USECA EXPRESS

volume 3 no.5 May 1988

The OFFICIAL NEWSLETTER of the UTICA-SHELBY EMERGENCY COMMUNICATIONS ASSN. of Macomb County,Michigan WA8Z RPTR- 147.18/ .78 located near Cass & Mound rd., Utica, Mi.- with satellite rcvr at SELFRIDGE ANG Base. Club meetings held on 2nd Tuesday of month, 7:30 pm, at FAITH LUTHERAN Church, 1/ 4 mile south of 23 Mile Rd. on SHELBY RD..UTICA,MI. (west of Van Dyke). Items for publication must reach the Editor no later than 3rd Thursday of month, which is one day following the night of the BOARD MEETING. EDITOR: JERRY MCGINN,K8CFY, 20216 MCKISHNIE,MT.CLEMENS,MI. 48043 (313) 791-4484

EDITORIAL.....

Due to my recent illness,(which seems to be lingering on), I am not sure just how much "EXPRESS" I can chug out this month. I can say that with more member input of articles it would be better, but,.....! (Iseem to get on the same soap box; right?) Well, like a parrot, - if heard enough times, eventually results ensue. How else can I stir you up? - Wake you up- and get results? LOOK:- The 220 and 440 battles rage on(and they are serious threats) -what have YOU done about it?Have you written to your legislators, the ARRL, or other appropriate agency/organization ? I can assure you these are serious issues, and dangerous times for the welfare of the rights of Amateur frequencies. If you are so smug as to think all is well, and all will go on as before - consider the case of the poor guy that got nailed by the FCC for interfering with a broadcast station on 40 meters ! (Check it out-- it's in the W5TI Report). Also please please read the article in this issue on the 220 UPS threat. It's the best bit of worded firepower I have'ever read ! COPY IT! & SEND IT ALONG WITH YOUR OWN COMMENTS TO YOUR LEGISLATORS ! We must get involved.

Charity, they say, 'begins at home'. Do you believe it? Have you thought about a donation to the W6HIU ANTENNA APPEALS CAMPAIGN?.....You never HEARD of it? C'mon !! Well, you have now! Joel,(W6HIU), needs about $1,000 now, up front ,to start appeal proceedings in his precedent setting court case on the right to put up his tower.Mucho dinero has already been spent on this legal battle.. YOU can be a part of history. YOU can help to insure that not just Joel wins, but that we all will be benefitting winners.....especially the new young hams & novices..You do want them to have something secured for the future don't you? OK..so give a little !

Now let's see how well you all have been paying attention to your newsletters. Right from the start, from the time of my first column, I have frequently encrypted messages thruoghout the pages and articles. Have you ever noticed? GOOD! .....

TELL YOU WHAT! You show me proof of having deciphered some of them, and I will MATCH you, dollar for dollar, your contribution to the W6HIU ANT APPEALS FUND !

Friends and fellow amateurs. I hope I have stirred you up !! SEND ALL HATE MAIL, MONEY, suggestions, comments and , (dare I say it again?) articles of interest for publication to:

EDITOR- K8CFY
20216 MCKISHNIE
MT.CLEMENS, MI. 48043

I sincerely hope that all who made the annual trip to Mecca, (Dayton)-the hams Holy Land -enjoyed it and brought home lots of good booty, or at least lots of ideas to dream about for the future. I sure do miss good ol' Dayton Hamvention!

73 & 30, *Jerry K 8 C F Y*

THE RELIGION OF COMPUTERS

Edmund C. Berkeley, Editor Emeritus

(de Computers & People,Nov/Dec 1987)

Is there a religion of computers?

For a religion to exist,there needs to be a group of "believers" and a doctrine in which all (or nearly all) of them believe, a set of statements to which they agree. Ordinarily, this doctrine is attreibuted to decrees or "truths" coming from "divine" origin, persons (or forces) real, historical, ancient, or imagined, who have asserted the statements in past centuries. These statements are declared to be "true" and any denial of them regularly causes a "believer" to be rejected from the group.

Religions attract people. It is easy, comfortable, and natural to grow up within a family and neighborhood and to accept from family and neighborhood the neighborhood religion. But great contenders of the neighborhood religion are science, industry, and government. These institutions of society require change, changes as time goes by in all kinds of statements. The test of a scientific statement is experience and experiment : if the experiment works,it is provisionally true;if not it is provisionally false. The test of statements by industry and government is again 'Does it work? Does it happen?' These tests are a trouble to religious people who "believe" in an unchanging"sacred" or "divine" world. They are regularly unable to change (or update) their religious beliefs.

A large number of people now "believe" in computers. For computers perform activities which never previously were possible. Most people are convinced that computers do actually performthese activities;but most people do not understand how computers accomplish these "magical" acts,and their common everyday viewpoint is a combination of "They work, and sometimes I can use them,but that are completely mysterious to me." So they have a rather profound religious quality.

For example,part of the religious aspect of computers is the common statement "Garbage in,garbage out." This refers to the fact that if you put wrong information into a computer (either a machine or a person),you are very likely to receive wrong information out of it. But if you think over situations in the real world,you observe that adding a tiny amount to a big amount often results in the the big amount unchanged.. 10,000 miles plus 1 mile is practically the same as 10,000 miles . Another famous example is that for over 200 years the physical & geometric description by Isaac Newton of the motion of planets in the sky was accepted as the truth.

And so we come to a rather surprising conclusion:

1. There is a religion of computers .
2. It consists of a small number of facts and true statements .
3. It consists of a large number of beliefs and mysteries .

As we all become more & more involved with a computerized civilization,we become less & less able to use the common sense and wisdom of past civilizations .

"WALT - N S 8 N "

Thanks for your help at our last testing session. we greatly appreciated your experience as a`VE ', and helping put together and completing our testing session.

FIELD DAY:

Well our USECA family is off to a good start. Our chairman FRED,WB8ITB and co-chairman WALT,WB8E have 5 stations: Chairpeople- WALT WB8E - 20 CW. JOHN N8EWG - 40 Meter phone; FRED WB8ITB - 40 AND 80 Meter CW; and BOB WB8B 15 Meter cw. SHIRLEY WD8IWE - 80 Meter Phone *for the FEMALES ONLY.*

These chairpeople are going to need all our family help as usual. So let's not wait until the last minute to offer our time. Whether you can be there only one hour or the whole week-end, it's going to take all of us , once again working together as a family, to make this another NUMBER ONE EVENT ! DON WB6F is taking on the job with AMY KA8ZAI in the kitchen,and are planning a great week-end FOOD BONANZA, to keep all tummies full at all times . Sure sounds wonderful eh? OK ! Be there , to participate and enjoy ! Y'all Come now! WB8G

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R T T Y

NEW RTTY NET ON U.S.E.C.A.REPEATER

A new R T T Y net will be on the 147.18 repeater (useca), ***Wednesday nights at 9:00 p.m. est. Meets every wednesday except the first of the month (L'anse Creuse meeting) , starting MAY 11.*** Bill,N8CVC

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AUTODIAL

The access codes for the the autodial system will be changed on the night of the MAY meeting,at 12:00 midnight. For further information you must get in touch with any **Board member; Control operator, or Technical committee** person. WA8Z

Macomb Daily photo by Bob Sassonello

Creating his own sound

Mount Clemens High School 10th grader Dwayne Beckmon used a little ingenuity to keep track of his favorite baseball team — the Detroit Tigers. Beckmon constructed a radio for an electronics club project and spent a few minutes on a sunny day recently listening to the Tigers' game.

c r e d i t s

These people contributed to this masterpiece of amateur radio journalism. We thank you all .

WB8G; N8CVC; WA8Z; K8CFY; the WIRELESS; WB8ITJ; the MACOMB DAILY; DEC ARC; GATEWAY; and Jeff MacNelly.

From GATEWAY

The ARRL Packet Radio Newsletter
Stan Horzepa, WA1LOU, Editor

AMSAT-TAPR DSP PROJECT UPDATE

Steve Sagerian, KA0YRE, of Motorola has really come through for the digital signal processing project. He arranged for Motorola to come up with two S6001 EXP kits. This kit comes with bare boards, boot ROMS (a debugger, monitor), PALs and manuals. They decided to be very generous and throw in two DSP56001 chips. This board has a 20.48-MHz clock and processes 10.25 MIPS. Using the architecture to its fullest, one could do a 1024-point Fourier transform in 3.48 ms. We expect further support from Motorola as they get applications back from us. We wish to thank Motorola, Inc for their generous support.

THE "STAGGERED BACKBONE" NETWORK CONCEPT

Florida's packet radio network has undergone many evolutionary changes over the years. First, there were many individual packeteers connecting over long distances on quiet channels. Then, as more people joined in, dedicated digipeaters were pressed into service. Then came switches, the 220-MHz backbone and, most recently, NET/ROM. At a Southern Region Wide Area Networking Symposium, I proposed what I believe will be the next evolutionary step in the development of our network: "Staggered Backbone."

We knew a long time ago that as the number of users and PBBSs grew, it would become impractical to move traffic between portions of the network on the same 2-M channels shared by the users. We also knew that packeteers in adjacent towns would cause interference to each other as they all tried to access their local digipeater. We, therefore, moved towards an architecture in our network that allowed users in a given area (a Local Area Network) to reside on a different 2-M channel than their neighbors. We tied all of the LANs together using the 220-MHz band. This is roughly where the network stands today.

There is still room for improvement. We discovered that the problem of "hidden transmitters" (two stations cannot hear each other and transmit at the same time) and "hold off" (a station is prevented from transmitting for long periods by other traffic) exist on the backbone and cause the same congestion as on 145.010 MHz. Because the number of stations which access the backbone directly is deliberately kept small, the problem is minimized to a certain extent, but not eliminated.

Another problem which confronts the current backbone structure is how to increase its speed. With the nodes on the backbone operating at 1200 bauds, speeding things up might require that every node upgrade on the same day (an impossible situation) or that some nodes move to a different frequency, thus, breaking the backbone.

The staggered backbone solves many of these problems and has a great potential for allowing a significant increase in network throughput. The staggered backbone concept is built upon the fact that NET/ROM software allows a three-port or four-port node to be assembled quite easily. Three ports allow the node to operate on three separate frequencies (or bands) at the same time and to route packets between them.

In a network with a staggered backbone, most nodes would consist of three TNCs and three transceivers operating on the 144, 220 and 440-MHz bands. The 144-MHz port serves local users on a preassigned LAN frequency and connects to the other ports via a special serial port cable and diode matrix. The 220-MHz port handles the transfer of information to neighbors in one direction; the 440- MHz port handles information going in another direction. The reason for choosing three separate ham bands is to minimize interference between the radios without the need for costly tuned cavities and special filters.

The staggered backbone works best where the network topology is linear. Where Y-shaped splits in the network are required, the options are to use still another band (eg, 900 MHz) in place of 144 MHz (resulting in a dedicated 3-port backbone node with no LAN service), construct a 4-port node (to serve the node plus three backbone frequencies) or to stick with the current scheme of having three different background nodes on a common frequency (this should only be used if the three nodes can all hear each other clearly).

The benefits of using a staggered backbone:

1. Since there are only two nodes on any given backbone radio link, "hidden transmitter" and "hold off" are completely eliminated from these links. In fact, the only place that packets can collide (besides on the LAN) is in the cable that mates the TNCs at the node. And, since communication between TNCs typically runs at 4800 or 9600 bauds and does not include TXDELAYS and long DWAITS, the TNCs can recover from collisions on the cable very quickly. All of the TNCs talking on the cable can hear each other clearly, so there are no "hidden transmitters" there.

2. The speed of any link can be increased at any time without creating a logistics nightmare. In fact, when two adjacent nodes agree they are prepared to go faster, they can do it at their convenience. The only thing the rest of the network will notice is improved performance and temporary down time while they switch over.

3. Backbone nodes can take advantage of directional antenna systems to "squirt" all of their signals to a specific neighbor instead of having to use omnidirectional antennas or directional antennas with power splitters. So, in addition to the improvements gained by having a quieter channel, many nodes would see an increased signal strength from their neighbors.

4. Automatic routing table updates managed by the nodes can be trusted again. In many areas, nodes are operating with "permed" tables because of NET/ROM's tendency to hear a distant broadcast and add it to a routing table as a high quality path. With less traffic on the same frequency and directional antennas in use, the chances of this happening are greatly reduced.

The transition from the current backbone to a staggered backbone, equipment costs aside, could be accomplished in a short time. Many of the nodes along the Florida Gold Coast have made plans to proceed along this line; the backbone link from Boca Raton to Hollywood will probably be the first to move to 440 MHz on a permanent basis sometimes early this year. We hope that others will join us and continue to strive for improvements in the network in all areas.

Ammunition for The 220 Fight !

By Jan Steinman N7JDB
Box 500, MS 50-470
Beaverton, OR 97077

Following is a letter sent to me by US Congressman Ron Wyden, who represents the 3rd Oregon District. (I live in the 5th district--he's not even my rep!) Other Oregon hams have received the same letter. Congressman Wyden makes an interesting point, that may have been missed in the extensive amateur comments: that packet radio in the disputed band provided valuable aid in fighting forest fires in Oregon last season. He also suggests an interesting alternative: the 226 MHz military band. If you have not filed your comments yet, you may wish to refer to Congressman Wyden's position in your comments.

Here is the text of the letter:

(Heading deleted)

Dear Mr. Steinman,

I thought you might be interested in a proposal before the Federal Communications Commission which could have a significant impact on amateur radio operators.

The FCC is proposing to reallocate the 220-222 MHz radio frequency band exclusively to the land-mobile service. The FCC argues this will facilitate development of a technology called ACSSB, which has the potential to increase land-mobile efficiency.

While I support efforts to develop more efficient communications technology, I am concerned that reallocating the 220-222 MHz band would be harmful to amateur radio operators and the services they provide the community.

Use of the 220-222 MHz band during the many fire emergencies in the West last year highlights the importance of this band to the amateur service. It was possible for amateur radio operators to establish a packet radio network in the 220-225 MHz band without interfering with other communications. Reallocation of the 220-222 MHz band would significantly reduce this capability.

I have written to FCC Chairman Dennis Patrick urging the Commission to consider another alternative. It may be possible to reallocate the two lowest bands of the spectrum now reserved for military use, 226-227 MHz, to the land-mobile service. Of course, consideration would have to be given to ensure that this would not threaten our national security. But, if surplus military spectrum exists, I think it should be made available to the land-mobile service. This would preserve the 220-222 MHz band for use by amateur radio operators.

The FCC is expected to issue final regulations within two months. In the meantime, please feel free to keep in touch.

Sincerely, Ron Wyden

Comments by DEC ARC

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of General Docket No. 87-14
Amendment of Part 2 of the Commission's Rules
Regarding Allocation of the 216-225 MHz Band

To: The Commission

Reply Comments of
DEC AMATEUR RADIO CLUB
Submitted by Fred R. Goldstein, Vice President

Pursuant to Section 1.415 of the Commission's Rules, 47 CFR 1.415, on behalf of the DEC Amateur Radio Club I hereby submit Reply Comments in response to Comments filed by United Parcel Service of America, Inc. The DEC Amateur Radio Club is a group of radio amateurs employed by Digital Equipment Corporation. (The comments below are comments only of the individuals who are members of the club, and should not be construed as representing the opinions of DEC.) Currently the club has approximately 30 full members in the E. Massachusetts and S. New Hampshire area, plus about 150 corresponding members throughout the United States, most of whom hold Extra or Advanced class licenses.

Late-filed comments by United Parcel Service are fundamentally flawed in their inability to distinguish between voice and data transmission and the spectrum needs for each. Although most of UPS' comments are devoted to expounding the alleged benefits of new "narrowband" technology, employing 5 kHz channelization, UPS Comments, p.8, "The adoption of narrowband technology by the marketplace will permit the 220-222 MHz band to employ 5 KHz channelization, giving it four to five times as many channels within the same spectrum band as current FM channelization." Furthermore, these remarks are only applicable to voice technology.

Most present-day land mobile operation utilizes narrowband FM voice transmission (16F3 emission). Narrowband FM bandwidth is typically computed as the sum of twice the nominal deviation frequency and twice the maximum audio frequency. Given 5 kHz deviation and 3 kHz audio, a 16 kHz bandwidth is required. So-called narrowband radio (ACSSB) utilizes single-sideband transmission with a vestigial pilot carrier, with a net bandwidth equal to the audio bandwidth (3-4 kHz). In both cases, these bandwidths are based upon that required to transmit intelligible human voice.

UPS, however, appears to be primarily concerned with deploying a data service. On page 4 of its Comments, UPS states, "The proposed private land mobile data network will allow UPS to increase the quality of its service to the public ... Second, UPS will be able to have fully up-to-the-minute information on the delivery status of customer packages through use of a terminal aboard each delivery vehicle ...

The technical characteristics of data transmission by radio, however, are entirely unlike those of voice transmission, and the required spectrum bandwidth is substantially different. UPS fails to show that they cannot make use of existing spectrum for this purpose; indeed, their principal competitor, Federal Express, operates just such a mobile data system using frequencies already allocated for that purpose.

Although voice has a well-understood effective bandwidth of 3 kHz, the amount of bandwidth required for data transmission is a function of the quantity of data to be transmitted and the amount of time available for such transmission. Unlike voice, however, multiple data terminals are capable of sharing a single channel by use of various multiplexing techniques. Thus there are two separate data rates that must be considered, the "burst" rate at which a transmitter operates, and the "throughput" rate averaged over time.

Given both a throughput and a burst rate, one can then select an appropriate modulation technique. Several well-known techniques are available for transmitting digital information by radio. In terms of spectrum efficiency, some are clearly superior to others.

One particularly crude technique, widely used by radio amateurs in the 144 MHz band, is to utilize audio frequency shift keying over an FM carrier. Such systems typically provide 1200 bps burst data rate while using 15 kHz radio bandwidth. This technique is primarily used because existing voice radio equipment can be recycled by the addition of a simple AFSK modem circuit. A far more efficient use of bandwidth can be obtained at fairly low cost by utilizing simple Frequency Shift Keying. Using the optimal frequency shift (1/2 the bit rate, known as Minimum Shift Keying, MSK), the required radio bandwidth is approximately 1 Hz per bps. Such a figure (1 bps/Hz) can be taken as a bare minimum of efficiency for any purpose-built radio, and utilizes conventional FM radio circuitry. Commercially-available radio implementing this technique have recently become available for amateur radio operation in the 220-222 MHz band.

Commercial radio systems used by telephone common carriers achieve far higher bandwidths. By using such techniques as quadrature partial response signaling and 16-level phase shift keying, data can be transmitted at approximately 3 bps per Hz. Such modulation schemes are, however, more costly to implement at the present time. Within a few years, however, the falling cost of digital signal processing technology may make them cost-effective for land mobile radio service. Telephone line modems using similar techniques are currently sold in the $1500-3000 range.

One cannot simply apply telephone modem technology to a radio transmission system designed for voice. High-efficiency modems are dependent upon the phase relationships within the transmitted waveform. This information, while preserved by a carrier-based radio, is lost when an audio modem is fed into a single-sideband radio. While modems over FM radio systems are inefficient of bandwidth, all but the crudest, slowest (FSK) modems simply won't work over SSB ("narrowband") voice radios.

ACSB is particularly inappropriate for data transmission. Its compression and expansion effects will not help data integrity and will make packet synchronization harder than other methods which utilize the same bandwidth. Its use of a "pilot tone" further complicates data transmission and reception.

Given UHF spectrum with 20 kHz minimum channelization, it is perfectly reasonable to expect digital radios to operate with a burst data rate of at least 20 kbps, and possibly much higher. A narrowband voice channel, however, would be hard-pressed to carry more than about 1200 bps, based upon AFSK technology (which does not require the phase information missing in SSB). UPS therefore seems to be proposing a system that is less than one-fourth as efficient as FM (MSK) digital radio, yet at far greater cost and lower reliability. Indeed, it is likely that for the cost of the propose ACSSB system, digital radios could be built with a bandwidth efficiency of at least 2 bps/Hz.

Given the burst nature of data transmission, a number of mobile units can easily share a single channel. Indeed, amateur packet operators typically have several separate connections established at any one time over a single channel. Evaluating the likely data requirements of a mobile data terminal, even using a simple MSK radio, reveals a rather small requirement for spectrum bandwidth.

UPS has failed to state the quantity of data that will be transmitted using the proposed service. While UPS has not characterized the size of individual data packets, it appears unlikely that any given message will require more than 100 octets (800 bits) of data to be transmitted in order to report the status of a parcel. If a single delivery vehicle needed to report on the status of an average of one parcel per minute, then its actual data throughput requirement would be no more than 800 bits/minute, or 13.3 bps. Applying a 35% overhead for error detection and correction bits results in 18 bps per truck.

The least efficient of the widely known techniques for packetized data channel contention is known as Aloha. This presumes that individual transmitters do not wait until the channel is clear before transmitting, and retransmit at intervals until an acknowledgement is received. This results in a maximum channel utilization of 17%. CSMA, which results from a master-slave relationship (i.e., mobiles communicate only through a full-duplex repeater), doubles this. Amateur packet networks utilizing single frequency "digipeaters" typically achieve results in between these two numbers, or about 25% efficiency. Mobile data terminals would appear to have similar characteristics if a single frequency is used.

Thus, given a single 20 kHz channel using MSK techniques and a net per-vehicle throughput requirement of one parcel per minute (18 bits per second), and a single-frequency packet radio system, over 250 delivery vehicles can share a single FM channel in a single metropolitan area. MSK transmission, along with other members of the FM family of emissions, has a "capture effect" as well and is thus amenable to cellular techniques for frequency reutilization. ACSSB is not.

Given these facts, it thus appears clear that UPS' need is not effectively fulfilled by providing new narrowband voice spectrum in the 220-222 MHz space. In all likelihood, a total bandwidth of less than 100 kHz can meet all of their fleet requirements, at less cost, simply by applying the appropriate digital technology to other allocated frequencies. This does not require the reallocation of frequencies presently being utilized by the Amateur Radio Service.

Respectfully Submitted,

DEC Amateur Radio Club (WA1VBE)
by Fred R. Goldstein (K1IO)
Digital Equipment Corporation
550 King St. LKG2-1/Y4
Littleton MA 01460

The Caboose

MAY 1988 USECA EDITION By K8CFY

Our third month,March, got its name from that of the Roman month, "Martius," honoring Mars, the god of war. Martius had the distinction of being the first month of the Roman year until the adoption of the Julian Calendar in 46 B.C. March 25th was the feast of the Annunciation. With its special religious significance, it appropriately marked the start of the year; it retained its position as the first day of the legal year in England until 1752. The Saxons gave this period the name"The Loud and Stormy Month"(that "comes in like a lion and goes out like a lamb"). They also called it "Length Month,"as the days began to exceed the nights in length. Among the cheyenne this period was known as "The Dusty (Lightsnow) Moon," and "Buffallo and Horse Begin to fill Out Moon." The Arapaho,among others,called it the "Windy Moon." Among the Sioux groups,it had a number of related names: "Moon When the Grain Comes Up," and "When the Geese Return From The South Moon"; "The Warm, Awaking Moon"; "The Bud Moon," and "Moon of the Falling Rains." The Ponca knew it as the "Moon When The Ducks Come Back and Hide." Other tribes called it "Big Clouds Moon"; "Long Days Moon," and "Melting Snow Moon."

APRIL- The name April probably comes from the Latin verb, aperire- "to open," as with buds. In the old Roman calendar April was the second month,during which important festivals, including the birthday of Rome on April 21,753 B.C. took place.

The Anglo-Saxons called it "Easter Month";the Christian celebration of Christ's Resurrection took its name from the Anglo-Saxon term. Charlemagne, in his new calendar, called it "Grass Month"- for the start of new plant life.

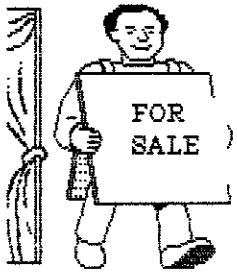
The Sioux repeated that name,"Grass Moon";they also called it "Moon of the Birth of Calves," and "Moon When The Geese Lay Eggs". For the Cheyenne and the Arapaho it was "Moon of the Red Grass Appearing",and Spring Moon". Later the Arapaho,showing the influence of the mission-school and its introduced practices, named it "Colored Egg Moon". For some unknown reason,the Omaha called it "Moon In Which Nothing Happens". The Ojibwa,experiencing a delayed spring,named it "The Snow shoe Breaking Moon";and,in a different clime,the Apache called it "The Time of the Big Leaves". Among the Oto it was known as "Moon of Little Frogs Croaking"; and the Kutenai,noting the drying of the soil,called it "Earth Cracks Moon".

(to be continued)

___ QUESTION OF THE MONTH :

Why do they call them FLEA MARKETS? (fleas are for dogs)

MARKET PLACE



FOR SALE:

Ameritron AL-84 Amplifier., 600 W PEP, Ecellent condition.....$325.00

Yeasu FT 708R (H.T.),.....440 Mhz Excellent condition.....$155.00

GORDIE, N8DXL..949-3063...(please leave msg)

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40 FT.Aluminum Tower, Mosley Tri-Bander, Rotor control.....$300.00

BOB, N8BYY.....247-6574

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SKITREK COMMUNICATIONS WORKING WELL

Packet radio is running full tilt from the northern frontier thanks to the help of Advanced Electronic Application's President Mike Lamb,N7ML. AEA has provided its highly-rated PK-232 digital communications units for the SKITREK team to use. The University of Surrey in England reports regular communiques from Sredniy Island on 20 meter packet. The bulletins from there have been relayed by the UO-11 satellite. Operator EX0CR(also known as UA3CR)has been using the PK-232 to communicate with the outside world on packet.

Meanwhile,the ICOM HF station donated to the Canadian radio support team by ICOM'S marketing manager Evelyn Garrison, KA7LPK,has been logging tens of thousands of QSOs, reports from the arctic indicate. Both AEA and ICOMhave been in the forefront in supporting SKITREK

from AMSAT news

usecans back from DAYTON ?