

Short Circuit



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Next Activities: February 7 & 8, 1986

On Friday, February 7, on the regular meeting night, there will be a potluck dinner at the fairgrounds. You don't have to be a ham to be welcome. Just bring along an interest in communications -- by radio, voice, waving at passing trains, or any other means. There is a map on the outside cover of the newsletter to help you find the building. The gathering will start at 6:30, and must be over before the bunny hunt the next morning. The plan for bringing food is called "random walk." In other words, bring whatever strikes your fancy. We may all eat deserts or salads. That's part of the charm (it sez here)!

For the survivors of the pot luck, the club is sponsoring an Alka-Seltzer hunt. The hidden antacid will be in the possession of Jim Gilmore, KL7SW, who will also have a radio transmitter with him. Jim will occasionally talk on the radio, on 146.52 MHZ FM, giving clues to the location of his pocket full of fizzies. Unfortunately, Jim claims to have forgotten exactly where he will be, and his clues at times may be somewhat obscure. It would probably help if you came equipped to find Jim, and the "soothing settlers of serious gastric distress," by electronic means. Radio direction finding equipment is recommended. Jim has promised to stay more or less in Fairbanks, but no one knows where. Mystery!

The first "bunny hunt" of 1986, will start at 1:00 pm Saturday, February 8, from Creamer's Field. Show up around noon to calibrate your equipment and psych out the opposition. If you would like to go on the hunt, but don't have DF equipment, come to the Creamer's Field parking lot at noon. There will be space available for some, on a first come first served basis, in the cars of some hunters. You don't have to be a ham to participate. People will meet after the hunt at the Bakery on College Road.

Calendar of Upcoming Club Activities

Ham for lunch	Wednesdays	noon-ish	Bakery on College Road
Westlink News	Sunday's	9:00 pm	146.88 Mhz
Pot Luck	Friday February 7	6:30 pm	Fairgrounds Energy Ctr
Bunny Hunt	Saturday February 8	1:00 pm	Creamer's Field 146.52
QSO Party/Quest	Saturday February 22	8:00 am	On the air
Ham Exam	Saturday March 1	1:00 pm	UAF Duckering Bldg (?)
Meeting	Friday March 7	7:30 pm	Geophysical Institute

===== Operating Activities =====

WILL AN "ALASKAN WOODPECKER" BE YOUR NEIGHBOR?
Fred Brown, KL7CUS

(Any opinions are the author's, and don't necessarily represent those of the AARC.)

Anyone familiar with the pop-pop-popping of the radio interference caused by the so-called "Russian Woodpecker" would be concerned about an American proposal to build our version of an over-the-horizon (OTH) radar in our radio backyard. Yet, out of real necessity, that's what the U. S. Air Force proposes to do in Alaska, and there's even a chance that we won't notice it.

On January 22, Air Representatives held a "scoping" on the OTH radar proposal at the Noel Wien Library in Fairbanks, and about one-third of the relatively small attendance were amateur radio operators. Contrary to some news reports, this was not a public hearing: that will come later, probably in June. This session was an opportunity for the Air Force to brief the public on the proposal and have informal discussions.

Air Force representatives said they expect to have three OTH radar systems in operation by about 1990, and that the first will come on the air this spring, in Maine. The second will radiate from Oregon and the third from somewhere in Alaska at one of the proposed sites now under discussion, with construction to start in 1989 if funding is forthcoming. The "scoping" hearings were held at locations near those proposed sites and in Fairbanks (and, presumably, in Anchorage).

The likelihood is that the Alaska OTH radar will be located on or near the Richardson Highway, perhaps as far north as Tok, although the apparently ideal location, based upon the stated goals of the system, seemed to be somewhere near or east of Glenallen.

Some of us went to the meeting far less better informed than we might have been. I later discovered that W6QYT, Dr. D. G. Villard of SRI, had published an article on the proposal nearly six years ago in QST (Over-the-Horizon or Ionospheric Radar, QST, April 1980, 39-43) and that I had actually scanned (but not read) the article and shelved the magazine when I received it. More recent mention of the American system and an Australian system is in the current issue of Ham Radio, in Bill Orr's "Techniques" column (Ham Radio, January 1986, 70).

What we -- or at least I -- had not known was that the American system is NOT a pulsed system, but a continuous-wave one. That (cross your fingers!) may make the big difference.

Anyone who has listened to key clicks or to a hot-switched amplifier on the ham bands has a good intuitive feel for the potentially wide bandwidth of a sharp pulse, and engineers and physicists have equations that show the kinds of horrible bandwidths high-powered HF pulse transmitters can have.

The Russian woodpeckers (yes, there's more than one: oddly, our Air Force officially mentions only two but informally acknowledges the three noted in technical journals, including ham magazines) are pulse radars operating in the HF spectrum, using power on the order of 50 to 100 megawatts. Because they use a crude, old-fashioned radar pulse, they generate "spikes" on each side of their operating frequency that cover a very wide spectrum. We're not talking about the 2 to 6 kiloh-

ertz that an ssb or voice a.m. signal takes up, we're talking about half-megacycle and more bandwidths.

The American system, according to Villard, will instead use a continuous signal that is frequency-modulated ("chirped") for range resolution. Any modulation at all results in some bandwidth: the American OTH radar is expected to have a relatively flat 10-kilohertz bandwidth, but with slopes that are about 75 db below the peak power level 50 khz each side of center frequency (Fig. 5 of Villard's article).

That's many orders of magnitude better than the Russian woodpeckers, but some of you may want to compute the power level of something that is 75 db down at a frequency you're concerned with, but which is down from one megawatt!

So there could be problems. Yet the Air Force spokesmen insisted that there was only one interference complaint from an amateur radio operator during the testing phase of the site at Columbia Falls, Maine. And that was after a QST article with subheads "What to Do if Interference is Encountered" and "Amateur Help Requested," and we certainly know that there is a noticeable amount of serious ham activity in New England and eastern Canada!

The American system can work without pulses because it uses two separate sites for transmitting and receiving, and therefore doesn't have to turn off its carrier to listen for the backscattered echoes.

Fortunately for Alaskan amateurs, the Maine system is expected to come back on the air (with sturdier and larger antennas and a wider range of frequencies) in approximately April 1986. That means that before the public hearings in Alaska on the Alaska OTH radar, we may hear from amateurs on the east coast of North America -- and possibly Greenland -- if there is noticeable interference from the full-range, full-power radar.

The early-eighties New England test used a range of frequencies from 6.74 Mhz to 22.25 Mhz, while the fully operational systems are expected to use 5 to 28 Mhz. The system uses ionospheric sounding so it can look for a unoccupied usable frequency, and Air Force personnel insist that all frequencies in use in the area will be "programmed out" -- yet we may also need to ask for a bandwidth cushion and solutions for harmonic problems to fully protect Alaskan HF radio users. W6QYT's article shows the amateur bands as protected but the shortwave broadcast bands as clobbered.

We may be in for more than this. The Air Force briefing was to comply with federal law that affects installations in this country, and the later hearing will really be to determine environmental impact of facilities built in this country. Yet recent technical articles imply an additional OTH radar on HF in western Canada, the "Canadian West segment." (New Radar Installations Promise 360-Deg. Air Defense Perimeter, Aviation Week & Space Technology, December 9, 1985, 56-63).

Clearly we need to have warning of low-flying cruise missiles which may be submarine-launched or bomber-launched, and to see and hear into the Soviet Union over an area wider than our pinpointing spy satellites. Let's hope, though, that the U. S. -- and its closest neighbor -- can have such a system and again demonstrate our technical superiority over the Soviets by carefully not interfering with the amateur, private, and commercial HF radio services, and without flagrantly violating international telecommunications treaties as have the Soviets for so long.

Also, the Air Force and their SRI consultants need to be informed about all HF frequencies used by Alaskans (since the FCC sometimes stumbles in its attempts to provide such information), including the Alaska Coastal, Alaska Public Fixed, Alaska Private Fixed, Amateur, and Citizens services, and the Alaska Emergency Frequency.

And you big guns on 20 meters - find out what the W1's, VE1's, VE2's, VO1's, VO2's, and OX and TF stations have to say --if anything -- about the Maine HF radar when it signs on this spring!

[If you learn anything on the air from other hams about the OTH site in Maine, write or call your information in to Short Circuit. I'll see that it gets published. Ed.]

Arctic Amateur Radio Club Participation
in the Fairbanks Ice Festival 1986
by Craig Bledsoe, K4TXK

There are two major gatherings for fun and recreation in the Fairbanks area every year. One in late summer is known as Golden Days, and the other in late winter is the Ice Festival. This winter, there are over 30 major events being sponsored by the Fairbanks Chamber of Commerce, the parent organization of the Ice Festival. The schedule includes everything from sky divers parachuting from helicopters to ice sculpture contests and parades with massive floats wending their way through downtown Fairbanks. Two of the most significant events are the Open North American Sled Dog races and the Ice Man Classic Triathlon competition. The Arctic Amateur Radio Club has been invited to play a key role in a number of these events.

Last fall, the Ice Festival planning committee, under the leadership of Sohio's Bill Pair and city councilwoman Janet Halverson, asked Craig Bledsoe to coordinate the volunteer communications efforts of the Arctic ARC and the various event managers. The result of this liaison was sponsorship by three agencies of the Interior Alaskan QSO Party, a worldwide contest wherein amateur radio ("ham") operators of all countries and other states have radio contacts with Fairbanks area amateur operators and exchange postcards confirming those contacts. These postcards come in three printed designs reflecting the official logos of each of the three sponsoring agencies -- the Open North American sled dog sprints, the Yukon Quest International 1000 mile sled dog race, and the 1986 Ice Festival. These "QSL" cards have been printed and paid for by each sponsor, and the Ice Festival is contributing the postage to send the thousands of cards across the globe in a major publicity campaign. Arctic ARC member Ed Hunstein is the organizing backbone behind this contest, and he and Kim Demming, the new Ice Festival chairwoman, are working hard to make the Interior Alaskan QSO Party a success over the duration of the Ice Festival from March 7th to the 16th.

On the last day of the Ice Festival, the Ice Man Classic Triathlon will take place. Open to men and women, individuals and three member teams, the race has three exhausting scenarios -- cross country skiing, snowshoeing, and running across rugged terrain. The race will begin at Ft. Wainwright's Birch Hill ski lodge, continue up White Bear trail to the Borough's ski trail complex, back to the ski lodge, out the Trainor Gate and wind up at Graehl Park. Providing emergency communications to reach exhausted participants at any point on the course who may need medical assistance is the primary objective of the Arctic ARC's complex radio linkup. Additionally, the electronic tracking of the competitors will benefit race officials at each checkpoint and the general public at the ski lodge and around the finish line. Club computer expert Mike Drury will oversee a computerized communications and racer tracking sys-

tem which will provide digital communication of information on each participant's progress throughout the race course. Todd Davis, manager of the Mary Siah Recreation Center and director of the Ice Man Classic, recently visited the Arctic ARC at its monthly meeting at the University of Alaska's Geophysical Institute. At that meeting, he expressed his appreciation for the support and contribution to competitor safety that area ham radio operators were providing, and he commended the close working relationship between the Arctic Amateur Radio Club and Ice Festival 1986.

Interior Alaska QSO Party
February 22 through March 31, 1986
by Ed Hunstein, KL7XD & Lewis Overton, N0SN

From the last part of February through the whole month of March, 1986, hams in interior Alaska are invited to participate in a QSO party celebrating the Open North American sled dog sprints, the Yukon Quest International sled dog race, and the Fairbanks Ice Festival. This is not a contest, and no contest style exchanges are involved. Instead, it is an on-the-air party. All classes of amateurs are invited to operate their own stations to make contacts with other hams around the world. The party is open on all bands, using all modes of operation. Alaskan hams are encouraged to tell the people they talk with about the dog races and the ice festival, and generally to meet people from around the world and to introduce them to some activities unique to the north. None of this is required, however. Hams may participate in any manner they choose.

The sponsoring organizations described in the article by Craig Bledsoe have purchased QSL cards for use by Alaskan hams in the QSO party. These cards are available through either Ed Hunstein or Craig Bledsoe to confirm contacts made during the party. The only requirement for using the cards is that your contact mention the QSO party and the events associated with it. Postage is also being paid by the sponsors. The choice of which card to use for a particular contact is up to you, but contacts made during the actual events should probably be associated with that event. Special event dates are:

Ice Festival	Friday, March 7 through Sunday, March 16
Ice Man Triathlon	Sunday, March 16
Open North American	Friday through Sunday, March 14-16
Yukon Quest International	Starts Saturday, February 22

There are no special requirements for logging. Just keep your usual contact confirmation log data. Obtain cards from the club event sponsors (Ed and Craig), fill them out, and return them to the sponsors for posting. Have fun telling the world about these spring events in Alaska.

==== For Sale or Trade ====

Heath SB-221 Linear Amplifier for sale at \$225. Call Hank Hove, KL7HPR, at 479-3063 evenings or weekends.

Yaesu FT-757GX transceiver, FC-57AT automatic antenna tuner, and FP-757HD power supply. Would like to trade for an Apple Profile 10 MByte hard disk drive for an Apple IIe computer. Write to Dave Culbertson, WL7Q, at Meade River School, Atkasuk, AK 99791.

==== Club News and Commentary ====

Short Circuit congratulates David Straight (new tech), Mark Richards, WL7BEH (gen to adv) and Hank Hove, KL7HPR (20 wpm code).

PRESIDENT'S CORNER
by Mike Rice, KL7YV

We are all downhill now, as far as winter is concerned. Amateur activities in the form of public service and just plain fun, will soon be at a fever pitch. Already upcoming for many area hams is the Yukon Quest later this month. Soon after is the Ice Festival, with activities including a special events station and commemorative QSL cards. Also approved (or soon to be) by the board are the Yukon 800 and raft races. And, just next week, the first official bunny hunt of the season will start on Saturday afternoon from the Creamer's Dairy turnout (details elsewhere in this newsletter). WOW! What a slate of activities coming up.

Several months ago, I started enumerating reasons a ham in interior Alaska might want to join the Arctic Amateur Radio Club. I do believe we have another good reason: Participation. . . participation in some of the grandest tests of amateur communications found anywhere in the world. And what high commitment interior hams make to enhancing communications in this larger than life State of Alaska. Last week on the "Westlink" amateur radio news broadcast, the commentator was making a big thing out of an "all day event" along a 26 mile marathon race - the big event of the year in southern California. So big that the national Westlink news was calling for help (anyone want to volunteer?).

Wonder how those 6's would handle a kilo-mile dog race or the world's longest power boat race, both through the most rugged, most unforgiving territory in the world. We should be proud of our accomplishments; they are impressive.

Don't break your arm patting yourself on the back, and don't get a swelled head, or you'll make a better target for the spring crop of mosquitoes.

Do pitch in with your fellow hams and make this special events season a memorable one. It starts for real next week with the potluck and bunny hunt. I'm hoping for an enthusiastic turnout. C U L at the potluck.

73 from Mike, KL7YV

Emergency Communications
by David Williams, KL7JIZ & Lewis Overton, N0SN

Borough planning for emergency communications is the responsibility of the Borough Community Safety Division (CSD). Dick Jackson is the director of the CSD, and Dorman Steele is the Emergency Management Coordinator for the borough. The CSD asked club member Dave Williams, KL7JIZ, to help establish a Communications Safety Advisory Board. That has been accomplished, and Arctic ARC members are active members of this citizen advisory group. Jim Gilmore chairs the committee. Members include Dave Williams, Jerry Wilson, Rick Plate, Chief Schecter, Bob Merritt, and Tom Ferri. This committee has been asked to review a study evaluating borough communications and to make recommendations to the CSD for how to improve communications, especially emergency communications.

Part of the borough's emergency preparedness includes the existing Emergency Operating Center, located at the University of Alaska Fire Station. This center supports some transmitters capable of operating on various emergency frequencies. It does not presently include operating ham equipment, although the borough owns some commercial ham gear and some surplus HF and VHF equipment which could be converted to ham frequencies. The Communications Committee is expected to include evaluation of the EOC in their recommendations.

Other emergency communications activities recently included the American Red Cross "Un-Disaster Day." This simulated disaster centered on the old school in downtown Fairbanks. Jim Gilmore, KL7SW, set up a portable packet radio station in the basement of the school. With only 3 watts from the basement, Jim was able to reach KL7YV and KL7AG for digipeating. Dave Williams took his mobile HF equipment to the un-disaster, and operated from the school. Red Cross director Ed Webb, in-charge of the event, said he was happy with the results, which demonstrated at least limited communications capability from portable stations.

Director Webb also indicated that the Red Cross is short of funds this year because of heavy resource drains caused by hurricanes in the southeast. He is trying to raise \$6,500 to replenish the Red Cross operating funds. The Red Cross is not a part of borough emergency communications, but works with the borough. The Red Cross is primarily responsible for health and welfare traffic, providing food and shelter for victims of disasters.

Arctic ARC Board Meeting Minutes for 12/26/86
by Kurt Torgerson, NL7GW, AARC Secretary

Old Business

1. Repeaters (KL7XD): Access is no longer guaranteed for 16/76 and it will be removed from its present location. AL7EX has requested club support for a repeater at Coldfoot. The 34/94 autopatch is waiting for a phone line.
2. Education (NL7GW): Kurt and Egor are team teaching the novice & upgrade classes at TVCC Monday nights. Fourteen people are registered.
3. Name Tags (NOSN): a fifth order for name tags has been placed. Response has been favorable to the project, but most orders come from personal contacts, not mail.
4. Discussion continued on new novice privileges. The board will consider a cross band 220 to 146 MHz repeater if novices are granted voice access to 220.

New Business

1. The club will pay for the 34/94 phone line if necessary. Passed unanimously (NOSN/KL7CUS) [FNSB Community Safety Division will sponsor autopatch line. Ed.]
2. KL7XD discussed ways to disable autopatch timer during emergency calls.
3. Yukon 800 boat race approved as club event. Sponsors are Marge Austin, KL7VY, and Pat Moore, AL7L. The race is scheduled for May 30.
4. Ice Festival participation approved as club event. Sponsors are Craig Bledsoe, K4TXK, and Ed Hunstein, KL7XD.
5. QSL cards for QSO party associated with Quest, North American, and Ice Festival, are being provided at no charge to club members participating.
6. Club liaison with borough emergency communications, and the participation in development of a borough communications plan are being conducted by Dave Williams, KL7JIZ, and Jim Gilmore, KL7SW.
7. Discussion of preparation for the fair included recommendation for telephone contacts of prospective participants (NOSN).
8. NL7GW was requested to contact ARRL for application and information on establishing an official observer in Fairbanks to help with interference complaints.
9. The next board meeting will be held February 23 at Fred Brown's house.

Comments and Concerns
by Lewis Overton, NOSN

The Electronics Communications Privacy Act of 1985, S.1667 and H.R.3378, has prompted a lot of comment in this and other amateur radio news media. Several members of the club have asked the board for information. Although neither the Arctic Amateur Radio Club, nor its board of directors can take an official position regarding this act, people are free to form and express their personal opinions. To help people arrive at informed opinions, the board requested and received copies of the proposed legislation. Several people have reviewed the bill. We have also received an advance copy of an editorial on the bill from the February QST. The opinions expressed in this article are those of myself and the people with whom I have talked.

This act focuses on the concept of "expectation of privacy" in communications. This seems to mean that if a person expects an electronic communication to be private, as with a telephone call, for example, then this act makes it a crime to intercept the communication. It is not necessary to divulge the intercepted information, and the intent of the receiver does not matter. However, if the offense is committed for "purposes of commercial advantage, malicious destruction or private commercial gain," then the penalty for intercepting an electronic communication rises from \$5,000 or imprisonment for six months to \$250,000 and a year in prison!

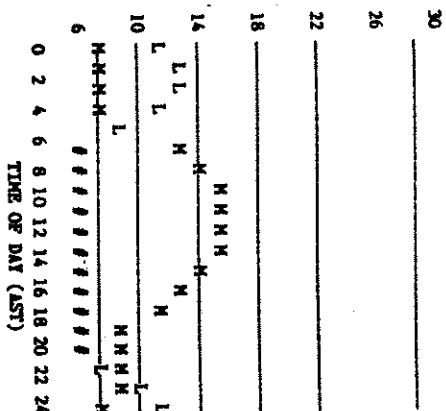
Since there is no expectation of privacy in amateur communications, it appears that they are not subject to the provisions of the act. If an amateur informs a person contacted via autopatch or phone patch that the communication is not private, then that too should not be of concern. It is not clear what would happen if an amateur did not so inform the person contacted. This is the stated opinion of the ARRL, and seems to be confirmed by reading the act.

The impact on listening to out-of-ham-band transmissions would seem to be much greater. For example, are police and fire company radio transmissions expected to be private? What about weather satellite transmissions? Are transmissions originating from outside the country, but received inside the country protected? Who determines if a transmission is intended to be private? If some transmissions are protected and others are not, how does one tell which is which? Remember that the crime is not divulging the intercepted information or even making use of it for private purposes. the crime occurs in the act of interception!

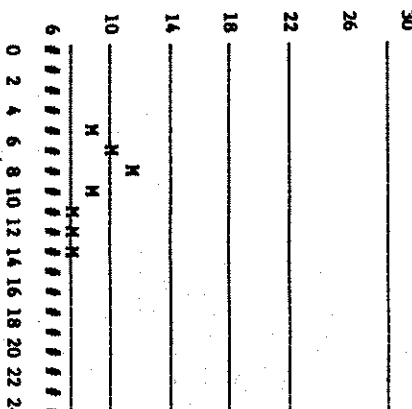
My concerns with this act are no longer those of a ham worried about his hobby. If my understanding of the bill is correct, ham radio, as such, is not really threatened. What bothers me more is that this act places the burden for assuring privacy of communications on the receiver instead of on the originator or on the person or business supplying the communications medium. Perhaps this is because participation in ham radio has made me well aware that radio communications are not private. Most hams know better than to announce on a repeater that they will be out of town and their homes "unguarded." Selling a communications service without telling the buyer that the medium is not secure, and relying on a law such as this to "protect" the buyer is, in my mind, a questionable business practice at best.

Please, whether your interest arises from concerns about our hobby, or from more general concerns about civil liberties, I encourage you to contact your legislative information office for a copy of the bill. Read the "It Seems to Us ..." editorial in February's QST. Form an opinion about the bill. If it bothers you, let your legislators know.

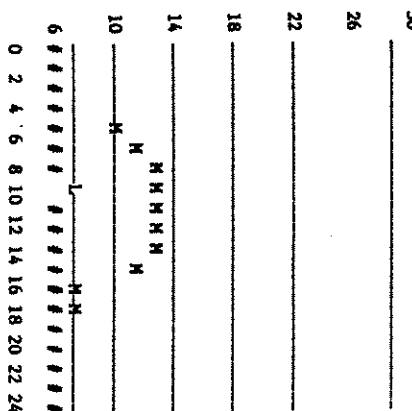
PATRAMS TO CENTRAL AMERICA
TO: 90 10 DEGREES & 6273 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



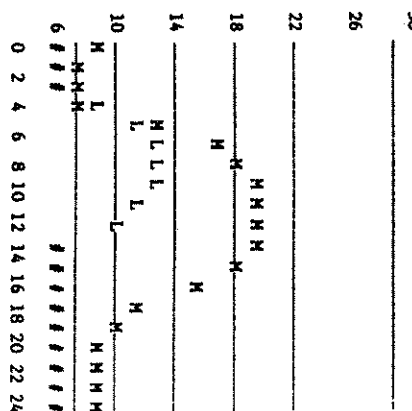
PATRAMS TO EUROPE
TO: DL 18 DEGREES & 4310 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



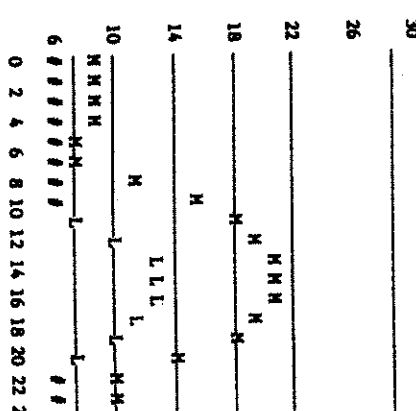
PATRAMS TO EASTERN U.S.
TO: W3 87 DEGREES & 3271 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



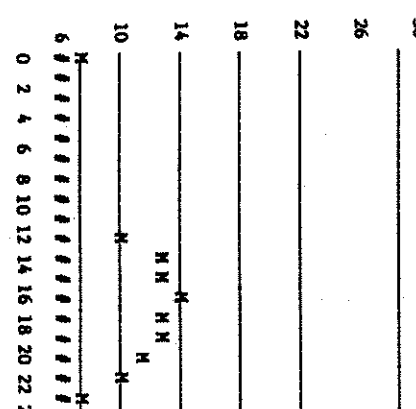
PATRAMS TO SOUTH AMERICA
TO: CP 106 DEGREES & 6988 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



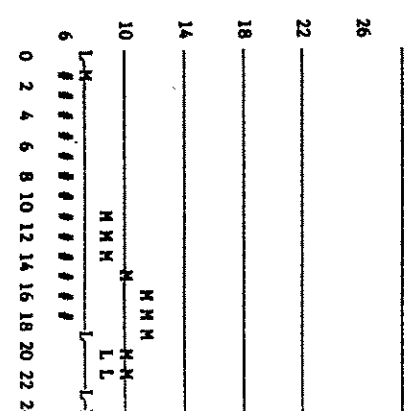
PATRAMS TO SOUTH PACIFIC
TO: 302 212 DEGREES & 5930 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



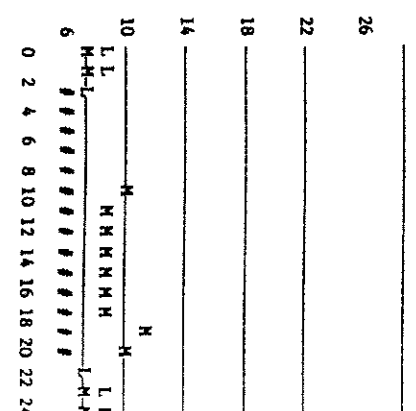
PATRAMS TO EASTERN ASIA
TO: BM 294 DEGREES & 3736 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



PATRAMS TO CENTRAL ASIA
TO: 9M 314 DEGREES & 5422 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



PATRAMS TO MIDW. EAST
TO: WZ 348 DEGREES & 6255 MILES
DATE: 2-12 TIME: AST
FLUX: 74 PLOT: MUF



27-day solar-flux forecast of Jan. 28, NOAA Space Environment Laboratory:
Maximum S.F. = 60, February 6; Minimum S.F. = 69, February 18
Average forecast S.F. = 74, Feb. 12 (basis for plots)

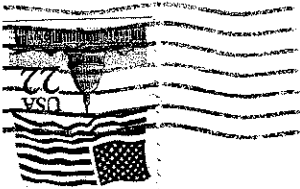
M - Maximum Usable Frequency (MUF)—frequency at which a signal will propagate at least 50 percent of the time under 'normal' conditions.
L - Lowest Usable Frequency (LUF)—lowest frequency that will support propagation along the path. Path is closed if L is higher than M.
- MUF or LUF off scale.

Geomagnetic Activity Range	Geomagnetic Level	AK**	Expected Propagation
Quiet	0-2	0-9	Above normal
Unsettled	2-3	7-15	Normal to high
Active	3-4	15-30	Normal to low
Minor storms	4-5	30-79	Below normal
Major storms	5+	80-159	Poor
		159+	

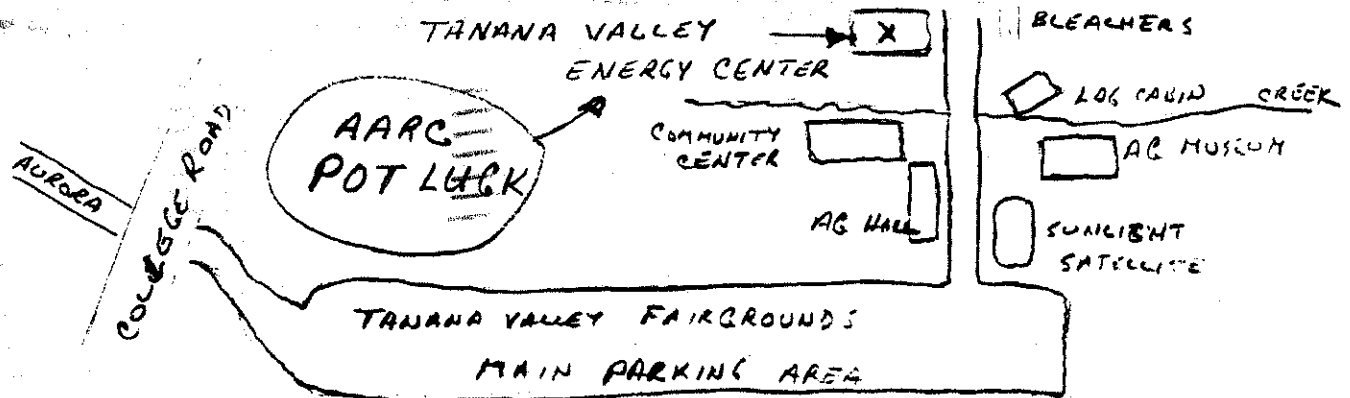
**Obtain actual daily readings of flux, A and K indices from WWV at 18 past the hour. If actual flux is higher than 74, then MUF is higher than forecast.

***Obtain actual daily readings of MUF index from 557-7398 in Anchorage (recording) or the UAF ACAD3 computer (at \$ prompt enter @DISK\$N:[FNCMP]BF).

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Short Circuit is an open dialog among people interested in Amateur Radio, not all of whom need be hams. Permission is granted to reprint from this publication with appropriate source credit. If you find something useful in these pages, we want to share it.

Our goal is to be a valuable resource of ideas and experiences beneficial to the Amateur Radio Community. We publicize and support the efforts of those who help keep ham radio alive and active, with emphasis on the activities of hams in interior Alaska.

You readers are participants in the dialog. The ideas and opinions presented in Short Circuit are those of the contributors, not of the Arctic Amateur Radio Club. We believe the Amateur Radio Community to be, as Worldradio expresses it, "... an alliance of active radio amateurs concerned with reality, using radio as a communications tool to develop the skill, quality and full potential of Amateur Radio." We want to hear what you are doing, what you need and want in order to keep amateur radio fun, and what amateur radio is doing for your community.