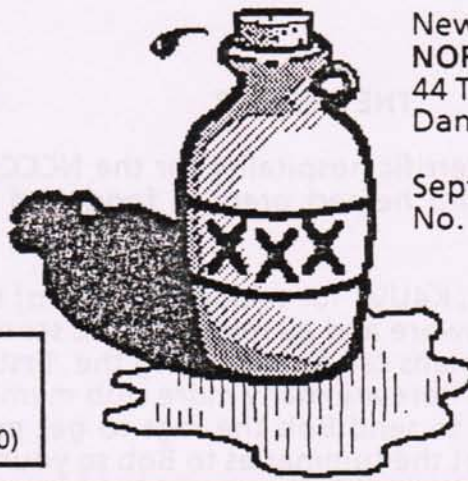
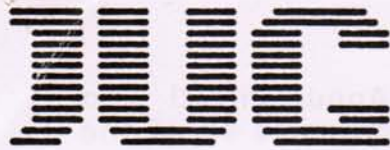


The Contest



Newsletter of the
NORTHERN CALIFORNIA CONTEST CLUB
44 Toyon Terrace
Danville, CA. 94526

September 1988
No. 194

PRESIDENT:	WB6MZQ
VP/CC:	K4UVT
SEC/TREAS:	K6MA
NCCC REPEATER:	147.24 (+ 600)

AWARDS:	K6ZM
JUG EDITOR:	W7MAP
DIRECTORS:	VE2AQS, K6KLY, WZ6Z, W6RGG

CALIFORNIA QSO PARTY

COMING EVENTS

BUGARIAN DX CONTEST	SEPT 4
EUROPEAN SSB CONTEST	SEPT 10-11
ARRL VHF CONTEST	SEPT 10-11
NA SPRINT CW	SEPT 11
SCANDANAVIAN CW	SEPT 17-18
CRRL CAN-AM SSB	SEPT 17-18
NA SPRINT SSB	SEPT 18
SCANDANAVIAN SSB	SEPT 24-25
CRRL CAN-AM CW	SEPT 24-25
CQWW RTTY	SEPT 24-25
CALIFORNIA QSO PARTY	OCT 1-2
OCTOBER JUG DEADLINE	OCT 6, 1988
SEPTEMBER MEETING	SEPT 23, 1988
PLACE: COCO'S IN SUNNYVALE	
NEAR THE CORNER OF S. MARY AND FREMONT	
TIME: DINNER (6:30-8:00)	
MEETING (8:00 TIL ????)	

THE PREZ SEZ

Once again, Gary puts out his terrific hospitality for the NCCC Annual Picnic! Also many thanks to the people who helped prepare food and organize all of the activities.

Yours truly wishes to thank Bob, K4UVT for taking the reins of the VPCC once again. His able tracking of the 5 Meg aware and all related NCCC scores and summaries is a real asset to the club. Current plans call for awarding the first three 5 Meg awards at this year's Christmas dinner. There are many more club members very close to the 5 Meg plateau, and only need to send Bob the logs to get proper credit for their contributions. OK folks, let's get the summaries to Bob so your awards can be given at the March 18th awards banquet... this year to be held (again) at the Pleasanton Hotel.

During the course of the picnic festivities I heard the following question at least a dozen times: "What year is the NCCC going to get back to NR.1 in the CQ W.W.?" The competitive spirit lives within the NCCC! My suggestion would be to plan for the 1991 contest season. Why 1991? Well, for starters the propagation should be great. Secondly, 1991 is a close enough goal to be within view and yet far enough out for the significant amount of planning that is required for this type of an effort. 1991 also allows for training of new operators, intervening years as benchmarks and most of all the saving for those all-important DX-peditions.k

The feeling in this quarter is that there is a strong desire to regain our NR.1 position in the world of contesting and that CQ W.W. 1991 might just be the right vehicle.

We will see all of you at COCO's for the September meeting. Gary is prepared to pump us all up for the CQP!

Best 73
Steve
WB6MZQ

FROM THE VPCC...

For those of you who attended the annual NCCC picnic at the Qth of WA6VEF---I trust that you have dried out (off??) by now! But, in view of the weather, the pool and the beer was a welcome relief! As always it was a great outing and I'm sure was enjoyed by all of those in attendance.

In this issue (if I can type all of those numbers-Ed.) is the latest update on the 5 million point award. As you will notice, Gary WA5VEF is no longer alone in the 5 Meg column. He has now been joined by two Kenny's. Congratulations to N6RO and K6HNZ. Please also take note: there are several members very very close to an award.



Your esteemed El Presidente and I have received only a dozen or so summary sheets since the change of officers several months back. With all of the intervening contests there ought to be more summaries to be added to the contest scores. If you have scores that don't show up, please get the paperwork to me.

We've been talking about this award for a couple of years now. As of this writing we have three operators that qualify for it and several more very nearly over the top. If you can get your scores to me by the end of September you'll be in the first group to qualify. Remember, these are serialized awards and therefore time-sensitive... be there first!

DON'T FORGET

CAL QSO PARTY OCT 1-2

Gary, WA6VEF has put together a great program and contest write-up. (SEE THE AUGUST JUG). Let's all get together and support our very own contest, THE CAL QSO PARTY. There are lots of records to be broken and much family fun to be had... help make this the best CQP ever!

73
Bob, K4UVT

CQP 1988 A RECORD TURNOUT? ALL CA COUNTIES ON THE AIR? YOU BET!!!

It's time to test those vocal cords and stretch the fingers on that keying hand, because we're only about two and a half weeks away from the 1988 running of the NCCC-sponsored California QSO Party!

There's no doubt about it. This year's CQP should be the biggest and best ever. Some 75 NCCers intend to be active in the contest (see the list of "Who's going to be where" elsewhere in this issue of the JUG) and 15 of them are planning CQP county expeditions. Southern California should also be very well represented, as the SCCC has again organized their club into 5 man teams to compete in support of the CQP effort.

But that's not the best news. As of this writing (September 7th), we have confirmed Cal QSO Party activity from each and every one of California's 58 counties! No less than 50 will have activity from a fixed or portable station, while the remaining eight will be covered by mobile specialists K6XO, N6NKN, N6ESV, and K6YK. The mere idea that all the counties are spoken for, almost a month before the test, still boggles my mind!



CQP 1988: PREVIEW OF NCCC ACTIVITY

Marin County and North de Lyle, WW6F

W6FSJ Wendel will be active from Napa Co.
NA6T Bob plans to be active from Mendocino.
WW6D & WW6F Both Doug and Lyle plan limited single-op efforts from Sonoma Co.
K6LRN Dick will be gunning to break the single-op record he set from Marin Co. last year

SF and Upper SCV Report de Dick, K6LRN

San Francisco Co. Two NCCers will be active: K4TKM, and N1EE, who will be guest-operating at W6BIP.
San Mateo Co. SMAT will be well represented, with planned CQP activity by K6BR, KA6ING, K6KLY, W6KZJ, and WB6DSV.
Expeditions Look for W6SZN, K6TMB, and W6OAT to be roughing it at SZN's cozy cabin in Placer County. Also, Stan, K6MO, will again be maritime mobile at the 4 county corner of Solano, Contra Costa, Marin, and Sonoma.

Middle SCV Report de Steve, WC6I

K6MA Stan will be joining the Foothills ARS expedition to Mt. Tamalpais in Marin Co.
W6ISQ Jack intends part-time activity from San Mateo.
Santa Clara Co. Expect CQP activity from AJ6V, K6YT, W6VG, W6JKV, WC6I, and N6BT (who will be hosting WA6VEF).

Lower SCV #1 Report de Scott, N1EE

More friendly QRM from Santa Clara County. Look for these members to be on the air for CQP: AG6D, AD6E, K6KM, and N6XI.

K6XO Alan will be out mobiling again this year. He intends travel through Tuolumne, Mariposa, Mono, and Alpine Counties.
N6ZB Bob, along with Jim, KS6H, will again put Merced Co. on from San Luis Reservoir near Los Banos.

Lower SCVB #2 Report de George, KI6EZ

KA6W Ted will be hosting a multi-single from Santa Cruz Co. with operating help from KI6EZ and K4UVT.
AA6T & NS6G Lloyd and Karen will be expeditioining from Tehama County.
N6JL John plans a partial effort from Santa Cruz Co.
N6NOY Al will on mobile from Modoc Co.
KI6CG George will be operating from a portable location in Fresno Co.



- Upper and Lower East Bay Report de Mac, W6VSY
Alameda County The competition should be fierce, with anticipated CQP operation from N6CCL, N6DA, W6RGG, K6SIK, WAOYQM, K6CSL, N6EK, and W6MFZ.
W6BSY Mac will be expeditioning from Yuba Co.
- Eastern East Bay Report de Gary, WA6VEF
Contra Costa Look for CQP activity from VE2AQS/W6, K6ZM, El Presidente, WB6MZQ, NB6L, AK6T, and a multi-single effort from N6VV, K6XV, and K6PJY.
K6RK Chuck will be operating again from Calaveras Co.
WX6M Rich plans an expedition to Yolo.
- SJV Report de Duane, W6REC
WC6H Rich will be on from San Joaquin if his monobanders are back up in time.
W7MAP Chuck will be active from the home QTH in San Joaquin.
N6GG Rich plans a limited effort from Amador Co.
N6EE Ron is trying to get together an expedition to Tuolumne.
W6REC Duane will again activate Modoc County.
- Sac Valley/Nevada Report de Tim, NC7K
WA6AUE Jim will be on from Nevada, perhaps with some help from NC7K.
K3EST Bob plans limited activity from Yolo Co.
WA7NIN Pat says he may give it a go from Nevada.
VE7NKI New member Niki will be looking for CQPerS on CW on 20, 15, and 10 meters.

**1988 CALIFORNIA QSO PARTY
CONTEST OPERATING TECHNIQUES
DE WA6VEF**

1. CALL CQ!!! This is the only contest on the calendar where California stations are the "hunted" rather than the "hunters." So, it's not necessary to have a "big gun" station to attract attention to yourself.
2. Concentrate on CW QSOs during the first day. Be sure to try the CW subbands on the half hour, rather than at other time intervals.
3. The CQP is probably the only contest where, if conditions are decent, Sunday is productive. So, schedule you off-time so that you have plenty of operating time on Sunday.
4. The CAL QSO Party is also unique in that duplicate QSOs tend to be minimized. Thus, if you don't like to keep dupe sheets, you are probably safe if you just maintain dupe sheets on other W6s you work.
5. Don't forget 6 and 2 meters, especially if your station is in a populous area.



6. Hitting the sked times on 160, 2, and 80/75 meters will probably add 50 or more QSOs to your total.
7. That missing VE8 or VE6 or VE5 can often be found by pointing the beam north and calling some brisk CQs. In the past few years, the best time to do this on 20 meters has been around 1600Z-1900Z.
8. You can sometimes increase your SSB rate by announcing occasionally that you are operating in the California QSO Party, or that the other stations "don't have to be in the contest to work you," or "All I need to get from you is a QSO number and your state." In sum, add a few extra words to "CQ Contest" to entice others into calling you.
9. If you have a big signal on 40 meters, East Coast and Midwest sunrise can be productive (plus or minus 1200Z).
10. If the propagation gods smile upon us and permit 10 meters to be open, don't forget the Novice SSB sub-band. It can be the best source of high-rate activity.
11. Try and follow the flow of activity as it shifts from band to band

**CONTACTS NEEDED CQWW
RICH SMITH, N6KT**

I plan to be in Curacao this October for the CQWW PHONE CONTEST, signing PJ2FR. I will be trying for the WORLD RECORD this time and need to work as many Club Members as possible. The best times to find me will probably be the following:

10 meters	1800-2100Z
15 meters	2100-2300Z
20 meters	0000-0300Z
40 meters	0700-1000Z
80 meters	0700-1000Z
160 meters	0700-1000Z on the hour

This record has been held by N6AA of the evil Southern Cal. contest club for the last 8 years or so. I would love to bring it to Northern Cal. I would appreciate any help the NCCC members can give.

Please QSL via KI6EZ for any of my operations.
73, Rich, N6KT

STATIONS WANTED

AD6E and N6BIS looking for stations to operate CQWW..



**NCCC BOARD OF DIRECTORS MEETING
AUGUST 31, 1988
HELD AT QTH OF K6MA**

- K4UVT/6 was nominated to replace WB6MZQ as the VP/CC. Unanimous approval by the board.
- Extensive discussions on future meeting, locations and programs.
 - September 23 Membership Meeting
Location: Coco's restaurant in Sunnyvale. Same as July meeting (reserved by K6KLY).
Dinner at 7:00pm. Meeting at 8:00pm.
Topic: CQP preparation by WAGVEF.
 - October 3 Board Meeting
Tentatively at WZ6Z. WB6MZQ to confirm
 - October 21 Membership Meeting
Round table forum
CQWW preparation
Location to be determined
 - November 1988 B.O.D. location and date to to be determined.
 - November 18 Membership Meeting
SS preparation
Location to be determined.
 - December 17 Christmas Dinner
Pleasanton Hotel unavailable. Several alternatives discussed, such as Villa (San Mateo), Velvet Turtle (Burlingame), Mac's Tea Room (Los Altos). K6KLY to reserve one of the above ASAP.
 - January Members Meeting
Location to be determined.
K4TKM Dx Contest slide show. WB6MZQ to confirm.
 - March 18 Awards Banquet
Reservation to Pleasanton Hotel to be made by WB6MZQ, ASAP. \$100.00 check required to hold reservation.

Effective September 23, 1988, Barclay's Bank will be taken over by Wells Fargo. Account number will be changed.

K6MA stated only 60 members renewed to date. Reminder notices will be mailed next week.



TUNED 160 METER RECEIVING LOOP WITH MOSFET PREAMP

BY

TED ALGREN, KA6W

In early 1985, I was struck by the worst of all DX interests...160 Meter DXing! No other band (of which I am aware) offers so little in return for so much total effort. If you want technical challenges, try working 100 countries on 160 meters from the 6th district. No, I haven't made it yet but, I've slugged by way through about 80% of the journey.

While working the first few countries was easy, several locals were eating my lunch when any DX past 4000 miles away appeared on the band. It became painfully obvious that they were doing things I wasn't or they lived in very, very quiet locations! Much reading and talking to band residents produced the following conclusions:

1. Most stations used vertical antennas for transmitting.
2. Most stations used at least one other antenna solely for receiving... Beverages, horizontal loops, small loops, longwires, etc.

The receiving antenna that seemed most sensible to me was the small receiving loop. It offered a figure-eight pattern which could be used to reject localized noise and was touted as "quieter" than the verticals used for transmitting. I proceeded to visit all the known texts on 160 meter antennas and found a clever loop design in the ARRL Antenna Handbook, 13th and 14th editions. The loop used coax mounted on a bamboo frame and was an easy solution for providing a receiving antenna for a noise dominated band. The obvious thing to do was build one and "smoke test it."

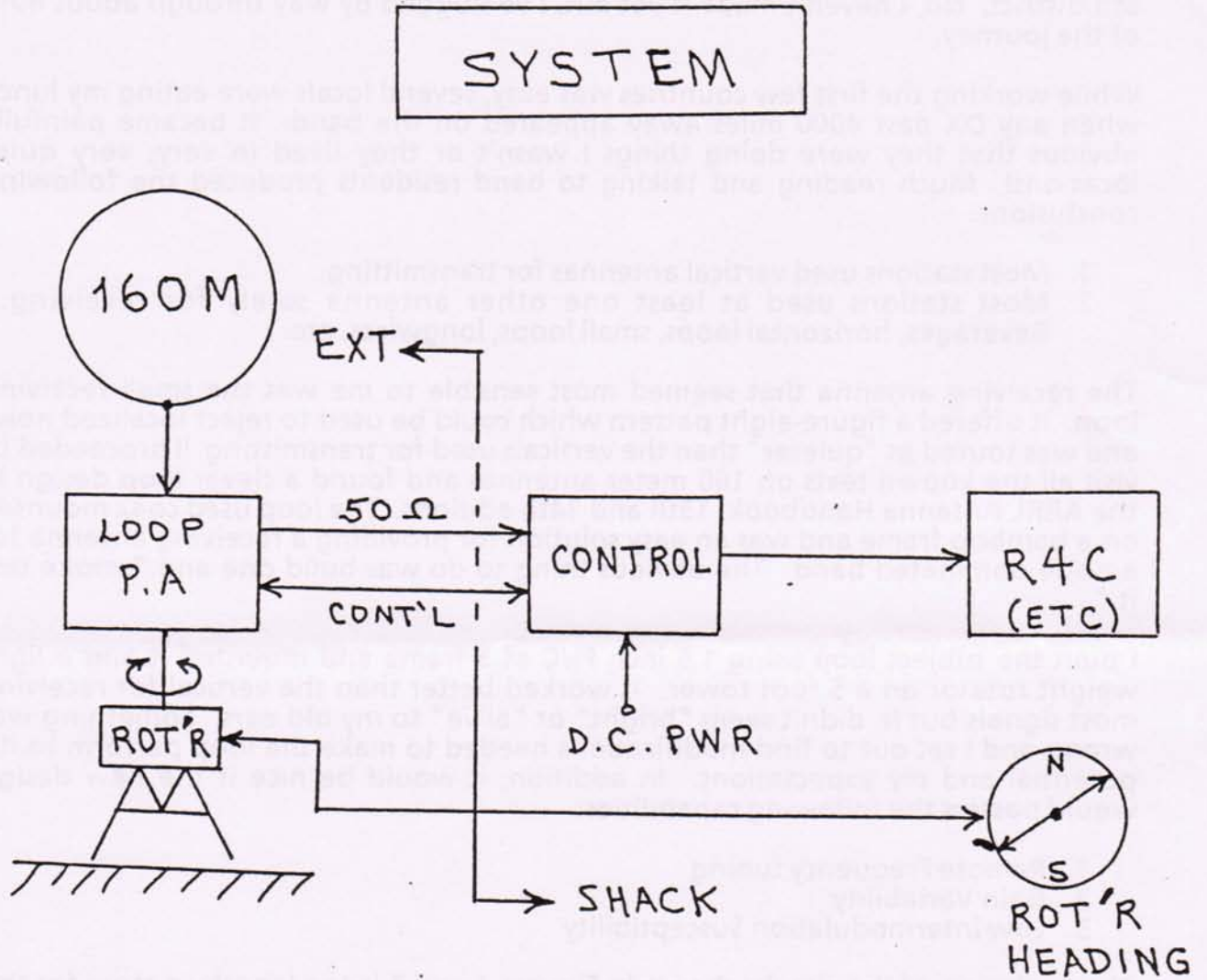
I built the subject loop using 1.5 inch PVC as a frame and mounted it and a light weight rotator on a 5 foot tower. It worked better than the vertical for receiving most signals but it didn't seem "bright" or "alive" to my old ears. Something was wrong and I set out to find modifications needed to make the loop perform to it's potential and my expectations. In addition, it would be nice if the new design would possess the following capabilities:

1. Remote Frequency tuning
2. Gain Variability
3. Low Intermodulation Susceptibility

The evolution of the circuits shown in Figures 1 and 2 is too lengthy a story for this article. Suffice it to say that a push-pull dual gate mosfet with varactor tuning provided all of the three mentioned capabilities. The loop became "bright" and "alive" to my old ears. Hearing and working Japan became a pleasure and the loop allowed me to work FT5ZB... whom I could NOT hear on my transmitting antenna. Europe has been heard and worked too! Alas, the loop didn't do much to help with a S-9 + line noise problem that appears frequently at my QTH. Only PG & E solves that one!



160 METER RECEIVING LOOP SYSTEM SCHEMATIC



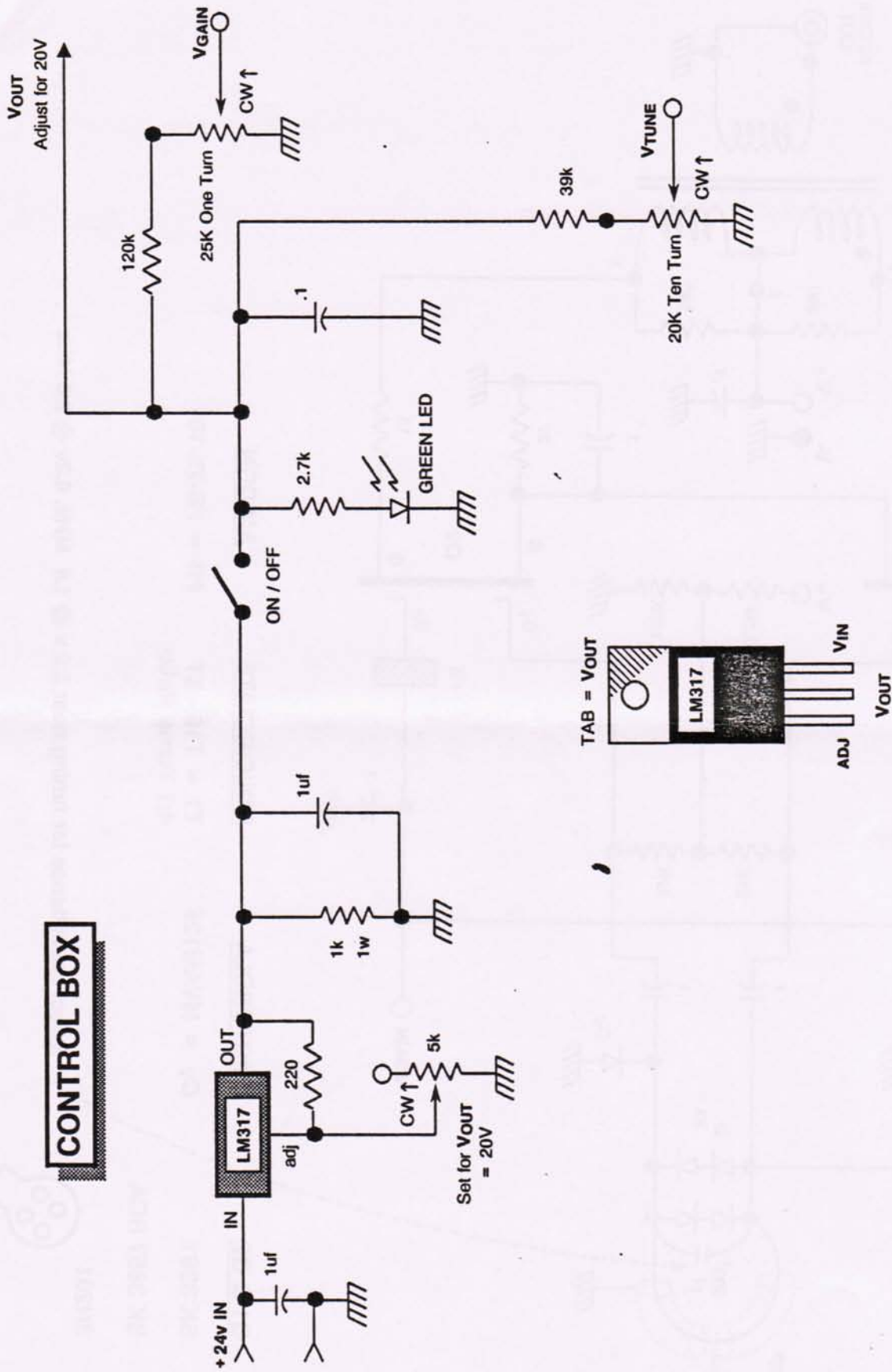
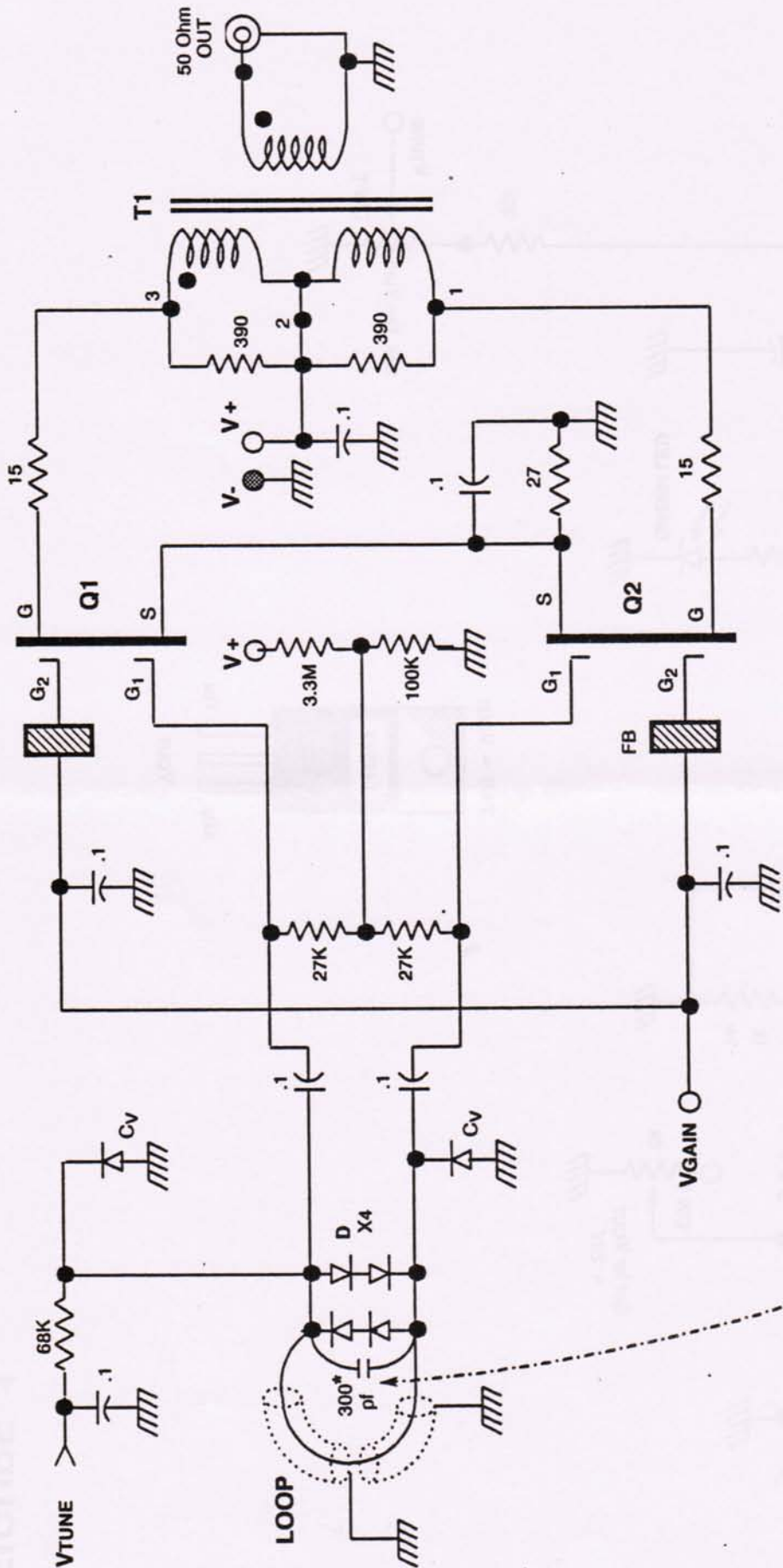


FIGURE 1



Q1 & Q2

MOTOROLA

MINICIRCUITS

AMIDON

SK 3991

MVAM125

T1 = T16 - 6T
4:1 Turns Ratio

FB = FB-75-101

SK 3857 RCA

3N201



* Select capacitance for tuning near 2.2 v @ 1.8 MHz, 6.2v @ 2.0 MHz

FIGURE 2

Now a few words regarding the system design. My loop consists of 28 feet of 0.25 inch soft copper tubing formed in a circle. The diameter is just under 9 feet and the preamp circuit is mounted in a small aluminum box. The copper tubing is cut directly opposite the loop preamp and separated about 1 inch.. a small piece of plastic tubing with hose clamps keeps the copper tubing in a circle configuration. For the loop internal wire, I used the insulated center wire of RG-62A/U coax (strip the coax outer insulation and ground braid) fed through the copper tubing. Why RG-62A/U? It has low distributed capacitance per foot. Mounting the loop on a 1.5 inch diameter ABS frame makes the loop much stronger than the PVC design described earlier. Use good RF assembly techniques when building the circuit shown in Figure 2. I built the circuit on a piece of brass using mini standoff insulators. The transistors and output transformer are placed in sockets for easy repairability. This is necessary since you WILL inadvertently transmit into the loop. No, I've never been that stupid! HI

Performance specifications are estimated as follows:

Preamp Gain: Variable 0-35 dB (MOSFET transcond. dependent)
Noise Figure: 5 dB (Not important on 160 meters)
Frequency Range: 1.550 to 2.010 MHz (Tuning 0 to 6.2 volts)
Loop Q-Factor: 150 (Mainly affected by Varactor Q)

Yes, this design could be scaled to 80 meters (and below). I have not tried but suggest you start with a loop circumference of 13 to 14 feet. Change the set tuning capacitor (300 pf at 160 meters) to an appropriate value to achieve the recommended band tuning voltages. Remember that the loop CIRCUMFERENCE must not exceed 0.09 wavelength to yield a good figure-eight response pattern.

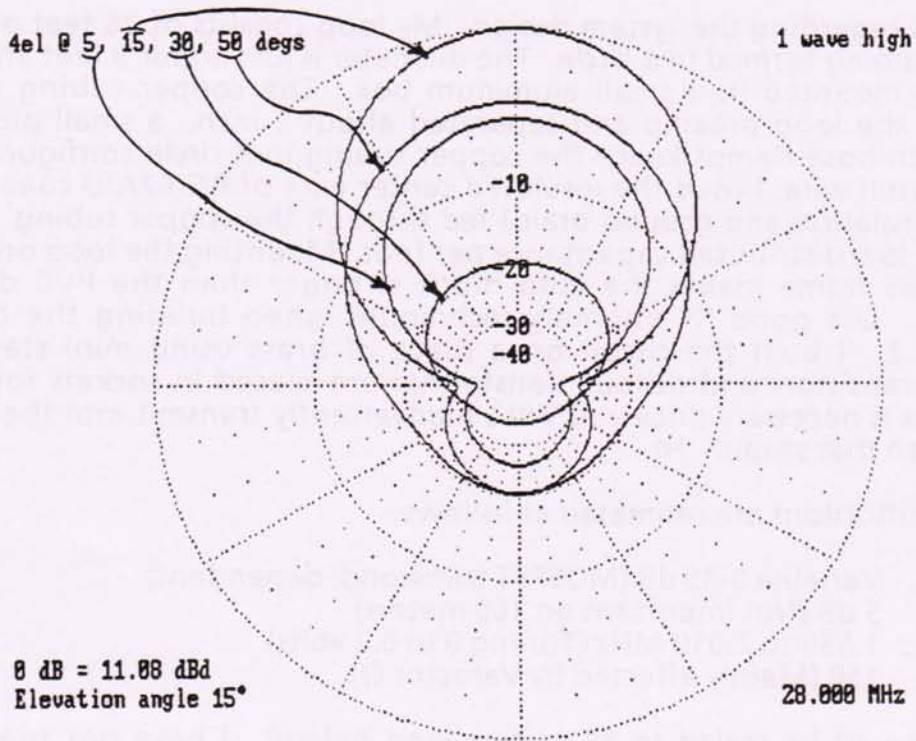
73 and Good S/N on 160 meters
Ted, KA6W

QUIZ FROM BT'S ANTENNA FARM

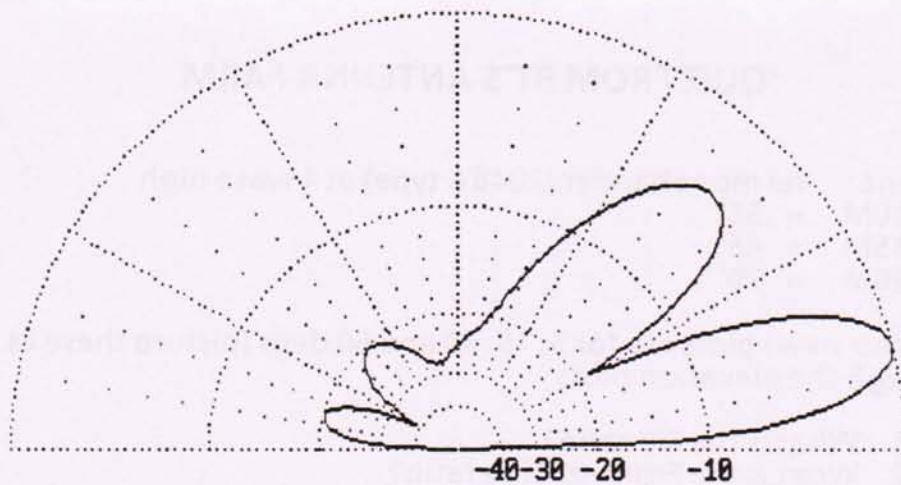
- * Test antenna: 4el monobander (204BA type) at 1 wave high
 - 10M = 35'
 - 15M = 46'
 - 20M = 70'
- * Azimuth (top view) plots are for 5, 15, 30 and 50 degs (picture these as horizontal slices through the elevation plot)

- Questions:
1. What is the F/B ratio?
 2. What is the Front-to-Side ratio?
 3. Ratios in relation to what?
 4. What incoming wave angles will it hear best?
 5. What incoming wave angles will it hear worst?





4el 1 wave high



0 dB = 11.16 dBd
Azimuth angle 0°

28.000 MHz



CALLSIGN _____

STATE/PROV/COUNTY _____

BAND MHz	TIME UTC	STATION	SENT	RECEIVED			POINTS
			NR +	NR	STATE/CTY	MULT	
			1				
			2				
			3				
			4				
			5				
			6				
			7				
			8				
			9				
			0				
			1				
			2				
			3				
			4				
			5				
			6				
			7				
			8				
			9				
			0				
			1				
			2				
			3				
			4				
			5				
			6				
			7				
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			9				
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			4				
			5				
			6				
			7				
			8				
			9				
			0				

CALIFORNIA QSO PARTY
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 CALIFORNIA QSO PARTY

Sponsored by THE NORTHERN CALIFORNIA CONTEST CLUB

CALL SIGN *****
 *
 *
 *
 *

STATE *****
 *
 OR *
 *
 COUNTY *****

BAND	QSOs	
	CW	PHONE
VHF	*****	*****
10	*****	*****
15	*****	*****
20	*****	*****
40	*****	*****
80	*****	*****
160	*****	*****
TOTAL QSOs	*****	*****
	x 3 =	x 2 =
TOTAL QSO POINTS	*****	*****

CLASS *****

_____ SINGLE OPERATOR

_____ MULTI-SINGLE

_____ MULTI-MULTI

_____ SINGLE-OP COUNTY EXPEDITION

_____ MULTI-OP COUNTY EXPEDITION

_____ SINGLE- or MULTI-OP MOBILE

OPERATOR(S): _____

POWER LEVEL: _____

CLUB COMPETITION: _____

TOTAL
 CW AND
 PHONE QSOs

 *
 *
 *
 *

TOTAL MULTIPLIER

 *
 *
 *
 *

FINAL SCORE

 *
 *
 *
 *

MAILING ADDRESS

Novice/Technician Class? Yes No

NAME _____

ADDRESS _____

CITY, STATE/
 PROVINCE _____

ZIP _____

TEL. = _____

AGE _____

"I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge. I agree to be bound by the decisions of the Contest Committee."

Signature

Call

California Counties and their Abbreviations

(Out of state stations--please check off
counties as worked and submit with your entry.)

Alameda	Ala	Marin	Marin	San Mateo	SMat
Alpine	Alp	Mariposa	Marip	Santa Barbara	SBar
Amador	Ama	Mendocino	Mend	Santa Clara	SCla
Butte	Butte	Merced	Mer	Santa Cruz	SCruz
Calaveras	Cala	Modoc	Modoc	Shasta	Shas
Colusa	Col	Mono	Mono	Sierra	Sie
Contra Costa	CCos	Monterey	Mont	Siskiyou	Sisk
Del Norte	DelN	Napa	Napa	Solano	Sol
El Dorado	ELD	Nevada	Nev	Sonoma	Son
Fresno	Fres	Orange	Org	Stanislaus	Stan
Glenn	Glenn	Placer	Pla	Sutter	Sut
Humboldt	Humb	Plumas	Plu	Tehama	Teh
Imperial	Imp	Riverside	Riv	Trinity	Trin
Inyo	Inyo	Sacramento	Sac	Tulare	Tul
Kern	Kern	San Benito	SBen	Tuolumne	Tuol
Kings	Kings	San Bernardino	SBer	Ventura	Vent
Lake	Lake	San Diego	SDgo	Yolo	Yolo
Lassen	Las	San Francisco	SF	Yuba	Yuba
Los Angeles	LA	San Joaquin	SJoa		
Madera	Mad	San Luis Obispo	SLO		

* * * * *

Rules--Worked All California Counties Certificate

1. Contacts may be made on any amateur radio band or mode. (NO repeater or digipeater contacts allowed.)
2. QSL cards for contacts made on or after October 1, 1987, may be submitted for the WACC Award.
3. A QSL card must be presented for each of the 58 counties.
4. Each QSL card must have the county claimed, printed, or written on the card by the person issuing the card.
5. All of your contacts must be made from the same country.
6. Portable and mobile stations may be worked.
7. You do not have to be a member of the NCCC.
8. Your QSL cards will be returned with the WACC Certificate.
9. Send your 58 QSL cards and \$3 or 10 IRCs (to cover expenses) to:
NCCC WACC Certificate, Phil Frazier K6ZM, 44 Toyon Terrace,
Danville, CA 94526.
10. An official entry form is available by sending an SASE to K6ZM at the above address.

CALIFORNIA QSO PARTY ALL TIME RECORDS

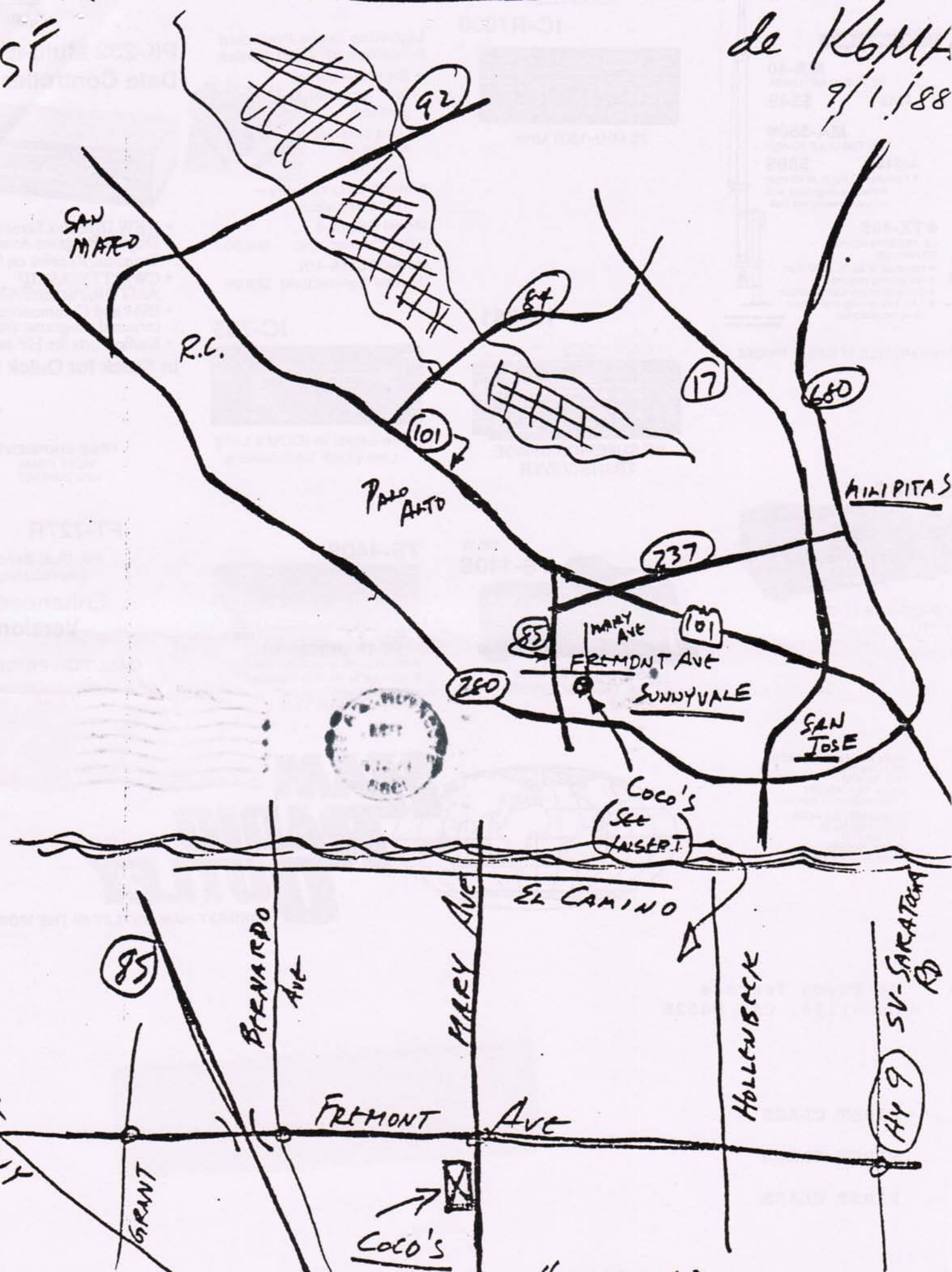
<u>SINGLE OP</u>											
ALAMEDA	W6SZH	80	232,788	1939	57	ALABAMA	KD4XR	01	32,148	342	47
ALPINE	W6XB	79	70,700	707	50	ALASKA	W7K	86	16,400	164	50
AMADOR	N6OR	86	171,171	1001	57	ARIZONA	K7GH	81	34,522	343	41
BUTTE	K6AAN/6	85	51,357	414	57	ARKANSAS	W5DTK	79	24,012	261	46
CALAVERAS	K6RK	87	145,264	1067	56	CALIFORNIA	N6TR	81	293,248	2373	58
COLUSA	K6MHZ	80	97,240	884	55	COLORADO	AC0S	86	23,650	207	43
CONTRA CO.	N6BY	87	266,220	2011	58	CONNECT.	W1GMR	81	34,892	302	44
DEL NORTE	W6MAT	85	43,656	428	51	DELAWARE	K3HBP	87	17,480	140	46
EL DORADO	W6TPH	79	193,820	1762	49	FLORIDA	K4XS (W64E op.)	87	118,726	922	58
FRESNO	W6G1M	87	35,427	343	49	GEORGIA	W4G	87	117,392	889	58
GLENN	AJ6V	84	106,596	956	54	HAWAII	AMGAZ	87	25,208	223	46
HUMBOLDT	W6GSLJ	79	139,810	1271	55	IDAH0	W1PID	75	54,172	467	58
IMPERIAL	W6GRH	75	44,006	469	47	ILLINOIS	W6AVL	82	91,616	746	56
INYO	W6GZM	79	128,336	1234	52	INDIANA	KBOC	87	37,692	349	54
KERN	W6FA/6	85	218,254	1798	58	IOWA	W00EMD	82	91,190	750	55
KINGS	N6BT (W6VEF op.)	86	258,738	2046	58	KANSAS	W00HAP	79	28,350	315	45
LAKE	K6MHZ	81	189,126	1659	57	KENTUCKY	W4XT	83	29,500	292	50
LASSEN	K6AAN	86	131,254	1017	58	LOUISIANA	KZSD	87	38,988	310	54
LOS ANG.	W6AQ (W6GTU op.)	86	266,452	2065	58	MAINE	W1GLM	81	25,757	257	57
MADERA	K6MHZ	83	198,476	1711	58	MD-DC	KK3T	86	80,541	605	57
MARIN	K6LRN	87	102,030	692	57	MASS.	W1B	86	21,798	203	42
MARIPOSA	K6MHZ	82	199,288	1718	58	MICHIGAN	W0BHCQ	82	27,762	289	42
MENDOCINO	W6AT	82	135,945	1116	57	MINNESOTA	K10F	87	52,839	421	57
MERCED	W6TPH	82	180,612	1434	58	MISS.	K5MK	87	23,683	200	47
MODOC	W6REC	87	199,578	1450	58	MISSOURI	N0R3	78	23,228	258	45
MONO	W6GZBX	87	111,216	993	56	MONTANA	W7JYV	75	19,006	221	43
MONTEREY	K06V	81	109,497	925	57	NEBRASKA	KV0I	87	74,536	577	56
NAPA	W6FSJ	83	95,817	703	57	NEVADA	W7M1M (W6GAT op.)	83	73,776	606	53
NEVADA	A16V	86	242,846	1913	58	NEW HAMPS.	K11TS	81	28,413	268	41
ORANGE	N16W	R7	181,714	1360	58	N. JERSEY	N2AEV	82	29,190	276	42
PLACER	W6SZH	H1	171,775	953	55	N. MEXICO	W51S	87	70,676	163	44
PLUMAS	K6AAN	87	126,266	920	58	NEW YORK	W2HG	87	41,184	337	52
RIVERSIDE	W6KFX	80	43,142	385	45	N. CAROLINA	AA4HC	86	61,380	484	55
SACTO	K160	81	167,238	1302	57	N. DAKOTA	W3PWL	87	49,000	384	56
S. BENITO	WV6Z	86	149,292	1200	58	OHIO	W3BT	86	40,333	318	53
S. BERNA.	W6MAL	86	107,502	788	57	OKLAHOMA	W5TZH	87	27,650	254	50
S. DIEGO	K6HA (N6TR op.)	87	292,842	2283	58	OREGON	N6TR/7	86	130,500	1030	58
S. FRAN.	N6BY	79	232,560	2040	57	PENN	N6CQ/3	87	64,314	483	54
S. JOAQ.	K6AYA	76	101,640	965	58	RHODE IS	KA1G0W	86	28,764	245	47
S. LUIS	W7CB	82	221,328	1777	58	S. CAROLINA	W60KX/4	86	15,540	138	42
S. MATEO	N6BY	82	270,454	2245	58	S. DAKOTA	KD0EE	87	20,539	184	47
S. BARB.	W60UL	80	165,642	1301	57	TEHH	K4LTA	87	65,448	501	54
S. CLARA	N6BT (W6VEF op.)	82	292,436	2350	58	TEXAS	W5JB	87	73,872	575	57
S. CRUZ	W6RZ (W6SHD op.)	80	276,892	2338	58	UTAH	KE7KF	87	24,860	226	55
SHASTA	AA60X	79	168,376	1619	52	VERMONT	W1JYV	87	24,104	196	46
SIERRA	N1EE/6	87	56,056	413	52	VIRGINIA	W3YY	86	52,528	400	56
SISKIYOU	WJ60	87	37,050	294	50	WASH	N7ZZ	77	52,704	488	54
SOLANO	K86JK	85	188,422	1653	57	W. VA.	W6VEN	82	5,356	103	26
SONOMA	K86ZA	81	136,287	1194	57	WISCONSIN	N0BSH/9	87	102,828	839	57
STANIS.	W6SZH	83	148,656	1076	57	WYOMING	K7MM	86	12,012	124	39
SUTTER	W6T00	78	93,138	817	57	MARITIME	VE1BMM	81	27,520	212	46
TEHAMA	K6AAN	83	134,007	1004	57	QUEBEC	VE2EDK	87	11,560	103	40
TRINITY	W6MBE	81	23,520	240	49	ONTARIO	VE3KK	87	19,926	164	41
TULARE	K16CG	87	89,552	772	58	MANITOBA	VE4VV	79	12,768	168	38
TUOLUMNE	N6TP	79	38,976	406	48	SASK.	VE5US	75	5,680	71	40
VENTURA	N6TR	81	293,248	2373	58	ALBERTA	VE6BME	86	9,672	104	31
YOLO	N6JV	81	88,776	724	54	BRIT. COL.	VE7SK	87	72,561	553	57
YUBA	K6MHZ	84	159,268	1373	58	NWT-YUKON	VE8CM	86	6,162	79	39
						ASIA	JH70PB	83	9,842	128	37
						EUROPE	LABPF	86	5,518	63	31
						S. AMER.	YV50PG	86	3,762	57	33
						N. AMER. DX	XE1LLS	80	6,552	117	28

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<u>MULTI OP</u>					
MULTI-SINGLE	AJ60	82	259,840	2119	58
MULTI-MULTI	N6KT	79	493,928	4258	58
<u>COUNTY EXPEDITIONS</u>					
SINGLE-OP	N6BT (W6VEF op.)	86	258,738	2046	58
MULTI-OP	N6KT/6	78	306,356	2641	58
<u>MOBILE SINGLE-OP OR TEAM</u>					
	NAARO/WJ60	87		705	
<u>MOST CW QSO'S</u>					
	W6UE (AA6RI op.)	87		1004	

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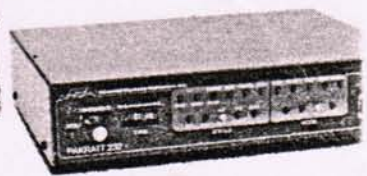
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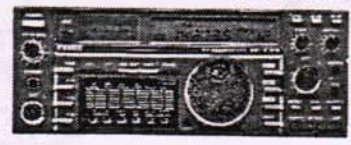
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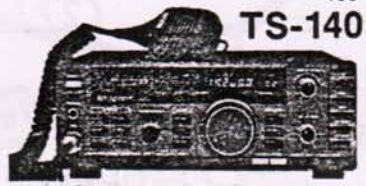
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