RF

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLII NO. 4 P.O. BOX 3454, TUSTIN, CA 92861-3454 APRIL 2001

The Prez Sez:

"April Fools!"

NEW FIELD DAY RULES FOR 2001 DESIGNED TO ENHANCE THE FUN

Field Day 2001 will run from 1800 UTC June 23 to 2100 UTC June 24, **as always, the fourth full weekend in June**. Typically a club or group event, Field Day is the most popular operating activity of the year--and one of the most enjoyable for hams of all skill levels. A few rules changes this year affect bonus points for Field Day scores.

* The non-traditional mode bonus has been expanded from 100 to 300 points for doing three separate demonstration modes.

* Packet is back and will be counted as one of the three demonstration modes, but to claim packet credit, you must set up a portable digipeater system. Existing, permanent packet networks do not qualify for this bonus.

* You may earn a 100-point bonus if an invited local government official or representative of one of the agencies that ARES serves in an emergency visits your Field Day site. To earn this bonus, the invited official must actually visit the site, not just be invited.

* The message-handling bonus has been changed. You may now earn 10 points per message, up to 100 points total, for origination, relay, and delivery of formal NTS messages. In the past, only messages received and relayed were counted. The Field Day participation message to the Section Manager or Section Emergency Coordinator under rule 7.3.5 does not also qualify for bonus points under these rules.

This marks the last year that the extra Novice/Tech Plus station will exist in its current form. The Novice/Tech station is a non-counting transmitter, and its QSOs count for QSO point credit. The ARRL Membership Services Committee is considering several options to encourage participation by newly licensed hams.

The ARRL Contest Branch has compiled a 24-page Field Day 2001 Information packet:

http://www.arrl.org/contests/forms/01fdpack.pdf

This document is available in hard-copy format by sending an SASE with four units of postage to Field Day Package, ARRL, 225 Main St, Newington, CT 06111.

Via: *The ARRL Letter* V20 #10

The International DX Convention Notice

The IDXC is coming up April 20-22, 2001, Visalia Holiday Inn, Visalia, CA. See their web site at: http://www.ncdxc.org/Ncdxc/Convention/idxc2001pre01.htm

The April Program:

The program speaker for the April meeting will be Malcolm Levy, KO6SY, of the Western States Weak Signal Society. Malcolm, also licensed as G4ACU, has lived in the US for the past 16 years. He will be demonstrating weak signal SSB on the VHF bands.

You don't want to miss our next meeting to be held on:

Friday, Apr 20th @ 7:30 PM

We hope to be back in our normal Red Cross meeting room in April.

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Reminder:

MAY 5th 2001

Next Club Breakfast

THE ORANGE COUNTY 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
IHOP
1001 E. 17th Street
(west of Lincoln)
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 December & 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.

A Simple Multi Band HF Antenna You Can Build

By: Larry Beilin - K6VDP

Several years ago, my 14AVQ vertical antenna quit working. I found that the traps had finally given up from corrosion. I then decided to try a delta loop wire antenna. The dimensions were taken from the book: *73 Vertical, Beam and Triangle Antennas*, by Ed Noll - W3QFJ.

My present loop is a full wavelength on 40 meters, about 142 feet around the periphery. The three sides are unequal and were dimensioned to fit the roof. It is supported by a single 33 foot mast mounted on a wooden platform which straddles the peak of the roof. The two sets of guy lines are 5/16" Dacron rope, purchased from a boat supply company. The guys are attached to three eye-bolts which are fastened to three 2 X 4's bolted through the face boards around the edge of the roof. This avoids making any holes in the roof.

The loop is made of #14 gauge enameled solid copper wire. My first loop used #16 gauge bare stranded wire, which after a few years, showed severe corrosion. The loop is fed with home-made ladder line, constructed of the same solid copper wire and polystyrene insulators. The ladder line is only about 15 feet long and is routed through a plastic window to my tuners. Commercially made ladder line is available for about 11 cents a foot, much cheaper than coax.

The delta loop antenna operates on all HF bands and 6 meters. I use four different tuners: a Johnson Matchbox, a Harvey Wells Z-Match, a Kenwood AT230 and a home brew tuner for 6 meters. The first two and the home brew are true balanced tuners as both terminals are above ground. No baluns are used anywhere. For 160 meters, I tie both feed wires together and connect them to the wire antenna terminal on the Kenwood tuner Tuning takes all of 10 seconds on any band. The antenna does not seem to be directional; however a second element could easily be hung on the same mast to make a beam.

There are no magic antennas which perform best under all conditions. However, the delta loop is a simple all-band antenna that really works. It is very efficient as there are few losses in the system. It receives quite well due to its large aperture or capture area. It can be configured horizontally in a triangle or square with somewhat less performance. I will help anyone interested in building one. My tuners were purchased used at the TRW swap meet for reasonable cost.

I recently added a small series coil at the base of the 33 foot mast and four 33 foot radials to make the mast into a 5/8 wave vertical for 17 meters. It works well, and with the Kenwood tuner it will tune up on all bands from 40 to 10 meters.

News From our Member At Large On Vacation:

Hi Everyone. I'm in Florida now heading for Savannah. GA. Was able to VIP view the Discovery launch on the 8th. What a spectacle. Haven't had much time for hamming, but it has been fun. Mardi Gras was fantastic!!!
I'll be back for B2V.

73, Larry, K6LDC, 03/16/2001

This picture was taken at a 1971 OCARC club meeting. In those days we met in the basement of Lincoln Savings and Loan, Bristol and 17th Street in Santa Ana. How many of these faces can you name? There are two that we are not sure of. If you know who they are, please let us know!

Back row from left to right: Jerry VerDuft - WA6ROF (now ADØA), Unknown #1 (?Mike Flaherty - WA6UBW?), Bud Barkhurst - WA6VPP, Don Gould - W6EQY, Bob Eckweiler - WB6QNU (now AF6C), Unknown #2 , Paul Taylor - WA6ENT

Front row from left to right: Bill Robinson - WB6WOO (now N6BR), Ron Cade - WA6FIT (now W6ZQ), Billy Hall - WA6CQR, Ken Konechy - W6HHC, Jack Shaw - WA6YWN (SK).

Tech Talk

by Bob, AF6C

Attenuators:

Often, on one band or another, you'll hear: "Larry, you're two S-units stronger than Bob at this QTH." Or "Bob, you're lighting two more bars than Larry, here." Or perhaps, "Ken you're 40 over nine here, Bob's an S-7." While these sound like good signal comparisons, their accuracy leaves much to the imagination. Most receiver S-meters are notoriously inaccurate and their sensitivity varies tremendously from band to band. How can you give a good comparative report? It's simple if you have a reasonably accurate step attenuator. Reasonably accurate step attenuators are inexpensive and easy to build for the HF and VHF bands. They can also be purchased in all sizes and flavors from companies like MFJ and Hewlett Packard.

Probably, if your rig has one, you've used the built-in attenuator to reduce strong signals or help remove interfering QRM. The step attenuator differs from a built-in attenuator in that it has 4 to 8 or more switched attenuator sections, each of which can switch in a fixed attenuation. Steps are often binary, such as 1 dB, 2 dB, 4 dB, 8 dB, 16 dB, etc. On less expensive attenuators the largest step is usually 20 dB since attenuation larger than that requires extra careful shielding. Since attenuators are usually low power devices, it is best to use one only with a radio that has a separate receive antenna line. Transmitting through most attenuators will result in smoke!

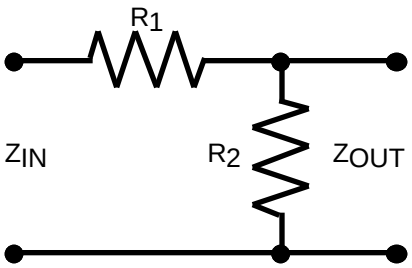
After you've installed an attenuator in the receiver antenna line, you can set all the switches to the out position and receive normally. To compare two signals, as in the first example above, wait until Larry is transmitting and then start switching in some attenuation until the s-meter reading is peaking at some convenient point; say S-6. Note the setting of the attenuator switches. Now, when Bob starts to transmit, remove (or add) attenuation until the S-meter again peaks to the same convenient point. Again note the attenuator setting. The difference between readings is an accurate report of the difference in signal strength of the two stations. The station with more attenuation is the stronger.

To read the attenuator, just add the dB reading of the sections switched in. For example, if Larry is an S-6 with the 20 dB and 4 dB sections switched in (24 dB total), and Bob is S-6 with the 8 dB, 2 dB and 1 dB sections switched in (11 dB total) then Larry is 9 dB stronger than Bob. If you have the chart handy from last month's ***Tech Talk***, you can report: "Larry is eight-times stronger than Bob at this QTH!" When finished be sure to switch all sections out or you'll think your receiver has gone hard-of-hearing!

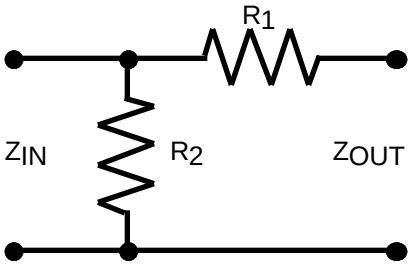
If your rig has a bar-type S-meter you're at a slight disadvantage. However, with practice, the level can be adjusted so a given bar segment is just flickering at a reference point. Bar type S-meters are more rugged and cheaper than real meters, but that is where the advantage ends. The reason they are becoming so popular is the latter reason!

With an attenuator you can do a relative calibration of your S-meter. What you need is a steady signal source for each band. A signal generator or grid-dip meter will work. With a minimum of 3 dB set on the attenuator; adjust the signal source for full S-meter deflection. Now add attenuation until the S-meter drops to the next mark and note the change in attenuation. Continue for all desired calibration points. When you run out of attenuation, reset the attenuator back to 3 dB and readjust the signal source level until the S-meter is at the last calibrated point and continue. Always start with a minimum of at least 3 dB; the reason for this is explained later. If you are lucky to have access to a signal generator that has a calibrated output, you can even calibrate your S-meter directly in microvolts. In either case, you'll notice that the calibrations vary significantly from band to band and possibly even from one end of a band to the other.

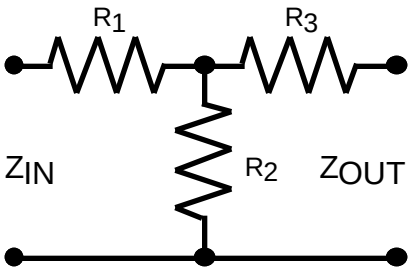
Attenuators are commonly resistive devices that operate over a large frequency range and down to DC. They come in numerous types. Besides their attenuation value, other specifications are input and output impedance (attenuators with the same input and output impedance are called symmetrical), power capability, and balanced or unbalanced. Unbalanced attenuators are used with signals that have one side grounded (RF in coax for example). Balanced attenuators are used with balanced lines such as many audio lines and ladder-line. Figure one shows four common types of unbalanced attenuator circuits. Circuits 1a and 1b are commonly used to match two different impedances over a wide frequency range. They are often called "minimum loss pads". For any given impedance change this attenuator gives the minimum loss that can be achieved with resistive matching. Note that the circuits are bidirectional. The first circuit increases the impedance and the second lowers it. Circuit 1c, called the "tee", and circuit 1d, called the "pi", allow you to select the input and output impedance and attenuation independently. Often, as in the case of the step attenuator discussed earlier, the input and output impedances are symmetrical, commonly 50 or 75 ohms. The "tee" and "pi "circuits can be used interchangeably. The circuit using the most standard value of resistors is usually selected.



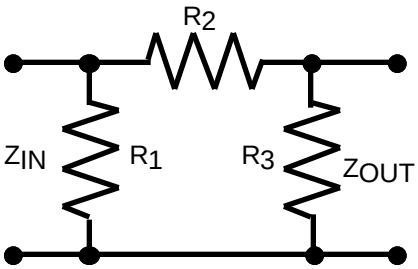
a) Unbalanced "Pad" Attenuator
$Z_{IN} > Z_{OUT}$



b) Unbalanced "Pad" Attenuator
$Z_{IN} < Z_{OUT}$



c) Unbalanced "Tee" Attenuator
$Z_{IN} <=> Z_{OUT}$
$R_1 = R_3$ for $Z_{IN} = Z_{OUT}$



d) Unbalanced "Pi" Attenuator
$Z_{IN} <=> Z_{OUT}$
$R_1 = R_3$ for $Z_{IN} = Z_{OUT}$

Figure 1: Unbalanced Attenuator Circuits

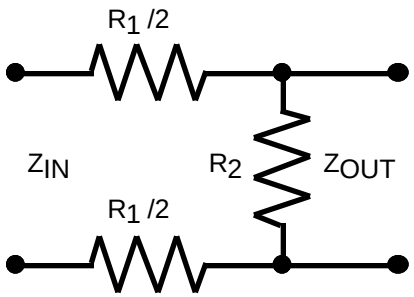
Figure two shows five common balanced attenuator circuits. Circuits 2a through 2d correspond to their unbalanced cousins. The series resistors are just divided equally between legs. Circuit 2e is a favorite in audio circuits; it's called the symmetrical lattice attenuator. The values for R1 and R2 can be interchanged without affecting the attenuation on this circuit only.

Calculating resistor values for attenuators is beyond the scope of this series. There are numerous books that have programs for handheld calculators and computers for calculating the resistor values for given parameters. See the side bar on nepers. Table one shows some common 50 and 75-ohm attenuator resistor values.

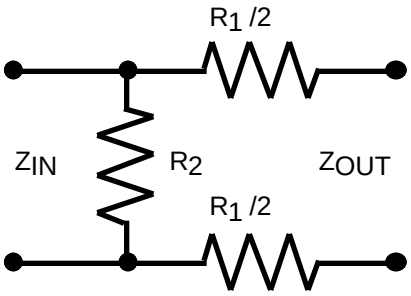
What is the input and output impedance of an attenuator? Since attenuators commonly work to DC you can use an ohmmeter to check them. The input impedance is just the impedance (resistance at DC) that you measure looking into the input when the output is terminated at its impedance. For a 50-ohm attenuator connect a 50-ohm resistor across the output and measure the resistance of the input. It should read close to 50 ohms too. The output impedance is just the reverse; terminate the input with its specified impedance and measure across the output terminals.

Another feature of an attenuator is that it corrects circuit impedance errors. A small attenuator, or "pad", is often used between a signal generator and circuit under test. This helps insure that the signal generator is seeing the impedance it's designed to work into. Thus it's a good idea to have a minimum of 3 dB of attenuation on when making measurements with your attenuator. That assures that the antenna looks close to 50 ohms to the receiver and that the receiver input looks close to 50 ohms to the transmission line.

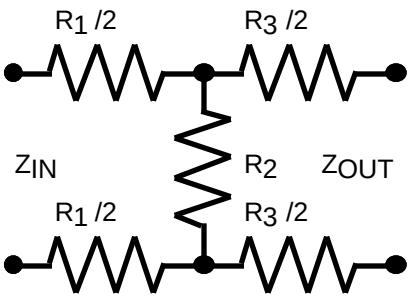
If you decide to build your own attenuator here are some suggestions that will help make it a top notch unit up into the VHF region. First, attenuator sections should be shielded from each other. Printed circuit board or brass stock (available at hobby and hardware



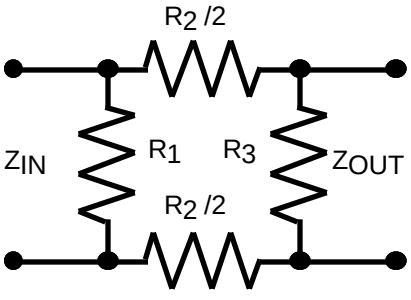
2a) Balanced "Pad" Attenuator
$Z_{IN} > Z_{OUT}$



2b) Balanced "Pad" Attenuator
$Z_{IN} < Z_{OUT}$

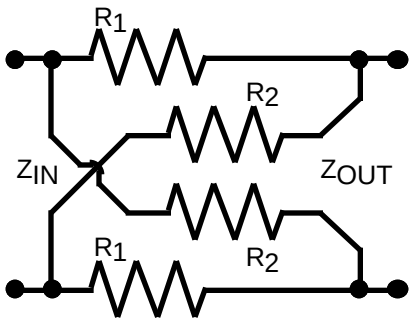


2c) Balanced "H" Attenuator
$Z_{IN} <=> Z_{OUT}$
$R_1 = R_3$ for $Z_{IN} = Z_{OUT}$



2d) Balanced "O" Attenuator
$Z_{IN} <=> Z_{OUT}$
$R_1 = R_3$ for $Z_{IN} = Z_{OUT}$

Figure 2...



2e) Balanced Symmetrical Lattice Attenuator
$Z_{IN} = Z_{OUT}$
Values of R_1 and R_2 may be interchanged

Figure 2: cont.: Balanced Attenuator Circuits

stores) can be used for shielding. Second, use the proper type switch. Cheap slide switches actually work very well due to their wiping action. If you use miniature toggle switches, use the ones that are designed for "dry switching". These usually have gold contacts and don't rely on a bit of current to keep the contacts clean. Third, keep sections that have large attenuation separated when possible. If you have two 20 dB sections, don't put them directly next to each other; put a lower value attenuator section between them to reduce unwanted coupling. Finally, keep the sections at or below 20 dB; above that leakage will limit the section's accuracy.

Next month we'll start a new topic. In the meanwhile, if you have any questions or suggestions for new topics please email me at: af6c@arrl.net

Here are some references on attenuators where you can get more information, construction ideas, etc.:

Jules Gilder, *Basic Computer Programs in Science and Engineering*, Hayden Book Company, 1980, Chapter 12 "Attenuator Pads"

Pete Ostapchuk, N9SFX, *A Rugged, Compact Attenuator*, QST - May 1998, pp. 41-43, (See errata)

Reference Data for Radio Engineers - fourth edition, IT&T Corp., 1956

The 1989 ARRL Handbook, "Low Power Step Attenuators", pp. 25-36 to 25-38

Nepers:

If you decide to calculate attenuator resistor values you will likely come across the term nepers. The neper is similar to the decibel, except it is based on the natural logarithm ($\log_e$):

$$\text{Nepers} = (1/2) * \log_e (P2 / P1)$$

$$dB = [\log_e (10) / 20] * \text{Nepers} = 8.686 * \text{Nepers}$$

$$\text{Nepers} = [20 / \log_e(10)] * dB = 0.1151 * dB$$

50 Ohm "PI" and "O" Symmetrical Attenuators

Atten. dB	R1 & R3 Ohms	R2 Ohms
1.0	869.7	5.77
2.0	436.3	11.6
3.0	292.5	17.6
4.0	221.0	23.8
6.0	150.5	37.3
8.0	116.1	52.8
10.0	96.2	71.1
16.0	68.8	153.7
20.0	61.1	247.3

50 Ohm "Tee" and "H" Symmetrical Attenuators

Atten. dB	R1 & R3 Ohms	R2 Ohms
1.0	2.87	433.4
2.0	5.73	215.3
3.0	8.55	142.0
4.0	11.3	104.9
6.0	16.6	67.0
8.0	21.5	47.3
10.0	26.0	35.1
16.0	36.3	16.3
20.0	40.9	10.1

Table 1...

600 Ohm Balanced Symmetrical Lattice Attenuators

Atten. dB	R1 Ohms	R2 Ohms
3.0	3508.8	102.6
6.0	1805.7	199.4
10.0	1155.0	311.7
12.0	1002.5	359.1
20.0	733.3	490.9

Minimum Loss Pads (Reversible)

Atten. dB	Z Ohms Zin	Zout	R1 Ohms	R2 Ohms
5.72	75	50	43.3	86.6
13.42	300	50	273.9	54.8
11.44	300	75	259.8	86.6
7.66	600	300	424.3	424.3
14.77	600	75	561.2	80.2
16.63	600	50	574.5	52.2

Table 1 cont.: Typical Attenuator Resistor Values

I.S.S. Visible Passes

Bob, WB6IXN has once again supplied a list of upcoming **International Space Station** visible passes for the Orange County area. Since orbits can change, you might want to recheck them the day before. The web site is:

http://liftoff.msfc.nasa.gov/RealTime/JPass

Times and dates are local.

DATE	RISE	SET
Apr 21	7:36 pm	7:41 pm
Apr 22	7:55 pm	7:59 pm
Apr 24	6:56 pm (overhead pass)	7:06 pm
Apr 27	6:12 pm (southwest sky)	6:21 pm
May 9	5:04 am	5:13 am
May 12	4:01 am (at sunrise)	4:08 am
May 13	4:10 am	4:16 am
May 27	5:10 am	5:18 am

RF HAS MYSTERIOUS BIRTH

by: Bob, WB6IXN

Probably the most appropriate beginning for our mystery would be the conception of the idea of a paper, by W7CRB, to be published monthly for radio amateurs here in Southern California. W7CRB had been inspired by a column in *QST* entitled, "CALLS HEARD". He thought that such a column in a local paper would be the nucleus for its continuance. CRB had been licensed in the state of Washington in 1932. He also held the call of W7DBB (for portable operation in those days). Ed. note: (Know whom I am talking abt?? ...Then HUSH!... Let's keep the younger OPs guessing, as did our very first mysterious editor of 'RF' when he publish ANONYMOUSLY the first copy of 'RF' on Nov. 27, 1953). Horace Bates, W6QZQ, and Rehse Mowry, W6OZO, helped our mystery editor with publication chores.

'RF' was an immediate success! Over 400 copies were distributed at the expense of the editor and two other OPs. But I can keep you in suspense no longer! As Shakespeare so aptly put it, "The truth will out!" Our first editor of 'RF' was:

/--/.-/.-./../-./..-/.../
/-.-./---/-./.--/.-/-.--/
W7CRB/W7DBB/W6UPP

An excerpt from the June 11, 1954 *RF*:

"*RF* was started by W6UPP in Nov. 1953 and was merely intended to be a local news sheet for nearby clubs, for announcements, etc. The response of the first few issues was so overwhelming that it was obvious that *RF* was destined to expand and need a transfusion of new blood to keep it alive. At the onset, the able assistance of W6ZE kept *RF* alive, until W6OZO and W6QZQ, who were breathing down the editor's neck and abt to make a kill of the discovery, were recruited as co-editors, and co-financiers, around March 1954. Needless to say, *RF* was not a financial success. However, we had encouragement from commercial advertisers, and *RF* became *RF of Western Wireless*. However, this venture was not successful, and OCARC took over publication of *RF* with Vol. 2, No. 1, dated. 11/13/54."

Thanks to the efforts of Optical-ScanMaster Bob AF6C and Web-Master Ken W6HHC, PDF copies of the *RF* Newsletter Vol 1, No 1 and Vol 1 No 2 has been placed on the OCARC WEB SITE (under "Monthly *RF* Newsletter" link) for you to enjoy.

PORTOLA PARK FD Site in Santa Ana Moving Forward

By Ken - W6HHC

Ken-W6HHC had a good meeting with Rip Ribble of the Parks and Recreation Department of Santa Ana on March 20th. Basically, we have a verbal agreement to proceed with our plans to use PORTOLA PARK (on Santa Clara, between Tustin Ave. and Grand Ave.) in northeast Santa Ana.

The following conditions or suggestions were made:

1) Confirm Location for GROUND RODS:
There is a chance that ground-rods penetrating over 2 feet could strike an electrical pipe or water pipe. An "on-site" inspection with Art Sarinana of Parks (714 647-3323) of the proposed location of any ground rods must be made one week prior to the event. There is no issue with tent stakes nor guy stakes.

2) Letters to Nearby Residents:
The police representative suggested that a letter to the residents along the East Wall of the park would go a long way towards avoiding problems. This way, neighbors will know about the activities ahead of time, be given an opportunity to obtain answers to questions before the event, and can be invited to visit and learn more through the letter. I will drive by and obtain the addresses of the affected houses. I recommend that the OCARC Secretary send the letter four weeks prior to FD.

3) Key for Rest Rooms:
Art Sarinana of Parks will issue a key for our use of the rest rooms at the park after hours. The rest rooms are usually closed from 9:30 PM until 8:00 AM.

4) INSURANCE ENDORSEMENT:
We are required to mail a copy of an Insurance Endorsement, naming the City of Santa Ana as additional insured, to Rip Ribble (714 571-4276) one week prior to the event.

5) Set-up at 7:30 AM on Saturday
Despite the original request to start set-up at 6 AM on Saturday, the city requested 8 AM. We compromised on 7:30 AM to start set-up. The mobile homes can certainly come in earlier than 7:30 AM to park and reserve parking places.

6) Noisy MOTORHOME Generators at Night:
Again the police representative said we may get complaints if motor homes close to the East Wall run noisy generators at night time (it is a very very quiet neighborhood at night). Two suggestions were discussed:
(1) run club generator power to any at-risk motor homes at night,
–or–
(2) move some at-risk motor homes with noisy generators to the west wall end of parking lot (next to the orange tree orchard).

"CQ FIELD DAY de W6ZE"

Minutes of the March 2001 General Meeting:

The March 2001 general club meeting was held on Friday, Feb 16th @ 7:30 PM. Les Allen – KM6SQ was the guest speaker. He talked on the 220 MHz CONDOR repeater system. The system is open to all amateurs without charge (Donations are accepted!) Les provided handouts on the system. If you missed the meeting you can find out more on the CONDOR web site:

http://www.condor-connection.org

The program was well received by our members and guests. Meeting attendance was 28 souls.

Fried - WA6WZO, the SWD ARRL Director talked briefly on the ARRL dues increase, the Volunteer Resources Committee and the upcoming ARRL Convention in Riverside.

A short business meeting was held after the break. All board members were present except Larry - K6LDC who is on an extended vacation.

The February Board minutes were accepted as published.

Treasurer's report: Ken - W6HHC reported our income since January 1 is $734.38; expenses are $335.24. The current balance is $1,930.68.

Tom - WA6PFA announced the raffle prizes for the meeting. First prize was a world clock. Fried - WA6WZO donated some ARRL publications to the raffle.

The $250 ham gift certificate raffle was brought up before the members. The motion was made by Ken - W6HHC and seconded by Lowell - KQ6JD. The club will raffle off a $250 gift certificate from a local Ham store. Tickets will be sold until the club gains a minimum 15% profit. The vote passed unanimously.

Lowell reported that the pizza bash with the Long Beach club is on hold due to their club president's current unavailability.

Bob - KD6BWH showed his home brew antenna mount for hotel/motel room windows. This is the mount he uses for the Baker-to-Vegas event.

The club is looking for a source of QSL cards for W6ZE and members too. If you have any information please contact Bob - AF6C

Under the **Good of the Club**, Bob - AF6C is looking for articles from club members for the *RF* Newsletter.

The meeting adjourned at 9:15 PM.

Submitted by Bob - AF6C

Minutes of the April 2001 Board Meeting:

Due to the Baker-to-Vegas race that many club members were participating in on April 7th, an abbreviated breakfast was held at IHOP and no board meeting was conducted.

Submitted by Bob - AF6C

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