Bob Cooper's

APRIL 15 2002

SatFACTS

MONTHLY

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

IN THIS ISSUE

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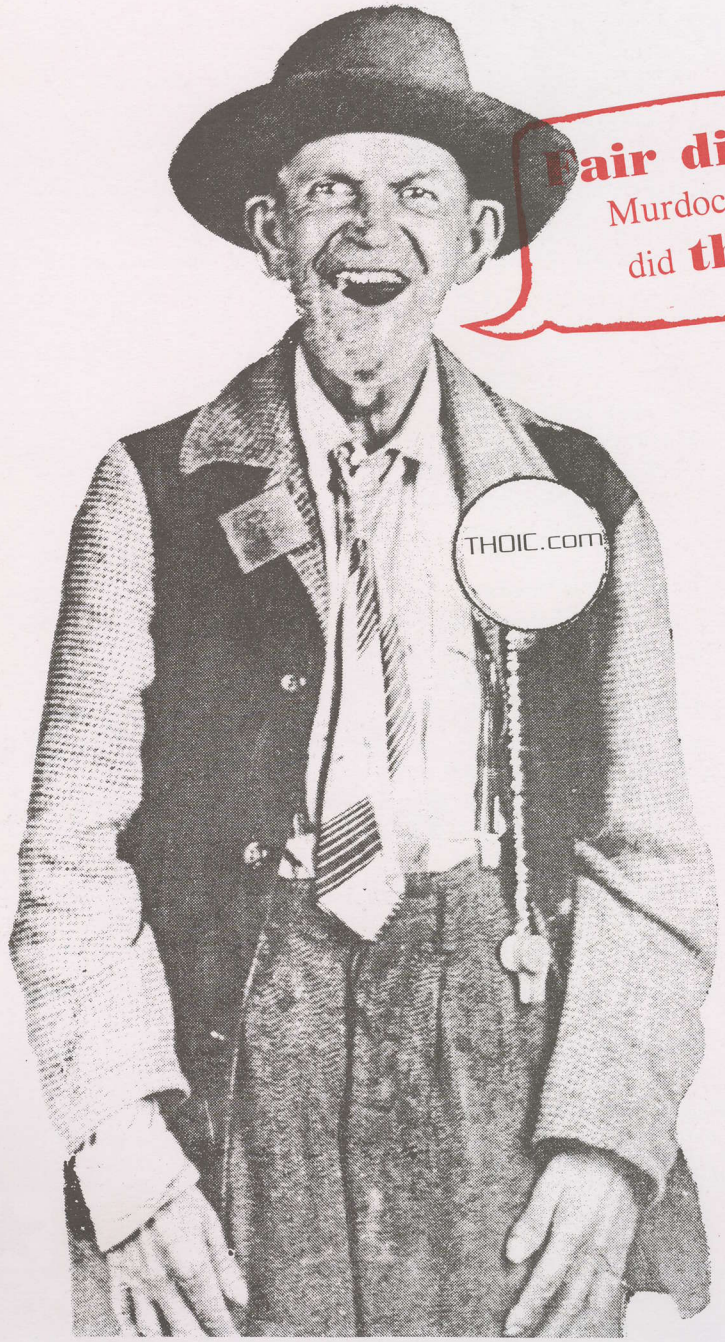

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This publication is dedicated to the premise that as we are entering the 21st century, ancient 20th century notions concerning borders and boundaries no long define a person's horizon. In the air, all around you, are microwave signals carrying messages 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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ERRATA

COOP'S COMMENT

April 15, 2002

Australian author Neil Chenoweth in "Virtual Murdoch" describes the formation days of NDS, the slightly secret Rupert Murdoch Israeli firm which specialises in developing and marketing conditional access technology (smart card systems). It seems the founding "visionary" of NDS, an American named Michael Clinger, arrived in Israel with some skeletons in the closet. He was under indictment in America for stock fraud, and a Grand Jury had recommended his arrest. Only nobody at NDS - or so the story goes - realised his background. Rupert Murdoch personally conceived NDS as an arm of News Corp with one purpose - to create a pay-TV encryption system (ultimately Mediaguard) which would allow his British BSkyB infant system to charge people money for satellite TV. After several years, the law caught up with Clinger and he was forced to step down from heading News Datacom (now NDS).

But he left things behind. For example, on the side and unknown to Murdoch, he had created a firm that manufactured blank smart cards. Then he arranged from his head position at News Datacom to buy smart card blanks from his own firm - neglecting - or so the story goes - to advise anyone at News Corp that it was he who was making the card blanks. He wore two hats at the time - first he was selling to News Datacom, and then he was buying for News Datacom. Little surprise that when all of this unravelled News Corp discovered they had been paying a premium price for the blanks!

If this was the only skeleton in the News Datacom/NDS closet, it might be considered an aberration. Unfortunately, there is more. Much more. Like the day 70 Israeli tax agents descended on News Datacom hauling away tons of paper records because they suspected the firm had been doctoring the books in lieu of paying proper taxes.

Now comes pretty solid proof that News Datacom/cum NDS paid for and operated by remote control various Internet piracy web sites. They defend this revelation by claiming it was for the purpose of "*gathering information to help them beat piracy*." No doubt being the secret "web master" for sites such as THOIC.com allowed them to get their hands on a great deal of piracy information. But when Canal Plus charged NDS with releasing information on Internet sites designed to defeat the conditional access security of News Corp competitors such as iTV Digital and Canal Plus, well, one has to at least ponder what THOIC.com was *really* intended to do for NDS.

The THOIC.com site provided information to hackers about busting the security of Irdeto, SECA, and a host of others. The THOIC.com Australia-NZ operation had a 'Sky NZ' segment but after *months* of operation, it attracted well under 50 "postings" while at the same time Australia's Austar postings were exceeding 100 *per day*. Of course Australia was using Irdeto, competitive to News Datacom's Mediaguard whereas Sky NZ was (and still uses) Mediaguard.

Canal + says in their US$3 billion lawsuit NDS "*crossed over the line*" when sites it sponsored released specific instructions for busting competitor's smart card systems. iTV Digital, the British terrestrial DVB-T pay-TV service that has attempted to compete with Murdoch's BSkyB satellite service, loses 1 subscriber in 4 to "churn". That means people sign-up, watch the iTV Digital service for a month or longer, and then "sign off". iTV Digital in suing NDS claims one of the primary reasons for their "churn" is because at street stalls and weekend boot sales piracy iTV Digital cards are being sold for around $30 each - about the same amount legitimate subscribers pay per month. iTV Digital no longer wonders why its' "churn" is so high - one Brit in four finds $30 one-time a better deal than $30 a month.

Some are forecasting smart cards are dead - that the era of smart cards will close within two years. Perhaps sooner. Others are certain newer, "smarter" cards are on the way. Unfortunately, for iTV Digital and others, it will probably be too late to save them.

-ON THE COVER-

Imagine the worst thing that might happen to Rupert Murdoch's News Corp empire. Now double that. (p. 6)

What's New at AVCOM RAMSEY?
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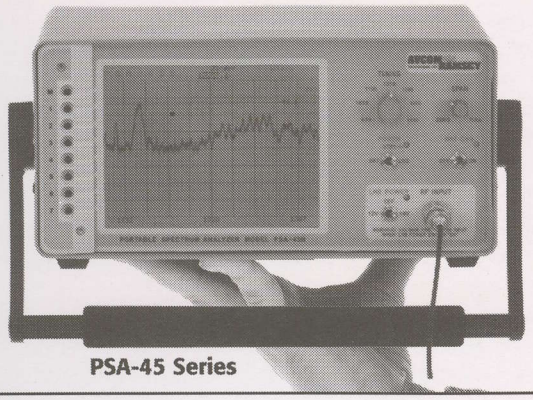

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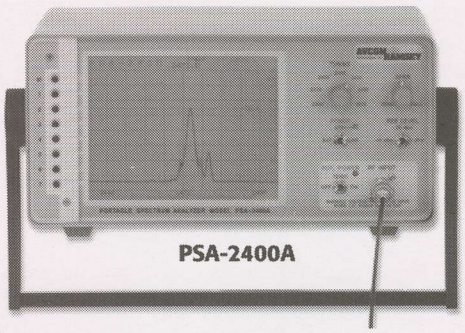

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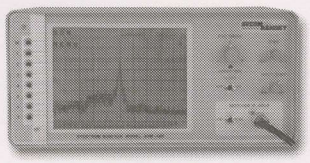

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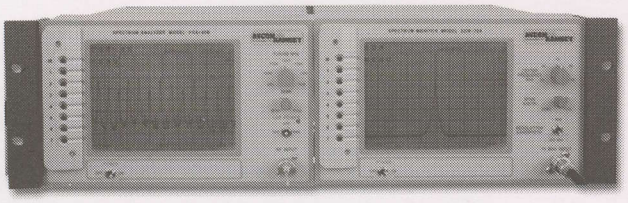

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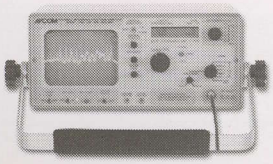

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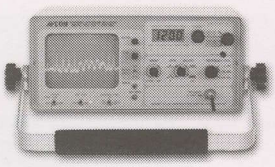

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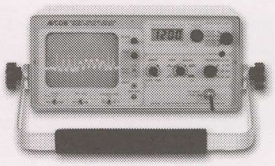

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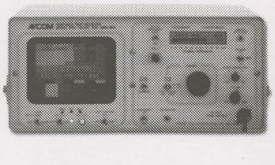

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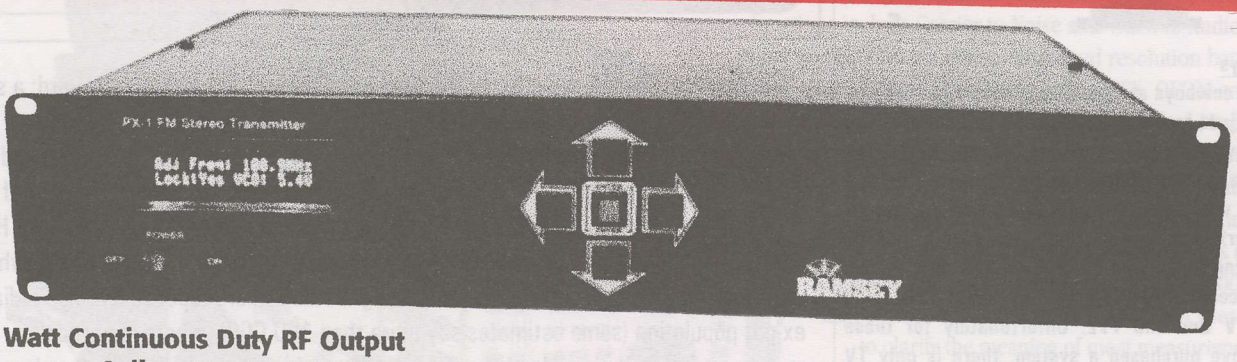

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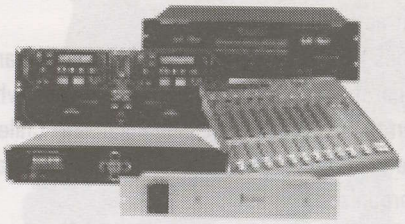

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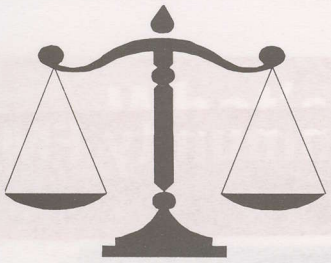


LETTERS

Cowboys

"The cowboys are starting to drop from the sky. I have just received a telephone call from a very unhappy customer, not one of my own. The problem is 'promise versus performance'. A local fellow who once worked for (name of pay-TV provider) has taken out advertising locally promising those who purchase a FTA dish system will receive ABC-TV, Prime TV, TV3, TV4 along with TV One and TV2. Unfortunately for those who have purchased a system, there is only TV One plus TV2 and if the weather is perfect and the dish was installed with great care, ABC 'some of the time'. The installer (who spelled satellite as sattelite in his advertising!) when pressed about the missing channels proceeds to blame the wholesale supplier of his receivers. He says, 'I was told TV3, TV4, Prime would be FTA within a few weeks so I simply passed that on to the customer.' So we have a two-stage lie. The wholesaler, anxious to sell product, passes along his belief or perhaps some carelessly reported web site posting as 'gospel' and the dealer sees this as an opportunity to get a sale - and he passes it along as well. The consumer at the end of the lie-chain knows no better (after all - is not TV One and TV2 FTA already?) but after patiently waiting for days, weeks, and now months - is frustrated. 'What can you do?' I am asked. The answer is not much except to post this warning of my own concerns that our frail small time industry is further threatened by such careless sales techniques. Let's clean up our acts before some 'higher authority' does it for us!"

Paul Burton, Waipu Cable TV

It gets worse. Salesmanship has taken on an ugly colour when role models such as Rupert Murdoch are alleged to be involved in piracy and hacking. The answer is neither easy nor probably practical. It is called 'honesty'. But there is another element as well - often called 'The Peter Principal'. This says a person rises to the highest level supported by their skills, and then unfortunately, one step beyond. Once at that one-up level, their employer is stuck with a person 'in over their head' and faced with a tough decision - keep them on and try to train them for the spot where they have been promoted, or, move them sideways looking for something they can still do adequately. We investigate this scenario on page 14, this issue.

Canal + versus NDS

"Having just 'digested' CTD for April 5, I must commend you on the extremely thorough coverage of all aspects of this situation. One question: If these guys - NDS - are the market leaders in encryption technology, and they have such low business ethics as to bust and then release Canal+ software, what does that say about all aspects of pay-TV?"

ES, NZ

PROGRAMMER PROGRAMMING PROMOTION UPDATE

APRIL 15, 2002

Correction: On p. 1 we refer to the NDS encryption system as Mediaguard; a slip of the finger. It should of course be Videoguard!

Zee TV in Hong Kong. Four Zee channels (Zee TV, Zee News, Zee Cinema and Zee Music) are now available in Hong Kong through Hong Kong Cable at a rate of HK$ 248 per month (US$32). Zee "toyed" with selling its services directly into HK one year ago, met with dish installers there, hoping to create a legal scenario which would correct a piracy problem in Hong Kong. Dealers there report a sizeable Indian ex-pat population (some estimates say more than 100,000), where in particular restaurants and ethnic-clubs have "imported" receivers from India and elsewhere. The CA system is Mediaguard which as we all now know is "busted" in its present form world-wide.

DVD/CD piracy? A group of major music firms has filed law suit against Thomson Multimedia SA's Technicolor unit. The suit alleges Thomson has been making illegal (read pirate) copies of compact discs. The firms bringing the suit include big-names such as Sony, Vivendi (yup - the same folks suing NDS), Walt Disney and AOL Time Warner. The music CD industry is very nervous about what they term piracy but which others call "duplicating free to hear". CD "copying" has certainly cut into CD sales; down 10.3% in 2001 versus 2000. Paranoid movie makers fear that CD copying is but the tip of a new generation iceberg that will see DVD copying and Internet distribution of live video performances escalate world-wide. Welcome to the 21st century.

iTV Digital, the terrestrial pay-TV platform in the UK that has joined Vivendi in suing Rupert Murdoch's NDS for aggressively assisting pay-TV card pirates to bust their security, is facing bankruptcy. Soon. An "administrator" has been appointed to try to save the company, which as we report starting on page 6 here, is seeking hundreds of millions of US dollars from NDS as settlement for piracy related charges. The sharks are already circling iTV - potential "salvage value" buyers lining up to bid for the assets of the pay-TV firm should it actually go under.

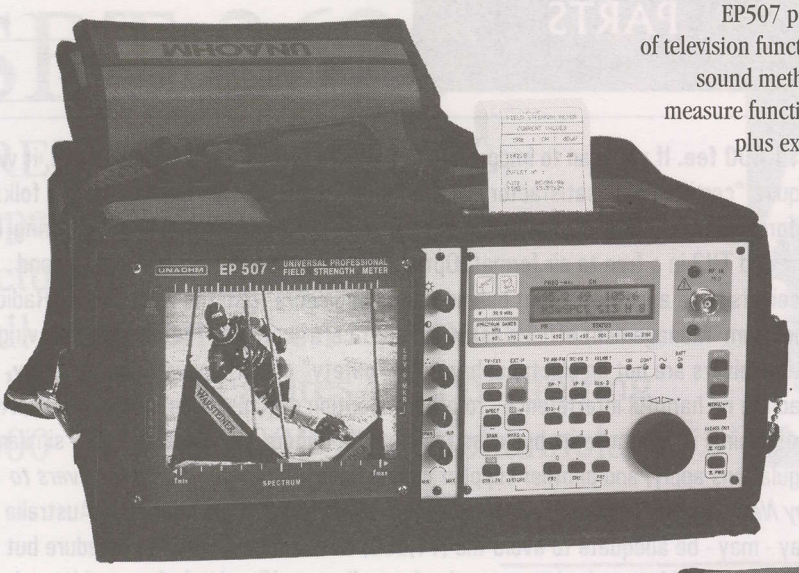
Next to go? Now that DirecTV (USA) has kicked out NDS as a provider of smart cards (see page 6), the next step is consideration about DirecTV Latin America which is bound by a similar contract with NDS.In the last six months, NDS cards in Chile and Argentina have been wholesale hacked and there is concern that Star TV Asia and Sky NZ may be next on the pirate's organised "hit list".

Preliminary court hearing? Vivendi is asking the California court to "expedite" their suit against NDS, pleading they "need court protection" from NDS before they begin releasing their own 'next generation' smart cards. At SF press deadline, the court is trying to clear an opening for sometime in May.

And the winner is. New Zealand's government funded subsidy programme that allows TV broadcasters to create programming "of and about New Zealand" approved 8 new programme series for TV3, 7 for TV One and 3 for TV2 during February. The smallest was a NZ$29,136 grant ("2002 ANZAC Day Wreath Laying ceremony" for TV One) while the largest was $1,210,369 ("Tagata Pasifica" for TV One). In dollars and cents, TV One was the big winner with $2,645,110 and TV2 the smallest at $503,970. Something to look forward to? "The Living Room", ten shows 1/2 hour each (less commercials of course) for TV3 at $37,926.60 per episode.

Lee Gibling, the creator and operator of the now infamous THOIC.com piracy web site, *really has* disappeared. His testimony is eagerly sought by Vivendi in their law suit filed against NDS and the French Secret Police have joined in the search for the missing Brit. *Shades of Tron*?

The growing Unaohm Television Analyser family



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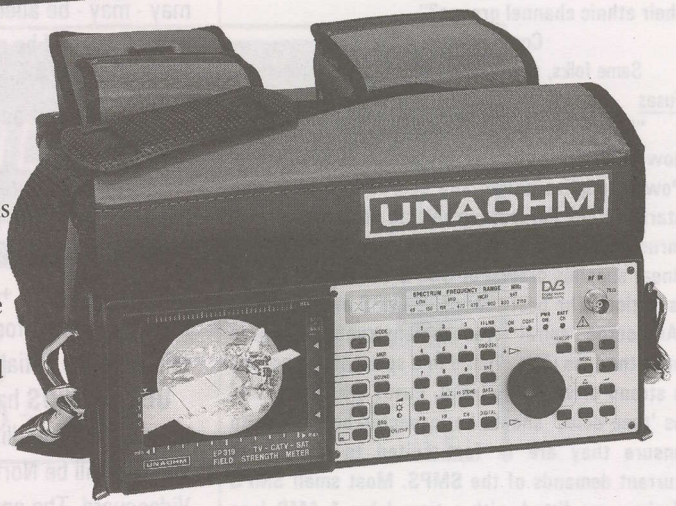

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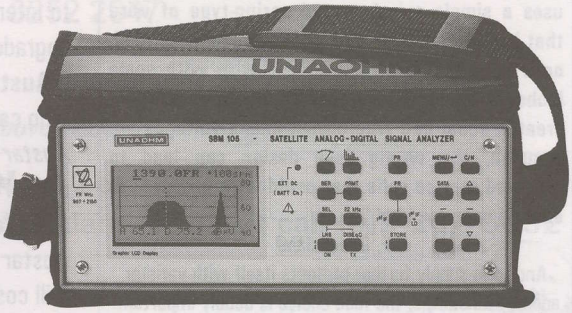

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Crying wolf?

"I note with interest comments appearing in Sydney papers from Michael and Regina Boulos (TARBS) concerning the proposed merger of programming interests by Foxtel and Optus. They seem to be threatening 'leaving Australia' and moving on to North America and Europe 'if the proposed contract before the ACCC is not somehow modified to force the cable firms to add TARBS channels' to their packages. Are these not the same people who have one by one eliminated the free to air C-band ethnic telecasters from the airwaves, leaving thousands or tens of thousands of Australians with worthless C-band dishes on which they previously enjoyed their home country television? Are these not the same people who sold more than a hundred million dollars in microwave frequencies to Austar thereby making a major contribution to Austar's precarious financial position? Are these not the same people who recently signed new hundred million dollar contracts with PanAmSat to use PAS2, 8 and 10 to reach Africa, Europe and North America with their ethnic channel groups?"

Constantine B., NSW

Same folks, same modus operendi, same result.

Fuses

"March SF article concerning the (Palcom) power supply potential problem. Switch-Mode-Power-Supplies potentially can have a very high start current (inrush current). In some cases, this inrush current is greater than even old-fashioned linear supplies draw. For SMPS the choice of fuse is critical. The best fuses for SMPS are known as 'Anti-surge spiral wound construction'. These have the fuse wire wound in a spiral shape around a strand of white material. Fuses which are sold as 'time delay' should be inspected before use to ensure they are in fact suited to the inrush current demands of the SMPS. Most small SMPS designs are fitted with a time-delay 1 AMP fuse that is 'anti-surge'. If a fuse blows, replacing these specific design devices with a standard 1 AMP or even a 1 AMP slo-blow version will usually lead to it popping as well. Fuses are unfortunately classified by type although their actual inrush current capacity and characteristics may vary greatly. A 1 AMP 'anti-surge' is correct because at start-up the SMPS will often approach 200 watts at 240 volts or 100 watts at 100 volts. I advise people to avoid 'time-delayed' fuses even if of the correct amp value if the construction uses a simple spiral wound spring-type of wire that has no centre strand as previously described, or it may look like a strand of wire with some blobs of solder 'stuck' on it. All fuses are not created equal and where high mains voltages are common, the wrong fuse design can lead to repeated service calls that could with proper fuse education be avoided."

IF, Queensland

And, if a supply further protects itself with varistor and/or TransZorbs, the fuse choice is doubly important. A fast fuse will often blow from a small voltage surge which the varistor could safely dissipate (as heat) but the non-time-delayed fuse would blow unnecessarily.

HARDWARE EQUIPMENT PARTS UPDATE

APRIL 15, 2002

$1,800 fee. If you plan to import a new satellite receiver into New Zealand, it will require "certification" satisfactory to the Radio Frequency management group folks before - that is before - it can be put out for sale. On the heels of TVNZ's offering TV One and TV2 in a free to air format (Optus B1), a number of new to New Zealand receivers have appeared. Right behind them - engineers from the Government Radio Spectrum Management offices asking to see "certification". That involves proving the receivers are not an electrical hazard (a "safety" check) and verification they "radiate no harmful interference" to other reception devices. One Palmerston North firm claims it will move its business to Australia (where - by the way - very similar regulations apply) and another supplier claims he is, "*no longer selling receivers to any New Zealand based customer - only out of country*." Certification in Australia may - may - be adequate to avoid the ($1,800) New Zealand testing procedure but sellers will still be required to prove the Australian certification before making sales. Oh yes - the Government guys routinely "troll" the Internet looking for satellite and other equipment advertising and use leads gathered there to make up their "visit schedule."

JcSat 8 (to be renamed JcSat 2A) successfully launched March 28, should be nearing permanent home at 154E as you read these words. Watch for C-band testing from 3.4 - 3.7 (horizontal) and 3.7 - 4.2 (vertical only) and your reports please to SatFACTS (fax ++64-9-406-1083, Email skyking@clear.net.nz). There are no known "clients" for the C-band portions at this time, so it could be some years following the initial testing before you "see" signals on C from 154E again.

UEC and NDS have jointly announced a project to design, build and distribute two new set-top (satellite) IRDs. One version will have a built-in hard drive for recording, another will be North American targeted and include a DOCSIS modem and Videoguard. The announcement was made prior to the present NDS "problems" and the plans may have changed since "the" lawsuit was filed.

Donna Maree Ryder (donnamaree@nzonair.govt.nz) is collecting views from New Zealanders concerning why Government rules governing satellite set-top boxes and free-to-air access should be formulated. If you believe you have reasons why Sky's monopoly should be controlled, contact her.

Philips DVS 8000 digital IRD with MTV CA capability. Contact is Patricia Ng at Philips Singapore; fax ++65-6356 9031 and Email is patricia.ng@philips.com.

Viaccess cards for FTV. One cable operator who signed up for carriage of now encrypted Fashion TV service (As2) has received ten cards (!) and instructions to go to Internet to "upgrade" his Viaccess IRD "Version 1" to "Version 2". IRD to be upgraded must of course have suitable PC port.

Austar advertising. To avoid install costs, they are offering "prizes" to anyone who can "*connect their IRD to the telephone line on their own and register as an Austar connected-by-telephone subscriber.*" Should be interesting effort for those still using Pace DGT400 set-tops! In another newspaper ad, Austar is looking for de-installers (*Austar Box Collectors*) - folks to go around and take out disconnected Austar customer equipment - apparently hoping "de-installers" taking equipment out will cost them less than installers already under contract at a fixed fee. Qualifications? "The successful Subcontractors will have an eye for detail, be committed to quality and have well developed interpersonal skills." Being fleet of foot and not afraid of large, vicious dogs would also be good.

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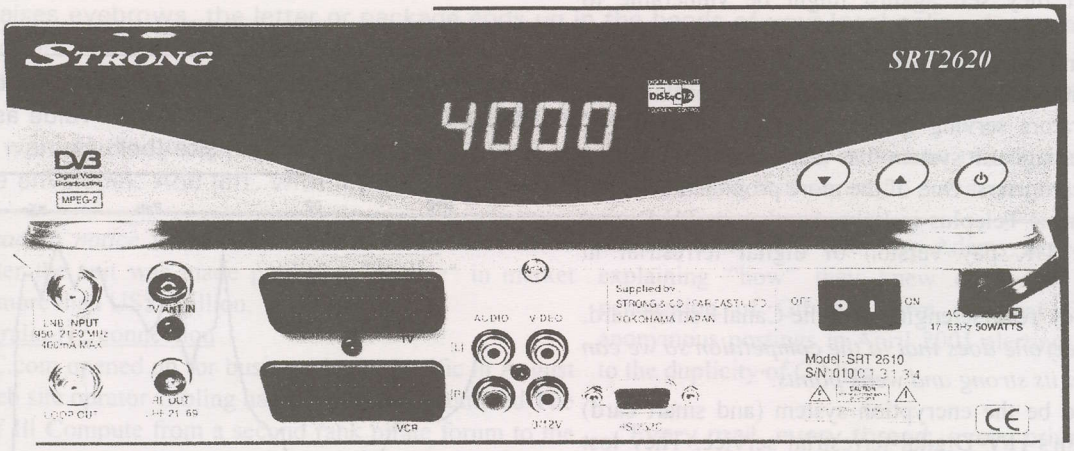

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The King may be naked

If Murdoch is found guilty of hacking Canal+ can NDS and News Corp survive?

Imagine the worst possible thing that could happen to News Corp. *Now double it.*

NDS, a UK firm 79.2% owned by News Corp and sharing virtually all of the corporate structure, has been formally charged in a California court with smart card piracy by French pay-TV programmer Canal Plus. C+ is asking for a jury trial, and damages of US$3 billion. This is the kind of fantasy normally confined to movie screens.

C+ claims NDS took their Mediaguard smart cards into a laboratory near Haifa, Israel in 1998 and proceeded to "delaminate" (take apart, layer by layer) the cards to reverse engineer how the cards had been designed, why they worked. So far no crime - competitors do this sort of thing to discover where a product they sell against might be vulnerable to improvement.

Canal Plus and NDS compete in the smart card pay-TV world. NDS's Videoguard system is in use by approximately 40 pay-TV operators serving nearly 28 million subscribers. Canal Plus's Mediaguard system has between 12.5 and 15 million 'paying' card users. One of the more prominent users of the Canal+ system is Teleplus in Italy. Another is iTV Digital in the UK; the UK pay version of digital terrestrial in Australia.

NDS *admits* they 'reverse engineered' the Canal+ smart card, but explains, "*everyone does that to the competition so we can better understand its strong and weak points.*"

NDS hoped to be the encryption system (and smart card) supplier to Britain's iTV Digital terrestrial service. They lost out to Canal +, possibly because News Corp operates BSkyB satellite in direct competition to iTV Digital in Great Britain. But iTV-D bought Canal+ and almost before the service went to the marketplace piracy cards were being sold for under NZ/A$50 a pop in street stalls and weekend boot sales.

Canal Plus in their California filed lawsuit claims NDS not only reverse engineered the C+ card system at the Haifa laboratory, but then proceeded to ship the decryption code with 'hacking instructions' to an affiliate firm; NDS California. Still, no crime.

But, according to C+, NDS UK instructed NDS California to *release* the smart card codes to a popular hacker web site (www.dr.7.com). **Now** we have a crime.

dr.7.com followed instructions, accordingly to C+, and in March 1999 everyone who didn't already know how to bust Canal +'s encryption system could follow dr.7.com instruction. By the end of 1999, encryption users in Spain, Italy and the UK were being "hit hard" by large scale, well promoted piracy cards. In the UK, the piracy cards were offered for under A/NZ$50 each at a time when iTV Digital subscriptions charged that much *per month.*

The dr.7.com release was soon being paralleled by a more popular, wide spread, pirate site operating with the name

Vivendi's Canal Plus alleges NDS helped steal digital-TV broadcasts

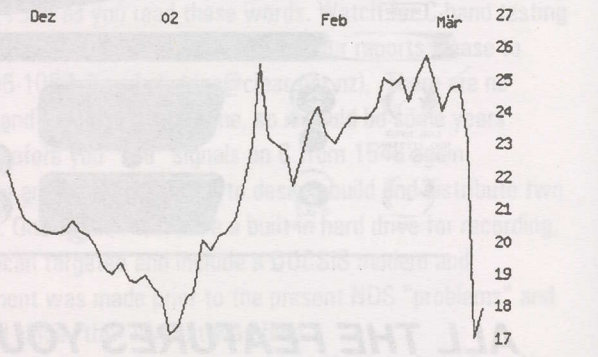
French pay-TV firm sues News Corp. unit for $1 billion

Murdoch company in $1bn TV piracy row

Murdoch TV firm now accused of funding hackers

The plot thickens...

The headlines greeting Rupert Murdoch (above) and the instant 26% drop in NDS stock value as posted by a German site (below).



THOIC.com (The House of Ill Compute). Thoic was managed by a man named Lee Gibling who was living in the UK but used a web server located in North America. NDS *admits* it paid money to Gibling for maintenance of his THOIC.com site, and also admits it provided increased server capacity for THOIC.com's "expansion" into the Australia and New Zealand market.

Canal+ says all of this (and more) convinces the French firm that NDS deliberately set out to destroy their Mediaguard encryption system, to compromise the system, because it was a competitor to the NDS Videoguard encryption. NDS of course denies the allegations.

Canal+ is charging NDS in a California court because NDS Americas is located there, and this NDS affiliate is alleged to have been the source for the dr7.com posting. A number of anti-racketeering laws are cited and the charges, if proven, could soak upwards all the way to the top of NDS and parent News Corp. Two of Rupert Murdoch's sons, Lachlin and James, serve on the NDS Board of Directors. Murdoch, who depends heavily on "share-market" value for his various corporate

thoic online forums

"My heart skipped a beat - two guys in blue at my front door."

"I am not involved in selling or dealing in piracy cards. But with all of the Internet information available offering card writers and data stream readers, I could resist no longer at least trying to see if my own skills were up to the play. I ordered in a package including a reader and a writer from a UK source. It seemed harmless enough and the European magazines carry page after page of advertising for these products and of course the 'blank Gold cards'. The products arrived promptly, no problems. But on a whim I ordered the cards (ten in all because that is where the price break occurred) from a source in Dubai. I liked their colourful catalogue and after all - 'blank cards are cards'.

'*Are you* (they repeated my name)?' I verified I was. Their freshly pressed uniforms and manner demanded I pay close attention to their query and answer truthfully.

'*Do you recognise this?*' said one holding up the colourful catalogue from Dubai? I answered 'yes'. And the second man-in-blue continued. '*Did you order something from this place?*' I saw no reason to deny it - what harm is there in blank cards, after all?

'*You know,*' he continued, '*Austar is having financial troubles and these* (holding up an envelope stuffed with ten [I assumed] blank gold cards) *is not helping them.*'

I gulped hard. He continued. '*Now, there is nothing illegal about these devices as they have arrived in our country* (Australia) *but we look with suspicion upon someone who orders so many* (God forbid I ordered 100!).'

He went on to explain that, '*since 911 we have been checking all mail originating in Middle Eastern countries.*' Dubai, for those not sure of their geography, sits on the Persian Sea surrounded by Saudi Arabia, just across the water from Iran. 'All mail' means the Australian postal service flags all letters, all packages coming from any of the 'middle east' countries, and sends it off to be opened. Inspected. If something inside raises eyebrows, the letter or package ends up in the hands of your local police department with instructions. In this case, someone smart enough to recognise 'gold card blanks' had tagged the envelope, written an explanatory 'verbal script' for the local police detectives and eventually they got around to 'dealing with my case.'

I was warned. They kept the blank cards (it never occurred to me as they stood on my doorstep to ask for the envelope). And left, with me shaking in my gum boots. Let this serve as a warning to others."

stocks, *had to notice* when NDS value instantly nose-dived 26% after the suit was made public; a "decline" in market value of more than US$1 billion.

The Australia-NZ connection

THOIC.com opened up for business in the Pacific in August 1999. Web site oprator Gibling had in two years promoted **T**he **H**ouse **o**f **I**ll **C**ompute from a second rank pirate forum to the world's most popular piracy site. He had the direct backing of NDS's top security man, Ray Adams, who routinely exchanged Emails with Gibling and who also authorised multi-thousand pound deposits from NDS to Gibling's personal account. In April 2001, THOIC collapsed after an insider who knew the truth about the site posted a warning telling users, "*Everything said here is placed on a disc and couriered directly to top officials of NDS.*" Gibling promptly disappeared and has not been heard from since the posting.

Back in August 1999, Gibing contacted SatFACTS with an offer. He wrote us:

"We currently host some of the leading names in satellite-tv piracy and enjoy a safe haven with the server located in the USA. On Friday I take delivery of a new server with 4 times the processing power. We currently see some 4gb of daily requests and all the sites are averaging somewhere in the region of 300,000 hits per day."

Gibling's Emails to a man named Ray Adams at NDS have appeared in various newspapers including The Guardian (UK). Adams is Director of Security at NDS. In December 2000, and later in March 2001, THOIC.com was the target of a hacker "break-in". Hacker-elite, suspicious of Gibling's financial backers, managed to get into his computers and actually dump (copy) more than 100 Gb of content from Gibling's personal communication file. It was here that the Emails going to and coming from NDS and Ray Adams were located. Without explaining "how" they knew or "what" they knew, this penetration of Gibling's own personal files caused these anonymous postings in April 2001 alerting THOIC.com users to the duplicity of Gibling.

"Every mail, every thread, every private message is logged on THOIC and sent to NDS on CD each week. If you continue to use it then so be it but do not say no one warned you. THOIC is run by NDS (who owns Sky) and they use it to spy on the public who use it."

Eventually the 100 Gb+ Gibling files ended up in the hands of Canal+ parent Vivendi International. These files are likely to feature prominently if the NDS case actually goes to a jury trial in California.

NDS, in admitting the funding of Gibling, says this was "*merely an effort to gather information about hacking.*" What they have not been able to explain is the iTV Digital situation. When iTV Digital went on the air, it chose Canal Plus encryption. NDS was so angry when iTV did not select their Videoguard system they filed a lawsuit against the terrestrial pay-TV broadcaster. Then for no apparent *reason* they dropped the suit.

In fact there was a reason, alleges Canal+. NDS, "saw a better way" to punish iTV Digital than taking them into a court. They simply placed iTV Digital hacking information on the THOIC.com site where anyone with a $100 card reader/burner and a blank card could create as many iTV Digital cards as they wished.

Imagine a tooth paste manufacturer who secreted ground glass into a competitor's tubes. Or an automobile maker who deliberately arranged for his competitor's tires to fail on SUVs.

Some of the more 'quotable' quotes from those 'suing' NDS

Francis Carayol, chief executive of Canal Plus Technologies (the arm of C+ which like NDS is in the smart card business):

"It is really astonishing and surprising for us that our best-kept secret had been exposed and published (on Internet). This went way beyond piracy and hacking. No company is above the law and we intend to see the law applied to halt NDS's illegal actions."

Stuart Prebble, chief executive of iTV Digital: "It is absolutely extraordinary for NDS to be funding this web site at a time when the web site was deliberately publishing codes which were specifically designed to undermine our system, to encourage piracy of iTV Digital, and to ultimately put us out of business as a competitor to BSkyB."

Francis Carayol (above) speaking about bringing the details of NDS hacking to the attention of top NDS personnel between December 2001 and March 2002 when the lawsuit was filed: "We were willing to listen to NDS and try to reach an amicable solution. NDS said it would launch an internal investigation (into the charge that NDS released Canal Plus encryption data through dr.7) but they never came back to us."

The "Tron" incident

On October 22, 1998 a 26 year old "computer whiz" named Boris Floriciz was found dangling from a tree limb at a public park in Berlin (Germany), his feet dragging on the ground and his belt wrapped around his neck and the limb. On May 18, 2001 the police closed their files on his death and concluded it was "suicide".

Known to his hacker world friends as "Tron," he was considered one of the most brilliant computer programming minds in Europe. He was the first to dissect the secrets of the German Deutsche Telekom preloaded telephone card, an act resulting in his arrest as he sat surrounded by hundreds of parts from a pay telephone he had disassembled. Anxious to not have Tron's new found knowledge "go public" the authorities and the telephone company extracted his promise to stop hacking telephones and placed him on probation. Tron went straight - back to University where he earned a computer science degree in record time and in his spare time created a scrambler that encodes data and telephone calls on high-speed digital lines. His fame jumped far outside of Germany and NDS tried to hire him for work in their Haifa, Israel research facility. NDS spokesperson Margot Field, following his death, said of Boris: "*He was an exceptionally talented engineer.*" True, but Tron disliked working for any single company, preferring to be a "loaner" and tackle impossible assignments which would improve his skills and abilities. He viewed the web as a conduit for information exchange, believed strongly that "secrets" should be "shared" with others but never-never for personal financial gain.

Tron's limited socialising was through "Chaos", a computer club which allowed only the very best programmers to participate in their often explosive forums. On October 17th Boris left his mother's apartment after a lunch of pasta. He didn't say where he was going but she knew he would not be long as he always carried his laptop with him if he as going to be gone for more than a few hours. Nearly 120 hours later his limp body was found dangling from a tree limb. Chaos members instantly believed he had been killed but police were less certain. Their final report more than 3 years later came to the odd conclusion he had committed suicide but the report failed to explain how someone who was freshly hanging from a tree more than 120 hours after eating pasta would still have undigested pasta on his stomach when cut down and examined. Boris Floriciz nee Tron had not just died, he had miraculously died more than 120 hours before his body appeared in a park, nearly as fresh as it was when he left his mother's home.

What does this have to do with Canal+ versus NDS? Chaos members refuse to accept the police report as gospel, and suggest Tron was killed because of what he knew and either (1) refused to share with others, or, more likely, (2) because it was his habit to "share" everything he knew with others. The Tron "incident" may well be reopened during the Canal+ - NDS jury trial if the trail now being followed leads to the UK. Canal + has attracted some top level investigators to its plight - the French Secret Service has assigned a sizeable team to run down leads which ultimately are destined to be used against NDS in court in California.

"Not Healthy"

One gauge of the importance the world's financial leaders attach to a court challenge like this is to study their reactions revealed in press interviews. If this was merely about one firm busting another firm's technology, it would have been consigned to the back business pages of larger newspapers. But it made (and continues to appear on) the up-front pages of

Quotable quotes from defensive NDS personnel

Tony Ball, chief executive for BSkyB: "iTV digital is completely pirated, a joke. For (US)$7 you can buy a card for all channels." He was addressing a gathering of News Corp investors at a high level conclave in New York City just prior to the Canal-Plus suit announcement.

Margot Field, NDS spokesperson in defending the revelation that NDS had funded THOIC.com: "Payments were made for information about hacking activities. It was a commercial arrangement to gather information. It is all a part of normal intelligence gathering."

Dr Abe Peled, NDS CEO and President: "(Canal Plus's) problem is due solely to the inferior nature of their conditional access technology, the failure of its business plan to contain measures to protect against piracy and its failure to deal with piracy once it began." In another forum, he is reported to have admitted: "The (Canal Plus) system was exceptionally easy to crack, it is not 'state of the art' and suffers from 'inadequate technology'. (This suit) is a blatant attempt by Canal Plus Technologies to shift the blame for their inferior technology and their inability to deal with piracy. We had nothing to do with the piracy of their cards, we had nothing to do with the selling of these illegal devices, or publishing it on Internet."

The Wall Street Journal, The Guardian, the International Herald Tribune and dozens more. Editors realise that if the charges "stick" and NDS is found guilty as charged, NDS + News Corp + BSkyB + *yes* - Rupert Murdoch - could be finished. More importantly, smart card technology could be a thing of the past as well, as we shall explore.

Josh Bernoff, iTV Analyst for Forrester Research:

"This sort of shooting war is not healthy for the (pay-TV) industry. It sends a not so subtle message to the community at large that (pay TV) is not secure and can be easily counterfeited."

Steven Philippsohn, Senior Partner for Philippsohn -Crawfords-Berwald (a law firm specialising in Internet fraud):

"The bottom line is if it is shown that top directors of NDS and/or News Corp knew or should have known what was going on, the court is likely to find them personally liable for the action." He was referring to Lachlin and James Murdoch on NDS's Board, Rupert Murdoch at News Corp.

A BBC Ten O'clock News presenter reported on the air:

"With so much mud being thrown by both sides, if the case ever comes to court it promises to be riveting entertainment - which is one very good reason why it will almost certainly be settled long before it gets in front of a judge."

A BBC corporate attorney was less subtle:

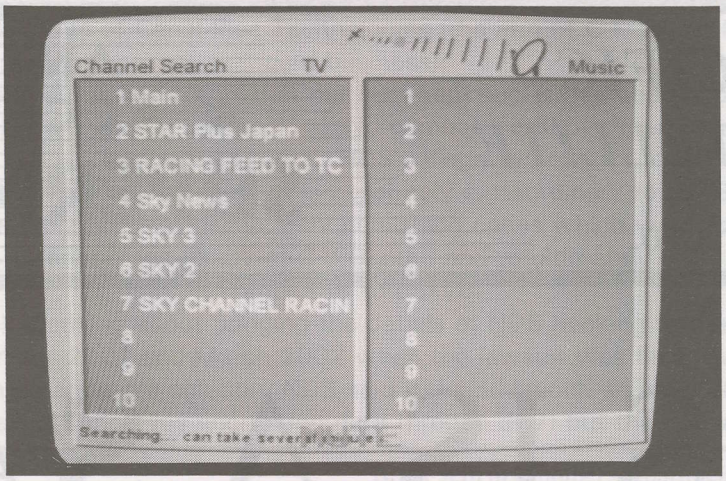
"This case will settle - there is far too much at stake here for NDS and News Corp to allow it to actually get into a jury trial." Interpretation? From all evidence now available, NDS is in big trouble if a jury hears the evidence.

NDS "was" secure

NDS had a reason to blame Canal Plus Technologies (Mediaguard system) for being a "soft touch" for pirates. One of the anticipated defences by NDS - should the filed case actually be heard by a jury - is the timing of the release of hacking material on the web. The important dates are March 1999 when Canal + claims NDS Israel transmitted (using Internet no less) the full software code busting instructions to NDS America in California.

In a news report published by The Guardian (UK), a hacker identified only by the pseudonym 'Glitch' is quoted:

"The companies hack each other's cards as a part of their research and development. They had already been hacked by the time Canal's cards were released to the public."



NOKIA produced the original card-buster. Not on purpose. The 9200 followed by the 9500 contained 'hidden' software menus which under the direction of German 'after-market' software designers allowed the receivers to access an almost unlimited range of encrypted services using grey market (piracy) cards. The authorities brought this to a halt by 'encouraging' Nokia to eliminate the hidden software and then by closing down the German software modification sites on Internet.

If that proves accurate (SatFACTS in attempting to verify this time-crucial point has not been able to locate hard data to verify the claim), NDS could well convince the jury that while it "may" have been responsible for reverse engineering the Canal + encryption algorithm, by not being first to "post" the information on hacking iTV or Italian and Spanish pay-TV cards using the same technology, it cannot be held legally responsible for the financial losses of the card users. Canal Plus believes, "*over half of the cards in use in Italy are pirate - hundreds of thousands of cards in total.*"

Hacker Glitch went on to tell The Guardian, "These companies (refering to Canal +, NDS and ten other firms creating smart card technology) just won't accept as fact that no security system will ever be 100-percent secure."

NDS's system stayed secure with one major exception for many years. But as Josh Bernoff of Forrester Research revealed to The Guardian:

"The code breaking is 'business as usual'. In NDS's case, the company has (also) suffered wholesale piracy of its own technology. NDS needs to show customers that its rival's security is no better (than NDS) and they need to show this to the marketplace."

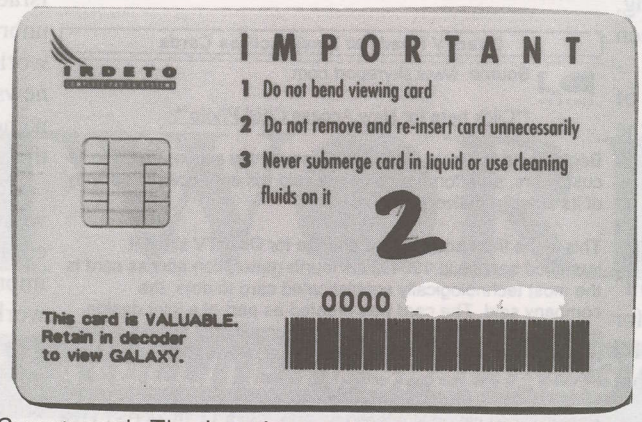
Avigail Gutman, a security detail employee of NDS to SatFACTS, admits, "*The piracy of our system in the USA was our one major security loss.*" When the pioneering DirecTV system in the USA began operation in 1994, they chose NDS for security. In mid-March, a major New York City radio personality (Sid Rosenberg) went on the air and told millions of listeners, "*You are a chump to pay DirecTV for their service. I bought a* (pirate) *card for* (US)*$300 and have enjoyed the service for years now.*"

New York City newspaper, The Post, sent reporters into the field to investigate. They visited 25 commercial pubs and found 11 willing to admit, "*We use piracy cards*".

DirecTV has taken it 'on the chin' from all of this adverse publicity. They fully understood the extent of the piracy ("*We may have 25% of our viewers who have never paid us any money*") but as long as it was kept quiet and swept under the rug, it was a "dirty little secret." *No more.* Following Rosenberg's "confession" on big-time radio, and The Post's study, every news organisation in the USA scrambled to find their own slant to the story.

Canada has always been the albatross around USA pay-TV's neck. Canadian law says that you are doing nothing illegal until you market devices inside of Canada which will allow unauthorised entry into Canadian operated pay-TV systems. Pointedly, it is not illegal to create and sell hacking materials

for non-Canadian authorised services. DirecTV is widely used in Canada but it has no legal status there; it is a grey market product supported by USA DirecTV dealers who maintain US mailing addresses for users who actually reside in the neighbour to the north. The Canadian influence began in 1984 when Canadian national telecaster CBC (functions similar to ABC in Australia) was forced into (satellite) encryption if it wished to continue buying popular USA network programmes for Canadian release. CBC had grown accustomed to buying hit shows and showing them 2 to 3 weeks ahead of their US release dates, a condition to the programming deals. But the USA programmers did not like having these programmes sent via Canadian satellite throughout the USA - ahead of the USA release dates. An Illinois (USA) firm, Oak (Orion), had a solution; the first "cut and paste" video encryption system brought to market.



Smart card. The 'root' was designed in 1977 by three professors at Massachusetts Institute of Technology, called RSA after their initials. This was a code algorithm system using two "key" numbers - one freely available (obvious) and the second hidden by encryption. In 1980, Australian Bruce Hundertmark as Technology Advisor - Europe to Rupert Murdoch, discovered an Israeli research team at Weizmann Institute trying to make money with the RSA system. Meanwhile, an Indian physicist in California had created a working smart card model but it lacked the technology to make it do something useful. Hundertmark and American turned Israeli Michael Clinger put the two together (1988) and with US$3.6 million in Murdoch seed money devised what we now know to be "the smart card."

In less than six months, Oak's system was busted. 1984 was pre-smart card days and Oak had a "chip" which was factory programmed to decode the video encryption. A Canadian who was incensed because outback Canadian communities also depended upon the CBC service (and whom CBC would not authorise for Oak decryption equipment) did the deed. By mid-1985, Oak's system which had been under contract to several USA terrestrial TV stations who had been authorised by the FCC to "test" encrypted pay-TV, was also dead. For those who might think "busting encryption systems is a minor annoyance to broadcasters", think again. Because the Oak system was violated, terrestrial pay-TV never made it to air in cities such as New York and Chicago. In the UK, iTV Digital could well end up in the same "busted" financial position because of card piracy.

DirecTV claims 10 million subscribers. They would never admit to how many of these are outside of USA (Canada, Caribbean, Mexico - even [Communist] Cuba - where President Fidel Castro has a DirecTV system!) because *in theory* none are outside the 50 states. Special DirecTV coverage beams spotlight Hawaii and Alaska and SatFACTS was recently introduced to a Russian engineer residing in Anadyr (located on a peninsula in extreme eastern Russia, just south of the Arctic Circle and 550km west of the USA's Saint Lawrence Island in the Aleutians group) who has "discovered" DirecTV.

"*I gained access to a 13m parabola which was originally intended as a* (cold war) *radar antenna to detect incoming American missiles. I arranged with a friend in the USA to walk into a Radio Shack store and purchase a DirecTV system which was sent to me through the regular mails. On a Canadian web site I found the piracy cards. The rest is history.*"

When the (New York) Post went "snooping" it found lawyers, sport stars, policemen and politicians who were ready to admit they were using DirecTV 'piracy cards.' Larry Rissler is DirecTV's top security guy. He told The Post, "*We cannot quantify how much money we lose but at some point it has to cost the consumer who pays for service money because we end up devoting serious resources to fighting the rapid explosion in piracy cards.*"

DirecTV is about to spend more than (US) $100 million to elevate the stakes in the game. The company, in response to Sid Rosenberg's on-air admission and the following rush of newspaper reports sparked by The Post's revealing reports, announced:

"*We are transitioning our conditional access system away from NDS Group plc and taking it over ourselves, in house.*" With estimates than 1 viewer in 4 is stealing DirecTV, and with an average paying subscriber invoice near (US) $50 a month, losing 2.5 million subscribers is equal to losing (US)$125 million each month. Spending US$100 million to get back US$125 million each month seems like a good plan.

Of major interest here, DirecTV has "had it" with NDS. Although DirecTV has a contract through 2003 to pay NDS for their smart cards and security advice, as soon as they are able to replace ten million cards, NDS is through. "We intend to continue paying NDS for their security contract until the end of the contract term (August 2003) - but the new cards were designed 'in house' by our people and we won't be actually using NDS anymore."

DirecTV will replace, over a nine month period, all 10 million of its paying subscriber cards. They hope this will leave the piracy cards inoperative.

A Canadian pirate smiles when asked about this scenario.

"*I sell cards for US$300. If they knock out all of the piracy cards, I have a brand new opportunity to resell the same people again for another $300. It is like Christmas for me - I can't wait for DirecTV to start replacing cards!*" Which of course sounds very much like the statement European pirate Glitch gave to The Guardian:

"These companies just don't understand that no security system will ever be 100-percent secure."

Wrong, of course. DirecTV understands that all right. But they also understand that now the wholesale busting of their NDS designed security system is "out in the open" and on front pages of major New York City newspapers, they have to respond. It is a "public relations image" challenge - they have

no choice but to make strong, confident statements and then proceed to do something - *anything* - to keep another 25% of the public from falling into the piracy card world.

Are smart cards dead? Perhaps in their current form. But a University of Surrey (UK) team believes creating a new "32-bit" computer processing system for the next generation will set it all right. Where have we heard that before?

Just how deep the NDS water?

NDS stock shares closed on NASDQ Tuesday April 2nd at (US)$13.30, down 5.7% (81 cents) from April 1 for a new 52 week low. The 52 week high was (US)$46.79. What this says is that from the high of the past year, NDS has lost 72.6% of its peak value (http://www.nds.com).

News Corp owns 79.2% of NDS. And on June 30th coming, News Corp must satisfy bankers that the billions of dollars the firm has outstanding in loans are "secure". As Neil Chenoweth in "Virtual Murdoch" (the book we told you to run out and buy and read months ago), reported, some "very fancy accounting" is done just ahead of June 30th to prove to creditors News Corp is sound.

Depending upon the status of the Canal Plus suit in mid-June this year, it could be a very tough effort.

News Corp has guaranteed the loans of New Zealand's Sky Network. The terms of the bank funding to Sky include clauses making News Corp the ultimate responsible party if something goes under at Sky. But News Corp's ability to handle a financial emergency depends totally upon two factors:

1) The value of its stock in the world market,

2) The goodwill of the banks who have advanced it billions of dollars to operate.

Of all of the events tied somehow to the Canal Plus lawsuit, the abandonment of NDS smart card security by DirecTV may prove to be the most difficult for News Corp to deal with. Yes, NDS will continue to receive financial payments from DirecTV through August 2003 even though DirecTV is discontinuing use of the NDS smart cards. But this is not totally about the "money" NDS earns (in 2001 it claimed to earn US$62 million). Increasingly, rapidly, it is about confidence (or a lack of confidence) in the NDS security system. And how that shrinking of confidence will play in the world's stock markets.

NDS has always been able to assure both users of their encryption system and the investing public at large that its' Israeli-based technology was (1) unbreakable, and, (2) the best in the world. But now DirecTV, The Post newspaper and a radio personality named Sid Rosenberg have destroyed the veracity of that myth.

Remember the child's story about the weavers who convinced the King they could create the most stunning, impressive "golden" clothing in the world? The weavers were hucksters, they had no gold thread and wove no golden cloth. But they convinced the King the imaginary clothing they lifted down over his body was in fact real. And so the King, not confident in his own ability to determine golden clothing from no clothing, marched through the streets of his fiefdom stark naked. Nobody dared - under threat of an unkingly reaction - to mention to his majesty that he was bare arsed.

Nobody but a tiny lad who shouted as the King strode by buck naked, "*Mommy - mommy, the King has no clothes on!*"

Radio personality Rosenberg in America's largest city went on the radio and said what 25% of all DirecTV viewers knew to be the truth. "*NDS security is so poor that you don't need to pay for reception. Just buy a card from your friendly, local, card shark and tune yourself in. It's all there and it is all free.*" The king was indeed naked. The "gold card" was a farce and as Rosenberg said on the radio, "*only a fool pays for something that is available free.*"

Which brings us to the 64 billion dollar question. What happens next? Will this, indeed, "settle" (out of court, to be buried in a private contract between Rupert Murdoch and Jean-Marie Messier - head of Vivendi/Canal Plus)?

That might have worked had it not been for Sid Rosenberg's explosive confession on New York City radio, and the rapid escalation of DirecTV's plan to kick NDS out and replace it with internally designed smart cards. And that might have worked prior to an announcement from Britain's iTV that it is filing a similar suit against NDS seeking compensation for losses it claims happened after a NDS sponsored web site posted iTV card busting instructions.

NDS has indeed been more difficult for pirates to "crack" - the one-off USA format used by DirecTV being the exception (not all NDS systems are identical, DirecTV was the first major system user). But buried in the flood of piracy related news, this posting:

"NDS BSkyB is busted - cards and instructions are now available" with an early March posting date. Hidden in Canal-Plus paperwork, an admission its own engineers had reverse engineered the NDS system. Would Canal Plus be guilty of what they accuse NDS of doing? Stay tuned.

DirecTV Ready to Swap Access Cards

Source: www.skyreport.com

Click here for New Access Card Photo

Beginning this week, DirecTV will issue new access cards to its customers, an effort the company said will enhance the security of its satellite-delivered signal.

This is the third access card change for DirecTV since it launched service in 1994. This fourth-generation access card is the most technologically sophisticated card to date, the company said. The card was created as part of a joint design effort by DirecTV engineering and its conditional access system and access card developer and supplier, News Corp.'s NDS Group.

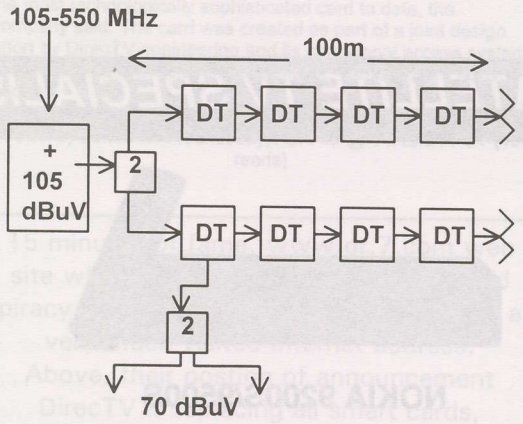
Posted by admin on Wednesday, April 03 @ 14:16:34 PST (128 reads)

15 minutes of fame. www.dr.7.com web site which Canal Plus claims posted card piracy instructions continues today to be a very much visited Internet address. Above, their posting of announcement DirecTV is replacing all smart cards, ending relationship with NDS. Below, what dr.7 claims is new "Version 4" DirecTV access card - note they do not show the "working side" with embedded chips.

Rising to the level of one's incompetence

MISTEAKS: We all make them.

This is a true, recent story. It involves a 32 room motel built along a long (100m) hallway with units on both sides. The facility initially had installed a distribution system using various frequencies between 105 and 550 MHz. A "headend" amplifier producing +105 dBuV output on the 543.25 MHz (highest frequency) channel fed a two-way splitter creating +101 dBuV after splitting into a pair of RG6 "distribution" lines. These lines run the 100m length of the single story hallway on each side in the overhead attic. If you ran RG6 to the end of the attic, 100 metres later you would expect to find around 85 dBuV at 543.25 MHz - the 15/16 dB of "loss" being caused by the 100m run of RG6.



But between the "headend" amplifier and the last unit there are 16 locations requiring cable drops - on each side. The appropriate method of "tapping signal out" of the master RG6 run is using a device known as a directional coupler (DC). The DC has numerous advantages over splitters - (1) the signal flows "through" and only a small (measured) amount is taken out of the cable at each location whereas a splitter divides the signal into 2, 3 or 4 equal parts; (2) the DC provides far more "isolation" between TV sets than a splitter which means anything nasty happening at one set will not "feed back" into the main line as it can do with splitters; (3) DCs are available in various "output attenuation" values, meaning that if the line level is very high at the point of tap off (such as 100 dBuV) and you want only 70 dBuV at the TV set, you would select a DC with a "value" of 30 dB (100 - 70 = 30).

In this system each side-of-hallway attic run was broken in four locations and a four-output DC installed there. With a four output DC, four separate TV set locations can be served, each receiving the same amount of signal as the other three, and each properly "isolated" from the main line.

Within each "unit" there are two TV sets. Therefore, while a DC might have four outputs, what we need from each DC is 8 outputs. What might have been done is for 8 DCs to be installed on each cable run, each serving two units with two outlets per unit. Or, another option would be to select 8 output DCs at 4 locations per hallway side and run two cables from each DC to each unit. The system elected a third option because of the way the units were configured. One line connects from the DC and runs into the unit proper. There, buried on top of a wall at the time of construction, a two-way splitter was installed. Most of the unit outlets were on back to back walls - one splitter atop the wall with opposing wall plates for connection to the TV sets.

By calculating in advance the amount of signal attenuation between the "headend" amplifier and each DC location, the appropriate value of DC was selected. Into that calculation went the additional loss of the two-way splitter and the modest but measurable loss in the shorter RG6 runs from the DC to the two-way and then the two-way to the two opposing wall plate outlets.

In a distribution system such as this you begin with two known numbers:

#1) The maximum output level available on the highest TV channel (frequency) from the "headend" amplifier;

#2) The minimum signal level (by design) to be delivered at the wall plate outlets.

The maximum level is 101 dBuV (after the two-way headend splitter). The minimum design level to a wall plate is 70 dBuV. The difference between the two is 31 dB. Which means - in the very worst case (typically at the end of the line) we can "lose" 31 dB along the run from the headend amplifier and still deliver adequate signal to the wall plate.

Knowing this number you begin by adding up the known losses over which you have no real control:

1) Cable loss at highest frequency - 16 dB

2) Two-way splitter loss within each unit - 4 dB (now 20 dB total)

3) Short cable runs from DC to two-way and then from two-way to wall plates - 2 dB (now 22 dB total).

What remains (31 minus 22) is the value of the directional coupler - 9 dB (the closest off-the-shelf "fit" is an 8 dB DC/DT). This tells us the maximum loss in the system (from headend to last outlet). All that remains is to stair step the DCs closer to the headend.

Not quite. The DC has through-loss. Not much, but some. The amount of through-loss (signal lost as the line runs through the DC and a small amount is tapped off to the 4 outputs) varies as a function of the DC "value". The smaller the number (such as 8 dB) the higher the through loss. A 17 dB DC has less than half the through-loss of an 8 dB. In a system with only four DCs in a line, the total (DC) loss will approximate 3 dB (varying from slightly more than 1 dB to a couple of dB).

But in this system, a 4-outlet 8 dB DC is self-terminating. That is, by design the signal does not pass through totally. It comes in OK, is split in a four-way circuit internally and fed to the four outlets. Nothing comes out because a 75 ohm "terminating resistor" marks the "end of the line". Therefore we can ignore the through loss in the last DC, leaving only the first three to consider.

In this system the first DC after the headend is 20 dB, the second is 17 dB, the third 11 dB and the final one 8 dB. This is diagrammed above and if you have followed the discussion to

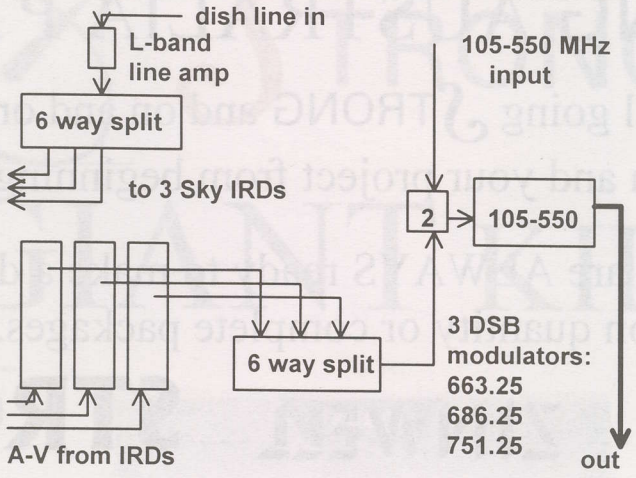
this point, the diagram is self explaining. Now - about the mistake and how it happened.

The objective

Three new Sky channels were to be added to the system. The Sky installer failed to take several factors into consideration:

#1) Although significant unused spectrum space existed between 45 and 105 MHz in the system for three channels, following Sky's standard practice UHF channels were selected for the additional services.

#2) The previously installed distribution system, by design, was created for the spectrum 45 - 550 MHz (although the 45 - 105 MHz space was unused).



A trio of Sky IRDs provided video and audio to 3 Kingray MD100U modulators operating on NZ TV channels 45 (663.25), 48 (687.25) and 56 (751.25).

#3) The Kingray double sideband modulators are field frequency selectable but only within the UHF region. It happens that while the top prior-system frequency in use was 543.25 MHz, the region from 478 to 542 MHz was not in use; 64 MHz of space lying fallow.

The Sky installer set up his three modulators on 663.25, 687.25 and 751.25 MHz. The headend amplifier passes (and amplifies) 45 - 550 MHz. Note that all three UHF modulator channels are above the upper cut-off frequency of the amplifier (and in fact is plainly marked in large black letters as being 45 - 550 MHz).

Now, the Kingray's are capable of 105 dBuV output - the same as the 45 - 550 MHz headend amplifier. He could only explain by admitting, "*I do not know what TV channels relate to which megahertz* ." We found a table of frequency versus channel number in the Kingray modulator instruction sheet he abandoned on the job after leaving in frustration.

When an amplifier designed to pass 45 - 550 MHz is presented with a trio of signals operating between 662 and 758 MHz, they are significantly attenuated as they attempt to pass through the amplifier. The original installer was presented with two options, after initially deciding to use the Kingray units and after deciding to place them on frequencies between 662 and 758 MHz.

Option one: Run them through the input of the headend amplifier by using (as he did) a two-way splitter as a "combiner" (thereby marrying the original signals from 105 to 543 MHz to the new UHF modulator channels) but accept that the amplifier was never designed for signals in the 662 - 758 MHz region.

Option two: Use a two-way splitter as a combiner, and mix the trio of UHF modulator channels in with the 105 - 543 MHz prior-existing-signals after the headend amplifier. He chose option one, which it turns out was because (1) he had no spectrum analyser, (2) did not (still does not) know or understand how to relate TV channel number to frequency in megahertz, (3) does not understand that an amplifier designed to operate in a limited spectrum region (such as 45 - 550) simply will not function 100 or 200 MHz outside of its passband. In fact, when quizzed by SatFACTS, he did not comprehend what the term "*bandpass*" means.

This is the point where we can elect to further divulge the shortcomings and abilities of this individual or simply get on with the answer here.

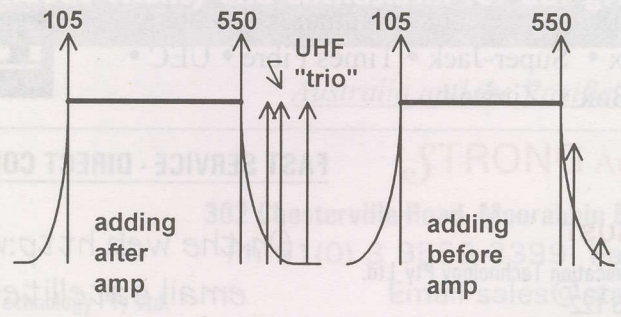
"*I plugged the mods in, cranked up the output and started going through the rooms tuning the TV sets. Most of the channels had lines all over so I went back and cranked down the modulators until the lines went away. But now down at the end of the hall, the Sky channels had disappeared. I think the cable system is crook.*"

Fixing it

Two solutions here. You could move the two-way splitter/combiner from the input of the 45 - 550 amplifier to the output. Now the Kingrays could operate at full output (we found the levels measured after he "cranked the levels down until the lines disappeared" varied between 63.6 and 72.8 dBuV at the input to the two-way).

Or, you could move the Kingray outputs down to channels in the vacant (not in use) 478 - 542 MHz region and leave the two-way splitter/combiner at the input. (Kingray makes double sideband modulators which mean they occupy more than a standard 7 or 8 MHz wide UHF channel. Therefore you cannot place three on immediately adjacent channels - such as 519.25, 527.25 and 535.25 MHz.) There is some danger here. Although the 478 - 542 MHz segment is not in use in the prior-existing cabled system, there is a measurable amount of "amplifier noise" there. You could try this but be prepared to abandon the effort if amplifier noise is a problem (you would know this by seeing strong enough but noise-grainy images on the screen). If this worked, the output of the Kingrays operating on UHF channels such as 535.25, 519.25 and 503.25 would then be adjusted to "match" the cable channels already presentgoing into the amplifier.

The installer in question was very close to making it *almost* work, at least far better than it was when he abandoned the job blaming the cable installation in the building ("*We were hired to add Sky, not repair someone's else's mistake.*"). His mistake would have been significantly less severe by moving the combiner that adds the trio of UHF channels to after the amplifier, and then setting the Kingray outputs to maximum output (105 dBuV). By selecting before the amplifier, the Kingray UHF channels were "well down the



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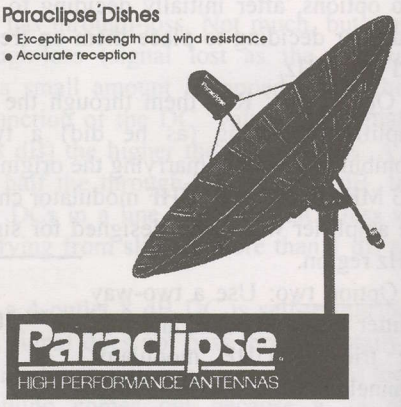

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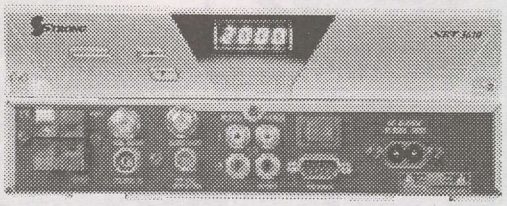

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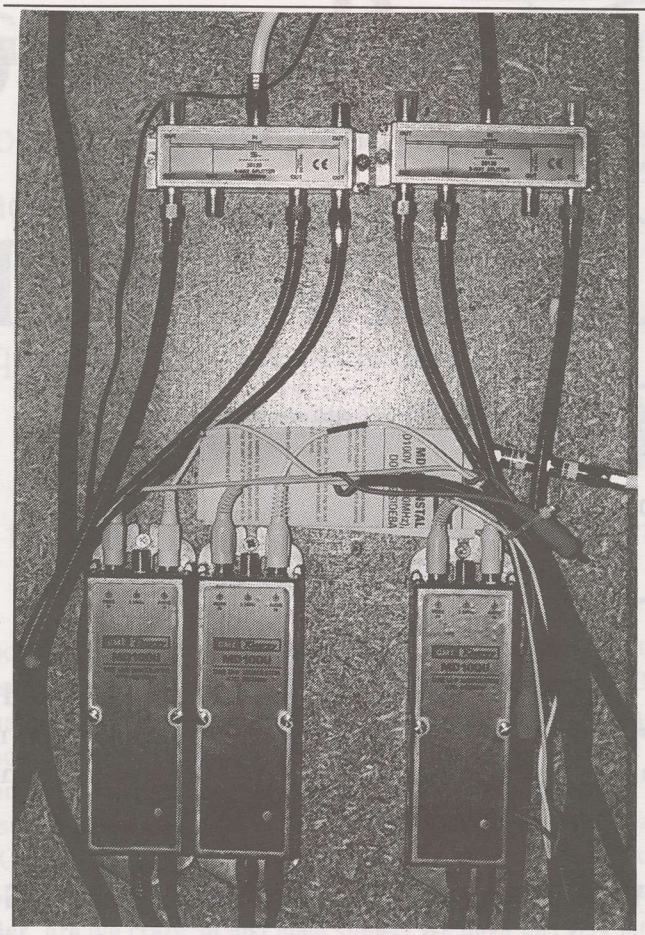
gain slope" of the 45 - 550 MHz amplifier, and no matter how much he "cranked up" or "cranked down" on the Kingray output level controls, he was not going to find a "sweet spot" where the system worked without either creating cross modulation in the amplifier, or losing the added UHF channels as he went further and further down the hallway away from the amplifier.

Wham-bam-thank you mam!

All businesses operate on a cost + profit basis, or they won't be around very long. Profit is what covers mistakes, allows a company to carry slow pay debt, build inventory.

Kingray (or other) moderate output modulators are typically selected because they have sufficient output level to *force* their way through attenuation that follows. Higher power makes up for things the installer cannot control - if a piece of cable is aged and losses are higher than expected - if a connector buried in a wall has worked loose - if a wall plate outlet is salt corrosion rusted, the answer is higher power. Unfortunately, high power will not fix all problems and if it is used in a dumb way - as our example system installer did - it may cause new problems that did not exist before the high power equipment was installed.



Why six-way splitters? "Because they were on the truck". Never mind that for the input he had three Sky receivers and needed only a three-way (left hand splitter). Also never mind that by using a six-way to combine the three Kingray modulators, the combiner loss was 12 dB whereas with a 3-way it would have been 6 dB. What's an additional 6 dB of combining loss when you don't have a spectrum analyser to set levels in the first place? Also notice - unused splitter/combiner ports have no terminations.

Our example installer made so many mistakes it is difficult to understand how he was let out of the shop without a supervisor. In fact (and this should be noted by Sky's top engineering personnel), "he is the supervisor" - the only tech in that segment of the country "allowed" to work on any motel/hotel installation.

Some of our conversation with him:

"As I went down the hallway tuning in the TV sets to the new (UHF) *channels, rooms would randomly have bad pictures. Not just on our* (Sky) *channels but on all channels. I knew the cable system had to be crook from that."*

So we went back and checked on those rooms. Sure enough, towards the middle but randomly spotted were four rooms with bad pictures. One had bad pictures on both TV sets, the other three had good pictures on one TV set and bad (or gone totally) on the other same-unit outlet.

All three of the single set defects were traced to the same cause. The rooms are located on the ocean side of a bay, less than 30 metres from the water. Salt spray in the air has corroded everything metal in every unit on that side of the building. In each case, by pulling the jumper cable out at the wall plate and at the TV set, and inspecting the female side of the fittings, we found rusted metal. Badly rusted metal. After replacing two of the wall plates, and scraping a third clean of rust with fine grit sand paper, all was well. On the opposite side of the hallway, the unit with both TV sets showing noisy pictures. Logic said go up and find the splitter, or if that proved good, back track the line from the DC to the splitter. The splitter was bad - although no obvious corrosion or other ailments were apparent. Replaced, both TV sets had 75 dBuV and all was well again.

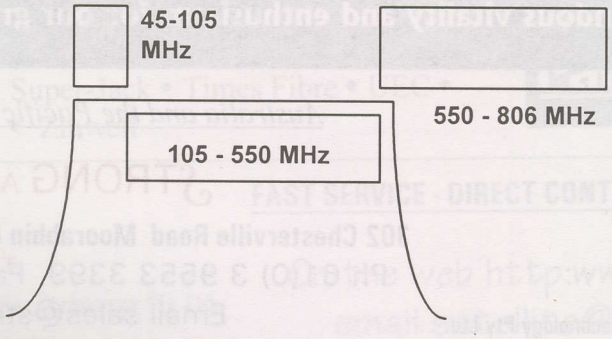
Crook cable distribution system? Hardly. Just some quick to apply routine maintenance and common sense.

And the Sky channels? The correct technical answer we believed was to make use of the 45 to 105 MHz spectrum. With VSB (single sideband) modulators, adding them into the system after the amplifier with an appropriate combiner, not a six-way splitter used backwards as a signal combiner! By the way, the Kingray installation instructions which the original Sky installer had left tacked to the equipment board carried this warning:

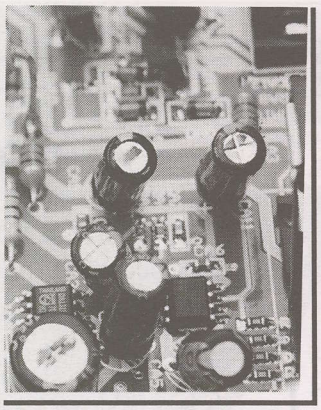
"Double sideband requires one full channel spacing below the selected frequency to be vacant."

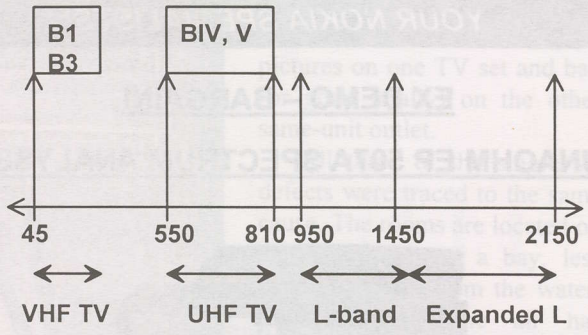
That's because in a DSB modulator the inexpensive design allows the unwanted sideband to be transmitted. There are much better ways to do this in 2002; and not charge $2,500 for the installation.

Finding spectrum space. In the example-system detailed here, while the "TV band" including cable-only "mid" and "super" (band) segments extends from 45 to 806 MHz (in NZ), segments from 45 to 105 and 550 to 806 were not in use.



The CABLE Connection

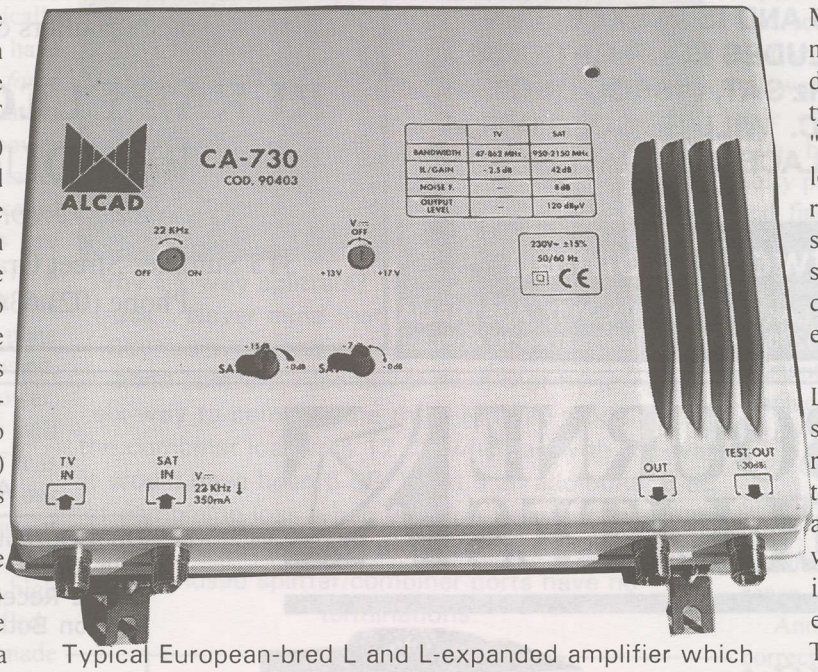




Marrying satellite and off-air VHF-UHF

Ikusi ANZ is one of the few South Pacific sources where one can find the equipment required to wire a building (house, motel, office building, hotel) with a cable distribution system capable of relaying throughout the building a range of frequencies starting with band I VHF (45-90 MHz), band 2 (the FM broadcast band + some isolated Australian TV channels), band III, bands IV and V (the UHF television channels) - and - the satellite TV IF (intermediate frequency) bands between 950 and 2150 MHz. In the frequency world, an "octave" is one frequency times 2. 45 to 90 MHz is one octave while 90 - 180 is another octave. Equipment designed to amplify (make stronger) or distribute signals is octave-designed.

Modern satellite receivers (whether CA or FTA only) allow the user to connect either a satellite source signal band (950 - 1450 MHz or higher) or through a separate socket signals functioning in the more common Band I/III/IV and V terrestrial format. Thus the basis is present for all of these frequencies to originate at a common point ("headend") and then ultimately end up being accessed at one or more different locations in the same facility. Coaxial cable is the transmission medium. At the receiving location, the IRD remote control allows the user to select either the input within satellite L-band or input in the spectrum below L-band (such as 45 to 800+ MHz). Your job, as the system creator and installer, is to produce the correct frequency bands at the proper signal levels at each point where reception is desired.

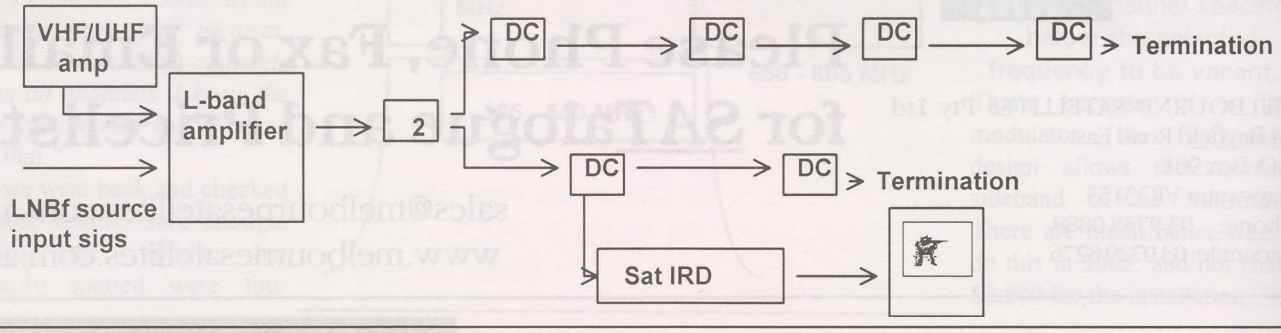


Typical European-bred L and L-expanded amplifier which "passes through" externally processed Band I, III, IV and V signals with no gain or attenuation.

Problem one

The cable is problem one. The variation in cable loss (attenuation) between 45 MHz and 2150 MHz is monstrous - from under 1 dB for 30m to over 10 in typical RG6. Your task is to "balance" or "equalise" the levels so that at any single reception location there is sufficient signal on any single frequency to produce quality reception - however that is defined.

Because the below-L-band signals (that is, the standard TV band signals) require 70 dBuV or thereabouts for adequate analogue reception quality, we know those levels quite indelibly from 50 years of experience. The satellite TV L-band signals are another matter. If they are analogue (as some might be if you are processing from the LNBf to the system a full 950 - 2150 MHz band width), signal levels in the region of 40-50 dBuV are required for adequate reception. And more than that does not usually "hurt". If some (or all) of the signals are digital, slightly lower levels (down to 35 dBuV) are permissible. And once again, more than "threshold values" is not going to hurt the system - up to an "upper threshold" (overload of IRD) point.



Given the very wide range in cable losses, the most practical way to deal with a "super wideband" cable distribution system is to break the inputs into segments. Just as terrestrial systems may treat Band I, III separately from bands IV and V, so too in processing the L-band segment. What this requires is an amplifier designed for L-band distribution purposes, capable of sufficient output capability to ensure those 10 dB plus cable loss chunks do not degrade the levels so rapidly as to make the L-band signals unusable.

At the same time at some point in the "headend" the VHF/UHF signals and the L-band signals have to be "joined together" into a single cable. The answer is to treat the VHF/UHF signals as if you were creating a VHF/UHF only distribution system. That means adequate gain to overcome the cable and DC (directional coupler) losses in the system. Once that is done (on paper), attack the L-band portion separately. The approach is the same - you need to amplify sufficiently to create signal levels which will reach the end of the line strong enough to drive receivers located at that point. Once you have that calculated, the two can be "combined" so all services from 45 to 2150 MHz "share" the same cable runs to the receivers.

Some cautions. Terrestrial TV passive devices (such as signal splitters, directional couplers) are not going to function properly at L-band. Unless of course they were designed to do so and the manufacturer so warrants the product(s). A device marked "5 - 890 MHz" is either untested or unusable at 1500 or 2150 MHz. It is far better to verify the frequency range of passive devices before you make the installation than going back afterwards trying to locate and replace the 5 - 890 parts with L-band rated components.

Some of the more common parts are especially troublesome. For example, wall plates. A standard South Pacific wall plate is equipped with a PAL (European) socket. Any tests SF has seen (including those we have done ourselves) of these "garden variety" wall plates always end up the same - at someplace around 1,000 MHz, they give up. The mechanical connections on the rear which are grasping the centre conductor and shield on the RG6 cable simply were not created with L-band in mind. The best choice is to source F-connector wall plates (typically they use a F barrel mounted in the room-showing wall plate portion and you prepare a standard F fitting to screw onto the rear of the plate's barrel connection and then run from the front portion to the IRD with another F connector). Look at it this way - if PAL sockets and plugs worked at L-band, wouldn't you find them on satellite receivers? It is a shame how many installers do a fine job designing and installing a super wideband system only to mess it up with a PAL wall plate at the end!

Another common problem is the "stock jumper cable". Needless to say, if you have made the mistake of installing PAL socket wall plates, you are already in trouble when you grab a PAL male equipped jumper to go to the IRD. Plan to make your own F to F jumper cables using RG6.

Finally there is the challenge of the all-mixed-together 45 - 2150 MHz bandwidths at the wall plate. Only the 950 - 2150 MHz portion of the combined spectrum is to go to the IRD's L-band F connector. The remainder (45 - 890 MHz) needs to go to the "TV Antenna" input on the IRD. One quick but dirty way to do this is to install a wide band (5 through 2150 MHz) two-way splitter at the wall plate, perhaps even creating wall plates with two outlets - one for VHF/UHF and the other for L-band. But there is a better answer - as we shall see.

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 April 2002

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
Thcm3/78.5	SkyChAust	3695/1455V	up to 3	3/4	5(.000)	Finally settled here from As2
	MRTV-Myn	3676/1474H	1	2/3	6(.000)	erratic service
	MidEst Mux	3640/1510H	up to 12	3/4	28(.066)	Now essentially all CA
	Mahar/DD1	3600/1550H	up to 8	3/4	26(.661)	USA religion chs, CMM music FTA
	ME Mux	3569/1581H	up to 4	3/4	9(000)	New November - possibly TARBS?
	Nepal TV+	3554/1596V	3+ in mux	3/4	13(.333)	FTA + CA mux
	3ABN +	3551/1600H	4+ TV, radio	3/4	13(.330)	3 Angels USA, Ch of Hope, + 9 radio
	JAIN TV	3538/1612V	1TV	3/4	3(.300)	new here April; PIDs 4132/4133
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(.333)	recent frequency change
	TARBS?	3520/1630H	unknown	3/4	28(.062)	MUX tdssting (April), believed TARBS
	TARBS/Th5	3480/1670H	6+ TV?	3/4	18(180)	TARBS labell, CA-no SIDs
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	**ETV mux**	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here; wide beam
	DD2	3910/1240V	1	3/4	5(.000)	SCPC, ; OK E. Aust. wide beam
	DD National	3830/1320V	1	3/4	5(.000)	SCPC; OK E. Aust. wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E. Aust wide beam
	AsiaNet	3683/1467V	1	3/4	4(.340)	SCPC, OK E. Aust. wide beam
	Jaya TV	3615/1535V	1	3/4	3(.255)	SCPC; OK E. Aust. wide beam
	ETV Mux#2	3485//1665V	4+TV	3/4	27(.000)	Several new ETC here, wide beam?
ST1/88E	MMBN	3632/1518V	12TV	3/4	26(.667)	Nagravision, some FTA; erratic
As2/100.5E	**Euro Bouqt**	4000/1150H	6TV, 21r	3/4	28(.125)	FTA; MCM gone
	5-Star Med	3951/1199H	3TV	3/4	13(.185)	Macau MUX
	WorldNet	3880/1270H	4+/20+radio	1/2	20(.400)	Will move here-replace analogue
	Hubei/HBT	3854/1296H	1	3/4	4(.418)	FTA SCPC, teletext
	Hunan/SRT	3847/1303H	1	3/4	4(.418)	FTA SCPC, teletext
	Guan./GDT	3840/1310H	1	3/4	4(.418)	FTA SCPC, radio APID 81
	In. Mongolia	3828/1322H	2	3/4	8(.397)	FTA: #1 Mongolian, #2 Mandarin
	APTN Asia	3799/1351Hz	1	3/4	5(.632)	Sometimes **FTA**; also 3895Vt
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	WorldNt/US	3764/1386H	1 + 20 radio	3/4	6(.100)	FTA; to shut down "soon" (see 3880H)
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)	FTA SCPC, radio APID 256
	Jiangx/JXT	3727/1423H	1	3/4	4(.418)	FTA SCPC, teletext, radio APID 81
	Fujian/SET	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
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)	Thru TARBS Aust, occ. **FTA**
As2/100.5E	**Feeds**	4086/1064V	1	3/4	5(.632)	FTA SCPC feeds
	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 + radio
	ShaanxiQQ	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	3795/1355V	1	3/4	2(.533)	Now Irdeto version 2 CA
	MSTV	3791/1359V	1	3/4	4(.340)	FTA SCPC
	Myawady	3766/1384V	1	7/8	5(.080)	FTA SCPC - difficult to load
	Saudi TV1	3660/1490V	5+/tests	3/4	27(.500)	FTA MCPC
As3S/105.5	Zee bouquet	3700/1450V	9TV	3/4	27(.500)	Mediaguard CA
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC; reported audio problems
	Now TV +	3760/1390H	4	7/8	26(.000)	CA + NOW-TV FTA
	Star TV	3780/1370V	22(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	18(+)TV, 1r	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3880/1270H	19(+)TV	7/8	26(.850)	NDS CA (Pace DV211, Zenith)
	Indus Music	3900/1250V	5TV	7/8	27(.895)	PAL, NTSC, 1 ch CA
	Star TV	3940/1210V	9(+)TV	7/8	26(.850)	NDS CA as above
	CNNI	3960/1190H	6(+)TV	3/4	26(.000)	PowVu CA; Sr changing April 29
	StarTV	3980/1170V	2+TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	4000/1150H	10(+)TV	7/8	26(.850)	NDS CA + **2 (Chinese) FTA**
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" testing SCPC
	CCTV bqt	4129/1021H	4(+) TV	3/4	13(.240)	moved from 4115
	Zee Bqt #2	4140/1010V	4(+) TV	2/3	22(.000)	some (**Kaveri**) FTA + CA; SID change
Cak1/107.5	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs
T'Kom/108E	**IndoBqt**	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17.500, 3496H/19.615
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA; NT/NC only
	Anteve	4144/1006V	1	3/4	6(.510)	recent change from 4055V; FTA SCPC
	new mux	4080/1070H	4	3/4	28(.125)	new (April) mux testing,

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(C2M)	**SCTV**	4048/1102V	1	3/4	6(.618)	FTA SCPC; NT/NC only
	Indone.Mux	4000/1250H	6+TV	3/4	26(.085)	unstable platform - testing?
	Satelindo	3935/1215H	1TV	3/4	6(.700)	Test card only reported
	TPIN	39241226H	1TV	3/4	5(.632)	New Feb 2002; also 3718H, same parm
	Indo. MUX	3880/1270H	3+ TV	3/4	28(.125)	TVRI, others FTA
	GlobalVision	3760/1390H	10TV	3/4	26(.087)	new service testing, FTA currently
	Brunei/Sing	3733/1417H	1TV	3/4	6(.000)	FTA; share time, Brunei-23hrs,Sing1h
	RCTI	3475/1675H	1	3/4	8(.000)	FTA SCPC, Australia OK
	Myawad TV	3706/1444H	1	3/4	5(.924)	may be test; svc has been erratic
JcSt3/12	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)	PowVu, some **FTA** (ch # 1,3)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)	CA & **FTA** NTSC: Japan, Taiwan
MeaSat 2	Astro Mux	11.602H (+)	up to 10TV	3/4	41(.500)	Aust East beam - FTA + CA
Op 3/156	**Mediasat**	12.336V/T2	5TV, 3 radio	2/3	30(.000)	FTA - TRT+, CA feeds
	Aurora	12.407V/T3		2/3	30(.000)	Aust, NZ 90 cm; CA (*); ABC Nat
	Aurora	12.532V/T5	Inc Zee TV	2/3	30(.000)	cvrs Aust, NZ 90 cm; CA (*)
	Aurora	12.595V/T6		3/4	30(.000)	Aust only; * - smart card p. 26
	Aurora	12.657V/T7	TV tests	2/3	30(.000)	cvrs Aust, NZ 90cm(Optus **FTA** test)
	Aurora	12.720V/T8		3/4	30(.000)	Aust only;* - smart card p. 26
	Austar	12.314H/T9	iTV + here	3/4	29(.473)	Austar i-TV; CA, subs avail. Aust.
	Austar/Optus	12.376H/T10		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.438H/T11		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.501H/T12		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.564H/T13		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.626H/T14		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.688H/T15	(some FTA ra)	3/4	29(.473)	CA, subscription available Australia
Op 1/160	**ABC NT fd**	12.258V	1TV, 3 radio	3/4	5(.026)	V832, A833
	ABC feeds	12.317H	1	3/4	6(.980)	also 12.326, 12.335; ex PAS8 Ku
	Net 7 service	12.367H	1	3/4	7(.200)	Full schedule less commercials
	Central 7	12.354H	1TV	3/4	3(.688)	VPID1280, APID 1281
	Imparja mx	12.360H	1	3/4	5(.424)	VPID 1024, APID 1025, PCR 1024
	Sport feeds	12.420V	1	3/4	6(.110)	Weekend footy feeds reported-FTA
	Mediasat#3	12.424H	3+ TV	2/3	19(.800)	
	TVNZ DTH	12.456V	2TV	3/4	22(.500)	FTA 2 channels; more possible
	Nine Net	12.512H	1 TV typ.	3/4	5(.632)	testing digital feeds
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.644/671V	9TV	3/4	22(.500)	NDS CA, subscription available NZ
	ABC HDTV	12.670H	5TV	7/8	14(.300)	also 12.686 12.706H; ABCVic, Qld
	Tel/Saturn	12.706/733V	8+TV, 1 radio	3/4	22(.500)	Irdeto CA, tests, S16 FTA occ.
PS8/166	TARBS3	12.326H	13TV + radio	3/4	28(.067)	TPG/EurodecMDS CA, occ. FTA
	TARBS	12.526H	13TV + radio	3/4	28(.067)	TPG /Eurodec MDSCA, **radio FTA**
	TARBS2	12.606H	13TV + radio	3/4	28(.067)	TPG/Eurodec MDS CA; **TRT FTA**
	TARBS5	12.646H	testing	3/4	28(.067)	TPG/Eurodec MDS CA
	TARBS4	12.726H	13TV + radio	3/4	28(.067)	TPG/Eurdec MDS CA; **radio FTA**
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)	Irdeto CA, **some FTA** tests
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)	Launched 31 December; dateline west
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)	PowVu CA
	NHK Joho	4065/1085H	7TV, 1 radio	3/4	26(.470)	PowVu CA & **FTA**; subscription avail
	ESPN USA	4020/1130H	7+TV, data	7/8	26(.470)	PowVu CA; ch 11 DCP-CCP bootload
	Discovery	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA (some audio **FTA**)
	CalBqt/Pas8	3940/1210H	up to 8TV	7/8	27(.690)	PowVu CA & **FTA (EWTN)**
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)	FTA at this time
	Filipino Bqt	3880/1270V	up to 9 TV	3/4	28(.700)	Some **FTA**; also 4040V, 27.686,7/8
	TaiwanBqt	3860/1290H	4TV + 30 radio	5/6	28(.000))	New Sr from November
	CCTV Mux	3839/1311H	up to 4	3/4	13(.240)	PowVu FTA, replaces PAS-2 svc
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)	was As2; PowVu CA
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowVu, CNN/CNNI now CA
	MTV	3740/1410H	8	2/3	27(.500)	1-7 CA; #8 **MTV China occ FTA**
PS2/169	Pv Bouquet	12.281V	2+ TV, radio	2/3	27(.500)	PowVu CA, WIN, ABC NT
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)	PowVu CA, WA only - D9234
	TVB Mux	4026/1124V	up to 8	3/4	22(.000)	CA feeds to pay-TV; 6 chs **FTA**
	Fox Bouquet	3992/1158V	8TV/data	7/8	26(.470)	Pv, CA/FTA (**FTA ch 3 only**)
	Feeds	3966/1184V	1	2/3	6(.620)	PowVu (FTA) occ feeds
	Feeds	3957/1193V	1	2/3	6(.620)	PowVu (FTA) occ. feeds
	Feeds	3929/1221V	1	3/4	10(.850)	PowVu (FTA) occ sport feeds
	Feeds	3912/1238V	1	2/3	6(.620)	PowVu(FTA) occ. feeds
	Feeds	3898/1252V	1	2/3	12(.000)	PowVu (FTA) occ. feeds
	Middle East	3836/1314V	4 typ	3/4	13(.331)	LBC/ART CA Irdeto; new PIDs 02/02
	Feeds	3803/1347V	1	3/4	6(.000)	PowVu (FTA) occ sport feeds
	BBC +	3743/1407V	3	3/4	21(.800)	**BBC FTA**, others CA usually

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(PAS-2/169)	**Feeds**	4040/1010H	1	3/4	10(.850)	PowVu occ FTA feeds
	7thDayAdv.	3872/1278H	1	3/4	6(.620)	Sat, Sun 0030, 0900+UTC
	Feeds	3868/1182H	1	2/3	6(.620)	FTA (occ sport); also try 3863,Sr6.100
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498	FTA-typ NTSC-occ sport, live Shuttle
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)	PowVu CA + **FTA**
	HK bouquet	3850/1300H	up to 8	2/3	24(900)	was 4148Vt; some **FTA**
	occ feeds	3776/1374H	1 typ	3/4	5(.560)	occ feeds, typ FTA; also Sr 5.600
	Korean Bqt	3762/1388H	up to 3	3/4	11(.570))	Korean MUX, reloasd June 01
I702/176E	AFRTS	4177/973LHC	8TV, 12+radio	3/4	26(.694)	PowVu CA
	RFO Poly	4027/1123L	1TV	3/4	4(566)	SE spot beam
I701/180E	TNTV	11.060&11.514	9	3/4	30(.000)	east spot; 10TV + r each, vertical pol.
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)	3 **FTA**, Mediaguard; also 10.975
	TVNZ	4195/955RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
	TVNZ	4178/972RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
	TVNZ/feeds	4161/989RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
	RFO-Canal+	4086/1064L	4TV, radio	5/6	12(.500)	east hemi 20.5 dBw thru 2003+
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)	DMV/NTL early version,occ feeds, typ ca
	TVNZ feeds	4044/1106R	1	3/4	5(.632)	SCPC, mixed CA and **FTA** feeds
	NZ Prime TV	4024/1126L	1	2/3	6(.876)	PowVu CA; Auckland net feeds
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)	CA, Leitch encoded
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)	New Feb 2002; vert strong NZ, Pacific
	Ioarana	3772/1378L	1	3/4	4(.566)	FTA SCPC; East Hcmi Bcam-Tahiti
	TVNZ	3846/1304R	1	3/4	5(.632)	SCPC, mixed CA & **FTA**, feeds
	10 Australia	37691381R	4	7/8	20(.000)	PowVu CA & **FTA; #3 TBN**
	USA feeds	3749/1401R	4?	?	26(400)	16-QAM (not MPEG-2 compatible)

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

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM Pty Ltd, 61-2-9939-4377.
Benjamin DB6600-CI. FTA, Foxtel/Austar w/CAM+card. Autosat Pty Ltd 61-2-9642-0266 (review SF#72)
eMTech eM-100B (FTA), eM-200B (FTA + CIx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
Humax F1-CI. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).
Humax ICRI 5400. Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available, review SF#76.
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)
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
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
MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. 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 was available from (www.BAKKERELECTRONICS.COM), now only from established users.
Nokia 9500/9600. Numerous versions for different world parts; not distributed in Pacific but assistance from Av-Comm Pty Ltd.
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.
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 never 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)
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.
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 61-3-9888-7491, Telsat 64-6-356-3749)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above).
STRONG Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review March 2002 (# below).
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Aust 61-3-8795-7990.
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, Aurora, exc. vendor support. Strong Aust 61-3-8795-7990.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84); Strong Aust 61-3-9553-3393
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faultyP/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers.
Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fx 64-9-814-9447.
Xanadu. DVB compliant special-priced receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9939-4377)

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-8, 4020/1130Hz, Sr 26.470, 7/8; pgm ch 11 and follow instructions (do not leave early!)

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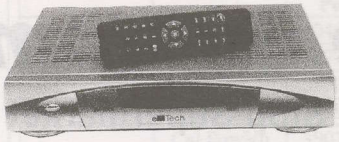
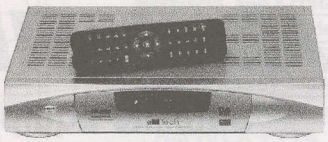


20Gb PVR Model



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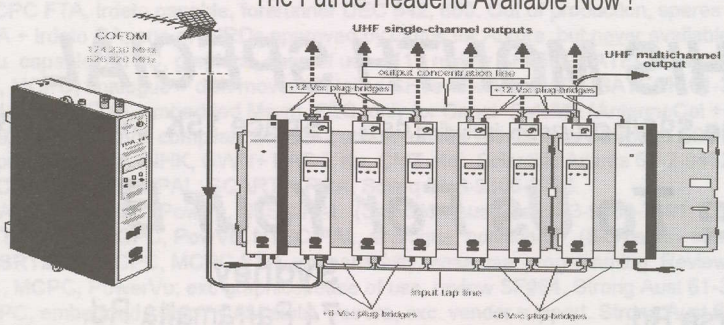

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WITH THE OBSERVERS

AT PRESS DEADLINE

As of April 8, www.dr7 web site appears to be having problems (se p. 6). Jacko (NSW) reports PAS8 Ku 12.301 Hz, Sr 6.002, 3/4 VPID 0522, APID 0650 ABC Asia Pacific with Radio Australia on APID 0651, 0652. Signal is not strong, may be SE Asia beam? Optus B1, 12.578Hz new home for "Mix 106.3", Sr 1.740, 3/4, APID 4195 (was 12.546); FTA.

AsiaSat 2/100.5E: "FTV (Fashion) went Irdeto V2 CA on March 12 (3795, Sr 2.533, 3/4)" (GW, PNG). "PIDs for APTN feeds on 3799H have changed; now VPID 200, APID 280" (**Walter Scoro**, HK). "3640H has three new programmers - Nile Variety, Future TV USA and ESC 2" (**Grant,** Sri Lanka). "Telstra Sydney T.O.C. Philips test card on 3927V, Sr 6.110, 3/4. Chinese CCTV1 feed on 3895V, Sr 5.632, 3/4" (**D. Mitchell**, NSW).

AsiaSat 3S/105.5E: "Turner (CNN, Cartoons et al) will change symbol rate on As3S service (3960H, currently 26.000, 3/4) at 1000 hours Hong Kong time April 29. In theory (fingers crossed), as this is PowerVu, IRDs authorised will automatically jump to the new (unknown at this time) Sr. On the other hand, if your CNNI/Cartoon service quits on April 29, contact Vincent Luk at tel 852-3128 3518, fax 852-3128 3928 or Email vincent.luk@turner.com.." (**Cindy Tong,** Hong Kong) "SIDs for Alpha TV Bangla and Alpha TV Marathi on 4140V have changed - you may need to reload" (Grant, Sri Lanka).

JcSat 2A-8/154E: Testing soon, 3.4-3.7 GHz Hz, 3.7-4.2Vt.

MeaSat 2/148E: "New activity 11.602H, Sr 41.500, 3/4 - Shenghai Broadcasting Network (PIDs 368/369), ETTV (PIDs 288/289), Phoenix InfoNews (PIDs 448/449), Guandong TV (PIDs 400/401 - on Eastern Australia beam" (**Ming L**, NSW).

Optus B1/156E: "NRL football feed (Penrith/St George) 12.420V, Sr 6.110, 3/4" (**DM**, NSW). "BBC World has been moved from 12.608V to 12.546V within Sky bouquet; E! has appeared on 12.608V as well" (**Craig S**, NZ). "Network 7 feed on 12.367Hz, Sr 7.200, 3/4 has been FTA carrying full 7 schedule less only ad break periods when screen goes blank. Comparing it to local 'Prime' channel, it runs around 1/2 second behind. Image is widescreen" (**IF**, Qld).

Optus B3/160E: "Aurora FTA on all channels around 7PM local (NSW) March 23" (DM, NSW).

Palapa C2M/113E: " Global Vision 3760Hz, Sr 26.087, 3/4 has been transmitting computer generated slides advertising a new bouquet, text in English and one of the Indonesian dialects; eM100B loads 10 channels" (IF, Qld). "A new MUX on 4080Hz, Sr 28.125, 3/4 with 4+ programme channels" (RJ, PNG). "MTV Asia is on 3880H, FTA, Sr28.125, 3/4, PIDs 512/650" (RJ, PNG). "Check 3880H for Global TV" (**Anthony K**, NT). "Satelindo Asia test card on 3935H, Sr 6.700, 3/4, PIDs 308/256" (**Bill Richards**, Aust).

Austar's dumping of C7 service March 31 was the tip of the corporate battle iceberg launched by Foxtel against Seven Network; see p. 29.

PanAmSat PAS2/169E: "Al-Jazeera remains active on 3836V, Sr 13.331, 3/4 - but may be testing CA there" (**Josef**, NZ).

PanAmSat PAS8/166.5E: "TARBS is adding/has added yet another transponder. We had 12.526, 12.606, 12.326, 12.726 (all H) and now the newest - 12.646H. All have a symbol rate of 28.066 and FEC of 3/4" (IF, QLD).

TeleKom 1/108E: "CITI TV7 has been testing on 4095H, FTA, Sr 6.000, 3/4" (GW, PNG).

ThaiCom 2-3/78.5E: "Suspect new TARBS transponder on 3520H, Sr 28.062. 3/4; no PIDs being transmitted at this time" (Bill Richards, Aust). "Jain has moved to 3538V from 3536V PAL; Sr 3.300, 3/4, PIDs 4132/4133" (**Kamar**, Solomon Is.)

Soapbox: "Have discovered Hualin Pty Ltd ((02 9746 6866) which has some real TVRO bargains including V-box for under A$90" (**David**, NSW). "With all of the furore over the sad state of pay-TV satellite installers, let me commend the exact opposite attitude at Sky (Racing) Australia. Every one of these guys I have met is spot on, bright, and does a high quality job. Either the best guys have given up on Austar/Foxtel and gravitated to Sky, or, Sky has higher entry level requirements." (**AI**, NSW). "Austar has changed radio channel r13 from CA to FTA. It is a mixture of various types of music broken with announcements promoting Austar

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 May 15th issue: May 4 by mail or 5PM NZ May 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

The "battle" for corporate control of Australian pay-TV

As the calendar ticked over from March 31 to April 1 (2002), Network 7 production **C7** which had been appearing on Optus Cable TV and Austar satellite TV throughout Australia disappeared. The "announcement" posted by Austar appears to the left. Score one for Foxtel. Earlier in March, Foxtel and Optus reached an unusual agreement. Foxtel would assume the financial liability for contracts originally signed by Optus with USA based major movie firms getting Optus "off the hook" for debt which was dragging its pay-TV division down. Optus in its original enthusiasm to be a pay-TV provider had negotiated contracts for movies and agreed to pay Hollywood on the basis of 500,000 paying subscribers. For example, if a film package sold on the basis of $1 per home per month was shown, Optus would pay Hollywood $500,000 - for 500,000 homes. Only Optus was not serving 500,000 homes and had barely reached 250,000. So Optus was paying $2 per home per month in our example. Unfortunately, Optus could not charge homes double the price it had originally planned to charge because to do so would drive subscribers away by the tens of thousands. So it gulped hard and paid twice as much per home for movies as it should be paying - all because it never reached the magic 500,000 homes served plateau.

The Foxtel - Optus agreement covers many other elements of pay-TV. Optus would replace C7 sport with Fox Sport 1 and Fox Sport 2, on April 1. A new Foxtel created "Footy" channel would become available as well. Then in November (2002) Foxtel and Optus would "swap" programming - virtually anything available on Foxtel (previously exclusive to Foxtel) would be available on Optus, and vice versa. There is more. Optus - not the cable operator but the satellite operator - in launching their new C1 satellite late (very late) this year has sold 12 to 14 Ku band transponders to Foxtel, sufficient spectrum space to support upwards of 120 TV channels. Foxtel says this will allow it to "expand its digital base" and "speed up the conversion of Foxtel cable systems from analogue to digital."

The agreement makes Foxtel the "gate keeper" for virtually all Australian pay-TV programming. Optus is a customer. Austar is a customer. With limited unimportant exception, Foxtel will decide what programming can be seen in Australia. Yet Foxtel and Optus claim they will be competitors, at least on the cable side. Both operate cable networks, Optus had the foresight to build a mostly-digital-capable cable network while Foxtel cut some investment corners and opted for a limited channel capacity analogue system. Both Optus and Foxtel parent Telstra are moreover also in the telephone business. Under the agreement, Telstra - the telephone company - and Optus - the telephone company - will now be able to offer "bundled subscriptions". Customers will be sold packages that wrap telephone, Internet, television and even mobile phone service into one single-source monthly bill.

Not everyone is overjoyed about this deal. Competitive telephone service groups (such as Telecom NZ which operates as AAPT and TCNZA in Australia) worries that without television as a part of its inventory, it will find selling against Telstra and Optus difficult. Ethnic telecaster TARBS which is currently offering 52+ TV and 52+ radio channels via PAS-8 satellite to Australian homes threatens to abandon Australia altogether unless Government steps in to force Foxtel and Optus to carry its programming as well. Tiny independent Neighbourhood Cable (Ballarat, Victoria) believes that its very limited access to programming will shrink even further with Foxtel in charge (they have been able to deal - sort of - with Optus). TransACT, the Canberra-based high speed network provider is frightened on behalf of 100 localised ISPs that without television to sell, they will also be put out of business. The Ten Network is worried Telstra's 95% coverage of Australia will become even less "competitive" when indirectly through Foxtel they control essentially all of the pay-TV programming in the country. And then there is Seven Network - the owner of C7. Which on April 1 found itself essentially without any way to distribute its programming. All of this and more will come into focus as the ACCC meets to consider whether approval of the Foxtel - Optus deal is warranted.

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pay-TV ("Austar Digital Radio - the home of Austar news and information"). (**NS**, NSW). "New Footy channels within Austar bouquet load as #50 - AFL QLD, #51 - AFL NSW, #52 - AFL VIC/ACT and #53 - AFL SA. There is no AFL-WA in this bouquet, available only through Foxtel." (**FH**, NSW). "ABC-TV on Austar channel 2 indicates it has both teletext and subtitles available - but I can't load them to play." (**AI**, QLD). "Aurora Radio ch 42 has been carrying a Northern Territory AM radio station (8HA) and the label reads '8HA Radio 8 Test'. Reception quality prior to uplinking is noisy with sounds identical to an AM radio being operated in close proximity to a TV set, plus bursts of SMPS noise. I suspect they have the receiver in the Imparja facility where it picks up all sorts of trash. Have they not heard of a long wire external antenna?" (**RG**, Vic. - Or a loop antenna? - **Ed**) "Imparja's program guide service on Aurora ch 31 locks up very often and displays a default Windows menu. Isn't Microsoft wonderful!" (**RG**, Vic.) "On my eM100B, a challenge. In trying to get the Imparja feed on B1 to play, merely loading the VPID and APID numbers will not work. eMTech gives you a menu choice of decimal or hexadecimal entries for VPID, APID and PCR. The default setting in PCR is (decimal) 8191. Leaving the PCR in default prevents Imparja from playing. If on the other hand you enter either the VPID or APID for the default PCR setting, the channel plays perfectly - but there is no channel label, no EPG, no subtitles. On the Imparja radio channels, the PCR needs to be set to the same number as APID to work. If you leave the PCR set for Imparja's TV feed as described and wish to watch another TV channel, the reception plays and locks up." (**DM**, NSW). "Contacts for subscribing to Middle East services now using Irdeto V1 on PAS-2 (3836V, Sr 13.331, 3/4) is tel 61-2-9747 1011, fax 61-2-9747 1022, Email wmi@worldmedia.com.au. They are telling people to purchase a UEC 720, Zinwell, Strong or Humax receiver and then contact them for a subscription card." (**PE**, Auckland). "Middle East bouquet

receiver sales by Strong Technologies Pty Ltd are brisk; World Media sells the systems and sends us shipping orders for the receivers. A surprise to me - percentage wise more are going to New Zealand than Australia!" (**Leon Senior**, Vic). "Av-comm's 1.2m prime focus spun aluminium dish on special for A$66 is one heck of a bargain!" (**DM**, NSW). "The 'DTH' bouquet on B3 Horizontal has been relabelled to AD 210559. Perhaps these are the initials of the programmer (AD) and his date of birth (21 May 1959)." (**IF**, Qld). "Austar is now promoting their package to schools (www.switchedonschools.com.au) perhaps believing that if the schools get the service, kids will go home and pester their parents for a subscription!" (**AI**, NSW). "Reference TARBS shuffling on PAS-8 Ku. From SatFACTS #90, pages 14 and 18, these changes have now happened: (1) TV channel 41 is now labelled A1TV (CA), Ch 44 is labelled ORT and is CA. The new channels are 53 to 65 labelled TS60 through TS72. TRT on Ch 14 and TV5 Thai Global on Ch 52 remain FTA. In radio channels, all of the 26 radio channels listed in SF90, p. 18 remain per the list except ELSH has no audio currently; and channels from 17 on have been relabelled. Ch 17 was RA77 is now RA117. Radio channels 38 (labelled R130) and 39 (R139) are a strange mixture of 50 hertz hum and various European radio stations. (UEC 642) channels 57, 61 and 64 are labelled DU90, DU91 and DU92 but either there is no audio or they are CA." (**NS**, NSW). "Bloom is off the FTA TV One, TV2 rose in northern NZ; local installer reselling IRDs at his cost, charging only for labour of making installation." (**PB**, NZ). "Article appearing in European satellite magazine urges people to quit spending money for low noise LNB/LNBf making point as dB noise scale is logarithm, an improvement from 0.7dB to 0.5 dB (0.2 dB better) represents less than 1/2 of one percent improvement. They are urging readers to invest in larger dishes, using example that 60cm dish growing to a 1.3m dish is an improvement in surface area of 17%. Does any of this make any sense?" (**SG**, Thailand).

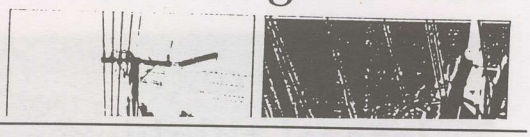
Actually, no. Lower noise (factor) LNBs work better primarily because they have a better way of transferring the incoming energy to the input of the first low noise gain stage. Less signal is left behind in the feed - more gets to the actual gain circuits because of improved "impedance matching". There are limits to how low the noise factor can drop and still be an improvement - at Ku band 0.5 dB noise figure, if real, approaches the limits of the terrestrial and atmospheric noise that surrounds the incoming satellite signals. Think of the noise factor as the backyard fence in "*Tool Time*." The higher the fence, the less we see of Tim's next door neighbour. The higher the noise factor, the more signal it takes to "see over the fence" to the first gain stage. But if you lower the fence too much, you discover a second fence is there - the natural noise of the atmosphere and ground. As for the antenna size improvement - going from a 60cm dish to a 1.3m is a 7 dB gain improvement at Ku. Which means? (1) There will be 7 dB more signal to the LNBf with a 1.3m, (2) the system if it was at threshold (marginal reception) with a 60cm will now have 7 dB of "spare" headroom, (3) If the 60cm worked in a footprint level region where 47 dBw from the satellite was available, the 1.3m will work where a much weaker 40 dBw signal is available. Somebody in Europe needs to go back to school!

"Correction. JcSat1B is at 150, not JcSat4A - which is at 124E. I saw a coloured test card from 124E over a year ago for a few hours, nothing since that time. And from 124E they have the identical footprint coverage of 128E - but for whatever reason have simply not used the C-band capability from 124 on other than a test basis" (**D. Leach**. NSW).

AT Sign-off

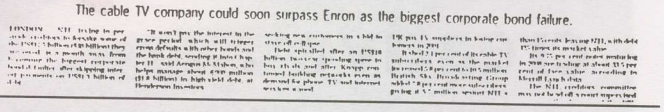
Hidden cost of a great view

Never mind the scenery ... the big black cables are a sign of progress, says a TelstraClear supporter. **Peter Griffin** reports.



NTL on brink of record default

The cable TV company could soon surpass Enron as the biggest corporate bond failure.



It is all about making money - or is it?

In the 1950s and 1960s, guys pretty much like you and I wandered around the rural towns of North America locating communities where TV reception was below standard. When all of the ingredients were right, they went to the city fathers and requested something called a "cable franchise" - official city permission to wire up the streets with coaxial cable lines, amplifiers and attachments. In North America, a "franchise" is (and was) a ten, fifteen or twenty year permit to operate a business utilising the public rights of way; the easements retained by the community so that power and telephone firms could string their wires. It was all done at the "local" community level and until the 1970s there was seldom any higher authority (such as the state they were in or the federal government) meddling in their activity.

A town of 5,000 people could produce more than 1,000 cable connections in as little as 3 years. Funds to build the systems typically were provided by the cable hardware equipment suppliers who were eager to sell their stuff and keep their production lines going. When the cable operator had the hardware supplier paid off, he typically spent around 25% of his annual take for maintenance and looked for ways to hide the balance from the tax collectors. Those were the good decades of cable TV and if the operator was wisely advised by clever accountants, he kept the ball rolling by jumping from one paid-off system to another new one. And another and another. A guy who may have started with $10,000 could look back after ten years in the business and have 5,000 paying subscribers in 5 towns scattered nearby.

And then along came pay-TV. HBO (Home Box Office) was the first major player, using satellite to distribute movies from a New York playout centre to living rooms in Enid (Oklahoma), Spokane (Washington) and San Juan (Puerto Rico) simultaneously. HBO and other similar satellite delivered channels were offered as "optional extra-pay" channels and where before HBO the typical cable home was paying a very modest $5 a month for perhaps 12 channels of service, when HBO came along the $5 jumped to $15. Of this, the cable guy kept half of the HBO extra fee which doubled his own take from $5 a month to $10. His bank account flowed over.

This attracted a new breed of cable investor. These original pioneers wandering about dirt roads in remote rural areas searching for new towns to wire were replaced by corporate conglomerates listed on the stock exchange. They made the originators of the industry "offers they could not refuse". When a cable home put $10 a month directly into the cable operator's pocket (for 12 regular channels + HBO), he would collect $120 a year per home. Fancy dressed guys sporting Madison Avenue suits walked into their offices and offered them $1,000 per subscriber - in cash - if they would sell. As that was more than 8 years revenue most of the cable pioneers jumped at the chance, collected huge checks and rode off in their brand new pickup trucks into the sunset, retiring to Florida or Arizona. This happened several thousand times between 1970 and 1980 as the satellite delivery revolution caught on.

But guys dressed in Madison Avenue suits were often incompetent as cable operators in towns like Enid and by 1990 a new breed had arrived to buy out the suit guys. These were the major players in telecommunications with names like General Electric, AT&T and NTL.

They had a different plan. Phase one was to "get the cable into the home - get the home connected". TV would do that. Phase two was to increase the cable's capacity to allow telephone and ultimately Internet to flow through the same wires. If these buyers were already in the telephone business (such as AT&T), they planned to ensure that nobody else would ever be in the same business and compete with them. If they were not in the telephone business at the time (like NTL in the UK), their plan as to compete with the existing telephone firm (BT).

Something has gone terribly wrong with the plan. As The New Zealand Herald and many web sites reported April 6, Britain's largest cable communications (including TV) operator, NTL, is 30 days away from defaulting on more than US$11 billion in debt. Putting that into perspective, the failure of American energy company Enron resulted in defaults on US$9.9 billion in debt. NTL could be the largest bankruptcy in the history of the world. And it is all about delivering TV to homes.

Meanwhile in Auckland telecommunications company TelstraClear is in a battle for its life. The firm has signed a contract with local electrical energy firm Vector to lease/rent pole space to hang bundles of fibre optic and coaxial cable as large as 450mm in diameter. Some of the public is outraged at having something that large added to their front (or rear) viewscape and politicians are reacting by coming down on the side of angry residents.

TelstraClear maintains that when they finish their system, on average *every home in Auckland* will see a $100 reduction per year in telephone and Internet charges, even if they don't subscribe to TelstraClear. Simply because for the first time, there will be competition to established Telecom. In Christchurch and Wellington, where TelstraClear is already operating, it is true that Telecom to be competitive to the new service has indeed chopped their own charges.

The angry public is demanding TelstraClear "go underground" rather than attach to existing power poles. TelstraClear properly argues that if they are forced underground, it will cost them 500% as much to build their system. And if that happens, well, there goes the $100 per home competition factor. What everyone seems to be missing is that if TelstraClear is allowed onto existing Vector poles, within ten years those wires will be underground anyhow because Vector plans to bury their own wires (jointly with TelstraClear) in most areas within that time frame. When both Vector and TelstraClear jointly bury, tremendous cost savings result. The alternative is "junk bonds" as NTL issued, defaults and bankruptcy. And then Telecom wins.

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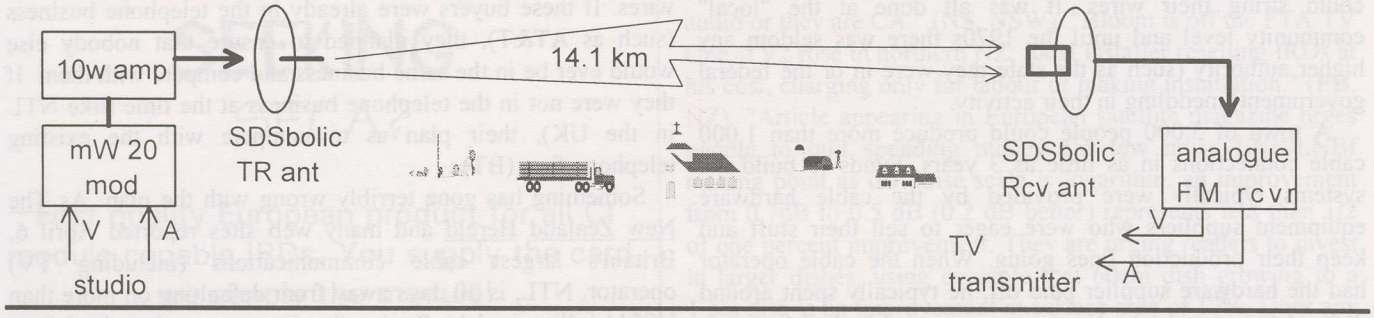
... point to point
LINKING

SDStv.com case history B002-003:

"....so this guy calls on the phone and he has been quoted $20,000 for a 14 kilometre one-way video link to connect his TV studio to his TV transmitter using some Italian equipment in the 10 GHz band. *'Can you beat that???'* he asks. We smiled. *'How about under $1,500 and we'll deliver no less than 50 dB video signal to noise at the receive end?'* Want to see how we did it? Or how you can beat the high priced point-to-point equipment? Read on!"



mW20: $190
A10 amp: $690
SDSbolic: $190
"Active" SDSbolic: $240
Analogue receiver: $125

UNDER (US) $1500 for a complete 50dB-plus video signal to noise link!

Background:

SDStv.com designs are forcing people to rethink why they spend **huge** amounts of money to create 0 to 30 km television/radio/data links using microwave technology. Our 27 MHz bandwidth FM analogue design mW20 transmitter/modulator is user frequency selectable (push-button agile) on 24 channels between 950 and 1450 MHz. Our 10 watt solid state amplifier is the least expensive "circuit booster" available in the world! Video (plus inbuilt subcarrier audio) links are a primary use but any data signals you can stuff into 27 MHz comes out the other end without resorting to high cost technology.

Foreground:

Our prices are sooo-low that you might think SDStv.com equipment is not of professional quality. That would be **wrong**. We just happen to be extremely clever daring to move into the latest microwave chip devices while the high priced guys are still charging "traditional" multi-thousand dollar amounts for equipment they build for a few hundred dollars. SDStv.com designers have pioneered microwave transmission and reception technology since 1979. And by using 27 MHz wideband FM, users benefit because any and every L-band analogue satellite TV receiver makes a dandy receiver for a fraction of normal receiver costs.

THIS important notation: SDStv.com operates on user-selected frequencies between 950 and 1450 MHz (L-band). Or on special order - up to 2150 MHz. Not every country will allow SDStv.com licensing (if licensing is indeed required) so check first before ordering.

SDStv.com Daffynitions

Formal discone?

The ever popular SDStv.com Discone antenna has a new look. We added a "top hat" to the "cone tails" and now this versatile L-band transmit (and receive) antenna has gone "formal".

Better VSWR: under 3-1 and typically under 2-1 over full 950 - 2500 MHz spectrum.

Lower radiation angle: more than 90% of the transmitted power (or receive sensitivity) is concentrated within 3 degrees of the horizon

Translation:
It works better, transmits further, radiates more signal. But the price is still the same.

A dirt-cheap bargain!
SDStv.COM FM Analogue starter kit. One mW20 (24 channel frequency agile) transmitter, one "Top-Hat Discone" transmit antenna, one passive-logi receive antenna. You supply the analogue L-band receiver(s). US$295 + shipping. Worldwide.

HOW do you distribute an adult channel in an African country that has no such service? Erect a sizeable dish, capture the service with a matching receiver and then plug the resulting decrypted audio and video into a mW20 transmitter. Now add a SDStv.com 10 watt amplifier, a "Top Hat Discone" and pump those watts into the atmosphere. Result? The installer is a doing a brisk business in SDStv.com receiver system sales, expects to hit 1,000 installs by July. Sometimes the "colour of money" is silky-white.

FREE for the ASKING instructions for SDStv.com systems

Send us an Email (skyking@clear.net.nz) and ask for "SDStv.com instructions". Or a fax (++64-9-406-1083) - provide your full name and mailing address in either case and we will airmail to you the SDStv.com installation notes. There is no better way to study what SDStv.com can do for you, your business, and your "neighbourhood. Quit procrastinating; do it today!

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Web sites: http://www.sdstv.com and http://www.sdstv.co.za

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Australia? Another (excellent) option is through AV-COMM Pty Ltd. See page 30.

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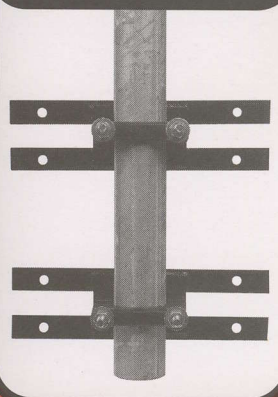

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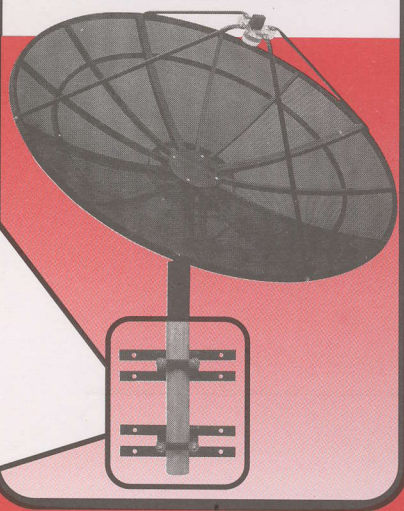

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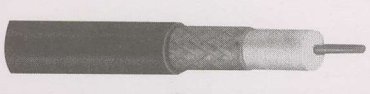

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