



ORANGE COUNTY AMATEUR RADIO CLUB

VOL. XXX

NO. 5

P.O. BOX 3454 TUSTIN, CA.

MAY 1989

"MYSTERY PROGRAM"

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Club Historian	Bob Evans	WB6IXN	543-9111
W6ZE Trustee	Bob Eckweiler	AF6C	639-5074
R.F. Editor (Act.) ..	Mark Stanford	KJ6JC	991-7398

CLUB FUNCTIONS

MONTHLY MEETING:

MAY 19, 1989
JUNE 16, 1989

3rd Friday of each month, 7:30PM at:
MERCURY SAVINGS & LOAN TUSTIN, CA.
1095 Irvine Blvd. (4th St. becomes Irvine)
Talk-in on 146.55 MHz

JULY 21, 1989

(Take the 4th St. exit of the 55 FREEWAY
and head east. Continue about two blocks
past Newport Blvd. It's on the left.)

CLUB BREAKFAST:

JUNE 3, 1989
JULY 1, 1989
AUGUST 3, 1989

1st. Saturday of each month, 8:00AM at:
DENNY'S RESTURANT
2314 E. 17TH Street
Santa Ana, CA. (714) 543-0872
(Second building west of the Newport (55) Freeway)

CLUB NETS

BAND	MODE	DAY	LOCAL TIME	FREQ MHz	SPLIT	PL	OPERATOR
2 Meters	FM	Wed	2100 hrs.	146.550	smplx	na	W6HHC
15 Meters	SSB	Wed	2000 hrs.	21.375*	smplx	na	WB6IXN
15 Meters	CW	Thu	2000 hrs.	21.175*	smplx	na	WB6IXN
2 Meters	PKT	Wed	1900 hrs.	145.090	smplx	na	W6HHC

(Listen for W6ZE, net control) *Plus or minus QRM

ARES DISTRICT NETS

2 Meters	FM	Mon	1900 hrs.	146.220	-600	1A	N6HQI	1
2 Meters	FM	Mon	~1915 hrs.	145.340	-600	4Z	WA6VKZ	2
2 Meters	FM	Mon	1930 hrs.	noted	smplx	na	noted	3

1 - ARES Info net. 2 - ARES District 3 net starts after info net is completed (Usually about 1915 hrs).

3 - City nets; Orange: 146.565, N6DWF; Tustin: 146.505, WA6VKZ; Santa Ana: 147.585, W6HHC

*** ON THE NETS ***

4/5 15m phone net - W6ZE/IXN checks in NG7D, COJ, BHQ (wid JSV on side), YZG, KR4T (Willie) frm Anniston, Ala. NG7D says official temp. was 101°...105° at his QTH! John also says Dick Smith Electronics bought out by American Electronics, Inc. And John also gets call frm parents on board ship in straits of Indonesia! COJ has ham gear fer sale...IXN suggests ham-ad in 'RF' fer items left over after swap meet. BHQ will attend swap meet wid COJ. YZG watches dog race to see which dog will finish eating first, & KR4T was happy to find our net! Willie is extra class wid a Kenwood 520. He previously held a '6' call, & IXN cud use some of his 48° WX in the shack! 4/5 2m phone net- W6ZE/HHC, at AF6C's QTH, checks in AF6C, BPX, IMP, RE, JSV, BHQ/6, IXN, UJD, RNA, YZG, VCW(Orv, FV), ULU, & ATK...nice check-in, OPs! HHC asks for volunteer net control on this net. IMP loses GTE land-line tonite! NGO & XYL take off fer 3 or 4 wk vacation in JA land. BPX rpts 102° at his QTH...Wyatt 'sprinkles' lawn all day?! RE reports 1990 Space Shuttle to carry WA4SIR who will operate voice, video, & Packet bet 46°N & 46°S of equator. Alex also 'early birds' to Prado Dam to assist NRA wid shooting contest. ATK enjoys net & RE's Westlink 'tapes...Kent must run! HHC authorizes ULU to pay OCARA dues fer Club. JSV & BHQ talk to another OP in Anniston, Ala! PFA still can't raise YMH on packet yet! UJD reports his back is better. RNA will try to attend next Club meeting. Vic also gives history of 'Wheel Chair Olympics'...IXN also rpts times & dates of 'WCO' in 'RF'(Apr). YZG says, "It's hot!!", & VCW 'flew in & flew out'! ULU joins PFA in trying to raise YMH on packet! 4/6 15m CW net - W6ZE/IXN checks in WB9YAS frm Belvidere, Il., abt 60 mi NW of Chicago. 'C.W.' paints trim stripes on new Chryslers & Dodges. C.W. is 48, wrked fer Chrysler fer 20yrs. We lose C.W. in QSB & QRN! 4/12 15m phone net - W6ZE/IXN checks in NG7D, W5LF(George, Tulsa, OK), IMP, W6RQF(Paul, Seattle, Wash.), KL7XP(Orv, Bettles, Alas.), W9LSC(Koby, in Wis.), XO, WDØFZW(Kelly, Souix Falls, SD). NG7D gets QSL frm Quajalein in pacific, & figures out how to modify PFA's 'Sam Says' program! IMP hears LF talk abt relatives who lived in Bellflower in 1909. NG7D inherits a lot of ham gear frm an OP moving to KH land. XO mentions Apr. 7 (4.6 mag) quake to 7XP, who knows seismologist, KL7XO, at Univ. of Alaska in Anchorage. LSC, Koby, tries out his TS-440 rig in 30°WX, as XO informs LSC abt our recent 3-day heat wave! We quickly lost all DX OPs in the QSB! 4/12 2m phone net - W6ZE/HHC checks in AF6C, PFA, RE, JC, IMP, ATK, IXN, & XO. IXN arrives late on net to hear HHC relate VKZ getting rear-ended as he returns frm Sacramento! Frank received back injuries & is recuperating at home. AF6C finishes taxes & awaits return of his money frm cancelled Apple 'Scuzzy' (SEXY) card?! JC tells XO there is room in 'RF' fer RNA's announcement on 'Wheel Chair Olympics' event. IMP will try to work on erecting a tower this weekend (nøne will supervise!). XO may bring tapes of Whittier Narrows quake to next meeting. PFA tells us that City of Orange ARES grp will survey City of Orange for HT coverage effectiveness. Tom also gets additional '1099s' after his taxes are done! ATK has day off, gets chores done, visits HRO, & doesn't buy anything!!! PFA uses his '10-10' number to get S. African contact, & IXN will get Jerry Ver Duft program info. to John, LAB. 4/13 15m CW net - W6ZE/IXN checks in TEJ. RJ's QTH was 2 blocks frm epicenter of Apr 7 quake in Newport. His Chimney broke away frm the house, & he has several cracks in the masonry walls. RJ will now lead a group of abt 80 homeowners in earthquake preparedness! IXN gave RJ some leads. TEJ hopes to involve Newport OPs in the group. 4/19 15m phone net - W6ZE/IXN, at JSV's QTH, checks in JSV, UAB, & VKZ(wid 'Ma Bell' on the side)! UAB has been out of the country...Bankok, Hong Kong, & Seoul! Jim now works in LA, & he will send 'hidden ant' article to IXN fer 'RF'. VKZ tells all how seat belts saved him frm serious injury, & UAB questions OPs abt mobile gear fer the auto. (cont'd)

(On The Nets - cont'd): 4/19 2m phone net - W6ZE/AF6C checks in VKZ, BPX, LAB, RE, JSV, IXN, PFA, UJD, UL, IMP, HHC, XO, RND, YZG. Gud check-in, OPs!! IMP, immersed in hot tub (wid nØne on side), uses 220-2m link to check in! OPs congrat. RE on 55th, & BPX on 66th wedding anniversaries, & IMP & nØne on their first! BPX & Blanche celebrate wid 3 da. in Ariz, only to come home & plan garden of corn, black-eyed peas, beans, & okra! RE & XYL celebrate at Mexican restaurant, only to have RE end up 'under the table' wid a teenage girl at Mater Dei H.S. Red Cross blood drive?!! AF6C promises to refurbish 15m ant., & HHC looks fer mysterious 'Phil', W6HHC, who shares his call!? VKZ listens in vain fer packet crew at 7 pm... no net? Frank then relates '2m whiplash' & '80m whiplash' received frm recent rear-ending, to AF6C & OPs. VKZ uses 5/8 wave mag-mount ant on fireplace & blackens all 5 bars on JSV's HT! PFA describes 'poor man's spectrum analyzer', & UJD's son gives blood at Red Cross unit at Mater Dei H.S. UL gets a bandage fer XYL's toe, & asks IXN fer an old letterhead frm 'RF'. Jane tells OPs that Broadway Press made letterheads, too. IXN tells UL to check wid COJ fer possible silk screen. JC can't copy VKZ too well tonite, & OPs send cudos to Mark on great 'RF'. JSV & EZS celebrate Jim's birthday in Bull Head City & Lake Havasu, & bring back piece of London Bridge! LAB joins us fer 1st time on 2m wid ant 50 ft. up! YZG joins us late, listening to San Diego program on Gen. Griswald's death, who was also a Ham. RND tells us that solar flux went down on Apr6, just in time fer earthquake on Apr 7! HHC tells all that NGO is checking on new power cables fer Club generator, & HHC experiences the 'MacIntosh virus' at work! 4/20 15m CW net - W6ZE/IXN checks in RND & TEJ. RND & IXN discuss John's dipole ant. IXN will change his 15m vertical in the future. IXN cudn't hear one OP in the QSB & RJ inherits a lot of old gear frm one of his mother's neighbors. RJ will call IXN by landline abt earthquakes, etc., soon, & we'll hear more abt old gear RJ inherited! 4/26 15m phone net- W6ZE/XO assumes net control on 15m as IXN moves to net control on 2m. Bob checks in IXN, GDZ, & YZG. XO & IXN discuss 3.5 mag. quake at 3:10pm, 9mi W. of El Segundo. YZG then gives OPs solution to all E.Q. problems...simply walk 2 in. above ground!! GDZ can't hear 2m gang too well, & Will tells OPs abt LJA's friend, Marcie, & her Red Cross work & RACES activities. 4/26 2m phone net - W6ZE/IXN checks in LAB, BPX, JSV, YZG, UJD, ATK, RE, IMP, ATJ, (Dennis), & THQ (Ed). LAB tells of his mountain-top adventures repairing radios, rptrs, etc. BPX still hasn't planted his beans, B.E. peas & okra, as he watches the garlic reach maturity! JSV, wid Bruce on side, tries in vain to work OP in Sidney, Aus. But OP is ladies' man, & Jim's voice wasn't high enough in pitch! Bruce cleans shack & listens on scanner as he awaits his ticket! UJD checks in mobile & ATK queries OPs on ant. lead-in lengths, wid LAB providing info. fer HF & UHF operation. RE's XYL has colon scan tomorrow, & Alex plays Westlink tapes & attended mas-casualty exercises this morning. IMP gets old Dodge smogged, & will take in the Yaesu 757 fer repairs before FD. Chris went fishing at Lake Hemet last weekend. LAB tells OPs that UC will have a video tape on the Visalia DX Convention, & possibly an E.Q. tape. YZG repeats his E.Q. solution (15m net)! 4/27 15m CW net- W6ZE/IXN checks in N6CBS, Al, in Playa del Rey. IXN will send Al copy of last 'RF'. Other check-ins were TEJ, & KW6J, Brian, in Corona del Mar. Welcome to the net, OPs! TEJ must pay attention to crying son! Hpe to have Al & Brian join us agn!

*** MAGNITUDE SCALES FOR EARTHQUAKES ***

Recent info. from Bob, KD6XO, shows that there are several magnitude scales that can be used by various services to compare earthquake energies!

GS MAGS - Magnitudes computed by the U.S. Geological Survey/Nat. Earthquake Info. Center

MB - Body Wave Magnitudes

Msz - Vertical Surface Wave Magnitude

ML - Local Magnitude (Richter Magnitude)

JMA - Japanese Intensity Scale

RF - Rossi-Foril Intensity Scale

Roman numerals - Modified Mercalli Scale

We will deal with Local Magnitude, or Richter Magnitude, since the news media reports to us on this scale.

Energy is defined as the ability to do work. Work is done (energy stored or released) when a force moves through a distance: $Work = force \times distance$.

Force is defined when a unit MASS changes unit velocity in unit time (acceleration!), thus, $Force = mass \times acceleration$, and, using cgs. units:

$$= 1 \text{ gm} \times 1 \frac{\text{cm}}{\text{sec}} = 1 \frac{\text{gm cm}}{\text{sec}^2}. \text{ Thus, a force of } 1 \frac{\text{gm cm}}{\text{sec}^2} \text{ is given the label } 1 \text{ dyne.}$$

The dyne is a unit of force. The erg is a unit of work or energy. From above, since $work = force \times distance$, 1 dyne of force moving through 1 cm distance = 1 erg of work or energy:

1 dyne x 1 cm = 1 erg (the amt of work done when a 1 gm mosquito jumps through 1 cm!)

The *magnitude* of an earthquake is a quantitative measure of its size, determined from the amplitudes of the elastic waves it generates. The scale of magnitudes now in universal use was first developed by C. F. Richter for local earthquakes in California and subsequently improved and generalized to earthquakes at any distance. It is known as the Richter magnitude scale; the historical development of its present form has been well summarized in Richter's (1958) own book and the whole problem of magnitudes has been reviewed by Bath (1966b).

The original magnitude scale was developed from a study of surface wave amplitudes; body waves are now in more general use and a slightly different scale leads to a body wave magnitude *m*, but *M* and *m* are directly related, so that this is a problem of detail and not of principle.

Fundamental interest in the magnitude scale is greatly enhanced by the direct relationship between magnitude and the total elastic wave energy of an earthquake. Here the significance of the factor *aT* in Eq. 4.1 becomes apparent, as this ratio is a measure of the actual ground strain in a seismic wave. We can thus represent the relationship between total energy and magnitude in terms of an obvious empirical equation

$$\log_{10} E = A + BM \quad (4.2)$$

Noting that wave energy per unit volume of rock is proportional to the square of strain, if earthquakes of different magnitudes produced wave trains of similar forms we would have $B = 2$. However, both the spectra and lengths of wave trains are functions of earthquake magnitude and the appropriate values of *A* and *B* must be determined by comparing magnitudes with integrated wave energies for earthquakes with a range of magnitudes. Values of the constants have varied considerably since the first estimates but recently have converged to better agreement; with the values preferred by Bath (1966a), Eq. 4.2 is, for *E* in ergs,

$$\log_{10} E = 12.24 + 1.44M \quad (4.3)$$

or

$$\log_{10} E = 6.5 + 2.3m \quad (4.3A)$$

In our first article, we developed a magnitude scale to the base *e*. Below, another local magnitude scale will be developed to the log base 10, according to equation (4.3) listed left. The excerpt, left, was copied from a book on physics of earthquakes in the Santa Ana Library.

According to eq. (4.3), a 1 mag. quake = 4.79×10^{13} ergs = .4 lb of TNT*.

(*assumed to be correct from previous article in 'RF') Thus, 1 lb of TNT = 1.20×10^{14} ergs (= 1.2×10^7 joules). Thus, using eq. (4.3), for a 1.1 mag. quake, where *e* = energy in ergs:

$$\log_{10} E = 13.824$$

$$\text{antilog}_{10} E = 6.67 \times 10^{13} \text{ ergs}$$

$$\frac{6.67 \times 10^{13} \text{ ergs}}{1.20 \times 10^{14} \text{ ergs/lb of TNT}} = 5.5 \times 10^{-1} =$$

.6 lb of TNT for a 1.1 mag. quake.

The table, next page, is derived by similar reasoning. Figures were NOT rechecked for accuracy, & were calculated from a computer slide rule for log conversions.

Substitution in Eq. 4.3 of *M* = 8.7 for the largest

earthquakes gives the prodigious energy of

$$5 \times 10^{24} \text{ ergs!}$$

*** EARTHQUAKE ENERGY CHART IN LBS/TONS OF TNT (log base 10) ***

MAGNITUDE	ENERGY	MAGNITUDE	ENERGY
1.0	= .4 lb	6.0	= 3163 ton
1.1	= .6 lb	6.1	= 4417 ton
1.2	= .8 lb	6.2	= 6125 ton
1.3	= 1.1 lb	6.3	= 8542 ton
1.4	= 1.5 lb	6.4	= 12 thousand ton
1.5	= 2.1 lb	6.5	= 17 thousand ton
1.6	= 3.0 lb	6.6	= 23 thousand ton
1.7	= 4.1 lb	6.7	= 32 thousand ton
1.8	= 6.0 lb	6.8	= 45 thousand ton
1.9	= 8.0 lb	6.9	= 63 thousand ton
2.0	= 11 lb	7.0	= 87 thousand ton
2.1	= 15 lb	7.1	= 121 thousand ton
2.2	= 21 lb	7.2	= 169 thousand ton
2.3	= 30 lb	7.3	= 235 thousand ton
2.4	= 41 lb	7.4	= 328 thousand ton
2.5	= 58 lb	7.5	= 458 thousand ton
2.6	= 80 lb	7.6	= 638 thousand ton
2.7	= 112 lb	7.7	= 888 thousand ton
2.8	= 156 lb	7.8	= 1.2 million ton
2.9	= 218 lb	7.9	= 1.7 million ton
3.0	= 303 lb	8.0	= 2.4 million ton
3.1	= 422 lb	8.1	= 3.3 million ton
3.2	= 588 lb	8.2	= 5 million ton
3.3	= 818 lb	8.3	= 6.5 million ton
3.4	= 1142 lb	8.4	= 9 million ton
3.5	= 1592 lb	8.5	= 13 million ton
3.6	= 2208 lb	8.6	= 18 million ton
3.7	= 1 ton	8.7	= 24 million ton
3.8	= 2 ton	8.8	= 34 million ton
3.9	= 3 ton	8.9	= 48 million ton
4.0	= 4 ton	9.0	= 66 million ton
4.1	= 6 ton	9.1	= 92 million ton
4.2	= 8 ton	9.2	= 128 million ton
4.3	= 11 ton	9.3	= 179 million ton
4.4	= 16 ton	9.4	= 249 million ton
4.5	= 22 ton	9.5	= 347 million ton
4.6	= 31 ton	9.6	= 483 million ton
4.7	= 43 ton	9.7	= 671 million ton
4.8	= 59 ton	9.8	= 938 million ton
4.9	= 83 ton	9.9	= 1304 million ton
5.0	= 115 ton	10.0	= 1821 million ton
5.1	= 160 ton		
5.2	= 223 ton		
5.3	= 310 ton		
5.4	= 433 ton		
5.5	= 604 ton		
5.6	= 838 ton		
5.7	= 1171 ton		
5.8	= 1629 ton		
5.9	= 2271 ton		

If one compares this chart with the chart to the log base e in our first article on earthquakes, it will be easy to see that this scale to the log base 10 is stingier with energy/quake. However, I would tend to think that this chart is somewhat more reliable for energy levels than our first information source. At any rate, it is not difficult to understand why a log scale is preferable when one considers the jump in energy release for .1 magnitude!

de WB6IXN/KD6XO

MINUTES APRIL GENERAL MEETING

The April General Meeting was called to order at 7:02 pm on the 21 of April by the President Frank, WA6VKZ. 29 members and guests were present. Board members Mark, KJ6JC, Kei, N6NGO, Bob AF6C and Ron KB6EZF were absent. Visitors were Allan, KC6CSA, Justine and Doug, WB6DTI, Marie, N6EXV and Arnold W6VMV. Old business - Generator still stored in Frank's storage unit; it needs someone to start it periodically; also need new power cables for field day. Frank showed 50 feet donated to the club and asked for input on how much to spend for 6 50 foot lengths. Bob, KD6XO made motion to spend up to \$200 on wiring for field day. Seconded and carried. New Business - None. Good of the Club - Vic, WA6RNA still needs volunteers for communications at the Ninth National Veterans Wheelchair Games June 13-17 at the VA in Long Beach. Tom, WA6PFA sends RFs to new hams and members of emergency groups for potential new members. Carl, KB6WLD donated technician class videos and tapes for use by the members of the club. Motion made by Alex, W6RE to donate \$25 to the Westlink Support Fund. Seconded and carried. Program was presented on the new HiTech handhelds and a video was shown of the Whittier Narrows Earthquake. Adjourned at 9:06 pm.

Respectfully submitted - Bob, KD6XO, Secretary.

ORANGE COUNTY AMATEUR RADIO CLUB, INC.
P. O. BOX 3454
TUSTIN, CA. 92681



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