USE THIS AS A PLAY TOY – even if it's marked "current-limited."

Toy: Amateur Radio Transmitters used as Diathermy Machines

Operating Principle: Since a diathermy machine is basically a radio transmitter, some people are tempted to adapt a surplus radio transmitter to operate at the same frequencies as one. Because of the extreme risk of deep, painful, and slow-healing radio frequency burns, I won't even list the characteristics of doing this. It is simply too dangerous.

Caution(s): DO NOT USE AMATEUR RADIO TRANSMITTERS AS PLAY TOYS!

Toy: Diathermy Machine

Operating Principle: Doctors and physical therapists use diathermy machines to warm the interior tissues of a patient's body for the relief of arthritic pain and muscle soreness. It is basically a radio transmitter operating at low radio frequencies. By use of properly positioned and operating antennae and grounding pads, the radio waves pass through the body and warm up the tissues as described in Chapters 6 and 11. A number of controls on the machine can adjust the radio wave strength, the frequency, the duration and many other factors. In the hands of a skilled operator, it can be quite therapeutic.

Voltage(s): Low output voltages of the radio signal. The voltages aren't, however, the key to the machine's operation; the frequency is. The machine is powered from a wall outlet (120 volts AC)

Current(s): Low currents of the radio frequency signal flow inside the body. Generally less than 1 μa (microamp).

Frequency(ies): Diathermy machines operate at the low radio frequencies – generally between 50,000 to 200,000 Hz (Hertz).

Body Effect(s): Warming of the interior tissues by radio waves. (See Chapters 6 and 11).

Intensity: Generally mild warming sensations.

Psychological Aspects: The presence of a large, complicated machine can intimidate a bottom who is not familiar with diathermy machines. This intimidation can be enhanced when the bottom is restrained. When a bottom is blindfolded the feeling of tissue warming with nothing contacting the skin can either be pleasurable or worrisome to them.

Caution(s): These machines are rarely usedbecause of lack of availability in the used medical equipment market. If you can get a used one it should be carefully inspected and tested as it may be damaged. An apparently operating but yet damaged machine can be a source of radio interference (see Chapter 6). This can lead to an investigation and prosecution by the FCC. Also care must be exercised in the use of the antenna and grounding pads as there is the potential for inflicting deep, painful, and slow-healing burns inside the body. You should get the operating manuals with the machine and become thoroughly familiar with them.

Chapter Fifteen

Putting It All Together

Michael Faraday was a brilliant English physicist and chemist of the early 19th century and the inventor and discoverer of many of the electrical devices and laws used today. Once at an industrial exposition where his devices were displayed, the Prime Minister stopped by his exhibit. Michael in a flush of excitement from the sheer honor of it eagerly showed off his new inventions.

"That's all very well and good, Mr. Faraday," the Prime Minister exclaimed, "but of what practical use is this electricity of yours?"

After a brief pause, Michael retorted, "Ahh, but Mr. Prime Minister, some one of these days you can put a tax on it."

"OK, Unc, we learned all about the Three Ps of electricity... but how do we use it for play?"

Boy, am I ever glad you asked that question. In fact, I encourage you to write the publisher of this book clamoring for more information about electrical play. Then "Juice Too" will miraculously appear on the store shelves.

Remember way back in the early chapters when I said this book was a basic primer and that understanding was the necessary key to electrical play? Well, those of you who studiously waded through this text so far will now be rewarded. Those of you who haven't, shame on you. Don't cheat. Read this book from the beginning. The information contained herein might save somebody's life some day.

Now let's take a look at how to think about and play an electrical scene.

Preliminaries: The Equipment

This step usually, but not always, belongs to the top in the scene.

Choose an electrical toy. Looking at chapter 14 will give you a description of the various toys available. If this is going to be your first electrical scene, then I would recommend a TENS unit. (Why? – See Chapter 13, page 100.)

When you buy or borrow an electrical toy, make sure you test it out. Test it out on yourself. With a TENS unit, plug in a set of the small electrodes and place them at each end of your finger. Feel what the sensations are like at different control settings. (What kind of controls would you expect with a TENS unit? What kind of sensations would you expect? Why? – See Chapter 14, page 107.) Make sure you physically inspect the leads, the electrodes, the case, and the battery – especially if the unit is a used one. (Why? – See Chapter 7, page 45.)

The above inspection should also be done by the top just prior to using any electrical toy in a scene. This is really a double check just to make sure.

Preliminaries: CPR Training

Take a CPR course – pure and simple. (Why? – See Chapter 10, page 78.)

The Negotiation

Both of you already know about negotiation. (If not then put this book down and start reading SM 101 by Jay Wiseman; get some experience; and then read this book from the start.) The sixteen negotiation points in SM 101 (see Bibliography) are a good starting point. Both of you are defining your limits and supplying valuable information about safewords, health issues, trust issues, pain tolerances, and the like.

The top should pay particular attention to heart health and abuse issues of the bottom. Ask specific questions such as, "Do you have any heart problems or trouble with high blood pressure?" (Why? – See Chapter 10, page 77) and "Have you ever been nonconsensually tortured with electricity?" (Why? – See Chapter 13, page 101.)

The top should also inquire about muscle issues, particularly if you're going to be using heavier toys like the relaxicisor or cattle prod (Why? – See Chapter 9, page 70, and Chapter 12, page 91). He should find out how experienced the bottom is with electrical play. A bottom new to electrical play should have a lighter scene than would a more experienced electrical play bottom.

Notice I say "...experience... with electrical play." You can have a bottom who's spent years being tortured with whips, canes, brands, hot wax, etc., but who may never have played with electricity before. The same can be said for "experienced" tops.

During the negotiations, the top should take note of the fascination the bottom has about the impending electrical play. Why do they want to play with you particularly? Do they have specific fantasies? Have they seen you play? What are their tone, demeanor, and breathing like when they talk about their interest in electrical play? Also, what fears do they have about electrical play? Have they had any bad experiences with electrical play or with electricity? Remember the 3rd P, Psychology. In electrical play you are playing with the Fear-Fascination-Trust triangle (See Chapter 13, page 97).

If you are going to be playing with any insertion devices such as conductive vagina or butt plugs then get information about cunt and/or asshole health. Is the bottom prone to vaginal infections? Does she have anal warts? Are there any tears, cuts, or fistulas? (Would you use heavier toys internally? Why or why not? – See Chapter 9, page 69.)

Find out about any metal that may be on or in the bottom's body of which you might not be aware – piercings hidden by clothing or flesh, or metal pins or implants under the skin or in the bones.

Finally if you are going to be using arcing toys such as violet wands, clothing issues need to be discussed. Rayon lingerie might look hot on a cute, writhing bottom, but it has a tendency to melt under prolonged arc placement. Wearing cotton, wool, burlap, or nothing at all would be a better material choice here.

Hey you – bottom! Just because I use the word "top" in the above paragraphs doesn't mean that you should fall asleep or skip them. You're responsible for your own body and your part in the scene. It is imperative (as I said in Chapter 13, page 97) that you make sure your limitations, health, and fears are known. Your life quite literally depends on it. Also, listen to the questions the top asks. Do you get the sense after reading this book that he knows what the hell he's doing?

Remember also, you two (or three or four or...) that negotiation can be seductive. Yes, you are communicating necessary information, but sometimes just talking about play can get you all "hot and horny." That's not bad intrinsically (in fact it adds to the impending play), but negotiations are supposed to be carried out with both parties operating in rational mode.

Preparation

As the bottom is preparing herself, the top should be preparing his equipment for the scene. Sometimes the ritual of pulling out the TENS unit from the toy bag and plugging in the leads can increase the anticipation of the bottom as she takes off her clothes.

The top should make a final test and inspection of the equipment (See "Preliminaries: The Equipment" above). Any orifice devices that will be used during the scene should be swabbed down with alcohol and/or toy cleanser. (Latex condoms over the device will, unfortunately, act as an insulator.)

The top should also make sure that the toy is turned off and all the controls are set to minimum.

The Scene: The Beginning

Whatever the ritual is for starting your scene, do it. For many it is the collaring ceremony. From this point on the scene depends on what you have negotiated, the safewords you agreed upon, the communication between you two, and finally the skill of the top.

The Scene: Building Up

For first electrical scenes I usually like to have my bottoms reclining face up and in spreadeagle bondage. Using cuffs and a bondage table not only is comfortable for the bottom, but is comfortable and convenient for me. All my equipment and the bottom's body parts are accessible to me.

I usually like to fondle and caress my bottom's body to check responses and to start getting them excited. Building up is an important part of a scene because it provides a transition between "real-time, real-world" head space to scene head space.

I may then do a light flogging of the bottom's body to sensitize her skin and to let her struggle against the bondage to enhance her feelings of helplessness. This is a turn-on for many bottoms.

Next I attach the electrodes. Even if we've negotiated for orifice electrical play, I generally start with surface skin electrodes first. Thus I test for responses and also give my bottom a little taste of what's to come.

As for the selection of electrodes and electrode sites, I have a wide choice. Generally I'll start with wider electrodes attached to the top apexes of the pubic hair triangle. This is close to the genitalia, thereby enhancing the turn-on. (Why wider electrodes? – See Chapter 9, page 73). As an alternative I may do it across the soles of the bare feet. (Would you play nipple-to-nipple? – See Chapter 11, page 86. What parts of the body's surface would you not play with? Why? – See Chapter 9, page 68).

Attachment of electrodes need to be planned ahead. Since both of my hands will be needed to operate the TENS unit, the electrodes need to be attached using adhesive tape or adhesive electrodes (but they're pricey). And a little of her pubic hair under the adhesive tape makes "repositioning" of the electrodes more exciting. (By the way, in negotiations did you check about her allergic sensitivity to adhesive tape? Are you using hypoallergenic adhesive tape?)

Then starting with the unit off and all the controls at minimum, I turn it on. Then I start slowly increasing the intensity (voltage) control until the bottom notices it. (She'll either say so or her body will stiffen in response.) Then I can play with the frequency control. I'll increase the frequency and check her responses.

For first scenes, the use of the "One to Ten" scale questions (from "SM 101") during a scene is definitely helpful here. "On a scale from 1, light, to 10, heavy, what did that feel like?" I'll ask. This lets me check my bottom's lucidity as well as providing important information about her sensory perceptions.

Using both the intensity and frequency controls (and the duration controls if the TENS unit has one), I'll slowly work up the scale until my bottom says "...8" or "...9." This gives me a range of control that I can work with – on that particular part of the body.

I then reposition the electrodes to other parts of the body that I want to play with. Cunt lips or the penis from base to tip are favorite places of mine which I save for the last of the experimental trials. Always with a new position I'll start with the controls at minimum and work up. (The bottom in the meantime is enjoying the hell out of it and getting turned on more and more.)

During this building up process I like to talk with my submissive. Using my best seductive voice I ask the "... I (being light but perceptible) to 10 (heavy, almost to the point of calling the scene)" questions, and occasionally ask her what the safewords are that we agreed to. Here I'm maintaining communication and checking lucidity. (Some bottoms can "space out" into a non-verbal state which renders them incapable of saying the safeword, and I need to know if that happens.)

The above is but one variation of building up. There are many ways of doing it. The object is to get the bottom more turned on and obtain information as to her range of responses.

The Scene: The Middle (Loosing the Dogs of War)

Once I know the ranges of control and the responses of my bottom, now I can have fun. My sadistic glee comes out by first positioning the electrodes in a particularly sensitive path, and then starting from a "1" and working up to an "8" or "9." How slowly or rapidly I do this depends on the responses of my submissive. Very often I'll start building up to, say a "5," then backing off a little, then rapidly going to a "9," staying there for a brief moment, then backing down. I always keep her off balance. She doesn't know what kind of sensation or intensity she'll get next. She feels helpless and not in control. She is a toy dancing under my command. I definitely get a power rush on this kind of play.

Sometimes I'll pre-attach several sets of electrodes and my bottom will not know which ones will give sensation next. Again, this is a method to keep her off balance.

In the back of my mind (background processing if you're familiar with computer terminology), I'm paying attention to responses. Every once in a while I'll check on limbs to see if they feel cold (which can indicate circulation being cut off by restraints), and I'll ask her her name or what the safewords are. I will also periodically check her pulse (Why? See Chapter 10, page 77). I am always in control and getting information and feedback on my bottom's condition.

I always talk to my bottom during play. Intermixed with response questions, I do a banter that reminds her that she is the helpless, restrained, receiving bottom totally at my mercy. If humiliation has been agreed to during negotiation, I'll do it now. I also tell her what level I'll hit her with next, and then either carry it out or give her some lighter or harsher variant. I may even offer veiled hints that she are in the hands of a madman, an evil, sadistic Dr. Mengele toying with a victim.

I also do a lot of touching and fondling between electrical bouts. This is also a good time to introduce orifice toys (if that has been agreed to in negotiations). With such a new toy, however, I'll do the same range testing as with the surface electrodes.

I may even use whips and riding crops at this point. The enjoyment of scenes is not dependent on electrical play alone.

This combination of talking, touching, and torture, together with my "back of the mind" processing, definitely gives me an intense feeling of craftsmanship and orchestration. I don't get bogged down by the minutiae of play. The details are never far from my awareness, and yet I'm having fun.

Also, because of my heightened awareness of my bottom and the intense level of communication we have with each other, I get an intense feeling of intimacy with her. If we're at a party, it seems that we are the only two people there, even though others are watching or are doing their own scenes. And yet I'm peripherally aware of the others. (I know enough not to back into another's play space, and I can prevent unwarranted intrusion by other players and watchers.)

What a combination – power rush, craftsmanship, and intimacy. No wonder I have a tremendous feeling of elation and tell myself, "Damn, I'm good!" at the end of a scene.

The bottom is getting something too. I am playing with her fear and fascination. She is the recipient of a variety of unpredictable, variable, pleasurable and sometimes painful sensations. She feels she's under someone else's control. But really, she's in control too. She trusts me. She knows that she has the safewords. She trusts herself. This allows her to relax and enjoy the experience.

This is one of many different type of play styles. As you play with different partners, especially a long-time partner, you'll develop variations that uniquely satisfy both of your needs, wants and desires.

The Scene: Winding Down

Almost as important as building up and the main part of the scene, the winding down phase allows the bottom to "come down" from scene space to or towards reality.

I use the same techniques as I used in the main part of the scene for the winding down phase, except my emphasis is more on the talking and light touching. At this point, I fondle only if we're going to transition into lovemaking.

I start mentioning that I'm going to start easing off. I start asking my bottom some more real-world questions like, "How do you feel?" or "Are you warm enough?" Such questions require that the bottom start using her rational mind. This excursion into reality starts getting her in touch with her body and her surroundings.

This can also be a time when emotions – sometimes deep ones – come up. The top needs to deal with them. Also, the bottom sometimes needs to take care of strong emotions (guilt, fear, sadness) that may have come up for the top. Both the bottom and the top may need reassurance at this time.

This is a time where I hug my bottom a lot – just to let her know that there is someone to welcome her back. Often I'll cover her with a blanket.

This winding down process can take either a couple of minutes or sometimes as long as the scene. This depends entirely on the people involved and the intensity of the scene just finishing.

The Scene: Aftercare

When the bottom is (at least somewhat) lucid and can navigate on her own, the top's job is not yet finished. Taking the bottom to a chair or couch away from the play area is recommended. There you can get something to drink (moisture replenishment is important after a scene) or eat. This can be done in a scene context (for example, sending your bottom to get some food and drink and serving it to you on her knees) if she is also a submissive and it's been negotiated.

Then you talk. Rather than ask, "Was it good?" I usually ask, "What did you like the most and the least about the scene?" Such open ended questions invite a thoughtful response. I get good feedback, and the bottom is brought further back to her rational side and hence reality if needed. The discussion needn't be deep. The object here is to get first impressions – particularly helpful if you're going to do another scene later.

Sometimes a bottom will still have endorphins coursing through her system. In that case I usually make sure that she is taken home rather than letting her drive by herself. If possible, I might arrange for a stayover.

And I'm still not done. I usually call first time play partners the next day to see if they're OK. This gives them another opportunity to express their opinion about the scene we did after some sober reflections. Second impressions are important too.

The Upshot

The above description of a lightweight scene is just an example of one of the many, many variants that electrical play scenes can take. You should be able to see how the understanding of the "Three Ps" help in the scene and how they can be used in a seamless way and without getting bogged down in minutiae.

Everyone and every time is different of course, but addressing these major aspects in your own way will just help both of you enjoy the experience more. After all, the play is the thing.

Chapter Sixteen

Some Typical Play Scenarios

It would be impossible to describe all the electrical play scenes that you can do. It would even be impossible to describe the ones that I've seen at play parties that I've attended. So what I'll do is describe a few typical scenes to illustrate some of the things that you need to consider when playing with electrical scenes. Understand that the gender references given here are just for purposes of illustration. A scene described here between a man and a woman can just as easily be done by two women or two men.

Scene 1 – A Beginner's Scene

Doe is a young submissive female new to the scene. At her first party she sees Bob doing electrical play on another submissive. Bob is using a TENS unit on his submissive, John, and both seem to enjoy it.

Doe is fascinated by the electrical play. She vows to try it.

After Bob and John are through, she approaches Bob and strikes up a conversation with him. Bob soon realizes that he's dealing with a new submissive who is very interested in trying out his TENS unit. They start negotiating. Because Doe has limited experience in negotiation and playing, Bob takes great pains in talking about the subject of negotiations, safewords, and the like. Then he asks her about any limited experience she might have ("none," she says) and what her fantasies are. He asks her about restraints and nudity. Doe is willing to try these. Bob then shows her and explains to her the TENS unit and the various electrodes, clips, and the vaginal plug that he uses in play.

Bob then starts asking her health questions and especially asks about any heart problems she might have. He explains to her that even though she's young, he needs to ask these questions just to make sure. Doe is impressed with Bob's attention to detail. Both of them agree to do a scene.

Bob has Doe strip naked and he puts a collar on her neck. But before he puts restraints on her, he assigns her the task of wiping down the electrodes, clips, and the vaginal plug with alcohol. In this way Bob demonstrates and also assures Doe that cleanliness and prevention of possible disease transmission is important to him. Doe does as she is ordered and is getting more excited by the minute.

Upon completion of her task, Bob spreadeagles Doe to a bondage table. In smooth, confident maneuvers he strokes her naked body and places an electrode on each of her inner thighs. Then standing over her, he manipulates the controls of the TENS unit to start the stimulation.

At first Doe feels only a mild tingling on her inner thighs. She moans softly. Bob strokes her body again which just enhances her feeling. By more control manipulation, Bob builds up the intensity of the sensations. Doe feels the sensations and moans with pleasure.

At one point, Bob asks Doe, "On a scale of 1 to 10 where 10 is definitely unpleasant, what does the sensation feel now?" "Six," she answers.

Bob cranks up the controls again. It's getting more intense but still manageable for Doe. "Uuuuh...that's an eight," she responds. Bob now knows the range that he can work with on Doe. He checks her hands for temperature and takes her pulse. Everything's fine. The restraints are not too tight.

Now Bob goes through a series of stimulations starting from the low point and raising it to the high point. He varies the speed and tempo of the stimulations in response to Doe's moans and cries. He also tries different electrode positions and different rhythms. He also periodically checks her body signs and pulse and frequently asks her how she's doing. All is well. He then uses light clip electrodes on her labia. This too works out successfully.

As the finale for the scene, Bob now uses the vaginal plug. As this is in Doe's orifice, he works her the same way as when he first put the electrodes on her inner thighs. He uses the 1-10 technique and finds that he has to work with a smaller range on the TENS unit. He also checks her body responses and pulse and gets feedback from her. Soon she is writhing and moaning loudly to his control of her through the box. Finally he slows down the intensity and the pacing. He's bringing her down. Orgasms were not discussed during negotiation, so he decided for a more conservative course.

After releasing Doe they hug. Bob strokes her and massages her neck and shoulders. He talks to her to make sure she had an opportunity to tell him about any problems she had with the scene and to talk her back to the real world. Doe had no problems and in fact thoroughly enjoyed the scene. She gets dressed and they clean up the area and then go to the social area for coffee. Doe is reluctant to give Bob her telephone number, so he gives her his. He wants her to call him if she has any problems arise as a result of the scene. Doe and Bob depart satisfied.

Scene 2 – The New Toy

Sally and Mary had been living and playing together for two years. Sally was the top in the relationship and Mary her slave. Mary was a masochist as well and liked intense pain.

Normally Sally and Mary did flogging and caning scenes, and Mary liked to be vaginally fisted after a scene with Sally. Their relationship was intimate and close.

They bought a TENS unit and played with it. Mary enjoyed the electrical play but still preferred a caning. Sally and Mary talked about using a cattle prod in their play, but did nothing about it.

One day Sally bought a cattle prod and brought it home with her. Both of them agreed to do a heavy pain scene that evening, but Mary didn't know that Sally had brought home this new toy.

When Mary saw the cattle prod, she became very anxious. She had always wondered what it felt like, but had never had one used on her. She seen it used on others and heard that it was very intense. And now it was here in their apartment. It was very real, and she was frightened.

Sally told Mary that she'd like to use it on her that evening but would only do so if Mary picked it up and handed it to her. Then she set it on the coffee table. As the evening wore on, Mary couldn't take her eyes off it. Sally noticed this.

When it was time to start their scene Mary picked up the cattle prod and handed it to Sally.

"You know this is intense?" Sally asked Mary.

"Yes, I do," Mary replied in a low voice.

To demonstrate the power of the toy, Sally placed the tips up to her own butt. She then fired a shot. "Oh shit!" she cried as she jumped forward. Even through her leather skirt it gave quite a jolt. Mary started to sweat and tremble, but she still wanted to try it.

Soon Sally had Mary stripped to her underwear and tied to the suspension bar. Sally then proceeded to give Mary a warmup flogging. It seemed to Mary that Sally had gotten more energized and toppy with that cattle prod zap she took. Soon Mary was in deep subspace and had a nice red glow on the whipped parts of her body.

Sally now grabbed the cattle prod. She lazed the wicked points of the cruel instrument over Mary's trembling body. Mary pleaded with Sally but she did not call the safeword. Sally placed the point directly on the fleshy part of Mary's ass and waited. Mary tried clenching her ass cheeks and then relax them. She didn't know when the cruel shock would come. She wanted Sally to get it over with, and yet at the same time not to do it. This wait was agonizing.

Finally Mary felt a sharp, painful jolt on her ass. She leapt forward. It was worse than a caning. Sally grabbed Mary by the hair and hissed, "How was that baby? Are you ready to wuss out?"

"Whatever pleases you, Mistress, but please have mercy," Mary sobbed in reply. She was still feeling the pain of the jolt. Still she did not call the safeword.

Sally used the cattle prod a couple more times. Mary was jumping around and pleading. Finally Sally put her on the sling and gave her a good fisting. They then went to bed and made love all night.

Late the next morning the two of them talked about their new toy. Both agreed that it was going to be used often in future play.

Scene 3 – Jack and the Mistress

Jack and Mistress Kim had played several times already. Jack liked to be flogged and spanked, and also enjoyed psychological scenes where he could get in touch with his emotions.

One time Jack set up an appointment to play with Mistress Kim. In their negotiations, Jack said he wanted as part of his scene to be tied in a chair and have her torture his cock with her TENS unit. They had never played with electricity before, so Mistress Kim asked him some important health questions. He had no heart problems. His EKG's came back normal and his doctor had given him a clean bill of health.

The two of them started their session. Mistress Kim flogged and spanked Jack as per their usual scene and Jack seemed to enjoy it. Now it was time for the electrical scene.

Mistress Kim tied Jack up in a wooden armchair. She then placed electrodes on either side of his erect cock. He seemed nervous, but excited to try it.

As Mistress Kim started off slowly and checking Jack's body responses, pulse, and verbal feedback, Jack seemed to be OK. Now having the range that she could use, she started varying the intensity and tempo of the stimulations.

Jack at first was moaning softly, but after one of the more intense stimulations, he started sobbing.

"Oh mommy, I'm sorry. I'll never play with my pee-pee again. Please stop. Don't hurt me any more." He continued on this way for several minutes.

This was definitely something that was new to her and something they had not talked about. Mistress Kim immediately saw that Jack was acting out a childhood trauma, and she immediately turned off the TENS unit. Jack still did not stop his pleadings to his mother.

Seeing that Jack was not hostile or aggressive, she started talking to him to tell him that everything was going to be OK. Jack was still ranting, but he seemed to understand at some level.

Mistress Kim kept talking as she placed a blanket around Jack's shoulders. She explained to him what she was doing and kept talking to him to bring him down from his crisis. They sat on a pillow together as she held him and rocked him and told him everything would be OK.

Jack finally calmed down and stopped ranting and crying. When he was much calmer he explained that he had started remembering being sexually abused by his mother as a child. He'd done his best to forget that experience; however, it was brought back to him by the electrical play. He apologized profusely, and thanked her for helping him come down.

Jack soon sought therapy to resolve his traumas. Mistress Kim is now more cautious in her interviews; although she knows that surprises happen, she does her best to find out about histories of abuse or trauma so that she can be as aware as possible of potential trouble areas.

Scene 4 – A Boy and His Daddy

Max was Tom's daddy. Tom need strict guidance from his daddy, and Max was just the kind of daddy Tom needed. Tom was mischievous and did things to try and challenge Max. Max brought him back in line quickly and sternly and in no uncertain terms. They had been doing this now since they met five years ago.

Tom and Max were members of the same gay male, Daddy-Boy S/M Club. They often played at the club's parties together. One time the club was going to have a party at the dungeon of one of its members. However, rather than announcing the location in the flyer, each Boy was given the information and told to keep it a secret from his Daddy. The Daddies would have to torture the information from their Boys.

Having agreed to do a scene, Max was now ready to extract the information out of Tom.

"Where's the party location, Tom?"

"I'm sorry daddy, I can't tell you. It's a secret."

"Take off your clothes Tom."

"No, I won't, and you can't make me."

Max, being bigger and more powerful than the slightly built Tom, grabbed the young man, bent him over his knee and started spanking him. Urged on by spanks and sharp stern commands, Tom was soon naked and squirming spreadeagled face down on the bondage bench.

"Boy, I'm only going to ask you this once. If you don't give me the party's location, I'll beat it out of you. When you tell me, the torture will stop," Max said to Tom in a measured tone.

Tom still refused to talk, but his cock was rock hard.

Max started with the heavy leather strap. In a steady agonizing rhythm Tom felt the blows of the strap fall on and heat up his bare ass. He screamed and pleaded for his Daddy to stop, but he still wouldn't reveal the secret.

Max then used a cane even though Tom's ass was already on fire. Still Tom wouldn't talk.

All throughout this torture, Max made sure that he checked Tom's body responses.

"OK, Boy, you know what this means."

Tom indeed knew what it meant. Max was going to use the telephone magneto on him.

Tom felt the electrodes being secured to the soles of his feet. He broke out into a sweat. They had played this way before, and he knew that he couldn't resist this torture too long. But still he had to keep the secret at all costs.

Max gave the magneto a couple of cranks. Sharp pains tore into the soles of Tom's feet. His lower leg muscles jumped like they had a mind of their own. He started crying and pleading more earnestly now. Every now and then Max would check on him.

Several more crankings of the magneto finally broke Tom. He screamed out the location to make the pain stop. Max was satisfied. He was also proud of his Boy for being willing to take so much.

After cleaning themselves up, they went to the party. The Daddies compared notes and Max beamed with pride that Tom held out the longest.

The Point?

I hope you saw that this was more than one-handed reading. Yes, the themes were about electrical play, but in these stories were embedded points about electrical play that I brought up in the text of the book. We see how the tops pay close attention to their bottoms, how a newcomer is started off, what a heavy scene is like, and even what happens when a scene goes wrong. I would suggest that you reread these stories and look at them from the aspect of the points brought up in the book.

Once you've done that, you're now ready for your final exam.

part
four

REVIEW

Chapter Seventeen

Test Your Understanding

The Final Exam

And you thought you were just going to passively read a book. Hah!

Actually this chapter will be more of a learning process than an actual exam. In the following pages I'll give you several scenarios and some questions about each scenario. These scenarios will deal with real-world situations that you may encounter during your career as an electrical player, and the questions will illustrate the ones you might think of if you understand the principles contained in this book.

Yes, I'll also include some answers. They'll be on the backside of the page that contains the scenario and questions and will contain reference suggestions to Chapters and pages for you to take a look at. But I would suggest you write down your own answers first before comparing them with the ones in the book.

Understand that your answers may be different from mine (hopefully not much different). There are no supreme authorities in this form of play. You are responsible for your own play and beliefs. I can only hope that in your different answer you can point to some factual, theoretical, and/or demonstrable basis for it. Remember, the object here is to stimulate your thinking process so that you can start thinking like an electrical player before you stimulate someone electrically.

I'll use the following shortcuts so that the publisher can save on some printing costs and forests won't have to be decimated. I'll use –

C = Chapter number

P = Page number

and F = Figure number

Thus (C5 P45 F21) would mean "Chapter 5, page 45, figure 21."

Ready?

(By the way, if you're a cute masochist, don't forget the special test I'll personally give you in C3 P26.)

Scenario 1 –

You are a total beginner at electrical play. You've read this book. Man you're ready to kick some serious electrical butt! You want to do some electrical play with your partner who has also never played with electricity before. Your partner is interested in trying it.

Questions –

1) Before even one electron is exchanged between you and your partner, what is the first thing you need to do?

2) What toy would you select for your first electrical scene with your partner? A TENS unit? A violet wand? A cattle prod? Why?

3) Should your first electrical scene be combined with other play? Why or why not?

4) Should you know CPR before you do electrical play with your partner?

Suggested Answers to Questions –

1) Before you start playing – especially for newcomers – you should discuss the play and each of your feelings about doing it. What do each of you want out of it? Don't forget the negotiation. Even if you've done scenes before, you should especially review the special questions shown in C10 P77.

2) For newcomers it is best to start slow (see C13 P98). A TENS unit has generally milder sensations and has more range of control (see C14 P107). This would be the preferred first toy of choice. A violet wand has little control (see C14 P114) and a cattle prod is too heavy for newcomers (see C14 P116).

3) Here I would suggest just trying electrical play for your first electrical scene. Here you can better judge your partner's reactions to the electrical play alone rather than have the reactions from other play influence it. Remember here your attention to your partner and your partner's feedback is important (see C13 P99). Starting with the second scene you can start combining different forms of play. But then again this is your choice.

4) YES!!!! (See C10 P75.) Even though you're both sound as the American dollar (uhh...well...) it is always good insurance. You can never be too careful.

Scenario 2 –

You have done several scenes with electrical play and you want to do a scene with your partner using a TENS unit. You want to do this by placing one electrode on each of your partner's wrists. You've negotiated this with your partner. Your partner has agreed and is healthy with no history of heart problems.

Questions –

1) What will be the path of the current you'd expect?

2) What are the possible danger(s)?

3) What mitigating circumstances might offset these danger(s)?

4) What precautions should you take anyway?

5) Would it be safer if you place the electrodes on each sole of your partner's feet?

6) What would your partner feel and where would it be felt?

7) Would you personally do this scene?

Suggested Answers to Questions –

1.) The current path will be from one terminal of the TENS unit, to the first wrist, up that arm, through the chest area including the area where the heart is located, down the other arm, out the other wrist, and return to the other terminal of the TENS unit.

2.) There is a possible current path through the heart and the sinoatrial node. This might possibly be harmful under certain circumstances. There is also a very minor risk of vagal output causing slowing of the heart if the sensations are prolonged (hours). See C10 P76.

3.) First, only a very minute portion of the current going through the body might ever be seen at the heart because of the distance of the current path from the heart, the current limiting qualities of the skin (C9 P67), and the fact that the current will take the easy path rather than the other more resistive paths (C11 P86) which may not involve the heart.

Secondly, your partner is in good health with no history of heart problems. While that is no guarantee, it does give you a better chance.

4.) As with any electrical play you want to continuously monitor your partner's responses. Your partner should give you feedback (C13 P101). You should also take your partner's pulse. Of course, by now you have already taken a Red Cross CPR course and have close access to a phone so you can dial 911 in the unlikely event you need to do both (C10 P78).

5.) Yes, the anticipated current path would be farther from the heart, but it's no certainty. With prolonged play (hours) you could have a possible body chemical slowing of your partner's heart (C10 P76).

6.) Your partner would feel a tingle (C13 P107) generally at the location of the smaller electrode (C9 P73).

7.) I personally would not do this scene, and would urge anybody I cared about to avoid it. However, you're a grown-up: if you choose to take such a risk, that choice, and the responsibility for its outcome, is also yours – yours and your partner's.

Scenario 3 –

You are a bottom at a party. You see this one hot dominant doing electrical play on another bottom, and you feel excited by the thought of having the same thing done to you. You see all sorts of neat toys that the dominant is using, and they seem to be used with great effectiveness. After that scene is finished, you strike up a conversation with the dominant. There seems to be a mutual interest, and so you start negotiating to do a scene. You describe the kind of scene that you'd like to have done.

Questions –

1) If the dominant asked you the regular health questions except if you had any heart problems, what would you do?

2) The dominant tells you, "I've done electrical play a lot. It's perfectly safe even with nipple to nipple play." What would you do?

3) The dominant seems reluctant to do so but accedes to your request to look at the toys that will be used on you in the prospective scene. What is one impression you might get about the dominant? Why?

4) Would you do the scene with this particular dominant at this time? Why?

Suggested Answers to Questions -

1) I don't know about you, but I'd be a little leery about that dominant's knowledge. I would certainly volunteer that information in the negotiation if it wasn't asked of me (see C10 P77).

2) I don't know about you, but to me this wouldn't look so good. See C3 P19 and C11 P86.

3) Again, your call, but to me the dominant seems like he's not very concerned about your concerns and questions. You need to pay attention in negotiations to the things that don't seem right as well as those things that seem positive and promising.

4) All partners in an electrical play scene have a responsibility (C13 P99). This is your body that you will be putting on the line – as it is with any scene. Now there might be mitigating circumstances, like you have seen this dominant do scenes before and believe him to be safe, or you may have a desire to do this despite the things that don't seem right. But unless you see the balance tipped heavily in favor of going ahead, you really may want to consider not doing the scene. Trust is an important issue here (C13 P97 F32). Your satisfaction is also important. You are responsible for yourself.

Scenario 4 –

You are a top in a long-term relationship with your partner. You've done many electrical scenes before and both of you enjoy them. You know that your partner is a masochist who can take heavy pain.

The two of you will be going to a private party soon and you want to do something really special with your partner.

Your partner seems to be turned on by fantasies of being tortured with household AC current – direct out of the wall socket. Both of you know that this is too dangerous to do in reality, but you devise a way to make it look like you're going to shock him with household current. You have a stick that looks like it's got the exposed bare ends of an electrical extension cord. The extension cord is not really connected at all, but the wire ends are connected to a cattle prod that you can operate but that he can't see. The scene is really a mindfuck, and a pretty good one at that.

Questions –

1) You'll be doing this at a private party. What precautions do you think you'll need to take considering that there'll be other people there? What other precautions should you take?

2) What are you trying to maintain with your partner to make this scene work? How can you accomplish this?

3) On what parts of your partner's body might you use this disguised cattle prod? What parts would you stay away from? What need you watch for in doing this?

4) When might your partner call the safeword? What would you do?

5) What aftercare would you give your partner after such an intense scene? Why?

Suggested Answers to Questions –

1) Because others at the party might intervene if your play appears unsafe, you probably want to inform them of your plan. You'll need their silence and cooperation to make this mindfuck work (C13 P97). Of course you'll also need to keep it a secret from your partner. At a more public party, this conspiracy might be more difficult to carry off.

   You'll also need to to assure yourself that your toy is really no more dangerous than the cattle prod that you've used before (assuming that the wire ends are no closer together than the electrodes on the prod). It should be tested on you before you use it on your partner (C15 P126).

2) You need to balance his fear and fascination so that his trust in you is maintained (C13 P97 F32). You'll especially need to gauge his reactions the first time you show your partner your device. You should know by now whether he still trusts you to continue the scene. Some bottoms, especially in a long-term relationship, will feel confident enough that you won't intentionally harm them that they'll let themselves participate in their darkest fantasies. But even here the line can be crossed. It is very important to gauge and be able to interpret their reactions properly. Of course your safeword agreement should be scrupulously honored.

3) Cattle prods should only be used on the large muscle mass portions of the body: the buttock area and the backs of the legs. All other parts should be considered off limits. You'll need to watch for the muscle jerk reaction and plan for the possible limb movements (C9 P71 and C12 P91 F31).

4) Your partner might call the safeword if his fear level exceeds his fascination level (C13 P97 F32). You would of course stop the scene immediately and bring him down from scene space (C13 P102).

5) Aftercare is always unique for the partners involved. You are responsible for bringing your partner down from scene space (C13 P102). He might feel some embarrassment about being taken in by the mindfuck. You'll need to reassure him that you are proud of him and that he did very well.

Scenario 5 –

Two partners who had experienced some play with electricity before have just purchased a new violet wand. They so far have stayed away from "...playing with electricity above the waist," but they've heard it said that you can use a violet wand to do nipple play because "...it's just static electricity." They've heard that you've studied this book, and so they ask you if you think it safe to do nipple play with their new violet wand.

Questions –

1) What would you advise these people? Why?

Suggested Answers to Questions –

1) Once you get past the very strong suggestion to them about reading this book, and you've decided to take on their question (you can beg off, you know), you might want to apprise them of the following:

Because of the possible heart effects with electrical play, ask them if they've discussed the health issues during their negotiations. Does the bottom have any known heart problems? (See C10 P75)

Does the top know CPR, and can she easily phone 911 – just in case? (See C10 P75)

You may want to explain to them the operation of the violet wand (C8 P55 F21-25) and how it does not really operate by static electricity. Also talk to them about the possible current paths that the current from the violet wand spark takes through the body and how the currents in the region of the heart might be mitigated (C8 P59).

You should also give them the lecture about the risks and responsibility of electrical play (C1 P3).

Perhaps better yet, tell them that they should get their own copy of this book and read it through. After all, electrical play is edge play; they should understand what is happening in their electrical play.

Scenario 6 –

You're a top who plays with electricity. You have all your toys at a party, and you do a scene with one partner. During that scene you notice someone looking at it with rapt fascination. You suspect that she's a bottom who might want to do a scene with you. After you finish up your first scene, you talk with this person. Sure enough, she is a bottom and does want to do a scene with you.

Questions –

1) During the course of negotiations with that person, what additional health questions would you ask her?

2) What past experience questions might you ask her?

3) If this person were a complete beginner, what general level of scene and what precautions might you consider for your scene with her?

4) If this person were experienced, what general level of scene and what precautions might you consider for your scene with her?

5) Is there an element of fascination on the other person's part? If so, how should you play with it?

Suggested Answers to Questions –

1) There would be the questions asking if she had any heart problems or a pacemaker (C10 P75). You might also want to inquire if they've had any abuse experiences, especially with electricity (C13 P99).

2) You'll want to determine what level of experience she's had with electrical play. Is she a complete beginner or has she played before? If so, how often? What kind of toys did she play with? Was she top or bottom when she did this? What was her experience of that like? If she is a total beginner, you would want to ask her either what her fantasies about electrical play are – or, if she has no fantasies, ask her what fascinated her about the electrical play that she watched you do. You should also find out what her pain tolerance level is. Does she only like light stimulation or really heavy shocking?

3) Go slow and light (C13 P99). Watch her reactions carefully (C13 P101). Instruct her to give you feedback during the scene (C13 P101). Monitor her pulse (C10 P77). Be prepared to abort the scene if you feel or she feels that something is not right (C13 P102).

4) Same as with #3 above, except that you could do heavier play (within negotiated limits of course). If this were the first time you'd be playing with this particular experienced partner, it would probably be wise to do somewhat less play than you'd do with partners you've played several times with. This allows you some margin – just in case.

5) Your first guess was that there was some fascination. This can be confirmed during your negotiations (see #2 above). You should also assess her fear level of electricity during your negotiations. Generally a beginner will be more apprehensive than an experienced bottom, but I've certainly seen examples of a reverse of this. You should then balance the fear and fascination to maintain the trust s/he has in you so that the pleasure of the scene can be maintained (C13 P95 F34).

Scenario 7 – EXTRA CREDIT for those who have read and understood Appendix Two (P. 167)

Someone has a bright idea about doing nipple to nipple play. They want to use a TENS unit and two special nipple clamps. The two nipple clamps will have each of its sides connected to a different polarity of the TENS unit output (see fig. 34 – I also don't claim original art on this. It was posted on the Internet.). This they figure will avoid any currents going through the heart. They ask you to evaluate the idea.

Questions –

1) How would the clamps need to be designed?

2) Assume a 10 volt battery used in the TENS unit, 10,000 ohms for skin resistance, and 2,000 ohms for internal body resistance. Can you show a full equivalent circuit for the scheme? (Hint: for inside the body, see C5 P33 F11).

3) What would be the current through each nipple?

4) What would be the current(s) inside the body in the region of the heart?

5) Do you think it might be safe? Why?

6) Is it safer than if you put one terminal of a TENS unit on one nipple and the second terminal on the other nipple? Why?

7) How would you state your answer? Why?

8) Would you play using this scheme? Why or why not?

Suggested Answers to Questions –

1) The clamp could not be a solid metal piece or made from all metal. There would need to be two metal parts separated by an insulator, thus preventing the two terminals of the TENS unit from shorting out. See figure 33.

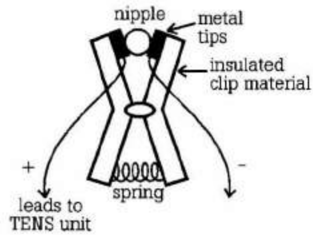


FIGURE 33

2) The full equivalent circuit for the scheme is shown in figure 34.

3) With this scheme the current through the inside of the nipple would be about 1 ma (milliamp) through each nipple (see R_1 and R_2 in figure 34).

4) The currents are already down to 1 microamp in Loop #8 in each of the lattice networks (see fig. 35). Whether this represents the actual currents across the heart is not really known at this time.

5) It probably might be from a current standpoint, but the heart also speeds up or slows down to the body's chemical signals (C10 P74). The models don't show anything about that.It also doesn't show what might happen if a pad on each nipple makes a poor connection so that the current runs across the chest.

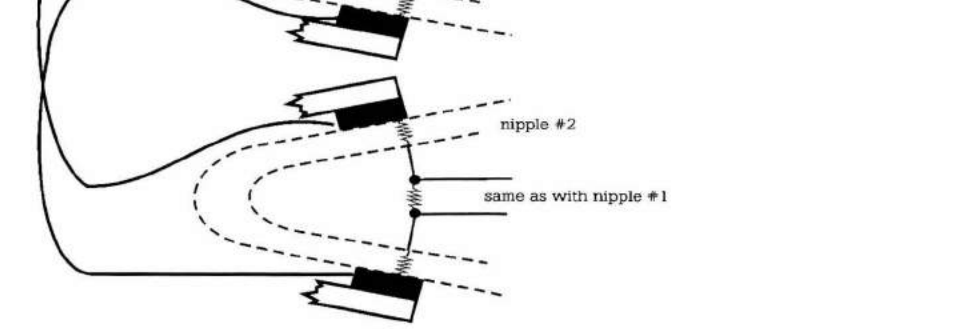


FIGURE 34: EQUIVALENT CIRCUIT

6) The equivalent circuit model for one terminal on one nipple and another on the other nipple is shown in figure 35. Here the lattice resistance network is almost entirely due to the inner part of the body across the chest. Even though the current would be less than I microamp at Loop #8 it would be across more area of the chest. This could mean that the heart might see more current. Then again, maybe not. But, to answer the question, the other scheme might appear safer.

7) For me it would depend on how the other people will use the information. If they want to use your answer as an authority, you should have them read the book and make up their own minds based on understanding the material. There are many more things to understand in electrical play than just a simple answer to this relatively simple question. The other people are responsible for their own safe play.

8) Now that you understand electrical play, gentle reader, that decision is entirely up to you and your partner. Play safely.

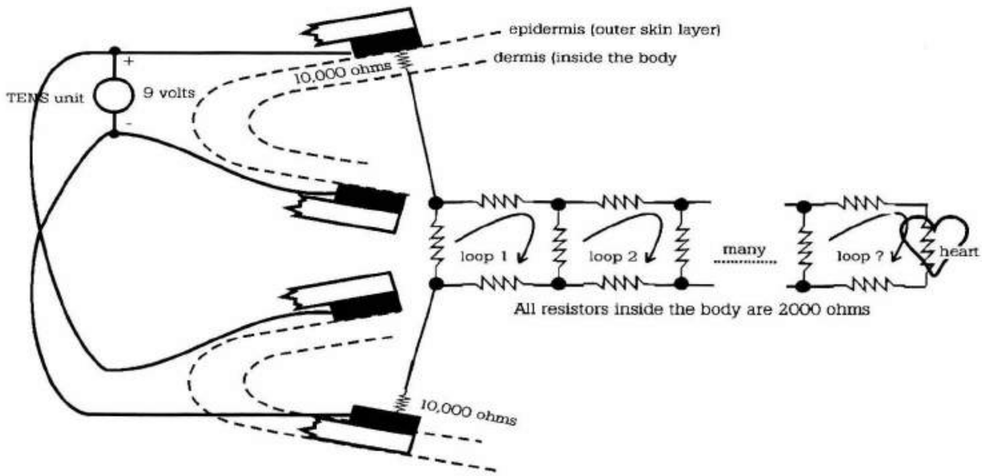


FIGURE 35: EQUIVALENT CIRCUIT MODEL

Now that you answered the questions in this final exam, you may have found some areas that you need to restudy. Please feel free to do so.

As I've said repeatedly (sometimes, I dare say, in the minds of some readers too much) ***YOU CAN PLAY SAFER IF YOU UNDERSTAND WHAT YOU'RE DOING.***

Chapter Eighteen

Some Final Thoughts

Well, I hope you liked this modest little effort. I tried to lead you through the various steps I felt you needed to know to understand the basics of electrical play. Your willingness to buy and read this book shows me that you are dedicated to safe play, and that is very good. With the knowledge you now have, you are well on your way to doing just that in playing with electricity.

Remember too that this is only the basic information. You can't really call yourself an electrical engineer or a physiologist. But as you advance in your skills and practical knowledge of this art, you'll come to realize that these basics I've presented you in this book are really all you need to understand what you're doing.

If this book has been of interest to you or you have other comments about it, please write to me in care of Greenery Press. If the interest is there perhaps there can be another book talking about more advanced techniques.

Play safe and enjoy safely.

(Uncle) Abdul 'Ibn Hurreeya
San Francisco, California

Appendix One

Electrical Meters and Their Uses

In electricity and electronics, a wide variety of meters are used to measure everything imaginable. Normally in electrical play you don't even need meters of any kind. However, if you choose to purchase meters for your own understanding, for experiments, or for designing and testing your own equipment, then this section will give you some basic information on their use and help you understand their limitations. Typically, if you used meters, you'd be using either a voltmeter, an ammeter, an ohmmeter, or a combination of these three called a multi meter (also called a volt-ohm-milliammeter or a VOM). All these meters can be purchased for a few dollars from any electronics supply house.

Voltmeter

A voltmeter is a meter that measures – strangely enough – volts. This is a high resistance instrument and is set for either DC or AC, and placed in parallel (see C2 P17 F4) across the circuit device you're measuring. Here most of the current will flow through the lowest resistance of the pair. Therefore the resistance of the meter (normally about 2.5 megaohms) should be much higher than the circuit device it's measuring. This is really no problem with circuits you'll normally encounter, like in a TENS unit or a relaxicisor. However, you'll notice immediately that such a meter will not work for static electricity or high-voltage devices like violet wands (and may be damaged if you try it). Static electricity and high-voltage equipment require very expensive and specialized voltmeters.

Ammeter

An ammeter is a meter that measures current in amps. This is a low-resistance meter and is placed in series (see C2 P17 F5) with the device that you're measuring the current for. Here you want the ammeter's resistance to be lower than the resistance of the device you're measuring. You should have an approximate idea of the current that you want to measure. Too high a current through an ammeter can burn it out – sometimes dramatically. If you don't know, start working with the largest current setting that the meter will measure and work down. Also the ammeters that you normally get from an electronics supply house will only measure DC current. You'll need special ammeters if you want to read AC current.

Ohmmeter

Ohmmeters measure resistance in ohms. Inside an ohmmeter is a small battery (DC) that sends a small current through the device you're trying to measure the resistance of. This tells you right away that you really don't want to measure the resistance on any device in a circuit that's already powered, or you could burn out the meter or the circuit.

Multi Meter

The nice thing is that all three of the above meters are often combined in one called a multi meter or a Volt-Ohm-Milliammeter (or VOM). You can get these from many different stores quite cheaply. I find it's a good investment if you know how to use them and you're going to be testing or building circuits. For the best system, consider investing in an oscilloscope and a spectrum analyzer as well.

Caution on the Use of Meters Where the Voltages or Currents are Not from Batteries or from Normal AC

Now, one important thing about using any meters. If you are measuring voltages or currents coming directly from a battery (DC) or from a wall outlet or regular transformer (60 Hz (Hertz) AC) then the meters will do a good job giving you reasonably good results. But if that signal has any different shape or characteristic – like with pulsed DC from a TENS unit – all bets are off. You'll get a value, but that value will be as if it were measuring a battery or an outlet. This is because meters are slow and can't follow the rapid changes in high frequency AC or even the signal from a TENS unit. You'll either have to get special meters, or you'll have to know how to interpret the value you read on the meter to the signal that you're measuring. This can be done, but you have to understand the mathematics of the signal.

Appendix Two

A More Advanced Look at Current

In keeping with my promise not to bog you down with a lot of complex math I chose not to include many complex formulae in the main text. Indeed there are some topics that I left out that a traditional teacher of electricity or physiology would gnash his teeth at.

Much of the material in this book has been stripped down to just the bare essentials needed to understand electrical play. I did want to, however, include this one selection as an option just to show the more motivated reader:

1) How fast things can get complicated

and

2) That there are ways of producing reasonably accurate models of even the most complex electrobiological operations.

The topic we'll tackle is how currents distribute themselves in a conducting medium such as salt water or inside the human body. I won't show the complex math involved, but I will discuss the limitations of the model.

Remember the carbon block example in Chapter 2 (page 19, figure 5)? What happens in the carbon block is the same thing that happens in the salt water thought experiment. There are many current paths available. But, let's go back to the thought problem I set forth in Chapter 11 (P 85) – the high power line in the San Francisco Bay and the swimmer in Australia. We discussed verbally why the Australian swimmer does not get electrocuted. But is there a best or even a better way to show this? There are answers, but you won't like what you have to do in order to get to them (unless you love math).

The best way to do it is to actually take an ocean and to measure the voltages and currents in different parts of it. This, however, requires very special and very expensive voltmeters and ammeters and, of course, scuba gear. A better way of doing it is by making a mathematical model of the ocean as far as electric current is. The first trouble with that is that it's a model, and models have limitations. The second trouble is how close the model is to the real thing.

Imagine if the ocean were thinner than a sheet of paper (which of course it isn't). Then I could have what's known as a lattice resistance network, as shown in figure 36. The value of each of the resistors would be 2,000 ohms.

You'll notice that the further I go from San Francisco, the more resistors the current must go through (even though they're in parallel). I'll save you the math (but, unfortunately, I can't avoid it) and tell you the results. With 120 volts at San Francisco and the circuit as shown, the current in the first loop, Loop #1, is about 22 ma (milliamps). At about the 9th loop out, Loop #9, the current is already at 1/2 micro-amp. At the hundredth loop, Loop #100, the current is down to about one electron passing through the Australian swimmer every 100 billion billion billion years.

Now, how real is this model? I can't really tell you. But it does show that the current rapidly diminishes the further away from a voltage source it is. That's the chief benefit from this particular model.

I can also make a highly simplified math model such as in figure 37, which is similar to the ocean model. Here I'm including a resistance for the skin of 10,000 ohms and a internal body resistance of 2,000 ohms. At Loop #1 the current is about 1ma (milliamp), and it falls to less than 1 μa (microamp) at Loop #8. Even if I change the voltage to 120 volts, the current at Loop #8 is still less than 1 μa (microamp). But how big physically are the loops themselves?

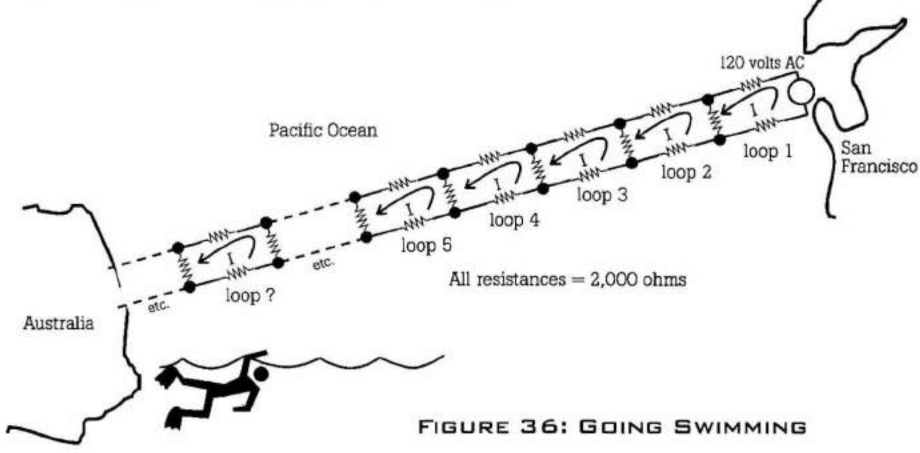


FIGURE 36: GOING SWIMMING

Is this a good model? Can I still get results from it? The answer for all is, "I don't know." The only results you can derive from these models strongly suggests that the inner currents inside the body rapidly diminish away from the main current path.

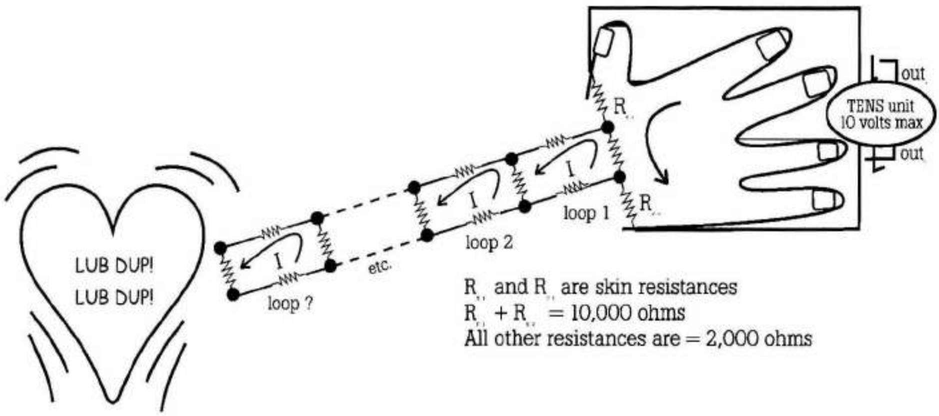


FIGURE 37: GOING PLAYING

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For more information about possible dangers of EMF fields, send for a free booklet from *http://www.niehs.nih.gov/emfrapid* (or call 1-800-363-2383).

http:// www.top-gear.org is a good source for violet wands and other toys.

http://bdsm.miningco.com/index.htm offers links to many electricity-related sites.

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