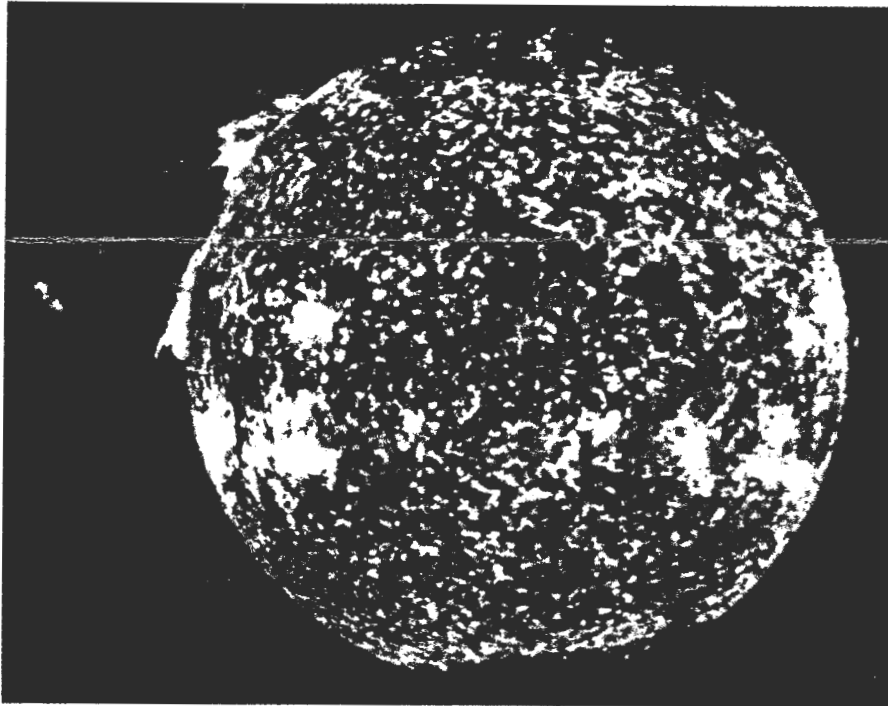


# THE DXer

SEPTEMBER 1989

VOL XLII - NUMBER 9



This photograph of the Sun, taken December 19, 1973 by Skylab 4, shows one of the most spectacular solar flares (upper left) ever recorded, spanning more than 588,00 kilometers (367,000 miles) across the solar surface. Skylab photographs such as these may provide clues to the mechanism by which such quiescent features erupt from the Sun. The photograph was taken in the light of ionized helium by the extreme ultraviolet spectroheliograph instrument of the U. S. Naval Research Laboratory. (NASA Photo)

# DUES ARE DUE, SEE BELOW

## The NCDXC DXer

SEPTEMBER 1989

VOL XLII - NUMBER 9

### September Events

- Sep 8 - NCDXC meeting, Palo Alto.
- Sep 9 - ARRL VHF QSO party.
- Sep 9 - WAE DX SSB Contest.
- Sep 9 - Electronic Flea Market, last one of the year, Foothill College, Los Altos.
- Sep 30 - Deadline for October DXer.
- Oct 7,8 - California QSO party.
- Oct 13 - NCDXC meeting, Palo Alto.

Meeting Notice: Friday the 8th of September will be the next regular meeting of the NCDXC. The meeting will start with dinner around 6:00 PM Friday afternoon. The evening's speaker will start at 8:15. The speaker will be Bob Artigo, KN6J. Bob will tell us what it's like to activate a (possibly) New One when he shares his exploits of Banaba Island (T33JS).

### New Members and New Life Members

We have two new members and three who have become life members. First the new members:

Gregg Marco, WA6IZT  
508 Orange Avenue  
South San Francisco, CA 94080

Steve Salmon, AA6LF  
2915 Shasta Road  
Berkeley, CA 94708

Welcome to the world's greatest DX club.

Newly elected a life members are: Bill Stevens, W6ZM; Stan Kuhl, K6MA; and Bob Wilson, NQ6X. None of these people have moved or changed phone numbers, so the current roster information is OK.

73, Dave, AF6S

Cover photo via NT6G

## DUES ARE DUE

- Regular Member \$24.00/year.
- Family Member (same QTH) an additional \$15.00/year.
- Absent Member (outside of NCDXC area) \$16.00/year.

Please send your Dues to:

NCDXC Treasurer  
P.O. Box 608  
Menlo Park, CA 94026

### Thursday Night Net Help Needed

Dave, KD6AZ is moving and will have to give up his Thursday night net support of News Line (News Line used to be called West Link). If you can make a phone call, record News Line and then play it back later on the net, then call Ralph, AG6Q or Dave, KD6AZ at their roster numbers.

### California QSO PARTY

The 1989 CQP sponsored by the Northern California Contest Club will begin 1600 UTC October 7, 1989 and end 2200 UTC October 8, 1989.

Single-ops operate 24 hours minimum time off 15 minutes clearly marked in logs, Multi-ops may operate full 30 hours. Stations may be worked once on CW and Phone on each band. All contacts must be simplex. No MCW. Single-op and multi-operator are allowed only one transmitted signal.

Outside of CA work as many CA counties as possible; in CA work anyone. CA use states and VO/VE1 and VY1/VE8 for 58 multipliers. Out of CA use CA counties for 58 multipliers. Phone contacts 2 points, CW contacts 3 points.

Entries and further information to:

NCCC c/o Gary Caldwell, WA6VEF  
P.O. Box 8014-56  
Blaine, WA 98230

### Fried Spaghetti

When your baby daughter turns on the cordless screwdriver and stiches it in the phone jack of your 930S (definition adapted from a true story).

S.F. Slick

# DUES ARE DUE, SEE PAGE TWO

THE NORTHERN CALIFORNIA DX CLUB,  
INC., PO BOX 608, MENLO PARK, CA 94026

The *DXer* is the bulletin of the NCDXC and is published monthly for the benefit of its members. Permission to use any portion of this publication is hereby granted, provided credit is given to the *DXer*.

## NCDXC OFFICERS

President: Rusty Epps, W6OAT  
Vice President: Larry Souza, KG6GF  
Secretary: Dave Barton, AF6S  
Treasurer: Stan Kuhl, K6MA  
Director: Jerry Griffin, W8MEP  
Director: Chuck Vaughn, AA6G  
Director: John Cronin, K6LLK

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Send DX ladder reports to:

Larry Bloom  
2520 Heather Lane  
San Bruno, CA 94066

## NCDXC REPEATER W6T/R

Output 147.36 Mhz, Input 147.96 Mhz  
Trustee: Bob Vallio, W6RGG  
Repeater Committee Chairman:  
Smitty Smithwick, W6JZU  
Suggested simplex freq.: 147.54 Mhz

## NCDXC THURSDAY NIGHT NET

On W6T/R Thursday at 8:00 PM local time.  
Operations Manager: Ralph Hunt, AG6Q  
DX News: Bob Artigo, KN6J  
Propagation: Al Lotze, W6RQ  
Contest News: Bob Dorse, K4UVT  
Westlink: Dave Bottom, KD6AZ  
Swap Shop: Ben Deovlet, W6FDU  
933 Robin Lane  
Campbell, CA, 95008  
408/374-0372

QSL Information: Mac McHenry, W6BSY

## NCDXC DX BULLETIN BROADCASTS

Trustee: Bob Vallio, W6RGG  
W6TI, the NCDXC memorial station broadcasts DX bulletins each Sunday at 1800 PST (Monday 0200 UTC) on or about 7.015 Mhz and 14.002 MHz.

## 1990 International DX Convention

The Southern California DX Club will host the 41st International DX Convention to be held at the Visalia Holiday Inn, April 6, 7 and 8, 1990. **NOTE THIS EARLIER DATE!**

The 1990 Convention Committee met in early August to start the planning of this yearly gathering of DX notables from around the world. Technical presentations, DX-peditions, and a special ladies program on Saturday will highlight the weekend.

Hotel reservations can be made direct to the Holiday Inn, Visalia. 1-800-821-1127. Make sure you mention the DX Convention for special room rates. *Ed note: on 8-28-89 hotel was half booked up!*

Pre-registration information will be available early next year. For more information, contact Don Minkoff, NK6A. 213-397-2984. 12567 Brooklake St., Mar Vista, CA 90066.

## de KE6ZE

This issue of the *DXer* has a number of articles about activity on the Sun. As the Sun Spots increase lots of things happen. A few articles about these effects are included here for your information. Thank you NT6G, W6RQ, W6CF, K6LRN, & KA6ING for providing the articles reprinted here.

Last month's issue of the *DXer* was the one year anniversary of your editor. It has been an interesting year and I'd do it over again, even with the knowledge of what the job is. However, it is now the turn of another member to step forward and carry forth the job of *DXer* editor. The December 1989 issue will be the last *DXer* of your current editor.

The job is not all that difficult there is lots of help, Martin, KB6BW maintains the mailing list, Ron, W6VG takes care of the printing, addressing, stamps and mailing. The editor does not have to write anything, just read your mail and assemble the articles. You don't even have to type much, the club will pay a typist to re-type any necessary input. Do I hear any volunteers out there? Contact W6OAT or KE6ZE if you have an interest.

*Regards, Dave*

# DUES ARE DUE, SEE PAGE TWO

## RUSTY'S RAVINGS

Whatever happened to the once-held belief that a QSL card is the final courtesy of a QSO? And why are cards received via the bureau of less value than cards which come in an envelope all by themselves?

For a couple of years now I've watched with growing dismay what I consider to be the demise of QSLing. It used to be that if you wanted a DX QSL in a hurry (usually because it was a new one), you'd send your card via direct mail and enclose a self addressed envelope with enough postage or IRCs for the DX station to send you a card right back. Otherwise, you just sent your card via the bureau and in a few months to a year you'd get your reply which, most of the time, you'd just file away in the old QSL drawer or shoebox.

Things are different now. More and more it seems DX stations and/or their QSL managers are demanding direct-only QSLs. There seem to be two reasons for this: one is ego and the other is financial gain.

The ego trip runs along the line that if you're not willing to spend (relatively) a lot of money on postage to get my card direct, then I'm not going to waste my time on you. Even though you're just going to file my QSL away in your shoebox, I really need to see you spend the money on postage so that I'll know you consider me important enough to justify my time in answering your card. I find it particularly incredulous that QSL managers take this attitude, but we all know lots who do. My thought is that these folks ought not be QSL managers! As for the individual DX station who adopts this attitude, I'm disappointed in him, but nonetheless I concede he's entitled to decide how, or whether, he wants to send QSLs. I just wish he'd let me know his feelings about QSLing before I wasted one of my cards on him. That applies in spades to the contest operator who is looking for me to supply QSOs for him on all bands, but who doesn't intend to answer my cards. If my bureau card isn't good enough for him, then he isn't worth the time I have to spend in the pile-up trying to get through so he can claim a bigger score.

Those in the QSL business for financial gain leave me even colder. They truly are a disgrace to

amateur radio as I grew up knowing it. These are the folks who require that you send your QSLs to them in such a way that they make a profit from you. They're the ones who require, say, a minimum of a "green stamp" when the cost of return postage is only going to be a quarter, or who will not answer a card unless a "sufficient" donation is enclosed. To these folks, cards via the bureau are anathema because they don't make money on them.

A key point here is the difference between accepting donations as contrasted with requiring them. I think it's great when hams include something extra to help offset the cost of printing QSLs or when they kick in an extra buck or two because they know the DX station encountered a lot of expense on a DXpedition. But these are voluntary donations from thoughtful DXers, not required fees as the quid pro quo for obtaining the DX QSL.

The Northern California DX Foundation recently adopted a QSL policy statement for the DXpeditions it supports. I think it's worth repeating that policy here, because it represents the minimum standard to which any DXpedition requesting general support should adhere:

"NCDXF believes that part of the justification for spending Foundation funds to assist DXpeditions is to enable DXers who work the DXpeditions to obtain QSL cards. Consequently, NCDXF believes that the DXpeditions it assists should answer every QSL, whether received direct or via the bureau, provided the sender is in the log and provided the QSO is not a duplicate on the same band and mode. Stations who send the DXpedition one or more self addressed envelopes of proper size and with sufficient postage deserve to have their QSLs sent to them directly. "Sufficient" means only enough stamps, IRCs or cash to cover the postage cost. All others are entitled to receive their QSLs via the bureau. A DXpedition may request donations in excess of the postage cost, but it never should require such donations. A DXpedition may choose to answer the QSLs of stations making donations first, but it still should answer all others in a reasonably expeditious manner."

# DUES ARE DUE, SEE PAGE TWO

Because the NCDXC is one of the world's oldest and foremost DX Clubs, I think it is appropriate that we make our opinions known on matters, like QSLing, which affect our hobby. As you can see, I'm not at all shy about stating my own personal view on this issue. However, I'm sure that lots of you have other opinions and I hope you'll use The DXer as a forum to make your thoughts known publicly. Take a few minutes now to fire off a letter to editor KE6ZE letting him know your thoughts about QSLing.

- . . . -

NCDXC will be hosting the DX Forum at the Pacific Division Convention in San Jose at 11:00 a.m. on Saturday, October 7. Be sure to join us. This will be an excellent opportunity to recruit some newer hams into the world of DXing.

Steve, W6MKM, has finalized the date for the NCDXC picnic. It will be on Sunday, October 15, at Coyote Point in San Mateo. We have access to the site anytime after 09:00 a.m. We'll have full details in next month's The DXer and at the meeting.

The September meeting will be on Friday, the 8th, at Harry's Hofbrau in Palo Alto. Bob Artigo, KN6J, will tell us all about DXing from the Pacific. Come see what Banaba Island really looks like--who knows, it just might be your next DXCC country!

*73 de Rusty, W6OAT*

## July NCDXC Board Meeting

The August 1989 meeting of the NCDXC Board was held at Ron, W6VG's home.

### Items:

1) President Rusty, W6OAT reported that some members had suggested changes to the procedure by which new members are sponsored. One of these suggestions was in the form of a letter from K6ITL. After discussion at considerable length, covering quite a number of possibilities and their ramifications, the board resolved that the procedure, covered in 1-103 of the Procedures Manual, be changed by adding the following provisions:

a) One of a prospective member's sponsors must be present to speak for him or her at the applicant's 2nd reading.

b) If neither sponsor can be available for the regularly scheduled 2nd reading, it will simply be deferred to the next general club meeting at which one of the sponsors is available.

The new provisions are effective starting with all first readings at the September meeting.

2) The club picnic, at Coyote Point Park on Oct. 15 was discussed, and it was resolved that Steve, W6MKM, who has already begun working on it would be asked to continue to be in charge of this project.

3) Rusty asked for and received an expression from the board on the possibility of having a Christmas party. Negligible enthusiasm was shown, but the board agreed that if the general membership wanted a party and if someone would take charge of making it happen, there would be no objections.

4) A brief discussion of repeater problems was held, with the conclusion being "leave it to Smitty", (Repeater Committee Chairman, W6JZU).

5) WB2CHO's letter requesting sponsorship of a Soviet ham's speaking tour of the U.S. was discussed, with the board's consensus being that we would be more than willing to invite the Soviet to make a presentation at a NCDXC meeting, and to show general hospitality, but not to provide airfare.

6) The board voted to accept K6MA, W6ZM and NQ6X as life members and to put the matter to the vote of the general membership, per standard procedure.

7) The board discussed attitudes of some members toward packet.

*Respectfully submitted, Dave Barton, AF6S,  
secretary NCDXC*

## July NCDXC Meeting

The July, 1989 meeting of the NCDXC was held at Harry's Hofbrau in Palo Alto. Rusty, W6OAT presided. Rusty opened the meeting with the introduction of guests.

# DUES ARE DUE, SEE PAGE TWO

## Items:

1) The annual club picnic was announced. The picnic will be held October 15 at Coyote Point Park and the picnic chairman is Steve, W6MKM.

2) The club voted in W6ZM, K6MA and NQ6X as life members.

3) Second readings were held for:

WA6IZT      Greg Macho

AA6LF        Steve Salmon

Both of these gentlemen were accepted as new members.

4) Jim, W6CF gave a fine presentation titled "What ever happened to Eric Palmer, Jr.?"

*Respectfully submitted, Dave Barton, AF6S, secretary NCDXC*

## Carolines DXpedition

Dear NCDXC:

I am very glad to inform to you about an upcoming DX-pedition. At moment, I have plans to be QRV on KC6 western (Palau) and KC6 eastern (Micronesia) in September with three friends. We will be happy to contact you and your friends from those countries. We will appreciate informing your friends who need KC6s concerning our DX-pedition as follow:

Date: September 12 - September 19, 1989 (included travel hours)

Bands: 1.9, 3.5, 7, 14, 21, 28, 50 MHz SSB and CW; 29 MHz FM; 10, 18, 24 MHz SSB and CW depends on license. Maybe OK!

Gear: multiple transceivers, linear amps and antennas.

Calls: Palau - KC6YU (JH1NBN/JH2BIM), KC6NX (JH2BNL) KC6MK (JH2HLTR), KC6MZ (JI2UAY)

Micronesia - KC6.. (if possible, we will use the new V63 prefix!) For a few days, some of us will go to Micronesia (KC6 eastern). We have not received licenses from Micronesia administration yet. But, we have confirmed, from the Micronesia radio license administration, that our licenses have

been approved and sent to us. The change from KC6 to V63 will be done as soon as the US FCC tells Micronesia to use V63 officially.

Guam - KH2/JH2BIM maybe September 19.

I am looking forward to seeing you again soon! Best DX and good luck!

*73 "YUKI" Yoosuke Uchiyama, JH1NBN/JH2BIM via W6RVS*

## Another New One?

There are a couple of local QRPers that work everything but have failed to apply for the DXCC award. One was by last week and all he wanted was information on new countries.

We acknowledged that Aruba and Western Sahara were two recent additions to the countries list. Something might happen with regard to Okino Torishima when a decision would be made as to what went where. M-V Island was the big event last summer and in November the word came out of Newington that the official ARRL decision of 1970 establishing the Island's DXCC status was reaffirmed. Rotuma made it to the Big List just before year's end and then there were rumors of someone petitioning for separate country status for Marquesas.

The QRPer was delighted at all this information. "Getting closer all the time", he said and we had to ask questions. There was that beady-eyed smile and we braced for some devious thinking. "I'm getting closer all the time to working Santa Claus Land for a new one", he said. "One of these days, the ARRL Advisory Committee is going to vote in favor of DXCC credit for Santa Claus Land. SCL on the DXCC Countries List! Jingle Bells and that one-horse open sleigh! And I'm aiming to be the first one to submit a QSL from Santa for DXCC credit."

We had to think over for a bit before replying. "That would mean that you are getting something for nothing, wouldn't it? Santa Claus Land is not a country by reason of government," we said and the smile was even brighter. The QRPer leaned closer and said: "Isn't it about time one of us DXers got something for nothing? Something after all these years?"



# DUES ARE DUE, SEE PAGE TWO

Son of a Gun! We were with him there for the DXers are a patient and deserving group and though we may not make the rules, we can play by them.

*OH2BH & OH2BN*

## ARRL BULLETIN

NR 47 August 23, 1989

Sherrie P. Marshall was sworn in on August 21, by commissioner James Quello as a member of the Federal Communications Commission. She was nominated by President Bush on June 16, and confirmed by the US Senate on August 4. AR

*Hmmm - So, the attorney representing United Parcel Service interests in their 220 MHz grab is now one of the keepers. Maybe the OFs on 75 can now arrange it so they really do own "their" frequency. - Ed.*

## Propagation

### A Look Back

One cannot appreciate the progress made in the science of radio wave propagation over the past 65 years, without having a look back to the situation in the early 1920's and seeing the high standard that had been attained in radio technology.

In 1908, Marconi and Ferdinand Brown were awarded the Nobel Prize for their contribution to the practical use of electromagnetic waves in radio communication.

The spark TX, which produced only damped waves, was superseded by the arc TX, developed by Mr. Poulsen. The coherer was replaced by the detector and the invention of the thermionic valve by the Austrian, Robert Von Lieben, and it's updating by the American Lee de Forest, opened a completely new era in receiving and transmitting techniques.

The Titanic disaster and World War I brought about further improvements in equipment and techniques. In the early 1920's broadcasting had started and every point on the earth could be reached by radio waves and radio navigation was in it's infancy.

Summing up, one could say that a high standard had been reached in radio technology and the only outstanding development as we know that technology today, was the development of the transistor or semiconductors.

### Propagation

Contrary to this, however, the knowledge of radio propagation was in a very poor shape, only half the story was known.

All the experts tried to explain how radio waves propagated along the surface of the earth.

A formula was derived by Austin Cohen, which gave the fieldstrength for a given distance and a given wavelength. This formula, which said that fieldstrength increased with wavelength, worked well for low frequencies. Hence, wavelength was chosen as long as possible and the shorter wavelengths were regarded as useless. It was left to the amateurs to show that wavelengths shorter than 200 meters could be used for long distance communication, with transmitters having only a fraction of the power of the commercial stations on the longer wavelengths.

### The Ionosphere

Heavyside of the U.K. and independantly Kennelly of the USA, at the beginning of the century, suggested that there may be a reflecting layer in the upper atmosphere, but it took as long as 25 years for this reflecting layer to be generally accepted.

Several phenomena pointed very strongly to more than one path of propagation; for example, the fading of radio waves - fieldstrangth did not fall off with distance, the variation of fieldstrength from day to night and the huge errors associated with direction finding systems during the night and in particular at dawn and dusk. The first experiment to determine the height of the reflecting layer was made by de Forest in 1914 using a spark TX invented by Poulsen.

He esitimated the height of the reflecting layer to be 62 miles which compares with the heights of the E layer. Also around that time, the theory of an electrically conducting layer which was able to bend or reflect radio waves had been advanced by men like Eccles and Larmor. At that time, all these theories were "taken with a grain fo salt".

## DUES ARE DUE, SEE PAGE TWO

In the mid-twenties, direct proof was established of the existence of a reflecting layer. Appleton and Barnett of the UK and Briet and Tuve of the USA showed convincingly that at the least two "rays" arrived at a distance of a few hundred kilometers at night for a wavelength of a few hundred meters.

Appleton was given the credit for discovering the ionosphere and rightly so, as he devoted all his scientific activities to this fascinating region of the upper atmosphere. It's only fair to say also that Larsen of Cologne was involved in this scientific study and in the dispersion formula associated with the propagation of radio waves in the atmosphere, the polarisation term which later proved to be erroneous in this formula was omitted from the very beginning in the Larsen formula.

As originally stated, Appleton, Barnett, Briet and Tuve demonstrated the existence of this reflecting region above the earth by transmitting short bursts of radio energy vertically upwards and listening to the returning signals, thereby establishing the height of the time it took from transmit to receive.

They also established that by increasing the frequency above a certain frequency, the ionized layer no longer reflected the signals back to ground. This frequency is known as the critical frequency ( $f_c$ ).

Briet and Tuve experiments were carried out in various locations throughout the world and it soon became apparent that the critical frequency varied as a function of the time of day, season of the year and geographical location. The highest critical frequency being approximately 20 degrees from either the North or South poles (earth's magnetic field).

All of the above suggest that this reflecting layer was under solar influence. This was further verified in 1927 when a sharp decrease in critical frequency occurred during a total eclipse of the sun. This eclipse experiment established that ultra violet radiation was the cause of radio waves being reflected.

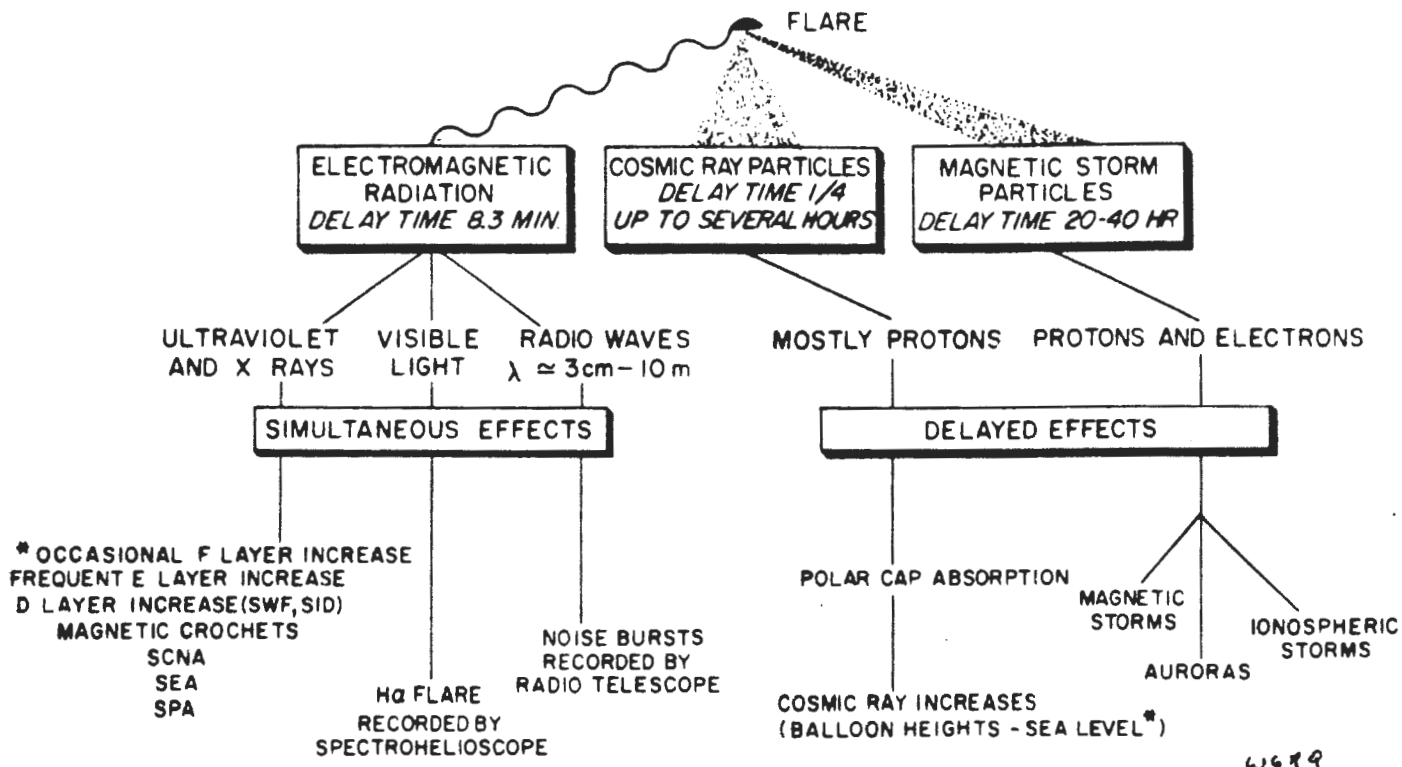
Scientists began to question whether a black body of 6000 degrees K like the sun could produce enough ultra violet radiation. This led to changes in the then current picture of the composition of the sun.

Ionising radiation doesn't come from the visible surface of the sun but from a hotter outer atmosphere called the corona of the sun. This discovery gave the clue to the influence of the 11-year cycle on the ionosphere. Electron density varies as much as 4 to 1 between sunspot maximum to sunspot minimum although visible radiation does not change at all. Although I used the term ionosphere in the second last sentence, it was not until 1933 that the term ionosphere was applied to the electrically conducting region by Sir Robert Watson Watt. His definition of the ionosphere which is still accepted today is "that part of the atmosphere in which free ions exist in sufficient quantity to affect the propagation of radio waves".

*From the IRTS Newsletter, Jan 1989, via W6CF*



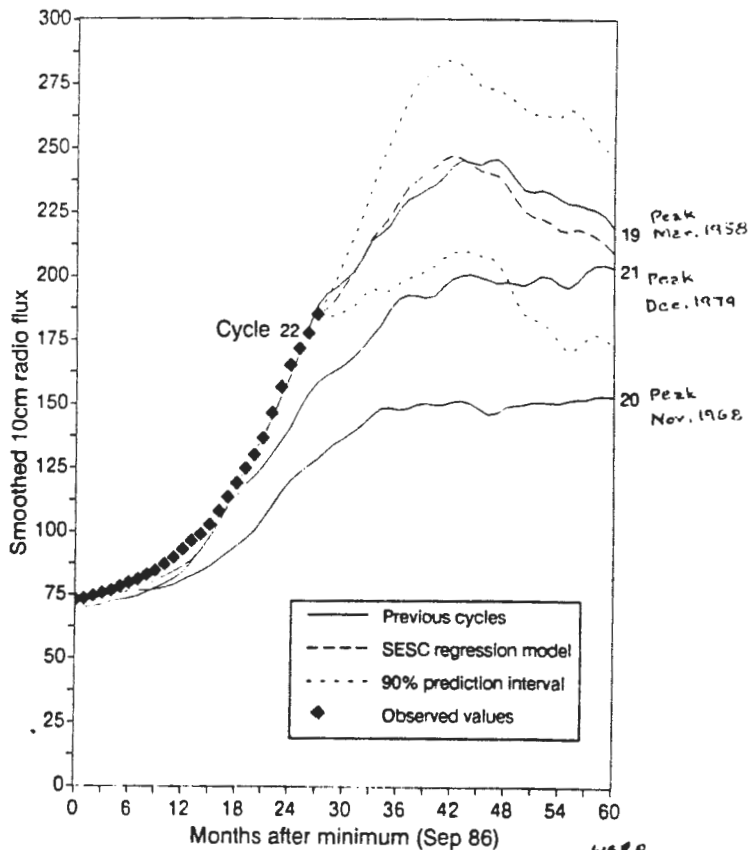
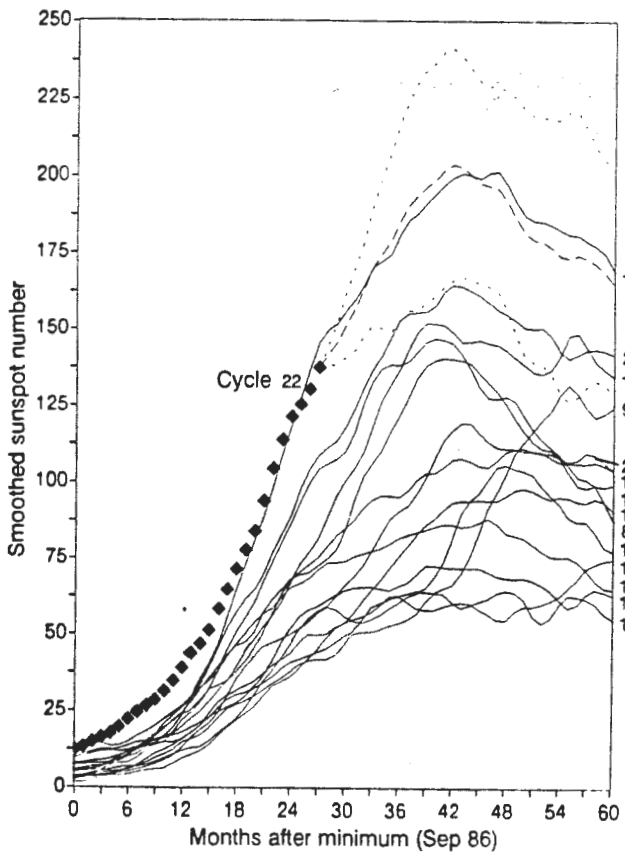




*The terrestrial effects of a solar flare.*

(After R. W. Knecht, unpublished.)

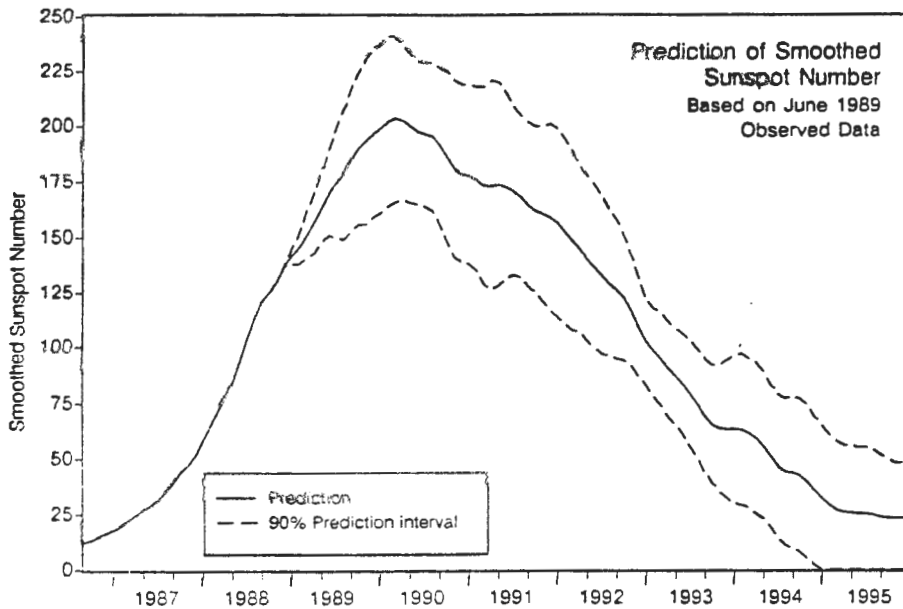
### Rise of Solar Cycle 22 Compared to Previous Cycles



NOAA/SEL July 1989

4689

**SESC Regression Model Prediction of Smoothed Sunspot Number**



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1986	(**)	(**)	(**)	(**)	(**)	(**)	(**)	(**)	12.3 (0)	13.2 (0)	14.9 (0)	16.3 (0)
1987	17.6 (0)	19.6 (0)	22.1 (0)	24.4 (0)	26.5 (0)	28.4 (0)	31.3 (0)	34.8 (0)	39.0 (0)	43.6 (0)	46.7 (0)	51.3 (0)
1988	58.2 (0)	64.6 (0)	71.3 (0)	77.5 (0)	83.6 (0)	93.7 (0)	104.3 (0)	113.7 (0)	121.2 (0)	125.2 (0)	130.2 (0)	137.4 (0)
1989	141.9 (3)	145.5 (7)	151.1 (10)	156.9 (14)	163.3 (16)	170.1 (19)	174.6 (25)	178.8 (29)	185.5 (32)	190.5 (35)	193.7 (37)	196.6 (38)
1990	199.1 (35)	202.1 (39)	203.6 (35)	202.5 (36)	200.1 (34)	197.6 (33)	196.7 (33)	195.6 (34)	191.3 (35)	186.1 (38)	181.3 (40)	179.0 (40)
1991	178.3 (41)	176.4 (42)	173.7 (44)	173.1 (47)	174.0 (46)	173.0 (42)	171.1 (38)	168.5 (37)	164.7 (37)	162.1 (38)	160.7 (39)	159.0 (42)
1992	156.8 (43)	152.6 (42)	148.6 (40)	145.0 (38)	140.3 (37)	136.7 (37)	133.0 (36)	129.2 (34)	126.5 (31)	122.8 (29)	117.0 (25)	109.5 (22)
1993	102.7 (20)	98.3 (20)	94.8 (21)	90.5 (22)	87.0 (22)	83.5 (23)	79.2 (24)	74.4 (25)	69.2 (26)	65.3 (27)	63.7 (29)	63.1 (31)
1994	63.1 (33)	62.5 (34)	61.5 (34)	59.1 (34)	55.6 (33)	51.1 (32)	46.6 (32)	44.0 (33)	43.5 (35)	42.3 (35)	39.4 (34)	35.8 (34)
1995	32.3 (32)	29.3 (31)	26.9 (31)	25.8 (31)	25.7 (30)	25.2 (30)	25.2 (30)	24.8 (29)	23.8 (28)	23.3 (26)	23.1 (25)	23.2 (25)

SESC PRF 723 11 July 1989



# DUES ARE DUE, SEE PAGE TWO

## SUNSPOTS

"Sun Spot Activity will increase until year end" from SF Chron, 5 June 1989.

Sunspot activity is rapidly increasing and could reach record levels by the end of the year, possibly threatening radio transmissions, satellites and even electrical systems, the National Oceanic and Atmospheric Administration reported.

The current sunspot cycle began in 1986 and is expected to peak by the end of this year or the beginning of 1990, according to Joseph Hirman of NOAA's Space Environment Service Center in Boulder, Co. Increasing solar activity has already had serious effects. In March, a solar flare precipitated a power blackout in Canada, interfered with some satellites and provoked an intense display of the northern lights.

The most intense cycle of solar activity occurred in the late 1950s, and the current increase threatens to equal that, Hirman said. Solar activity rises and falls in a cycle lasting about 11 years, and at the peak the cycle normally climbs to an average of 120 sunspots at a time, Hirman said. Already the average has reached 130, and the peak is still months away. There is no reason to think it won't continue to rise, and so the momentum will carry us to near the top of past cycles," Hirman said. The peak average on record was 201.3 spots during March 1958.

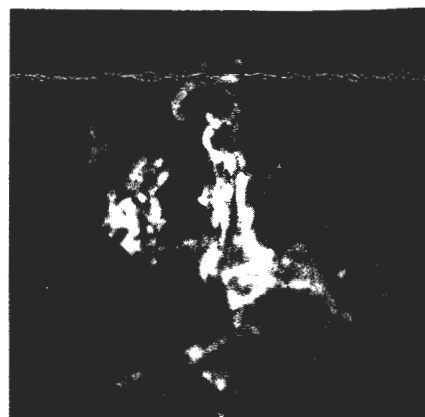
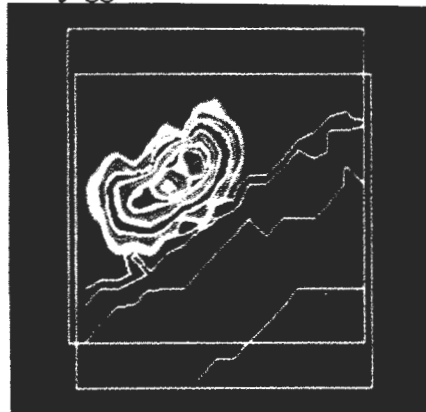
Although sunspots are easy to count and are the most visible part of the solar cycle, they actually have little effect by themselves. What really concerns scientists are the bursts of radiation from the star that follow a cycle, too, and are expected to occur in peaks and valleys for as long as three or four years, Hirman said.

*Thanks to K6LRN and KA6ING who each sent a copy*

## Solar Max Snaps a Big, Brilliant Flare

On March 6, a giant solar flare, one of the largest of the last decade, erupted from the sun's eastern edge. An X-ray detector on NASA's Solar Maximum Mission satellite managed to capture images

of the flare at its peak. The computer-processed image shows the intensity of X-rays at a wavelength of 1.85 angstroms, which represents radiation emitted by iron atoms stripped of all but two electrons. Such X-rays are detectable only when a solar flare erupts. The temperature within the flare's hot plasma exceeded 10 million kelvins, contrasting with the balmy 3-million-kelvin temperatures typically observed in the sun's corona. The jagged white lines mark the sun's edge.



The flare erupted from a large cluster of sunspots, which remained visible for about two weeks as the sun rotated on its axis. The sunspot image from the Solar Optical Observing Network station in Holoman, N.M., shows the cluster on March 9, when it was farther from the sun's edge. By the time the cluster directly faced Earth, researchers had observed seven large, or "X," flares and many smaller ones. However, none of these later flares matched the intensity of the first one, rated near the top of the scale at X15.

*Science News via NT6G*

# DUES ARE DUE, SEE PAGE TWO

## Geomagnetic Blackouts

Long Beach, Calif.--After coping with such terrestrial problems as storms, earthquakes, angry consumers, hostile state regulators, and rising interest rates, utility executives might very well have asked themselves lately, "What next?"

The answer, apparently, is an invisible threat from outer space.

Geomagnetically induced currents (GIC), which are linked to solar conditions, have already caused one major disruption--a power outage throughout the Canadian province of Quebec on March 13. The same day, utilities from Southern California to Sweden reported hundreds of problems, ranging from overheated transformers and tripped transmission lines or capacitor banks to misoperations of relays and protection systems.

So it was with a sense of urgency that U.S. and European engineers met here on July 12 for a session on the causes and effects of GIC, during the IEEE Power Engineering Society's summer meeting.

### Clear Message

The message of the session was clear. "The power industry has to take this issue more seriously," said John Kappenman, an engineer with Minnesota Power and Light, and one of the top experts on GIC. Kappenman noted that GIC incidents tend to follow the 11-year cycle of sunspot activity, the next maximum which is expected in 1991. And in recent years, as utilities have relied more and more on transmission networks to link demand center with remote generating plants, they have become much more susceptible to the effects of GIC, he said.

Kappenman explained that solar phenomena affect the earth's magnetic field via the solar wind, a plasma of protons and electrons emanating from the sun. The plasma interacts with the earth's magnetic field in a complex way, and certain solar events, such as flares, can cause sudden fluctuations in the field. Strong fluctuations are called geomagnetic storms; an unusually strong storm caused the Quebec outages in March.

Some 21,300 megawatts on the Hydro-Quebec system were lost for periods ranging from a few hours to two days. According to Daniel Soulier, an engi-

neer in the operating group at Hydro-Quebec, the trouble began on a Monday about 2:45 a.m., when a severe geomagnetic disturbance induced current in five 735-kV transmission lines linking massive hydroelectric installations at James Bay with Montreal and other demand centers in southern Quebec. Within one minute, all seven static volt-ampere reactive compensators on that transmission system were tripped. The loss of the devices, which are used to control voltage, caused the voltage to drop rapidly, which in turn caused the five James Bay lines to trip. Soon the outage of transmission lines began cascading, spreading eventually throughout the province.

### Solution Needed

Severe geomagnetic storms can create ground voltages as high as 6 volts per kilometer, according to another panelist, Vernon D. Albertson, a professor of electrical engineering at the University of Minnesota in Minneapolis. That voltage drop, when present between the distantly spaced grounded neutrals of wye-connected power transformers, can in turn induce an extremely low-frequency current in the lines between the transformers. The longer the transmission line, the greater the voltage drop and induced current. GIC in the range of several hundred amperes is not uncommon during a severe storm, Kappenman said.

Other than limiting long-distance power transfers during times of high geomagnetic activity, utilities can do little to protect themselves from the phenomenon, the panelists agreed. Soulier said Hydro-Quebec would begin receiving forecasts from Energy Mine Resources Canada, an Ottawa-based agency that monitors geomagnetic activity. Also, dispatchers at the company have been instructed to operate the network within conservative tolerances during periods of high activity.

*Glenn Zorpette in IEEE, The Institute, September 1989, via KE6ZE*

## Solar Cycle Linked To Weather

Atmospheric scientists have discovered a strong statistical link between the 11-year solar cycle and the weather here on earth--a finding that may eventually help explain why some winters are mild while others are unrelentingly harsh. The

## DUES ARE DUE, SEE PAGE TWO

report was presented last week at a meeting of the American Geophysical Union in San Francisco.

Scientists have known about the solar cycle for more than a century and have long attempted to associate it with weather and a host of other phenomena. "The number of polar bears, the length of women's skirts, the stock market: Everything imaginable has been correlated with the solar cycle," says Harry van Loon of the National Center for Atmospheric Research (NCAR) in Boulder, Colo. "The field has been in ill repute."

The Cycle is actually a minute variation in different properties of the sun. During the cycle maximum ultraviolet and X-ray radiation increase, more sunspots appear on the surface of the sun and the total solar output is greatest.

Previous attempts to find a link between the cycle and the variations in weather have failed. When scientists look at the weather from one year to the next, temperature and air pressure and other aspects vary wildly, with no connection to the cycle. But Karin Labitzke, of the Free University in West Berlin, discovered in March that if she included only certain years, the stratospheric winter temperatures over the North Pole closely followed the solar cycle.

Labitzke grouped years according to a pattern of stratospheric winds over the tropics called the Quasi-Biennial Oscillation (QBO). During the west phase of the QBO, winter winds travel from west to east, and the opposite holds true for the east phase. On average, the wind reverses each year, but sometimes it misses a year.

During her recent visit to NCAR, Labitzke and van Loon probed deeper into this problem. By examining only the years of the western QBO they uncovered a remarkable correspondence between the solar cycle and the air pressure and temperature in certain areas, such as the eastern United States. For example, she says, "If the QBO is in the west phase, and we are in the solar minimum, the winter in Charleston [S.C.] will be normal or mild. And if we are in a solar maximum, the winter will be normal or cold." Over the North Pole and extending down into Canada, this correlation appears strongest, measuring as great as 0.8 on a scale of 0 to 1. This means that the link between the solar cycle and the weather accounts for 64 percent of the variability in winter temperatures and air

pressure in that region. Considering all the elements that affect weather, says van Loon, this is a huge correlation.

For other areas, the connection between solar cycle and weather is weaker or nonexistent. In general, a map of the areas of correlation is a blotchy affair with no apparent pattern. (The years of the eastern QBO also show correlations, but they are weaker than during the western phase.)

Statistical tests have indicated that there is an extremely low probability that these patterns are coincidental, says Labitzke. In computer runs, the correlations emerged out of random sequences a mere 25 out of 10,000 times.

Still, the data on the QBO go back only to 1953, limiting the researchers to 3 1/2 periods of the solar cycle, and Labitzke acknowledges that the pattern could fall apart during upcoming periods.

The disreputable history of solar-cycle correlations has made scientists wary of reports of new links. And no one can yet explain the mechanism of the correlation. They wonder how a small oscillation in several solar properties can exert such a drastic influence on earthly weather.

But the statistics are beginning to speak out to scientists. "I think it's really very convincing that there's something going on," says Brian A. Tinsley of the National Science Foundation.

Many people have wondered whether this correlation will help in making weather predictions. However, van Loon says, "This is purely statistics, and we don't understand the physical mechanism. Until we understand it, we should not use statistics to form predictions." Labitzke believes the most important effect of her find will be to force meteorologists to consider basic questions about the role of the QBO and the solar cycle.

*Science News, 12/19 & 26/87 Issue, via NT6G*

### Silent Key

NCDXC member Mac, Virgil J. McClusky, W6DNY became a silent key on July 7, 1989.



# "PACIFICON '89"



1989 ARRL PACIFIC DIVISION CONVENTION  
October 6, 7, & 8 at The Le Baron Hotel in San Jose

The Santa Clara County Amateur Radio Association invites all with an interest in amateur radio to a real barn-burner of amateur radio information, training, and good fellowship. There will be something for everyone; the beginner, the experienced, the young, the not-so-young, the licensed and the hopeful. We promise you a good time, but you have to attend to enjoy it.

### STARTING ON FRIDAY

0900 A bus will take a group, not exceeding 40, to Stanford Linear Accelerator Center to attend a lecture by one of the scientists followed by a tour of the facility. If you are interested in learning the latest about exploring the atom, sign up early to be sure of a seat. Bus fare for this trip is \$9.00. 1800 a session on emergency communications followed by opening remarks by the Pacific Division Director and a social mixer. 2030 THE GASLIGHTER THEATER in Campbell (just a few miles and you will get an easy to follow map using your own transportation) to see MELODRAMA: witness pathos guaranteed to make the strongest man weep; deeds so dastardly that the frailest of women must be restrained from tearing the villain limb from limb. VAUDEVILLE: most highly qualified and adept proponents of the vocal and terpsichorean arts bringing you a collection of songs, dance, and comedy -- Sophie Tucker, Mae West, dancing frogs and others. Reduced price tickets are \$9.00, including FREE POPCORN limited block of tickets, sign up early..

### SPOUSES SATURDAY

0800 A bus will whisk spouses to the South of Market garment district of San Francisco. There you will be able shop at discount prices for all those items on your wish list. Discount prices are the norm, and there are always sales offering even lower prices. The bus returns at about 1730. The cost of this trip is \$19.00, but you will receive \$17.00 in cash back coupons making the trip cost \$2.00, if you use all of them. The ladies, who scouted this trip for us had a ball.

HOTEL RATES \$55.00/night 1 or 2 occupancy. Ask for convention special.

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SESSION HOURS 0900-1700 on Saturday - 0900-1300 Sunday  
LICENSE TESTS Sat & Sun AM  
"FOX HUNT" Sunday AM

### YOUTH FORUM

We ask you to sponsor a youngster or youngsters at the convention. AA6PZ and others are preparing a forum aimed at them. A drawing will be held to award a prize to a youngster and one to his sponsor.

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