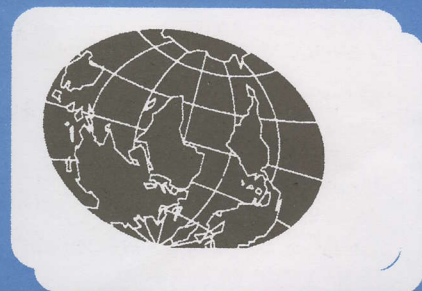


Bob Cooper's

MAY 15 2004

SatFACTS



MONTHLY

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

IN THIS ISSUE

SKY Pacific:
Fiji's
Launch Plan

Your future:
DVB-T married
to the home

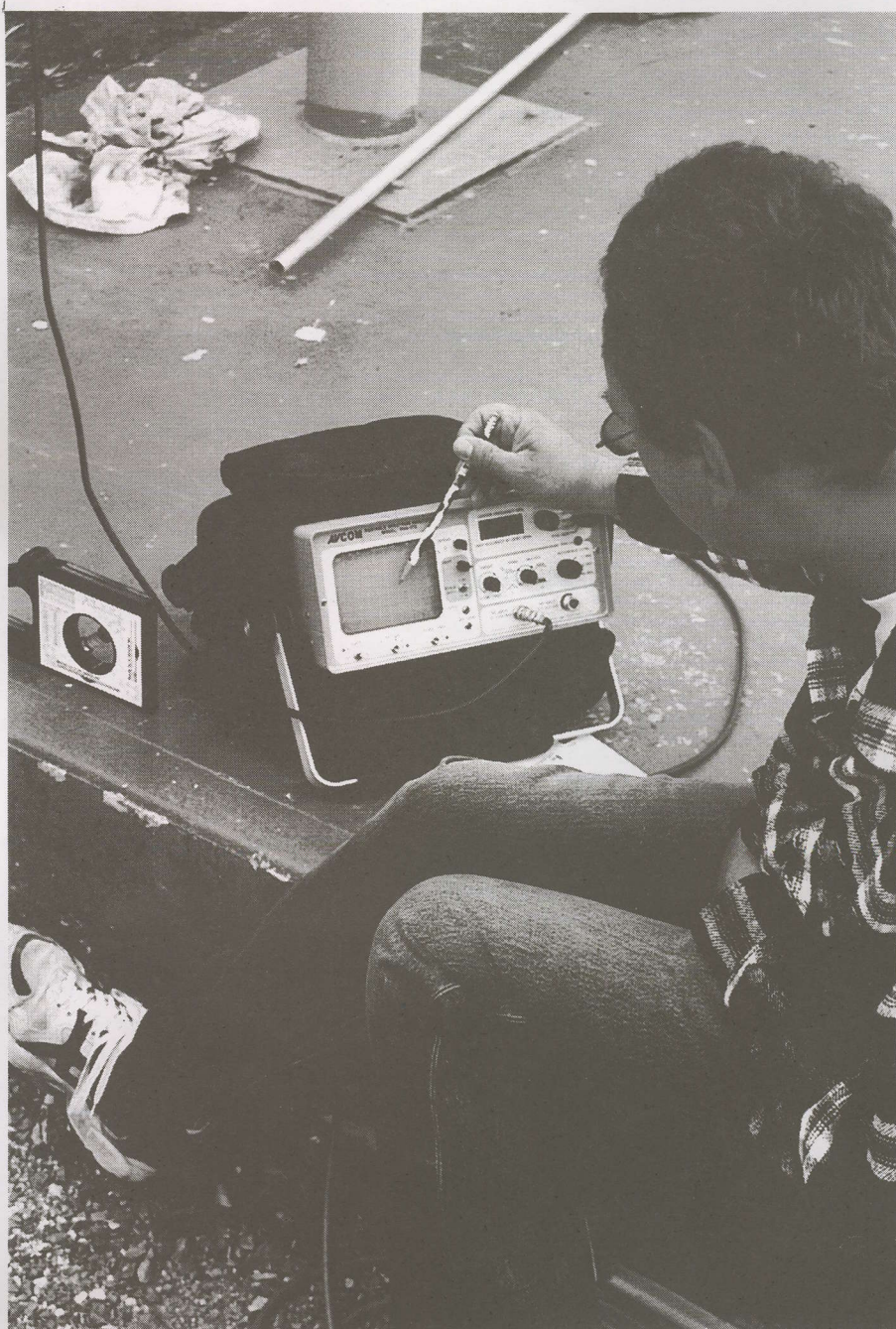
3m test results
with USA
C-band

- ✓ Latest Programmer News
- ✓ Latest Hardware News
- ✓ Code-Key update
- ✓ Observer Reports

Vol. 9 ♦ No. 117

Price Per Copy:

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- Digital Audio Output (S/PDIF)
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- Wide Screen (16:9) Hot-Key
- S-VHS, CVBS & RGB Video Outputs



- Super-Fast Channel Scan
- Electronic Program Guide
- Channel Rename Function
- Software Upgradeable

Magix 8800 Receiver
(Made in Korea)

\$220

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(Made in Korea)

C & Ku band input, PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$160

\$180/each (for 6 unit)

\$160/each (for 30 units)

Coship digital receiver
(Iredto V2.09 CAM embedded)

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11.3 GHz/Universal Ku
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bracket.

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High symbol rate >45,000
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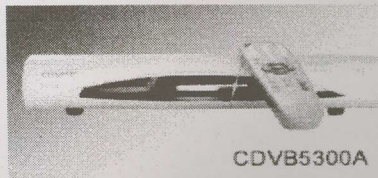
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Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output



CDVB5300A

SPACE 2300 digital receiver

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$140

Irdeto 2.06B CAM	\$140	Zinwell C band LNBF	\$35
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1.2 motor		LNBF	
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(motorized)		RG6 Stripper	\$20
2.4m heavy duty			
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(motorized)			
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band on Intelsat 701)
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Channels.

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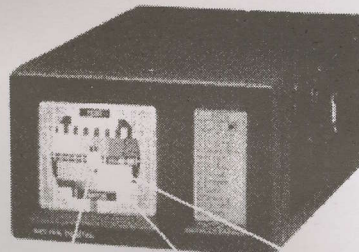
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- Presents full range spectrum (and expanded)
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SAT-part:

- 920-2150MHz spectrum analyzer. Digital BER, QPSK and S/N-ratio
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- Tunable audio bandwidth 5.5-8.5MHz
- LNB voltage 13/18V, 22kHz tone switch
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- KU- and C-band (normal/inverted video)

Full range of C/Ku band satellite dish - panel & mesh, prime & offset, from 45cm to 4.5m

Full range of Zinwell, MTI C/Ku LNBF - Dual output, one cable solution, C/Ku combination

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2.4 GHz AV sender and Remote extender

RG6 Cable and Motor cable

Full range of satellite accessories



THIS MONTH SPECIAL



SPACE 2300A FTA Digital Receiver \$1300/(10 units)

Magix 8800 Digital Receiver \$1200/(6 units)

Phoenix 2.3m Mesh dish \$1650/(pallet of 10 sets)

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

COOP'S COMMENT

If one created a list of all of the nations in this world now employing regular DVB-T broadcasting, 86% between Andorra and Zimbabwe would be missing. If one made a second list of only those countries with a definite, hard date to cease all analogue telecasting in favour of DVB-T, only Germany and Sweden would be posted.

As of July 1st, 50% of all TV sets offered for sale with 36"/91cm or larger screens in the USA must be "DVB-T" compliant. That is step one. By 2006, all TV sets with a 13"/33CM or larger size screen must be DVB-T compliant or they cannot be offered for sale in the USA. Like it or not, terrestrial digital telecasting is here to stay. Moreover, it is going to replace analogue broadcasting totally. That's not "if" - it is at best, "when."

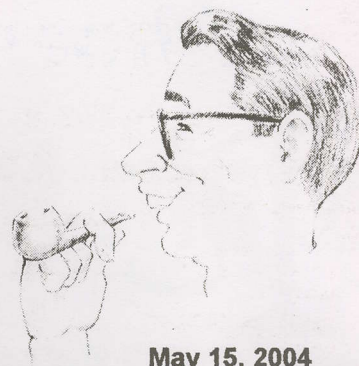
Simultaneously, the penetration rate for DVB-S (digital satellite) and DVB-C (digital cable) is growing very rapidly; so fast that today between satellite and cable, more than 85% of all homes in America are "connected." What that leaves, in America, is less than 15% of homes still dependent upon indoor or rooftop aerials for (analogue) reception. In next-door Canada, that percentage is below 10 while in Belgium and (the) Netherlands, hovering around 5%.

Politicians are in charge of the analogue switch off and swap over to digital; folks you don't trust to set your taxes have now assumed responsibility for creating a replacement system that delivers into your home information, education and entertainment. The driver here is money. *Lot's of money*; politicians love money. Analogue television requires bandwidth in the VHF and UHF spectrums. Fifty years back when these spectrum segments were initially set aside for TV delivery, nobody foresaw that personal communication devices (such as cell phones, pocket pagers, wireless short range in-home phones) would also one day exist and each would also require spectrum space. With the explosion in technology, mankind now knows how to do virtually everything "by wireless" but alas, there is not sufficient spectrum (bandwidth) remaining to accommodate all of the new gadgets we have today - not to speak of 2010 or 2020 and new "gadgets."

By shifting TV from analogue to digital, the efficiency of digital will leave hundreds of megahertz of VHF and UHF spectrum available for conversion - reassigning what is today TV broadcast space to new uses. Government - yours, mine and theirs - sees in this an opportunity to modernise television and by reclaiming spectrum space raising hundreds of trillions of dollars (world-wide) by reselling today's TV spectrum to new users for huge sums of money.

And if some users of analogue television are no longer able to receive television with a rooftop or set-top aerial after the conversion? Not a big deal - because to back up the conversion there is the rapid growth of satellite and cable to "fill in the white areas" where analogue now reaches but digital will not go.

The sums of money Government(s) see at the end of this conversion are so gargantuan that no matter how many problems DVB-T encounters, the conversion will not, shall not, be deterred. Which is why our p. 18 feature by Tim Alderman takes on special meaning this month. DVB-T is here to stay and you as an installer should be looking for ways to adapt, "go with the flow," as *swimming against the current is death*.



May 15, 2004

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Code-Key Fall-Out -p. 7

The outer limits of Pacific-NA reception -p. 8

Under 10 degree Ku-band reception -p. 14

GWN, WIN, ABC, SBS head into PAS-2 Ku Sunset -p. 15

At the end of the DVB-T conversion (Tim Alderman) -p. 18

Digital disparities found in Europe -p. 28

Dreambox DM500-S world's smallest LINUX -p. 28

BBC publishes report on digital TV switchover -p. 30

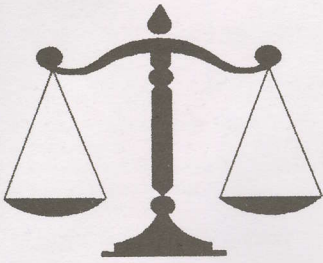
Departments

Programmer/Programming -p.2; Hardware/Equipment Update -p. 4; SatFACTS Digital Watch -p. 22;

Supplemental Data -p. 26; With The Observers -p. 27; At Sign-Off ("Dream" on) -p. 30

-On the cover-

Digging North American birds out of the background noise - p. 8



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**PROGRAMMER
PROGRAMMING
PROMOTION**

UPDATE
MAY 15, 2004

Digital Idiots?

"I have just contacted Foxtel about getting a second STU for my satellite service and was told that I can NOT have another unless I upgrade to Digital. I then had about a 20 minute argument with them that their satellite service is digital and that I should be able to get a second STU. But I was informed that their satellite service was an analogue service and not a digital service and that the only way I could get a second STU was to changeover to their NEW digital service. These people are just idiots when it comes to their own services."

PH, NSW

Not quite idiots; mostly dishonest. The front-line folks at Foxtel have been trained in a very narrow reponse area - they have been told that their 'new service' is digital while their old one is analogue. Obviously that is incorrect. What they really mean to say, but they have not been taught to parrot, is that the 'new Foxtel digital' is significantly more advanced than the 'old Foxtel digital.' It includes FBO and other telephone connected feedback links, more TV channels (about which the less said, the better - if you cannot 'wow' them with quality, overpower them with quantity!), and on the horizon widescreen and HD - even if that point disappears over the horizon of reality. Their intent is to get you to 'trade up', to pay them money to have them send out an installer to replace your existing UEC box with a new (or two new) PACE boxes, connect your boxes to the telephone line, so they can suck you dry when in a moment of emotional weakness you succumb to their promotion for a new \$6 movie offering - to be added of course on top of your existing cable bill. Read the fine print in a new "Foxtel digital satellite" contract - 24 month period, totals \$1,275.80 (\$55 install + one month of platinum service at \$94.95 + 23 months of Digital Basic at \$48.75). You are forced for the first month to take the full 'Platinum' package (\$94.95) because they hope once you have been exposed to the 'every channel service' you will come back and upgrade from the lower fee \$48.75 service. Pure and simple temptation. Drug dealers have a similar approach to sales: "Try this - free - just once," At the end of the day, Foxtel is a monopoly. End of story.

Fiji's coming out party. It is now official; Sky Pacific launch 1 July (not a "firm" date) through NSS-5 spotbeam 2 "reaching from Vanuatu and Solomon on west to Cook Islands on east;" Ku of course; see p. 6.



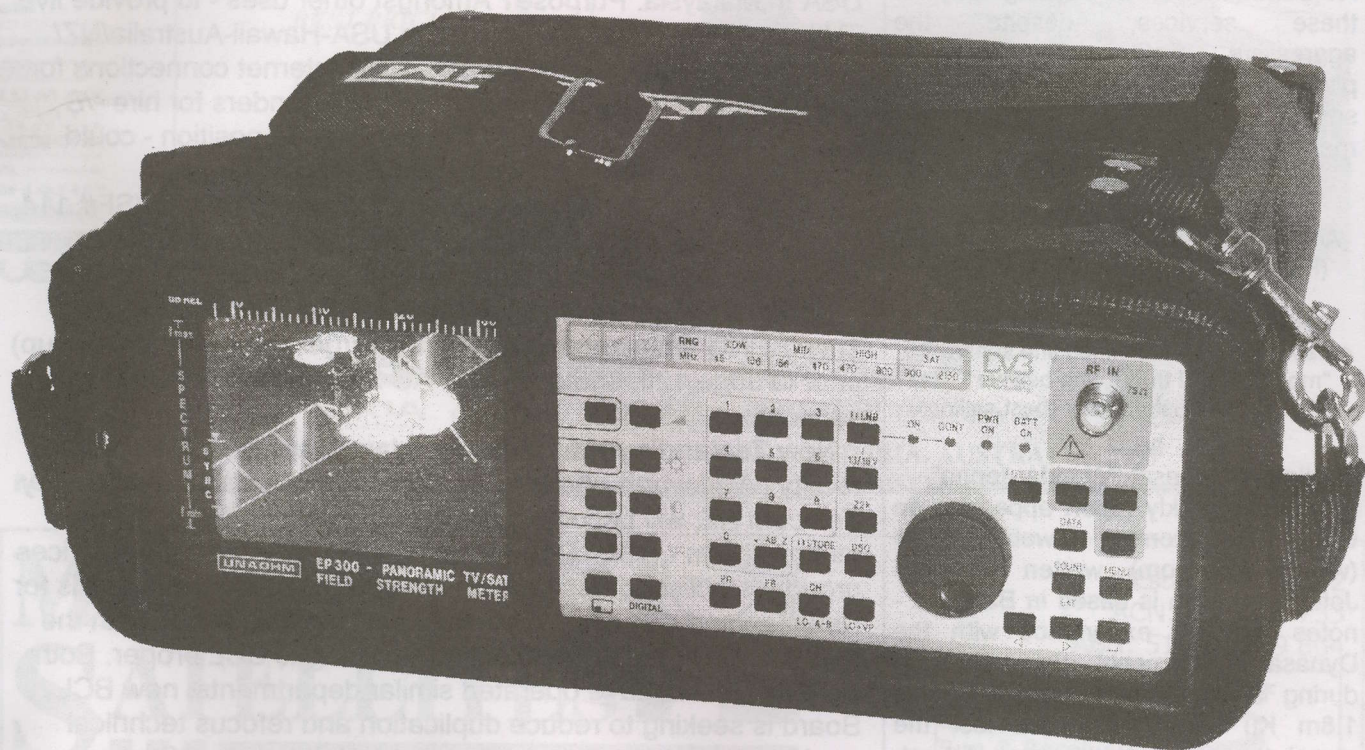
GWN missing? Some readers report they were able to recover this soon-to-go-away service (along with WIN and ABC WA and SBS WA) on the new 12.673 PAS-2 frequency by repeaking their dish (or as in some cases, replacing with a larger dish); others report this worked for a few days and then on May 3-4 the service went intermittent again. In fact, it appears while the signal may be nominally strong enough to lock and load (such as 8 dB C/NR), it really requires 12 dB or more signal to do this. June 12th remains the announced shut-down date. Oh yes - the "replacement" receivers being provided when SA models are turned in come from ADB (model ABS3Q76). Details, p. 15.

"Over 2,000 copies - somebody must be reading it!" Garry Cratt's Av-comm Satellite TV Specialists has the 4th edition of "Practical Guide to Satellite TV" now available - A\$49.95 including GST. Source is related at (61) (0)2 9939 4376, or through <http://www.avcomm.com.au>. If there is *anything* you want to better understand about C and Ku satellite reception in Australia (and the Pacific), this is the must-have reference book.

TVNZ "extra" channel? SF#114 suggested, "*maybe the (TVNZ) programming guys need to take a look at sourcing their own copyright owned materials from archives - a 'TVNZ Yesteryear' channel and then allowing selected portions to be rebroadcast under contract by the UHF regional outlets around the country.*" More recently, from Sky NZ, a proposal to telecast fulltime the NZ Parliament - something, as it turns out, TVNZ itself would like to do. So a new plan - combining live coverage of Parliament with time-delayed same-day news programmes and selected archival material. Officially, no mention of satellite distribution - only suggesting it would be transmitted over Auckland on a UHF channel TVNZ owns there. But unofficially, putting this new service on satellite is a part of the plan. When? Proposal remains an "if" at this point, but earliest likely start date would be late 2004. The UHF channel for Auckland would be an interesting addition because Sky NZ installers routinely disconnect their digital customers from the home's VHF-UHF aerial system - a challenge the regional UHFers have battled for several years. No aerial connected? No 'Yesteryear' service without a service call from an aerialist!

ABA concerned. Investigation underway to determine 'who' is responsible and 'where' they are - the guys (and gals) behind Free-X TV, BlueKiss and Sexz TV. NSS-6 service is widely available across Australia (PNG, etc.) bypassing national film review/classification systems. This one could get nasty.

The first Digital meter FOXTEL Approved.



Analogue and Digital, BER and MER, QPSK and COFDM or QAM for DTH, MDU, MRE, MATV, SMATV or UBB work, the challenges new technology bring to your tv measurements are many.

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Janet Jackson Revisited

"For the record: SEXTV and Blue Kiss. There is growing concern that the introduction of these services into developing countries will do much damage to the local culture. In particular PNG, Solomon Islands, Fiji etc. where there is already a certain level of lawlessness and unrest. In many countries where religion plays an important part of local culture, these channels will be seen as very insulting. Call us prudish, but Av-Comm won't be selling any of these services, despite the aggressive, profit motivated sales pitch pushed down our throats by some of the more inexperienced members of our industry."

Garry Cratt, Av-Comm Pty Ltd,
Sydney

An interesting parallel in the USA where (FTA) broadcasters have come under increasing pressure to eliminate programming (radio and TV) which crosses over an undefined line separating "morality" and those who believe "The Bible" to be "just another (best selling) book."

Thailand's Dynasat "Wonder-tenna"

"A new weekly report appearing on Craig Sutton's web site (www.apsattv.com) written by Kiwi John Clark who is based in Bangkok - notes that his experience with the Dynasat 7.5' 'mesh' dish was that during a heavy rainstorm when his 1.8m Ku rated solid dish lost the signal, the slightly larger mesh did not. In checking with the factory, I learned Australian supplier Hualin Pty Ltd. (www.hualin.com.au) is an agent for this antenna. Could SF arrange to test one so those of us who would like to have the best possible Ku performance will know whether this antenna is a candidate?"

Siam Global, Thailand

Comparative testing is one element in evaluating an antenna but on the 'strength' of one rain storm and one comparison, does not tell us enough to form a solid judgement. For example, how good (or bad!) was the performance of the 1.8?

Yes, we are discussing acquiring a Dynasat 7.5' with Hualin and will advise when - if - it arrives here.

Russians only look north?

"New Russian AM 11 at 96.5E; 3675RHC very weak into Australia. Why do they only use northern beams these days - years ago it was global!"

David Leach, NSW

Perhaps because Russia's 11 time zones are all NORTH of the equator?

HARDWARE EQUIPMENT PARTS

UPDATE

MAY 15, 2004

2005. Mark it. Something called 'Worldsat (3)' is scheduled for launch to 172E. The new bird will have an interesting mix of C and Ku transponders with an oval-shaped coverage pattern extending from Alaska to below New Zealand, west coast of USA to Malaysia. Purpose? Amongst other uses - to provide live TV to commercial planes plying the USA-Hawaii-Australia/NZ/Asia routes. Secondary purpose: "Live" Internet connections for passengers as well. Last purpose? Transponders for hire - C and Ku. Actually, 172E may ultimately not be position - could end up slightly east in region of 174W.

Rescheduled. 138E Apstar 5/aka Telstar 18 C + Ku (SF# 114, p. 28 coverage map) that did not make April launch - now scheduled July 9th using Zenit 3 launcher.

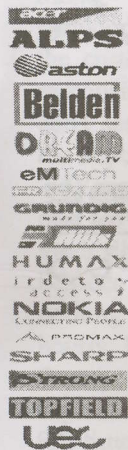
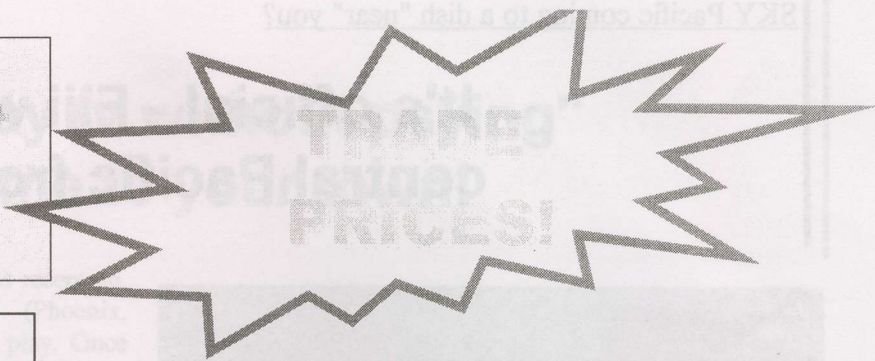
Hardware search. Cable/SMATV systems located in East Timor, PNG are scrambling to locate larger dishes (4.5m and up) prior to June 12th shutdown of PAS-2 GWN/WIN/ABC/SBS Ku services.

New Zealand's primary (North Island) satellite interconnect facility (Warkworth - north of Auckland), owned and operated by Telecom NZ, will become a technical responsibility of TVNZ's technical arm - BCL. Perhaps related, TVNZ's Satellite Services group, established decades ago to co-ordinate satellite feeds for New Zealand and other countries, is being dismantled with the responsibility for its operations likely going to BCL proper. Both BCL and TVNZ have operated similar departments; new BCL Board is seeking to reduce duplication and refocus technical arm's activities. Under new Government direction, BCL and TVNZ have become independent of one another to allow BCL to be more of an "industry supplier" than a TVNZ clone.

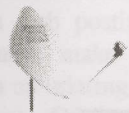
New at 135W. So you have looked previously (at 135W) where aging RCA C4 was located? Look again! SES Americom turned on brand new AMC 10 at this location May 5 at 0800UTC - 10PM AET. Does it reach into the Pacific? See SF#115 front cover for the footprint that does, indeed, include at least parts of the Pacific. Reports please to SatFACTS! (AMC-11 to go to 131W will follow by mid-year - another opportunity.)

Do you do contract dish installs? Please see first-time listing p. 29 this issue. With the increased interest by consumers in ethnic programming, largely on Ku through B3's Globecast, in both Australia and new Zealand, there is a shortage of known-to-be-available skilled installers outside of the major metropolitan areas (such as Auckland, Sydney). If you do or would like to do installs, please supply SatFACTS with the following information to be listed in future issues: 1/ Your name-business name, 2/ the town where you are located and a radius area you are able to cover, 3/ your telephone number and/or e-mail contact information. Those representing programming will contact you directly from this listing. Send to us at fax ++64 9 406 1083, e-mail skyking@clear.net.nz.

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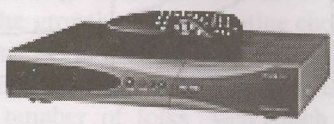
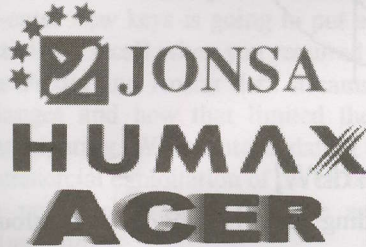
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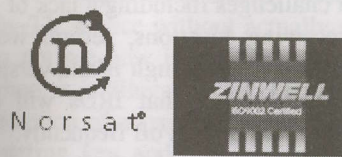
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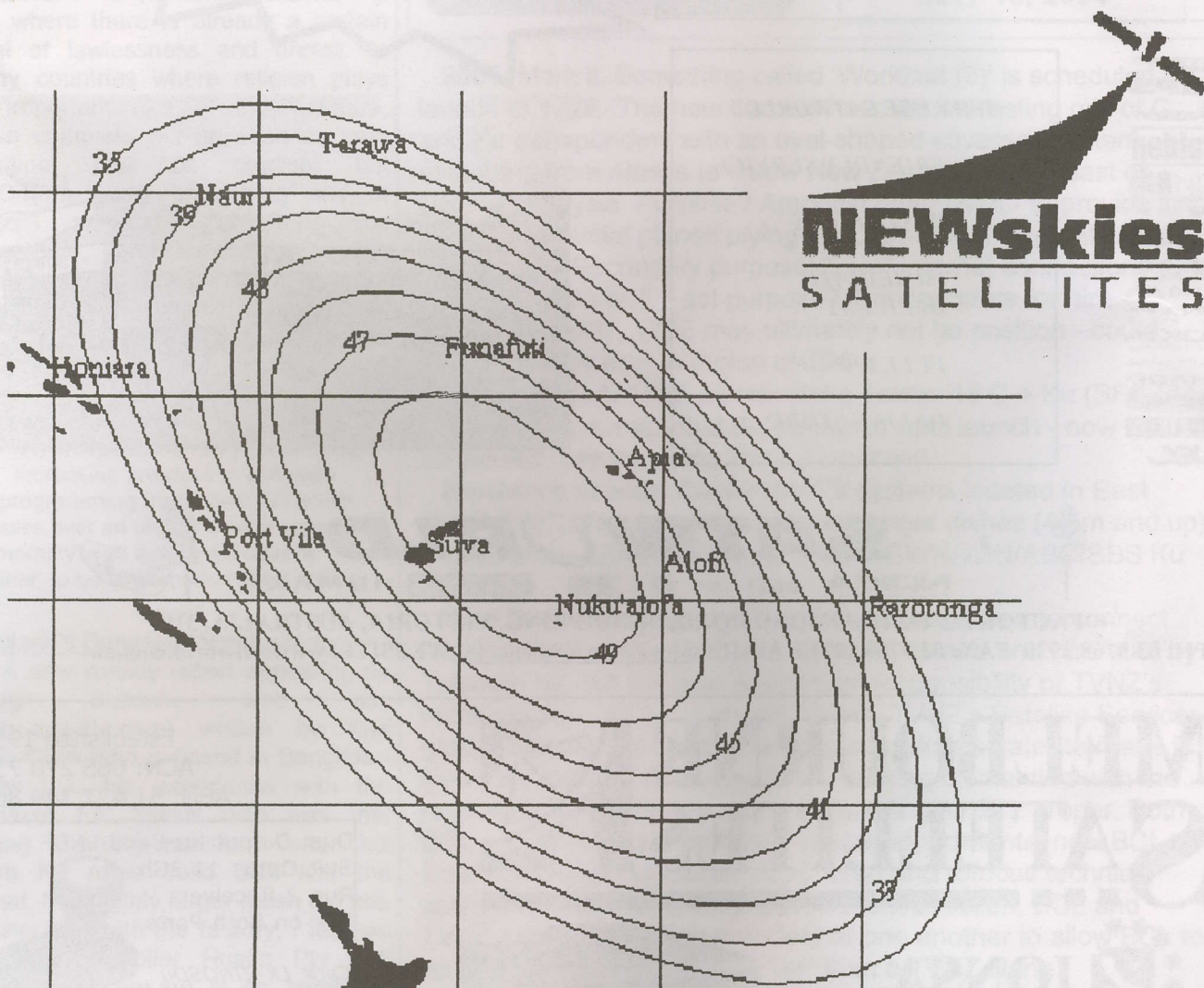
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It's official - Fiji will serve central Pacific from NSS-5



High Power Ku-Band Spot 2 Beam on NSS-5 [EIRP in dBW]

Fiji's coming out party. It is now official; Sky Pacific launch 1 July (although this is likely to slip some because of uplink delivery unknowns) through NSS-5 spotbeam 2, "reaching from Vanuatu and Solomon on west to Cook Islands on east;" Ku of course, from 176W. In first 6 channels (F\$49.95 p/m), Fiji One + 5 more not defined yet; level 2 (F\$59.95, add 4 channels), level 3 (F\$69.95) adds 2 more and in future - pay-per-view. Fiji-One (the terrestrial TV channel) will be FTA and within Level One. This will be first English (+ Hindi) language(s) service to a wide region including Western Samoa, Cooks, Solomon and with a big enough dish - into PNG as well. NSS-5 Spotbeam 2 is being reconfigured for this service (see our previous map, p. 27, SF#116) as shown above. Receivers will come from a well known Korean supplier, CA systems from Nagra; Fiji TV will be source for

receiver packages including dish + LNB et al at around F\$1,000 per system.

The service faces unusual challenges including a lack of 24 hour electricity at many receiving locations, several week transit time for delivery of equipment through island version of "Pony Express," and probability that IRDs will be subjected to "stress" by being turned on and off frequently.

In coverage map, allowing for rain fade margin (a significant factor in tropics), centre ring is 0.9m, Rarotonga 3m. First time "reasonable" size dish service will fall into Nauru (2m+), Kiribati (2.4m+), Western (& American) Samoa (1.2m) with extended coverage assuming 3m+ dishes into Marshall Islands. New Zealand or Australia? Highly unlikely given "scrunched" pattern on eastern and western edges in New Skies forecast (map above).

Contacts? Try kclark@fijitv.com.fj.

SF stirred up a hornet's nest!

OK - so "pay tv without paying" has come to your town!

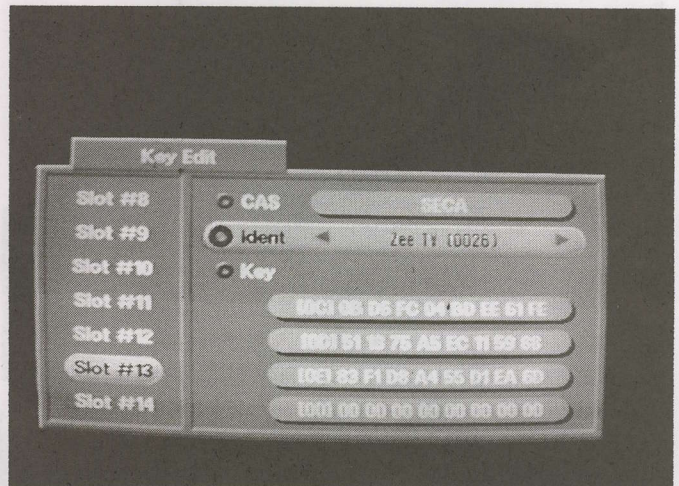
"My view is that such receivers allow fortuitous reception. Majix receivers come from the importer (Phoenix, Melbourne) already programmed. Just plug and play. Once the customer utilises the website info to update keys, the responsibility for illegal (if it is that) reception becomes his. I don't see any problem in selling the receiver as supplied by the importer." (Australia)

"Your report only considered monthly key changes. In fact, one of the most popular Asian-available services has gradually over the past several months shortened the time between key changes - currently close to every 36 hours and nothing will prevent them from changing the keys daily or hourly. Moreover, as SF warned in the closing paragraph of the report, users must have the total backup of the dealers to buy these receivers and expect something approaching full-time results. Correct keys for CBS/ABN, for example, on LMI, have been months behind the times and often totally missing on web postings. Finally, the UK and many EU countries now make it illegal for dealers to pass any information on relating to 'the theft of pay TV signals' (as it is called there). Of interest, in the UK's largest satellite magazine where smartcard hacking equipment is widely advertised, there is not one advertisement for the code key receiver family that identifies what 'special attributes' such receivers may possess." (SE Asia)

"The real key here is auto updating. In studying web sites and (European) chat room posts, while there may well be 'an army' of folks out there and some of these have the technical skills to catch the latest code sets when they are transmitted through the programmer's uplink, for the average user having to shut down monthly or whenever the keys change and then re-enter new keys is going to put a lid on the growth of this activity. I recall when you required a full-time PC to monitor the Foxtel and Austar data streams to capture the latest key changes and how that limited the actual number of folks participating. When auto updating became card-possible, the commercial exploitation of the technology took off like a shot. In my humble view, this one awaits that breakthrough." (Australia)

"Is it legal? In countries where it is 'illegal' to watch any pay-TV service without actually making payment for same, I do not see how it can be anything but illegal. In countries where it is 'illegal' to modify hardware or software to allow reception of a pay-TV service without paying, I believe that entering key codes is no different than electing to use a MOSC (gold or other modified card). And, in countries where it is OK to do either or both of these things in the privacy of your home as long as you do not engage in 'sharing' your results with someone outside the home, it is probably a marginally 'legal' activity." (Australia)

"I note that some Zee channels are available through local or national agencies in countries beyond India. In Fiji, for example, Fiji TV is the Zee web site 'agent' for eight of their language services. Pointedly missing are the Zee TV English



Code key entry system for Strong 4800 II is more complex than SF#116 reported Divitone, requires knowledge of special "software entry" numbers and a routine that is "hidden."

language channels (such as MGM Movies); Fiji TV is not authorised to distribute nor resell these channels. That suggests Zee does not have the legal right to license firms such as Fiji TV (and more than a dozen others in countries listed on their web site; the Maldives distributor, for example, only has redistribution rights for Zee TV and Zee Cinema) for programming beyond those channels which it actually creates internally (such as Alpha Gujarti TV). But the code key receivers do not separate the channels by copyright criteria - it is an 'all for one - one for all' approach based upon the CA routine chosen by the programmer." (Fiji)

"There is a new software program being distributed on the web which purports to give the Humax receivers special skills but it is not clear how one implements this. I believe you use your PC to actually make the code key changes after a modified software routine has been preloaded into the IRD. Perhaps someone who has worked through this routine could explain?" (Australia)

"Regarding the (apparently) German origin TuxOnHumax HoT EMU 1.2; it is supposed to emulate a card. It appears to work as both a client and server for card sharing purposes. However, it does not appear (at this time) to work with the card formats in use in Australia or we do not have the keys to make it work 'openly' available. The amount of 'work' and 'time' being spent on refining this or other similar approaches is quite spectacular and new card interfaces as well as patch software seems to be reported weekly on such sites as austech. All of this is being 'driven' by the significant number of Humax (and similar) receivers throughout the Pacific which lost their card access during February and March. Like it or not, this is FTA Satellite TV of 2004!" (Australia)

Investigating the outer limits of Pacific satellite TV reception



In SatFACTS #115, we introduced you to the challenges relating to receiving directly on your dish transmissions from C (and Ku) satellites created for service to North America. In SF#116, an updated report indicating that such reception, even with relatively small dishes in the 3 and 3.7m class, was possible if you happened to live "in the correct location." The mystery here was that nobody, including SatFACTS, could pinpoint where such reception was possible. You had to equip your dish to look "east" towards the American satellite belt and using information we provided do your own "scan" of the various locations where North American satellites are functional. SF#116 did report high quality reception as near as American Samoa and to a lesser extent, using a "tiny" 3m antenna, in northern New Zealand. This report expands upon that information.

To the west

Our "radio horizon" (limit of visual satellite accessing) at SatFACTS occurs near 94.5 degrees east. This means NSS-6, the bird with the powerful Ku transponders delivering Blue Kiss and other (adult) services, is 0.5 degrees above our horizon. Nobody expects a dish to work that close to the horizon but as some South Australia and Victoria readers have found, signals can and will appear "right at the horizon" under ideal circumstances. Using the 3m Patriot dish shown here, an appropriate feed and Gardiner 0.7 dB noise figure LNB, we actually had no difficulty locating Australian Telstra on AsiaSat 3S (105.5E); 12.596 GHz. The look angle here is around 10 degrees and the signal we found was more

Our locally modified 3m Patriot dish had been equipped with a "swivel" bracket at the top and two all-thread rods (1m in length) which pass through loosely fitting brackets on the dish support structure.

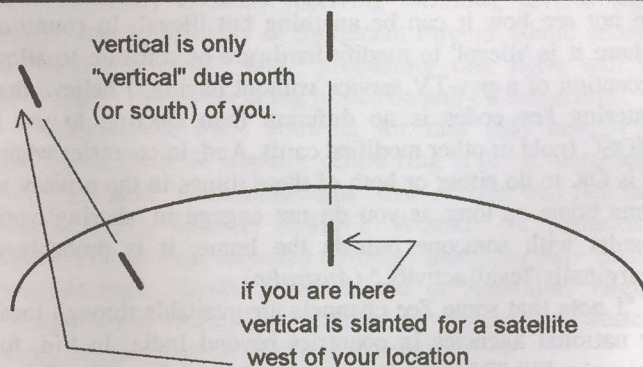
This allows us to make 0.1 degree elevation adjustments while rotating the square support tube on the round 5" diameter antenna support pipe for azimuth scanning.

horizontal than vertical in polarity but up to 10 dB C/NR; see separate report, p. 14, here.

Some folks are having difficulty understanding why a signal that leaves the satellite in one polarity (such as vertical) ends up at your distant location at almost the opposite polarity (such as horizontal). This becomes increasingly important when you are dealing with signals close to either horizon - far to the west or east. The answer is as follows.

Polarity is set at the satellite based upon the bird's longitude. A satellite at 166E (PAS-8) will have its vertical and horizontal transmitting antennas aligned so that anyone located north or south of the satellite (166E) will see vertical as vertical, horizontal as horizontal. But as you go east or west of 166E, the satellite stays stationary while your location is off to the "side" of that longitude. For example, a transmission that is vertical (12 o'clock to 6 o'clock if visualised on a clock face) at 166E from a different location at 146E or 186E (same as 174W) will be "twisted" in relation to your location. What is vertical at 166E (12 o'clock to 6 o'clock) twists to 11 o'clock - 5 o'clock at 146E, and 1 o'clock to 7 o'clock at 186E/174W. The further you are from being either directly north of, or south of, the satellite's geostationary location, the greater the amount of "polarity twist" (diagram, below).

There is no way you can achieve even a small measure of horizon-satellite (those close to either of your horizons) unless you employ polarisation compensation. A vertical signal, close to either horizon, is in theory almost horizontal and vice versa. But there are exceptions and they can (and will) drive you around the bend.





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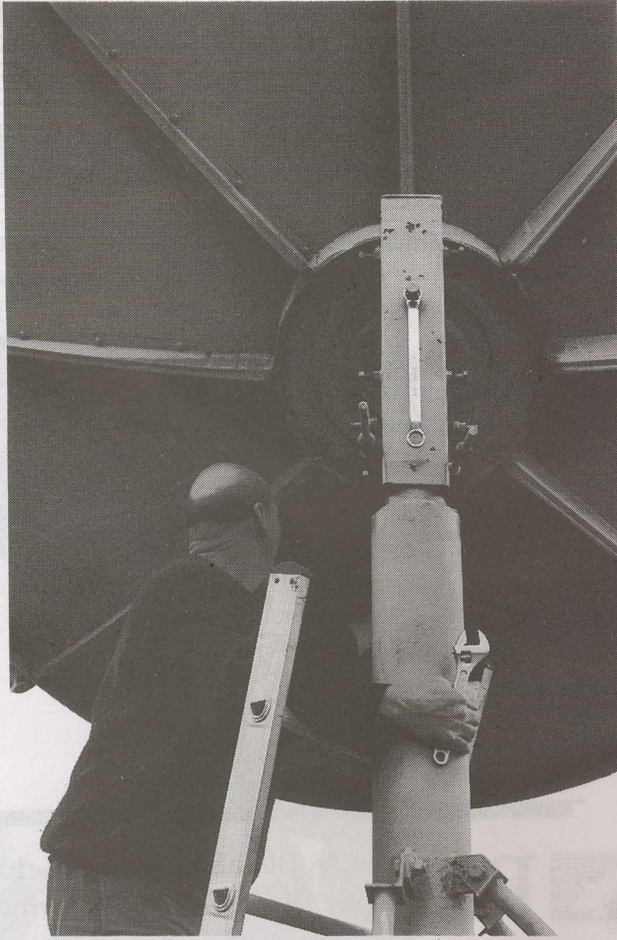
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When Kiwi Cable (on the Kapiti Coast, near Wellington, NZ) installed their 15 m/49 foot dish in the early 90s, they had quite excellent signals from a number of analogue services originating on North American focused C-band satellites. But as Nigel Clough, who was brought in to fine tune the antenna, discovered, there were some unexplained aberrations - things nobody had predicted nor expected.

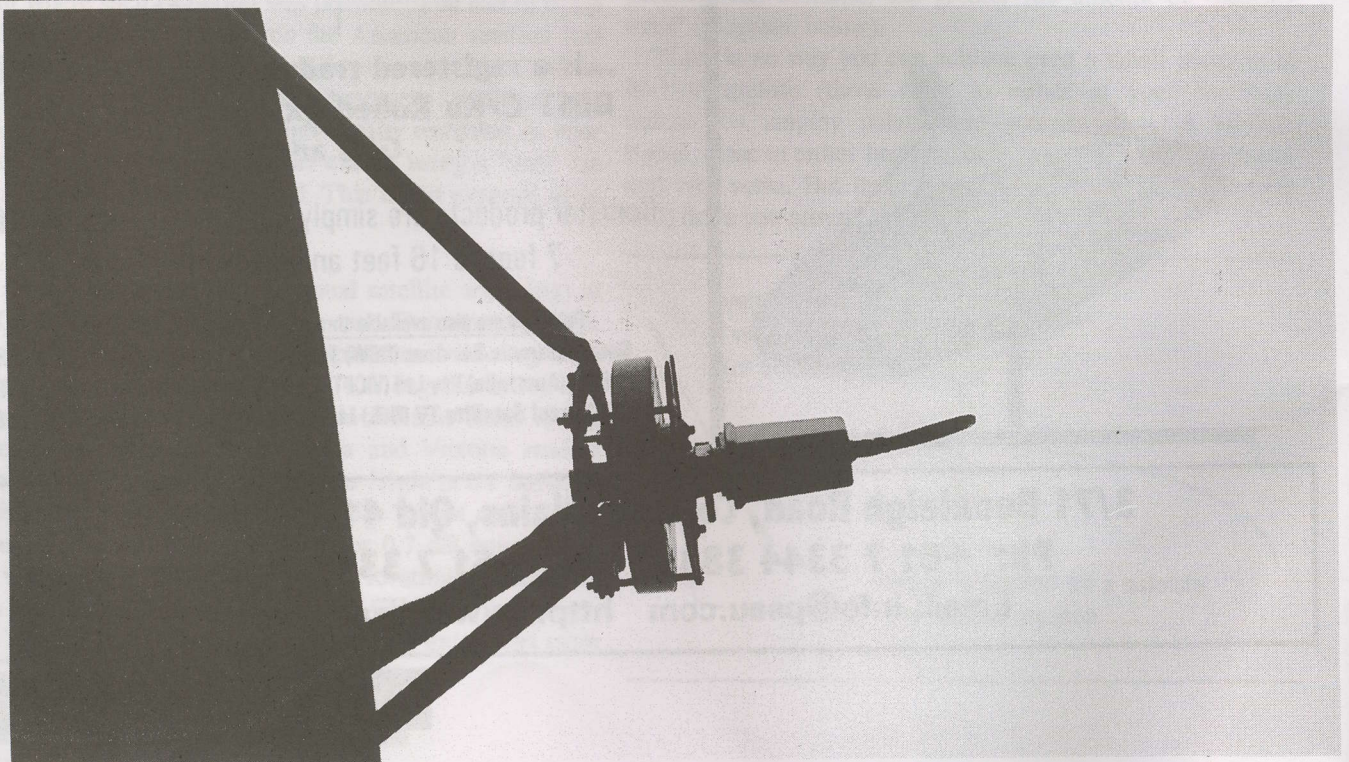
Some (not all) of the vertical polarity signals remained more or less vertical (as if he was in fact due north or south of the satellite itself - which he was not when the satellite was

Every adjustment you make must be measured and properly recorded so you can with accuracy return to a setting which was producing results. With so many satellites close together to the east, and with polarities unpredictable, measuring both the elevation of your dish and the apparent azimuth (with a quality compass) is essential. Documentation of your dish and your findings separates the skilled from the amateurs.

at 135W and he was at 174E) while simultaneously most of the horizontal signals were - twisted - to almost vertical. Which meant that both the verticals and horizontal appeared in one single polarity - vertical in this case.

Satellite operators depend upon the integrity of the polarity - vertical is vertical, horizontal is horizontal - to allow the adjustment of the feedhorn and probe inside of the LNB to separate the two polarisations. But when both horizontal and vertical end up being vertical - well, that is a new technical challenge of considerable complexity. The explanation for why this happens is terribly complex so suffice to say, "it does" and we move on from that point. If you really are intrigued by "why" remember that when a satellite such as C4 at 135W focuses its energy at the USA state of Kansas (and we are about as far from Kansas as is practical while remaining LOS to the satellite) that any signal we see at all is sent our way by "scattering" from the satellite's antenna system. That means energy that leaves the satellite transmitting antennas in the vertical format strikes (bounces off of) some support structure within the satellite, and in that "bouncing" has its polarity "twisted" 90 degrees (or some number of degrees close to 90). After "bouncing" it is at that instant horizontal - and it behaves in our direction like the actual horizontal polarised signals. Which means - before it arrives out here in the Pacific, the difference in longitude between 135W and 174E (or wherever you might happen to be) sees a "twist" - and both polarities end up as the same polarisation at our location.

Practical problems? Of course when both polarisations arrive at your dish as one polarity - you have a new problem.



Separating the two. It is tough enough when they are 90 degrees apart - it becomes much more complex when they are 20 degrees in separation (such as horizontals end up being 1 o'clock to 7 o'clock at your receive site while the verticals end up being 2 o'clock to 8 o'clock).

In our 3m tiny antenna tests we saw it happening on Galaxy 13 (127W). In the best case (shown here) we were +5 dB above noise or about -2 dB reference digital signal lock and -3 dB analogue threshold. But that assumes no interference - that the vertical signal on G13 was not appearing simultaneously with the horizontal signal on G13. The spectrum analyser images published here depict what we found - both there, simultaneously, even though we had very carefully peaked everything including polarity adjustment.

Three photos here illustrate the challenges involved (to right). In the top photo, a single analogue (happens to be VC2 format CA) signal at 3940Hz. It is not strong enough to resolve (even with threshold extension -p we tried!) but it is "clean" of interference.

In the middle photo, two carriers. The jagged one to the right is analogue (3960Hz) while to the left, a cleaner MPEG-2 format signal (3860Vt). Both are at about the same level (and both too weak to resolve) although the MPEG-2 digital is on the opposite polarity to the analogue. No, there as no apparent peaking of either except as both changed simultaneously when the feed probe was carefully rotated.

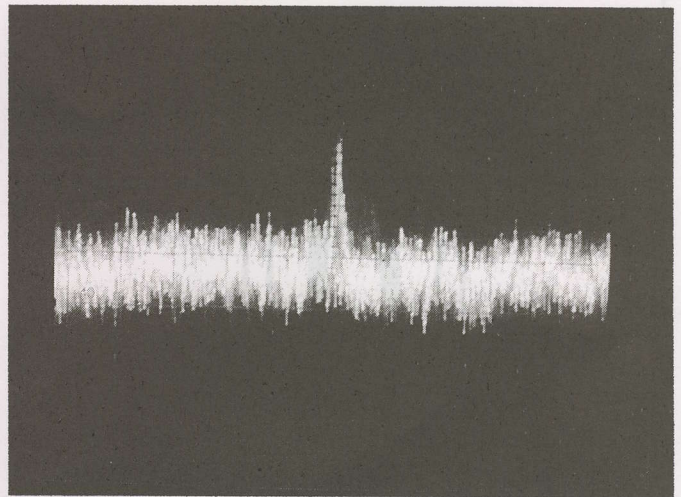
Finally, in the bottom photo, you have to look carefully to see the centre of screen VC2+ 3780Hz signal (STARZ! East) and the almost on top of it 3800V Caracol TV MPEG-2 signal (thin line just to left of analogue signal). Here the specan "span" has been narrowed to move the two signals closer together on the display.

In the worst situation you can imagine, two opposite polarities end up being more or less the same polarity (Clough's and our observations say horizontal becomes near vertical while vertical - in some instances - remains near vertical) and while they may be +/- 20 MHz in frequency of operation, it may not be possible to resolve each of them independently. Move on to others. What we relearned after Clough's valuable advice is that mechanical stability of the dish and the feed are essential for repeatable results. A dish that moves in azimuth or elevation in a "sloppy" manner is acceptable until you try to return to an earlier setting hoping to replicate some observation. If the dish wanders about 2 or even 1 degree, that is too much - you may never locate the same heading again!

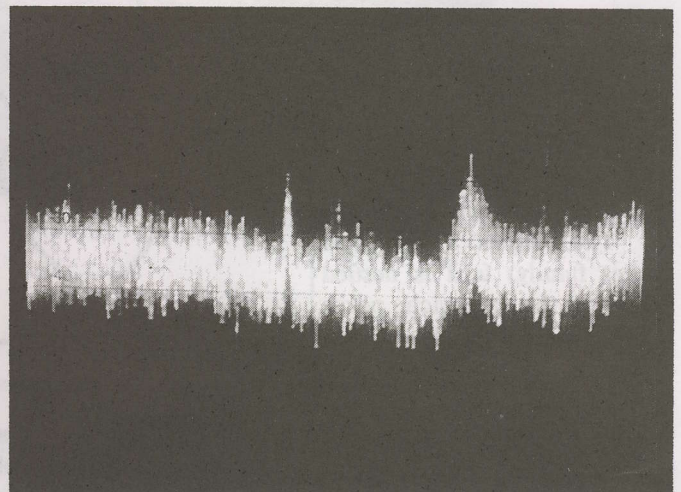
Even very small (such as 0.1 degree) adjustments in either the elevation or the azimuth can be critical. Likewise, the LNB and the feed adjustments are far more demanding at the eastern and western extremes than when satellites are 3 or 4 degrees apart and essentially "dead overhead."

Mechanical stability requires some attempt to eliminate anything that wiggles or moves at the antenna feed. Note the photo to left. The Patriot dish we have been using for our tests normally has four whimpy feed support legs. Over time, even with annual maintenance/painting, they have deteriorated. Our solution was to eliminate one leg but in doing this the four-point support of the original legs was lost; the entire feed "wobbled" and refused to stay stationary (which is essential for careful dish + feed adjustment).

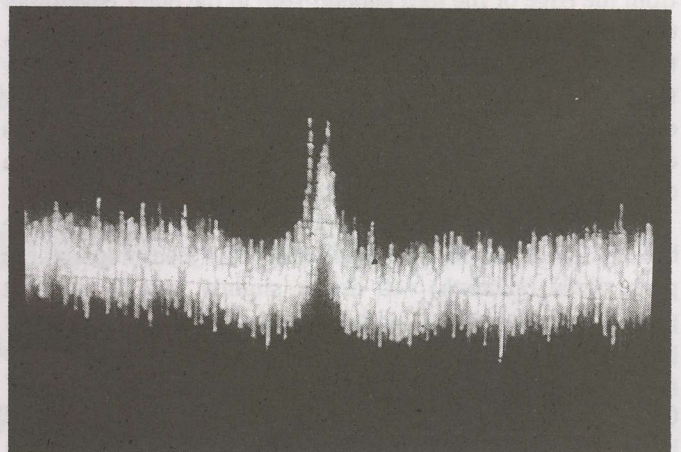
What we have done (see diagram, p. 12) is create a 2cm width circular ring to which the three remaining feed legs



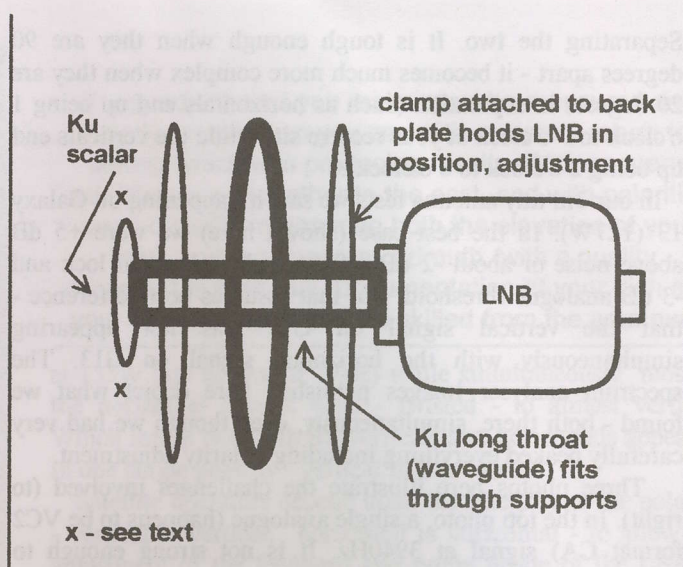
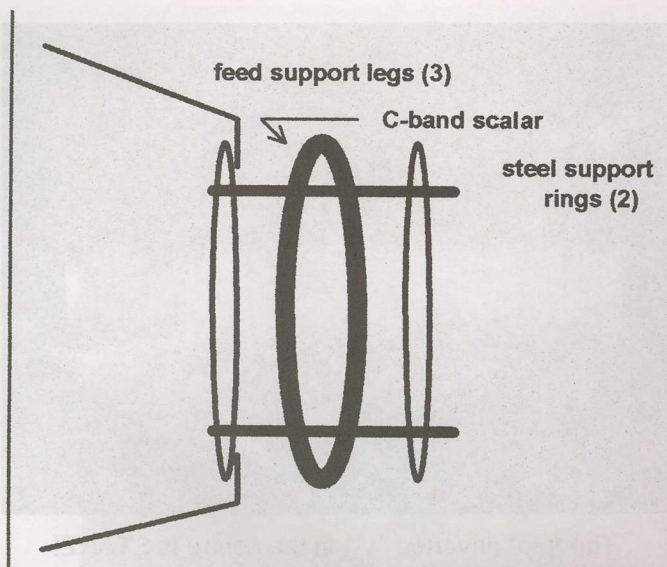
The "pip" (inverted "V") in the centre is STARZ! Theatre East (3940 Hz). The uneven line at the bottom is the noise level (noise figure) on the 17 degree LNB. This (VC2 format CA) analogue signal peaks 4 dB above the noise level. The feed probe is optimised at 1 o'clock/7 o'clock.



The pip right of center is STARZ! West (3860 Hz); analogue VC2+ CA format. Note just left of centre a much narrower signal - MPEG - which is STARZ! HD (high definition) at 3880V (vertical - not horizontal). Both signals peak at about the same feed probe adjustment - 1 o'clock/7 o'clock; both polarities.



Look closely - analogue VC2+ (centre) and just to left, narrower MPEG-2. See text.

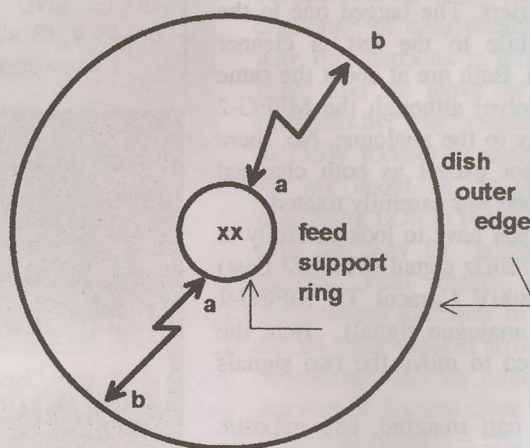


attach. To that using 10cm stainless bolts (3) we have attached a C-band (Chaparral) scalar ring. Now we have a "sandwich" which defies movement; everything is stationary. Finally, when using this test dish on Ku, a second steel rung is suspended behind the C-band scalar as a support ring for the long neck prime-focus Ku band feed.

The long-neck Ku band (scalar family) feed is nestled inside of the sandwich, pokes through the normally C-band dimension open hole in the center of the C-band feed, and can be adjusted (in and out, and rotate the feed for polarity) very easily from the rear. Moreover, the LNB can be changed without taking off the Ku-band feed.

Alignment of the Ku (or C) scalar ring comes next. First, determine that the distances

Determine the feed support plate is in centre of the dish by measuring from circular plate edge to outer edge/lip of dish at a minimum of 4 points (12 o'clock, 3 to 3, 6 to 6, 9 to 9). Ideally, the distances will be very close to identical (within 5mm at Ku, within 10mm at C). Now, if the feed ("xx" in drawing) is also positioned exactly in the centre of the feed support ring, the dish will give maximum gain and point accurately.



from the edge of the feed support ring to the outer edge/lip of the dish are equal all around the dish (see diagram above, text below). Next, with the Ku (or C) scalar feed supported by the support plate (rings), measure from the edge of the scalar outer run directly to the center point on the dish. This determines if the feed is "square" looking directly at the dish centre ("x" and "x" in diagram at top right).

If the feed is installed so it points not at dish-dead centre but say left of centre, once you realign the feed properly, the peak signal (azimuth) will not be slightly west of where it previously (mis) peaked with the feed off centre. A feed that points off of centre will still work, but at reduced overall dish gain. The same defect will also occur if the feed points "low" (below dish centre) - once properly (realigned) you will find the signal comes up when you reset the elevation. When making azimuth (east-west) and elevation (up and down) adjustments, always end up doing the elevation tweak (fine

tune) last - before you button up the antenna and tighten down all of the mounting holes.

About which - the rule of thumb is that as you complete your azimuth peaking, there are some quantity of bolts that stabilise the dish to the mounting pole. One version of the Patriot 3m used for illustration has 9 separate locking bolts in a saddle configuration. As each bolt is cinched up, the position of the saddle against the dish support pole shifts - slightly, perhaps 1 or 2 mm. The act of tightening up the saddle bolts, if not done carefully and slowly while monitoring the received signal level, can cost you several hard earned dBs!

Any mount to pole attachment will change the actual position of the dish and therefore the signal received during the locking down exercise. The answer is to not tighten any one bolt totally, just until it starts to grab and then move around the remaining bolts tightening each just enough to be snug - all of the while monitoring the signal level. If tightening one bolt seems to make a "big" change (such as 1 dB), back it off slightly and go to the opposite side matching bolt and tighten there, working back and forth until all bolts are tight and you have retained the maximum signal level(s) you measured while the bolts were loose enough to allow dish azimuth movement.

When azimuth is tight, then as a last check return to the elevation adjustment and fine tune the dish for maximum signal; this compensates for small irregularities in the dish azimuth adjustment routine.

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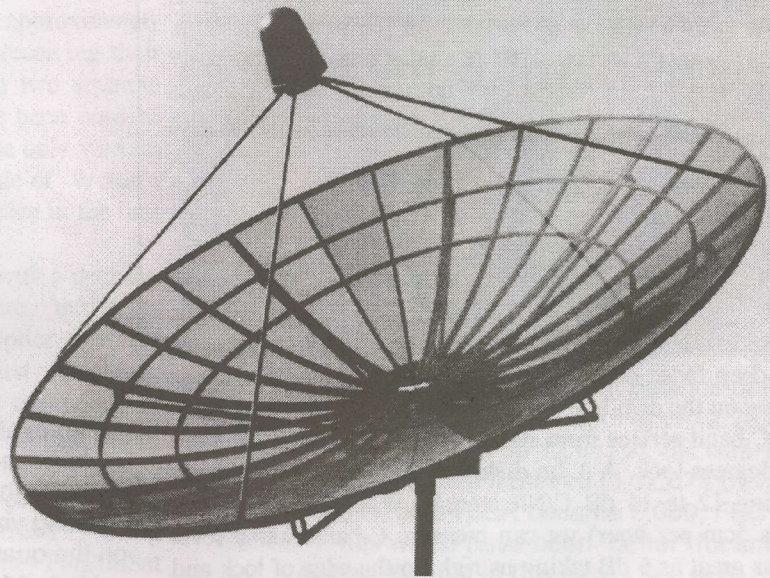
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At 9.5 degrees elevation we find AsiaSat 3S Ku: at 0.5 degrees - yes, NSS-6 is there - but!

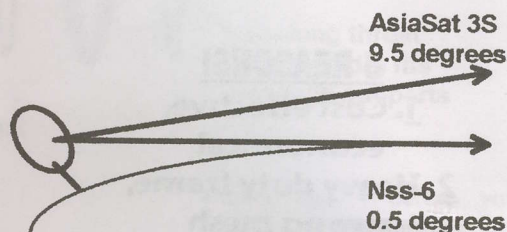
With two hours to spare at the end of a day's tedious searching through the eastern sky on C-band, using our 3m Patriot test system retrofitted with a 0.7 dB Gardiner LNB and appropriate Ku feed, we headed for the western horizon. Along the way we passed I701 (Canal + New Caledonia - 9 dB C/NR maximum in clear air - not enough for any clouds or rain, however), PAS-8 at 166E (Australian beam with TARBS on board - *no sign* of any signals whatsoever), Measat 2 at 148E (just a hint of a carrier - maybe 1 dB worth - at 11.602Hz) and then a long dry spell until we reached AsiaSat 3S (105.5E) where Australian telephone Telstra is on 12.596Vt. Of course this far west, look angle 9.5 degrees, the vertical was significantly twisted clockwise towards horizontal. We found a 10 dB C/NR signal here, subject to quick, deep fades of up to 3 dB; almost like somebody was bouncing on the dish like a trampoline.

Our C-band service from AsiaSat 3S is solid, reliable, even at 9.5 degrees look. A 3.7m dish cranks away 24 hours daily producing 12 to 14 dB C/NR signals. When there is heavy rain (as 5cm per hour) we can measure C-band signal level losses as great as 6 dB taking us right to the edge of lock and load (digital threshold). Our Ku tests were run with moderate clouds on the western horizon, no real rain. The quick, deep fades observed on Ku have never been observed on C. From our location, a 9.5 degree elevation signal travels through approximately 60km of lower atmosphere before breaking clear to the drier stratosphere.

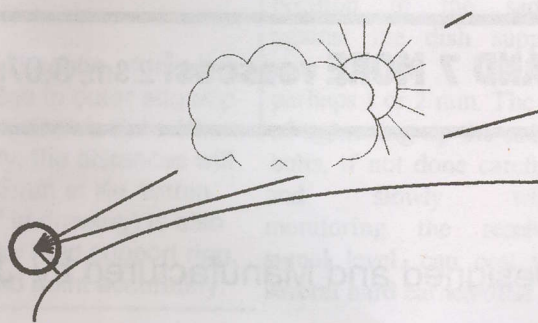
Next stop was virtually at the horizon - NSS-6 is at best (it become more difficult to calculate the nearer to zero you go) 0.5 degrees from 95E. This is truly the end of our line although when Russia's 1996 era Orbita II/S14 lived at 96.5E, we had quality (analogue) signals (subject to the inclined orbit of course). That's one of the obvious differences between C And Ku at look angles sub-ten degrees; the atmosphere plays havoc with the Ku reception while C usually powers on through.

We found 3 signals, two vertical, on horizontal. And a perfect example of "polarity warping" (see p. 8, here) because all 3 signals peaked at the same (mostly horizontal) LNB setting. Yes, we expected the verticals to turn and twist to a horizontal perspective but the lone vertical remaining vertical was a surprise.

Not a surprise was the rather abrupt and deep fading observed for these signals which easily pass through 100km of lower and middle level atmosphere before finding our 3m dish. Anyone who has ever experienced "fringe area" VHF (and more especially, UHF) TV reception, where the signal is being received beyond the normal coverage area courtesy of atmospheric bending, has seen the same effects. The lower the look angle, and therefore the greater the amount of atmosphere penetrated by the signal, the more extreme the fading. NSS-6 "might" be usable for those fortunate Kiwis located where there is a LOS angle but not with any



At elevation angles approaching the ground/water horizon (to your east, or, west) the signals pass through increasingly more "atmosphere" before reaching your dish. The atmosphere has a direct effect on the quality (level) of the signals and introduces the kind of fading one would expect to see on a UHF terrestrial signal arriving from an "over the horizon" transmitter.



Very dry air, which approximates the transparency of space itself, produces low elevation angle stable signals. Alas, as soon as moisture appears along-in the path, which happens most of the time when signals pass along and through the atmosphere rather than cutting through it like a knife at a higher angle, there is fading and loss.

reasonable size dish! AsiaSat 3S, on the other hand, for those approaching ten degree look angles, would at least be serviceable on a quality 3m although the present data-only format carries no appeal.

Bottom line? As others have observed and reported, C-band at low look angles often works surprisingly well while Ku becomes far more subject to atmospheric (fading) effects. As always, your own observations are welcome.

GWN, WIN, ABC, SBS Head into PAS-2 Ku Sunset

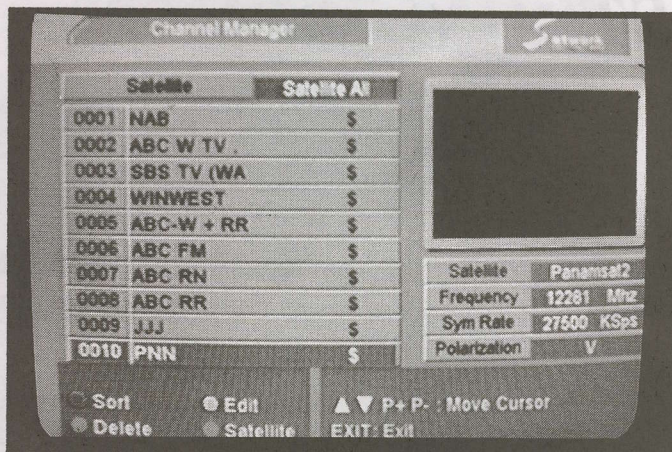
The all-too-brief history of the Western Australia service on PAS-2 Ku is a prime example of corporate firepower against a competitor. It made little sense in 1998 when it began, it makes even less commercial sense today. On approximately June 12, Western Australians who have been receiving their ABC, SBS, WIN and GWN services through two separate transponders on PAS-2 will lose it; they have been notified and told of their options and on the last day the only viewers left may be those in PNG and elsewhere outside of Western Australia who were never intended to have service in the first place.

Rewind to March 1998. Optus is struggling with a decision - they have chosen the Irdeto CA system, using an Australian-unique variant, and primary supplier UEC is woefully tardy with delivery of the first receivers. Simultaneously, Optus is pushing on B-MAC users such as GWN and WIN to "come to the Aurora party" but unable to confirm when the party will begin. Telstra senses a business opportunity and slides in with an alternate proposal - let Telstra distribute to Western Australia using Scientific-Atlanta CA and a non-Optus satellite; PanAmSat PAS-2, on Ku, where Telstra has squatting rights. Telstra wins and before Optus can launch Aurora's platform and deliver receivers, Telstra's PanAmSat MUX is up and away.

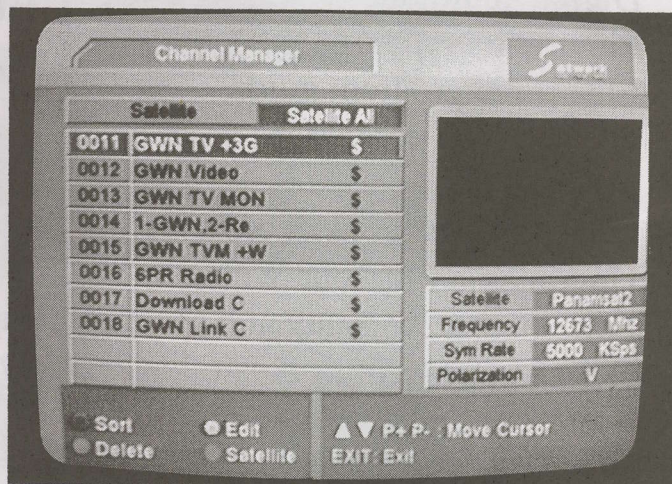
What this did was to isolate WA with their own unique CA system, unique receivers, and using a satellite which nobody else is using. Optus is burned and angry, and threatens to take legal action. GWN digs in its heels and refuses to budge off of the Telstra decision, forcing the balance (WIN, SBS, ABC) to go along.

SA receivers are, through the RABS exchange programme funded by the Australian government, an exchange for the previous B-MAC units. But the quantity ultimately is small - the primary users of the PAS-2 service turn out to be community groups operating terrestrial VHF low power ("translator") stations where one SA receiver for GWN (for example) will serve a few hundred or a even a few thousand homes through local terrestrial repeaters.

The PAS-2 service works well enough, but because it is "unique," never quite fits in to the balance of the Australian television delivery scheme. Over time, individual home users discover their 1.2 - 1.8m dishes can be redirected, reconnected to a Humax or other locally available IRD, and powered by a "gold card" gain them access to a wealth of new channels they never knew existed. The PAS-2 service is eaten away by an internal bug - and D9234 and D9225 receivers lay fallow, unused. From a high of perhaps 2,500 receivers at the peak, the number actually using the service by 2003 is half that. And growing smaller every week. The trickle of folks abandoning PAS-2 in early 2003 becomes a flood as C1 launches and viewers discover how they could switch and have dozens of channels. GWN and WIN are losing ground here. Rapidly. Whereas until C1, WA viewers were



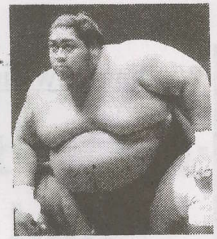
GWN has always been splitoff from balance of PAS-2 WA MUX; above, Satworks loading of 12.281Vt. When GWN was located on 12.637Vt, SR was 18.000 with FEC 3/4. But when it moved to 12.673 (reversing 3 and 7 digits; below) SR became 5.000, FEC 1/2. Normally, this would have been "better" for smaller dishes. But not in this case - see text.



essentially limited to the MUX package on PAS-2, this was no longer true.

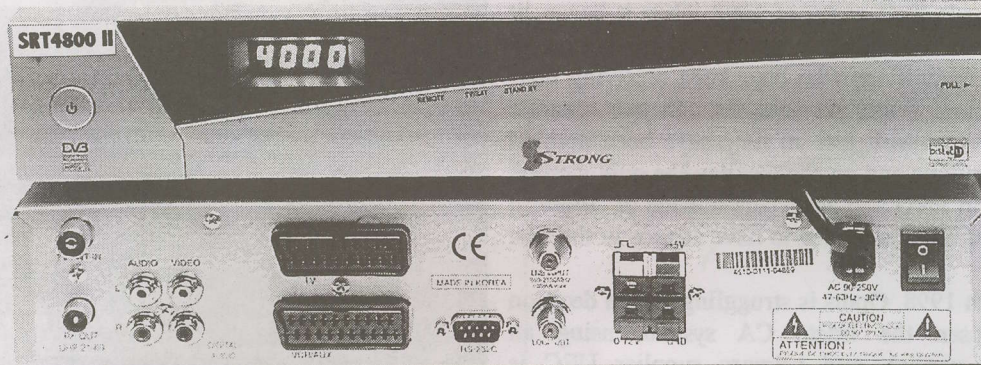
Meantime the PAS-2 Ku beam has been covering a much larger region - PNG in particular. For viewers here, this was a reliable quality link to Australian mainstream TV. In preparation for the PAS-2 shutdown, GWN was moved in March from 12.637Vt to 12.673Vt. SA receivers on line were "told" of the move, by the data stream, but not a small percentage failed on GWN after the move took place. There is a mystery here - the new GWN SCPC signal would seem to be "robust" (Sr 5.000, FEC 1/2) whereas in fact it was not. Many hundreds of receivers lost GWN, temporarily or permanently and many "fringe area" sites found they could only get it back by upgrading to a larger dish. In fact, GWN was no longer fully DVB compliant and the FEC 1/2 rate was at best misleading. And now all that remains is June 12th's shutdown.

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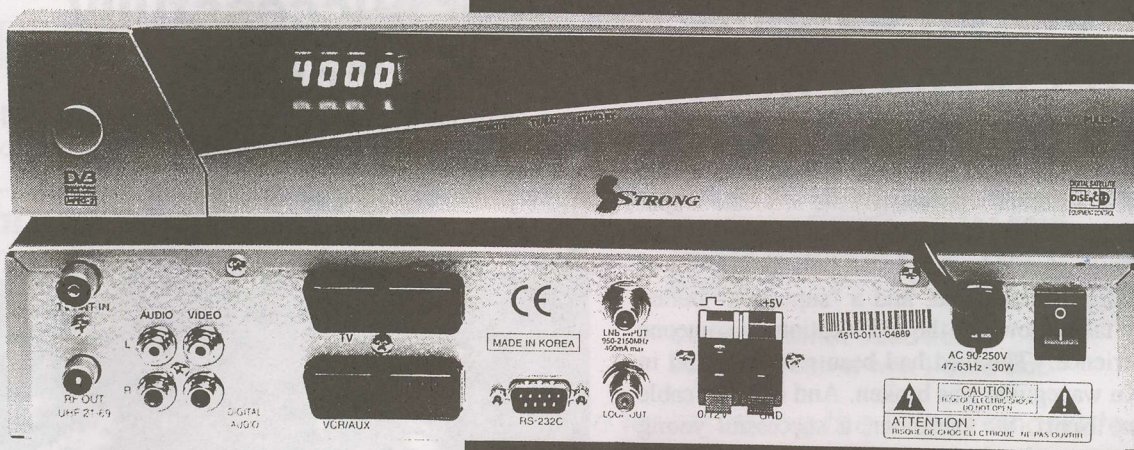
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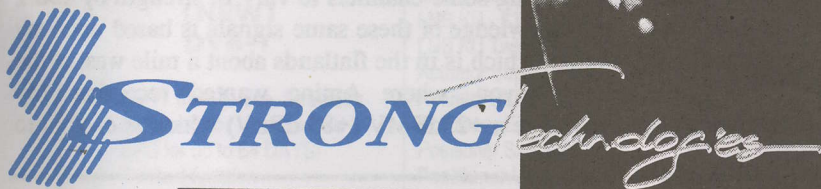
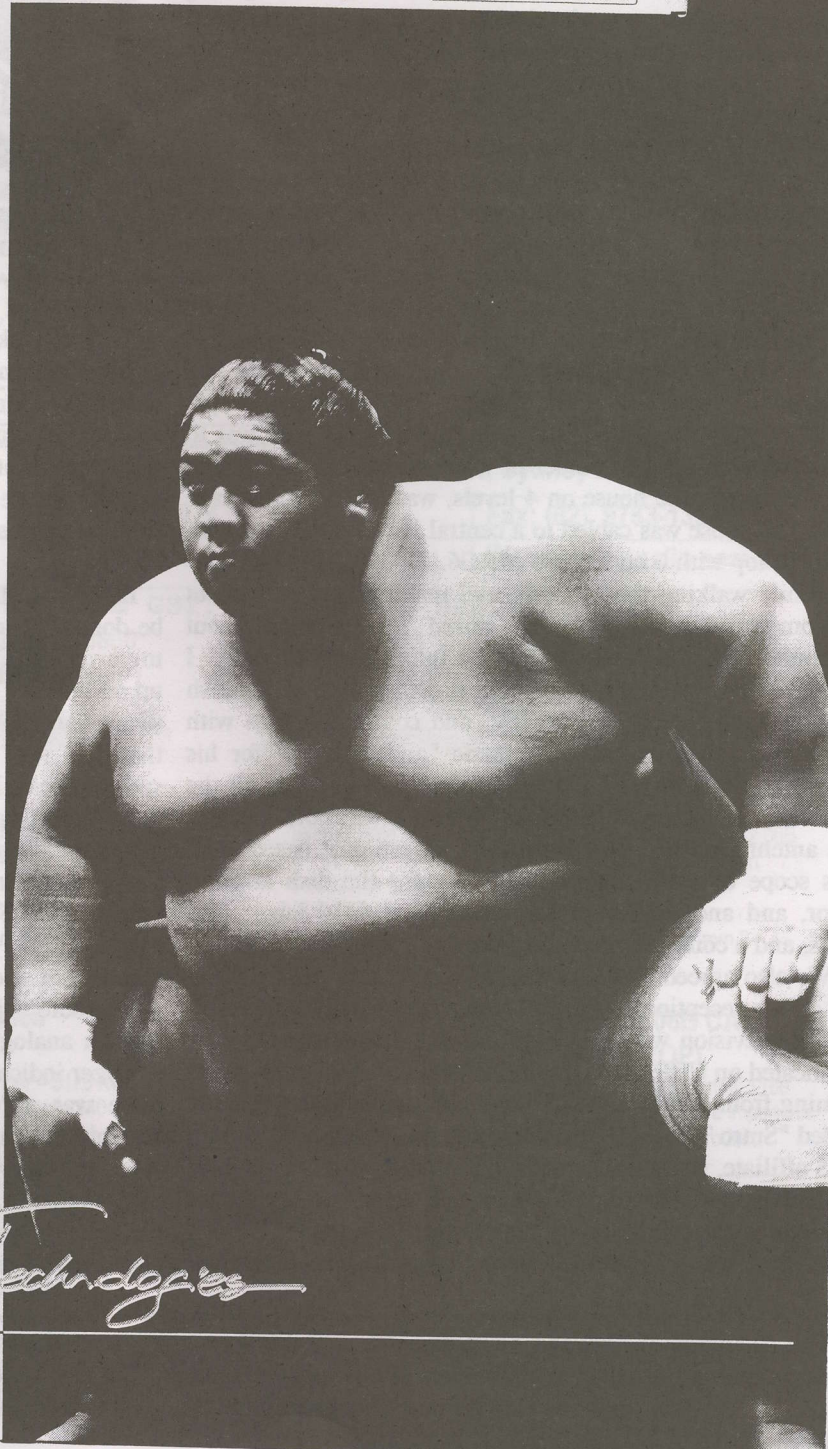
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A veteran satellite installer successfully reclaims a home in "cable country"

I had been called out to do a "TVRO site survey" in the Oakland Hills by a customer who wanted me to locate a spot for a satellite dish he had moved from another location. It was a mess, a literal pile of rubble that I saw behind a grove of trees. An 8' dish, still assembled, and a "superjack" pulled apart. Obviously taken down at the old location by someone who had no experience. The feed had been removed, and in the process the Ku waveguide was broken. And one-run cable in knots. Amine Nebri, the customer, a successful young computer programmer, who decided he wanted to keep his C band dish rather than subscribe to cable.

Walking around the yard with my Gourmet-Entertaining Sat-Site tool, I located two spots where the arc was fully visible, if only a few branches were trimmed. The steep hillside meant the dish would be far down the hill, and away from potential conflicts with neighbors. We quickly settled on a spot and left a marker where the pole would go. I also looked at his house, and decided that the best way to distribute was to re-use his existing cable, installed by previous owners. The whole neighborhood had been burned out during the Oakland Hills "firestorm" of 1991 which had taken 2500 homes and 30 lives. This was rich people territory, and a retaining wall next to where the pole was to go was a blackened reminder of what remained. Everything else, including the house on 4 levels, was less than a decade old. The house was cabled to a central location in a sub area near the top with 6 home runs of RG6.

While walking the property and making decisions about equipment placement, Amine raised the question about disconnecting cable and using it for internet service only. I agreed to provide a quote for both re-installation of his dish and bringing in local off-air TV, and combining both with local modulators to create a classic "private cable" for his family, and get him off the monopoly. He was to do all the "grunt work," installing conduit, running wire and erecting the antenna on his roof. I provided an estimate based upon this scope of work request, 15 hours for the dish at \$750 labor, and another 15 for the antenna, at \$450 labor, plus parts, and a complete block diagram upon job completion.

We also agreed that this was to be a "digital only" system for off-air reception, after explaining recent developments in off-air television where all the local broadcast channels were duplicated on UHF of the traditional VHF analog assignments coming from San Francisco's combined transmitting location called "Sutro Tower." I also knew that one channel, KCSM, a PBS affiliate, was still broadcasting from the older tower farm at "San Bruno Mountain" which was about 10 degrees of antenna orientation different than Sutro, from his location. I went to a local electronics store that still carried outdoor



The site - Oakland's "Firestorm" of 1991 claiming 2,500 homes and 30 lives gradually returning to normal habitation; "cable TV country."

antennae and purchased a UHF double-bow-tie antenna suitable to pick up both. As I already had a VHF antenna for channel eleven, brand new in a box, for the single San Jose channel, I didn't need to buy another. I also knew that that San Jose channel, KNTV, had taken over as local affiliate for NBC, and that they used VHF channel 12 for their digital signal. As he wanted all the principle networks to choose from, we agreed my quote would be for two antennae on his roof.

Before construction could begin, I insisted a "signal study" be done to determine the exact channels possible. I brought my own ATSC tuner and monitor out and together we set it up on his roof near a chimney. I brought a ten foot pole and the two antennae and connected them. I was surprised to find that, half way down a steep canyon, his UHF reception was spotty at best. Digital signals either work or they don't. There is no "ghosting." What I found was that it took me half an hour, using my spectrum analyzer and the ATSC tuner, to peak the Sutro/San Bruno Mountain signals so both were available. The strength of the signals were such that it took a long time to "sync in," or acquire the digital channel as I tuned from one to the next. Then I found "tiling" which is much more objectionable as a marginal signal than ghosting was on analog. I also noticed the signals on my spectrum analyzer indicating that knife-edge diffraction was present, as there was a "comb filter" effect as I slightly rotated the antenna, causing some channels to vary in strength by 15dB. My local knowledge of these same signals is based upon my own rooftop, which is in the flatlands about a mile west of the Caldecott Canyon, where Amine wanted reception. My signals average a +25dBmV (+85 dBuV) which is enough to

Tim Alderman of Oakland, California (tim@electron.org) pioneered North American home dish systems in the 80s and today remains one of the few survivors of that era, still cranking out dish systems for private individuals. But he urges that you "think outside the box" in these rapidly changing times for television reception technology.

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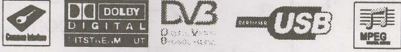
SATELLITE

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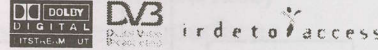
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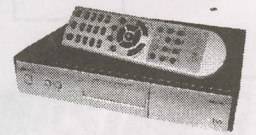


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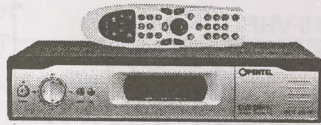


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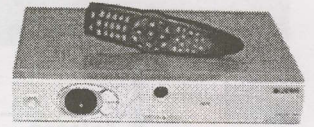


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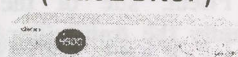
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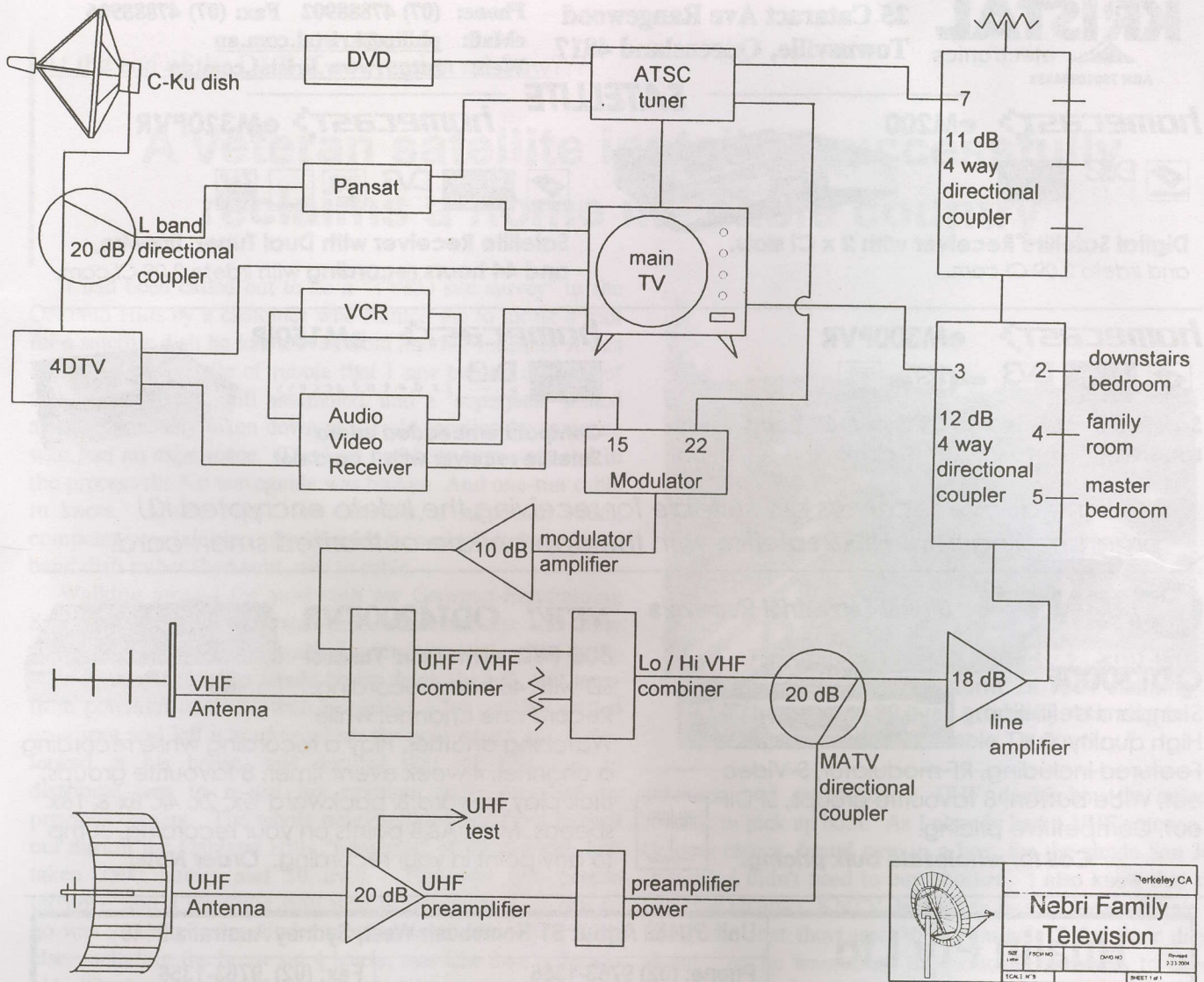


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roast a turkey, and require directional coupler attenuation before presenting to my two televisions.

Fortunately, the Blonder Tongue VHF eleven antenna worked looking southwest towards a ridge line just blocking Loma Prieta, site of the 1989 earthquake, but more importantly the transmitter location, some 40 miles away. The channel 12 digital signal immediately "popped in," despite being on the band edge of a channel eleven antenna. Such is the nature of VHF reception. Later on, I discovered that he also picked up a second NBC affiliate, KSBW in Salinas, off this antenna, from a transmitter on Fremont Peak south of Gilroy, an additional 50 miles further south. But that signal was analog, and a bonus free channel, as my commitment was strictly for only digital.

So, we had obtained spectacular digital from distant VHF and lousy local UHF from the signal survey. In addition to the variations I saw on the local UHF due to knife edge diffraction, the overall signals were in the -15dBmV region from both antennae. Yet the KNTV digital "popped right in" while the San Francisco/San Bruno UHF signals waited for several seconds while the ATSC tuner struggled with error correcting the signals.

The antenna from the local store was returned and while there I talked with the staff and other customers who knew of Caldecott Canyon. They all told me I was crazy, the canyon was a "white area" for rooftop antenna reception. I next went to another local retailer looking for a fringe UHF antenna

from Winegard, a company with a history of fighting cable to deliver free signals to American households. When the owner, who had 40 years experience in the business, told me I was flat out crazy, Charring Cross, the street Nebri lived on, was, he said, a street he wouldn't touch. A quick eyeball of the rooftops in that canyon confirmed this was indeed cable's home turf and territory.

But I had built a reputation on difficult reception issues, having brought the first legal reception of CNN and MTV into what was then the Soviet Union. On the roof of the Communist Party Central Committee's Moscow hotel, a decade before, I fought not only being 1500 miles outside the Ku satellite footprint, but had to also contend with interference from a local in-band terrestrial microwave signal some 50dB stronger. I managed to use my childhood knowledge of how signals worked around knife edges by using the copper roof to catch MTV while avoiding the same frequency coming in locally, by moving the non-penetrating roof mount a fraction of an inch at a time. To me, this local "white area" reception hole made the design a challenge.

I needed at least 25dB gain from a UHF antenna, and beamwidth well under the 30 degrees quoted for "deepest fringe digital" reception currently available. I knew the answer was a dish, a UHF dish. Only a parabolic or spherical, from the Oliver Swan era, could do the job. Yet this dish also had to be mounted in a "normal" fashion, on a pole, so weight and wind loading were constraints, not to mention

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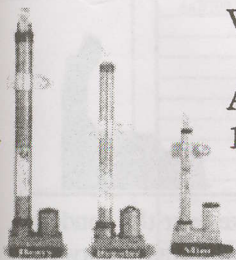
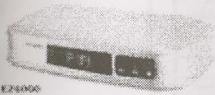
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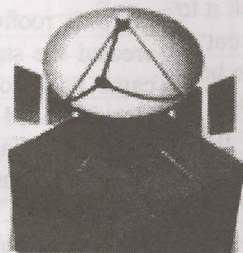
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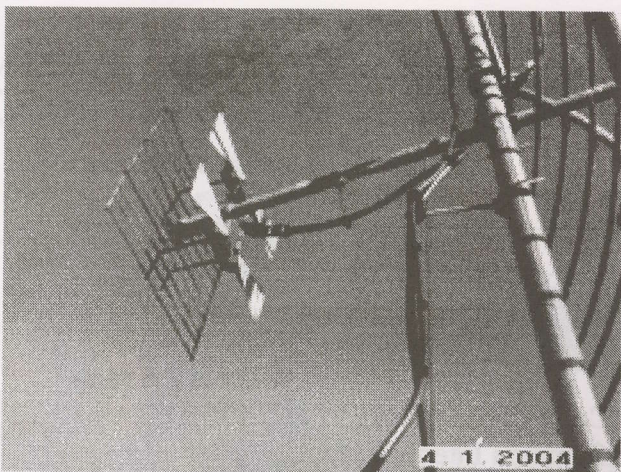
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Channel Master 7 1/2 m UHF terrestrial dish feed had to be rebuilt after years of neglect; antennas of this "fringe" class have not been available "new" for more than a decade.

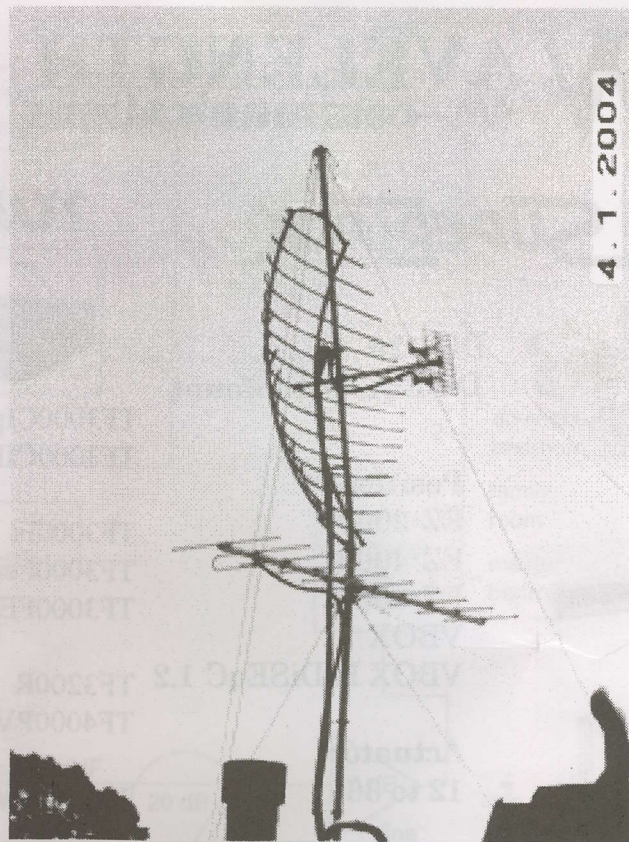
appearance to the neighbors of some gargantuan device in their neighborhood.

Back in ancient times, Channel Master made model 4251, a seven foot parabolic reflector that met all of these conditions. It was light weight, broadband, and had relatively narrow beam and at least a 20dB front-to-back ratio. It was also discontinued. Having one on my roof for 20 years, I knew it was a real deal. But where could I find one? Well, a decade before, I had sold one to an old friend in Nice, CA, in a true white area. But he never installed it, off air not being his interest. I also gave him a Paracclipse 12 dish for C band, which is all he wanted. At some point, he threw away the feed, but kept the reflector and button hook, as they had not rusted away. I managed to convince him to give me the worthless reflector, and removing the feed off mine, took it to a local welder to see if he could duplicate the backplane out of wire. He did a magnificent job for a mere \$75, even the bent spokes that held the double stacked V dipoles. I then went to a local hobby store and bought Teflon plastic in 3/8" thick block for \$10. Carefully tracing the outline from my feed, I duplicated this insulator, and followed that with aluminum sheet I cut to match the pickup elements.

Next was to test this new feed on my existing rooftop to see if it matched the performance of my existing feed. Not only did it meet, but it beat it by 1.2dB in signal strength. I checked out the cross-pole isolation by rotating the feed while watching the spectrum analyzer on the ladder at my feet, some 40 feet up. I was surprised to find that the cross pole null was at least as good as a C band polarotor feed, surprised to find the in phase peak was rather sharply defined, verifying that the TV stations transmitting digital all were horizontal polarity.

Next, I hung the feed in free space to find the feed's true front-to-back ratio was also equal to 20dB and the cross pole was also a healthy 23dB. Yum.

Finally, I had something, but not enough to get the signal from Amine's rooftop and all the way downstairs to the sub area. So I ordered a Blonder Tongue UHF line-powered amplifier and power supply. This enabled me to boost the entire UHF band and give some headroom for the inevitable attenuation I knew I'd have to deal with from knife-edge diffraction I had discovered deep in that canyon.



In the meantime, Amine asked me to take over the conduit installation as he was to busy at work, and I was otherwise available. I kept careful track of these as "change order modifications" to the original quotation, for my bill.

When the equipment arrived, my custom feed was ready. I mounted the dish and put the VHF yagi right below it on a 20 foot pole I had saved from a second stack I wanted to erect on my own rooftop, but which circumstances had cancelled. I erected the stack on his roof instead, and the following day came back to find the winds that came up suddenly had almost ruined my carefully laid construction plans. A quick call and he approved a third change order modification, a "wind kit" that also came out of my boneyard.

Setting up the guy wires, I noticed that when I tilted the pole off plumb, pointing the UHF reflector up the hill, the knife edge hole deepened. But what also happened was the overall gain increased by 2dB. I measured the look angle with a roof pitch angle pointer and found the roofs of the houses that formed the knife-edge some 1,000 feet away was only 8 degrees. I took down the heavy galvanized upper section of the mast and substituted a standard EMT pole, which I pre-bent to that 8 degree angle.

This produced actually a 3dB increase, and I was also able to rotate the entire reflector on the mast, and found that the horizontal polarization from Sutro Tower was off by 2 degrees. This enabled me to further increase the knife-edge effect, and thus pointing the stack in the right direction, I got an additional 2dB of reduction of the highest level signals. Thus I sacrificed most of the gain from pointing the stack up the hill to get a better balance of signals to the pre-amplifier. Blonder Tongue said their amp had a high input signal overload capability but I wasn't taking any chances. I needed to be sure of enough strength to be certain the digital ATSC tuner that Amine bought would not start tiling when the winds picked up.

Tim Alderman: continues on p. 30

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 May 2004

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym		
Them3/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(,000)		
	Korean Central	3665/1485H	1	2/3	3(,367)		
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(,066)		
	Ch Nepal	3626/1524V	1	3/4	15(,556)		
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(,667)		
	SE asia Mux	3569/1581H	2+ TV	3/4	12(,500)		
	RR Sat mux	3551/1600H	8TV, 10 radio	3/4	13(,333)		
	JAIN TV	3538/1612V	1TV	3/4	3(,300)		
	PTV1+	3521/1629V	1TV, 1 radio	3/4	3(,333)		
	TARBS	3520/1630H	12TV, 12 radio	3/4	28(,066)		
	TVK Cambodia	3448/1702H	1TV	1/2	6(,312)		
	TARBS/Tb5	3480/1670H	12 TV+radio	2/3	26(,667)		
	KCTV/Korea	3424/1726H	1TV	3/4	3(,366)		
	Thai Global	3425/1725V	up to 7?	2/3	27(,500)		
	InSat 2E/83	ETV mux	4005/1145V	6+ TV	3/4	27(,000)	
Hyd Dig 2E		3910/1240V	1	3/4	5(,000)		
Kairali TV		3699/1451V	1	3/4	3(,184)		
Indian mux		3643/1507V	3	3/4	19(,531)		
ETV Mux#2		3485/1665V	4+TV	3/4	27(,000)		
Sky Bangla		3430/1720V	1TV	3/4	6(,000)		
NSS6/95E		Free-X TV, plus	12.729V-Australia	5+TV	7/8	27(,500)	
		Shandong TV	4070/1080H	1TV	3/4	6(,811)	
As2/100.5E		Euro Bouq	4000/1150H	6TV, 21r	3/4	28(,125)	
		Sichuan TV	3946/1204H	1TV + radio	3/4	4(,420)	
As2/100.5E	Reuters News	3905/1245H	1TV	3/4	4(,000)		
	WorldNet	3880/1270H	4+/28radio	1/2	20(,400)		
	Hubei/HBT	3854/1296H	1	3/4	4(,418)		
	Human/SRT	3847/1303H	1	3/4	4(,418)		
	Guan/GDT	3840/1310H	1	3/4	4(,418)		
	In. Mongolia	3830/1320H	2 TV + 4 radio	3/4	8(,397)		
	APTN Asia	3799/1351H	1	3/4	5(,632)		
	Reuters/Sing.	3775/1375H	1	3/4	5(,631)		
	Liaoning/Svc2	3734/1416H	1	3/4	4(,418)		
	Jiang/JXT	3727/1423H	1	3/4	4(,418)		
	Fujian/SET	3720/1430H	1	3/4	4(,418)		
	QinghaiTV	3713/1437H	1	3/4	4(,418)		
	Henan/Main	3706/1444H	1	3/4	4(,418)		
	Egypt/Nilesaf	3640/1510H	7+, radio	3/4	27(,850)		
	As2/100.5E	Macau MUX	4148/1002V	5TV	3/4	11(,850)	
		Feeds	4086/1064V	1	3/4	5(,632)	
		Dubai MUX	4020/11430V	4+, radio	3/4	27(,500)	
		Jilin Sat TV	3875/1275V	1	3/4	4(,418)	
		Shanghai BN	3846/1304V	1	3/4	4(,800)	
		Hellong/Jian	3834/1316V	1	3/4	4(,418)	
		JSTV	3827/1323V	1	3/4	4(,418)	
		Anhui TV	3820/1330V	1	3/4	4(,418)	
		Shaanxi/QQ	3813/1337V	1	3/4	4(,418)	
		Guan/GXTV	3806/1344V	1	3/4	4(,418)	
		Fashion TV	3795/1355V	1	3/4	2(,626)	
		3-ch miniMUX	3752/1398V	up to 3	3/4	5(,640)	
		Saudi TV1	3660/1490V	7+/tests	3/4	27(,500)	
		As3S/105.5E	Telstra I-Net	12.596V	no TV	5/6	30(,000)
			RR Mux	3669/1481V	up to 5 TV	3/4	13(,333)
			Zee bouquet	3700/1450V	10TV	3/4	27(,500)
			Ch News Asia	3706/1444H	1TV (+)	3/4	6(,000)
			BTV World	3725/1425V	1TV	3/4	4(,450)
			Arirang TV	3755/1395V	1	7/8	4(,418)
			New TV +	3760/1390H	up to 8TV	7/8	26(,000)
	Star TV		3780/1370V	7(+)/TV	3/4	28(,100)	
Star TV	3840/1310H		7(+)/TV	7/8	26(,850)		
Star TV	3860/1290V		5(+)/TV	3/4	27(,500)		
AbuDhabi MUX	3880/1270H		8+TV, 2Radio	3/4	27(,500)		
Star TV	3920/1230H		4+ TV	7/8	26(,850)		
Star TV	3940/1210V		6(+)/TV	7/8	26(,850)		
CNNI	3960/1190H		8(+)/TV	3/4	27(,500)		
StarTV	3980/1170V		6+TV	3/4	28(,100)		
Star TV	4000/1150H	8(+)/TV	7/8	26(,850)			
Sahara digital	4020/1130V	8TV	3/4	27(,250)			
Pakistani TV	4091/1059V	4TV, 1 radio	3/4	13(,333)			
Sun TV	4095/1055H	1	3/4	5(,554)			
TVB Mux	4110/1040H	3	3/4	11(,230)			
CCTV bqt	4129/1021H	4(+)/TV	3/4	13(,240)			
Zee Bqt #2	4140/1010V	8(+)/TV	3/4	27(,500)			
Cak1/107.5	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2.655	33(+)/TV	7/8	20(,000)		
	IndoBqt	3460/1690H	up to 6	3/4	28(,000)		
T'Kom/108E C2M/113E	TPI	4185/965V	1	3/4	6(,700)		
	TVE Asia-Africa	4160/990H	1	3/4	5(,632)		
	Anteve	4144/1006V	1	3/4	6(,510)		
	Indo Mux	4080/1070H	5+ TV	7/8	28(,125)		
	Indostar	4074/1076V	1	3/4	6(,500)		
	SCTV	4048/1102V	1	3/4	6(,618)		
	Indonesian Mux	4000/1250H	6+ TV	3/4	26(,085)		
	Satelindo	3935/1215H	1	3/4	6(,700)		
	Bali TV	3926/1224H	1	3/4	4(,208)		
	Indo MUX	3880/1270H	3+ TV	7/8	28(,121)		

Receivers and Errata
CA (#1, 3); FTA audio #2 (dm)
Global footprint, changes 02/03.
CA + 2 FTA(A1TV, IRB3)
New 03/03; FTA
Thai + Indian services; FTA
MRTV3, MRTV (DM)
3TV, 5radio currently in use
PIDs 4132/4133
frequency change
Feeds to TARBS Australia and PAS-8
FTA
3FTA: TV5, VTV4, ATN Bangla
Not 24 hour
FTA (reaches SE Australia)
Several ETV now here; wide beam
SCPC, OK E. Aust. wide beam
SCPC, OK E. Aust wide beam
corrections 12/02
Several new ETV here; Asia beam
New - November 2002
Require authorisation: sales@bluekiss.biz; some fla
New - October 2002
FTA TV + radio; TV5 Asia moved "down" April
Note: "Missing" April 1
Was 3923H; sometimes FTA
FTA; multiple audio services V2360, A2320
Note: "Missing" April 1
Note: "Missing" April 1
FTA + Guangdong Satellite Radio A81
FTA: #1 Mongolian(A256), #2 Mandarin(A512)
Sometimes FTA; also 3895Vt
FTA & CA
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
Thru TARBS Aust, occ FTA
5 chs TV, FTA, some tests
FTA SCPC feeds
FTA, sometimes includes sport
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
Note: "Missing" April 1
FTA as of May 1, 2003
Sun-TV, Surya TV, KTV (FTA)
FTA MCPC; Yemen, MBC EURSport tests
Signal useful for dish testing - no TV
Bluekiss adult here; CA cards sales@bluekiss.biz
Mediaguard + Conax CA; 2 occ FTA
New September 2003; English + V1160, A1120
Bangladesh TV FTA started early March 2004
FTA SCPC; New PIDs V3601, A3606 June 2003
CA + NOW, Bberg, Indus Music, MTA FTA
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
New April 2004: link to Optus B3 Globecast
Star Sports Asia (+), FTA NTSC; V512, A640 English
NDS CA as above; may NOT be operational
PowVu CA; new SR Apr 29
NDS CA; Star News India FTA VPID 514, APID 648
NDS CA w/ 4(Chinese) FTA
New Sr September
new Sr, channels, Nov 2003
"History Channel" testing SCPC
MATV Chinese movies FTA; + CA
moved from 4115
Mediaguard (SECA) CA
NDS CA using RCA/Thomson,
Pace IRDs; 2.535 has 2 FTA
also 3586H/17.500, 3496H/19.615
FTA SCPA; NT/NC only
New August 2003
change from 4055V; FTA SCPC
Global TV - erratic new FEC 06/03
FTA (new 06-03); V2201, A2202
FTA SCPC; NT, New Caledonia only
undtable platform - not always there
test card - only - reported
FTA, may not be active full time
FTA; Sr change 01/03; erratic

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
	GlobalMUX	3760/1390H	up to 11 TV?	7/8	28(.121)
	Brunei/Sing	3733/1417H	1TV	3/4	6(.000)
	RTCI	3473/1677H	2	3/4	8(.000)
As4/122E	STV mux	38801270H	8 or more	3/4	26(.500)
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)
Jc2A 154	Cnet	3880/1270V	up to 12	3/4	30(.000)
	BYU tests	3915/1245V	2	3/4	3(.703)
MeasSs2	Astro Mux	11.602H	up to 17TV	3/4	41(.500)
	VTV MUX	11.522V	3 TV	3/4	9(.766)
B3/152	Optus tests	12.407V	4+ TV, 4+ radio	2/3	30(.000)
	GlobeCast tests	12.501H	MultipleTV, radio	2/3	30(.800)
	GlobeCast tests	12.525V	8+ TV, radio	2/3	30(.000)
	Sydney Racing	12.564H	1+ TV	2/3	30(.000)
	GlobeCast Main	12.657V	8+ TV	2/3	30(.000)
	GlobeCast tests	12.720V	8+TV, radio	2/3	30(.000)
C1/156E	Optus testbed	12.287V/T1L	9tv, 24 radio	1/2 (*)	28(.199*)
	Optus test bed	12.322V/U	mixed	1/2 (*)	28(.220)
	Unknown test bed	12.367V/T2	TV+	2/3	27(.800*)
	Aurora Biz	12.407V/T3	TV + radio	2/3	30(.000)
	Pay-TV	12.447V/T4	varying # TV services	3/4	27(.800)
	Unknown test bed	12.487V/T5	TV+	3/4	23(.333)
	Pay-TV	12.567V/T7	varying # TV services	3/4	27(.800)
	Pay-TV	12.607V/T8	varying #TV services	3/4	27(.800)
	Pay-TV	12.647V/T9	varying #TV services	3/4	27(.800)
	Austar	12.278H/T11	varying TV + data	3/4	30(.000)
	Pay-TV	12.358H/T12	varying #TV services	3/4	27(.800)
	Pay-TV	12.398H/T13	varying #tv services	3/4	27(.800)
	Pay-TV	12.438H/T14	varying #TV services	3/4	27(.800)
	Pay-TV	12.478H/T15	varying #TV services	3/4	27(.800)
	Pay-TV	12.518H/T16	varying #TV services	3/4	27(.800)
	Pay-TV	12.558H/T17	varying #TV srvcies	3/4	27(.800)
	Pay-TV	12.638H/T19	varying #TV services	3/4	27(.800)
B1/160	Occ. feeds	12.380H	1 TV - *	3/4	6(.111)
	Occ. feeds	12.384V	1 TV - *	3/4	6(.111)
	Net 7 service	12.397H	1	3/4	7(.200)
	Net Ten	12.353H	1TV + 1 radio	3/4	5(.100)
	Imparja mux	12.379H	2TV + 8 radio	3/4	5(.424)
	7 digital feeds	12.397H	1TV	3/4	7(.200)
	Feeds to NZ	12.411V	1 TV	3/4	6(.111)
	SBS Mux	12.420H	3+ TV, 2+ radio	5/6	12(.600)
	TVNZ DTH	12.456V	5+TV	3/4	22(.500)
	Nine Net	12.512H	1 TV typ.	3/4	5(.632)
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)
	Sky NZ	12.644/671V	9TV	3/4	22(.500)
	ABC HDIV	12.603H	5TV	7/8	14(.300)
	Sky NZ	12.707/733V	8+TV	3/4	22(.500)
	Mix 106.3	12.574H	1 radio + data	3/4	1(.851)
P8/166	TARBS3	12.326H	13TV + radio	3/4	28(.066)
	TARBS	12.526H	13TV + radio	3/4	28(.066)
	TARBS2	12.606H	13TV + radio	3/4	28(.066)
	TARBS5	12.646H	testing	3/4	28(.066)
	TARBS4	12.726H	13TV + radio	3/4	28(.066)
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(.470)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(.470)
	NET +	4121/1029V	1 TV	3/4	4(.774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(.470)
	Discovery	3980/1170H	8 typ.	3/4	27(.690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(.690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(.694)
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(.000)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(.240)
	TVBS-N	3836/1314V	1FTA, 4+ CA	3/4	22(.000)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(.850)
	MTV	3740/1410H	8	2/3	27(.500)
	ABS-CBN APT	3712/1438V	1	3/4	3(.712)
P2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(.500)
	WA PowVu	12.673V	1TV, many radio	1/2	5(.000)
	TARBS	4090V/1060V	9TV + radio	3/4	21(.000)
	Feeds	4037/1113H	1+ TV	2/3	6(.620)
	Feeds	4027/1123H	1+TV	2/3	6(.620)
	Feeds	4023/1127V	1+TV	3/4	13(.328)
	Feeds	3966/1184V	1	2/3	6(.620)
	Feeds	3957/1193V	1	2/3	6(.620)
	Feeds	3929/1221V	1	3/4	10(.850)
	Feeds	3912/1238V	1	2/3	6(.620)
	Feeds	3898/1252V	1	2/3	12(.000)
	Middle East	3836/1314V	4 typ	3/4	13(.331)
	Anirang TV K.	3815/1335V	1TV	3/4	4(.400)
	Feeds	3803/1347V	1	3/4	6(.000)
	PAS/BBC mux	3744/1406V	3	3/4	21(.500)

Receivers and Errata

test cards (11), new Sr/FEC 01-03
 FTA ; Singapore 23hrs, Brunei 1 hr, Brunei V1200
 FTA SCPC; Australia, New Caledonia, some English
 First TV mux to appear this new bird; erratic service
 PowerVu; some FTA (Ch. 1 & 3)
 CA & FTA NTSC: Japan, Taiwan
 Cnet (Taiwan) tests; not full time
 Erratic service; strong NZ & Australia
 Aust East beam - 3 FTA + 14 CA
 WA only? Skew path, intended Asia
 now differs from 12.407 C1; **time ch FTA**
 Nat B beam; unusual parameters-wrong NIT
 GlobeCast, frequent programming changes
 Competitor to TAB; FTA but not for long
 GlobeCast "home" 1 February; temporary?
 Testing - **not** fulltime - erratic (GlobeCast)
 testing as of late Feb; * - may be temp #s; on and off
 testing as of late Feb; *-may be temporary numbers
 Tests; not always operational; NDS only? SBS.
 NZ (90cm) + Australia (**Only svc left on NZ; C1**)
 Australia NA only (leakage to Norfolk, New Cal)
 Australia NA only (leakage); 9-Net x 3 widescreen
 Australia NA only (leakage to Norfolk, New Cal)
 Australia NA only (leakage to Norfolk, New Cal)
 Australia NA; has unique NIT
 CA, subscriptions available Australia, Norfolk
 CA, subscriptions available Australia, Norfolk
 CA, subscriptions available Australia, Norfolk
 CA, subscriptions available Australia, Norfolk
 CA, subscriptions available Australia, Norfolk
 CA, subscriptions available Australia, Norfolk
 "Home"CA, subscription available Australia, Nrlfk
 CA, subscription available Australia, Norfolk

 * - plus 12.451H, 12.460H
 * - plus 12.293V, 12.402V, 12.411V
 Full schedule less commercials - links
 Possibly feed to Tasmania?
 PIDs vary; also try 12.360, 12.370
 occ. digital feeds; typ fla
 Often NTSC; USA-Australia-NZ
 Also 12.420H same params; SBS HDTV + w-s
 FTA 4 channels (TVNZ x 4); +Maori, other here
 testing digital feeds; Sr may vary
 NDS CA, subscription available NZ
 NDS CA, subscription available NZ
 NDS CA, subscription available NZ
 also 12.626, 643, 670, 688, & 706H
 NDS CA, subscriptions available NZ
 Radio SCPC is "cover" for high speed data
 TPG/EurodecMDS CA, **occ. FTA**
 TPG/Eurodec MDS CA, **1 radio FTA**
 TPG/Eurodec MDS CA
 TPG/Eurodec MDS CA; **2 TV FTA**
 TPG/Eurdec MDS CA
 June 2002-Irdeto-2 CA
 Dateline west; also east PAS2, 3901V
 PowVu CA
 PowVu CA & FTA; subscription available
 was PAS-2, previously 3992V; **feeds FTA**
 NET25 + FTA; new PIDS April '03; reload
 PowVu CA; ch 11 DCP-CCP bootload; audio FTA
 PowVu/CA (some audio FTA)
 PowVu CA & FTA (EWIN +)
 NDS CA (6 channels); one test card FTA
 Myx FTA V1960, A1920 + radio FTA
 Mixed FTA & CA, STC FTA +; STCgone
 PowVu FTA, replaces PAS-2 svc
 Difficult because of CCTV cross pole
 was As2; PowVu CA
 PowerVu; some audio FTA
 PowerVu; Asian MUX; new parameters Nov '03
 # 8 MTV China FTA V289, A290; rest CA
 24/7 English track 2 news; V4096, A4099 11-03
 PowVu CA, WIN, ABC NT, SBS
 PowVu CA, WA only - D9234; see p. 15 SF#117
 Occ FTA (Chile +); BIG power reduction Nov.
 Sporting feeds (occasional)
 Sporting feeds from USA (occasional)
 feeds to (USA) pay-TV
 PowVu (FTA) occ feeds
 PowVu (FTA) occ. feeds
 PowVu (FTA) occ sport feeds
 PowVu(FTA) occ. feeds
 PowVu (FTA) occ. feeds
 Irdeto 2 CA - **subscriptions avail; Strong Tech**
 Switched from Anirang TV World to AW korea
 PowVu (FTA) occ sport feeds inc. Japan BB
 BBC, test card FTA, others nominally CA

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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	Adventists.tv	4040/1010H	1	2/3	5(.900)
	Feeds	3868/1182H	1	2/3	6(.620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)
	HK bouquet	3850/1300H	up to 8	2/3	24(.900)
	Korean Bgt	3771/1379H	1	3/4	9(.041)
1804/176E	iPSTAR	12.619H	1	2/3	25(.220)
	Tests-NZ beam	12.646H	1	3/4	22(.418)
	RFO Poly	4027/1123R	1TV	3/4	4(.566)
1701/180E	TNTV	11.060&11.514	9	3/4	30(.000)
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)
	TVNZ	4195/955RHC	1	3/4	5(.632)
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)
	TVNZ	4178/972RHC	1	3/4	5(.632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(.680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)
	TVNZ/feeds	4161/989RHC	1	3/4	5(.632)
	RFO-Canal+	4086/1064L	4TV, radio	5/6	12(.041))
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)
	TVNZ feeds	4044/1106R	1	3/4	5(.632)
	NZ Prime TV	4024/1126L	1	2/3	6(.876)
	NBC to 7 Oz	3960/1190R	1	7/8	6(.447)
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)
	Iearasa	3772/1378L	1	3/4	4(.566)
	Feeds	3830/1320R	1	3/4	5(.632)
	TVNZ	3846/1304R	1	3/4	5(.632)
	NBA (Barker) Ch	3803/1347R	1	3/4	6(.111)
	10 Australia	3769/1381R	4	7/8	20(.000)
	USA feeds	3749/1401R	4?	?	26(.400)
NSS-5/177W	Pacific IP Data	3745/1405R	none-date	3/4	44(.995)

Receivers and Errata
New December 2003; 24/7 "Hope Chs."
FTA (occ sport); also try 3863, Sr6.100
FTA-typ NTSC-occ sport, live Shuttle
PowVu CA + FTA (BBC gone)
was 4148V; some FTA
Korean MUX, reload 02/03
Tests, late May start; also 12.646H
Testing possible data links; June 2003
SE spot beam; was 4027LHC
east spot, 10TV + r each, vertical pol.
1+ FTA, MediaGd "2"; + 10.975 weaker
DMV/NTL early vers., occ feeds, typ ca
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
DTS Direct to Sailors; audio previously FTA - no more
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
east hemi 20.5 dBw +; new Sr
DMV/NTL early vers. occ feeds, typ ca
SCPC, mixed CA and FTA feeds
PowVu CA; Auckland net feeds
CA, Leitch encoded
New PIDs Dec 03 very strong NZ, Pacific
FTA SCPC; East Hemi Beam-Tahiti
Occ. feeds reprinted April 2004
SCPC, mixed CA & FTA, feeds
NBA feeds - probably CA - new Nov 2003
PowVu CA & IBN-JCTV FTA
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment, top Sr check

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

Aston Simba 201. Embedded SECA (Zee, Canal +); review SF#97. MediaStar 61-2-9618-5777.

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept '98. Av-COMM P/L, 61-2-9839-4377.

AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.

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

Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Available from Satlink NZ www.satlinknz.co.nz (ONLY KNOWN DISTRIBUTOR IN WORLD)

Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.us>

eMTECH eM-100B (FTA), eM-200B (FTA + Cb2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)

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

Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.

Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).

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.

INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix Technologies, and available in Singapore.

ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.

MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777

MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777

MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.

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. SF#95, p. 14

Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)

Pace DGT400. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working; still does radio including CA, not TV).

Pace DVR500. Original DGT400 modified for NBC (PAS-2)/RSA use, with CAM equivalent to DGT400 but more reliable; better P/S.

Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).

Panasat 520/630/635. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370. No longer works with Austar/Foxtel.

Panasonic TU-DS10. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but never available in Australia (SF has one - want it??? Collector's item!)

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

Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.

Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++887-43.81.56)

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). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).

PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@adigitalife.com

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 64-6-356-2749); no longer available.

SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.

SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.

SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator, improved version 3618. Review SF#113; available DMSi (above).

Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superseded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin

Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).

Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#84. Strong Technologies 61-3-8795-7990.

Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.

Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.

Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSeqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.

UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3836.

UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/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; propensity to fall off back of trucks.

Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fax 64-9-814-9447; long term teletext problems (loses TT).

Accessories:

Aurora smart cards. MYCRYPT (Irdeto V2) cards now available (Oct. 2003), Sciteq 61-8-9409-6677.

PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)

WITH THE OBSERVERS

AT PRESS DEADLINE

PAS2 169E 4022H, "The Hope Channel" + radio reported Sr 5.900, 2/3 (V1160, A1120) FTA. Optus B3 152E CTN Cambodia 12.525V, Sr 30.000, 2/3 V2060, A2020 + Emarat Radio (A2421), Radio Oman (A2422) appear permanent.

AMC10/135W: "Bird now at 135W and transfer to it took place May 5. If you checked 135W previously under C4, try again - now!" (SF)

AsiaSat 2/100.5E: "TV5 Asie has moved 'down' within transponder, using channel space previously showing test card - or MCM if you go back far enough. TV5 is still on the air!" (Billy T) "Cannot explain this but IF 1173.75/3976.5V, find Russian analogue ORT with inverted video (as you might expect to see on Ku setting), audio 6.470. Anyone else?" (DLeach, NSW)

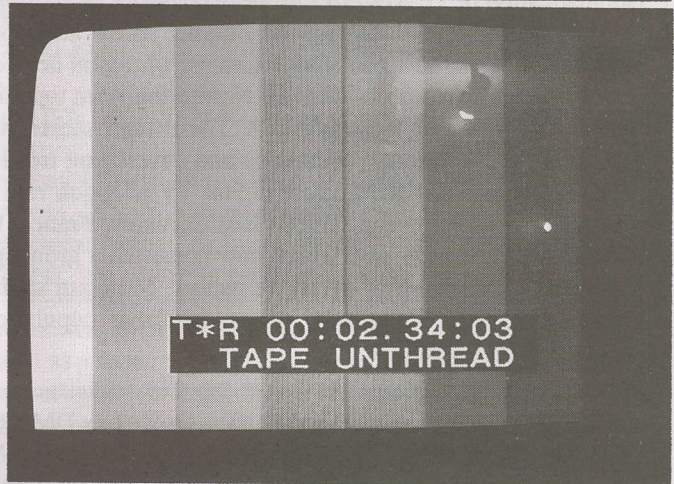
AsiaSat 3S/105.5E: "Trace TV testing 3669V, FTA, V2081, A2082." (Ken) "BlueKiss promo replaces Malibu TV 3669V; V2081, A2082." (TK) "BTV World testing 3725V, Sr 4.450, 3/4, FTA V308, A256." (PD) "MTA International seems to have abandoned 3760H." (TK) "TVB8 moving to 4111Hz, Sr 13.650 probably before you read this." (Hen)

Express AM11/67.5E: "Satellite was launched successfully, is now testing (only northern beams reported)." (Grady) (Editor's note: 96.5E may NOT be final resting place for this guy- reported moving EAST at deadline!)

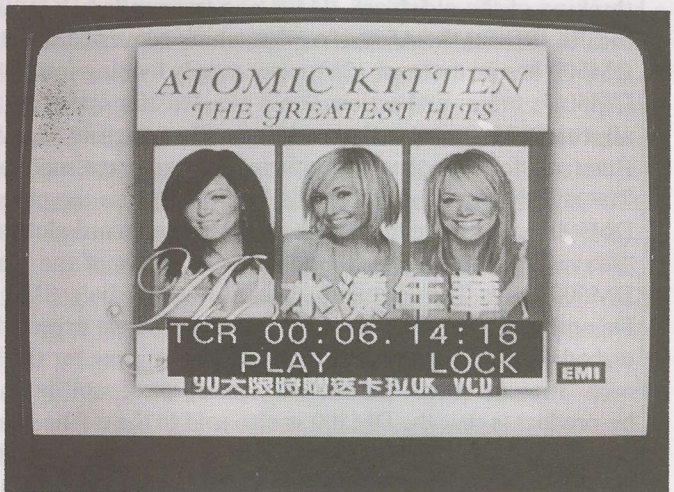
Intekat 701/180E: "Video programing feeds 3830R, Sr 5.632, 3/4 on West Hemi beam." (DS)

NSS6/95E: "ABC A-P testing 12.673V, Sr 6.508, 3/4, Australian beam, V2307, A2308." (Bill Richards, Aust) "New Skies Promo comes and goes on 11.594H; V257, A258." (Arnold, NT) "AloEmaiim TV 12.729H, FTA, V513, A651." (TK)

Optus B3/152E: "Daystar (USA religion) has left 12.525V; 12.501H; TCT World also gone from 12.525V." (IF, Qld.) "3 weaker than normal transmissions as follows: T9/12.314H, Sr > then 40, either National B or HP. T11/12.420H, Sr between 20 and 30; possibly NB or HP. T14/12.659H, Sr between 4 and 7, NB or HP. All appear to be deliberately low in level to 'hide' them from unauthorised eyes, probably require 3m or larger dish to load and identify." (NS, NSW) "TAB competitor Sydney Races now on 12.564H, Sr 30.000, 2/3 FTA V1160/A1120." (DM, NSW) "GWN backhaul, 12.460H, Sr 6.670, 3/4." (NS, NSW) "GOD Channel, headquartered in Middle East but our version is customised for South Africa, on 12.525V, Sr 30.000, 2/3 (V2560, A2520) has a constant video rate of 2.5 MBit/s whereas same channel on 12.501H runs at 2 MBit/s. Globecast transponders are not created equal!" (IF, Qld) "CTN Cambodia 'testing' 12.525V within



Another one gone. "Sound Track Channel," within PAS-8 Taiwan MUX (3860H) disappeared late in April leaving behind innocuous announcement (above) that is on occasions replaced with direct feeds of commercials and other brief programming (below).



Globecast MUX." (CS, NZ -Ed's note: Appears permanent as we go to press.)

PanAmSat PAS2/169E: "New PIDs BBC World 3744V (Sr 21.500, 3/4) V1160/A1120 + V1460/A1420." (Avery) "3804Vt, Sr 6.620, 3/4, V1110, A1211, SID2 Japanese Basketball feed labelled '12K3C Slot E'." (BRichards, Aust)

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

Digital disparities found in Europe

Despite having the second highest digital TV penetration rate, Ireland has been ranked 14 of 17 European countries on a 'Digital Life Index.' The country scored high on digital television adoption because of the success of Sky in Ireland, said Jupiter research analyst Mark Mulligan, the author of the "Digital Life Index" report. But its high marks for digital TV were tempered by poor scores in other areas, pulling down the Republic's overall score. For example, Ireland had the second lowest Internet adoption rate, the report said. While Germany and France both sit close to the European average, both with a "Digital Life Index" (DLI) score of 101, Ireland lags significantly behind with an index score of 91. Behind Ireland on the table is Italy (85) Portugal (72), and Greece (51). The inaugural index quantifies the relative degrees of digital sophistication of 17 Western European countries by scoring each country across six main categories of digital sophistication. These key digital determiners are Internet access adoption; digital TV adoption; wireless and mobile; on-line advertising and e-commerce; on-line activity; and use of digital devices. A geographical hierarchy has also become evident in Europe, according to the research, with the Nordic countries topping the list. Sweden had the highest DLI score -- 132 -- followed by Denmark's 123 and Norway's 114. These high scores were driven by widespread Internet penetration, high broadband adoption, strong Internet commerce and advertising trends, as well as mature Internet surfing habits, according to Jupiter. The UK, boosted by the highest digital TV adoption rate in Europe, also scored rather high with a rating of 113, beating other Northern European nations like Germany, France, the Netherlands. Yet Ireland's position in Northern Europe still saw it surpassed by Spain, which now possesses a growing digital market thanks to strong broadband growth and dynamic e-commerce and on-line advertising sectors, Mulligan said. In fact, despite their relatively low scores, Spain and Italy will experience energetic growth, driven by large populations, the continuation of recent adoption trends, and ongoing infrastructure investment.

Dreambox DM500-S - Dream's newest toy

The world's smallest Linux Receiver is a pocket rocket! "They did it again!", this is what everybody in the satellite world will shout out when they see the all new "Benjamin" - the little brother - of all Dreamboxes for the very first time. "They" is nobody else but Dream Multimedia; that bunch of bright engineers who dared to challenge the world two years ago with the world's first LINUX operated satellite receiver. This year these guys achieved another first place in the standings and the world's ever lasting list of glory: "They" have developed the world's smallest LINUX operated satellite receiver ever manufactured. With not even 20cm in width and 4cm in height it will fit in the tiniest mouse hole like space available to place a satellite receiver in your setup at home. "But what about the heat..." I already hear people asking this question, thinking of the old, black PACE egg-fryer called DGT400 that was used by Australian Pay TV providers or the Samsung Stealth IRD for the African market which converted smartcards into charcoal. In this case -- again - it's another novelty: The DM500 has an external 12V power supply looking just like your cell phone charger; integrated in the power plug to keep the DM500's brains and actions "cold blooded" for operation. Dream Multimedia would not be where they are today if size was all; the DM500 is also the world's smallest satellite receiver with an RJ45 Ethernet port to connect the unit to LAN / WAN (Internet) for browsing and information exchange such as OSEM (On Screen E-Mail) or OSNT (On Screen News Ticker). The stylish appearance reminds immediately on the eldest brother DM7000 with the swung line on the front face but the DM500 doesn't need a flap to hide the smartcard slot; it's proud to show it to the world as if it would like to shout out "see... I belong to you, the Pay TV receivers of the world"! "That was exactly the idea when we first thought of the DM500" says Tim Ziemann, Dream Multimedia's CEO in Germany. "We knew that our own content protection system DreamCrypt would be launched this year and we expected hesitation from the satellite receiver manufacturers worldwide to embed DreamCrypt even though we give it away for free!" So the only solution for the Dream boys was to bring out their own "Provider box," the DM500; small, price worthy and thus affordable for the shaken Pay TV industry. The amicable by-product is that the DM500 is also sold to the public at a price which should make the DM500 a bestseller.

Feature list of the Dreambox DM500-S

250 MHz IBM PowerPC "Volcano" Processor (350 MIPS) / Linux Operating System, Open Source / DreamCrypt embedded / 1 x Smartcard-Reader / MPEG2 Hardware decoding (DVB compatible) / COM port V.24/RS232 / 100Mbit full duplex Ethernet Interface / 2 Status - LED / 32 MByte RAM / unlimited channel list for TV & radio / Zapping: change of channel in less than 1 second (< 1 sec) / fully automated channel search / transponder scan** / Supports unlimited Bouquet Lists / EPG-Support (Electronic Program Guide) / Supports multiple LNB switches (DiSEqC) / Adoptable OSD in multiple languages (Skin-support) / SPDI/F optical TOTX178 AC-3 output / 1 x SCART output (completely software controlled) / A/V output (Audio / Video Cinch) / External 12V power supply / Dimensions: 196 x 130 x 40 (Width x

Depth x Height).

*MIPS = Million

Instructions Per Second,

** Uses satellites.xml

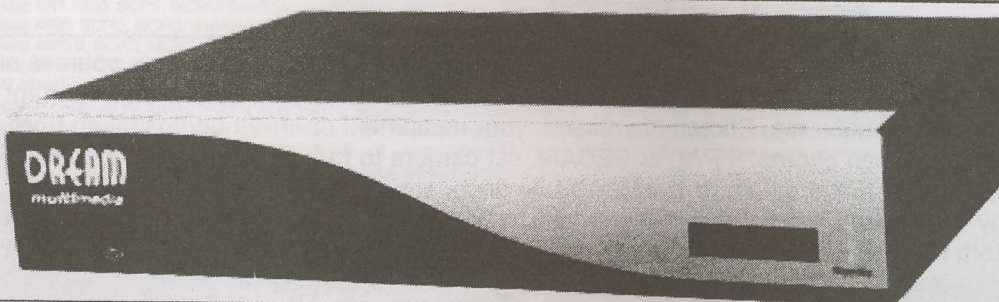
configuration file.

(courtesy

rolf@promotec.co.za to

whom queries should be

directed.)



These firms are available to do contract dish installs

New Zealand:

Glenn Fitzgerald, **Wellington** (Masteron-Levin PAS-2, B1, B3) (fitzgerald@ihug.co.nz)
Frontline Electronics, **Mosgiel** region (ethnic Ku packages) (Ph 03 489 4001)
Nelson TV & Video Svcs, all **Nelson Bays** (Ph 03 548 0304; ntv@tasman.net)
Quality Pics, entire **Waikaito** region (Ph 0800 007 667; maxnkay@xtra.co.nz)
John Stewart, **southland** including Otago (john.s@tritec.co.nz)

New South Wales:

Goodcom Communications P/L, 100km radius of **Walcha** (Ph 02 6777 1044; goodcom@northnet.com.au)
Home Satellite TV, 40km radius **Port Macquarie** (Ph 02 6584 3838; kazbah25@optusnet.com.au)

Victoria:

Geoff's Communications, 60km radius **Korumburra** (Ph 0408 582010; gwyhoon@tpg.com.au)

Queensland:

Phil's Antenna Systems, 100km radius of **Hervey Bay** (C+Ku since 1996). Ph 0741 256 273

To be listed here, tell us: 1/name of your business or your name, 2/ your home town and radius-distance covered from same, 3/ your telco, 4/ your e-mail. Send to skyking@clarar.net.nz, or fax to ++64 9 406 10-83 or mail to SatFACTS, PO Box 330, Mangonui, Far North, NZ. No, there is no charge to be listed.

PanAmSat PAS8/166E "Pili Sat 3860H FTA late April (Sr 28.000, 5/6)." (ML) "Videoland Sports FTA (normally CA) several times, for days, 3860H, Sr28.000, 5/6." (TK) "Arirang TV World has replaced Arirang TV Korea 3815V PowerVu, Sr 4.400, 3/4 V1160/A1120." (Fannie)

Soapbox: "A new (late 2005/early 2006) C + Ku band bird, to locate someplace in region of 174E, with 20 x 138 watt Ku transponders and 18 x 80 watt C-band will cover an oval from Alaska to southern New Zealand/Australia, California west to Malaysia. Primary purpose is to provide direct TV and Internet links to air travelers across the Pacific." (Kevin, USA - Editor's note: SES Americom, proposed operator of this satellite, is attempting to purchase assets of New Skies including NSS-5 and NSS-6.) "Triangle Television, operator of Ch 41 in Auckland, has been recommended for Wellington Ch 40; a 'network in the making'." (RT, NZ) "Sydney Sun-Herald 2 May reports Foxtel Digital has 50,000 customers connected, 140,000 waiting for connection. Article also states there is a long delay - as much as 17 months - to get connected. So - how did they do 50,000 in 6 weeks but require 17 months to do balance of 147,000? The maths are not working here!" (IF, Qld) "In response to NS in Soapbox SF#116 - Foxtel polarity switching. Voltage switching for polarity is still used. If at present you have 2 decoders via 2-way (Hz) splitter, Hz will always override. All new installations with two decoders have a double LNB; one LNB is wired direct to one decoder, second to the second decoder. With more than 2 decoders in household, the LNB is connected to a multiswitch and decoders connected via multiswitch. This gives each decoder access to both polarities independent of other decoders. The new LNBs have a LO of 10.7 in lieu of 11.3, primarily because of wider bandwidth of the 10.7 LO LNB which allows full use of intermediate frequencies to cover all of C1. As for FBO, each decoder has a unique smartcard address and when you order from say the bedroom decoder, only that box will receive the FBO ordered." (Brian Perry, NSW) "When in code edit menu for Vbox, press 1 and you get SkyCrypt while pressing 2 enters Conax - neither useful in Pacific." (CS, NZ) "All CoShips we have purchased are running fine after several months of service." (Frank Cochrane, Mosgiel, NZ). "Regarding past SF discussions of RS232 male (exposed pins) and female (recessed pins) connections on IRDs. When 2 piece of equipment are connected by an RS232/serial cable, they are usually a DTE (Data Terminal Equipment) such as a PC

connected to a DCE (Data circuit-terminating equipment), such as a modem. A DTE normally has a male (pins exposed) socket while a DCE has a female socket. The lead that connects a DTE to a DCE has corresponding pins connected on either end (pin 1 to pin 1). As noted in one of Rolf Deubel's SF articles, IRDs are normally connected to a PC using as null modem cable. A null-modem cable has the transmit and receive pins swapped to allow two DTE devices to be connected together. So, obviously, most IRDs are DTE devices. Of note, from the label on the ancient DGT400, it is DCE which means that a standard RS232 cable (i.e., not a null-modem cable) should be used. Others that should use a null-modem cable would include the Satwork and some Strong models." (NS, NSW) "Mid-April check on B3 in NZ - 12.407V, 12.487V, 12.595V, 12.657V on 1.2m offset - 12.407V is down 4 dB from other 3, 12.487V is several narrow data-rate SCPCs or SCPC." (RB, NZ). "In attempt to get approval for G13 service to American Samoa (STARZ! etc.) ran into roadblock that ultimately came down to, 'No, we will not authorise single family reception of these services to that 'Zip Code' (post address) for copyright reasons." (GE, USA) "Email from ABC A-P after requesting assistance with their program schedule: 'Strictly speaking, we should not be accessible in NZ as our programme rights do not cover the territory.' So where is NZ if it is not in the Pacific???" (Paul, Waipu Bay TV Radio) "Quote in ABA press release concerning adult programming on NSS-6: 'The guts of the investigation - is it really X and RC? If yes, we are dealing with prohibited content.'" (Grady)

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BBC publishes report on digital TV switchover

The BBC has published its first report on the proposed switchover to digital television. The report, 'Progress Towards Achieving Digital Switchover', submitted to Secretary of State for Culture, Media and Sport Tessa Jowell, states that digital switchover is challenging but achievable within the Government's timetable, given continued consumer enthusiasm and the right policy framework.

Key recommendations set out in the report indicate what the BBC believes to be essential if the UK is to achieve switchover from analogue to digital television. Foremost, switchover can be achieved within the Government's timetable if it makes a clear commitment including establishing an appropriate regional switchover sequence. Once this has been achieved, the BBC is also proposing the creation of a dedicated and properly staffed organisation to manage the switchover programme. Additionally, significant investment must be secured to support the marketing and communications campaigns that will be key to ensuring that the audience is able to make the transition to the fully digital world.

The final part of the digital jigsaw identified in the report is the development of a viewer-friendly, non-subscription digital satellite option. On this, the Corporation welcomes the opportunity to work with other organisations as quickly as possible to begin to make a non-subscription digital satellite option a reality.

"The BBC fully recognises that digital switchover has the potential to bring great economic, social and cultural value to Britain," commented Andy Duncan, Director, Marketing, Communications and Audiences, BBC. "Most importantly we are focused on our audiences and are aware of the danger of a deeper digital divide.

"By working with like-minded partners we would like to see an additional route to digital access - free-to-air digital satellite - become a viable and attractively simple option. This will ensure all our audiences can have access to the BBC's comprehensive portfolio of digital services and the fully digital world."

The growth in the UK's digital television market has been a great success to date, with digital television available in over 54% of homes with a significant contribution from the BBC/Sky Freeview system.

The BBC's investment in its digital channels and subsequent promotions has also played a pivotal role in exciting consumer interest in digital, tackling their initial confusion and assuaging their fears. Moving forward, however, the BBC said that there was a need for the Government to recognise the risks of switchover for the industry and work to underwrite the costs of any delays. Tessa Jowell underlined the Government's commitment to digital switchover as she welcomed the report into the issue. She said: "This Government is absolutely committed to working with the industry to achieve digital switchover. The potential rewards, including more choice for consumers and more space for new services, are too great for us not to be.

"The fact that half of homes in the UK now have access to digital TV shows there is a considerable appetite for the product out there. This provides a solid foundation for continuing the drive towards full switchover.

"Of course there are obstacles along the way, many of which are highlighted in this report. We are already considering what interventions are needed from Government and industry to overcome these in the journey to switchover. This report will help us focus on the challenges ahead." Switchover is being managed through the Digital Television project, a collaboration between Government, Ofcom, broadcasters, industry and other stakeholders. Its task is to develop a comprehensive framework and strategy for switchover.

Tim Alderman vs. cable TV: continued from p. 22

Down in the sub area, I built a mini-headend. During the process, I found that a local FM radio station, located on the ridge line just behind the Blonder Tongue yagi, was pouring a ton of signal into the VHF downlead. Left unchecked, it would eat up at least half the power bandwidth of the MATV amplifier I had chosen. So, I inserted a Blonder Tongue MLHF multiplexer, backwards, and terminated the VHF-Lo side with a 75 ohm terminator. This lowered the 94.5Mhz FM signal to 6dB less than (UHF) channel 57, my highest frequency digital signal. And, as I had an agreement that this was a digital ONLY system, any analog signals that came through were strictly a bonus.

I had done such a superb job in getting UHF gain off the rooftop that I discovered the unamplified VHF was 20dB lower, as were the local UHF double-sideband consumer modulators coming back from his living room. I merely used an old trick, a directional coupler run backwards, to solve the problem.

Finally, the whole thing needed some gain, to make up the loss of the directional couplers to distribute signals to the sets. I chose 11/12dB low loss couplers and 18dB MATV amplifier to drive it. In analog television, low signal levels mean noise or snow, especially on UHF, due to poor noise figure RF stages. With digital RF, it's the bit error rate that counts. Signal levels of minus 10dBmv just mean the AGC level is cranked up. So low distortion is much more important in the digital world than signal strength above zero dBmv.

My calculations proved correct, to the customer, his ATSC tuner delivers picture in under a second, and it translates the digital channels to the older VHF assignment as well. This gives him all the advantages of digital with out having to memorize new channel assignments. Plus the ATSC tuner runs a channel on his local modulator, and anyone can tune in that in his house on channel analog channel 22, and the TVRO is on channel 15.

Finally, private cable gives him growth capability. By adding additional ATSC tuners, individual sets can tune in different channels from the main set, and only cost is for the tuner itself, now down to around \$300. All ATSC tuners also are capable of HDTV; when he is ready, his private free flow of information digital system is already there.

I am proud to have delivered exactly what the customer wanted, and deliver it for modest cost, and he will never have to pay for cable again.

Editor's note: Tim invites technical queries from SatFACTS readers at tim@electron.org.

AT

Sign-off

The reality that Dreambox receivers or Humax IRDs equipped with TuxOnHumax HoT EMU 1.2 allows a user to access pay TV through a "shared smartcard" without directly paying on an individual per-subscription basis is threatening to the eventual stability of the pay-TV dish world. As recently as February-March, in Australia, we passed through a several year era when clandestine "gold" smartcards were being sold by the tens of thousands to unsuspecting consumers as a "free TV" answer alternative to calling Foxtel (or Austar) and ordering service. No sooner has one form of piracy disappeared and a new one (or ones) appears in the marketplace.

The first gold wafer emulator we witnessed was in Melbourne during September 2001. The individual demonstrating the system to us, during a satellite trade show held there, had a low-grade home PC permanently connected to his Austar receiver and by entering keyboard instructions as the codes changed, he was able to maintain access to all Austar channels. We were enlightened and amused but quickly came to the conclusion that as long as the user must have a full time PC connected to the DGT-400, above average computer skills, and access to web posted "secret numbers," none of this was a serious threat to the Austar (or Foxtel) CA integrity.

Eventually the proliferation of modified smartcards was caught out by improved encryption routines as programmers upgraded their "version 1" software with clever "talk to me" sub-routines built into both the cards and the receivers. If a card was unable to communicate in near-real time with the receiver in support of data stream instructions received via satellite, the card stopped functioning. Gold wafer cards shut down and no less an authority than Rolf Deubel forecast, "the end of the hacked card era."

More recently, in SF#116, we reported on code key routines using software upgraded IRDs that no longer require a smartcard at all to access some (not all) of the remaining "version 1" CA routines still operating. On the surface, that would seem to be fulfilling Deubel's prophecy - "the end of the hacked card era."

None of this seems as if smartcards will continue to be with us for very much longer; in any form. On the other hand, there is the DreamCrypt CA system engineered by the same folks who are manufacturing Dreambox receivers. DreamCrypt uses a telephone-like "SIMS" card which is a use-once and throw-away device not dissimilar to Lotto cards with their "scratch and reveal" approach to secret numbers. Perhaps cards per se are not dead, only those that allow a clever user to reconfigure or modify the card contents to gain access to an otherwise secure transmission. There is a very strong message when super-hacker Rolf Deubel has joined forces with others of similar talents to create an encryption system approach which is (they claim - SF#116, p. 13) 32 times as sophisticated as Microsoft's Internet Explorer and

includes an internal security password that is 512 letters/numbers (characters) in length. To "crack" DreamCrypt would require that each of the 512 characters be an exact match to the password characters. Using only 24 alphabet letters and 10 numbers (0-9) available to define each of the 512 characters, that's 512 times 34 or 17,408 possible answers times all of the possible combinations one has with 512 characters. The answer you are pondering is in the trillions of billions.

So it turns out that as bright and smart and clever as pay-TV folks have been to date in creating smartcard systems, they have not been as skilled at their task as the super-hackers like Deubel. And now these folks with hacker-roots have moved on, taking with them all they learned and dissected from the mistakes of others, to build a new machine - one designed to end hacking forever. At least that is their claim.

All of this would be quite refreshing were it not for their unique and to date apparent simultaneous devotion to busting the guys still using old fashioned hacking systems. This would be the Dreambox, a satellite receiver so clever that it can function as a "base station" with Irdeto, Conax, SECA and other pre-DreamCrypt CA systems. As SF#114 reported, Dreambox allows the user to load (Internet available) software so that it functions in virtually any CA format. Moreover, it can hold two or more CA formats simultaneously and seamlessly switch back and forth between the systems.

Irdeto 2 and other current versions of CA insist that the programmer issued smartcard and the receiver "talk" to one another while simultaneously receiving and processing instructions through the satellite feed. Dreambox goes this requirement one better - it can *also* talk to a second, third, etc. Dreambox at the same time. So when a programmer issued card is inserted in the "base station" Dreambox, and additional Dreamboxes are connected (via a local cable, or through Internet to some distant point) to the master Dreambox, everyone talks back and forth and to the "shared" authorisation card; one card resting in the "base station" communicates with all of the other (cardless) Dreamboxes and when a remote Dreambox wants to change channels, or is turned on, the distant card provides all of the appropriate software answers; one card acting on behalf of all of the interconnected Dreambox receivers.

Several years back, Rupert Murdoch's NDS was accused in France, the UK and the United States of facilitating hacking of competitive CA systems and posting the hacking information on the web. None of this landed in court primarily because Murdoch's lawyers were smarter than SECA, Irdeto attorneys. But the possibility that one CA system operator (NDS) would hack and then distribute information that would close down a competitive CA system was brought to the surface by the charges.

Dreambox and DreamCrypt could well be following the same pathway; Dreambox is the tool that allows users to "shack" ("s" from sharing, "hack" from hacking) the other guys while DreamCrypt proudly stands outside the arena offering to, "solve your hacking problems."

Has pay-TV encryption now come full circle? Have the inmates taken over the asylum? Was Clockwork Orange a fictitious movie script or is it merely progress? Stay tuned.

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- Tech Bulletin (TB) 9402: MATV (master antenna terrestrial) systems - wiring up a home, motel, hotel, camp site from one set of antennas - \$15 all regions
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- TB9305: Cable TV - the basics. How a cable system works, how you can build one! \$15 all regions.
- Nelson Parabolic Manual. The "bible" of building your own 13 foot dish from scratch. Serious stuff for dedicated builders. \$15 all regions (supply limited)

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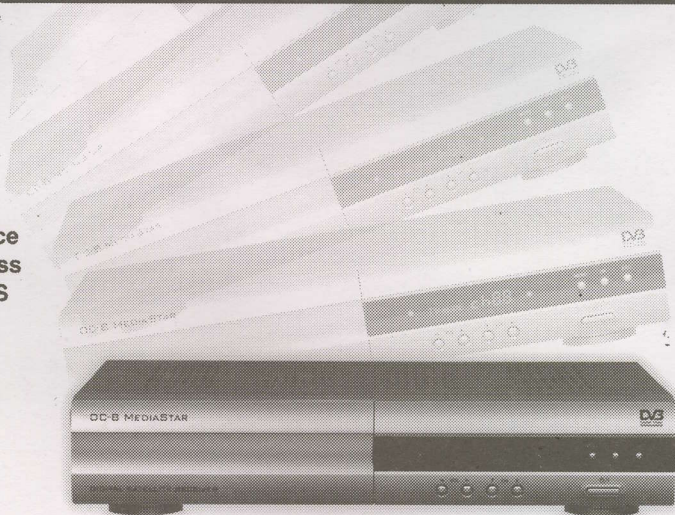
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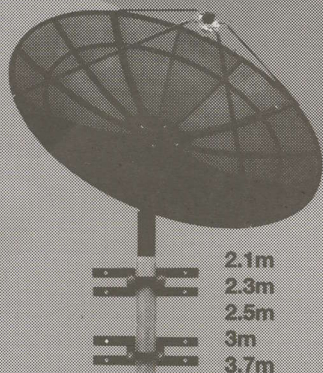
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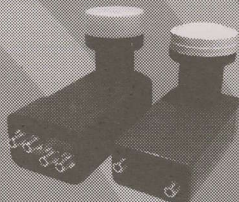
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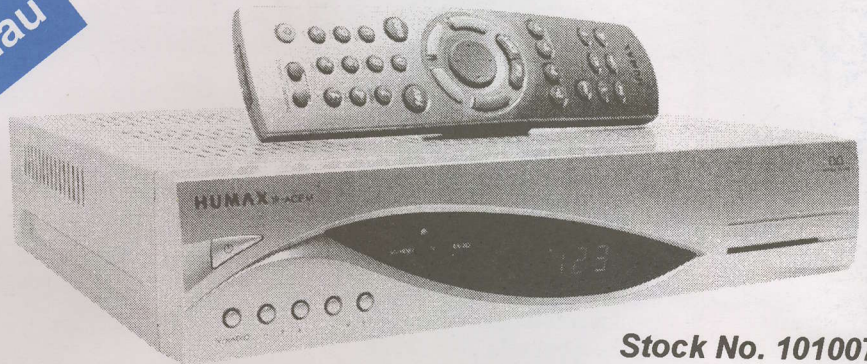
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