CORRECTIONS 14-11-97 9AM

Bob Cooper's

NOVEMBER 15 1997

SatFACTS

MONTHLY

Reporting on "The World" of satellite television in the Pacific and Asia

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HYUNDAI's 2.25 Software

Videoplexed Analogue: How It Works

- ✓ Latest Programmer News
- ✓ Latest Hardware News
- ✓ Latest SPACE Pacific Reports
- ✓ Cable TV Connection

Vol. 4 • No. 39

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SPRSCS '98 RETREAT REGISTRATION

Are you a member of SPACE Pacific? If yes, skip section one.
[SPACE Membership number (found on certificate _____]

SECTION ONE

☐ ENROL me/our firm as a member in SPACE Pacific as follows (select category)-

☐ INDIVIDUAL MEMBER (no commercial interests in TVRO-DTH or Cable)
[Annual fee is NZ$30 per year]

☐ INSTALLER / DEALER MEMBER (sell, service, install DTH-TVRO systems)
[Annual fee is NZ$75 per year]

☐ CABLE TV or SMATV SYSTEM OPERATOR
[Annual fee is NZ$150 per year]

☐ SATELLITE PROGRAMMER / EQUIPMENT MANUFACTURER/Distributor
(including importers for wholesale distribution)
[Annual fee is NZ$250 per year]

SECTION TWO

I WISH TO ATTEND (check all applicable)

☐ MARK LONG / SPACE Pacific Digital Satellite TV Course **February 17 and 18** and will bre on hand by 10AM Tuesday February 17 for the course opening . I understand the course fee is US$350 and this will be charged to my credit card on January 6, 1998 or is being paid at this time by enclosed cheque.

☐ SPRSCS '98 RETREAT **February 19 and 20** and will be on hand by 10AM Thursday February 19 for the retreat opening. I understand the Retreat fee is NZ$275 and this will be charged to my credit card on December 5, 1997 or is being paid at this time by enclosed cheque.

☐ MARK LONG / SPACE Pacific Satellite Technician Installer Course **February 21 and 22** and will be on hand by 10AM on Saturday February 21 for the course opening. I understand the course fee is US$240 and this will be charged to my credit card on January 6, 1998 or is being paid at this time by enclosed cheque.

SECTION THREE

PAYMENT DETAIL (please complete and total as applicable at bottom)

	US $$	NZ $$
1)		$
2)	$	
3)		$
4)	$	
Total (for both US and NZ currency as applicable)	$	$

SECTION FOUR

REGISTRANT DETAIL

(only one registrant per form - if you are lodging with another registrant, see lodging below)

YOUR NAME_____

Mailing address _____

Town/city _____ State/District _____ Country _____

Telephone #_____ Fax #_____ email _____

SECTION FIVE

LODGING and ARRIVAL DETAIL

I will arrive (date _____) and require lodging for the nights of February __16 __17 __18 __19 __20 __21 __22

I will require lodging for (number___) person(s) for this period

___ I do NOT object to sharing with another attendee to reduce lodging costs provided _____ (skip if not applicable)

Additional lodging requests (please indicater type of accomodations requested) _____

_____

Note: Based upon this information, lodging arrangements will be made for you and in our confirmation the lodging details will be included.

SECTION SIX

TRANSPORT DETAIL

Notes: If you will drive or will arrange your own driving for the final leg Auckland to Doubtless Bay, simply tick top box.

☐ **I am driving to Doubtless Bay and I can find my way to Mangonui on my own!**

☐ I will fly to Auckland and then fly to Kaitaia on February ____ and request that I be picked up at the Kaitaia aerodrome at _____ local time

☐ I will fly to Auckland on February ____ arriving at _____ local time and request assistance from Auckland to Mangonui

☐ I am hopelessly inept at finding my way on my own and request your help!

SECTION SEVEN - CREDIT CARD or CHEQUE DETAIL

I am paying by:

☐ Enclosed cheque to SPACE Pacific Ltd (amount from total in section three)

☐ VISA card ☐ Mastercard

Number __ __ __ __ - __ __ __ __ - __ __ __ __ - __ __ __ __

Expires _____

in name of _____

RETURN COMPLETED FORM via fax (64-9-406-1083 if paying by credit card) or mail to SPACE Pacific Ltd, PO Box 30, Mangonui, Far North, New Zealand. Telephone queries to 64-9-406-0651.

SatFACTS
MONTHLY

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is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no long define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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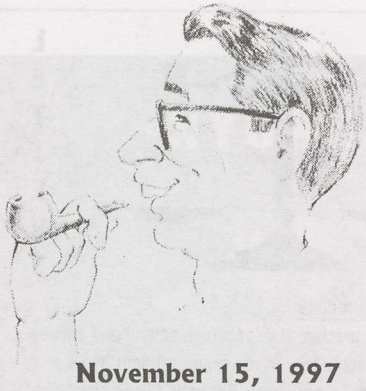
COOP'S COMMENT



November 15, 1997

SPACE Members were shocked (some were confused) by the mailing they received late in October advising that SPRSCS '98 had moved in time (from January 27-31 to February 17-22) and in venue (from Auckland to - of all places - the Doubtless Bay region in far northern New Zealand. Dozens called to ask - *"Why did you do this?"*

The answer is very straight forward. My Doubtless Bay Cable TV system is now essentially complete (a cable system in a growing community is never totally complete - there are always new line extensions to be considered). And right here in my literal backyard we have the most innovative satellite receiving and cable distribution plant in all of the South Pacific. How innovative? 50 or more channels before mid-February (43 as we go to press), local programming, direct satellite reception of network and non-network shows "live" from America (which we call "USA Direct"), something in excess of 25 digital receivers (the number seems to change weekly), nine satellite dishes. More important, how do we get those 43 or 50+ TV channels from our 6 racks of cable headend equipment to more than 200 homes scattered out as far as 6 kilometres (20+ cable line amps) away? And even more important, how have we been able to achieve profitable operation status in an industry where the "big boys" are losing billions of dollars?

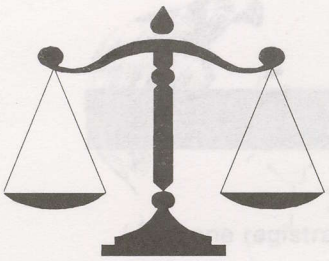
So the SPRSCS '98 "Retreat." February 17 and 18 - Mark Long will conduct his brand new Digital Satellite TV Course while February 21 and 22, the 1998 version of the well established Satellite Technician Course. Both courses are of course optional. Then there is the hands-on "Retreat" itself - February 19 and 20. For much of the two days, attendees will be out of doors (sun screen, comfortable walking shoes, hats will be very important!). Using the nine satellite dish headend, "Retreaters" will gain first hand step by step knowledge of how one starts off with a 50 to 550 MHz clean slate and then fills up the cable bandwidth 7 MHz at a time until leaving the headend you have a (very nearly) full spectrum. And the cable plant - from how we have managed to bury 30+ kilometres of cable without incurring the wrath of the local citizens (covering permits, route planning, implementation) to working with .500 and .540 diameter coaxial cable, directional couplers, taps, and amplifiers. Retreaters will go from headend to plant end, experience amplifier and passive installation, set-up, field adjustment.

And it will not be totally hands on because before you can begin construction of a cable plant there are paper planning and system layout considerations - how minor changes in equipment placement and cable routing can have a significant impact on the bottom line costs of building a system.

SPRSCS '98 Retreat is a unique opportunity to walk the walk, talk the talk, and get your hands and eyeballs directly on not some theoretical model of the next century's telecommunications model but a real operating system. We believe it will be far more rewarding for both satellite and cable (and cable and satellite) enthusiasts to get out of a classroom and into the field where it is not only happening, but it is actually operating as a business that pays its bills and retires its debt daily. See page 20 for more detail.

-ON THE COVER-

At a time when C-band dishes are getting smaller (p. 10) and anything larger than a 90cm dish is considered "unsightly" for Ku band, what in the world is Doubtless Bay Cable TV doing installing a 4.6m Scientific Atlanta for Ku band? Full details at SPRSCS '98!



LETTERS

Teaching Satellite

"I am a teacher at a local high school and include satellite technology in my senior student 'New Technology' programme. Recently I have purchased a 3.6m solid dish (originally on a roof of a Whangarei hotel!), now have it functional and most of the balance of the equipment is borrowed. The dish is a four section polar mount with a hand actuator, with it came a Plessey B-MAC and (US) Channel Master Videocipher receiver plus a Channel Master NTSC to PAL standards converter and Winersat WR370 receiver."

Ian Stevenson, Whakatane, NZ

The dish sounds as if it were primarily used many years ago for the then-available (Aussat series satellites) Australian B-MAC services. These services are winding down, will convert totally to digital during 1998. The Channel Master Videocipher receiver would be of interest to those with dishes large enough (7m and up) who have reception from the USA satellites; don't throw it away!

NVE Not As Naughty

"I have an agreement on my desk awaiting execution for the supply of two types of adult programming. The first is identical to the Galaxy/Foxtel 'Nightmoves' service which is hard R rated sold for A$19.95 to satellite and MDS viewers. The second is a PPV (pay per view) type of service designed to sell for around A$4-$5 per movie showing. This is an X rated product under the banner of the new Australian NVE classification (non-violent erotica). Both of these services are in operation in Australia and are classified for sale and broadcast by the ABA. I believe this, rather than an imported Exxxtasy for example, is the safe option for us to derive financial benefit from this genre of programming. Personally. I don't care what people choose to watch in the privacy of their homes and I don't believe any government has the right to interfere. I do believe that the Exxxtasy product, as described to me, may be a little shocking for the local market and would open us up to legal action. I propose that for smaller cable system operators in the Pacific that a management company be formed that would negotiate rights and handle distribution of product that has been previously cleared for distribution by the ABA (and hopefully the equivalent agency in New Zealand). I'd like to hear from other cable and SMATV operators concerning this.

Garth Freeman, Director, Neighbourhood Cable Pty Ltd
Tel 61-3-5021-0511; fax 61-3-5021-0096

New Zealand's Broadcast Standards Authority has just changed the regulations to bring all forms of pay TV under the same regulations as FTA broadcast TV. In the process of this, they specifically ruled that satellite delivered adult programming coming from outside of NZ is exempt from their rules.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

NOVEMBER 15, 1997

AsiaSat 3 loading is subject of much speculation as we approach the December 12-18 Proton launch window. Satellite is headed for 105.5E where it will replace AsiaSat 1. When AsiaSat 1 took on Star TV as a customer, they gave up the legal right to sell FTA or pay-TV services transponder space to anyone that might be considered "competitive" to Murdoch's Star. That contract restriction does not apply to AsiaSat 3 and SF is being told, "*Expect surprises when this satellite goes into operation.*" What sort of surprises? "*Major name programmers who very much want to be at 105.5E*" because this satellite location (through present AsiaSat 1) has "*more Asian viewers than all other satellites combined.*" The 105.5E "neighbourhood" already has tens of thousands of SMATV and CATV dishes pointing there plus millions of DTH system antennas. The easiest and quickest way to "launch" a new programming service to this market is to be on As3 when it takes over from As1. When will we be told who these "major name programmers" are? Not until after the satellite is safely launched and on station. Service nipplewort date? "*Mid to late January*" is AsiaSat's goal.

Australian Channel 9 Network, owner of EM TV and co-owner of Sky Racing Channel service, has been quietly planning a "30 programme channel DTH service" to be headquartered and uplinked from Sri Lanka. US$16 million has been set aside for the project, and at this point there are no details as to the programming content or whether it will be all CA or partially FTA. The satellite? Certainly AsiaSat is a prime candidate; no, we did not specify 2 or 3.

ZakNet, the Kuwait based Internet access service currently found on AsiaSat 2 (3940 vertical) is telling Internet users to "hang loose" because some of their reception problems "may go away" in next 60 to 90 days. Why? A move to a new satellite is mentioned. And "sixty to ninety days" certainly fits a move to AsiaSat 3 when launched.

Not our fault (this time). French pay TV promoter for Pacific, Raymond Wohler, corrects his contact numbers for those interested in Canal + and other French language services on a DTH basis through Intelsat 701 at 180E: tel ++689-54-40-00 and fax ++689-54-40-05 plus email rwl9tt50@mail.pf.

Filipino GMA is advising clients and supporters outside of the Philippines, "*We do not intend to cease our use of Palapa C2 after Mabuhay becomes operational.*" Most Filipino broadcasters are moving to Mabuhay (which has no expected coverage south of the equator) but GMA and ABS/CBN realise they have significant important-to-them viewership with ex-pat Filipinos through regional coverage on non-Mabuhay satellites.

EM TV now testing SA PowerVu (turning off analogue November 8) on AsiaSat 2, 4006/1144IF vertical with Msym 5.632 and FEC 3/4. The signal is not spectacular as they are sharing a transponder with ownership-related Sky Racing Channel and may not have the operational parameters of such sharing totally worked out yet. HSS-100C, Nokia V1.63 work OK currently; strangely, some or all e3s do not!

Galaxy client/affiliate Austar is scheduled to launch own DTH feed (Optus B3, 12.689 Hz) on 15 November. Galaxy presently utilises 12.376 and 12.438 (Hz) on B3; testing on and near the new announced Austar frequency has been observed since late October. Austar may be protecting their patch should Galaxy fold (p.32).

Aurora testing on B1 12.376 Hz at presstime involves DiviCom hard and software and plan to issue viewing cards that are automatic for each Australian time zone. If it works, WA viewers will only access WA feed (etc.) for ABC, SBS and others.

Hyundai: Not as Reported

"According to SatFACTS August, my HSS-100C should not work on the B1 Aurora test appearing on 12.376 GHz. In fact, I have been able to tune-in these tests although the Hyundai will not work at 12.376, only when I enter 12,377. I have also noticed testing being done on 12.626 and these tests have not been listed in SatFACTS. I first noticed them with my spectrum analyser. However, my Hyundai said the transmissions were encoded. More recently, I had my HSS-100C software upgraded and can report a significant improvement in performance. With the original software, the receiver would not display Sky News; now it does this service. I can now also access the TVSN service on Galaxy which previously would not play. And the 12.626 service turned out to be Optus Vision testing with sometimes in the clear programming."

David Haigh, Southern Cross Satellites

As long as Aurora (or any other) transmissions remain DVB Compliant, the Hyundai will recover them just fine. What the Hyundai lacks is a conditional access module (CAM) and many programmers while not actually employing conditional access do transmit a data stream that "tickles" the CAM just to verify it is in place in the receiver. The early Hyundai receivers interpreted this data bit to mean the signal is encrypted when in fact it is not. Unfortunately, the original software without a CAM cannot process these "partially conditional access" signals. The 12.626/8 service has been one (of several) temporary services testing (by Optus Vision) and more recently by Galaxy affiliate Austar (on 12.689 Hz, B3).

EMTV Testing - In the Clear For Now

"EMTV testing on 4005.75 vertical (As2) at 5.632 and 3/4 should play well on a Hyundai HSS-100C for at least the next six weeks. The service is PowerVu but SA advises EMTV they will not be able to supply a suitable quantity of receivers until at least January."

Gary Welsley, N.G. Vending Services Pty Ltd

EMTV's switch over to PowerVu is an interesting and expensive choice. Not only must relatively impoverished PNG citizens somehow grapple with the cost of the receiver, but can you imagine the fun they will have trying to set up this user unfriendly machine while it is sitting in a grass hut powered by a two-cycle portable generator? EMTV may have won this battle but in the process they have lost the war and totally lost sight of the rural PNGers they were originally mandated to serve.

Video-Plexed??

"Thank you for a great quality informative magazine. I have located I180's 701 and have near perfect pictures from CNN, WorldNet and RFO. And those USA feeds as well. Now I need a video diplexing device - is there such a box available? If not, a kit or circuit?"

Charles Ernie Wright, Bathurst NSW

See our report in this issue, p. 18. This warning: The long term future of the vidiplexed service is uncertain and a betting man would anticipate these feeds being replaced by yet another of those conditional access digital bouquets at some future date. Ten Net Australia already has such a bouquet operating on 3765 RHC (same 180 bird) which feeds ABC, CBS, NBC and Fox programming.

HARDWARE EQUIPMENT PARTS UPDATE

NOVEMBER 15, 1997

Nokia is rethinking their present sales policy outside of Europe and considering discontinuing all authorised distribution for Nokia satellite receivers in Southeast Asia. Why? They have been stung by a lack of what they consider adequate after-sale representation and to date do not believe they have identified a firm that can adequately provide repair and other technical services. Without this backup, their present thinking goes, they would prefer not to be here (i.e., for sale) at all. Would cancelling distribution arrangements with SE Asia and Pacific firms end the flow of Nokia receivers out here? Hardly. Anyone with Internet access can locate a dozen or more European firms anxious to ship. Hey Nokia (we know you are reading this) - do it right and find a firm to handle your service work in the SE Asia/Pacific region. Stopping authorised distributors won't stop the sale of your product and the only result will be another grey market layer between you and your consumer customers.

Gardiner LNB fans are lamenting that firm's decision to stop building LNBs for Ku band, switching instead to an LNBF-only product line. The F stands for "feed (horn) built-in" and anyone trying to optimise a Ku dish installation wants his LNB and feedhorns separate for mix and match mating. The Gardiner 0.6 and 0.7 dB noise figure units were, simply put, the best available although not without flaws. Their failure rate was high (often as much as 50% failure in first 30 days) but when you got a good one - you savoured the performance and would never lend it out! The only units that come close are by Norsat (at a far higher price).

Panasat - the brand name - will disappear shortly although South African manufacturer UEC has not settled on a replacement name yet. They do have a model number (642) and a functional next generation design (Irdeto + CAM equipped, 2-45 Msym). Reason for dropping Panasat name? Too much ill will in South Africa towards the name.

SA continues to flounder with their expected decision to appoint 6 to 8 regional IRD distributors for the forthcoming HACBSS PowerVu format receivers. The plan - still not "*approved by corporate headquarters*" - is to insert Australian firms between the HACBSS consumer and themselves, perhaps a wise move since SA's staff seems incapable of dealing with even technically literate customers (heaven forbid they are forced to deal with Joe and Mary Consumer).

ApStar 2R test carriers first reported on Ku (12.620H) 4 November, C-band 3.643 Hz from its 76.5E location. Australians in particular should be watching this spot.

Thaicom 3 (78.5E) scheduled to be testing "regional" coverage (read: Australia) through November 28th; frequencies to watch on p. 31 this issue (reports to SF!).

SinoSat (Chinese), about which very little is known, says they will launch to 110E in January. Originally described as 24 C and 14 Ku, the location will be just west of Palapa C2.

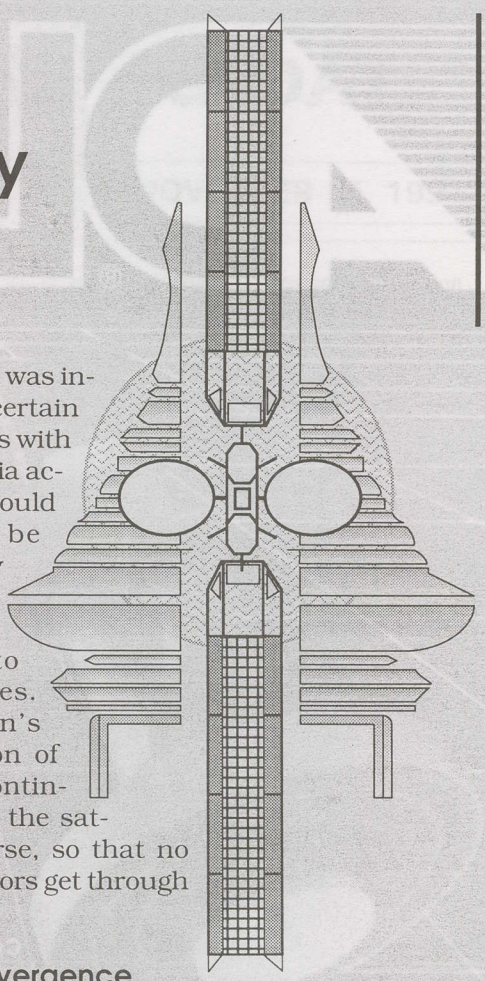
ChinaStar 1, about which even less is known, claims a December 7th launch schedule (Long March) to a location Mark Long identifies as 87.5E. Originally, this one was to have 24 each C and Ku.

Espano - remember that? Nobody ever saw one (except in prototype form) and ultimately it was a non-starter. Now Antares Electronics Pty Ltd. (tel 61-7-3205-7574, fax 61-7-3205-4049) reports the "ProSat P-2000" will be available "end of November" as a "consolation prize." This looks to be a cross between the Hyundai HSS-100C and Nokia e3, Msym 1-45 (SCPC and MCPC) with out the door pricing of A$625 (plus tax as applicable). Why so reasonably priced? No CAM in the first version (although planned for May 1998 availability).

A "Crystal Ball" view of satellite-based entertainment in the new millennium

2001: A Satellite Odyssey

by Mark Long in Thailand



January 1, 2001-Chiang Mai, Thailand. My last night in the Twentieth Century started in the midst of a rowdy party at Chiang Mai's effervescent Bubble Disco and ended on a nearby mountain summit where I joined thousands of other celebrants to watch the "official" dawn of the new millennium, at least according to the Gregorian calendar. I've got it all on digital video tape too, from the chanting monks in their flowing saffron robes, to the dancing hill tribe people and awestruck tourists who were treated to a dazzling sunrise that lit the golden spires of Chiang Mai's mountain-top temple of Doi Sutep.

Now that I'm back home, I'll need to transfer today's video onto my computer system. Like most people who work at home these days, I have a "living office" instead of separate living and office rooms. Why duplicate video, stereo audio, and Internet delivery systems in both the office and the living room when a single streamlined system can do the job?

In the 21st Century, the distinction between satellite TV receivers and personal computers has all but disappeared. The on-going global switch from telephone modem to satellite dish for data downloads off the World Wide Web is making the Internet a viable home entertainment medium. The expansion slots in my new Pentium IV computer are filled with MPEG video, satellite tuner, and smart card reader boards for receiving more than 500 digital DTH channels from various satellites. I can also download Web sites at dizzying speeds and even access pay per view video programmes directly from my favourite satellite-based Internet server. Best of all, I can view everything on a new high definition digital TV monitor which serves as the heart of my integrated work/play environment.

All of this was made possible by the global telecom deregulation that occurred at the end of the Twentieth Century. Several of the newly privatised national telcos, as well as their multinational competitors, now offer high-speed satellite access to the Internet with data downloads at dizzying speeds that are thousands of times faster than what the average telephone modem link used to deliver. I still shudder when I recall the days when my typical Internet download made a Bangkok traffic jam look like the Indianapolis 500!

In light of the region's limited ground-based infrastructure, it was inevitable that certain Asian countries with protective media access policies would eventually be forced to allow individuals to connect their computers to satellite dishes. Each nation's new generation of cyber-cops continues to control the satellites, of course, so that no unwanted visitors get through the front door.

Digital Convergence

In case you've been marooned on a desert island for the past year, let me be the first to tell you that on January 1, 2000, a group of university students in Seoul, Korea founded the Virtual Channel. An endowment from a couple of the Ka-band satellite operators made it possible for "Virtual [C]" to establish an Internet server onto which anyone can now upload their own digital TV programmes. If you have a video camcorder and an Internet/MPEG capable multimedia computer system you too can become a satellite TV programmer!

"Asia's Weirdest Home Videos" was the first Virtual [C] programme to attain widespread popularity. More recently, "Eyewitless News" has been in vogue. Amateur videographers now carry their digital pocket camcorders virtually everywhere in the hope that they will encounter something zany that's also newsworthy so they can get their footage aired on both programmes. Several cable TV operators even carry Virtual [C] programming these days. They use satellite dishes to download programme fare off the Internet and then play out selections according to their own scheduling needs.

If the region's new Ka-band satellite operators have their way, the distinction between a digital DTH programme bouquet and a satellite-based Internet download may soon be history. Why just last month, Hughes moved one of its new Ka-band Spaceway

satellites to an orbital assignment over the Andaman Sea. The hot news is that for a limited promotional period, Hughes is providing dirt cheap satellite uplink time. The new Ka-band personal earth station (PES) that I bought over the Christmas holidays transmits as well as receives satellite signals. It may have been a bit dear at US$ 4,000, but then again I paid more than that for my first satellite TV system back in 1981.

Spaceway is just one of the many new Ka-band satellites which will soon be offering "bandwidth on demand" services, which means that I only have to pay for the satellite capacity that I use and the amount of time that I actually use it. The Spaceway satellite footprint produces a network of cellular beams, one of which covers Chiang Mai province quite nicely. To uplink my video I merely have to tell the computer to find an open Spaceway transponder frequency and command the satellite to route my programme contribution to the Virtual [C] via Spaceway's Seoul, Korea downlink spot beam. My new video is on its way at the touch of the keyboard. Now all we need to do is make the popcorn, kick back and enjoy.

Waking Up to the Multimedia Revolution

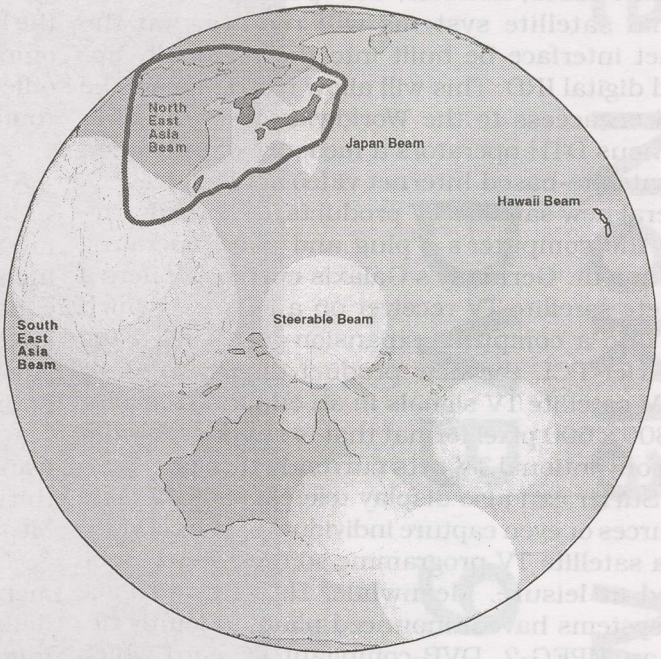
If the speculations outlined above seem a bit far-fetched, they shouldn't. The technologies and trends needed to make this crystal ball vision of the future a reality are already present and accounted for.

Of course not every technological wonder is an instantaneous hit among consumers: witness the long time lag between the initial development of HDTV in the mid-1980s and its formal adoption by the *International Telecommunication Union* in 1997. The Internet's ever-increasing demand for additional bandwidth, however, coupled with Asia's inadequate landline infrastructure, appear to make the marriage of Internet and satellite technologies as close to a sure thing as I can imagine. In Singapore, Hong Kong, Kuala Lumpur, or even a sprawling metropolis like Bangkok, fibre-optic cable is one answer to the Internet's voracious appetite for bandwidth. For those of us who live outside the region's major metropolitan areas, however, satellites are the only feasible solution on the horizon.

In today's operating environment, it is as if every local *Internet service provider (ISP)* is trying to drink the entire Mekong River through a soda straw. Satellites are the perfect choice for the implementation of asymmetrical communications networks where the receiving site uploads information requests at low data rates using a telephone line and the transmit site downloads the requested information to a PC at a very high data rate.

Satellite-based Internet servers have been operating in the USA and Europe for a while already. In September of 1997, Zak-Net inaugurated a regional

The Satellite/Internet Connection first started to have its effect on the region in 1997, when Zak-Net inaugurated its Zak-Sat service on AsiaSat 2 and DirecPC Japan began serving subscribers via Superbird C (coverage map shown below).



C-band Internet using the AsiaSat 2 satellite. What's more, DirecTV Japan expects to launch its high-speed "DirecPC" Internet service on the new Superbird C satellite beginning this December.

The new DirecPC service for Japan will offer three different types of service: a periodic, on-demand service; a real-time multimedia data pipe delivering MPEG-based video programmes; and a high-speed Turbot Internet/Intranet service for business use. DirecPC customers will be able to receive the new service throughout Japan using antennas ranging from 45 to 60cm in diameter.

The new "Worldwide Satellite Web" coming our way can even send TV programmes directly to the computer desktop or "living office." Today's international pay-TV programmers use automated video servers to format their programme lineup at the satellite uplink. These servers consist of bar-coded tape libraries and automated cart machines that insert the tapes in the correct order and at the proper time. In the 21st Century, the Internet will also be a video server, but one which the viewer rather than the programmer controls.

Turn On, Plug In and Play Out

Zak-Net, DirecPC and many of the other Internet service providers coming soon to a satellite near you intend to build their satellite data receivers onto PC cards that can plug into the expansion ports on any IBM PC compatible computer system. The installa-

tion is similar in all respects to that of a regular satellite TV receiving system, except that instead of connecting the coaxial cable from the outdoor dish and LNB to a stand-alone receiver, the cable connects to the back of the computer terminal.

In some cases, however, the operators of certain national satellite systems will require that the Internet interface be built into the nationally approved digital IRD. This will allow restrictions to be placed on access to the Worldwide Web and offer indigenous DTH operators a measure of protection from satellite-based Internet video servers.

Several new satellite TV products are already targeting the computer's "plug and play" operating environment. Germany's Galaxis currently offers a complete satellite TV receiver on a PC card, which plugs into a computer expansion slot. Called the Sat-Surfer PCI, the new product displays PAL or SECAM satellite TV signals in an enhanced resolution, 800 x 600 pixel format that is superior to what most conventional TV sets currently deliver.

Sat-Surfer can also display teletext from satellite TV sources or even capture individual frames of video from a satellite TV programme so that they can be printed at leisure. Meanwhile, Hitachi and Pace Microsystems have announced plans to jointly develop an MPEG-2, DVB-compliant PC card which will allow computer operators to download video, audio and data from a wide variety of sources.

I Want My Digital TV

In the Summer of 1997, the ITU formally defined a new universal digital TV standard which combines features from separate digital HDTV standards which America's *Advanced Television Standards Committee (ATSC)* and Europe's *DVB Group* have already adopted. The result is a single compatible system that will soon be implemented by TV set manufacturers worldwide to produce wide screen TV pictures with a resolution equal to, or even exceeding, the clarity of 35mm film. The new standard also will offer sixteen sound channels for multilingual broadcasting and support a variety of picture formats including a wide-screen display comprised of 1080 x 1920 pixels.

The new all-digital TV sets are slated to appear in the marketplace before the end of next year, when digital terrestrial TV is scheduled to begin in Europe and the USA. Leading TV set manufacturers already have agreed on a common interface that will allow consumers to connect their new digital TV sets to terrestrial, cable and satellite signals. The new digital TV sets also will support a wide range of Conditional Access (CA) systems and software applications. Best of all, there will be no proprietary designs to prevent the new digital TV sets from interacting with any of the available digital programme streams.

With its high-resolution video monitor, CD player, and stereo sound system, today's multimedia computer system has become a state of the art home entertainment system. Once the digital TV sets begin arriving next year, there should be little incentive for individuals working at home to duplicate in the living room what they already have in their home office. Hence my earlier coinage of the term "living office" to describe the integrated work/play environment in the year 2001.

Asia's Communications Satellite Explosion

One important economic limitation to downloading TV programmes off the Internet is the current high cost of satellite capacity. At today's prices, a C-band satellite transponder can be leased for as low as 1.5 million U.S. dollars per year. This translates into a transponder cost of about US$ 170 per hour.

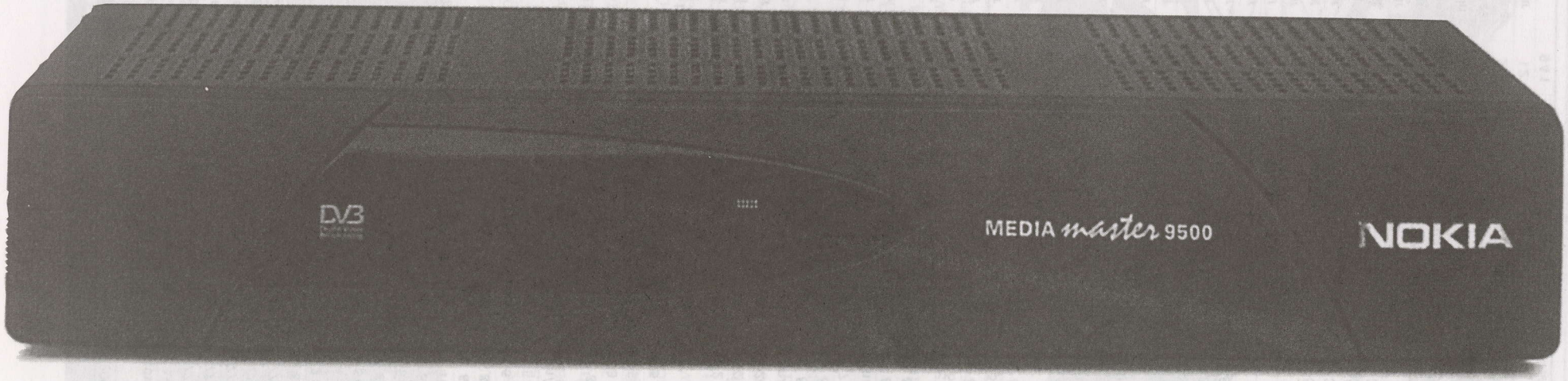
A single wide-band (54 MHz or greater) satellite transponder could theoretically carry approximately thirty simultaneous movie transmissions at 1.28 Megabits/sec. which translates into a raw cost of $8.5 per 90 minute download. With royalty payments, overhead and profit factored in, the cost of delivering pay TV movies on demand over an Internet/Satellite link is quite high in comparison to other delivery options. But that's about to change.

The good news is that transponder pricing should soon come down dramatically. Between now and the year 2001, more than thirty new geostationary satellites will be launched to cover the Asia/Pacific region. The total number of available C-band transponders in the region will grow by over 33 percent, while the number of available Ku-band transponders will increase by a staggering 85 percent.

By the year 2001, the region's available satellite capacity will be expanding at a rate that far surpasses the projected economic growth for most nations of the region. The transformation of the Asia/Pacific from a seller's to a buyer's market will come about through the intense competition for hard western currencies as the region's satellite system operators scramble to compensate for lower than expected growth in their local markets.

New spacecraft construction technologies are also helping to lower the cost of satellite capacity. Given the high reliability of today's electronic circuitry, a communication satellite's life in orbit is predominantly a function of the amount of on-board station keeping fuel which it carries into space. Until now, every communication satellite has had to carry tanks filled with a heavy hydrazine gas that is used for spacecraft station keeping while in orbit. Propulsion systems using new xenon ion technology, however, use the impulses generated by pairs of thrusters that eject electrically charged particles at a speed of 30 kilometres per second or nearly ten

The Nokia Mediamaster DVB 9500 S.



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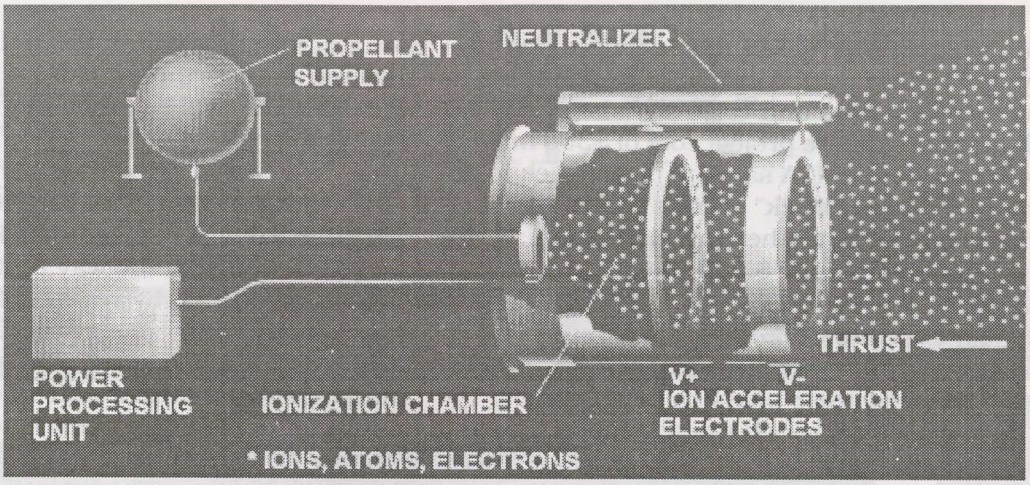
Asia/Pacific Geostationary Communication Satellites In Orbit							Year 2001		
Orbital Location	Satellite Name	Polarity (C/Ku)	C Tprs	Bandwidth (in MHz)	Power (in Watts)	Ku Tprs	Bandwidth (in MHz)	Power (in Watts)	BOL Year
57° East	Intelsat 703	Circ/Linear	20	36, 72, 77	10 to 33 W	10	72, 77, 112	35 & 50 W	1994
60° East	**Intelsat 902**	**Circ/Linear**	**22**	**36, 41, 72**	**5 to 16 W**	**10**	**72, 77, 150**	**20 & 40 W**	**2000**
62° East	**Intelsat 901**	**Circ/Linear**	**22**	**36, 41, 72**	**5 to 16 W**	**10**	**72, 77, 150**	**20 & 40 W**	**1999**
64° East	Intelsat 801	Circ/Linear	20	36, 72, 77	10 to 30	5	72, 77, 112	40	1997
66° East	Intelsat 704	Circ/Linear	25	36, 72, 77	10 to 33 W	10	72, 77, 112	35 & 50 W	1994
68.5° East	PAS-4	Linear	16	54 & 64	34	8	54 & 64	63	1995
68.5° East	**PAS-7**	**Linear**	**14**	**36**	**50**	**30**	**36**	**100**	**1998**
74° East	Insat 2A	Linear	18	36	4 & 10 W	—	—	—	1992
75° East	**LMI-2**	**Linear**	**24**	**36, 54, 72**		**16**	**36/54/72**	**n/a**	**1999**
76.5° East	**Apstar 2R**	**Linear**	**28**	**30 & 36**	**60**	**16**	**36 & 54**	**120**	**1997**
78.5° East	Thaicom 2	Linear	10	36	n/a	2	54	n/a	1994
78.5° East	Thaicom 3	Linear	24	36 & 72	n/a	11	36 & 54	n/a	1997
80° East	Express 6	Circ/Linear	12	36	15 & 75 W	2	40	20	1996
83° East	**Insat 2E**	**Linear**	**18**	**36**	**4, 10 & 50**	**3**	**72 & 77**	**20**	**1998**
87.5° East	**Chinastar-1**	**Linear**	**18**	**36 & 72**	**45**	**20**	**36 & 72**	**85/135 W**	**1997**
88° East	**ST-1**	**Linear**	**14**	**36**	**n/a**	**16**	**54**	**n/a**	**1998**
91.5° East	Measat 1	Linear	12	36	12 watts	6	54	110	1996
91.5° East	**Measat 3**	**Linear**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**1998**
93.5° East	Insat 2B	Linear	18	36	4 & 10 W				1993
93.5° East	Insat 2C	Linear	18	36	4, 10 & 50	3	72 & 77	20	1995
95° East	**K-TV 1**	**Linear**				**30**	**36**	**100/110**	**1998**
100.5° East	AsiaSat 2	Linear	24	36 & 72	55	9	54	115	1995
105.5° E.	**AsiaSat 3**	**Linear**	**28**	**36**	**55**	**16**	**54**	**138**	**1997**
107.3° E.	**Indostar**	**S-band 5 tpr**			**70**				**1997**
108° East	**Telkom 1**	**Linear**	**32**	**n/a**	**n/a**				**1999**
110° East	BS-3N	Circular				3	27	120	1994
110° East	BSAT 1A	Circular				4	27	106	1997
110° East	**BSAT 1B**	**Circular**				**4**	**27**	**106**	**1998**
110.5° East	**Sinosat 1**	**Linear**	**24**	**n/a**	**21**	**14**	**n/a**	**97**	**1997**
113° East	Koreasat 1	Both				15	27 & 36	12 & 120 W	1995
113° East	Koreasat 2	Both				15	27 & 36	12 & 120 W	1996
113° East	Palapa C2	Linear	30	36	21	6	72	135	1996
115° East	**LSTAR 1/2**	**Linear**				**32**	**n/a**	**n/a**	**1999**
115.5° E.	**Intelsat 805**	**Linear**	**28**	**36, 72, 77**	**10 to 30**	**6**	**72 & 77**	**40**	**1998**
116° East	**Koreasat 3**	**Both**				**15**	**27 & 36**	**12 & 120 W**	**1998**
118° East	**M2A**	**Linear**	**52**	**27 & 36**	**20 to 240**				**1999**
120° East	Thaicom 1	Linear	10	36	n/a	2	54	n/a	1993
120° East	**Thaicom 4**	**Linear**	**24**	**36 & 72**	**n/a**	**11**	**36 & 54**	**n/a**	**1998**
122° East	**AsiaSat 4**	**Linear**	**28**	**36**	**55**	**16**	**54**	**138**	**1999**
124° East	JCSat 4	Linear	12	36	34	28	27 & 36	60	1997
125° East	Chinasat 8	Linear	24	36	8 & 16 W				1998
128° East	JCSat 3	Linear	12	36	34	28	27 & 36	60	1995
132° East	N-Star A	n/a	6	n/a	n/a	8	n/a	n/a	1995
134° East	Apstar 1A	Linear	24	36 & 72	16				1996
136° East	N-Star B	n/a	6	n/a	n/a	8	n/a	n/a	1996
138° East	Apstar 1	Linear	24	36 & 72	16				1994
139° East	**Orion 3**	**Linear**	**10**	**36**	**15**	**23**	**27 & 54**	**inc. BSS**	**1998**
144° East	Superbird C	Linear				24	36	90	1997
144° East	Aguila 1	Linear	30	36	n/a	24	36	n/a	1997
148° East	Measat 2	Linear	6	72	n/a	9	50	110	1996
150° East	**JCSat 5**	**Linear**				**32**	**27 & 36**	**60 & 90 W**	**1998**
150.5° East	Palapa C1	Linear	30	36	21				1996
154° East	**JCSat 6**	**Linear**				**32**	**27 & 36**	**60 & 90 W**	**1999**
156° East	Optus B3	Linear				16	54	50	1994
158° East	Superbird A	Linear	—	—	—	19	36	50	1992
160° East	Optus B1	Linear	—	—	—	16	54	50	1992
162° East	Superbird B	Linear	—	—	—	19	36	50	1992
166° East	**PAS-8**	**Linear**	**16**	**54 & 64**	**33 W**	**16**	**54 & 64**	**63**	**1998**
169° East	PAS-2	Linear	16	54 & 64	33 W	16	54 & 64	63	1994
174° East	Intelsat 802	Circ/Linear	20	36, 72, 77	n/a	5	72, 77, 112	n/a	1997
177° East	**Intelsat 804**	**Circ/Lin.**	**20**	**36, 72, 77**	**10 to 30**	**5**	**72, 77, 112**	**40**	**1997**
180° East	Intelsat 701	Circ/Linear	20	36, 72, 77	10 to 33 W	10	72, 77, 112	35 & 50 W	1993
183° East	Intelsat 702	Circ/Linear	20	36, 72, 77	10 to 33 W	10	72, 77, 112	35 & 50 W	1994
185.7° East	TDRS-PAC	Linear	12	36	5.5 W	—	—	—	1991
64 satellites			**941**	C-band tprs.		**724**	Ku-band tprs.		



Block diagram of a xenon ion thruster (courtesy of Hughes Space & Communications Group).

times the velocity of conventional hydrazine thrusters. Fuel weight can therefore be reduced by up to 90 percent, which gives manufacturers several attractive options: launching a lighter spacecraft at a lower cost; installing a more complex, heavier communications payload which can lower the cost per transponder; extending the mission lifetime of the spacecraft; or any combination of these options.

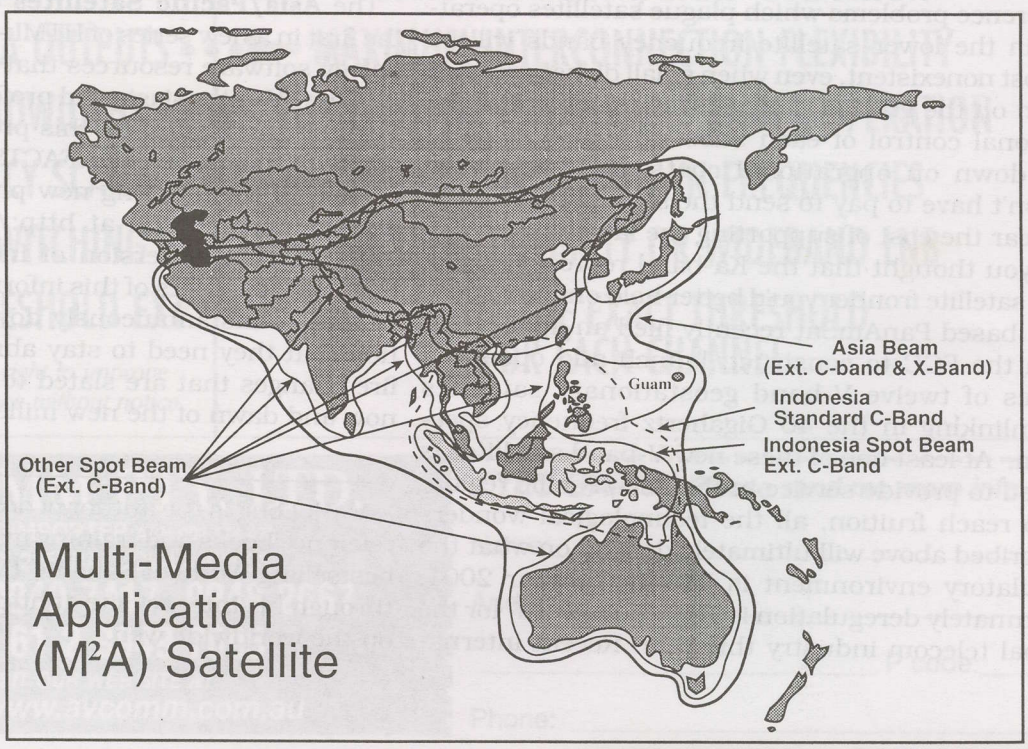
A $300 million investment typically was required in the mid-1990s to put a twenty-four transponder C-band satellite into geostationary orbit for a ten year mission lifetime. By 2001, a $300 million investment will be able to produce a thirty-six transponder satellite which achieves a mission lifetime of fifteen years.

Multi-Media Satellites

In December of 1996, PT Pasifik Satelit Nusantara of Indonesia contracted with Space Systems/Loral to build a high-powered multimedia satellite and deliver it to orbit at either 134 degrees east or 118 degrees east in early 1999. The agreement also calls for the construction of long lead parts for a second spacecraft as well as options for the constructions of five additional satellites.

PT Pasifik's M2A satellite, the most powerful C-band spacecraft ever, will generate more than 11 kilowatts of electrical power and transmit more than 4 kilowatts of radiated power. The spacecraft will have the ability to operate 54 transponders in the standard C-band, extended C-band and the X-band. M2A will also be the first C-band satellite to provide direct broadcast services to small terminals with apertures comparable to what are currently used for reception of Ku-band DTH services.

The M2A spacecraft will provide a total of seven shaped spot beams and one regional beam. The high power, the frequencies selected and the broad coverage of the satellite will enable customers to use small, inexpensive terminals to access video, au-



M2A regional and spot beam coverage.

dio, Internet content, VSAT data services and telephony and even have the option of transmitting as well as receiving data and voice signals.

With an approximate project cost of $350 million, the 54 transponder M2A satellite is on track to deliver more "bang per buck" over its twelve year mission lifetime than any other satellite to date: a raw transponder cost of only $ 540 *thousand* per year.

The World Above 18 Gigahertz

Several international satellite operators have already announced their plans to begin serving the Asia/Pacific region through a new series of Ka-band satellites operating in the 19.2 to 20.2 Gigahertz frequency range. A single geostationary Ka-band satellite will be able to simultaneous reuse the available Ka-band frequency spectrum dozens of times by dividing the earth into a honeycomb of highly focused spot beams, each no more than 400 miles in diameter. An on-board processor will allow users to automatically route their transmissions between any two spot beams or retransmit within the same beam. A single Ka-band Spaceway satellite will be able to form a virtual Internet in the sky by simultaneously carrying up to 11,520 duplex circuits operating at a data rate of 384 kilobit/sec. Hughes estimates that a single Ka-band satellite will be able to support hundreds of thousands of subscribers because most subscribers will only need access on an occasional-use basis.

What's more, consumers will be able to directly uplink as well as downlink Ka-band satellite signals. Because Ka-band satellites use super high frequencies, the beam width produced by each personal uplink antenna will be so narrow that the interference problems which plague satellites operating in the lower satellite frequency bands will be almost nonexistent, even when small dishes are used down on the ground. Putting the uplink under the personal control of each subscriber also helps to cut down on operational costs; the subscriber doesn't have to pay to send the signal to an uplink or bear the cost of supporting the facility.

If you thought that the Ka-band represented the new satellite frontier you'd better hold onto your hat. U.S. based PanAmSat recently filed an application with the FCC to construct, launch and operate a series of twelve V-band geostationary satellites downlinking in the 40 Gigahertz frequency spectrum. At least one of these new V-band satellites is slated to provide service in the Asia/Pacific region.

To reach fruition, all the technological wonders described above will ultimately depend on what the regulatory environment is like in the year 2001. Fortunately deregulation is THE "buzz word" for the global telecom industry this year. Recent international agreements guarantee that previously isolated national markets throughout the Asia/Pacific region and elsewhere will be much more open by the early 21st Century.

Information Resources for the New Millennium

Back in 1994, I realised that I needed to make a dramatic change in the way that I provided technical information to my readers if I was going to retain a competitive edge in the 21st Century. With today's information overload, technical almanacs, annuals, encyclopaedias and other printed reference materials struggle to keep pace with the latest changes and are inevitably out of date the day they roll of the presses. The question in my mind was how to create a dynamic publication that could be accessed by virtually everyone and easily updated.

The first time that I sat down to use an Internet browser I knew that I had found the answer. The HTML software used to create web pages is a universal language that bridges the gaps between otherwise mutually incompatible computer systems. What's more, web browsers such as Internet Explorer and Netscape Navigator are freely available, either in trial versions that can be downloaded off the worldwide web or on diskettes that are given away by the major computer magazines. Even better, you don't need an Internet connection to use an HTML based software product. You can store an HTML program on your computer's hard disk, browse its contents at your leisure, and use the available hyper links to quickly track down the information you need. Best of all, you can download the latest information updates from the Internet while sipping coffee at your local cyber cafe.

The **Asia/Pacific Satellites on Disk Library** is the first in a new series of HTML-based satellite technology software resources that I am developing for satellite TV enthusiasts and professionals worldwide. Further information on this product appears elsewhere in this issue of SatFACTS. Moreover, a demo version of this exciting new product is now available at my web site at http://www.mlesat.com. Through the conversion of Internet and satellite technologies, users of this information resource will be able to instantaneously download the information that they need to stay abreast with the rapid fire changes that are slated to take place between now and dawn of the new millennium.

Mark Long is the author of dozen communications reference books and training manuals, including the bestselling World of Satellite TV. He can be reached through his Internet site at http://www.mlesat.com on the worldwide web.

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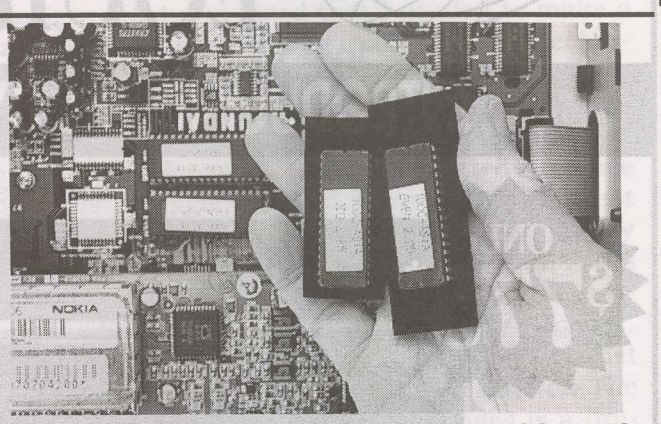
Test Results

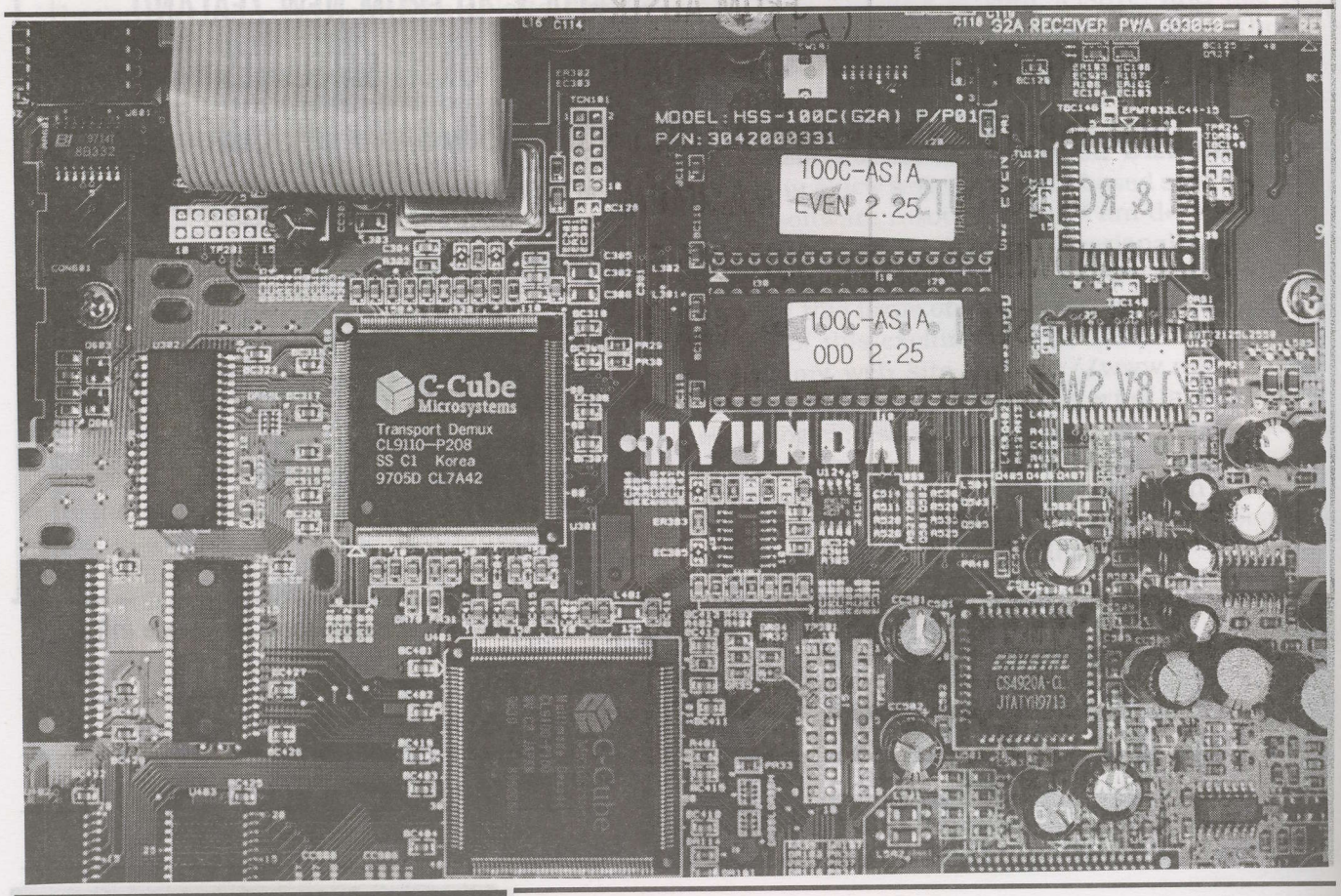
HSS-100C by HYUNDAI PUTS PRESSURE ON COMPETITORS

The Hyundai HSS-100C consumer level DVB Compliant IRD has led a chequered life during the relatively short time it has been available. There is considerable controversy and not a little "infighting" between distributors. We reported on the early trials (see "The Hyundai Affair" SF June, p. 32) and noted a May statement by D.M. Yoon (Manager, DVS Products at Hyundai) that: "*We have not completed the solution to resolve NTSC to PAL conversion and we are now trying to make the receiver fully compatible with PowerVu. When we have this problem solved, we will release this software version.*"

From our June report until late September, Hyundai was working on the NTSC and PowerVu "problems." Several software versions followed (some say three, some say four) and each arrived as sample chips to distributors in Australia for trial and review. There are two chips that control the important software that addresses memory channels, menu functions, on screen features. Ultimately these 32 pin chips would be designated "odd" and "even" and distributors would be told that to upgrade a receiver, replace with new (Hyundai supplied) chips. It was sometime during the series of software chip trials that a clever Australian



Magic chips which upgrade software are 32 pin ICs which plug (not solder) into sockets. Step one- take out the original chips. Step two - replace one for one with new chips. Inexperienced? Let someone who knows how do it! (Yes-Hyundai uses Nokia tuner - lower left)



Note "magic chips" (upper, centre) marked "100C-Asia" (see text)

figured out he could duplicate the software in the chips; if you had one genuine Hyundai set, you could create as many copies as you wished. In short order, grey market chips were everywhere. One distributor in their November issue of an in-house newsletter (*Pacific News* by Angela Kittel) writes:

"*The new upgraded version of Hyundai receiver is available from the middle of November. This is the official version for Hyundai HSS-100C and it is only available from ...(name of company). To avoid confusion, the official Hyundai upgrade service has the Hyundai wording on top of them where the others have nothing on it.*" The "Hyundai wording" apparently is a reference to the magic upgrade chip sets. To our publishing deadline, SF as seen many chip sets but none have had Hyundai written on the chips.

All of this intrigue aside, is anybody's version of the new chips an improvement? SF went to Hyundai devotee Stu McLeod (Napier, NZ) for his analysis and it follows.

"**My testing** began with an analysis of the 4 meg capable EPROM (chips). The Odd and Even chips contain Hex files that are approximately 1.5 megs each; there is room here for growth. The old version identified as '2.05' while the new software identifies as 2.25.

"**2.05 software** was fussy about the exact IF being entered (which by the way is uniquely in kilohertz, not megahertz - add three zeros); 2.25 is not. This could be a function of AFC (automatic frequency control) range being extended or another factor (to be discussed).

"**With the 2.25**, lip sync is now automatic; NTSC detection is automatic, and there is the illusion of greater receiver sensitivity. (Editor's note: The software is not capable of affecting the IRD input threshold but if the sampling rate was reduced, as we suspect it has been, then the apparent sensitivity would improve.) Version 2.05 software would not lock onto RAI/ART (PAS-2) nor TVNZ SCPC feeds on I180. 2.25 software does both (if not perfectly). Both of these signal sets are benchmark marginal with my dish system.

"**Those are the better points.** The 'still not right' or 'worse than before' points are as follows:

" 1) **If the receiver** powers up on a stored channel that does not (for whatever reason) have a healthy signal on it, the receiver goes off on a never ending search. If you turn off, for example, while tuned to PAS-2 1249, 3/4 and 30.800 and move the dish to As2 the following will happen:

" a) **It will search** for values in the last viewed memory channel, which will not of course correspond with the new satellite;

" b) **Step** to the next higher memory channel and repeat a search;

" c) **Continue** this process until it finds a stored channel that matches the new satellite (and polarisation you are on).

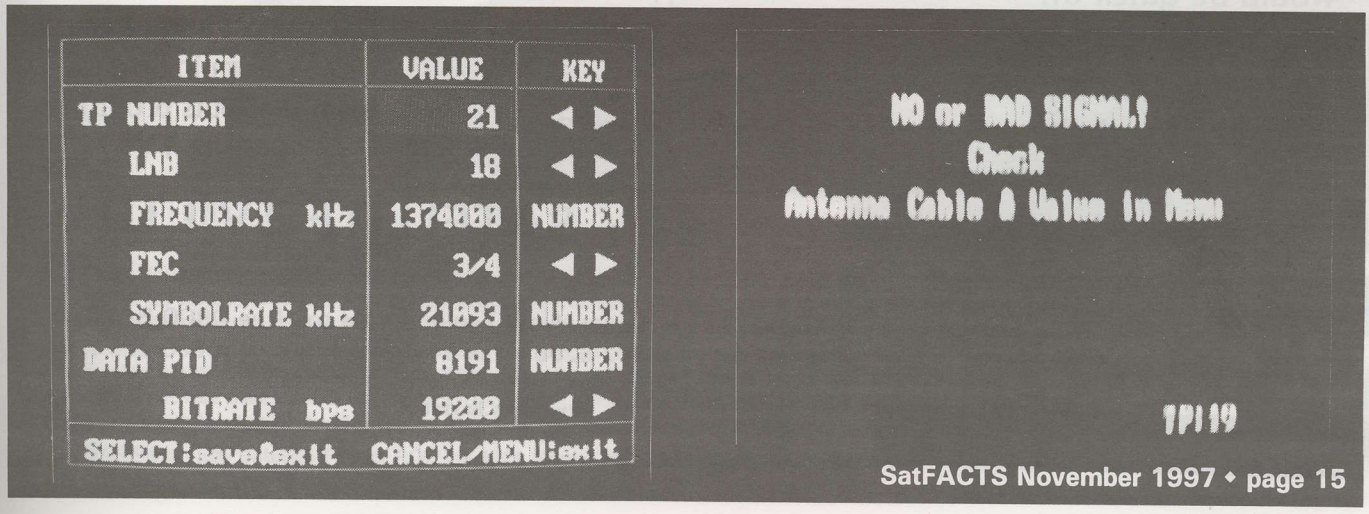
"2) **A search** from one transponder to another takes up to 15 seconds

"3) **If you have** a number of memory channels loaded, the receiver can take what seems like forever to prompt you with a response "*BAD or NO Signal*" (see below). In version 2.05, this took several seconds - much less than with 2.25.

"4) **The usefulness** of the new signal level meter is, to me, on a par with fluffy dice. On a weak signal I tried moving the dish 1 or 2 counts (enough to lose TVNZ, for example). The meter did not budge. (Editor's note: A more recent 2.25 we checked had much better meter performance).

"The BER (carrier to noise here) indicator is conversely very useful but more as a point of reference than as a tuning aid. My personal view is that bit error rate (BER) is the only really useful readout with digital. I would suggest future receivers scrap signal level meters totally and just give us BER.

"This receiver needs a cancel button function to shut down the searching process. This thing just chases its tail forever. The fan cooling is a good concept but it needs to be mounted on silicon pads. This is a rowdy box in an otherwise quiet house. That 'other' noise is the clicking of the 14/18 volt relay when the receiver voltage switches during search. You can create the sound of a ticking clock by loading alternate memory positions (TRs) with 14 or 18 volts and telling it to search!"



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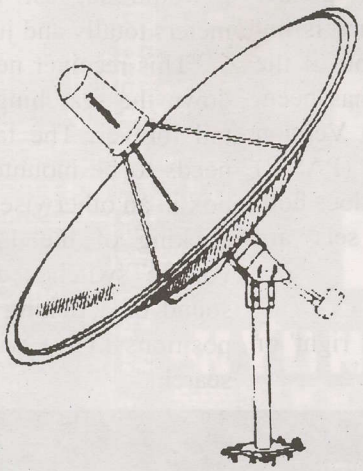
We are forging ahead to create system packages that are easy to sell, quick to install, low in "profile," high in performance and most importantly - **profitable** to you, the dealer.



Paraclipse 1.5m Hydro

Our Paraclipse 1.5m **Hydro** for example produces P5 reception from CFI Paris in a complete dealer package under $800 (+gst)! And we now have cheaper packages of PowerVu (CMT, EWTN) and MPEG-2 DVB coupled with innovative marketing assistance that makes you the local satellite expert.

And remember - Uncle Baysat doesn't send staff into "your patch" to compete with you!

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VIDIPLEX: Two Video Signals On One Transponder

Way (way) back in 1978, American firm RCA devised a scheme to send two separate TV programmes on the same analogue satellite transponder. This was aeons before digital, and their technique works whether you are using a full, half or lesser part of a transponder. The concept is as basic as interlaced television technology from the mid 1930s.

Television images are constructed from individual "pixel lines." The TV screen is divided into some number of horizontal lines (typically 525 for NTSC, 625 for PAL) and each line is a series of consecutively transmitted light or dark dots of picture (pixels). Computer images start at the top left hand corner and progress left to right line by line until the screen is filled up. Then the process is repeated with a new image. Each image is called a frame and with NTSC there are 30 new frames each second while with PAL there are 25. If the image is moving, each new frame has a slightly modified content from the last complete frame and by changing the on screen image (frame) 30 or 25 times each second, the illusion of motion is created.

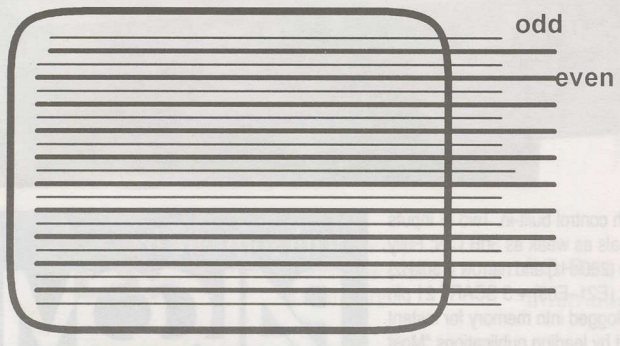
Computers use progressive scanning of lines (#1, #2, #3 and so on to 525/625 and then start over). Television images use an older technology called interlace scanning. Lines 1,3,5,7 and so on (the odd numbered lines) are scanned to the bottom of the screen and then the line maker jumps back to the top and starts over again with line 2 (followed with 4, 6, 8 and the rest of the even numbered lines). After going through the odds, and evens, we have one complete frame and 25 or 30 times each second this process is repeated.

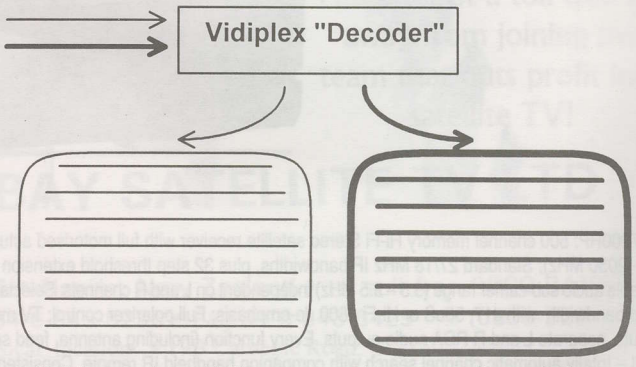
RCA's people said to themselves, "*What would happen if we had two completely different, unrelated television pictures from two sources. And we fed the odd lines from the first source but only the even lines from the second source?* "

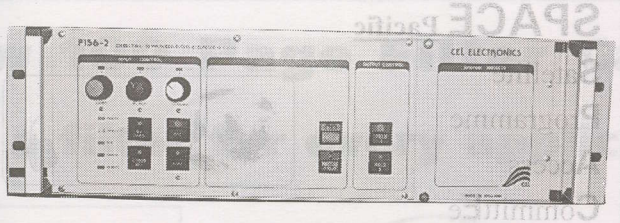
Not plesant to look at: On screen, two separate images seemingly laid one on top of the other.

What they got were two images at once (see above). And a clever, low-cost technique to use one satellite transponder (of whatever width they wished) to send two separate TV channels at once. They called this Vidiplexing and when Intelsat began serving the Pacific, Australian networks (7 and 9 primarily) elected to use this technique to send USA TV programming to Australia. RCA also used the same technique on some of its domestic satellites to double up on feeds to Alaska and other out of the way places.

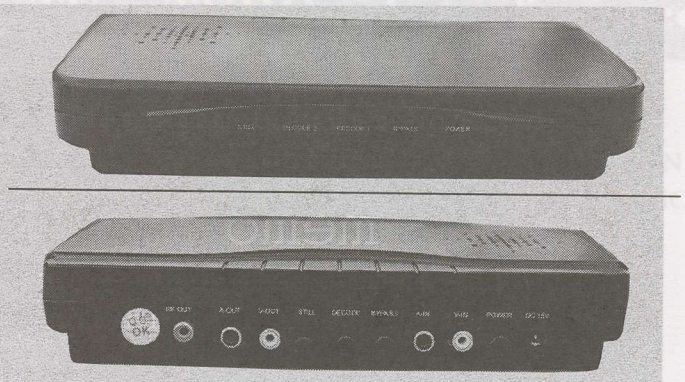
Mixing two separate video sources together at the uplink is not difficult. First they built a box that would pass only odd or even lines of video on command. Then they combined the video image from box one (call it odd) with the video image from box two (call it even) into one odd + even image. As for the audio, well, there is always plenty of sub-carrier spectrum space on an analogue satellite channel and it was a simple matter to stick the audio from the odd line programme on one







This UK built "Digital Standards Converter" was one way to separate odd and even fields at a cost of several thousand dollars (1987 manufacture).



1997: This Taiwan built Vidiplex decoder separates "odd" and "even" into two reasonably high quality images, one at a time.

subcarrier frequency and the audio from the even line image on a second subcarrier frequency.

To recreate two separate sets of video at the downlink site (or, one image at a time) was but to reverse the process. Now we need a box that only responds to either the odd or even lines.

If you know your basic TV technology, you may be wondering what happens to the image if you only transmit *half* of the original video information. Will there be a "blank line" every other line? Won't that look funny? The answer is (a) if you only transmit half of the original image (every other line), now you have a half-resolution (i.e., 50% of the original image detail) picture, and, (b) by skipping every other line the image "timing" (that keeps the picture stable and locked) is also upset.

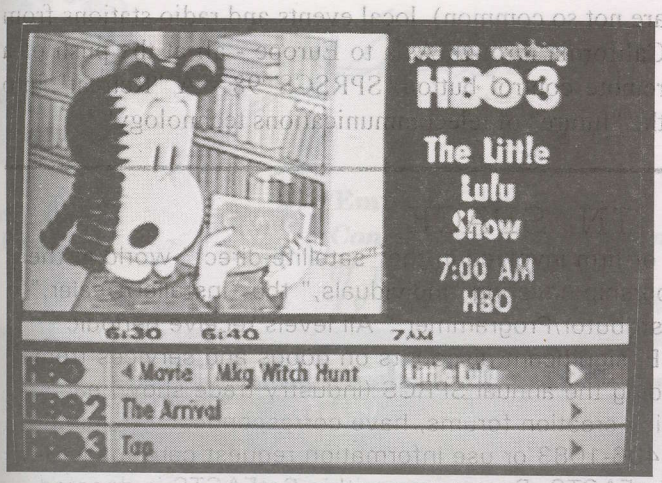
To cure this, a "Vidiplex Decoder" fills in the missing lines by extracting (similar) video information from the line(s) above and below the missing lines. Purists would point out, correctly, that you still only have half of the original picture information and that while multiplying the lines actually received by two may then make a full number of lines, that does not correct for the missing "intelligence" in the original lines lost. Net effect? A low resolution, but stable image.

The original Vidiplex Decoders sold for upwards of US$20,000. Until someone in Australia and another someone in New Zealand figured out that if they built a "simple, low cost" box that only responded to (switch selectable) odd or even lines, they could (after a fashion) recover one image at a time.

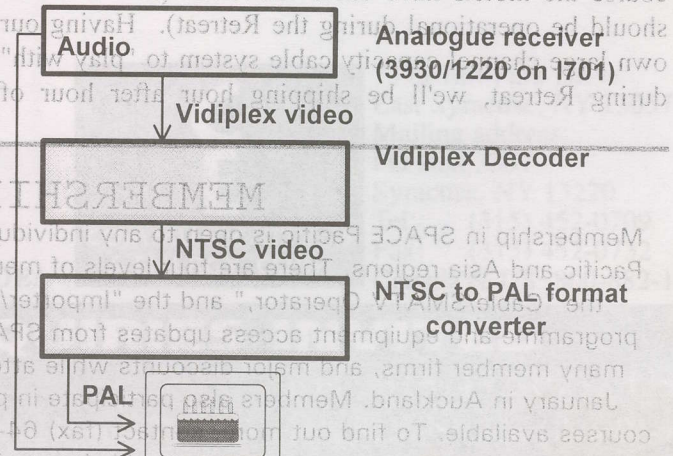
The commercial CEL P156 unit (upper left) built in 1987 makes a fine Vidiplexer even if it was originally intended for something quite different. How much this cost when new is uncertain but certainly in the mega-thousands of dollars.

Leapfrog now to 1997 and you find the smaller unit (upper right) manufactured in Taiwan by an enterprising electronics firm. The market is small for Vidiplexers (the technique is utilised on few satellites anymore and those still doing so will doubtless go to digital one day soon) but the price is under A/NZ$500 for the unit shown. To be effective, Vidiplexers require sufficient "memory" to allow reconstruction of the half-resolution image into an approximation of a full resolution image. Time base correction (to take out jitter) is also desirable. Vidiplex sources include Av-Comm Pty Ltd (tel 61-2-9949-7417) and Bay Satellite TV Ltd (tel 64-6-843-5296).

The primary Vidiplex location these days is on Intelsat 180 where various USA networks continue to feed programming to Australia and the Pacific. The signal is not strong and a sizeable dish may be required for quality reception.



Some of the Vidiplexed programming on I180, 3930/1220 RHC can be surprising



a technical and marketing advisory

memo

to the membership from your industry trade association

SPACE Pacific
Satellite
Programme
Access
Committ**E**e

A trade association for users, designers, installers, sellers of private satellite-direct systems in the Pacific Ocean & Asia Regions

SHOW of SHOW Becomes Retreat of Retreats

This year's South Pacific Region Satellite & Cable Show is taking a giant leap in technology teaching techniques. Rather than talking heads at a podium, SPRSCS '98 becomes talking feet and fingers under what may be a warm late summer sun. By moving the venue to the northern New Zealand communities on the shores of Doubtless Bay, we move from the classroom to the field to explore the limits of our technology process as we come within striking distance of a new millennium.

There will be no exhibit hall (although creative industry suppliers are planning a range of solutions to this problem including motel hospitality suites and in field demonstrations of equipment and services). Attendees will move from field location to field location by bus, the noon day meal will be packed picnic lunches and drinks (including of course beer) will be available in coolers at every field stop. Sun glasses, sun tan protection and hats are the order of the day. An industry banquet is a part of the package Friday evening February 20th.

Motels and lodging - we have booked every available room in the five Doubtless Bay communities for the Retreat period. Room rates are lower than Auckland by a measurable amount, accommodations range from very up market to very basic. Most of the facilities are located directly on the sandy north shore beaches and of course the motels have cable television (50+ channels should be operational during the Retreat). Having our own large channel capacity cable system to "play with" during Retreat, we'll be shipping hour after hour of special Retreat-Topic videos to your rooms from the cable headend after hours.

Doubtless Bay is a comfortable 4.5 hours drive north from Auckland. Some out of country Retreaters are planning to fly into Auckland and then take a day or two to drive north to sample the north island scenery (the world's last, surviving sizeable Kauri tree forest is very worthwhile - right up there with the California Redwoods). Others will fly into Kaitaia or KeriKeri airports and be met by Retreat ground transport for the final 30-45 minute drive. Some are bringing family who will swim in the ocean, play tennis or golf or go deep sea fishing while hubby attends the Retreat.

Doubtless Bay Cable TV is a community affair; the community is deeply involved in its operation, does not hesitate to be a part of its day to day operation, and considers it their own. In many ways, it can serve as a model for others who dream of wiring their own towns for "cable TV." For the satellite-only folks, the sizeable working collection of nine dishes ranging from 2 to 4.6m collecting signals from as many satellites on C and Ku connected to more than 60 satellite receivers all running full-time will be a bit of an eye opener.

TV fanatics will marvel at a rural NZ community that has 50 channel push-button choice in their parlours between hometown Los Angeles TV, the full range of Intelsat 701 / PAS-2 / Palapa C2 / Optus B1 / Optus B3 / AsiaSat 2 and AsiaSat 3 programming (plus a few that are not so common), local events and radio stations from California through Asia to Europe - all at the push of a remote control button. SPRSCS '98 - A "Retreat" into the "future" of telecommunications technology!

MEMBERSHIP IN SPACE

Membership in SPACE Pacific is open to any individual or firm involved in the "satellite-direct" world in the Pacific and Asia regions. There are four levels of membership covering "Individuals," the "Installer/Dealer," the "Cable/SMATV Operator," and the "Importer/Distributor/Programmer." All levels receive periodic programme and equipment access updates from SPACE, significant discounts on goods and services from many member firms, and major discounts while attending the annual SPRCS (industry trade show) each January in Auckland. Members also participate in policy creation forums, have correspondence training courses available. To find out more, contact (fax) 64-9-406-1083 or use information request card, page 34, this issue of SatFACTS. Page space within SatFACTS is donated each month to the trade association without cost by the publisher.

Year #30* Filters For Cable TV • TVRO • Interference

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- CABLE TV SYSTEMS
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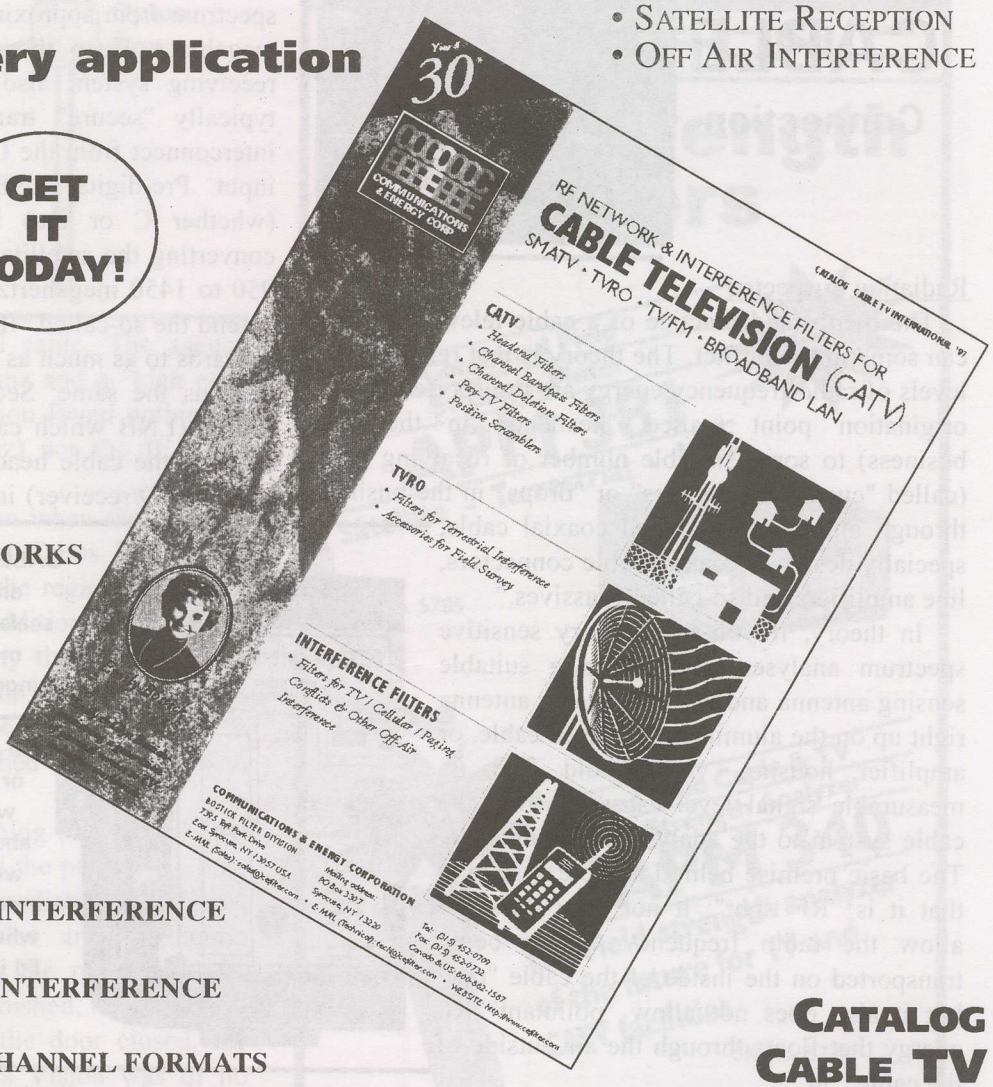
Multiple channel deletion filters
LOWPASS FILTERS
HIGHPASS FILTERS
CHANNEL REPROCESSING NETWORKS
BANDSPLITTERS (hi/lo diplexers)
PAY TV TRAPS & FILTERS:
History of CATV trapping
INTERFERENCE SUPPRESSION
NETWORK PASSIVES
DROP LINE DEVICES
WEATHERIZED HOUSINGS



TVRO: FILTERS TO SUPPRESS INTERFERENCE

BOOKS: CATV, TVRO, MMDS, INTERFERENCE

APPENDIX A: INTERNATIONAL CHANNEL FORMATS
APPENDIX B: INTERNATIONAL CHANNEL FREQUENCIES
APPENDIX C: ORIGIN OF CATV, TVRO, PAY-TV

CATALOG CABLE TV INTERNATIONAL/97

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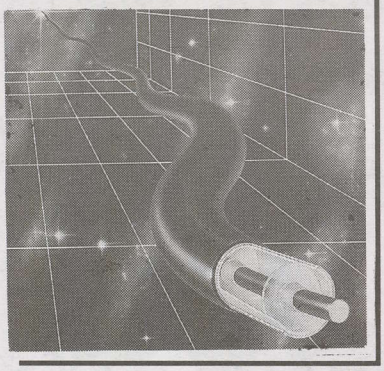
The CABLE Connection



Radiation Suspected

The theory and practice of a cable television system can sometimes conflict. The theory is that relatively low levels of radio frequency energy are transported from an origination point (called "headend" in the cable business) to some sizeable number of receiving points (called "customer premises" or "drops" in the business) through aluminium jacketed coaxial cable, specially designed coaxial cable connectors, line amplifiers and so-called "passives."

In theory, if you take a very sensitive spectrum analyser attached to a suitable sensing antenna and lay the sensing antenna right up on the aluminium jacketed cable, or amplifier housing, you should find no measurable signal level escaping from the cable system to the analyser sense antenna. The basic premise behind a cable system is that it is "RF tight"; it not only does not allow the radio frequency energy being transported on the inside of the cable "out" but it also does not allow "pollutant" RF energy that floats through the air outside of the cable, "in."

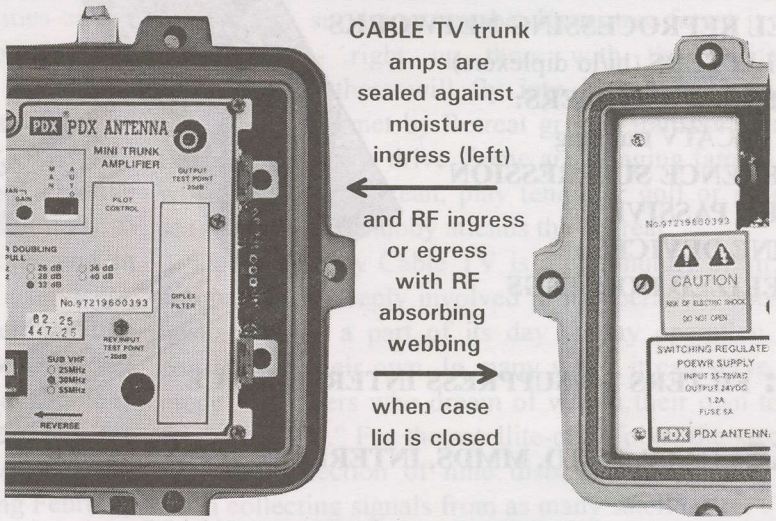
Cable claims to deliver perfect (as in high quality, blemish free) multiple channel service because it does two things that the average household viewer cannot afford to do:

1) It establishes signals at the headend which are as close to technically perfect as is within financial (budgetary) reach, and,

2) It protects those super-clean signals from interference and degradation as they travel between the headend and the customer's television set.

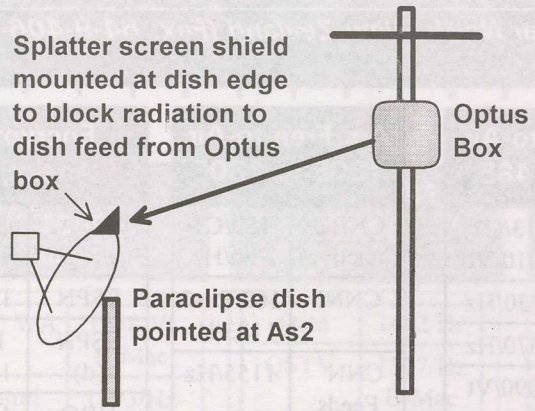
Creating "super clean" images and sound within the headend is a challenge primarily because of the extensive amount of not always compatible equipment that occupies a relatively small space. All of those local oscillators, IF and RF amplifiers, switching power supplies and coaxial cable sheath (outer skin) circulating currents can make life pretty complex in confined quarters. Alas, this is a piece of cake when compared to the challenge of maintaining the integrity of the cable system service while kilometre after kilometre of cable, passives and amplifiers wind their way from the headend to distant viewing locations.

Modern cable television occupies an "in-cable" spectrum from approximately 50 to 550 (or 650 or 750) megahertz. Keep those numbers in mind. A satellite receiving system also makes use of coaxial cable's typically "secure" transmission capability when you interconnect from the LNB output to the receiver (IRD) input. Pre-digital LNBs processed the satellite band (whether C or Ku) into the home after frequency converting the satellite energy to the more manageable 950 to 1450 megahertz region. More recent LNBs may extend the so-called "IF" (intermediate frequency) range upwards to as much as 2050 megahertz but the principal remains the same: Secure the transmission path from source (LNB which can be compared on a very small scale to the cable headend) to the reception point (the indoor IRD/receiver) inside of reasonably well shielded coaxial cable. In theory, a satellite receiving system should be able to operate in close proximity to a cable television distribution line without interference in either direction. Both are in shielded coax, and more important, *they do not share any common frequencies.*



Comes now a report from **Tony Molina** of Melbourne (Australia). Tony's C-band home dish system was producing highly reliable service from the European Bouquet (AsiaSat 2) until one day when it began to be erratic. Tony first tried to trouble shoot his own installation - changed the LNB, cabling and even tried a different dish. The troublesome problem was compounded by an erratic nature. It would go days without a glitch, and then without warning - the EBB service locked and nothing Tony did would right it again. Until it cleared up all by itself.

Tony next contacted Australia's Spectrum Management Agency and asked for assistance. His theory was that something in the area was radiating energy in the region of 1150 Megahertz and that signal - whatever it was - ended up clashing with the LNB output frequency for the European Bouquet as he carried



it inside through his own coaxial cable. The agency appeared with a suitable test antenna and a "high end" spectrum analyser. The investigation found nothing in the satellite band (4000 megahertz) nor the IF range (950-1450).

Tony then began to backtrack on when the problem was first noticed. It happened that Optus Vision had been installing cable television in the region and as the lines went up, followed by the addition of the cable active and passive equipment, Tony thought he saw a pattern. His attention was focused on what he describes (without technical expertise in the cable field) as "a large, grey square metal box attached to the pole with thick cables connected to it."

One day while Tony was watching satellite TV, an Optus technician appeared, climbed the pole to the box, and opened the hinged door. Immediately his digital picture from EBB went into tiles and the audio screeched from the speaker. Then the reception quit; totally. When the technician had finished, he closed the door and instantly - precisely as the door closed, the EBB reception came back. Optus Vision was of no assistance and as noted the Spectrum people had been unable to find any interference. Even with the hinged door shut, Tony's reception quit almost daily - sometimes for a few minutes, up to two hours.

He took his mystery to Mark Long in Thailand on email. Mark suggested Tony build a shield to mount between the dish feed and the suspicious Optus Vision grey box. For A$5 Tony found one of the metal mesh screens used to cover the top of a fry pan to keep grease from spattering out. He bent it in a 90 degree angle in the middle and attached it as bent to the edge of his Paraclipse dish such that it was right in line between the dish centre and the grey box. The result?

"One week later the EBB reception had not experienced a single drop out. To confirm that the shield was doing the job, I took it off and sure enough shortly the reception stopped from EBB. Putting it back, and no problem! I can't believe how $5 in material and ten minutes of time cured a problem which the official people could not find with a mega kilobuck spectrum analyser and trained staff!"

Well done, Mark, by email no less!

SatFACTS Pacific/Asian Region Orbit Watch: 15 November 1997

Analogue Free-to-Air 57E to 80E

Sun Music	**57E/703** 1395R
Sun Mov.	1342R
Gemini	1220R
AsiaNet	1170R
WorldNet	1095R
NEPC	1085R
TVi	1025R
Muslim	975L
ESPN Feeds	**64E/801** 1134R
E-TV	1093/L
ViJAY TV	965R
Home TV	**68.8/Pas4** Vt1310
ABN	Hz/1365
Sony TV (Hindi)	Hz/1240
Doordar & Iran TV	Vt/1116
CNNI	Hz/1065
TNT/Cart.	Hz/1040
MTV Asia	Hz/965
MCOT	**78.5/Th3** Hz/1180
HSTV	Hz/1200
TVT	Vt/1280
Army TV NNV 5	Vt/1390
RAJ-TV	Vt/1510
UB TV	Vt/1534
Contin.TV	Vt/1565
Punjab TV	Vt/1605
TK Rossija	**80/Exprs.** 1475RHC
Feeds	1315RHC
VTV4/ Mos. TB6	1275RHC
ACT/TB3	1225/RHC

Anal. Free-to-Air 80E to 113E

Russia 3	**80/Exprs** 1025R
RTR 1	**90/S6** 1475R
Orbita I	1275R
RTR II	1234R
Orbita II	1215R
VTV	**91.5/Me1** Hz/1440
Doordar.1 National	**93.5/In2b** 1030/Vt
Doordar.1	1160/Hz
Doordar.9	1080/Hz
Doordar.7 Telugu	1070/Vt
Doordar.9 Kanada	1180/Vt
Doordar.1	1268/Vt
Doordar.	1310/Vt
Doordar.3	1348/Vt
Doordar 4	1388/Vt
ORT 1	**96.5/S14** 1475R
Madagas-car	1325R
Tv Azer.	1275R
ERTU Egypt	**100.4/As2** 1508/Hz
TV Shopping	1490/Vt
Mongolia, Iran/plus	1470/Hz
WorldNet	1265/Hz
CCTV4	1190/Hz
RTPi	1170/Vt
RTR	**103/S21** 1475R
Vrk/Apt	1275R
CFI	**113/C2** 990/Hz

Gorizont 30 Mystery Gz30, last at 142.5E, reported on move possibly to 121E. **Any reports?**

Anal. Free-to-Air 113E to 148E

Brunei, feeds	**113/C2** 1010/Vt
MTV Asia	1030/Hz
TPI	1070/Hz
TV Indosiar	1090/Vt
ABN	1110/Hz
ANteve	1130/Vt
CNNI	1177/Vt
SCTV	1190/Hz
GMA	1240/Hz
TV3	1250/Vt
ATVI Australia	1270/Hz
TVRI	1310/Hz
RTM	1330/Vt
BazTab	1350/Hz
RCTI	1408/Vt
CNBC	1530/Hz
Test Card	**128/Jc3** 1070Vt
CETV SD	**134/Ap1A** 1330Hz
CETV2	1250/Vt
CETV1	1170/Vt
CNNI	**138/Ap1** 1170/Vt
CCTV7	990/Hz
Orbita-I	140/**S7** 1475R
NTV	1425R
ORT1	**145/S16** 1475R
RTR Russia	1275R
Test Card	**148/Me2** 1070/Hz

For MPEG-2 format digital, see pages 26/27.

Challenge? Russian MIR downlink analogue FM on 10.830 RHC.

An. Free-to-Air 150E to 180E

CNBC (inactive)	**150/C1** 990/Hz
CNNI	**169/Pas2** 1183/Hz
CNN Feeds	1155/Hz
NHK	1114/Hz
TV Shopping	1400/Hz
Feeds	**174/I802** 984R
Feeds	973R
Feeds	**177/I702** 984R
Feeds	963R
Feeds	**180/I701** 1430R
Feeds	1175R
RFO	1105R
Feeds	1020L

PALAPA C1 150.5E

CNBC	990Hz
Tests	1030Hz
Tests	1140Hz
Tests	1220Hz
Tests	1330Hz
Tests	1360Hz

Palapa C1 not reported last 30 days

Encrypted Analogue

Discov. India	**68.8/Pas4** 1365/Vt
ESPN	1290/Hz
ESPN (d)	**113/C2** 1030/Hz
HBO Asia (d)	1150/Hz
Discovery (d)	1430/Hz
TNT + (a)	**169/Pas2** 1218/Vt

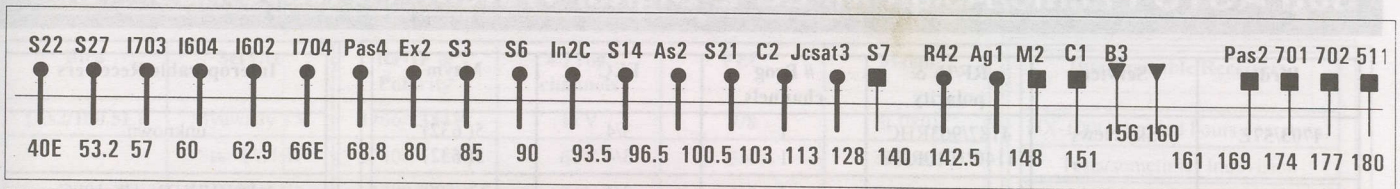
NON MPEG-2 DIGITAL SERVICES

People's Net (GI 1.5)	**113/C2** 1220/ Hz
RPN-9 (SA 1.5)	**142/G2** 1225L
Fox/ Prime (SA 1.5)	**169/ Pas2/** 1161/Vt
Filipino Channel (GI 1.5)	1060/Hz

NOVEMBER ALERT

ApStar 2R now testing (76.5E), reported Ku (12.640Hz) and C (3643 Hz). Thaicom 3 (78.5E) now testing through November 28 "regional" beam which could include Australia on 3425, 3465, 3505, 3545, 3585 (all Vt). Chinasat 6 (125E) reported testing 4140 Hz. Australian shake-up (or shake-out) of existing platforms: Watch B3 Hz 12.376, 12,563, 12.626, 12.689 for signs of unusual activity; and, PAS-2 Ku 12.280 and 12.300 Vt.

OP B3 T2 - 12341/1041 Vt
T2 - 12661/1361 Vt



OPTUS B3 156E (Ku only)

ABC WA	1358/Vt B-Mac
Central ABC HACBSS	1393/Hz B-Mac
Imparja	1355/Vt
MPEG Tests	1328/Vt
GWN	1300/Vt
Net 9, Sky specials	1233/Vt B-Mac
ABC NT/ Imparja N.T.	1201/Hz (centre) B-MAC
Galaxy	1137/Hz Irdeto Mpeg 2
Galaxy	1073/Hz Irdeto Mpeg 2

Optus A3/152E(a)

ATN7png	1297/Vt
ATN7png	1430/Vt

a/occasional use

Palapa C2 Ku (seen South equator)/113E

Test bars	11.148/Vt

MeaSat 2 148E

Tests	1070Hz*

* Colour bars , audio 6.8; C-band covers Australia., NZ

OPTUS B1 160E (Ku only)

Data	1402/Hz
QSTV	1377/Hz B-Mac
SE ABC HACBSS	1370/Vt B-Mac
SE SBS HACBSS	1344/Vt B-Mac
NE SBS HACBSS	1339/Hz B-Mac
NE ABC HACBSS	1313/Hz B-Mac
Sky Channel	1296/Vt B-Mac
ABC Radio	1276/Hz (digital)
OmniCast	1270/Vt (FM/FM)
ABC feeds	1247/Hz Pal
Sky Nz (sport)	1245/Vt VidCrypt
Net 9 feeds	1220H B-MAC
Sky Nz (Orange)	1218/Vt VidCrypt
Net 10	1182/Vt E-Pal
Net 9	1180/Hz E-Pal
Net 10 feeds	1155/Vt Pal
QTQ9	1145/Vt
Net 7	1120/Vt E-Pal
Net 9 feeds	1091/Vt Pal
Aurora MPEG-2	1076/Hz (tests)
CAA air to ground	1009/Vt Nbfm

(a) B-MAC encrypted, no access available; (c) MPEG, encrypted, access may be possible (d) B-MAC, subscriptions available in some geographic areas.

PAS-2 169E (C + Ku)

CCTV	1433.5/Vt (Sa9223)
Napa feed	1407/Hz
Value Ch.	1400/Vt
Discovery PowerVu	1374/Hz (Sa9223)
Napa feed	1370/Vt
AB Asia, feeds	1335/Vt
WCE-TV, feeds	1250/Vt
MPEG-2 PowerVu Sylmar	1249/Hz (Sa9223)
TNT+ (1/2Tr)	1218/Vt B-Mac
CNN+ (1/2Tr)	1183/Hz
FoxSports	1160/Vt (SA 1.5)
NHK	1115/Hz
Feeds	1105/Vt
Napa feed	1065/Vt
ABS/CBN (5 chs)	1064/Hz (GI 1.5)
NBC Mux MPEG	1057Vt (Philips)
MPEG-2 PowerVu HonKong	1002Vt (Sa9223)
TCS Sing.	967/Hz

see p. 27 detailed MPEG listing PAS-2

PAS-2 Ku

MediNet	12.280V
Telstra Bendigo	12.300V (MPEG)
Napa TC	12,415V
HiLife	12,582H
MTV Asia	12.604H (MPEG)

Intelsat 801 174E

Feeds	963R
Feeds	984R

Intelsat 702 177E

Feeds	963R
AFRTS	973L (PowVu)
Feeds	984R
Space TV Sys	12.612H (MPEG)

Intelsat 513 177W

Feeds	963
Feeds	984

(513 Ku)

Service	RF Freq.
US Nets	10.980V
NBC	11.015V
Feeds	10.510V

Ku Services
Intelsat Ku band services shown here are boresighted to Japan and nearby Asia, have not been reported south of equator.

TDRS5 / 174.3W

Fuji TV	1305 Hz
BBC World	1163Hz MPEG

Intelsat 701 180E(W)

TVNZ	955/Dmv 3000
TVNZ	964/Dmv
TVNZ	972/Dmv
TVNZ	980/Dmv
TVNZ	988/Dmv
Occ Vid.	1,020**
TVNZ	1,030
SCPC	1,054 **
RFO Tahiti	1,105
SCPC	1,126
SCPC	1,136
World-net	1,175
Vidiplex	1,220
Feeds	1,254
NHK(e), NBC	1,270
SCPC	1,326
10 Oz MCPC	1,385 (PwRvu)
CNN USA	1,430
Baccar.	1,439 **

* RHC & LHC
** LHC only
e/ encryption

(701 Ku)

NHK	11.135H
CBS	11.475H
CNN	11.508H

UPCOMING SATELLITE LAUNCHES

JcSAT 5 December 2nd
ChinaStar 1 December 7th
AsiaSat 3 to 105.5E December 12-18
Indostar 1/Cakrawarta to 106E S-band delayed

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 November 1997

Bird	Service	RF/IF & polarity	# Prog channels	FEC	Msym	Interoperable Receivers
I703/57E	Sky News	4187/963RHC 4140/1010RHC	1 1	3/4 3/4	5(.632) 5(.632)	unknown
I704/66E	CFI	4055/1095 RHC	4	3/4	27(.500)	N163/17X/2X, HS-100C
PAS4/68.5E	ART/RAI, BBC	3966/1184Vt	2	3/4	5(.632)	e3
	BBC World	3996/1154Hz	1	3/4	6(.620)	DMV, e3
	Channel 0/TVSN	3743/1407Hz	1	3/4	21(800)	? (MPEG-2, Iredeto)
	CCTV	3716/1434 Hz	6	3/4	19(.850)	Pv9223, N163/2X, HS-100C
Thaicom 78.5E	UTV	3920/1230 Hz	6TV (**#1**)	3/4	27(.500)	HS-100C, Philips, probably others (some chs now CA)
	UTV/MCOT	3880/1270 Hz	6TV (**#2**)	3/4	27(.500)	HS-100C, Philips, probably others (some chs now CA)
Measat 1/91.5	India Bouquet	12284/12346Vt	10+TV?	7/8	30(.000)	Philips
As2/100.5E	European Bouquet	4000/1150 Hz	6TV, 12 radio (**#3**)	3/4	28(.125)	DMV, HS-100C,Gng. N163. /17X/2X, N2000, P400**(b)**, P500. Pn520/630, Sk888
	Hubei TV (HBTV Main)	3854/1296 Hz	2	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Hunan TV (SRTC)	3847/1303 Hz	1	3/4	4(.418)	HS-100C,N163/17X/2X, N2000. Ph3950/11
	Guandong TV (GDTV)	3840/1310 Hz	1	3/4	4(.418)	HS-100C,N163/17X/2X, N2000. Ph3950/11
	Inner Mongolia TV Zizhiqu	3828/1322 Hz	2	3/4	8(.397) (1-China) (2-Mongolia)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	APTV London	3800/1350 Hz	1	3/4	5(.631)	DMV, HS-100C, N163 /17X/2X
	BBC Radio	3793/1357 Hz	?	?	?	(Receiver format unknown)
	WTN Jerusalem/ London	3790/1360 Hz	1	3/4	5(.631)	DMV, HS-100C, N163/17X/ 2X
	WTN London	3786/1364 Hz	1	3/4	5(.631)	DMV, HS-100C, N163/17X/ 2X
	WTN HK	3775/1375 Hz	1	3/4	5(.631)	DMV, HS-100C, N163/173/2X
	Liaoning TV (Service 2)	3734/1416 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Jiangxi TV (JX Sat TV)	3727/1423 Hz	1	3/4	4(4.18)	HS-100C, N163/N17X/2X, N2000. Ph3950/11
	Fujian TV (SETV)	3720/1430 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Quinghai TV Zenghou	3713/1437 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Henan TV Main	3706/1444 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
As2/100.5E	Sky Racing	4020/1135Vt	3TV	1/2	18(.000)	Pace DVS-211 (CA)
	EMTV	4006/1144Vt	1TV, 2 radio	3/4	5(.632)	HS-100C, N163
	Hallmark	3940/1210Vt	1TV	2/3	26(.650)	HS-100C, e3
	STAR TV (Hong Kong)	3900/1250 Vt	5TV (**#4**)	3/4	28(.100)	HS-100C, Pace DVS211(CA). DMV, N163*/17X+/2X
	Hei Long Jiang	3834/1316Vt	1TV	3/4	4(4.18)	HS-100C, e3
	AHTV	3820/1330Vt	1TV	3/4	4(.418)	HS-100C, e3
	"QQQ" China (Shaanxi)	3813/1337 Vt	1, 1 Radio	3/4	4(.418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Guangxi GXTV	3806/1345 Vt	1, 1 Radio	3/4	4(418)	HS-100C, N163/17X/2X, N2000. Ph3950/11
	Rebar TV Taiwan	3785/1365 Vt	5TV (**#5**)	3/4	18(.000)	Pv9223 (CA) [Video inverted?]

Bird	Service	RF/IF & Polarity	# Prog. channels	FEC	Msym	Interoperable Receivers
(As2/100.5E)	Myawady TV	3766/1384Vt	1TV	7/8	5(.080)	HX-100C (limited hours operation)
	Star TV HK	3740/1410Vt	6TV	3/4	28(.100)	Tests/sometimes Indovision
	STAR TV Hong Kong	3700/1450 Vt	8TV (#6)	3/4	28(.100)	Pace DVS-211 (CA). N163/17X/2X
C2/113E	Tests	11.500Hz	multiple TV	7/8	26(850)	Pace DVS-211 (CA)
	Star Indovision	3500/1650Hz 3580/1570Hz	20 TV (#7)	7/8	26(.850)	Pace DVS-211 (CA)
	Indovision	3460/1690Hz	6TV	7/8	21(000)	Pace DVS-211 (FTA?)
	MegaTV	3780/1370Vt	5TV (#8)	3/4	27(.500)	N2X/DVS-211(CA)
	Tiernan-1/PTV	3926/3935Hz	1TV	3/4	4(880)	N2X (occasional use)
Thaicom 1/120E	Thailand terres.	4120/1030Vt	6TV	2/3	27(.500)	unknown
AP1A/134E	AXN	4060/1090Vt	4	7/8	28(.330)	unknown
AP1/138E	Reuters	3732/1418Vt	1TV, data	3/4	5(.632)	N163/17X/2X
Palapa C1/150.5	Indovision	4117/1033Hz	10TV	7/8	26(.850)	same as 3580 C2
Optus B3 156E	Galaxy	12.438Hz 12.373Hz	20+TV (#9)	3/4	29(.473)	Gng, P400, P500, Pn520, + Pn630. Sk888 (c)
(if operating)	Aurora Test	12.564Hz	up to 6TV	2/3	30(.000)	e3, HS100C, PV9223
	Optus Vision	12.626 Hz	16TV, 8 radio (#9A)	3/4	29(.473)	(when testing is over, only IRDs with CAM)
(15/11/97)	Austar	12.689Hz	?	?	?	
Optus B1 160E	Aurora (MPEG test)	12.377Hz	5+ TV (#10)	2/3	30(.000) [27(.500)]	N163/17X/2X, Pv9223, HS-100C
	ABC Exchange	12.540Hz (.550, .560)	1 each	3/4	6(.980)	Pv9223, HS-100C, N2X (FTA)
PAS-2 169E	Telstra Bendigo	12.300Vt	3TV, 2 radio (#11)	1/2	10(.138)	Pv9223, N2X (some Pv CA)
	MTV Asia	12.605Hz	8TV	1/2	22(.490)	Unknown- Asia beam only
	Hong Kong PowerVu	4148/1002 Vt	8TV (#12)	2/3	24(.430)	Pv9223, HS-100C(*), N2X* (some FTA)
	NBC Hong Kong	4093/1057 Vt	7TV (#13)	3/4	29(.473)	HS-100C, Gng, N163/17X/2X, P400 (b), P500, Pn520, Pn630, Sk888
	JET Singapore	3962/1188 Vt	2TV (1-Ntsc, 2-Pal)	1/2	13(.740)	Pv9223 (CA)
	ESPN (USA)	3860/1290Vt	4TV, 2 control	7/8	26(.470)	Pv9223 (CA)
	CCTV China PowerVu	3716.5/ 1433.5 Vt	5TV (#14)	3/4	19(.850)	Pv9223, HS-100C, N163/17X/2X (FTA)
	TCS Singapore	4183/967 Hz	2TV (#15)	1/2	6(.620)	Pv9223, HS-100C N17X/2X (FTA)
	ITJ-Japan	4.174/976 Hz	1 TV	3/4	5(.632)	HS-100C
	AAR-ART/ RAI Int	4153/997 Hz	3TV (#16)	3/4	5(.632)	HS-100C, Pv9223, N17X/2X, (continues FTA)
	PAS-2 feeds	3940/1210 Hz	2TV(NTSC)	2/3	6(.620)	Pv9223, N2X, HS-100C
	California PowerVu	3901/1249Hz 12425Vt	8TV (#17)	3/4	30(.800)	Pv9223, HS-100C (*) N17X/2X (*), (some FTA)
	Satcom 1-6	3862/1288Hz	6TV	7/8	19(.465)	Pv9223 (CA)
	Disney/Aust.	3804/1346Hz	1TV	5/6	21(.093)	Pv9223 (CA)
	Discovery Singapore	3776/1374 Hz	7TV (#18)	3/4	21(.093)	Pv9223, HS100C, N2X (occasionally Ch. 2 FTA)
I702/177E	AFRTS	4177/973 LHC	8TV, 12 radio & data (#19)	3/4	28(.000)	Pv9223 (CA)
(may not be operating)	SPACE TV Systems	12.612/1312 Hz	13TV,11 radio (#20)	3/4	26(.694)	Pv9223,HS100C, P2X (All but 1 CA)

Bird	Service	RF/IF & polar.	# Prog. Chs	FEC	Msym	Interoperable Receivers
I701/180E	TVNZ Gennet (feeds)	4195/955RHC 4186/964 4178/972 4170/980 4162/988	1TV(CA) (BBC Gennet) 1TV(CA) (APTV/Tokyo+) (MTV Europe)	3/4	5(.632)	DMV, HS100C, N17X, 2X, e3 (for non CA chanels when active; not all chanels active all of the time)
	Americas	4175/975LHC	3+ radio (?)	3/4	3(.680)	e3, (CA)
	TVNZ CRY	4120/1030RHC	1TV	3/4	5(.632)	(see TVNZ above)
	Canal Plus	4091/1059LHC	1TV (?)	3/4	34(.368)	Sagem ISD2050 (?), CA
	Unknown	4088/1062RHC	unknown	3/4	28(.100)	e3, (CA)
	10 Australia	3765/1385RHC	6TV	7/8	29(.900)	Hs100C, e3, Pv9223 (5ch CA)

TVN3-MTV 3806/1344 3/4 5.632 28.896 e3, HS100C

Bouquets: **1)**Thailand UTV: (1) CNN, (2) TTV, (3) ESPN, (4) HBO, (5) Ch. 5, (6) itv; **2)** Thailand UTV/MCOT: (1) Ch. 9, (2) DIscovery, (3) Ch. 3, (4) TNT, (5) Star Sport, (6) Ch. 7; **3)** European Bouquet. (1) Deutsche Welle, (2) MCM, (3) RAI International, (4) RTVE, (5) TV5 Paris, (6) [when operating] Deutsche Welle special programme channel with MediaNet VBI included [lines 10-15, requires DMV M2/Pro/Txt board inserted in 3000 series receiver]; Radio (1) DW#1 (stereo), (2) DW#2 (stereo), (3) DW#3 (stereo), (4) YLE (left) & RCI (right), (5) SRI (l) & WRN (r), (6) REE, (7) DW#1 (stereo), (8) DW#2 (stereo), (9) DW#1 (stereo), (10) NN RA6, (11) NN RA8; **4)** STAR TV Hong Kong. (1) Sky News London , (2) Sports Contribution, (3) Channel [V] International, (4) Star Movies Japan [NTSC], (5) Star Plus Japan [NTSC] ; **5)** Rebar Taiwan. (1) "U1" [movies], (2) "U2" [news], (3) "U3" [sport, cartoons, general entertainment], (4) "Rock TV", (5) Tests [FTA]; **6)** STAR TV Hong Kong. (1) Channel 6, (2) ESPN Contributory, (3) Racing Ch., (4) Star Movies SEA, (5) Star Chinese, (6) NBC, (7) CNBC, (8) Sky News, (9) VIVA Cinema; **7)** Indovision. (1) HBO Asia, (2) STAR Movies SEA, (3) Film Indonesia, (4) MGM Gold, (5) ESPN Asia, (6) STAR Sport, (8) Channel 'V' International, (9) Channel 'V' Asia, (10) RCTI, (11) STAR +, (12) Discovery, (13) STAR Movies and NBC Asia, (14) Phoenix Chinese, (15) CNN, (16) BBC World, (17) CNBC, (18) Cartoon + TNT, (19) Preview 1, (20) Preview 2; **8)** MegaTV. (1) CNNI, (2) Discovery, (3) ESPN Asia, (4) HBO Asia, (5) Cartoon + TNT, [(6) MGM Gold, (7) Cinemax (6-7 may not be operating]; **9)** Galaxy. Presently 20+ programme channels. **9A)** Optus Vision tests of 16 programme channels, programming decisions to be finalised; **10)** Aurora. (1) SBS NT, (2)SBS NE, (3)SBS, (4) Sky News, (5) ABC WA ; **11)** Telstra Bendigo. (1) Imparja, (2) ABC, (3)ABC radio, (4) Imparja radio, (5) ABC TV FTA ; **12)** Hong Kong PowerVu. (1) CTN 1, (2) CTN II, (3) TVBI Hong Kong, other feeds [NTSC], (4) **Ad-hoc 1 PA** [PAL], (5) **Ad-hoc II** [NTSC], (6) **ABN**, (7) CTN II, (8) CTN; **13)** NBC Hong Kong. (1) CNBC, (2) CNBC Mandarin A, (3) NBC Asia, (4) colour bars, occasional feeds, (5) CNBC Mandarin B (6) NBC "2" Asia/Taiwan, (7) Colour bars, "future" use; **14)** CCTV China. (1) **CCTV4** , (2) **CCTV3** [(3) **CCTV 9**, (4) **CCTV4**, (5) **CCTV5**, (6) **CCTV8, (7) CCTV tests** ; **15)** TCS Singapore. (1) **TCS Test**, (2) **TCS Default** [repeats channel 1]; **16)** SCPC3. (1) ad-hoc use, (2) AAR/ART, (3) RAI International; **17)** California PowerVu. (1) **CMT**(NTSC), (2) **CBS feeds**, others including CTV Canada (NTSC), (3) ATN Asia TV Network(NTSC), (4) **EWTN** (NTSC) global Catholic radio, ch. 2, (5) **BBC World** (NTSC), (6) **Bloomberg Financial** (NTSC), (7) Golf Channel (NTSC), (8) TEST(NTSC); **18)** Discovery. (1) Disc. Aust/NZ, (2) **Disc. default**, (3) Disc. Japan, (4) Disc. SE Asia, (5) Disc. Taiwan, (6) Disc. Philippines, (7) Disc. China; **19)** AFRTS. (1) News, Sports [ACII, CW, RR, 9.6 kbps, TV], (2) Spectrum [Urban, 64 kbps], (3) AFN Pacific [TV], (4) Channel 1 - Mirror [TV], (5) AFN Korea [contingency, 1.536, TV], (6) The Jim Lambert Test Channel [!!!], (7) EPG, voiceline, (8) EPG, u/i voiceline, (9) AFN Atlantic [Top 40, HR, NPR, TV], (10) AFN Americas [Top 40, TV], (11) AC1, (12) Country, (13) Adult Rock, (14) NPR [US National Public Radio], (15) Urban, (16) Pure Gold, (17) Top 40, (18) Hard Rock (19) Contingency.; **20]** SPACE Systems (177E, Ku) is either off the air or very limited in programming. Reports of Exxxtasy and True Blue (adult) services being back but in ViaAccess CA are not verified. SPACE Systems is defendant in Taiwan lawsuit involving their rights to export Taiwan terrestrial TV services CTV, CTS, TTV and others and may not be with us much longer. NOTE: Listings in **bold face** are PowerVu transmissions that are typically (but not always) FTA (free to air). Note 2: At presstime, all SPACE TV System services except Formosa TV News are CA, but status changes weekly..

MPEG-2 DVB RECEIVERS: [Data here is believed accurate; we assume no responsibility for errors in this volatile area!]

DMV/NTL 3000. Skandia Electronics Pty Ltd (tel 61-3-9819-2466)

Grundig (Gng) DTR1100 (badged Panasat 630, believed no longer in production). Av-Comm Pty Ltd (tel 61-2-9949-7417)

Hyundai-TV/Com. Model HSS-100C is officially available from Pacific Satellite (tel 61-7-3344-3883) , Skandia Electronics (tel 61-3-9819-2466), and Bay Satellite TV Ltd (tel 64-6-843-5296). Current version of chips 2.25.

Nokia 9500 S (V1.63). This version is no longer available although it had ability to identify Msym and FEC parameters of unknown carriers. (V1.7X) was a German language "d-Box" version originally imported by OPAC; it functioned with the same parameters as the V1.63. (V2.X; 2.233/e3, 2.034 and others perhaps not yet identified) are current (after June/July) software versions that allow virtually unlimited stacking of bouquets and programmers and for at least the 2.233 version also allows limited red menu correction of NTSC glitch (see SF#36, p. 6). e3 is current Asia-Pacific factory version. Factory supplied sources known include: AV-COMM Pty Ltd (Tel 61-2-9949-7417); SCITEQ (61-8-9306-3738); Telsat (64-6-356-2749). AV-COMM also has macro-command IR remote that expedites 'red menu' operations for e3 version 9500 S. (see SF#36. p. 32).

Nokia "d-box" (V1.7X) suitable for C-band use. Instructions, on-screen prompts may be in German. No longer available.

PACE DVS-211. Officially available only through Sky (racing) Australia (Bob Pankhurst tel 61-2-9451-0888].

PACE DGT400. Through Galaxy offices, Australia.

PACE DVR-500. Bay Satellite TV Ltd. (tel 64-6-843-5296); also supplied by NBC to affiliates.

Panasat 520 (Pn520). OPAC Pty Ltd (tel 61-2-584-1233); no longer available.

Panasat 630 (Pn630). Antares Satellite (61-7-3205-7574); no longer available

(Panasat) 642. A notation - The (642) will not be released except in South Africa and only after start of 1998

PowerVu D9223 et al. Scientific-Atlanta (Sydney) Tel 61-2-9452-3388; BaySat (tel 64-6-843-5296), Telsat (64-6-356-2749)

ProSat P-2000. Available late Nov; Msym 1-45, no CAM. Antares Electronics Pty Ltd. (tel 61-7-3205-7574)

SAGEM ISD2050. SAGEM SA, Mrs. Salima ALAOUI (tel 33-1 40 70 63 63)

Samsung VS-2000 (ver 1.31). Pacific Satellite (tel 61-7-3344-3883)

SK888. Skandia Electronics Pty Ltd. (tel 61-3-9819-2466)

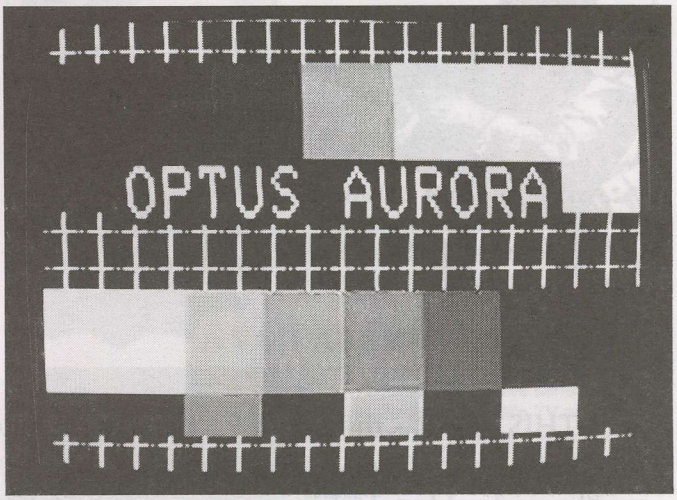
WITH THE OBSERVERS

AT PRESS DEADLINE

EMTV's analogue service (As2, 3765 Hz) ceased November 8 with full reliance now on PowerVu MPEG (As2, 4005.5 Vt). Signal shares with Sky Racing, is several dB lower (at presstime) than other vertical side services. Hyundai will load (for now), Nokia e3 will load but may not display. One video, one radio only service.

Australians should benefit from the activation of ApStar 2R (76.5E) as it rolls through testing (3643 Hz and others at presstime). ApStar, while commercial, is basically owned and operated by business arms of the Chinese government. You can try talking with them at their TT&C station (no. 22, Dai Kwai St., Tai Po Industrial Estate, New Territory, Hong Kong; tel ++852-2663-3058 and fax ++852-2666-7838). And anyone who tumbles into information about their proposed transponder loading is asked to pass it along to SatFACTS for sharing!

Aurora platform testing, still the preferred distribution format for Australia's ABC, SBS and perhaps others, tested briefly on Optus B3 (12.563.5 Hz, Msym 30.000 and FEC 2/3) in addition to the established B1 12.377 Hz service. Not yet defined, whether Aurora will attempt full national coverage using one high powered beam or revert to "cluster coverage" and using multiple beams. For spectrum conservation, one "national" makes the most sense and carries the added benefit of being available beyond the shores of Australia with suitable dish size and careful attention to feed and LNB selection/installation.



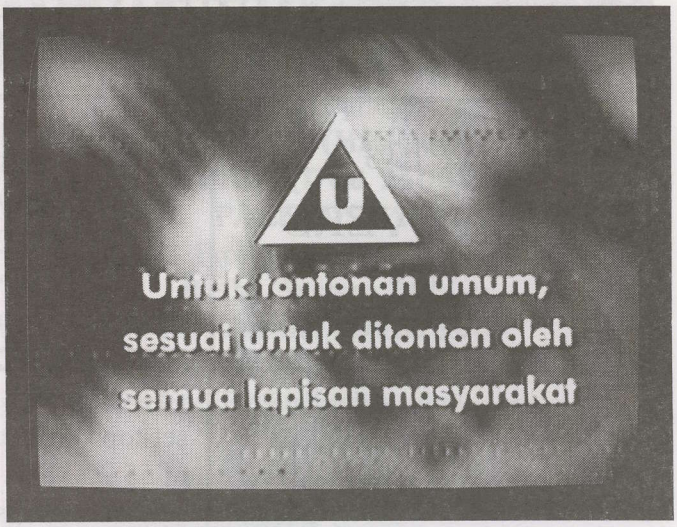
Aurora platform (by Optus) now testing using DiviCom uplink equipment on B1 12.377 Hz is to be format for ABC, SBS and other HACBSS services throughout Australia.

Not everything coming down from satellite these days in digital form is TV programming. One rule of thumb (which is not perfect): If the Msym rate is below 4.XXX, chances are you are tuned to a data or otherwise non-video service. Example: **Francis Kosmalski** (Auckland) and several others have located a very strong SCPC type of signal on I1701, 180E, 4175/975 LHC (opposite to most of the normal traffic on RHC) with a Msym of 3.680 and FEC of 3/4. A similar signal was earlier in the month reported on the same satellite at 4186/964LHC (but with Msym of 5.632 and FEC 3/4). Both signals when loading into a Nokia 1.63 advise the following (audio/data?) channels on board:

(1) New Sports/voice/stereo; (2) Pacific/UI voice/Ster2; (3) Stereo service 2.

Kosmalski and others report they have seen video "PIDs" when they check these signals with an SA-9223 which would normally indicate a video signal (or two) buried in there someplace as well. Kosmalski wonders if anyone has been able to determine the actual format and content of this service.

Another interesting I1701/180E digital feed comes up at 4088/1062 LHC (again, not RHC). On a Nokia 1.63, the parameters are 28.100 and 3/4 (which are Murdoch service numbers such as one finds in use for STAR TV on AsiaSat 2) but nobody has been able to get a menu listing of the content of this MCPC to date. Again, any hidden knowledge out there? The amount of SCPC and MCPC traffic on 180E is



Linguist? What is the language, and, what does it say?

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for December15th issue: December3 by mail (use form appearing page 34), or 5PM NZST December 4th if by fax to 64-9-406-1083.

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considerable and alert observers are just now beginning the task of untangling it all.

Observer **Steve Jepson** (NZ) suggests RFO on I701 has gone down in level since the initial turn-on of this new to location satellite early in September. He also advises finding CNN Newsource in MPEG digital on a Nokia e3 at 3765/1385 RHC (Msym 29.900, FEC 7/8) in Australia's Net 10 service. **David Leach** (NSW, Australia) also with a Nokia e3 reports 'Encode (Ch) 5' in this set often is FTA with USA net feeds. Anyone else?

Still on I180, **Stu McLeod** (Napier, NZ) reports finding TVNZ MPEG feeds on 4186/964 RHC on a Hyundai HSS-100C, "*in the clear with BBC domestic programming feeds over most of the weekend*" (November 1-2). TVNZ feeds (as many as five different SCPC frequencies are used; see p. 28) appear to be mostly CA with the exception of the MTV feed from Europe (4162MHZ, RHC).

Finally on 180E, Pacific Skylink occasional video services in FTA analogue (test card) is found on 4129.5/1020.5 LHC.

Gregorio V. Hermosa, Jr. (Sultanate of Oman) reports that contrary to reports, the Indian ISkyB service is not testing and not on the air on PAS-4 Ku. The Indian government is considering legislation which could, ultimately make it illegal for ISkyB to operate into India (by outlawing any representatives from collecting money from Indian users). The proposed law is scheduled for early 1998 hearing. He also reports a 90 cm dish in Oman equipped with a Nokia e3 receiver, suitable LNBF, dish stand, cables and installation of the system sells for list (US)$1,022. Among the recoverable signals, 10 digital channels from European Hot Bird 2 at 13 east.

Thaicom 3 at 78.5E, a bit close to ApStar 2R at 76.5E, may have worked out an arrangement so that neither satellite duplicates the frequency and polarisation of the other to avoid interference problems on the ground. Considerable MPEG-2 testing has been reported on 3560 Hz (and other frequencies) by western Australian observers (**Peter Merrett** and others). Australians should watch vertical polarisation at centre frequencies of 3425, 3465, 3505, 3545, and 3585 for testing of "regional beams" through the end of November. Thaicom 4 which had been scheduled for 1998 launch is now rescheduled to 2000 because of economic problems in Thailand.

Latest Palapa C2 programmer: Baztab TV on 3800 Hz is apparently only transmitting from 17.30 to 18.30 UTC.

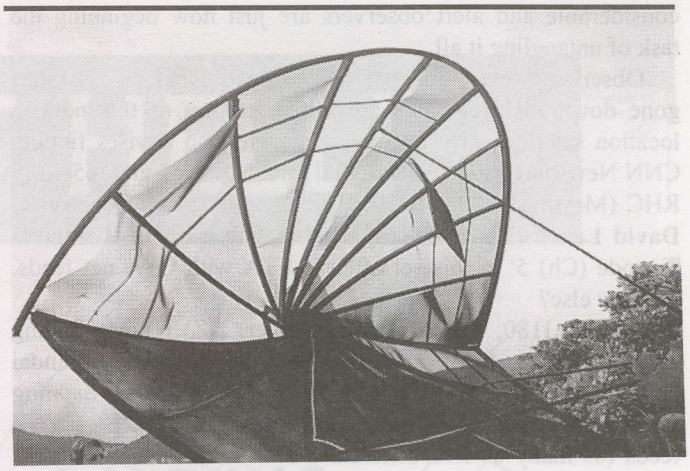
As previously announced in SatFACTS, Australia's 7 Network is planning major increase in domestic Australian content on Palapa C2 ATVI service; first programming changes took place November 1st. Expect more 7 Network news, sport and Australian drama.

New Chinese SCPC's operating: AHTV 3820/1330 Vt and Hei Long Jiang TV on 3834/1316 Vt; both are 4.418 and 3/4. More SCPC services are reported on the way - an eventual goal of 26 is reported, to represent each of the political areas (old provinces) in China.

Chinasat 6 is finally reported active: Try 4140 /1010 Hz at 125E (test bars and 6.6 audio). South of the equator? No reports yet.

"*The last 10 Chaparral 17 degree Sidekick LNBs on planet earth are just now clearing NZ Customs*," reports **Telsat Communications** (64-6-356-2749). Pity this excellent performing piece is no longer in production. Chaparral started in the DTH hardware business with a single feed in 1979; all good things eventually come to an end.

AT Sign-off



Service after the sale? Hong Hong's David Weaver (Satellite Television Rentals Ltd) had his hands full repairing other people's bad installs following a typhoon. Below - the storm "drove" the actuator drive rod clear through the bottom of this housing.

Life is a Bitch - and then you die

A paranoid person could find much to be distressed about in the satellite TV world. For example, these newspaper headlines from Australian dailies just days before we go to press:

"*Australis execs seek help in Hollywood*"

"**Hollywood warning on Australis**"

"*Foxtel refuses funds but Australis keen*"

"**Australis sacks 140 as merger hopes fade**"

Satellite and MDS pay TV pioneer Australis (Galaxy) has much to be proud of. And not a little to be ashamed about. They have world-pioneered technology (Irdeto conditional access DTH) and against significant odds managed to put together a programming package which in most regions of the world would be enviable and a top-rated seller. When one compares the Galaxy DTH / MDS consumer package (16 to 20 channels) against the trans-Tasman Sky service (4.5 channels) at about the same (local currency) $50 per month, Galaxy has to be declared "the winner." Their technology has largely worked (MDS coverage disappointments and new IRD teething problems aside) but pitted against the combined giga-bucks and management staff pros at Fox and Optus, their marketing has been a disaster.

Not that Fox(tel) and Optus (Vision) have exactly found their competitive-to-Galaxy cable operations profitable. They have not and the combined "losses" (money spent on day to day operations against money taken in for services delivered) top A$2 billion as of September; and climbing.

Clearly, the Australian pay TV market cannot support three competitive players. In fact, two is probably overkill in a "country" that has only half the population of the state of California. New Zealanders have no room to gloat about their home grown Sky Network service; it has "lost" nearly NZ$150 million since it started up seven years ago. Indeed, Sky has never had a profitable year.

Pay TV - the universe that includes pay cable, pay satellite and pay MDS (microwave) has only managed to be profitable in a tiny percentage of the operations begun to date. The Australian (and New Zealand) "experience" is hardly unique; Malaysia, Indonesia, South Africa, even the USA have yet to figure out how to turn regular profits at DTH and MDS (the US *cable* industry makes money, but not as much as they would like you to believe). Only Rupert Murdoch's UK based BSkyB claims to be making really significant profits but BSkyB accounting is so interwoven with Murdoch's broadcast TV, newspaper and magazine publishing ventures that nobody - not even his accounting department - might be able to prove their claims under close scrutiny.

So *who* is <u>really</u> making money in the pay TV game? Certainly some of the larger programmers must be (CNN, ESPN, Discovery et al). *Possibly* some of the equipment suppliers (although recent financial reports from Scientific Atlanta, for example, indicate their profit margin is very slim indeed). Satellite operators? It is difficult to be know about PanAmSat, in one case, because they (like Murdoch) keep raising new money for new projects so often that one cannot be certain day to day operations are profitable. (Yes - their annual reports look glowing but when you continually raise hundreds of millions of dollars to build new satellites, who can be certain the funds being raised are not at least partially being used to keep the door open day to day?)

What does all of this have to do with you and I? Equipment and programming. If Galaxy were to fold up, there goes jobs for thousands of people and entertainment for more than a hundred-thousand homes. And a big black mark for any project involving "pay TV." Even the little ones that keep you and I out of trouble.

If Nokia shuts down distribution of their receivers in Asia and the Pacific (see p. 4, this issue), who does that hurt? You and I. Because Nokia receivers, for their perceived faults, are head and shoulders ahead of what will flow in to replace them. A recent industry visitor to Taiwan saw not one but six different "Nokia knockoff" models on display by six unrelated firms. "*What will they be called?*" our friend enquired. "*What name would <u>you</u> like us to put on them*?" was the answer. One firm offered to "private label" the Nokia knockoffs in a "production run" as small as 100. So we could - in say 90 days time - be faced with a bewildering choice of all-the-same "inside" (but cosmetically different outside) IRDs. Service after the sale? Now *that* is optimistic!

We are victims of technology run amuck; it is as if satellite television is being reinvented every 12 to 18 months with brand new everything. *Service*? Good luck!

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• NEW programming sources seen since Nov 1st: _____

_____

• Changes (signal level, transponder, programming content) in pre-existing programming sources since Nov 1st: _____

_____

• OTHER (including changes in your receiving system): _____

_____

NOTE: Please use P1 - P5 code when describing signal levels and receiver IF/RF settings.

Your Name _____ Is this contest entry? _____
Town/City _____ _____ _____
Make/size dish _____ LNB _____ Receiver _____
Bonus Word Entry: _____ on page _____

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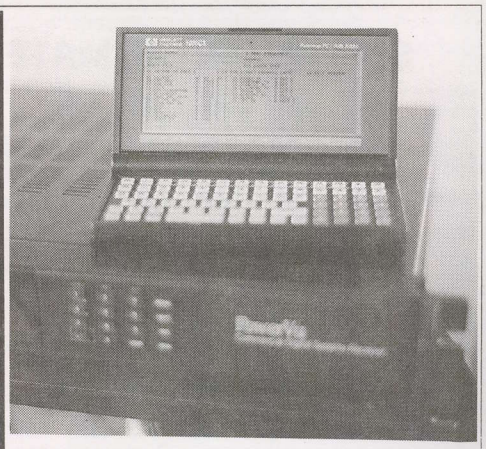

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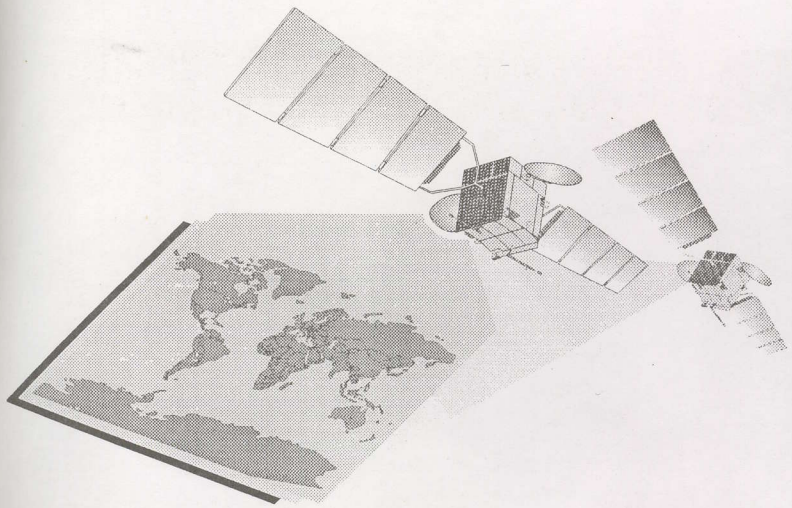

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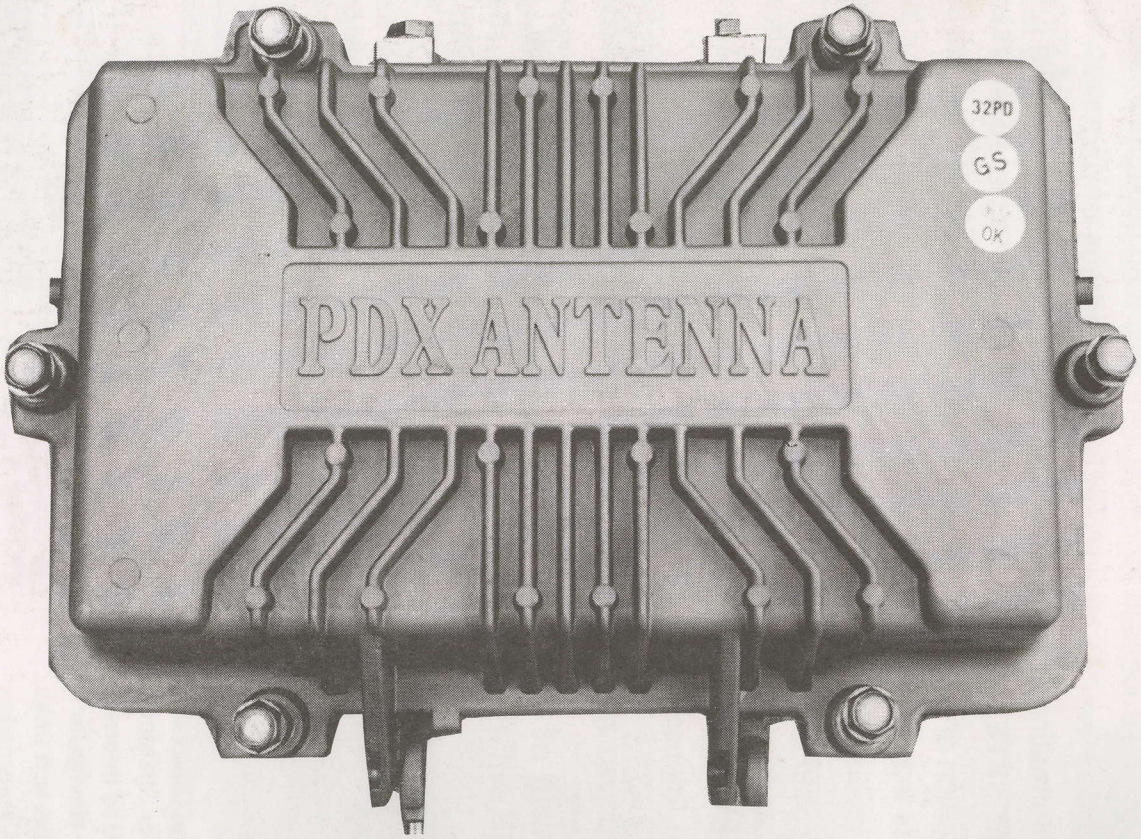

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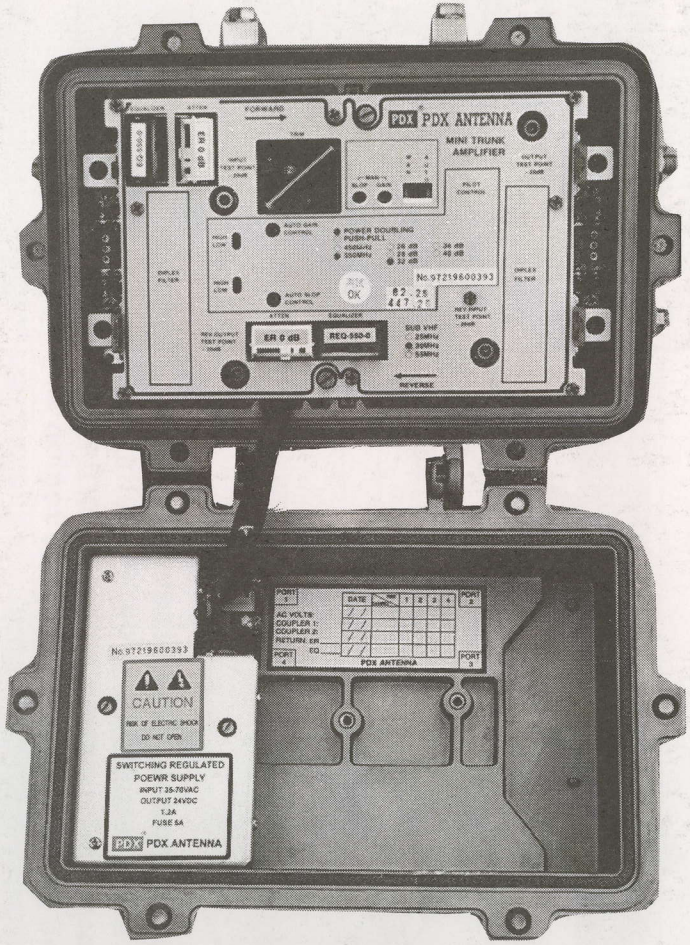

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