

15/03/01 - 3am

Bob Cooper's

March 15 2001

SatFACTS

MONTHLY



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

IN THIS ISSUE

**HOW LOW
can you go
to the horizon?**

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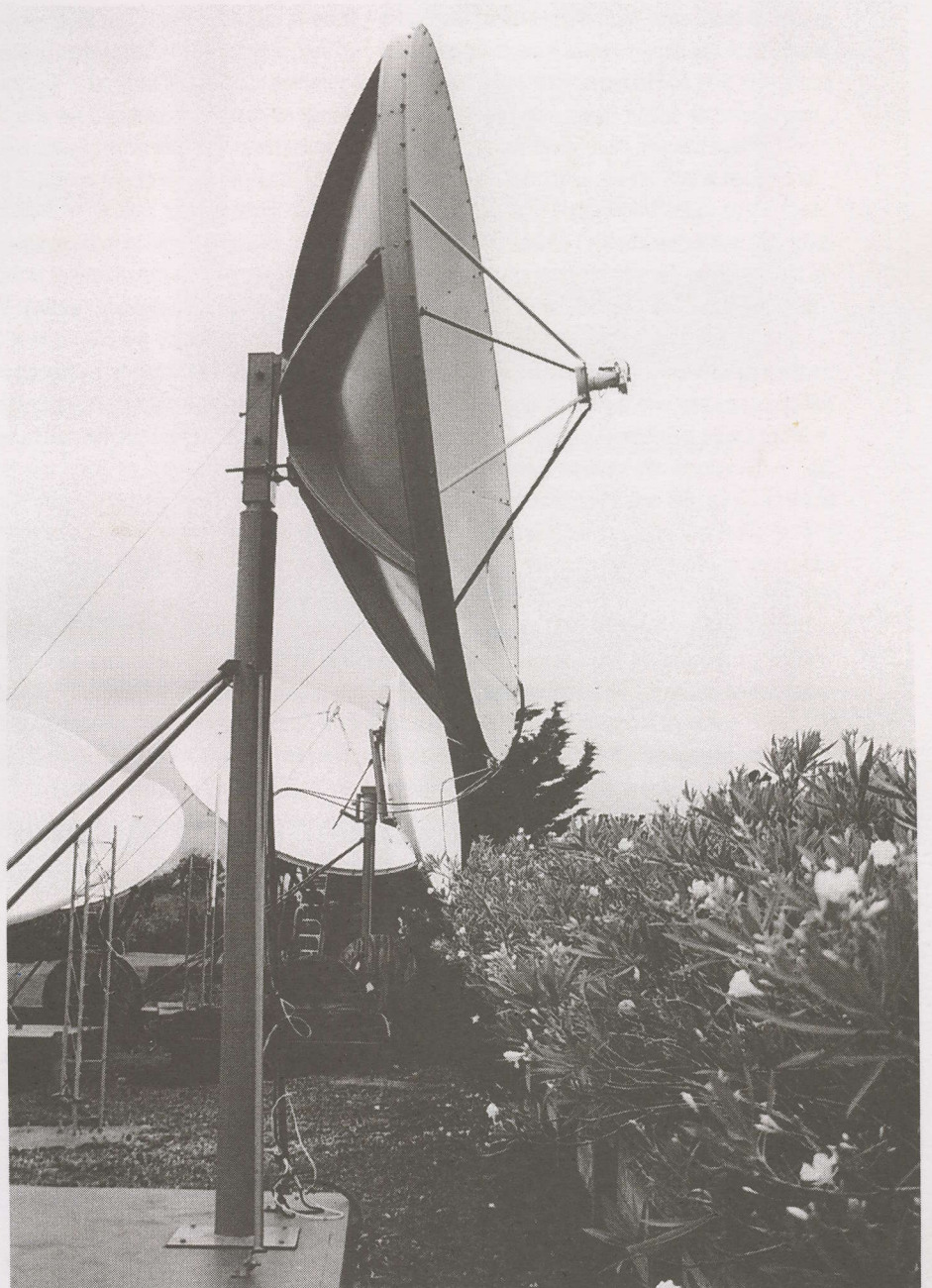
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- ✓ Latest Hardware News
- ✓ Latest SPACE Pacific Reports
- ✓ Cable TV Connection

Vol. 7 ♦ No. 79

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The PX1 High Power FM Radio Station

The ultimate in superb state-of-the-art sound quality (stereo? *Of course* and SCA *too!*) using the most recently developed audio processing and transmitter linearity circuits for "big-station" sound.

The PX1 Technical Standard - for sound so good you will swear you are in a recording studio!

- **Frequency range:** 87.5 to 108.0 MHz in 100 kHz steps (you dial up your frequency - if circumstances change, just reach up and move your station to a new frequency!)
- **Power output:** from -60 dBm to +47 dBm (40 watts maximum output, smoothly adjustable down to a fraction of a watt!)
- **Broadcast Modes:** Stereo (+/- 75 kHz bandwidth) with 55 dB minimum separation (typically 60-70dB) from 50 hertz to 16 kilohertz audio range with THD (total harmonic distortion) not over 0.3% with processing - or you have switch-option of standard mono with or without SCA (it even has digital inputs for the future!), and, a "brick wall" 16 kHz steep low pass filter to ensure that even if your CD source somehow has audio stuff above that frequency, it won't get into the system and cause beat problems (19 kHz is "down" 68 dB)
- **Operating power source:** 110VAC, 220-250VAC, and 12VDC (requiring 11 amps for full power - a 100amp rated car battery easily runs it for 10 hours or more which means a modest solar panel array would operate PX1 with no commercial power required!)
- **Inputs:** Connect the audio output (in stereo or mono) from a satellite receiver through a pair of professional, balanced, XLR audio inputs (yes - we *include* these special plugs with each PX1 so if you are on Kiribati with no Dick Smith store, you're still able to get on the air immediately), or, plug in a CD player, microphone(s) or your own (you provide) switching audio input source (a mixer - we can source for you until we have our own!)
- **Input adjustments:** We've been in the satellite link business forever (well, since 1979) and fully understand that you can have widely varying inputs from different sources. So we built-in 4095 steps of audio input adjustment (you can *really* fine tune this baby!) so even the "weakest" audio input from Granny's cassette player can be amplified to full modulation volume (which, by the way, also has 4095 steps of adjustment)
- **Cooling:** High volume CFM fan for those moist, humid climates where you need to get the heat away from the oversized heat sinks quickly to maintain transmitter efficiency - plus, over temperature automatic detection winds back the output power if anything gets "too hot" and is in danger of becoming a problem (we've never been to Kiribati but we can appreciate that an FM transmitter there needs special automatic protection circuits)
- **Output stability:** While we expect you to connect the transmitter output to our own line of 50 ohm antennas for maximum coverage, we also know someone will try to broadcast using a 19" clip lead hanging down from the type "N" output connector on the rear panel. So we built in automatic VSWR (standing wave ratio) protection which senses abnormally high reflected power (transmission juice not accepted by the transmitting antenna array and sent backwards to the transmitter) to ensure you never - NEVER - blow up your solid state final amplifier transistors. If the VSWR rises, the output power automatically reduces until you fix whatever is wrong with the antenna system (we field tested the PX1 on a remote island in the Caribbean for years, know what happens if something fails and the manufacturer is thousands of miles away and nobody within a thousand miles has any idea what an RF output transistor is!)
- **Clean neighbour policy:** The PX1 has tremendous bandpass filtering built in - hey, we had to beat the very stringent USA specs demanded by the FCC/Federal Communications Commission, to get this transmitter approved for use there - we are better than 90 dB below the selected frequency output at full output on 2X (second harmonic) which means you won't get into anyone's TV reception or screw up the local airport tower when operating this super-clean transmitter!
- **More clean neighbour policy:** So the neighbourhood meenie kid comes into the station with his latest rap-CD and wants to "crank it up" to full volume. We've been there and built in "over modulation protection" to make sure that no matter how loud his rap or how much he cranks it up, the only thing that will fault is his own ear drums.
- **Comfort zone:** Everything you need to monitor we monitor for you. If it is not automatic (such as automatic over modulation protection), we create a switch selectable (fluorescent character) display which you can check as often as you wish for PX1 operating parameters. Like? The actual temperature of the preamp and the final amplifier, left and right audio levels to PX1, VCO (transmitter oscillator) voltage, modulation levels, and the actual power output plus the reflected power from the antenna - to ensure you know when you have the antenna properly mounted and tuned. It's all there on the front panel display so nothing sneaks up on you and goes "snap."
- **Housing:** All of this is in a standard 19" rack (hey - if you are going to be a professional radio station, scrounge up a real world professional rack to stick this baby in - that is 5" high and 15" deep - you don't have to have a rack of course - it will sit nicely on a banana crate or folding card table or even the front passenger seat of your Ford Explorer equipped with the Bridgestone tires) - but it gives your station a "professional" touch.
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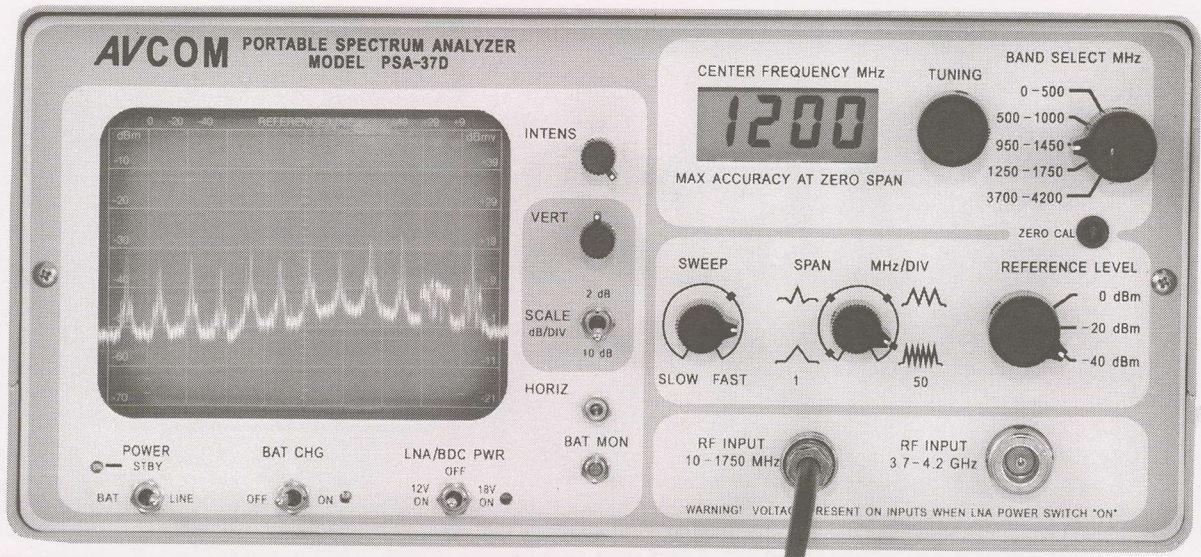
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* - Talk about field support! SPR 9901 next scheduled Optus B1, 12.336Vt, Sr 30.000, FEC 2/3 Sunday April 8th 2PM NZT, 12 noon AEST, 10AM WA, repeats 5 hours later.

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Tel: (852) 2873 9777 • Fax: (852) 2555 1589 • E-mail: pasinfo@panasian.com
Offices in Manila, Singapore, Dubai - visit us at www.astrx.com

SatFACTS MONTHLY

ISSN 1174-0779

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

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

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

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<http://www.satfacts.kwikkopy.co.nz>

Subscription Rates

Within NZ: \$70 p/ly

Australia: AV-COMM Pty Ltd, PO Box

225, Balgowlah, NSW 2093

61-2-9939-4377

Elsewhere: US\$75p/ly

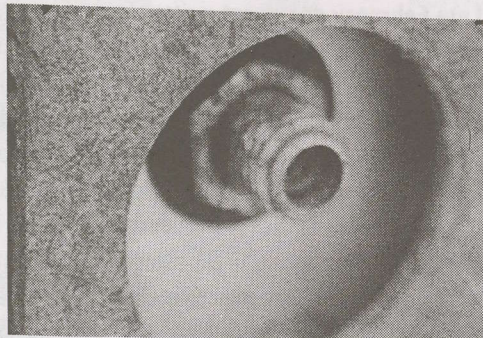
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COOP'S COMMENT

Odds and ends that have accumulated. We joke about crimping tools, people send us funny stories relating to crimping tools, copies of a 1998 Comet directive warning installers to stop using pliers to install F fittings - if they break or lose their crimper, Comet advised, "Stop work immediately and call in for help." The fact is the "F" fitting is by far the most widely used



Early "C" connector on TV converter

coaxial cable connector in the world. Nothing else even comes close in volume. In 1990, before SatFACTS and CTD, I began a backward trek through history to locate the creators of some of the things we all take for granted today. Including the "F" fitting. I knew, for example, that before there was a "F" fitting there was a "C." I sought out some long time friends from the dawn of the American cable TV industry (1948 was when it began) hoping they could point me at the transition from "C" to "F." As an amateur historian, it bothered me I could not pick up a book and locate the person or firm who first built TV boosters, first built TV signal splitters, first built all-channel TV antennas. Or "F" fittings. I told Gay, "I'll find who these pioneers were, identify them, get their stories and write my own book about the 'little things' that made TV work."

Early in March after 10 years of searching, I have finally come to the end of the "F" fitting trail. I spent 9 years falsely trying to track down the sequence you can possibly see - I certainly thought I saw one. First the "A" fitting, then the "B", the "C" and so on to "F". It bothered me there were no "G" or "H" but in my certainty that fittings began with "A" and progressed to "F" I overlooked that important clue.

I am indebted to Maqbool Qurashi, Eric Winston and Sruki Switzer for revealing the truth about the "F" fitting. Yes, there was a "C" - it was smaller than the "F" but looked very similar. It was created around 1947 for RG59 cable - and RG59 cable first appeared in 1942 inside of American bombers (B19 then B29). "C," it turns out, did not denote the third in a series ("A", "B" and then "C") but rather it stood for - are you ready for this??? - Connector!

But RG59 cables were (and remain today) very lossy so a larger cable was needed as master antenna TV systems and then cable TV developed. RG6 was the answer but it was 1953 - 1954 before RG6 was popular enough to create a specialised fitting. If you tried very hard, the "C" could be forced onto RG6 but the result was a bad mechanical connection as the RG6 was simply physically too large for the "C" connector. Maqbool and Winston went into the shop at Jerrold Electronics and designed a new fitting just for RG6. Like engineers everywhere they had to think of something to call it. First it was called "fitting" and that was abbreviated to "F" (for fitting). A fitting, you see, was different than a connector. And Sruki Switzer? He designed the first crimping tool after standing on too many ladders in Saskatchewan, Canada winters with a pair of ice coated pliers trying to close the collet on early 2-piece F fittings for his pioneering cable system. Patents? Yup. Protection? Nope. Time to finish the story? Perhaps not.

In Volume 7 ♦ Number 79

ABA + Optus - The Mess -p. 6

Revisit: Astrx D 1000CI IRD -p. 0

How Low Can You Go? -p. 13

Optus B3 is Bursting at the Seams -p. 18

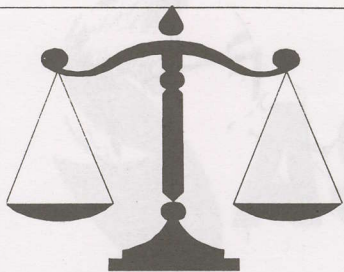
Departments

Programmer/Programming Update -p.2; Hardware/Equipment Update -p. 4; SPACE Pacific Report (DVB-T Options - to sell or not to sell?) - p. 20; Technical Correspondence (UEC Powering, ABA Measurements) - p. 22; SatFACTS Digital Watch -p. 24; Supplemental Digital Data -p. 26; SatFACTS Analogue Watch -p. 27; SPACE Pacific Report - TV Show schedule -p. 28; With The Observers -p. 29; Eb/No - p. 31; At Sign-Off (Paying a price for television) -p. 32

-ON THE COVER-

Low look angle tricks - something called ground gain can make your dish act 213% bigger than it really is! (page 13 here).



**Freedom to view?**

"I will not renew my subscription to SatFACTS; this is not a reflection on the content nor quality of the magazine. It is because I have been unable to obtain permission from the City of Christchurch Council to erect a satellite receiving dish on my property. Under the Resource Management Act 1991, I must have consents from the Council and my neighbours. In consulting two local firms, I learned that 60 foot trees surrounding my property would interfere with reception. The City Council officer told me that if the dish is visible to any neighbour or obstructs their view in any way, no permit can be issued. I am in my early 70s and long retired. The restrictions with which I would have to comply make a dish installation impossible for me."

Frank Swift, Linwood, Christchurch

Christchurch has been a difficult area for C-band dishes (or a Ku band dish over 90cm in size). Some C-band installations have been done in the hills by setting the dish against a hill so that the upward running terrain sits behind the dish and acts as a "reference point" to measure from. Setting that aside, your location precludes such an effort. It is our opinion that Christchurch violates your rights to access television which is in support of your educational or religious activities. To deprive a person of a specialised television service which has ethnic programming that fits their own ethnicity, or your religious beliefs (there is plenty of religious programming on AsiaSat 2 and 3 for example) seems to us to violate your freedom of choice and your freedom of worship. In Victoria, local Councils have "caved in" when faced with these arguments. It *might* work in Christchurch.

Pnomh Penh Cable TV

"Have just returned from a 'Sat Fact' finding trip to Cambodia. The skyline is dotted with hundreds of satellite dishes, virtually all are redundant. I visited 8 firms listed in the business guide claiming to sell TVRO systems; only one still does so, the balance have given up satellite for cell phones. The reason - two cable companies (Cambodia Cable TV and Pnomh Penh Cable). Either will cable up a premise for (US)\$50, both offer between 70 and 80 cable channels including ALL of the popular film and sport services (HBO, Cinemax, et al). They help themselves to these signals from neighbouring UBC in Thailand with a generous mix of FTAs from C and Ku. Being such a poor, underdeveloped country, it is apparent the USA copyright lawyers have left them alone so far. Computer software, CDs, DVDs are likewise freely available at dirt cheap pricing. End result? For US\$8 to \$10 a month, these people have virtually unlimited access to every TV channel in Asia - surely one of the world's cheapest and most comprehensive cable services. And as a result, satellite TV is dead as a doornail there."

Siam Global, Bangkok

**PROGRAMMER
PROGRAMMING
PROMOTION****UPDATE****MARCH 15, 2001**

Late February document written by executive at Cable & Wireless Optus claims "39,000 smart cards in (Aurora) database." Document also offers 64 kbit/s (monaural) audio channel on 3 year contract at A\$40,000 per year (A\$109.59 per day), 128 kbit/s mono/joint stereo bandwidth at A\$70,000 (\$191.78 per day) and 192 kbit/s joint stereo bandwidth for A\$105,000 per year (A\$287.67 per day); all plus GST. Lowest cost option (not priced) is 19.2 kbit/s low speed data bandwidth. Users would have to deliver their service to Optus Rochedale Earth Station - at their own expense - for linking to B3 satellite. Document identifies "Imparja Info TV" (not to be confused with Imparja commercial TV service) as "available Australia wide," says Sky Channel "live racing and sports for commercial premises" is "available throughout Australia and New Zealand by subscription" (1-300-302-245). Other Australia-wide + New Zealand services identified by document: RHEF (Rural Health Foundation for health care professionals - 1800 646 015), Health Television Network (National health care network for health care professionals - 1800 658 499), CITEC (Interactive television - 1800 066 888), NSW DET (NSW Department of Education and Training - 61 [0]2-9715 8666), VIC DOE (Victoria Department of Education - 61 [0]3-9637 3379), Pacific Knowledge Network (Workplace training and education for commercial users - 1800 888 118 or 61 [0]2-9279 2101). *Unfortunately*, document is loaded with errors and mistakes and has not been updated since 1999 - another example of "Optus skills" we suspect.

Aurora subtitles. Seems since that infamous December data stream change, subtitling has become a user problem. When called on screen using remote control, the first two lines appear normally. Then the following lines of text are typed directly on top of the first two lines (they are not removed before new lines are added). Some shows have flawless subtitles, many more do not (live Australian sporting events with real time subtitling are affected as well as older shows). Switching subtitles off and then back on restarts the process - two clean lines followed by overwriting. Anyone at Aurora listening?

Medical training on Optus BTV1. Rural Health Foundation (www.rhef.com.au) produces monthly (fourth Tuesday, 19:30-22:00 Sydney time) specials for doctors and other health professionals (TV channel 4 on 12.407Vt Aurora). Recent topics have included HIV, suicide, diabetes and March 20th is "Contraceptives." Yes, FTA if you have an Aurora card.

RTVe (Spain) wants "affiliates" (CATV, SMATV) in Asia and Oceania; contact Maria-Jesus Perez at contratos_canales_inter.ep@rtve.es or fax + +34(91)581-7441. We all know about RTVE's general entertainment channel within European Bouquet, they are also announcing availability of "24 HORAS," all Spanish news channel.

Mystery pay-TV firm. Primestar Communications Australia Pty Ltd. has received ABA approval to deliver up to 70 pay-TV channels via an as-yet unknown system (whether satellite or terrestrial is not disclosed). Coincidence? Primestar is name used by USA firm DirecTV but no indication there is a relationship. DirecTV is in process of selling, one of the potential buyers is Rupert Murdoch's News Corp. Could this be an end run around Telstra within Foxtel system? Stay tuned.

Not a problem. CNNI into NZ (or other) *private home*? Au\$250 per year (you supply D9223 or equivalent) through John Martin, Television Oceania at 61-2-9281-4481.

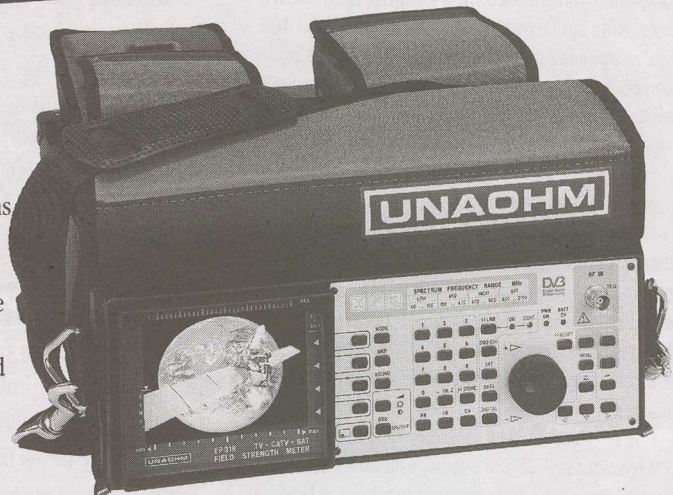
All the news - early. "Seven Ansett News," look alike to Seven Net 6PM weekdays/6.30PM Saturday/Sunday, is fed live via Mediasat B3 12.336Vt 4PM Sydney using same programme channel as SPACE Pacific Report allowing Ansett Australia/NZ to tape and show on flights with illusion of being "live" to passengers.

The growing Unaohm Television Analyser family



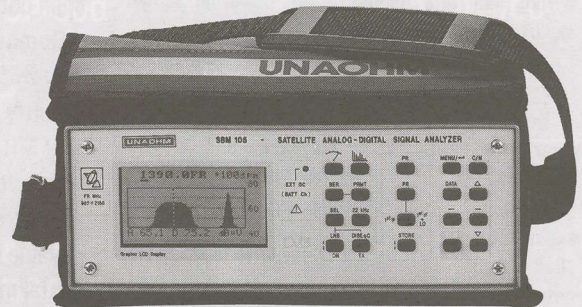
EP507 permits excellence in measurement across a wide range of television functions. Dual colour coded frequency markers provide a sound method of Digital Channel Power measurement. Automatic measure functions include Carrier to Noise and Video to Audio Ratios plus expanded Data Logging. Improved resolution bandwidth displays extra Spectrum detail. QPSK, OFDM and QAM quality measures of Bit Error Rate and Modulation Error Ratio etc., colour Constellation Diagram and printout of MPEG Network Information Tables are available. An internal reference Noise Generator that permits measurement of insertion loss or filter alignment etc. anywhere between 45 and 2000MHz is also available. A quality TFT LCD screen uses colour to clarify the meaning of most measurements, or simply to show a colour TV picture.

EP 319 level and Spectrum measurements feature high accuracy and selectable Resolution Bandwidths of 100kHz, 1.5MHz and 4MHz to provide real time spectrum displays of signals from TV stereo audio and colour sub-carriers to SCPC satellite signals. 5-40MHz is included, with Analogue and Digital data logging. Options include Digital Signal Quality measures of QPSK+QAM or OFDM. Operational running time is extended thanks to a Ni MH battery pack. Dual Spectrum Markers with Frequency and Level difference (Delta) measures, an electronically generated graticule, On Screen Display function indicator, automatic analogue Carrier to Noise and Vision to Audio ratio measures, DiSEqC 2.0 switching, Teletext etc. are included.



EP-313 provides a new benchmark for price, function and quality in a Television Analyser. Spectrum mode uses an easy to see frequency marker. Carrier to Noise ratio, Vision to Audio ratio and Digital Channel Power measurements display digitally and are automatic. 100 Preset tuning positions store your favourite channels, whilst factory preset channel plans enable tuning by CHannel almost anywhere, by FRequency either by direct entry or step. Teletext is standard. Factory Digital Signal Quality options for QPSK, OFDM or QAM round out the EP-313's measurement abilities.

SBM-105 makes all the necessary measurements for Digital and Analogue Satellite signal Quality. Built around the standard Unaohm Digital Signal Quality measures, the SBM-105 includes Spectrum with Analogue and Digital signal level measurement. The graphic matrix LCD is readable in direct sunlight or low light. Versions are available for QPSK, QAM and OFDM. The SBM-105 is a low cost answer to installer measurement requirements of digital from a company with over 60 years experience manufacturing electronic instruments.



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Appalling

"I have been catching up on my reading and was appalled by your article in Cable Connection (October 2000) advocating the piracy of a part of the (radio) spectrum. If the Family Radio Service (FRS) is licensed in your country, it is for private, family use, not for commercial users such as cable TV operators. The licensing laws usually limit these radios to a personal use, and do not permit any modification, such as fitting a higher gain antennae (as you suggest). I am shocked that a magazine such as SatFACTS, which generally advocates high standards of behaviour should be advocating this kind of piracy."

Alan Smith, Thailand

Guilty. FRS is a US service and the dirt cheap and usually high quality radios the service has spawned are Asian built but typically sold primarily in the USA.

There is no equivalent service in New Zealand, but there are other (conflicting) users for these frequencies. Our intent, not an excuse on our part, was to point out to cable system operators in PNG, and the islands of the Pacific a low cost method of monitoring cable plant performance from a central location. We doubt quite seriously the FRS spectrum (around 462 MHz) is assigned or in use in say Palau (Island) or the Solomon Islands and there the cable operator might as well be using this spectrum and these low cost radios for a productive purpose. Sorry we misrepresented that one!

TV ore not TV - a question

"I live on an island on the Marovo Lagoon in the Western Province with nothing on it except a few houses. And I intend to buy a satellite system and need some information. Could I please have the last 6 to 12 issues of SatFACTS Monthly and any other relevant material available and charge to my Visa card?"

Hans J. Beldi, Solomon Islands

Back issues of SF are available on an as-available basis - of the past 12 issues, four months are sold out. We routinely provide copies on request and the charge is the cover price on a single issue (depends upon where you are!) or we include them in a one or three year subscription package as a part of the normal 12 or 36 copies.

Kudos for help

"Kudos for your professional suggestion reference my inquiry with our neighbour's small engine interfering with our satellite dishes (SF#77, Cable Connection, p. 22). Following SF's suggestion, we changed out the spark plug and wiring and this helped a lot - we no longer experience massive pixelation and signal loss."

Les DeBrum, Marianas CableVision, Saipan
Channels 36, 37, 38 DVB-T

"Noted SF's website mention of Bendigo channel interfering with VCR playback and pay-TV channels. In the Illawarra region of NSW (Wollongong and south), digital terrestrial scheduled on the air in June-July will use channels 36, 37 and 38 for the 3 commercial networks. This will require creativity to fix!"

Brian Parry, Down to Earth Antenna Service

The ABA is not perfect. The UK, generally given high marks for their technical handling of analogue to digital terrestrial, recently admitted similar problems.

HARDWARE EQUIPMENT PARTS

UPDATE

MARCH 15, 2001

It's all about hardware. Last November New Zealand's taxpayer owned TVNZ and Wellington based terrestrial cable TV operator TelstraSaturn announced joint venture to provide up to 16 FTA + pay channels using Optus B1, Tr8. In January another 8 channels were added to pot as TVNZ acquired rights to second transponder (TR4) on B1. Original announcement called for "April-May" launch date and late in January TelstraSaturn announced they had outbid satellite competitor Sky Networks to bring home an All Black rugby tour coming up in November. Then SF#78 reported (p. 32) February 15th a difference of opinion regarding selection of a digital IRD (set-top box in consumer language - STB). By March 1, TVNZ was confirming launch date would be June, then July, now August. *We now believe* there will be *two*, not one, data streams - one with TVOne, TV2 and perhaps TV3, 4, Prime as a part of TelstraSaturn 24 channel package, using 5-year-old Pace DGT400 IRDs sourced from ex-Galaxy, ex-Austar, ex-Foxtel Australian warehouses; second - using yet to be defined (UEC is front runner) STBs equipped with modem, OPEN TV interactive functions, operating in 27 MHz (one half) of second transponder. This half-transponder service will satisfy TVNZ requirement for interactivity, but consumers will have to pay around NZ\$500 for higher grade STB (plus \$100 installation) whereas DGT400s will go in for just the cost of installation. Is this the final word? Not likely - lots of "balls in the air" still and August months away.

Talk about IRD subsidies! In USA, if you subscribe for a year of minimum - charge package service (around US\$300), they *give you* the IRD + antenna + LNB etc. In UK, if you agree to pay typically 40 pound installation fee, and also agree to leave IRD connected to telephone line for one year, you get ownership of IRD at end of 12 months even without a subscription. Now in USA for an extra \$49 (each), you can buy as many extra IRDs as you wish (UK still won't allow more than one at an address unless you can prove it will be in residence of separate family unit - not in same household) or you can pay 400 pounds for second IRD. However, at end of first year, you can *then order* a second IRD for standard 40 pound install price. Typical NZ and Australian charges for second IRD - \$25 a month, you will *never* "own" it.

Optus Aurora open hours. Western Australia (and South and central and Northern) Aurora installers, handicapped by Optus authorisation office shutdown at 5PM Sydney, now have a longer day. With summer time, 3 hour offset between Perth and east coast was a killer - installs not completed by 2PM Perth were unable to be turned on. Now Optus has been shown the error of their ways, has agreed to stay open until it is 5PM Perth.

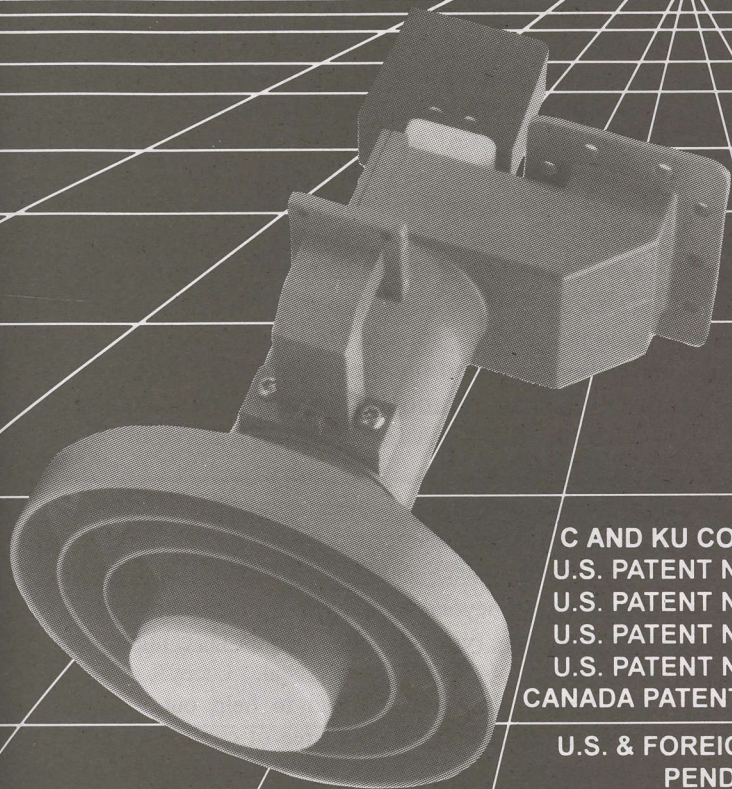
Combo cable. Maser Wire & Cable (www.maser.co.nz, tel 64-9-414-0331) has a new RG59/twin 0.75 cable with capability of connecting RF (through coax) and security equipment (through copper pair in same sheath); losses (this is 59, not 6) at 100 MHz are 11.2dB per 100m. Of interest, real braided copper shield (95%) on coax which you can *actually solder to!*

Australian notice: Postal money orders obtained at Australian post are ONLY payable inside of Australia (Norfolk), not NZ. Subscription orders accompanied by this postal money order are returned to the sender by SatFACTS for replacement by either a personal check or international bank draft. You ought to be ordering from Av-Comm anyhow - where an Australian Postal Money order is 'legal tender!'

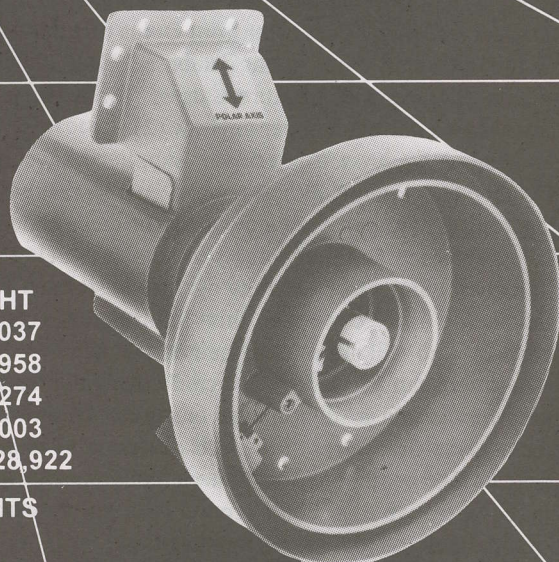
Updates? If you don't have the <http://www.satfacts.kwikkopy.co.nz> habit, get it for near-daily updates on everything happening in the Pacific-Asia satellite world.

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ABA Fallout - blind leading the blind into a darkened train tunnel?

Numbers. If someone wished to "measure" the composition of the Australian Ku-band satellite marketplace, a good place to start would be Optus where Aurora platform smart cards are issued. In theory, nobody can be using the Aurora platform without a card (1) and as Optus is the official card source, they should be able to tell us how large the market (industry) is.

Cable & Wireless Optus considers this information to be "commercially sensitive" and therefore ducks the question when asked. But numbers do slip out and SatFACTS has obtained an official document from Optus that makes the claim of "39,000 smart cards in our database." That 39,000 may not include all categories of Aurora users (see table, p. 7) and it may not be a correct number anyhow (2).

Another approach. Receiver suppliers have numbers - Nationwide certainly knows how many receivers it has imported, it may *not* know how many of these ended up in the Aurora project and how many others are being used less formally for say piracy activity against Austar and Foxtel. But Nationwide also considers this information "commercially sensitive" and will not release their data either.

Yet another approach. Smart card counts. Optus sells smart cards for Aurora to distributors (such as Nationwide, Sciteq, Norsat) who in turn resell them to dealers who finally sell the cards to the consumer user. Can we count cards? Some yes - one co-operative distributor reports 740 Aurora cards passing through their hands in 20 months time. Another reports a slightly larger number. But even this counting technique is imprecise because the primary source, Nationwide, releases no data.

Receivers? Many of the major buyers of the Aurora system receivers were quite public in their RFQ (request for quotation) process (Rural Health Education Foundation and Health Television Network as an example, in an RFQ specifying 5,830 receive systems initially). The original RABS Aurora project was also unavoidably "public" because of the furore over processing of subsidy vouchers (with 12,250

1) This overlooks the 150+ DGT400s working just fine with the Arrow One radio channel operated by the Australian News Agents Federation (SF#77, p. 29).

2) Optus document includes statement, "*While care has been taken in assuring the accuracy of the information contained within this guide, Cable & Wireless Optus disclaims all liability for errors that may occur...*" In fact, majority of information is either out-dated, inaccurate or was just plain wrong even when originally written.

3) Amusing story department. "We had a late rebate (after RABS closed down) instigated by a member of Parliament on behalf of a constituent. Nationwide first refused to pay it, then wanted to discount the \$750 claimed. They got a call from the MP's office and promptly paid the full amount."

Important numbers to understand

39,000 - Number of Aurora "smart cards" Optus claims in data base - (19 February 2001)

978 - Number of ABA approved Blackspot applications as of 2 March 2001

10,300 - Approximate number of subsidy UEC 642 receivers processed at \$750 each by Nationwide Antenna (additional 1,830 reportedly chose Telstra's PAS-2 Scientific Atlanta package "spending" their subsidy vouchers with SA)

9,225 - Surveyed number of non-UEC Irdeto capable IRDs sold through to dealer level including 1,830 D9234 SA for PAS-2 WA service

vouchers issued, close to that number returned for collection) (3). Alas, not all Aurora associated receiver sales have been reported in public places and this led SatFACTS to the importers above and beyond Nationwide for *their* numbers.

Some surprises here (virtually all of the non-UEC importers - Autosat Australia, AV-COMM, Kristal, Lacey's, Sciteq, Skyvision, Strong Aust were invited to help out with our analysis and did so). With a high degree of confidence in the number, we can report 9,225 non UEC Aurora capable (Irdeto imbedded or Irdeto CAM capable) IRDs had been imported and sold through to at least the dealer level as of 1 March. That works out to 23.6% of the *Optus reported* 39,000 smart cards in their data base, but of course not all 9,225 non-UEC receivers were for Aurora.

Where does all of this lead us? It is a first step in monitoring the size, scope and supply lines to the Aurora portion of the industry with at least some hints at how Irdeto embedded or CAM capable receivers that might be used for "other" purposes are flowing into Australia. More importantly, under some pressure from SatFACTS, we finally have the ABA releasing their "Blackspot" category approval numbers. It is shockingly small, under 1,000 in the first year.

The Blackspot enigma

When first announced (SatFACTS #66, p. 6), the ABA instigated Blackspot project was widely believed to be the salvation of the Aurora project which after initial RABS subsidy exchanges had fallen into a low volume business. Only those who lived totally outside of all terrestrial TV station coverage zones were qualified, pre-Blackspots, for satellite reception from ABC, SBS plus either WIN/GWN or Central 7/Imparja.

Prior to February 2000, the only way to sell a home system *inside of a terrestrial coverage zone* had been to misrepresent where the system was going. A network of exchanges developed - dealers living where there were no terrestrial services provided addresses to dealers who lived where terrestrial existed so that when Imparja (or any of the other

Who has bought Aurora capable IRDs and who sold them?

Name of service provider	Apparent number of receivers	UEC share of market	"Other" share of market	Notes
ABC + SBS only	3,475	2,300; 66.2%	1,175; 33.8%	includes rebroadcast
7C + Imparja	8,200	7,100; 86.6%	1,100; 13.4%	see note 6
GWN + WIN	4,650	1,750; 37.6%	2,900; 62.4%	includes 1,830 SA
All 4 commercial	275	250; 91%	25; 9%	
Westlink	1,250	1,250; 100%	0; 0%	
Centrelink	900	900; 100%	0; 0%	
Sky Channel	7,650	7,650; 100%	0; 0%	see note 6
Reminiscent TV	450	350; 77.8%	100; 22.2%	
Zee TV	925	875; 94.6%	50; 5.4%	
RHEF + Health TV Net	5,830	5,830; 100%	0; 0%	Handwritten: 600 Hosp. sites - Hosp. sat Doris Joral/Lease \$29 q month
Citec	800	800; 100%	0; 0%	Handwritten: mainly in places
NSW DET	1,260	1,260; 100%	0; 0%	Handwritten: Tange Joral in Fremantle
VIC DOE	2,400	2,400; 100%	0; 0%	
Optus Biz TV	900	900; 100%	0; 0%	
Pacific Knowledge	300	300; 100%	0; 0%	
FTA/no Aurora smart card	2,600	950; 36.5%	1,650; 63.5%	
Sat Music Australia	3,200	1,900; 59.4%	1,300; 40.6%	
NIRS	850	625; 73.5%	225; 26.5%	
Information Radio	200	150; 75%	50; 25%	Handwritten: Stereo ch. on Westlink - in the 990m - on stereo from Westlink
RPH	550	450; 81.8%	100; 18.2%	Handwritten: every one can have
UCB	275	125; 45.5%	150; 54.5%	
Radio Italia/BBC	750	350; 46.7%	400; 53.3%	
Totals:	47,690	38,465	9,225	

Aurora smart cards: Optus reported 39,000, we tally 47,690 less 7,650 in Sky Channel data base less 2,600 no card less 1,830 SA = 35,610. see note 6.

Peter Merrett of Sciteq makes an interesting observation about the Blackspot project. "Most of what we have sold has been in the WA market. Out here, distances are long between towns and the terrain is mostly flat. With limited exceptions, we don't have Blackspots in WA (as defined by the ABA)." For WA, Peter believes "5% would be too high." Of interest - of the 9,225 Aurora capable receivers imported and sold through, our survey suggests not fewer than 3,460 ended up in WA including 1,830 SA units used on PAS-2 Ku. All of this suggests the importance of the ABA's Blackspot programme has been badly over estimated by many - including (we admit) SatFACTS.

There are presently three ways to become "ABA approved / Optus authorised" for reception from the national or regional telecasters within Aurora.

1) Buy an IRD with smart card, go directly for smart card/IRD approval and turn on (1300 301 681). This will get you ABC, SBS television, access to Westlink, RHEF programming on BTVI (channel 4) and radio sources ABC (including Triple J, News Radio/Parliament), SBS, Information Radio 990 WA (possibly in WA only), BBC radio, UCB (United Christian Broadcasting), Queensland TAB, Satellite Music Australia channels 1 - 7 and Radio Italia (which is also an SMA service). Others may be available upon request (4).

2) Have an address in a location where no terrestrial TV coverage exists (i.e., outside of the paper drawn coverage contours of a regional or major market station or stations). In this case you go to Optus for ABC/SBS and their first level authorisation, then directly to the satellite telecasters (5) for approval and turn-on, subject to their certification that your "address" is outside of terrestrial coverage zones.

3) Play the Blackspot game, under the new rules put into effect March 1 (see SF#78, p. 9), subject to some uncertainties about how Imparja/Central 7/ GWN/ WIN will actually handle the application processing (see p. 8, here).

The reality is that if you are selling a system, the "easiest" route is to deal directly with the satellite broadcasters (5) and claim you are located at an address beyond the terrestrial coverage of any licensed broadcaster. That leaves the ABA out of the process. Of course if you are really inside of a terrestrial paper-coverage zone, that is illegal. The next "easiest" method

three) "checked" on the location's suitability, it would pass muster. Legal? No. Practical? Yes.

"The importance of Aurora to the sale of embedded or CAM capable IRDs has been badly overrated" comments a prominent distributor. "I feel only 25% of all such receivers have been sold for Aurora use with 15% of these going to homes outside all terrestrial coverage." How many have actually gone for Blackspot approval? "Not over 5%" suggests Jim Cotterill of Skyvision Australia.

4) When authorising through 1300-301-681, ask for all the currently available channels. Others possible: NIRS/ National Indigenous Radio Service (07-3252-1588), RPH/ Radio for print handicapped (02-9310-2999). Imparja radio channels are available only to those authorised for Imparja TV.

John Anderson - as RHEF
H.A.
Pau Bennett

18-19,000 - 17 + 1800 5 mus ago
RPHS

Our correspondence with Greg Cupitt, Manager of Television Planning for ABA

In SatFACTS #78, we reported a shortage of feedback (answers to our questions) concerning the new March 1 effective Blackspot application process rules. Basically as we reported in February, where installers/home dish system sellers previously made the required terrestrial TV measurements and submitted the required forms directly to the ABA, from March 1 those forms go to one or more of the four satellite telecasters. Here is some insight into the new procedure.

We asked: "*Was the ABA aware* when it adopted procedures in February 2000 that those procedures were contrary to the wording of section 7 (2A) of the Broadcasting Services Act 1992?"

In other words, did the ABA knowingly "violate" the 1992 Act with the procedure which had the applicant submitting directly to the ABA rather than to the satellite telecaster?

The answer: "*Yes, we were aware of this.* Prior to the passing of the legislation, the ABA was aware of a significant amount of viewer interest in the provisions of out-of-area reception (then called black spot reception). The ABA believed it was in the best interests of viewers at the time to implement a process whereby applications were sent directly to the ABA rather than through the relevant out-of-area broadcaster as the applicant. Adopting this approach has aided installers in understanding the requirements of the process and at the same time cleared a significant backlog of applications. It was always the intention of the ABA to (at some future date - ed) implement a process that passed the responsibility for lodging applications to the relevant broadcaster, in line with the intentions of the drafters of the legislation.

"In addition to the administrative arrangements the ABA has a legal obligation to provide reasons for its decisions to either grant permission, or refuse permission for each out-of-area application. To this end the ABA cannot meet its obligations if the (satellite - ed) broadcaster does not satisfy the ABA that a person is receiving inadequate reception of a (terrestrial - ed) broadcast service."

Our interpretation. The Act's intent was to preserve the "sacred monopoly" which terrestrial broadcasters have been awarded. The Act is based upon "commercial advantage" and if a home located within the predicted (on paper) coverage zone of a terrestrial broadcaster is not receiving a suitable terrestrial signal, the "economic advantage" of that home switching from (poor quality) terrestrial reception to satellite reception passes to the satellite broadcaster. The rules were created so that the satellite broadcaster, "asking to take a home located inside of a terrestrial coverage zone and presently benefiting the terrestrial broadcaster," must be the formal applicant because if the application is approved, the "economic benefit" of that home now passes to the satellite broadcaster. In essence, each home is a pawn on a chess board and when the satellite broadcaster "captures" a terrestrial broadcaster's pawn, he has to justify what he has done to the ABA.

We asked: "*Under the new regulations,* with the satellite broadcaster becoming the formal (virtual) applicant, what is the relation of the installer and to whom does he submit the basic field-drawn application?"

The answer: "*If we assume the technical part of the applications* will still be prepared by installation contractors, we (the ABA - ed) would expect that the out-of-area broadcaster would vet the technical aspects for worthiness and completeness and then forward a covering letter (with the technical application, to the ABA - ed) as the (actual - ed) applicant. Note that a statutory declaration is required to be furnished by the person supplying the technical information that the details are true and correct. What satellite broadcasters do in relation to engaging installers is up to them and not a matter with which the ABA should be involved. In a recent telephone discussion with one of the satellite broadcasters it was indicated that they have no plans to do other than utilise the services of existing installers."

We asked: "(In the past when you applied to Imparja, for example, but indicated a request for Central 7 as well, Imparja contacted Central 7 and arranged dual turn on for both services). *Under the new routine,* with each satellite broadcaster becoming an applicant, to which one (of any two) should the (technical field drawn) application be sent?"

The answer: "*If the viewer wishes to receive two services* (such as Imparja and Central 7), identical (technical) applications should be submitted to both satellite broadcasters."

Our interpretation: Although Greg Cupitt privately warns us, "not to be unduly concerned," about the status of installers, it is our "job" to do just this. It may come down to an issue of how the satellite broadcasters deal with the new routine. Consider *you* are an installer and you have a system sale conditioned upon the relevant approval from ABA. What is to prevent Imparja or any other satellite broadcaster from "working deals" with individual or groups of installers to the detriment of *you*? Could Imparja not negotiate an arrangement with one installer in Tasmania, for example, and simply refuse to process applications from any other Tasmanian firms? Is this not an invitation for a firm such as Comet to move into Aurora installations, become the "official Aurora installers" on behalf of say Imparja and Central 7, thereby shutting out the independent dealer/installer who to date has been the backbone of this segment of the industry? And as for having to submit *duplicate* applications to both stations - **good grief!**

Our correspondence with Greg Cupitt - continued

We asked: "We are concerned about privacy issues. A field prepared technical application, for example, contains everything that a satellite broadcaster or someone else would need to contact the actual consumer directly to perhaps make them an 'alternate offer' for a home Aurora system. By making the satellite broadcaster the 'virtual applicant' what happens to the privacy of the material submitted?"

The answer: "The ABA's Assessment of Inadequate Reception of Broadcasting Services form, required to be completed by the broadcaster, contains a clause at the beginning that states, 'As a part of its consultation with the (terrestrial) broadcaster(s) that are licensed to serve a particular area, the ABA intends to disclose the business details of the person making the declaration to the licensed (terrestrial) broadcaster(s) of the area. If the person making the declaration has any objections to the disclosure of its business details, it should advise the ABA in this application.' In its consultation with the terrestrial commercial broadcasters for out-of-area reception, the ABA discloses the address detail but not the *name* of the viewer. How installers and the satellite broadcaster deal with privacy issues is a matter for them, as the ABA need not be advised of the name of the person with reception difficulties under revised procedures."

Our interpretation: A can of worms and plenty of opportunity for precise information concerning the satellite dealer and/or the consumer applicant to be revealed to a competitor or an unrelated third party. The ABA is basically saying, "they will not disclose information" but then turn around and admit that when the terrestrial broadcaster in who's coverage area the real applicant resides is advised of the application, the information passes to the terrestrial broadcaster anyhow (as it always has done). We are reminded of the NSW distributor who mailed out sales literature to the original RABS users of the B-MAC system allegedly using a mailing list obtained from the files of the ABC. Apparently, it will be the ABA that will notify the (affected) terrestrial broadcaster and according to Cupitt, "the terrestrial broadcaster will have one week to respond to the notice." He further notes to SatFACTS, "Applications currently take about 3 weeks to process, which includes one week allowed for terrestrial broadcasters to comment on each application. Terrestrial broadcasters will not be able to 'block' an application unless the application is technically defective."

is to obtain a doctored smart card capable of accessing all of the services, but illegal cards are "illegal" and usually have a very short "shelf" (use) life.

Market study

Much has been made of the "uncontrolled importation and sale" of Irdeto embedded or CAM capable IRDs which pay-TV providers claim are contributing to a piracy mentality in Australia. Some additional numbers.

Recent public reports claim 427,000 subscribers for Austar (virtually all are satellite), 673,000 for Foxtel (approximately half are satellite). That is a total of 764,000 *satellite* subscribers in Australia, before Aurora. Our own importer survey identifies 9,225 imported Irdeto embedded or Irdeto CAM capable (not the same as Irdeto operational) receivers sold through by Australian distributors. Further, we can identify no more than 2,600 which apparently have been sold without Aurora smart cards (making them "suspect" as to their ultimate use).

If we were to assume that every single one of the 9,225 non-UEC receivers were being used for piracy activities, that would be 1.2% of the total IRDs distributed by Foxtel + Austar (764,000) to paying subscribers. However, based upon Aurora

smart card sales, we can identify only 2,600 receivers out of 47,690 sold into the Aurora marketplace which appear to not have a legitimate Aurora function. Now we are down to 0.3% of the Foxtel + Austar subscriber base who by supposition are using our surveyed receivers for some use *other than* Aurora. FTA (free to air) could be one of those uses, *quite legal*.

In fact, there has been a much larger "receiver base" in the hands of would-be pirates all along; the Pace DGT400s left over from the Galaxy era. This category of receivers has been estimated to be as great as 50,000 units (although a smaller number such as 10,000 seems more plausible).

The numbers attributed to "piracy use" simply do not add up properly and the blame laid on the doorstep of embedded Irdeto (or CAM capable Irdeto) receiver importers is difficult to sustain when you consider that any UEC receiver purchased openly from importer Nationwide has the very same "piracy capability" as say a Humax IRCI 5400. The only difference between a UEC receiver and a Humax or Benjamin or Satcruiser is the official "monopoly status" awarded to the UEC by personnel at Optus. In the hands of a would-be pirate, a UEC works just like any of the non-Optus certified models. Recent pay-TV software changes have made DGT400s essentially useless for most piracy purposes - have UEC sales risen since late January as pirates have scrambled to locate replacements for their DGT400s?

Bottom line? The importance of the Blackspot programme has been overrated by many (us included). Now for the first time we have a "numerical profile" of Aurora, and can see how as dealers and distributors we all fit into the larger equation. We can also see that the numbers do not support the "panic" which Foxtel, Austar and others brought to Parliament last winter while new Copyright legislation was being formulated. For those who must still deal with Blackspot applications, we wish you luck and suggest patience.

5) Satellite broadcaster contacts are, Imparja 08-8950-1411, Seven Central 07 4726 2000, GWN 08-9721-4466 and WIN 08-9345-5990. ABA is Greg Cupitt at 02-6256-2800, fax 02-02-6253-3277, Email planning@aba.gov.au

6) Sky Channel maintains its own data base, issues its own (Irdeto) smart cards indicating their 7,650 would NOT be in the Aurora 39,000 smart card list. Imparja maintains its own authorisation file, but does so with Optus issued smart cards indicating their 8,200 ARE within the Optus reported 39,000.

REVISIT: Astrx D1000CI All Scanning IRD

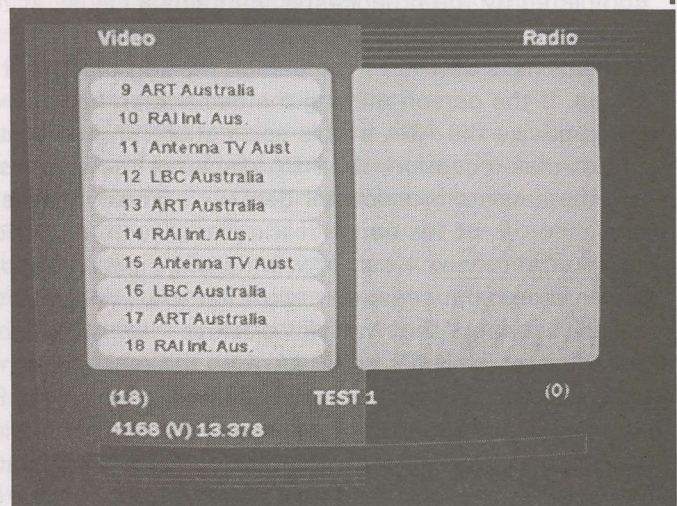
SatFACTS for February (#78) reported on a slow moving but seemingly reliable "all scanning, all-finding" IRD designed in Korea and sold through Hong Kong Pan Asian Systems Limited. This firm is what remains from the original game plan hatched in 1991 when STAR TV Asia was going to take over the world one country at a time. In 1995, STAR TV became a News Corp (Rupert Murdoch) firm and a number of related businesses originally created in support of STAR began to unravel. There was Fortress Satellite for SMATV systems and Pan Asian Systems for receiving equipment and distribution in the Hutchison Whampoa stable of firms.

Astrx is a trade mark or brand name that is attached to many product lines (including coaxial and fibre optic cable) from PAS. As we reported in February, the D 1000CI is one of several (five digital) satellite receivers and the only model in the line that includes common interface CAM slots.

What attracted most of our interest was the receiver's ability to go through a single transponder or an entire satellite a frequency and symbol rate number at a time in minute steps. We noted that scanning a full satellite (500 MHz L-band, both polarities) through any reasonable megasymbol range (such as 3.000 to 15.000 or 15.000 to 31.000) requires days of patience. Days, not hours. Basically, the bigger the frequency range scanned and the larger the megasymbol region scanned the longer it takes to do the job. We ended by saying the receiver would be a useful "second" IRD for those who could afford to have it running day and night while a dish was stuck on a single satellite as a means of keeping track of new transponder activity. We still say that but with some new caveats.

Multiple loading

It is not unusual for a searching routine to locate a service at two separate symbol rate numbers - especially when the signal is relatively strong and the symbol rate "steps" don't land squarely on the service's real symbol rate. The D 1000CI



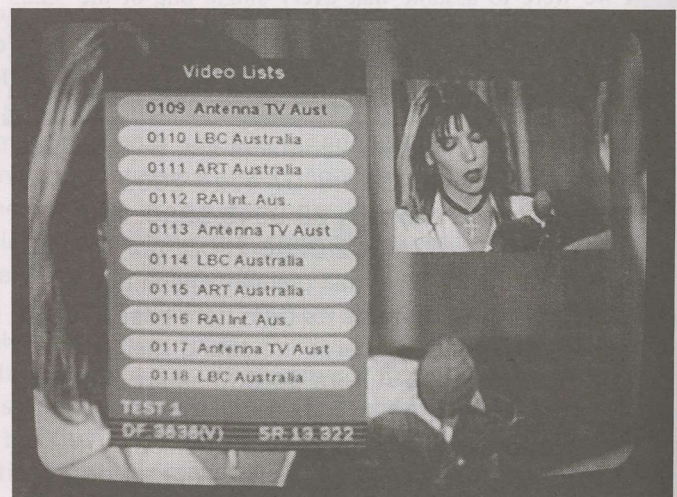
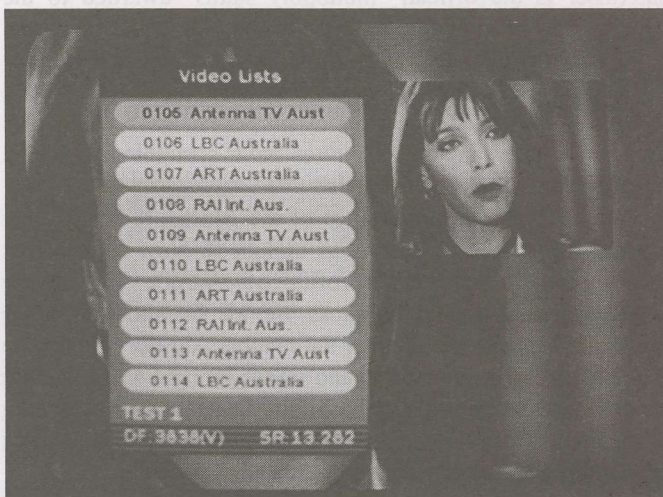
Mystery number one - why does the Middle East Bouquet repeat so many times during a scanning exercise?

moves ahead in .006 Sr steps - for example, from 13.322 to 13.328 to 13.334. Below we see the Middle East Bouquet found on PAS-2, 3836Vt, official symbol rate 13.331 and FEC 3/4.

That means the D 1000CI will not land squarely on 13.331 because its .006 steps fall either side. Not unreasonably you might expect it to latch onto the bouquet with a Sr of 13.228 and again at 13.334 - .003 either side, if the signal is strong enough (if it is right on the edge of locking, it could also skip right over the bouquet since it will not look at 13.331 at all).

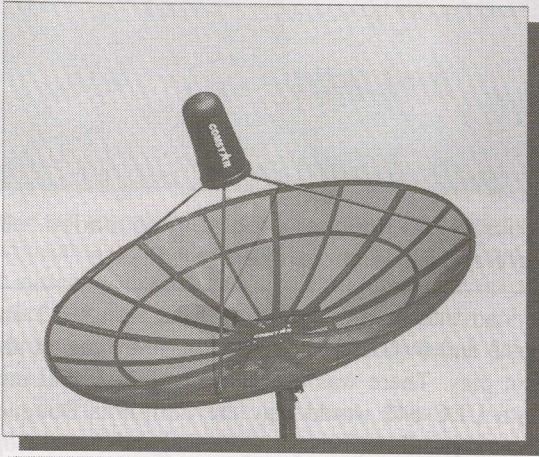
The surprise. While scanning PAS-2 vertical, the D 1000CI found the Middle East Bouquet *four* different times. And 13.228 and 13.334 were not included. It found it as 13.262, 13.322, again at 13.362 and 13.410. Was this unique? No, it found (and refound) virtually all other services multiple times

As the Sr counts upward, it first loaded Middle East Bouquet as Sr 13.262 (lower left of left) and as symbol rate advanced upward found it again as 13.322 (LBC shown here - real Sr is 13.331).

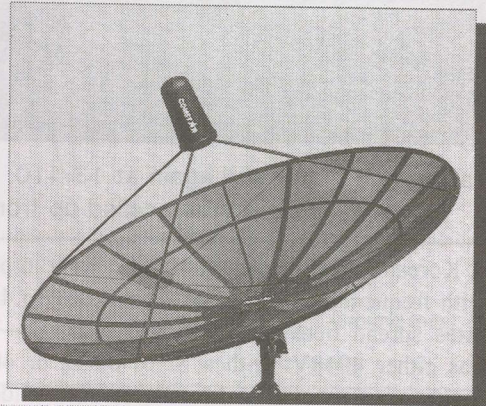


ANY WAY YOU LOOK AT IT ...

ST-7



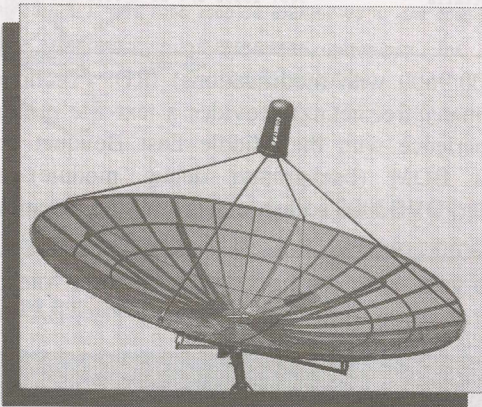
ST-10



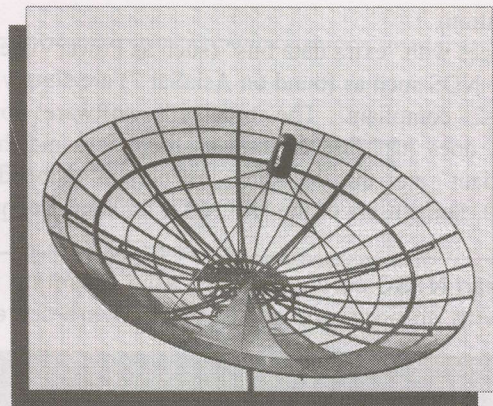
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2 - 13 Ghz antennas ...

ST-12

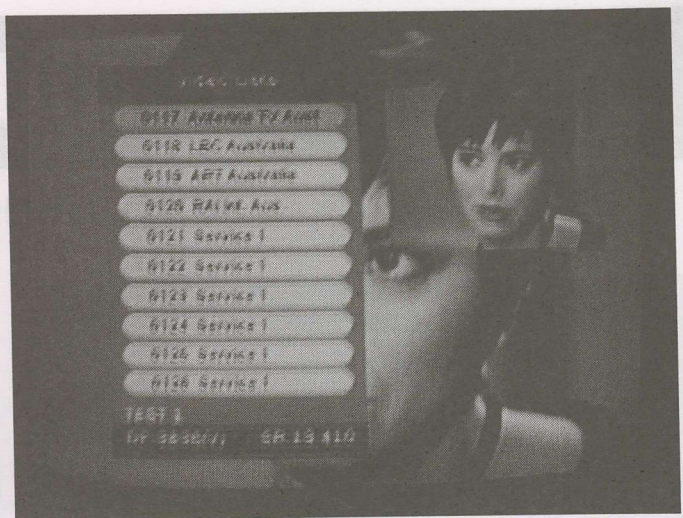
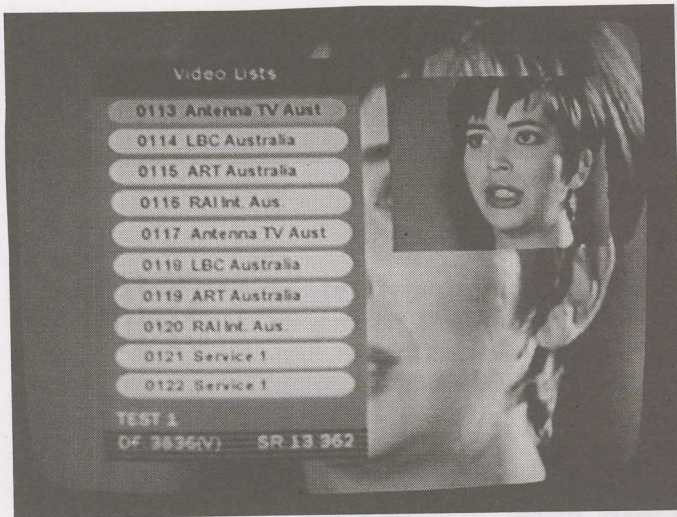


ST-16



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And again at 13.362 and again at 13.410. In each case, all four of the bouquet programmes loaded, all played when called up from the menu memory as LBC is shown here.

as well. A Korean SCPC service at 4065Hz went into memory 8 times with frequencies that varied from 4.061 to 4.065 and symbol rates spread between 5.045 and 5.075. A TVBS-N service was either 4048Vt with a Sr of 6.642 or 4043Vt at 6.624 - take your choice. Moreover, the Middle East bouquet's four time load at 3836Vt repeated four more times at 3838Vt for a total of 8 (times four programmes or 32 memory positions occupied). Yes, *what* it loads, it plays from memory.

Some of the "unusual activity" going on here may be traceable to the language barrier. The User Manual, like so many interleaving operational steps with set-up instructions, and originally written in Korean and then "loosely translated" to English, is bound to have lost some important information in the process. You see this when trying to piece together anything more complex than inputting numbers on command. But we suspect, after discussing it with others who have a keen interest in receiver software codes, there is another explanation.

Services with "extra data bits" (such as PowerVu, even when FTA or NDS such as found on AsiaSat 3) are simply not DVB MPEG-2 compliant. The receiver's software routine we suspect does just fine as long as there is a match between "compliant" and the decoding instructions embedded inside the IRD. Some users of the UEC 642, for example, have found

they can load into memory services from AsiaSat 2 and 3, PanAmSat 2 and 8 (C and Ku bands) but they cannot always make them play. There was a period of time several months ago when a UEC 642 would play the California Bouquet on PAS-2 C-band just fine (for several weeks) and then it stopped as suddenly as it began. It does not take much of a change, correction, or variation in the data stream to turn a receiver "on" or "off" even when in what most of us would consider a FTA mode.

Other options

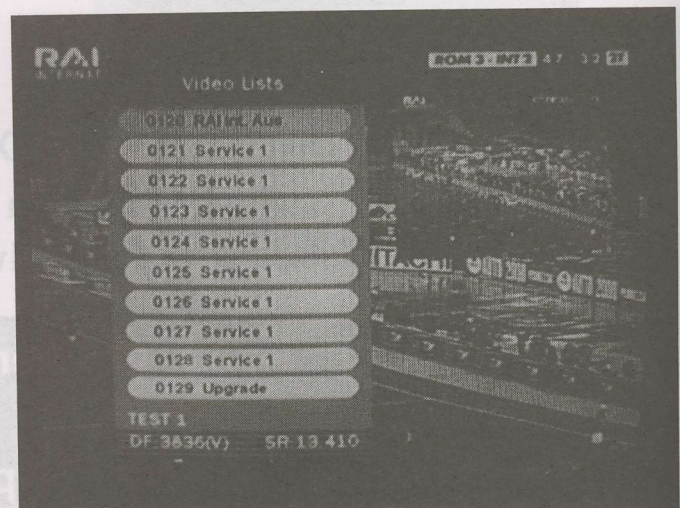
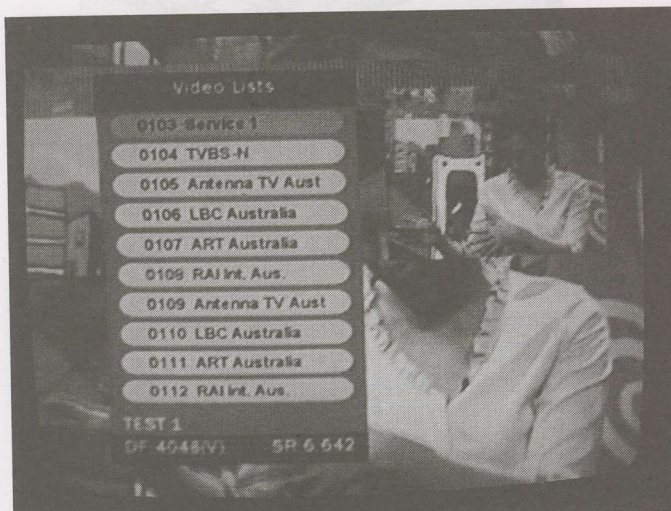
The ultimate answer to scanning and logging of important operational numbers of course continues to be DVB2000 software injected into an appropriate Nokia (d-box or,

Antenna TV Australia	3837	13333	3/4	30	V	0200	028A	0100	1FFE	1F	FF	00FF	0000	PAL	N	0v	0	Auto	01	0001	0001	FFFF	1	0	0000	00	00	00	0
LBC Australia	3837	13333	3/4	30	V	0981	0982	0101	0980	1F	FF	00FF	0000	PAL	N	0v	0	Auto	01	0001	0002	FFFF	1	0	0000	00	00	00	0
ART Australia	3837	13333	3/4	30	V	0983	0984	0102	0980	1F	FF	00FF	0000	PAL	N	0v	0	Auto	01	0001	0003	FFFF	1	0	0000	00	00	00	0
RAI Int. Aus	3837	13333	3/4	30	V	0095	0095	0103	0090	1F	FF	00FF	0000	PAL	N	0v	0	Auto	01	0001	0004	FFFF	1	0	0000	00	00	00	0

9200/9500/9600 with modifications) IRD. Technical Bloke (satelliteman@free.net.nz) provides a text file printout of his own experience with the Middle East Bouquet on PAS-2. Using a BDM (background debug module) and new bootloader, DVB2000 software logs and files channels.

Korean NTSC service has unusual pulsating colour with no apparent ability to software correct.

Double yes. Yes, we had the D 1000CI "picture in a picture" running in these photos; Yes, RAI futbol.

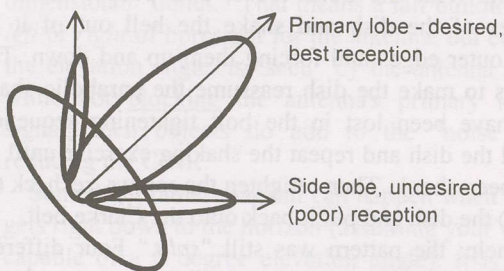


How Low Can You Go before noise covers the signal?

If you study virtually any satellite footprint (coverage on the ground) map, you will see one of two "end of coverage" points indicated; either "5 degrees elevation angle" or "edge of visual coverage." The further a satellite is located east or west of your location, the nearer it "sits" to the horizon (your distant ground level to the west or east).

Most satellite engineering guides suggest that when your "elevation angle" is below 10 degrees, you will begin to experience reception difficulties. And in fact a high percentage of adjustable (azimuth over elevation / az-el, or, polar mounts) dish systems allowing pointing your antenna at the appropriate satellite do not make it possible for you to "look" at an elevation angle below 5 degrees (i.e., between 0 degrees and 5 degrees).

There are several practical reasons why antenna manufacturers might not give you even the *option* of looking below 5 degrees elevation (or in some cases 10-12 degrees). Most of these are based upon sound engineering practice and decades of experience. Mildly stated, "satellite reception from elevations between 5 and 10 degrees is unreliable and below 5 degrees essentially fortuitous." Are there circumstances that defy this reasoning and might there not be something you can do to improve your odds with low look angle reception?



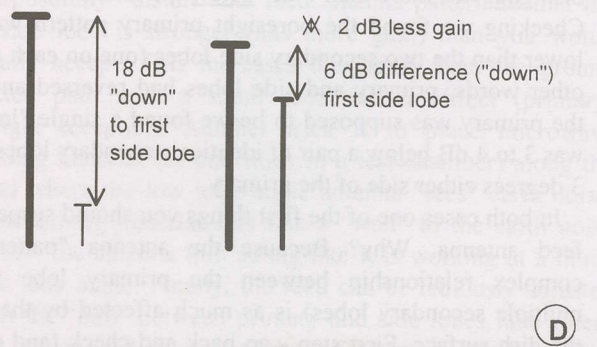
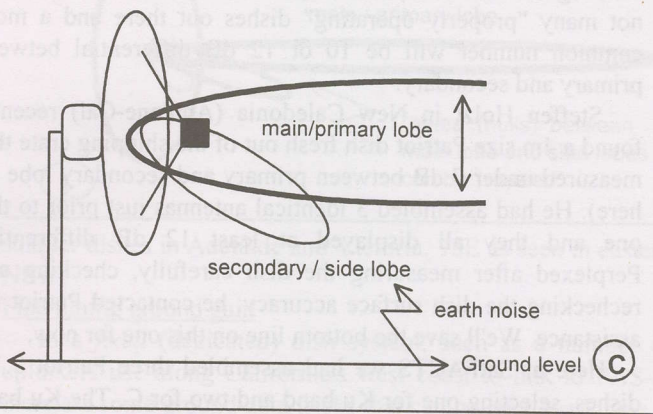
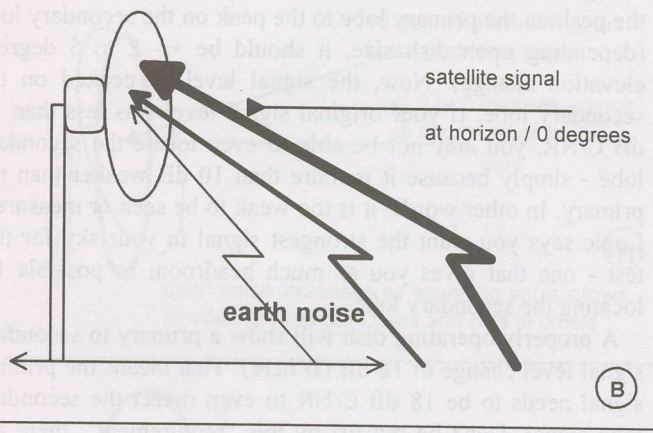
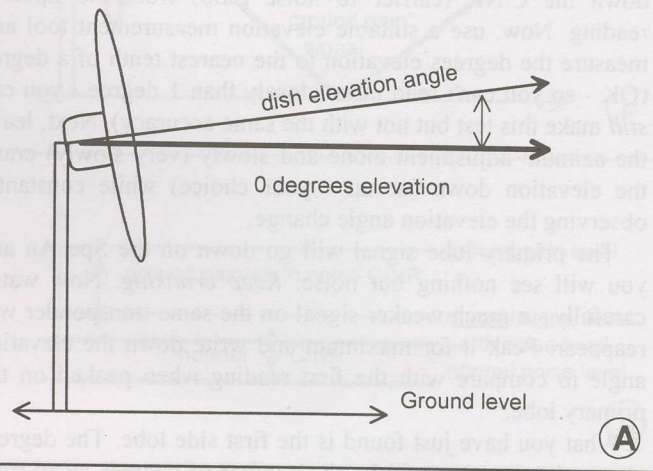
All antennas have primary and secondary lobes; secondary (side) lobes rob power from primary

The antenna and the noise

Every version of a "dish" antenna has been designed to maximise gain (reception) in a single forward direction. It does this by *minimising* gain in all other directions. This creates an antenna system which has a primary gain pattern (lobe) surrounded in all directions by lesser gain patterns (secondary lobes).

In a two-dimensional drawing, above, these "patterns" appear flat but in fact they are round donut shaped not unlike the shape of the (parabolic) antenna itself. In other words, they cover a 360 degree circle. Here are two can't-be-done-except-on-paper situations:

- 1) If all of the theoretical gain from a 3m dish could be confined to a single "primary" lobe and a suitable feed created, it would work like a 10m dish!
- 2) Any gain that shows up in a secondary lobe detracts (robs from) the gain exhibited by the primary lobe.
Side lobes are therefore bad.



But, side lobes are a fact of life and we have to work around them. The drawings here show a single two-dimensional side lobe either "side" of the main or primary lobe. Remember - all lobes have a donut (round) shape and are three dimensional. The "strength" (gain) of the first side lobe (the one either side of the primary lobe, nearest to the primary lobe) can be measured with a spectrum analyser. First you pinpoint the satellite with the primary lobe and carefully measure and write down the C/NR (carrier to noise ratio) from the SpecAn reading. Now, use a suitable elevation measurement tool and measure the degrees elevation to the nearest tenth of a degree (OK - so you can't read more closely than 1 degree - you can still make this test but not with the same accuracy). Next, leave the azimuth adjustment alone and slowly (very slowly) crank the elevation down (or up - your choice) while constantly observing the elevation angle change.

The primary lobe signal will go down on the SpecAn and you will see nothing but noise. *Keep cranking.* Now watch carefully - a much weaker signal on the same transponder will reappear. Peak it for maximum and write down the elevation angle to compare with the first reading when peaked on the primary lobe.

What you have just found is the first side lobe. The degrees change in elevation will be the number of degrees away from the peak on the primary lobe to the peak on the secondary lobe (depending upon dish size, it should be +/- 2 to 5 degrees elevation change). Now, the signal level as peaked on the secondary lobe. If your original signal level was less than 10 dB C/NR, you *may* not be able to even locate the secondary lobe - simply because it is more than 10 dB weaker than the primary. In other words, it is too weak to be seen or measured. Logic says you want the strongest signal in your sky for this test - one that gives you as much headroom as possible for locating the secondary lobe.

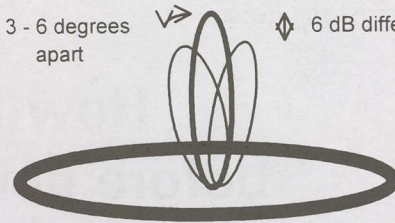
A properly operating dish will show a primary to secondary signal level change of 18 dB (D here). That means the primary signal needs to be 18 dB C/NR to even detect the secondary lobe signal. Don't be put off by this "requirement": there are not many "properly operating" dishes out there and a more common number will be 10 or 12 dB differential between primary and secondary.

Steffen Holzt in New Caledonia (Antenne-Cal) recently found a 4m size Patriot dish fresh out of the shipping crate that measured under 7 dB between primary and secondary lobe (E here). He had assembled 3 identical antennas just prior to this one and they all displayed at least 12 dB differential. Perplexed after measuring the dish carefully, checking and rechecking the dish surface accuracy, he contacted Patriot for assistance. We'll save the bottom line on this one for now.

Here at SatFACTS we had assembled three Patriot 3.1m dishes, selecting one for Ku band and two for C. The Ku band dish gain was more than 6 dB below the manufacturer's claim. Checking we found the boresight primary pattern was 4 dB lower than the two secondary side lobes (one on each side). In other words, primary and side lobes had reversed and where the primary was supposed to be we found a single "lobe" that was 3 to 4 dB below a pair of identical secondary lobes around 3 degrees either side of the primary.

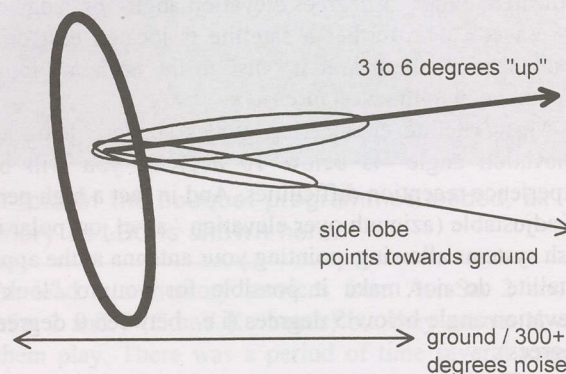
In both cases one of the first things you should suspect is the feed antenna. Why? Because the antenna "pattern" (the complex relationship between the primary lobe and the multiple secondary lobes) is as much affected by the feed as the dish surface. First step - go back and check (and recheck)

3 - 6 degrees apart



dish pointing straight up

(E)



with dish pointing at low look/elevation angle, side lobe now points towards "high noise" ground

the dish for surface accuracy; one of the standard checking steps for Patriot antennas is to loosen all of the bolts that hold the petal panels together and to the hub assembly after repositioning the dish so that it sits pointing straight up (bird bath position). With the bolts loose, two people stand on opposite sides of the dish and shake the hell out of it by grasping the outer edges and forcing them up and down. The "cure" here is to make the dish reassume the parabolic shape which may have been lost in the bolt tightening sequence. Move around the dish and repeat the shaking exercise until all panels have been shook. Then retighten the screws, recheck (as in, "restring") the dish and put it back onto the Clarke belt.

It didn't help; the pattern was still "split." Four different feeds later, each producing the same "split" primary peak, we were back to square one. And we'll save the bottom line here, as well, for now.

Sometimes an antenna that has primary to secondary lobe "problems" at Ku will still work within acceptable levels at C-band. There is a strong hint in this discovery - telling you that relatively small "surface distortions" in the dish are creating "ripples" in the primary and secondary lobe patterns. A surface distortion that affects Ku band has to be three times as large a distortion to have the same negative affect on C-band. Why? Because C-band wavelengths are longer and dish surface distortions that create problems at Ku can be too small to do the same thing at C. Between "bad at Ku" and "not bad at C" you have a grey region where distortions lower the gain at C but not enough to attract your attention.

Low look angles and noise

Low look angles (small elevations) mean the dish is pointing someplace between 10 degrees and 0 degrees "up." Side lobes fall + and - all sides of the primary lobe - as you measured in the example test (2 - 5 degrees away from primary). If your dish is pointed at 5 degrees elevation and your first side lobe is 5 degrees away, guess where it is pointing. The ground, out in front of the dish. And if your first side lobe is only 10 dB

weaker than your primary lobe, then it is going to receive "ground noise" that is "10 dB down" (weaker) from the primary lobe. That 4m Patriot measured by Steffen Holz in New Caledonia? The ground noise at 5 degrees look angle would be "down" less than 7 dB.

Most of us don't make primary to secondary lobe measurements but sooner or later you will run into a situation where the lower look angle reception is poor - *even for low look angle*. The answer may well be an antenna side lobe problem. How's that?

All satellite reception is a C/NR (carrier to noise ratio) challenge. You can improve reception quality by making the carrier (C) stronger, or leave it alone and make the noise (N) weaker. That's why we all try to select low noise LNB and LNBf products - less noise means better reception with less signal.

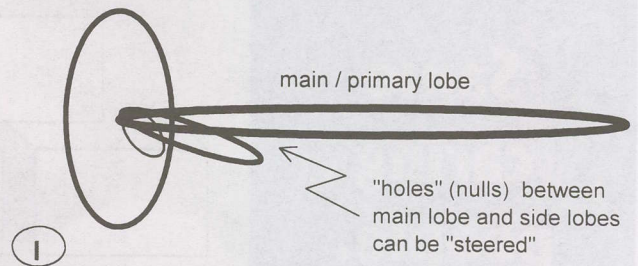
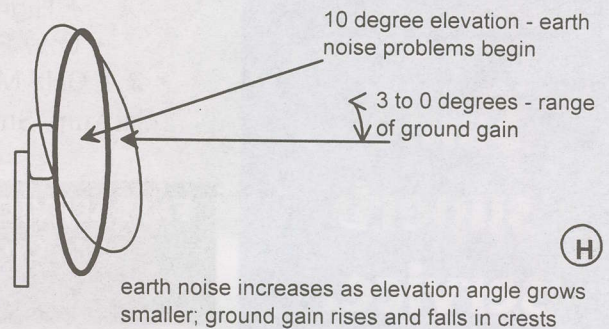
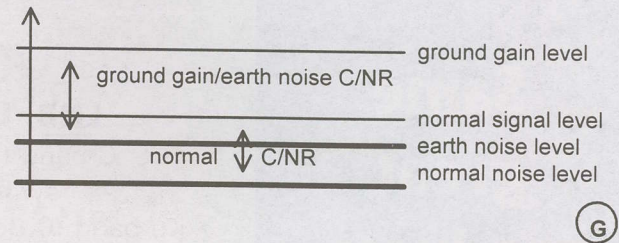
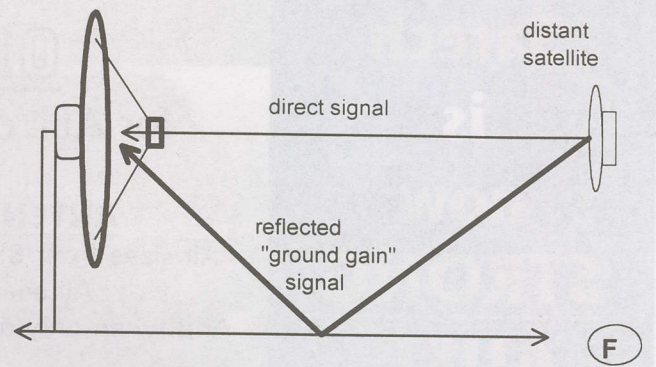
When a side lobe heads towards the ground, it is pointing at a very high noise source (roughly equivalent to 300 degrees Kelvin - the same as a 3 dB noise source). If there is electrical or other equipment "on the ground" the noise can be significantly greater than 3 dB (see SatFACTS #77, p. 22 reference *ignition noise*). 300 degrees Kelvin? Can you imagine how bad your reception would be if you replaced your 20 degree Kelvin LNB with a 300 degree or your 0.6 dB Ku LNB with a 3.0 dB unit? That is precisely what happens, subject to the "gain" of the secondary lobe of the antenna, when you go down to low look angles.

Between 10 degrees elevation and around 1.5 - 2 degrees, the side lobe(s) on your antenna pattern sees progressively more "earth noise" as the elevation angle becomes smaller. Remember the pattern is not two-dimensional - it is a three dimensional "donut." That means a tall building (trees, a hill), *left* or *right* of boresight for the antenna, but equal to or above the elevation angle, is "seen" by the antenna side lobes. And while not blocking the antenna's primary lobe (boresight) signal, such objects do add to the "noise field" present, reducing the C/NR.

Something rather magical can happen when your look angle gets right down to the horizon (assuming your visual horizon is capable of a 0 degree elevation angle). It is called "ground gain." When a signal is arriving at the dish with an elevation angle of between 0 and 3 degrees, some of the incoming wavefront energy strikes the ground (or better yet - water) out in front of your antenna. It reflects (bounces) from this "hard surface" and continues on towards your antenna. Now you have two separate signals from the same satellite source - the direct one through the air all the way and a new, "ground reflected," signal.

Under some fortunate (for you) circumstances these two signals can add together. The direct + ground gain combined signals in theory can "amplify" the actual amount of signal level by 6 dB. How much is that? For you, like changing from a 3M to a 6.4m dish at C-band, from a 1.35m to a 2.7m at Ku. Isn't this like getting something for no investment?

Not quite. Because of earth noise. As the antenna elevation angle comes down, the earth noise comes up and that is almost unavoidable. So if you happen to be located where an "almost at the horizon" signal (in the region of 0.5 to 2 degrees look angle) is available, and the satellite's footprint "comes your way," where normally you would be out of luck because of the rise in earth noise the ground gain factor could give you reception even with increased earth noise. There are examples of this reported to SatFACTS: PAS-4 as seen on 2.4m and



smaller dishes in Adelaide and Victoria, 75E as seen in eastern NSW.

Fine tuning ground gain

In a *fixed* (dedicated) dish system, such as a number of uplinkers use along California's west coast to link to PAS-8, there are some ground gain tricks that can be employed. One is to purposefully "distort" the feed antenna pattern so that the first side lobe is stronger (has more gain) than you would normally accept. This increases the signal from the ground reflected path with a small reduction in direct (primary) boresight reception. Another trick is to place microwave absorbing material (as one finds in a test chamber) along the ground where the low look angle antenna "sees" earth noise. This absorbing material acts like a "wall" to the earth noise and fools the antenna into acting like it is working at a much higher look angle. Finally, the feed can be tediously adjusted so that the "null" between primary and side lobes falls where signal is enhanced or knocked down for best results (I, here).

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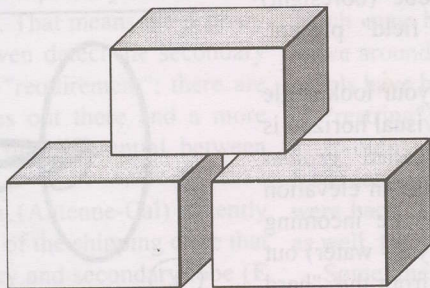
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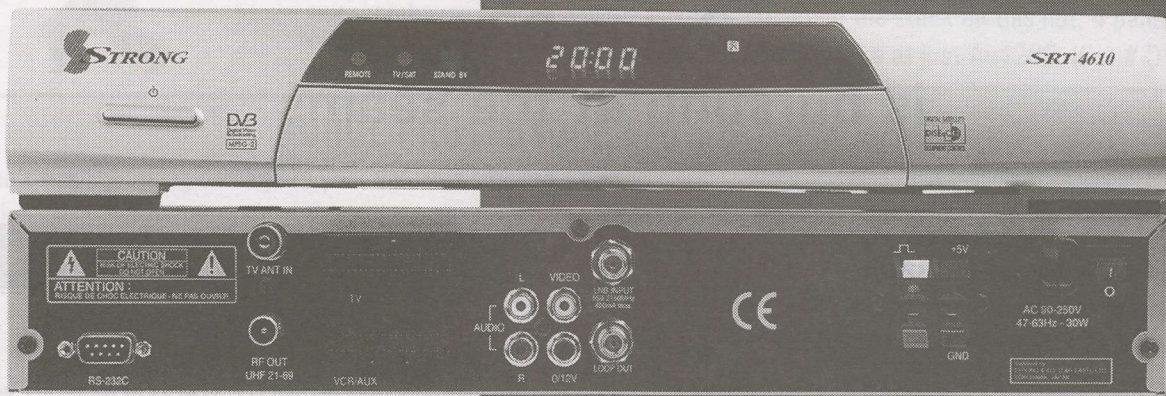
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Optus B3 is bursting at the seams

Vertical Polarity

Centre frequency 12.282 GHz
Possible beams: National (A) **, SE, NZ (?)
SCPC data, NBFM for civil aviation, others

**T1
Vt**

Centre frequency: 12.344 GHz
Possible beams: National (A), SE, NZ. Mediasat:
12.336, Sr 30.000, 2/3 + 12.363, 6.111, 3/4.
FTA, CA (PowerVu, Irdeto, more) TV, radio, feeds,
scheduled programming, SPACE Pacific Report

**T2
Vt**

Centre Frequency 12.407 GHz
Possible beams: National (A), SE, NZ. Aurora NIT
#1 (TV chs 1-20, radio chs 1-20; SF#77, p. 28).
12.407, Sr 30.000, 2/3. FTA and CA (with card).

**T3
Vt**

Centre Frequency: 12.470 GHz
Possible beams: National (A) (?), SE, NZ.
Note: Last B3 transponder without single user.
Spectrum scan March 11th revealed 4L and 4U
narrow band data services only. (*)

**T4
Vt**

Centre Frequency: 12.532(.3) GHz
Possible beams: National (A), SE, NZ. Aurora NIT
#4 (TV chs 46-61, radio chs 64-66; SF#77, p.
28). 12.532, Sr 30.000, 2/3. CA (including Indian
services) with Aurora card.

**T5
Vt**

Centre Frequency: 12.594(.9) GHz
Possible beams: National (A), SE, WA, NZ. Aurora
NIT #2 (TV chs 21-35, radio chs 21-44; SF#77,
p. 28). 12.594, Sr 30.000, 3/4. CA (with Aurora
card).

**T6
Vt**

Centre Frequency: 12.657(.5) GHz
Possible beams: National (A), SE, WA, NZ.
Aurora NIT #5 (TV chs 62-69; radio chs not
assigned; SF#77, p. 28). 12.657, Sr 30.000, 2/3.
CA (including [Zee] Indian services) with card.

**T7
Vt**

Centre Frequency: 12.720(.1) GHz
Possible beams: National (A), SE, WA, NZ. Aurora
NIT #3 (TV chs 36-45, radio chs 45-63; SF#77,
p. 28). 12.720, Sr 30.000, 3/4. CA, card.

**T8
Vt**

Horizontal Polarity

Centre Frequency: 12.313(.2) GHz
Possible beams: High Performance, National (B) ** (?).
Unknown new user testing (12.314) as of 03-03-01 with Sr
30.000, 2/3. (Previously used for narrow band coms).

**T9
Hz**

Centre Frequency: 12.375(.8) GHz
Possible beams: High Performance, National (B). Irdeto
pay-TV NIT #5: 12.375, Sr 29.473, 3/4. CA (Austar,
Foxtel). See SF#76, p. AB.

**T10
Hz**

Centre Frequency: 12.438(.4) GHz
Possible beams: High Performance, National (B), NE. Irdeto
pay-TV NIT #4: 12.438, Sr 29.473, 3/4. CA (Austar,
Foxtel). See SF#76, p. AB.

**T11
Hz**

Centre Frequency: 12.501 GHz
Possible beams: High Performance, National (B), CA. Irdeto
pay-TV NIT #6: 12.501, Sr 29.473, 3/4. CA (Austar,
Foxtel). See SF#77, p. AB and this issue, p. 29.

**T12
Hz**

Centre Frequency: 12.563(.6) GHz
Possible beams: High Performance, National (B). Irdeto
pay-TV NIT #2: 12.563, Sr 29.473, 3/4. CA (Austar,
Foxtel). See SF#77, p. AB.

**T13
Hz**

Centre Frequency: 12.626(.2) GHz
Possible beams: High Performance, National (B), NE, CA.
Irdeto pay-TV NIT #3: 12.626, Sr 29.473, 3/4. CA
(Austar, Foxtel). See SF#77, p. AB.

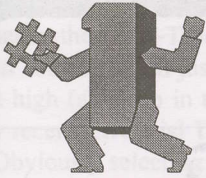
**T14
Hz**

Centre Frequency: 12.688(.8) GHz
Possible beams: High Performance, National (B), NE, CA.
Irdeto pay-TV NIT #1: 12.688, Sr 29.473, 3/4. CA
(Austar, Foxtel). See SF#77, p. AB.

**T15
Hz**

* / Lack of transponder use could be "safety valve" as backup should another assigned transponder fail. However, last reported video was during 1999 (Ten Network sport feeds). Normal practice is to hold 1 Tr on each polarity "in reserve" as emergency replacement in event an assigned transponder quits (B3 is 11 for 8 redundant)

**/ National A is capable of power split beam between NZ and Australia; National B is Australia only.



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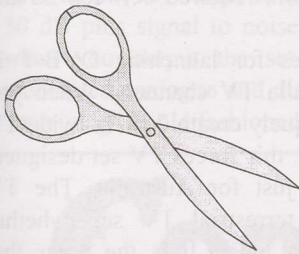


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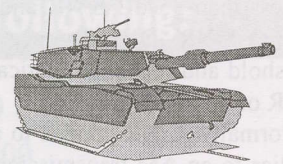


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Update on DVB-T

Skyvision (Australia) appears to have completed their initial round of set-top DVB-T testing. During a media show held in Sydney late in February, several stands were displaying set-tops and the major "hype" heard was along the lines, "Boy - are we going to make a lot of money with digital terrestrial." That would seem to be contrary to what other countries have experienced and continue to experience today. The warning here is to not be caught up in the excitement of digital terrestrial causing you to lose hold of your good business sense. You might notice that the people who are hyperventilating about the "promise" of DVB-T at this stage are those who will *never* have to deal with a dissatisfied consumer or spend four hours on someone's roof searching for an acceptable bit error rate in a misty, cold rain.

At the Sydney show, several stands displayed working DVB-T. One stand had a side by side display of 3 (and sometimes 4) different DVB-T set-tops operating. There was some new "language" heard here. While we are accustomed to reciting BER (bit error rate) in DVB-S, there is likely to be a "new number" of concern in DVB-T. That is the C/NR (carrier to noise) level.

Analogue television, to produce a noise free image, requires no less than 35 dB S/NR and in most receiving locations 40 dB (+) S/NR. DVB-T, once there is enough signal to pass threshold and lock, automatically creates a clean image with a S/NR of 50 dB or greater.

Normally, C/NR applies to an FM transmission while S/NR applies to an AM transmission. C is carrier, S is signal. In an FM system, there is the non-linear "knee effect" where viewable or listenable signal to noise ratio of the demodulated signal does not track perfectly with C/NR: at lower carrier to noise ratios, the signal to noise improves much faster than the

signal grows stronger. In an FM system, when "full quieting" (all noise gone) is obtained, then for the first time a 1 dB change in carrier to noise will result in a 1 dB change in signal to noise.

Forget all of this with digital (DVB-T or DVB-S). Overlooking a very tiny C/NR window within which the digital reception "sputters" (tiles, breaks up), the digital signal either produces high S/NR reception (50 dB or better) or it produces no reception at all. At Sydney, four boxes were compared using off-air DVB-T signals. One set-top, branded Nokia, locked onto DVB-T signals and produced high signal to noise ratio reception with a C/NR of 18 dB. Three others, all prototypes except for the Thomson, required between 22 and 24 dB C/NR to lock.

One of the major challenges for launching DVB-T in Australia is the unique-to-Australia TV channels. When you wander off on your own and uniquely create 7 MHz wide TV channels for *both* VHF and UHF, this forces TV set designers to create a one-off set design just for Australia. The TV channel selection device in a terrestrial TV set (whether analogue or DVB-T) is called a tuner. It is the tuner that establishes which channels can be tuned, how "wide" the channels will be, and most important, what the sensitivity of the TV set will be. TV set tuners are rated by their sensitivity, their ability to reject adjacent channels, and their in-channel "flatness." The reason why some of the set-tops on display in Sydney worked with C/NRs of 22-24 dB while the Nokia triggered and worked with a C/NR of just 18 dB was tuner performance. *If* this was a satellite test and not a terrestrial test, an 18 dB tuner would be equivalent to a 60cm dish while a 24 dB tuner would be a 1.2m dish. In the satellite world it is significant to trade upwards from a 60cm to a 1.2m but in the terrestrial world, if a 5 foot long rooftop aerial is the

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Members also participate in policy creation forums, have correspondence training courses available and their support makes possible the TV show SPACE Pacific Report. To find out more, contact (fax) 64-9-406-1083 or use information request card in previous issues of SatFACTS. Page space within SatFACTS is donated each month to the trade association without cost by the publisher.

equivalent of a 60cm dish, and you are stuck with a 24 dB tuner in the DVB-T box you are trying to install, the "size" of your rooftop aerial just became huge; 20 feet! That is l-o-n-g, not high (as in up in the air) - see SF#71, p. 14 and others in our recent terrestrial TV aerial series.

Obviously selecting the correct, as in most sensitive, DVB-T box is going to be very important for the installer. Unfortunately there are other parameters at work as well, such as price, availability (no, you can't order in a Nokia 18 dB box) and service backup (nobody repairs Nokia IRDs in Australia anyhow and Nokia's track record for supporting products in the Pacific and Asia is abysmal).

Skyvision believes they will receive the first commercial-quantity shipment of DTR-5200T (digital terrestrial receivers) early in May. At this stage the primary competition is the Thomson unit built in France (Au\$699 retail). Skyvision is targeting dealer costs at or under Au\$500 and this means when you couple the sale of a DTR-5200T with the installation of a (new) suitable rooftop aerial system for the consumer, the set-top box portion could go out for as low as Au\$599 (20% mark-up on box).

Deciding between the Thomson and the DTR-5200T should not be a difficult task. Many (most) of the early installations will go into public places with big screen TVs. Big screen sets typically have a S-VHS input socket and for best digital quality, you would connect the set-top box to the big screen using the S-VHS cable. Except the initial Thomson boxes don't have an S-VHS output so any chance of even approaching the 50 dB plus signal to noise that DVB-T is capable of is lost when you output the set-top box in old fashioned UHF modulated analogue and display it on a big screen that is also "receiving" in old fashioned analogue.

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Operating UEC IRDs on step-down transformer

"Reference Eric Fien's SF#78 (p. 4) suggestion that you can reduce the heat generated with UEC 600/700 series IRDs by installing a step-down (auto) transformer and using the 117V ac output rather than the normal 230-250V ac primary. I am not sure what to make of this suggestion and in the worst case it might be dangerous (to the IRDs, and the user). I will explain why.

"The case for the UEC642 is labelled: '210 - 250V, 50Hz, 30W';

"The operator manual indicates: '210 - 250V, 50 Hz;

"The training manual indicates: '198V - 264V, 50Hz +/- 5%.

"As the insert (above right) shows, it would appear the IC that does this task is capable of operating over a wide voltage range. But, that does *not mean* the balance of the circuit can handle being run at lower voltages (there must be some reason why the training manual specifies the unusual voltage of 198). For example, the primary winding of the transformer will have to be capable of surviving higher average currents at the lower voltage (something we do not know).

"Out of curiosity, I hooked up a UEC642 to a Variac (variable voltage output transformer) and made some tests. Monitoring the mains current drawn (in case the chopper stalled as the voltage was dropped), I gradually lowered the voltage starting at 255V and recording the current in 5 volt increments. Amazing (to me) there did not seem to be a problem even when I took the supply voltage to as low as 90V: the UEC appeared to be operating quite normally. By the way, the test was performed with the LNB connected and it consumes around 2.5 watts.

"At 250V the UEC draws 138mA (true RMS), which equates to 34.5 watts (ed note: watts consumed equals voltage [250] times current [138mA entered as .138] or 34.5 watts). At 90V, the opposite extreme, the UEC draws 313 ma which equates to 28.2 watts. So operating the UEC642 on 115V rather than 250V consumes about 6 watts less power. This means the SMPS will be producing 6 watts less heat and this could make quite a noticeable difference in the operating temperature of the SMPS (ed note: it works out to 17.39% less heat). So Eric Fien is correct when he reports, '*much-much cooler*.'

"If it is indeed safe (within the specifications of all of the components of the SMPS), Eric Fien would also be correct about expecting that the power supply would develop less problems (at the lower mains voltage).

"Alas, we still don't know all of the answers required to form a decision. UEC specifies 210 - 250V, and very possibly the IRD has never been properly tested for RF interference produced by the SMPS running at lower supply voltages. It is

The TOP225Y Device

The 3-terminal IC which contains the MOSFET chopper and the PWM (pulse width modulation) control circuit for the SMPS in a flyback transformer circuit is a TOP225Y manufactured by Power Integrations. This is a 'three terminal off-line PWM switch' which offers low ac/dc losses, built-in auto-restart and current limiting, and latching thermal shutdown. Implements buck, boost, flyback or forward topology (note: USE uses a flyback circuit). Works with primary or opto feedback (note: UEC uses an opto-coupler). Maximum output power at 100/115/230V a.c. is 100W. Operating temperature: -40C to +150C, 3 pin TO220 case."

quite possible that the increase in current being switched by the IC will produce a large (perhaps disproportionate) increase in RFI. Perhaps this is the (or one) reason for the conservative rated supply voltage range.

"As I have never seen any other UEC models (or their SMPS diagrams), I have no idea if the other models have identical SMPS or mains ratings to the 642. It may even be possible that later manufactured 642s could have a different specification, to my unit. I do wonder how Eric Fien figured out that the UEC642s could run off of 117V as none of the written information I have come across suggests a mains voltage below 198V. Finally, while Eric did not specify the rating for the transformer, if he is (as reported) operating 5 receivers from the same transformer, it would appear to be at least 250VA rated.

"Since new I have always run my 642 IRD off a transformer that outputs 230V because of my own high mains voltage situation. But, until I have more proof that it is actually safe to operate these IRDs from 110/117V, I won't be making that change here." (IF, Queensland)

ABA's bureaucratic math

"After reading the report describing the ABA bureaucratic approach to signal strength calculation, I would like to offer the following. Broadcasters, as you say, are interested in field strength at a particular location which is measured in $\mu\text{V}/\text{m}$ of free space. The amount of signal received by a 1 metre (length) dipole suspended at a height of 10 metres above ground (which by the way is related to the height of a 'typical chimney' in Europe) is the 'reference' used (thus ' $\mu\text{V}/\text{m}$ ' as in 'per metre of space'). Now, as a 1 metre dipole is not the correct length for the (any) frequency you will be measuring, some adjustment needs to be made. One metre of space (occupied by a dipole one metre in length) is of course not tuned to any band I, III, IV or V channels. So some conversion is required to convert from something that is one metre to something that is resonant (the correct dipole length) for the actual frequency being measured.

"However, field strength (the calculated number) and signal level (the measured number) are related by the factor $\lambda/\lambda\lambda$ where λ (lambda) is the wavelength.

"As an example, using the Illawarra channels, this works out to be 0.12 (18 dB) at the top of band V. So let's consider a reading of 60 dBuV on say channel 65.

dBuV = +60 dB (as measured with test antenna)

Known gain of antenna at that frequency = (-) 17 dB

Downlead loss 10m of RG6 = (+2) dB

Conversion factor = (+) 18 dB

which if all numbers are summed (+60 - 17 = 43 + 2 = +45 + 18 = +63 dBuV/m.

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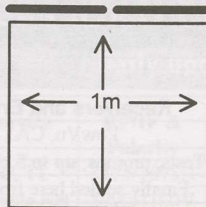
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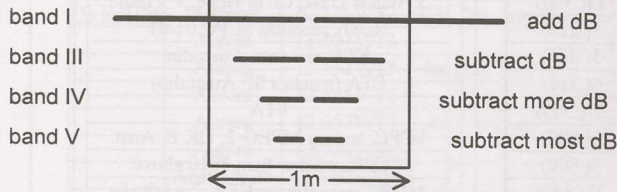
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How much "energy" is found in a 1m per side "box" in space?



1m dipole which is resonant around 150 MHz.

Note: The 1m wide and tall and deep "space" versus 1/2 wave dipole.



"In fact, using the Hills TCX 34 and typical RG6 cable, you can usually just add 3 dB for (all) UHF channels to arrive at the 'correct' /m number. If the ABA decides to require decimal point accuracy, they will have to give us something better to measure with than a typical peak of sync tip reading analogue meter!

"This must be an acceptable approach as I have not had any applications knocked back. However, I did have one form returned because I inserted the wording, 'No measurable signal' and they wanted this modified to read '<20 dBuV' and then resubmit it. Where the form calls for a number, you must supply one. Creative writing is strictly verboten at the ABA!" (Brian Parry, Down to Earth Antenna Service)



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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
Ap2/76E	TVB8 +	3849/1301H	4	3/4	13(.238)
	AXN	3920/1230H	up to 8	7/8	28(.340)
Them3/78.5	SkyChAust	3695/1455V	up to 3	3/4	5(.000)
	MRTV-Mynr	3666/1484H	1	3/4	6(.000)
	Mega +	3640/1510H	12	3/4	28(.056)
	Mahar/DD1	3600/1550H	up to 8	3/4	26(.661)
	TRT +	3551/1600H	4+ TV, radio	3/4	13(.330)
	Greece TV	3430/1720H	1	3/4	3(.225)
	PTV2	3420/1730V	1	3/4	3(.366)
	TV Maldives	3412/1738V	1	1/2	6(.312)
	Thai Global+	3425/1725V	up to 7?	2/3	27(.500)
Insat 2E/83	DD2	3910/1240V	1	3/4	5(.000)
	DD tests	3832/1318V	1	3/4	5(.000)
ST1/88E	Taiwan Bqt	3509/1641H	13	3/4	23(.450)
Yam1/02/9	Tumen TV	3578/1572I.	1+radio	3/4	4(.355)
	TV6 Bqt	3645/1510L	3(+)	3/4	28(.000)
MeS 1/91.5	Malay. TV3	4147/1004H	1	3/4	7(.030)
As2/100.5E	Euro Bouqt	4000/1150H	6TV, 21r	3/4	28(.125)
	Reuters	3909/1241H	1	3/4	5(.632)
	Hubei/HBTB	3854/1296H	1	3/4	4(.418)
	Hunan/SRT	3847/1303H	1	3/4	4(.418)
	Guan./GDTV	3840/1310H	1	3/4	4(.418)
	In. Mongolia	3828/1322H	2	3/4	8(.397)
	WTN Jer/Lon	3790/1360H	1	3/4	5(.631)
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)
	WorldNt/US	3764/1386H	1 + 20 radio	3/4	6(.100)
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)
	Jiangx/JXTV	3727/1423H	1	3/4	4(.418)
	Fujian/SETV	3720/1430H	1	3/4	4(.418)
	Hubei TV	3713/1437H	1	3/4	4(.418)
	Henan/Main	3706/1444H	1	3/4	4(.418)
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)
As2/100.5E	Feeds	4086/1064V	1	3/4	5(.632)
	TVSN	4033/1117V	1	3/4	4(.298)
	Jilin Sat TV	3875/1275V	1	3/4	4(.418)
	Beijing TV	3864/1286V	1	3/4	4(.418)
	HeiLongJian	3834/1316V	1	3/4	4(.418)
	JSTV	3827/1323V	1	3/4	4(.418)
	Anhui TV	3820/1330V	1	3/4	4(.418)
	ShaanxiQQQ	3813/1337V	1	3/4	4(.418)
	Guan/GXTV	3806/1344V	1	3/4	4(.418)
	Fashion TV	3795/1355V	1	3/4	2(.533)
	MSTV	3791/1359V	1	3/4	4(.340)
	Myawady	3766/1384V	1	7/8	5(.080)
	Saudi TV1	3660/1490V	1 (?)	3/4	27(.500)
As3S/105.5	Zee bouquet	3700/1450V	9TV	3/4	27(.500)
	ETV Bangla.	3749/1401V	1TV	3/4	4(.340)
	Arirang TV	3755/1395V	1	7/8	4(.418)
	Now TV	3760/1390Hz	2	7/8	26(.000)
	Star TV	3780/1370V	17(+)/TV	3/4	28(.100)
	Star TV	3860/1290V	14(+)/TV	3/4	27(.500)
	Star TV	3880/1270H	12(+)/TV	7/8	26(.850)
	Alive TV	3900/1250Vt	5TV	7/8	27(.895)
	CNNI	3960/1190H	4(+)/TV	3/4	26(.000)
	Star TV	4000/1150H	7(+)/TV	7/8	26(.850)
	Sun TV	4095/1055H	1	3/4	5(.554)
	CCTV bqt	4115/1035H	4(+)/TV	3/4	19(.850)
	Zee Bqt #2	4135/1015V	4(+)/TV	1/2 or 2/3	15(.000)
Cak1/107.5	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+)/TV	7/8	20(.000)
C2M/113E	TPI	4185/965V	1	3/4	6(.700)
	Metro TV	4089/1061H	1	3/4	6(.498)
	Ch NewsAsia	4071/1079H	3	3/4	14(.060)
	Anteve	4055/1095V	1	3/4	6(.510)
	Space TV	4000/1150H	11TV, radio	3/4	26(.666)
	ETTV Shop	3790/1360H	1	3/4	3(.050)
	C Net Taiwan	3760/1390H	11TV, radio	3/4	26(.666)

Receivers and Errata

PowVu, CA
Tests, promos, up to 5 chs FTA
Finally settled here from As2
erratic service
Mega Cosmos here; new Sr
USA religion chs, CMM music FTA
3 Angels USA, Ch of Hope, + 9 radio
Newly reported SCPC 01/01
FTA, not seen Australia
FTA (reaches SE Australia)
FTA
SCPC, testing MPEG-2; OK E. Aust.
SCPC, weaker than 3910 above
MCPC, sometimes FTA , 2 adult chs
unlikely south of eqtor
new Sr; unlikely south of eqtor
CA but occ. FTA
FTA (TV5 teletext); now includes RTPi
occasional feeds, some FTA MPEG2
FTA SCPC, teletext
FTA SCPC, teletext
FTA SCPC, radio APID 81
FTA: #1 Mongolian, #2 Mandarin
Mostly CA; some FTA
FTA & CA
FTA; up to 20 radio channels
FTA SCPC, radio APID 256
FTA SCPC, teletext, radio APID 81
FTA SCPC, + radio APID 80
FTA SCPC, radio APID 80
FTA SCPC, + radio
Thru TARBS Aust, subs now OK
FTA SCPC feeds
Occ. FTA , not same as Aust. version
FTA SCPC, + radio
CA and FTA SCPC , not full time
FTA SCPC
FTA SCPC, + radio
FTA SCPC
FTA SCPC, radio APID 81
FTA SCPC, radio APID 257
FTA SCPC, reload VPID 308, APID 256
FTA SCPC
FTA SCPC - difficult to load
FTA MCPC
Mediaguard CA, ch 8 FTA
PowVu but FTA at this time
FTA SCPC; reported audio problems
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DV211, Zenith) + 1 FTA
PAL, NTSC, 1 ch CA
PowVu CA; some FTA feed channels
NDS CA + info card FTA
"History Channel" testing SCPC
was analogue; now FTA MCPC
New bqt, Zee News + here
NDS CA using RCA/Thomson, Pace IRDs
FTA SCPC; NT only
testing new svc (03-01)
CH News Asia FTA; VPID 33, APID 34
FTA SCPC; NT only
CA, sometimes FTA
FTA SCPC
CA, subs available -10 radio typ. FTA

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(C2M/113	RCTI	3475/1675H	1	3/4	8(.000)
JcSat3/128	Miracle Net	3990/1160V	3 up to 6	5/6	22(.000)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)
MeaSat 2	Astro Mux	11.106H (+)	up to 7TV	7/8	30(.000)
	Mediasat	11.540H	occ 1+TV, tests	5/6	30(.800)
Op B3/156	Mediasat	12.336V/T2	9TV, 3ra, Inter.t	2/3	30(.000)
	Aurora	12.407V/T3		2/3	30(.000)
	Aurora	12.532V/T5	Inc Zee, ATV	2/3	30(.000)
	Aurora	12.595V/T6		3/4	30(.000)
	Aurora	12.657V/T7	6CA testing	2/3	30(.000)
	Aurora	12.720V/T8		3/4	30(.000)
	Austar/tests	12.376H/T10		3/4	29(.473)
	Austar/Foxtl	12.438H/T11		3/4	29(.473)
	Austar.Fxtl	12.501H/T12		3/4	29(.473)
	Austar/Foxtl	12.564H/T13		3/4	29(.473)
	Austar/Foxtl	12.626H/T14		3/4	29(.473)
	Austar/Foxtl	12.688H/T15	(some FTA ra)	3/4	29(.473)
Op B1/160	ABC NT fd	12.260V	1TV, 3 radio	3/4	5(.026)
	ABC feeds	12.317H	1	3/4	6(.980)
	Central 7	12.354H	1TV	3/4	3(.688)
	Imparja mx	12.360H	1	3/4	5(.424)
	Mediasat#2	12.406V	up to 6 TV	2/3	30(.000)
	Mediasat#3	12.424H	3+ TV	2/3	19(.800)
	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)
PAS8/166	TARBS	12.526H	12+ TV	3/4	28(.067)
	TARBS2	12.606H	6+TV	3/4	28(.067)
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)
	Boomerang	12.725H	5 TV	7/8	25(.728)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)
	NHK Joho	4065/1085H	7TV, 1 radio	3/4	26(.470)
	Japan Bqt	4050/1100H	2	3/4	12(.000)
	ESPN USA	4020/1130H	7+TV, data	7/8	26(.470)
	Discovery	3980/1170H	8 typ.	3/4	27(.690)
	CalBqt/Pas8	3940/1210H	up to 8TV	7/8	27(.690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)
	Filipino Bqt	3880/1270V	up to 9 TV	3/4	28(.700)
	Feeds	3854/1296H	1	3/4	6(.110)
	Lakbay TV	3813/1337V	1	3/4	5(.044)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)
	MTV	3740/1410H	8	2/3	27(.500)
PAS2/169	Pv Bouquet	12.290V	2+ TV, radio	2/3	27(.500)
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)
	HK PowVu	4148/1002V	up to 8	2/3	24(.430)
	Fox Bouquet	3992/1158V	8TV/data	7/8	26(.470)
	Feeds	3966/1184V	1	2/3	6(.620)
	Feeds	3957/1193V	1	2/3	6(.620)
	Aust-feeds	3942/1208V	1	2/3	6(.620)
	Feeds	3934/1216V	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)
	Feeds	3803/1347V	1	2/3	6(.620)
	BBC +	3743/1407V	3	3/4	21(.800)
	CCTV Pv	3716/1434V	5 typical	3/4	19(.850)
	Feeds	4040/1110H	1	3/4	10(.850)
	KBS/Korea	4026/1124H	1	3/4	5(.062)
	7th DyAdv	3872/1278H	1	3/4	6(.620)
	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)

Receivers and Errata
FTA SCPC, Australia OK
PowVu, some FTA (ch # 1,3)
CA & FTA Ntsc: Japan, Taiwan
Aust east coast beam; also 11.168Hz primarily data
CA, some FTA, Herbalife, new svcs
cvrs Aust, NZ 90 cm; CA (*)
cvrs Aust, NZ 90 cm; CA (*)
Aust only; * - smart card p. 28
cvrs Aust, NZ 90cm; CA(*)
Aust only; * - smart card p. 28
Austar I-TV tests
CA, subscription available Australia
CA, subscription available Australia
CA, subscription available Australia
CA, subscription available Australia
CA, subscription available Australia
may go to 12.280; V832, A833
also 12.326, 12.335; ex PAS8 Ku
VPID1280, APID 1281
VPID 1024, APID 1025
also try Sr 28.000; FTA & CA
net feeds, Australia only, FTA & CA
testing digital feeds
NDS CA, subscription available NZ
NDS CA, subscription available NZ
NDS CA, subscription available NZ
TPG /Eurodec CA, occ. FTA
Tests, inc. ESPN, see TARBS above
Irdeto CA, some FTA tests
CA, subs avail Aust, CNN FTA
PowVu CA
PowVu CA & FTA; subscription avail
PowVu CA; NTV Int, Fuji TV
PowVu CA; ch 11 DCP-CCP bootload
PowVu/CA (some audio FTA)
PowVu CA & FTA (EWTN/EB Net)
FTA at this time
Some FTA; also 4040V, 27.686,7/8
occ. feeds, inc. Mediasat Sydney
(Filipino) sometimes FTA; PowVu
was As2; PowVu CA
PowVu, CNN now CA
CA; #7,8 FTA feeds
PowVu CA, WIN, ABC NT
PowVu CA, WA only - D9234
PowVu CA; some FTA
Pv, CA/FTA (FTA ch 3 only)
PowVu (FTA) occ feeds
PowVu (FTA) occ. feeds
Mediasat outward bound feeds
PowVu (FTA) occ. feeds
PowVu(FTA) occ. feeds
PowVu (FTA) occ. feeds
Pv FTA, have tested CA; was 3778V
PowVu (FTA) occ. feeds
BBC FTA, others CA usually
PowVu FTA; # pgm chs varies
PowVu (FTA) occ. feeds
some FTA, some CA
Sat, Sun 0930UTC typ; sports 3873
FTA (occ. sports); try 3864, Sr6.459
FTA-typ. NTSC-occ. sport, shuttle
(PowVu) CA+FTA

SatFACTS Digital Watch: Supplemental Reference Data / March 2001

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	occ feeds	3776/1374H	1 typ	3/4	5(.560)
	Feeds	3767/1383H	1	2/3	6(.620)
	Satcom 1-6	3743/1407H	up to 5	7/8	19(.465)
I702/176E	AFRTS	4177/973LHC	8TV, 12+radio	3/4	26(.694)
	RFO Poly	4027/1123L	1TV	3/4	4(.566)
I701/180E	TNTV	11.060V	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)
	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	13(.347)
	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)
	Ioarana	3772/1378L	1	3/4	4(.566)
	TVNZ	3846/1304R	1	3/4	5(.632)
	10 Australia	3769/1381R	4	7/8	20(.000)

Receivers and Errata
occ feeds, typ FTA; also Sr 5.600
PowVu (FTA) occ feeds
use unknown at this time
PowVu CA
SE spot beam
eastern spotbeam, pay TV tests
Mediaguard CA, 1 ch FTA
DMV/NTL early version, occ feeds, typ ca
DMV/NTL early version, occ feeds, typ ca
DMV/NTL early version, occ feeds, typ ca
DMV/NTL early version, occ feeds, typ ca
DMV/NTL early version, occ feeds, typ ca
east hemi 20.5 dBw, to be 15.5
DMV/NTL early version, occ feeds, typ ca
SCPC, mixed CA and FTA feeds
PowVu CA; Auckland net feeds
CA, Leitch encoded
FTA SCPC; East Hemi Beam-Tahiti
SCPC, mixed CA & FTA, feeds
PowVu CA & FTA; #3 TBN

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

ASTRX D 1000CI. SCPC, MCPC, two CAM slots, auto search routine. Review SF#78 & #79. LTG Mason 61-3-9457 1222.

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

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

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

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

Humax ICRI 5400. Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available, review SF#76.

Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)

Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.

Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.

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

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

MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738

Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. Tricky to use.

Nokia 9200. When equipped with proper CAM, does Aurora, pay-TV services provided software has been "modified" with Dr Overflow or similar program was available from (www.BAKKERELECTRONICS.COM), now only from established users.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.

SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-3749)

SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above).

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

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

Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, Aurora, exc. vendor support. Strong Aust 61-3-9553-3399.

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

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

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

UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers.

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

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

Accessories:

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

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

SatFACTS Pacific/Asian FTA ANALOGUE Watch: 15 March, 2001

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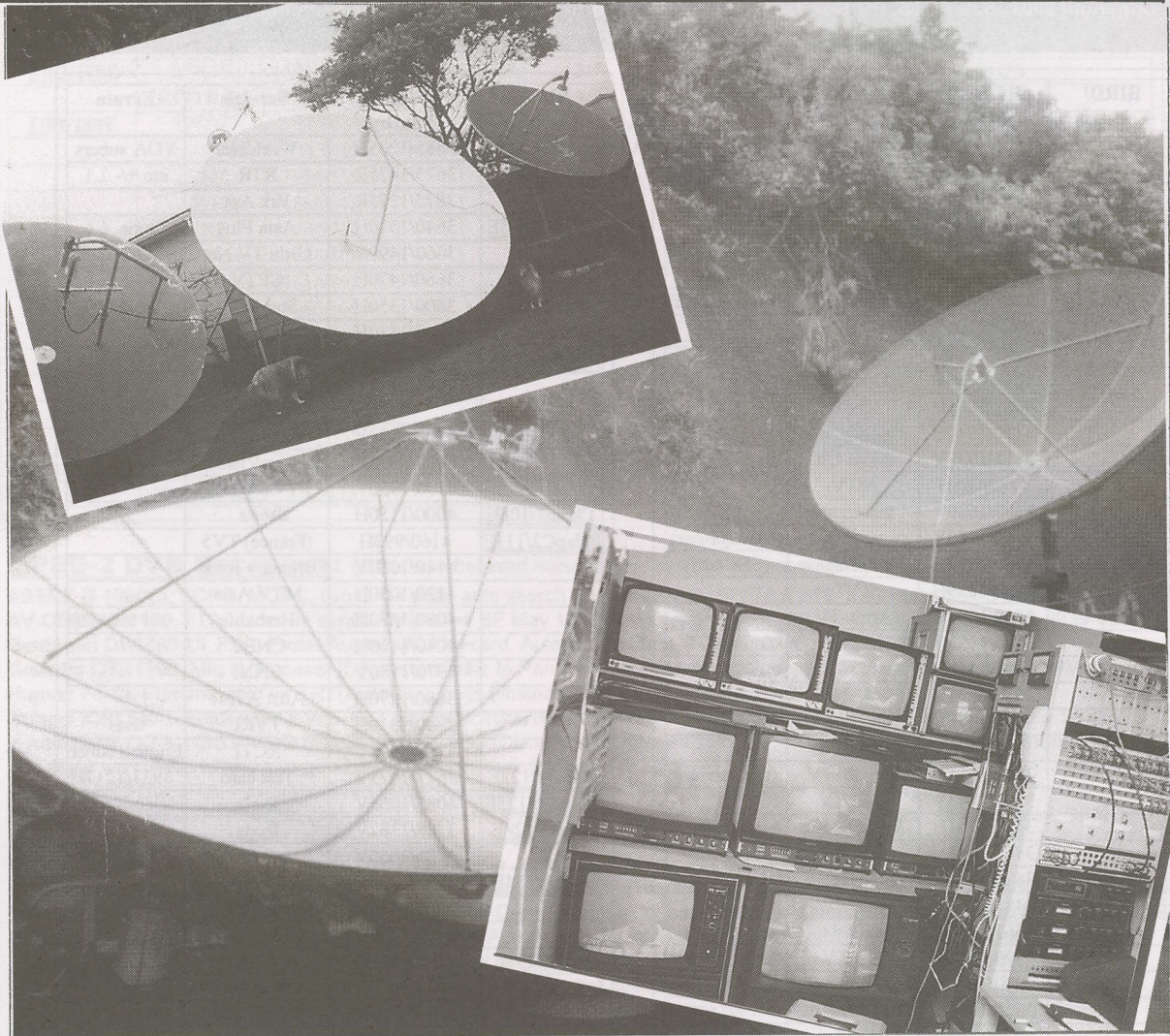
BIRD/Location	RF/IF & Polarity	Service	Errata
<u>I703/57E</u>	3808/1342R	Udaya TV	
	4052/1098R	WorldNet	VOA subers.
	4178/972L	MTA Inter.	
<u>I604/602/60E</u>	4166/984	various feeds	
<u>I704/66E</u>	3765/1385R	tests	
	4015/1135L	Mongolia	(SECAM)
<u>PAS4/68.5E</u>	3743/1407V	RTPi	(+ radio subcr)
	3864/1286V	BBC World	
	3907/1243H	Sony TV	Hindi
	4034/1116V	Doordan	(various)
	4087/1063H	CNNI	
	4110/1040H	TNT/Cartoon	
	4113/1037V	Series Ch.	
	4182/968H	MTV	
<u>PAS7/68.5E</u>	3470/1680V	test signal	
<u>LM1/75E</u>	3980/1170V	various	(Madagascar)
<u>ApStar 2R</u>	3780/1370H	TV Malagasy	(SECAM)
<u>Thaicom3/78E</u>	3871/1279H	TVT	
	3760/1390V	Army TV	
	3685/1465V	MRTV	off air???
	3685/1465H	VTV	6.6, 7.02
	3616/1534V	ATN	
	3576/1574V	ATN Bangalr	Bengali
	3554/1596V	test card	
	3536/1614V	Punjabi TV	(occ service)
	3507/1643V	RAJ-TV	
	3489/1661H	Vasta Music	occ tests
	3465/1685V	RAJ-TV	
<u>Expres 6A/80E</u>	3675/1475R	RTR	(global beam)
<u>InSat 2E/83E</u>	3481/1669V	Sun TV	
	3562/1588V	Vijay/Asianet	aud. 5.5/6.6
	3599/1551V	JayaTV	
	3810/1340V	DD1-Tamil	"
	3850/1300V	DD1-National	"
	3929/1221V	DD2 Metro	"
	3970/1180V	Teluga 1	"
	3998/1152V	sport feeds	"
	4035/1115V	Sun TV	"
	4060/1090V	Surya/Sun TV	"
	4093/1057V	DD7	"
<u>ChnStr1/87.5E</u>	3880/1270H	occ feeds/ card	P4 NSW, Ntsc
<u>ST1/88E</u>	3550/1600V	test card	
	3582/1568V	Nila TV	(vintage TV)
<u>Yamal 102/90E</u>	3675/1475R	RTR1	P3 NSW
	3875/1275R	Orbita 1	
	3916/1234R	RTR II	
	3935/1215R	Orbita II	
<u>MeSat-1/91.5E</u>	3710/1440H	VTV1,2, 4	
	3880/1270H	RTM-1	
<u>Gz 28/96.5</u>	3675/1475R	RTR	inc +/- 3.7
<u>Chinasat22/98</u>	3900/1250H	tests	+ 3940/1210
<u>InSat 2B/93.5E</u>	4165/985H	India Metro	NSW on 3.7m
	4080/1070V	DD7 (Tamil)	
	4070/1080H	DD9	
	3970/1180V	DD9 (Kan.)	
	3882/1268V	DD1	
	3840/1310V	DD?	
	3762/1388V	DD4	
<u>AsSat2/100.5E</u>	3660/1490V	feeds, tests	
	3680/1470H	feeds	
	3860/1290V	feeds	

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BIRD/Location	RF/IF & Polarity	Service	Errata
<u>(As2/100.5E)</u>	3885/1265H	WorldNet	VOA subers
<u>Exp. 9/103E</u>	3675/1475R	RTR	inc +/- 2.1
	3875/1275R	Vrk Apt	
<u>As3S/105.5E</u>	3640/1510H	Asia Plus	China, 6.6
	3660/1490V	Urdu TV Net	6.6, 7.2 audio
	3680/1470H	CETV	
(temp FTA)	3800/1350H	Star Sport	NTSC
(temp FTA)	3840/1310H	Channel [V]	NTSC
(temp FTA)	3920/1230H	Phoenix Ch	NTSC
	3980/1170V	Zee TV Asia	(to shut down)
	4020/1130V	Sahara TV	6.2, 6.8
	4060/1090V	IndusVision	6.6, 7.2
	4100/1050V	PTV2/World	
<u>T'kom1/108E</u>	4000/1150H	tests	
<u>PalapC2/113E</u>	4160/990H	(France) TV5	
	4140/1010V	Brunei + feeds	
	4120/1030H	MTV Asia	
	4080/1070H	Herbalife	+ tests
	4040/1110H	CNBC	
	3970/1180V	CNNI	
	3880/1270H	Aust ATN7	
	3840/1310H	TVRI	tests
	3742/1408V	RCTI	English subcr
<u>AsSat1/122E</u>	3677/1473V	Test card	3933/1217H
<u>ChinS 6/125E</u>	4085/1065V	feeds	seldom seen
<u>JeSat3/128E</u>	3768/1382V	feeds	occ., P5 NZ
	4085/1065V	test card	NTSC, 6.8
<u>Ap1A/134E</u>	4160/1050V	CETV	
	3980/1170V	CETV1	
	3900/1250V	CETV2	
<u>Ap1A/138E</u>	4160/990H	CCTV7	
<u>G25/140E</u>	3675/1475R	ORT Moscow	inc. +/- 4.9
	3875/1275R	feeds, tests	
<u>LMAP2/142.5</u>	3675/1475L	RTR Moscow	+/- 3 deg inc.
<u>Gorizont 33</u>	3675/1475R	tests	+/- 1 deg inc
	3875/1275R	RTR	audio 7.5
<u>Ag2/146E</u>	3787/1363H	GMA	P1/2 s. eqtr
<u>Me2/148E</u>	4080/1070H	test card	occ. use
<u>PAS8/166.5E</u>	3880/1270V	test card, feeds	not full time
	3865/1285H	Napa test card	not fulltime
<u>PAS2/169E</u>	3940/1240V	Napa test card	not full time
<u>SpNet4/172E</u>	3920/1230V	unknown video	
<u>1802/174E</u>	4166/984R	Feeds	
	4177/973R	Feeds	
<u>I702/176E</u>	4166/984R	Feeds	from 177E
	4187/963R	Occ. feeds	
<u>I701/180E</u>	4187/963R	Occ. feeds	
	3841/1309L	RFO	East Beam
	3845/1305R	Occ. feeds	inc. from USA
	3930/1220R	USA net feeds	FTA & ca
	3975/1175R	Occ. feeds	

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

NOT in MY backyard! A montage of SatFACTS Observers.



Many are unidentified - our careless records. Credit to Gavin Barbour, Christchurch, NZ for his photos.

TUNING IN THE INDUSTRY'S TV PROGRAMME

SPACE Pacific, the Asia-Pacific industry membership trade association, has produced (and continues to produce) a series of one hour television programmes. These "SPACE Pacific Report" shows, hosted by Bob Cooper, cover a range of topics of interest to installers and enthusiasts. Show numbers and content are as follows: **#9901**- Spectrum Analyser techniques, **#9902**- Feeds and LNBS, **#9903**- Dish antenna designs and problems, **#9904**- The dish marketplace, and, "tiny parts," **#9905**- Dr Overflow (Nokia) software (Robin Colquhoun), **#9906**- How the uplink works (tour of RCA's Vernon Valley site), **#9907**- Uplink Two, including uplink transmitters, **#9908**- Digital Basics (Mark Long), **#9909**- Real World Installs (Mark Long), **#9910** - Installing a polar mount dish and signal level test equipment, **#9911** - "SPIN" (the hidden side of satellite). **#0012** - First Report from SPRSCS 2000 (recorded in Melbourne June 28, 29 - "Ideal IRDs," more), **#0013** - Second Report from SPRSCS 2000 (recorded in Melbourne June 29, 30 - "ABA Blackspot session"), **#0014** - Naughty Nokia from SPRSCS 2000; **#0015** - The DVB-T Tangle from SPRSCS 2000 (Eric Fien). "Report" is broadcast by Mediasat on Optus B3, 12.336Vt, ad-hoc channel 3(*) (Sr 30.000, FEC 2/3). The coming-weeks schedule: **Sunday March 18** - Show 0012, 0200-0300 UTC (1400 NZ, 1300 AEST, 1000 Western Australia; repeats 0700 UTC/7PM NZ, 6PM Sydney, 3PM Perth). **Sunday March 25** - Show 0013, 2PM/7PM NZ, 12noon/5PM Sydney, 10AM/3PM Perth; **Sunday April 1** - Show 0014, repeats same time as March 25; **Sunday April 8** - Show 9901, same times as March 25; **Sunday April 15** - Show 9902, same times as March 25; **Sunday April 22** - Show 9903, same times as March 25; **Sunday April 29** - Show 9904, same time as March 25. (* - Mediasat may pre-empt showings, check other bouquet channels - if not on 3.) SPACE Pacific Report has also been broadcast by Westlink, Aurora service on Optus B3, vertical (12.595, Sr 30.000, FEC 3/4 - requires Optus Aurora card but is otherwise FTA). Westlink will again carry SPACE Pacific Report when new shows currently in planning are produced and available; details here in future issue (will start after April 1). In the event of schedule changes (*), SPACE Pacific attempts to pre-announce which show(s) will appear through the SatFACTS Web site prior to each weekend (<http://www.satfacts.kwikkopy.co.nz>). SPRSCS 2000 sessions taping scheduled for play on Mediasat and Westlink are currently in "editing production." Sponsorship of SPACE Pacific Report. In general answer to queries - Av-Comm, Satech and Sciteq have contributed corporate funding to make possible the production of the first set of nine SPACE Pacific Report programmes. If interested in sponsoring future shows, contact Bob Cooper at skyking@clear.net.nz (64-9-406-0651).

WITH THE OBSERVERS

AT PRESS DEADLINE

Are you an Aurora **INSTALLING** dealer? SatFACTS needs your help. (1) How many Aurora installs have you done? (2) Of that number, how many required ABA approval? (3) Of the total number, how many used UEC product and how many used "other" receivers? **ALL** information held in **STRICT** confidence for industry survey.

AsiaSat 2/100.5E: "European bouquet PID changes introduced 5 March at Israeli turn around site: RAI VPID now 2433, A 2434, PCR 2432 while TV5 V2561, A2562, PCR 2560 (note that V and PCR are now different numbers). No guarantee this will last but reloading of receiver may be required" (**Tony Drexel**, SA). "Analogue RTPi service shut down February 24 on 3980Vt, remains in European Bouquet 4000Hz" (**D. Leach**, NSW).

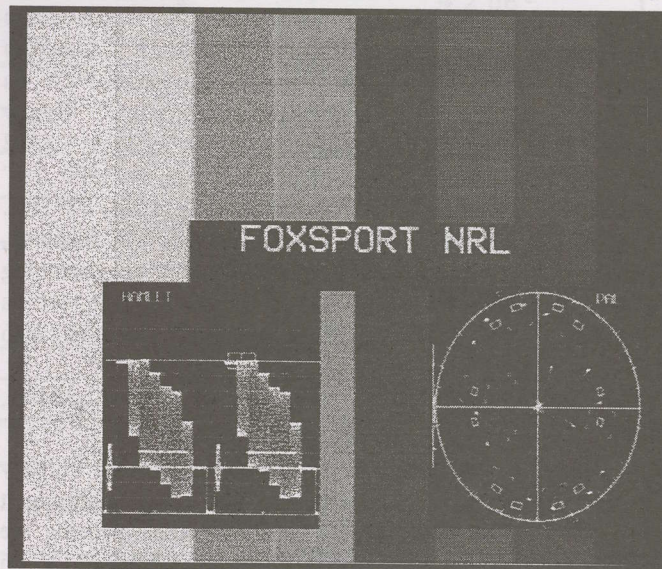
AsiaSat 3/105.5E: "PhoenixNet, 3820Vt, Sr 27.496, 3/4 may be only data service - maybe not. Also new, Alive TV is FTA on 3900Vt, Sr 27.895, 7/8" (**S. McLeod**, NZ). "Alive TV is one of 5 programme channels: #1 - Alive Net PAL, #2 - Alive Net NTSC, #3 - PCM TSG1 test card, #4 - same as 3, #5 -CA) with English language travelogues on 1, 2" (**L. Mathews**, NZ). "4135Vt, Sr 15.000, FECs vary from 1/2 to 2/3 - lots of testing here mostly FTA" (**Arch Oboler**, Australia). "Zee TV News, Bharathi TV noted FTA on 4135Vt" (**D. Leach**, NSW). "Indus Vision testing, may be erratic, 4060Vt FTA analogue" (**Holmes**, Australia).

Intelsat 701/180E: "RFO directors have approved addition of RFO NC onto the CSAT digital bouquet (11.619Hz) with start-date sometime late March, early April" (**Steffen Holzt**, New Caledonia). "4052RHC, Sr 5.632, VPID 0308, APID 0256 'TVNZ Perth 25' feeds" (**Jacko**, Australia).

Intelsat 702/176E: "RFO Polynesie now on 4027LHC, FTA, Sr 4.566, 3/4 on SE zone beam, will shut down I701 service 17 - 21 March" (**G. Waldref**, Tahiti).

ChinaStar 1/87.5E: "News feeds on 3880Hz, PAL and NTSC" (**D. Leach**, NSW).

Optus B1/160E: "Sky NZ 12.671 continues roll-out of OPEN TV software here with mixed FTA and CA associated services loading as IA HP, G1, G2, G3, G4, G5, G6, G7, IA W" (**Craig Sutton**, NZ). "Minor changes in Sky's 12.671 bouquet: (1) Sky Sport ESPN, (2) SBO Movies, (3) Playboy, (4) Spice, (5) SBO Movies; on 12.608 (1) Juice TV, (2) Trackside, (3) Discovery, (4) Prime, (5) Sundance, (6) SI 1026E, (7) NHK, (8) VCR Scart; on 12.644 (6) is now Sky Movie" (**R. Whitehead**, NZ). "6 programme channels, multiview feeds, CA, Melbourne F1 on 12.406Vt, Sr 28.000, 3/4 through Mediasat" (**B. Richards**, Australia). "Channel 9 news feeds 12.424Hz, Sr 5.632, 3/4" (**B. Richards**). New Mediasat transponder designed for "multiview" contribution services for use by Australian TV networks; T3 (12.407Vt centre frequency also covering NZ) and T11 (12.438Hz, Australia only). "Probably new Mediasat package with 3



Example of PC "screen grabber" routine capturing reception, transferred by Email attachment (**Bill Richardson**, Australia).

programming channels for TEN Net; 12.424Hz. Sr 19.800, 2/3" (**B. Richards**, Australia). "Testing of Nine Net digital feeds 12.512Hz, Sr 5.632, 3/4" (**D. Pemberton**, Australia).

Optus B3/156E: Mediasat (12.336Vt) has upgraded MUXing gear, adding 4 new video channels shortly including some FTA, all using PowerVu Plus. "Test Bouquet for pay-TV (12.501Hz) changing channel line-up often, typically (1) DISN, (2) SKYN, (3) C7G, (4) C7S, (5) C7S2, (6) NCEO, (7) 1210, (8) FS1, (9) LIFE, (10) CMDY, (11) SKYN, (12) TCM, (13) Fox, (14) FX. Is there no practical limit to statistical compression and the number of channels they can cram into a single transponder?" (**IF**, Queensland). "12.315Hz, Sr 30.000, 2/3 but no PAT transmitted" (**B. Richards**, Australia - see p. 18 here, ed.)

Palapa C2M/113E: "Metro TV on and off 4089Hz, FTA, Sr 14.059, 3/4 and also reported 4076Vt, Sr 6.498, 3/4" (**S. McLeod**, NZ - yes, and Australia ATVI video-only has shut down on 4089 as well, ed). "CNNI continues to be P4 on FTA analogue 3970Vt, 3m dish" (**L. Mathews**, NZ).

PanAmSat PAS2/169E: A report in Skyvision E-Bulletin #8 advises Middle East bouquet (3836Vt, Sr 13.331, 3/4) is planning a transition to Irdeto. Four programme channels (LBC, Antenna, ART and RAI), allegedly LBC will do CA

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, or, use screen grabber software (above) and Email as attachment. Deadline for April 15th issue: April 3 by mail or 5PM NZ April 4th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

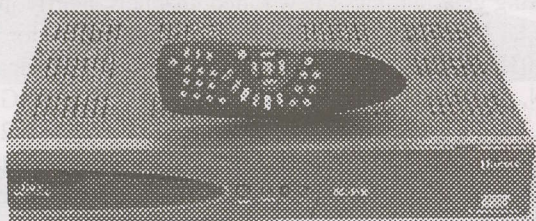
first. This bouquet has threatened CA in past but PowerVu still loaded as PV March 08 ("ART Napa Valley") - no sign of Irdeto format. "Signal level has been up several dB of late; contacts regarding CA subs reportedly 1800-700-506 or 61-2-9747-1011. What you get is an answering service and no real information" (IF, Queensland). "3901Hz, Sr 30.800, 3/4, 'Adhoc 1' channel (nominally Panamsat Napa test card) feeds CBS Evening News 2330 and 0000UTC, Letterman Late Show as early as 0430, as late as 0700UTC and in between 0100-0400 occasional CBS-TV east/west coast USA prime time programming" (R. Anthony, Australia). "Although Melbourne F1 feeds on Optus were CA, found FTA on 3942Vt, Sr 6.620, 2/3" (B. Richards, Australia). "Rugby (Bulls v. Hurricanes) FTA 3864Hz, Sr 6.459, loads as 'PAS-2 TV1'" (Jacko, Australia). "News feeds 3.777Hz, Sr 6.620, 3/4" (D. Pemberton, Australia). "NBA basketball game, 3873Hz, Sr 6.620, 2/3 VPID 4160, APID 4120 in NTSC" (B. Richards, Australia). "KBS Korea news feeds and regular programming 4026Hz, Sr 5.062, 3/4, VPID 33, APID 38, SID2 as well as VPID 3601, APID 3604, SID1" (B. Richards, Australia - also see p. 13, ed.)

PanAmSat PAS8/166.5E: "Suspect Internet on 12.284Hz, Sr 26.665, 5/6" (B. Richards, Australia).

Soapbox: "CNNI wants US\$200 a month for our military base installation, won't authorise us from PAS-8 claiming it will now only be used for NZ and Australia, insisting we install new dish for As3 feed - good-bye CNN! MTV on PAS-8 has 'donated' service to base, even gave us Cryptoworks card - we may not know what's happening in the world but at

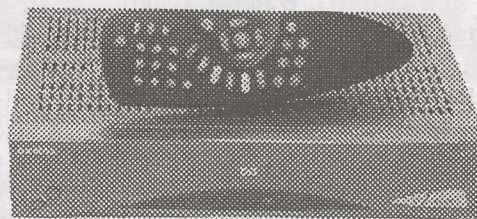
least we'll swing to a beat!" (R. Brooks, Kwajalein, Marshall Islands) "Phone call to TPG/Boomerang (1300-360-855) confirms they plan Internet offering PAS-8, 12.560Hz, end of March start. Pricing reported - installation charge \$199, plus \$65.85 for 3 month period" (IF, Queensland). "Spoke with Boomerang to give them hard time about their promised movie channel - promised six months ago. They said no satellite boxes are currently being released, they are running new 'hardware compatibility tests' related to forthcoming Internet" (R. Anthony, Australia). "A+NET Sales (www.abac.com) promising 2-way satellite Internet for the full Pacific through company called Tachyon with new bird launch later this year" (R. Brooks, Marshall Islands). "Spoke with Palapa op control, they now admit perhaps new problems with C2M transmit antenna and power supplies - does not sound good. One test I watched had RTB on 1070Hz, then 1010Vt with Hz P5, Vt P2" (D. Leach., NSW). "Will Hills or other Australian supplier sell me a suitable Irdeto IRD + smart card for NZ address?" (BF, NZ). "RTVE is looking for SMATV, CATV partners in Pacific & Asia - contact Maria-Jesus Perez at contratos_canales_inter.ep@rtve.es" (alas, they quoted Triangle TV Auckland US\$1000 per month for taking daily news show feed! - ed). "Prime TV hopes to be a part of TVNZ digital bouquet when launched, but no contract yet" (HK, NZ). "Premier, the UK folks who brought to market the handheld digital installer meter, is dead. But engineers with firm have gone off to launch new business, new meters due out in May" (Bill Eaton, UK). "Digital watch error - only two InSat 2E (83E) Indian DD channels are on wide beam reaching

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Eb/No for Common Modulation and Coding Systems

Abbreviations in use here: (1) BER - Bit error rate; (2) Eb/No (coded): Theoretical Eb/No with coding, in dB; (3) Margin: Implementation margin including group delay (in dB); Eb/No (reqd): Eb/No required if back to back (in dB).

For QPSK or BPSK with FEC of 1/2 (8 levels of soft Viterbi):

BER	Eb/No (coded)	Margin	Eb/No (reqd)
10 ⁻³	3	1.2 dB	4.2 dB
10 ⁻⁴	3.8	0.9 dB	4.7 dB
10 ⁻⁵	4.5	0.9 dB	5.4 dB
10 ⁻⁶	5.2	0.9 dB	6.1 dB
10 ⁻⁷	5.8	0.9 dB	6.7 dB
10 ⁻⁸	6.3	0.9 dB	7.2 dB

For QPSK or BPSK with FEC 3/4 (8 levels of soft Viterbi):

BER	Eb/No (coded)	Margin	Eb/No (Reqd)
10 ⁻³	3.9	1.4 dB	5.3 dB
10 ⁻⁴	4.7	1.5 dB	6.2 dB
10 ⁻⁵	5.4	1.6 dB	7.0 dB
10 ⁻⁶	5.9	1.7 dB	7.6 dB
10 ⁻⁷	6.6	1.7 dB	8.3 dB
10 ⁻⁸	7.1	1.7 dB	8.8 dB

Australia: 3910Vt, Sr 5.000, 3/4 and 3832Vt, Sr 5.000, 3/4 both FTA. 3929, listed as digital, is in fact analogue" (D. Leach, NSW). "Have SA D9234 previously used on Discovery, logged in their data base, for sale; currently not authorised" (Steffen Holzt, antenne-cal@canl.nc). "Wyndham City Council sent notice to all of my neighbours titled 'Notice of application for planning permit' and is asking for 'objections to be filed'. Dish has been in place four years and they are trying to enforce a new law in reverse!" (Paul Hadlow, Australia). "About confusion over Comstar dishes. Two years ago original firm using this name went belly up, name and perhaps tooling purchased by established Bangkok firm Longwave Technology owned out of Taiwan. Now, all 3 telco, fax, cell phones disconnected. Maybe it went back to Taiwan?" (Siam Global, Bangkok, Thailand)

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AT

Sign-off

Money talks

Reader Alan Smith emails, "Sorry Coop, but there is a country that still licences people to watch TV. Good old Great Britain. 'land of the messenger boys,' still expects people to pay 100 pounds. As a special dispensation - blind people get a discount!"

Alan was responding to our editorial (p. 1, SF#78) lamenting the situation in Australia where a licence is required from the ABA before the commercial (Central 7/Imparja, or, GWN/WIN) services can be viewed. We said, "Nobody, not even China, still licences individuals to 'receive' television."

It turns out there are a number of countries where regulations disallow reception of "foreign" signals (Afghanistan, Iran, Iraq, Malaysia) and others where individuals are not allowed to view foreign signals but businesses (such as hotels) are granted permits for this (Singapore, China).

In free-speech, free-press countries, television reception has for decades been a matter of cost. If an individual was willing to spend the bucks, he or she could have reception from outside the local area. In countries such as India, the cost of foreign signal reception is spread out amongst hundreds or thousands of viewers when a cable operator installs dishes and strings wires and collects a relatively small amount monthly from viewers.

Some countries still maintain Government operated public television. Most African nations, more than half of the countries in Asia have some form of Government television and a few of these also have private television as well.

Private television is funded by the sale of advertising. Common products such as soap, loaves of bread, bags of rice, electronic devices and cars all have a budget amount built into the sale price for "marketing." Product *marketing costs* vary between 0.5% and 11% of the selling price with most common super market items budgeting 4 - 5% of the product consumer price to "marketing."

Marketing includes a range of promotional activities; newspaper print advertising, radio and TV, "co-op" advertising where the manufacturer agrees to pay a portion of the distributor's advertising costs in return for having its products prominently displayed, signs that appear in aisle ways of stores. If you purchase a new TV set for \$400, you are paying not less than \$20 for the signs you see and the advertising you heard or read promoting that TV. Any suggestion that advertising creates "free-to-air" television and radio is a misconception. A \$20,000 car will have not less than \$800 in marketing costs included (4% of selling price). In the end, a portion of every dollar you spend in the marketplace goes towards providing "free television" and "free radio."

The Great Britain 100 pound licence fee (Au\$287, NZ\$350, US\$147) turns out to be a bargain. For this, viewers receive multiple BBC channels of commercial-free service. The Australian ABC is a prime example of what tax supported TV

can be, although in this case the licence fee is hidden in general taxation. Think of the British 100 pounds as a fee to view, and consider that for each 2,500 pounds Sterling spent by a UK family, they have just contributed an *additional* 100 pounds to advertising supported TV.

"Free" TV is a *myth*. So is free radio.

When the true cost of owning a TV set and watching programming is disguised in product costs, we tend to forget that each item we buy has a portion of its cost being spent on promoting us to buy that product in the first place! A family spending \$2,000 a month on food, housing, clothing and the other necessities of life is really *contributing* \$80 (4% of \$2,000) to "free" TV and radio. The same family subscribing to Austar, Optus, Foxtel, Sky NZ for \$60 is now spending \$80 + \$60 or \$140 per month for "free" + pay-TV.

As every product sold has a built-in cost of marketing, there is no way you can escape subsidising "free TV and radio" with your purchases. Imagine the reaction of the store manager when you offer him 4% less than his requested selling price by explaining, "I never watch TV or listen to the radio - I refuse to pay for something I don't want or use!"

In fact, he has probably never thought about how "marketing costs" increase the price of a product, and would be dismayed to be shown that 4% of the cost of that can of dog food you hold in your hand supports these activities.

And the ABA licence process. The entire purpose of ABA licensing is to try to control *who* watches *which* TV station. There are two pathways to TV - let anyone who can build a transmitter without interfering with someone who was previously licensed, operate. Or, "subsidise" the TV station by refusing to allow competition.

Allowing new TV channels based solely upon technical criteria (the interference issue) is the free market approach. Adopting rules that prohibit new TV channels even if they can operate without creating interference is the "controlled market" approach. Australia has chosen the latter. A TV licensee has a "guarantee" from Government that no other TV station(s) will be granted in their "coverage area." Imagine how this affects the station's operation - with little or government limited competition, stations sit there raking in money at 4% of the retail sales level in their coverage region. If their coverage area has \$100 million in retail sales each year, they can pretty much count on attracting \$4 million in advertising revenue.

The ABA Blackspot receiver licence programme threatens to reduce that \$4 million simply because for each home that "proves" it cannot receive the programming of the terrestrial broadcaster, the station has to accept a loss in revenue. Newspapers in the same area have no such government guarantees. Advertisers are pretty smart - when they see hundreds, thousands of homes going to Imparja/Central 7 over the regional TV broadcaster, they begin to question just how good the station's coverage is for the *remaining* homes. A door-by-door study of which homes receive which channels, and *how well* they receive them, would be a major blow to the "guaranteed income" of the terrestrial telecasters. The best way for regional telecasters to head this off is to kill the Blackspot monster by cutting off its head - at the ABA.

All of which correctly identifies a flaw in the present system. Advertising is an essential ingredient to all marketing efforts. But should it be the *only* tool by which we measure the success or failure of a service? Is the ABA really in charge or is it merely the tool of broadcasters?

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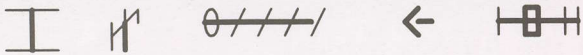
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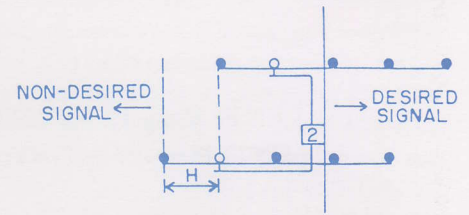
- SATELLITE TELEVISION:** The Booklet. Excellent introduction to home dish ownership for the layman, including major contributions from the father of geostationary satellites - famed science fiction writer *Sir Arthur C. Clarke*. The perfect tool to help the satellite system seller explain home satellite TV to the consumer. From SPACE Pacific. NZ\$10/ A\$12 / US\$10, airmail.
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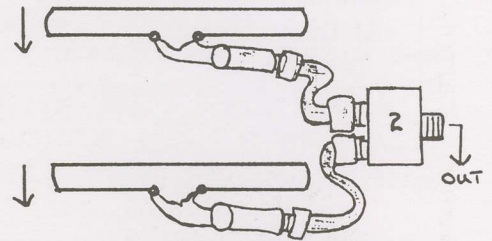


Terrestrial TV Antenna Handbooks

Tech Bulletin 9301 *Co-channel and antenna phasing.* How to turn a simple one-yagi or log antenna array into two or more antennas stacked and/or phased to eliminate co-channel or adjacent channel interference from other stations. There are some very neat tricks you can employ to make the antenna system a "channel eliminator" while at the same time it is a better "channel getter." There is no "secret science" here - anyone with elementary terrestrial TV antenna knowledge can employ this technology for vastly improved TV (or FM radio) reception. With digital (DVB-T) transmitters coming on the air, same or adjacent channel interference will be a new challenge. When you know how it is done, you make more money! \$15 per copy or special package price (below).



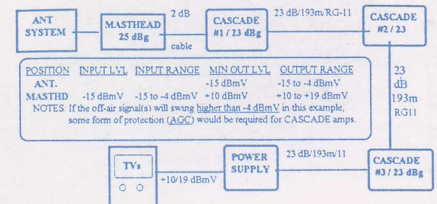
Tech Bulletin 9302 *Weak Signal Reception Techniques.* Stacking antennas (using two or more identical yagi or log antennas to build a "receiving array") is just like installing a larger satellite / DTH dish to improve reception. The greater the antenna "capture" area, the more signal intercepted and received. But, there is a major difference. A 3.7m dish uses one feed, just like a 1.2m dish whereas "stacking" 4 identical yagi or log antennas creates "four feeds" - one per antenna. How to connect them together (there are several techniques), how to mate with a masthead amplifier (where and how) are all part of "weak signal reception techniques." Going from one terrestrial reception antenna to two is the same as graduating from a 2.4m dish to a 3.5m dish at C-band. Or, from 1 to 4 antennas is the same as going from 62cm to 1.2m at Ku. This is a very practical manual, and everything here applies to the new DVB-T world as well. \$15 each, below.



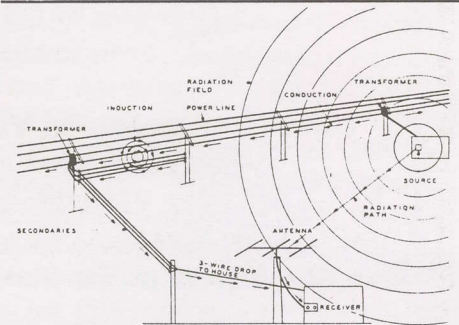
WHEN STACKING WITH COAXIAL CABLE RADIATION LOSS FEED POINT

Tech Bulletin 9303 *UHF: The Next Frontier.* With the arrival of DVB-T, UHF has finally come into its own (in Australia). It is no longer the "oh - by - the - way - band" where rural areas and SBS are relegated. First, how VHF and UHF differ - there is much more than wavelength. Think of VHF as C-band, UHF as Ku. Big time differences in reception characteristics and technical approaches to solving reception problems. This is a very practical manual with hands on examples you can follow to solve difficult UHF reception situations - larger antennas, even big parabolic dish antennas as large as 40 feet to make UHF signals work well beyond their normal coverage zones. How to "repeat" UHF, on channel, for added coverage: masthead amp tricks. \$15 each, below.

PLANNING A UHF CABLE DISTRIBUTION SYSTEM

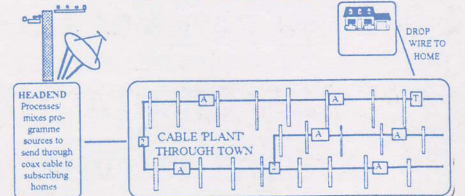


Tech Bulletin 9304 *Beating Noise/Combining Cross Pole.* Power lines, gasoline or diesel engines, fish tank water heaters, rheostat light dimmers - more than 1,000 different man-made objects are known to be creators of RFI - radio frequency interference. And RFI is transmitted through power lines, often kilometres from the source. How to recognise the distinct on (TV) screen "signature" of different RFI sources, how to trace them to their origin and then repair the offending device. Using the right tools - such as a portable radio - and knowing what you are listening and looking for, locating radio frequency interference to TV, FM and two-way radio reception becomes a specialised science which you can do yourself. It is all here in logical, step - by - step sequence. Plus - how to use one antenna downline to combine both vertical and horizontal polarity signals to a TV receiver situated where both polarisations are in use. Not as complex as you might imagine! And an extra bonus - how one town deprived of a major national service created their own repeater / translator using public support as a tool. \$15 each, package price below.



Tech Bulletin 9305 *Cable Television: Fact and Fiction.* The story of how a cable television system is designed, built and operated. The perfect document to answer your questions about this technology that is capable of delivering hundreds of channels to individual homes and businesses. Very practical, explains the technology and more important the considerable costs associated with building and operating a "CATV" system. Where cable remains practical is in areas shielded from terrestrial network TV, or located in a remote area where only multiple satellite dishes can produce a "full dial" of services. Cable is a technology - yes, but more important a business which many enthusiasts tend to overlook in their excitement to build a system. \$15 each, below.

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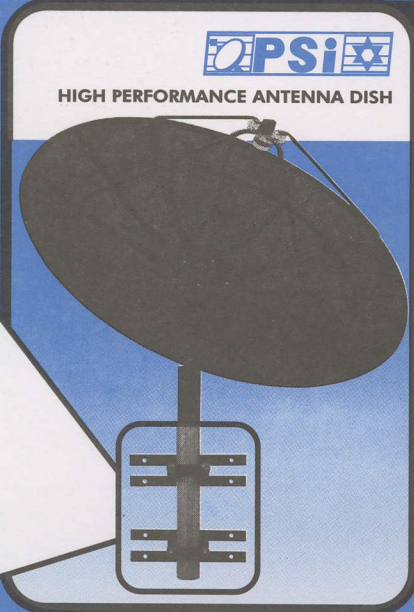
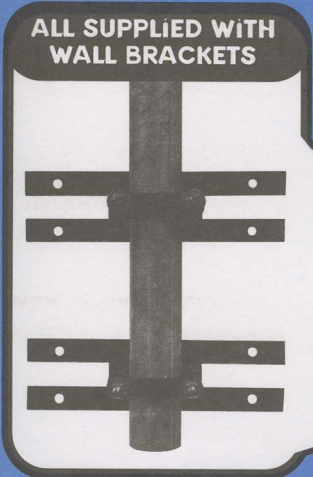
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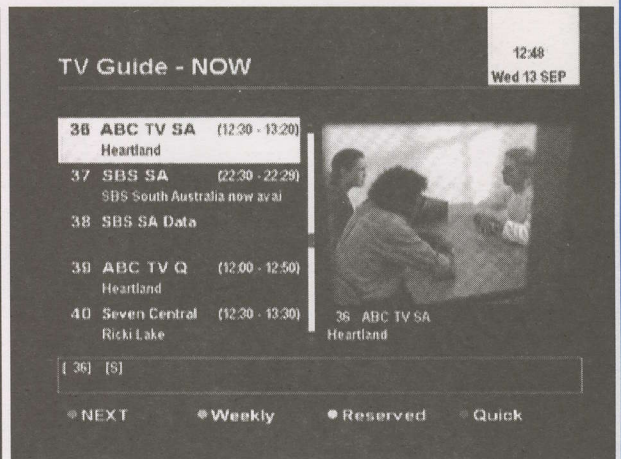


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