



# RF



## ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLIII NO. 6

P.O. BOX 3454, TUSTIN, CA 92861-3454

June 2002

### The Prez Sez:

by Cory KE6WIU

Well, it's that time of year again, Field Day 2002 is now upon us. (See Pg 8 for details). Now, I know you all are probably tired of my reminders asking you to "come on out to FD !!", but as "The Prez" that's my job.

So for the last time this year: If you haven't planned on coming out to FD, please reconsider. It really is a lot of fun, and a good demonstration as to just how crazy, fast, fun, and frantic the world of Amateur Radio can really be. Thanks for putting up with my "FD Soap Box".

Now onto next month... The O.C. Fair!!! We are looking for Ops to man the Amateur Radio booth at the Fair. This too is alot of fun. You get to talk to people and explain why we do what we do, and help the kids send their name in morse code (don't worry, there's a cheat sheet!). If you are interested, contact Bob Buss, KD6BWH, for more details.

See you all at the meeting and 73's--Cory

### The 2002 ARRL Southwestern Division Convention

The 2002 ARRL SW Division Convention will be coming this summer to the California Center for the Performing Arts in Escondido, California on August 16 - 18, 2002

Featured keynote speakers will be **Jim Haynie W5JBP**, President of ARRL and also **Riley Hollingsworth, K4ZDH**, head of the FCC Enforcement Bureau - Special Counsel for Amateur Radio.

**Session speakers** will include:  
Joe Moell- KØOL on ARDF  
Brent Hildebrand- KH2Z on APRS  
Marvin Johnson, KE6HTS on building a tape measure beam  
Jerry Hill, KH6HU, forum on ARRL Education Project  
Harry Hodges-W6YOO DXing 101  
Islands on the Air program (IOTA)

For more details, see the special convention **WEB SITE** at

<http://sd2002.hamcon.net/>

### June PROGRAM:

The June meeting **will be held one week early** on June 14 to prevent interference with Field Day.

The presentation at this meeting will be:

#### "Field Day...

- short FD slide show
- Operation plans"

Don't miss it. All members and visitors are welcome.

The next regular meeting will be:

**Friday, June 14th**  
**@ 7:30 PM**

We will be meeting in Anaheim Room in the east **Red Cross** Bldg.

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AMATEUR RADIO CLUB,  
INC.**

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**Monthly Events:**

**General Meeting:**

Third Friday of the month  
at 7:30 PM  
American Red Cross  
(near Tustin Ave & 4th St)  
Santa Ana, CA

**Club Breakfast:**

First Saturday of the  
month at 8:00 AM  
CowGirl's Cafe, Too  
2610 S. Harbor Blvd  
(just south of Warner)  
Santa Ana, CA

**Club Nets (Listen for W6ZE):**

Wednesday Evenings

28.375± MHz SSB  
7:30 PM - 8:30 PM  
Bob AF6C, Net Control

146.55 MHz Simplex FM  
8:30 PM - 9:30 PM  
Bob, WB6IXN, Net Control

**VISIT OUR WEB SITE**

<http://www.w6ze.org>

for up-to-the-minute club information, the latest membership rosters, special activities, back issues of RF, links to ham-related sites, vendors and manufacturers, pictures of club events and much much more.

**Club Dues:**

Regular Members ...\$20  
Family Members\* ...\$10  
Teenage Members ..\$10  
Club Badge\*\* .....\$3

Dues run from January thru Dec and are prorated for new members.

\*Additional members in the family of a regular member pay the family rate up to \$30 per family.

\*\*There is a \$1 charge if you'd like to have your badge mailed to you.

## Tech Talk #18

### Practical Ohm's Law

by  
Bob Eckweiler - AF6C

(This is the fourth part of a Tech Talk series to review Ohm's Law)

In our last discussion of Ohm's Laws we learned how to derive all twelve equations. This month let's look at some practical examples for these equations. First we'll choose the proper resistor to use with a new AlInGaP high intensity LED (See Sidebar). Next, we'll handle that dreaded phone call many people get. Finally we'll look at building a load bank to test that new 12 Volt 25 Amp power supply you just bought surplus.

#### Example One - The Bright LED

You want to attach an indicator light to your 28VDC power supply so you will remember to turn it off when it's not needed. You don't want to use an incandescent bulb since they seem to burn out at the wrong time. Also, you want an indicator that is bright over a wide angle so you can see it from across your work area. You choose a new AlInGaP light emitting diode (LED).

A quick check of its specifications reveals that the diode drops 2.15 volts at its rated forward current of 70 milliamperes. Since the LED is a current device, you must select the proper resistor to limit the current through the device to 70 ma. from the 28.00VDC source. The resistor must also be chosen to handle the power it is dissipating. From Figure one we see that the resistor must drop 25.85 volts when 70 ma is passing through it. Using equation (3) [Equations are from the February 2002 Tech Talk article on Ohm's Law]:

$$R = E/I = (28.0 - 2.15)/0.070 = 25.85/0.070 = 369 \text{ ohms}$$

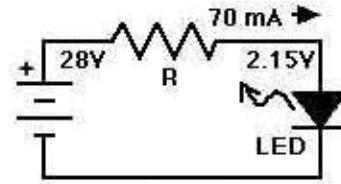


Fig 1 - LED Current limiting Circuit

The nearest 5% resistor value is 360 ohms. Using equation (2) the actual current would be closer to 72 ma. A better choice may be to use the next larger 5% resistor value, 390 ohms; this results in a lower current of 66 ma. which trades off some brightness for more life and reliability.

Are we done? NO! All resistors dissipate power when voltage is applied across them. If we put in a resistor that can't handle this power it will soon fail. If it fails open the LED goes out; if it fails shorted the LED burns out! Neither is desirable. Use equation (12) (from Feb.) to find the power dissipated in the 390 ohm resistor:

$$W = E^2/R = (25.85 \times 25.85)/390 = 668.2/390 = 1.7 \text{ watts}$$

If you used a common quarter-watt or half-watt resistor, a new fragrance would be in the air soon after you turned your power supply on. You could use a two-watt resistor, which would give a small 17% safety factor. But since this resistor will see continuous duty, a larger safety factor would be added insurance. One excellent solution would be to use two 750 ohm 2-watt resistors in parallel. This would give:

$$R = (750 \times 750)/(750 + 750) = 750/2 = 375 \text{ ohms}$$

$$I = 25.85/375 = 69 \text{ ma. (very close to the desired 70 ma.)}$$

Tech Talk #18 - Cont'd on Pg 4

$W = (25.85 \times 25.85)/750 = 0.9$  watts (in each resistor) A very conservative 120% plus safety factor.

$W(\text{total}) = 0.9 + 0.9 = 1.8$  Watts for both resistors.

### Example Two - "Dad [Mom] [Honey], The Car Won't Start"

Eventually, we all hear or say those words in one flavor or another. Often the problem is that the lights or other battery-draining device was left on; other times the battery has reached the end of its life. Rarely it is an expensive component (starter motor, etc.) that has failed. What do you do?

In our scenario you've just gotten the call and are puzzled. Your wife swears she didn't leave the lights on and the battery is only a year old.

Also, she has reported a few times lately that the car was "starting funny". Armed with that information, a few simple tools, jumper cables, your trusty multimeter and some Tech Talk knowledge you head to the mall where the car sits. Upon arriving, the first thing you do is try to start the car. All you hear is a rapid clicking as you turn the key and you notice that the overhead light dims to almost nothing in rhythm with the clicking.

Figure two is a simple schematic a starter circuit. Some resistors have been added that aren't really resistors but are part of the circuit none-the-less.  $R(\text{bat})$  is the internal resistance of the battery;  $R(\text{term})$  is the resistance of the connection between the battery post and the clamp on battery connector.  $R(\text{wire})$  is the resistance of the wire. These resistances are normally VERY SMALL!

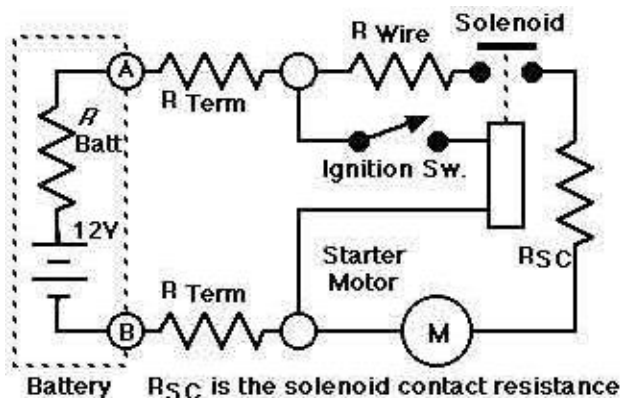


Fig 2 - Typical Starter Circuit of Automobile

The first thing you do is measure the battery voltage across the battery posts; 13.1 volts - the battery is not dead.

You'd like to check the battery under load, so you ask your wife to turn on the headlights. They light, but dimly. Again you measure the battery voltage right on the battery posts (Points A). The meter reads just a bit lower than it did before but it's too small to read the difference; 13.09 volts you surmise. The problem is not the battery.

Quickly you move the meter leads to the battery cable clamps; whoa, here the meter reads a lowly 7 volts. You immediately wiggle the cable and are greeted by a sizzling noise, the lights flicker and the meter jumps between 7 and 13 volts. You ask your wife to turn the lights off and the meter returns to 13.1 volts.

A few minutes with your tools and you've removed the battery terminal, cleaned the corrosion out and reinstalled everything. This time, when you turn the key the car starts like new and your wife decides to go back into the store to buy you something special for dinner!

What happened here? One of the  $R(\text{term})$  resistances became higher due to corrosion, a common occurrence with car batteries. How high? Typical low-beam headlights (along with the associated tail and marker lights) draws on the order of eight to ten amperes. Assuming 10 amperes, a battery voltage of 13 volts and that all the other extraneous resistances are zero, this amounts to a resistance of just 1.1 ohms (Can you use ohm's law to get this answer?)

When the key is turned the solenoid (which doesn't require a lot of current) closes switching the starter motor into the circuit. The 0.2-ohm starter motor that would normally draw about 50 amperes is suddenly in series with this 1.1-ohm terminal resistance. The result is a voltage divider circuit, which we studied in a previous Tech Talk. The starter motor is seeing less than 20% of the voltage it normally would see. Also, the solenoid sees that same voltage which is too low to keep the contacts in, and they open disconnecting the starter motor and causing the solenoid to contact again; thus the rapid clicking sound.

This is just one of many scenarios. If, after turning on the lights, the voltage at the battery posts drops substantially then  $R(\text{batt})$  is dropping the voltage and the battery is probably defective. If the battery, with no load, measures low then it is either discharged, defective or the car's charging system is malfunctioning. Look at each resistance in figure two and think about what would happen if any of them became too large.

### Example Three - A Load to Test Your Power Supply.

You're in your garage. It's late night on the third Friday of October. You've just come home from the local radio club auction with a surplus 12-volt power supply. It's rated at 25 amperes and will be ideal to run your mobile rig when it's out of the car. Before you hook it up to your expensive rig you want to be sure it operates. You plug it in, turn it on see the voltmeter rise to a nominal 14 volts. With your old oscilloscope you look for AC ripple on the output. It's just a few millivolts and you begin to think you've acquired a real prize. Carefully you tweak the voltage adjusting control as you look on your trusty meter; you set it right on 13.8 volts - the ideal voltage for equipment designed to run off a 12-volt car battery under charge.

Everything looks ideal, but how will it perform with a 25-ampere load? What can you use as a test load? A few moments with you calculator and Ohm's law and you find you need a 0.56-ohm 350-watt power resistor. Damn, there was one at the auction, but you didn't bid on it, thinking; "What would I ever use it for?" Looking in your junk box you find numerous low resistance 100-watt resistors. Can you use them? Maybe!

Each power resistor has a specified resistance and a specified wattage. These are usually marked on the resistor body. Using ohms law you can calculate the maximum voltage and current the resistor can handle using equation (9) for the voltage and equation (10) for the current. (I often tag these values on power resistors). For 100-watt one, two and five-ohm resistors these voltages and currents are 10V/10A, 14.1V/7.1A, and 22.3V/4.5A respectively. Remember that these are maximum values above which you will exceed the 100-watt power rating of the resistor. The one-ohm resistor can only handle 10 volts so we can't use them unless we series them; the two-ohm resistors will just handle the voltage, but since this is a short test we will ignore any safety factor. We can place three 2-ohm 100-watt resistors in parallel across the power supply. At 13.8 volts each will draw 6.9 amperes for a combined 20.7 amperes. The resistors can be applied one at a time so the power supply can be checked at 6.9 and 13.8 amperes too. To get the load up to 25 amperes, we still need to draw another 4.3 amperes. We can add the five-ohm resistor to raise the total current By 2.76 amperes to 23.46 amperes. This should be close enough, but if your motto is: "Perfect is close enough" then you need to draw another 1.54 amperes. The maximum voltage for a 10-ohm 25-watt resistor is 15.8 volts. We have one, so lets add it in parallel with the others. At 13.8 volts it draws an additional 1.38 amperes; our total is now 24.

84 amperes. We're now less than 1% from 25 amperes, way within the tolerance of typical power resistors.

At all currents the power supply performed well and you are very satisfied. By now it's way past midnight and you think about bed; but you suddenly realize it's nice and warm in the garage for an October night and you pull out the next treasure you picked up at last night's auction...!

This concludes the Tech Talk series on Ohm's Law.

Next month Ken will continue his series on Digital Communications. What will my next Tech Talk subject be?

I haven't decided yet; now is a good time to send some suggestions my way as I'll be open for influence from the audience!

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### AllnGaP LED Sidebar:

**Recently**, a new type of light emitting diode (LED) came on the market. This LED was designated as AllnGaP (for its material elements...chemical symbols for Aluminum-**Al**, Indium-**In**, Gallium-**Ga**, and Phosphorus-**P**). These LEDs have colors between red and yellow and are much brighter than standard LEDs. They also have a higher forward voltage drop - 2+ volts versus about 1.6 volts, and a higher current requirement - 50 to 70 ma. versus 20 to 30 ma.

To give you a rough idea of the improvement in brightness...a high efficiency red LED (old type) with a viewing angle of 36 degrees has an intensity of 8.7 mcd. at 20 ma.

Compare that to:

The AllnGaP LED has a viewing angle of 90 degrees and an intensity of 1250 mcd. at 70 ma.

Quite an improvement!!!

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**ARRL REPORT**  
**on**  
**H.R. 4720**  
**by**  
**Art-W6XD & Tuck-NZ6T**

A bill introduced in Congress May 14 would provide relief to amateurs prevented by private CC&Rs from installing outdoor antennas. Rep Steve Israel (D-NY) introduced the "Amateur Radio Emergency Communications Consistency Act." The measure--H.R. 4720--would require private land-use regulators to "reasonably accommodate" Amateur Radio antennas consistent with the limited federal preemption known as PRB-1, which now applies only to states and municipalities.

Now here's a opportunity for Club action! Tuck and I are asking each Assistant Director to work with your Club members in writing to their representatives to ask those reps to become co-sponsors of H.R. 4720. It's also a good idea for your Club to send a letter to your Reps on behalf of its members.

Two key points to make are a) the bill is necessary for Amateur Radio to fulfill its role in Homeland Defense and b) the bill is non-partisan. The ARRL full story on H.R. 4720 is located at:

<http://www.arrl.org/news/stories/2002/05/14/102/?nc=1>

Organize a write-in campaign to your Representatives to get them to co-sponsor H.R. 4720.



**Frank Smith- WA6VKZ at the mike of his FT-847 in his new QTH in Tustin**

**WHOis - the Publicity Chairman?**  
**by**  
**Ken W6HHC**

(This is the fifth in a series of articles to inform you about the background of the officers and leaders of the OCARC.)

The Publicity Chairman for the OCARC this year is Frank Smith – WA6VKZ. Frank became interested in HAM radio at the age of 12, through the activities of two uncles: W3QM and W3DL. Frank vividly remembers seeing the world map in W3QM's shack, with red pins for each QSO location....and really being impressed by the Moscow pins. Frank still has the 1936 ARRL Handbook given to him by his uncles which shows how to build 5 Meter rigs (NOT 6M, but 5M !!). Frank first got licensed while in the Marine Corp as K3UZM. His USMC travels allowed him to operate from Japan. He claims to be the only OCARC member to ever operate from the Antarctic...he operated as KC4USX from Williams-Antarctic for two seasons and as KC4USB from Byrd Station-Antarctic for 6 weeks. After returning from Viet Nam, Frank was relicensed in 1977 as WA6VKZ. He has been a member of the OCARC since 1977. Frank has held every office in the OCARC (except VP) and claims a record for being elected OCARC President five times!!

Frank has just moved back into the City of Tustin....after touring the country in his travel trailer, visiting the Orlando Ham Fest and the Dayton Ham Fest...and after spending some "quiet time" living in Anza. His primary base station is a FT-847 - an all mode 1.8-thru-440 MHz (including built in 'satellite modes'). Currently the only lowband antenna is a 10M dipole. The base VHF/UHF antenna is a Comet for 144/22/440. A Kenwood TM331 for 220 MHz is getting ready to go active.

For mobile operations, Frank uses a 2M Yaesu 2400, a 220 MHz ADI Model 247, and a 440 MHz Yaesu Model 7400. The mobile antenna is a Comet tri-bander vertical.

Frank's favorite HAM radio activities include Public Service, QRP, GPS, HAM conventions, and mobile operations...and he has mobile operated all the ways across the US.

Frank was born in Philadelphia. He is currently retired after a career in the Marine Corp (radio operation) and a second career in Cal-Trans (Civil Engrg) He obtained BSCE from Cal State Fullerton on GI Bill after the Marine Corp. His daughter, Sue-KA6QVU, lives in San Jose.

Non-ham activities include reading books, computers, dog (ask Frank about Ollie), and traveling to see the country

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## General Meeting Minutes

17-May

The presentation was on PSK31, given by Dennis Kidder- WA6NIA and Fred Wagner- KQ6Q using 2 laptop computers and 2 radios to show a full 2-way conversation. One of the stations showed how you can use a real inexpensive setup with a homebrew computer to radio interface, and the other showed how you can go all out and buy a pre-built interface.

The business meeting was called to order at 9:13pm. All officers present except Phil N7PA.

**VP:** June speaker is Larry K6VDP speaking on the upcoming Field Day. July will hopefully be John De Boer speaking on Solar Power.

**Treasurer:** As of May 6: Savings - \$25, Checking - \$2889.69, \$7 received at the meeting for license laminating. New checking account has been established at Orange County's Credit Union.

**Secretary:** A letter from the IRS confirming our status as a 501(c)(7) non-profit organization.

**Membership:** 49 members the on roster. A comment was made about trying to do more active recruitment of new members.

There is a ham radio class at OCC coming this Fall, which Matt K6LNX is helping to set up along with the professor there who taught this class previously. They need VE's to give a test session at the end of the class. Students in the class will be encouraged to join OCARC.

**Activities:** Lowell KQ6JD substituting as activities chairperson.

**Technical:** Nothing to report.

**Publicity:** Matt K6LNX sent email to OC Register about Field Day.

**Old Business:** Field Day: The June General Meeting will be moved to Friday June 14th to avoid possible schedule conflicts with Field Day. Email announcement will be sent to all members.

**New Business:** Payment is due for the P.O. Box in Tustin, all members present were in agreement to pay and keep the box.

Bob AF6C made a motion to do an audit to verify the club financial records, 2nd by Matt K6LNX, audit to be conducted at the discretion of treasurer, with any help as is deemed necessary.

The audit was called for because the club financial records, including the checkbook from Washington Mutual bank, were stolen from the vehicle of treasurer Al N6TEZ. Fortunately the financial records were later recovered. The only club property that was lost is estimated \$20 cash, however Al lost some of his personal property.

**GoC:** OC Fair: Wednesday July 17th will be the day for shifts to be filled by OCARC members. Members are encouraged to volunteer to help the Amateur Radio booth at the fair, and show people what ham radio is all about. Those interested in volunteering please contact Bob KD6BWH.

**Emergency Communications:** Fred and Dave (the speakers this evening) are members of Hospital Disaster Support Communications System- [www.hdscs.org](http://www.hdscs.org) & were involved in providing emergency radio communications in Placentia, after a recent train accident. By fate or fortune a drill was scheduled on the day the accident happened, so many people were already in place and well prepared to handle the situation.

License exam testing will be held on the 3rd Tuesday each month at the Red Cross (same place as OCARC meetings).

Respectfully submitted:  
Matt K6LNX

## June Board Meeting

Board meeting came to order at 8:40am. All officers were present except Phil N7PA & Lowell KQ6JD.

**Treasurer:** The treasurer was asked to perform an audit of the club financial records, because of a theft last month. Details of the theft are in the May Meeting minutes. Copies of paperwork for the audit were distributed to all board members. The Board found that the audit was done extraordinarily well, and all records are in order and properly balanced.

Al N6TEZ wanted to donate \$36 to the club to cover the cash lost due to the theft, but Larry K6LDC made a motion, 2nd by Frank WA6VKZ, to not accept the donation because it was unnecessary. The motion passed unanimously.

Al told the Board that he wished to resign as treasurer, and he felt the audit was uncalled for, and that it put undue strain on him. Several members of the board expressed their concern for Al, and Bob AF6C who made the motion for the audit apologized and said that he meant no offense by calling for the audit. He simply wanted to be sure that the financial records were in order so that there would be no problems when the time came for the end of the year audit.

Al will remain standing treasurer until a new treasurer is elected at next Gen Mtg, in accordance with Bylaws.

**Secretary:** We received a receipt for the payment of the PO Box.

**Membership:** With 2 new members, this new roster total is 52.

**Old Business:** Field Day: Cory has to withdraw as captain for the 20M operation for Field Day. Phil N7PA expressed his interest in the position to Cory earlier, he will be contacted.

FD chairman Larry K6VDP said we need a captain, part time, to cover the

## Field Day is Coming!!

by Larry K6VDP  
OCARC FD Chairman

Field Day is almost here!! It is the 4th weekend in June (22-June & 23-June ...one week after our June meeting) and will be held in Portola Park, on Santa Clara Avenue in Santa Ana. This is the club's major yearly event.

The rules have changed a bit for this year. We will be operating Class 4A with four simultaneous stations on the air (plus VHF/ UHF) for the 24-hour period. The operations begin at 11 AM on Saturday and will end at 11 AM on Sunday. We need all the help we can get, even if you can come for only a few hours.

**10M/80M** - Larry Beilin - K6VDP (714-557-7217) is the team captain for the 10M/80M station. This team will operate 10M while open and

75M/80M at night. This location will also set up a VHF station in the 10M/80M shelter.

**15M** - Ken Konechy - W6HHC (714-744-0217) is the team captain for 15 meters. This station will remain on while the band is open.

**20M** - Phil-N7PA (949) 492-1900 & Frank-WA6VKZ are the co-captains for 20 meters team. They will need operators to help stay on the air for the 24 hour period.

**40M** - Chris Winter - W6KFW (714-543-6943) is the team captain for 40 meters. We need a shelter (tent or motorhome/camper) for the 40 meter station. Larry, KR6LO will be there to operate CW and SSB.

**BONUS STATION** - The team captains for the bonus station will be Tom Thomas - WA6PFA and Bud Barkhurst - WA6VPP. We can get lots of bonus points as listed below.

- Public information table-100 pts.

We need to make hand out sheets and visitor log.

- Alternate power-100 pts. We need to make a minimum of 5 contacts on solar power.
- Demonstration-100 points each for a demonstration of APRS, ATV, and SSTV.
- Site visitor-100 points for a visit to our site by a government or Red Cross official.

Fone contacts count 1 pt each and CW/digital contacts count 2 pts each. I challenge each station to make a few CW contacts.

Set-up starts at 7:30 AM on Saturday morning. The OCARC will provide meals to all for Saturday Dinner and Sunday Breakfast. Traditionally, the Team Captains have provided for Saturday Lunch.

Be sure to come out and join the fun.

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ORANGE COUNTY AMATEUR RADIO CLUB, INC  
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***First Class Mail***

***Time Dated Material.  
Please Expedite!!***