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Bob Cooper's

MARCH 15 2002

SatFACTS

MONTHLY

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

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STRONG Tech's SRT 2620 Test

Foxtel and Optus join hands

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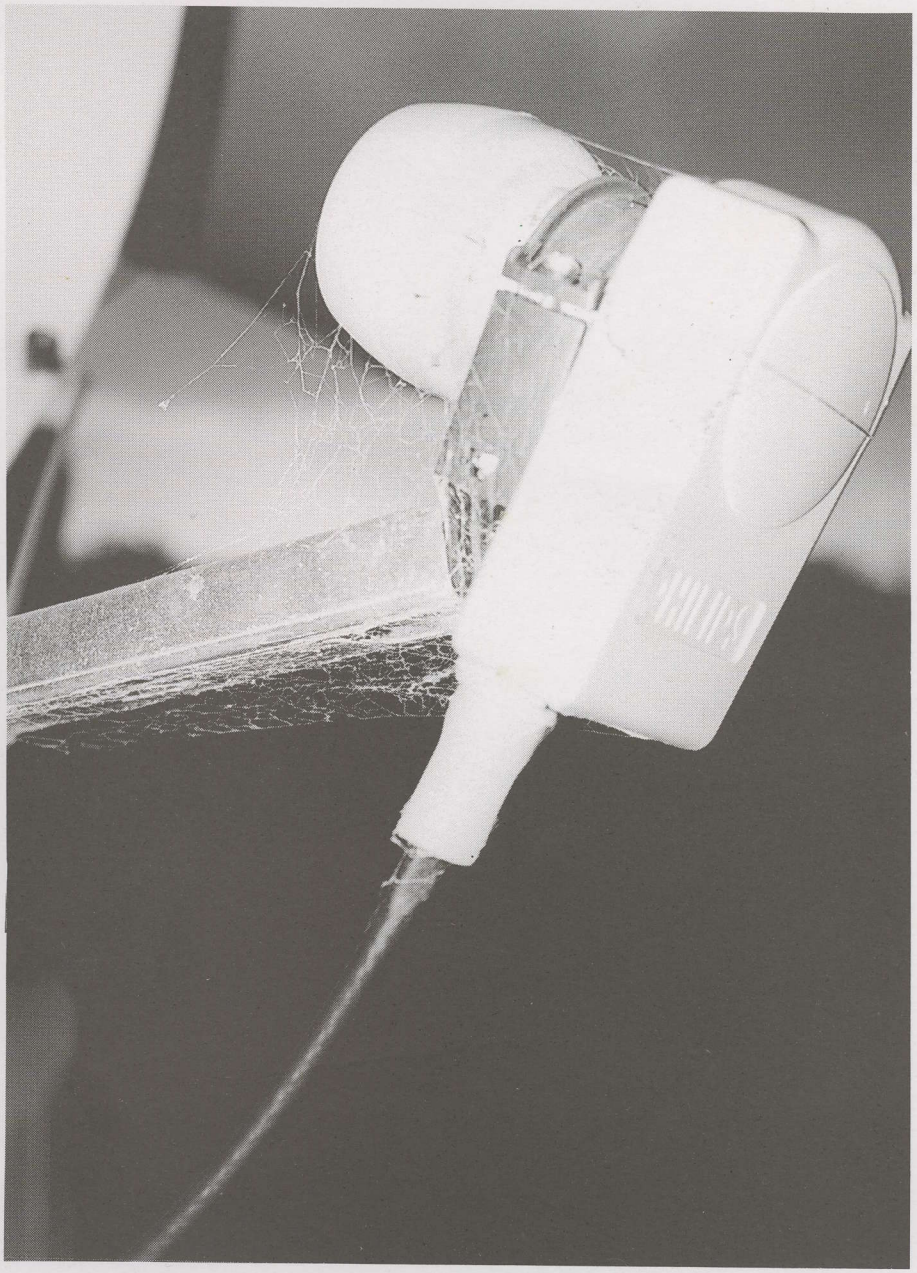

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MONTHLY

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

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COOP'S COMMENT

March 15, 2002

Frequency spectrum. As recently as five years ago, spectrum space (frequencies) above 1 GHz (1,000 MHz) were considered "exotic" and only useful for special applications. The "microwave" region begins near 1,000 MHz (1 GHz) and as every textbook written since 1950 tells you, microwaves don't travel very far and must have LOS (line of sight) to be useful. But when telephone cell phone systems outgrew their upper-UHF spectrum space (near 900 MHz) a new interest in the 1 GHz and up region was kindled with the telephone companies as a driving economic force. In the past 12 months, microwave bands (50/100/300 MHz chunks) have been "sold" (leased actually) by governments to private firms for ten and twenty year periods for as much as US$100 billion. Virtually every nation in the world has decided that there are huge revenues to be realised by "selling" off chunks of microwave to salivating telephone system operators.

Frequency management people working in obscure, unmarked offices with dingy desks suddenly became the fair-haired guys (and gals) of government. Imagine the elation when the Brits raised more than 7% of their annual budget by selling off one chunk of microwave frequencies near 2 GHz. Bureaucrats, who were unknown except to their immediate superiors, were suddenly "economic heroes" to cabinet ministers who as a rule could not even spell "m i c r o w a v e" properly and thought of the word only in relation to warming up their food for a late night snack.

Consider now the awesome responsibility these bureaucrats have suddenly assumed. If they have erred in the past by assigning "worthless" microwave spectrum to folks who need to connect point A to point B with dish-links, thereby earning government perhaps a few hundred quid a year for use of the spectrum, imagine their reaction to learning the same spectrum could bring in millions - nay, billions of dollars, if put out to auction. The same guy or gal who can be a hero can also be an short-sighted idiot for letting spectrum go for the wrong purposes to the wrong users.

In New Zealand and Australia, the spectrum between 960 MHz (the top end of most active cell phone repeater sites) and 4 GHz has been carved up based upon examples created by European and North American governments. So we find that in NZ, while the 960 - 1215 MHz (0.96 to 1.215 GHz) chunk is being used by 104 licensed transmitters, the spectrum from 1215 - 1240 MHz (1.215 - 1.240 GHz) has no licensed users. None at all. And where 1240-1260 MHz has 14 licensed users (each in a very small geographic area because microwave signals don't go very far), the 1300 to 1492 MHz spectrum also has no licensed users. None.

How can so much valuable, useful spectrum space sit there dormant, unused, when just a spectrum chunk away there are firms willing to pay hundreds of millions of dollars for virtually identical space?

The answer is bureaucracy. People put into spectrum management positions a decade or two or three ago who have grown "cosy" with the very firms they grant licenses to and with their international compatriots who fill similar positions in foreign countries. A decade back these spectrum managers brown bagged their lunch, went to an annual European conference or two with tickets and accommodations paid by government, and did their best to be unnoticed by anyone of importance. But when microwave chunks began to attract **big** economic attention, suddenly these folks were eating crayfish (lobster) salads for lunch and drinking wine with lobbyists from the telephone firms.

All of this happened so rapidly that no system of checks and balances on the private and dare we suggest it personal activities of the bureaucrats was in place to monitor who was getting "favours" for doing what. *It doesn't stop with lobster for lunch.* And not everyone can "hide" in southeast Asia from enquiring minds.

-ON THE COVER-

LNB(f) shrouded in cobwebs. It is not always an internal failure that shuts down the reception (p. 6)

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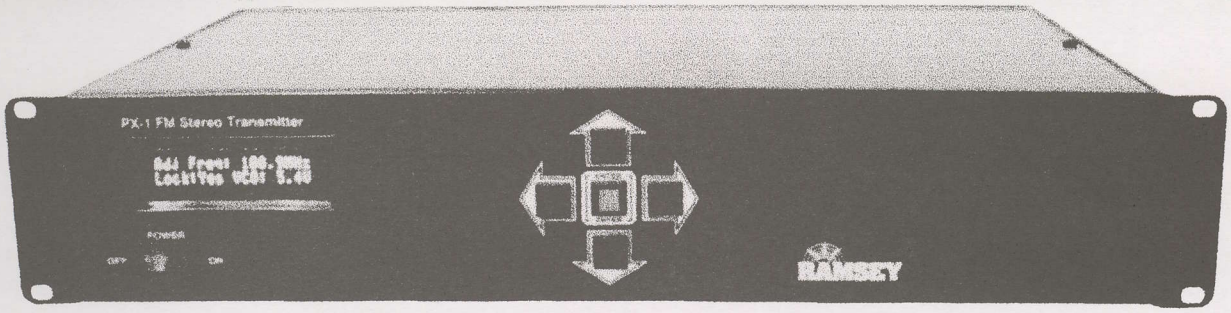

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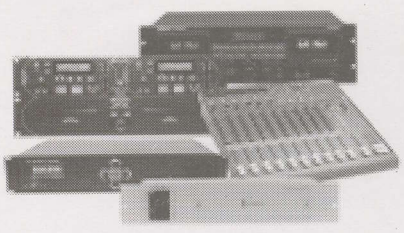

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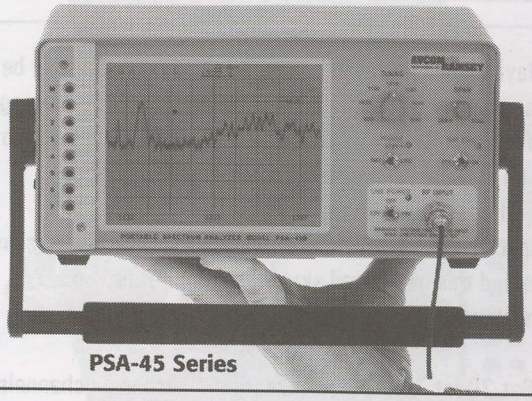

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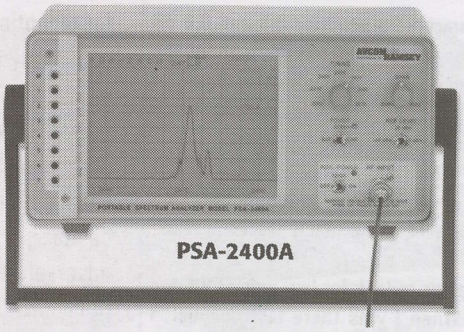
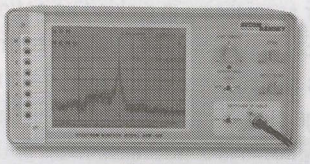


PSA-2400A



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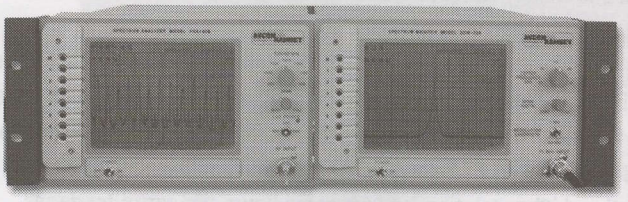

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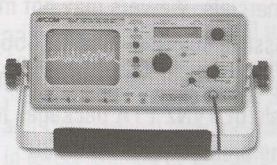

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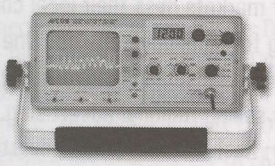

- 5 bands cover 1-1750 MHz plus 3.7-4.2 GHz
- Frequency display

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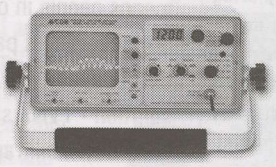
PSA-33A



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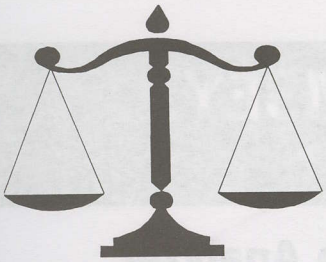


LETTERS

Restoration

"I am getting ready to do restoration work on my satellite dishes and am not sure which paint is appropriate for fibre glass dish panels. I have both solid and wire mesh type dishes, do they require different types of paint?"

L. DeBrum, Saipan

Use a flat (not gloss), acrylic, non-leaded based paint of a suitable colour; non-reflective white is OK while dark colours such as black tend to absorb heat which on a solid fibre glass dish is a no-no. On mesh dishes, the same advice but black is less of a heat problem (witness the preponderance of black mesh dishes!)

LNBs

"I see in February SF a need for 0.5 and 0.6 dB Gardiner LNBs for prime focus use. How about the Syntec 2000 which claims a 0.3dB noise figure? I have seen them for offset, and perhaps they are also available for prime?"

Craig Sutton, NZ

Anyone know if Syntec 2000 series are available for prime focus- and - where one contacts them or a seller of same?

"Dubai is the place to look for low noise LNB and LNBf products. When I was there last summer, I found 0.6 and 0.7K LNBs at the very nice price of US$20 each. I didn't look any further but surely if they exist, Dubai will have them!"

IL

OK - so Dubai readers - any 0.5 or 0.6 dB noise figure 12.25 - 12.75 GHz (LO 11.300) prime focus LNBs for sale there?

Teletext

"To be sure of the teletext capability of an IRD, they should be tested in both AV and RF mode. I have a half dozen digital IRDs and not one shows teletext through the AV sockets or SCART. However, on analogue, Israeli TV (LMI at 75E) has teletext and any TV receiver I tried produces the TT displays. Indonesian TVRI used to have TT on their Palapa C2M analogue service but when I checked it did not appear."

SG, Bangkok, Thailand

Illegal?

"I came across a text statement while exploring the Foxtel pay-TV channels which confuses me. It says it is illegal to 'watch pay-TV without authorisation'. I though it was illegal to hack the smart card or use a card which was not issued by the pay-TV firm; but not 'watching' the broadcast. Can you clarify?"

Arnold T., NSW

Australian law makes it an offence to deal in piracy equipment including but not limited to non-official smart cards. The law says nothing about watching pay-TV without authorisation and it also makes exceptions for private activities done in your home by you as long as you are not "sharing" your technology.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

MARCH 15, 2002

JcSat 8 to head (after delayed launch from December) to 154E and possibly be testing on C-band frequencies as early as April 10. SF published footprint coverage on August issue (p. 4) which shows 34 dBw (2.1m or even smaller dish) over all of Australia and NZ. But - only on vertical polarisation (because of frequency co-ordination problems with other satellites in region) in 3.7 - 4.2 region, plus, horizontal only in 3.4 - 3.7 spectrum. YES! We'd like full reports of reception signal levels and content when you find this one (Email skyking@clear.net.nz, fax ++64-9-406-1083). And check www.apsattv.com for actual launch and testing feedback.

InSat 3C has replaced InSat 2C (at 74E) and is collecting other Indian channels from InSat 2E as well - bad news for those who depended upon the older satellites for reception if you live in Australia. The 3C footprint is very tightly sculptured, apparently on purpose to prevent "spill over" not only towards Australia but Europe as well.

Sky NZ's "problems" with new set-top box operating software is apparently not over; reports from Sky installers say, "Many people are phoning us as an installer because the normal Sky toll free numbers are jammed for hours at a time and they cannot get through. Some of the older model Zenith decoders seem to be most adversely affected, they apparently would not accept the new software. For most problems, 'fix' is to unplug from mains and repower the unit."

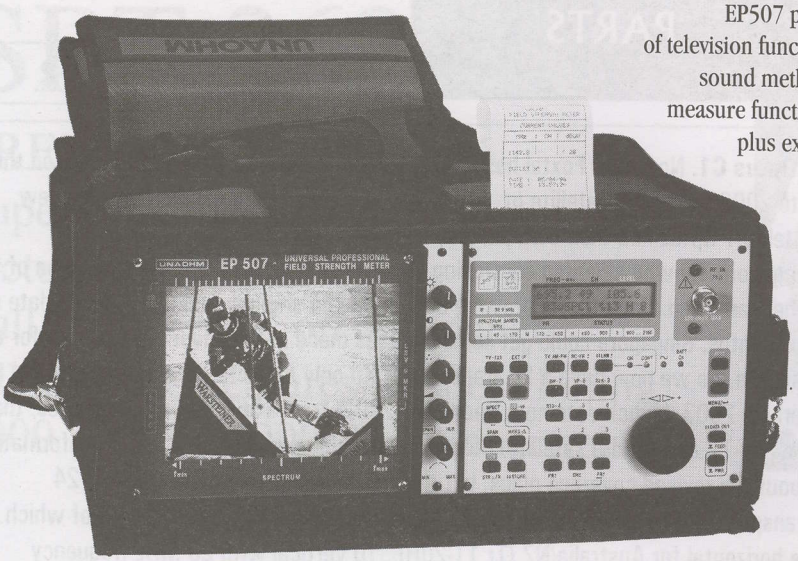
TARBS spending money. Television & Radio Broadcasting Services, Australia's pioneering foreign language provider specialising in picking up national language (ethnic) services in Europe, Middle East and Asia and bundling them into subscription packages, is expanding. TARBS has signed ten-year new contract with PanAmSat to transport their 50+ channel package outside of Australia for resale in North America and Africa using existing PAS-8 facility, PAS-2 (for relay linking), then PAS-10 for Indian Ocean/Africa and Galaxy XR satellite for domestic coverage inside North America. TARBS is calling export service "TARBS World Television".

Tech TV within "Now mux" on AsiaSat 3 (3760Hz) turned on PowerVu CA March 1 as promised; assistance in gaining access and locating a receiver is through Karen Kaufman Perlman, fax ++1-415-355-4055 or Email karenperlman@techtvcorp.com.

TVNZ's Optus B1 (12.456Vt) FTA service has been having teething problems. First, teletext quit, then high resolution, and for some hours the entire feed was turned off. Now back up running properly but uncertainty as to whether it will become permanent remains. Latest challenge: Sky NZ's carriage of same two services transmits only "national" and "Auckland" region advertisements which means people in other markets miss their local commercials. Viewers may not mind but advertisers paying for local coverage do! One possible solution - use 12.456 extra capacity to "switch in" regional advertising to Sky viewer package. Another solution - TVNZ stops selling regional advertising. Sale of TVNZ FTA packages has gone down hill rapidly; SatLink's TV Guide advertising created fewer than 30 enquiries nation-wide suggesting strongly that until TVNZ's 12.456 adds Prime, TV3 and TV4, Sky has "won" this commercial battle.

Wolf Radio. It appears FTA within Sky NZ bouquet, is actually used as link from South Island studio to 26 scattered (FM broadcast) terrestrial transmitter sites. Sky NZ leases receivers to Wolf at $25 each per month and gains additional radio service for normal home viewers in the process. Unfortunately, when Sky recently reloaded software to universe of decoders, Wolf's 26 quit working until restarted.

The growing Unaohm Television Analyser family



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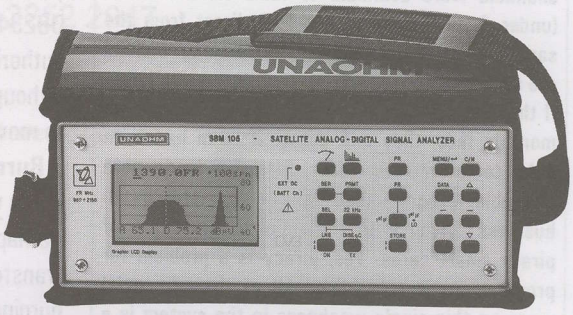

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Optimistic

"Reference your February editorial. My view is that every home wants television, and as a businessman I must find products and services that help people attain that simple goal. Digital TV is here to stay. Australia has selected the superior (COFDM) system which is supported by the recent back-down in Korea where ATSC was first adopted but now COFDM is being implemented. Better-than-analogue TV picture quality is available right here right now, for those who will invest in a set-top box. The market is small at the moment as the only people who want it are those in bad (analogue) reception areas and technophiles. We have reports of homes who's analogue was so bad they had virtually no TV and who are absolutely stunned by the perfect digital they now have. I recall sales of DVDs were slow to take off as well. We are in an industry with a great future."

Peter Lacey, Laceys TV, Victoria

The latest audit (1 March) says 12,500 set-top boxes have been "bought" by dealers but it does not tell us how many of these have gone to consumers. At the same time, 28,000 widescreen monitor/TVs have been sold to dealers (again - no report how many have gone to consumers) - the widescreen displays are being driven almost totally by DVD widescreen (16:9) display, not DVB-T/DTT. "*Better than analogue TV picture quality*", alone, will never make DVB-T/DTT succeed. People may talk about "picture quality" but the reality is they only reach for their wallet when there is something on the screen using a new technology that they can't receive with the present analogue equipment. DVD is such an attraction; DTT will be very slow to take off until the bureaucrats and politicians wake up to the basic premise: "*People buy quantity of TV, not quality.*" The rules prohibiting new programming on DTT/DVB-T are totally at fault for the present failure of digital terrestrial to grow. Allow 7, 9 and 10 to broadcast totally different, unrelated programming and stand back for an explosion in DTT/DVB-T growth!

RemiTV's bankruptcy

"I suggest your analysis of why Reminiscent TV failed as an optional Aurora service may be too simplistic. Perhaps there were piracy cards out there and perhaps Irdeto and/or Optus erred by not making a stronger effort to correct that fault. But in my opinion, RemiTV failed because they had very little to offer in Australia. Their two initial channels were available to folks with smallish (under 2.1m) C-band dishes FTA direct from the same satellite Remi used for their linking. Indians are no different than any other ethnic group here - if they can install a less costly system and pay no monthly fees, they will do so. If Remi had been able to offer new and different (and more desirable) programming, they would still be in business - even with the reported onslaught of piracy smart cards. Yes, piracy is a problem for programmers but to blame all of their financial woes on this single weakness in the system is a mistake."

L. Senior, Strong Technologies Pty Ltd.

HARDWARE EQUIPMENT PARTS UPDATE

MARCH 15, 2002

Optus C1. Now that Foxtel has leased 12 (some say 14) Ku transponders on this late-2002-to- launch satellite (p. 14), what exactly can we expect from the new satellite? Optus had their own plans prior to mid-2001 and then along came Singapore Tel who acquired controlling Optus interests, including the operation of C1 when launched. Back to the drawing boards - if the original June-July launch date slid six months, Singapore could get some changes made in the coverage patterns for the satellite. So we now have a 24 transponder Ku-only satellite to go into operation early in 2003 (launch date now December 2002) from 156E; replacing B3. Yes, that's the pay-TV and Aurora satellite. Singapore has clamped a tight lid on any information about the revised coverage plans, but this much we believe to be true: (1) 24 transponders from 12.250 - 12.750, each typically 41 MHz wide; (2) 10 of which will be horizontal for Australia/NZ (Tr 11-20H) , 10 vertical with 20 MHz frequency offsets (i.e. unlike PAS, opposite polarities will not share a common centre frequency), transponders 1 - 10V, (3) three beams on board - selectable by the user - (a) "National A/NZ beam" which coverage maps show will be 65cm dish size from Perth to Sydney/Melbourne/Brisbane while Darwin and Adelaide will require 1.5m , (b) "National B/North Asia" (user switchable) and (c) "North Asia" (the last 4 transponders, all horizontal in polarity; 21H - 24H). By replacing B3 at 156E, no dish repointing will be required but downlink frequency changes seem inevitable with Aurora and Foxtel-Austar perhaps trying to command their respective receiver universes to shift to new frequencies by downlink command. Work ahead? If Foxtel is going to lease more than 10, it is inevitable they will be using both polarisations; some interesting new polarity switching challenges are ahead for the universe of single polarity dish systems! The changeover date should be a day/week to long remember (or forget if you don't like hassles).

SA PowerVu products. The variety of PowerVu models capable of handling PowerVu's unique format has grown since we last visited the subject. So have the prices. For example, PowerVu Plus D9228 multiple decryption receiver is US$5,995 but it will decrypt two same-MUX data streams simultaneously. 4:2:0 or 4:2:2? Model D9224 at US$3,995. The original D9223? Six different versions ranging from US$1595 to US$2795. Least expensive? D9234-Lite at US$850. Unfortunately, there are North American versions and "other region" versions for virtually all of the options offered making IRD selection (by part number, not by model number) a challenging task. Assistance from Joy McNeel at joy.mcneel@sciatl.com. Oh yes, if you are in (US) military and allowed to shop at Military PX stores in Europe, the D9234-Lite is discounted there to under US$600. At this time AFRTS is not authorising military personnel in Asia-Pacific to have private AFRTS receivers although in Europe they do so. Rumour has it AFRTS on I702 (176E, 4177 LHC) plans to move to a Ku band transponder late 2002 - early 2003.

Burning varnish smell? Some receivers run hot - we all know that. But do we know why or what this could mean in terms of health and safety for the user(s)? Perhaps not. SatFACTS has uncovered a receiver we believe is using 60 hertz AC transformers in our 50 hertz environment resulting in not only a strong smell of burning (transformer coating) varnish but raising possibility user could be exposed to mains voltage if the transformer laminations "melt". Details on p. 31.

Latest cable TV set-top box from Asian firm Fukuzawa has interesting A-V output in addition to RF output. Unfortunately, unit has been designed for NTSC (America) only and while it does work in Pacific, you need a multi-standard TV receiver.

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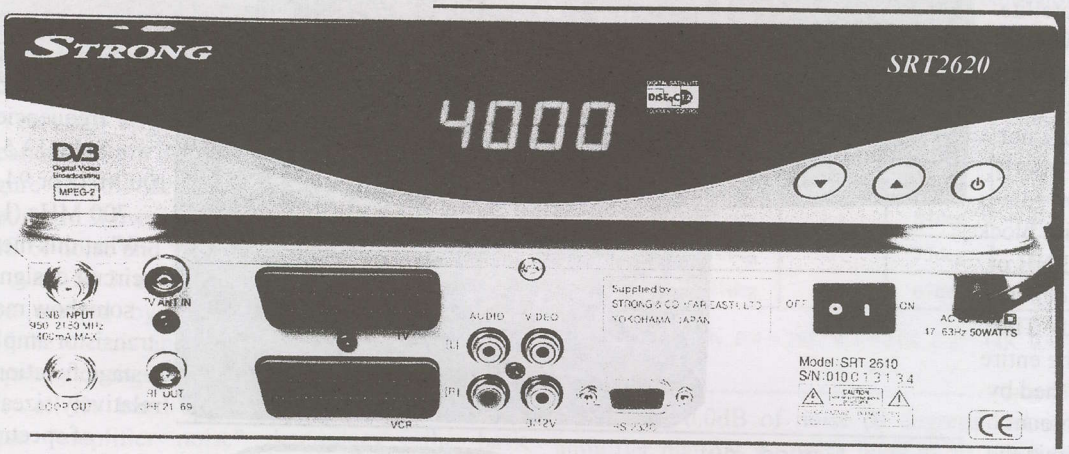

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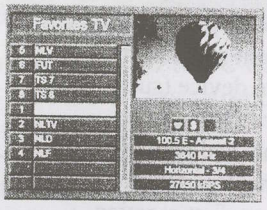

PIP Menu

STRONG Technologies PTY LTD
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Tel: +61 3 8795 7990 - Fax: +61 3 8795 7991

LNA = LNC = LNB = LNBf

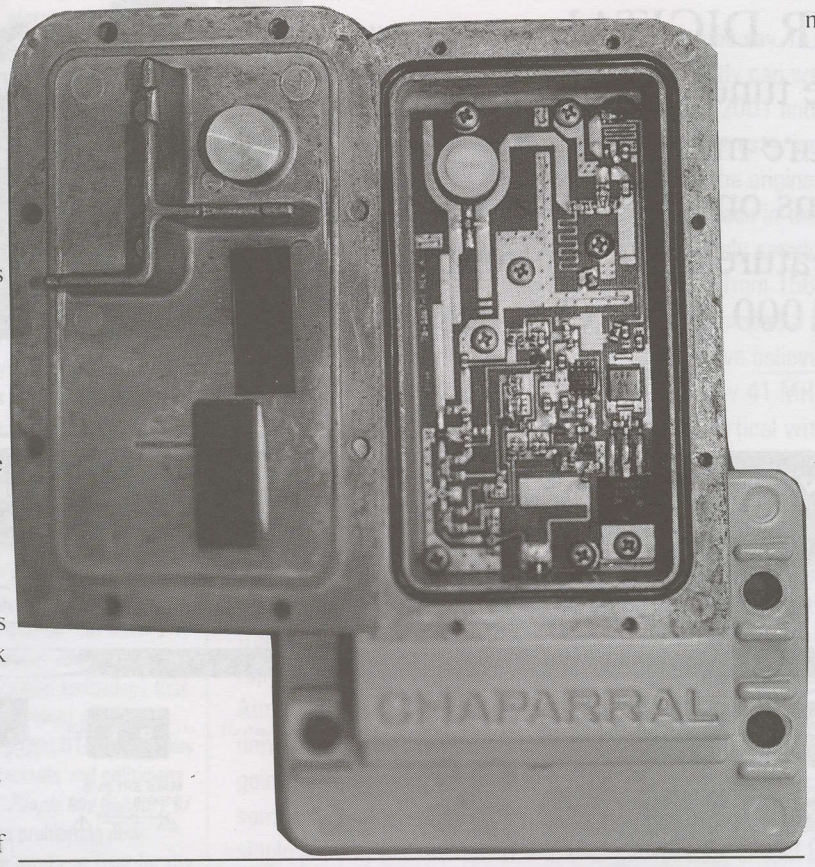
They have gotten dirt cheap - but do they work any better?

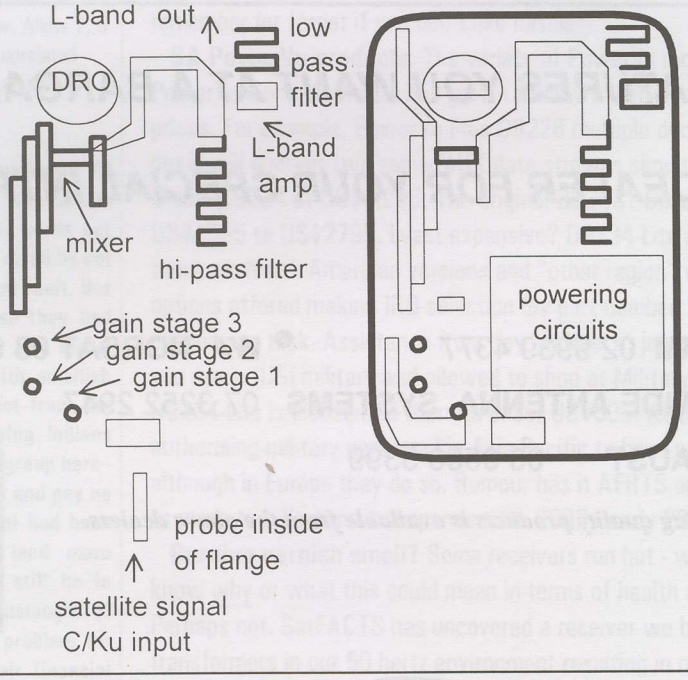
In the home or commercial satellite system equation, some minimum number of "dB (decibel) circuit gain" must be in place and functioning or system performance suffers. Some of this "gain" comes from the passive (non-electronic) antenna, some from the antenna mounted amplifier, still more from the satellite receiver proper. When the total gain is below some specified minimum, the system either does not work or functions poorly. The least tolerant gain is within the low noise block downconverter (LNB or LNBf where "f" denotes an attached feed). The performance of the entire system is established by the quality and amount of amplification within the LNB. There are two sides to this equation: (1) the *amount* of gain (which can be measured in dB), and, (2) the "*quality*" of that gain which is measured in the noise level performance of the LNB.

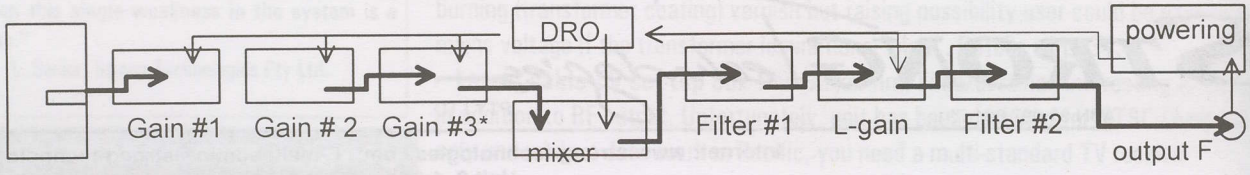
Gain created is a function of the number of gain stages, and, how those stages have been designed to operate. Gain comes from some form of solid state device (such as a microwave graded transistor) and when you inspect these parts (photo, right) your first reaction may be these are very tiny items. Transistors that will create useful gain at microwave frequencies are a relatively recent development. Most satellite downlink bands are 500 MHz in width (spectrum space); i.e., 3,700 - 4,200 C-band or 12,250 - 12,750 Ku. As a percentage of operating frequency, 500 MHz is 13.5% at 3,700 MHz and 4.1% at 12,250 MHz. To compare that to more commonly understood VHF frequencies, 13.5% would be 13.5 MHz at 100 MHz or 94.5 MHz at 700 MHz (UHF).

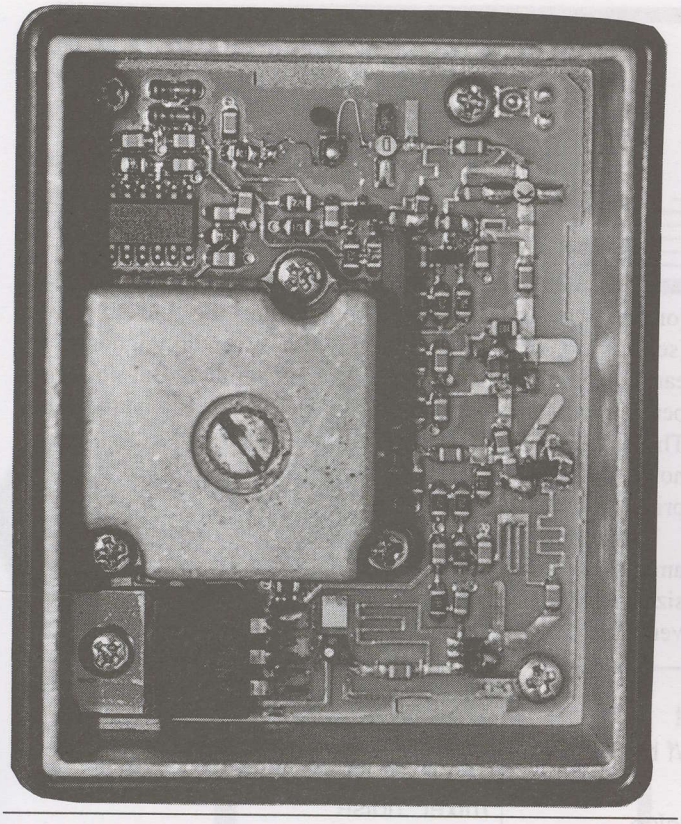
What this means is the circuit designer must somehow make the transistor amplification stage function over a relatively sizeable chunk of spectrum.

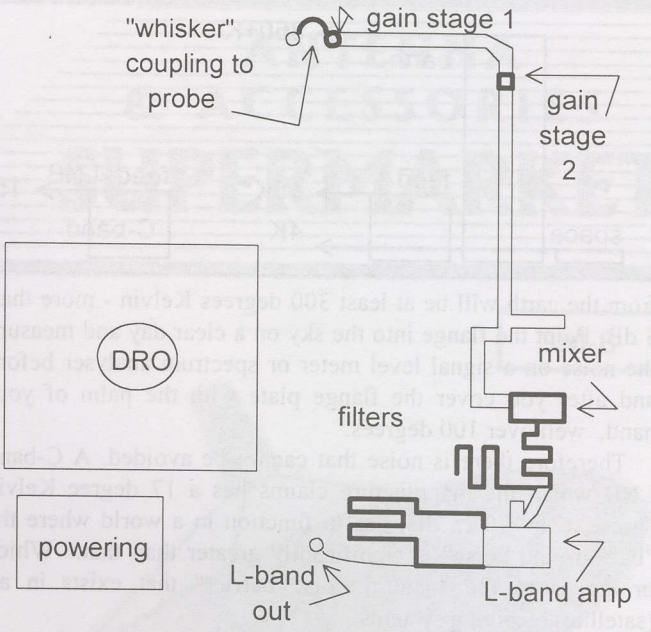
"Function" versus "optimum performance" is a challenge when it comes to the noise level performance of an amplifier stage. Any radio frequency amplifier can be optimised (tuned for) maximum gain over a narrow range of frequencies, or it can be tuned for less than maximum gain over a wider range of frequencies. Or, and this is the tricky part, it can be tuned for lowest noise factor and some less than optimum amount of gain over a wider range of











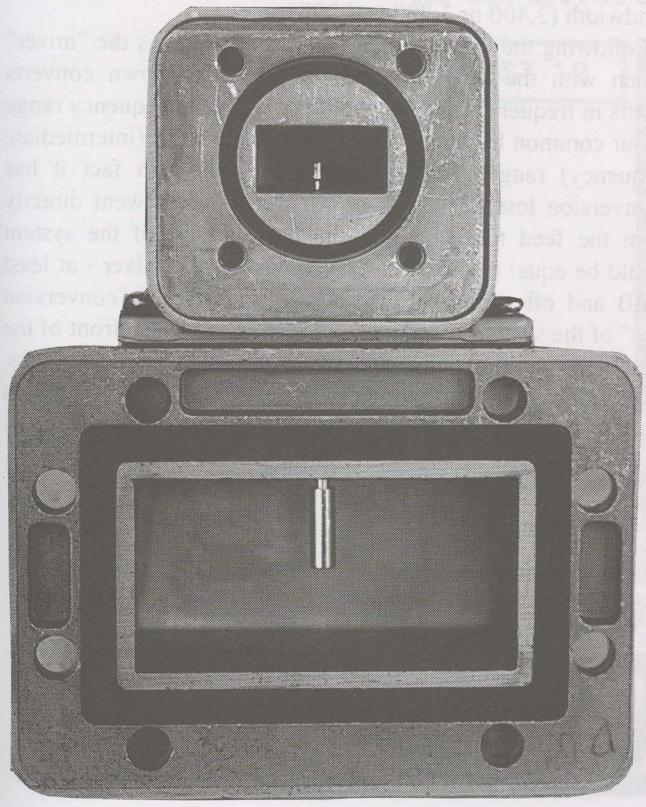
frequencies. Years ago when each LNB arrived with a "report card" specification sheet in the box, you were told the gain and the noise figure for the device at different frequencies. A common sheet might show 0.7 dB noise and 55.4 dB of gain at 12,250, 0.8 dB of noise and 57.1 dB of gain at 12,500 and 0.6 dB of noise with 54.3 dB of gain at 12,750 (MHz). The variations are created by the slightly different operating parameters of the circuit and the parts in the circuit as the operating frequency changes. The noise quality or noise figure is for virtually all Ku band applications the most important factor because "amplifier noise" determines the basic "sensitivity" of the entire receiving system. C-band noise is measured in degrees Kelvin while Ku-band noise is measured in decibel units. Noise is noise regardless of the measurement system as the following comparison shows.

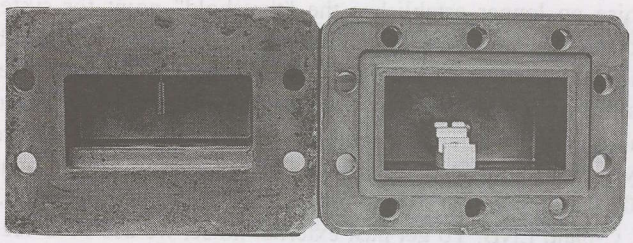
Noise in dB	Noise in Kelvin	Noise in dB	Noise in Kelvin	Noise in dB	Noise in Kelvin
2	170deg	1.2	92deg	0.8	59deg
1.5	120deg	1.1	84deg	0.7	51deg
1.4	110deg	1	75deg	0.6	43deg
1.3	101deg	0.9	67deg	0.5	35deg

For C-band only: 0.4 = 28K, 0.3 = 21K, 0.2 = 14K, 0.1 = 7K and 0.0 = 0K.

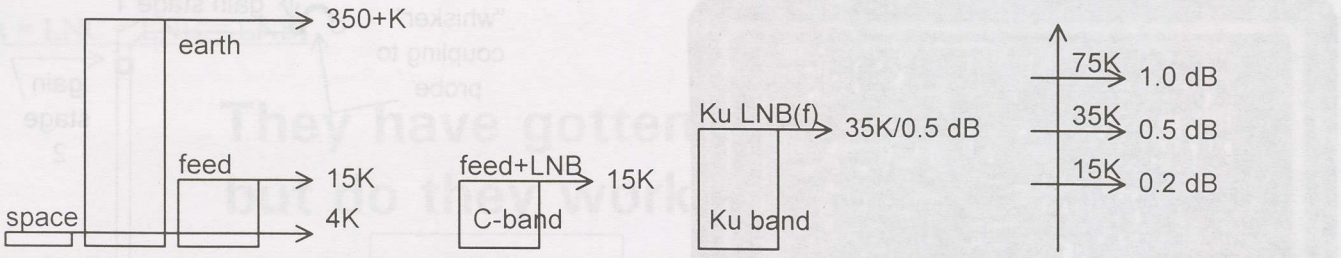
Ideally, 0.0dB of noise (0 degrees Kelvin) would be an amplifier that has no noise level at all. As a practical matter, when electricity flows through a circuit, transistors (and attached parts) generate noise. Anything that "moves" electrons (or atoms) creates noise so the instant you apply electricity to an LNB, it creates noise of its own. With a suitable antenna and amplifier, you could measure the "cosmos" noise from interstellar space at something greater than 4 degrees Kelvin. Or power up an LNB even without a feed and lay the open flange down facing ground. The noise

Left - One-third the size. Ku-band waves are 30% the length (size) of C-band, which makes the "waveguide" opening, probe signal processing circuits one-third the C-band size (Ku top, C is on bottom)





Above - two different approaches to the C-band probe. Standard plated tube (left), stair-stepped "wideband" design (right).

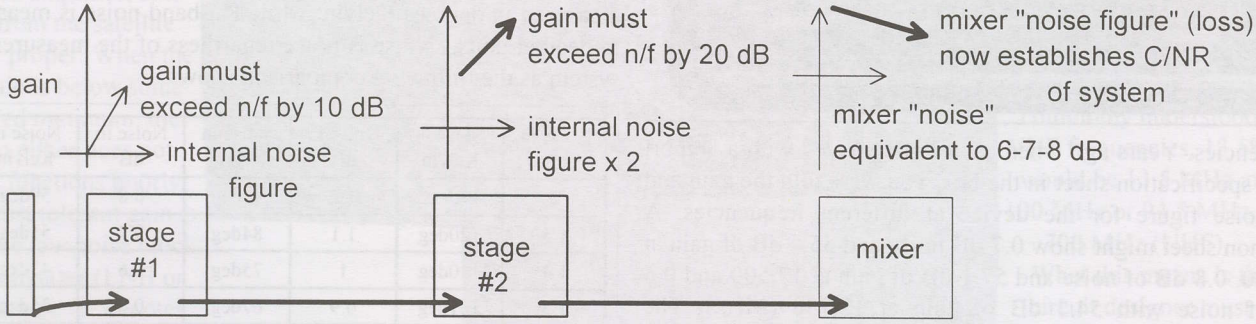


from the earth will be at least 300 degrees Kelvin - more than 3 dB. Point the flange into the sky on a clear day and measure the noise on a signal level meter or spectrum analyser before and after you cover the flange plate with the palm of your hand; well over 100 degrees.

Therefore there is noise that cannot be avoided. A C-band LNB which the manufacture claims has a 17 degree Kelvin "noise temp" (0.25 dB) has to function in a world where the "background noise" is significantly greater than that. Which brings us to the "natural noise barrier" that exists in all (satellite) receiving systems.

(or the "f" in LNBf) to concentrate the pickup power (sensitivity) on the surface of the dish, essentially ignoring the earth or buildings beyond the edge of the dish. But no feed is perfect and some noise from external sources is unavoidable. The "trick" with the LNB + feed is to minimise the external noise contribution leaving the LNB's gain stages as the primary source of system noise.

This is done with some quantity of C or Ku band solid state amplifiers. Because the amplifier stages must function over a sizeable bandwidth (3,400 to 4,200 for the extended C-band versions; 23.5% of the lowest operating frequency), the gain

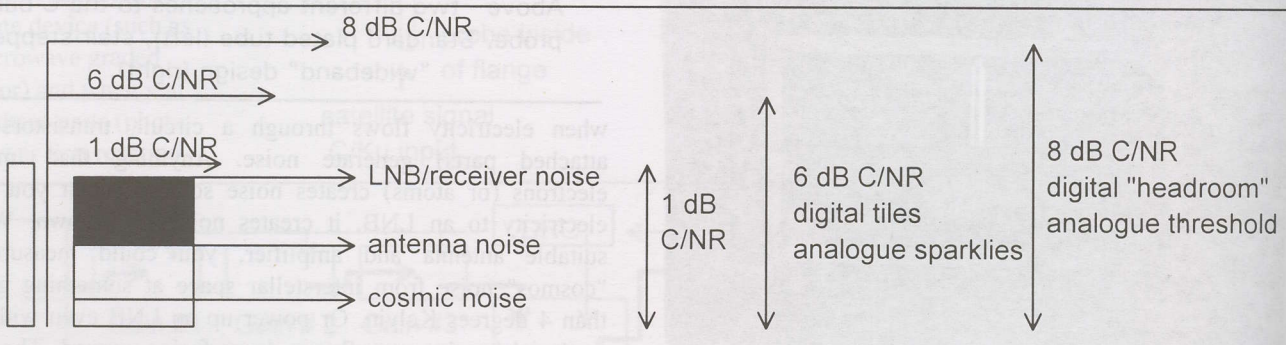


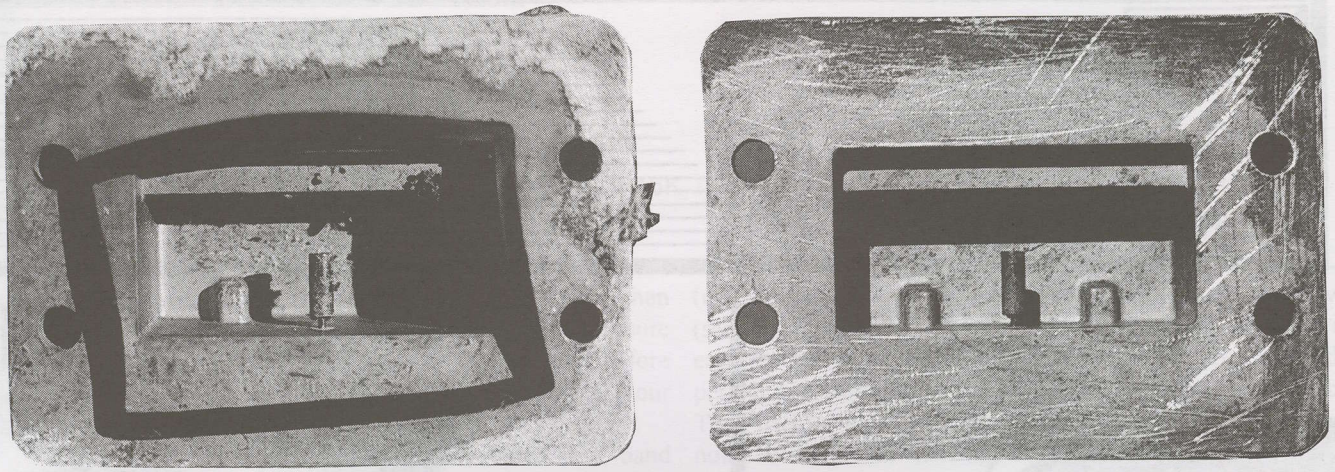
Noise from two or more sources can (1) add together to create a new (higher) noise level (1 + 1 = 2) , (2) "integrate" such that the second noise source blends in with the first (1 + 1 = 1) or (3) actually cancel (1 = 1 = 0). Most commonly the sources add when they are external to the equipment (a car with bad spark plugs driving by the dish) but can be made to integrate or even cancel with some clever engineering provided the sources are *internal* to the equipment.

External noise originates before the LNB and when it is greater than the noise figure of the LNB, the LNB's lower noise no longer establishes the "threshold" point for system noise. An extreme example of this is solar noise, created by the sun. When at equinox period (right now for many readers as the sun crosses the equator) the sun aligns directly behind the satellite of interest, noise generated by the sun is captured by the dish and feeds into the LNB. This noise often reaches 500 degrees Kelvin which makes a mockery of your 17 or 20 K C-band LNB. To get past external noise, we use LNB feeds

is "staggered" through multiple stages. The first stage is typically designed to cover only a portion of the C (or Ku) bandwidth - such as 3,700 - 4,000 while the second stage covers the remainder with an overlap (such as 3,900 to 4,200). The "sum" of the C or Ku band stages equals the full bandwidth (3,400 or 3,700 to 4,200).

Following the C or Ku band amplifier stages is the "mixer" which with the help of the local oscillator down converts (shifts in frequency) the original C or Ku band frequency range to our common L-band (950 - 1450 or higher) IF (intermediate frequency) range. The mixer has no gain - in fact it has "conversion loss." If the C or Ku band signals went directly from the feed to the mixer, the noise figure of the system would be equal to the "conversion loss" of the mixer - at least 6 dB and often more. To minimise the adverse "conversion loss" of the system, there must be sufficient gain in front of the mixer (i.e., the first gain stages) to swamp or override that loss. The amount of gain required depends upon the conversion loss





It went south (left). Chaparral LNB fitted to hybrid (dual) mode feed became sanctuary for spiders and their prey changing characteristics of "flange well" and probe. Cleaned up (right) it still refused to play properly.

of the mixer. If we label "conversion loss" with its loss = noise figure, a 6 dB mixer loss requires something approaching 20 dB of low noise gain in front to eliminate the effects of the mixer.

Following the mixer we find L-band gain, sufficient to allow the entire package to create an overall gain of at least 50 dB from the input to the first C or Ku gain stage to the output F fitting at L-band. A LNB with 55 dB of claimed gain actually has 55 dB + the loss of the mixer in "real gain" (61 dB in our example).

Matching

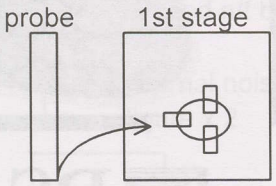
Consider a home garden watering system. You start with a 12mm plastic hose and connect it to a 19mm faucet. The 19mm faucet runs at maximum capacity but at the connection to the 12mm hose we have 58% more water by volume than the 12mm hose can carry.

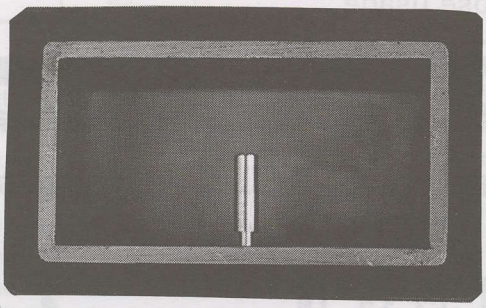
Electronic stages work in a very similar fashion. The probe at the front of the LNB - that typically gold or silver coloured device you can see at the opening of the LNB flange - is a "hose" to catch the droplets of satellite signal funnelled into the system through the feed. As the "hose" has a diameter, the probe has electrical parameters created to ensure the maximum amount of probe intercepted signal is transferred into the LNB's first gain or amplifier stage.

But the probe is only half of the "input antenna" for the LNB. The other half is the rectangular "hole" or "well" surrounding the probe. The dimensions of the "well" determine with the probe the operating frequency and the operating "impedance" of the input circuit to the first gain stage.

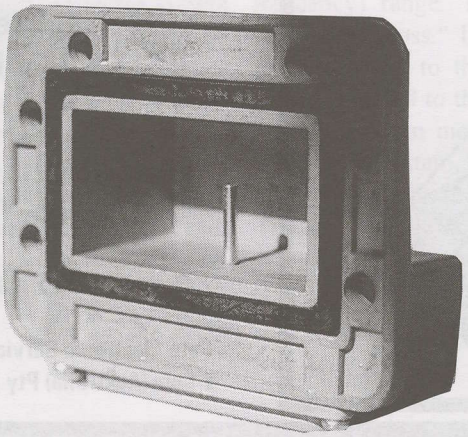
Any foreign objects that take up residence inside the well or attach to the probe change the operating characteristics

When input impedance is set by probe alone, any change in probe is bad





A "clean" probe is a happy probe!



"Gasket seal" for most LNBs fits into groove, can be "tacked" in place with water soluble grease or Vaseline to ensure it does not move out of groove during installation.

of the probe + well. Furthermore, the probe's skin or surface is adversely affected by corrosive elements which change the natural conductive properties (surface resistance) of the probe.

As the diagram (left) shows, the probe in some (many, actually) LNB designs is directly attached to the input of the first amplifier stage (see photo at top of p. 7). This means there is nothing to "isolate" (keep apart electrically) the exposed probe and the actual transistor device; if you power up the LNB and touch your finger to the probe, your finger has just become a "part" of the LNB's amplifier circuit.

LNBs generate heat which attracts creepie-crawlie creatures. If there is an access way into the feed and from the feed to the probe, the flange-well makes a desirable shelter for bugs. It is possible to do permanent (electrical) damage to the first gain stage by allowing anything to come into contact with the probe proper.

It is also possible to change the operating characteristics of the LNB by having a family of spiders (plus their trash) occupying the flange well. A spider web wrapped around the probe and then connecting to the metal wall on the flange well will if the web becomes moist conduct, creating a resistance path from the probe to the well ground. It is akin to "shorting" the probe out, and it will definitely alter the probe's impedance such that like our 19 to 12mm water hose connection, not all of the probe's satellite energy is carried into the first gain stage.

Moisture inside the flange well, with or without creepie crawlies, is an especially bothersome problem. When in doubt, seal everything up with a water soluble grease such as Vaseline.

HONEY - they *shrunk* the receiver!

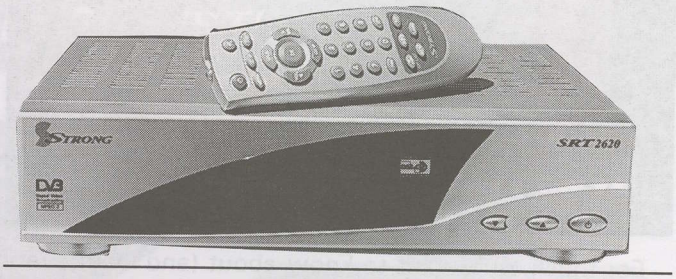
STRONG Technologies SRT 2620 is analogue make-over

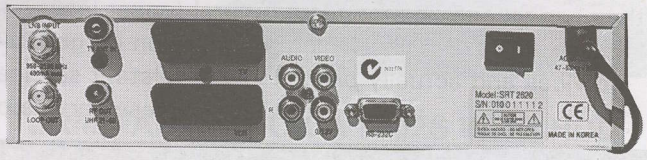
When you design satellite receivers to pack in saddle bags on the back of camels, they tend to be small. The Middle East and the Arabian Peninsula are especially active markets for satellite equipment these days and when people live in tents and travel light, smaller is a sizeable advantage for sales. The Strong Technologies SRT 2620 is the most recent example that size matters only when it is small and getting smaller with each new generation of digital IRD.

They claim it weighs 2 Kg. Our's weighs less. It measures 260mm by 60 by 185 and the companion remote is absolutely tiny - if you have difficulty keeping track of standard remotes, this one will need a minder or its own beeper.

Having been shrunk does not appear to have affected in any adverse way the performance of this FTA receiver. One of the nifty pluses about seeing (for test and review) most of the newer models is to observe how much more friendly each successive generation of receiver becomes. That is not a brand name statement - it means that as software creators get a better handle on what users *really* would like on their screen to guide through the always worrisome receiver first-start routine, the steps have become more integrated and the results more positive. We've said it before (most recently with the eMTech 200) and doubtless will repeat it again with the next unit to be tested - set up has never been easier, more foolproof, quicker. These software guys finally have had some (apparent) input from the people who create software for automatic loading of terrestrial TV channels on the current versions of analogue home receivers. Even the menu for the 2620 has a very familiar "look" to it (very similar to Philips' latest TV set tuning procedures).

There is slightly more "innovation" to the 2620 than the shrinking of the package. For example, as the twin photos below illustrate, this is a "tiered" board design. One way that receiver manufacturers pack more parts into a given space is to use 2, 3 and 4 layer boards. Anything that goes past 2 layers is extremely costly to produce and that ends up raising the price of the product. Strong's designers had a perhaps original





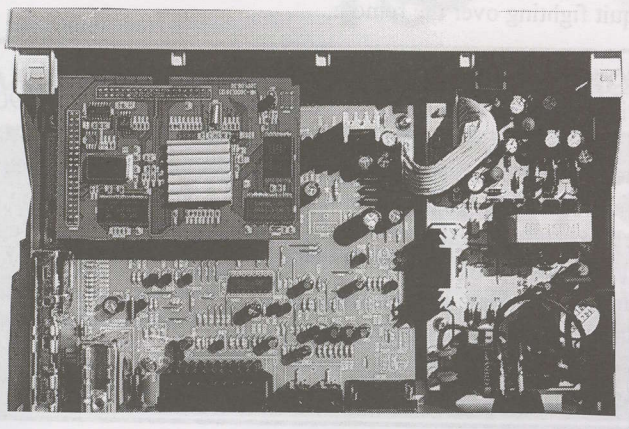
thought - stack two *separate*, related but not identical circuit boards into an air insulated sandwich. That means more air flow between parts, cuts down on heating, and does some amazing things to costs.

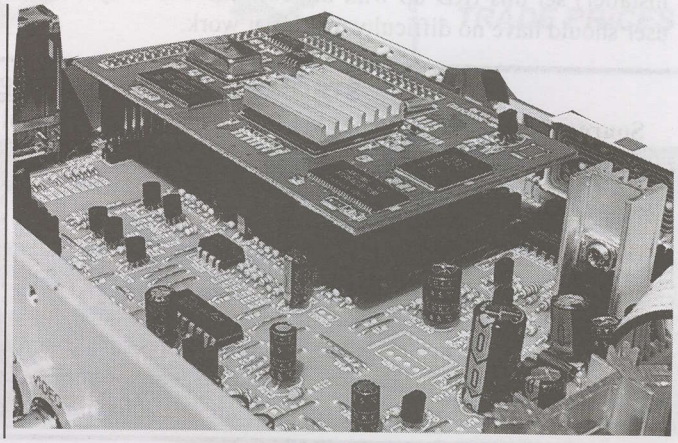
The essence here is the bottom board shown houses all of the post-detection video and audio processing circuits as well as the basic channel hopping and display functions. In fact (here's the cute part) this same board could - in fact does - the same functions for an analogue receiver as a digital version. That means they have worked out a way to employ analogue boards and technology as the "base" for the tack-on-top digital processing. Which is of course what the smaller upper board does; *process* digital. (Yes, the same "bottom" could be used in an analogue receiver by substituting a analogue processor on the top board.)

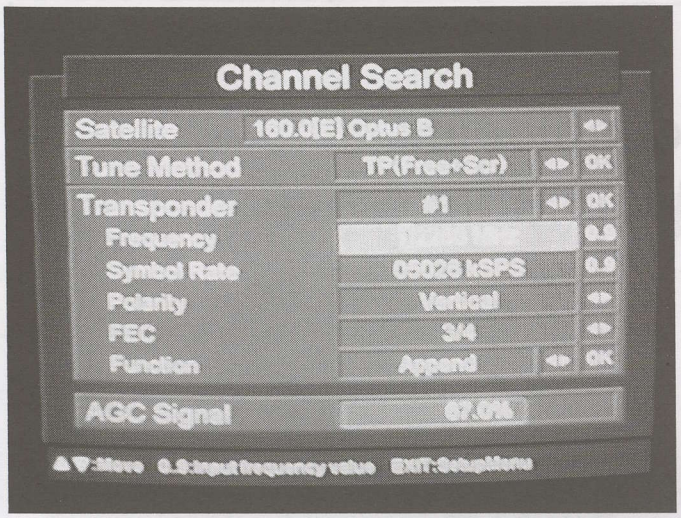
None of this has an adverse impact on how the SRT 2620 performs - unless you believe that after millions of analogue receivers built they probably have the bugs worked out of the video/audio processing segment on the bottom. Innovation is especially nice when it goes backward!

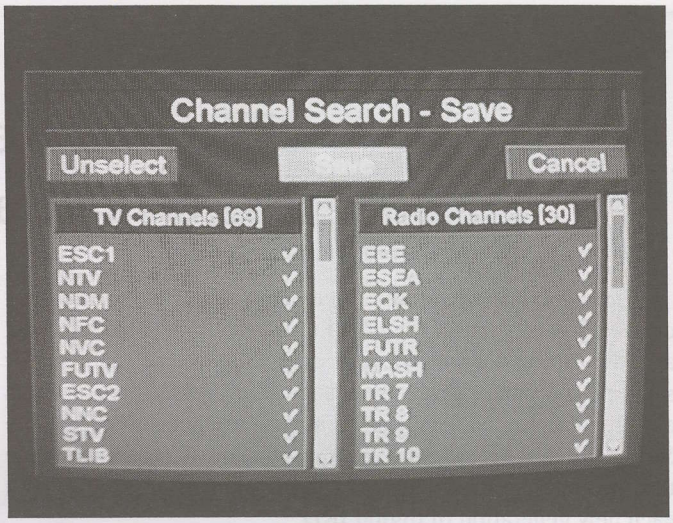
Like most digital IRDs you start off by doing "Antenna Set-up" (telling it which LNB and switching system you have

Digital board sits on stand offs in upper right front corner (here - left upper) with power supply in right hand third of enclosure. And the entire case could be "shrunk" even further as digital board (right) shows.

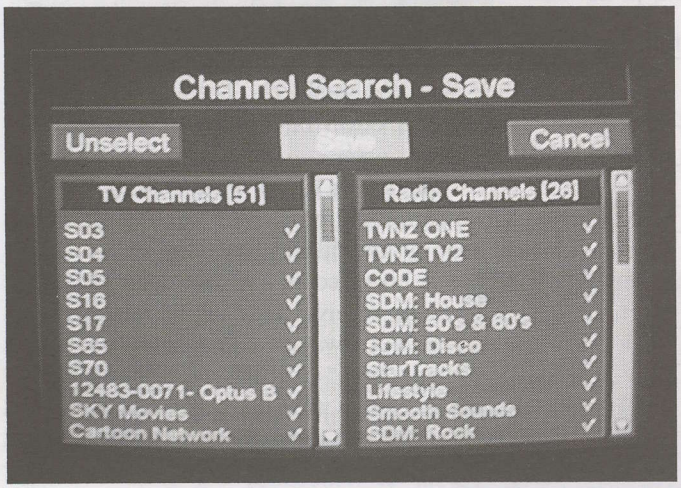


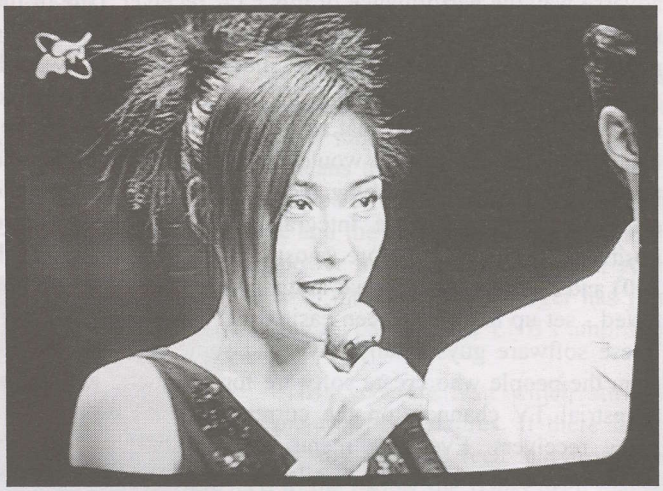






For those who want to know about (and load) everything on the birds, the "Free + Scrambled") option on the channel search menu is a natural (upper left). For example (upper right) there is the full load of AsiaSat 2 services (3640Hz) which on occasion do go FTA. On Optus B1, for NZ, it loads all of the FTA + CA services and actually *plays* TVNZ's teletext service (lower left). Quality is excellent as this popular (SCPC low res) Chinese service on As2 illustrates (lower right).





connected) , selecting their in-memory satellite(s), pointing the dish at the selected satellite, and then asking the receiver to scan through the full roster of memorised channels and parameters to see if there is signal present. When there is, the receive blinks for a fraction of a second, loads it to the permanent operational memory and moves on to the next memory channel. This is a quick operation, slightly slower than the eMTech 200 but faster than most others. You can of course search by satellite, by transponder (they call it "channel") or by various sub-menu lists (for example, "Favourite"). The bottom line here is that once you (the installer) set this IRD up with the customer's dish system, the user should have no difficulty making it work.

Performance: Video and audio quality are top notch, as good as digital gets. The sensitivity we measured was in the region of 5.6 dB Carrier to noise ratio for threshold which means there are few (if any) receivers that do any better. The receiver runs very cool (we measured under 22 watts draw; they say 30 maximum), covers the range of AC hertz (47 - 63 hertz) and AC mains voltages (100 to 250V AC). We did not test it at the upper voltage end (250 or heaven forbid the often found Australian rural "standard" of 260+). The only major problem a user is likely to have is keeping track of the tiny remote control which hungry camels might devour. Or figuring out how two of the 2620s can be afforded so the family can quit fighting over the remote.

STRONG Technologies SRT 2620 MPEG2 FTA DVB Receiver

Source: Strong Technologies Pty Ltd. , Unit 2 1-3 Westpool Drive, Hallam, Victoria 3803, Australia. Tel +61 3 8795 7990, Fax +61 3 8795 7991. **Symbol rate range**: 2 to 45 Mbps (SCPC and MCPC). **Processor:** 32bit operating at 60 MHz. **Data rate**: Up to 15 Mbit/s (more than adequate for HDTV with video resolution up to 720 x 576; 4:3 or 16:9 display). **Video format**: NTSC/PAL/SECAM with auto conversion to any output format. **Video and audio connections**: RCA x 1 video, RCA x 2 audio, SCART with RGB, CVBS and audio. **RF modulator:** User settable over 470 - 860 MHz in PAL B, G, I and K formats. **IF range** (tuning coverage): 950 - 2150 MHz, RF loop-through for additional receivers (storage for 3000 TV, 1000 radio channels). **LNB supply**: 14 and 18V switching, up to 400 mA load; plus, 22KHz and 0/12V. **DiSEqC**: Version 1.2 compatible. **Teletext**: Yes indeed, VBI (vertical blanking insertion) of standard (whatever that is!) TVNZ teletext and ABC/TVNZ closed captioning. **Adding transponders**: Easy to do, allows PID insertion. **On screen display**: 8 possible colours (OSG) plus 16 levels of transparency (allowing you to determine how much video you will allow to "show through").

Rational? -

Foxtel-Optus joining of hands is harbinger of new pay-TV order

The announcement was a surprise - following months of rumours that had (1) Optus and Austar merging or joining forces, (2) Foxtel building and launching its own satellite (for which it paid more than a million dollars to the Australian government for a "license fee" to use Australian reserved orbit space), (3) Austar going out of business (see p. 2), Foxtel changing from Irdeto to NDS encryption, (4) Foxtel's two minority partners (Packer and Murdoch) selling out to 50% owner Telstra - it all came down to saving money and plodding ahead pretty much as they are now configured.

The basics. Optus is no longer an Australian operated firm. For a number of months, Australia's pioneering satellite firm has been majority owned by Singapore Telephone (SingTel). What the new owners intended to do with their acquisition has been the subject of massive, usually wild guestimate, speculation. With the acquisition, SingTel took over a project nearly completed - the fabrication of the next generation Optus satellite, C1. This new satellite (as reported on p. 4 here) C1 was originally hoping to go into service midyear 2002 - this year. But the SingTel take-over occurred just in time to create a delay while the new offshore management folks reviewed what it could and would do when launched. There will now be 4 Ku band transponders boresighted on Asia and another group of up to 10 which can be "switched" for Asian coverage. In other words, the domestic satellite family of Optus was modified to become an international satellite system.

Optus has three choices with C1: (1) Put it into an orbit location (such as 164E) where no Optus satellite is currently operating (you may recall Optus B2 failed during launch and might have otherwise been at 164E today), or, (2) put it where B1 is (160E) and move that satellite to 164E, or, (3) put it where B3 is located (156E) and move that satellite to 164E. Putting C1 at 164E would be clean and simple - a new bird at a new location with a clean start-up. Well, almost clean. From 164E there was "that problem" with PAS-8 at 166 (or 166.5)E. With both satellites operating in the 12,250 - 12,750 MHz band, and only 2 (or 2.5) degrees apart in space, it would be difficult to make 65 or 90cm dishes play properly. Most satellite engineers agree that 4 degrees apart is the minimum "safe distance" for high power DBS (direct to home) satellites working to dishes under 1.5m in size.

In November -

Foxtel subscribers gain ...

Animal Planet
ESPN
MTV
Odyssey
Oh!
Ovation

Optus (cable) viewers gain ...

Channel V
Comedy Channel
Discovery
fX
Fox Kids
Hallmark
(the) History Channel
Lifestyle
musicMax
Nickelodeon
UK TV
TV1

As soon as April -

Optus will gain access to Fox Sports and Fox Sport 2 which will be labelled "Optus Sports 1 and 2" to viewers

Foxtel claims 770,000 cable + satellite subscribers, Austar claims 420,000 (primarily satellite only except in NT) while Optus says it has 270,000 (primarily cable)

When PAS-8 went to 166(.5)E there was a "minor" disagreement with the Australian folks. The original PAS-8 plan, or at least as the Australians relate the story, was that PAS-8 would not use the same frequency band as any future Australian satellites - from 166E. Because from 166E that would preclude a later-launched Optus satellite from using 164E to their best advantage. How this disagreement was resolved was never announced but at least one PanAmSat source told SatFACTS, "*money changed hands*" - to Australia.

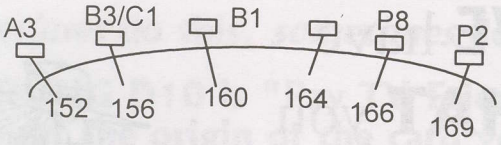
So that leaves 152E, 156E and 160E as potential homes for C1. Well, 152 and 150 are 2 degrees apart and JcSat (4) sits at 150. They radiate little south but from Singapore and "North Asia" having C1 only 2 degrees separated could be an interference challenge With "foreign" birds at 148, 150 and 166E, the Australian-Singapore planning was "boxed in" on both sides.

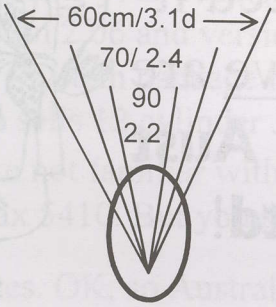
Now add a new element to the equation. Foxtel. First Telstra on behalf of Foxtel talked the Australian government into accepting a plan for a new orbit spot. Their stated plan was to make it even more difficult for Optus to operate inside "the box". Foxtel let it be known it was considering launching their own satellite and if they did that - the Foxtel pay-TV traffic would move away from Optus altogether. Now the folks in Singapore had a real challenge - the financial difference between having Foxtel on C1 and losing Foxtel altogether was going to amount to A$40 million a year. In ten years, A$400 million. Which works out to be just about the cost of C1's commercial transponder portion. With the threat of Foxtel bailing off of Optus altogether, even becoming a competitor with transponder space of their own to lease to others, Singapore suddenly woke up to the seriousness of the threat. What Singapore had going for them was time - from a dead stop start, Foxtel would be nearly 3 years getting a "Foxtel bird" up in the air. C1 on the other hand was not more than 12 months away. And Foxtel, Singapore believed, needed space sooner not later because the future growth of Foxtel (the pay TV service) as well as the expansion of Foxtel (the digital data service) was if nothing else riding on an ice cube sitting in the noon day sun.

So they came together. First, Foxtel and Optus would become joint distributors of various TV channels (see list above; a start but hardly the final word in that department). The pundits are calling this joint-content agreement

"rationalisation of Australian pay-TV." What they mean is, as far as programming choice goes, there will be far less to differentiate Optus from Foxtel (or vice versa) after the November (this year) effective date of the agreement. Provided.

Provided there is no adverse ruling from the ACCC or some other Australian government agency. The "deal" for programming exchange will only be valid if it gets the blessing of the regulators; not a sure thing. Perhaps the most evolutionary element in the new proposed sharing of "assets" involves programming acquisition. One example: Optus carries its own three-channel movie package (Movie 1, Movie Extra, Movie Greats), and these three channels are filled 24 x 7 with flicks rented from the various Hollywood and foreign sources. Foxtel has movies as well - not the same movies and not from the same sources. Both firms pay a fee per subscriber per movie per month and the movie company contracts dictate how many times an individual movie selection can be played within a 30 day period. And when the movies can first be shown.





Beamwidth of offset dishes: Typical 60cm has a "3 dB beamwidth" of 3.1 degrees - meaning signals coming from off boresight by 1.55 degrees are reduced in level only 3 dB.

The glitch. Optus when it negotiated movie use contracts many years ago was competing with Foxtel for various film products. Optus at the time had fewer than 100,000 subscribers but to "outbid" Foxtel for movie packages, it agreed to pay the movie folks fees based upon a minimum subscriber universe of 500,000 homes. Optus has barely half of that number today - which means it is paying for twice as many homes (per movie) as it is collecting income from. Or to put it another way, Optus pays twice for every movie it shows - *once* for the real (paying) subscriber and *once again* for the "phantom" subscriber they don't have but agreed to pay for.

They agreed to this term because they were desperate to outbid Foxtel (at that point in time, Optus could have ended up with no major movie sources and as a consequence there would have been no Optus movie channels). Analysts believe Optus is spending around A$30 million per year for "phantom subscribers" - people they don't serve, just to hold onto the movie rights they negotiated. Of course the movie providers are hardly concerned - they get paid twice as much by Optus (per subscriber) as they receive from any other pay TV operator in the world.

The new deal. Optus will no longer contract for any movies. Rather, the "exclusive" deal Optus now has with the movie providers will be transferred to Foxtel and then Optus will become a secondary "shared user" of the movies through Foxtel. And Foxtel will end up with rights to package and show Movie 1, Movie Extra, Movie Greats. What this does is save Optus the reported $30 million a year because the combined fees being paid for the movies by Foxtel and Optus now go (well) past the 500,000 subscriber number.

Foxtel gets more channels, Optus gets the same channels but pays half of what they are now paying. And in theory saves A$30 million a year. Seemingly that is a "win-win" situation. Not everyone sees it that way.

Fred Grossman of Ballarat's Neighbourhood Cable (essentially the only "independent" pay-TV operator in Australia after Austar/Foxtrel/Optus) sees a potential for Foxtel abuse. "*It would certainly be against our interests if Foxtel tried to become the exclusive wholesaler of pay TV content in Australia. If, on the basis of their new subscriber numbers* (Foxtel + Optus = nearly a million homes) *and spread* (add in Austar and the 'Foxtel reach' covers both rural and metropolitan homes), *Foxtel would be in a position to negotiate exclusive distribution rights with virtually all of the programme suppliers desiring Australian coverage. And that would cut out small, regional suppliers such as us.*"

Without access to programming (Neighbourhood has remained viable by dealing with Optus and importing material on videotape from the USA), the Ballarat firm would face certain extinction. Others also fear what happens when pay TV control of programming ends up in the board room of one firm.

TransACT, the Canberra high-speed network provider, worries that when Telstra bundles (adds) its Internet and Telephony products with Foxtel's new larger stable of TV programming, independent ISPs and service providers could be squeezed out of business. "*Foxtel may well find it politically expedient to offer ISPs access to TV programming, but as they will set the rates we can never compete with their wholesale cost they pass on to themselves.*"

The ACCC (Australian Competition and Consumer Commission) is on the case, reacting almost instantly to the Foxtel/Optus announcement. "*It most definitely has competition issues in that it creates a single buyer of pay TV programming, which has both positive and negative elements. On top of that there is an entirely new set of bundling issues - firms that have only one product to sell, such as the mobile phone companies, simply will not be able to compete with bundled Internet + telephone + cable or satellite.*"

Programmers are of course impacted as well, if the arrangement goes ahead as announced. "*Some sporting groups such as the AFL have enjoyed rising revenues because the competing pay TV firms have bid for their rights. Now with only one content wholesaler* (Foxtel), *those rights can no longer be put out for bid. Anyone providing programming to pay TV is likely to see their revenue base shrink with the next contract renegotiation.*"

The ACCC is attempting to maintain a "wait, study and then decide" approach to the proposal. Apparently, if the ACCC or some other regulatory body comes out against the plan and no concessions are possible by Foxtel (and Optus - but Foxtel is driving this car), "the deal will be off." What that means is unclear at this stage - does that mean Foxtel would not only not become the wholesale programming provider to Optus but

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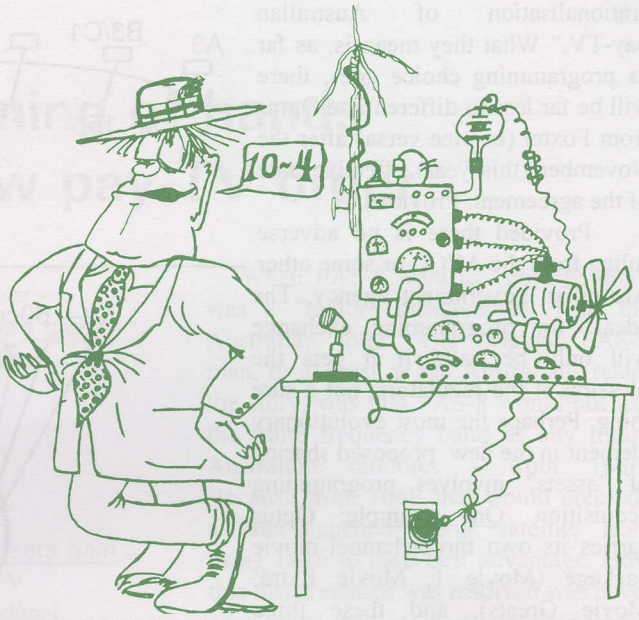

If you are not buying your DTH TVRO supplies from STRONG Aust Pty Ltd - you are paying too much and getting too little choice of products. Nobody - but NOBODY - has our volume buying strength, and our ability to save you big money on the products you need to complete dish system installations!

February-March Specials on TVRO/DTH Antennas *

MESH DISHES - 2.3m and 3.0m: The least expensive in Australia- bar none, no matter what "sale" you are going to. Get everyone else's price *first* - then call STRONG Aust. We'll beat any price on a quality for quality basis you get from a legitimate distributor.

Six-segment solid dishes - 1.8 and 2.3m. Where else can you buy a 1.8m prime focus polar mount all solid dish for A$118? Who else has a "no-crate" dish line that eliminates paying upwards of A$100 just for the stupid crate to ship your otherwise "bargain" dish? This is a *great antenna* for C and Ku for NT - because we don't sell you a low-cost antenna and then rip you off by charging A$100 for a shipping crate!

* - Specials - Hell! We are the lowest cost folks in the Pacific ALL of the time!

Paraclipse. We are now going to share a well kept secret. The Paraclipse 90cm offset dish actually out performs Jonsa 1.2 and most 1.5m dishes for Ku. Paraclipse is - well, *Paraclipse*; the Rolls Royce of all antennas. And the quality shows - very pleasing to the customer's eye, better performance than 1.2 and 1.5m Asian specials, 10X as strong and you won't end up requiring 6 stitches on your left hand trying to tippy-toe around sharp, unfinished edges the Asian cheap dishes have. **STRONG** Aust stocks in depth the *Paraclipse* antenna line for the South Pacific. If we don't have it in stock - it's not for sale south of the equator! When a man needs a **REAL** antenna, he needs a *Paraclipse* - not some cheap Asian paper-thin sometimes-parabolic, most of the time not, pretend dish created from reconstituted beer cans.

MADE IN AMERICA!

STRONG Aust buys Paraclipse by the container load - nobody outdoes our volume in Paraclipse!

WHAT'S ALL THIS CRAP about embedded IRDs that *sometimes* do this, *sometimes* do that???

The STRONG D10 is "Pay TV Friendly" and "neutral" about the origin of the card you stick into it.

We don't sell "cards". We won't sell cards. But what you do with your **STRONG** D10 inside the privacy of your own home is your business. What we do sell is a "Pay TV Friendly" IRD. And we sell version 2.06 and version 2.09 cams. In fact we have a complete French TV (Intelsat I701) system package less only the card (hey - we are all grown up folks here. The guy who sells 12 cylinder Jags doesn't tell you what kind of petrol to put in it - right?). If you are not familiar with the D10 - well, it's the **STRONG** equivalent of the Humax 5410. But you knew that - didn't you?

TERRESTRIAL TV set-top boxes. OK, so Australia has not exactly gone crazy for terrestrial digital TV. Maybe it's the fault of the broadcasters for not putting more on digital - maybe it's the ABA's fault for listening to some bad advice. But the fact remains WE have digital terrestrial on the air, in the air and *we* are one of the first countries in the world to do so. Show some Australian pride - *support digital terrestrial*! And it is actually fun to play with. You deserve to have some fun - so get a digital terrestrial set-top box and see what all the commotion is about. After you play with it, surely you can find a customer to flog it off to for at least the wholesale price we'll charge you for our STRONG 5100 set-top terrestrial box. We have the 5100 in stock (A$500 + gst trade, A$399 + gst trade in quantity). Buy one today and stick an Australian flag in your front window.

ANALOGUE receiver/dish controller. Are we crazy, or just plain stupid? We have this very large supply (anything more than 3 would be a "very large supply" - in this case) of Palcom SL7700 super-low-threshold analogue receivers. Brand new, factory cartons. Analogue? Yes, we said analogue. Good grief. What a disaster! Maybe not. The SL7700 when reviewed by SatFACTS yonks and yonks ago was rated "*the very best of the best*". It still is. So what makes this worthy of you spending your money? Well **#1** - it has full automatic tracking of the satellite. The dish mover "brain" samples the signal every minute or so and if the satellite is moving (such as the Russian birds for TNT and NTV), it creates a pulse to the dish mover to repeak the signal. Better yet - it does this for both the elevation and azimuth motor drives! The signal need not even be a "real" analogue TV carrier - it can be a beacon, for example. **#2** - it has step after step after step of threshold extension - the last of the "*red hot analogue weak signal machines*". **#3** - playing with SDStv.com analogue stuff in L-band? That's right - super low threshold for maximum SDStv.com range. **#4** - finally, if you have a digital IRD but lack a suitable dish mover, the SL7700 is the best and easiest to use - bar none. The price? Too hot to publish - *call us*!

STRONG Aust Pty Ltd is a full service - full line supplier. From "F" connectors and tools to dishes and mounts - and everything in between. We are the "strongest" source of DTH/TVRO hardware and here for the long haul. We are the folks you can count on to be here and help you out when everyone else is giving you a line of excuses. We have a new vitality and enthusiasm for our great industry - join us!

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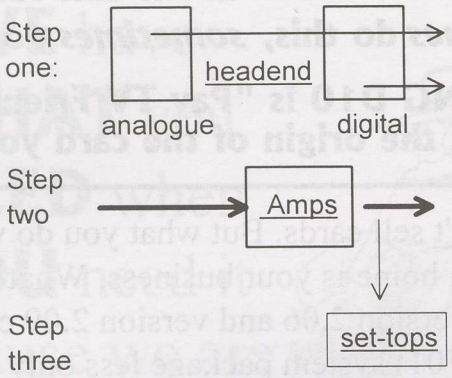
would also not take over 12 to 14 of the new C1 transponders???

Foxtel sources are suggesting the present channel line-up would, with the availability of new transponders on C1, "grow to between 125 and 150 service channels." But there is another portion of the Foxtel expansion that does not involve satellite - their present analogue format cable TV service. Unlike Optus which has invested in a digital-capable cable TV network, Foxtel is still utilising analogue only distribution. To grow beyond their present channel level (51 on cable or 357 MHz of active bandwidth) to a possible 150 channel universe will be an interesting exercise to watch develop. Telstra in New Zealand, in partnership originally with Saturn and now Clear, has taken a very advanced approach that builds into the cable plant a complete two-way network capable of allowing subscribers to have high speed (10Mbit/s) access to Internet as well as communicating "backwards" through the cable system to the cable headend. This makes the cable headend the "ISP" for the cable connected clients.



Converting Foxtel cable to digital: Initially, existing analogue must continue while digital is added to the spectrum. New digital (QAM format) modulators will be installed using an expanded frequency spectrum not presently in use for analogue (step one). Next, the cable plant must be retrofitted with new amplifier (and some passive) equipment which increases the cable bandwidth (frequency coverage range) to include the new digital/QAM service channels (step two). Finally, cable homes will be offered digital set-top boxes which will replace existing analogue units.

Telstra has the technology, in their Christchurch (NZ) plant, to do something identical or similar in Australia. But the costs are extremely high when high speed Internet delivery and two-way communication from individual subscriber homes is added to the mix. There is no field proof yet that this system actually can be profitable although UK and United States cable operators believe it will eventually become so. A familiar brand name (UEC) has a contract to provide the innovative digital two-way set-top boxes for the Christchurch system.

Two-way cable systems are exceptionally vulnerable to installation problems with the cable system plant and each home so-connected requires equipment (including the digital two-way set top box) that quickly amounts to more than A$600. When a subscriber home has two or more digitally functional TV set locations, the expenses mount even more rapidly.

Within Foxtel, there are three corporate "partners" - Telstra the telephone company, News Corp the multi-media company and Packer the broadcast company. Rebuilding the Foxtel cable plant to allow it to deliver digital television channels benefits all three. Going a step further and adding two-way capability and Internet delivery benefits just Telstra since it is the only one of the trio which has extensive Australian telephone holdings. The dollar difference per home in stepping from digital TV to interactive digital TV + Internet is essentially double. Will News Corp and Packer agree to somehow fund this added expense? Not unless they are "cut into" the profits from the service - if in fact there will be any profits at all.

There is another business aspect to expanding the Foxtel system to be two-way capable. Telstra (the telephone company) has been facing stiff competition from new upstart firms in the narrow area of providing high speed Internet services and data carriage to big corporate customers. Telstra at the same time as announcing the possible deal with Optus also revealed net profits dropped 20% during the last accounting period. Some of this loss in profits can be traced to the stiffer competition for corporate data carriage customers. That's where the rebuilding of the existing analogue cable TV network could be very useful. By staying totally away from individual home customers for high speed Internet and dedicating their new cable bandwidth capacity to delivering point to point data for business customers, Telstra *might* actually reverse the losses. Corporate data connections chew up fibre optic and copper wire capacity very rapidly and point to point microwave channels are all but impossible to create in central business districts because of rapid growth by competitors. The rebuilt cable TV network could in CBD regions provide Telstra with some new carriage capacity that would serve the commercial customers.

The forgotten elements -

Austar remains the "odd man out" in this scenario. They have always been a "wholesale buyer" of most of their programming, sourcing from Foxtel as well as Optus (Austar has an ownership position in a small number of services as well, a hold over from the original Galaxy days).

TARBS has won a court decision which gives it some leverage to force Foxtel (and Optus) to carry some or perhaps more than some of its foreign language content programming on their cable systems. A Foxtel switch over to 150 channel capacity could well include planning to do just that except in this case it will be TARBS functioning as the programming "buyer" and Foxtel as the "wholesale distributor."

What TARBS might end up doing is going with Foxtel's 12 to 14 transponder set on C1, eventually abandoning PAS-8 (but not any time soon because of contracts held by PanAmSat from TARBS). What Austar will continue to do is "share" the Foxtel owned transponders on C1 along with the conditional access authorisation system now jointly operated. And although Austar has somehow managed to "squeak by" with the consortium of banks to whom it owes more than A$400 million (see p. 2), the firm is by no means yet cash-flow positive (i.e., it continues to spend more money each month than it takes in). That Austar might eventually become an operating division of Optus or Foxtel remains a major possibility.

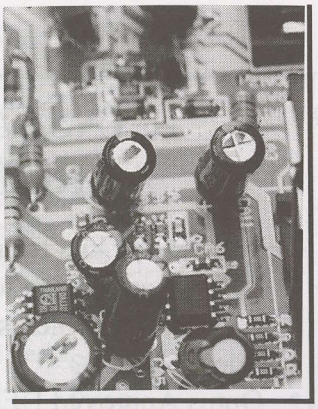
What about B3? Replacing it with C1 is a trifle premature. Optus B1 was launched on August 13, 1992 with a design "life" of 13 years. That means station keeping fuel and solar

cell / battery problems could begin to be worrisome not later than mid 2005 and perhaps earlier. Optus B3 was launched on August 27, 1994 and with a 13 year design life should continue to be functional through 2007. Obviously B3 will not be shut down any sooner than it becomes an operational problem.

So where will B3 "go"? SingTel is not saying; the options include replacing B1 at 160E (thereby gaining 2 more useful years at 160E before scheduled replacement) or sending it to 152E where it would become the third operational satellite in the fleet. There is no present announced plan for C2; not what it will be, when it will be, where it will be. Optus completed a new 13m control and transmit dish installation (Belrose, Sydney) during January for Optus C1 suggesting strongly that B3 will stay with its present tracking and control dish when the unusual replacement manoeuvre is done early in 2003. The 13m Mitsubishi dish had originally been installed in Hobart in 1985 as a part of the then Aussat project with Australia's first domestic satellites.

For those who get excited about major changes, the B3 to C1 changeover will be a fun exercise to observe if not directly participate in. Traditionally, the replacement satellite is moved into a collocated position after test and check out at another unused orbit location, and once in place individual transponders are switched off of the old (B3) bird at the same instant the new replacement transponder (on C1) is turned on. The sequence for full transition will require from three to ten hours, assuming no glitches along the way. The major unanswered question is how hundreds of thousands of pay-TV receivers scattered throughout Australia will respond with the new C1 parameters. We'll keep you advised of dates when known - but unlikely before late January 2003.

The CABLE Connection



LNB Analysis

Out of service? That means no performance at all, not even weakly. First, verify there is voltage leaving the F fitting on the receiver going into the coaxial cable to the LNB. Second, if LNB voltage is 14 volts, temporarily switch to 18 volts to see if reception resumes. Third, disconnect coax at LNB and measure voltage present. Fourth, inspect F fitting on LNB to verify no moisture has gotten in (rusty looking centre on fitting, white corrosion on shield). Fifth, replace LNB.

LNB grading

LNB failures fall into two general categories - those you can repair and those you cannot! The former includes possible faults in the voltage regulating portion which accepts the 14 or 18V DC fed up the coaxial cable from the receiver and converts that voltage to a suitable level (voltage amount) for each of the LNB stages. Faults that involve any of the C or Ku band radio frequency (RF) amplifier stages are beyond the skills and test equipment levels of most people simply because of "circuit matching" challenges internal to a gain stage. The L-band gain is typically a "block" (a small square or rectangular object with multiple legs - typically 3, 4 or 5) which will sit near the output F connector point on the circuit board. L-band gain "blocks" are actually multiple stages of gain covering the 950 - 1450 (2150) MHz region, all internally connected within the block. A L-band "block" may have the equivalent of 3 or 4 or even 5 separate transistors, but the block can only be replaced, not repaired even if the failure is a single transistor inside of the device.

The preliminary steps to determining whether an LNB is failing to perform properly are at upper right. The most common LNB failure is not the LNB at all but rather a failure of the receiver voltage to reach the LNB. LNB transistor stages typically require between 6 and 9 volts of DC to function. The lowest nominal voltage provided by the receiver's LNB power supply is 14 volts (more nominally 14-15 volts). This "too high" voltage is reduced ("regulated down") to the proper transistor operating voltage using a voltage regulator device mounted inside of the LNB case. If there is a bad connection in the coaxial cable connecting the receiver to the LNB, or the receiver's output (LNB) voltage has been accidentally switched off with an erroneous software command, the LNB stops working or has reduced performance. If the voltage appearing at the LNB-cable-end F fitting is below 10.5 to 11 volts, the regulator lacks the "head room" required to regulate the supply voltage to the required 6 to 9 volts. Most LNBs have dual regulators, one to drop the voltage to the 9 volt region (to run some of the transistors inside) and another to drop the supply voltage to around 6 volts. If the voltage going to the 9 volt regulator is too close to 9 volts to properly regulate, the transistor circuits requiring that particular voltage operate at reduced efficiency (or stop working altogether). Perhaps 50% of all LNB failures can be traced to either the input voltage to the LNB F fitting being too low, or, a volt regulator failing.

Both of these conditions can be repaired with minimal test equipment (a suitable voltage measuring meter, fine point pencil tip soldering iron and a replacement part or two).

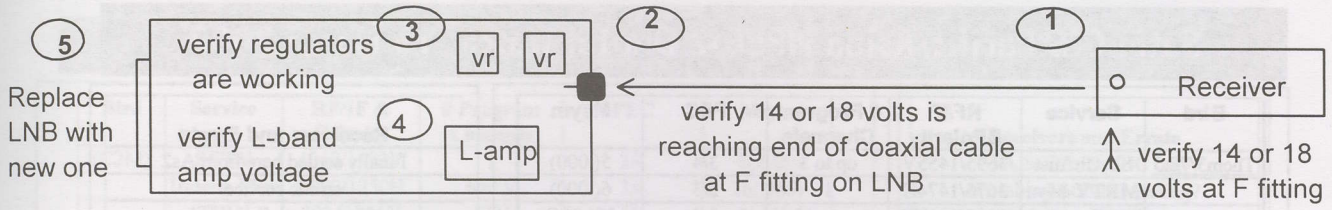
Some typical symptoms for less than complete failure are as follows:

1) *Signal level is low to receiver*, but reception is otherwise normal. After eliminating the possible loss of 14 volts reaching the LNB proper, the drop in signal level will trace to the L-band block amplifier. Confirm the amplifier chip is receiving a suitable operating voltage (found by opening two LNBs and making measurements - the one that is bad versus one that is of identical make and model and known good). If it is, the chip probably needs replacing because one or more internal gain stages have quit functioning properly.

It is possible to have the same analogue-sparklie level reception with a low gain amplifier, or, the same digital threshold level reception when L-band gain is reduced - the receiver has gain reserve and can still function even with a reduced input. A temporary (emergency) fix might be simply sticking a 10 - 18 dB gain line amplifier on the coaxial line to replace the gain from the degraded L-band chip with external gain from the line amp (the line amp in fact probably has a chip amp inside that is very similar if not identical to the L-band portion of the LNB).

Mfg	Model	13V	15V	18V	Status
Chap.C	17 deg	110mA	112mA	112mA	Bad
Chap.C	17 deg	108mA	118mA	118mA	Bad
Chap.C	17 deg	104mA	114mA	114mA	Bad
Chap.C	17 deg	106mA	112mA	112mA	Bad
Echo.C	35 deg	**116mA**	**144mA**	**144mA**	Good
Chap.C	20 deg	108mA	118mA	118mA	Bad
Dyna.C	20 deg	100mA	100ma	100mA	Bad
CalAmp	20 deg	**102mA**	**132mA**	**132mA**	Good
Dyna.C	20 deg	**102mA**	**134mA**	**134mA**	Good

Mfg	Model	13V	15V	18V	Status
JaegerC	18 deg	**104mA**	**104mA**	**102mA**	Good
MicroC	17 deg	**64mA**	**64mA**	**64mA**	Good
NorsatC	35 deg	**92mA**	**108mA**	**108mA**	Good
Chap.C	20 deg	102mA	112 mA	110mA	Bad
CalAKu	0.9dB	**130mA**	**130mA**	**130mA**	Good
CalAKu	0.9dB	**132mA**	**130mA**	**130mA**	Good
GardKu	0.6dB	106mA	106mA	106mA	Bad
GardKu	0.7dB	**132mA**	**130mA**	**128mA**	Good
GardKu	0.6dB	**142mA**	**142mA**	**142mA**	Good



2) Signal level is low and *there is sparklies in analogue and/or a higher apparent digital threshold* where pixels/tiling starts to occur.

This points to a defective C/Ku band RF amplifier gain stage. If the tiny transistor quits altogether, the current drawn (used) by that stage will typically also stop flowing, which may be detected by determining that the overall current load of the LNB is lower than when the LNB was new. A stage that quits no longer draws current and as the total current drawn (used) by the LNB is the sum of all stages (C/Ku RF gain stages plus L-band block chip amp), any stage that quits will reduce the total current consumed by the LNB.

It would be handy to have an infallible "rule of thumb" that tells you how variations in LNB current draw can determine the status of the LNB and even where the LNB has failed. Unfortunately, as the table to the left shows, there is no such rule of thumb. Unless - you have when the LNB was first installed measured the current drawn and recorded it (such as with a weatherproof black grease pencil on the LNB case). In the table at left, we took 18 LNBs of various makes, with a selection of noise figures, and measured the amount of current each drew (used) at three supply voltages - 13V DC, 15 and 18V DC.

This table verifies that most (but not all) draw more current at a higher operating voltage (such as 116mA at 13 volts and 144 mA at 15 and 18volts). Comparing LNBs that still work ("Good") versus those that have a failure ("Bad") reveals no real trend (or even isolated example of a trend) in current draw versus operating voltage. What the table does not show is how the "Bad" LNBs drew current prior to going bad. Has there been a change in the current after LNB failure? The answer is yes and no. Approximately half of the LNBs now classified as "Bad" drew more current at the lowest operating voltage (13V DC) when new and still "Good" than they do "Bad". But the remainder draw the same current "Bad" as when they were "Good."

This suggests there is a not-uncommon failure mode which causes the LNB to degrade in performance but does not in that process change the current draw.

In fact, out of 8 "Bad" LNBs tested for this analysis, only one (Chap.C 20 degree, 4th amplifier in right hand column) had stopped functioning totally; the balance of 7 "Bad" had merely lost performance quality. Note this was the only "Bad" LNB that drew less current at 18V DC than at lower (15 or 13V) powering. And even that cannot be identified as a "warning sign" as two LNBs still "Good" have similar 18V characteristics.

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

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
Thom3/78.5	SkyChAust	3695/1455V	up to 3	3/4	5(.000)	Finally settled here from As2
	MRTV-Myn	3676/1474H	1	2/3	6(.000)	erratic service
	MidEst Mux	3640/1510H	up to 12	3/4	28(.066)	Now essentially all CA
	Mahar/DD1	3600/1550H	up to 8	3/4	26(.661)	USA religion chs, CMM music FTA
	ME Mux	3569/1581H	up to 4	3/4	9(000)	New November - possibly TARBS?
	Nepal TV+	3554/1596V	3+ in mux	3/4	13(.333)	FTA + CA mux
	3ABN +	3551/1600H	4+ TV, radio	3/4	13(.330)	3 Angels USA, Ch of Hope, + 9 radio
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(.333)	recent frequency change
	TARBS/Th5	3480/1670H	6+ TV?	3/4	18(180)	TARBS labell, CA-no SIDs
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	**ETV mux**	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here; wide beam
	DD2	3910/1240V	1	3/4	5(.000)	SCPC, ; OK E. Aust. wide beam
	DD National	3830/1320V	1	3/4	5(.000)	SCPC; OK E. Aust. wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E. Aust wide beam
	AsiaNet	3683/1467V	1	3/4	4(.340)	SCPC, OK E. Aust. wide beam
	Jaya TV	3615/1535V	1	3/4	3(.255)	SCPC; OK E. Aust. wide beam
	ETV Mux#2	3485//1665V	4+TV	3/4	27(.000)	Several new ETC here, wide beam?
ST1/88E	MMBN	3632/1518V	12TV	3/4	26(.667)	Nagravision, some FTA; erratic
As2/100.5E	**Euro Bouqt**	4000/1150H	6TV, 21r	3/4	28(.125)	FTA; MCM gone
	5-Star Med	3951/1199H	3TV	3/4	13(.185)	Macau MUX
	WorldNet	3880/1270H	4+/20+radio	1/2	20(.400)	Will move here-replace analogue
	Hubei/HBT	3854/1296H	1	3/4	4(.418)	FTA SCPC, teletext
	Hunan/SRT	3847/1303H	1	3/4	4(.418)	FTA SCPC, teletext
	Guan./GDT	3840/1310H	1	3/4	4(.418)	FTA SCPC, radio APID 81
	In. Mongolia	3828/1322H	2	3/4	8(.397)	FTA: #1 Mongolian, #2 Mandarin
	APTN Asia	3799/1351Hz	1	3/4	5(.632)	Sometimes **FTA**; also 3895Vt
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	WorldNt/US	3764/1386H	1 + 20 radio	3/4	6(.100)	FTA; to shut down "soon" (see 3880H)
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)	FTA SCPC, radio APID 256
	Jiangx/JXT	3727/1423H	1	3/4	4(.418)	FTA SCPC, teletext, radio APID 81
	Fujian/SET	3720/1430H	1	3/4	4(.418)	FTA SCPC, + radio APID 80
	Hubei TV	3713/1437H	1	3/4	4(.418)	FTA SCPC, radio APID 80
	Henan/Main	3706/1444H	1	3/4	4(.418)	FTA SCPC, + radio
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)	Thru TARBS Aust, occ. **FTA**
As2/100.5E	**Feeds**	4086/1064V	1	3/4	5(.632)	FTA SCPC feeds
	Jilin Sat TV	3875/1275V	1	3/4	4(.418)	FTA SCPC, + radio
	HeiLongJian	3834/1316V	1	3/4	4(.418)	FTA SCPC
	JSTV	3827/1323V	1	3/4	4(.418)	FTA SCPC, + radio
	Anhui TV	3820/1330V	1	3/4	4(.418)	FTA SCPC + radio
	ShaanxiQQ	3813/1337V	1	3/4	4(.418)	FTA SCPC, radio APID 81
	Guan/GXTV	3806/1344V	1	3/4	4(.418)	FTA SCPC, radio APID 257
	Fashion TV	3795/1355V	1	3/4	2(.533)	FTA SCPC, reload VPID 308, APID 256
	MSTV	3791/1359V	1	3/4	4(.340)	FTA SCPC
	Myawady	3766/1384V	1	7/8	5(.080)	FTA SCPC - difficult to load
	Les Amis	3714/1436V	2	3/4	6(.500)	two test cards - December
	Travel UK	3708/1442V	1	3/4	13(.021)	CA, may be test
	Saudi TV1	3660/1490V	5+/tests	3/4	27(.500)	FTA MCPC, Dubai Sports Europe
As3S/105.5	Zee bouquet	3700/1450V	9TV	3/4	27(.500)	Mediaguard CA
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC; reported audio problems
	Now TV +	3760/1390H	4	7/8	26(.000)	CA + NOW-TV FTA
	Star TV	3780/1370V	22(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	18(+)TV, 1r	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3880/1270H	19(+)TV	7/8	26(.850)	NDS CA (Pace DV211, Zenith)
	Indus Music	3900/1250V	5TV	7/8	27(.895)	PAL, NTSC, 1 ch CA
	Star TV	3940/1210V	9(+)TV	7/8	26(.850)	Recenty started -NDS CA as above
	CNNI	3960/1190H	6(+)TV	3/4	26(.000)	PowVu CA; CNN + Cartoons, occ **FTA**
	StarTV	3980/1170V	2+TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	4000/1150H	10(+)TV	7/8	26(.850)	NDS CA + **2 (Chinese) FTA**
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" testing SCPC
	CCTV bqt	4129/1021H	4(+) TV	3/4	13(.240)	moved from 4115 July 1
	Zee Bqt #2	4140/1010V	4(+) TV	2/3	22(.000)	some (i.e. **Kaveri**) FTA + CA
Cak1/107.5	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs
T'Kom/108E	**IndoBqt**	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17.500, 3496H/19.615
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA; NT/NC only
	Anteve	4144/1006V	1	3/4	6(.510)	recent change from 4055V; FTA SCPC
	Satelindo Bq	4089/1061H	2+ 1 radio	3/4	14(.062)	ChNewAs poss here - V33/A34,

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(C2M)	**SCTV**	4048/1102V	1	3/4	6(.618)	FTA SCPC; NT/NC only
	Indone.Mux	4000/1250H	6+TV	3/4	26(.085)	unstable platform - testing?
	TPIN	39241226H	1TV	3/4	5(.632)	New Feb 2002; also 3718H, same parm
	Indo. MUX	3880/1270H	3+ TV	3/4	28(.125)	TVRI, others FTA
	Brunei/Sing	3733/1417H	1TV	3/4	6(.000)	FTA; share time, Brunei-23hrs,Sing1h
	RCTI	3475/1675H	1	3/4	8(.000)	FTA SCPC, Australia OK
	Myawad TV	3706/1444H	1	3/4	5(.924)	may be test; svc has been erratic
JcSt3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)	PowVu, some **FTA** (ch # 1,3)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)	CA & **FTA** NTSC: Japan, Taiwan
MeaSat 2	Astro Mux	11.478H (+)	up to 10TV	7/8	30(.000)	+11.664; 18 pay-TV svcs, CA
Op 3/156	**Mediasat**	12.336V/T2	5TV, 3 radio	2/3	30(.000)	FTA - TRT+, CA feeds
	Aurora	12.407V/T3		2/3	30(.000)	Aust, NZ 90 cm; CA (*); ABC Nat
	Aurora	12.532V/T5	Inc Zee TV	2/3	30(.000)	cvrs Aust, NZ 90 cm; CA (*)
	Aurora	12.595V/T6		3/4	30(.000)	Aust only; * - smart card p. 26
	Aurora	12.657V/T7	TV tests	2/3	30(.000)	cvrs Aust, NZ 90cm(Optus **FTA** test)
	Aurora	12.720V/T8		3/4	30(.000)	Aust only;* - smart card p. 26
	Austar	12.314H/T9	iTV + here	3/4	29(.473)	Austar i-TV; CA, subs avail. Aust.
	Austar/Optus	12.376H/T10		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.438H/T11		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.501H/T12		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.564H/T13		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.626H/T14		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.688H/T15	(some FTA ra)	3/4	29(.473)	CA, subscription available Australia
Op 1/160	**ABC NT fd**	12.258V	1TV, 3 radio	3/4	5(.026)	Also try 12.265; V832, A833
	ABC feeds	12.317H	1	3/4	6(.980)	also 12.326, 12.335; ex PAS8 Ku
	Occ feeds	12.356V	1	3/4	6(.110)	Mostly sport feeds from w/in Australia
	Central 7	12.354H	1TV	3/4	3(.688)	VPID1280, APID 1281
	Imparja mx	12.360H	1	3/4	5(.424)	VPID 1024, APID 1025
	Mediasat#3	12.424H	3+ TV	2/3	19(.800)	net feeds, Australia only, FTA & CA
	TVNZ DTH	12.456V	2TV	3/4	22(.500)	FTA 2 channels; more possible
	Nine Net	12.512H	1 TV typ.	3/4	5(.632)	testing digital feeds
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.644/671V	9TV	3/4	22(.500)	NDS CA, subscription available NZ
	ABC HDTV	12.670H	5TV	7/8	14(.300)	also 12.686 12.706H; ABCVic, Qld
	Tel/Saturn	12.706/733V	8+TV, 1 radio	3/4	22(.500)	Irdeto CA, tests, S16 FTA occ.
PS8/166	TARBS3	12.326H	13TV + radio	3/4	28(.067)	TPG/Eurodec CA, occ. FTA
	TARBS	12.526H	13TV + radio	3/4	28(.067)	TPG /Eurodec CA, **radio FTA**
	TARBS2	12.606H	13TV + radio	3/4	28(.067)	TPG/Eurodec CA; **TRT FTA**
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)	Irdeto CA, **some FTA** tests
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)	Launched 31 December; dateline west
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)	PowVu CA
	NHK Joho	4065/1085H	7TV, 1 radio	3/4	26(.470)	PowVu CA & **FTA**; subscription avail
	ESPN USA	4020/1130H	7+TV, data	7/8	26(.470)	PowVu CA; ch 11 DCP-CCP bootload
	Discovery	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA (some audio **FTA**)
	CalBqt/Pas8	3940/1210H	up to 8TV	7/8	27(.690)	PowVu CA & **FTA (EWTN)**
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)	FTA at this time
	Filipino Bqt	3880/1270V	up to 9 TV	3/4	28(.700)	Some **FTA**; also 4040V, 27.686,7/8
	TaiwanBqt	3860/1290H	4TV + 30 radio	5/6	28(.000))	New Sr from November
	CCTV Mux	3839/1311H	up to 4	3/4	13(.240)	PowVu FTA, replaces PAS-2 svc
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)	was As2; PowVu CA
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowVu, CNN/CNNI now CA
	MTV	3740/1410H	8	2/3	27(.500)	1-7 CA; #8 **MTV China FTA**
PS2/169	Pv Bouquet	12.281V	2+ TV, radio	2/3	27(.500)	PowVu CA, WIN, ABC NT
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)	PowVu CA, WA only - D9234
	TVB Mux	4026/1124V	up to 8	3/4	22(.000)	CA feeds to pay-TV; 6 chs **FTA**
	Fox Bouquet	3992/1158V	8TV/data	7/8	26(.470)	Pv, CA/FTA (**FTA ch 3 only**)
	Feeds	3966/1184V	1	2/3	6(.620)	PowVu (FTA) occ feeds
	Feeds	3957/1193V	1	2/3	6(.620)	PowVu (FTA) occ. feeds
	Feeds	3929/1221V	1	3/4	10(.850)	PowVu (FTA) occ sport feeds
	Feeds	3912/1238V	1	2/3	6(.620)	PowVu(FTA) occ. feeds
	Feeds	3898/1252V	1	2/3	12(.000)	PowVu (FTA) occ. feeds
	Middle East	3836/1314V	4 typ	3/4	13(.331)	LBC/ART CA Irdeto; new PIDs 02/02
	Feeds	3803/1347V	1	3/4	6(.000)	PowVu (FTA) occ sport feeds
	YTN Korea	3769/1381V	2+ TV	3/4	11(.570)	Svcs 1 and 2, CA
	BBC +	3743/1407V	3	3/4	21(.800)	**BBC FTA**, others CA usually

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

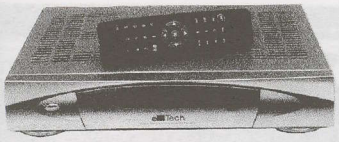
MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM Pty Ltd, 61-2-9939-4377.
Benjamin DB6600-CI. FTA, Foxtel/Austar w/CAM+card. Autosat Pty Ltd 61-2-9642-0266 (review SF#72)
eMTech eM-100B (FTA), eM-200B (FTA + CIx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
Humax F1-CI. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).
Humax ICRI 5400. Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available, review SF#76.
Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. Int. 61-2-9618-5777
MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. Tricky to use.
Nokia 9200. When equipped with proper CAM, does Aurora, pay-TV services provided software has been "modified" with Dr Overflow or similar program was available from (www.BAKKERELECTRONICS.COM), now only from established users.
Nokia 9500/9600. Numerous versions for different world parts; not distributed in Pacific but assistance from Av-Comm Pty Ltd.
Pace DGT400. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818)
Pace DVR500. Original DGT400 modified for NBC (PAS-2) affiliate use, with CAM equivalent to DGT400 but more reliable.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.
Panasat 520/630/635. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370.
Panasonic TU-DS10. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but never available in Australia.
Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222 out of production
Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review Nov. 1998. SATECH 61-3-9553-3399.
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-3749)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above).
STRONG Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review March 2002 (# below).
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Aust 61-3-8795-7990.
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, Aurora, exc. vendor support. Strong Aust 61-3-8795-7990.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84); Strong Aust 61-3-9553-3393
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faultyP/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers.
Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fx 64-9-814-9447.
Xanadu. DVB compliant special-priced receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9939-4377)

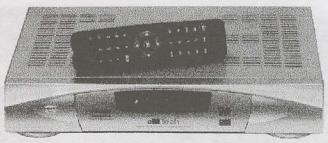
Accessories:

Aurora smart cards. New v1.6 now available, 1.2 no longer available for RABS. Price now A$105, Sciteq 61-8-9306-3738.
PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 7/8; pgm ch 11 and follow instructions (do not leave early!)

eMTech Digital Satellite receivers-SatcoDX® compatible



20Gb PVR Model



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eM300 FTA with 2 x CI slots and 20GB Hard drive built in $A999 RRP

The eM300 is the latest model from eMTech.
20GB HDD gives up to 11 hours of recording/playback at 4MB/sec.
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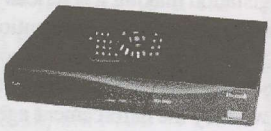
Time shift function allows you to pause live off-satellite program and resume after a period up to 11 hours, and continue watching the program with the time shift.
The receiver will continue to record the incoming live program while you watch the delayed program!
USB port allows to to upload and download PVR , WAV and MP3 files to and from your PC.
USB lead and driver supplied.
Dolby AC3 digital optical bitstream output lets you patch into a high quality audio surround system
The lastest software is on our site

HUMAX



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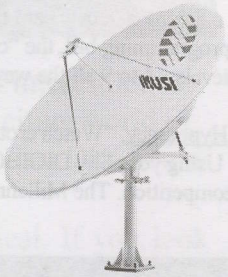

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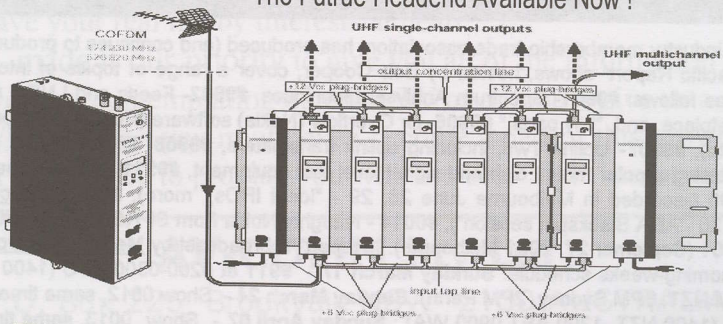

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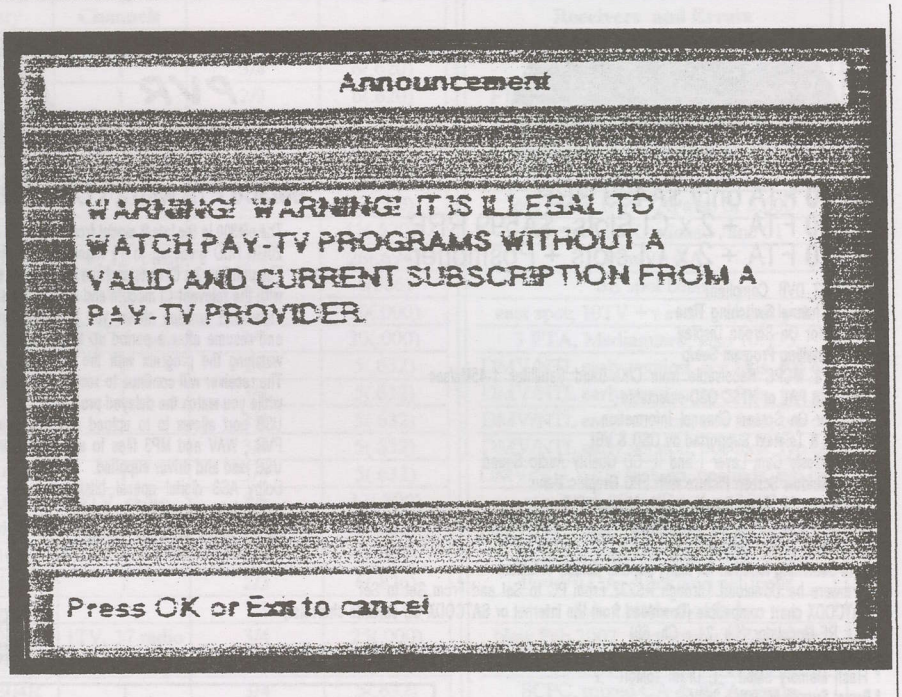
PIRACY: What is to be done?



The bankruptcy of Australian pay-TV provider Reminiscent TV (using Irdeto "protected" Aurora) reported in SF for February (p. 2) and commented upon in this issue (p. 4, 30) should be a wake up call for everyone involved in our industry. We may not agree why Bill Khan's RemiTV went out of business, why it attracted only 17 paying subscribers (in Australia plus 21 in New Zealand) but we can agree there is a significant, unresolved problem facing us all with Irdeto as an encryption mechanism. Bluntly, it was "busted" by clever pirates in Europe before it reached Australia (initially used for Galaxy) and while Australia (and NZ) now have legislation making it a serious crime to engage in the manufacture, distribution and sale of piracy products, those who do so have basically operated without more than a token slap on the wrist by the enforcement agencies and sellers of pay-TV.

If we look to Europe for guidance, the examples we see are not encouraging. Big time news-stand magazine "Satellite TV Europe" (previously WHAT Satellite TV) carries page after page of most explicit advertising for hardware and software that allows anyone who wishes to "go around" paying for pay-TV to do so. Firms selling receivers routinely offer CAMS and equipment to make "clone" cards. And they appear to do so in multicolour full page advertisements with impunity. The British explain their publication does not offer schemes for busting the UK's BSkyB service - only those from outside the UK. Which is supposed to make it 'OK' to offer such products. If you want UK BSkyB hardware and software, you merely move down a metre on the magazine rack and pick out a German magazine (largely in English) or one from France (not largely in English) which focus on UK system routines but ignores their own German or French services. In the British magazine, www.wizardsatellite.co.uk in a two page expensive advertisement offers "Millennium Programmer 2000" ("includes leads, power supply, software and instructions - 69 pounds") or the "xTools Programmer" ("Best programmer available - only 99 pounds"). Programmers? Just below the two products are "Cards" (Gold Wafer - 6.50 pounds, Piccard 1 for 15 pounds, Funcard for 15 pounds). First you start with an authorised programmer issued card, insert it into the Millennium or xTools programmer to "read" the data hidden there, and then using the appropriate Gold/Pic/Fun card "blank" you transfer the legitimate card's hidden numbers to the blank card. Instantly you have a "clone" - a new card that functions just like the original. As long as the person who provided the original pays his or her monthly satellite programming bill, the "clone" will work. Satellite City Ltd advertising in the same issue offers "Gold Wafer Cards" in six different quantity levels - 1 to 9 all the way to 10,000 plus (2.1 pounds each). Can you imagine what type of user needs "10,000 plus" gold wafer cards for his "family and friends"!

Hypocracy. "Watch erotic movies & entertainment Inc. XXX from broadcasters outside the UK! Without subscription charges! Every night! Using your Sky DIGIBOX," and a telephone number. Page after page of programmer busting hardware, cards, software. And there is price competition. The Millennium 2000 product goes down to 35 pounds and there are "Q cards", "Silver cards", "P2 cards" and a host of others.

Do you think we have a "piracy" problem in the Pacific? Hell, we can't even spell piracy!

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 (Robin Colquhoun), **#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; **#0101** - Preview of new technology including SDS from SPRSCS 2001 (Septemer 27, 2001 Melbourne). "Report" is broadcast by Mediasat on Optus B3, 12.336Vt, ad-hoc channel 4(*) (Sr 30.000, FEC 2/3). The coming-weeks schedule: **Sunday March 17** - 9911 at 0200-0300 UTC (1400 NZT, 1300 AEST, 0900 Western Australia; repeats 0700 UTC/7PM NZT, 6PM Sydney, 2PM Perth). **Sunday March 24** - Show 0012, same times as March 17; **Sunday March 31** - Show 0013 at 0200-0300UTC (1400 NZT, 1200 AET,0900 WA) ; **Sunday April 07** - Show 0013, same times as March 31; **Sunday March 14**- Show 0014 same times as March 31; **Sunday April 21** - Show 9901, same times as March 31; **Sunday April 28** - Show 9902, same time as March 31 (Note: Daylight savings time adjustments - we stay with original UTC times). (* - Mediasat may pre-empt showings, check other bouquet channels - such as 3 - if not on 4.) In the event of schedule changes (*), SPACE Pacific attempts to pre-announce which show(s) will appear through http://www.apsatv.com 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. IKUSI ANZ contributed funds for completion of 9910. If interested in sponsoring future shows, contact Bob Cooper at skyking@clear.net.nz (64-9-406-0651) * - Note: Mediasat Sunday feed loads have increased and the first showing (0200UTC) may be "bumped" to accommodate other clients. The 0700UTC feed typically is not bumped and would be the better choice if taping for later review.

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Comstar 2.3m dish (Model ST-7 C/Ku, 38.2 dB gain at 4.2 GHz) + **Zinwell** LNB (15 degree Kelvin, 65 dB gain, 3.4 - 4.2 GHz) + **Dion** Digital receiver (950 - 2150 MHz L-band: C & Ku) + DiSEqC 1.0/1.2 (including positioner control) + 3100 channel memory + Multi-language (5) menu + TV/VCR Scart and RCA outputs, UHF remodulator (chs 21-69)

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That's why we have made it our priority to give you all of the information to help you make your hobby a success. So if you are contemplating Satellite TV as a hobby, give us a call; we'll help get you off on the best track. Who knows - you might even become a part of this growing industry!! You can count on our decades of experience to provide you with the best "right" solution at an affordable price.

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WITH THE OBSERVERS

AT PRESS DEADLINE

Solar equinox time; alignment of your dish and satellites will produce solar-noise-wipeout daily late in month (for south of equator) up to 20 minutes per day. New Dubai mix 4020V on As2, Sr 27.500, 3/4 includes expanded channel line-up originating Dubai

AsiaSat 2/100.5E: If you have lost Fashion TV (3795Vt), try new PIDs of 308/256. "Travel Channel UK has been testing on 3708Vt, MPEG-2 CA, Sr13.021, 3/4 PID257/258" (**Conner**, Qld). "Kuwait Space Channel seems to have been added to 3660Vt FTA package, PIDs 2560/2561" (Conner, Qld)

AsiaSat 3S/105.5E: "Tech TV 3760Hz within NOW-TV bouquet is now PowerVu CA" (**Arnold T.** - yes, but access is available, see p. 2 here). "Zee Mux previously 4135Vt has moved to 4140Vt, Sr 22.000, 2/3" (**Chantilly**, NT). "Zee TV News briefly FTA on 4153Vt, Sr 5.500, 3/4" (Conner, Qld).

InSat 3C/74E: "DD4 Kerala 3919Vt, FTA, Sr 5.000, 3/4; DD10 Maharashtra 3799Vt, FTA, Dr 5.000, 3/4; DD9 Karnataka on 3731Vt, FTA, SR 5.000, 3/4; DD 11 Gujarati on 3851 Vt, FTA, SR5.000, 3/4." "I apparently have a very weak - P2 - analogue signal testing from this satellite on 4162 but difficult to tell if Vt or Hz because of major skewing in low look angle signal" (**D. Leach**, NSW - Ed: this could be DD Gyandarshan, 4165Hz, PAL with audio on 5.5 subcarrier)

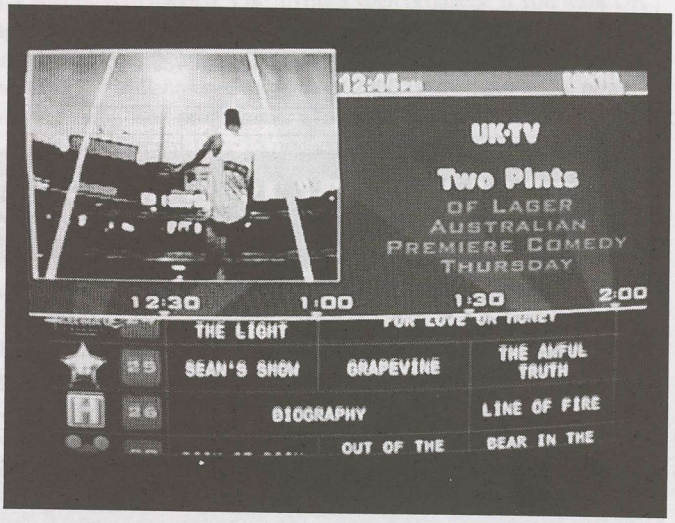
JcSat 3/128E: "Asian bouquet (C Sky Net) 3960Vt was FTA much of mid-February including "Rainbow" (porno) and their "Hollywood Movie Channel" (**Jacko**, Aust).

Optus B1/156E: "ABC TV Victoria replaced ABC TV NSW on 12.688Hz HDTV feed channel" (**Clem**, NSW). "ABC Queensland has replaced ABC NSW on 12.706Hz." "Mix 106.3 radio comes and goes on 12.456Hz, Sr 1.740, 3/4 (APID 4195)" (Clem, NSW).

Optus B3/160E: "Croatian TV HRT1 appeared briefly within MediaSat mux 12.336Vt in mid-February" (**Penny Jones**, Qld). "Radio channels previously on 12.626Hz from 12.564 and whatever is left on latter is CA" (Conner, Qld).

Palapa C2M/113E: "End of an era? ABC News Radio, Triple J, Radio Australia have left 3976Hz" (Conner, Qld). "Myawady TV, not known for stability, is now on 3706Hz, Sr 5.926, 3/4 and FTA at least some of the time" (**Terry Rogers**, NT).

Adios Music Country (above). "The Soundtrack Channel" is the new name, gradually phasing out country music by 1 May. Foxtel's new programme guide look (below).



PanAmSat PAS-2/ 169E: "Contrary to some reports, while BBC-W has left 3901 California Bouquet, it is not CA there" (**Bill Richards**, Aust). "Hong Kong bouquet no longer on 4148Vt - now 3850Hz, Sr 24.900 and 2/3 with same programmer line-up" (B. Richards, Aust). "Late I know but the frequencies could be useful later on: Olympic feeds from SLC were on 3768Hz (6.620, 3/4), 3803Vt (6.620, 3/4) and 3812Hz (6.620, 3/4)" (Jacko, Aust). "They did it - ART Australia is now CA on 3836Vt and likely to stay that way" (**Kafulto**, NZ).

PanAmSat PAS-8/ 166.5E: "The Soundtrack Channel is new name for CMT within California Bouquet 3940Hz" (**Brian Gladdings**, NZ). "SET International (PID480/481) has been added, H&W eTV is gone from 3860Hz mux" (Chantilly, NT).

Telecom 1/ 108E: "Channels come and go with no particular sequence on 3586Hz (Sr17.500, 3/4), 3460Hz (28.000, 3/4)-

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 April 15th issue: April 2 by mail or 5PM NZT April 3rd if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

OFFICE OF THE MINISTER FOR COMMUNICATIONS, THE INFORMATION ECONOMY AND THE ARTS
Senator the Hon Richard Alston

Mr Peter Andren MP
Member for Calare
PO Box 181
BATHURST NSW 2795

Dear Mr Andren,
"Thank you for your representation of 30 March 1998 to the Minister for Communications, the Information Economy and the Arts on behalf of Mr. (name of constituent) concerning introduction of digital television. Over the past decade there have been dramatic changes in communications and broadcasting due to the development of digital technologies. Digital signal processing techniques offer many advantages over traditional analog systems. In broadcasting, digital technologies allow significantly improved picture and sound quality. Digital television allows the broadcast of widescreen, cinema quality pictures with surround sound. Within the reception area, it generally provides clearer, sharper pictures without interference and ghosting. Digital technology also enables the provision of a range of different services, including data services, permitting the viewer to access a more enriching and even interactive, television experience.
The United States and Britain are both well advanced in the conversion of broadcasting systems to digital technologies. Other European countries, Canada, Japan and other nations are in the process of making decisions about the introduction of digital television. Australia has little choice but to follow suit if it wishes to maintain a modern, high quality terrestrial broadcasting system, and to continue to have access to the programs in digital format which originate from other countries.
"(Your constituent) raises a number of issues related to the reception of digital television signals. These matters are being addressed in the context of the planning for digital broadcasting. The digital television legislation passed by the Parliament requires the Australian Broadcasting Authority (ABA) to develop a conversion scheme which is directed to meeting specified policy objectives. One of these objectives is that, as soon as practical after the start-up date, digital transmissions should reach the same level of coverage and potential reception quality as achieved by analog transmissions in each licence area. Individual broadcasters are required to develop implementation plans which comply with this objective, for approval by the ABA (for commercial broadcasters) or the Minister (for national broadcasters).
"(Your constituent's) comments on B-MAC are not relevant to digital terrestrial television as B-MAC is (was) a satellite transmission system. When it was adopted in the mid 1980's, B-MAC was the only satellite television transmission technology available that could offer a 625 line video signal, of comparable quality to PAL. With the introduction of digital transmission technology, B-MAC is (now) at the end of its useful life.
The free-to-air broadcasting industry in Australia has announced its preference for the European developed DVB-T standard for digital terrestrial television, which uses MPEG-2 coding for the video signals. Reception equipment for digital terrestrial television which complies with DVB-T is expected to be commonly available from many manufacturers."
David Quilty, Chief of Staff / Chief Adviser

The (above) undated letter was date-stamp received by MP Andren's office on July 30, 1998. How much of this actually *happened* 3 years and 8 months down the track? (**1**) Surround sound remains elusive, (**2**) Wide-screen remains expensive and supported by only a handful of shows daily, (**3**) Digital set-top boxes actually cost more to acquire than 21" analog television sets, (**4**) "Data" availability is zip - nada, none and moreover the available set-top boxes typically won't process it anyhow, (**5**) The first complete all-in-one consumer available "digital terrestrial television set" (as opposed to set-top boxes and wide screen monitors which are non-integrated devices) has yet to appear in shops. And you will note all of Senator Alston's emphasis was on "improved quality," not new diversity in reception of programming. Basic TV truism number one: "*People don't spend money for reception quality, they spend money for reception quantity*."

3496 (Sr19.615, 3/4) - some FTA, some CA. The Indonesians sure do like to 'test' things!" (Chantilly, NT). "Metro TV on 3640 sometimes, PIDs 60/61 but ID reads 'Global-1' and audio is terrible" **(D. Nolan**, Aust.)

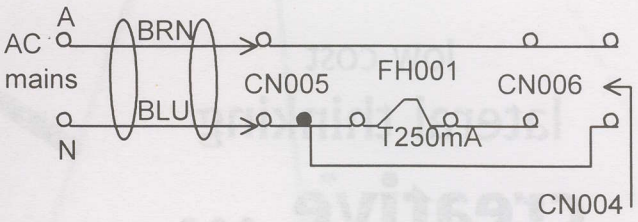
Thaicom 3/78.5E: "Someone at TARBS must be trying to outfox the pirates; all SIDs have disappeared from the data stream on 3480Hz; silly folks!" (**PC**, NSW). "All TARBS channels were briefly FTA (22-23 Feb) on 3640Hz"

(Chantilly, NT). "Your 3485Hz TARBS mux appears to really be on 3480Hz" (Arnold T.) "HRT 1, briefly on MediaSat mux Optus B3, was also here on 3551Hz briefly at about same time" (Clem, NSW).

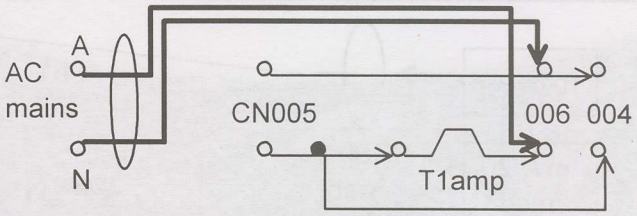
Soapbox: "I currently have an enquiry with ACA for 0.05 watt allocation within the Sydney CBD for a SDS type of service using a single (27 MHz) transponder bandwidth. Building managers are demanding annual fees of A$20,000 and up to place a C-band antenna on top of a high-rise roof so what is needed is some low cost way to do this just once and then relink the received services using SDS FM to other nearby buildings without incurring the horrendous top of building rental fees." (**E. Fien**, NSW) "For US$100 a local supplier is selling an Irdeto 'splitter' box that allows one UBC (pay-TV satellite) card to be used simultaneously by two IRDs. Other models at higher pricing will handle up to 5 IRDs allowing one card plus (up to) 5 receivers to each access a different channel of service. The seller is a UBC installer although the pay-TV firm denounces it as not functional, I have seen it work and it does even with the latest 'Irdeto 2' format now being employed!" (**IL**, Bangkok, Thailand). "By reading the court papers filed with Reminiscent TV bankruptcy proceeding, I learned: "The service was actually provided between 12 November 1999 and 9 May 2001 and ceased on that date due to default by the Company and that default arising pout of a dispute as to the integrity of the Aurora platform. By integrity it is meant that the customers of the company are exclusively by use of an Optus card the only persons capable of making use of the satellite TV channels. It is alleged by Mehboob Ahmad (Bill) Khan that it was possible to pirate the system by persons acquiring a cloned card to use with a set top box specifically manufactured to enable the Optus card not to be a necessary ingredient in obtaining access. In amongst all of this customers were signed up of total value (A)$10,743 during the company's history of trading commencing on the first contract 30 June 2000 and the last contract 21 March 2001. There were seventeen (17) sales made in all." (**G. Pierce**, Qld)

Editor's note: "That" 17 were apparently all in Australia; another 21 were reported to be in New Zealand as well. Those suggesting Khan failed because he was not offering a service that people could only access from him - meaning his channels were also available on various Asian satellites FTA - cannot make the same argument reference New Zealand as the Asian satellites could not be seen in NZ at all. For those "subscribers" it was RemiTV or no Indian TV. On the other hand, the piracy cards Khan alleges "did him in" are/were equally available on both sides of the Tasman.

AT Sign-off



What's wrong with this? First, CN006 has the primary of the positioner transformer plugged in while CN004 has the primary of the actual receiver transformer connected. The fuse only appears in the positioner line; the receiver has no fuse protection. Second, the A(ctive) lead from mains is not fused, only the neutral. Third, the 250mA fuse value is dangerously close to blowing when start-up current flows after changing the fuse to a position where the receiver is properly protected.



Safer. (1) Inside AC mains receiver socket, reverse A and N connections. (2) Plug mains into CN006 (not 005). (3) Plug positioner to CN005. (4) Plug receiver proper into CN004. (5) Change fuse to T (time delay) 1 amp.

Health and safety issues

Over the years we have reported a number of receiver design considerations relating to power supplies and their potential to harm human beings who come into contact with metal shells that normally would be electrically safe to touch. This is another one of those reports but it differs because this is about a recent revelation affecting a receiver that is no longer in production (although it is being sold factory new by some suppliers). We've communicated with the sellers of this particular (analogue) unit alerting them to safety concerns involving the manner in which the power supply has been wired. The only clues we will give you as to the identity are (1) it is analogue, and, (2) it has a positioner system inbuilt. If you own or sell such a receiver, this might be an opportune time to take the shell cover off to see what may be happening inside; we'll call this "Satellite Receiver Power Supply 101A."

Power supplies (whether analogue or digital receiver based) are "universal" these days. The same basic supply ends up going to Germany, North America, India and Australia. Manufacturers attempt to reduce the receiver "versions" by designing supplies (with appropriate components) that function over a wide range of AC mains frequencies (such as 47 - 63 hertz) and an even wider range of AC mains voltages (such as 100 - 260V AC). When this is done correctly, the only part of the receiver requiring customisation for a particular country or area of the world is to select the proper AC mains cord and male plug to connect to the local mains.

A critical design element in this process is the power transformer. A transformer consists of tightly wound coils of wire wrapped around laminated metal (typically steel) cores held together with some sort of fixative - such as glue and/or varnish. In a "standard" (non-SMPS / switch mode power supply) system the transformer can be specifically designed to work in a 50 hertz environment, a 60 hertz environment or virtually anything else likely to be encountered. It is possible to create a 50/60 hertz transformer but they tend to be more complex (bulkier) which is one of the few benefits to the SMPS design.

The receiver in question here uses a "standard" power supply and although the manufacturer claimed the plug-in and play ability to handle 50 or 60 hertz mains, in fact the two transformers inside are (here's one problem) 60 hertz. What happens when a 60 hertz transformer is operated on 50 hertz mains is not good - it runs hot. And because there are two separate transformers in this unit (one for the receiver proper, the second for the motor drive circuit to operate the actuator), we have two devices running "hot". How hot? After 2 hours of operation, if you place your finger on the transformers it is likely to stick (burn and attach to the transformer). Needless to say that is far too hot to be safe (getting rid of all of that heat becomes a problem and endangers the long term reliability of the receiver).

While some transformers may have markings on them to denote whether they are 50 or 60 hertz, receivers in this line inspected for SatFACTS did not. So a comparison check was done. First disconnect the secondary (output side) of the power transformers from anything (i.e., the transformers become mains connected but they power nothing) and then measure the amount of current they consume (no-load test). Then compare the current drawn by the transformers against known-50 hertz models of a similar value. Our test showed huge differences - verifying that the transformers were indeed designed for 60 hertz and by operating from 50 were working extra hard and consuming unnecessary amounts of wasted (heat generating) current. Two examples: At 220V AC mains, the original transformers drew 109mA (24VA) while the comparison 50 hertz units drew 42mA (9.3VA). At 260V AC, 310mA (80.6VA) against 60mA (15.6VA). Which means? The transformers are not rated for the mains frequency, draw too much current, consume too much energy, run far too hot to be safe. In the most lethal scenario, the windings of the transformer break down and short to the laminated cores placing AC mains voltage on the receiver's protective metal case.

There are other problems, equally serious, illustrated above. The fuse appears in the neutral rather than the active lead, and is connected only to the actuator transformer. And the fuse is too small (250mA) for the receiver alone - our test popped it when it was rewired to the receiver portion of the supply without the actuator turned on (change to T1amp). You can fix everything but the transformer problem by following our suggestions above. A separate fuse for the actuator alone also makes excellent sense.

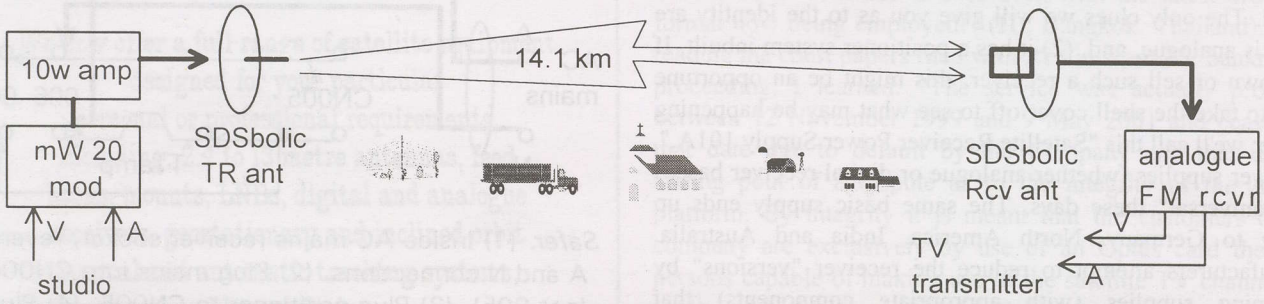
Pop the lid off your receiver to see how "safe" you are!

low cost
lateral thinking
creative ...

... point to point
LINKING

SDStv.com case history B002-003:

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



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

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

Background:

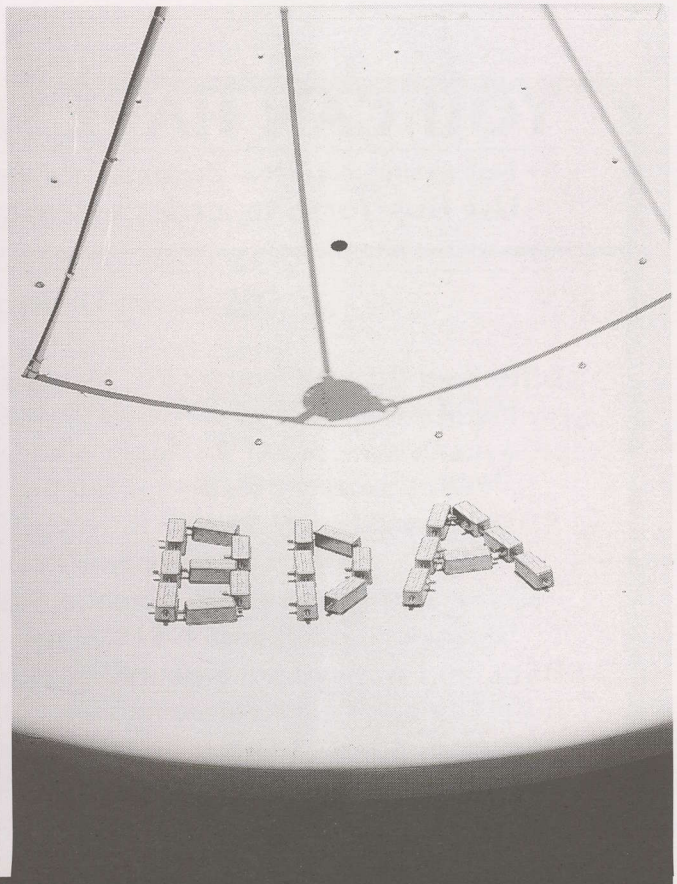
SDStv.com designs are forcing people to rethink why they spend **huge** amounts of money to create 0 to 30 km television/radio/data links using microwave technology. Our 27 MHz bandwidth FM analogue design mW20 transmitter/modulator is user frequency selectable (push-button agile) on 24 channels between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

Foreground:

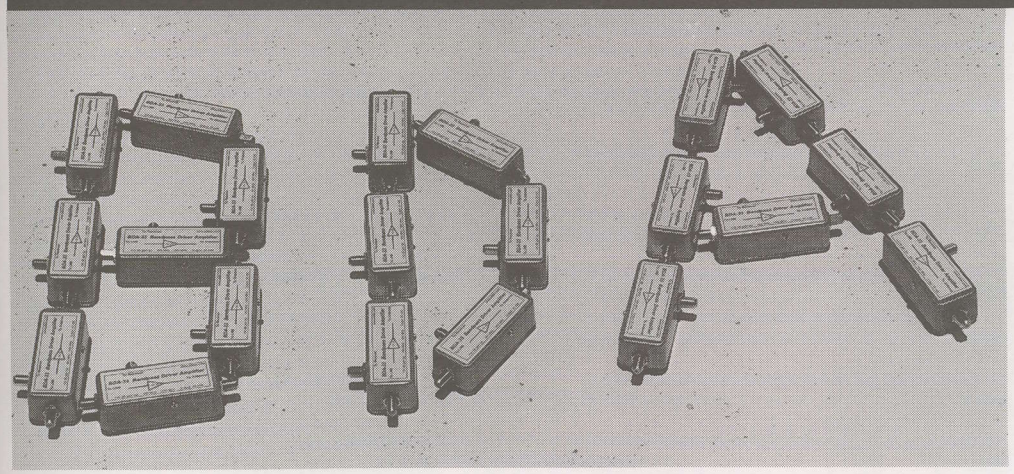
Our prices are sooo-low that you might think SDStv.com equipment is not of professional quality. That would be **wrong**. We just happen to be extremely clever daring to move into the latest microwave chip devices while the high priced guys are still charging "traditional" multi-thousand dollar amounts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

THIS important notation: SDStv.com operates on user-selected frequencies between 950 and 1450 MHz (L-band). Or on special order - up to 2,150 MHz. Not every country will allow SDStv.com licensing (if licensing is indeed required) so check first before ordering.

HOW DO YOU SPELL "One dish" equals THOUSANDS OF RECEIVERS?

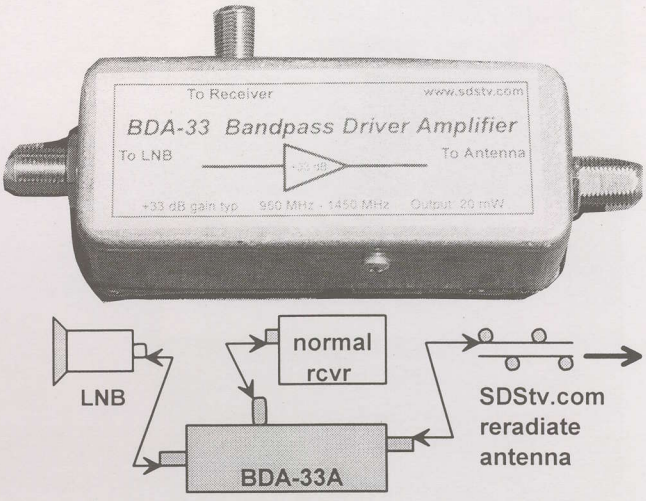


BDA. Bandpass Driver Amplifier.



BDAs are the neatest thing since sliced bread. Think of it as a "signal diverter" that grabs off a tiny amount of LNB signal on the way to your receiver, amplifies it, and then using an SDStv.com antenna relays the entire LNB output band to a distant point, through the air, **without cable**!

ONE satellite dish (whether C or Ku band) through a normal LNB (as long as it creates 950-1450 L-band output) can reach directly to the next door neighbour, an entire block of flats, across streets or even a full community. **Without wires!** All of the normal signals received by the LNB are amplified by the BDA and connected to an SDStv.com reradiation antenna (such as SDStv.com Passive Logi, Discone). At each receiving location, the SDStv.com "Active Logi" (see left page) creates enough "gain" to overcome losses through the air. Transponder formats are not tampered with - analogue stays analogue, digital stays digital, FTA is FTA and CA is CA. The only "change" is **direction** of signal flow - from the dish-installed BDA to whatever area you wish to reach, **without running cables**!



SDStv.com order/pricing on next page

YOU CAN HAVE SDS.tv in YOUR AREA!

* - Not available in New Zealand nor Australia unless you are a licensed Radio Amateur

Use this form to order equipment, solicit additional information

SDStv.com Limited Factory-Direct Orders

☐ **SDStv.com 20 mW Starter Kit.** You receive 24 channel-agile L-band transmitter with (230-260 V AC) power pack supply, Discone omni-directional transmit antenna with RG6 pigtail and F connector, 6 dB gain "Passive-Logi" receive antenna. Connect up your A/V source, connect "Passive-Logi" to any functional analogue L-band receiver, set the mW 20 and receiver to the same L-band channel and turn it on. Instant television with subcarrier audio over distances of 0 - 4km.

☐ **SDStv.com 20 mW Starter Kit - X003**. Same as above but substitutes R-003A "Active Logi" with 21 dB package gain for receive antenna. US$358 + Air Parcel Post/Fed-X charges.

☐ **SDStv.com Passive Logi antenna**. 6 dB gain over frequency range 950 - 2500 MHz, 75 ohm, F connector installed with mounting snaps. 1 - 6 US$25 each; 7 - 24 US$22.50 each. Quantity required: _____

☐ **SDStv.com Active-Logi antenna.** 21 dB gain over frequency range 950 - 1450 MHz, reduced gain to 2150 MHz. 75 ohm, F connector installed with mounting snaps. 1 - 6 US$90, 7 - 24 US$81 each. Quantity required: _____

☐ **SDStv.com 10-watt Linear amplifier.** 27 dB gain turns 20 mW into 10 watts, or BDA-33A (below) into 10-watt total for full 950 - 1450 MHz bandwidth. Requires external 24V DC, 2 amp power supply (you supply - Dick Smith Model AIL 4542 M9636 or equivalent). US$590 + Air Parcel Post/ Fed-X charges.

☐ **SDStv.com BDA-33A Wireless Link System.** You receive BDA-33A bandpass amplifier (powered from your existing analogue or digital receiver), SDStv.com Discone transmit antenna with pigtail RG6 and F connector, 6 dB gain "Passive-Logi" receive antenna. Connect as shown on p. 33 here and use any analogue/digital receiver with passive logi to receive full 950 - 1450 bandwidth dish signals over distances as great as 3 kilometres. US$260 + Air Parcel Post/Fed-X charges.

☐ **SDStv.com BDA-33A/R003A Wireless Link System.** Same as system directly above but substitutes R-003A "Active Logi" for passive Logi receive antenna. US$323 + Air Parcel Post/Fed-X charges.

☐ **YES** - I have checked http://www.sdstv.com web site and I have the following question(s):

_____

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Have you REALLY gone to http://www.sdstv.com for more information???

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Town/City _____ State/Province _____ Mail Code _____ Country _____

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☐ Charge to (VISA or Mastercard - only) credit card as follows:

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Total amount of order (in listed US$) $_____ (*) Signature of card holder_____

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Return: Fax to 64-9-406-1083 (tel 64-9-406-1282; email skyking@clear.net.nz) or mail to

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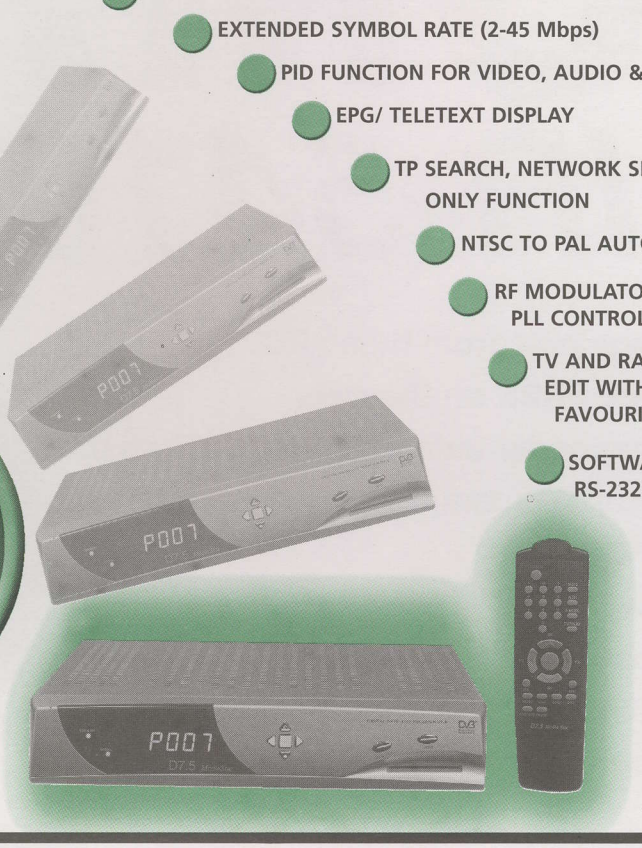
NEW D7.5 MediaStar



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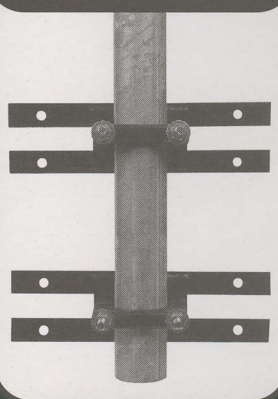
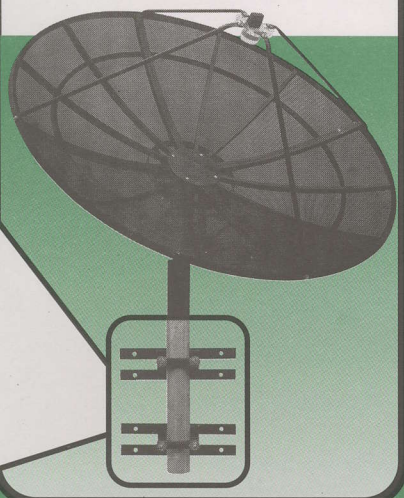


PSi
HIGH PERFORMANCE ANTENNA DISH



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- 2.3m Quad Polar mount
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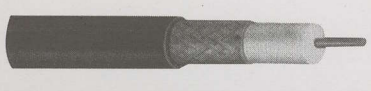

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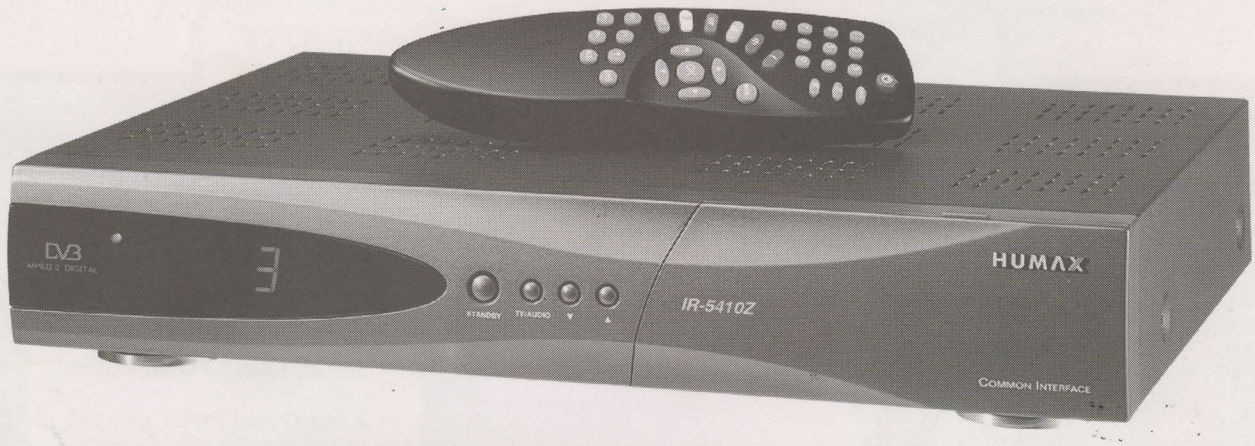

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