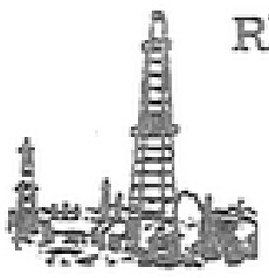
MID-OKLAHOMA REPEATOR NEWSLETTER FOR AUGUST 1973



REGULAR MEETING AUGUST 7 in CITY EOC--MIKE FRIGHT HITS LOCALS

MID-OKLAHOMA REPEATOR INC.

Serving Central Oklahoma Amateur Radio Operators

MORI MEETING SCHEDULED--And yet another MORI meeting scheduled for you, this time in the month of August on the 7th at 8 p.m. at the City EOC, 46th and North Eastern. Program plans are tentative and may include anything from a full blown technical discussion to a Bingo game. Attendance is encouraged since membership is now pushing 145 and getting that 30% quorum necessary to transact business is getting tough, especially during the summer months. Take a MORI break before breaking away for that vacation.

MIKE FRIGHT OVERCOMES LOCAL AMATEURS, TRUSTEE SAYS ITS NOT FATAL--WA5AOB reports a rash of a generally heretofore unknown disease in this area known as Mikus Frightus-a rare OKC strain. The symptoms are relatively simple to identify, a key down carrier on the repeater with no modulation generally timing out the machine and the patience of the trustee. The general cure is the simultaneous removal of the operator's PTT switch from the gluteus maximus of the operator and the car seat of his auto. I have heard outbreaks before in Tulsa and apparently it has spread to OKC. There have been three reported outbreaks of repeaters being keyed on and left until the driver of the car shifted, scratched, or felt a basic urge to leave his car. The result has been the tie-up of an important service. The AOB prescription: DON't throw your mike in the car seat where it is easy to sit on it or throw books on it and depress the PTT switch. DON'T take your TR-22 mike and place it in its case while the transceiver is on,less an improper movement place it on the air. DON'T leave the rig on where the kids can get to it. Positive insurance can be purchased at your friendly local radio store in the form of a 35¢ mike clip for the dash. Store the mike out of the way. Reroute the power to the radio so that it goes through the accessories switch on the ignition so that the radio is off when you are out of the car. Don't force the trustee to ride out to the repeater site to see what's wrong with the repeater. This has happened!! Common sense and care will spare those midnight rides of AOB.

KO Z CORNER--Whatever happened to mike clips? Alas, we knew them well. Whatever, now is the time to check to see that your transmitter is fullproof against it being accidentally keyed by sitting on it or throwing books and other materials on top of it.

We would like to impress upon you a few more common sense notions about repeater operation (no friends, not rules. Hams are suppose to cooperate.-Remember?) The MORI 34/94 is shared by more than 130 different amateurs located in the OKC area. It's purpose is the convience and public service aspects offered to its members. Remember, the proper use of the repeater is for the boosting of portable and mobile stations operating in intracommunity service. If you have the capability to make direct contacts without the repeater, then it is not for you. Two base stations operating through the repeater in disregard for this principle are sadly wasting the capability of this machine and denying the privilege to other stations.

RESULT: Excessive and broadcast type transmissions of little or no interest to the majority of listeners. Use the repeaters to call your friends, then if possible move him off frequency. If you can't, OK, but keep it to the essentials. The repeater should be your last choice for communications capability, not your first and only choice.

Another factor: techniques useful on the low frequencies find little use on two meters. The most common problem--repeating on the repeater. Most FM transmissions are relatively noise free and QSB is usually not a problem. Don't catch yourself repeating information (unless traffic) when it is odvious that they will hear you the first time. Repeating on the repeater is wasteful and if clarification is needed it can be quickly obtained on the next transmission. Call signs can be excessively used as crutches for nothing to say. FCC regulations, §97.87 says that identification shall be given at the beginning at each transmission or series of transmission. This is your call sign only. You do not have to give the call sign of a person who calls you. "This is W5KOZ, go ahead." is sufficient. §97.87 also sez that at the end of a series of transmissions, you only have to give the call sign of at least one of the stations of the group that you are talking to. This is logical in order to identify the next station to transmit. "W5KOZ portable " is not enough! You must attach that call area to it in order to make it a legal I.D. Long series of call letters followed by yours usually done on the low bands are not necessary nor desirable on the repeater. Show your skill as a communicator and demonstrate courtesy to fellow monitors. WA5AOB sez that the repeater gets upwards of up to 6-7hours of use a day. How much of that time is yours? This breaks down to about 2 1/2 minutes per member. The question is not limiting yourself to just less than 3 minutes a day, but just remember that the nature of repeaters and the number of repeater users demand your careful and concise consideration in your use of the machine. Conversations with your friends are to be encouraged since the repeater is there for your use. But it is not 75 meter phone. It is to the advantage of the club to have as many monitors on frequency as possible for the assistance of mobiles and transients. But most base sta-

tions usually are engaged in other activity and a constantly chattering repeater is fatiguing and a distraction. Keep the repeater the useful service that it is and above all give the mobiles and portables an opportunity to break and call their station. Fortunately this is not a serious problem in OKC. Most MORI users are courteous and receptive to other users. Happy FMing.

Recent purchases by MORI include the necessary crystals for a two meter transceiver (donated by WA5AOB) for the Red Cross Center with the following lineup 34/94, 22/82, 52/52, 07/67, and 94/94. The Union City tornado convinced the club at the last meeting that the Red Cross should have the capability of using all the major frequencies. In addition, a 4 channel scanning receiver with crystals for 94, 82, 07 has been purchased (per club vote last year) and is now ready for installation (courtesy of Elmo Black) at WKY as soon as arrangements are made. In addition, WA5EPK purchased more than 90 dollars worth of replacement tubes for WA5AOB the other day! Who sez that repeaters don't cost money!

KIND OLD ZOMBIE

U.S. POSTAL DEPARTMENT DEPARTMENT--Check the stamp used in mailing your trusty rusty newsletter to you and you will (hopefully) see the new commemorative stamp issued by the post office called "Progress in Electronics." We purchased special for the newsletter mailout and there should be enough to go around and hopefully leave enough for all MORI business correspondence. Stamps are available now and the new 11¢ air mail versions and others will be available soon (probably by the time you read this). Get a few. They really spiff up QSL's.

MORI MEMBERS SAY 73 TO HAM RADIO MAGAZINE PRICES -- Excessive prices that is. The membership has been the recipient of several (slurp, gulp) magazine subscription offers by the publishers. Example 1: 73 MAGAZINE for just $3.00 a year (This is for present nonsubscribers only). HAM RADIO publisher Skip Tenney at EXPO 73 handed me a sheet that offers their excellent journal to club member for just (gasp!!) $4.50 for one year and $10.50 for three years. All that is necessary is that we order at least five subscriptions initially, but after that we can send them in at any time or quantity. A penny pincher's delight. We'll be gathering together the necessary five subscriptions in order to get on this gravy train at the next meeting, so if you can help-contact the Secretary-Treasurer. More info on other mags as it becomes available.

POST EXPO FACTO 1973--What a trip! 800 miles to the Chicago FM club's EXPO 73. WA5LTM and myself felt like two elephants in a sardine can after climbing out his Toyota in Joliet (remember the home of WR9AAA, the first repeater licensed under the new rules) at 4:30 a.m. A miscalculculation of the time necessary for the trip meant that our motel reservations were used for only two hours (one of sleep and another to clean up) and get back on the road for Chicago at 7 the next morning. Anyway it was worth it. This is really one of the nice hamfests around. No airconditioned buildings, but plenty of manufacturer's exhibits and a truly great flea market. They had everything, from minature components to Motorola handie-talkies and transceivers (low band) and test equipment. WA5LTM almost bought a Standard H-T, but his built in hesitancy swept him out before I convinced him that this was a deal. Alas too late. Going back, the radio was gone. He compensated by buying an amplifier instead.

The seminars were interesting. Perhaps one of the more significant was a speech(?) made by the FCC's John Johnston (whom I have a suspicion is the person who sent the MORI application back (See the july newsletter). This seminar gave a considerable insight into what the FCC has on their mind these days. The discussion itself was less than successful (between harassment by Lew McCoy and Wayne Green and Johnston's own hostility in refusing to answer certain questions) but certain key words and ideas kept creeping into my mind from his discussion. My impressions are that the FCC is trying to rapidly change their philosophy of treatment of amateur radio from that of a CARETAKER's status to a Goal oriented organization. Those of you who are familiar with administrative studies know about PPB (planning, programing, and budgeting) the whiz kid's bureaucratic acronym that arose during the Kennedy administration in the DOD under McNamera. It was at that time that the structure of administrative agencies changed from incremental control (changing as the conditions changed) to the achievment and production of certain specified goals. Well, it has finally filtered to the Amateur Service (having been through the broadcasting divisions and currently embroglioed in the CATV areas) and the hams are apparently taking the brunt of the action. These people want to take a hobby that previously existed as an independent service with little regulation and change its organization into a regimented utility with goals and achievements the primary outputs. OK, then. Not bad so far. Ham radio could use a little shaking. A systematic approach might prove useful. But the problem comes in determining those goals and what they are to achieve. I conclude that the FCC has not been imaginative enough in realizing the potentials of amateurs (and especially repeaters) and overly protective in determining what safeguards should be applied. Examples? They abound. Which is more important? The possibility of a repeater malfunction and a carrier on the air for an hour or two or the crippling of a valuable service at night or on weekends because someone isn't available to monitor the system? By limiting the number of control stations to 6, you

cut down on the legwork of the field engineer in inspecting a repeater, but you also increase the possibility that the system will be off the air because of overworked monitor stations. Walker's comments on the CB service (if accurately reported) at the Rochester hamfest indicate their desire to see large number of radio operators with radio mobile capability, yet when you impose rules that restrict and discourage the growth of a potential emergency communications system with exams and repressive regulations, then you prevent ham radio from reaching its potential. And thus, the ham might truly be a dying breed. The FCC should be asking for our cooperation, not building us into a corner by trying to achieve their goals completely through regulations. There is a tremendous informal structure that they have never attached to and it appears that any spirit of cooperation that previous existed between the amateur service and the FCC is rapidly dissolving into the foggy mist that was public service. And the difficult part to accept is that all the histrionics and hysteria will do no good. Administrative agencies have made themselves fairly impervious over the years to the demands of the groups that they regulate (and in some instances for good reasons. If the FDA didn't, the drug industries would have killed all of us long ago). This is part of the administrative nature. The solution might be some independent amateur oriented person like Ralph Nader who acts(much as Archibald Cox) as an independent watchguard over these agencies. Ham Radio needs a Ralph Nader, not a Chicken Little.

JUMPING AT EXPO--What else was happening? Well, I'll tell you. In the manufacturer's exhibits, WALLER ELECTRONICS was demonstrating its new touchtone pad made from a single IC chip. It uses the new Chromerics pad that is much smaller than the original Chomerics. These are currently available for your Walkie-Talkie. Some of the difficulties that are currently encountered because the chip is not RF proof. This might be overcome when John Waller unveiled his new synthesized touchtone pad which uses a single crystal and a LSI chip that synthesized all the tones. I saw the prototype in his motel room and it should be one of the ultimate answers to touchtone control for your H-T or mobile. The device is being made so that you just place it over the microphone of your radio and there are no connections. THE PORTABLE CLINIC operated by Bob Hicks is a new operation that offers the latest in Motorola and H-T accessories. Bob worked for Motorola for many years and is the person responsible for many of the modifications now available. He carries a 12 transmit 12 receive universal (with remote microphone) Motorola HT-220 with minature Chromerics TT pad that looks like it must have taken a sqint-eyed leprechaun to assemble. VHF ENGINEERING was offering their new receiver kits and transmitters and you can buy a complete repeater kit from them at a substantially smaller cost than many of the current models. DYCOM and STANDARD both had repeaters in place and operating for the duration of the meeting. A handy new device is the DYCOM "Sniff-it," which in conjunction with your local VOM will indicate low level RF currents clear up and past 450 MHZ. and power levels as low as 1 milliwatt. Just right for tuning up that oscillator or tracing out that transmitter stage. MOTOROLA, GENERAL ELECTRIC, AND RCA were all present and passing out literature. GE had members of the Chicago Amateur Radio Club demonstrating their new "voting machine" which uses satelite receivers and then "votes" the best signal by comparing signal to noise ratios. COLLINS Radio was there having recently got an amateur advertising budget back after having it sliced a year or so ago. We were able to scrounge a manual for the 32S1 recently acquired by the OU Radio club from Dave Maughn, Amateur Service Division Manager. 73 MAGAZINE and (of course) Wayne Green were present and we enjoyed talking with him again and meeting Keith W7DXX/1. Needless to say, when I walked away from his booth, I was staggering under a load of Wayne's new petition to the FCC to reconsider the Repeater Docket 18803. They'll be present at the next meeting if you want to sign them. Skip Tenney and HAM RADIO MAGAZINE were present and here is a fine fellow who really believes in the format of his magazine. He and Wayne both had impressive displays of manuals and other books. Lew McCoy and the ARRL were passing out free repeater directories and ARRL manuals. We got to glance over the remarks that Prose Walker made at the Rochester Hamfest that had been transcribed by the ARRL. TOPEKA FM was there with displays of their products and goodies. Those of you interested in amateur TV (including SSTV) would do well to subscribe to A5MAGAZINE. The first two issues that I got of my subscription are useful and interesting. Details from P.O. Box 6512, Philadelphia, Penn. 19138. REGENCY was showing their new counter as well as the new HR2B. They did not recommend any new immediate source for the new receive crystals that the 2B takes instead of using crystals used in the old models. HEWLETT PACKARD was demonstrating their spectrum analyzer to all those with Walkie-Talkies and surprizing many of them with the bad harmonic content.

And last but not least SPECTRONICS, oh that SPECTRONICS. We visited their booth at the convention site and then trucked down to the store on Garfield on our way out of town on sunday and needless to say, I have never seen so much equipment in one place. According to Art Householder, the large room I was in stacked to the ceiling with FM equipment was one of 7 rooms in 1 of 3 buildings. Just about anything you could want in the way of Motorola goodies. WA5LTM came away with a T44 450 Mhz transmitter for his control station for the OU repeater and a 450 antenna. I was able to find an exceptionally clean Handie-Talkie board to put together

a HT-100 in the near future. And if you want back issues of RPT Magazine, Spec has them for $1.00 each or $6.00 for the entire set (12 issues or so). I am sure that many(if not all) of the several hundred Motorola H-T's we saw at the convention site came someway from ART and Spec. It is quite a place. All kinds of goodies at that place

ELECTRIFYING NEWS--We are reproducing the following graph from the IEEE Spectrum in order to demonstrate a few important rules concerning safety. Remember that a current as small as 75 mils can start the degenerative fibrillation which can cost you your life. The figures are for 60 hz and a man of 68 Kg. Skin resistance is usually on the order of 100K when dry, but moisture and other factors can drop the skin resistance drastically to the order of 1K. Voltages above 600 pierce the skin automatically circumventing your most important protection . Currents above 10 mils can approach the let-go current (above whichyou can't let go). RF currents rarely electrocute (unless particularly high) because of that all important "skin effect." The important factor in the start of ventricular fibrillation is the amount of current that goes through the heart. It has been shown that as little as 10 uA through the heart during a particular time (the T wave or repolarization cycle of the ventricle can cause fibrillation). At 60 hz or DC the body tends to act like a volume conductor and the current density through the heart is high. Since RF follows the skin effect, the current rarely goes directly through the heart, but the high current density at the point of contact and current exit will usually cause burns. Fibrillation is usually irreversible, but the victim can be kept alive by closed chest cardiac massage and artificial respiration. Defibrillation (as many of you have probably seen on television on Marcus Welby) is accomplished by the use of a high current (energy on the order of 200 to 350 joules) which places the heart in a complete cardiac contraction which hopefully allows it to start beating again after fibrillation has ended. Keep the chart and post it where it can be seen by anyone in your shack. It may save your life.

BARGAIN BILLBOARD

FOR SALE--GENERAL ELECTRIC Progress Line Transceiver. 117 Volt Base Station wi five channels, 34/94, 22/82, 52/52, 58/58 already installed. There is space for 07/67. The machine has a nuvistor preamp. For more details, See Mac K2GKK/5. Phone 672-4947.

FOR SALE--HEATHKIT SB-102 with power supply and 400 Hz CW filter. In mint shape and brand new with only a few hours of operation purchased and built by radio technician for use on novice frequencies. Call Gordon Hubbell, Norman. Phone 329-3789.

FOR SALE--REGENCY HR2A with crystals, 34/94, 22/82, 28/88, 46/94, 94/94, 07/67 for $175. Going all Motorola. See Micheal Salem WA5EPK. Phone 321-5453.

Got something to buy, sale, or trade? Let us know. Write or call the Secretary-Treasurer before the 15th of the month preceding the mailing of the newsletter. News items are also welcome as well as your comments. Equal time (within space limitations) will be offered to any member sufficiently offended to write in about it. This newsletter is published by Mid-Oklahoma Repeator Inc. as a service to its members. For information about the club write or call the Secretary-Treasurer or ask any member of MORI. The address of the Editor is Micheal Salem, WA5EPK, 1324 Lincoln, Norman, Oklahoma 73069. . .Phone 321-5453.

CULTURAL EXCHANGE--We are undertaking an exchange (we hope) of newsletters with other repeater groups. If you have the address of an established repeater group within this region that you think might benefit or appreciate the newsletter, let us know. We prefer the address of their newsletter editor or the trustee.

MID-OKLAHOMA REPEATOR INC.
1324 Lincoln
Norman, Oklahoma 73069

First Class

To Amateur Radio Station

HERE IS YOUR AUGUST
MORI NEWSLETTER!!!

MID-OKLAHOMA REPEATOR INC.

Serwing Central Oklahoma Amateur Radio Operators

ELECTRICAL SAFETY CHART

ARTIFICIAL RESPIRATION

1. Seconds count---Don't delay.
2. Get victim away from live wire.
3. Pull main switch--Yank out plug.
4. Use insulated pole or stick.
5. Tilt head well back and push jaw up to open through air route ("In sword swallowing' position)-vital.
6. Seal nostrils with your cheek or pinch with fingers.
7. Take deep breath, open your mouth wide and seal it tight around victim's.
8. Blow into lungs. Watch for chest to rise. Then take your mouth away.
9. Watch chest fall while taking next deep breath (and listen for return rush of air).
0. Repeat process. Do first six inflations quickly. Then at ten a minute for an adult; Twenty lighter breaths a minute for a child.

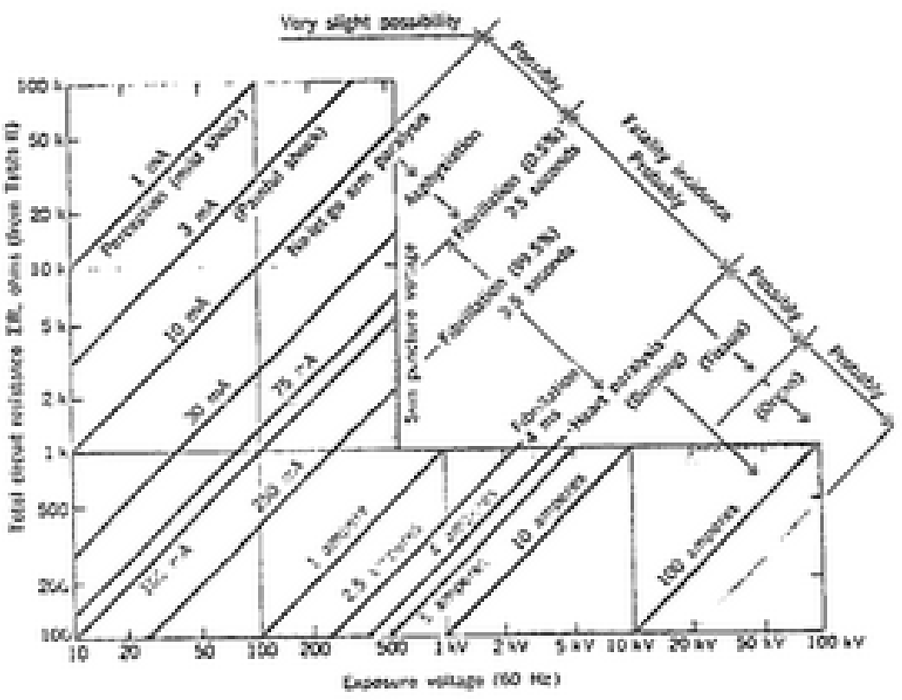


FIGURE 1. A resistance-voltage-current shock appraisal chart.

In Fig. 1, the fibrillation line is shown at 75 mA. Actually, this is the threshold sensitivity for an exposure of five seconds or more. For shorter times, the threshold current is higher, along a constant *I²t* line. It should be noted that, if the duration of shock is only 0.008 second or one-half cycle of 60 Hz, the fibrillation threshold current is raised to 1000 mA or 1.0 amperes. Referring back to Fig. 1, such a situation moves the threshold over almost to a heart-paralysis and tissue-burning zone, and reduces the pertinent area of the fibrillation zone.

This sensitivity, increasing with time, explains why a victim who is "frozen" to a current source is much more likely to be electrocuted than one whose contact does not involve hand grasp. A full hand grasp immobilizes the victim such that he cannot let go; hence the exposure time may extend to many seconds, placing it in range of the 75-mA threshold. In comparison, a casual contact (such as with a fingertip) causes instant retraction of the arm, interrupting the shock-current path. In this case, the victim is exposed for only a few thousandths of a second and is much less likely to sustain an injury. According to Fig. 1, an exposure of 10 ms could sustain a current of 1.5 amperes or 20 times as great as when a paralyzing hand grasp was involved.

In addition, data have been compiled showing the corresponding voltage required to force certain current values through a man having a circuit resistance of 500 ohms. Although this value appears to be rather a pessimistically low human resistance, it can be approached by a man having sweat-soaked cloth gloves on both hands, and a full hand grasp of a large energized conductor and a grounded pipe or conduit. Moreover, cuts, abrasions, or blisters on a man's hands can negate the skin resistance, leaving only internal body resistance to oppose current flow. A circuit value as low as 37.5 volts could be dangerous in this instance. For a 1000-ohm man, 75 volts could be dangerous, and 120 volts would require only a 1600-ohm human resistance.

Since humans are affected in direct proportion to the duration of the shock, the following practice in handling parts or equipment that may possibly be energized appears most logical in reducing this duration:

1. Whenever potentially exposed to values above 50 volts, employ light finger touch only, rather than hand grasp. The strong muscles of the arm, reacting from the muscular contractions of a 10-mA or higher shock, will pull the fingers away, whereas a full hand grasp will probably not be overpowered by the upper arm muscles.

2. Whenever contact is made in such a manner as to be able to retract the contacting portion of the body, duration of current flow is extremely short, since the retraction is instantaneous, with the muscles operated directly by the shock current, rather than from the relatively low motor nerve currents from the brain, which require reaction times of 0.7 second or so.

3. This short duration of shock is much less dangerous than one of the same current having longer duration such as incurred by "freezing" to the contacts from a full hand grasp.

Where voltages above about 2300 volts are involved, the victim cannot grasp the energized conductor, since an arc is initiated to his hand, causing it to retract before he can complete a grasp. For this reason, high-voltage shocks are nearly always of very short duration, reducing the magnitude of burning (watt-seconds) as compared with the result of a long-duration shock.

It is obvious that men cannot work in complete safety when exposed to ratings much over 50 volts. Hence, it is paramount that working conditions be created to eliminate such a situation as far as is humanly possible. The basic condition here is to permit no live work above 50 volts; this means that all circuits within ready reach of any location where work is to be done are to be de-energized during the work period.

II. Human resistance for various skin-contact conditions

Condition (Area to Suit)	Resistance, ohms Dry	Wet
Finger touch	40 k–1 M	4–15 k
Hand holding wire	15–50 k	3–6 k
Finger–thumb grasp*	10–30 k	2–5 K
Hand holding pliers	5–10 k	1–3 k
Palm touch	3–8 k	1–2 k
Hand around 1½-inch pipe (or drill handle)	1–3 k	0.5–1.5 k
Two hands around 1½-inch pipe	0.5–1.5 k	250–750
Hand immersed	—	200–500
Foot immersed	—	100–300
Human body, internal, excluding skin	—	200 to 1000 ohms

* Data interpolated.

III. Resistance values for equal areas (130 cm²) of various materials*

Material	Resistance, ohms
Rubber gloves or soles	More than 20 M
Dry concrete above grade	1–5 M
Dry concrete on grade	0.2–1 M
Leather sole, dry, including foot	0.1–0.5 M
Leather sole, damp, including foot	5 k–20 k
Wet concrete on grade	1 k–5 k

* Data compiled by the author.

I. Current range and effect on a 60-kg man

Current (60 Hz)	Physiological Phenomenon	Feeling or Lethal Incidence
< 1 mA	None	Imperceptible
1 mA	Perception threshold	
1–3 mA		Mild sensation
3–10 mA		Painful sensation
10 mA	Paralysis threshold of arms	Cannot release hand grip; if no grip, victim may be thrown clear (may progress to higher current and be fatal)
30 mA	Respiratory paralysis	Stoppage of breathing (frequently fatal)
75 mA	Fibrillation threshold 0.5 percent	Heart action discoordinated (probably fatal)
250 mA	Fibrillation threshold 99.5 percent (≥ 5-second exposure)	
4 A	Heart paralysis threshold (no fibrillation)	Heart stops for duration of current passage. For short shocks, may restart on interruption of current (usually not fatal from heart dysfunction)
≥ 5 A	Tissue burning	Not fatal unless vital organs are burned

The different values of 60-Hz alternating current and their effects on a 68-kg (150-lb) human are listed in Table I. In short, any current of 10 mA or more may be fatal, those between 75 mA and 4 amperes are probably fatal from heart discoordination, and those above 5 amperes may be fatal from severe burns. It is a fact, however, that shocks in this last current range are statistically less dangerous than those from 75 mA to 4 amperes. In view of the wide diversity of injuries derived from contact with electric energy, it is only logical that, to prevent electric shock or electrocution, there must be minimum exposure to energized parts.

To determine the current, which is the value of interest, Ohm's law is applicable, with the human serving as the resistive element of the circuit. The *E* of Ohm's law is, of course, the voltage of the system itself. The *R*, which is the variable, is actually the controlling factor. Essentially, it is the human skin, along with such factors as area of contact, tightness of contact, dryness or wetness of skin, and cuts, abrasions, or blisters that introduces the variables. Except for the skin, human resistance is about 250 ohms per arm or leg, and 100 to 500 ohms from shoulder to shoulder or hip. The more muscular the person, the lower the resistance. Skinny arms or legs, and those made up principally of fat, have higher resistance. Bone too has a high resistance. Table II shows the range of human resistance variations. The total human circuit resistance is, of course, the sum of the two contact resistances and the internal body resistance. (Compare with Table III.)

Detection of the fibrillation condition requires medical skill. Application of closed-chest massage--a treatment in which blood is circulated mechanically in a fibrillation victim--can result in death of a subject whose heart is not in fibrillation.