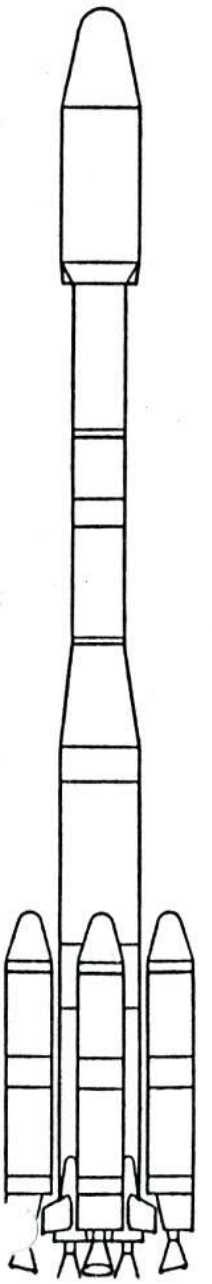
AMSAT-SM INFO

Nummer 3 September 1988



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Omslaget: Raketen som gjorde'1, ARIANE 4, läs mer på sidan 6.

ORDFÖRANDENS TANKAR

Så var den då uppe, den sedan länge efterlängtade PHASE IIIC som efte separation från ARAINE4 blev det trettonde tillskottet i OSCAR-serier nämligen OSCAR13. Med tre analoga och en digital transponder är det de mångsidigaste amatörradiosatelliten hittills. Med sin bana oc sändareffekt kommer den också att bli den lättaste att använda Förhoppningsvis kommer detta att innebära att inte bara de ytterst entusiasterna kommer att syssla med radiokommunikation via satel utan att vi nu kommer att få och höra och köra många nya röster öv transpondrarna. Du kan ju praktiskt taget använda dina befintliga antenn för 2m. och 70 cm. Till en början kan man klara sig utan att kunna eleve hela rasket och på så sätt komma igång på så att säga 'studs'. Vi komm att hålla Er, kära medlemmar, uppdaterade med information och banda (som kommer att hålla sig aktuell länge på grund av banan) geno INFO-bladet, INFO-nätet och SAT-INFO Bulletinen.

Detta är det tredje INFO-bladet som kommit ut i år. Det var (är) m förhoppning att utgivningstakten skulle kunna öka till sex nummer per Denna förhoppning har dock inte kunnat infrias ännu, tyvärr beroende bidragsbrist. Med risk att bli betraktad som en extremt tjatig gnällsp måste jag ännu en gång påtala det faktum att utgivningstakten skulle ö om bidragsinfödet ökade. Artiklar av typen 'så ser min station ut' vore exempel mycket trevliga och skulle vara till stor hjälp för nykommling som behöver praktiska tips. Jag sitter nu i den sitsen att jag är bå ordförande och redaktör i föreningen. Detta ska dock inte betraktas s någon sorts maktfullkomlighet från min sida utan jag delar mer en gär med mig av arbetsuppgifterna, bland annat skulle jag behöva hjälp med vaska fram material till INFO-bladet ur den strida ström av telemail s inflyter. Om någon känner sig kallad att ge mig ett handtag så slå en sig eller varför inte utnyttja vårat eminenta postverk.

En delegation från AMSAT-SM var under sista helgen i Juli på AMSAT-U UoS satellitmötet i England. En rapport från denna begivenhet komme nästa INFO-blad som beräknas utkomma i början av December. Tills d ber jag att få önska er en skön höst.

-PUY / Leif

Initial AO-13 Reports Positive

With a week's experience operating the new AMSAT OSCAR 13, new insights into the satellite are now emerging. The satellite officially continues in the engineering evaluation and "fine tuning" phase prior to being declared fully operational. Nevertheless, a large number of satellite users, newcomers and veterans alike are appearing on the satellite.

The attitude of AO-13 is now said to be at or close to the target (BLON=180; BLAT=0). There have been no further magnetorquing sessions of any length around perigee for the last several days.

While it is asserted the objective attitude has been attained, there is, however, some fragmentary evidence to the contrary. Mode L performance, for example, appears in some reports to be below specification. This could be due in part to satellite antenna off-pointing.

Mode B operations, begun on July 22, continue apace with excellent results generally reported. Actual Mode B link performance seems to compare favorably with the published values suggesting 21.5 dBW EIRP (141 W EIRP) is sufficient for an average 10 dB signal-to-noise ratio downlink. Experience suggests a dB or so more uplink power may be required when the Mode B transponder is heavily loaded as it has been in recent days. Nevertheless, after the chaos of the initial operations on July 22, Mode B operations have been excellent.

Mode J operations began July 24. Observations suggest this mode too meets or exceeds expectations. The recommended uplink power of 25 dBW (316 W EIRP) evidently is being exceeded by many users unfortunately. Downlink signals approaching 20 dB above the transponder noise floor were common suggesting QRO users are not hearing terribly well.

AO-13 Mode J users should employ only sufficient power to equal the General Beacon at 435.651 MHz. Under normal conditions, that should require only about 20 watts to the feed of a 12 dBic antenna. The 50 kHz of Mode J sub-band has been chock-a-block with signals suggesting a high level of interest and satisfaction with its performance.

Mode L operation, which also began July 24, has a way to go, however, to attain expectations. An analysis of Mode L performance is being made but there is no suspicion whatsoever of a transponder failure. Indeed, the fact that such potent signals are being heard from the J sub-band of the L transponder gives the L-transponder transmitter itself a clean bill of health. It's working great.

The question is why are Mode L uplink signals not generating the anticipated downlink signal strengths? Reports from around the U.S. suggest Mode L downlinks are at least 10 dB less than expected.

It may be, AMSAT officials said, that the reason Mode J signals are so strong and Mode L uplink signals don't currently compare is attributable to the difference in the uplink antenna beam widths. The 24 cm receive antenna has a much narrower beamwidth commensurate with its higher gain, they said. If one assumes some off-pointing, that would account for the difference in J and L uplink performance. (An analysis follows another bul' tin)

In general, then, AO-13 appears to be performing very well a
with the exception of the open questions about current Mod
performance, providing excellent service even as the engine
complete their final check out procedures and prepare to com
the spacecraft to full operational status in a week or two.

Here is the current AO-13 operating schedule. It will remain valid unt
September 21 and may be deviated from for engineering tests.

Revised Operating Schedule: V3.0 6Aug88

Mode	From (Inclus)	Thru (Inclus)	Remarks	Duration MA	Duration Minutes
Off	MA 241	MA 002	Solar eclipse window	18	48.3
Mode B	MA 003	MA 099		97	260.2
Mode L	MA 100	MA 180	Mode JL optional	81	217.3
Mode B	MA 181	MA 220		40	107.3
Mode B	MA 221	MA 240	With omni antennas	20	53.6
Mode S RUDAK			Commence September(?) Testing; ops pending		

The current attitude is approximately BLON=180, BLAT=0.

AO-13 Frequencies Recalibrated

The past week of operating AO-13 has provided a number of surprises. Among these surprises are discrepancies in the actual transponder frequencies compared to those previously announced. The discrepancies from the AMSAT-DL tables vary from 2 to 21 kHz. These are now updated based on actual measurements as follows:

For Mode B, the sum of uplink and downlink frequencies equals a constant 581.398 MHz such that at Mode B mid-band, 145.890, the required uplink is 435.508 MHz. This uplink frequency is 3 kHz higher than previously announced.

For Mode J, the sum of uplink and downlink frequencies equals a constant 580.413 MHz such that at Mode J mid-band, 435.965, the required uplink is 144.448 MHz. This uplink frequency is 2 kHz lower than previously announced.

For Mode L, the sum of uplink and downlink frequencies equals a constant 1705.356 MHz such that at Mode L mid-band, 435.860, the required uplink is 1269.496 MHz. This uplink frequency is 21 kHz higher than previously announced.

A correlation between J and L uplinks and the JL downlink has now been confirmed. The JL downlink sub-band center is 435.965 MHz. The corresponding L uplink is 1269.391 MHz. The corresponding J uplink is 144.448 MHz. Thus, stations transmitting on 1269.391 and 144.448 MHz should appear on the same downlink frequency in the absence of Doppler shift.

When making frequency measurements, careful attention must be paid to Doppler shift. All beacon frequencies appear to be very close to the previously announced values; to within a kilohertz.

Additional surprises have come in the form of the telemetry. It had been thought, based on the PSK telemetry frames, that on Mode B, the 70 cm omni and the 2 meter high gain array was being employed. As it now develops, the binary status bits for these functions were recently changed but that information remains esoteric. While it was reasonably well-known the spin rate values yielded by the telemetry were spurious, the antenna configuration status bit changes are new and unheralded.

ARIANE 4

Av SM0PUY / Leif Möller

Den 6:e Juni 1988 klockan 11:19:01 UTC lyfte för första gången e ARIANE4 raket. Uppskjutningen av den nya raketen konfigurerad med 'strap on boosters' ,44LP, var en demonstrationsflygning. Med på flygning fanns APEX4 vilket betyder Ariane Passenger EXperiment. APEX4 bestod a tre speciellt utvalda satelliter som skulle vara representativa f framtida satelliter. De tre satelliterna var: en europeisk vädersatellit Meteosat P2, en kommunikationssatellit - Panamsat och amatörradiosatelliten PHASE IIIC. Totalvikten för APEX4 (satelliter o adaptrar) blev 3200 kg. Denna last skulle placeras i Geostationär Trans Bana (GTO) med perigeum 220 km, apogeum 36290 km och inklinationen grader.

Raketen är 58.4 meter hög och väger ungefär 471 ton vid start. ARIAN bygger till stor del på tidigare ARIANEraketer och den största skillnac är de större bränsletankarna i det första steget. På grund av att de f Viking V motorerna i det första steget är oförändrade jämfört m föregående ARIANE-raketer så måste de brinna längre tid för accelerera den tyngre raketen. Bränslemängden är 220 ton (ARIANE3 ton) och ger 205 sekunders brinntid (ARIANE3 135 sekunder), alltså bränsleförbrukning av ungefär 1 ton i sekunden. Bränslet är UH25 blandning av osymmetrisk dimetylhydrazin och hydrazinhydrat) hydrazin(N_2H_4), oxidator är kvävetetraoxid(N_2O_4). Varje Viking V moto försedd med vattenkylning, för detta ändamål finns en vattentank s rymmer 8200 liter. Separation av första steget sker på 76.2 kilome höjd (ARIANE3 57 kilometer), hastigheten är då 3256 meter per sek Det andra stegets Viking IV motor har en brinntid på 124 sekun Bränslet består av 34 ton UH25 och N_2O_4. Separation av andra och tr steget sker på 150 kilometers höjd. Steg tre har en brinntid på sekunder och HM7B-motorns bränsle är 10.5 ton flytande syre och väte. andra och tredje steget har förstärkt struktur för att kunna ta en ty nyttolast men är förövrigt i det närmaste oförändrade jämfört ARIANE3.

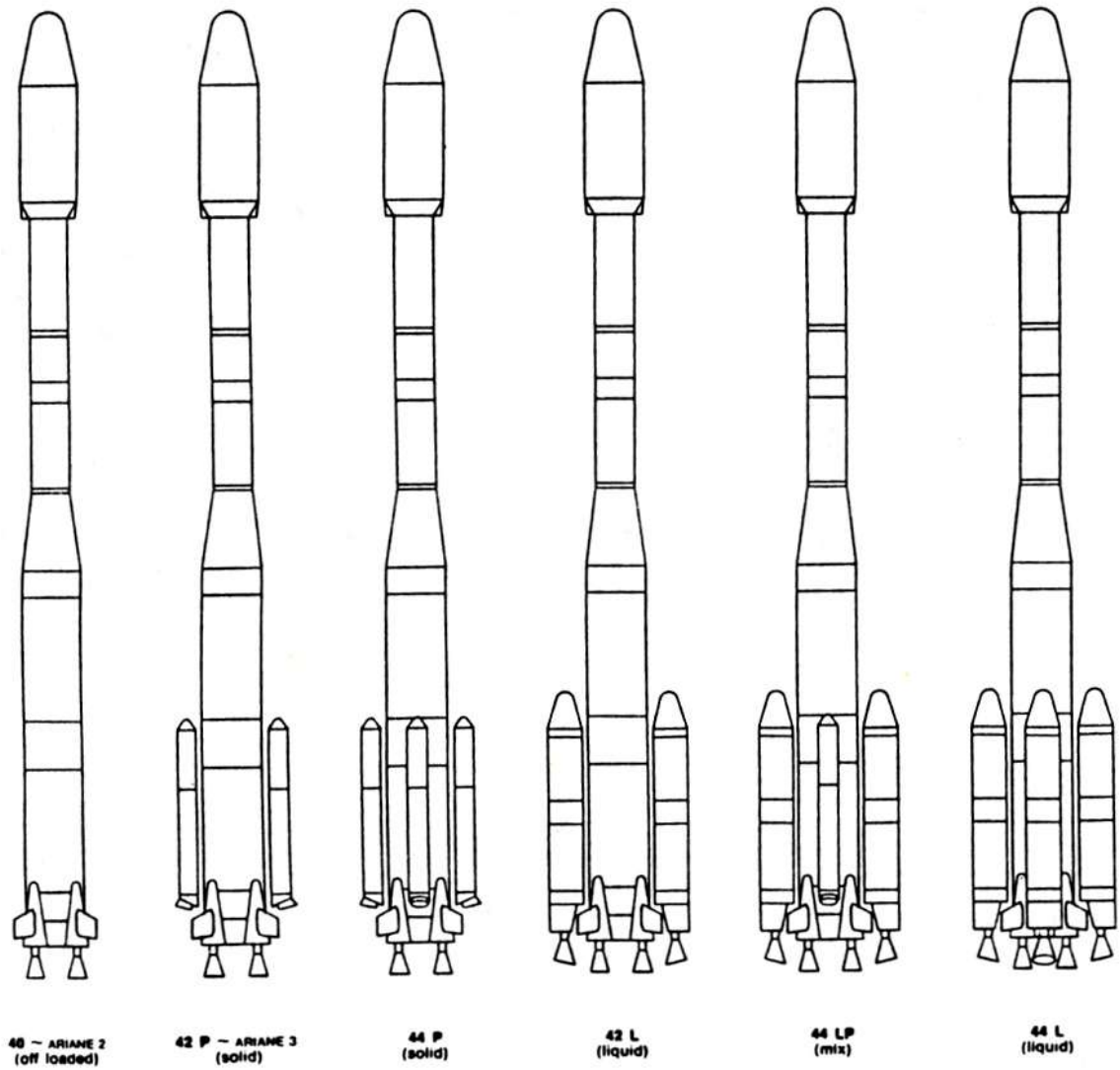
ARIANE4 kommer att erbjudas i ett antal olika konfigurationer beroend hur stor massa (1900 - 4200 kilo) som skall placeras i bana. Ett 'strap on boosters' kan kopplas till raketen för att ge ökad drag Maximalt kan fyra boosters med fast bränsle (P - powder) eller fly bränsle (L - liquid) av samma typ som i första och andra steget an till raketen (se bild). Boostern med fast bränsle har en brinntid p sekunder med 9.5 ton bränsle. Boostern med flytande bränsle brinner sekunder med 39 ton bränsle.

De störtsa skillnaderna från ARIANE3 är:

* Förstärkta strukturer i andra och tredje steget.

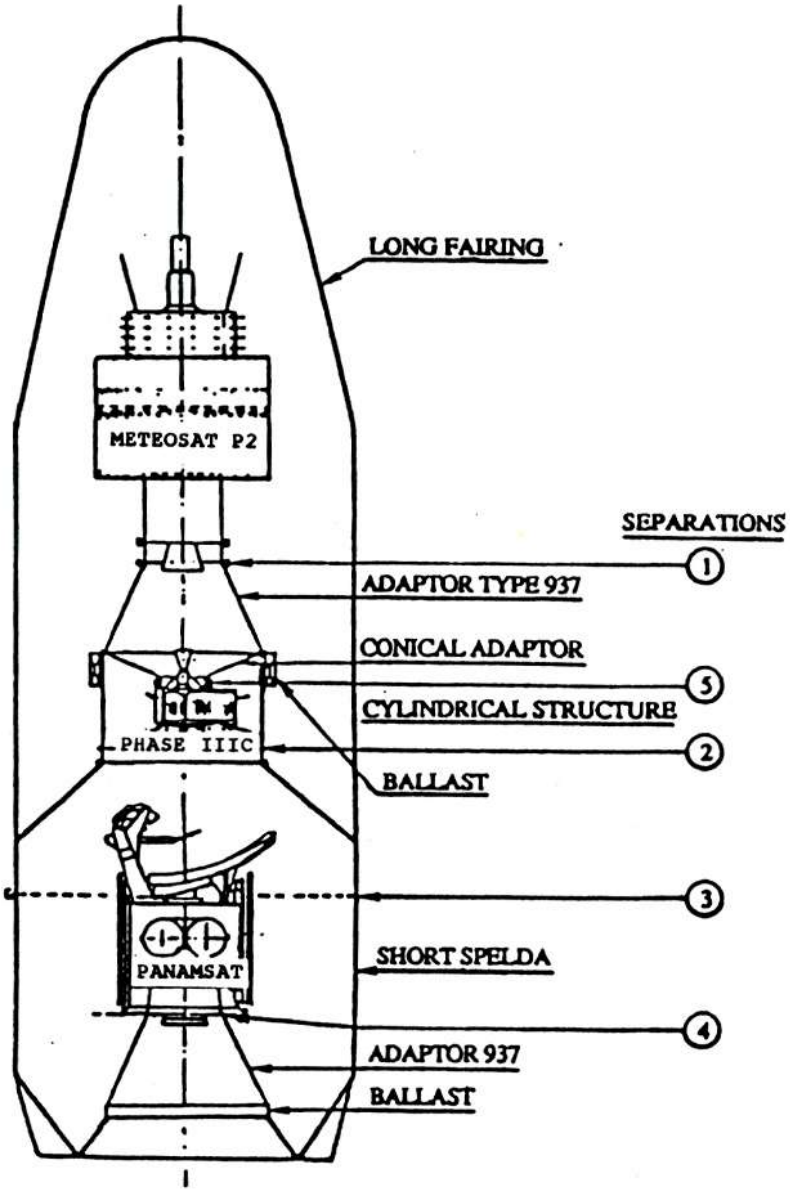
* En ny omborddator (OBC) och ett nytt lasergyro system.

* Modifierat första steg, ny vattentank, större bränsletank, förstärkt struktur.



ARIANE4's olika strap-on booster konfigurationer.

APEX 4 - CONFIGURATION



RUDAK PROBLEM

There is a problem with RUDAK. When attempting to boot from th PROM that (fusable link type) the RUDAK CPU (a 6502) gets a wa and then hangs. The little 10 byte loader module will not all a special program to loaded into the RAM in the unit. Please patient of the schedule slides around a bit while the team w built RUDAK work on the problem. From thermal vacuum we rememb that the PROM was temperature sensitive and it is possible turn on the LIU which will warm it up considerably may solve t problem.

There folks really worked hard on this project and wish them lu while they work on the problem!!

FREKVENSER FOR AMATÖRRADIOSATELLITER
UPPDATERAD 21 JULI 1988

7.050	UoSAT-1	CW BEACON
14.002	" - "	CW BEACON
21.002	" - "	CW BEACON
21.120	RS-10	MODE K, T, KA, KT ROBOT UPLINK
21.130	RS-11	MODE K, T, KA, KT ROBOT UPLINK
21.160-21.200	RS-10	MODE K, T, KA, KT UPLINK
21.210-21.250	RS-11	MODE K, T, KA, KT UPLINK
29.331	RS-5	ROBOT DOWN
29.341	RS-7	ROBOT DOWN
29.357	RS-10	MODE A, K, KA, KT BEACON
29.360-29.400	RS-10	MODE A, K, KA, KT DOWNLINK
29.401	RS-1	BEACON
29.403	RS-10	MODE A, K, KA, KT BEACON/ROBOT DOWN
29.407	RS-11	MODE A, K, KA, KT BEACON
29.410-29.450	RS-5	DOWNLINK
29.410-29.450	RS-11	MODES A, K, KA, KT DOWNLINK
29.453	RS-11	MODE A, K, KA, KT ROBOT DOWNLINK
29.460-29.500	RS-7	DOWNLINK
29.502	UoSAT-1	CW BEACON
144.425 - 144.475	OSCAR-13	MODE J UPLINK
145.810	OSCAR-10	GENERAL BEACON
145.812	OSCAR-13	GENERAL BEACON
145.820	RS-10	MODE A, KA ROBOT UPLINK
145.825 - 145.975	OSCAR-13	MODE B DOWNLINK
145.825 - 145.977	OSCAR-10	MODE B DOWNLINK
145.825	UoSAT-1/2	GENERAL BEACON
145.826	RS-5	ROBOT UPLINK
145.830	RS-11	MODE A, KA ROBOT UPLINK
145.836	RS-7	ROBOT UPLINK
145.850	OSCAR-12	MODE JD UPLINK
145.857	RS-10	MODE T, KT BEACON
145.860 - 145.900	RS-10	MODE A, KA UPLINK, MODE T, KT DOWN
145.870	OSCAR-12	MODE JD UPLINK
145.890	OSCAR-12	MODE JD UPLINK
145.900 - 146.000	OSCAR-12	MODE JA UPLINK
145.903	RS-10	MODE T, KT BEACON
145.907	RS-11	MODE T, KT BEACON
145.910	OSCAR-12	MODE JD UPLINK
145.910 - 145.950	RS-5	UPLINK
145.910 - 145.950	RS-11	MODE A, KA UPLINK, MODE T, KT DOWN
145.953	RS-11	MODE T, KT BEACON , ROBOT DOWNLINK
145.960 - 146.000	RS-7	UPLINK
145.985	OSCAR-13	ENGINEERING BEACON
145.987	OSCAR-10	ENGINEERING BEACON

435.025	UoSAT-1	ENGINEERING BEACON
435.025	UoSAT-2	ENGINEERING BEACON
435.025 - 435.175	OSCAR-10	MODE B UPLINK
435.420 - 435.570	OSCAR-13	MODE B UPLINK
435.601 - 435.637	OSCAR-13	MODE S UPLINK
435.651	OSCAR-13	GENERAL BEACON
435.677	OSCAR-13	RUDAK DOWNLINK
435.715 - 436.005	OSCAR-13	MODE L DOWNLINK
435.795	OSCAR-12	BEACON
435.800 - 435.900	OSCAR-12	MODE JA DOWNLINK
435.910	OSCAR-12	MODE JD DOWNLINK
435.940 - 435.990	OSCAR-13	MODE J DOWNLINK
436.020	OSCAR-10	MODE L ENGINEERING BEACON
436.040	OSCAR-10	MODE L GENERAL BEACON
436.150 - 436.950	OSCAR-10	MODE L DOWNLINK
1269.050 - 1269.850	OSCAR-10	MODE L UPLINK
1269.330 - 1269.620	OSCAR-13	MODE L UPLINK
1269.710	OSCAR-13	RUDAK UPLINK
2400.325	OSCAR-13	BEACON
2400.711 - 2400.747	OSCAR-13	MODE S DOWNLINK
2401	UoSAT-1	CW BEACON
2401.5	UoSAT-2	ENGINEERING BEACON
10470	UoSAT-1	CW BEACON

MODE	UPLINK	DOWNLINK	FINNS I SATELLIT
A	2 m.	10 m.	RS 10/11
B	70 cm.	2 m.	OSCAR 10, 13
D	Batteriladdning, transpondrar avslagna		
J	2 m.	70 cm.	OSCAR 12, 13
K	14 m.	10 m.	RS 10/11
L	23 cm.	70 cm.	OSCAR 10, 13
S	70 cm.	13 cm.	OSCAR 13
T	14 m.	2 m.	RS 10/11

Swedish Space Corporation

RWD

THE FREJA SCIENTIFIC SATELLITE

April 28, 1988

FREJA is a Swedish scientific satellite designed to carry instruments for reasearch into aurora and other magnetospheric phenomena The satellite is planned to be launched by a Long March 2 rocket from the Jiuquan Satellite Launch Center in China in the third quarter of 1991. The satellite will weigh 230 kg in the final orbit which will range in altitude between 659 and 1790 km. The inclination of the orbit is 63-68 degrees.

The project is nearing the end of the phase B study, and the development phase of the project should be initiated in 1988 to meet the planned launch date. The phase B study has been performed jointly by the Swedish Space Corporation and SAAB-SPACE under the aegis of the "FREJA Project Team".

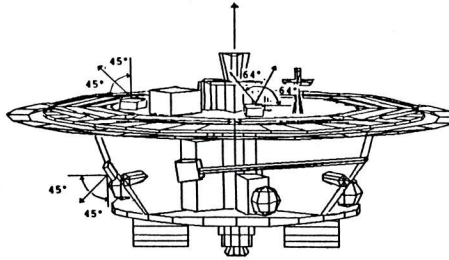


Fig. 1 The FREJA Satellite.

The scientific mission of FREJA has many similarities with that of Sweden's first satellite, VIKING. The auroral zone is the "mission target" and the satellite will carry energetic particle dtectros, magnetic and electric wave experiments, electric field sensors and possibly also a UV imager.

The FREJA design strives to provide substantially higher data rate than used on VIKING for an ambitious scientific payload of the same size as that on VIKING. The satellite apogee height is limited by the initial mass (274 kg) which is roughly half of VIKING. The satellite is designed to be launched in a piggyback mode on a Chinese CZ-2C launch vehicle together with a Chinese FSW-1 observation satellite.

The attractive piggyback launch price will be combined with a low-cost design and management approach to make it possible to implement a rather sophisticated satellite project within a the present budget restrictions of the Swedish space program. In order to avoid any substantial increase in technical risk by using a low-cost approach the project must utilize existing design concepts and hardware and software from the VIKING project and other scientific satellites.

Cost and risk is also limited by avoiding narrow design margins in terms of mass and power resources in board the satellite. Good power budget margins are ensured by having a sun-pointing satellite which constantly turns a large solar panel area toward the sun. Since the scientific experiments need a spinning body to keep wire boom sensors extended the spin axis points to the sun. The mass budget margin is obtained by limiting the need for a high apogee to what is achievable with with certain existing solid rocket motors.

Despite the goal of low cost the performance of FREJA shall in some respect exceed that of VIKING. A much higher data rate will be provided by the TM/TC system; the bitrate will be increased by a factor 5-20 over that of VIKING. The minimum bitrate of FREJA will be 256 kbit/sec. Also, the power budget will permit

continous operation of the payload and downlink trasnmitter making it possible to receive data in other parts of the world. A station in Canada, for example, can greatly enhance the data coverage while the satellite traverses the polar cap. The Canadian station could function in the receive-only mode and the control of the satellite need use only the ground station at Esrange.

1. Ni/Cd battery
2. "
3. LiSO2 battery
4. spin coil
5. precession coil
6. nutation damper
7. "
8. PSUbox
9. safe & arm device
10. "
11. spin rocket
12. "
13. "
14. "
15. P1/ wireboom with probe and box
16. "
17. P1/ wireboom with probe and box
18. "
19. P1/el.box
20. P2/boom)
21. P2/SME(probe)
22. P2/ MSP
23. P3/ ICI sensor
24. "/ DPU
25. P3/ ICI depl. mech's
26. P4/ boom
27. P4/ search coil
28. P4/ 3 pre-amp
29. P4/ wave analyser
30. P4/ wireboom with probe and box
31. "
32. P5/ UV camera

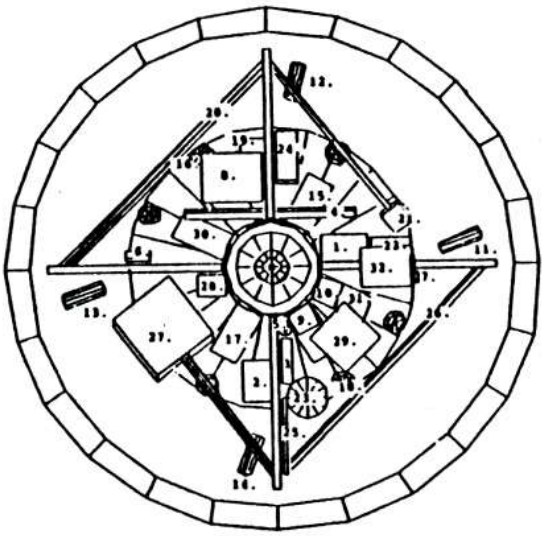


Fig. 2 FREJA equipment layout

The satellite has the shape of a spinning disk with a diameter of 2.2 meters. The axis of the disk will point in the direction of the sun and the spin axis orientation will be maintained by means of magnetic torquers. The satellite structure consists of a central tube, an upper and lower platform for mounting equipment and four radial frames to support the solar panels and the launch vehicle interface ring. The datahandling system communicates with all onboard equipment via a serial databus. The downlink will operate on S-band, while the uplink will use the 450 MHz telecommand band.

The launch vehicle, the Long March 2 (CZ-2) is manufactured by the Beijing Wan Yuan Industry Corporation under the Mininstry of Astronautics. Since going into operation in 1974 the CZ-2 has carried out about a dozen successful satellite launches. According to the Chinese manufacturer the only failure occured on the first launch (in November 1974) and was caused by a broken wire in a pitch rate gyro.
The CZ-2 is a two-stage liquid rocket. It configuration is shown below.

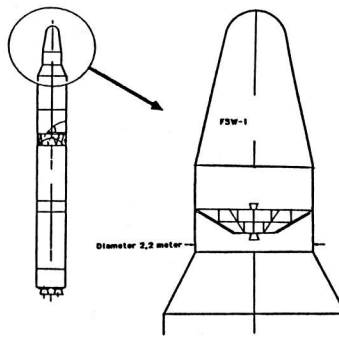


Fig.3 The Long March 2 launch vehicle adapted for FREJA

For launching FREJA the CZ-2 is modified by the additon af a cylindrical transitition bay (or "piggyback cabin") between the FSW-1 satellite and the top of the second stage of the CZ-2. The transition bay is split into two cylindrical sections. The FREJA satellite has an interface ring which is clamped between the outer rims of these two cylinders

AMSAT Pioneers New Microsats

A consortium of Amateur Radio groups and a Utah college have teamed to construct and launch a new class of ultra-compact "microsatellites". They are so small they can be launched on virtually any launcher.

Three AMSAT organizations, AMSAT-NA, AMSAT-LU and BRAMSAT (Brazil AMSAT) have teamed with the Center For Aerospace Technology (CAST) at Weber State College, Ogden, Utah to produce four satellites. TAPR is providing initial financial support and ARRL is assisting with design and construction.

Each satellite consists of a bus of common design which carries a mission-specific payload. AMSAT-NA and AMSAT-LU payloads are packet radio transponders (PACSATs). BRAMSAT's payload is a voice synthesizer and the CAST payload is an earth-looking, low-resolution CCD camera.

The most unique characteristic of each satellite is its volume and mass. Only 23 cm (9 inches) on a side, each cubical spacecraft weighs less than 10 kg (22 lbs). The small mass and volume make it feasible to launch these spacecraft inexpensively. And microsats can fit where larger ones cannot so many more near-term launch opportunities are available.

Microsats pioneer a new class of payload analogous to NASA's Shuttle Getaway Special cannister (GAS can) only smaller. AMSAT has pioneered small satellites for nearly 20 years with roles in OSCARs 5 though 13.

A PACSAT is a packet radio store & forward communications satellite which can blanket every inch of the earth up to eight times per day. Two PACSATs will be built: One each for AMSAT-NA and AMSAT Argentina.

AMSAT Argentina had undertaken a satellite project of its own beginning in early 1988 but decided to collaborate with AMSAT-NA on the PACSAT project instead.

"We thought it would be most efficient to join with our colleagues from AMSAT-NA in the development of our satellite project," said AMSAT Argentina President Carlos Huertas, LU4ENQ. "We have found a way to incorporate many of our own ideas in the basic PACSAT design," Huertas said.

Arturo Carou, LU1AHC, says "The satellite will be jointly constructed but financed by Argentine sources and licensed in Argentina. When placed in operation, LU-SAT will be commanded from Argentina but will be available for non-profit use by Radio Amateurs worldwide."

BRAMSAT's Project DOVE (Digital Orbiting Voice Encoder) aims to "Be the first satellite specifically designed to transmit spoken messages that implicitly promote peace between the nations" says Brazil AMSAT President Dr. Junior DeCastro, PY2BJO.

Project DOVE's primary function is to make direct access to satellite communication available to the "average man". It will produce signals which can be heard on inexpensive VHF scanner type radios -- the type commonly used to monitor police bands.

Its implicit message of peaceful use of space will flow from an explicit space education mission. "It will not become a propaganda machine for anyone," PY2BJO says. "BRAMSAT will have the voice synthesizer programmed for various languages to interest students in developing engineering skills...the kind needed to build devices like Project DOVE," DeCastro adds.

According to the mission plan revealed by PY2BJO, DOVE will transmit various telemetry parameters measured by its many sensors to provide a rich source of data on satellite in-orbit behavior. These data will be easily accessed by the "common man" because they will be transmitted in synthesized speech requiring no special receiving equipment; simply a VHF radio, a pad of paper and a pencil.

PY2BJO emphasized "This mission has immense educational value for anyone equipped with a simple VHF scanner. It's a window to space for students and scientists in many areas of scientific research seeking easy, reliable access to such data."

"The success of UoSAT OSCAR 11's Digitalker relaying SKITREK position data to perhaps 250,000 students and teachers equipped only with simple VHF radios has underscored our conviction there is great social value in Project DOVE," said Dr. DeCastro, PY2BJO.

Construction of the four microsats has begun in a facility in Boulder, Colorado. Design activities are being carried out in Boulder and several other cities in the U.S., Argentina, Brazil and Canada. Several design reviews have already been completed.

AMSAT-NA has contracted for a 1989 launch for these microsats. They will be launched by Arianespace into a 822 km sun-synchronous orbit inclined 98.7 degrees. The primary payload will be the French SPOT-II mission. A June, 1989 launch is planned.

Project DOVE:

The BRAZIL PEACETALKER Satellite

Every earth satellite has its mission. Some are for communications; others for weather forecasting; still others do remote sensing for agriculture and geology. All carry complex computers, sensors and instruments and are monitored and controlled by ground command stations. And, since they orbit high above the earth's surface, they usually survey most of its surface frequently.

But most satellites are built to be operated and used by governments, scientists and in some cases by commercial companies. To tap into the data stream connecting the satellite to the users, one usually needs considerable equipment and skill. Accessing the telemetry is usually well beyond the ability of the average individual even if appropriate equipment were available.

But it needn't be that way. In fact a new project now in the design phase changes all that and makes access to a satellite link as easy as tuning in your 2 meter HT or VHF scanner.

The satellite is being designed under the banner of Project DOVE (Digital Orbiting Voice Encoder) the BRAZIL PEACETALKER.

A voice synthesizer carried on board an earth satellite in low earth orbit and connected to a powerful 2 meter FM transmitter in the satellite will spread a message of peace and education over the globe making more than a dozen orbits per day and covering every square inch of earth's surface at least once per day!

The peace message is articulated in Portuguese, English and Russian and encourages all space faring nations to use space for peaceful purposes. The space education mission is implemented by the simple use of voice telemetry to articulate the satellite operating conditions and other meaningful parameters. Students monitoring on simple VHF FM receivers around the world will be able to chart trends, learn graphing, orbital prediction, radio propagation and more.

Project DOVE: BRAZIL PEACETALKER is being sponsored by Brazil AMSAT under the direction of its President Dr. Junior DeCastro, PY2BJO, in cooperation with AMSAT-NA. The satellite will be launched during 1989 and should be in operation soon after launch.

For further information on Project DOVE: BRAZIL PEACETALKER, please contact AMSAT-NA at P.O. Box 27, Washington D.C. 20044 or BRAMSAT, Rua Macaubal No. 119, CEP 01256, Sao Paulo, BRAZIL.

Launch Plan Includes PACSATs

Arianespace, the marketing and management arm of the European Space Agency, has announced its new launch manifest which includes a launch on which AMSAT will fly its new class of microsats.

Launch	Launch Date	Launch Vehicle	Payload Satellites
V-25	09/88	Ariane 3	G-Star III/Geostar RO2 + SBS-5
V-26	10/88	Ariane 2	TDF-1
V-27	11/88	Ariane 4	Astra-1 + Skynet 4B
V-28	12/88	Ariane 2	Intelsat V F15
V-29	01/89	Ariane 4	JC-Sat 1 + MOP-1
V-30	02/89	Ariane 2	Tele-X
V-31	03/89	Ariane 4	Superbird A + DFS-1
V-32	04/89	Ariane 3	Olympus
V-33	05/89	Ariane 4	TV-Sat 2 + Hipparchos
V-34	06/89	Ariane 4	SPOT-2*
V-35	09/89	Ariane 4	Intelsat VI F1
V-36	10/89	Ariane 4	Superbird B + Inmarsat 2 F1
V-37	11/89	Ariane 4	TDF-2 + DFS-2

*AMSAT plans to fly 4 microsats on this mission including projects sponsored by AMSAT-NA, AMSAT-LU, BRAMSAT and the Center for Aerospace Technology (CAST) at Weber State College, Ogden Utah. The AMSAT-NA and AMSAT-LU projects are PACSATs while BRAMSAT's and CAST's projects are aimed at a space education mission.

Sida 19 saknas tyvärr

Sida 20 saknas tyvärr

SHORT BURSTS

OSCAR 11 (UoSAT2) används för närvarande i ett experiment för att forska i SEU (Single Event Upset). Ett SEU kan orsakas av att en laddad partikel passerar genom en RAM-cell i minnet och orsakar då att cellen ändrar logisk nivå. OSCAR-10 råkade ut för många SEU men en speciell 'bit-rättar' algoritm hindrade att problem uppstog. Till slut blev dock den ackumulerade dosen i IHU'n i OSCAR10 så stor att felen som uppstog inte gick att rätta. Experimentet i OSCAR11 går ut på att analysera alla SEU som har uppstått i satellitens DSR-minne som laddades med ett speciellt mönster den 18 Juli. Varje Onsdag dumpas minnesinnehållet ner via satellitens UHF nedlänk på 435.025 MHz med en hastighet av 4800 Baud.

Rymdskytteln Discoverys tre huvudmotorer motorer genomgick ett viktigt test den 10 Augusti. Motorerna kördes i 22 sekunder och testet bedöms som mycket lyckat. Starten är planerad till slutet av September.

Enligt ryska satellitoperatörer vid Radio Sputnik Control Center (RS3A) nära Moskva så är RS5 och RS7 nu ur funktion. De är övertygade om att batterierna i satelliterna nu är döda. Det har dock kommit rapporter om att en eller båda satelliterna har hörts efter Juli. RS3 - RS8 placerades i bana tillsammans den 17 December 1981.

AMSAT-NA har två BBS:ar som man kan ringa upp. Den ena ligger i Iowa och har tel. 515-961-3325 och den andra ligger nära Saint Louis och har tel. 314-447-3003. Det är kostnadsfritt förutom själva telefonsamtalet.

- DON'T COME to meetings.
- When you do come, COME LATE.
- If you do attend a meeting, FIND FAULT with the officers and other members.
- NEVER accept any committee appointment, as it is easier to criticise than to do things.
- However, GET SORE if you are not appointed on some committee: but if you are, DO NOT attend committee meetings.
- If asked by the chairman to give your opinion about some important matter, tell him you have NOTHING TO SAY. After the meeting, tell everybody how things OUGHT to be done.
- DO ABSOLUTELY NOTHING, but when other members willingly and unselfishly use their ability to help matters along, HOWL that the Society is being run by a CLIQUE.
- When a lunch or dinner is arranged, tell everyone that MONEY IS BEING WASTED.
- When no lunches or dinners are arranged, say the Society is DEAD.
- Don't ask for a banquet ticket UNTIL ALL ARE SOLD.
- Then swear that you were CHEATED out of yours.
- If you do get a ticket, DON'T PAY FOR IT.
- If asked to sit at the Chief Guest's table, modestly decline. If not asked, RESIGN from the Society.
- Hold back your dues as long as possible, or DON'T PAY AT ALL.
- keep your eyes open for something wrong, and when you find it RESIGN.
- At every opportunity, THREATEN TO RESIGN and then get your friends also to threaten to resign.
- When attending a meeting, VOTE TO DO SOMETHING; then go home and do the OPPOSITE.
- AGREE with everything said at the meeting, and then DISAGREE with it outside.
- ALWAYS DELAY replying to communications from the Society, or better still DON'T ANSWER AT ALL.
- And last but not least, DON'T ACTUALLY RESIGN, otherwise you will lose the opportunity to kill the Society.

MARTS Newsletter, Kuala Lumpur, Malaysia

Men det gäller väl inte oss i AMSAT-SM.....