

W6VIO CALLING



MARCH

MARCH 1990 Volume 19 No. 3

Jet Propulsion Laboratory
W6VIO CALLING M/S 264-419
Attn: Eileen McKinney
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Club Meetings:

Everyone is welcome - Bring your lunch.
12 Noon in 238-543
Second Wednesday of month (Program)
Fourth Wednesday of month (Business)

Newsletter Article Deadline: The 5th. day of each month. If the 5th. falls on a weekend, the following Monday will be the deadline.

Your articles, ads, photos, diagrams, Letters to the Editor, or technical instructions should be submitted to Editor at address above.

EXCHANGE CLUBS PLEASE NOTE ADDRESS ABOVE IS CORRECT ADDRESS FOR EXCHANGING NEWSLETTERS.

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ARRL NOTES (de W6EJJ)

FCC ISSUES CODELESS LICENSE PROPOSAL

On Feb. 8 the FCC decided to issue a Notice of Proposed Rulemaking in a new proceeding, PR Docket No. 90-55, which would establish a codeless class of amateur license. At the time this is being written we have only the FCC press release on the subject; we do not have the actual text of the NPRM. Copies of the NPRM will be available through ARRL Headquarters or your local League representatives as soon as it is issued by the FCC.

Judging from the press release, the FCC proposal differs in one very major respect from the ARRL's petition, RM-6995: the Commission proposes to stop issuing Novice licenses so that the one point of entry into Amateur Radio would be Communicator. This differs substantially in philosophy from what the League has envisioned.

We urge that you study the actual NPRM before submitting comments to the FCC. For this proceeding, there will be a comment period of six months, beginning upon publication in the Federal Register, followed by a one-month period for reply comments. Thus, you will have plenty of time to formulate your comments and make your views known to your League director. The League will not file its comments until after the League's Board of Directors meets in July.

Here is the text of the FCC news release:

ACTION IN DOCKET CASE February 8, 1990

FCC PROPOSES NEW CODELESS CLASS OF AMATEUR OPERATOR LICENSE (PR DOCKET 90-55)

The Commission is proposing to amend its rules by establishing a codeless class of amateur operator license to be called the Communicator Class. The Communicator Class would be incorporated into a simplified licensing structure containing four ascending steps: 1) Communicator 2) General, 3) Advanced, and 4) Amateur Extra Classes. Current Technician and Novice Class operator licenses would be grandfathered indefinitely, with no new licenses issued for those license classes but existing licenses could be modified or renewed.

The codeless operator class license would satisfy three major objectives. The first objective is to offer an entry level license for all persons who find telegraphy a barrier to pursuing the purpose of the amateur service. The second objective is to design a codeless license that can easily be implemented into the current licensing process. The third objective is to avoid any negative effect upon current licensees, the volunteer examiners who administer amateur examinations, or the Commission's workload.

The amateur service exists for the purpose of self-training, inter-communication and investigations to be carried out by duly authorized persons interested in radio technique solely with a personal aim, and without financial gain. Individuals seeking a license to operate an amateur station must prove that they can send correctly by hand and receive correctly by ear, text in Morse code signals. Although this requirement may be waived for an operator of an amateur station transmitting only on frequencies above 30 MHz, each of the five classes of operator licenses issued by the Commission requires the applicant to pass an examination in the international Morse code.

The Communicator Class operator license would not require knowledge of Morse code telegraphy messages. Privileges for the Communicator Class would include all emission types. The Communicator Class license would replace two existing beginner operator classes and would simplify the amateur operator license structure.

The Commission would require applicants for the Communicator Class license to pass a 60 question written examination. The new question pool would be comprised of the questions from the two pools currently used in the Novice and Technician license examinations as well as the addition of new questions.

The proposed transmitter power for the Communicator Class would be 200 watts peak envelope power and the licensee's station would be eligible for a Group D call sign. Stations with Communicator Class control operators would not be permitted to transmit on the 2 and 6 meter VHF bands and the HF bands. The Commission is requesting comments on the effect of excluding Communicator Class licensees from the two VHF bands. Comments are also requested on the desirability of including the opportunity for Communicator Class licensees to experience on-the-air telegraphy operation on the HF bands. Additionally, a Communicator Class licensee who passes or receives credit for a telegraphy examination would be authorized the privileges of the Technician Class.

The Commission is requesting comments on all aspects of this proposal.

Action by the Commission February 8, 1990, by Notice of Proposed Rulemaking (FCC 90-11), Commissioners

-FCC-

News Media contact: Patricia A. Chew at (202) 632-5050. Private Radio Bureau contact: Maurice J. DePont at (202) 632-4964.

MINUTES OF BOARD MEETING 24, JAN, 1990

The JPL ARC membership and board meeting was convened at 12:05 in 300-217. The following members were present:

Mark Schaefer, President
 Bill Morris, Vice-President
 Sid Johnson, Secretary
 Jim Kesterson, Treasurer
 Walt Mushaglan, Emergency Communications
 Jon Adams
 Rick McKinney
 Steve Jenkins
 Jan Tarsala

The meeting was conducted by Mark Schaefer.

The 300-217 conference room will not be available for the February general meeting. Sid Johnson will find out the future availability of the 303 conference room and Bill Morris is to look into the availability of the bldg. 103 conference room.

A discussion held regarding membership renewal, the new questionnaire designed by Mark Schaefer and raising dues for the year 1990. Sid Johnson moved that dues be raised to \$6.00. Bill Morris seconded and the motion carried unanimously. Dues go from \$4.00 to \$6.00 on Feb. 15th.

Mark announced that he has a letter from John Tallon to acquire the Mt. Gleason site for field day this year. Also Mark stated that Courtney Duncan has run orbital path calculations on the STS-35 and STS-37 shuttle flights. These calculations show that radio contact with these flights will be brief and very low to the horizon requiring high gain steerable antennas and very high transmitter power. Stan Sander is to write a letter to the Motorola club stating the difficulties and suggesting that a club with a better view of these shuttles be selected to work them.

Rick McKinney reported that the 1990 club preliminary budget must be presented to the ERC by Feb. 15th along with an equipment inventory, membership list and proposed grant request. Rick stated that this year the ERC will issue grants by matching funds put up by the club up to an amount as high as perhaps \$1000.00.

The new budget was discussed and approved by the board and will be presented to the general membership for approval at the Feb. general club meeting.

The meeting was adjourned at 1:05.

Sid Johnson WB6VWH Secretary.

I DON'T GOT THE PC BLUES
(but I want 'em)

Jon Adams — NW6H

Lurking in some dark closet in some office or lab in your section may be something that the Radio Club really needs - a PC or PC-XT computer!

In order to help the W6VIO radio shack (you DO remember the radio shack, don't you?) catch up technologically in this age of microwave toilet seats and Von Neumann-machine-operated doggie doors, the club is asking for DONATIONS of PC-type computers for the shack.

What will these be used for, you might ask. (Well, ok, go ahead and ask anyway.) Plans are sprouting for full-time BBS/Packet stations, traffic-logging terminals, remote station controllers, remote weather controllers (well, at least measurement), amateur satellite position prediction and antenna tracking positioners, etc. All those little things that the "World-Famous"

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>>>>> JET PROPULSION LABORATORY <<<<<
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should have.

I am looking specifically for various computer items, the most critical of which are listed here:

- 1 PC-XT with 10Meg Hard Disk
- 1 PC with at least a 360k floppy
- 1 Monochrome PC Display
- 1 EGA Graphics Display
- 2 Keyboards
- 1 2400 Baud Modem (1200 will do)
- 1 Epson-compatible Printer with parallel interface

This is really only a minimum wish list; there is a lot of support hardware (cables, switch boxes, power strips) that we are looking for also.

Most of these things must be available out there as groups and whole sections switch over to more modern, faster, newer equipment. The older printers are continually being updated to LaserJets and the like.

Beg - Plead - Cajole!

Please keep your eyes open for this stuff - ask your Supervisor; your Section Manager; your ALD! If you have access to unwanted computer equipment as described above, it is a very simple matter to provide these to the Amateur Radio Club on long-term loan (read:forever). (In fact, this is a fine way to sell this idea to your section; as storage space becomes more and more valuable, this is an ideal way for a group to put away a computer that they have no need for without actually sending it to Chell!)

If you see something that looks good but that you're not sure is usable, please give me a call - I'll help you in any way I can. Talk to me, Jon Adams, NW6H at x43445 or x43957 or send me a FAX at x42825... (No, I don't carry a 220 radio).

With your help, the JPL Amateur Radio Club will edge perilously closer to the recent past, instead of fading into the hazy, dark recesses of ancient history.

The launch of the six new amateur satellites went flawlessly and was re-transmitted from W6VIO on Sunday evening, January 20, 1990 (January 21 UTC). The six satellites, in order of deployment are:

Abbrev. Name	Object No.	Frequencies	UO-14
UoSAT - 3	20439	435.070	UO-15
UoSAT - 4	2047	435.120	AO-16
PACSAT-1	20438	437.025, 437.050	DO-17
DOVE-1	20440	145.825	WO-18
WEBERSAT-1	20441	437.100, 437.075	LO-19
LUSAT-1	20442	437.150, 437.125	

Also, there is a new Japanese amateur satellite, nearly a perfect clone of FO-12 but with better solar cells so that a more robust operating schedule can be maintained.

FO-20 Fuji-OSCAR 20480 435.795, 435.910

The primary transmission frequency is listed first in each of the above. Note that LO-19 sends CW telemetry on 437.125 simultaneously with the PSK on 437.150. AO-16 and WO-18 are either/or frequency choices. If you don't hear one, try the other. The FO-20 435.795 beacon is CW or RTTY telemetry. This beacon is on when the mode JA transponder is on. JA frequencies are 145.900 - 146.000 up corresponding to 435.900 - 435.800 down (note that the transponder inverts information (sideband) and direction of frequency in tuning). The 435.910 is the PSK transmission frequency that corresponds to mode JD operation. Modes JA and JD are thought to be mutually exclusive.

UO-14 transmits AFSK telemetry just like UO-11 (which has been in orbit for over five years.) AO-16, WO-18, and LO-19 transmit AX.25 packet with PSK modulation. DO-17 transmits AX.25 packet with FM-AFSK modulation. Listeners with conventional 2 meter packet stations can monitor by tuning to 145.825. All five satellites are in testing and calibration mode and none are yet open for business. UO-15 has not been heard since the day after launch, 22 January 90. Any reception reports would be welcome. When monitoring, please note that doppler shift can cause two meter signals to be +/- 3 KHz from the published frequency and 70 cm signals +/- 9 KHz from the published frequency. Therefore to listen to WEBERSAT-1, for example, tune the range from 437.109 to 437.091.

FO-20 has been heard and operated in both modes JA and JD. Mode JD is a digital relay only, and will not be an orbiting mailbox until additional software can be uploaded. AMSAT is awaiting an operating schedule for FO-20.

The following bulletins give more details on these late developments.

73, Courtney, NSBF

AO-10 STATUS

HR AMSAT NEWS SERV. BULLETIN 043.09 FRM AMSAT HQ SILVER SPRING, MD FEBRUARY 12, 1990

AMSAT-DL has announced that the current sun angle of OSCAR-10 has put it in a position such that it is out of solar "fuel" and will be not usable for the next few weeks. Over the past few weeks there was a noticeable drop in beacon strength as well as FMIing of signals on the transponder. In recent days the beacon and signals on the transponder have disappeared completely. Do not use AO-10 until further notice. Once the sun angle improves, the bird will be "returned to service".

FUJI-OSCAR-20 IS BORN!

HR AMSAT NEWS SERV. BULLETIN 043.01 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

A New OSCAR Is Born: FUJI-OSCAR-20

On Wednesday, February 7, 1990 at 01:33 UTC the National Space Development Agency of Japan (NASDA) launched an H-1 booster from its Tanegashima Space Center. Aboard this launch vehicle were three payloads: MOS-1B, DEBUT, and JAS-1B. MOS-1B, is a Marine Observation Satellite and is intended to be used for oceanographic resource studies. DEBUT is an experimental satellite which will have deployable booms and an umbrella-shaped antenna. The third payload was JAS-1B, the JARL follow-on satellite for FO-12. The three satellites were successfully injected into orbit. Separation of DEBUT and JAS-1B from the upper stage of the H-1 occurred over Santiago, Chile at 02:33 UTC February 7th. At that moment the 50 kg amateur radio satellite which is now known as FUJI-OSCAR-20 was born! The upper stage of the H-1 rocket at that point had successfully completed the final boosting of FO-20 to an apogee of 1200 km. At this altitude, FO-20 will be in a more favorable orbit from the stand point of not having to experience long solar eclipse periods for the first 150 days after launch. After day 300 and until day 470 after launch, FO-20 will be in a sun-earth orientation such that it will not experience solar eclipse periods. This is expected to provide an excellent power budget for FO-20 users.

On the first orbit over Tokyo at 03:09 UTC, FO-20's CW beacon was heard at 435.795 MHz. The signal was strong and stable. The Doppler shift was estimated to be about 9 KHz. After the first orbit many QSO's were heard on the Mode JA downlink passband between 435.800 to 435.900 MHz. For example, N9CZA and NK6K worked W6AMW on their first pass on Mode JA. Also, on the second orbit, N5BF made CW contacts on FO-20 on Mode JA to WA4SBC, WB8ELK, and K18QE. On the third orbit N5BF was able to even push a few packets through the Mode JA transponder using his PSK modem. Later, reports started to pour in about the excellent signals heard from FO-20. W2RS reports that he has worked G4CUO, G6HMS, and G8ATE, all on SSB mode JA on Orbit 38. On the same orbit HB9XJ worked WA8VXH.

After the initial check-out of all the spacecraft subsystems of FO-20 are accomplished, JARL will announce the operating schedule. Mode JD and the BBS may be released for service after the initial check-out is completed. Watch for the FO-20 operating schedule in the AMSAT News Service (ANS) bulletins and in ARRL bulletins. Also, stay tuned to AMSAT HF/VHF Nets for any further updates and news regarding the operating schedule for FO-20.

WO-18 IMAGE SCHEDULE

HR AMSAT NEWS SERV. BULLETIN 043.07 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

The software aboard WO-18 which downloads images, automatically switches to the next image stored in memory at start of the first transmission after 05:45:26 UTC each day. Therefore the image schedule is planned as follows:

pic 2 - after Sun Feb 11 05:45:36 1990
pic 3 - after Mon Feb 12 05:45:36 1990
pic 4 - after Tue Feb 13 05:45:36 1990
pic 5 - after Wed Feb 14 05:45:36 1990
pic 6 - after Thu Feb 15 05:45:36 1990
pic 7 - after Fri Feb 16 05:45:36 1990
pic 8 - after Sat Feb 17 05:45:36 1990
pic 9 - after Sun Feb 18 05:45:36 1990
pic 10 - after Mon Feb 19 05:45:36 1990
pic 11 - after Tue Feb 20 05:45:36 1990
pic 0 - after Wed Feb 21 05:45:36 1990
pic 1 - after Thu Feb 22 05:45:36 1990

The image being sent is encoded in the SSID of the destination address of the packet. e.g., WEBER-1>PHOTO-7 means photo 7 is coming down. The application software on board now can be told to replace any of the 12 image slots with a new image based on time and/or horizon sensor limits. The header contains the time the image was taken. Also, a particular image can be selected and downlinked at anytime.

Although N4HY and NK6K will continue to provide some operational support for the telemetry and power control software for a while longer, the application is now totally under the control of the ground station at Weber State University.



I just left the ole S-Line after having a ball in the ARRL CW DX Contest. All bands were in fantastic shape for this event. Chalked up a few new ones on every band, but 20. Even worked some band-zones that I need for the 5-Band WAZ Award! Why am I telling you all this? The DX Bulletin is chuck full of relatively rare action ready to open shortly and the conditions support you working it all! Here goes:

Franz Josef Land - 4K2OT and 4K00IL share spectrum between 14007 and 14010 kHz from 2300 to 0200Z. I snagged 4K2OT on 21053 kHz at 2030Z during the Contest.

Jan Mayen - JX6DFA will be active from 1 April to 27 July. Look for him on 3501, 7005, 14010, 21010 and 28010 kHz.

Marion Island - ZS8MI is active on 14240 kHz from 1420Z on Sundays. He also operates CW on Friday mornings around 14050 kHz from 1430Z.

Pitcairn Island - Look for VR6JR. He'll be on this garden spot for several months. He was reported on 21239 kHz at 0130Z, also at 28290 kHz at 1615Z.

South Orkney Island - LU1ZA is active on 40 thru 10 meters. He's most available from 14004 through 14020 kHz starting at about 2330Z. I finally worked him from the Cabin after only three years of effort!

United Arab Emirates - A61AD plans all-band operation from 23 to 28 March, both cw and ssb. His frequencies are 3505, 7005, 14030, 21030, and 28030 kHz on cw; and 3795, 7045, 14145, 21295, and 28495 kHz on ssb.

Vanuatu - YJ0ABF and several others are keeping the troops happy with their all-band activity through 4 March. Published frequencies are 3795, 7075, 14195, 21195 and 28495 kHz on ssb. They're also active on cw 5 kHz up from the low band edges of 80 through 10 meters.

Vietnam - Want an easy QSO with Vietnam? Look for 3W3RR on any band as follows: 3795 or 3501 kHz at 1500Z, 7004 kHz from 1300 to 1600Z, 14001 kHz at 1400Z, 28510 or 28004 kHz from 0100Z.

Walvis Bay - This may become a new country for DXCC in the near future. There was activity from here in the Contest. ZS9S can also be found on 14180 kHz at 0500Z, 28610 kHz at 1630Z, and in the 21335 kHz net at 1500Z.

Western Sahara - S01A is active on 28500 kHz from 1700Z. Haven't heard him yet, but he's one of seven countries I still need on SSB.

This is a long report this time, but I didn't want you to miss anything. Have a ball in the pile-ups.

Good hunting!
Bob, N6ET

PHONE RATES FOR AMATEUR RADIO

Pacific Bell now offers residence rates for Amateur Radio Service Operators. The recent decision was reported in the January 8, 1990 issue of the "Pacific Bell Update" (employees newsletter).

"Our decision was based on two factors," said Customer Services Manager Jennifer Just. "One, that Ham Radio Operators are prohibited by law from using the services for business purposes. Two, that Pacific Bell values the emergency backup help Ham Radio Operators provide and would like to make the service as widely available as possible." Amateur Radio locations will not be required to meet normal residence qualifying criteria such as having bedrooms and bathrooms. She went on to say that Amateur Radio Operators should call their local business office to apply for the change.

This has not always been the policy. You will never know how difficult it was to obtain the present phone service for the repeater site. With residence rates now available for the Mesa site, we should consider adding an autopatch on W6VIO. This would improve our emergency capability, reduce the need to break a QSO for a patch, and help balance activity.

Walt Diem, WA6PEA

MICROSAT UPDATE

HR AMSAT NEWS SERV. BULLETIN 043.05 FRM AMSAT HQ SILVER SPRING, MD FEBRUARY 12, 1990

Week three of the AMSAT Satellite factory has continued to keep the AMSAT Engineering team deprived of sleep and chained to their keyboards. Bob McGwier, N4HY, and Harold Price, NK6K, report that the shakedown program for the 4 Microsats is proceeding without any major problems.

Bob and Harold have been uploading new revisions of the operating systems to the birds (in excess of 40,000 bytes per upload) and they are coming closer to final commissioning of each satellite. The problem of "very long" packets sent by LO-19 seems to have been resolved over the past week. Bob and Harold's schedule has kept them so busy that they have not been able to spend much time playing with the new FO-20.

Although reception of the microsats does not require high gain antennas and preamplifiers, there have been reports that the deep fades of AO-16 have been significantly reduced by utilizing a LHCP antenna. Additionally, DO-17 seems to favor RHCP to reduce the fading. The spacecraft are not yet fully stabilized and these observations may change over time.

WO-18 PICTURES TAKEN

HR AMSAT NEWS SERVICE BULLETIN 043.06 FROM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

When you have a moment, go outside, look up and say "Cheese". On Saturday, February 10, 1990 at about 1655 UTC, the AMSAT Engineering Team activated the picture taking software on Webersat (WO-18). The spacecraft was over the Great Lakes at the time. Twelve pictures were taken in response to on-board software commands, each ten seconds apart. To ensure spacecraft safety during this dangerous event, careful monitoring of telemetry was performed and the results analyzed essentially in real time. With the operation now completed, there is no reason to believe any safety problems exist aboard WO-18, which reflects the degree to which the procedure was planned in a professional manner.

Initial pictures show solar flaring on the camera lens. No effort was made to engage the horizon sensor inhibit for this first engineering checkout attempt. Pictures of the sun are not expected to damage the camera. The picture download sequence will increment once per day. The header of the current picture specifies the picture number.

Evaluation of the first frames of picture data indicate that the color burst signal from the camera has been digitized, which suggests that the color burst circuitry of the camera is functioning, as well as the digitizer itself. Additionally, impact sensor data from the event strongly suggests proper operation of the electro-mechanical iris is taking place. The WEBERSAT team feels at this point that the preliminary results are most encouraging. They are devoting top priority to releasing the picture decoding and display program (Weberware).

For those wishing to be able to view these pictures, you must capture RAW frames. A way to do this is to use timdc or some terminal program which does not strip the high order bit of characters or filter characters when in terminal emulation mode. Your TNC must be operating in KISS mode. Until Weberware is made available, simply capture the raw frames from WO-18 and keep them stored on disk. Think of the process as taking the pictures now and waiting until the Fotomat opens.

THE PRESIDENTS MESSAGE by Mark M. Schaefer

First I want to thank you all for joining for another year and filling out those questionnaires. Plenty has happen already this year. We have doubled the number of oscar satellites and it won't be long now till we can use them. Contact our resident Amsat VP Courtney Duncan for the latest word or listen for the birds. I sure W1AW bulletins will also be up to the minute. The club retransmitted the launch audio from French Gulana to Australia on 15 mtrs, the locals on the W6VIO repeater, and to whoever could here us on 75 mtrs. There was quite an enthusiastic response on 15 mtrs from Japan to Argentina to Washington State to Indiana listening in.

We have reserved Mt. Gleason for Field Day and have an opening for FD chairman, here's your big chance!

A new Novice Class will start Feb 28 at 5:30 pm at Clark Education Center. Don't worry if you start late, better late than never and it's never too late. Contact Gil Yanow, Peter McCloskey, or Ted Pfeiffer for more details.

At this time the LA Marathon is still looking for volunteers and you won't even break a sweat (if your sitting in the shade) so contact Sid Johnson before this run passes you by.

The repeater upgrade is still an uphill battle but at least things are looking up. The order is out for a new controller for W6VIO. The new WB6IEA Kendecom repeater is being repaired at the factory under warranty. The Intermod Control Frontends should be arriving soon as well. These should give us a clean signal to the usual places with plans to expand our coverage coming along.

At the time of this writing, there were still Encounter QSL's to mail. This could be your last chance to read the mail on what hams across the country think of JPL, NASA, Voyager, and the operators.

SAREX the Shuttle Amateur Radio Experiment for STS-35 has been checked out and is ready to go. However the launch has been delayed. STS-35 is due for launch in June with 2 mtr FM and standard Packet. STS-37 which will also carry ATV receive capability on 440 MHz band has been delayed to November. The logistics is questionable, the signal path is barely plausible yet I am still hopeful that we can pull it off. The goal of this experiment is that we at JPL can gather a group of school kids together to watch NASA Select of the shuttle Astronauts watching our transmitted ATV of the school kids. Video feedback is the least of our worries however. This is an important opportunity for Amateur Radio, we should give it our best effort if we ever expect another.

At the time of this writing, rumors are flying about NO-CODE license. I will wait till I see it in writing before I say I told you so. I just think that we should probably go for whatever they say, if we hassle the FCC too much, they may create a NO-LICENSE code.

HPE 2 HR FRM U SOON ---. de WB6CIA

FO-20 SPECIFICATIONS, PART 1

HR AMSAT NEWS SERV. BULLETIN 043.02 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990
FO-20 Specifications

LAUNCH AND ORBIT: 1. Launch (scheduled) Time:
February 7, 1990, 01:33 UTC

Launch Vehicle: H-1 (2-stage) rocket
Launch Site:
Tanegashima Space Center, National Space
Development Agency of Japan (NASDA)

2. Orbit (planned)
slightly elliptical polar orbit, with 1200 km
perigee
Period: 105 minutes
Inclination: 99 degrees

SATELLITE SPECIFICATIONS 1. Dimension

Size:
26-face polyhedron measuring 440mm across and
470mm in height
Weight: Approx 50 kg.

2. System Configuration

Analog and digital transponder in Mode J
(uplink 145 MHz, downlink: 435 MHz)

3. Attitude Control

Satellite attitude will be maintained by using
the torque generated by interaction of two
permanent magnets with the earth's magnetic field.

4. Thermal Control

Passive control using thermal insulation

5. Planned service life: 3 years

SYSTEM SPECIFICATIONS 1. Beacon and telemetry JA
beacon: 435.795 MHz nominal frequency; RF Output
power 100 mW, CW or PSK (also capable of A0
[NON]transmission)
JD telemetry: 435.910 MHz nominal frequency RF
Output power 1 W, packet in PSK

2. Telemetry

CW telemetry: 12 analog data items; 33 status items

PSK telemetry: 29 analog data items 33 status items

3. Commands: Equipped with real-time program command
function

4. Transponder - Frequency and modes (see the table
below) are similar to those of FO-12. The analog
system (JA) consists of the inverted heterodyne
transponder with a bandwidth of 100 kHz operating
with a Mode J of uplink 145 MHz and downlink of 435
MHz.

The digital system (JD) functions as a mailbox
using the AX.25 link level protocol. Stations who
have used FO-12 will be able to use JAS-1B without
any modifications to equipment.

(1) Analog System Transponder:

inversely heterodyned linear translator.
Uplink passband: 145.900 to 146.000 MHz
Downlink Passband: 435.900 to 435.800 MHz
Transmitter Output: Approx. 1 watt
Bandwidth: 100 kHz (3 db bandwidth)
Uplink EIRP Required: About 100 W

(2) Digital System Transponder:

Store-and-forward packet communication using
AX.25

link level protocol, version 2

Uplink Frequencies: 145.850 MHz, 145.870 MHz,
145.890 MHz, 145.910 MHz.

BI-phased Manchester code on FM signal, with a
bit rate of 1200 bps.

Uplink EIRP Required: About 100 W

Downlink: 435.910 MHz/NRZI/PSK, 1200 bps

Transmitter output: About 1 W

FO-12 SPECIFICATIONS, PART 2

HR AMSAT NEWS SERV. BULLETIN 043.03 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

FO-12 Specifications, Part 2:

5. Antennas 144 MHz receiving antenna
(RCVR-ANT):

Ring turnstile antenna mounted at bottom of side
panels

435 MHz transmitting antenna (XMIT-ANT):
turnstile antenna mounted at the top of satellite
(shared by analog and digital modes)

	Polarization	Gain
RCVR-ANT:	circular	+0.5 dBi max.
XMIT-ANT:	circular	+4.0 dBi max.

6. Power Supply

Solar cells: Gallium arsenide

Size and Quantity: 2x2 sq-cm and 1x2 sq-cm, over
1300 cells

Power Output: More than 10 W @ Beginning of
Life

Battery:

Cell type and quantity: 11 series-connected
NiCad cells (rectangular) Capacity: 6 Ah

Voltage Converter

Bus voltage: +11 to 18 V (14 V average)

Regulated voltages: +10 V, +5 V, -5 V

Efficiency: Better than 70%

Power control functions:

Bus voltage upper limit control (full-shunt
type), and UVC function to disconnect load when
battery terminal voltage drops

NEW TRANSPONDER SCHED FOR AO-13

HR AMSAT NEWS SERV. BULLETIN 043.04 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

AMSAT OSCAR-13 Transponder Schedule (Valid Until
May 09)

Mode-B : MA 000 to MA 165

Mode-JL : MA 165 to MA 195

Mode-S : MA 195 to MA 200 BLON = 207.1 degrees

Mode-BS : MA 200 to MA 205 BLAT = + 2.9 degrees

Mode-B : MA 205 to MA 256

Omnis : MA 240 to MA 060

From 21 Feb 90 to 21 Mar 90 there will be an OFF
period from MA 20 to MA 90 due to solar eclipses
affecting AO-13. The length of the eclipses will
vary from 12 to 89 minutes. Only the Mode B beacon
will be active during Mode-S from MA 195 to MA 200.
Optimum Squint angle occurs around MA 200.

HELP NEEDED WITH UoSAT-OSCAR-15

HR AMSAT NEWS SERV. BULLETIN 043.08 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

Following the last reported reception of signals from UO-15 at around 05:00 GMT on 23JAN90, nothing has been heard from the satellite - despite continued attempts by University of Surrey to activate redundant on-board systems. While the University of Surrey will continue to explore redundant paths and configurations available on the satellite, the time has come to investigate whether the spacecraft has suffered a major malfunction.

It should be possible to resolve this question by listening for residual signals from the on-board local oscillators (to confirm the operation of the power systems) and any very low-level signals at the nominal downlink frequency (indicating a transmitter or antenna problem). If signals from either the local oscillators or the transmitter can be detected, then there are several tests that can be done to trace the nature and extent of the problem. We are, however, fortunate in having a virtually identical satellite (UoSAT-OSCAR-14) alongside in orbit to act as a test-bed or reference for our recovery attempts.

The level of local oscillator signals present at the spacecraft antenna were measured before launch to be -60 dBm. Examination of the link budget associated with the above experiments shows that large antennas and sensitive, narrow-band receivers operating in the 132-136 MHz (local oscillators) and 435.120 MHz (downlink transmitter) will be required to stand any chance of success. It is recommended that tests first confirm the detection of local oscillator signals from the operational UO-14 before attempting to listen for UO-15.

It is also very important that we narrow the window between the last reported reception of UO-15 at 05:00 GMT on 230190 and first AOS (or lack thereof) at University of Surrey at 10:00 GMT the same morning. Was anyone else listening? Telemetry would be ideal, but even a report of the presence of a signal from UO-15 on 435.120 MHz would help enormously.

Anyone with any information are requested to contact Martin Sweeting G3YJO at UoSAT.

MIR / HAM ACTIVITIES

HR AMSAT NEWS SERV. BULLETIN 043.10 FRM AMSAT HQ
SILVER SPRING, MD FEBRUARY 12, 1990

As many Amateurs will recall, in the past there has been some exciting Amateur Radio activity from the Soviet space station MIR. The last activity on 2 meters from MIR ended in April, 1989, when Alexander Volkov (U4MIR) and Sergel Krikalov (USMIR) returned to Earth. The station remained inactive from April through September until it was re-manned with the TM8 crew of Alexander Viktorenko and Alexander Serebrov. Unfortunately they have not continued the tradition and no amateur activity has been observed.

On Sunday, Feb 11, at 0616 UTC, the Soviet TM9 crew was scheduled to blast off from Baikonur Cosmodrome with Commander Anatoly Soleyvov and Flight Engineer Alexander Balandin. They may be expected to dock with MIR approximately 50 hours later. This will be a six month mission and it is not inconceivable that we may see 2-meter activity resumed on the station. It is possible that for the week or so that both crews remain on the station there may be some resurrection of the 2-meter operation. Previously, this activity has been on 145.55 FM simplex-although this was not the originally intended operating scheme.

Listeners in the Northeast US can expect to receive signals from the Soyuz TM9 ascent module on 121.75 FM (NOT standard AM aircraft signals) when in contact with its Atlantic tracking vessel, the Kosmonaut Yuri Gagarin, prior to docking with MIR approximately 0800z/13Feb. Please report any observations to AMSAT.