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Bob Cooper's

January 19 2001

# SatFACTS

## MONTHLY



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

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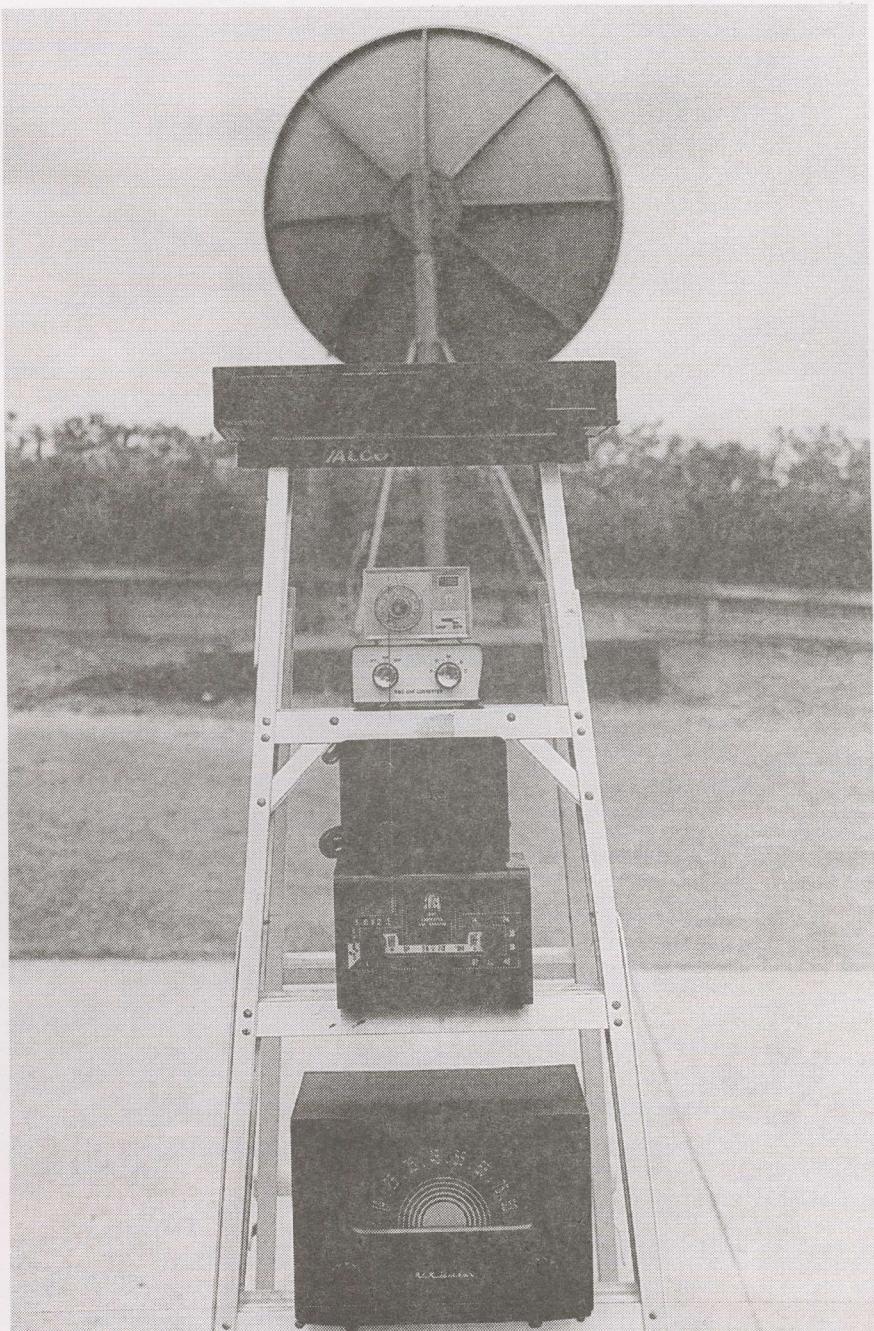
**SET TOP  
BOXES-  
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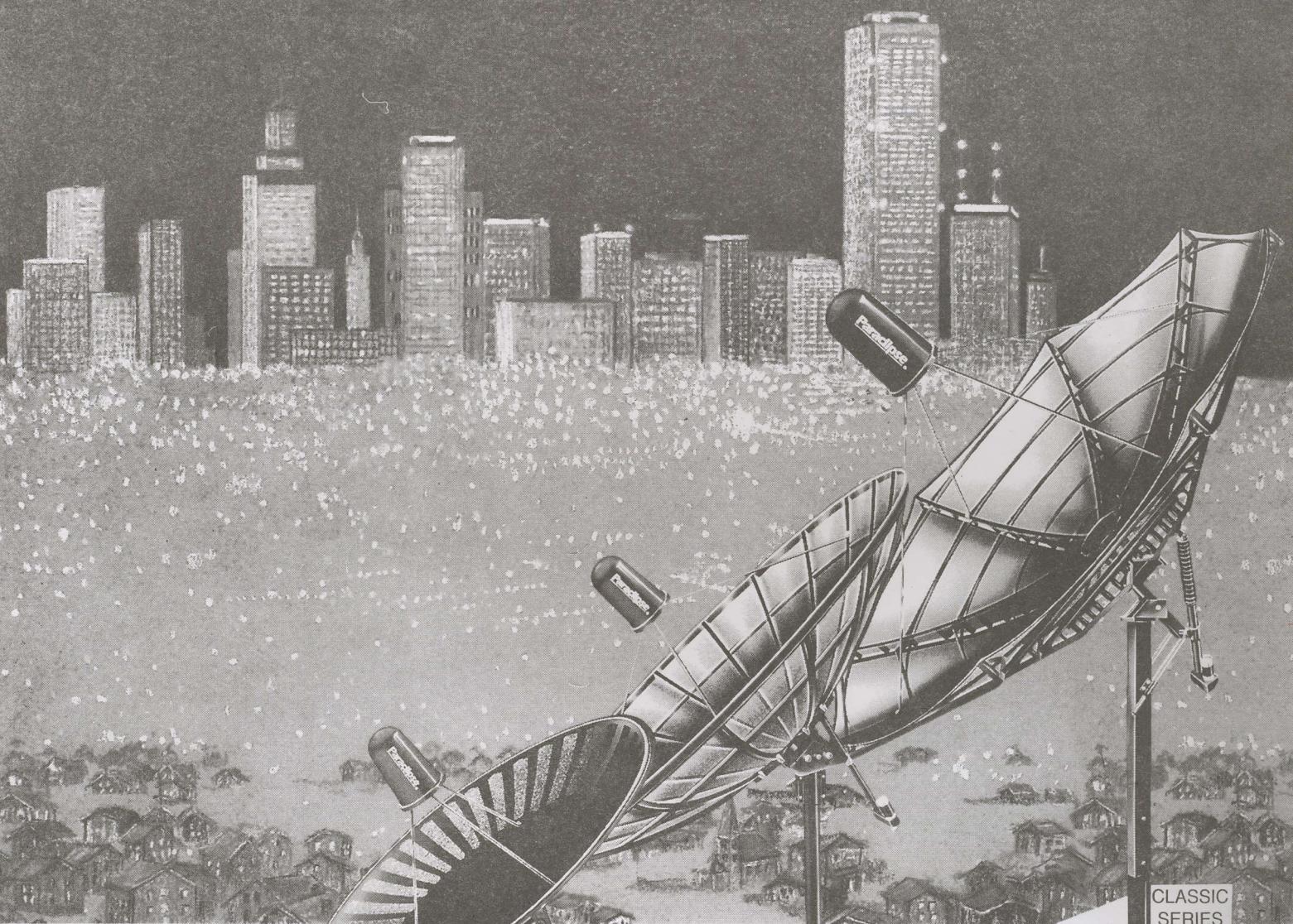
**TVNZ-sat grows;  
DVB-T masthead  
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- NEW programming sources seen since January 1st: \_\_\_\_\_
- Changes (signal level, transponder, programming content) in pre-existing programming sources since January 1st: \_\_\_\_\_
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NOTE: Please use P1 - P5 code when describing signal levels and receiver IF/RF settings.

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## REVISIONS for SKY NZ Optus B1 Services

DTH pay television pioneer Sky Network NZ will have competition starting sometime in April/May from state owned TVNZ and pay cable operator Telstra-Saturn Ltd. Whether any of the FTA (free to air) TVNZ service channels (TVOne, TV2) will become available to Sky satellite subscribers remains to be negotiated. For now, the Sky services line-up as follows (all Optus B1, vertical, NZ beam with 52 dBw at boresight)

**12.518Vt/T5Lower (7TV + 4 radio):** (1) Sky Movies, (2) Cartoon Network, (3) ESPN, (4) Sky News, (5) Fashion TV, (6) Weather, (7) Arirang TV (Korea) + R1/Sport, R2/Star Tracks, R3/Lifestyle, R4/Smooth Sounds.

**12.546Vt/T5Upper (7 TV):** (1) TCM, (2) Granada UK, (3) Sky Sport, (4) National Geographic, (5) CNBC, (6) ETTV (Taiwan), (7) SETN (Taiwan).

**12.581Vt/T6Lower (6TV + 2 radio):** (1) Mosaic, (2) Sky 1, (3) Hallmark, (4) Sky Sport 2, (5) Animal Planet, (6) CNN, (7) National radio, (8) Concert radio.

**12.608Vt/T6Upper (6TV, 2 "internal"):** (1) Juice TV, (2) Trackside, (3) Discovery, (4) Prime TV, (5) Sundance, (6) SI 1026 E (internal), (7) NHK (Japan), (8) VCR Scart inp.

**12.644Vt/T7Lower (7 TV):** (1) Sky Movie Max, (2) Nickelodeon, (3) TV3, (4) TV3, (5) TV4, (6) Sky Box Office, (7) Phoenix (Hong Kong Chinese).

**12.671Vt/T7Upper (4 TV):** (1) Sky Box Office movies, (2) Playboy (adult), (3) SPICE (adult), (4) Sky Box Office movies.

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# SatFACTS MONTHLY

ISSN 1174-0779

is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd.

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

These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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## COOP'S COMMENT

Killing the messenger. A man named Ed Guz visited us late in 1995, he was Director of Engineering for a firm called Galaxy at the time. Using a 2.1m spun dish and 0.7 dB LNB, we went fishing for signal from the then operating Galaxy service encrypted in General Instrument MPEG 1.5. In those days no CA was needed - GI receivers were rare, and nobody worried much about decoding the signal anyhow. I had forgotten about Guz until December

23rd when his name surfaced again. This time he was an employee of Optus, and he was being blamed for something torrid within the Aurora data stream. Hundreds, perhaps thousands of Strong, Satcruiser and Benjamin CI version IRDs reportedly had stopped working and Guz was getting the shaft for the changes.

Bad timing. Optus elected to make the data stream changes which corrupted the working receivers only hours before the entire staff was scheduled to leave for extended holidays. Dealers led by Steve Wallace at Norsat WA, realising that if the problem was not promptly corrected, it could last through Christmas and New Years, tried in vain to get Guz (or anyone else at Optus) to cancel their latest data stream iteration. We provide an expanded report starting on p. 15 here.

The history of Optus selection of the UEC receiver as the only "approved" Aurora receiver has been bubbling just below the surface since 1998. Virtually every dealer and distributor in the industry believes there was something done under the table between UEC and Optus to create this situation. Optus has done nothing to dispel this popular urban myth, in fact almost seems to relish the story as if it is some sort of merit badge for astute business dealings.

In modern business, "getting a competitive advantage" can make or break a company. If a manufacturer can sew up a valuable distributor by sending the distributor and his wife to Bali every year, well - that's business. If a key employee at the distributor can be persuaded to recommend the manufacturer's product over others on the shelf, business logic suggests he should be rewarded for his 'loyalty.' These rewards may not be illegal but they push the envelope of ethical business dealings. We all know or strongly suspect politicians engage in this sort of immoral activity and with each election we stand in line to vote for the man or woman whom we believe will be the most moral in protecting our democratic principals.

Not all cultures treat business ethics in an identical manner. South Africa, only a decade out of being on the world's "black list" for trading and commerce, does not approach business dealings as say New Zealand or Norway. UEC Commercial (Proprietary) Limited is a wholly owned subsidiary of Allied Technologies Limited which in turn is owned by Allied Electronics Corporation Limited, a public company in South Africa. When South Africa was prohibited from acquiring advanced military hardware because of the UN arms embargo, Allied was one of many firms involved in creating a South African advanced jet fighter (the "Cheetah"). Corporate management who spent decades subverting the UN embargo as a livelihood would have no difficulty "manipulating" Australian law to their advantage.

The time has come for Optus to clean up this issue before more people are hurt.

## In Volume 7 ♦ Number 77

Set-top boxes are nothing new -p. 6

Optus Aurora "dumps" on non-UEC receivers - p. 15

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Programmer/Programming Update -p.2; Hardware/Equipment Update -p. 4; SPACE Pacific Report (Masthead amplifiers and DVB-T) - p. 20; Cable TV Connection (Don't mow down my dish!) - p. 22; SatFACTS Digital Watch -p. 24; Supplemental Digital Data -p. 26; SatFACTS Analogue Watch -p. 27; SPACE Pacific Report - TV Show schedule -p. 28; With The Observers -p. 29; Two Weeks into DVB-T in Australia - and the buzzards are circling -p. 31; At Sign-Off

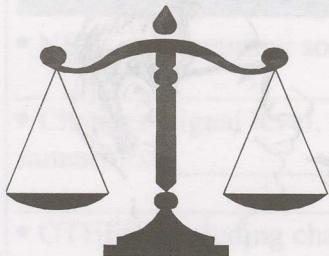
(How do you spell d-i-g-i-t-a-l?) -p. 32

## ON THE COVER

Set-top boxes are hardly a new creation. TV and radio reception has long been enhanced, expanded or excited by the addition of auxiliary equipment created to take advantage of the original "receiver" by expanding its capabilities. The saga of the set-top (page 6, here).



January 19, 2001



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**That flexible coax - last time**

"Maybe they have parallel sections of miniature coax inside that bright copper sheath?"

Al, Queensland

Closer. The copper foil sheath is quite rugged and totally wraps around the inside part - forming the equivalent of a braid or braid plus foil on normal "coax."

Inside and the mystery - a rubbery plastic "glove" beneath the copper cover which serves as "insulation" from the copper and inside that - a single piece of solid #20 wire which is the centre conductor. How this tightly packed sandwich approximates 75 ohms is the real mystery!



**DVB-T tuning tip**

"While attending a terrestrial digital seminar, I learned from John Hill (an engineer at Channel 7) his fail-safe method of installing DVB-T. He inserts a 10 dB attenuator in the line between the antenna and the TV set, locates the correct spot for the aerial and tweaks for best indicated signal. Having done this, the 10 dB pad is taken out leaving behind a '10 dB safety margin' for inevitable antenna system ageing and changes in reception conditions."

Leon Senior, Strong Australia

Clever but potentially time consuming. Without some type of instrument to measure BER and signal level, you could be on the roof a long time finding the right location. Having once found it, however, by having an extra 10 dB of margin over best reception is a good policy. On the other hand, if you don't have enough signal for 10 dB of margin (as will be true in fringe areas) you might spend a frustrating time even finding a suitable signal with a pad in the line.

**Country Music - again**

"Further to on going discussion about reduction in video quality for CMT/MC. It is not merely their video that is down graded - the audio also now lacks high frequency components, as if a tape player with dirty heads or wrong tape tension is being used. I once used CMT as a stellar example of high quality video to demo satellite TV on a projection set. I cannot do that anymore and surely they must be aware their baseband V and A quality has deteriorated since midyear 2000?"

Laurie Mathews, Auckland

## PROGRAMMER PROGRAMMING PROMOTION

# UPDATE

JANUARY 19, 2001

**Printer's holiday:** This issue of SatFACTS is dated January 19th because our printer takes a generous holiday break. February will return to the "normal" 15th of the month mailing date.

**Not one but two** transponders are now in line for launch of New Zealand's TVNZ + Telstra-Saturn joint venture service. Originally announced Optus B1, Tr8 (vertical) with symbol rate of 22.500 and FEC 3/4, is now to be joined by at least half of transponder 4 (also Vt) for total of 24 programme channels, initially. TVNZ + has chosen symbol rate and FEC identical to competitor Sky NZ, on same bird and polarity, in hopes further negotiations (underway) will result in Sky agreeing to send software commands to its 230,000 + universe of digital IRDs allowing them to tune-in FTA TVOne and TV2 services. TVNZ has asked TV3, TV4 and Prime to "join" their bouquet but for each programme channel carried, somebody has to cough up Au\$ 0.5 million for the use of transponder space. System will use Irdeto with OpenTV, all viewers will require smart card (as with Aurora in Australia) - next major decision is announcement of receiver supplier(s).

**CNNI scheduled to encrypt** PAS-8 digital service (3780Hz) February 11, and C2M analogue service (3970Vt) as early as February 1. No, individual homes cannot subscribe - at least in NZ and Australia where enquiries have been told to contact their "local pay-TV operator." SMATV, CATV ops should contact Edith Chan in HK, + +852-3128-3555 (e-mail mimi.chan@turner.com).

**European Bouquet potential changes** - announcement January 10 advises renewal contracts with MCM (French music service) and WRN (World Radio Network) have not been completed and in theory both could be *missing* from As2 (4000Hz, Sr 28.125, 3/4) after January 21. No advice where MCM (or WRN) would go, or if their Asia-Pacific services would shut down if last minute contract negotiations fail.

**Self promoting.** Australian 7, 9 and 10 networks are investing heavily in promotion of switch over to digital TV with on air promos and "news" features built around the new technology. Strangely, in USA where hype is pervasive, neither networks nor TV stations have adopted a similar approach perhaps partially explaining why the average American still cannot spell much less define "digital TV."

**Letter boxing.** Live (Addidas International) tennis coverage created by 7 (and shown on GWN) had black top and bottom of screen "border." Welcome to the next half analogue - half digital world artefact! When programming is produced for 16:9 (see p. 12), but shown on 4:3 screens, image is "letter boxed" with black border - one side effect is constant reminder to viewers, "*You are watching this telecast on an 'old-fashioned' TV set!*" Oh yes, 7 is using a BBC created 14:9 on analogue to reduce angry analogue viewer feedback. Get used to it.

**More signs of the times.** We reported Star TV Asia plans to shut down Hong Kong's DTH service (SF December, p. 15). "Economising" is apparently the name of the game at News Corp where Fox TV web sites are being closed down and consolidated in a move reducing employees by 200. And, Fox TV stations in USA are shedding several hundred personnel as well. Downsizing is a part of the new "Visa Card mentality" world-wide.

**And Foxtel sales down.** Installers under contract to do Foxtel install work report new systems have dropped from multiple-per day and flat-out to, "as few as 1 a day or less." Subscribers with reception problems ("break up, poor video quality") are being routinely told, "two weeks before we can do a service call" but those who want to be de-installed are getting 2 day service. A strange way to treat existing customers!

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#### Bart Simpson hair cuts

"Can't get my hands on a DVB-T box so have to be satisfied with looking at the services on a spec-an. Just like Bart Simpson's hair cut - very neat and tidy almost text book perfect "square displays" that run somewhat lower in level than peaks on adjacent analogue channels. Channels 7-digital (actual 6) and 10-digital (actual 10) are significantly lower in level from Melbourne than 9-digital (on 8) and the analogues. What happened to alternate sources for DVB-T boxes?"

PM, Victoria

We are going to have to invent some new print terminology here to save valuable text space. We all know that the digital channel is not the same as the analogue and perhaps the easiest way to make that distinction is to refer to 7-D, 9-D, 10-D and so on for the major city stations. When the aggregated markets come on line, we'll adapt accordingly!

#### Some Aurora history

"I read with interest problems people are reporting with Aurora. This recollection may be of interest. One Monday, perhaps 8 months ago, we received a call from an installer who had just bought a quantity of Multichoice decoders. 'They don't work,' said he. He was right - they did not work when you entered only the homing transponder of 12.407. Oddly enough, it was only new installs that were a problem - as long as you did not rescan an existing installation, everything was fine. We contacted Optus and when they realised it was a Multichoice decoder, they quickly shifted gears and said, 'That is not an (Optus) approved decoder - sorry, we cannot help you.' We did learn in the conversation Optus had upgraded their computer that transmits the Network Information Table the preceding day. On our own, we found the Multichoice would work fine as long as you individually loaded each transponder doing those with FEC 3/4 first (important!), then the 2/3. If pay-TV was also being used, do Aurora 3/4, then pay-TV (all of which are 3/4), finally Aurora 2/3 - one transponder at a time. By Thursday of the same week, even the Optus 'approved' UEC IRDs were having the same problem. Armed with this information, we went back to our Optus contact who then conceded, 'Yes, we probably do have a problem' (as their beloved decoder choice had at that point developed the same error, they had no choice but to admit this!). The following weekend they did another (unannounced) update to the NIT and everything went back to normal with just the homing transponder of 12.407 required to load the bouquet."

Peter Merrett, Sciteq Pty Ltd

"My dealer, Kansat, suggests I report to you that in December I lost reception of SBS. I have a Satcruiser receiver and when I called Optus they said, 'We only support UEC receivers.' I can still receive Central 7, ABC and Imparja but not SBS."

Neil Trottier, Qld.

Hundreds - thousands? - nobody knows how many IRDs lost SBS or worse during December, all because Aurora's software managers made changes in the authorisation data stream. We report on p. 15, here.

## HARDWARE EQUIPMENT PARTS

## UPDATE

JANUARY 19, 2001

**Humax IRCI 5400** now PowerVu/NTSC compatible. Following on our extensive report/review (SF December, p. 6), Kristal Electronics advises, "*The HUMAX IRCI 5400 will do DVB PAL and NTSC and PowerVu PAL and NTSC when the newly available software is loaded. However, it does not convert the NTSC to PAL with the new software, it passes it through without conversion.*" And Scott Nesbitt of SCITEQ confirms, "*Humax has not put the new upgrade software on their web site, owners should take the unit back to the dealer for the upgrade because there are chances to do it wrong if you don't know what you are doing!*" Apparently all distributors now have the new NTSC/PowerVu upgrades available.

**New Zealand's government has ducked** the pressing issue of mandating a universal open access technology for present and future TV transmission systems. A wide ranging "Telecommunications Inquiry" created by Government asked for recommendations to modify existing systems so that as technology charges ahead, the country is not left behind. Most pressing issue of all - should *one* firm (Sky NZ in this case) be in a position to control all content and all set-top boxes because it happened to be first with their News Corp CA system? Most comments received by Government urged adoption of a common "open access" conditional access regime, available to all programmers equally without commercial preference.

**Sky's NZ Pace/Zenith boxes.** We now believe these boxes *will*, in fact, receive and reproduce plain (non CA) DVB-S free to air transmissions without difficulty, *provided* that the box has an authorised smart card inserted (no card, the box is basically disabled), *and*, Sky NZ transmits the appropriate "open access" commands to the box(es). Issue is important because as competitive TVNZ + Telstra-Saturn service launches in April or May, it would like FTA's TVOne and TV2 as a minimum to be accessible by existing universe of Sky IRDs.

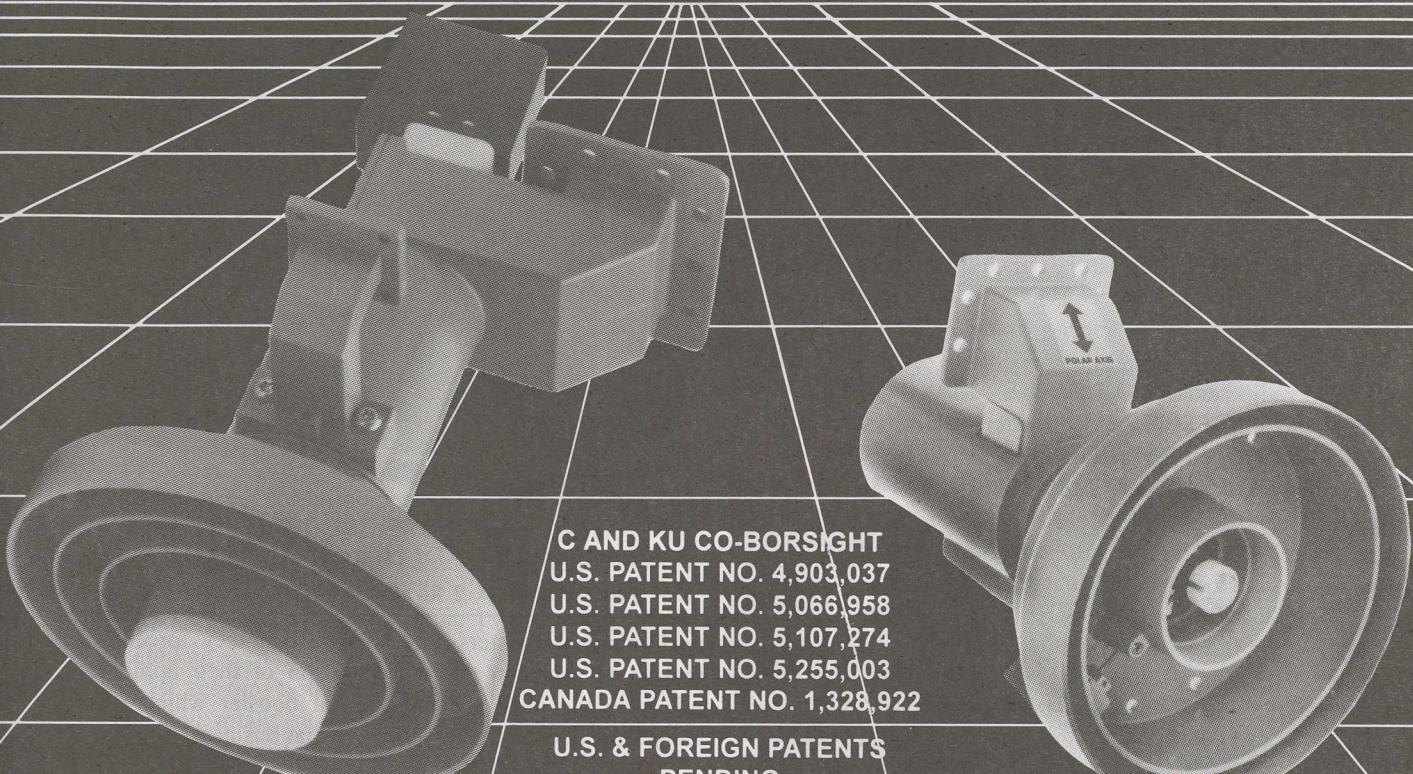
**Canal Caledonie** has appointed Nationwide Antenna Systems (Brisbane) as distributor for Pioneer TS series IRDs used for distribution of mini-bouquet of French language service now available legally for first time in Australia on Ku band from Intelsat 701 at 180E. Bouquet includes all-French language services less any sport, movie or adult channels for a reduced semi annual or annual fee (Alain Corroy, tel 07-5539-5488 is agent for service; email corroyac@australiarmail.com).

**Virtual channel tables?** When you tune in 7 Network in Australia, it appears in TV tuner dial "7" position. TV channels are part of the channel's identity and beyond reproach. Until digital. Now we have "virtual channel table" which in the satellite world is akin to selecting the European Bouquet (first step) and then when the 5 or 6 TV and 20+ radio channels appear in the menu, selecting again the actual programme channel. Almost like that but not quite. 9, for example, can assign itself a "major number" which the digital TV set or set-top box will recognise and go to when "9 digital" is selected for viewing. But of course 9 "digital" will not be on 9 at all, it will be on (real world channel) 8 (or something else). Then when 9 transmits two or more programmes simultaneously, "minor" channel numbers come into play. The main 9 programme would be on "major 9" while the second programme (or alternate camera angles) would appear on 9 "minor." The fun is just beginning.

**AsiaSat has concluded US\$250 million finance package** to allow ongoing construction for AsiaSat 4 (122E, first half of 2002) and AsiaSat 5 (to be collocated with As3S at 105.5E bringing new C and Ku band transponder space there - no launch date announced). And, Australian Telstra's agreement for 4 As3 Ku band spot beam transponders has now been expanded for optional C-band space as well.



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Set top boxes are nothing new

## Set-top Boxes are Add-ons: While TV set makers play catch up

Set-top boxes are the product of evolution and the driving force is "property rights;" who will control and therefore benefit from the technology inside and the services that technology provides. This is a period of great transition, factors totally unforeseen by creators of the digital evolution are now manipulating how we receive data and information. This will not be a swift process - it is likely to be 2010 before it all shakes out into an orderly system.

When someone designing a basic appliance, such as a stereo set, fails to include in that set the capability of processing all of the various "formats" the consumer is offered, attachments known as "set-top" boxes appear. In the last half century there have been many examples of this, including:

1) FM radio came onto the scene, AM radio manufacturers created "set-top" FM to AM converters to allow consumers to tune-in FM on their AM radios;

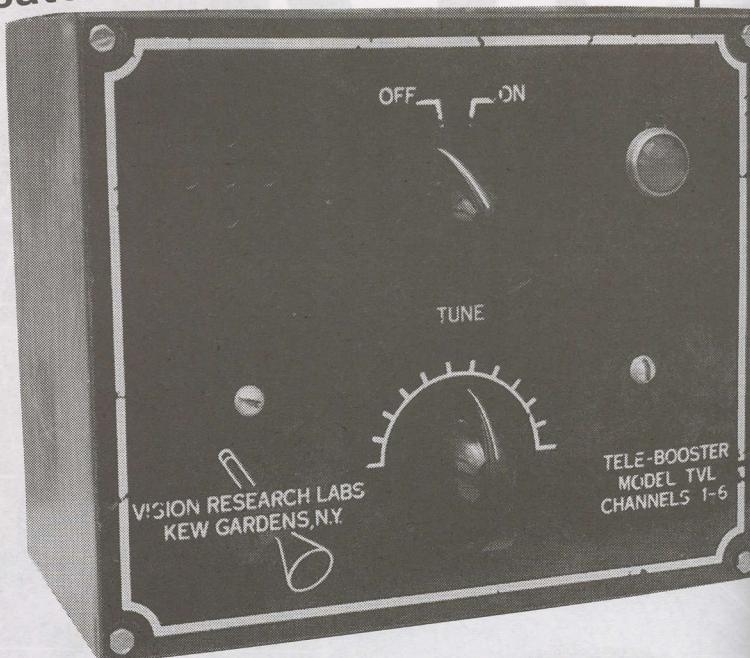
2) When all records were 78 rpm, and 45 and 33.3 rpm discs appeared, consumers were told they could purchase "add-on turn tables" to allow them to continue using their 78 rpm equipment with the newer format records.

3) When all television was VHF (and black and white), and UHF was introduced, consumers were given the option of adding UHF channel tuning to their VHF televisions with a set-top UHF to VHF converter (frequency translation device).

4) When the first (NTSC) colour was introduced in the USA, consumers were offered "colour adapters" for their black and white TV sets.

And that only takes us into the 1950s! Since that time we've seen a steady stream of consumer add-ons designed to make whatever format device as was in consumer hands work - after a fashion - with some new fangled format or service. Some new format devices requiring a "set-top" device outlived their format - 8 track audio tapes are an example, while others lived long enough to see the add-on attachment built into the basic equipment where it should have been in the first place (UHF tuning for television sets is an example).

Not all add-on set-tops actually delivered new formats to a basic appliance; some were designed to enhance the performance of the original piece of equipment. The television signal booster is an example of this. When television receivers were first introduced (1936-1938 in UK, 1941 in USA), they were very insensitive appliances requiring large amounts of aerial induced signal to function. The reason for their lack of sensitivity was a lack of technology required to build TV sets with RF (radio frequency) amplifier stages. TV sets until the early 1950s had either no RF gain stages or very poor RF gain. Tubes (transistors were not yet in use) capable of amplifying radio frequency signals in the 40-230 megacycle region were of poor quality and typically created more noise than signal gain. Manufacturers of TV sets believed anyone who did not have a high level of aerial signal pickup was not going to invest in a TV set anyhow, so there was not much incentive to do better. Along came TV set-top "signal boosters" which provided extra signal gain and better (lower) noise generation



1941 version of the set-top box for TV reception tuned all (USA) TV channels from 1 - 6 only - because that's all there were 60 years ago!

performance. Boosters sold so well that they forced TV set makers to redesign the tuner portion of their appliances to eliminate the need for an external booster which promptly caused the booster makers to leave that business.

National TV booster, Sutco combo unit (see text)



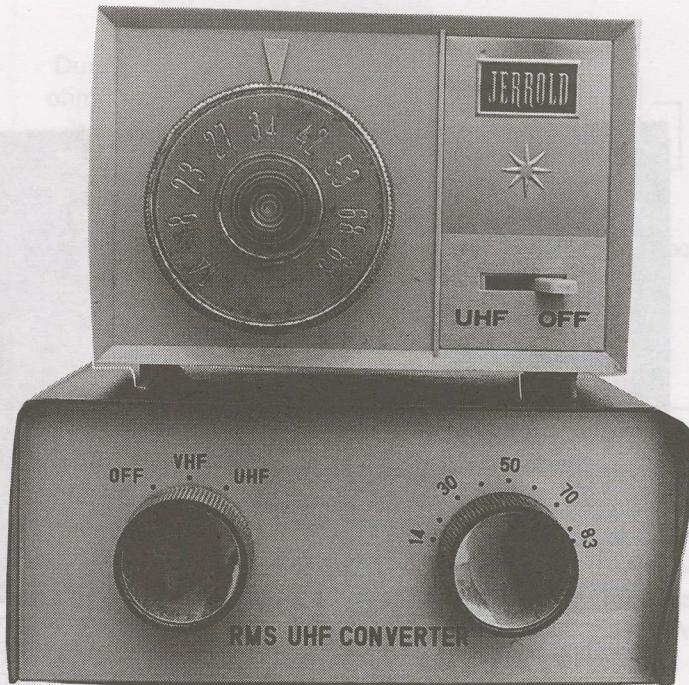
A different sort of challenge arose when in the USA the original VHF TV channels (numbered 2 - 13) were decreed inadequate for the nation's needs and an additional set of UHF channels (numbered 14 - 83) was created (1952). There is a parallel here to the start-up of digital terrestrial now underway in Australia. Within a few months of ruling on UHF channels, more than 300 such stations had been approved for construction. The parallel? With the exception of the Zenith brand TV sets, no manufacturer of TVs had a tuner capable of viewing the new UHF channels. And the Zeniths were cumbersome to modify requiring a technician to visit the home, dismantle the TV set, remove the tuner and substitute new "channel strips" for specific UHF channels in place of unused VHF channel strips (that is, VHF channels not used in that region of the USA). As this was the end of the set-top "booster" era, some manufacturers tried to stretch their booster period sales by marrying a booster to a UHF converter in the same box (Sutco's unit, left).

The answer was a set-top box, a channel 14 - 83 tuning device which translated or converted the new 14 - 83 channels down in frequency to a TV channel which the VHF-only TV sets could tune-in. The first UHF set-tops were huge - approximating the size of a current day 13" TV set (see RCA unit on front cover, bottom of ladder)! To view UHF required that the VHF-only set select the proper channel to receive the signal from the set-top (typically 5 or 6), then standing at the TV set tuning the set-top's channel selection dial to the desired UHF channel. Mind you, this was prior to remote controls and viewers were accustomed to going to the TV set to adjust any changes including even the volume.

UHF to VHF set-tops lasted well into the 1960s for a number of reasons. You might suspect that as soon as the TV set makers knew there would be channels 14 - 83 available they would rush out to add internal tuning capability for these channels to the TV sets; after all, with hundreds of new UHF stations, what manufacturer would want to be in the marketplace with a TV set that missed them totally?

Well, it did not happen. That way or at all. Ten years after UHF channels were created, most TV sets still did not have UHF tuning capability and a frustrated Government then took the unusual step of passing a law that required all TV sets "shipped in interstate commerce" have UHF tuning capability. The TV set manufacturers screamed in protest, claiming the cost of adding UHF would drive up set prices for consumers by "hundreds of dollars." This was at a point where UHF set-tops had become tiny in size (see right), transistorised, and cheap - what was originally US\$99 were now selling for under US\$20.

The ten year delay in making UHF reception as easy for the consumer as VHF reception set back the growth of UHF significantly. Between 1953 and 1970, more UHF stations



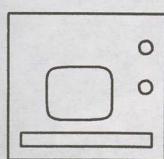
TRANSISTORS reduced the bulk (and the price) and made it possible for single "D" cells to operate set tops for several weeks at a time.



went on the air and then shut down for a lack of viewers than actually stayed on the air. UHF operators came on the air and went off in bankruptcy by the hundreds - sometimes three or more separate stations would have a go on the same UHF channel in a city. Consumers became very gun shy when UHF was mentioned - spending \$50 to \$100 to equip their homes for UHF, only to have the stations abandon the airwaves, was a costly exercise when multiplied against hundreds of thousands of homes in a region.

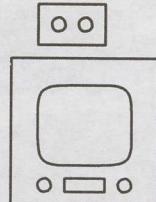
The trend here should be obvious. Something new or better was discovered, and TV set makers dragged their feet

1936 - 1952



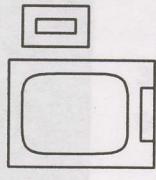
First TV sets had no RF amplifier stage

1948 - 1955



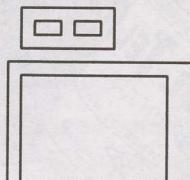
Set-top boosters introduced

1953 - 1965+



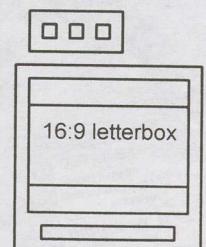
UHF tuning was through set-top

1970 - 1990

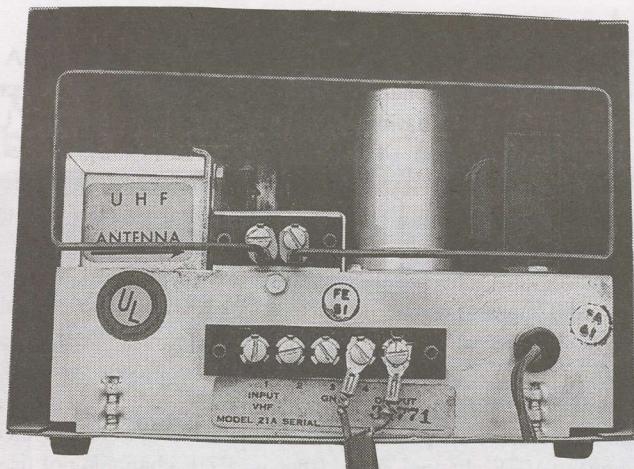
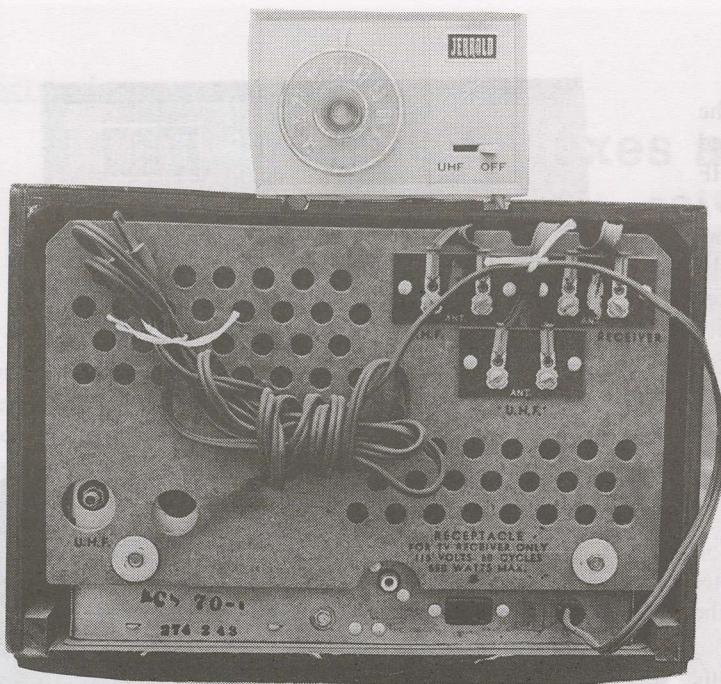


Cable TV channel tuning via set-top

2000 - 2010?



digital set-top, analogue TV



Massive RCA UHF set-top (circa 1953) was as large as today's 13" TV sets (left; 1965 Jerrold mini-verter on top for size comparison). Sutco's VHF signal booster + UHF converter came with UHF "loop" antenna.

unwilling to change their designs until they were forced (by law), coerced (by consumers) or challenged (by competitors) to upgrade their designs.

A set-top box has always been an impediment to consumer viewing or use. It brings new functions, new controls, new wiring for integration to the basic device (an analogue TV receiver). In an era when every device has its own separate infrared remote control, it creates a new challenge to the button-impaired average consumer.

Just as TV set manufacturers ignored the UHF channels (in America) until forced to include them by law, the growth of cable TV was another example of foot dragging. Cable TV systems utilise spectrum space between 40 and 900 MHz which "normal" terrestrial broadcasting does not. Cable can get away with using frequencies normally used for police, public safety or military two-way radio - without interference - because the coaxial cable bottles up the signals inside the sheath and outside signals that might otherwise interfere are simply blocked by the cable's wraparound shield. When cable began to grow in channels and added these frequencies, TV set makers (again) ignored the trend. Cable solved this with a "set-top box," basically an expanded purpose-designed box which in the 1970s and beyond did the same thing as the UHF set-top converter of the 50s and 60s, increasing the "tuning range" of the TV set's tuner portion. The TV set was tuned to a

single channel while the channel changing was performed with the set-top box, covering normal VHF-UHF channels plus the added cable-only channels.

#### The new family of set-tops

History repeats. If you live in the UK and wish to receive DVB-T, you have two basic choices:

- 1) Purchase a new DVB-equipped TV set, or,
- 2) Acquire a set-top box which does everything but display the picture and sound, functions still retained by the existing analogue TV set.

If you live in the USA, similar choices today:

- 1) Purchase the RCA (once again, pioneering a new technology) DTC100 ("D" - Digital; "T" - television; "C" - converter). Or,

- 2) Purchase a DVB-T equipped television set.

And in Australia:

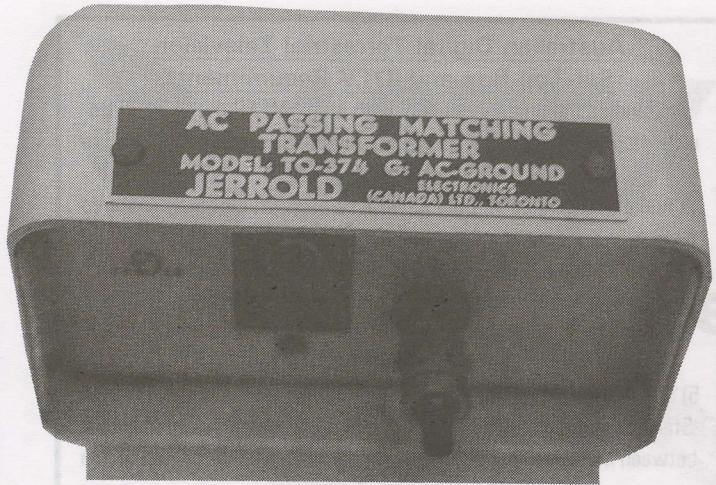
- 1) Purchase a Thomson set-top box (TV sets will follow at some uncertain date, perhaps as early as April).

But the "digital world" of set-tops is far more complex than the older analogue world just described. In the analogue world, we were mostly using set-tops to expand the frequency range or the TV sets. Not so with digital.

In the USA, their ATSC digital terrestrial format gives the broadcaster options - *36 in all!* Why so many? Well, it was difficult to obtain a consensus of opinion regarding how many

Before 75 ohms, TV sets and set-tops were 300 ohm line impedance transformer (circa 1952) for early adopters of coaxial cable. This was prior to "F" fittings and coax was "attached" using something called a "Motorola plug" (bag, right). What's unusual here - notice the black "rubber" strip protruding from the unused Motorola plug - the centre conductor of the coax was forced into the pin portion and without soldering "held tight" against the pin's inner walls with the rubber force-fit strip. Shield was "crimped" with pliers!





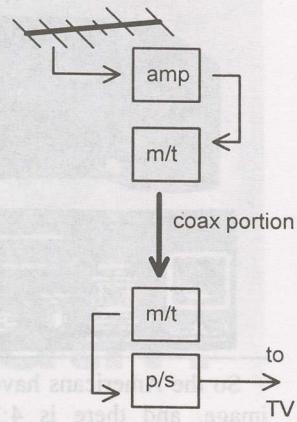
"lines" of material should paint the screen, and whether the lines should be painted on alternately (line 1, 3, 5, 7 to the bottom, then back to the top for 2, 4, 6 and so on - called interlace) or in sequence (1, 2, 3, 4 etc - called progressive). So there is 480 line i, 480 line p, 720 line i, 720 line p and so on in steps of progressive higher resolution images all the way to 1080i and 1080p.

Then there is the screen width. TV screens have been 4 units wide by 3 units high since 1940, a decision based at the time on the state-of-the-art of cathode ray (picture) tube manufacturing capabilities. Movie screens, considered by many to be the "ultimate viewing experience," have been *at least* 16 units of width by 9 units of height for 60 years. With all-new TV sets and all-new transmission standards required for digital, it seemed (to some) a suitable time to change the "aspect ratio" of TV display screens from 4:3 to 16:9.

Problem one: Material created for TV, whether on tape or film, has been "shot" in 4:3. If you try to be clever and "blow up" 4:3 to 16:9 you end up with 16:12 (4 times 4 and 4 times 3). Which means some of the height material will no longer fit on the "wide" screen. Yes, if you start with a 16:9 image at the programme creation point using a newly formatted 16:9 camera, everything works out fine. But for the first ten years or

#### Transition Pieces

During the period when 300 ohm "flat line" was going out and coax was coming in, special parts had to be made to transfer back and forth between the two. Here, 300 ohm antenna and amplifier, fed through a downline of coax, required power passing 300 to 75 ohm transformation at top and bottom of antenna run.



so - while "I Love Lucy" and "Star Trek" are still running on TV, how do you get 4:3 to play on 16:9?

The answer is more complex than you might imagine. Suppose you start with brand new programming in 16:9 which on wide screen TVs fills the screen. But on older TVs equipped with 4:3 screens, what happens? Two choices here:

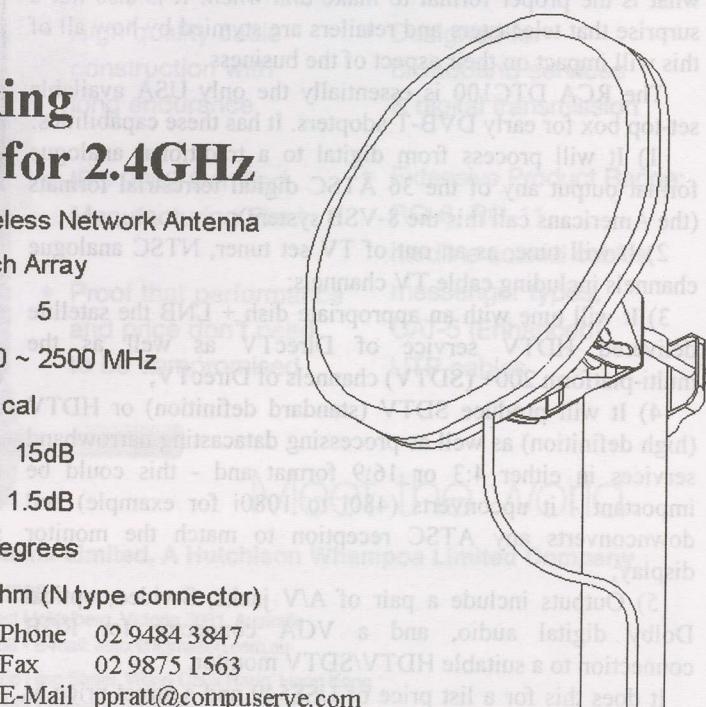
1) Let the picture fill the screen left to right on a 4:3 screen, and then accept a less than full height image vertically. This is called "letter boxing" and the viewer on an older 4:3 receiver ends up with total-black bars (a top and bottom frame) around the image. This way the new TV set viewer gets the full image as intended, while the old TV set viewer is visually reminded every time he sits down to watch TV why he needs to consider buying a new "wide screen" TV set. As the Americans have discovered, full-time letter boxing has undesired side effects - the picture tube "burns in" the black bars and soon (within a hundred hours or less of viewing letter boxed images) the screen has a permanent - cannot be removed - top and bottom black frame, even when viewing 4:3 material.

2) Or, let the image fill the screen top to bottom (3 = 9) but accept that the material on the left and right edges (4 will *not* equal 16) will be "cut off;" not shown.

## Wireless Networking Antenna Systems for 2.4GHz

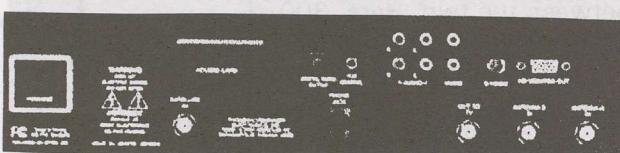
Description	Wireless Network Antenna
Antenna Type	Patch Array
Number of Elements	5
Frequency Range	2400 ~ 2500 MHz
Polarization	Vertical
Gain	15dB
VSWR	1.5dB
Beam Width	30 degrees
Impedance	50 ohm (N type connector)

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Pennant Hills NSW 2120



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Fax 02 9875 1563  
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RCA DTC 100



So the Americans have a stair step progression of lines per image, and there is 4:3 and there is 16:9. And, we are approaching their 36 total options. Remember - it will be the telecaster who decides which line count, which screen format, which scanning system to use. One station in a city could well opt for 720i, 4:3 while at that instant another station could be using 1080p, 16:9. The set-top box (or TV set) is expected to accurately "track" these format changes and without viewer instruction select the correct one for each station tuned in, and each broadcast. That is asking a great deal of the yet unproven box. And there is more.

There is datacasting (the ability to transmit text or computer graphic material) and there are sound (audio) options to be chosen by the telecaster. Should the programme be in monaural - and if yes, equal volume on both the left and right channels (pseudo stereo)? What about stereo? Should the sound have only left and right, or should it have left, right, front and back with sub-low woofer material?

By the time the telecaster selects each ingredient for the telecast, and supports those choices with suitable input video and audio material, we have a very complicated framework for television transmission. Analogue, for its defects, was never this complicated.

It is no wonder that set manufacturers, faced with the ultimate decision of *when* to quit building analogue and thereafter only build digital receivers are confused, uncertain what is the proper format to make *and when*. It is also not a surprise that telecasters and retailers are stymied by how all of this will impact on their aspect of the business.

The RCA DTC100 is essentially the only USA available set-top box for early DVB-T adopters. It has these capabilities:

- 1) It will process from digital to a traditional analogue format output any of the 36 ATSC digital terrestrial formats (the Americans call this the 8-VSB system);
- 2) It will tune, as an out of TV set tuner, NTSC analogue channels including cable TV channels;
- 3) It will tune with an appropriate dish + LNB the satellite delivered HDTV service of DirecTV as well as the multi-platform 200+ (SDTV) channels of DirecTV;
- 4) It will produce SDTV (standard definition) or HDTV (high definition) as well as processing datacasting narrowband services in either 4:3 or 16:9 format and - this could be important - it upconverts (480i to 1080i for example) and downconverts any ATSC reception to match the monitor display;
- 5) Outputs include a pair of A/V jacks, S-video, optical Dolby digital audio, and a VGA connector for RGB connection to a suitable HDTV/SDTV monitor.

It does this for a list price of US\$549 and a street price as low as US\$475 (Australian \$852).

### Australian Digital Terrestrial Television Set-Top-Box and iDTV Requirements

- 1) Standard definition video only with MP @ MPEG decoding (Video outputs: RGB, Composite, and modulated PAL tuneable from Ch28 to 69).
- 2) Audio decoding of MPEG 1 Layer II formats (Audio outputs: stereo and mono)
- 3) Capable of operating on Australian VHF and UHF bands with 7 MHz channels (some channels with 125 kHz offsets)
- 4) Ability to decode all 7 MHz COFDM modes including 8K and hierarchical (refer AS4599)
- 5) Support of DVB-SI and MPEG tables in accordance with Australian Standard 4599 such as PMT, SDT, TOT, EIT, now/next, to navigate between multiview video in a program or multi channel programs in a transport stream
- 6) Ability to display now and next information from DVB-SI
- 7) Programmable remote control to allow easy navigation of receiver functions including multiview and APIs
- 8) Support of DVB-T teletext and DVB bit map subtitling
- 9) Processor to have a preferred speed of 120MIPS
- 10) Memory: 8Mbyte Flash and 8Mybte DRAM
- 11) Ability to interface to an external modem
- 12) Inclusions of an aspect ratio converter capable of producing a 4:3 image from a 16:9 picture
- 13) Ability to support decoding of data transmissions and downloading of data in conformance with Data Broadcasting Standards ETSI EN 301 192 and as explained in ETSI TR 101 202
- 14) Support of MHEG-5 UK Profile 1.05 (including full colour graphics in digitext, quarter screen video, local interactivity, EPG etc) and subsequent upgrades and migration to MHP
- 15) Support of DSM-CC data/object carousels
- 16) Capable of supporting software upgrades via the broadcast signal
- 17) Mains operation - Australian electrical mains supply is nominally 240 V AC 50 Hz (mains powered equipment shall comply with AS/NZS 3250)

### Optional Requirements

- A) Common interface (CI): fitted with at least one (preferably two) PCMCIA Type-2 slots conforming to DVB standard (A Conditional access [CA] system is not required to be included but may be added later by the user via the CI socket.) DVB 'Simulcrypt' compliant
- B) Internal modem (Australian C-Tick approved)
- C) Two PC type interface connector to allow memory expansion (Flash &/or RAM)
- D) Interface to hard disk drive

The Thomson box for Australia has more limited capabilities. It will not process HDTV, does not serve as an analogue tuner, will not process HDTV or SDTV satellite services. The "official" street price is Au\$699 (US\$390). The Australian set-top box has gone through several planning changes - we list the original (late October 2000) requirements above.

Given that Australia is the only country in the world to adopt legislation making HDTV transmission mandatory, with increasing amounts of HDTV content required each year, it is something of a surprise that 7, 9 and 10 networks should go "shopping" for a set-top box that is not HDTV capable. What is that all about?

There are two routes to HDTV:

- 1) Purchase a new HDTV TV set (current pricing ranges from US\$2200 upwards, depending upon screen size, whether widescreen or only 4:3, CRT or projection), or,



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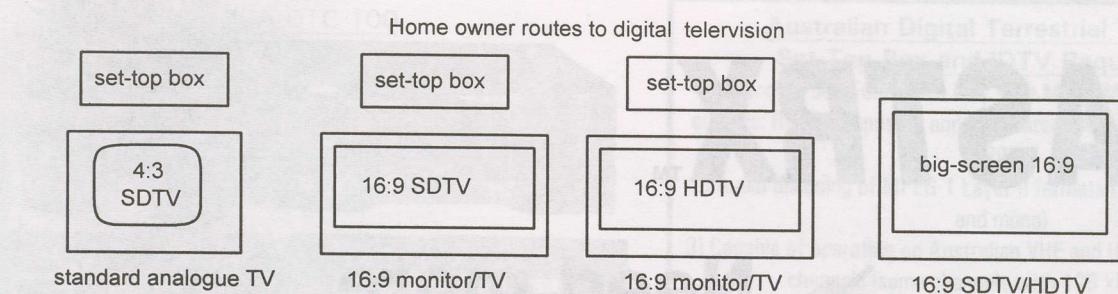
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2) Purchase the set-top box which at least in the USA has HDTV outputs which you can in turn connect to a separately acquired HDTV monitor.

It is the monitor (display portion) which is in a state of design disarray presently. And it is the display portion (screen, sound system) that will change the most in the next five years as manufacturers figure out how to make less expensive and more versatile displays. More than 80% of all North American purchases of HDTV have been through the set-top box and a *separate* display system. Early model HDTV sets with the tuner and DVB-T decoding built-in will be the first to be antiquated and the first to be superseded by models that do more. Buying today's HDTV one-box receivers is a sure path to obsolescence. Australians, because their set-top box has been "designed" by engineers at 7, 9 and 10, are *not* given the choice of marrying a set-top box (with HDTV capability) to an external HDTV monitor for HDTV without being stuck with an early version HDTV receiver.

What drove this decision? Price? Perhaps but remember that the initial set-top box provider, Thomson, is a French owned company (majority owned by the French Government, much like the Australian Government owns the majority of Telstra) and Thomson has many non-French investments in the consumer electronics field world-wide. Guess which one it owns in the USA? RCA. The same RCA that produces the DTC100.

The UK is held out as "the model for digital introduction" with something approaching 20% of all homes now digital-TV capable. But beneath this impressive number after 26 months of digital availability are some disturbing facts:

1) "Digital TV" in the UK has two routes - the terrestrial OnDigital transmission service (like its Australian 7, 9, 10, ABC and SBS counterpart), and, satellite delivered BSkyB. Yes, 20% of UK homes now have digital TV available but 15 of that 20% are getting their digital through BSkyB. And the BSkyB service is almost identical in delivery to the Australian Foxtel, Austar, (Optus) and NZ Sky services.

2) If you "back out" the impact of satellite delivered digital services, you are left with a 5% home penetration for terrestrial digital after 26 months of operation which is not so impressive. But there is more.

3) OnDigital has a list price of Au\$1200 on their home set-top box but typically *gives* the box to the viewers if they agree to subscribe to basic programming packages. Australian homes are being asked to spend \$699 for their box, which does far less than the OnDigital box that is free to homes.

As recently as late December, Australian newspapers were reporting that 7, 9 and 10 networks were "subsidising" the deployment of DVB-T boxes. "Subsidy" means "money granted (by a state or corporate body) to keep down the price of commodities." Subsidised housing rents are an example. The message here was that 7, 9 and 10 claimed to be *paying*

some portion of the cost of the (ultimately \$699) set-top boxes to "jump start" the take-up of terrestrial digital. This is a *deception*.

What 7, 9 and 10 have done for Thomson (and

offered to do for other would-be set-top box makers) is to "guarantee" the set-top maker would be paid for an initial, "salt the earth" run of set-tops. The original request from 7, 9 and 10 called for 20,000 set-tops, "possibly to be increased to 40,000." In fact, with mounting uncertainty that the public would consume even a small number, 7, 9 and 10 reduced their guarantee to the 10,000 reported by Thomson. There is *no* "subsidy" here - Au\$699 is the *full* retail price (and a high one at that when you consider the RCA DTC100 as a similar model with a USA street price as low as Au\$852).

Meanwhile, returning to the UK. As shown above, you can tack a set-top box onto an existing analogue TV set and have at least digital TV transmission if not digital TV display. What you get - if everything works as advertised - is improved signal to noise ratio TV pictures but you won't have extra sound channels, you won't have higher definition, you won't have 16:9 display.

Of those (just reached) 1 million UK homes with OnDigital terrestrial TV, 92% have opted to stay with their analogue TV set. Fewer than 80,000 homes have actually gone out to purchase a 16:9 "wide screen" digital TV set or 16:9 monitor. There are several reasons why 16:9 has not taken off:

1) Cheap 4:3 colour sets are now a world phenomenon. 20" 4:3 sets with built-in teletext are selling this month for Au\$275 at the Asda electronic supermarket chain in the UK. Or a 14" colour set without teletext for Au\$195. It gets better than that in the USA: 13" colour TV with VCR built-in for Au\$168 or 19" colour TV for Au\$126!

2) 16:9 screens require new tooling, new production facilities at CRT makers. They are in a quandary - at what point do they cut back on 4:3 production in favour of 16:9? While they wrestle with that decision, 4:3 plants are running at capacity turning out more and more tubes that are increasingly cheaper to produce.

16:9 screen sets, hard to find in most countries (Japan is the exception where 40% of all new TVs sold are 16:9), are priced from 3 to 5 times more than comparable screen size 4:3 sets in the UK. And that is *not* for a HDTV 16:9 but a SDTV 16:9. HDTV sets, at this stage only available in the USA, are much more pricy; Au\$4,200 for a "cheap one" with a projection (not direct view CRT) display screen (requiring an *external* DTC100 type set-top to process HDTV), on up - *way up*.

So why would anyone elect to upgrade to a digital TV receiver that is *not* 16:9? Letterbox display is one answer - but a bad one based upon early American experience. Moreover, with a mandate that Australia's 7, 9 and 10 networks must reach certain plateaux of HDTV programming (20 hours per week by 2003), annually the reasons for a 16:9 HDTV display will increase. But not quickly and as HDTV's number one cheer leader, Senator Richard Alston, told ABC news early in January, "*The process will be evolutionary, not revolutionary. It will be 2 or 3 years before we can measure the success.*"

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ST.10

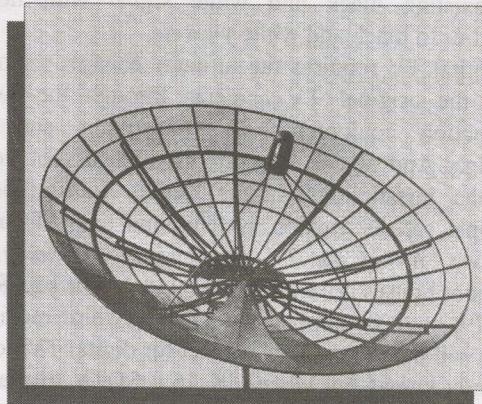


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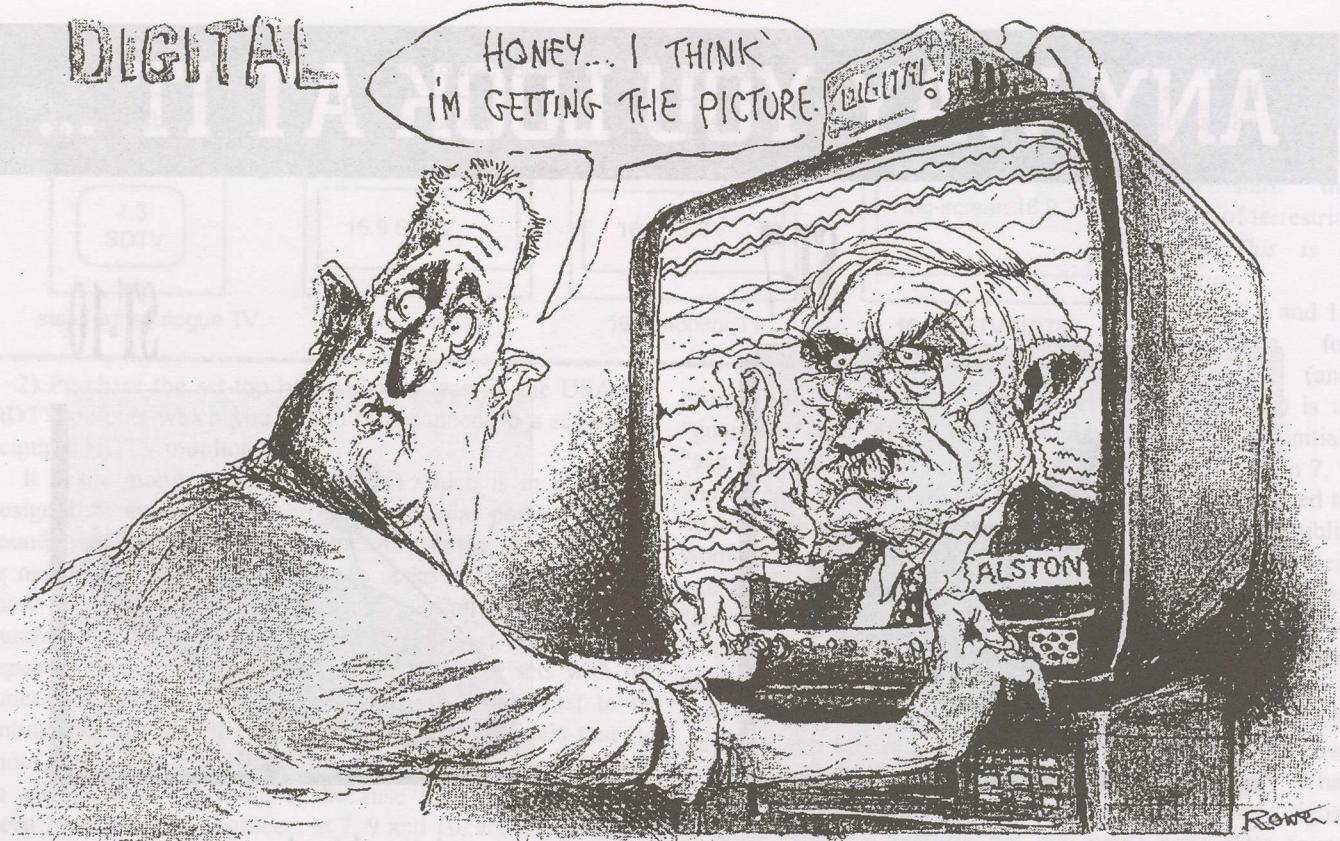
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# DIGITAL

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DIGITAL

DIGITAL



Alston and Government have been under increasing attack from unfriendly politicians, some disgruntled TV broadcasters, and recently the public at large. As the above news-cartoon (*Sunday Mail Herald*, January 7, 2001) rudely depicts, the public feels "screwed" by the "digital TV situation."

#### Evolution or revolution?

Black and white TV *evolved* into colour TV - in the interim of evolution nobody was denied access to at least the original black and white service. Colour was able to be "tacked onto" the existing black and white signal with no significant penalties to black and white viewers.

Digital TV requires the ultimate changeover of everything from the original TV cameras through the switching and production equipment, TV transmitter and transmitting antenna. And at the receiver, as often as not new receiving antenna installations, higher quality transmission line and multiple set distribution systems and then of course the TV receiver. *All of the TV receivers in the home*. Where US discount houses are now selling 13" colour sets for as little as Au\$79, homes equipped with second, third receivers abound. How will the multiple-set market for digital TV homes evolve? Nobody knows but when UK 16:9 SDTV displays currently sell for more than Au\$1200, we are not likely to see extra-sets for secondary locations at anything approaching today's sub-\$100 price tag for a decade or more.

Ten years of *evolution*? More likely ten years of revolution as nothing about the digital system we have today is mature. When NTSC/PAL analogue TV launched, the "standard" by which it would be transmitted was locked in agreement, allowing the orderly development of receiving sets. Nothing approaching a "locked standard" exists with DVB-terrestrial and that is why TV set makers, even would-be set-top makers, are dragging their feet. They'd be delighted to produce equipment for the market - if anyone could properly define *what* and *where* the market is!

#### Meanwhile - the teething problems

Thomson's promise was to deliver 500 DVB-T set-tops to Australia before Christmas, 4500 more during January, the last 5000 before the end of March. Australian newspapers lamented that as digital turned on 1 January, only a small handful (not 500) set-tops were in place. Thomson's initial 500 boxes arrived all right - and did not work. "A software glitch," they quietly explained. That tiny handful of people who were actually watching DVB-T on January 1 were using prototype Nokia DVB-T boxes.

Leading up to January 1, newspapers predicted that when digital was "turned on" many people would experience problems with their analogue reception. A hot line was established by the networks for people seeking help in sorting out why their TV suddenly went berserk on January 1 (800 016 009). More than 10,000 calls were attributed to the number in the first week but a sizeable percentage turned out to have nothing to do with digital versus analogue (one caller blamed digital TV for the death of her gold fish).

There have been two categories of "real" problems: People using UHF output channels on their VCRs which coincided with new DVB-T transmissions (see SF December, p. 4). And new (primarily band III) digital transmitters causing digital to analogue "co-channel interference" for (mostly) fringe region viewers. In Melbourne, ABC on digital-12 is operational with 30 kW ERP (effective radiated power), 9 Network on digital-8 is operating at reduced power (15 kW ERP) and trying to resolve problems with translators that currently receive 9-analogue inputs. Melbourne 7 and 10 Networks have bigger problems - using 6-digital and 11-digital, if they run more than 200 watts (not a misprint) ERP, their digital signals create interference for analogue viewers of channels 6 and 11 in Ballarat, 100 km distant.

Lesser problems with masthead preamps have also surfaced - unable to handle the "extra power" of the digital signals added to the pre-existing analogue services (see p. 20, here).

## Optus Flexes Aurora Muscles - Shuts Down Thousands of IRDs

Was it deliberate or a fluke - that Optus personnel selected the day before their annual Christmas-New Year's exodus to make a (some say major) change in their NIT (Network Information Table) with the unpleasant result that hundreds, thousands - nobody really knows - of Aurora user IRDs quit working properly? Deliberate or not, the result was the same - mad dealers who were being bombarded with calls from irate consumers who had lost some or all of their Aurora reception capability.

"I work for a company in Tasmania called Active Electronics. We have sold several Satcruiser receivers to customers for the Aurora service in remote areas.

As you know, these boxes have now had SBS disabled. I have been trying for at least a week to get to the bottom of the problem but we are all hitting our heads against the wall. My customers are now expecting us to replace their DSR101CI with a UEC at our expense!"

SatFACTS has reported on the development of Aurora from before day-one. In our February 1998 issue, we reported a letter we received from one Jeff Davies, Optus Sales Manager for National Media declaring, "Optus expects three or four approved decoders eventually, maximising the choice available to consumers and dealers alike and encouraging quality, price and feature competition amongst manufacturers."

Optus had chosen the Irdeto conditional access system based upon speculation that then-operating Galaxy/Australis would end up bankrupt and by adopting the same (Irdeto) system as Galaxy, Optus could waltz in and pickup the pay-TV subscribers as well. When Galaxy did pull the plug in mid-May, Optus was beaten out for the universe of pay-TV subscribers by Foxtel.

It was during the first few months of 1998 that Scientific Atlanta and PanAmSat grabbed the spotlight by launching a Western Australia DTH system using PowerVu, beating Aurora "on the air" by several months. Optus was unable to prevent this because their own Aurora plan was seriously behind schedule and GWN (and later WIN) needed to get off the old style (RABS) B-MAC analogue service before Aurora would be ready to operate.

It was a political decision by Government that created this havoc. To make rural viewers accept the wisdom of converting from RABS analogue (which would be turned off shortly) to digital, a Rural Telecommunications Infrastructure Fund (RTIF) was established using federal money. On January 29 (1998), Optus' Jeff Davies wrote SatFACTS, "The \$750 decoder voucher can be used for those DTH consumers who previously owned a BMAC decoder to buy an Optus compatible decoder, or SA device."

Clearly on January 29th, with Optus very angry about the launch of the SA PowerVu service for Western Australia, there was nothing they could do to stop consumers from spending their \$750 voucher for a service that did not use an Optus

satellite for delivery (PowerVu was and continues to use PAS-2, Ku).

Then came the now infamous Optus conducted testing of sample receivers in Hoopdorf, Holland starting on March 9 (1998). UEC was on hand with their 642 while competitor Panasonic/Comstream arrived with an IRD they called the TUDS10. Two other brands had been scheduled to test, at the last minute they dropped out. On May 11 (1998) Optus Communications Account Executive Damien Cook sent a two page "Dear Dealer" letter. It said, in part:

"The following domestic decoders have been endorsed for use on the Optus Aurora satellite platform: UEC - Model 642, Panasonic/Comstream. The UEC will be imported by Nationwide Antennas; the Panasonic/Comstream decoder will be imported by Multilink."

The same letter created a mystery which remains unanswered to this day. It advised:

"Nationwide Antennas (for their UEC 642 decoders) will be able to redeem RTIF vouchers for RABS viewers; Multilink (for their Panasonic receivers) will not be able to redeem RTIF vouchers."

Three executives at Optus established this policy; Dr Mike Wagg, Chris May and ex-East Coast TV person Rob Nichols. In effect, Optus was good to its word by approving two "competitive" IRDs for Aurora but very cleverly took Panasonic out of the game by deciding the \$750 RTIF vouchers would apply only to UEC models.

The original change over market - RABS analogue for Irdeto digital - was estimated to be around 12,500 units - a number that was borne out over the next six months. The post-RABS market for UEC 642 decoders has expanded significantly - estimates range from 40,000 to more than 60,000.

If this was a horse race, UEC was given a one minute head start on Panasonic. By the time when the RTIF voucher business had been swept up, there was very little point in Panasonic even starting the race.

So back in February (1998) we had the Government agreeing RTIF vouchers could be used for PanAmSat + SA PowerVu service for WA, but by May 11th we found Optus so completely in control of the RTIF voucher system that they could declare the vouchers only applied to one brand receiver and not another.

Who pulled off this power play, and how did they get away with it?

Optus from May 1998 to the present has insisted their Aurora data stream is "DVB Compliant MPEG-2." An Optus internal memo over the signature of Dr Michael Wagg clearly explains to the recipient this is not true, never has been true. The same memo strongly hints that UEC agreed to pay Optus a "royalty fee" for each Aurora receiver sold - a "copyright royalty" because, indeed, the generic MPEG-2 data stream which virtually everyone else uses (including the Australian

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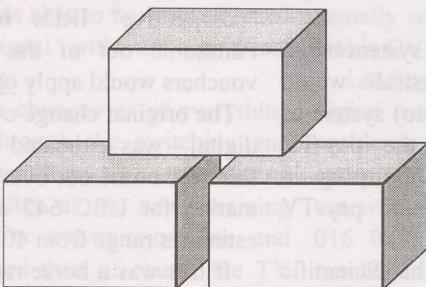
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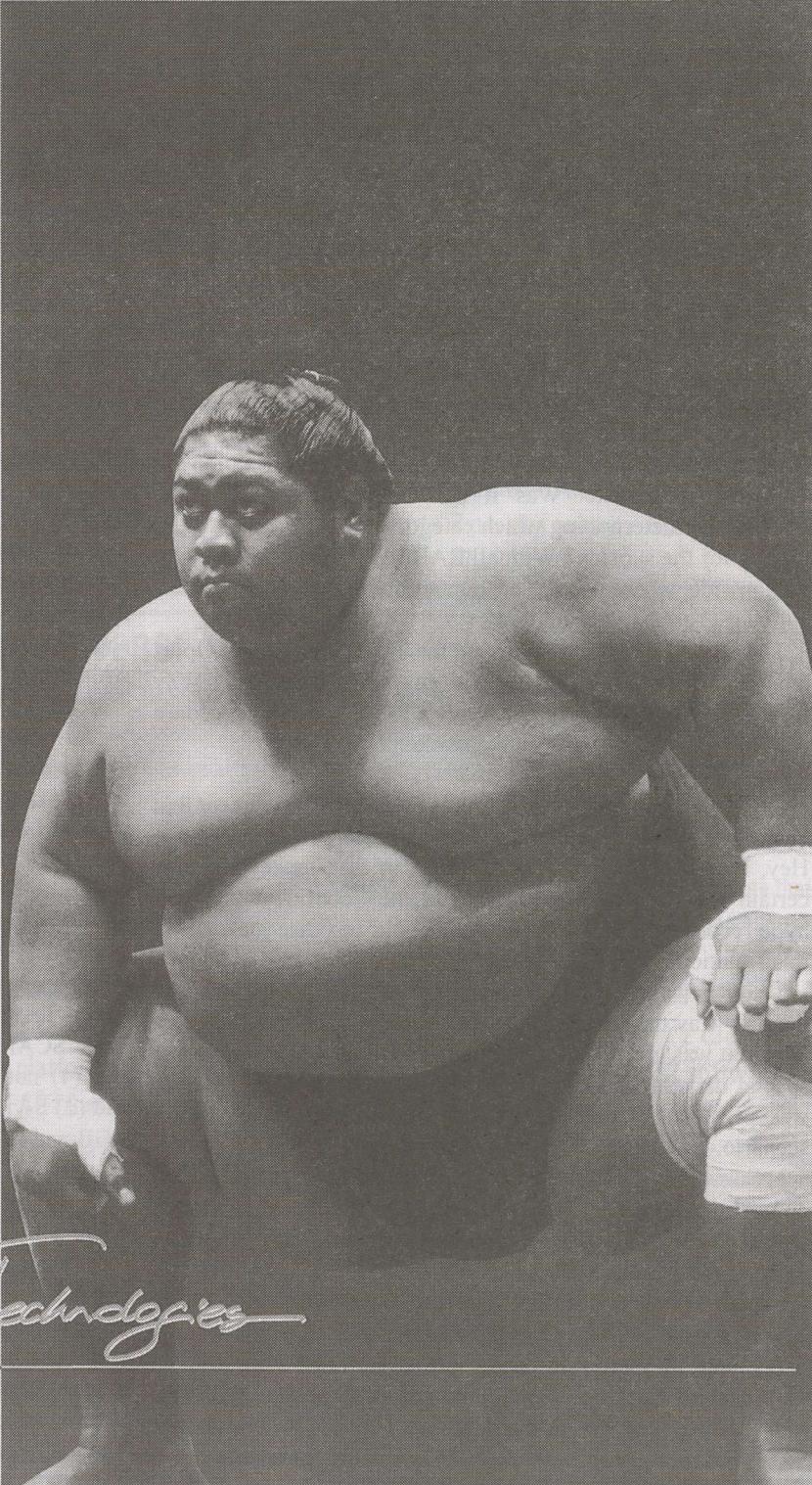
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**STRONG** technologies



pay-TV folks) had been "modified" to suit the Optus "special requirements."

It all sounds pretty clever. Take a non-copyrighted MPEG-2 data stream standard and modify it so it can be claimed as "new" and then subject to copyright. Then as the "holder" of the copyright, offer to authorise receiver designers to use your "private data stream" in exchange for a royalty fee.

It is unlikely this plan was in place in February-March 1998. Between the Hoopdorf testing and the early May announcement, a "clarification statement" over the signature of R.J. Badger, First Assistant Secretary, Licensed Broadcasting and Information Services Division, Department of Communications and The Arts, said in part:

"Consistent with the Government's broader commitment to enhancing a competitive and deregulated communications environment for the benefit of the Australian community ... remote area viewers are eligible to claim the Commonwealth (RTIF) \$750 subsidy irrespective of whether they choose the Optus (Irdeto) or Telstra (PanAmSat + PowerVu) systems."

So we had the Government saying they did not care which service remote viewers selected, we had Optus claiming they had approved two "competitive" IRDs for Aurora use and then as an aside - "only the UEC IRD will qualify for the \$750 Commonwealth subsidy."

When Panasonic complained about being edged out by this clever play, the Government suddenly pretended it did not have any authority in the matter - "*the decision is a commercial one made by Optus,*" a pretty strange position for Government to take. Was it not Government writing the cheques and determining which category of RABS users would qualify for the subsidy? With all RABS RTIF cheques going to Nationwide, where was the accountability in the system?

#### Why UEC as a single supplier?

The Hoopdorf testing approved the TU-DS10 leaving Optus unable to claim this IRD was in any way "defective." Why would Optus be motivated to create a RTIF voucher procedure that eliminated Panasonic in the marketplace?

Here are some *possible* reasons:

1) UEC and management at Optus came to an agreement that benefited Optus or benefited management people at Optus. Hey, record producers give "payola" to disc jockeys to play certain records more often than others - confident that will hype record sales. Optus personnel could be "disc jockeys" in this situation.

-2) Optus wanted total control over the data stream users, and the only way they could get that was to modify the data stream so that it was not "DVB compliant" and would only respond to special data stream instructions which only the UEC receiver was privy to. This is the "UEC pays a royalty to Optus" scenario.

3) Somebody at Optus is very stubborn, very dead set against competition, does not believe the best marketplace is an open marketplace. "*This was my plan and over my dead body will it be changed by anyone!*"

Which brings us back half circle to December 22-23, 2000. The NIT table is changed, and when dealers call to ask what is happening, they are told things like, "The buck stops with (a man named) Ed Guz. This is his area of expertise, talk with him." Those who got through to Guz (02 9342 7800, or, 02 9412 2845, or, mobile 0412 600 813) were given the stock Optus line that has been with us since May 1998:

*"You have no right to be using unauthorised IRDs;"* the key word here being unauthorised which Guz translates to, "Our engineering department has not approved them for Aurora use." As the SatFACTS web site posted December 23 and after, Guz was the Optus fellow who took most of the flack - partially because of his attitude over the telephone ("unbelievable arrogance and denial that he was ultimately responsible"), and then frustration when Optus stopped connecting people to Guz's telephone number and he turned off his mobile. It was Christmas holiday season, and as one dealer wrote SatFACTS, "*I personally know of a half dozen dealers who's customers have been critically impacted over Christmas - more than 600 distraught families with little or no TV.*"

Guz was at one time the Director of Engineering for Galaxy, visited SatFACTS in New Zealand late in 1995 and conducted tests with us of the then General Instrument MPEG 1.5 data stream from Galaxy as received from across the Tasman. His photo, incidentally, appeared on page 1 of SatFACTS for November 1995 (as it does again, this month).

If Guz knows why UEC was given an exclusive deal for Aurora IRDs, he's not shared that information. But whatever the reason, he's not the cause of the policy and today is only following orders when told, "*figure out some way to shut these 'unauthorised' IRDs down.*" When an atrocity is committed, it is not the soldiers who ultimately carry the blame - it is the General who gave the order in the first place.

#### A fix?

Not all IRDs have been affected by this NIT change. Humax IRCI 5400s continue to network load without difficulty. Worst hit - Strong 4800s and Satercruiser DSR101CIs. The solution - at least for the Strongs - is to not use the network loading approach. Rather, load each of the Aurora transponders individually. Some suggest loading the 3/4 FECs first (12.595, 12.720) followed by the 2/3s (12.532, 12.595 and 12.407) in that order. The important point - do not start with 12.407 and do not allow the IRD to do a "network search."

As one Western Australian dealer lamented, "*My Strong 4800 will no longer load Aurora 12.407 without going into a mad fit and rebooting (on its own) or worse - locking up. If you load individual transponders, you might get away with it but 12.407 does not want to be a part of it.*" 12.407 is of course home to the SBS service nation-wide.

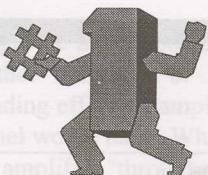
#### Other data stream changes

The NIT is not the only change in the revised data stream. You can now connect, through the SCART plugs, "S Video" - for the first time. First find the "SCART video menu."

TV SCART output has (1) composite, (2) RGB, (3) S Video and (4) not used; VCR SCART output offers (1) composite and (2) S-video; AUX 1 SCART output has (1) Composite, (2) RGB and (3) S video. The default for all three is composite.

In the TV SCART position the "not used" forces composite on all 3 SCARTs. And the AUX 1 SCART outputs only in composite regardless of what you select.

The single RCA "Video Out" socket on the receiver rear panel is composite video unless the TV SCART output is set to "S video" which turns this output into luminance only (black and white image). The TV and VCR SCARTs when set to "S video" conform to the standard S video - pin 13 is chrominance ground, 15 is chrominance signal, 17 is luminance earth, 19 is luminance signal. These can be wired to a standard 4 pin S-VHS plug.



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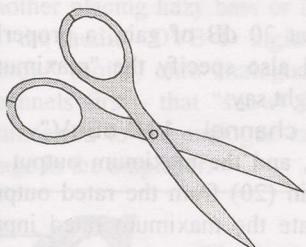


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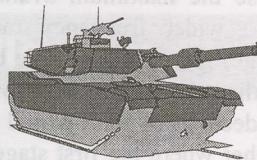


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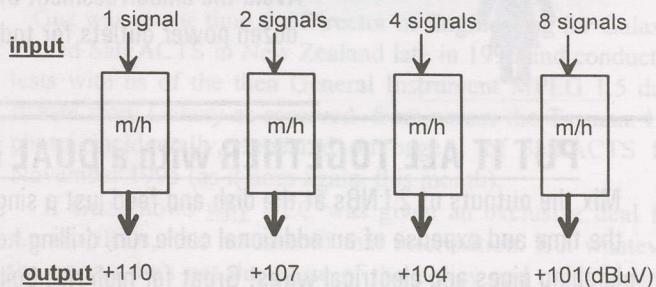


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### Mastheads and DVB-T

Masthead amplifiers are often pressed into service as a way of creating sufficient signal voltage from the aerial inputted signals to allow for lengthy downline runs and/or splitting to multiple receiver locations at the bottom end. Modern mastheads have separate gain controls for VHF (bands I and III) and UHF (bands IV and V) providing added installer flexibility where downline lengths and varying input signal levels from off-air antennas dictate that there is no "universal" one size fits all for every installation.

Masthead amplifiers, or indeed in-line amplifiers in MATV distribution systems, employ silicon transistor devices for signal enhancement. A typical masthead has two or more stages of gain (meaning two or more separate transistors) for each band segment (VHF is one, UHF is a second and sometimes VHF is split into two halves - band I and band III). Whether an amplifier "stage" is transistor or valve, it has a maximum gain characteristic which depends largely on the design of the transistor/valve as well as the nature of the "broadband circuitry" that surrounds the amplifier stage. The wider the gain bandwidth (40-230 MHz is bandwidth as is 470 - 890 MHz), the lower the gain per individual stage simply because the maximum available gain must be "spread out" over a wider frequency range. Getting 10 dB of actual (voltage) gain from a single broadband (40 - 230 MHz) stage is tickling the edge of state-of-the art; an amplifier rated at 20 dBg (decibels of gain) would require two stages, one following the other where the first stage provides 10 dB and the second stage adds another 10 dB. If an amplifier has a gain control (allowing the user to reduce the gain from the maximum rating), it typically goes into the first stage or in between the two stages. Any single stage of gain has both a maximum amount of gain it can contribute and a maximum amplified



signal *output* rating. For this discussion, we'll concentrate only on the "maximum *output* rating."

When an amplifier is rated at 20 dB of gain, a properly detailed specification sheet will also specify the "maximum rated output." For example, it might say:

"Maximum output - one channel - 110 dBuV"

If the maximum gain is 20 dB, and the maximum output is 110, then by subtracting the gain (20) from the rated output maximum (110) we can calculate the maximum rated input from the aerial (110 minus 20 = 90 dBuV).

Maximum rated output is always related to the number of separate carriers (channels) passing through the amplifier. If the maximum output for one channel is 110 dBuV, the maximum output for two channels will always be something less than 110 dBuV. Likewise, 4 channels will be less than two and 8 channels will be less than 4. The exact amount less varies between amplifiers but it is prudent to assume 3 dB less output each time the number of carriers passing through an amplifier doubles. We diagram this from 1 carrier/channel to 8 above.

### Enter DVB-T

Terrestrial digital channels may not have a "carrier" in the same way that analogue signals do, but the energy they emit

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through the air is "power" none the less. And to an amplifier (whether masthead or in-line) that "power" has the same degrading effect on amplifier performance as another analogue channel would have. When you add five new DVB-T "signals" to an amplifier "throughput," the amplifier has to work harder.

"Working harder" for an amplifier stage means it has to process and amplify new "signals." When you jump from 5 channels to ten (adding DVB-T), if the amplifier has been adjusted (or is factory set) such that it is *just below* the point where undesirable artefacts are generated by an individual "gain stage," the *new signals* push it over the limit creating something called overload (cross or x-mod).

There are two answers to this:

1) Go to the amplifier and turn down (reduce) its gain by at least 3 dB as a start, while monitoring the output side with a suitable TV receiver. When you turn down the gain past the "overload threshold" point, the pictures will magically clear up.

2) If you cannot operate *the system* with reduced output, replace the amplifier with a higher output rated unit.

Yet a third solution is to install single channel traps to cut down the input signal from the DVB-T channels (less input means lower outputs).

Because DVB-T does not have analogue sync signals present, overload can look pretty strange - unlike the more familiar analogue overload where one channel cross-modulates another placing hazy bars or lines on video and rushing noise in the audio. DVB-T digital overload typically generates "snow" (noise) onto analogue channels, typically the weaker channels first - that "snow" is actually digital "noise" being transferred to the analogue carrier signals by the overloaded stage in the amplifier.

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**IMAGE** LNBf

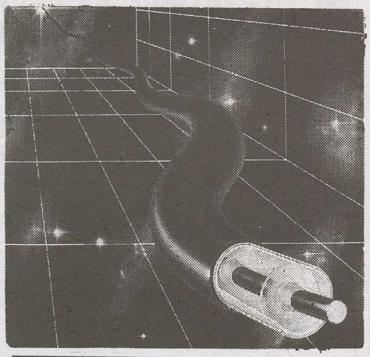
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# The CABLE Connection



## Ignition noise and Satellite Reception

Any gasoline or diesel fuelled engine relies upon a high voltage electrical "spark" jumping across an air gap on a spark plug to fire the petroleum product into ignition. It is an unfortunate side effect of such a spark that it generates a very brief but very powerful wide band "radio signal" in the process. The first wireless transmitters (circa 1895 until 1920) were called "spark gap" transmitters because they built up huge voltages and forced those voltages to "jump" across an air or rarefied gas medium when the Morse Code key was pushed down to close the circuit.

When a spark plug fires, it is using a transformer ("ignition coil") stepped up voltage to gain the "potential" to bridge the gap. The instant the voltage is released to the spark plug, there is a very rapid increase in voltage to the firing pin which bridges the gap with an electrical spark that ignites (burns) the fuel-air mixture in the chamber at the time. This very rapid rise of voltage (from zero to thousands of volts) creates a radio signal termed a "square wave."

Reader Leslie DeBrum at Marianas CableVision on the Island of Saipan has "square wave" problems. At his cable headend, whenever a nearby household fires up a lawn mower or brush whacker machine, his C-band digital and analogue signals go to heck in a hand basket.

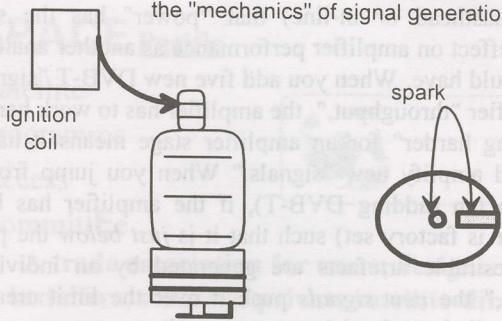
In the trade this is known as "ignition noise" and for an analogue signal the noise consists of sharp spikes of energy which under the worst of circumstances can actually destroy C-band reception. The noise spikes are broadband and rather randomly spaced in time resulting in black and white (salt and pepper) "sparklies" on analogue reception, as if the signal had suddenly become weak or you were experiencing a solar outage (the sun aligning behind the satellite with the dish and feed). For digital reception, the noise spikes degrade the Bit Error Rate (BER), the image pixelates and then freezes.

Most gasoline fired engines have taken design steps to minimise "ignition noise" radiation. Unfortunately for Leslie, the designers of "ignition suppression" systems for engines have probably never heard of C-band satellite.

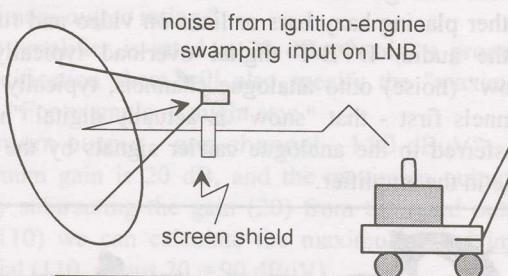
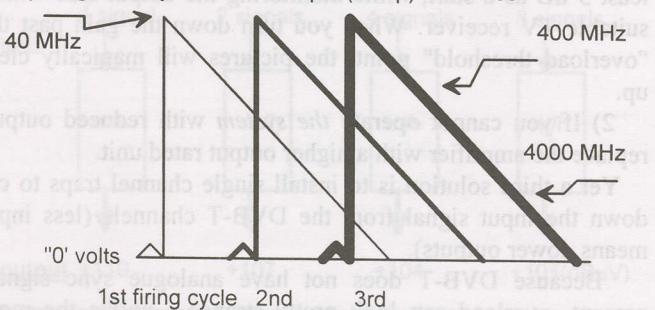
Square waves generated by a spark gap device are rich in "harmonics," in fact the very definition of harmonics involves square wave signal generation. That means that while the "centre" of wave form energy from ignition systems is typically in the region between 30 and 50 megahertz (MHz), and all by itself the amount of harmonic energy rapidly declines at 2 times (60 -100 MHz) or four times (120 - 400 MHz) the centre frequency, there is still measurable ignition "noise" even at 100 times the centre frequency (40 MHz).

Ignition suppression was a big deal when terrestrial TV broadcasting began in the 1930s-1940s. Most early TV operated between 40 and 100 MHz and virtually every car

the "mechanics" of signal generation



ignition systems have rapid (steep) rise times



rolling down the street caused salt and pepper dots on the screen and a pulsing in the audio. Automakers rushed to solve the problem, coming up with "resistor spark plugs" and "shielded ignition lead cabling" that within a few years became standard design practice for all auto and truck makers. Other gasoline operated engine designers quickly followed because the public would not tolerate salt and pepper on their brand new TV screens!

Alas, C-band TVRO is significantly removed from 40 MHz and "resistor spark plugs" and "shielded ignition cable" are virtually unknown in the lawn mower and bush whacking industries. A typical small gasoline operated machine spark plug (the Champion CJ8 or NGK BM6A) has no "RF resistance" properties at all. Leslie doesn't report what happens to his VHF TV reception (assuming he has any on Saipan) when the neighbour stokes up the lawn mower but we are betting it goes to salt and pepper immediately.

Leslie says he has had the neighbour bring the lawn mower and the bush whacker up close to the C-band dishes and he finds no problems at close range. He is using quad-shield RG-6 cable so it is not the LNB to receiver run that is picking up the ignition noise.

But when the gasoline fired appliance is off to the side or out in front of the dish, havoc. What Leslie is seeing here is an indication of the "reception pattern" of his dish and feed. When the appliance gets into a region which dish or feed

"sidelobes" pick up well ("illuminate"), the combined gain of the dish (40+ dB) and the gain of the LNB (55+ dB) adds up to a very sensitive receiving system for 4000 MHz noise spikes. So while the output power of the mower or brush whacker may be significantly less at 4000 MHz than at 40, just because of the law of square wave harmonics and diminishing levels with each new increase in frequency (octave), there is still plenty of ignition noise left when you go "after it" with a 40 + 55 dB "receive system."

#### The answers?

First, try to locate "resistor spark plugs" with built-in RF radiation reduction for the gasoline appliances. We tried to locate some through a local dealer and frankly he had never heard of any such small-engine specific spark plugs. We think they exist, but did not have any luck locating them here in New Zealand.

Next, replace the coil to spark plug lead with shielded "ignition wire" designed to reduce spark gap radiation. Third, wrap the coil in aluminium foil just as a test to see if its typically plastic case is leaking back-voltage spikes (EMF) from the plug's firing.

If you can get the neighbour to help you identify where he is in his yard with the machinery when the dish "sees" the noise and overloads your system, a 40-100 cm by 40 - 100 cm piece of copper (not plastic mesh!) window screen mounted in a wooden or aluminium frame and stuck up as a shield to protect the LNB-feed or dish surface from the noise originating area could be the solution (see bottom diagram, previous page).

And if all of this fails? Pave the neighbour's yard with concrete or buy him a goat!

As always, SatFACTS would be pleased to report other reader solutions to this unusual problem.

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# SatFACTS Pacific/Asian MPEG-2 Digital Watch: 19 January 2001

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	
Ap2/76E	Hallmark	3720/1430H	4	5/6	29(.270)	
	TVB8 +	3849/1301H	4	3/4	13(.238)	
	AXN	3920/1230H	up to 8	7/8	28(.340)	
Thecm3/78.5	SkyChAust	3695/1455V	up to 3	3/4	5(.000)	
	MRTV-Mynr	3666/1484H	1	3/4	6(.786)	
	Mega +	3640/1510H	12	3/4	28(.056)	
	<b>Mahar/DD1</b>	3600/1550H	up to 8	3/4	26(.661)	
	TRT +	3551/1600H	4+ TV, radio	3/4	13(.330)	
	Greece TV	3430/1720H	1	3/4	3(.225)	
	PTV2	3420/1730V	1	3/4	3(.366)	
	<b>TV Maldives</b>	3412/1738V	1	1/2	6(.312)	
	Thai Global+	3425/1725V	up to 7?	2/3	27(.500)	
Insat 2E/83	<b>DD2</b>	3910/1240V	1	3/4	5(.000)	
	<b>DD tests</b>	3929/1221V	1	3/4	5(.000)	
ST1/88E	Taiwan Bqt	3509/1641H	13	3/4	23(.450)	
Yaml102/9	<b>Tumen TV</b>	3578/1572L	1+radio	3/4	4(.355)	
	TV6 Bqt	3645/1510L	3(+)	3/4	28(.000)	
MeS 1/91.5	<b>Malay. TV3</b>	4147/1004H	1	3/4	7(.030)	
As2/100.5E	<b>Euro Bouqt</b>	4000/1150H	6TV, 21r	3/4	28(.125)	
	Reuters	3909/1241H	1	3/4	5(.632)	
	<b>Hubei/HBTV</b>	3854/1296H	1	3/4	4(.418)	
	<b>Hunan/SRT</b>	3847/1303H	1	3/4	4(.418)	
	<b>Guan./GDTV</b>	3840/1310H	1	3/4	4(.418)	
	<b>In. Mongolia</b>	3828/1322H	2	3/4	8(.397)	
	APTN A-O	3799/1351H	1	3/4	5(.631)	
	WTN Jer/Lon	3790/1360H	1	3/4	5(.631)	
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	
	<b>WorldNt/US</b>	3764/1386H	1 + 20 radio	3/4	6(.100)	
	<b>Liaomin/Svc2</b>	3734/1416H	1	3/4	4(.418)	
	Jiangx/JXTV	3727/1423H	1	3/4	4(.418)	
	<b>Fujian/SETV</b>	3720/1430H	1	3/4	4(.418)	
	<b>Hubei TV</b>	3713/1437H	1	3/4	4(.418)	
	<b>Henan/Main</b>	3706/1444H	1	3/4	4(.418)	
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)	
As2/100.5E	<b>Feeds</b>	4086/1064V	1	3/4	5(.632)	
	TVSN	4033/1117V	1	3/4	4(.298)	
	<b>Jilin Sat TV</b>	3875/1275V	1	3/4	4(.418)	
	<b>Beijing TV</b>	3864/1286V	1	3/4	4(.418)	
	<b>HeiLongJian</b>	3834/1316V	1	3/4	4(.418)	
	<b>JSTV</b>	3827/1323V	1	3/4	4(.418)	
	<b>Anhui TV</b>	3820/1330V	1	3/4	4(.418)	
	<b>ShaanxiQQQ</b>	3813/1337V	1	3/4	4(.418)	
	<b>Guan/GXTV</b>	3806/1344V	1	3/4	4(.418)	
	<b>Fashion TV</b>	3795/1355V	1	3/4	2(.533)	
	<b>MSTV</b>	3791/1359V	1	3/4	4(.340)	
	<b>Myawady</b>	3766/1384V	1	7/8	5(.080)	
	<b>Saudi TV1</b>	3660/1490V	1(?)	3/4	27(.500)	
As3S/105.5	Zee bouquet	3700/1450V	9TV	3/4	27(.500)	
	<b>ETV Bangla.</b>	3749/1401V	1TV	3/4	4(.340)	
	<b>Arirang TV</b>	3755/1395V	1	7/8	4(.418)	
	<b>Now TV</b>	3760/1390Hz	2	7/8	26(.000)	
	Star TV	3780/1370V	17(+TV	3/4	28(.100)	
	Star TV	3860/1290V	14(+TV	3/4	27(.500)	
	Star TV	3880/1270H	12(+TV	7/8	26(.850)	
	CNNI	3960/1190H	4(+TV	3/4	26(.000)	
	Star TV	4000/1150H	7(+TV	7/8	26(.850)	
	<b>Sun TV</b>	4095/1055H	1	3/4	5(.554)	
	<b>CCTV bqt</b>	4115/1035H	4(+ TV	3/4	19(.850)	
	<b>Zee Bqt #2</b>	4135/1015V	4(+ TV	2/3	15(.000)	
Cak1/107.5	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+ TV	7/8	20(.000)	
C2M/113E	<b>TPI</b>	4185/965V	1	3/4	6(.700)	
	<b>Ch NewsAsia</b>	4071/1079H	3	3/4	14(.060)	
	<b>Anteve</b>	4055/1095V	1	3/4	6(.510)	
	Space TV	4000/1150H	11TV, radio	3/4	26(.666)	
	<b>ETTV Shop</b>	3790/1360H	1	3/4	3(.050)	
	C Net Taiwan	3760/1390H	11TV, radio	3/4	26(.666)	

Receivers and Errata	
PowVu, typ. CA; Kermitt now gone	
PowVu, CA	
Tests, promos, up to 5 chs FTA	
Finally settled here from As2	
no longer operating?	
Mega Cosmos here; new Sr	
USA religion chs, CMM music FTA	
3 Angels USA, Ch of Hope, + 9 radio	
Newly reported SCPC 01/01	
FTA, not seen Australia	
FTA (reaches SE Australia)	
FTA	
SCPC, testing MPEG-2; OK E. Aust.	
SCPC, weaker than 3910 above	
MCPC, sometimes FTA, 2 adult chs	
unlikely south of eqtor	
new Sr, unlikely south of eqtor	
CA but occ. FTA	
FTA (TV5 teletext); now includes RTPi	
occasional feeds, some FTA MPEG2	
FTA SCPC, teletext	
FTA SCPC, teletext	
FTA SCPC, radio APID 81	
FTA: #1 Mongolian, #2 Mandarin	
mostly 4:2:2 SCPC (news feeds)	
Mostly CA; some FTA	
FTA & CA	
FTA; up to 20 radio channels	
FTA SCPC, radio APID 256	
FTA SCPC, teletext, radio APID 81	
FTA SCPC, + radio APID 80	
FTA SCPC, radio APID 80	
FTA SCPC, + radio	
FTA SCPC	
FTA SCPC feeds	
Occ. FTA, not same as Aust. version	
FTA SCPC, + radio	
FTA SCPC, test card	
FTA SCPC	
FTA SCPC, + radio	
FTA SCPC	
FTA SCPC, radio APID 81	
FTA SCPC, radio APID 257	
FTA SCPC, reload VPID 308, APID 256	
FTA SCPC	
FTA SCPC - difficult to load	
FTA MCPC	
Mediaguard CA, ch 8 FTA	
PowVu but FTA at this time	
FTA SCPC; reported audio problems	
also check 3900/1250Vt, same #s	
NDS CA (Pace DVS211, Zenith)	
NDS CA (Pace DVS211, Zenith)	
NDS CA (Pace DVS211, Zenith)	
PowVu CA; some FTA feed channels	
NDS CA + info card FTA	
"History Channel" testing SCPC	
was analogue; now FTA MCPC	
New bqt, Zee news + here	
NDS CA using RCA/Thomson, Pace IRDs	
FTA SCPA; NT only	
CH News Asia FTA; VPID 33, APID 34	
FTA SCPC; NT only	
CA, sometimes FTA	
FTA SCPC	
CA, subs available -10 radio typ. FTA	

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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(C2M/113	<b>RCTI</b>	3475/1675H	1	3/4	8(.000)
JcSat3/128	Miracle Net	3990/1160V	3 up to 6	5/6	22(.000)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)
MeaSat 2	Astro Mux	11.106H (+)	up to 7TV	7/8	30(.000)
	<b>Mediasat</b>	11.540H	occ 1+TV, tests	5/6	30(.800)
Op B3/156	Mediasat	12.336V	5TV, 3ra, Inter.t	2/3	30(.000)
	Aurora	12.407V		2/3	30(.000)
	Aurora	12.532V	Inc Zee, ATV	2/3	30(.000)
	Aurora	12.595V		3/4	30(.000)
	Aurora	12.657V	6CA testing	2/3	30(.000)
	Aurora	12.720V		3/4	30(.000)
	Austar/tests	12.376H		3/4	29(.473)
	Austar/Foxtl	12.438H		3/4	29(.473)
	Austar/Fxtl	12.501H		3/4	29(.473)
	Austar/Foxtl	12.564H		3/4	29(.473)
	Austar/Foxtl	12.626H		3/4	29(.473)
	Austar/Foxtl	12.688H	(some FTA ra)	3/4	29(.473)
Op B1/160	<b>ABC NT fd</b>	12.256V	1TV, 3 radio	3/4	5(.026)
	<b>ABC feeds</b>	12.317H	1	3/4	6(.980)
	<b>Central 7</b>	12.354H	1TV	3/4	3(.688)
	<b>Imparja mx</b>	12.360H	1	3/4	5(.424)
	<b>Mediasat#2</b>	12.400Vt	5+?	5/6	30(.800)
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)
	Sky NZ	12.644/671V	9TV	3/4	22(.500)
PAS8/166	TARBS	12.526H	12+ TV	3/4	28(.067)
	TARBS2	12.606H	6+TV	3/4	28(.067)
	JEDI/TVB	12.686H	11+ TV	3/4	28(.124)
	Boomerang	12.725H	5 TV	7/8	25(.728)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)
	NHK Joho	4065/1085H	7TV, 1 radio	3/4	26(.470)
	Japan Bqt	4050/1100H	2	3/4	12(.000)
	ESPN USA	4020/1130H	7+TV, data	7/8	26(.470)
	Discovery	3980/1170H	8 typ.	3/4	27(.690)
	CalBqt/Pas8	3940/1210H	up to 8TV	7/8	27(.690)
	<b>CNBC HK</b>	3900/1250H	up to 7TV	3/4	27(.500)
	Filipino Bqt	3880/1270V	up to 9 TV	3/4	28(.700)
	<b>Feeds</b>	3854/1296H	1	3/4	6(.110)
	Lakbay TV	3813/1337V	1	3/4	5(.044)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)
	<b>CNNI</b>	3780/1370H	3, up to 5 TV	3/4	25(.000)
	<b>MTV</b>	3740/1410H	8	2/3	27(.500)
PAS2/169	Pv Bouquet	12.290V	2+ TV, radio	2/3	27(.500)
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)
	HK PowVu	4148/1002V	up to 8	2/3	24(.430)
	Fox Bouquet	3992/1158V	8TV/data	7/8	26(.470)
	<b>Feeds</b>	3966/1184V	1	2/3	6(.620)
	<b>Feeds</b>	3957/1193V	1	2/3	6(.620)
	<b>Feeds</b>	3934/1216V	1	3/4	10(.850)
	<b>Feeds</b>	3912/1238V	1	2/3	6(.620)
	<b>Feeds</b>	3898/1252V	1	2/3	12(.000)
	<b>Middle East</b>	3836/1314V	4 typ	3/4	13(.331)
	<b>Feeds</b>	3803/1347V	1	2/3	6(.620)
	BBC +	3743/1407V	3	3/4	21(.800)
	<b>CCTV Pv</b>	3716/1434V	5 typical	3/4	19(.850)
	<b>Feeds</b>	4040/1110H	1	3/4	10(.850)
	Mbc/Korea	3981/1169H	1	3/4	2(.982)
	<b>7th DyAdv</b>	3872/1278H	1	3/4	6(.620)
	<b>Feeds</b>	3868/1182H	1	2/3	6(.620)
	<b>Feeds</b>	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)
	occ feeds	3854/1296H	1	2/3	6(.620)
	occ feeds	3794/1356H	1	3/4	5(.560)
	occ feeds	3785/1365H	1	3/4	5(.560)

Receivers and Errata
FTA SCPC, Australia OK
PowVu, some <b>FTA</b> (1,3)
CA & <b>FTA</b> Ntsc: Japan, Taiwan
Aust east coast beam; also 11.168Hz
primarily data
<b>CA, some FTA, Herbalife</b>
cvrs Aust, NZ 90 cm, CA (*)
cvrs Aust, NZ 90 cm; CA (*)
Aust only: * - smart card p. 28
cvrs Aust, NZ 90cm; CA(*)
Aust only: * - smart card p. 28
Austar I-TV tests
CA, subscription available Australia
May have been shut down?
also 12.326, 12.335; ex PAS8 Ku
FTA, purpose here unknown
FTA; recent freq shift
Early start, FT & CA, SE Aust beam
NDS CA, subscription available NZ
NDS CA, subscription available NZ
NDS CA, subscription available NZ
TPG /Eurodec CA, occ. FTA
Tests, inc. ESPN, see TARBS above
Irdeto CA, <b>some FTA</b> tests
CA, subs avail Aust, <b>CNN FTA</b>
PowVu CA
PowVu CA & <b>FTA</b> ; subscription avail
PowVu CA; NTV Int, Fuji TV
PowVu CA; ch 11 DCP-CCP bootload
PowVu/CA (some audio <b>FTA</b> )
PowVu CA & <b>FTA (EWTN/EB Net)</b>
FTA at this time
Some <b>FTA</b> ; also 4040V, 27.686, 7/8
occ. feeds, inc. Mediasat Sydney
(Filipino) sometimes <b>FTA</b> ; PowVu was As2; PowVu CA
PowVu, <b>FTA until Feb 11</b>
CA; #7,8 <b>FTA feeds</b>
PowVu CA, WIN, ABC NT
PowVu CA, WA only - D9234
PowVu CA; some <b>FTA</b>
Pv, CA/FTA ( <b>FTA ch 3 only</b> )
PowVu (FTA) occ feeds
PowVu (FTA) occ. feeds
PowVu (FTA) occ. feeds
PowVu(FTA) occ. feeds
PowVu (FTA) occ. feeds
FTA, have tested CA; was 3778V
PowVu (FTA) occ. feeds
<b>BBC FTA</b> , others CA usually
PowVu FTA; # pgm chs varies
PowVu (FTA) occ. feeds
was FTA, now CA
Sat, Sun 0930UTC typ
FTA (occ. sport feeds)
FTA-typ. NTSC-occ. sport, shuttle
(PowVu) CA+ <b>FTA</b>
(PowVu) occ. feeds
also SR 5.600, some <b>FTA</b>
also Sr 5.600, <b>some FTA</b>

## SatFACTS Digital Watch: Supplemental Reference Data / January 2001

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(PAS2/169E)	<b>occ feeds</b>	3776/1374H	1 typ	3/4	5(.560)	occ feeds, typ FTA; also Sr 5.600
	<b>Feeds</b>	3767/1383H	1	2/3	6(.620)	PowVY (FTA) occ feeds
	Satcom 1-6	3743/1407H	up to 5	7/8	19(.465)	use unknown at this time
<b>I702/176E</b>	AFRTS	4177/973LHC	8TV, 12+radio	3/4	26(.694)	PowVu CA
<b>I701/180E</b>	TNTV	11.060V	9	3/4	30(.000)	eastern spotbeam, pay TV tests
	Tele Fenua	11.168V	4 (?)	3/4	10(.100)	eastern spotbeam, pay TV tests
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)	Mediaguard CA, 1 ch FTA
	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
<b>RFO-Canal+</b>		4086/1064L	4TV, radio	5/6	13(.347)	east hemi 20.5 dBw, to be 15.5 soon
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)	DMV/NTL early version, occ feds, typ ca
<b>TVNZ feeds</b>		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
<b>Ioarana</b>		3772/1378L	1	3/4	4(.566)	FTA SCPC; East Hemi Beam-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

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

**ADI MediaMate.** FTA, NTSC+PAL outputs. (Pacific Digital Sys. Pty Ltd, tel 61-2-8765-0270)

**AV-COMM R3100.** FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM Pty Ltd, 61-2-9939-4377.

**Benjamin DB6600-CI.** FTA, Foxtel/Austar w/CAM+card. Autosat Pty Ltd 61-2-9642-0266 (review SF#72)

**Grundig DTR1100.** Mfg by Panasat (SA), very similar to Panasat 630; out of production, Irdet capable. See Av-COMM above.

**Humax F1-CI.** Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).

**Humax ICRI 5400.** Embedded Irdet + 2 CAM slots; initial units have NTSC glitch. 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, Irdet (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](http://www.BAKKERELECTRONICS.COM)).

**Nokia 9500/9600.** Numerous versions for different world parts; not distributed in Pacific but assistance from Av-Comm Pty Ltd.

**Nokia 9800.** Latest single chip version, with CI and Irdet capable. No software for Pacific, Asia; not recommended.

**Pace DVS211.** NDS CA (no FTA) for Star Asia, previously used for Indovision. (Solution 42, 61-2-9820-5962)

**Pace DGT400.** Originally Galaxy (Now Foxtel+Austar). Irdet, some FTA with difficulty (Foxtel Australia 1300-360818)

**Pace DVR500.** Original DGT400 modified for NBC (PAS-2) affiliate use, with CAM equivalent to DGT400 but more reliable.

**Pace "Worldbox" (DSR-620 in NZ).** Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.

**Pacific Satellite DSR2000.** Advises no longer current model; Clone of Mediastar D7 (see above)

**Panasat 520/630/635.** MCPC FTA, Irdet capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370.

**Panasonic TU-DS10.** FTA + Irdet CA; one of 2 IRDs approved by Optus for Aurora, but no longer available in Australia.

**Phoenix 111, 222.** PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222 out of production

**Phoenix 333.** FTA SCPC, MCPC, analogue + dish mover. Detailed SF review Nov. 1998. SATECH 61-3-9553-3399.

**Pioneer TS4.** Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)

**PowerCom.** FTA, PowVu, NTSC, excellent sensitivity. NetSat 61-2-9687-9903.

**PowerVu (D9223, 9225, 9234).** Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.

**Praxis 9800 ADP.** FTA SCPC/MCPC, PowVu, analogue, positioner. SF review Dec '98; withdrawn from Pacific sale.

**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).

**Skandia SK888 (aka DigiSkan-SMS).** FTA MCPC, Irdet CAM+software upgrade. Out of production; Skandia 61-3-9819-2466

**Strong SRT 4600.** SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. SATECH 61-3-9553-3399.

**Sky 21/SJ 3000ci.** Claims "clone" Hyundai HSS800ci; if so, poor copy. Runs very hot, reportedly burns up smart cards

**UEC642.** Designed for Aurora (Irdeto), approved by Optus; limited other uses. Norsat 61-8-9451-8300.

**UEC660.** Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.

**UECT00/720.** Single chip Irdet built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers.

**Xanadu.** DVB compliant special receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9939-4377)

**Yuri HSS-100C.** FTA, clone of Hyundai, V2.27 software custom to Australia (Nationwide-above).

**Accessories:**

**Aurora smart cards.** New v1.6 now available, 1.2 no longer available for RABS. Price now A\$105, Sciteq 61-8-9306-3738; V1.8 available through Norsat 61-8-9451-8300 at A\$107.50.

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

## SatFACTS Pacific/Asian FTA ANALOGUE Watch: 19 January, 2001

Copyright 2001: SatFACTS, PO Box 330, Mangonui, Far North, New Zealand (<http://www.satfacts.kwikkopy.co.nz>)

BIRD/ Location	RF/IF & Polarity	Service	Errata
I703/57E	3808/1342R	Udaya TV	
	4052/1098R	WorldNet	VOA subcrs.
	4178/972L	MTA Inter.	
I604/602/60E	4166/984	various feeds	
I704/66E	3765/1385R	tests	
	4015/1135L	Mongolia (SECAM)	
PAS4/68.5E	3743/1407V	RTPi (+ radio subcr)	
	3864/1286V	BBC World	
	3907/1243H	Sony TV	Hindi
	4034/1116V	Doordan	(various)
	4087/1063H	CNNI	
	4110/1040H	TNT/Cartoon	
	4113/1037V	Series Ch.	
	4182/968H	MTV	
PAS7/68.5E	3470/1680V	test signal	
LM1/75E	3980/1170V	various	(Madagascar)
ApStar 2R	3780/1370H	TV Malagasy	(SECAM)
Thaicom3/78E	3871/1279H	TVT	
	3760/1390V	Army TV	
	3685/1465V	MRTV	off air???
	3685/1465H	VT	6.6, 7.02
	3616/1534V	ATN	
	3576/1574V	ATN Bangalr	Bengali
	3554/1596V	test card	
	3536/1614V	Punjabi TV	(occ service)
	3507/1643V	RAJ-TV	
	3489/1661H	Vasta Music	occ tests
	3465/1685V	RAJ-TV	
Expres 6A/80E	3675/1475R	RTR	(global beam)
InSat 2E/83E	3481/1669V	Sun TV	
	3562/1588V	Vijay/Asianet	aud. 5.5/6.6
	3599/1551V	JayaTV	
	3810/1340V	DD1-Tamil	"
	3850/1300V	DD1-National	"
	3930/1220V	DD2 Metro	"
	3970/1180V	Teluga 1	"
	3998/1152V	sport feeds	"
	4035/1115V	Sun TV	"
	4060/1090V	Surya/Sun TV	"
	4093/1057V	DD7	"
ChnStr1/87.5E	3880/1270H	occ feeds/ card	P4 NSW, Ntsc
ST1/88E	3550/1600V	test card	
	3582/1568V	Nila TV	(vintage TV)
Yamal 102/90E	3675/1475R	RTR1	P3 NSW
	3875/1275R	Orbita 1	
	3916/1234R	RTR II	
	3935/1215R	Orbita II	
MeSat-1/91.5E	3710/1440H	VTV1,2, 4	
	3880/1270H	RTM-1	
Gz 28/96.5	3675/1475R	RTR	inc +/- 3.7
Chinasat22/98	3900/1250H	tests	+ 3940/1210
InSat 2B/93.5E	4165/985H	India Metro	NSW on 3.7m
	4080/1070V	DD7 (Tamil)	
	4070/1080H	DD9	
	3970/1180V	DD9 (Kan.)	
	3882/1268V	DD1	
	3840/1310V	DD?	
	3762/1388V	DD4	
AsSat2/100.5E	3660/1490V	feeds, tests	
	3680/1470H	feeds	
	3860/1290V	feeds	

BIRD/ Location	RF/IF & Polarity	Service	Errata
(As2/100.5E)	3885/1265H	WorldNet	VOA subcrs
	3980/1170V	RTPi	(radio gone)
Exp. 9/103E	3675/1475R	RTR	inc +/- 2.1
	3875/1275R	Vrk Apt	
As3S/105.5E	3640/1510H	Asia Plus	China, 6.6
	3660/1490V	Urdu TV Net	6.6, 7.2 audio
	3680/1470H	CETV	
(temp FTA)	3800/1350H	Star Sport	NTSC
(temp FTA)	3840/1310H	Channel [V]	NTSC
(temp FTA)	3920/1230H	Phoenix Ch	NTSC
	3940/1210V	Zee India	(to shut down)
	3980/1170V	Zee TV	(to shut down)
	4020/1130V	Sahara TV	6.2, 6.8
	4060/1090V	IndusVision	6.6, 7.2
	4100/1050V	PTV2/World	
T'kom1/108E	4000/1150H	tests	
PalapC2/113E	4160/990H	(France) TV5	
	4140/1010V	Brunei + feeds	
	4120/1030H	MTV Asia	
	4080/1070H	Herbalife	+ tests
	4040/1110H	CNBC	
	3970/1180V	CNNI	<b>CA February</b>
	3920/1230H	CNNI	tests
	3880/1270H	Aust ATN7	
	3840/1310H	TVRI	tests
	3742/1408V	RCTI	English subcr
AsSat1/122E	3677/1473V	Test card	3933/1217H
ChinS 6/125E	4085/1065V	feeds	seldom seen
JcSat3/128E	3768/1382V	feeds	occ., P5 NZ
	4085/1065V	test card	NTSC. 6.8
Ap1A/134E	4160/1050V	CETV	
	3980/1170V	CETV1	
	3900/1250V	CETV2	
Ap1A/138E	4160/990H	CCTV7	
G25/140E	3675/1475R	ORT Moscow	inc. +/- 4.9
	3875/1275R	feeds, tests	
LMAP2/142.5	3675/1475L	RTR Moscow	+/- 3 deg inc.
Gorizont 33	3675/1475R	tests	+/- 1 deg inc
	3875/1275R	RTR	audio 7.5
Ag2/146E	3787/1363H	GMA	P1/2 s. eqtr
Me2/148E	4080/1070H	test card	occ. use
PAS8/166.5E	3880/1270V	test card, feeds	not full time
	3865/1285H	Napa test card	not fulltime
PAS2/169E	3940/1240V	Napa test card	
SpNet4/172E	4199/951H	test carrier	may be beacon
1802/174E	4166/984R	Feeds	
	4177/973R	Feeds	
I702/176E	4166/984R	Feeds	from 177E
	4187/963R	Occ. feeds	
I701/180E	4187/963R	Occ. feeds	
	3841/1309L	RFO	East Beam
	3845/1305R	Occ. feeds	inc. from USA
	3930/1220R	USA net feeds	<b>FTA &amp; ca</b>
	3975/1175R	Occ. feeds	

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

## AURORA Transponder Loading (updated to 12 January 2001)

**TV - Data Channels:** Channel numbers are sequential - those not listed were not in use as of 12 January.  
**Optus B3/T3/12.407Vt (TV channels 1 - 20 and radio channels 1 - 20) - NOTE: This transponder covers Australia and New Zealand, 90cm dish typical requirement:** (4) BTV1 Optus Business TV (normally CA but 'Rural Health Foundation' (IRDs with standard cards can access); (5) BTV2 (CA); (6) BTV3 (CA); (7) Sky 1 (normal Sky sports TV channel, special events aired on Optus Business Channels - CA); (8) Sky2 NSW TAB Radio (normal TV video & audio + extra radio audio -CA); (9) Sky3 Vic TAB data (same parameters as 8 - CA); (10) Sky4 WA TAB radio (same parameters as 8- CA); (11) Sky5 Sat Comms (same parameters as 8 -CA); (12) Sky6 NSW TAB data (same parameters as 8 -CA).

RADIO on 12.407Vt: (1) R1 (Satellite Music Australia) Contemporary; (2) R2 Aria 100; (3) R3 Cool Vibes; (4) R4 Classic Gold; (5) R5 Country Beat; (6) R6 High Energy; (7) R7 Rock Radio; (8) SMA BUS1 Woolworths - CA; (9) SMA BUS2 SMA B02 -CA; (10) QTAB Radio; (11) NIRS National Indigenous Radio -CA; (12) RPH Radio for the print handicapped -CA; (13) BBC Radio (World Service); (14) CBAA Community Broadcasting Association of Australia -CA; (17) SMA BUS3 Big W Radio-CA; (18) UCB Vision FM (United Christian Broadcasting); (19) SMA ITA Radio Italia; (20) REF TONE Aurora (-14dBfs/1000Hz dual mono).

Notes: Programme services listed as (CA) or -CA are conditional access and require an authorisation card. Others (such as Satellite Music Australia Radio - above) may require an Aurora smart card but not a specific subscription or authorisation.

**Optus B3/T6/12.594Vt (TV channels 21 - 35 and radio channels 21 - 44):** (21) ABC TV WA ; (22) GWN TV - Network 7 affiliate; (23) WLK Westlink; (24) WIN TV Network 9 affiliate; (25) TUNE AURORA line-up channel (test pattern no audio); (29) ABC TV NT; (30) Imp TV - Imparja TV; (31) INFO TV "Imparja Programme Guide" + CAAMA radiosound - on rare occasions also used for TV broadcasts; Radio on 12.594Vt: (21) RABS TONE transmitter deviation test (-18dBfs/400Hz, dual mono); (22) ABC FM WA classical music; (23) ABC RN WA specialist information; (24) ABC RR WA regional radio; (25) 990AM information radio -CA; (26) ABC RR WS Regional radio Western Australia/south; (32) ABC FM NT classical music; (33) ABC RN NT specialist information; (34) ABC RR NT regional radio; (35) Caama Stereo (8KIN Alice Springs Imparja); (36) Teabba Radio Darwin Imparja); (37) 5PY Umuwa; (38) IMP R4 NT (TAB - now CA); (39) PAKAM Pilbara and Kimberly Aboriginal Media Imparja; (40) IMP R6 -CA; (41) Arrow One (test 96kbps mono) - not 24 hour; (42) IMP R8 - not in current use.

**Optus B3/T8/12.720Vt (TV channels 36 - 45 and radio channels 45 - 63):** (36) ABC TV SA; (37) SBS SA; (38) SBS SA - now CA, was data channel); (39) ABC TV Q; (40) Seven Central - Network 7 affiliate; (41) SBS Qld; (42) SBS Q Data - now CA; (43) CLK Centrelink Educational Network -CA; (45) ABC TV SE from Sydney studio.

Radio 12.720Vt: (45) ABC FM SA classical music; (46) ABC RN SA specialist information; (47) ABC RR SA regional radio; (48) SBS R SA; (51) ABC FM Q classical music; (52) ABC RN Q specialist information; (53) ABC RR Q regional radio; (54) TAIMA - possibly 4KIG -CA; (55) SBS R QLD; (56) ABC JJ youth radio; (57) ABC PN news radio and parliament; (58) ABC RR NQ - regional radio Far North Queensland; (61) ABC FM SE classical music; (62) ABC RN SE specialist information; (63) ABC RR SE regional radio.

**Optus B3/T5/12.532Vt (TV channels 46 - 61 and radio channels 64 - 66) - NOTE: This transponder covers Australia and New Zealand, 90cm dish typical requirement:** (46) SBS SE; (47) SBS SE Data - now CA; (48) SBS WA; (49) SBS WA - was data, now CA; (50) RTV1 Lashkara/Punjabi -CA; (51) RTV2 Gurjarti -CA; (52) RTV3 - Coming shortly - ASIA 1 Hindi -CA; (53) RTV4 - Coming shortly - RAAG Music -CA; (54) RTV5 - Coming shortly - CEEITV - Tamil -CA; (55) RTV5 - Coming shortly - Anjuman/Urdu -CA. Radio 12.532Vt: (64) SBS R SE; (65) SBS R NT; (66) SBS R WA.

**Optus B3/T7/12.657Vt (TV channels 62 - 69; radio channels have not been assigned) -Note: This transponder covers Australia and New Zealand, 90 cm dish typical requirement:** (64) Zee TV1 -CA; (65) Zee TV2 - cinema - CA; (66) Zee TV3 - music - CA; (67) Zee TV4 - news - CA; (68) Zee TV5 - Alpha Punjabi -CA; (69) Zee TV6 -Alpha Gujarati & Bangla / 12 hours each daily - CA.

Radio 12.657Vt: No radio at present time.

## TUNING IN THE INDUSTRY'S TV PROGRAMME

SPACE Pacific, the Asia-Pacific industry membership trade association, has produced (and continues to produce) a series of one hour television programmes. These "SPACE Pacific Report" shows, hosted by Bob Cooper, cover a range of topics of interest to installers and enthusiasts. Show numbers and content are as follows: #9901- Spectrum Analyser techniques, #9902- Feeds and LNBs, #9903- Dish antenna designs and problems, #9904- The dish marketplace, and, "tiny parts," #9905- Dr Overflow (Nokia) software, #9906- How the uplink works (tour of RCA's Vernon Valley site), #9907- Uplink Two, including uplink transmitters, #9908- Digital Basics (Mark Long), #9909- Real World Installs (Mark Long), #9910 - Installing a polar mount dish and signal level test equipment, #9911 - "SPIN" (the hidden side of satellite). #0012 - First Report from SPRSCS 2000 (recorded in Melbourne June 28, 29 - "Ideal IRDs," more), #0013 - Second Report from SPRSCS 2000 (recorded in Melbourne June 29, 30 -"ABA Blackspot session"), #0014 - Naughty Nokia from SPRSCS 2000; #0015 - The DVB-T Tangle from SPRSCS 2000 (Eric Fien). "Report" is broadcast by Mediasat on Optus B3, 12.336Vt, ad-hoc channel 3(\*) (Sr 30.000, FEC 2/3). The coming-weeks schedule: **Sunday January 21** - Show 9904, 0200-0300 UTC (1500 NZST, 1300 AEST, 1000 Western Australia; repeats 0700 UTC/7PM NZT, 6PM Sydney, 3PM Perth). **Sunday January 28** - Show 9905, repeats same time as January 21; **Sunday February 04** - Show 9906, repeats same time as January 21; **Sunday February 11** - Show 9907, same times as January 21; **Sunday February 18** - Show 9908, same times as January 21; **Sunday February 25** - Show 9909, same times as January 21; **Sunday March 04** - Show 9910, same time as January 21. (\*) - Mediasat may pre-empt showings, check other bouquet channels - if not on 3.) SPACE Pacific Report has also been broadcast by Westlink, Aurora service on Optus B3, vertical (12.595, Sr 30.000, FEC 3/4 - requires Optus Aurora card but is otherwise FTA). Westlink will again carry SPACE Pacific Report when new shows currently in planning are produced and available; details here in future issue (will start after April 1). In the event of schedule changes (\*), SPACE Pacific attempts to pre-announce which show(s) will appear through the SatFACTS Web site prior to each weekend (<http://www.satfacts.kwikkopy.co.nz>). SPRSCS 2000 sessions taping scheduled for play on Mediasat and Westlink are currently in "editing production." Sponsorship of SPACE Pacific Report. In general answer to queries - Av-Comm, Satech and Sciteq have contributed corporate funding to make possible the production of the first set of nine SPACE Pacific Report programmes. If interested in sponsoring future shows, contact Bob Cooper at [skyking@clear.net.nz](mailto:skyking@clear.net.nz) (64-9-406-0651).

# WITH THE OBSERVERS

## AT PRESS DEADLINE

YOUR obligation is to feed back corrections, additions to this section as well as Digital and Analogue watch (pages 24 - 28). Those who carp about "errors" they spot but fail to advise us of corrections are NOT doing their part! L. Mathews Auckland reports 142.5 3675 Moscow P3 linear feed but highly inclined.

**AsiaSat 2/100.5E:** "Has anyone else noticed how little use As2 (and PAS-2) make of their 4050 - 4200 spectrum portions - is there a reason? Beijing TV test card 3864Vt, Sr 4.420, 3/4 VPID 32, APID 34" (**B. Richards**, Australia).

**AsiaSat 3S/105.5E:** IndusVision is new FTA analogue 4060/1090Vt, audio 6.6/7.2; test card FTA analogue also reported 4180/970Vt. "Two new Phoenix Chinese channels (Phoenix Info News) lodged within Star TV Asia 4000Hz mux, and Phoenix Chinese (different programming - 3880Hz), FTA no less with most IRDs (Sr26.850, 7/8) and in PAL format - recoverable with latest UEC 642 software" (**IF, Queensland**). "Zee TV and Zee TV News once again threatening-promising switch to encryption having missed earlier announced December 1 changeover; now say both will be CA within months" (**G. Welsby**, PNG - Zee News still reported 4135Vt, Sr 15.000, 2/3 VPID 35, APID 36). "Zee Music in 3700Vt mux often in clear" (IF, Queensland).

**Express 6A/90E:** Test card reported 3640RHC, MPEG-2 FTA, Sr 5.966, 1/2. TV Center on 4125RHC, FTA, VPID 162 and 160, APID 88 and 80 respectively.

**Gz 28/96.5E:** "Dramatic increase in signal level 3675 for RTR to P4 (on linear feed) after months of P2 or worse in NSW" (**D. Leach**, NSW)

**Gz33/145E:** "RTR here - 3875, appears RHC but cannot be sure on linear feed. Many ex-USA programmes, audio at 7.0 (TV), and 7.5 (Radio Rossii), acts like PAL colour, apparent Moscow origin news shows, P2 on 3m with very minor inclined orbit movement - could be P4 with circular feed" (**L. Mathews**, Auckland).

**Intelsat 701/180E:** "Change in parameters for Ten Net links shared with TV3 NZ; now 3769RHC, Sr 20.000, 7/8 with downsizing of total programme channels (now 4 including TBN). Feeds for 7 & 9 are not on this mux" (**HF, California**).

**MeaSat 2/148E:** "Australian beam 11.044Hz (Sr30.000, 7/8) signal appears gone while 11.106 and 11.168 (same Sr and FEC) still operating - some FTA on 11.168" (**D. Leach**).

**Optus B1/160E:** "ABC -NT seems to have shut down on 12.256Vt - was good on 1.2m offset" (**K. Browning**, NZ). "Imparja mux has moved from 12.367Hz to 12.360Hz, Sr 5.424, 3/4 FTA VPID 1024, APID 1025" (**Jacko**, Australia). "Golf match feeds 12.706Vt, Sr 6.110, 3/4" (**B. Richards**, Australia). "Able to continue reception of ABC Victoria using 3.5m solid Kewitong dish and ho-hum LNB as well as Central 7 on 12.354 but no head room on either" (**G. Welsby**, PNG). "WorldNet, grabbed from As2 digital, appeared briefly



END of an era. Star TV Hong Kong service shut down "Channel Mosaic" selection system in mid-December, a first step to winding down the 450,000 "home" service by March - April.

on 12.689Hz but is gone now - no reason given for relay here" (**A. Schwartz**, Australia). "Network 10 feeds 12.458Vt (PAL) apparently gone, step towards clearing Tr3 for possible use in NZ later in year" (**D. Pemberton**, Australia). "Small change in Sky TV NZ line-up started 2 January - 12.671Vt (7U) now (1) SBO Movies, (2) Playboy, (3) Spice and (4) SBO movies" (**R. Whitehead**, NZ). "EPG announcement apologising for SMA intermittent service on both Aurora and pay-TV platforms over period December 24-25 - related to Aurora's NIT changes?" (IF, Queensland). "Arrow One (within Aurora) is a (radio - audio) service for the Australian News Agents Federation, uses Pace DGT400s, no CAM or card" (**R. Dalton**, Queensland). "Occ. feeds 12.317Hz, Sr6.980, 3/4" (**B. Richards**, Australia)

**Optus B3/156E:** "When loading Mediasat (12.336Vt, Sr 30.000, 2/3) it also indicates two additional NIT identified transponders - 12.359Vt, Sr 6.111 and 3/4 plus 3.859Hz, same numbers." (IF, Queensland). Zee TV and Alpha CA ethnic channels moved from 12.532Vt to 12.658Vt.

**Palapa C2M/113E:** "3760Hz and 4000 Hz did their usual holiday FTA stint but are now back mostly CA with Nagravision - next likely FTA period will be Easter" (**AK**, PNG). "ETTV Shopping Net testing on 3790Hz, MPEG-2 FTA, Sr 3.050, 3/4" (**A. Schwartz**, Australia). "4071Hz mux,

**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 February 15th issue: February 5 by mail (use form appearing page AB), or 5PM NZST February 6th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

Sr 14.060, 3/4 has Channel News Asia (VPID 33, APID 34), 'Test Channel' card VPID 1057, APID 1058, 'Channel 2' VPID 2081, APID 2082 and 'Channel 3' VPID 3105, APID 3106" (B. Richards, Australia)

**PanAmSat PAS2/169E:** "Occasional feeds 3767Hz, 3803Vt, 3957Vt, 3966Vt all Sr 6.620, 2/3 - typical VPID 308, APID 256; also, 4040Hz, Sr 10.850, 3/4 VPID 1160, APID 1120 ABC USA news programming with US adverts, and, 3888Vt, Sr 6.610, 3/4 with basketball feed; Herbalife feed into Pacific on 3803Vt, Sr 6.509, 2/3 VPID 33, APID 34" (B. Richards, Australia).

**PanAmSat PAS8/166.5E:** "EMTV has moved to this bird from As2, 3808/1342Vt, Sr 5.632, 3/4 PowerVu CA with 2 radio channels; main TV is VPID 1110, APID 1211" (D. Nolan, Australia - is there enough signal on vertical to lock this one in NZ? EMTV provided fax advisory to "viewers with private decoders" over weekend of January 4-6, said close down on As2 occurred at end of broadcast day January 5.) "CMT contact in Australia is Kirsty at (61-0)2-9460-8055. She says Music Country is new name because CMT name has been sold to another firm, still in use in USA, warns 'more pop music' is coming on MC which true C&W fans may not appreciate" (D. Leach, NSW). "NTV, Fuji TV new on 4050Vt, Sr 12.000, 3/4" (B. Richards).

**Thaicom 3/78.5E:** "MRTV (3666Hz) seems to have left digital as well as analogue on 3685; TV Greece 3430Hz, Sr 3.255, 3/4 and Mega TV Greece 3640Hz, Sr 28.056, 3/4 both remain FTA at this time" (D. Leach, NSW - try 3666Hz, Sr 6.000, 2/3-ed.). TV Romania briefly appeared 3551Hz MPEG-2 FTA (Sr 13.330, 3/4, VPID 2113, APID 2115). "Sky

Racing finally settled 3695Vt, Sr 5.000, 3/4; CMM (music) 3600Hz, Sr 26.662, 3/4 VPID 521, APID 740" (B. Richards)

**Errata:** "Humax finally came through with MPEG-2 NTSC fix - my loader version L 1.36 (0016.0000) is now L1.36 (0025.0000). Got my patch directly from Humax, using with conversion of DiSeQC 1.2 commands to reed switcher positioner commands driving 230cm solid dish in NT with great success" (Robert Anthony, NT, Australia). "The new software is not compatible with the current version FormulaV3 - this version receiver comes up with 'ErrorID' notice, getting around this being worked on by Humax and there will be a release when completed" (Scott Nesbitt, Sciteq Pty Ltd). "Le Bouquet Francais (LBF) is mini-package approved for Australia (TV5, RTL9, Euronews, RFOsat, MCM, RFM and radio Europe 1) at Au\$165/6 months, \$264 12 months plus Au\$22 for smartcard - the viewer provides own (90-150cm) dish" (A. Corroy, 07-5539-5488). "Drake ESR-700E dish tracker network help from John Kiner in USA at 01-513-746-6990" (D. Leach, NSW).

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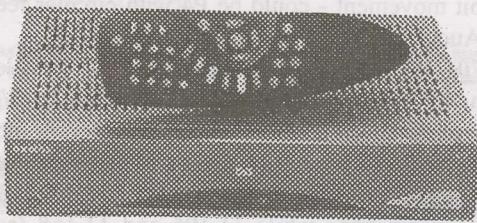
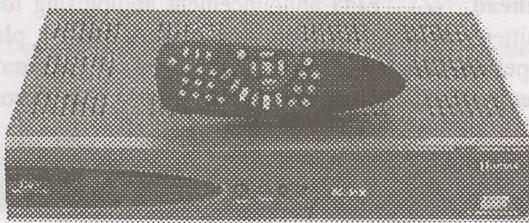
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## TWO WEEKS INTO DVB-T and the buzzards are circling

Australian print media and ABC-TV reports on the status of DVB-T there after nearly two weeks of full-time service paint a picture of public indifference and technical problems inhibiting the growth of the new medium.

An initial shipment of 500 Thomson brand set-top boxes arrived before Christmas but were found to be troublesome. Many in the shipment would not switch channels once a service was tuned in, 7-D and 9-D transmissions were working on others but not 10-D. In still others, the set-top had to be shut down and rebooted when changing channels.

The "Thomson source deal" was largely arranged by 9 and 10, 7 believing Thomson was not the correct set-top for Australia. There are reports 7 is still attempting to bring in its own version from Japanese firm Masprom Electronics.

Because each of the original 500 required hand check-out before being dispatched to waiting points of display (stores that had requested one or more for in-store demonstrations), the process was moving very slowly. How many of the 500 will ultimately end up in stores or consumer hands, or, be consigned to the "too difficult for now" pile and rebuild, has not been revealed.

The standard display technique is to place two TV sets side by side, one tuned to the analogue service and one to the (same) digital service. Sydney's Harvey Norman Auburn store was one of the early recipients of a display box. Harvey Norman outlets in Chatswood (Sydney) and Preston (Melbourne) reported they had not been able to make their Thomson boxes work - at all.

"Digital television has been on display since Tuesday (January 2) but consumers are not convinced there is any major change in quality over the current transmissions. The picture is clearer but not \$700 clearer," reported Wayne Campbell of HN. And there are difficult to explain challenges when doing a side by side comparison.

"The digital signal is delayed in time by 1 to 2 seconds so the sound you hear and the picture you see coming from the digital image is behind the analogue one. It won't make a bit of difference to normal viewing but try to explain why one is an echo of the other to a consumer standing there trying to make a comparison between the two!"

A spokesperson for Bing Lee had similar concerns. "It gives a slightly better picture but realistically, the \$699 price tag is not viable."

For most media the saga is a news story made in heaven. The great television world, long the ruler of advertising and sales promotion, appears to have stumbled on its own hype. If the stumble were to grow into a tumble, newspapers and other competitive media would be quick to benefit from television's problems. This has the print and radio media salivating each time they find someone who has something negative to say about the digital transition.

Web site news group posting:

"On the radio today, our lovely Government has told consumers to hold off buying the set top boxes that are due to go on sale this month. They said the reason for the advisory is

that the current lot of boxes being released will be superseded by better boxes soon."

If you were 7 Network, had a different set-top coming from Masprom (or anyone else), isn't that the kind of story you would "leak" into the salivating media?

Fuelling the fires of discontent, a report released January 10 from the Internet Industry Association (IIA) with the threatening title, "Why Australia has been short-changed on digital TV." The report damns the Government for its digital TV policies, damns the TV industry for being short sited and unable to see beyond their next monthly profit statements and urges the public to demand better treatment from both.

*"The regime is a mess. A week into the new regime and what do we have? Boxes costing \$700 virtually unobtainable by the average viewer, and a public recommendation that consumers not buy them."*

*"Our political decision makers are on notice that it must be fixed before the damage becomes irreversible. The future of wireless services for all Australians has been seriously compromised to protect established (analogue) broadcasting interests. The (present) plan is a lack of competition in the introduction of digital TV, a lack of urgency in making the new services available to the public and an unattractive list of potential benefits that falls well short of the new services Australians are entitled to receive. The broadcasting spectrum is a valuable and finite resource. It belongs to all Australians but at this stage it looks like only the rich will be interested in spending their money for the marginal benefits on offer."*

*"At present set-top boxes are too expensive and, in addition, the Government has not mandated an open standard to protect consumers from the advance of technology. This means that households that choose to adopt the technology will have to buy two or three boxes if they are to get the diversity of content that the new technology makes possible. Many people who purchase an early model will be turned off by the lack of improvement and will not consider spending additional money for the upgrades in newer boxes that will be inevitable. We will lose these early adopters because we did not adequately plan a system that included automatic software and hardware system upgrades as they become available. Anyway you look at the regime, you see 'anti-competitive' written all over it."*

Perhaps. But as our feature report on p. 6 here illustrates, set-top boxes have always been "**adapters for early adopters**" and for that privilege there is always a surcharge.

Somewhere between the trial Australian tests of ATSC versus COFDM and the present, both Government and the TV networks lost track of the plot leading to the present misimpression that when DVB-T launched it would be a stable, standards driven, *mature technology*. It is of course none of those three and given the speed of creation of new variations in digital transmission parameters, it will be none of those three for a decade or more to come. TV means "instant gratification" - this instant will last a decade.

# AT

## Sign-off

### The most pressing challenge of 2001

A report on CNBC during the second week of January was an eye opener. A survey of the top ten firms in the world producing integrated circuit chips revealed that just when industry has engaged in massive expansion of their chip making facilities they now face very significant down turns in chip production demands from equipment manufacturers. A new US\$1.5 billion facility built by Japan's Mitsubishi was singled out as having started down the road to expansion two years ago, committing to the funding and construction, based upon the conditions of 1998 - when everything was in short supply. Now as the plant comes on line, the tide has turned, demand for chips (including those that make satellite IRDs and DVB-T set-tops play) has shrunk and Mitsubishi has this nifty new plant and virtually no orders to support it.

This is not an isolated example of good planning turning into bad reality. There are others much closer to home.

New Zealand and Australian governments have dodged the issue of "standards" for IRDs and DVB-T boxes from day one, believing that somehow manufacturers with their own profits on the line can make better decisions than bureaucracies laden with academics.

New Zealand's government abdicated the DVB-T decision to a privately run "standards group." Nobody sat down, as they did in UK, USA, Sweden, Hong Kong or Australia, and held public hearings followed by exhaustive testing to determine the "best" technology for conversion to digital terrestrial transmission. Rather, an obscure group that decides what size pipe is "best" for transporting water, how "bright" light bulbs should be and when you should "change" the filter on your swimming pool met behind closed doors and "adopted" COFDM from the UK. Nobody from industry or telecasting or the public at large testified, no one had the opportunity to speak out in favour of HDTV or datacasting. Rather this unknown and largely unaccountable group switched agendas from "standard widths for sidewalks" to "terrestrial digital television" with the stroke of a pen and a break for morning tea. The result is - if and when digital terrestrial starts in New Zealand, the "standard" will be 625 line SDTV with no opportunity for HDTV or datacasting. *And that is a worry.*

Australia's march to Government mandated HDTV was done with a reasonable degree of openness and included extensive testing of the two then-competitive systems, ATSC/8-VSB from the USA and COFDM from Europe. Australia obviously made the correct COFDM decision if the utter and complete failure of ATSC as now struggling in the USA testifies. But having adopted the European model, Australian politicians then picked up the ball and began fine tuning the engineer's assessment. COFDM, unique to Australia, would be HDTV - nobody else anywhere has done this. And the original AC-3 Dolby multiple (5) channel sound system which DVD has made so popular was dumped at the last minute in favour of two channel pseudo stereo. This so upset the people at Dolby Labs they sent an urgent letter to Politician Alston and

delivered a DVD player to the man so he could actually witness what 5 channel sound does for digital delivery. Alston's comprehension of the technology issues debated here has been suspect for more than a year - since it was revealed he has very modest home television equipment, does not subscribe to a pay-TV service, and possibly has not used his family's antique VCR for more than five years. Perhaps someone will offer to drop by and hook-up the gratis DVD player so he can firsthand appreciate what digital video is all about.

So those of us who have to knock on the consumer door to perform an installation of new equipment or a repair of something already installed are left with the dubious challenge of explaining in lay terms why none of this seems to be working as promised. Which brings us to the primary challenge of 2001. **Digital.**

Anyway you pronounce it, anyway you spell it, digital is a headache that is not going away and is unlikely to be better in January 2002 than it is today. As a small industry that depends upon digital for our daily bread, we are near the bottom end of the feeding chain. We get the crumbs, and we get the excrement which follows the big guys feeding above us. Increasingly, it is becoming a smelly and uncomfortable location.

The digital challenge is simply this - *change*. When analogue TV was introduced, the transmission standards were fixed and stable. This allowed set makers to create "standard design" receivers, allowed aerial makers to fabricate improved rooftop devices, allowed installers to work out over time the best wiring techniques.

Digital's MPEG-2 standard is a joke. Most everyone violates it, and those few such as the European Bouquet who follow the rules are laughed at by the more aggressive broadcasters who have manipulated ways to warp the standard to their own selfish ends. This is why we have the Optus Aurora snafu, why in New Zealand the new TVNZ + Telstra-Saturn service is facing a difficult uphill battle against first-in-the-water Sky Network.

Set-top boxes abound, no two are alike, there is essentially no "national" much less a "world" standard. The individual at the *very end* of the feeding chain - *the consumer* - asked to lay out hard earned dollars for a "box" is vulnerable to promotional hype and purposeful misinformation. Consumers do not understand that "digital" is not to any standard, that every service they think they want may require not only a separate box but essentially an entirely new system. How many Aurora receivers went down just before Christmas because someone with a selfish self-interest decided he was going to make a point with IRDs he had not personally approved?

When something like this happens we are all reminded of the very thin cord which separates us from chaos on a daily basis. One "bit" change in a data authorisation stream and an entire universe of consumers loses service. Before digital it took a few sticks of well placed dynamite to cut off everyone's reception of TV broadcasts. Now it only takes a guy or gal sitting down at a keyboard and typing in one letter or number in a vulnerable location in the data flow.

Mitsubishi's new chip plant is a red flag that too many people like Senator Alston have participated in making decisions about technology they do not understand. The wrong people are doing the thinking and basing decisions on the wrong premises. Digital should not be spelt p-o-l-i-t-i-c-s.

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## Shows 9905, 9906, 9907, 9908 & 9909

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FTA terrestrial to multiple outlet sets. With DVB-T coming, this excellent step-by-step guide to proper master antenna system design and installation will prepare you for the far more complex world of distributing MPEG terrestrial digital signals around a home, multiple dwelling unit, motel or hotel. Basics of analogue distribution still apply - even with digital! Ltd Qty \$15 (SPACE discount)

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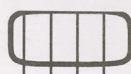
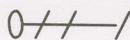
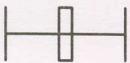
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# SPACE Pacific Terrestrial TV Reference Materials



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

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## TB 9302

**Tech Bulletin 9302. Weak Signal Reception Techniques.** If one cut-to-channel (Yagi) antenna won't do the job, will 2, 4 or 8??? How about 16? Stacking antennas, mating with carefully selected masthead amps, is an art. This explains how to do it for professional results up to 300 km from TV stations.

## TB 9303

**Tech Bulletin 9303. UHF - The Frontier.** Using parabolic style antennas surfaced with low-cost poultry mesh, build UHF dishes up to 40 feet in size to extend UHF off-air reception out to 300 km. And - learn the tricks to "squirt" signals from a hilltop to a valley below using low-cost receiving equipment.

## TB 9304

**Tech Bulletin 9304. Beating Noise Interference & Combining Cross-Pole Signals.** When TV and FM signals are weak, man-made interference from appliances, power lines can kill reception. Step-by-step instruction for identifying, locating, fixing noise sources + unique method of combining cross-pole TV signals.

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**Tech Bulletin 9305. Cable Television - Fact & Fiction.** The story of how a cable TV system is designed, built, operated. The perfect "So this is how it works!" report. Who knows - you might even like the concept so well you take out a mortgage on your home and wire your town!

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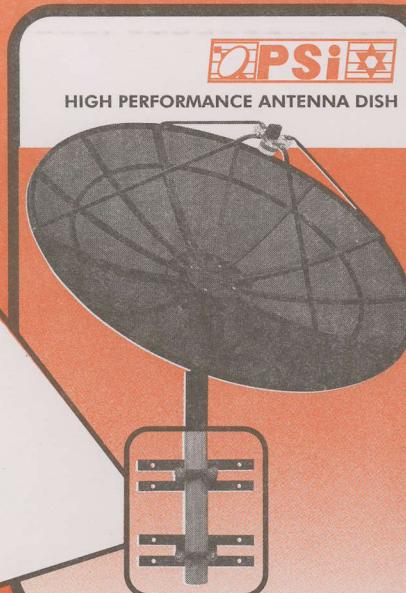
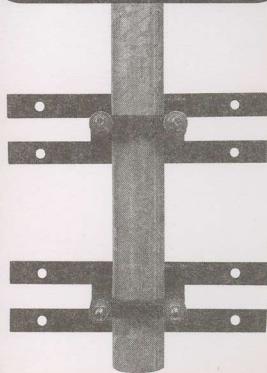
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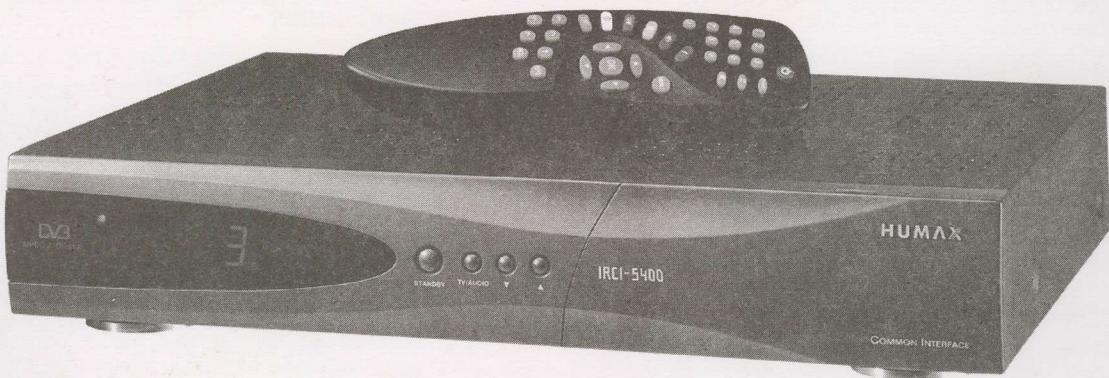
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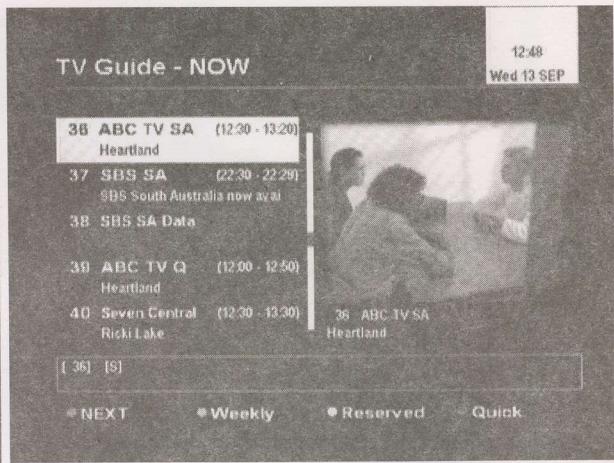


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Channel Data Upload/Download to PC		✓
Favourite Channels Selection		✓
Symbol Rate 2 - 31 MS/s		✓



Electronic Program Guide with channel preview screen

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