17-12-99 9AM

Bob Cooper's

DECEMBER 15 1999

# SatFACTS

## MONTHLY

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

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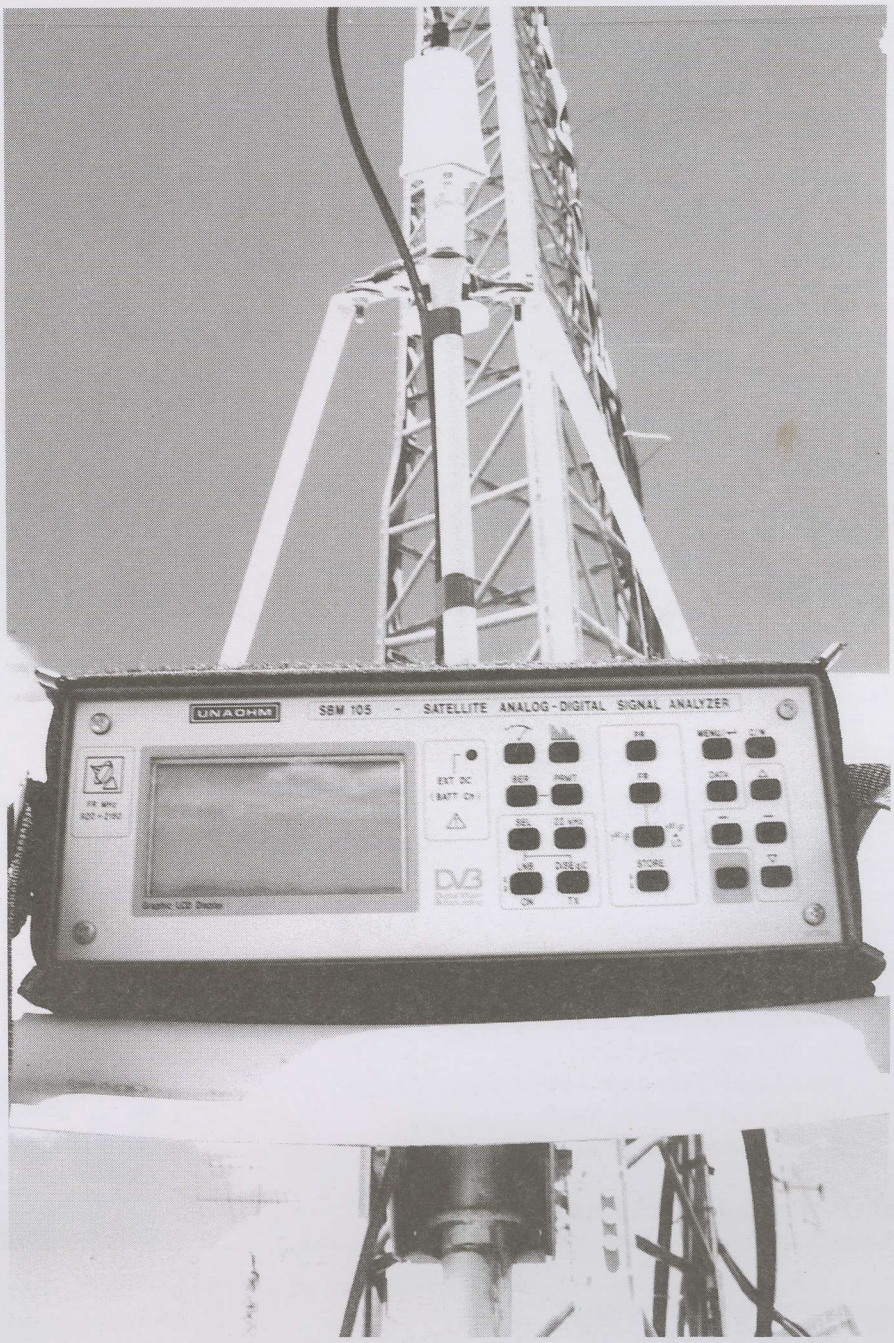

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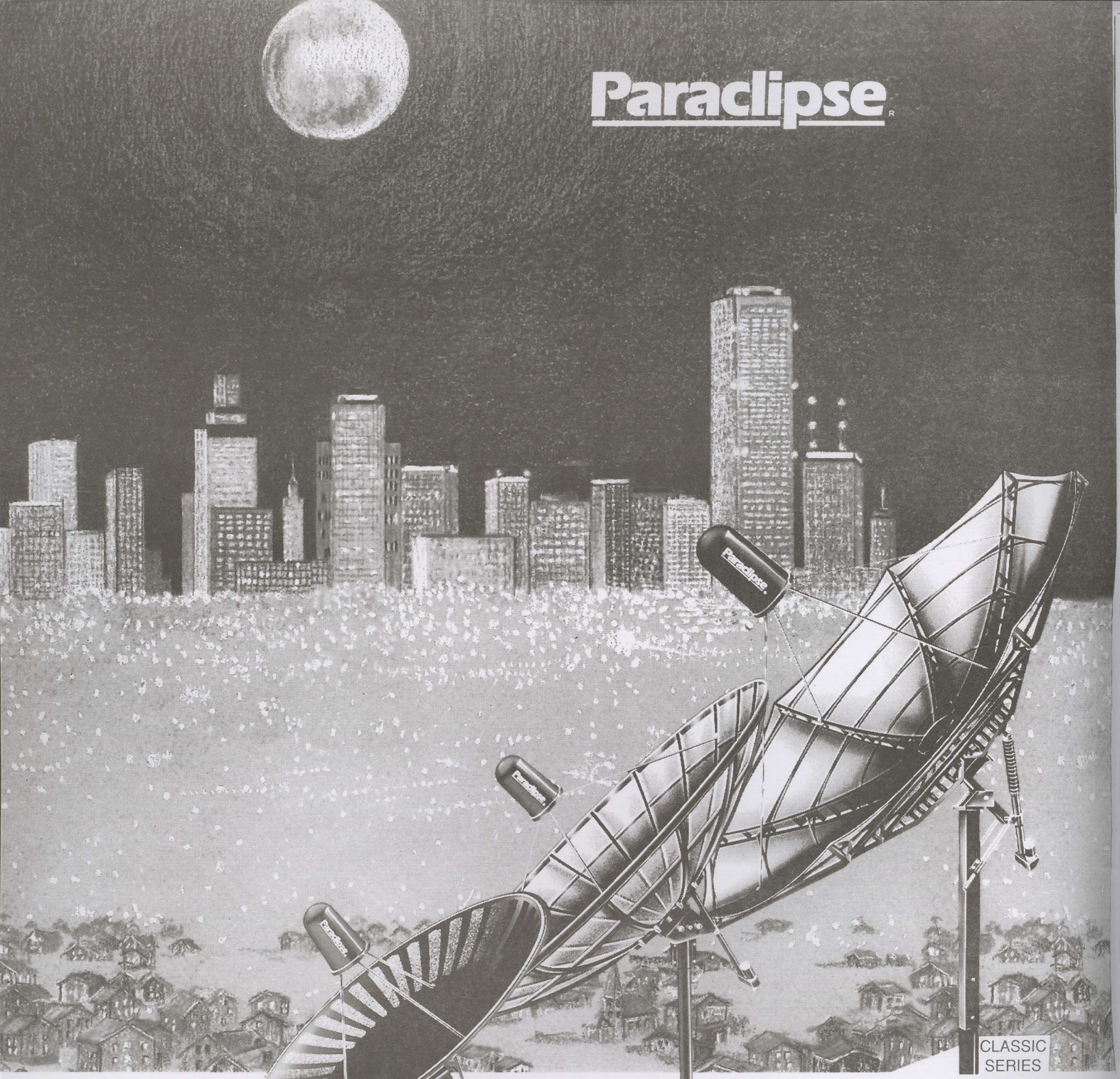


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*(updated December 15, 1999)*

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**TB 9405 SMATV Systems**

**Satellite to room - Commercial SMATV (Satellite) Dish Installations.** The easy part is the satellite dish or dishes. The difficult challenge is getting all of those signals - including the terrestrials - balanced and into every room and each TV outlet at the proper level. If you plan to do multiple-outlet systems, start here with this Coop written tutorial. LtdQty and only $10 per copy while they last! (SPACE discount)

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## SPACE Pacific Order Form (also see SPECIAL PACKAGES on reverse side)

Please send the following:

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I wish to pay this by ☐ cheque (enclosed) ☐ VISA card ☐ Mastercard

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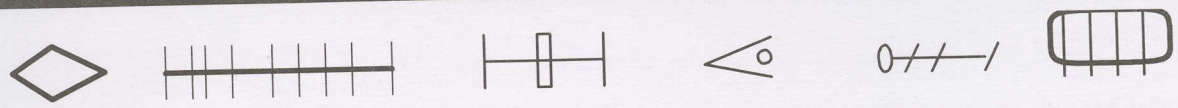
# SPACE Pacific Terrestrial TV Reference Materials



*Each of these editions researched, created by "Coop" to help you solve tough aerial problems*

| | |
|---|---|
| **TB 9301** | **Tech Bulletin 9301**. *Co-Channel & Antenna Phasing*. How to grow a single antenna (Yagi, broadband antenna) into a complex array to greatly increase gain, sharpen receiving pattern to eliminate co (same) channel interference. Totally hands-on, very practical, up-to-date. Go from novice to professional! |
| **TB 9302** | **Tech Bulletin 9302**. *Weak Signal Reception Techniques.* If one cut-to-channel (Yagi) antenna won't do the job, will 2, 4 or 8??? How about 16? Stacking antennas, mating with carefully selected masthead amps, is an art. This explains how to do it for professional results up to 300 km from TV stations. |
| **TB 9303** | **Tech Bulletin 9303**. *UHF - The Frontier*. Using parabolic style antennas surfaced with low-cost poultry mesh, build UHF dishes up to 40 feet in size to extend UHF off-air reception out to 300 km. And - learn the tricks to "squirt" signals from a hilltop to a valley below using low-cost receiving equipment. |
| **TB 9304** | **Tech Bulletin 9304**. *Beating Noise Interference & Combining Cross-Pole Signals*. When TV and FM signals are weak, man-made interference from appliances, power lines can kill reception. Step-by-step instruction for identifying, locating, fixing noise sources + unique method of combining cross-pole TV signals. |
| **TB 9305** | **Tech Bulletin 9305**. *Cable Television - Fact & Fiction*. The story of how a cable TV system is designed, built, operated. The perfect "So this is how it works!" report. Who knows - you might even like the concept so well you take out a mortgage on your home and wire your town! |
| **Lost Art** | **Lost Art of Rhombic Antennas** *-27 dB of gain VHF & UHF*. Everything you need to know to build the most sensitive VHF-UHF receiving antenna ever created. Rhombics are used for virtually all long haul military circuits. Includes super-Rhombic LaPorte design. 300 km? A piece of cake! |
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| **Half-Bolics** | **World-Famous Frias Half-Bolic Reflector**. Amazing design allows simultaneous reception over sizeable arc of transmission locations. City grade (80 dBuV) reception from distances of 280 km on VHF (45 MHz) through UHF (900 MHz). This is huge, but easily the best all-around deep-deep fringe antenna system. |
| **Raw Video** | **SPRSCS '99**. SPACE shot many hours of video during SPRSCS '99 to prepare for the (now available) 9901 - 9904 one-hour TV shows. In "Raw Video" you have everything shot, before editing, including material done by Robin Colquhoun for the Dr Overflow software explanation - all reshoots and mistakes! 4 hours, PAL. |

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☐ TB9301/9302/9303/9304/9305 - $40 -or- ☐ Rhombic/ 20-40' Dishes/ Half Bolics - $50 -or-

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Video: ☐ Space Raw Video/$35: ☐ SPACE Videos - 9901-9908 + Raw Video/**3 tapes** $135.

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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


**December 15, 1999**

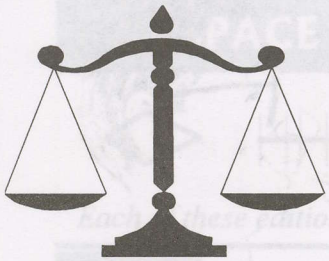

Of all the events reported in these pages over the first 349 days of 1999, none approaches the emotions attached to the arrest in Thailand of Rolf Deubel, alias MadMax of MOSC fame.

Catching him in the act of logging and recording Thai broadcaster UBC's data stream at the home of a Thai confederate (identified only as "Chatinon" by court records) was the first step in puncturing the cloud of secrecy the shrouds the card piracy world. Deubel carried with him a laptop computer and the hard drive containing thousands of entries connecting him to piracy card clients, sources and software hackers around the globe. Mindport - the Irdeto encryption people - promptly began the task of "dumping" the hard drive and cataloguing this gold mine of information. Not only had the Thai authorities apprehended a man responsible for Irdeto smart card piracy in Africa, Europe and Asia - they had his files and records!

Within days a Europe piracy card source was closed up by authorities - the assumption being the MadMax hard drive lead to them. Within six weeks, two more very well known European piracy card sources were visited by a team of investigators backed by Mindport and French Seca, a competitive conditional access program. Between his September arrest and early December, card enthusiasts who know they are on the hard drive because they had been in email correspondence with Rolf Deubel prior to his arrest, have received unsolicited communications from a group calling itself IPRP - Intellectual Property Rights Protection out of London. Early in November, Deubel's home was entered by South African Police carrying search warrants. They left behind a very confused Conny Deubel (Rolf's wife) carrying a home PC, computer discs and written files out the door with them. A December 8th advisory from Mindport to me says, "*Mad Max's Cape Town home was raided and a computer and its hard drive were handed over to Mindport and are currently being analysed.*"

Against what must by now be an incredibly valuable (to Mindport) collection of data it was with some surprise that Deubel and Chatinon appeared in a Thai court November 3rd and were told, after pleading guilty to the initial charges, they could be freed upon payment of a BAHT 200,000 fine (US$4,822 at the time). If that sounds like a very gentle slap on the wrist, and if that sent Deubel's hopes soaring, it was short lived. Within minutes of paying the fine (using money borrowed from a Thai man he met while in jail awaiting trial), Deubel was rearrested and charged with new crimes. In the first set of charges, the plaintiff was Mindport - the encryption company. The new charges were brought by UBC - the Thai pay TV broadcaster. Both cases deal with alleged violation of the 1994 Thai Copyright Act which allows separate charges to be filed on behalf of each and every copyright owner "violated."

And because UBC like most pay-TV services features many American made films, this lead to additional charges being filed on behalf of the MPAA - Motion Picture Association of America, early in December. In theory, each movie and TV programme copyright owner with product on UBC could be standing in line to bring their own charges against Rolf Deubel. With his admission of guilt for the first charges brought by Mindport, it will be difficult - perhaps impossible - for him to now deny he is not guilty of copyright violation. About which Mindport tells SatFACTS, "*He has* (again) *been denied bail, pending a trial on a date as yet unspecified. It is quite likely he will see the new Millennium in a Bangkok jail.*" Emotions aside, there is a very heavy message here and it certainly is not "Happy New Millennium from Mindport."



## LETTERS

84 and watching

"Having watched the first four editions of SPACE Pacific Report, I congratulate you for your initiative in providing much needed practical information. Although I am now retired (and 84 years young), I try to retain the ability to learn and to enjoy new hobbies or to extend the scope of existing activities having held an amateur license since 1954 (VK7LR)."

Athol Manning, Devonport, Tasmania

Funny numbers

"In the Analogue Watch column RF/IF & Polarity' you give a pair of 4 digit numbers. I understand the first set - RF or downlink frequency which I use to tune in a particular station. However, the second four digit number baffles me - what is it for? I also understand the suffix V and H, but R and L also mystify me. And am I correct in assuming all of the frequency information given in Analogue Watch is for C-band (only)? How would I know if it was for Ku? Finally, I have been struggling to tune in I701 and I702 - the receiver registers a strong signal but no real picture. The dish is 3.8m with dual actuators, digital + analogue receivers."

Doug Hancock, Australia via email

**While many receivers ask you for the C-band downlink frequency (such as 3675) some require the intermediate frequency (IF) which with 3675 is 1475. You find the IF or so-called L-band frequency by taking the local oscillator frequency of your LNB (typically 5150 at C-band) and subtracting the C-band downlink frequency (5150 - (minus) 3675 = 1475). With Ku band, you reverse the process - take the Ku downlink frequency (such as 12,300) and subtract the LNB's LO (such as 11,300) - 1,000 MHz in our example. R stands for right hand (circular) polarisation, L for left hand (circular). Intelsat and Russian satellites employ neither vertical nor horizontal at C-band - rather they "twist" the polarity into a spiral (circle) which rotates around a central axis. Attempting to receive a R(HC) or L(HC) polarity signal with a standard V(ertical) or H(orizontal) linear feed results in only getting 50% of the signal present - a 3 dB loss which makes a 3.8m dish act like a 2.4m dish. Moreover, both the V and H positions respond simultaneously to L and R signals which would be like getting V and H at the same time on PanAmSat or AsiaSat - not good as they interfere with one another and the receiver cannot decide what to do with the extra signals. A feed that responds individually to vertical, horizontal, LHC and RHC is a specialised item - try ADL (p. 5 here).**

**NHK?**

**"I have a potential Japanese customer - who handles NHK subscriptions to NHK-joho?**

Basil Davoren, SatDav, Gisborne, NZ

NHK IRDs (SA D9234 typically) and JoHo subscriptions are through Telsat Communications (64-6-356-2749).

# PROGRAMMER PROGRAMMING PROMOTION UPDATE

**December 15, 1999**

**The big one.** For several years we have been warned that something called the "Y2K Bug" would spoil planet earth's much anticipated celebration of year 2000 on the Gregorian calendar. The magic hour will be 2359 local time on December 31. Millions of computer operated functions will be on the line as the earth rotates to the east and on 24 separate occasions 1/24th of our planet's surface finds itself facing 2359. While many will argue which point of land will be first to record sunrise on 01/01/00, the TV networks have it figured out - New Zealand, Gisborne on the NE coast of North Island to be precise, gets the "prize" for being the point from which major networks (such as CNN) have installed portable uplinks to start the celebration coverage. Never mind Gisborne is not the first spot - to billions of TV watchers, it will be so because CNN, BBC, Sky News and virtually every other news service will say it is. But sunrise on 01/01/00 is a minor backdrop to the real story - which computer functions in New Zealand will fail because of Y2K? With the speed of International satellite links, viewers world-wide will be exposed to time zone after time zone as the sun marches west heading for Europe and North America with the precision of an atomic clock. In your lifetime - there will never be another event like this one; a "made for TV special" that allows the boys and their toys to show off the modern technology of the 21st century. CNN and others will be good for the uninitiated but the REAL fun will be on those feeds appearing on I701, PAS-2, PAS-8, AsiaSat 3 and AsiaSat 2. Check our digital and analogue "Watch Tables" at the rear (and special list on p. 34) for Reuters, APTV, CNN, Mediasat, ABC-USA, CBS-USA, NBC-USA and Fox-USA service links which will be filled to overflowing and at increasing tempo as 01/01/00's first sunlight moves relentlessly west. This is the reason you have a satellite terminal - to be "inside" the news as it happens, and more important, watching feeds which the average home viewers will never see - in their entirety or at all. Phones out in Auckland? Electricity down in Sydney? Planes circling Singapore with no communication? Street riots in Bombay? Looting and burning in Cairo? *Look out London, New York and Los Angeles* - **Millennium is on the way!**

**EBB turmoil.** Out of the chaos we report on p. 30, hints that a sixth TV channel is planned and the PMT changes noted were in preparation for that happening. EBB is silent - about everything.

**2002 World Cup.** Here's a shocker. Organiser FIFA has decided the "*bulk of the 2002 Football World Cup matches will not be available to fans who do not have satellite or cable.*" World Cup is moving from a basically FTA (terrestrial) distributed event to pay-TV. Matches will be held in Japan, terrestrial coverage will be limited to opening ceremony, semi-final and finals plus those matches in which a "home team" participates. Pay-cable and pay-satellite will get the rest.

**Indian TV on Ku** - official. January 3rd is target start date for a brand new Optus-Aurora transponder (not yet defined, but vertical on B3) with coverage into New Zealand and Australia - 90cm dish in NZ, most of Australia except Queensland heavy rain areas (essentially same footprint as the Mediasat service). Two programme channels (Punjabi / Lashkara confirmed, second will be either Hindi or Gurjari), Aurora smart card encrypted, A$20 (per month) for 1st channel, $35 for both. 90cm dish, Aurora compatible IRD, smart card, installation - target price - A$890. ATV Pty Ltd has signed 5 year lease for Aurora space. Installing dealers solicited - in Australia Bill Kahn at 02-9820-5962; in New Zealand Steve Johnson at 09-238-3083 or 025-938-313. Unknown - what Optus will do with balance of the transponder - being the first Aurora platform to be reach into New Zealand.

Industry Hero

"I wanted to make sure everyone recognises a true industry hero. When Patrick Bulley submitted his method of reactivating the Hyundai HSS100C receivers on the European Bouquet and you posted it on the SatFACTS Web site, he was doing a great public service. I am quite sure he does not realise how many (hundreds, even thousands) of people he has made happy, including myself, for his deed. He could have easily kept his technique for fixing these receivers to himself but he did not do that, showing his maturity and I thank him for this. If he ever needs any help with anything I can assist with, he has but to ask. Three cheers for Patrick Bulley!!!"

Pietro Casoar, DigitalSat Communications
Melbourne, Australia

As we relate on p. 30 here, on November 24 when the European Bouquet operators decided to revise their PID/PCR/PMT numbers, all hell broke loose with thousands of ethnic viewers instantly deprived of their favourite viewing fare. What is not explained is the total - as in TOTAL - failure of anyone contacted within the EBB to even respond to panic messages requesting help or an explanation. It was only on December 9th that an explanation was forthcoming, advising," *IRDs with Irdeto software were adversely affected. Reloading corrected all but the Hyundai HSS100C which seems to be incompatible with the MPEG2/DVB standard of the updated software.*"

Aurora cards - again

**"Following letter received from Optus' Greg Clarke (tel 02-9342-6485) citing current policy for new Aurora cards.**

"The following decoders and software only are approved by Optus for operation of the Aurora system: Domestic IRDs / Panasonic TU-DS10 (loader 2.30, Driver s/w version 3260A); UEC642 (loader 1.1, s/w version 1.2.01g). Professional IRDs / DMV3000, Tandberg TT1100, Tandberg TT1200, Divicom PV1200. Optus Aurora smart cards are only assured to work in Optus approved decoders loaded with Optus approved software. Although non-approved decoders may operate with an Aurora smart card on the Aurora system today, Optus will not guarantee this fortuitous situation will always apply. Over the air software downloads which may occur from time to time to Aurora approved decoders, to provide improved functionality, may cause operational problems to unapproved decoders. Optus provides no support for problems related to unapproved decoders and dealers should make this point clearly to intending purchasers of smart cards and decoders. Dealers selling unapproved decoders are responsible to ensure purchasers of unapproved decoders are aware of the Optus position which only supports approved decoders as system software changes are provided."

**"What is the story with the recent change from s/w version 1.2 to s/w version 1.6 on the Aurora cards?"**

E.L., Queensland

Optus originally explained 1.2 cards can only "store" and process up to 20 programme services; 1.6 some larger number. The price has also gone up - those who purchase 100 cards (minimum) now pay $75 rather than $50 - an increase which Optus says, "Is related to the additional cost of dealing with Pirate cards." On the other hand, read to right for conflicting statements also from Optus during same week in November!



# HARDWARE EQUIPMENT PARTS UPDATE

December 15, 1999

**Terrestrial digital (DVB-T) troubles.** Although most satellite folks seem little interested in how badly the rollout of terrestrial HDTV has gone in the USA, it would be foolish to ignore the warning signs. The USA's technical people adopted a digital terrestrial transmission standard based upon something known as the 8-VSB format, similar in design to our satellite system. Unfortunately, with slightly more than 100 terrestrial TV stations now operating there, major operating flaws have surfaced. The most frightening situation involves attempts to receive 8-VSB terrestrial digital with indoor "rabbit ear" or rod antennas attached to the TV - *it simply does not work.* Plus, the required outdoor antenna must be far better in performance than virtually all existing (analogue capable) outdoor antennas. And, "flats" and motels and other master antenna/coaxial cable distribution systems installed years ago for analogue reception don't "play" either. What this says is people who want HDTV must install a suitable, not inexpensive, rooftop (outdoor) receiving aerial which kills the concept of extra sets moving around the house using back of set aerials. For a house to have multiple sets, each will be required to be wired to a master rooftop antenna using techniques significantly more stringent (and expensive) than their existing analogue counterparts. A formal petition to the (American) FCC, asking that the 8-VSB "standard" be revisited has been filed - and has the support of more than 50% of all TV broadcasters. Now comes the all important Department of Defense (Pentagon) formally asking the FCC to approve a change from the American 8-VSB system to the European COFDM terrestrial system. The Pentagon says, "*the growing evidence that digital television receivers using 8-VSB may require large, highly directional outdoor antennas for adequate signal reception*" is a worry. *"Such antennas would be most likely to be destroyed in a weather or national security crisis*" making it impossible for citizens to tune-in important government advisories. And, "*By contrast COFDM appears to be a (more) robust modulation system which would significantly improve the ability to guarantee reception in routine and national emergency situations.*" 8-VSB was more than 5 years in study and approval, TV broadcasters and networks have invested tens of billions of (US) dollars in the transition to this point - all, obviously, now at risk. Et tu, Australia? Productivity Commission DTV hearings in Sydney winding down as we go to press - most likely scenario, hearings will decide previously issued draft report recommending against HDTV in Australia will be upheld. Alas, Howard and Alston show no signs of changing their position that HD-DTV is essential to the next millennium of Australian life. If the Americans can admit they made a mistake - *why not Australia*???

**Aurora cards.** As of early December, 11,852 RABS vouchers had been issued, 8,584 have been redeemed. Version 1.2 cards will *still* be issued to business customers, but no longer to RABS-class users. Upgrading from V1.2 to V1.6 will cost full price of V1.6 - and we quote, "*Currently there is no advantage in replacing smart cards as the v1.2 & v1.6 cards perform the same function. There is no commercial agreement yet in place to allow a v1.6 card to be used for Aurora and Pay TV.*" And this of-interest policy statement, "*All smartcards remain the property of Optus.*" Why - you may wonder - are you paying A$105 for V1.6 cards, then? If you are a business, can you deduct the cost of the card as a "rental" fee? Can you take a $105 deduction on your income tax at year's end claiming a donation to Optus? If the card "remains the property of Optus," is this a license fee to use their card? If the card remains their property and you want to upgrade from V1.2 to V1.6, why do you have to pay a new fee AND return the old card as well? Curious and more curious.

Proving when something is wrong

# The Next Generation Measurement Equipment -UNAOHM SBM 105-

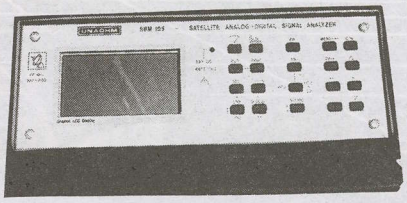
The recent experience with the European Bouquet (see p. 30) is a red flag alerting the industry to the potential mess that can be created when well meaning people start to diddle with MPEG-2 parameters. When an installer is faced with up to 100 irate dish system owners who have suddenly lost their EBB reception, those responsible for causing this turmoil should at least be honest with their explanations.

Digital reception is totally dependent upon the correct matching of transmission parameters and receiver instructions. MPEG-2 DVB Compliant is supposed to establish benchmark (reference) parameters which if followed by the broadcaster ensures that DVB receivers will be able to receive the broadcasts. When you sell a digital TVRO (system), install it properly and make the desired services (such as EBB) play, short of some equipment failure, the customer should have EBB service for life.

The key here is to identify the transmission parameters. Normally, if you enter the EBB parameters (4000/1150Hz, Msym 28.125, FEC 3/4), connect the IRD to an appropriate dish with the correct LNB and feed, and point the dish at AsiaSat 2 - you have service. But there are warnings in this.

Most dishes are installed when it is not rainy, and not overly windy. Fine weather is ideal for working outside but it is a best case situation; how can you be *certain* the system will function when it does rain and the wind does blow against the dish (causing it to move slightly in one direction or another)? Signal degradation, especially at Ku band but to a lesser extent at C as well, is very much a function of path losses. And the "path loss" we are concerned with here is from the satellite to the dish receiving antenna - especially the *last* kilometre or two through the lower atmosphere.

As Mark Long explains in SPACE Pacific Report 9908 and 9908 (currently on Mediasat), "*Digital is dangerous because without instrumentation, it is almost impossible to determine whether the dish is peaked or not.*" Peaking the dish means you have wrung the last portion of a dB out of the system - no further adjustment of azimuth, elevation, LNB centring or LNB placement will result in more signal.



Smaller than a shoe box - lighter than a digital IRD, more accurate than most of us will ever need.

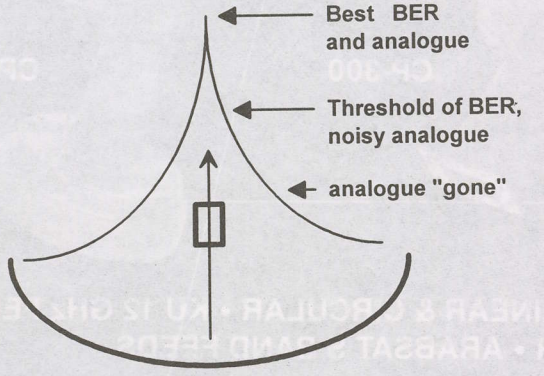
Digital signals are a "go or no-go" situation. When you have enough signal to rise above the receiver sensitivity floor (threshold), digital pictures appear. When you fall below that threshold, all reception stops. Unlike analogue where grainy or even noisy pictures are still visible, with digital there is no less-than-perfect reception. Knowing the dish is truly peaked, there is no more signal to be gained by further antenna system adjustments, is the mark of a professional.

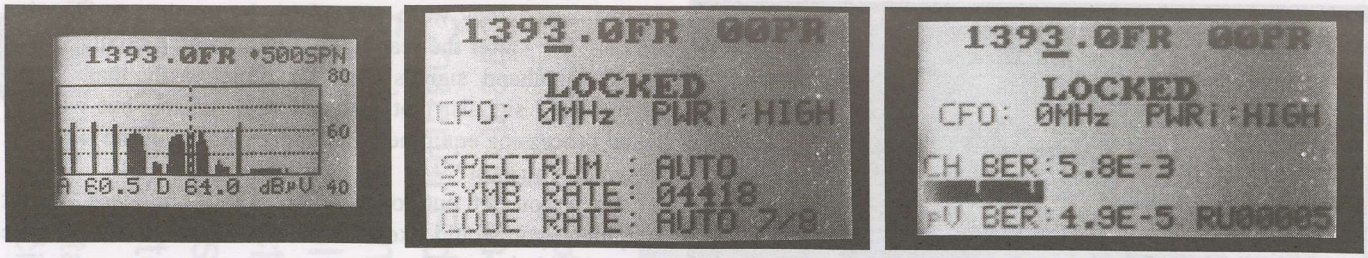
Why care? The drawing to left says it all - the best BER (bit error rate, or fewest digital errors) only occurs at <u>one</u> peaked point with the antenna system. Anything less than this "leaves signal" at the dish - where it does you no good. The more the dish is pointed away from the satellite, the greater the BER - until you reach a point where the digital receiver's threshold is passed and there is no more reception. At that point, comparable analogue from the same satellite is still present.

Some digital receivers give you a menu display function that monitors signal level. Many such on screen displays are at best relative and few have really adequate internal references. And, it is not much fun - often impossible - to haul a TV set and an IRD to the dish to assist while installing. What you need is some way to accurately measure the BER at the dish while installing. *Hello* - the Unaohm SBM105 is here.

This is a (A$2000 range) test instrument. It is not a toy and not like the simplistic "go/no go" green and red "signal-light" meters offered for pay-TV installers. The SBM105 tells you real information about the signal which as you learn how to properly use will make you a smarter, more capable installer of C and Ku systems.

SBM105 combines analogue and digital functions, provides a LCD 128 x 64 matrix display on which you read numbers and display a form of spectrum analysis. An internal, rechargeable lead acid battery, connection to an external 12/18VDC, or through an external mains supply that doubles as a charger (4 to 5 hours required for full battery charge) are the powering options. It will power LNB(f) devices with (0), 13, 15 or 18V selection. LNB switching covers the normal options - 22 kHz tone, DiSEqC. All of this in a 225 x 85 x 180mm container (housed in a nylon case) weighing around 2.8 kg (6.5 pounds) that is comfortably carried on the shoulder with a strap.






Spectral display on AsiaSat 3755/1395 (well, close) vertical - Arirang TV at centre. Set up for digital analysis (middle) shows CFO (signal centred in pass band) at 3757/1393 - see text. On right, Arirang "CH(annel) BER" is indicated 5.8E-3, Post Viterbi BER is 4.9E-5 and Reed-Solomon error count at time of photo was RU00005. See text.

As an instrument, you can measure and depend upon the following:

1) Whether the digital signal is "locked" or "unlocked"
2) Channel BER (bit error rate)
3) Post Viterbi BER
4) Reed-Solomon (uncorrected) cumulative error counts
5) dBuV signal level
6) C/N (carrier to noise ratio)
7) Tuning offset (CFO), whether you are tuned spot on or are off frequency (and if so - by how many MHz)

The LCD display doubles as a spectrum analyser as well - and you select the bandwidth to be scanned and displayed (50, 100, 300 and 500 MHz). The display takes a little getting used to if you are accustomed to using a CRT analyser - the transponders appear as "blocks" (squares) built up as a function of signal level and width on the display.

Let's see what it can do

The first idea we had was to go through each and every digital carrier in our field of view to record the BER - kind of a master reference and way to compare the relative performance of each. Approaching the 50th measurement point, we realised Christmas would arrive before we were through (a small exaggeration of course) and we gave that up as a time wasting exercise.

There is more than the simple BER readout to dial-up and record on paper. This instrument measures BER three separate ways. The excellent manual makes the case that because there is more than one place within the digital signal to make a BER measurement, different design instruments provide different readings. Peter Lacey, representing the SBM105 in Australia, argues that early meters available in Europe were giving such widely different readings of the same signal from the same dish that users began to suspect the accuracy of the different instruments. And he suggests Unaohm decided to solve this question by providing *all three* common measurement modes.

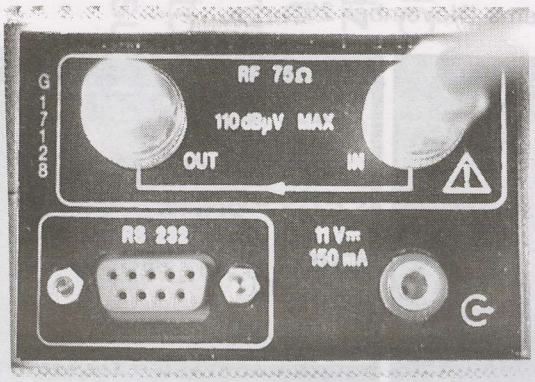
Well, it turns out that while it may be "nice" to know all three of these different numbers, we have to wonder how much use the Post Viterbi number really is. P-V BER means measuring errors after (or, post) the Viterbi "correction" circuit. Here's the rub. Pv may work to one efficiency in the SBM105, and a totally different efficiency in the IRD of your choice. CH BER is always the same, before error correction. And Reed-Solomon? It means the total number of errors still remaining, in a period of time, after all (FEC) corrections have been done.

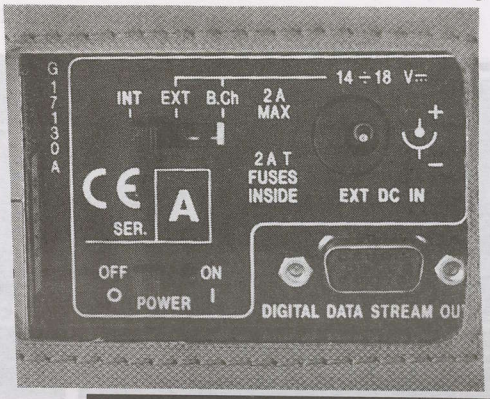
For our money, knowing the CH BER is fundamental. With the SBM105 you can leave the machine running (on an AC or external DC supply) and note how the RU (Reed Solomon) "count" advances over say an hour, or 8 hours. When it counts as high as 65535, the counter recycles to 00000 and restarts.

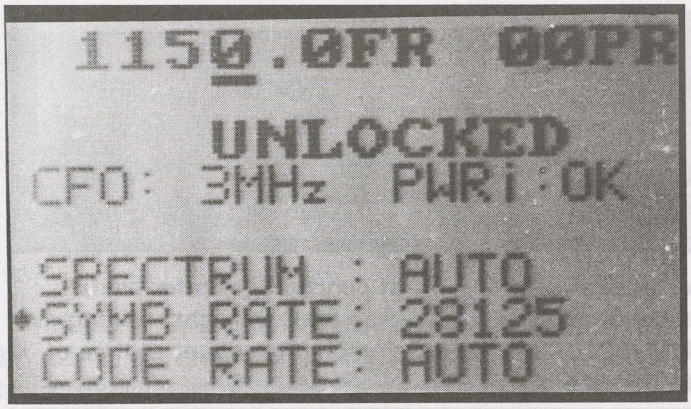
*Now - the fun stuff.* We started off not being able to find Arirang. Or many others. Then we found we were having our difficulty primarily with SCPC services (those with symbol rates below 7 or so). We sat down to reread the manual, noticing that even on the signals that would lock, our "CFO" reading was always in the "minus" (-) column and from this learned the local oscillator in our LNB was in fact operating at 5148 MHz and not the prescribed (and standard) 5150. We had entered 1395 (which is 5150 minus the C-band operating frequency of 3755) and Arirang did not lock. The keyboard allows you to enter all of the parameters (L-band frequency, Msym, FEC) and push "go." If it does not work, you can "walk" the L-band frequency up or down in 1 MHz steps. At 1393 (L-band), which is 5148 minus 3755, it "Locked."

If this was an isolated case, we might have two other explanations, being: (1) Arirang is off frequency itself by 2 MHz, or, (2) the SBM105 is off frequency by 2 MHz. By checking other AsiaSat 3 vertical services, we quickly found that using the CFO reading verified all digital (and analogue) services on this side of this satellite were off by between 2 and

RF input is through BNC connector using BNC/F P83 adapters supplied. "In" provides power to LNB, out allows daisy chaining of additional equipment (left). Powering options are on opposite side panel (right).






EBB would not lock - when 1150 (5150 minus 4000) and Msym 28.125, FEC 3/4 were entered. Strange - there it was playing on a Panasonic 520!

3 MHz from published (and official) figures. There is a strong lesson here for everyone who experiences difficulty getting various services to load and stay locked with their IRD - if your LNB local oscillator is off by a couple of MHz, you need to correct your L-band (or C-band) input frequency to compensate. The fact is - the CFO reading is almost worth the price of the SBM105, alone.

OK - so we identified one C-band LNB with a local oscillator frequency that was off a bit. *So?* Next we moved on to AsiaSat 2 and dialled up the European Bouquet (4000/1150Hz, Msym 28.125, FEC 3/4; above). SBM105 said "Unlock" - no signal there. We knew better with separate receivers independently playing DW, TV5, RAI and MCM from the same feed at the same time. By now, smarter, we began to walk down in frequency. Now - this is a new dish and a new LNB - new to the SBM105 that is. "Down" was a hunch, after the Arirang experience on As3. At 1149 L-band (indicating an LNB LO of 5149) we had lock (below). But the CFO said we were off (low) by 3 MHz. As all C-band signals are inverted, "low" or -3 is really up three at the local oscillator. So down to 1146 which translates with a 4000 MHz downlink to an LO frequency of 5146. As the middle and right photos below show, "Bingo."

Recall that the Arirang signal, SCPC and quite narrow at that, had to be spot-on the correct L-band frequency to lock (1393 in our case). One MHz either way, no lock, although the signal level is strong and the error rate very comfortable. On the other hand, the EBB service would lock when the L-band frequency was as much as 3 MHz away from "CFO" but as the numbers directly below show, the BER was close to threshold for this meter (they warn you of this by posting exclamation marks - !!!!! - after the reading). Assumption, partially valid - MCPC wideband signals lock far more easily than SCPC narrow band signals. Not just with this meter - but with *all* digital processing equipment including your favourite IRD.

Whom do you trust?

When you set out to spend $2,000 for a piece of test equipment, you would like to believe you can "trust it" to give you verifiable information.

The SBM105 has "traceable" standards built-in making it that kind of instrument. But of greater importance is its repeatability. Can you use it today on EBB, memorise the numbers, and then use it again next week and the week after at new installations to relate their measurement numbers to the first set? Yes, with a provision. Operating temperature.

Setting this meter (or any other quality instrument) in the bright sunlight for an extended period of time and allowing the internal circuit temperatures to rise is not advised. Meter accuracy and meter repeatability are proportional to the circuit's operating temperature. Unaohm states the analogue calibration is done for a range between 18 and 28C although the operating temperature range is 5 to 40C. What this says is - when it gets close to either 5C or 40C, the numbers you see on the LCD analogue display will vary from the "calibration standard." How much? They say +/- 3.5dB.

What we found in testing was the meter repeats itself nicely, and seems to be far more tolerant of higher temperatures than Unaohm suggests. You want to have something you can turn on, use and believe. We found the SBM105 was believable under any conditions we could create.

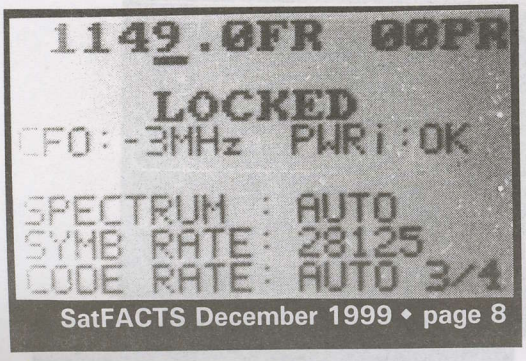
And -

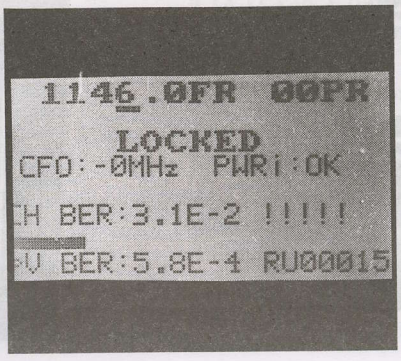
Analogue signals on the spectrum display are obvious - enter the L-band centre frequency for a carrier and instantly the display shifts to place that frequency in the centre of the screen. Now push C/N and you have an instant carrier to noise reading - perfect for adjusting a dish to a new satellite.

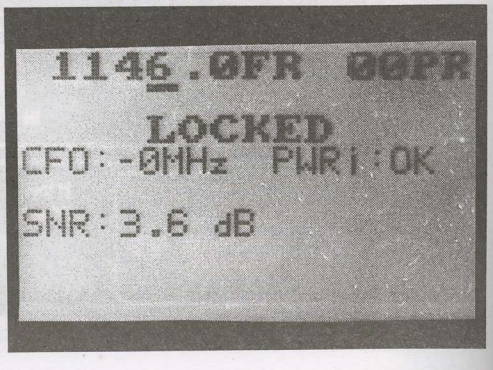
In the field, we expect most will use the *display* mode to initially locate a satellite (as it shows both analogue and digital signals), next the *analogue* C/N measurement to get the dish fine tuned and last selecting a digital signal, the *CH BER* to do the final system adjustments. And when it tells you the LO is off frequency? You adjust your L-band or C-band memory frequencies to compensate for that particular installation.

We'll continue this in January. SBM105 is available from Lacey's Australia, 12 Kitson St., Frankston, Victoria 3199; tel ++61-3-9783-2388, fax ++61-3-9783-5767 and email through placey@netlink.com.au.

Compare 1149 L-band "lock" against 1150 "unlocked" at top of page but note CFO is -3MHz (left). With CFO of 0 MHz, CH BER is 3.1E-2 (not good as indicated by "!!!!!" marks following reading; centre). And SNR was a miserly 3.6 dB (right). These European Bouquet measurements were taken during the height of their late-November data stream problems (November 25).

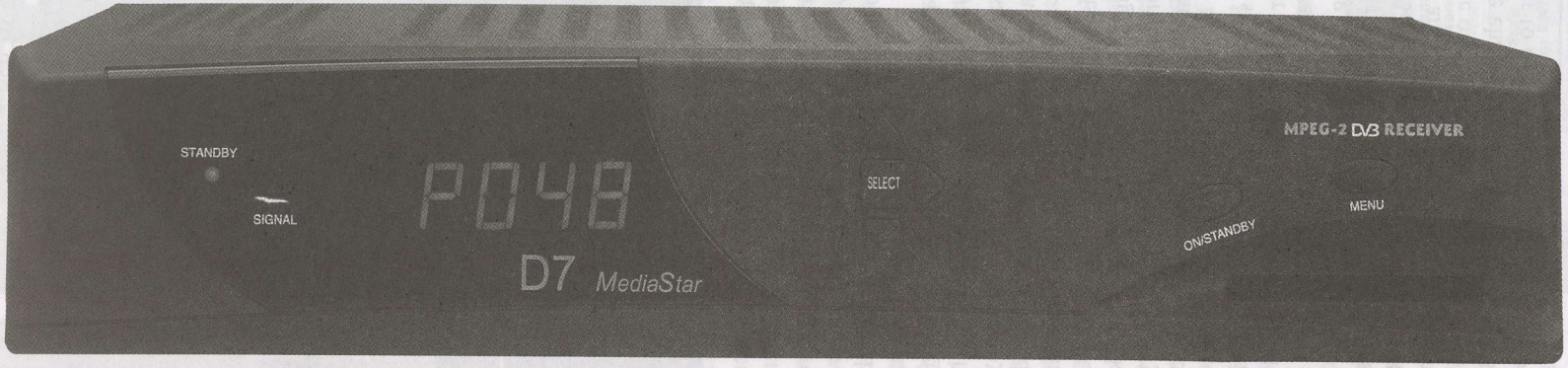


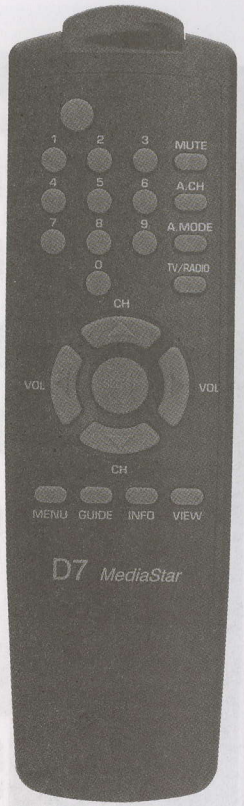



# The Most Advanced Free To Air Digital Satellite Receiver

# D7-MediaStar




- MCPC/SCPC 2-36 Msym
- Direct channel selection from channel list
- Channel Edit menu Delete, Skip, ON.
- Fast response when changing channels
- No channel over-write
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- Automatic search and download
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- 90-265VAC-50-60Hz power supply
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Sensitive, clean pictures, easy to use

# STRONG's 4600 DIGITAL IRD


First impressions of the Strong SRT 4600 relate to the almost overpowering graphics and easy to use software. Not only is the IRD quick to go from shipping container to operation, the important frequently used routines are logically presented in a way that even consumers should find them friendly.

From the first Panasat 520 IRDs imported from South Africa under cover of darkness, the receiver industry has come a long ways indeed. It is no longer necessary to accept an IRD that is insensitive, slow to use, and staggers from transponder to transponder.

Strong has obviously made a list of those functions which most users require and then rethought the software routines to simplify their application. Set up proceeds as follows (many of these will be the default settings and already functional when you turn on the IRD):

1) TV Set parameters - five selections to mate the IRD output to the TV set input (whether at RF or through a SCART cable);

2) Local parameters - selecting the language of the menu display, entering the local time for the clock functions

3) Service mode parameters - A tad confusing as you have two choices - DTH (which is you) and SMATV (which is not).

Set-up begins with displaying the on-screen menu - password protected (default 1234 but can be changed). Parental rating is the first option - allowing the user to deny access to specified channels unless a security password is entered. This particular function might prove counter productive as each time a password protected parental rated channel is selected, the password must be entered to view the channel. On the other hand, if you ignore this function it won't get in the way of normal viewing.

Installation entries

The 4600 has in memory virtually all of the popular C and many Ku satellites in our region. The menu leads you to select the desired satellite which once selected becomes the "target." With the dish pointed at that satellite, you then instruct the 4600 to go through all memorised transponders - a simple key stroke (it will ask if you want only FTA or "all," including encrypted, channels to be found). There is a subroutine that depends upon your polarity switching system; 0/12V switch, 14/18V switch, 22 KHz switch or DiSEqC switch. If the installation switches vertical and horizontal probes using 14/18V switching - as most consumer installations now do - you simply select that option (see on-screen photo here).

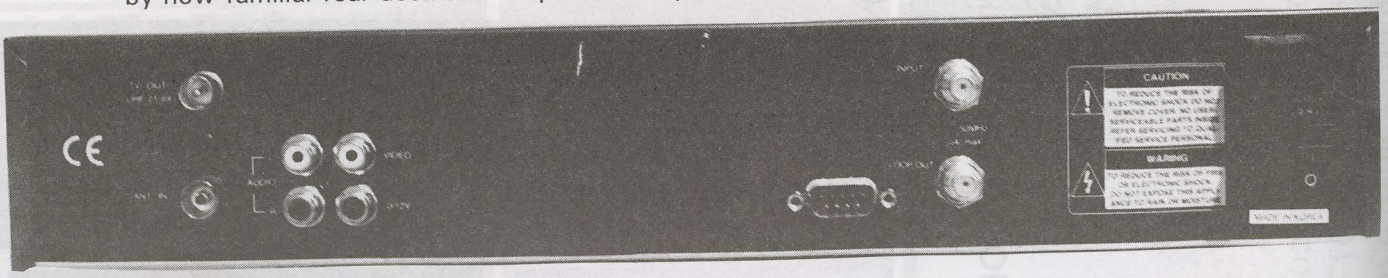
At this point the receiver knows:

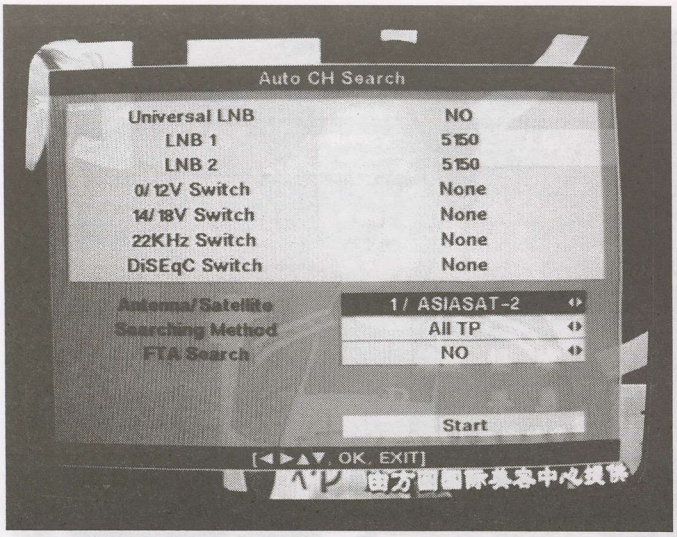
1) Which satellite (and from that which transponders as found in its memory)

2) Which category of signals (FTA or all)

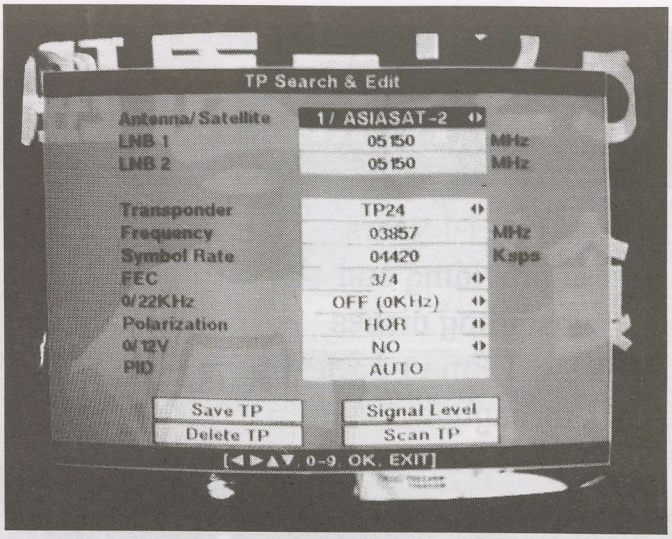
3) Which type of polarity switching to employ as it goes through the satellite from end to end .

Lost in the photo but there none the less - twin SCART sockets (one each video/VCR, and, TV set). And a by-now familiar rear deck that loops L-band, provides RCA twin audio, video and 0/12 volt.






Automatic channel search depends upon preloaded transponder data. Once the parameters for search are established, receiver will follow them until told to do otherwise.




New parameters for non-memory transponder. With 23 previously loaded-searched services, add-on becomes #24. Other options - save data to memory, signal level of any frequency.

The receiver default-assumes your local oscillator for C-band is 5150; you can change this if required. And you are ready to search the full satellite ("start").

Loading time will depend upon the satellite's inventory - As2 with all of the Chinese services takes around 3 minutes, AsiaSat 3 with fewer services only a minute or so. As each transponder is searched, a status menu lists them one by one on the screen (memory position number - such as "1", frequency - such as "4.000 GHz," status - such as "► OK"). Now, suppose there are new services which activated after the factory loaded the memory?

After loading everything from memory on each satellite of interest, and conducting a search, you then select "TP Install" which simply means a new set of non-factory-memorised parameters for a brand new frequency will be scanned after entry. Each new TP Scan entry requires the operating (C-band) frequency, polarisation (so the LNB switching knows how to function), the Symbol Rate (it will find the FEC on its own), and whether this is an FTA or encrypted service. And "start." New services are "filed" on the list at the end of the in-memory list for each satellite.

Typically, you will do these functions in less time that it requires to read our summation. The user is presented at the end of the exercise with a channel list which can be edited, or rearranged in sequence to suit their needs. Encrypted channels, if "all" is selected in scanning, are indicated with a "S" symbol. Most consumers will want these removed from channel list memory ("delete"), most enthusiasts will leave them in place (there is always that hope such channels might turn off the encryption at some point!). TV and radio channels have separate lists. A "Favorite" list can be "bookmarked" with a √ mark on screen - new channels located and filed at the end of the normal satellite list can be moved to their logical (by C-band frequency listing) position after being found. The user can also select a single channel and "Lock" it there - denying channel surfing rights to "guest viewers" when you are away from home (this amounts to the reverse of password protected channels).

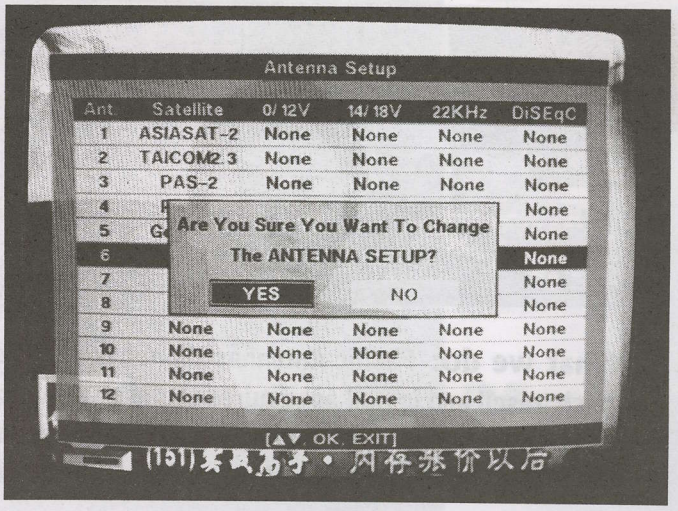
Handy touches -

When you do a search and find a signal, a "Signal Sensitivity" menu allows verification of the overall "headroom" (signal quality) of the service. From that menu, once in, the satellite and the transponder number can be "scrolled" one to the next to the next. This produces a quick way to check the quality of every signal being received - at the time of installation, the "Signal Locked!" performance bar can be written down for future trouble shooting reference (see photo, p. 13). The same information bar can also be used to peak a dish - we found the sensitivity of the "percentage" display excellent and instant to respond as we tweaked on the dish system.

Another handy display is the "Information Plate," accessed by pushing on the "Info" button - a quick way to identify the service provider.

Performance -

We have noticed with receivers arriving for test over the past 90 days that a new plateau of performance is now "standard." As recently as six months ago, there were significant performance differences between various brands and models. In testing IRDs, we always have our own set of "difficult" services to check - a way of establishing how sensitive the IRD might be, and whether it has any special problems with borderline data streams.



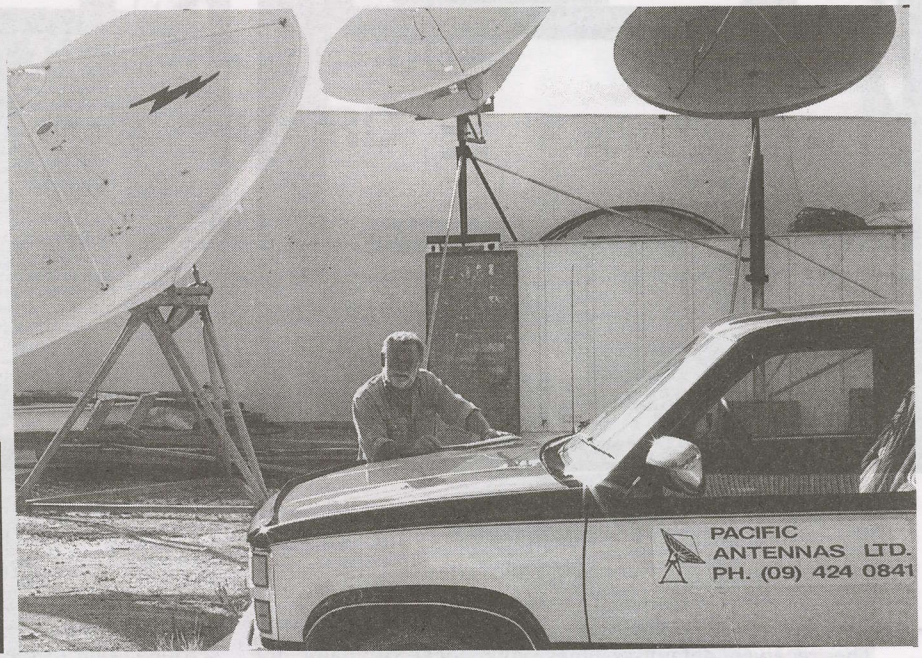

Double check on your intention - when you do change parameters in system set-up, receiver asks you to verify before deleting previous information.

> p. 13

# Gone fishin'!

After 14 years of providing and installing dishes from 1.8m to 13m throughout the Pacific -

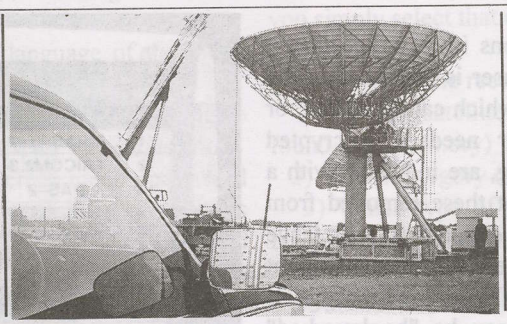
Bryon Evans' Pacific Antennas Limited is on the market.

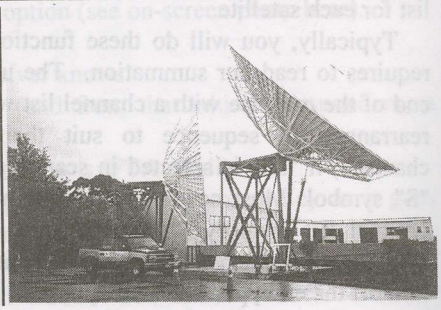



*A total operating established business with an enviable track record. Complete - all tools, a sizeable inventory of (Andrew, Patriot, R.S.I., Scientific Atlanta and other) antennas up to 6.5M in size, trailer mounted antennas equipped for demo or downlinking contract fulfilment, digital and analogue receivers, LNBs, feeds - first class (American) Chevy work vehicle, and work in process (real estate optional with on-site pads for dishes up to 13m in size!).*

**INCLUDES:** Dishes up to 6.5 metres in size on operating rental agreements at well established, 4-A rated, client facilities. Ongoing commercial business with clients such as AAPT, BT, Prime TV, Sky NZ and many more. Spectrum analysers, full tool and field construction equipment - everything we have needed to go virtually anyplace in the Pacific to install antennas up to 13m in size.

**FLEXIBLE purchase arrangements.** Your option one: Purchase business and inventory, move to your own location. Your option two: Purchase business and Whangaparaoa (north of Auckland) property (with dishes, pads for dishes to 13m in place, microwave linking permits to Auckland in hand). Your option three (at seller's discretion): Purchase segments less property, company (Chevy) work vehicle.





**What we do: Pacific Antennas Limited is the leading satellite dish rebuilder in the Pacific. We purchase, refurbish, resell and install as required professional grade transmit and receive satellite antenna systems featuring some of the most creative mounting and tracking systems on the planet. This is a hands-on business with a dedicated professional staff available for new management and enthusiasm.**

**Pricing: All up - NZ$330,000 ***

*Serious enquiries only - the present owner does not have time for dish thumpers who get in the way of his fishing!*

* - includes rental contracts, all equipment

## Pacific Antennas

**Limited**

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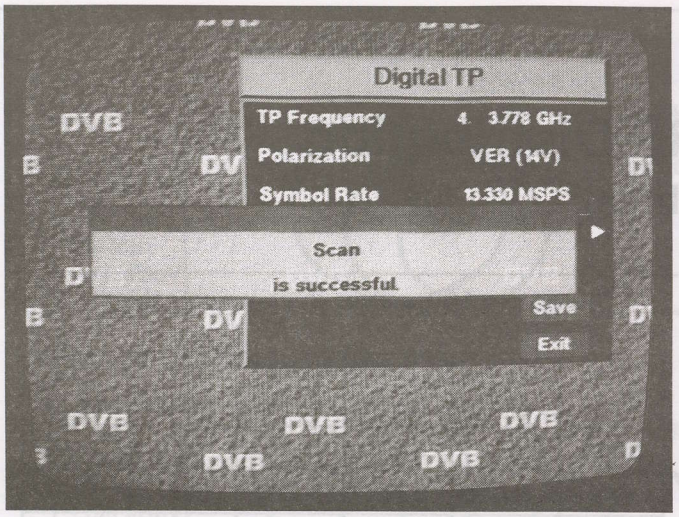
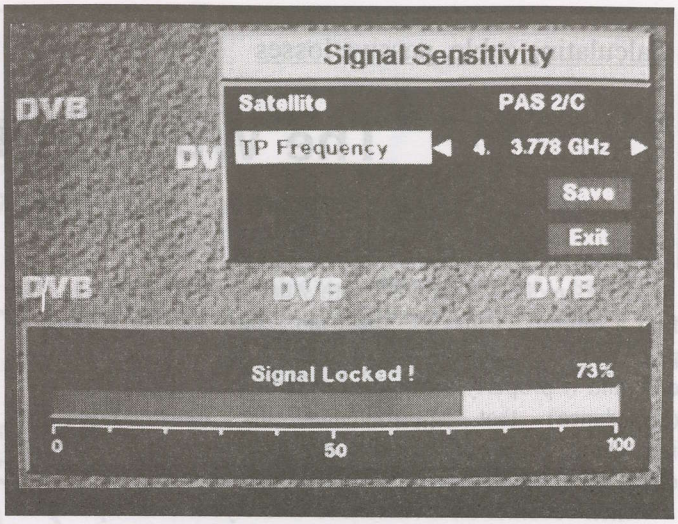



Confidence factor - when service has been scanned, is locked and ready to view - text on screen says so. If unsuccessful, tells you that as well.




Verification of effort - confirmation of signal quality. IRD will scroll through all loaded channels to report on signal level and quality (73% here).

In the November SatFACTS we reported the latest Hyundai (HSS800CI) loaded everything on our list, missing nothing. The Strong 4600 does just as well.

What this tells us is those distinctive performance and features that separate price levels for satellite receivers are rapidly disappearing. In terms of signal detection performance, there are now good receivers and slightly but not significantly "gooder" IRDs. Software continues to separate the basic from the more deluxe units but even that gap is narrowing.

There are no negatives about the SRT 4600 that we would wring out in a month of testing. No glitches, no "turn it off for a reset," no annoying software routine miscues. Equally at home on C or Ku, any format video, PowerVu or "real" DVB as long as the service is FTA.

Source is SATECH (6/477 Warrigal Road, Moorabbin East, Victoria 3189 - tel ++61-3-9553-3399, fax ++61-3-9553-3393) and their authorised distributors in Australia and New Zealand.

Calculating cable, passive losses

# The World of RF Distribution

## (part three)

There are few locations on this earth where a person will find a totally "clean" RF spectrum - one with no signals. A piece of coaxial cable is one of those. It has a beginning and an end, and if properly terminated at both ends with a resistance (impedance) that approximates the transmission line impedance, inside of the cable the spectrum will be pure and clean. *No signals at all.*

Which becomes an invitation to create your own "spectrum" and to send through that piece of coaxial cable signals which are of your selection, to the exclusion of all others. But there is a price for this "virgin territory."

The price is attenuation - the cable (any cable) is not a "loss less" medium and the signal entered at the top end (beginning) will be weaker (less strong) at the opposite end (terminus). Attenuation is a function of cable type (usually defined as cable size, or diameter), and, the operating frequency of the signal(s).

The general rules are as follows:

1) Larger diameter cable has less loss at any specified frequency for a unit of length - than smaller diameter cable

2) As the operating frequency of the signal(s) increases (becomes a larger number), the attenuation losses per unit length of cable increase

Attenuation is another word for loss - a weakening of the signal (voltage) present. Attenuation is most conveniently measured with a signal level meter designed to accurately measure fractions of a "volt" of signal; a millivolt (one thousandth of a volt) or a microvolt (one millionth of a volt). A millivolt or microvolt reading signal level meter is simply a voltmeter with two changes from a common Dick Smith instrument:

1) It detects radio frequency signals by user specified frequency (found through pushing buttons, tuning a knob, using a keypad)

2) Those radio frequency signals seldom attain even a one-volt level - typically they are significantly less than one volt.

Attenuation is usually talked about in a unit of measurement called the "decibel" - which means in literal translation "one-tenth unit of the bel" (or - a 'bel" is 10 dB). The joy of using decibels comes down to this:

*You can add and subtract decibels directly.* This is something that is not as easy to do with adding and subtracting fractional volts. There is a reference table translating dB figures to actual microvolts (or millivolts) but for most applications dBuV (decibels greater or larger than 1 microvolt) or dBmV (decibels greater or larger than 1 millivolt) solves most of your mathematical calculations. These notes:

*dBuV* means some amount of signal greater than 1 microvolt - which is about the lowest practical signal level worth measuring (a dB in dBuV and a dB in dBmV are the same).

*dBmV* means some amount of signal great than 1 millivolt - and as milli means 1,000 - a 1 millivolt reading is the same number as 1,000 microvolts. Therefore 0 dBmV or 0 dB of signal more than 1 millivolt is 1,000 dBuV. However, you can go through life not aware of any of this as long as you grasp

**Loss per 100 metres in common cables**

| Cable Type | 54 MHz | 90 MHz | 174 MHz | 230 MHz | 550 MHz |
|---|---|---|---|---|---|
| 59/U | 5.64 | 6.68 | 9.23 | 10.9 | 19.42 |
| 6/U | 4.43 | 5.26 | 7.25 | 8.57 | 15.28 |
| 11/U | 3.32 | 3.95 | 5.54 | 6.42 | 11.46 |
| 500 hardline | 1.35 | 1.63 | 2.33 | 2.79 | 5.08 |
| 750 hardline | 0.96 | 1.15 | 1.63 | 1.94 | 3.54 |

**Cable (only) losses in 200 metre system**

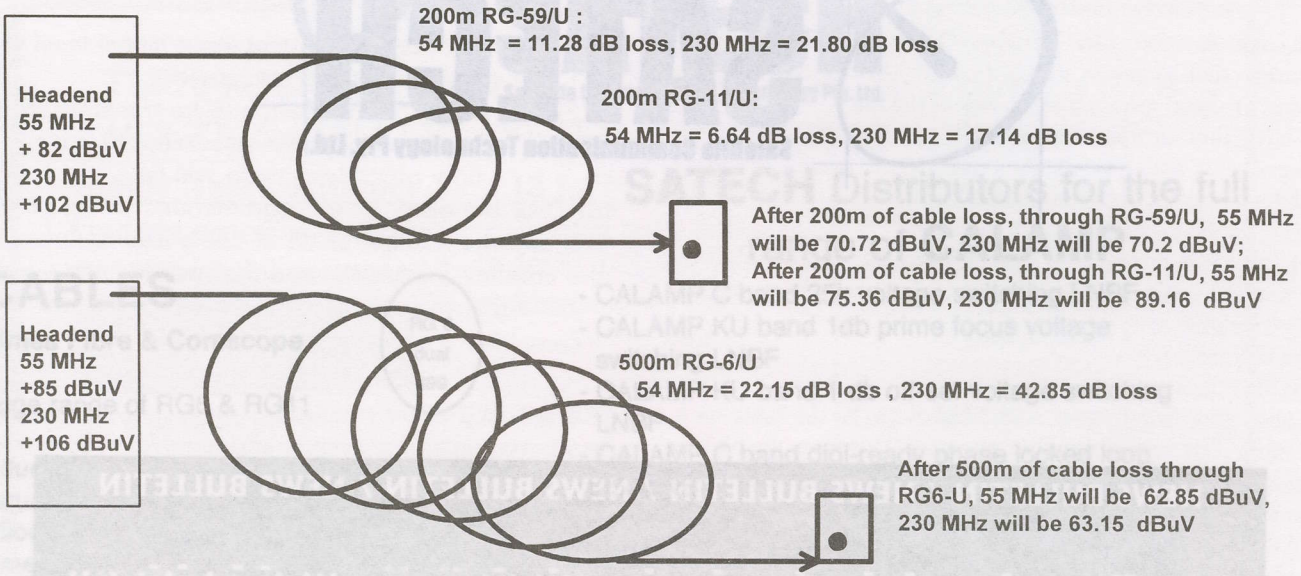
| Cable Type | 54 MHz | 230 MHz | 550 MHz |
|---|---|---|---|
| 59/U | 11.28 | 21.8 | 38.84 |
| 6/U | 8.86 | 17.14 | 30.56 |
| 11/U | 6.64 | 12.84 | 22.92 |
| 500 hardline | 2.71 | 5.58 | 10.16 |
| 750 hardline | 1.92 | 3.88 | 7.08 |

**Cable (only) losses in 500 metre system**

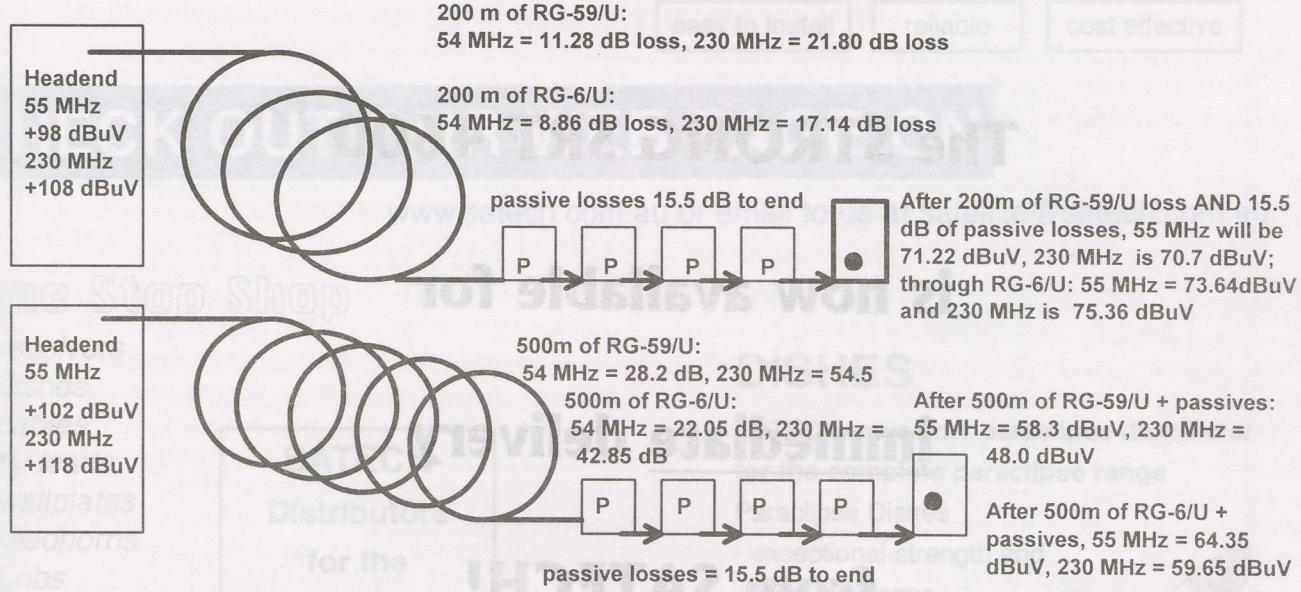
| Cable type | 54 MHz | 230 MHz | 550 MHz |
|---|---|---|---|
| 59/U | 28.2 | 54.5 | 97.1 |
| 6/U | 22.15 | 42.85 | 76.4 |
| 11/U | 16.6 | 32.1 | 57.3 |
| 500 hardline | 6.75 | 13.95 | 25.4 |
| 750 hardline | 4.8 | 9.7 | 17.7 |

**Typical "flat" losses for passive components**

| Passives | 2 way | 3 way | 4 way | 8 way |
|---|---|---|---|---|
| V-UHF | 4.0 dB | 6.0 dB | 7.5 dB | 10.5 dB |
| CATV | 3.5 dB | 5.2 dB | 7.2 dB | 12.0 dB |
| Direct. coupler | 0.4-3.2 dB | | 0.5-3.5 dB | |




Above - if the ONLY loss in the system is cable, the selection of cable makes a significant difference in the end-of-line level versus the headend signal level that goes into the cable. Below, when you add "flat" passive losses from splitters and directional couplers, the ratio of losses does not change - only the absolute numbers.




that *losing* dB through attenuation must be balanced someplace in the system by *gaining* dB through an amplifier.

A piece of cable, then, creates loss - a natural side effect of cable dynamics. You makeup or compensate for that loss by "launching" or starting the signal flow at the input end of the cable (called "headend") with sufficient signal level (measured in dBuV or dBmV) to counteract the losses in the cable.

Simple numbers: If the cable has 20 dB of loss from start to termination end, and you need a certain amount of signal level at the end - the amount of signal at the launch point must be the amount required at the end *plus* the 20 dB of loss along the way.

Some examples where you normally do not need amplification. In the satellite dish to satellite receiver cable connection, there is loss. But - as the satellite receiver operates quite nicely with less signal than the LNB (amplifier) puts out, the system can tolerate cable loss between the two points without adversely affecting the performance of the receiver. In this example, the LNB manufacturer has built into the LNB sufficient gain to equal (1) the minimum recommended signal level for the input of the receiver, plus, (2) the maximum likely amount of cable loss (attenuation) between the satellite dish and the receiver.

In a cable distribution environment, such as an apartment, hotel, motel or office complex, we have two slightly different categories of cable loss (attenuation). First there is the cable itself, greater losses at higher frequencies, higher losses with smaller cable (RG-59/U is smaller in diameter, therefore having more loss, than RG-6/U). If the object of our cable distribution system is to carry television programme channels

> p. 18

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Satellite Communication Technology Pty. Ltd.

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- CALAMP C band mini-mag digi extended 20k LNB
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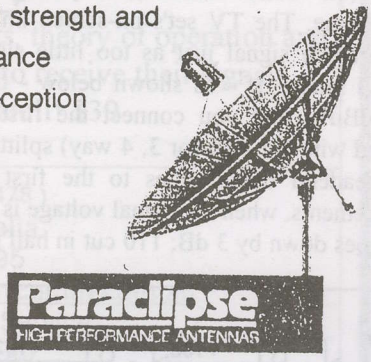



**All products available through the following SATECH distributors:**

**-Satech (Victoria) Tel: (03) 9553 3399**
**-South Satellite (South Australia) Tel: (08) 8377 0955**
**-Network Satellite Services (NSW) Tel: (02) 9687 9903**
**- Norsat (Western Australia) Tel: (08) 9451 8300**
**-Mathews Electronic Service Services (New Zealand) Tel: (09) 634 5130, outside Auckland 0800-777 376**

RF Distribution - continued from p. 15

from one location (the "headend") to multiple secondary locations (such as rooms with TV outlets), we have defined the amount of signal required at the end of the line.

A television set functions properly with an input signal level between +60 and +80 dBuV (most VCR, satellite receiver modulators output between 70 and 75 dBuV).

Adding up the losses-

In any cable distribution system, even the simple link from the satellite dish to the receiver, there are two distinct categories of loss:

1) Cable attenuation

2) "Flat" loss

Cable attenuation varies with frequency - as the table on p. 14 shows (top, right hand side of page). Therefore the highest frequency to be carried by the cable system becomes the "benchmark" for calculations.

"Flat loss" does not vary (significantly) with frequency. A signal splitter, for example, has the same "loss" (or division of available signal) at all frequencies carried by the cable. Two, three, four and eight way splitter "loss" is found in the table on p. 14 (bottom, right).

When calculating "total cable system loss" you sum (add) the two categories of loss together - the cable attenuation at the highest frequency to be carried - a number that depends upon the length of the cable, the type of cable, the frequency, and, the flat loss. Examples are given on p. 15 - two different lengths (200 metres, 500 metres) for two different types of cable (RG-59/U and RG-6/U). Remember - the amount of total signal required at the highest frequency to be cable transmitted is the sum of the cable attenuation at this frequency in the cable length to be used, plus, flat losses - added to the recommended input signal for the receiver(s) connected to the cable line.

Not at the end -

In the two preceding instalments of this report, we looked at various ways of taking signal out of the coaxial line at each receiver location between the "headend" and the end of the line (terminus). Common signal "splitters" are one way - but as the diagram below illustrates, this is a wasteful (and problem creating) approach. Because the typical television set wants to see someplace between 60 and 80 dBuV of input signal (on each channel), anything more than 80 is troublesome. The TV set's on-screen image can be degraded by too much signal just as too little signal creates a grainy (snowy) image. If - as shown below - the headend signal is +110 dBuV, and you connect the first TV set nearest the headend with a 2-way (or 3, 4 way) splitter , nearly half of the total headend output goes to the first TV set (in decibel measurements, when the signal voltage is cut in half, the signal level goes down by 3 dB; 110 cut in half produces 107 dBuV).

## Calculating how much amplification is required

#1) Determine the recommend input signal level to the receiving equipment

#2) At the highest frequency to be transmitted through the cable you have selected, determine how much loss there will be

#3) Take the dBuV level recommended to the (TV) set, add the number of dB of cable loss between the antenna (headend) and the receiver and you have the minimum output required from the amplifier (LNBF) at the antenna/ headend.

...

Example: 70 dBuV required input signal, 30 dB of loss between signal source and receiver: 70 + 30 = 100 dBuV at signal source.

In the drawing here, the 2-way splitters are cutting the available input signal by 4 dB to each output port on the splitter - few splitters are so perfect as to achieve a true "3 dB split."

Just for the number drill:

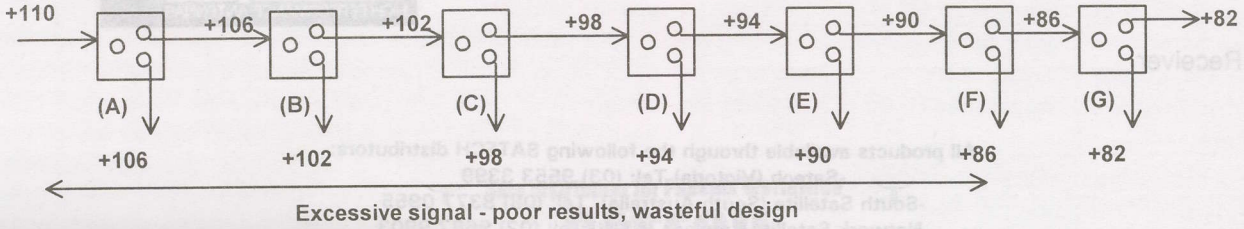
- 2-way splitter reduces the level by 4 dB (110 dBuV becomes 106 dBuV)
- 3-way splitter reduces the level by 6 dB (110 dBuV becomes 104 dBuV)
- 4-way splitter reduces the level by 7.5 dB (110 dBuV becomes 102.5 dBuV)
- 8-way splitter reduces the level by 10.5 dB (110 dBuV becomes 99.5 dBuV).

Three, four and eight way splitters reduce the signal a greater amount simply because each output gets a proportional amount of the original signal at the input.

When one output port on a splitter is used to feed the following splitter, there is a minimum signal level reduction of 4 dB with each successive splitter (more if using a 3, 4 or 8 way splitters).

Nobody who thinks this out and understands what is happening uses signal splitters as line "tap-off" devices. Rather, directional couplers are substituted for splitters. The directional coupler or "tap" allows the installer to select a *tap value* that corresponds to the signal level where the tap is to be installed. If the signal level is +100 dBuV and you want to deliver +80 dBuV to the TV set at that location, a (-) 20 dB tap is installed (100 - 80 = 20). Minus (-) 20 means the signal level through the tap fitting will be 20 dB lower than the signal level coming into the tap. Another advantage to the directional coupler - it only requires a small amount of signal to operate. A -20 dB tap, for example, removes only 0.7 dB of signal from the main line. Compare that with a 2-way splitter's 4 dB "loss."

This series will continue in future editions of SatFACTS.



a technical and marketing advisory

# memo

to the membership from your industry trade association

**SPACE Pacific**

**S**atellite
**P**rogramme
**A**ccess
**C**ommitt**E**e

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

Follow-up to Canal + Bouquet

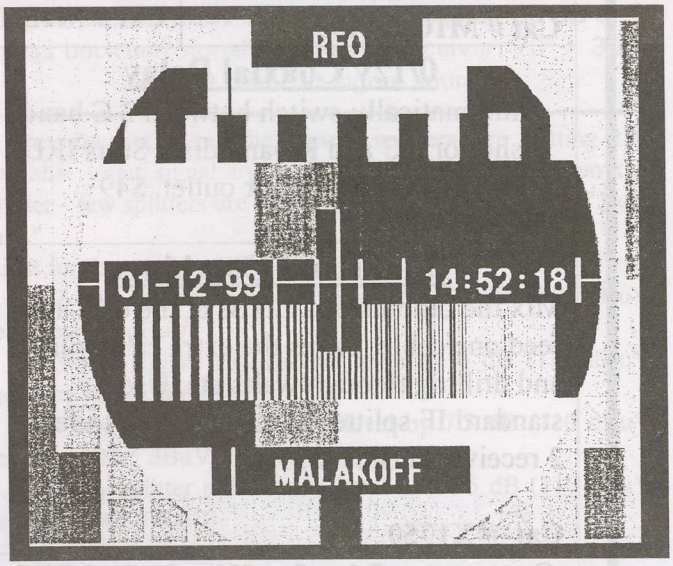
The French language Canal + / RFO bouquet on I701, Ku spot beam 2, is now fully operational. There is a measure of disappointment that footprint levels south of the boresight appear below predictions.

The original forecast levels called for 42 dBw (1.6m) into Melbourne, 45 dBw (1.16m) for Sydney, 39 dBw (2.1m) for the northern tip of North Island (NZ). Based upon reports to SatFACTS, as posted on our Web site, we believe the boresight (centre) of the footprint is north and west of the intended location. And there are some abnormalities with the observations.

Pietro Casoar (DigitalSat, Melbourne) using a "slightly warped" 1.5m Andrews prime focus dish measures 9.5 dB carrier to noise ratio using a Gardiner .7 dB noise figure "Universal" LNB. This translates to between 43 and 44 dBw - actually greater than the forecast.

Francis Kosmalski (Auckland) with a 3.7m Ku rated dish is barely at threshold with a .7 dB (Universal) LNB. Here at SatFACTS, we found our threshold is with a 3m Ku rated dish. The New Zealand coverage is from 2 to 3 dB below expectation.

Alain Corroy (Queensland) reports he has above threshold reception with a 60cm "Austar" dish. He notes, "In New Caledonia the (Canal + supplied) Pioneer IRD is producing a 'signal level' of 3.5 on 80cm dishes. We have the same level (3.5) on a 85cm (Penta) dish on the Gold Coast (of Queensland)." A report from Blacktown (near Sydney) claims a signal level of 3 on a 90cm dish. The Pioneer IRD instruction manual recommends a signal level of 3 and that the "sensitivity" be "in the green." The parameters are 11.610 Hz, Msym 30.000, FEC 3/4; CA is Mediaguard, unique to Canal +. The LNB LO must be 9.750 (L-band 1,860).




There are 17 services (16 TV and one radio) currently running, with one of the TV services FTA (MCM). From time to time, one or two other TV services have been FTA as well.

Alain Corroy - "Only MCM and TV5 have the rights to broadcast in all of the Asia + Pacific regions (FTA) and I believe they will end up being the only FTA services available here. Different IRDs have varying sensitivity 'floors' and one should not be discouraged if they don't get initial results. The Hyundai HSS100C, for example, loses the (FTA) portion when the signal level drops below 4.5 whereas on C-band, the (I701) RFO service drops out when the signal level is 5.5."

Receivers for the service are being supplied by CanalSatellite through SPACE Member AntenneCal in Noumea (tel ++687-28.96.84, fax ++687-41.52.40, email antenne-cal@canl.nc). The Pioneer brand IRD is US$450 -

## MEMBERSHIP IN SPACE

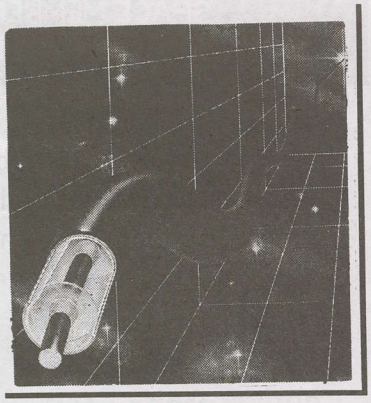
Membership in SPACE Pacific is open to any individual or firm involved in the "satellite-direct" world in the Pacific and Asia regions. There are four levels of membership covering "Individuals," the "Installer/Dealer," the "Cable/SMATV Operator," and the "Importer/Distributor/Programmer." All levels 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 year. Members also participate in policy creation forums, have correspondence training courses available and their support makes possible the TV show SPACE Pacific Report. 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.

and has a French-only menu. There is no UHF modulator - twin SCARTS, stereo audio. Corroy notes, "Memorisation of channels took 2 minutes; if you turn off the IRD, it must be rememorised. Channel change is 'very quick.' This IRD has a very limited (like BSkyB and Sky NZ) purpose - you can change polarisation (which the manual mis-lists as vertical), frequency, LNB LO, 22 kHz on or off and power to LNB on or off. Msym and FEC are 'software embedded' and not changeable from the preset 30.000, 3/4. The IRD will not play the FTA programme channels in the bouquet unless the supplied smart card is inserted in the slot. It does allow L-band (IF) looping to a second receiver."

Programming line-up is as follows: (1) Canal +, (2) Euronews, (3) Eurosport, (4) -no service yet -, (5) Tempo/RFO Sat, (6) RTL9 (1200 - 0700), (7) Cartoon Network, (8) Disney Channel, (9) Voyage, (10) Planete, (11) MCM, (12) RFM TV, (13) TV5, (14) Cine Cinemas, (15) Turner Classic Movies, (16) XXL, (17 - 22 - no services) (23) Europe 1 (radio), (100) CSAT Promo. Pricing is US$64 per month for Eurosport, RTL9, Cartoon, Planete, MCM, RFM TV, Euronews, TVNC, Tempo, RFO Sat; US$75 to add CineCinema, Turner Classic Movies (TCM), Disney Channel and XXL; US$105 to add Canal Caledonie. Promises that TCM, Euronews and Eurosport would have a second (English) language channel have to date not materialised. XXL is an adult movie service, two films per night, with an announced time of 11PM Sydney - not operating as we go to press.

Still missing - reports from Solomon Islands, PNG, central and Western Australia. Within the limitations of programme approval for reception in non-French Island regions, there remains an opportunity here for dealers to offer a unique service.

# The CABLE Connection



Commercial operation of the SA D9223/D9234 IRDs

Under "the right" circumstances it is now possible to have a Scientific Atlanta D9223 IRD authorised for two or even three CA services. For example, many cable and SMATV operators have found the need to have a "hot standby" unit in the event of IRD failure, but having two IRDs for each SA PowerVu channel is only practical when the number of system users is very large (such as in a large cable TV system, or commercial downlink system).

Having a "hot standby" that is shared between two or more services requires some method of re-instructing the receiver when, if needed, it must be moved to a new set of reception parameters. The normal technique is for someone - a person - to travel to where the receiver is located and enter the new parameters.

A newly available "Data Reader" developed for Av-Comm Pty Ltd. (tel ++61-2-9949-7417, fax ++61-2-9949-7095) could be a problem solver for your system. The DR-1 does the following:

1) Through a serial data connection (rear panel of D9223/D9234), DR-1 "communicates" with the IRD. The SA receiver is menu-adjusted to a data rate of 4800 baud (normal factory setting is 9600) to ensure error free communication.

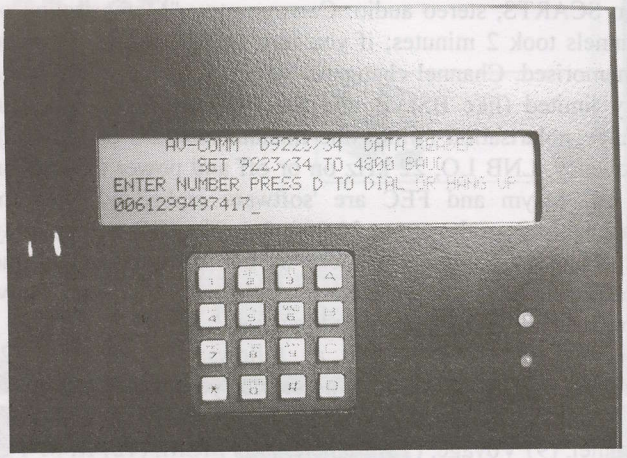
2) A PIC processor in the DR-1 has its own instructions in dedicated code. Once every 5 seconds, DR-1 scans the serial data port and displays (see photo) the IRD operating parameters - including Bit Error Rate (BER), AFC, signal quality (D9234 only), corrected errors, uncorrected errors, frequency, AGC, symbol rate, FEC, lock state, signal polarity, channel number, power on/off and the security lock status. A LED indicates on the front panel of DR-12 when the input signal is lost - a visual alarm.

3) Through a built-in modem, the DR1R allows the user to change frequency, symbol rate, FEC and polarity over a telephone line.

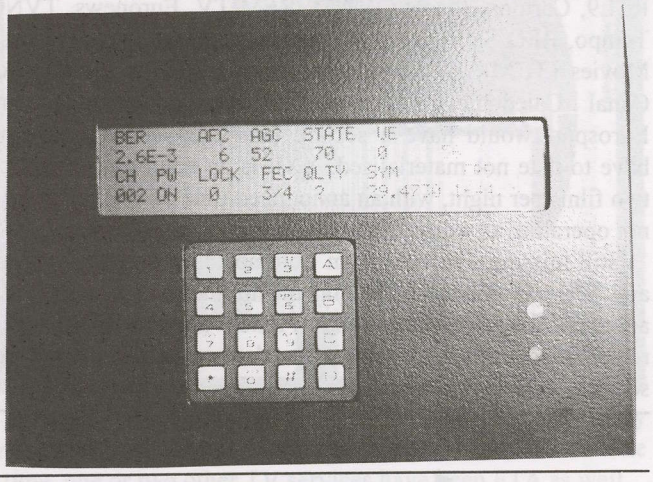
Powering is from a 9 volt battery or an AC power pack; current consumption is 130 mA.

There are other handy uses - set up and maintaining PowerVu remote receive facilities, for example, in locations where there is no video monitoring equipment. Essentially, DR1 and DR1R "tells you" everything you need to know to verify that a PowerVu installation is properly functioning - without ever looking at a TV screen, monitor or plugging in a PC.

In a multiple receiver environment, two or more DR1/DR1R data readers can be installed side by side in a standard 19" rack to provide instant analysis for all PowerVu services being received and processed at that location. DR1 and DR1R are




Data reader displays all important parameters of digital signal, as monitored through serial port on rear of D9223 or D9234 SA IRD.




available on special order from Av-Comm Pty Ltd with a typical delivery time of 4 to 6 weeks.

Non Conductive Fish Rod

One of the least enjoyable, most challenging jobs is to be asked to run new cable through an existing wall structure. Increasingly, satellite and cable installers are faced with this problem.

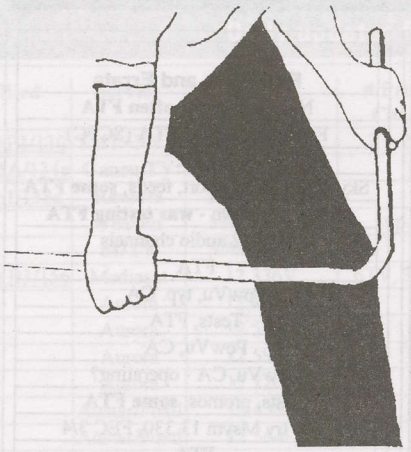
Various "fishing tools" exist which are intended to allow you to go into a wall through a modest sized hole at the bottom, and by shoving and pushing and manipulating the "fishing tool" upward, gain access to the top of the wall - typically inside of an attic. There are two major dangers here:

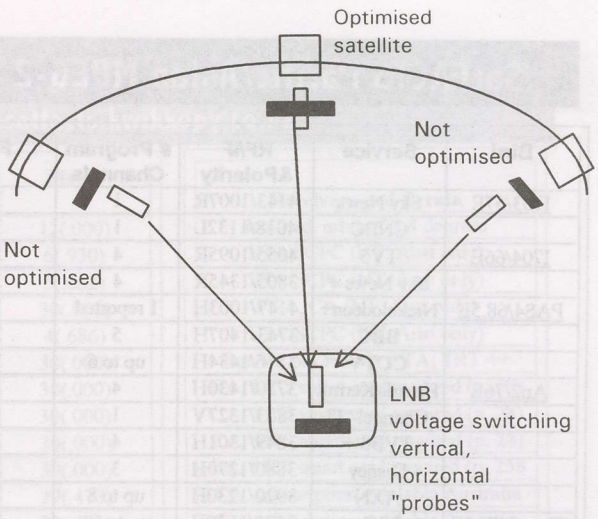
1) The wall cavity may not be open all the way to the attic, and as you push up you come into contact with a 2 x 4 or other solid object that prevents you from getting through to the attic;

2) Or, you are inside of a wall with electrical and other wiring and run the risk the "fishing tool" will lay across an exposed AC mains voltage contact interior to the wall.

Insulated fishing tools are available but most are light in weight and may even break if subjected to strenuous pushing and pulling. Being "inside" a wall and "losing" a fishing tool after 30 minutes of poking is likely to ruin your day.

Here is a tool that comes with the recommendation of installers who have used it. Slegers Installation Products (PO Box 241, Springvale, Victoria, Australia 3171; tel ++61-3-9560-3522, fax ++61-3-9562-0172) catalogue number SER3 is a 3.6m length non-conductive polypropylene tool. The material is extremely tough, and has excellent tight bending properties even with an exceptionally tight bending






radius. The 3.6m length comes in a coil, and has a modest memory. Before use, bend it "backwards" across your knee (see above) to remove the memory.

LNB switching probes revisited

Modern satellite receivers, especially in the digital family, give you multiple options for switching between linear vertical and linear horizontal satellite signals. Most receiver manufacturers assume you will be using a voltage/tone /DiSEqC LNB equipped with a pair of "antenna" probes - one for vertical - linear and one for horizontal - linear.

Older analogue receivers were equipped with a "polarisation skew control," designed to allow the user to rotate the "probe" antenna in the feed system through a partial circle of 200 degrees or so. By losing this control function (and no longer utilising feeds with adjustable polarity positions), we have gotten ourselves into a corner.

When you set up your LNB on a particular satellite, adjusting the feed/LNB to maximise cross pole null (the least amount of the opposite polarity signal), that adjustment is only good for that one satellite. Other satellites east and west of the primary satellite will arrive at your LNB "probes" skewed or no longer precisely vertical or horizontal, with reference to your probes. The further east (or west) you deviate from the original satellite, the worse the effects of cross polarisation reception becomes. In effect, by setting up on PAS-2, your probes are nearly 90 degrees out at As2 - and reversed..

# SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 December 1999

| Bird | Service | RF/IF &Polarity | # Program Channels | FEC | Msym | Receivers and Errata |
|---|---|---|---|---|---|---|
| I703/57E | Sky News | 4143/1007R | 1 | 3/4 | 5(.632) | NDS encrypted, **often FTA** |
| | CNBC | 4018/1132L | 1 | 3/4 | 6(.000) | Feeds - **typically FTA** (SCPC) |
| I704/66E | TV5 | 4055/1095R | 4 | 3/4 | 27(.500) | **FTA** |
| | Sky News + | 3805/1345R | 4 | 3/4 | 22(.520) | Sky News 24 hr, sport, feeds; **some FTA** |
| PAS4/68.5E | Nickelodeon+ | 4147/1003H | 1 reported | 1/2 | 24(.000) | Status unknown - **was testing FTA** |
| | **BBC** | 3743/1407H | 5 | 3/4 | 21(.800) | FTA; 2 audio channels |
| | **CCTV** | 3716/1434H | up to 6 | 3/4 | 19(.850) | FTA |
| Ap2/76E | Hmark/Kermit | 3720/1430H | 4 | 5/6 | 29(.270) | PowVu, typ. CA |
| | Channel "I" | 3823/1327V | 1 | 3/4 | 3(.570) | Tests, FTA |
| | TVB8 + | 3849/1301H | 4 | 3/4 | 13(.238) | PowVu, CA |
| | Disney | 3880/1270H | 3 | 5/6 | 28(.125) | PowVu, CA - operating? |
| | AXN | 3920/1230H | up to 8 | 7/8 | 28(.340) | Tests, promos, **some FTA** |
| Thcm3/78.5E | **ITC+** | 3520/1630H | up to 6+ | 2/3 | 26(.661) | also try Msym 13.330, FEC 3/4 |
| | **ITC** | 3569/1581H | 1 | 2/3 | 13(.333) | FTA |
| | **MRTV** | 3666/1484H | 1 | 2/3 | 4(.442) | FTA; difficult to load |
| | UTV | 3920/1230H | 6 | 3/4 | 26(.662) | Irdeto (MOSC cards were available!) |
| | UTV/MCOT | 3880/1270H | 8 | 3/4 | 27(.500) | Irdeto (MOSC cards were available!) |
| | **Mahar/DD1** | 3600/1550H | up to 8 | 3/4 | 26(.661) | FTA (has included Indian, Egypt) |
| | **PTV bouquet** | 3420/1730V | 2 | 3/4 | 6(.666) | FTA, new service, testing |
| | **TV Maldives** | 3412/1738V | 1 | 1/2 | 6(.312) | FTA (reaches SE Australia) |
| | **Thai Global+** | 3425/1725V | up to 7? | 2/3 | 27(.500) | FTA |
| ST1/88E | **NTSC bouq.** | 3441/1709H | 2 | 3/4 | 5(.800) | Open TV, Cosa TV |
| MeSt 1/91.5E | **Malay. TV3** | 4147/1004H | 1 | 3/4 | 7(.030) | tests, possibly permanent, FTA |
| As2/100.5E | **Euro Bouquet** | 4000/1150H | 5TV, 19r | 3/4 | 28(.125) | FTA (TV5 teletext) |
| | **Reuters** | 3909/1241H | 1 | 3/4 | 5(.632) | FTA, occasional feeds |
| | **Hubei/HBTV** | 3854/1296H | 1 | 3/4 | 4(.418) | FTA SCPC, teletext |
| | **Hunan/SRTC** | 3847/1303H | 1 | 3/4 | 4(.418) | FTA SCPC, teletext |
| | **Guan./GDTV** | 3840/1310H | 1 | 3/4 | 4(.418) | FTA SCPC, radio APID 81 |
| | **Inn. Mongolia** | 3828/1322H | 2 | 3/4 | 8(.397) | FTA: #1 Chinese, #2 Mangolian |
| | **APTN A-O** | 3799/1351H | 1 | 3/4 | 5(.631) | FTA SCPC (news feeds) |
| | WTN Jer/Lon | 3790/1360H | 1 | 3/4 | 5(.631) | Mostly CA; **some FTA** |
| | Reuters/Sing. | 3775/1375H | 1 | 3/4 | 5(.631) | **FTA** & CA |
| | **WorldNet/US** | 3764/1386H | 1 + 20 radio | 3/4 | 6(.100) | FTA; up to 20 radio channels |
| | **Liaonin/Svc2** | 3734/1416H | 1 | 3/4 | 4(.418) | FTA SCPC, radio APID 256 |
| | **Jiangx/JXTV** | 3727/1423H | 1 | 3/4 | 4(.418) | FTA SCPC, teletext, radio APID 81 |
| | **Fujian/SETV** | 3720/1430H | 1 | 3/4 | 4(.418) | FTA SCPC, + radio APID 80 |
| | **Hubei TV** | 3713/1437H | 1 | 3/4 | 4(.418) | FTA SCPC, radio APID 80 |
| | **Henan/Main** | 3706/1444H | 1 | 3/4 | 4(.418) | FTA SCPC, + radio |
| As2/100.5E | **Korea feeds** | 4090/1060V | 1 | 3/4 | 10(.320) | FTA SCPC/MCPC |
| | **TVSN** | 4033/1117V | 1 | 3/4 | 4(.298) | FTA, not same as Aust. version |
| | Sky Racing | 4020/1130V | up to 3TV | 1/2? | 18(.000)? | (Irdeto) CA; **1 & 3 occ. FTA** |
| | EMTV | 4006/1144V | 1TV, 2 radio | 3/4 | 5(.632) | PowVu CA; poor signal level |
| | **Jilin Sat TV** | 3875/1275V | 1 | 3/4 | 4(.418) | FTA SCPC, + radio |
| | **HeiLongJian** | 3834/1316V | 1 | 3/4 | 4(.418) | FTA SCPC |
| | **JSTV** | 3827/1323V | 1 | 3/4 | 4(.418) | FTA SCPC, + radio |
| | **Anhui TV** | 3820/1330V | 1 | 3/4 | 4(.418) | FTA SCPC |
| | **ShaanxiQQQ** | 3813/1337V | 1 | 3/4 | 4(.418) | FTA SCPC, radio APID 81 |
| | **Guan/GXTV** | 3806/1344V | 1 | 3/4 | 4(.418) | FTA SCPC, radio APID 257 |
| | **Fashion TV** | 3796/1354V | 1 | 3/4 | 2(.533) | FTA SCPC, now easy to load |
| | **Feeds** | 3785/1365V | 1 | 3/4 | 5(.632) | FTA & CA, feeds |
| | **Myawady TV** | 3766/1384V | 1 | 7/8 | 5(.080) | FTA SCPC - difficult to load |
| | **Saudi TV1** | 3661/1489V | 1 | 3/4 | 7(.128) | FTA SCPC + APID 660, 669 |
| As3S/105.5E | **Arirang TV** | 3755/1395V | 1 | 7/8 | 4(.418) | FTA SCPC; very strong signal |
| | Star TV | 3780/1370V | 17(+)TV | 3/4 | 28(.100) | NDS CA (Pace DVS211) |
| | Star TV | 3860/1290V | 14(+)TV | 3/4 | 27(500) | NDS CA (Pace DVS211) |
| | Star TV | 3880/1270H | 12(+)TV | 7/8 | 26(.850) | NDS CA (Pace DVS211) |
| | CNNI | 3960/1190H | 4(+)TV | 3/4 | 26(.000) | PowVu CA; some **FTA** feed channels |
| | Star TV | 4000/1150H | 7(+)TV | 7/8 | 26(.850) | NDS CA (Pace DVS211) |
| Cak1/107.5E | Indovision (S-band) | 2.536, 2.566, 2.596, 2.626 | 33(+) TV | 5/6 | 20(.000) | NDS CA using RCA/Thomson, Pace IRDs; improved reliability since June |
| Sinosat/110E | **CCTV2** | 3889/1261Hz | 1 | 3/4 | 3(.000) | FTA SCPC, difficult to load |
| C2M/113E | **TPI** | 4185/965V | 1 | 3/4 | 6(.700) | FTA SCPA; may be test |
| | **Indosiar** | 4074/1076V | 1 | 3/4 | 6(.500) | May only be test - not reliable |
| | **Anteve** | 4055/1095V | 1 | 3/4 | 6(.510) | FTA SCPC; may be test |
| | Space TV | 4000/1150H | 12TV, radio | 3/4 | 26(.666) | CA uses "floating sequence" system |
| | C Net Taiwan | 3760/1390H | 11TV, radio | 3/4 | 26(.666) | CA, subs available (**FTA 11/12/99**) |
| | **RCTI** | 3475/1675H | 1 | 3/4 | 8(.000) | FTA SCPC; may be test |
| JcSAT3/128E | Miracle Net | 3990/1160V | 3 up to 6 | 5/6 | 12(.997) | PowerVu; **TBN #3 FTA**, some CA |
| | Asian bouquet | 3960/1190V | up to 8 | 7/8 | 30(.000) | CA and **FTA**, Japan, Taiwan, China |

| Bird | Service | RF/IF & Polarity | # Program Channels | FEC | Msym | Receivers and Errata |
|---|---|---|---|---|---|---|
| L AP1/130 | **THT+NTV** | 3675/1475L | 2 + 2 radio | 3/4 | 12(.000) | inclined orbit +/-2.4 degrees |
| Ap1A/134e | **Gansu TV** | 3769/1381V | 1 | 1/2 | 6(.930) | FTA SCPC (NT, Aust only) |
| Ap1/138e | **Reuters** | 3742/1408V | 1 | 3/4 | 5(.632) | FTA SCPC (NT, Aust only) |
| | Viacom | 3860/1290V | up to 6 | 3/4 | 30(.000) | **FTA**, CA (NT, Aust only) |
| | **SDTV** | 3980/1170V | 1 | 3/4 | 4(.686) | FTA SCPC (NT, Aust only) |
| Opt B3/156 | Mediasat | 12.336V | 6TV, 3+ radio | 2/3 | 30(.000) | PowVu but **mostly FTA**; TRT ++ |
| | Aurora | 12.407V | | 2/3 | 30(.000) | CA, $105 smart card required (p. 28) |
| | Aurora | 12.532V | | 2/3 | 30(.000) | CA, $105 smart card required (p. 28) |
| | Aurora | 12.595V | | 3/4 | 30(.000) | CA, $105 smart card required (p. 28) |
| | Aurora | 12.720V | | 3/4 | 30(.000) | CA, $105 smart card required (p. 258 |
| | Austar/Foxtl | 12.438H | | 3/4 | 29(.473) | CA, subscription available Australia |
| | Austar/Foxtl | 12.564H | | 3/4 | 29(.473) | CA, subscription available Australia |
| | Austar/Foxtl | 12.626H | | 3/4 | 29(.473) | CA, subscription available Australia |
| | Austar/Foxtl | 12.688H | | 3/4 | 29(.473) | CA, subscription available Australia |
| Opt B1/160 | **ABC NT fd** | 12.256V | 1TV, 3 radio | 3/4 | 5(.026) | FTA, Sydney -30 minutes time zone |
| | **Central 7** | 12.354H | 1TV | 3/4 | 3(.688) | FTA, purpose here unknown |
| | **Imparja TV** | 12.367H | 1TV, 3 radio | 3/4 | 5(.424) | FTA, purpose here unknown |
| | Sky NZ | 12.391/418V | | 3/4 | 22(.500) | NDS CA, subscription available NZ |
| | Sky NZ | 12.518/546V | | 3/4 | 22(.500) | NDS CA, subscription available NZ |
| | Sky NZ | 12.643/671V | | 3/4 | 22(.500) | NDS CA, subscription available NZ |
| | **Imparja fd.** | 12.367H | 1 | 3/4 | 5(.424) | FTA, difficult to load, not full time |
| PAS8/166E | Pacific Time | 12.286V? | 10TV | 3/4 | 26(.470) | Viaccess CA, some **FTA** at times |
| | **ABCInterch** | 12.312H | 1 | 3/4 | 6(.978) | PowVu, FTA, news feeds |
| | **ABCInterch** | 12.321H | 1 | 3/4 | 6(.978) | PowVu, FTA, news feeds |
| | Pacific Time | 12.326V? | 8TV | 3/4 | 27(.500) | Viaccess CA, some **FTA** at timres |
| | **ABCInterch** | 12.330H | 1 | 3/4 | 6(.978) | PowVu, FTA, ABC Melbourne feeds |
| | Pacific Time | 12.366V? | 9TV | 3/4 | 26(.470) | Viaccess CA, some **FTA** at times |
| | TARBS | 12.526H | 12+ TV | 3/4 | 28(.067) | 'MDS' CA, IRDs useless other svcs |
| | NHK Joho | 4065/1085H | 5TV, 1 radio | 3/4 | 26(.470) | PowVu CA & **FTA**; subscription avail |
| | DiscovryTest | 3980/1170H | 8 typ. | 3/4 | 21(.084) | PowVu/CA test, same as PAS2 3776H |
| | CalBqt/Pas8 | 3940/1210H | up to 5TV | 7/8 | 27(.690) | PowVu CA & **FTA (EWTN)** |
| | **CNNI** | 3780/1370H | 3, up to 5 TV | 3/4 | 25(.000) | PowVu, FTA at this time |
| | MTV Test | 3740/1410H | 4 | 2/3 | 27(.500) | PowVu, intermittent tests, CA+**FTA** |
| PAS2/169E | Pv Bouquet | 12.281V | 2+ TV, radio | 3/4 | 27(.500) | PowVu CA, WIN, ABC NT |
| | WA PowVu | 12.637(.5) | 4TV, 8 radio | 1/2 | 18(.500) | PowVu CA, WA only - D9234 |
| | **TCS-Singap** | 4183/967V | 2 | 1/2 | 6(.620) | PowVu FTA |
| | HK PowVu | 4148/1002V | up to 8 | 2/3 | 24(.430) | PowVu CA, **some FTA** |
| | **NBCHonKn** | 4093/1057V | 5, up to 7 | 3/4 | 29(.473) | Philips MPEG-2, FTA |
| | Fox Bouquet | 3989/1161V | 8TV/data | 7/8 | 26(.470) | Pv, CA/FTA (**Fox News US, EWTN**) |
| | **Feeds** | 3942/1208V | 1 or 2 | 2/3 | 7(.497) | (PowVu) FTA, occ. feeds |
| | ESPN USA | 3860/1290V | 7TV, 2 data | 7/8 | 26(.470) | PowVu CA, Ch 12 bootloader updates |
| | **Middle East** | 3778/1372V | 4 | 3/4 | 13(.331) | FTA - testing CA, "threatening" |
| | **Service 1** | 3761/1389V | 1 | 3/4 | 6(.620) | (PowVu) FTA, occ. feeds |
| | **CCTVPv** | 3716/1434V | 5 typical | 3/4 | 19(.850) | (PowVu) FTA, # pgm chs varies |
| | **NTV Japan** | 4174/976H | 1 | 3/4 | 5(.632) | FTA SCPC feeds (occasional use) |
| | **Feeds** | 4138/1012H | 1 | 3/4 | 6(.620) | FTA occasional feeds |
| | **7thDyAdven** | 4034/1116H | 1TV, 14 audio? | 3/4 | 6(.620) | 0300-0400+; also see 3957H |
| | **CNNI HK** | 3996/1154H | 1 | 3/4 | 9(.998) | Reverse link HK to Atlanta, feeds, FTA |
| | Feeds | 3867/1183H | 1 | 2/3 | 6(.618) | FTA occ. (sport) feeds |
| | **7thDyAdven** | 3957/1193H | 1TV, 14 audio | 3/4 | 7(.000) | 1900-2030UTC; not daily, PowVu FTA |
| | **Feeds** | 3939/1211H | 2 (typ NTSC) | 2/3 | 6(.620)/7(.498) | FTA-typ. NTSC-occ. sport, shuttle |
| | Cal PowVu | 3901/1249H | up to 8 | 3/4 | 30(.800) | (PowVu) CA & **FTA** |
| | Disney | 3804/1346H | 3 | 5/6 | 21(.093) | PowVu CA |
| | Discovry Sng | 3776/1374H | 8 typ | 3/4 | 21(.093) | PowVu CA |
| | **Satcom 1-6** | 3743/1407H | up to 5 | 7/8 | 19(.465) | currently FTA, lowlevel, Mid East feeds |
| I702/177E | AFRTS | 4177/973LHC | 8TV, 12+ rad | 3/4 | 26(.694) | PowVu CA |
| | **ThaiBouqut** | 12.650H | up to 3 TV | 1/2 | 17(.800) | Thai5 service, tests, FTA-yes, operating |
| I701/180E | Canal+ Sat | 11.610H | 16TV, 1 radio | 3/4 | 30(.000) | Mediaguard CA, **MCM FTA** |
| | TVNZ | 4195/955RHC | 1 | 3/4 | 5(.632) | DMV/NTL occ. feeds, typ CA |
| | TVNZ/BBC | 4186/964RHC | 1 | 3/4 | 5(.632) | DMV/NTL occ. feeds, typ CA |
| | TVNZ | 4178/972RHC | 1 | 3/4 | 5(.632) | DMV/NTL occ. feeds, typ. CA |
| | TVNZ/Aptn | 4170/980RHC | 1 | 3/4 | 5(.632) | DMV/NTL occ, feeds, typ. CA |
| | RFO-Canal+ | 4095/1055L | 7TV, 5+ radio | 3/4 | 27(.500) | #1, 2 CA - **rest FTA-France to Polyn.** |

| Bird | Service | RF/IF & Polarity | # Program Channels | FEC | Msym |
|---|---|---|---|---|---|
| (I701/180E) | **TVNZ feeds** | 4044/1106R | 1 | 3/4 | 5(.632) |
| | NZ Prime TV | 4024/1126L | 1 | 2/3 | 6(.876) |
| | **RFO Polycast** | 3858/1292L | 1 | 3/4 | 4(.566) |
| | TVNZ (IL) | 3854/1293R | 1 | 3/4 | 5(.632) |
| | TVNZ | 3846/1304R | 1 | 3/4 | 5(.632) |
| | 10 Australia | 3765/1385R | 6 | 7/8 | 29(.900) |

| Receivers and Errata |
|---|
| SCPC, mixed CA and **FTA** feeds |
| PowVu CA; Auckland net feeds |
| FTA SCPC; East Hemi Beam-Tahiti |
| SCPC, mixed CA & **FTA**, feeds |
| SCPC, mixed CA & **FTA**, feeds |
| PowVu CA & **FTA; #3 TBN** |

**BOUQUETS - FTA vs. CA:** Listings here show SCPC (single channel per carrier) and MCPC (multiple channels per carrier) digital transmissions which "more or less" conform to the MPEG-2 DVB "standard." Unfortunately, "conforming to the standard" is interpreted differently by the various transmission equipment suppliers - of which, Scientific Atlanta is the most notorious with its PowerVu proprietary (that means "unique to SA") method of creating MPEG-2. If you want to see REAL MPEG-2 DVB-Compliant (as in world standard) signals - try AsiaSat 2, European Bouquet (4000/1150Hz). SA "modifies" their PowerVu format in an attempt to force each programmer using its uplink equipment to also use its proprietary (PowerVu) receivers. PanAmSat, closely linked to Scientific Atlanta, virtually insists that any digital service user of their satellites use PowerVu format transmission equipment. The good news is that some clever non-PowerVu receiver designers and receiver software writers have created "quasi-PowerVu" decoding routines which in many cases outperform the PowerVu originals. If your use requires access to one or more PowerVu CA (conditional access) service, you have no choice but to purchase a PowerVu receiver. If you are only interested in FTA (free to air) PowerVu services, there are many lower cost options (see below).

All services listed in bold face (i.e. **Arirang TV**) are FTA. When MCPC services are FTA, they are also listed bold face (i.e. **Euro Bouquet**). When there are mixed CA and FTA programme channels in a MCPC bouquet, see right hand column for a bold face indication of this (i.e. **some FTA**). The primary (mostly or total) FTA MCPC bouquets are as follows: PAS4/68.5E: CCTV (3716H); Thaicom 3/78.5E: Mahar (3600H), Thai Global (3425V); As2/100.5E: European Bouquet (4000H); Optus B3 /156E: Mediasat (12.336V); PAS8/166E: NHK Joho (4065H), California Bouquet (3940H), CNNI (3780H); PAS2/169E: NBC Hong Kong (4093V), Middle East (3778V), BBC + (3743V), CCTV (3716V), California PowVu (3901H), Satcom 1-6 (3743H); Intelsat 701/180E: RFO (4095LHC), 10 Australia (3765RHC). There are far more SCPC FTA digital services than MCPC FTA digital services.

## MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

**ADI MediaMate**. FTA, NTSC+PAL outputs. (Pacific Digital Sys. Pty Ltd, tel 61-2-8765-0270)
**AV-COMM R3100**. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM Pty Ltd, 61-2-9949-7417.
**Benjamin DB6600-CA.** FTA, Foxtel/Austar w/CAM+card. Try Steffen Holzt ++687-438-156.
**Grundig DTR1100**. Mfg by Panasat (SA), very similar to Panasat 630; out of production, Irdeto capable. See Av-COMM above.
**Humax F1-CI**. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).
**Hyundai-TV/COM.** HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26) (Dec 99 - serious glitch with EBB reception)
**Hyundai HSS700**. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8906.
**Hyundai HSS800CI**. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
**MediaStar D7**. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. Int. 61-2-9618-5777
**MultiChoice (UEC) 660**. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
**Nokia "d-box" (V1.7X).** European, FTA, may only be German language, capable of Dr. Overflow software. Tricky to use.
**Nokia 9200.** When equipped with proper CAM, does Aurora, pay-TV services provided software has been "modified" with Dr Overflow or similar program (www.BAKKERELECTRONICS.COM- Note: This site shut-down by Mindport early November - may not be functioning!). Reported factory 12 mo. warranty. Peter Older, tel 61-3-5133-7911, mobile 61-0418-386287
**Nokia 9500/9600**. Numerous versions for different world parts; not distributed in Pacific but assistance from Av-Comm Pty Ltd.
**Nokia 9800**. Latest single chip version, with CI and Irdeto capable. No software for Pacific, Asia; not recc nmended.
**Pace DVS211**. NDS CA (no FTA) for Star Asia, previously used for Indovision. (Solution 42, 61-2-9820-5962)
**Pace DGT400**. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818)
**Pace DVR500**. Original DGT400 modified for NBC (PAS-2) affiliate use, with CAM equivalent to DGT400 but more reliable.
**Pace "Worldbox"** (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.
**Pacific Satellite DSR2000**. Advises no longer current model (see. p. 2, here); Clone of Mediastar D7 (see above)
**Panasat 520/630/635**. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370.
**Panasonic TU-DS10**. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but no longer available in Australia.
**Phoenix 111, 222**. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222 out of production
**Phoenix 333**. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review Nov. 1998. SATECH 61-3-9553-3399.
**Pioneer TS4.** Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
**PowerCom.** FTA, PowVu, NTSC, excellent sensitivity. NetSat 61-2-9687-9903.
**PowerVu** (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.
**Praxis/DigiMaster 9600 MKII/9800AD**. FTA, PowVu+analogue, withdrawn from sale in Pacific (was Skyvision-below)
**Praxis 9800 ADP**. FTA SCPC/MCPC, PowVu, analogue, positioner. SF review Dec '98; withdrawn from Pacific sale (below).
**Prosat 2102S**. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
**SatCruiser DSR-101**. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-2-6292-5850, Telsat 64-6-356-3749)
**SatCruiser DSR-201P**. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - review this issue (Skyvision - see above).
**Skandia SK888** (aka DigiSkan-SMS). FTA MCPC, Irdeto CAM+software upgrade. Out of production; Skandia 61-3-9819-2466
**Strong SRT 4600**. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. SATECH 61-3-9553-3399.
**Sky 21/SJ 3000ci**. Claims "clone" Hyundai HSS800ci; if so, poor copy. Runs very hot, reportedly burns up smart cards
**UEC642**. Designed for Aurora (Irdeto), approved by Optus; limited other uses. Nationwide 61-7-3252-2947.
**UEC660**. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - above); power supply problems.
**Xanadu.** DVB compliant special receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9949-7417)
**Yuri HSS-100C**. FTA, clone of Hyundai, V2.27 software custom to Australia (Nationwide-above).

Accessories:
**Aurora smart cards**. New v1.6 now available, 1.2 no longer available for RABS. Price now A$105, Sciteq 61-8-9306-3738.
**PowerVu Software Upgrade**: PAS-2, 3860/1190V, 26.470, 7/8; Tune pgm ch 12 and follow instructions (do not leave early!)

# SatFACTS Pacific/Asian FTA ANALOGUE Watch: 15 December, 1999



| BIRD/ Location | RF/IF & Polarity | Service | Errata |
|---|---|---|---|
| I703/57E | 3808/1342R | Udaya TV | |
| | 4052/1098R | WorldNet | VOA subcrs. |
| | 4178/972L | MTA Inter. | |
| I604/602/60E | 4166/984 | various feeds | |
| I704/66E | 3765/1385R | tests | |
| | 4015/1135L | Mongolia | (SECAM) |
| PAS4/68.5E | 3743/1407V | RTPi | (+ radio subcr) |
| | 3864/1286V | BBC World | |
| | 3907/1243H | Sony TV | Hindi |
| | 4034/1116V | Doordan | (various) |
| | 4087/1063H | CNNI | |
| | 4110/1040H | TNT/Cartoon | |
| | 4113/1037V | Series Ch. | |
| | 4182/968H | MTV | |
| PAS7/68.5E | 3470/1680V | test signal | |
| AP2R/76E | 3745/1405V | Vasta Music | (P5 in NSW) |
| | 3691/1459V | TEN | |
| Thaicom3/78E | 3871/1279H | TVT | |
| | 3760/1390V | Army TV | |
| | 3690/1460V | MRTV | |
| | 3685/1465H | Myanmar TV | + radio 7.6 |
| | 3616/1534V | ETN | |
| | 3594/1556V | AGK | test card |
| | 3576/1574V | ATN Bangalr | Bengali |
| | 3554/1596V | RAJ Plus | |
| | 3536/1614V | Punjabi TV | (occ service) |
| | 3514/1636V | Falak TV | |
| | 3489/1661H | Vasta Music | occ tests |
| | 3465/1685V | RAJ-TV | |
| Express 6/80E | 3672/1478L | TK Rossija | (north beam) |
| InSat 2E/83E | 3481/1669V | Sun TV | |
| | 3575/1575V | Vijay/Asianet | aud. 5.5/6.6 |
| | 3810/1340V | DD1-Tamil | " |
| | 3850/1300V | DD1-National | " |
| | 3930/1220V | DD2 Metro | " |
| | 3970/1180V | Teluga 1 | " |
| | 3998/1152V | sport feeds | " |
| | 4035/1115V | Sun TV | " |
| | 4060/1090V | Surya/Sun TV | " |
| | 4093/1057V | DD7 | " |
| ChnStr1/87.5E | 3880/1270H | occ feeds | P4 NSW, Ntsc |
| ST1/88E | 3550/1600V | test card | |
| | 3582/1568V | Nila TV | (vintage TV) |
| CIS S6/90E | 3675/1475R | RTR1 | P3 NSW |
| | 3875/1275R | Orbita 1 | |
| | 3916/1234R | RTR II | |
| | 3935/1215R | Orbita II | |
| MeSat-1/91.5E | 3710/1440H | VTV1,2, 4 | |
| | 3880/1270H | RTM-1 | |
| InSat 2B/93.5E | 4165/985H | India Metro | NSW on 3.7m |
| | 4125/1025V | India National | NSW on 3.7m |
| | 4080/1070V | DD7 (Tamil) | |
| | 4070/1080H | DD9 | |
| | 3970/1180V | DD9 (Kan.) | |
| | 3882/1268V | DD1 | |
| | 3840/1310V | DD? | |
| | 3762/1388V | DD4 | |
| AsSat2/100.5E | 3642/1508H | ERTU Egypt | |
| | 3660/1490V | feeds, tests | |
| | 3680/1470H | feeds | |
| | 3860/1290V | feeds | |

| BIRD/ Location | RF/IF & Polarity | Service | Errata |
|---|---|---|---|
| (As2/100.5E) | 3885/1265H | WorldNet | VOA subcrs |
| | 3960/1190H | CCTV4 | |
| | 3980/1170V | RTPi | +5 radio svcs |
| CIS S21/103E | 3675/1475R | RTR | |
| | 3875/1275R | Vrk Apt | |
| AsSat3S/105.5 | 3660/1490V | Z-Marathi | audio 6.6 |
| | 3680/1470H | CETV | |
| (temp FTA) | 3800/1350H | Star Sport | NTSC |
| (temp FTA) | 3840/1310H | Channel [V] | NTSC |
| | 3900/1250H | AlphaTV Punja | |
| (temp FTA) | 3920/1230H | Phoenix Ch | NTSC |
| | 3940/1210V | Zee India | |
| | 3980/1170V | Zee TV | |
| | 4140/1010V | Angla Bangla | |
| | 4060/1090V | Zee Cinema | (Starcrypt) |
| | 4100/1050V | PTV2/World | |
| | 4120/1030H | CCTV | NTSC |
| T'kom1/108E | 4000/1150H | tests | |
| PalapC2/113E | 4160/990H | (France) TV5 | |
| | 4140/1010V | Brunei + feeds | |
| | 4120/1030H | MTV Asia | |
| | 4080/1070H | Herbalife | + tests |
| | 4040/1110H | CNBC | |
| | 3970/1180V | CNNI | |
| | 3880/1270H | Aust ATN7 | |
| | 3840/1310H | TVRI | tests |
| | 3742/1408V | RCTI | English subcr |
| AsSat1/122E | 3677/1473V | Test card | & 3933/1217H |
| ChinS 6/125E | 4085/1065V | feeds | seldom seen |
| JcSat3/128E | 3768/1382V | feeds | occ., P5 NZ |
| | 4085/1065V | test card | NTSC. 6.8 aud. |
| Ap1A/134E | 4160/1050V | CETV | |
| | 3980/1170V | CETV1 | |
| | 3900/1250V | CETV2 | |
| Ap1A/138E | 4160/990H | CCTV7 | |
| S7/140E | 3675/1475R | ORT Moscow | +/-4d. inclined |
| | 3875/1275R | feeds, tests | |
| LMAP2/142.5 | 3675/1475L | occ. tests | +/- 3 deg inc. |
| Ag2/146E | 3787/1363H | GMA | P1/2 s. eqtr |
| Me2/148E | 4080/1070H | test card | occ. use |
| PAS8/166.5E | 3880/1270V | test card, feeds | not full time |
| | 3865/1285H | Napa test card | not fulltime |
| PAS2/169E | 3940/1240V | Napa test card | |
| 1802/174E | 4166/984R | Feeds | |
| | 4177/973R | Feeds | |
| I702/177E | 4166/984R | Feeds | inc. KBS Korea |
| | 4187/963R | Occ. feeds | |
| I701/180E | 3810/1340R | Occ. feeds | |
| | 3841/1309L | RFO | East Beam |
| | 3845/1305R | Occ. feeds | inc. from USA |
| | 3930/1220R | USA net feeds | **FTA** & encrypt |
| | 3975/1175R | Occ. feeds | |

| | | | |
|---|---|---|---|
| PAS4/68.5E | 3785/1365V | Discovery India | BMAC |
| | 3860/1290H | ESPN India | BMAC |
| Ap2/76E | 3960/1190H | HBO Asia | GI Digicipher2 |
| C2/113E | 3930/1220H | Filip. Peo. Net | GI 1.5 MPEG |
| Ap1/138E | 4100/1050V | ESPN | BMAC |
| PAS2/169E | 3836/1341H | ABS/CBN | GI 1.5 MPEG |

## BEGINNER'S CORNER

**Keeping it cool**: It was only 2 years ago that the typical (average) digital IRD consumed more than 60 watts of AC power. Another way of stating that - think of turning on a 60 watt light bulb and holding it tightly in your hand for five minutes. No way. The amount of AC power (in watts) that a satellite receiver "consumes" is the amount of heat generated by the device. Modest heat is a necessary side effect of all electronics; excessive heat destroys the very circuits which generate that heat. A report (see p. 29 here, "At Press Deadline") of a new IRD that actually "cooked" (and destroyed) a smart card inserted into its (Irdeto) CAM within 24 hours of initial turn-on is frightening. Not only is the card permanently lost, but that much heat is also causing very significant damage to the receiver itself. Satellite receivers generate heat (get hot) because of one factor - the flow of current through a resistance. This is your basic household electric toaster at work folks. Current "masses" in and about power supply components, at large (or very large) integrated circuits, and where voltage regulating devices are installed. Careful engineering minimises heat by separating heat creating parts to widely different in-container locations. Another design trick is to connect something that generates heat to a larger heat-flowing surface - a metal case around the receiver, for example, becomes the "toast" in a toaster. Air flow through a satellite receiver is especially important - those ventilation slots on the top and sides are not there for sex appeal - they are intended to suck or draw fresh air through the box to set up convection currents of cooling air. Stacking books, copies of SatFACTS, last night's pizza plate or the kid's underpants on top of or around the satellite receiver is a fast ticket to destroying your own IRD. Placing the IRD inside of a hi-fi, stereo, TV or other cabinet with limited or no air flow is a short course in building an oven. The little woman may argue that she wants the unsightly "satellite thing" out of view - don't give in. Put it "proudly" on a shelf by itself, don't stack anything else below, above or next to it, and check it with your hand every now and again to monitor the temperature of the case. If it gets too hot too comfortably lay your hand on it, find out why. Or shortly it will tell you why - **bang**!

## ADVANCED INFORMATION

FEEDBACK - Polarotor (tm) "Hunting"

"In the text SF#63 refers to a 470 uF or 1,000 uF capacitor - these should be a form of electrolytic, not disc. The 100 pF is a disc ceramic. The diagram shown (SF#63, p. 28) suggests installing these parts at the receiver end of the circuit. In fact, this could increase the "hunting" defect because of the cumulative resistance of the cable run between receiver and dish/polarotor (the higher the total loop resistance, the more likely the problem will occur). Some suggestions: (1) Connect the servo directly to the servo controller (i.e. Polarotor to receiver terminals). Fit a current meter in the line with the +5volt. Operate the receiver pot/switch that changes polarity and observe that it rotates freely from end to end. When the servo stops moving (at an end, for example), the in-line current meter should never show 10 mA or more of residual current - if it does, the servo motor is jamming or hunting. Some servos are bad fresh out of the box (not uncommon) and many mechanically stick as they rotate (because the servo to probe coupling is too tight). (2) If the servo checks out in this manner, reconnect the cable from the dish to the receiver returning the Polarotor to the dish. Refit the current meter in the +5volt line and do small steps of rotation stopping every 30-40 degrees or so. If it is jamming or sticking with the resistance of the cable in the line (from dish to receiver) as indicated by 10mA or more current when the servo is 'resting', the next step is to fit an electrolytic capacitor between the +5volt line and the ground at the servo/Polarotor. If your run is modest in length and the wires #18/#20, a 1,000 uF cap should be adequate to stop the "hunting." If a 1,000uF does not cure the hunting problem, try a larger value - one of my installations using smaller, thinner wires to the Polarotor required 2,200uF.

The 1 ohm resistor shown in your diagram should not be required - the resistance of the cable itself should be at least an ohm. The 100pF cap you show from control (pulse) to ground should not be required either."

(I.R. Fischer, Lithgow, NSW, Australia)

Note: In SF#63, we said, with perhaps too little emphasis, "if the motor is still acting up ... (try) *the same connecti ns at the motor proper.*"

## TUNING IN THE INDUSTRY'S TV PROGRAMME

SPACE Pacific, the Asia-Pacific industry membership trade association, has produced (and continues to produce) a series of one hour television programmes. These "SPACE Pacific Report" shows, hosted by Bob Cooper, cover a range of topics of interest to installers and enthusiasts. Show numbers and content are as follows: **#9901-** Spectrum Analyser techniques, **#9902-** Feeds and LNBs, **#9903-** Dish antenna designs and problems, **#9904-** The dish marketplace, and, "tiny parts," **#9905-** Dr Overflow (Nokia) software, **#9906-** How the uplink works (tour of RCA's Vernon Valley site), **#9907-** Uplink Two, including uplink transmitters, **#9908-** Digital Basics (Mark Long), **#9909-** Real World Installs (Mark Long), **#9910** - Installing a polar mount dish (in production); "Report" is broadcast by Mediasat on Optus B3, 12.336Vt, ad-hoc channel 3 (SR 30.000, FEC 2/3) with the following coming-weeks schedule: **Sunday December 19** - Show 9905 - 0300-0400 UTC (1600 NZDT, 1400 AESummerTime, 1100 Western Australia). **Sunday December 26** - Show 9906, same times as December 19; **Sunday January 2** - Show 9907, same times as December 19; **Sunday January 9** - Show 9908, same times as December 19; **Sunday January 16** - Show 9909, same times as Dcember 19; **Sunday January 23** - Show 9910, same times as December 19( *Premiere showing*). SPACE Pacific Report is also broadcast by Westlink, Aurora service on Optus B3, vertical (12.694, SR 30.000, FEC 3/4 - requires Optus Aurora card but is otherwise FTA). Schedule is Monday, Wednesday and Friday as follows: Mondays: 8AMWST/11AM AEST; Wednesdays 10AM WST/1PM AEST; Fridays 8AM WST/11AM AEST repeated 12noon WA/3PM AEST. Show schedule: Week **of January 31, February 2, 4**: Show 9908; week of **February 7, 9 and 11**: Show 9909; week of **February 14, 16 and 18**: Show 9910. Westlink is in "hibernation' during the Christmas - January holidays, off the air from December 17 to January 31. SPACE Pacific attempts to pre-announce which show(s) will appear through the SatFACTS Web site prior to each weekend (http://www.satfacts.kwikkopy.co.nz). Shows are digitally mastered and VHS copies are available from SPACE Pacific - see insert card between front cover and page 1 here.

Sponsorship of SPACE Pacific Report. In general answer to queries - AvComm, Satech and Sciteq have contributed corporate funding to make possible the production of the first set of ten SPACE Pacific Report programmes. Funds derived from sale of VHS tape copies are also an important element to meeting the $1,300 overhead of each show. Mediasat and Westlink donate the time to broadcast the programmes, and both are to be commended for this support. As we move into the next group of (10) programmes now being scripted and shot, we solicit financial support from members of the industry with commercial activities they wish to have associated with the project. To discuss your own support, contact Bob Cooper at telephone 64-9-406-0651, fax 64-9-406-1083, e-mail Skyking@clear.net.nz. C-band wide area service is still being negotiated.

# WITH THE OBSERVERS

**AT PRESS DEADLINE**

Probable "Millennium Feeds" source - Fox has replaced MPEG 1.5 link on PAS-2 at 3989/1161Vt with PowerVu MPEG2; Msym 26.470, FEC 7/8 - 7 NTSC video/data channels (D. Pemberton). Warning: A new IRD that at first blush appears to be a clone of the HSS800CI (identified as Sky 21/SJ3000CI) appears to have very bad heat problems - destroying smart cards in under 24 hours!

**ApStar 2R/76E**: Total Entertainment Network (TEN) is FTA analogue 3691/1459Vt, audio 6.6 (**D. Pemberton**).

**AsiaSat 2/100.5E**: "Contact for queries, reception problems with WorldNet is George Cantalupo, ETS at fax ++1-202-205-2967" (**P. Burton**, NZ). Saudi Channel 1 has shutdown on 3811/1339Hz but continues on 3661/1489Vt. New audio services on this (Saudi) channel as well - APID 660, APID 669. Occasional Korean Broadcasting Service feeds reported 4090/1060Vt, Msym 10.320, FEC 3/4. Nile Valley Radio is now on 3640/1510Hz, 7.20 MHz.

**AsiaSat 3/105.5E**: "Now TV, previously analogue, now 3760/1390 Hz, Msym 28.125, FEC 7/8" (**S. Johnson**, NZ). "Zee/Alpha TV testing may have been temporary or precursor to post-January 1 parameters: 4020/1130Vt, Msym 27.000, 3/4 with Music Asia, Alpha TV Marathi/Bangla/Punjabi seen" (**A. Zapara**, WA). Note: Zee TV has taken 3 new transponders here - one to be FTA digital, two are new analogues - ed.

**Intelsat 701/180E:** "TBN feed on 3765/1385R has been increased 3 dB as of 5 November" (**M. Marfel**, NZ) - Can others verify improvement here?-ed. "French bouquet (11.610Hz) - best skew position for LNB when pointing at this satellite from Victoria seems to be same as for Austar" (**N.S.**) "French service reached saturation of transponder at point where Noumea measured signal is 47 dBw - Intelsat and CanalSatellite contract calls for 49.8 dBw. Unfortunately that is all there is available" (**S. Holzt**, Noumea).

**Intelsat 702/ 177E**: Southern command radio channels now gone from 4177/973L.

**Intelsat 804/64E**: Trinity Broadcasting is now on 3754/1396Hz, Msym 6.620, FEC 3/4, west hemi beam (**B. Miller**).

**JcSat 3/128E**: Asian bouquet known as C-Net has moved from 4100/1050Hz to 3960/1190Vt and *may* be received now south of equator (Msym 30.000, FEC 7/8 which won't help - adult porno reported here if that is incentive to check!). Another new one is BKT Singapore tests at 4040/1110Vt, Msym 6.110, 3/4 with 2 channels.

**LMI AP1/130E**: "Tracking required every 60 minutes with 3.7m" (**D. Leach**, NSW). New APID for Sport FM is 2821 (3675/1475L). New "Echo Radio" is operating with APID 2308.

**LM 1/75E**: "Test carriers, not video modulated, P3/P4 best in NSW on 3550/1600Vt, 3716/1434Hz" (D. Leach). Also


Irish and Scottish sport sent world-wide to bars and pubs. This sports network, distributed using PowerVu around the globe, is redistributed (CA) in Australia through Mediasat (Optus B3).

Too hot to handle. This black-plastic feed cover was installed on a small dish in Victoria. Unfortunately, the dish paint was defective and during equinox the heat melted the cap! No word on whether the LNB survived.

**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 February15th issue: February 5 by mail (use form appearing page 34), or 5PM NZT February 6th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

## European Bouquet PID/PCR/PMT Goes "Upside Down" Leaving Thousands Stranded

It was every installer's worst nightmare - 10 o'clock at night on the Australian east coast and the European Bouquet PID/PCR/PMT digital mapping goes haywire. Instantly, receivers of virtually every shape, size and brand quit working. Some stop totally - no EBB service at all. Others lose video but retain audio. Some hold onto a channel or two in the 5-channel bouquet - most do not.

It is November 23rd and a satellite technician at the Bezeq, Israel turnaround uplink site for the EBB package is at a keyboard giving instructions to the multiplex software. Whether he was following instructions or like the PanAmSat flight controller last August thought he was "off line" - when in fact he was on line - nobody was saying. In fact, neither the guys and gals at Bezeq nor their clients at the European Bouquet would even comment on the situation. Not until December 9th - 2 weeks after the event happened - when DW acknowledged, "*a problem with Hyundai HSS100C IRDs*" which DW suggests "*are not DVB compliant with the latest MPEG2 standard,*" tossing the problem back at the manufacturer. Not good enough. Numerous skilled Pacific installers did what they had to do. **Tony Drexel** - Free to Air Satellite: "*My phone began running hot at 10PM Tuesday night. Customers with Prosats had their audio PIDs change, one lost his video PIDs as well. Those with* (second software version) *MediaStar D7s adjusted to the changes on their own.*" **Jake Hendriks**, Tasmania: "*Phoenix 333, Hyundai HSS800CI adjusted to the new numbers without problems.*" Others reported the Skandia SK888, the Panasat 520s and the largest problem of all - Hyundai HSS100C - would not turn back on. Step one - reload the bouquet. For most this did not work. Step two: If the receiver had the ability to accept installer inputted video and audio PIDs and the PCR number, try a new set of numbers.

The SatFACTS Web site (http://www.satfacts.kwikkopy.co.nz) became the installer's best friend - DigitalSat's **Pietro Casoar** worked out the new PID/PCR/PMT numbers and they were quickly posted on the SF site. Within 24 hours the numbers changed again. *Somebody was playing at Bezeq.*

To help you understand, PID and PCR numbers are mapping tools to assist the IRD in locating, downloading and placing into memory the parameters of a programme channel. Each channel has its own distinctive numbers. When a service such as EBB initially loads into a receiver, the IRD figures out these numbers on its own and they become part of the memory for that channel. If someone changes these numbers, two things happen: (1) The IRD no longer recognises the new numbers as valid, and, (2) Either shuts down the reception (SK888, Panasat 520 et al) or - the receiver is "smart enough" to search for the new, replacement numbers (including but not limited to Phoenix 333, Hyundai HSS800CI, the various Sat Cruiser models).

The IRDs that found the new numbers on their own were off and running within seconds of the change. Those that don't have that software capacity quit. In the case of receivers which could be reloaded with new PID/PCR numbers - manually by the user - even though the receiver was not "smart enough" to find the new numbers on its own - once told what they were, would operate just fine (Prosat et al). Receivers without the ability to find the new numbers, and also lacking the PID/PCR operator input capability, were simply out of luck (Hyundai HSS100C, most versions of DigiSkan SK888, Panasat 520s). Some of these could be coached back into operation by going into the memory and erasing all references to the EBB - frequency, Msym, FEC - the lot. Then turn off the IRD, unplug from mains, wait a minute or so, repower and re-enter the numbers anew. And ask it to search for the service.

The Hyundai HSS100C went through this restart routine and then sent you a message on the screen: "No or bad signal." (Pace and Panasat IRDs told you, "Acquiring database, please wait." The wait would be *forever.*)

Short of EBB returning to its old (original) PID/PCR mapping (or Hyundai issuing new software - see p. 4, here, letters), the Hyundai problem appeared terminal. **Patrick Bulley** (NZ) thought otherwise and created by experimentation what has come to be known as "The Bulley EBB Solution" as follows:

(1) Clear all existing EBB information from the HSS100C memory (returning the operating frequency to '0', etc.); (2) Switch off the receiver and unplug from the (AC) mains; (3) Reconnect to AC, power up, and re-enter the EBB data (4000/1150Hz, 28.125, 3/4) and execute search. The screen will say 'No or bad signal.' (4) If using a polarity switching LNB, or polarotor type feed, switch to the opposite polarity (vertical) for six seconds, then return to horizontal. Alternately, unplug the L-band (IF) input cable and after 6 seconds, plug it back in. (5) The EBB signal will now reappear either instantly or with 2 seconds.

It works (see letter, p. 4 here) as dozens of installers following the instructions posted on the SF Web site reported. But this is a temporary fix, as **Garry Herden** (Adelaide) notes - you will most probably "lose" EBB if you move to another transponder, or move to another satellite. For people with dedicated EBB systems (ethnic viewers), it will hold as long as the AC mains power is not cut.

For those with PID/PCR capability, here are the latest (updated if required on our Web site) numbers: **DW**/ VPID 2305, APID 2306, PCRPID 2304, PMT 256; **MCM** / VPID 5125, APID 6406, PCRPID 8190, PMT 257; **RAI** / VPID 5135, APID 6446, PCRPID 2432, PMT 258; **TVE** / VPID 5145, APID 6486, PCRPID 8190, PMT 259; **TV5** / VPID 5155, APID 6256, PCRPID 2560, PMT 260. Complaints? Dr Nowotny via email at DW as nowotny@dwelle.de and their tech department piplak@dwelle.de or their "hotline" bockhack@dwelle.de.

check 3500/1650Vt, 3531/1619Hz, 3600/1550Hz, and 3630/1520Vt.

**Optus B3/156E**: "Oh!" has started on 12.626Hz, PIDs 522/650 and CA. Optus Web site (http://www.enterprise.optus.com.au) does NOT list Humax nor Hyundai IRDs as Optus approved for Aurora use. Optus source advises, "*UEC 642 semi-professional model differs from RABS 642 and has not been approved. 660 has completed testing, awaiting 'legal approval' to be added to list. The UEC700 and ADB (SMS) are currently being tested.* (Other) *manufacturer models are having software changes made, at Optus request.*"

**Palapa C2M/113E**: "Viewable here in NT, RCTI 3475/1675Hz, Msym 8.000, FEC 3/4; TPI 4185/965Vt, Msym 6.700, 3/4; Indosiar 4073/1077Vt, Msym 6.500, 3/4, Anteve 4055/1095Vt, Msym 6.510, 3/4 or automatic" (**Nolan**). C-net Taiwan 3760/1390Hz, Msym 26.666, FEC 3/4, in clear as SF goes to press (23 TV + radio services) (**B. Richards**).

**PAS 2/169E**: Telstra 12.265, 12.300 Vt have shutdown. New is 12.281Vt, Msym 27.500, 3/4, PowerVu CA including WIN, ABC north. WA package previously 12.265 now on 12.637.5, new Msym of 18.500, FEC 1/2. Changeover was December 1, all part of reconfiguring PAS-2 Ku for additional clients - shortly.

**PAS 8/166E**: A new pay-TV firm, TPG Internet, plans January-February start here on Australia beam. Plans are to have up to 8 TV channels, first 5 announced include ESPN - all to be FTA provided user has Internet terrestrial modem contract (A$19.95 per month) with firm. Details SatFACTS Web site. TARBS package now has 13 TV services, 10 radio but not all radio are in use (**A.I**. Qld). Unknown MPEG format service 12.725Hz, Msym 25.728, 7/8 with up to 4 programmes. Occasional analogue feeds 3880/1270Vt, usually NTSC. MTV bouquet testing 3740/1410Hz, Msym 27.500, 2/3 - up to 4 programmes. Discovery testing (again) MPEG2/PowerVu at 3980/1170Hz, Msym 21.084, 3/4 - identical to PAS2.

**Sinosat 1/110E:** CCTV2 now on 3889/1261Hz, Msym 3.000, FEC 3/4.

**ST 1/88E**: "Multiple digital signals strong here in Katherine, NT include 3441/1709Hz, Msym 5.800, 3/4; 3468/1682Vt Msym 20.000, 3/4 test with 5 Chinese TV including Beijing; 3550/1600 Msym 19.700, 3/4; 3632/1518Vt, Msym 26.667, 3/4 - includes MCM Asia, Phoenix Chinese" (D. Nolan).

**Thaicom 3/78E**: TRT on 3520/1630Hz is now Msym 13.330, 3/4 (D. Leach). "University of Information & Technology" also on this bouquet which I read as 26.661, 2/3" (B. Richards). "In fact, virtually all Th3 bouquets will work with both FEC 2/3 and 3/4 - amazing but true!" (**D. Morris, Thailand**). Mega Cosmos on 3447/1703Hz, Msym 2.892, FEC 3/4. Prabhat TV testing 3452/1698Vt, Msym 6.667, 3/4.

# AT Sign-off


Above - a "ghostly" SPN ran out of money from Nauru in July. Below - Orion 3's launch failed in May.


The Pacific "hole"

For as long as there have been satellites, the larger Pacific region has been the forgotten child of our technology. Our present PAS-2 (and more recently, PAS-8) coverage is but 5 years old this month and all of the Palapa, AsiaSat, InSat, Thaicom services came after.

The reality is (1) the Pacific is an area of the globe larger than Europe and Africa combined, and, (2) fewer people live in this region than in greater Tokyo. Neither of these factors encourages dedicated satellite coverage.

There are other factors. Language is one. Something approaching 90 dialects, each of which takes a small segment of the total population. English is universal but only as a second language. Economy. Money - currency - is a foreign concept for the majority of the lesser island residents. The primary method of trade is barter. A basket of fish in exchange for 5 gallons of petrol, for example. And telecommunications is by "thin" routes - one telephone circuit for an entire village - the lucky ones. The unlucky don't even have that.

The reality is that while many satellites are positioned so as to be capable of footprinting some or all of the Pacific region, very few do so. PAS2 was carefully designed to provide links from North America to and from Asia; Pacific coverage was a bonus. In fact, PAS2 included the ability to boresight in the Central Pacific (C-band) as an alternative to "Pacific Rim" coverage. Unfortunately, no commercial user for this specialised footprint materialised.

PanAmSat was much less generous with PAS8's design and for most purposes, even New Zealand is on the edge of the eastern coverage. And once PAS8 was actually launched and testing, numerous operational problems surfaced.

The one "great white hope" for the Pacific was to be dashed when Orion 3, going to 139E, failed to achieve geostationary orbit last May. This C + Ku band bird was of special interest because on board were medium power Ku footprints centred near Fiji that would have served dishes in the 1m region for most of the Central Pacific.

Intelsat 701 (180E) and 702 (177E) both have functioning Ku spot beams capable of delivering medium power footprints over significant portions of the Pacific. The CanalSatellite service that turned on this month from 701 (see p. 20, here) is teaching us the commercial potential of these satellites. The pity is that dealing with the Intelsat infrastructure and actually getting onto one of these beams requires very deep pockets, nearly unlimited capital, and a willingness to put up with a range of operational roadblocks.

C-band coverage for Pacific region services remains so uneven, or it requires very large dishes, that it is difficult for a would-be broadcaster to make a lasting impression. SPN, the Nauru based all sports for the Pacific service, held on for 17 months before running out of funds. It had the backing of the Nauru Sports Federation, and money to operate the service and rent the transponder time came from the Nauru Government.

SPN was unfortunately (for them) on Intelsat 701 with a puny signal that required a 4.5m dish for reliable service. *Strike one.* The circular polarisation (all Intelsat C-band beams) requires a special feed - good for ADL and feed makers, bad for casual tuners-in. It took as long as ten weeks for a remote island wishing to sample SPN to order and receive a circular feed and the cash expenditure was significant. *Strike two.* And SPN covered such a broad, wide ("global beam") region that they constantly ran into roadblocks when attempting to acquire redistribution rights to events. No matter that nobody in Japan watched or wanted SPN - if the global signal reached that point, programme rights owners wanted payment to include Japan. *Strike three* against SPN.

So lacking the appropriate satellite footprints, not having enough programming channels to make up a bouquet (as CanalSatellite has done), and faced with a never ending myriad of programme rights issues, the future for bringing even a modest bouquet of services to the Pacific Islands seems dim indeed. New Zealand had and passed on the opportunity; Australia was briefly interested in the scheme but dropped it as a bad investment. The French service headquartered in New Caledonia partially solves the puzzle but not for non-French speaking people.

A Hawaii headquartered American run service that also serves the Pacific is one possibility; a Fiji service is another. For now, the Pacific Region remains a giant hole with lots of water, few people and no indigenous satellite TV channels.

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## OBSERVER REPORTING FORM - Due January 5, 1999

• NEW programming sources seen since December 1st: _____

_____

• Changes (signal level, transponder, programming content) in pre-existing programming sources since December 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 _____

Town/City _____ _____ _____

Make/size dish _____ LNB _____ Receiver _____

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## MILLENNIUM FEEDS - where to look

**Analogue**: I701 - (180E) 3810/1340R, 3845/1305R, 3930/1220R, 3975/1175R; I702 - (177E) 4166/984E, 4187/963R; I802 - (174E) 4166/984R, 4177/973R; PAS2 - (169E) 3940/1210Vt; PAS8 - (166.5E) 3880/1270Vt, 3865/1285Hz; AsiaSat 1 - (122E): 3677/1473Vt; AsiaSat 2 - (100.5E) 3680/1470Hz, 3860/1290Vt.

**Digital:** I701 - (180E) 3765/1385R, 29.900, 7/8; 4044/1106R, 5.632, 3/4; 4170/980R, 5.632, 3/4; 4178/972R, 5.632, 3/4; 4186/964R, 5.632, 3/4; 4195/955R, 5.632, 3/4; PAS2 - (169E) 3939/1211Hz, 6.620 or 7.498, 2/3; 3867/1183Hz, 6.618, 2/3; 3996/1154Hz, 9.998, 3/4; 4138/1012Hz, 6.620, 3/4; 4174/976Hz, 5.632, 3/4; 3761/1389Vt, 6.620, 3/4; 3942/1208Vt, 7.497, 2/3; Optus B3 - (156E) 12.336Vt, 30.000, 2/3; AsiaSat 2 - (100.5E) 3785/1365Vt, 5.632, 3/4; 3775/1375Hz, 5.631, 3/4; 3790/1360Hz, 5.631, 3/4; 3799/1351Hz, 5.631, 3/4; 3909/1241Hz, 5.632, 3/4; I703 - (57E) 4018/1132L, 6.000, 3/4.

This is the BIG event - more satellite "time" has been booked over the period December 26 - January 5 than in any previous ten day period. If you have access to Internet, please file your own observations with Skyking@clear.net.nz for posting on our SatFACTS (http://www.satfacts.kwikkopy.co.nz) Web site. .

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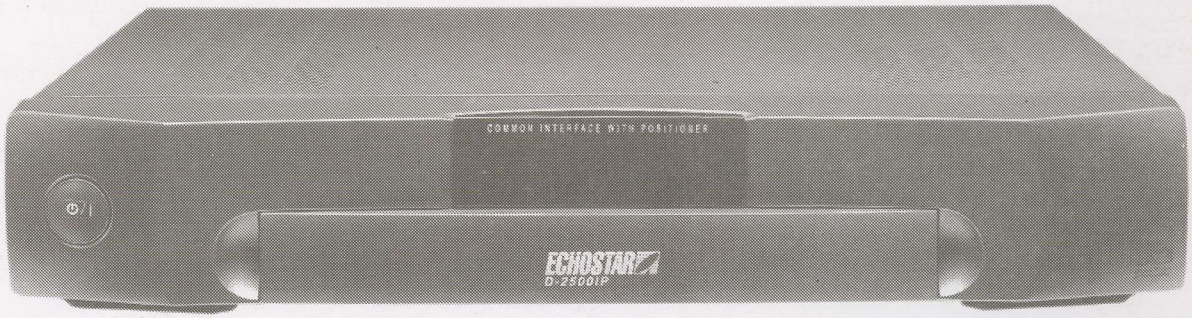


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