

14-06-01 11AM

Bob Cooper's

JUNE 15 2001

# SatFACTS

MONTHLY



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

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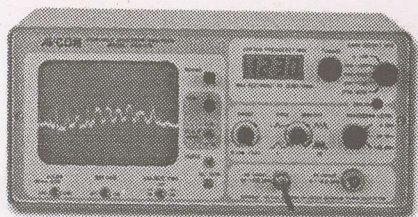
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**Vol. 7 ♦ No. 82  
Price Per Copy:  
NZ\$10/A\$11/US\$8**



# The AVCOM Family of Satellite Spectrum Analyzers

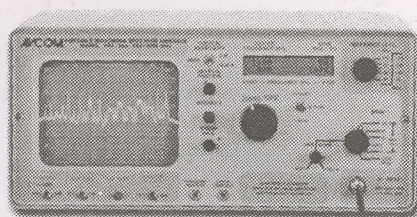


## PSA-37D

The "Workhorse" of satellite analyzers  
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- L-band (950–1450 MHz)
- C Band (3.7–4.2 GHz)
- 0–500 MHz band for IF monitoring
- Optional video demod output

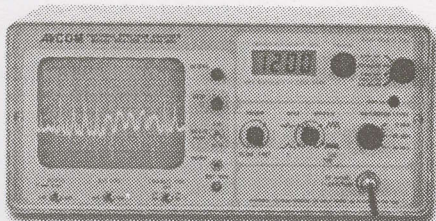
**\$2,475.00**



## PSA-39A

- Extended L band (950–2050 MHz)
- Direct display of C and Ku band frequencies

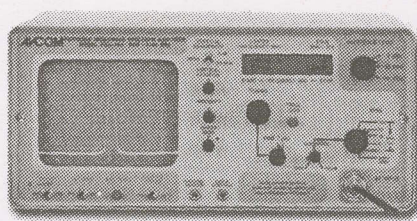
**\$2,845.00**



## PSA-33A

- Extended L Band (950–2100 MHz)
- 0–1100 MHz band for IF monitoring

**\$2,775.00**



## PSA-86A/001

- C-band Uplinks (5.5–6.5 MHz)

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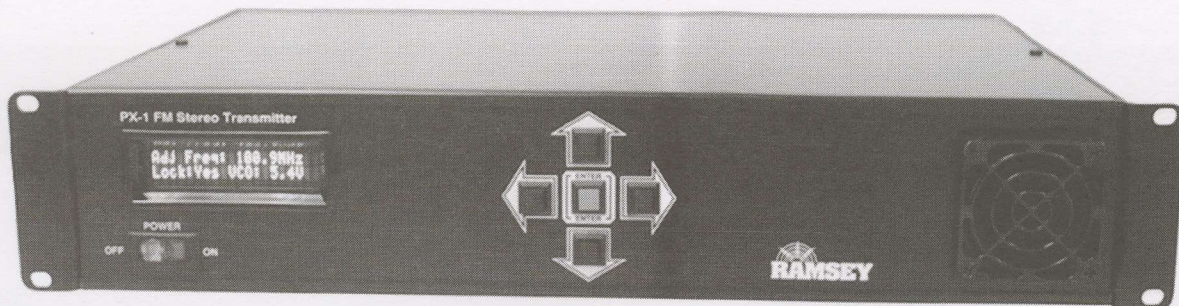
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- +12/18V LNB power
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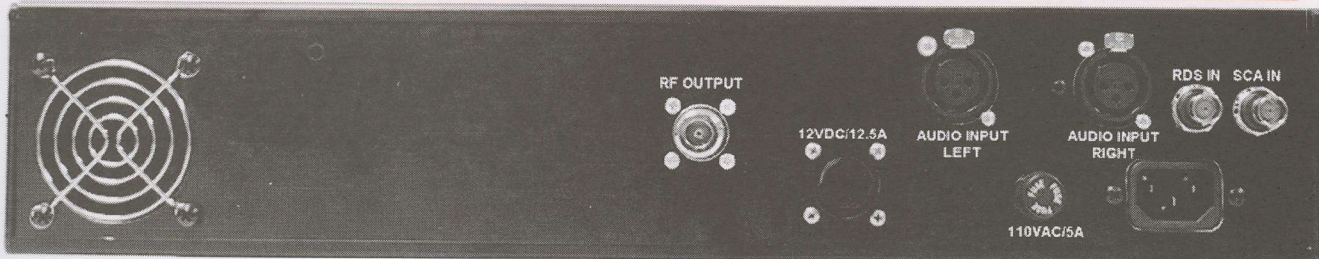
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**The PX1 Technical Standard - for sound so good you will swear you are in a recording studio!**

- **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 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!) • **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. • **More power?** Up to 600 solid-state watts output available!

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# INVITATIONS FOR SPRSCS 2001 ARE IN THE MAIL!

## September 27 - 28 - 29 in Melbourne

TO RECEIVE YOUR GUARANTEED SEATING COMPLETE FORM BELOW

**SIGN UPs** are **NOW** underway. Use the form below to request a full registration packet to attend the South Pacific Region Satellite & Cable Show in Melbourne. Full day long classroom sessions will teach a variety of subjects including (1) **SDS** - Shared Distribution Systems utilising L-band retransmission technology, (2) **DVB-T Terrestrial** digital signal capture and processing techniques, (3) **Low power FM** broadcasting (0.1 watt to 600 watt - system operation, transmission antenna techniques). **PLUS** - the usual cutting edge satellite TV reception sessions featuring the latest in equipment, the latest in knowledge!

You MUST indicate which topics interest you most - using form below

- PLEASE address an invitation to attend SPRSCS 2001 to the individual named below. My areas of interest while attending would be as follows (indicate with "X" mark please):
- I am interested in low power **Community FM** radio broadcasting  
If yes - please further indicate -
- I would like to **build** a low power FM stereo transmitter at SPRSCS 2001 and take it home with me
- The heck with building - I'd still like to **buy** one while there!
- I am interested in **SDS** (Shared Dish Systems) - p. 6 this April issue  
If yes, please further indicate -
- I am interested in the 950 - 1450 (2150) L-band **retransmission** of dish signals
- I am interested in retransmission by **remodulating** in L-band from satellite/tape/hard drive
- I am interested in **2.4 Gig** systems and would like to "play with one" at conference
- I would be interested in a one-day work shop leading to **building** these systems
- I think Aurora-RABS is dead but would still like a chance to **meet with ABA** folks
- I'd like the chance to meet with **someone from Optus** - perhaps Ed Guz???
- I want to "touch" and "play with" DVB-T
- I would be interested in a one-day workshop covering all aspects of DVB-T installation

Please place the following name on list for written invitations:

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Mailing address \_\_\_\_\_

Town/city \_\_\_\_\_ postal code \_\_\_\_\_ State/Country \_\_\_\_\_

Return this to **SPACE Pacific, PO Box 30, Mangonui, Far North, New Zealand**  
or, fax to + + 64-9-406-1083 or email as attachment to [skyking@clear.net.nz](mailto:skyking@clear.net.nz)

**REGISTER TODAY - don't put it off until the last minute - our planning depends upon you!**

# SatFACTS MONTHLY

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

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

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## COOP'S COMMENT

Emails. Barry Le Vien takes us to task for (1) having advertising in this magazine, (2) writing about anything other than "pure hobbyist satellite stuff," (3) "all this cable stuff," (4) "oh no - not that UEC stuff again." He summarises, "I see little here to capture the heart of a true satellite enthusiast."

As the first person on this earth to have a home C-band satellite system in their yard - bar no others including my good friend Arthur C Clarke, I am a little sensitive about what a "true satellite enthusiast" might be. Barry thinks anything relating to cable, low power FM radio, SPACE, or UEC is a betrayal. I suspect there are other hobbyists who feel the same way.

Hobbyists traditionally "start" the larger public sector down the road to recognising that something new and interesting is coming into our lives. The first users of radio were hobbyists (amateurs or "hams") and it was largely (probably totally) because of advances made by "hams" that the radio broadcasting industry got started in the early 1920s. Satellite TV began with this same pattern; 1979 in the United States winding down in the mid 1980s, while Europe caught the fever in the late 1980s and it lasted until the mid 1990s. Our hobbyist driven explosion in the Pacific caught fire when PAS-2 launched and was followed rapidly by a series of new satellites (C2, PAS-8, even JcSat-3 to mention a few). AsiaSat gave it a much needed boost because As2 (later As3) produced dozens of viewable programme channels.

I am the *original "true satellite enthusiast"* and from 1976 to today, I have never lost the thrill or fervour associated with TVRO. In 1979 I "discovered" the Molniya Russian satellite could be received in its elliptical orbit from Oklahoma (USA). In 1980 I demonstrated how a 6 foot dish connected to a ten watt TV transmitter could deliver first time television to folks who lived in areas with no terrestrial TV. In 1981 we did the same thing with a 3 foot dish and FM radio. In 1982, fellow enthusiast Tom Harrington and I published "The Hidden Signals on Satellite" describing how with modest equipment people could eavesdrop on thousands - tens of thousands - of private telephone conversations, plug into radio network feeds, even listen to the American Pentagon planning manoeuvres.

Hobbyists drive a marketplace for only a few years, then there is the inevitable maturing as a field develops. A large percentage of those who might have been candidates for hobbyist level installations end up subscribing to Foxtel, Austar, Sky NZ or even TARBS in this growth cycle. In the end, those who remain "true hobbyists" have only their memories of "the good old days" which typically passed by so rapidly that one was not even aware as it happened they were the "good old days." In a world where technology totally doubles its reservoir of knowledge every 14 months the "hobbyist interval" in any field is shortening rapidly. Home PCs? The Web? Email? All began as hobbyist interests, all developed into something of far more general appeal.

Barry Le Vien threatens me with "ending my subscription at the end of the current period." He urges us to "be informative, provocative, analysing new receivers and ask probing questions." The answer? Five years ago, this was a *provocative* industry in a new part of the world. Today Sky NZ, Foxtel, Star TV rule the airwaves and unless you are into hacking and being naughty, doing something "provocative" may come down to "sharing" your satellite reception with neighbours - perhaps just for the challenge to keep your creative juices flowing. SDS and low power FM offers this opportunity and that's why we write about it here. As for returning to X-rated movies FTA from Canada as once existed - don't hold your breath because it ain't gonna happen.

#### In Volume 7 ♦ Number 82

Troubleshooting power supplies in IRDs -p. 6

Cable TV Basics: The House Drop -p. 14

Bandscan: Thaicom 2/3 -p. 28

#### Departments

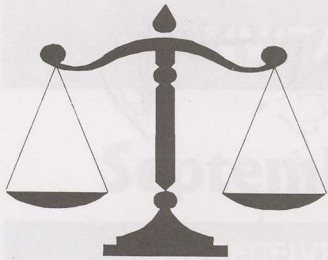
Programmer/Programming Update -p.2; Hardware/Equipment Update -p. 4; SPACE Pacific Report (Using a low power FM transmitter to 'monitor' your TVRO system while in the neighbourhood) -p. 20; Technical Corner (Getting the correct feed for the Ku-band dish) -p. 22; SatFACTS Digital Watch -p. 24; Supplemental Digital Data -p. 26; SatFACTS Analogue Watch -p. 27; SPACE Pacific Report - TV Show schedule -p. 28; Thaicom 2/3 Bandscan Report -p. 28; With The Observers -p. 29; At Sign-Off (After Mad Max - what?) -p. 32

#### -ON THE COVER-

Pinning a dish. This screen mesh satellite dish assembly involves "clipping" reflective surface in place along ribs and support trusses. It is a slow, finger numbing job especially in the rain as here.



June 15, 2001

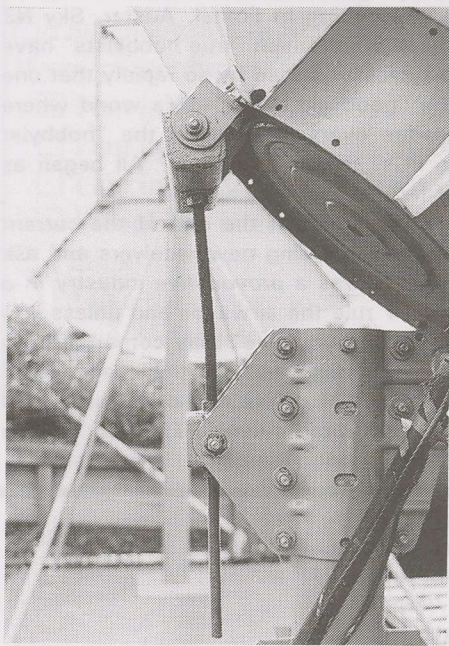


**OK - so what happened with Patriot 3.1m???**

"You left a dangling participle and a left shoe undropped. SF#79, p. 14 reported Patriot 3 and larger metre dishes were having proofing problems. Has that been resolved? The 'ten percent failure rate' reported is not encouraging me to order any for my commercial installs."

AI, Queensland

Reporter Steffen Holz (New Caledonia) has been shipped replacement hubs for his 3.7m and larger 'defective' dishes although Patriot disclaims any fault on their part. That's cool - as long as they replace the dish segments causing problems at their expense. As for our 3m with split beam tendencies - no such easy solution. We loosened all sixty-quadrillion rusted bolts (why oh why don't they supply stainless!) and shook the hell out of the structure hoping it would resettle into a true parabola. No such luck. C-band is fine, Ku still has a split beam. In the process we bent or it bent on its own - the threaded elevation adjustment rod. Look closely - compare to the 6" dish support pipe just beyond. The threaded support rod "bows" towards the top which makes tracking somewhat more complex in the elevation direction. Fault #17 - rain water collects in the "trough" where the threaded elevation rod anchors, rusts the devil out of everything in the vicinity and the stagnant water breeds mosquitoes.



**TVNZ/TelstraSaturn?**

"How do we convince this new service to allow independent installers to do their work?"

Don Johnson, Mt. Maunganui, NZ

T/T-S plans to use Downer, Hills, perhaps others. To talk turkey, try David Visser at 04-922-8400. Their internal goal is 50,000 installs by December 31 - pretty ambitious!

**PROGRAMMER  
PROGRAMMING  
PROMOTION**

**UPDATE**

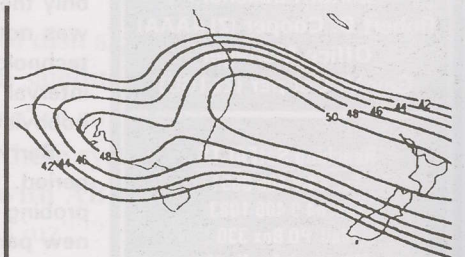
JUNE 15, 2001

**Cinema versus pay-TV.** While most cinema operators and their cohorts the video rental stores abhor the inroads made by stay-at-home and watch pay-TV services that feature recent release movies, BSkyB digital in UK has found a new business relationship. Odeon Theatre chain is new partner in BSkyB satellite delivered digital text service and as each digibox "knows" where it is by UK postal code, films promoted at "local" Odeon theatres are "tagged" with run dates and times based upon viewer postal codes and the nearest Odeon outlets. Home viewers receive extensive film promotional material via combination of digitext and dedicated promotional channels including film trailers that hype films.

**ALIVE TV dies.** It began last November - a cross between Discovery and America's "Travel Channel" and every month it got better. Suddenly on May 22nd it simply quit. Bankruptcy. No more money left. How they intended to make it is uncertain, their business plan was never evident and cable system subscribers advise, "They never answered our email or faxes asking to become a part of their network." The AsiaSat 3S FTA service was visually a winner and extremely appealing - unfortunately not to enough people it seems. Alive is now dead and it will be missed.



**Things that did not happen.** Which could have affected your lives. JcSat3, the strange C + Ku bird at 128E (SF#12, p. 6) has 50 dBw Ku-Hz beam that could have married Auckland to Sydney to Wellington at look angles no lower than 24d (Wellington). Alas, nobody in Australia nor NZ was in a buying mood when JcSat3 went into service so we have an unused footprint that could have delivered big time service to dishes as small as 65cm (a familiar size). Had Sky NZ gone here, for example, using 3 full transponders, TVNZ + Telstra Saturn would have been out of luck to join them.



**ATVI prospect.** Australian ABC hopeful of approval to reactivate this Palapa C2M service - has submitted proposal to relevant government agency, seeks \$15m per year government support (SF#80, p., 29). A private firm is also chasing the same annual allocation suggesting ATVI will come back but perhaps not before Australian general election later in year. Our urging - that ATVI when it returns move to a C2M horizontal transponder for improved Pacific region coverage - the vertical sucked.

**Bingo!** Kenneth Taisia writes, "Here in the Solomon Islands we can (still) receive some free to air channels and as SF states, the fortunate few have satellite dishes - the majority do not. Will the SDS system explained in SF#80 allow digital signals received on my dish to be received by neighbours using SDS equipment and a conventional digital receiver? Would like to serve 3 neighbours in a 500 metre range of my dish." Answer - *spot on*. The "linear translator" format for SDS will do precisely that and 500 metre coverage should be a piece of cake - even through Solomon vegetation! Details in next few issues.

# 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.

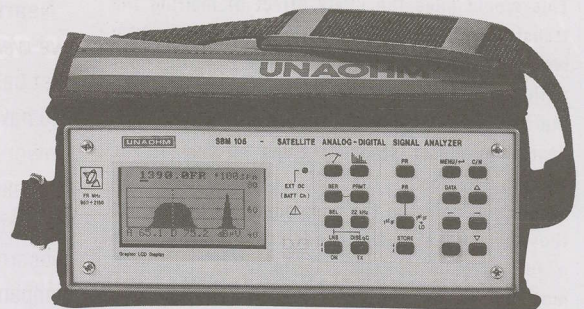
EP 319 level and Spectrum measurements feature high accuracy and selectable Resolution Bandwidths of 100kHz, 1.5MHz and 4MHz to provide real time spectrum displays of signals from TV stereo audio and colour sub-carriers to SCPC satellite signals. 5-40MHz is included, with Analogue and Digital data logging. 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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Morally correct

"I was a UEC fan personally but am now appalled with their SMPS. The UEC IRDs are dangerous to consumers and service people alike and should never have been sold in Australia in their present form. Moreover, they obviously produce unreasonable amounts of RFI through the mains line, through the air and through any (coaxial) cable connections. I'm very sorry that I own a UEC IRD, more disappointed that Optus forced Aurora customers (through their selfishly created voucher system) into buying these IRDs. I want to commend SatFACTS for taking what must be an unpopular path with your devotion to revealing the true nature of this IRD. Certainly this editorial posture is costing the magazine advertising support, and creates an opportunity for UEC and their fellow travellers to rant against the publication for their own purely selfish defensive reasons. I believe SatFACTS has followed the morally correct path, informing the industry just how dangerous, RFI noisy, and unreliable the UEC IRDs are. Hopefully UEC will realise that the longer they duck these issues the more impossible it becomes for them to admit their faults and repent without losing whatever small amount of integrity they may still have. Yes, it will cost them money to admit faults and offer no-charge modifications or repairs through authorised service centres. That is short term - longer term, their tactics dirties everyone involved in the Aurora project including engineers at Optus and sales people at Nationwide."

NS, Sydney

Why TOP225Y?

"Your series of reports on real and imagined design and operating faults with the UEC 642 has provoked lively lunch time discussion in our cafeteria. Recently an engineer brought a set specification sheets covering a range of ICs which might do the same job as the primary IC1 used by UEC; the TOP225Y in a TO-220 case. It is standard practice for engineers to second guess why certain components have been selected, most of us realise that in the end it will be a pencil pusher accountant making final parts selection within a broad framework of what will work. In that spirit, the UEC selected TOP225Y is a 100W rated SMPS IC. As such, it's internal current limiting will probably (as in almost certainly) not protect the SMPS or main board if a fault occurs. I believe the flyback transformer (XFMR 1) is highly likely to burn out if a fault drawing excess current occurs. This would have the likely effect of melting the transformer windings insulation and that in turn would be likely to make the metal case live, not with 1/10th milliamp as SF previously reported (April) but now with muscle frying, bone deadening, heart stopping amps of current. As everything about the UEC SMPS says an accountant selected the component parts because they were the cheapest available, the TOP225Y is a very strange selection. Certainly it costs UEC more money than the TOP224P/75w, 223P/50w or 224Y/31W. Has a UEC accountant confused 'Y', and 'P' series ICs when ordering?"

Charles Sampson, designer, Los Angeles

## HARDWARE EQUIPMENT PARTS

## UPDATE

JUNE 15, 2001

**Status of IRD + PVR.** Although British public was promised new Pace BSKyB IRD with in-built PVR (personal [hard drive format] video recorder) by May-June, release has now been rescheduled to "September-October." Pace delivered on time 40 Gb hard drive, twin-tuner set-top but BSKyB decided to stop release "at this time" for commercial, apparently not technical, reasons. 40Gb will hold as much as 30 hours of TV, twin tuners reportedly will allow one smart card to record one and watch a second channel - pretty swift; code name "XTV." SKY NZ which has variously promised PVR version for optional customer selection is now back to square one, claiming they have not even *selected* IRD (+PVR) supplier yet. Press story mentions "Motorola" and "Pace" as possible suppliers - Motorola has about as much chance here as you do to stumble over a \$100,000 bill on the sidewalk in the next hour.

**Smuggler's IRD.** Strong Technologies SRT 4800 twin CI receiver now has a baby brother - the SRT 3800. Both are identical in function and performance, the 3800 is however less than half the "cubic" space size of the larger 4800. Do so many homes have limited shelf space that a full redo of the 4800 is good business? *Wrong.* Smugglers complained the 4800 was too "bulky" for transporting into forbidden regions of the Middle East; seems cubic space is a big deal to these guys (picture then packing the IRDs in a canvass sack on the back of their camel). The 3800 is more profitable to smuggle - they get 3 in the same space as one 4800!

**Almost there - one.** The European bred, once high-flying and then out of business because of what were characterised as "shoddy business practices" hand held installer meter. Now back in business (in UK at least), the DSM 10 Digital satellite meter is here - in our hands in NZ. It has C and Ku transponders we specifically requested in memory, works quickly and with such simple instructions we wondered what we might be missing (nothing, it turned out). It was a shock to unpack, plug in and be reading BER (bit error rate) numbers and signal levels in less than a minute with no instruction at all. Alas, we are sworn to "secrecy" about what it does

(meaning - no review - yet) while the UK handlers sort out a few minor (we think) glitches. Stay tuned and don't be surprised if there are two or more similar handheld products offered first-time at SPRSCS 2000 in Melbourne. Ain't competition grand!

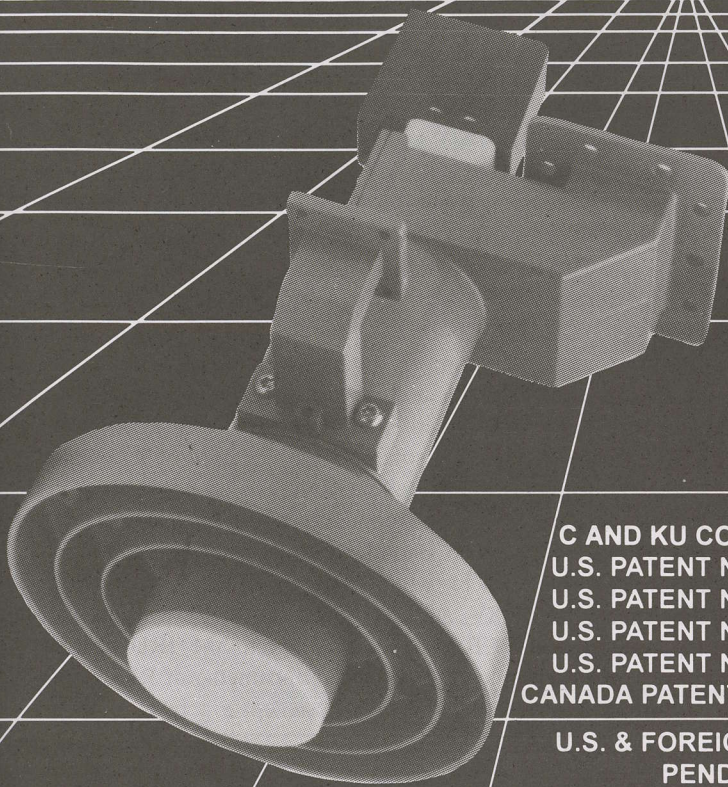
**Nearly there - two.** No SDS (satellite distribution system) update report this issue (we were optimistic in May). Our project designer (SF#80, p. 6) thought we were past basic microwave component design selection challenges - *not quite so*. When you have up to 6 separate FM TV carriers going through a single amp, the derating (power back-off) becomes significant (we knew that going in but did not appreciate how much back-off might be necessary). Motorola's 10 watt LDMOS transistors are most promising - that's 10 watts with one FM TV carrier, around 9 watts when audio subcarriers for the one TV carrier are added. Go to 6 video FM carriers each with companion audio sub-carrier are you have to derate to around 1 - 1.5 watts *per carrier*. Which is *where* we were headed initially. Meanwhile, Garry Cratt of Av-Comm Pty Ltd says he is putting together an "Asian version" of our SF conceptual L-band relay system using off-the-shelf parts which he plans to show-off at SPRSCS 2001 in Melbourne. *Gawd* this is promising to be a funtastic show!



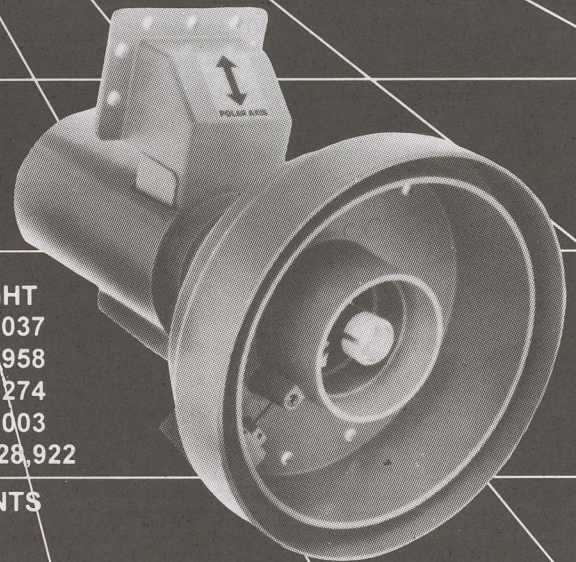




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## A Series of Field User Reports to Aid Repairs on Equipment

The UEC 642 is the most widely used single model satellite receiver in Australia, outside of the IRDs selected by Foxtel and Austar for their pay-TV operations. As SF reported in March, between 40,000 and 50,000 copies of this model are in consumer and commercial hands. In a different environment and with most any other receiver supplier, we would be awash in field assistance technical help from the manufacturer.

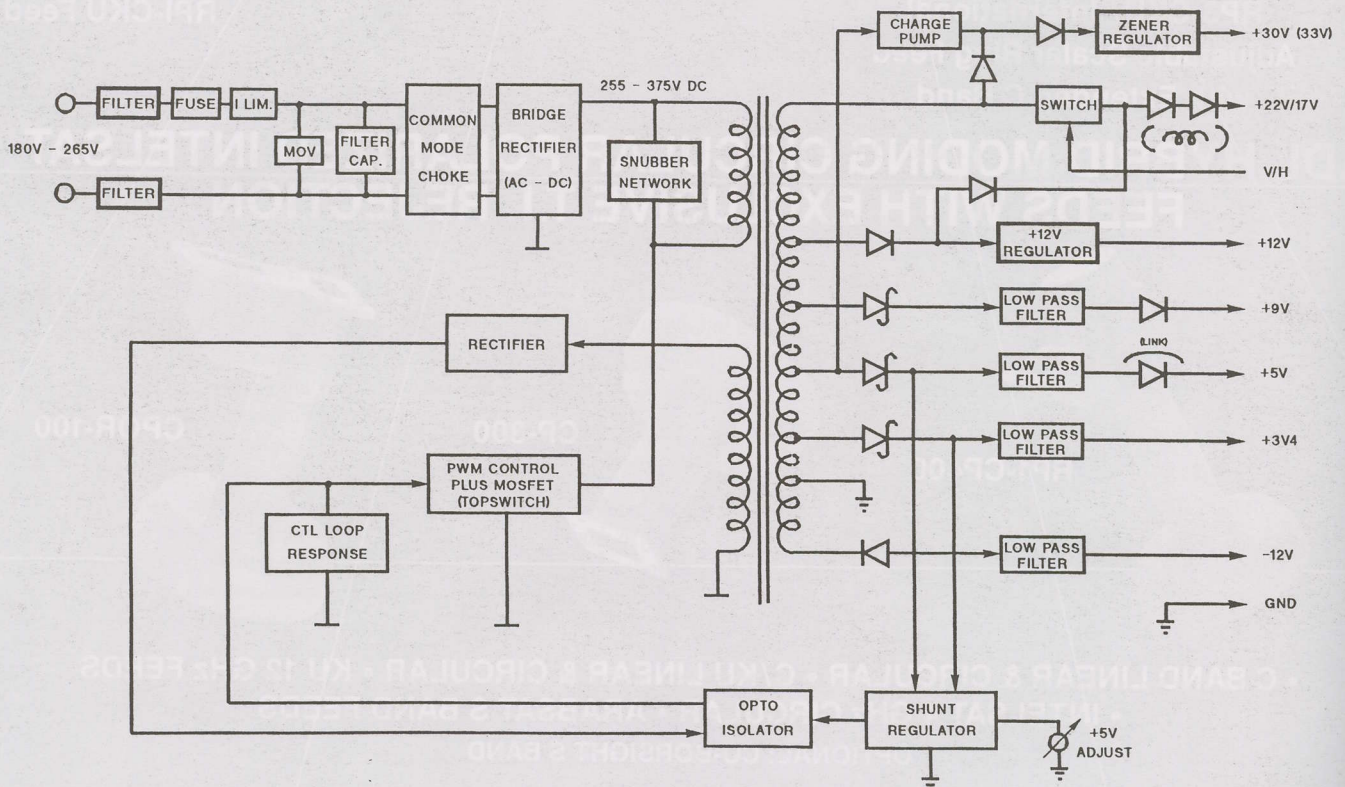
The nearest UEC and distributor Nationwide have come to offering field training was a course in August 1998 held in Sydney. Approximately 100 people attended and most left with a new appreciation for how satellite IRDs could be expected to perform under a variety of field conditions. However, this "course" was held before more than a token number of IRDs was actually in service and subsequent wide deployment of this particular IRD has produced significant data which as best we can determine has never been properly shared with the industry. It is reported Nationwide employs two full-time service personnel and a service manager for the UEC line of receivers, perhaps a monthly turn over in the region of 300 receivers for repairs or approximately 8-9% of the total 642 Australian universe annually.

The 642s are largely now out of warranty, eliminating a major reason why a defective unit would be returned over a considerable distance, at some expense, to a Brisbane service

centre. What Brisbane *might* have that you do not is experience and knowledge; it would be difficult to be involved in retrofitting more than 5,000 model 642s on behalf of Sky Channel / TAB without learning something!

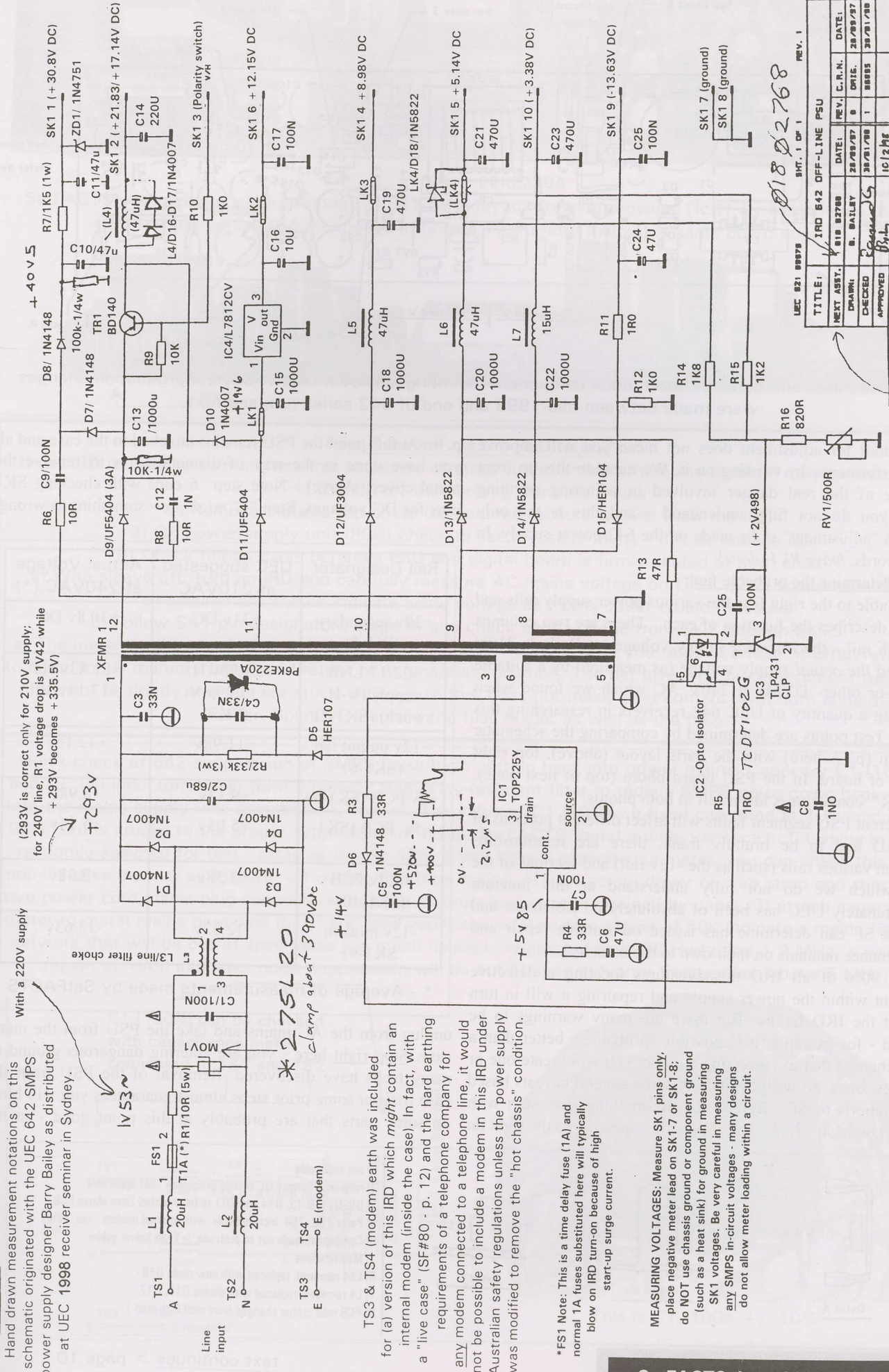
More than 90% -

Like most satellite IRD designs, the most common fault will be someplace within the SMPS (switch mode power supply) region, a self-contained circuit board. The input side is mains voltage (198-260V AC). The output consists of a series of rails: (1) 30V DC - originally 33V DC, (2) 22V/17V DC for LNB powering, (3) +12V DC, (4) +9V DC, (5) +5V DC, (6) +3.4V DC and (7) -12V DC. Subject to component value variations and uncertain AC mains inputs, some of these "rails" are controlled by a form of fixed voltage regulation (such as a Zener diode) while the +3.4V (actually 3.38V) and +5V lines have an opto isolator (IC2 - a part of automatic voltage adjustment) to ensure that both rails do not stray more than a fraction of a point around the rating (3.4V or 5.0V). The 5V rail happens to include an on-circuit-board voltage adjustment (part RV1) which can be used with care to "fine-tune" the 3.38V and 5V lines as (they) feed the all important digital PCB. *Great damage* to the IRD can be caused by indiscriminate tweaking (adjustment) of RV1 - just because it is on the board and will accept a screw driver or



IRD 642 PSU BLOCK DIAGRAM

Note: Hand notes on this drawing supplied by circuit designer Barry Bailey of UEC.  
 (components discussed in text are re-labelled; others appear as originally presented at UEC course)



(293V is correct only for 210V supply; for 240V line, R1 voltage drop is 1V/42 while +293V becomes +335.5V)

With a 220V supply

IV 53 ~

\* 275L20  
 clamp about 390Vdc

TS3 & TS4 (modem) earth was included for (a) version of this IRD which might contain an internal modem (inside the case). In fact, with a "live case" (SF#80 - p. 12) and the hard earthing requirements of a telephone company for any modem connected to a telephone line, it would not be possible to include a modem in this IRD under Australian safety regulations unless the power supply was modified to remove the "hot chassis" condition.

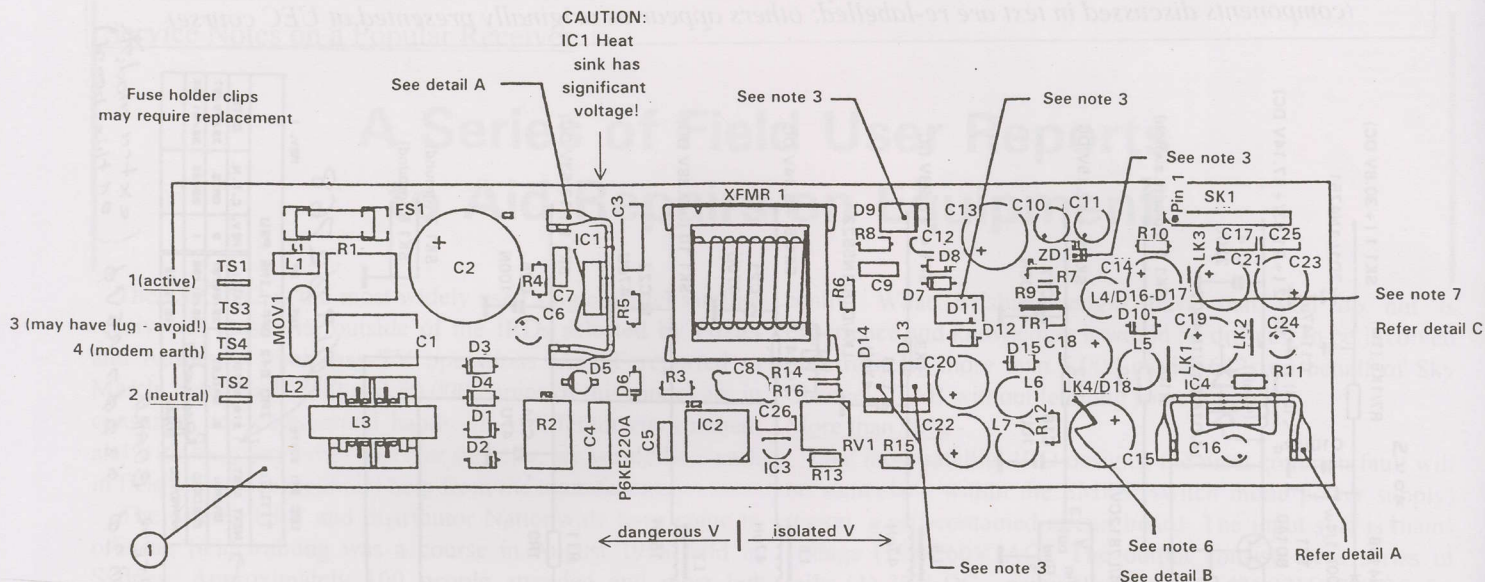
\* FS1 Note: This is a time delay fuse (1A) and normal 1A fuses substituted here will typically blow on IRD turn-on because of high start-up surge current.

MEASURING VOLTAGES: Measure SK1 pins only, place negative meter lead on SK1-7 or SK1-8; do NOT use chassis ground or component ground (such as a heat sink) for ground in measuring SK1 voltages. Be very careful in measuring any SMPS in-circuit voltages - many designs do not allow meter loading within a circuit.

018022768

TITLE: IRD 642 OFF-LINE PSU		REV. 1
REV. 1	DATE: 28/08/97	DATE: 28/08/97
DESIGN: B. BAILEY	CHECKED: B. BAILEY	DATE: 28/08/97
APPROVED: B. BAILEY	IC 2 ME	DATE: 28/08/97

LATER BOARD  
 020027 REV 0 (extra mod.)  
 on this board



Service notes and detail of unorthodox component mounting is shown below. Several production changes were made between mid-1998 and end of 642 series run; see text.

tuning tool for adjustment does not mean you will improve IRD performance by twisting on it. We mention this up front because of the real danger involved in adjusting anything which you do not fully understand - and this is the only obvious "adjustment" to be made on the 642 power supply. In other words, *leave RI alone!*

First - determine the probable fault

The table to the right lists the various power supply rails and briefly describes the function of each. There are two columns for each rail - the *intended* supply voltage (at Bailey's 210V AC) and the *actual* supply voltage (as measured by a suitable Fluke -or other- DVM) at 240V AC which we found when checking a quantity of UEC 642 receivers in researching this report. Test points are determined by comparing the schematic diagram (p. 7, here) with the parts layout (above), top right corner of board. In the PSU board photo (top of next page), the "SK" connector is lower left in both photos.

Different PSU segment faults will affect different portions of the IRD and to be brutally frank, there are relationships between various rails (such as the -12v rail) and sections of the IRD which we do not fully understand at this juncture (unfortunately UEC has been of absolutely no assistance and as best SF can determine has issued no suitable repair and maintenance manuals on their own to the industry).

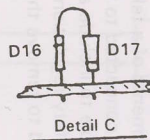
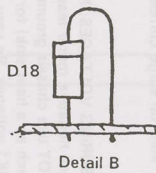
In 90% of all IRD misadventures locating a defective segment within the power supply and repairing it will in turn correct the IRD failure. But there are many warnings to be heeded - for example, it is possible (probable - better than a 50% chance) that in correcting a defect you will create one or two new ones. So we'll begin with some general caveats based upon reports to SF. Before you do anything else, start with "First Question - Is the PSU Faulty?:" appearing to the right on

p. 9. At this point the PSU remains attached to the case and all you have done in the way of dismantling is to remove the metal cover (sleeve). Note step 6 ends with checking SK1 pins for DC voltages. Step "7" *might be* - something is wrong,

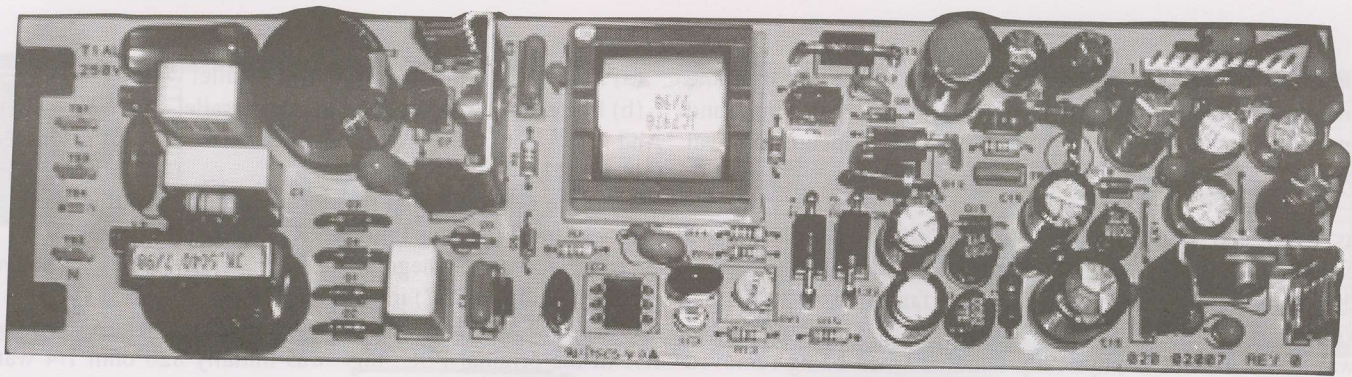
Rail Designator	UEC suggested at 210VAC	Actual Voltage at 240VAC (*)
+30v secondary (SK1-1)	+31v DC	+30.8v DC
+22/17 LNB supply (V-H switch) (SK1-2)	+21.75v Hz +17.09v Vt (SK3)	+21.83v Hz +17.14v Vt
+12v output tap (SK1-6)	+11.98v	+12.15v
+9v PCB (SK1-4)	+9.11v	+8.98v
+5v PCB (SK1-5)	+5.05v	+5.14v
+3.4v PCB (SK1-10)	+3.38v	+3.38v
-12v modem (SK1-9)	-12.32v	-13.63v

\* - Average of measurements made by SatFACTS

unplug from the AC mains and take the PSU from the metal case. Stop right here - you are entering dangerous ground as many techs have discovered. Removal of the PSU from the case *without* some prior steps almost guarantees you will blow up some parts that are probably at this point good - in the

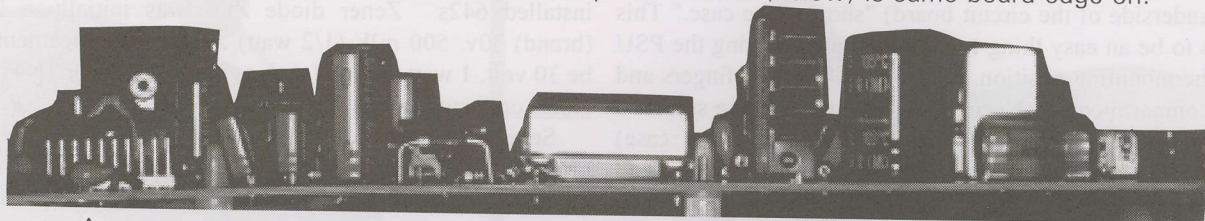


- 1) not applicable
- 2) reference factory QC testing procedure - not applicable
- 3) D9, D11, D 13, D14 and ZD1 to be mounted 2mm above PCB
- 4) Parts TS3, TS4 included only with internal modem - see notes
- 5) Component leads not to protrude > 2mm below solder ... Modifications ...
- 6) LK4 removed, replaced with new diode D18
- 7) L4 removed, replaced with diodes D16, D17
- 8) PCB mod status changed from mod 0 to mod 1.



↑ C4 + P6KE220A

SatFACTS photo above is mirror image of 642 parts layout drawing provided (left) by Nationwide during UEC training course (C4 mentioned in text, p.12) . Photo (below) is same board edge on.



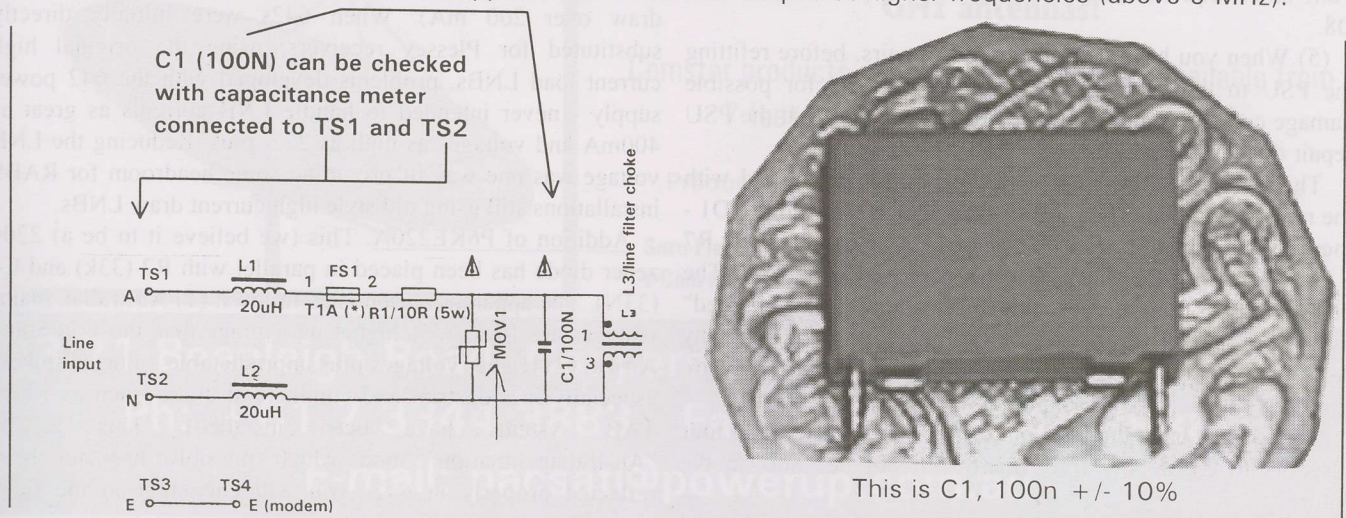
↑ SK1

**First Question - is the PSU faulty?**

If the IRD refuses to turn on, use this sequence of steps to determine where the problem may be located:

- 1) Switch off IRD, unplug from the mains
  - 2) Remove metallic top cover (sometimes called a sleeve) from the IRD
  - 3) On power supply unit (PSU) check to see if fuse is faulty - if it is, replace (a)
  - 4) Check ribbon cable between PSU and digital board is firmly seated at both ends
  - 5) With sleeve off, turn on IRD and carefully measure AC mains voltage on (TS1, TS2) spade terminals (measurement should indicate same voltage as mains outlet would measure)
  - 6) Follow SK1 pin designators (page 8) and check each voltage from SK1 through SK10.
- a/ The metal used in the FS1 fuse holder is unfortunately "soft." When you remove a fuse, it often refuses to do a "metal memory reset" and return to an unsprung position. The net effect is the replacement fuse will often not fit tightly and you are stuck with a fuse that does not make solid contact with both ends of the holder. Solution? Replace the fuse holder as well as the fuse.

Quick check of 642 suppression of SMPS noise/hash getting back into power mains: Capacitor C1 (100n) and L3 (an inductor/choke) form a broadly frequency-resonant filter to reduce SMPS noise going backwards into the mains supply (see diagram left, below). The value of C1 (100n - a fixed cap rated at 10% accuracy; 90-110n) is crucial to the proper suppression of noise. SatFACTS found a wide variance in C1 value in units randomly selected for test - often as low as 53n. If you have a capacitance meter, you can check this in a non-invasive manner as follows: (1) unplug IRD from mains; (2) use screw driver or wire strap and short the two power cord mains plug connectors together to drain any voltage retained by caps; (3) attach capacitance meter to metal mains plug pins (L, N) and read capacitance. Values in region of 50n indicate a mains filtering network that will be out of spec (pass too much noise) in region between 50 Hertz and 1-2 MHz; a value in region of 150n indicates noise suppression will be out of spec at higher frequencies (above 5 MHz).



process. Yes, even after disconnecting the UEC 642 from the mains, dangerous voltages remain "stored" in capacitors and must be discharged before you start the PSU board removal process.

Capacitors C10 (47U, 50 volt rated electrolytic), C11 (same as C10) and C13 (1000U, 35 volt rated electrolytic) are capable of retaining a charge after disconnecting the 642 from the mains (even with a fully healthy, fault-free 642). If that voltage should be shorted to the case/chassis because of the way the PSU unit is physically handled when being removed from the case, new damage to otherwise healthy components will occur. Examples: Diodes D7 and D8 will fail "short circuit" if certain circuit "tracks" (traces interconnecting parts on the underside of the circuit board) "short to the case." This happens to be an easy thing to do when manoeuvring the PSU out of the mounting position, balancing it between fingers and a tight compartment fit. Normally, allowing the trace side of a board to come into contact with the "ground" (metal case) would not be dangerous provided the circuit designers had taken steps to automatically discharge any power supply electrolytic caps in the circuit. The 642, in the interest of economy, has no such protection leaving the board vulnerable to new damage created by the technician who is removing the PSU from the case (the "live" area to be especially careful around includes C9, C10, D7 and D8). In circuits where electrolytics can be "trace-shortened" to a ground during service work and there is no designer attempt to discharge PSU caps, designers (example - VCRs) often place a thin sheet of transparent (insulating) plastic over the traces in the live portion of the circuit where shorting the traces would cause further damage.

Further, if IC1 fails or the primary on the transformer burns out, a technician would expect to find a "dead" 642. In fact C2 is left with 340V DC (at a healthy 68 uF charge) and C1 would also remain charged. Touching either would be a shocking mistake.

#### Protective step one:

- (1) Power the IRD down
- (2) Remove top cover of IRD
- (3) For 10 seconds fit a jumper from the thread of the F connector on the tuner to pin 1 on the back of the plug (connecting the SMPS to the main [digital] board), which should discharge the caps.
- (4) When working on the SMPS, use a DVM to recheck that C10, C11 and C13 are fully discharged. If they are not discharged, do so starting with C13, then C10 and finally C11 - *any other sequence* of discharging can easily destroy D7 and D8.
- (5) When you have completed your repairs, before refitting the PSU to the case, check again D7 and D8 for possible damage created in the repair process - no matter what the PSU repair done may have been.

This sub-note. Receivers which have been retrofitted with the now well known "TAB Mod" (replacing zener diode ZD1 - increasing dissipation from 1/2 watt to 1 watt - and resistor R7 - from 1/4 watt to 1 watt) can also damage D7 and D8. The caveat here is that because the electrolytics "stay charged" even after power down and mains plug disconnection, any work done on the PSU should not be undertaken until they are discharged in the C13, C10 and C11 sequence.

A fix. If you have the PSU out of the case, why not add four resistors to ensure the PSU board will not be "hot" in the future?

- (a) Place a 1/4 watt 10k resistor in parallel with C13
- (b) Place a 1/4 watt 100k resistor in parallel with C10. And C11? The 100k in parallel with C10 will also discharge C11 via R7.

(c) Place a 1.2 megohm resistor - drill holes for this, there is plenty of track (such as Philips VR37) in parallel with C1;

(d) Place a 1.2 megohm resistor - drill holes as above (another Philips VR37) in parallel with C2.

And the "TAB Mod" while you are in there anyhow. Replace R7. In the original PSU, this was initially 820 ohm 1/4 watt carbon film. A subsequent factory modification changed it to 1K5 ohm, 1/4 watt. The safe format now would be 1K5 ohm, 1 watt - based upon the unpleasant experience with TAB installed 642s. Zener diode ZD1 was initially a Lehman (brand) 30v, 500 mW (1/2 watt) zener. A replacement would be 30 volt, 1 watt region (such as BZX85/C30 or 1N4751).

#### Notes on factory mods

Several factory modifications have occurred between the original (September 1997) PSU design and later production models. You can determine the version of your on-bench unit by checking for these mods. The original circuit board (imprinted) number was 01802768; a later version PC board was renumbered 020 02007 rev 0.

D18 replacing LK4. LK4 was a #25 gauge tinned copper wire 0.5mm in diameter used to jump over tracks on the underside of the board. This was replaced with a 1N5822 (Schottky) diode - rated at 40v and 3 amps. This diode slightly reduces the 5.0 rail and contributes to the overall stability of the all important 3.4 (3.38)V rail that operates the main signal processing circuits.

L4 replaced with diodes D16, D17. The original L4 was a 47 uH power choke inductor rated at 1.77A. D16 and D17 are 1N4007 rectifier diodes rated at 1A. This change reduced the LNB voltage(s) which in the original supply ran high by as much as 1.3v. This change reduces the overall power consumption of the IRD (as measured in watts of heat) but raises conflicting opinions as to what the "standard" LNB voltages might be. Some references say 13/18, others say 14/18. On page 10 of 17 in the UEC field training manual, it refers to the standard as +12/16, clearly too low (note that training manuals distributed during UEC Sydney course did not have *actual page numbers* - we have numbered ours from front to back for reference). This would be a good point to remember that 642 digital IRDs replaced Plessey analogue receivers in the RABS exchange program - and included with a typical RABS installation was a LNB that typically drew between 300 and 400 mA (current production LNBs seldom draw over 200 mA). When 642s were initially directly substituted for Plessey receivers, using the original high current load LNBs, problems developed with the 642 power supply - never intended to handle LNB currents as great as 400mA and voltages as high as 22.5 plus. Reducing the LNB voltage was one way of providing some headroom for RABS installations still using old style high current draw LNBs.

Addition of P6KE220A. This (we believe it to be a) 220v zener diode has been placed in parallel with R2 (33k) and C4 (33N). The apparent reason is as follows: (1) Australian mains voltages are 10 to 15% higher on average than those in South Africa; (2) Higher voltages plus unpredictable voltage "spikes" especially in industrial and commercial areas (such as where TAB systems have been installed). This is an "Australian-situation" mod which possibly has not been reflected properly in 642s you will encounter in the field.

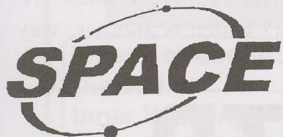


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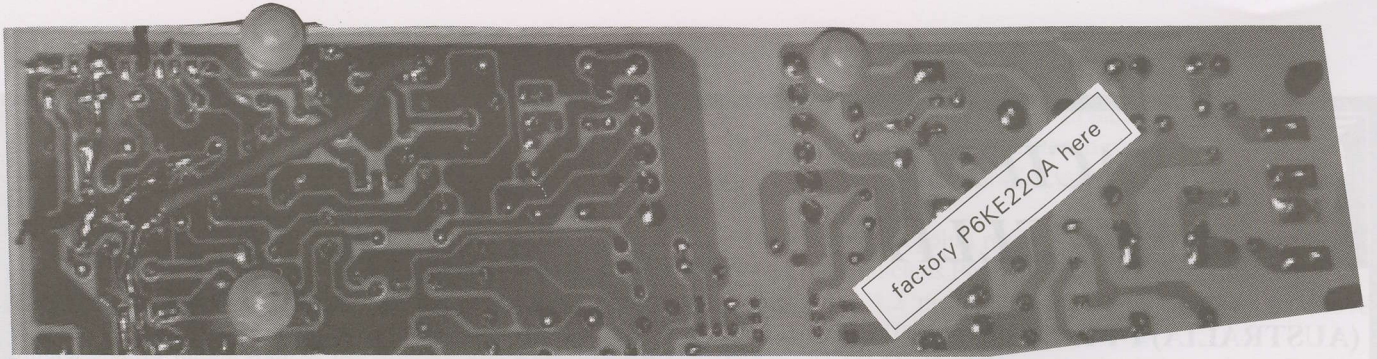
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**Removing Board from case:**

1) Outside wall of case nearest AC mains connections (T1, T2) has 2 screws; remove. 2) Plastic bracket adjacent to mains lead - remove. 3) Three (plastic) board supports (stand-offs) - two on top - near XFMR and SK1 (both marked with \*), third adjacent to IC4. Use small screwdriver to align holes in plastic supports allowing you to lever-out the board from the supports (do not force!). 4) Lift board out sideways towards AC mains connection end. 5) Remove connecting cable from SK1 to digital board at digital end, not SMPS end. 6) Read text concerning residual charges remaining in capacitors - drain to ground first!

Units with the (field or late factory) mod have diode P6KE220A tack soldered to the trackside of the SMPS circuit board; it is difficult to miss being the only component typically hanging under the board. See photo above. It is not where the factory placed it because our SatFACTS crew decided it was (one more) safety hazard stuck down there in a tight fitting sandwich between the PC board and the (grounded) metal case.

Move it. Our suggestion is you desolder the factory mod and then turn the board over. Locate C4 (see p. 9, photo top of page). Desolder C4 so it can be moved slightly to one side and P6KE220A will squeeze in parallel to C4 using the same lead holes if they are enlarged slightly. The diode sits up off the board (the original factory cut leads for reverse board mounting are long enough to do this) nicely and can be physically spaced so as to not touch C4 and R2 (this is

important for heat transfer reasons) nor the circuit board. If you will study the referenced photo on p. 9 and the indicated position of C4, you will *now* notice a diode (the P6KE220A) sitting just to the right in our preferred modification.

Other changes noted on our schematic (p. 7) include: (1) D12 is now a type UF3004 3 amp diode in place of the original 300V, 1A version - on the 9V regulated line (the 1 amp version was too light for this application). This line runs the inboard modulator through a separate onboard 5V regulator. In addition to being 5V operated (the original was 12V), the modulator finally fitted is much quieter than the original (some will recall the original modulator had unacceptable noise and trash at the output). UF5404 3 amp diodes were also substituted on the LNB and +12V lines. UF indicates normally indicates "ultra fast" which is another way of improving performance.



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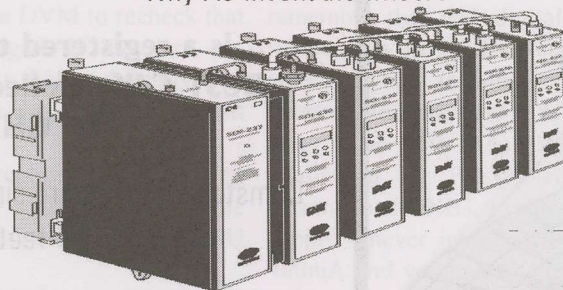
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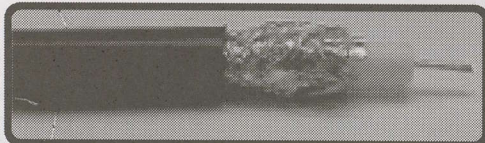
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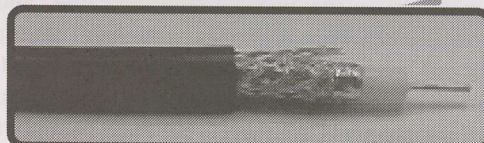
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<b>Impedence:</b>	75 Ohm
<b>Packaging:</b>	305m Quick Pull Box or 305m Reels

<b>Inner Conductor:</b>	1.02mm Copper Clad Steel
<b>Dielectric:</b>	4.60mm Foam Solid Polyethylene
<b>Braiding:</b>	0.16mm Bare Copper x64%
<b>Foil Type:</b>	Bonded Aluminium Foil
<b>Sheath:</b>	6.90mm PVC
<b>Impedence:</b>	75 Ohm
<b>Packaging:</b>	305m Quick Pull Box or 305m Reels

<b>Attenuation:</b>	dB/100 metres(20 deg. C) ±5dB			
	500MHz	1GHz	2GHz	3GHz
	-19.98	-22.808	-12.702	-8.7525

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**Test Description:**  
 Calibration was performed using a Network Analyzer to measure the Insertion Loss (S21) of the cable provided over a frequency range of 30kHz to 3 GHz.  
 Also the Return Loss (S11) at one end of the cable was measured with the other end terminated into 75 Ohm.

Markings on the cable were indentified as follows:  
 "CABLE MASTER RG6 QUAD SHIELD 75OHM".

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How much signal to the TV set?

## Cable TV - Part Two: The "drop" to the TV Sets

As described in SF#81 (May), the coaxial cable network running from headend to multiple subscriber locations carries both radio frequency (RF) spectrum and AC power. The bandwidth of the spectrum carried is determined first by the "active" segments of the cable system plant, and next by the choice of "passive" elements. An amplifier is active, a splitter is passive.

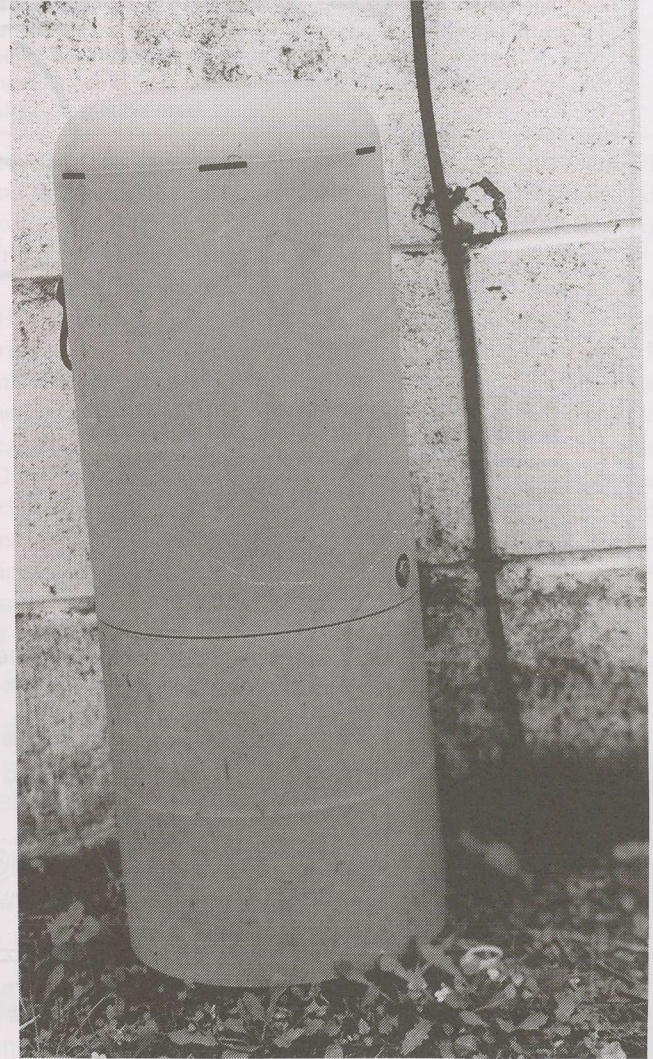
By design, the entire spectrum appears "at the street" in front of or behind each potential service residence. In budget systems the "spectrum" might be as small as 50 - 330 MHz, while in more modern systems capable of carrying more TV and data channels, it could include the region from 50 to 850 MHz.

There are three common ways to create the individual spectrum that goes into a single home. Choice one - you take all of the spectrum inside through a drop cable, and then supply the subscriber with a pre-programmed set-top box (STU) which only allows them to access a selected portion of the spectrum. This would be an "active" or "addressable" approach. All the channels are there - but the STU only allows the channels chosen by the subscriber to be viewed. In this addressable STU format, each set top unit has its own unique subscriber address (just like the conditional access IRDs for satellite television) and a computer at the cable office sends out a data stream advising each STU which channels it is authorized to display.

A variation of this places the channel selection segment of the STU in a locked box outside of the home. This prevents subscriber tampering - the full spectrum goes into the outdoor box, the STU inside communicates with the locked box outside and when a channel is chosen the inside unit asks the outdoor locked box unit to release that channel for viewing. Again, the outside portion which is the CA controller is in direct cable communication to the cable office - and it allows viewing only for those channels which the subscriber has selected.

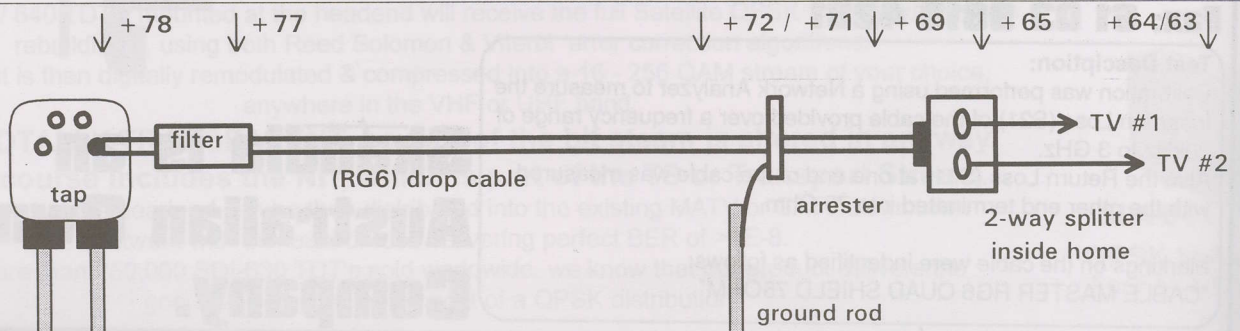
The advantage to both systems is that subscriber service levels (selection of channels) can be modified by computer control from the cable office - nobody has to roll a service truck to the subscriber's location when they decide they want a special channel or two. All state-of-the-art cable systems are now designed in this format.

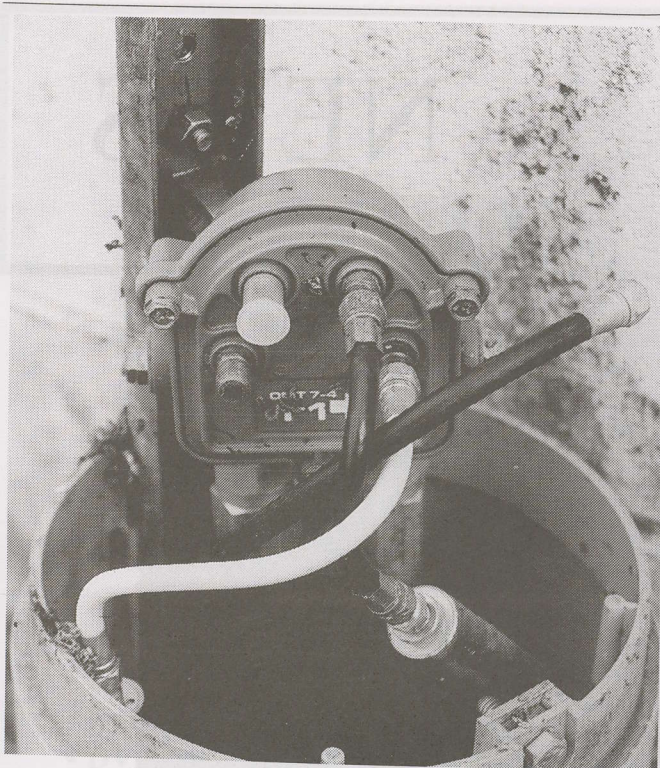
Method three is more economical, but more labour intensive for the cable operator. All of the cable spectrum appears in the



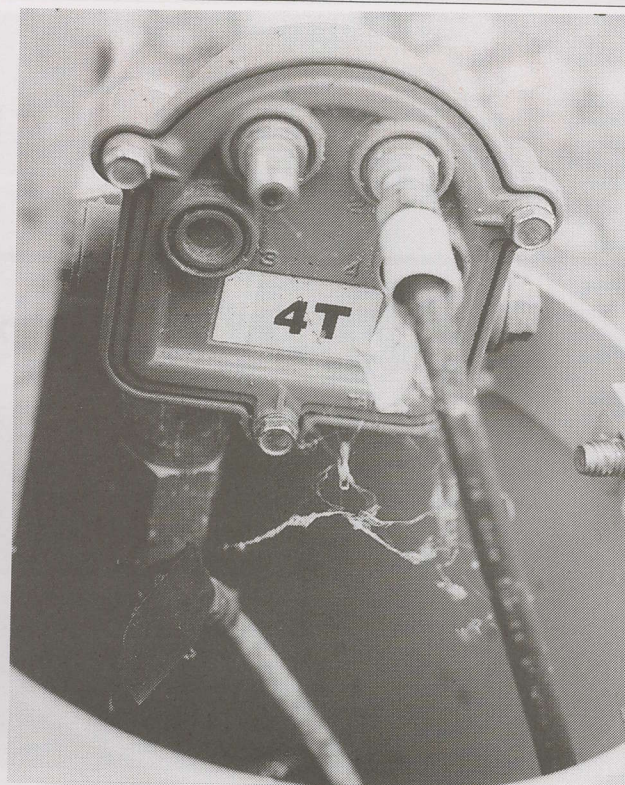
Fiberglass "pedestal" is combination weather and security cover for ground mounted subscriber attachment equipment - "the tap."

cable at the house but a "trap" or "filter" device is placed in the subscriber drop line going from street to TV set(s). The filter or trap (it can be either by design) allows a portion of the full cable spectrum to pass from the street cable line to the drop line. This is done inside of the cable firm's "locked"





Feeder line goes in (left/bottom) and out (right/bottom); 11 dB "isolation" tap has four subscriber "taps" (outlets) each of which is isolated from others (above). Filters determine which segment of the spectrum goes from tap to home (below).



At end of any line, including subscriber drop line, a (75 ohm) termination is required or highly advisable. This "4T" (4 dB, Terminating) tap goes at line end, provides 2 outputs (i.e. is a 2-way splitter) that self-terminates the 75 ohm line.

street side equipment - a typical (buried plant) pedestal is shown here. The pedestal is nothing more than a reasonably secure housing for the subscriber's tap, a location for the filter or trap, and a weather proof covering for all.

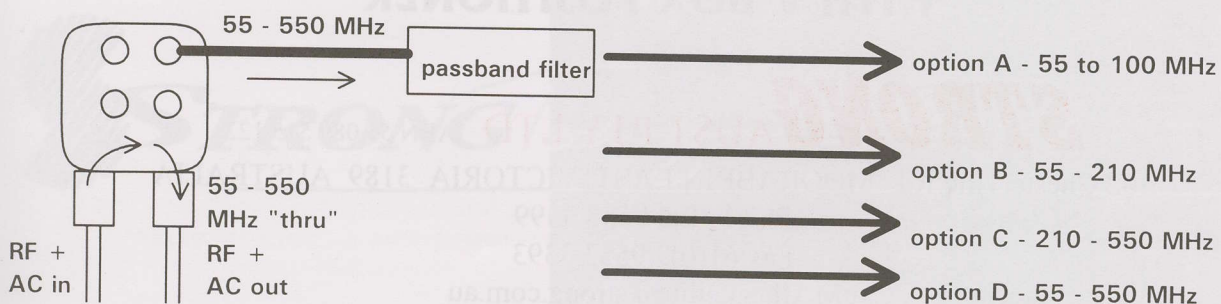
In the photo above, the master cable line goes into the bottom of the customer serving tap-off device (left hand, bottom) and then exits the tap-off through a second hard-line fitting (bottom, right in photo). Look closely - you will see two RG6 cables connected, a third hanging loose and a fourth F fitting covered with a plastic cap. Notice the round (tubular) device bottom right and the edge of another bottom left.

Not quite as obvious - the number "11" appears on the tap device (bottom, centre). This indicates that customer signal levels flowing out of any of the four F fittings will be 11 dB below (-11 dB) whatever the master line signal level is at that point. On the bottom of the page to left, we diagram signal levels from master line (left) to the eventual TV sets (right). The level of signal leaving the tap is shown as +78 (dBuV), the level leaving the filter is +77, the level entering an outdoor lightning and surge protection arrestor at the end of a street to house section of RG6 is +72 while the level into the customer

premise 2-way splitter is +69 dBuV. After split loss, an additional length of RG6 ends up delivering +64/63 dBuV to the actual TV set location. Working backwards at the beginning, if the input level to the filter is +78 dBuV and the tap is -11dB reference the master line level at that point, the master line level must then be  $78 + 11$  or +89 dBuV.

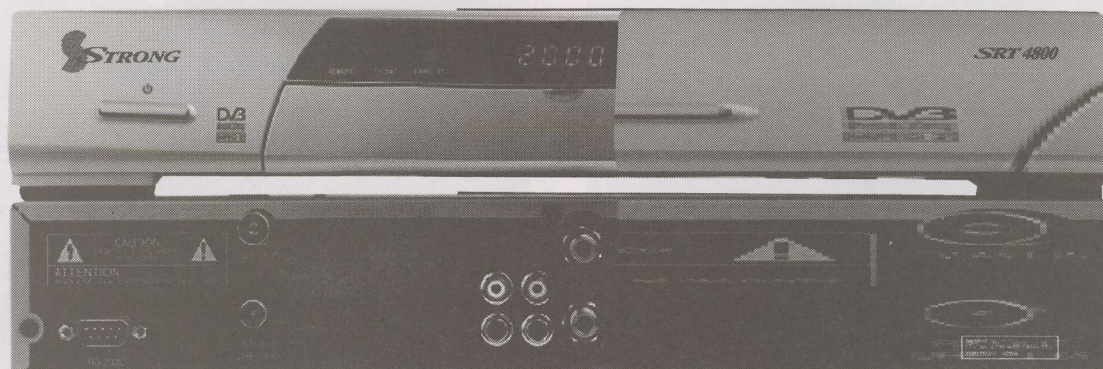
#### Termination

It is usually advisable to "terminate" any distribution line in the characteristic impedance of the line itself: 75 ohm termination for a 75 ohm line. At some point in a master line, there is an end. At this point the master line must have a 75 ohm termination (the equivalent of a 75 ohm resistor shorting between the centre conductor and the shield on the cable). In the photo directly above, this "end of line" tap marked 4T does just that. Note there is only a single master line connection - the input. There is no output because internal to the tap a 75 ohm termination is wired across the master line. "4T" means the level through the two (2) customer outputs will be 4 dB lower in level than the line itself at the end. Why 4 dB and why only two outputs? You might recall that a quality 2-way splitter divides whatever the input level might be into a pair of



June 2001

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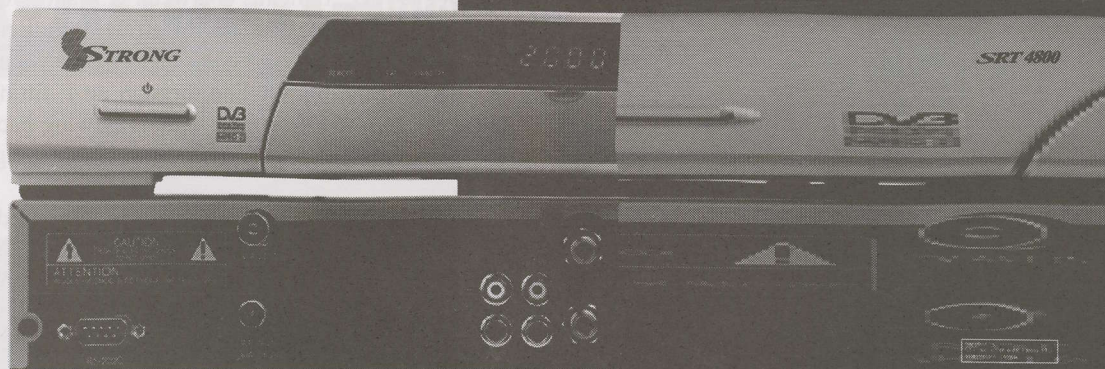
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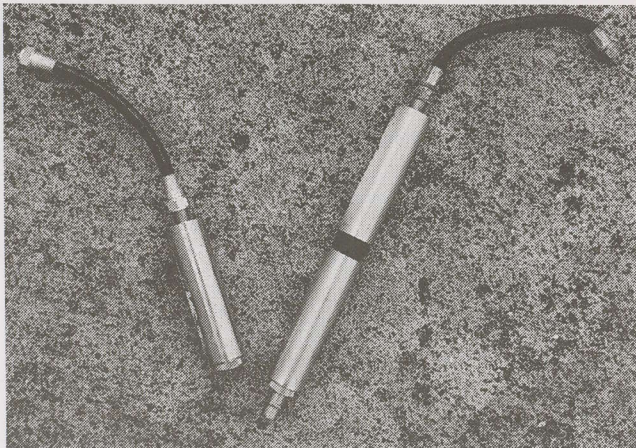


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Subscriber line "filters" stop or pass virtually any chosen selection of frequencies between 55 and 550 MHz and subscriber service level changes ("upgrades") only requires change of filter at pedestal.

equal parts - roughly 3.7 dB (4) lower in level than the actual input level. "4T" means we have the equivalent of a two-way splitter at the end of this line, terminated in a 75 ohm impedance.

What about the F connector outputs on the line taps - should they not be terminated when not in use to a subscriber TV set? This particular form of subscriber tap is known as a "directional coupler" which describes the way it is electrically designed. This means that each individual output is "isolated" electrically from all other same-tap-off location output fitting. The amount of *isolation* varies as a function of the tap-off

"number" (value) but is someplace between 18 and 42 dB. What do those numbers mean? Something happening on one of the F fitting outputs on a directional tap (such as a TV set going crazy and radiating signals back down the RG6 to the cable plant) will be isolated or reduced in (interference) level by at least 18 dB, typically between 25 and 30 dB, and sometimes by as much as 42 dB. In effect, the directional tap off is "self terminating" with reference to any unwanted signals getting back into the master line through an F fitting. Signals flow out, from tap to TV set, but signals flowing backwards to another same location tap-off point are significantly attenuated.

Bottom line? If directional couplers (as opposed to signal splitters) are used for system distribution, it is *not* necessary to place a 75 ohm terminator on unused ports. This should not be confused with the need to place 75 ohm terminators on any headend ports where 2, 4 or 8 way signal *splitters* are used on an L-band (satellite IF) line feeding multiple receivers. A cable "splitter" is not of the same quality or calibre as a cable "directional coupler."

The passive approach to controlling which portions of the spectrum are delivered to each subscriber location is economical, offsetting the higher potential labour factor. The filters (top, left) can be "pass band" or "stop band." Passband means they open up a spectrum window (such as 55 - 100 MHz or 210 - 550 MHz) for the home; stop band means segments of the spectrum "stop" at the device and do not go into the home (such as 100-210 MHz). At US\$20 each, they offer an economical approach to building different subscriber viewing packages without the expense of equipping each home with an addressable STU (US\$250 up - way up). Sources? CEC at ++1-315-452-0709 and MFC at ++1-315-438-4700.

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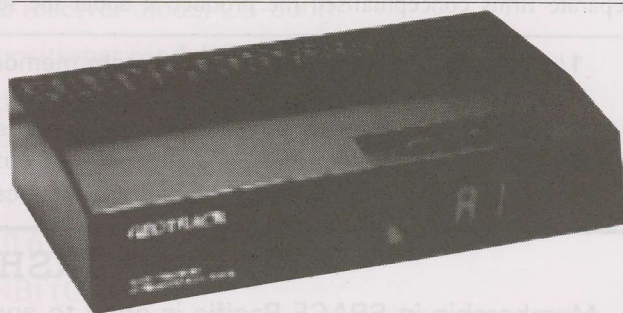
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### More on local FM broadcasting

Two versions of low power, unlicensed or simplistic-licence FM radio are available in Australia. Tourism radio, similar to a service also available widely through New Zealand, typically runs with up to 30 minute (solid state) looping audio. Solid state memory has largely replaced mechanical tapes and the uncertain life cycle of plastic recording. As most low power automated stations are left to fend for themselves, eliminating cassette tapes is a major step forward in reliability (1).

Another relatively new innovation in Australia calls itself "RadioSign." This is a palm sized FM radio transmitter with an intended range (using antenna supplied) of 100m, equipped with a self repeating endless (solid state) loop. Real Estate agents are renting the equipment for \$36 a week (plus a one time fee of \$45 to load with the sales message). A 100m range with a whip antenna suggests the transmitting power is in the region of 10-20 milliwatts. Real estate agents add instructions for tuning in the RadioSign transmitter to their visual out-front display sign. The hype surrounding the project has been considerable and this quotation illustrates:

"You are able to paint a lovely (word) picture of things in the house you can't see on the street. You can mention what it's like inside, what the backyard is like, talk about the suburb or history of the house. People might think it takes away from real estate agents, but customers are better prospects when they can ring him (her) as they are better informed."

There is some conflict over "name rights" as it appears two separate firms conceptualised the product at about the same

1/ If you are not familiar with solid state memory for audio recording and playback, check out [www.ramseykits.com](http://www.ramseykits.com) for "The Bullshooter Endless Loop Digital Voice Recorder" and the "Chatterbox Voice Storage Recorder" from Ramsey Electronics.

time; RadioSign Pty Ltd of Sydney and RadioSign Australia of Brisbane are trying to settle that matter, out of court.

The source of the RadioSign transmitters (and their availability outside the realty industry) is unknown to SatFACTS at this time. But we can direct you (see 1, below) to a full line of FM transmitter kits. Model FM100 is .3 watt and you select the operating frequency between 88.0 and 108.0 (US\$250); model FM100EX is a 1 watt version of the same (US\$329). Model FM25 is a fully frequency synthesised and available for stereo as well (US\$129). Model FM10A is .1 watt, tuneable from 88.0 to 108.0 and stereo (US\$35). Add-ons include the STC1 audio processor for broadcast spec sound on a budget (US\$60) and the previously noted Bullshooter 8 minute solid state loop (US\$100) and a shorter memory loop "Chatterbox" at US\$60. All of the elements (including FM band transmitting antennas) are in one spot and by the way - the prices given here are for build-it-yourself kits. Most of the items are also available w/t (wired and tested) as well for a modest increase in price. Moreover, most of this gear will run on low voltage DC (5 to 15V DC) and some even runs on a simple 9v battery.

One satellite enthusiast we know has assembled the low cost FM10A and uses it in a creative way. Because it is stereo, he feeds the audio from a TV channel of his choice (CNN for example) into one side of the stereo (such as left) and then feeds a second receiver audio into the right hand channel. This allows him to monitor two separate satellite TV (audio) services while moving around his and neighbouring properties. He reports, "I place one receiver in auto scan and go away from the TVRO gear. When it locates a signal and locks, the audio immediately appears in my earpiece and I know it is time to return to the satellite system to check what has been 'caught' in the scan."

As outlined in SF#81, New Zealand regulations allow 300 mW transmitters to operate within specified frequency ranges

## MEMBERSHIP IN SPACE

Membership in SPACE Pacific is open to any individual or firm involved in the "satellite-direct" world in the Pacific and Asia regions. There are four levels of membership covering "Individuals," the "Installer/Dealer," the "Cable/SMATV Operator," and the "Importer/Distributor/Programmer."

All levels receive periodic programme and equipment access updates from SPACE, significant discounts on goods and services from many member firms, and major discounts while attending the annual SPRCS (industry trade show) each year (September 27 - 29 in Melbourne - 2001).

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.



between 88 and 101 MHz (soon to be 108 MHz) provided the user complies with type accepted transmitter requirements. We published an "equipment review" of one 300 mW transmitter in May. Suppose you get hooked on being an FM broadcaster and then discover 300 mW just is not adequate?

There are two general techniques above the 300 mW level. One is full blown licensing. All NZ FM frequencies are "for sale" and after you identify a frequency which can be used by yourself without creating interference to other (FM band) users, you apply for an interim license using Radio 100 form titled "Application for Spectrum Licence." These forms are available from any of the (13) Radio Spectrum Management offices (<http://www.ram.govt.nz/ram/>). Virtually anyone with common sense can complete this 3 page (plus attachments) application without outside professional help. All licences go through an "auction" process and you will be granted a licence to operate on an interim basis until the next scheduled auction (typically around \$250 a month for the interim licence in a rural area).

There is a lesser known, *far* less expensive option called a "Low Value Licence." If your proposed station will serve 1,400 or fewer people inside its "primary coverage" region, you qualify for a long term (expires 2011) low value licence. The resource fee is NZ\$500 + GST (\$562.50) which works out to around \$56 a year. Validation of the coverage area versus number of people covered involves some research between the Department of Lands and Survey and the broadcast licensing folks ([www.rsm.govt.nz](http://www.rsm.govt.nz)). If you started out with one of the Avcom-Ramsey transmitters (inside front cover, here) and a suitable antenna, at some point between the 1 watt and 40 watt output power level the PX1 is capable of, you should hit 1,400 people in your coverage area.

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**GAWD - what a show! (see page 1)**

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## Ku feeds

As recently as 1991, virtually all satellite dishes for C or Ku (or S) bands were parabolic in shape. However, as Ku band service in Europe abruptly became very popular suppliers of hardware were caught unable to perform. The offset dish happened as a result.

True parabolic dishes (with the focus point at dead centre on the dish) in any size are difficult to manufacture and if the truth be known, not a great deal of fun to install. It is the focus point that creates all of the problems.

The offset fed dish is the result of this problem. The offset shape is as most realise a "segment" carved out of a parabolic, more shaped like a "petal" on a flower than a "dish" (1). By being closer-to-flat, offset dishes can be shipped with less container space wastage which reduces the per-antenna cost of transportation. And as most offset fed dishes are turned out in plants located in Italy and Eastern Europe, they travel by sea from the factory to their ultimate destination. As many as 3,500 65cm offset dishes will fit into a carefully engineered 40 foot sea-container.

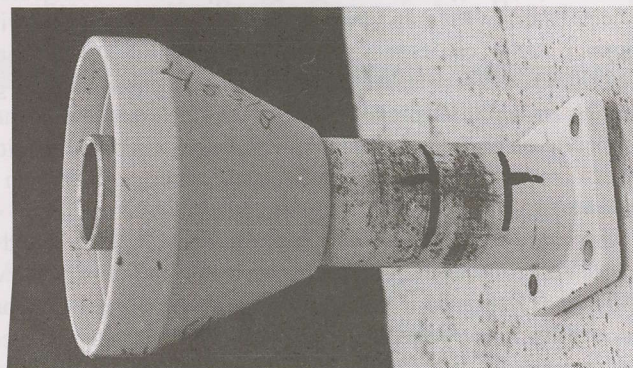
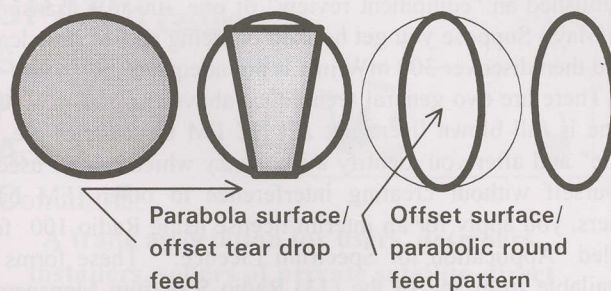
The feed for the antenna is the key element in system performance. A true parabolic (prime focus) antenna has a relatively simplistic feed structure - the feed sits in the centre at the focus point and must see equally well around the complete 360 degree circle. Alas, the offset feed sits not in the centre but near the base of the antenna. For the prime focus design, the distance from the centre of the feed to any point on the dish is uniform. For the offset it is as much as 63% further from the feed to the top of the offset petal as it is from the feed to the nearest segment of dish surface. And you have to but look at an offset dish to quickly see the height is greater than the width (but - *surprise* - only by a few percent).

Now an eye opener. There is only one formula for a parabolic antenna. Yes, there can be some variations (the f/D for example) but these don't directly effect the formula. This is not true with the offset design. For example, some very clever people have recently produced offsets that do two or more satellites at different locations without moving the dish. And this brings us to the feed.

If the dish surface is not circular then the feed must be designed so it "sees" (traces a pattern) which approximates the shape and size of the dish surface. If the feed is located near the bottom of the reflector surface and the surface is

- 1) Offset shape is dictated by shipping requirements. The closer the surface comes to flat, the easier it is to stack more into a fixed shipping box such as a sea container. Thus the ideal offset would be totally flat like sheets of paper!

Parabola surface



Ku band with offset insert (centre)

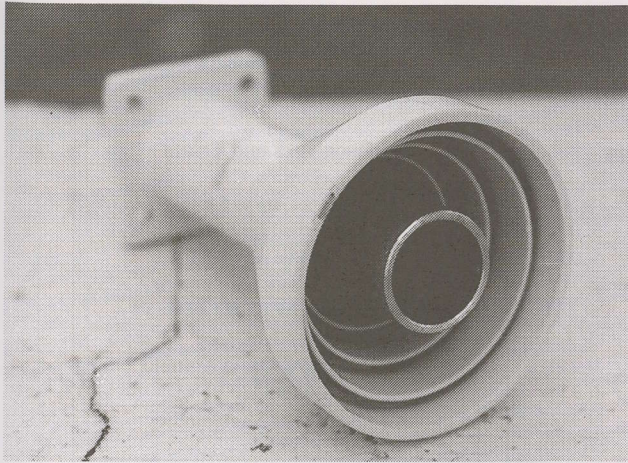
taller than it is wide, correspondingly the feed must "see" or trace more of a rectangle than a circle. In other words - the feed must emulate the antenna surface before it.

So what happens if you take a feed optimised for an offset dish and stick it at the focus point for a prime focus (parabolic) dish? The feed stills "sees" a rectangle out in front - and that rectangle is represented by being a *portion* of the parabolic surface. In other words, the feed traces a pattern that includes only a *segment* of the true parabolic dish. And it misses whatever signal as there may be coming from the area outside of the rectangle.

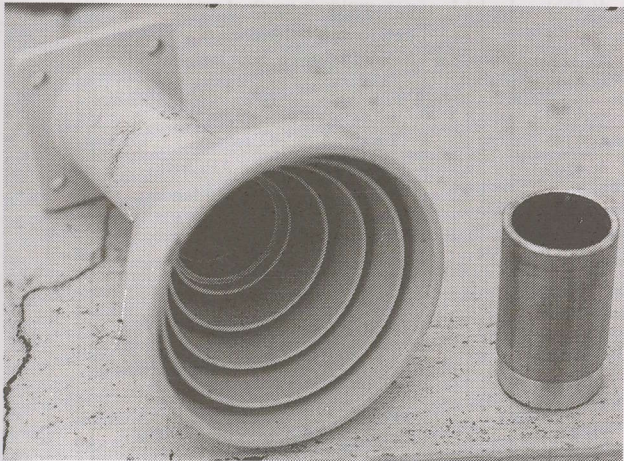
There is more. As the offset-optimised feed also sits closer to the bottom of the offset dish than to the top, it's "vision" is more like being nearsighted towards the bottom and far sighted towards the top. This produces a demand for a teardrop shaped feed pattern, fatter at the top than at the bottom. So our rectangle is more like a triangle with a fat head than a rectangle.

The photos here show a common (Taiwan built) feed which is a compromise between being optimised for offset or prime focus. The round tubular item inserts when you use this feed for an offset dish, comes out for prime focus.

As a practical matter, trying to use the offset format for prime focus is more harmful than vice versa. If you cannot get inside the mouth to inspect the design, there are clues. For example, with the tubular mouth in place (as for offset) and in use for prime, when you rotate the LNB + feed to peak for best polarisation match, you will find two distinct peaks - as you would expect. But one of the peaks will be 2-5 dB stronger than the other. Why? Because in one position the feed's narrow tear drop portion is down at the bottom (as it should be on an offset) and in the other position - 180 degrees different - it is at the top of the dish. Normally with a designed-for-prime-focus feed you will find two, equal, peaks 180 degrees apart as you rotate the LNB plus feed assembly. If the performance is not essentially the same after rotating the LNBf probe 180 degrees, you have the wrong feed for the reflector surface.



Offset waveguide inserted (above) and feed in prime focus (parabola) mode (below).



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## SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 June 2001

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	3676/1474H	1	2/3	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)
	Alpha TV	3430/1720H	1	3/4	3(.254)
	PTV1	3424/1730V	1	3/4	3(.333)
	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)
	Kairali TV	3699/1451V	1	3/4	3(.184)
ST1/88E	Taiwan Bqt	3509/1641H	13	3/4	23(.450)
Yam1/02/9	Tumen TV	3578/1572L	1+radio	3/4	4(.355)
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 Sing	3907/1243H	1	3/4	5(.632)
	Hubei/HBTV	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	3760/1390H	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	3900/1250V	5TV	7/8	27(.895)
	Star TV	3940/1210V	12(+)-TV	3/4	26(.850)
	CNNI	3960/1190H	6(+)-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 (was 2/3)	15(.000)
	ESM/unknw	12(.600)	unknown	5/6	30(.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)
	Ch NewsAsia	4071/1079H	3	3/4	14(.060)
	Anteve	4055/1095V	1	3/4	6(.510)
	MMBM	4000/1150H	11TV, radio	3/4	26(.666)
	ETV Shop	3790/1360H	1	3/4	3(.050)
	MMBM#2	3760/1390H	11TV, radio	3/4	26(.666)

### Receivers and Errata

PowVu, CA
Tests, promos, <b>up to 5 chs FTA</b>
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
Greece SCPC-OK in Australia
FTA, also 3420 PTV3
FTA (reaches SE Australia)
FTA
SCPC, testing MPEG-2; OK E. Aust.
SCPC, stronger than 3910 above
MCPCC, <b>sometimes FTA</b> , 2 adult chs unlikely south of eqtor
CA but occ. FTA
FTA (TV5 teletext); now includes RTPi occasional feeds, <b>some FTA</b> MPEG2
FTA SCPC, teletext
FTA SCPC, teletext
FTA SCPC, radio APID 81
FTA: #1 Mongolian, #2 Mandarin
Mostly CA; <b>some FTA</b>
<b>FTA &amp; CA</b>
FTA; up to 20 radio channels; SA format
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. <b>FTA</b> , not same as Aust. version
FTA SCPC, + radio
CA and <b>FTA</b> SCPC to Sydney; erratic
FTA SCPC
FTA SCPC, + radio
FTA SCPC + radio
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 MCPCC
Mediaguard CA, <b>ch 8 FTA sometimes</b>
PowVu but FTA at this time
FTA SCPC; reported audio problems
includes TECH TV from USA, both FTA
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DV211, Zenith) + <b>1 FTA</b>
PAL, NTSC, 1 ch CA
Most recent addition-NDS CA as above
PowVu CA; CNN + Cartoons, occ <b>FTA</b>
NDS CA + <b>info card FTA</b>
"History Channel" testing SCPC
was analogue; now FTA MCPCC
June 15th-reload with new PIDs
Reported WA and Qld
NDS CA using RCA/Thomson, Pace IRDs
FTA SCPA; NT only
CH News Asia FTA; VPID 33, APID 34
FTA SCPC; NT only
CA, subs available, sometimes <b>FTA</b>
FTA SCPC
CA, subs available - <b>10 radio</b> typ. <b>FTA</b>

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(C2M/113	<b>RCTI</b>	3475/1675H	1	3/4	8(.000)
JcSt3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)
MeaSat 2	Astro Mux	11.477H (+)	up to 7TV	7/8	30(.000)
Op 3/156	<b>Mediasat</b>	12.336V/T2	6TV, 3ra, Inter.t	2/3	30(.000)
	Aurora	12.407V/T3		2/3	30(.000)
	Aurora	12.532V/T5	Inc Zee TV	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 1/160	<b>ABC NT fd</b>	12.260V	1TV, 3 radio	3/4	5(.026)
	<b>ABC feeds</b>	12.317H	1	3/4	6(.980)
	<b>Central 7</b>	12.354H	1TV	3/4	3(.688)
	<b>Imparja mx</b>	12.360H	1	3/4	5(.424)
	<b>Mediasat#2</b>	12.406V	up to 6 TV	2/3	30(.000)
	<b>Mediasat#3</b>	12.424H	3+ TV	2/3	19(.800)
	<b>Nine Net</b>	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	TARBS3	12.326H	13TV + radio	3/4	28(.067)
	TARBS	12.526H	13TV + radio	3/4	28(.067)
	TARBS2	12.606H	13TV + radio	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)
	<b>CNBC HK</b>	3900/1250H	up to 7TV	3/4	27(.500)
	Filipino Bqt	3880/1270V	up to 9 TV	3/4	28(.700)
	<b>Tzu-Chi TV</b>	3850/1300H	up to 4	3/4	13(.240)
	Arirang 2	3815/1335V	1	3/4	4(.400)
	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)
	<b>Feeds</b>	3966/1184V	1	2/3	6(.620)
	<b>Feeds</b>	3957/1193V	1	2/3	6(.620)
	<b>Aust-feeds</b>	3942/1208V	1	2/3	6(.620)
	<b>Feeds</b>	3929/1221V	1	3/4	10(.850)
	<b>Feeds</b>	3912/1238V	1	2/3	6(.620)
	<b>Feeds</b>	3898/1252V	1	2/3	12(.000)
	<b>Middle East</b>	3836/1314V	4 typ (+ more)	3/4	13(.331)
	<b>Feeds</b>	3803/1347V	1	2/3	10(.322)
	BBC +	3743/1407V	3	3/4	21(.800)
	<b>CCTV Pv</b>	3716/1434V	5 typical	3/4	19(.850)
	<b>Feeds</b>	4040/1110H	1	3/4	10(.850)
	KBS/Korea	4026/1124H	1	3/4	5(.062)
	<b>7th DyAdv</b>	3872/1278H	1	3/4	6(.620)
	<b>Feeds</b>	3868/1182H	1	2/3	6(.620)
	<b>Feeds</b>	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)

Receivers and Errata
FTA SCPC, Australia OK
PowVu, some FTA (ch # 1,3)
CA & FTA Ntsc: Japan, Taiwan
some FTA reported June 01
FTA, CA - new chs June-reload
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
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
inc. 'Power TV' - Chinese
CA, Korea
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 sport feeds
PowVu(FTA) occ. feeds
PowVu (FTA) occ. feeds
Pv FTA, testing Irdeto; was 3778V
PowVu (FTA) occ sport feeds
<b>BBC FTA</b> , 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 3863, Sr6.110
FTA-typ. NTSC-occ. sport, shuttle
(PowVu) CA+FTA

SatFACTS Digital Watch: Supplemental Reference Data / June 2001

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	occ feeds	3776/1374H	1 typ	3/4	5(.560)
	<b>Korean Bqt</b>	3762/1388H	up to 3	3/4	11(.570))
	Satcom 1-6	3743/1407H	up to 5	7/8	19(.465)
<b>1702/176E</b>	AFRTS	4177/973LHC	8TV, 12+radio	3/4	26(.694)
	<b>RFO Poly</b>	4027/1123L	1TV	3/4	4(.566)
<b>1701/180E</b>	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	4178/972RIIC	1	3/4	5(.632)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)
	TVNZ/feeds	4161/989RHC	1	3/4	5(.632)
	<b>RFO-Canal+</b>	4086/1064L	4TV, radio	5/6	13(.347)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)
	<b>TVNZ feeds</b>	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)
	<b>Ioarana</b>	3772/1378L	1	3/4	4(.566)
	TVNZ	3846/1304R	1	3/4	5(.632)
	10 Australia	37691381R	4	7/8	20(.000)

Receivers and Errata
occ feeds, typ FTA; also Sr 5.600
Korean MUX, reload June 01
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 feds, typ ca
DMV/NTL early version, occ feds, typ ca
DMV/NTL early version, occ feds, typ ca
DMV/NTL early version, occ feds, typ ca
DMV/NTL early version, occ feds, typ ca
east hemi 20.5 dBw, to be 15.5
DMV/NTL early version, occ feds, 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. Reviews 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 Panast (SA), very similar to Panast 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 Irdets 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 CAM+software upgrade. Out of production; Skandia 61-3-9819-2466  
**Strong SRT 4600.** SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. 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 June, 2001

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

BIRD/ Location	RF/IF & Polarity	Service	Errata
<u>I703/57E</u>	3808/1342R	Udaya TV	
	4052/1098R	WorldNet	VOA subscr.
	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	

BIRD/ Location	RF/IF & Polarity	Service	Errata
(As2/100.5E)	3885/1265H	WorldNet	VOA subscr
<u>Exp. 9/103E</u>	3675/1475R	RTR	inc +/- 2.6
	3875/1275R	Vrk Apt	
<u>As3S/105.5E</u>	3640/1510H	Asia Plus	China, 6.6
	3660/1490V	Zee TV	was 3980
	3680/1470H	CETV	
(temp FTA)	3800/1350H	Star Sport	NTSC
(temp FTA)	3840/1310H	Channel [V]	NTSC
(temp FTA)	3920/1230H	Phoenix Ch	NTSC
	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	
	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. +/- 5.3
	3875/1275R	feeds, tests	
<u>LMAP2/142.5</u>	3675/1475L	RTR Moscow	+/- 3.5 deg.
<u>Gorizont 33</u>	3675/1475R	tests	+/- 1.3 deg
	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

## BANDSCAN: Thaicom 2/3 Analysis

Thaicom 2 and Thaicom 3 are in an unusual formation fly together as two separate but related satellites. The original Thaicom 2 had a very limited C-band capability, the result of being sandwiched in between numerous fully loaded C-band birds (either already in operation or planned). Thaicom 3 corrected this defect by using so-called "expanded C-band" with most of its operation below the normal 3,700 MHz (3.7 GHz) frequency boundary (normal C-band is 3,700 to 4,200 / 3.7-4.2 GHz). Because C-band LNBS have a normal LO (local oscillator) frequency of 5,150 MHz (5.15 GHz), the mathematics of creating L-band frequencies works as follows: 5,150 - 4,200 = 950 MHz IF while 5,150 - 3,700 = 1450 MHz. With the creation of expanded band LNBS (functional in the region 3.4 to 3.7 GHz in addition to the normal 3.7-4.2 GHz), the mathematics of creating L band becomes: 5,150 - 3,400 = 1,750 MHz - 1.75 GHz.

All of this is important because to achieve proper performance in the expanded (3.4 - 3.7 GHz) C-band region, both the LNB and the feed attached to the LNB have to be capable of performing below 3.7 GHz. Not all do with suitable service levels although most will "sort-of-work" with decreasing sensitivity and performance the further below 3.7 you go. Of course you also need a L-band receiver (satellite digital and or analogue) capable of working in the 1450 - 1750 MHz region.

What makes Thaicom 2/3 interesting is their "cheap approach" to providing satellite relay services. They are well known to "deal" with services, offering 3 to 6 months of no charge satellite transponder space with a contract that collects more money at the end than in the beginning. This attracts small-time, first timers to satellite. It also creates a revolving door scenario where services that are ill conceived or under funded (or both) get onto Thaicom 3 for an initial period of time and then after their "free period" is up, disappear. (Actually Optus allows a similar 90 day trial and PanAmSat offers 90 day delayed billing).

Thaicom 2 is primarily a SE Asia (i.e., bore sight Thailand) C-band + Ku band bird. It is seldom seen beyond SE Asia. Thaicom 3, however, gets out well when using their "Global" (as in - all directions with equal signal power), and less well (for areas south of the equator) when using their "Asia beam." At 78.5E, Thaicom 3 makes it with good "Global" signal levels as far east as the

Australian Tasman Sea/Coral Sea coasts to dishes often as small as 1.6m in size.

**3412Vt/TV Maldives**, MPEG-2 FTA/Sr 6.312, 1/2; VPID 512, APID 650, Asian beam.

**3420Vt/PTV Channel 3**, MPEG-2 FTA/Sr 3.333, 3/4; VPID 308, APID 256, Asian beam.

**3424Hz/Korean Central TV**, MPEG-2 FTA/Sr 3.366, 2/3, VPID 308, APID 256, **Global** beam.

**3424Vt/PTV-1**, MPEG FTA/Sr 3.333, 3/4, VPID 308, APID 256, Asian beam.

**3430Hz/Alpha TV**, MPEG-2 FTA/Sr 3.254, 2/3; VPID 308, APID 256, **Global** beam.

**3448Hz/TVK**, MPEG-2 FTA, Sr 6.312, 1/2; VPID 308, APID 256, **Global** beam.

**3451Vt/Raaj Plus-Raaj TV**, MPEG FTA, Sr 6.667, 3/4; VPID 512 & 513, APID 640 & 641, Asian beam.

**3470Vt/ETC - Entertainment TV**, PAL analogue, audio 6.60 Hindi, 7.02, Asian beam.

**3472Hz/Reminiscent TV**, MPEG-2 FTA, Sr 13.333, 2/3; VPID 512 & 513 & 514; APID 640 & 641 & 642, Asian beam.

**3536Vt/Jain TV**, PAL analogue, audio 6.80 Hindi, Asian beam.

**3551Hz/RR Satellite**, MPEG-2 FTA, Sr 13.333, 3/4; V257-A258 (TRT International), V2049-A2050 (3ABN) + radio, **Global**.

**3554Vt/Channel Guide +**, MPEG-2 FTA, Sr 13.333, 3/4; V512 & A 640 (Channel Guide), V513 & A 641 (ATN Music), Asian.

**3585Vt/Suprabhat +**, MPEG-2 FTA, Sr 26.666, 3/4; V512 & A 640 (Suprabhat), V513 & A 641 (Bloomberg Asia); V514, A 642 (Sanskar); V515 & A 643 (Prabhat); V516 & A 644 (SNTV); V517 & A 645 (Tara Bangla); V518 & A 646 (Tara Punjabi); V519 & A 647 (Tara Marathi); V520 & A 546 (Tara Gujarati), Asian beam.

**3600Hz/Thai Global Network +**, MPEG-2 FTA, Sr 26.667, 3/4; V512 & A 650 (Thai Global TV); V2944 & A 2945 (Maharisi Open); V514 & A 670 (Gujari Channel); V515 & A 680 (Lashkara Channel); V516 & A 690 (Aastha Channel); V518 & A 710 (VTV4); V513 & A 660 (ATN Bangla); V522 & A 750 (DD World); V521 & A 740 (CMM Music); V519 & A 720 (ATN World); V520 & A 730 (Anjuman TV), **Global** beam.

**3616Vt/ETC Channel Punjabi**, PAL analogue, audio 6.60 Punjabi, 7.02, Asian beam.

**3634Vt/Lashkara Channel**, PAL analogue, audio 6.60 Punjabi, 7.02, Asian beam.

**3640Hz/Unitel Hellas (Greece)**, MPEG-2 CA (1 FTA), Sr 28.063, 3/4; V513 & A 641 (Mega Cosmos-FTA), **Global** beam.

**3666Hz/MRTV (Myanmar)**, MPEG-2 FTA, Sr 6.000, 2/3; V308 & A 256, **Global** beam.

**3676Hz/various feeds**, MPEG-2 FTA, Sr 2.170, 3/4, **Global** beam.

**3695Hz/Sky (Australia) Racing**, MPEG-2 CA, Sr 5.000, 3/4, **Global** beam.

**3800Vt/DD Punjabi**, PAL analogue, audio 5.50, Asian beam.

**4155Vt/DD12 for Jammu & Kashmir**, PAL analogue, audio 5.50, Asian beam.

## 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 June 17** - Show 9910, 0200-0300 UTC (1400 NZ, 1200 AEST, 0900 Western Australia; repeats 0700 UTC/7PM NZ, 5PM Sydney, 2PM Perth). **Sunday June 24** - Show 9911, same times as June 17; **Sunday July 1** - Show 0012, same times as June 17; **Sunday July 8** - Show 0013, same times as June 17; **Sunday July 15** - Show 0014, same times as June 17; **Sunday July 22** - Show 9901, same times as June 17; **Sunday July 29** - Show 9902, same time as June 17. (\* - Mediasat may pre-empt showings, check other bouquet channels - if not on 3.) 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.kwikcopy.co.nz>). SPRSCS 2000 sessions taping scheduled for play on Mediasat 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 IKUSI ANZ contributed funds for completion of 9910. If interested in sponsoring future shows, contact Bob Cooper at skyking@clear.net.nz (64-9-406-0651).

\* - Note: Mediasat Sunday feed loads have increased and the first showing (0200UTC) may be "bumped" to accommodate other clients. The 0700UTC feed typically is not bumped and would be the better choice if taping for later review.



# WITH THE OBSERVERS

## AT PRESS DEADLINE

D. Leach (NSW) reports unmodulated carrier PAS10 tests from 72E (temporary location - will be 68.5E) between 3764-3879 variously Hz & Vt. ApStar 2R 3846Hz, Sr 10.2300, 3/4 TVB Asia, MATV Asia. Boomerang swan song - PAS-8 Australian Ku no longer carrying CNNI, CNNfn, only ESPN and Animal Planet.

**AsiaSat 2/100.5E:** "EBU ASB1 on 3944Vt, ASB2 on 3954Vt with Sr 6.110, 3/4 are MPEG-2/4:2:2" (B. Boyd, Australia).

**AsiaSat 3/105.5E:** Star-TV's specific seven channel English language package for Hong Kong shut down 10AM HK time May 30. Estimated 4,000 IRDs purchased by consumers are being bought back by Star at original purchase price. Grey market Zee TV and Thai Ku packages are being used as replacement - Thai service happens to carry some of the original English HK service channels. Only HK location IRDs are affected by this - other non-HK receivers on As3 continue to play. "Have found Ku band service 12.600, Sr 30.000, FEC 5/6 which loads as 'ESM' but appears to be CA or nothing is here - a first from Australia?" (D. Pemberton). "Also seen here in Perth" (A. Zapara). "Hallmark Asia tested briefly - 1 day - 3900Vt after Alive TV shut down" (B. Boyd, Australia). "Zee TV channels 4135Vt have changed PIDs and may require reloading now" (B. Boyd, Australia)

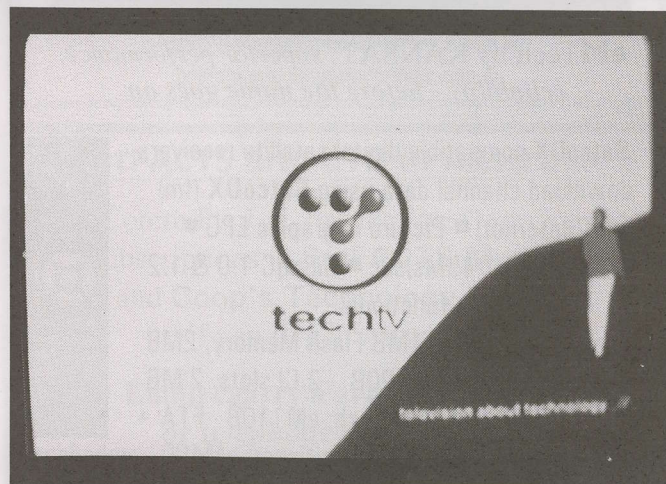
**InSat 2E/83E:** "Kairali Channel again on 3699Vt, Sr 3.184, 3/4" (D. Leach, NSW). "AsiaNet Global tests 3687Vt, Sr 4.390, 3/4 V4130/A4131" (B. Boyd, Australia)

**Intelsat 701/180E:** "Disturbing downward spiral in Canal+ 11.610Hz package here on 3m dish and high grade LNB + feed. Contacted Intelsat who believes all operating parameters normal, BT which says no change in boresight. Something surely has happened as our P5 is now P3 and it is not my installation!" (Francis Kosmalski, Auckland)

**MeaSat 2/148E:** "11.477Hz, Sr 30.000, 7/8 may have FTA VPID 161/APID 84 Hallmark Ch Asia plus V168/A112 (Filipino) RPN9" (B. Richards, Australia).

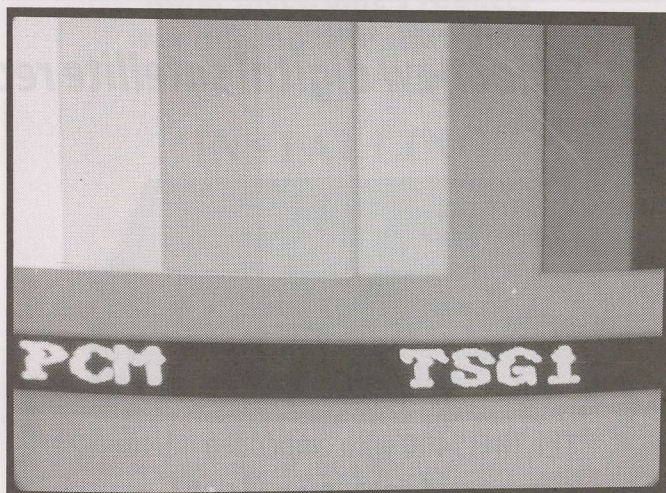
**Optus B3/156E:** Finally happened and you need to reload this service (p. 31). "TV5 Asie, RTPi have joined MediaSat 12.336Vt bouquet (Sr 30.000, 2/3)" (B. Richards + many others) SPACE Pacific Report will continue to be seen Sundays on channel 4 in this mux. Aurora 12.532Vt Indian Reminiscent channels leaving air - Lashkara and Gurjari now gone.

**Palapa C2M/113E:** "4071Hz Mux changes - Sr 14.060, 3/4 with CNA VPID 33, APID 34, CNBC V1057/A1058 + possible data channels as V2081/A2082 - V3105/A3106 - V4129/A4130, V5153/A5154 and V6177/A6178" (B. Richards, Australia). "SPACE TV packages (3760 and 4000Hz), usually CA but occasionally FTA - with radio FTA at all times - have had corporate business rename - now MMBN" (Ken Kasjon, Taiwan).



Fascinating content for anyone into computers and home electronics. "techtv" on AsiaSat 3S, FTA, 3760Hz, same bouquet as NOW TV.

Watch this space (below) - also As3S 3900Vt, Sr 26.895, 7/8 which ALIVE-TV vacated late in May.

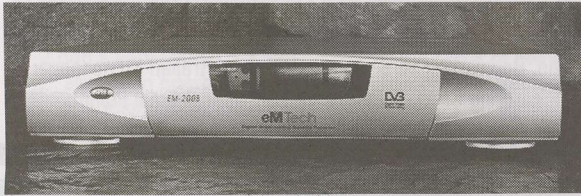


**PanAmSat PAS-2/169E:** "Major shakeup of content in Korean mini-bouquet 3769Hz: Sr is now 11.570, 3/4 - KBS-TV is now VPID 33, APID 356, YTN is V049/A052, Service 5 is V081/A084 while V3601/A3605 is CA" (Jacko, Australia, others). "Best motorsport feeds I've found - 3929Vt, Sr 10.850, VPID 0308/APID 0256" (Jacko, Australia). "Soccer feeds 3803Vt, Sr 10.322, V1110/A1211 - loads as '9M(JT#2)'" (Jacko, Australia). "ART-A1 Jazeera has started

**WITH THE OBSERVERS:** Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for July 15th issue: July 4 by mail or 5PM NZ July 6th if by fax to

64-9-406-1083 or Email skyking@clear.net.nz.

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within California Bouquet 3901, Sr 30.800, 3/4 with VPID 1160/APID 1120, in PAL - FTA initially" (D. Pemberton, Australia).

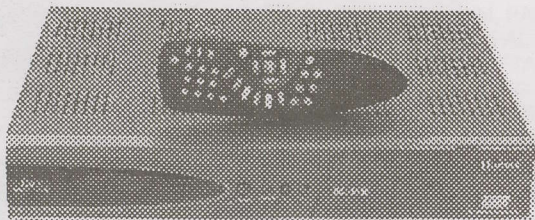
**PanAmSat PAS-8/166.5E**: Cartoons/TCM to shut down here (3940Hz) July 1, moving all cable users to new feed starting 16 June As3S (3960Hz, Sr 26.000, 3/4) leaving EWTN for now only regular user on 3940. "TARBS promo as scheduled running on 12.326Hz FTA, SR 28.067, 3/4" (D. Pemberton). "Power TV seems regular 3850Hz, Sr 13.240, 3/4" (B. Boyd, Australia).

**PanAmSat 10/testing at 72E**: Successful launch of new "superbird" to replace PAS-4 and 7 at 68.5E widely reported into eastern Australia while testing at 72E. Bird will be right at horizon for most now lucky enough to see tests from 72E.

**Thaicom 2-3/78.5E**: "Correct Alpha TV (Greece) parameters on 3430Hz are Sr 3.254, 2/3" (Paris C., Sydney). "Changes in PTV-1 replacing PTV2, 3424Vt, Sr 3.333, 3/4 and PTV3 on 3420 with new Sr of 3.333" (B. Boyd, Australia). "And they are gone again - MRTV on 3676Hz" (B. Boyd, Australia).

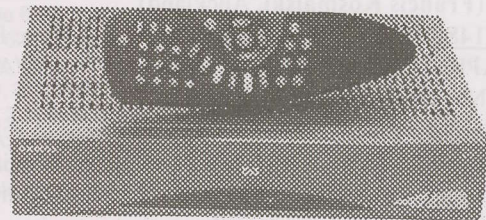
**Soapbox**: "Zinwell LC238C LNB coupled to Av-Comm high gain scalar ring feed seems ideal combination for weak signal reception - what do others find works best on InSat 2E and other low look angle signals?" (D. Leach, NSW). "Possible contact regarding obtaining Zee TV IRDs (As3S) and cable agreements outside of India - Alwyn Rodriguez at tel ++9122-4952733, fax ++9122-4963365" (G. Welsby, PNG). "Alternate sources for European programming schedules: DW-TV as www.auckland.ac.nz/Unisat/dw.htm; TVE as

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www.auckland.ac.nz/Unisat/tve.htm; TV5 as www.auckland.ac.nz/Unisat/tv5.htm; RAI as www.international.rai.it/tv/TVest/settimanaTv.htm" (**B. Oliver**, NZ). "Word from Thaicom advises their new 2003 launch scheduled iPSTAR satellite to 120E 'will cover whole of Australia and NZ' providing Internet access direct to users via ground gateways in Australia using new iPSTAR 2-way terminals" Contact is Teerasak Sawekpun at tel +66-2-5910736, ext 343 (D. Leach, NSW). "Reference SF comment about fictitious advertisement for flavoured milk (SF#81, p. 2) - this disgusting announcement is real, for Oak Brand - pretty tasteless featuring 2 flies and other assorted insects" (**Steve Sharp**). "Ten most important? If you are installer, and wanted to list the 10-most-important MPEG transponders in your sky (for install purposes, aligning dishes, etc) - what would they be?" To **Peter Lacey** as placey@netlink.com.au. **John Owen** uses 3.6m KTI dish and pair of Nokia IRDs for satellite zapping including watching SPACE Pacific Report on Sundays. **Allan Harley** (tiki@pocknowl.com.au) is searching for a commercially built Ku band dish with polar mount system, if you can help. PAL plugs and DVB-T set-tops? **Brian Parry** suggests using "crimper installed" PAL plugs, part # EC7009 on p. 30 of Lacey's 2001 catalogue. Unfortunately, screw-centre-conductor lock-down types are still the only variety sold at Dick Smith / Tandy (type) stores. Brian notes, "one of biggest problems is female PAL plug - almost impossible to connect RG6 with the steel inner conductor and not have the screw short to the outer."

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## PUBLISHER CORRECTION:

The price listed in the May 2001 issue of **SatFACTS** for **Rural Electronic Products** was our mistake, not theirs.

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New Service Parameters - Mediasat B3, 12.336Vt Popular FTA (+ some CA) Optus link (12.336Vt on B3, covers Australia + NZ, Sr 30,000, 2/3) requires that you reload this bouquet to add new services. Prosat: (1) Press **Menu** on remote; (2) Scroll down to **Add New Transponder**, press **OK**; (3) Select **Edit** from options **Add, Edit or Delete** and press **OK**; (4) Scroll down looking for **Mediasat MCPC**; (5) Highlight and press **OK** - brings up transponder setting menu; (6) Press **OK** - settings will reset; (7) Press **No** on remote to exit and return to normal viewing.

Strong: Following instructions do not apply to ALL Strong IRDs - Leon Senior suggests best option is to erase Mediasat bouquet from memory, and reload from scratch. Mediasat suggests: (1) Press **Menu** on remote; (2) Scroll down to **Installation** option and press **Enter**; (3) Password - your own or default 0000; (4) Scroll down to **TP Edit/Scan**, press **Enter**; (5) Scroll down bottom box (**Free + Scrambled or Free Only**); (6) Change option using side arrow, press **Enter** to bring up channels to be reloaded; (7) Press **Exit**; again, **Exit**; again **Exit**; (8) Again **Exit** to return to viewing.

New PIDs appear to be: (1) Maharishi TV V1160/A1120, (2) Thai TV5 V1260/A1220, (3) RTPi (test) V1360/A1320, (4) Feeds including Space Pacific Report V1460/A1420, (5) TRT-TV V1860/A1820, (6) TV5 (Asia) V1660/A1620, (7) MSAT Internet 1 V2001/A2002, (8) Access 1 Internet V1770/A1964 and (9) Access Internet V1951/A1952 (B. Richards).

# AT

## Sign-off

Don't look now - he's back.

Avigail Gutman works for a London based group that keeps close watch on pirates and would-be hackers who might pose a commercial threat to firms such as NDS and Irdeto. Ms Gutman was in Auckland recently and we talked. Our "legendary" (not our word) coverage of the Mad Max drama somehow suggests to Gutman and her associates that we have an ongoing dialogue with the shady characters hanging around the fringes of legitimate TVRO. During Mad Max's unexpected visit to a now infamous Thai recreation facility and his escorted tour of the Thai court system we had a "man on the ground" in Bangkok (several, actually) who did their journalistic and detective best to locate the exact whereabouts of one Rolf Deubel and then to describe his ordeal in the hands of the Thai police.

When Rolf alias Mad Max was released from internment after 5 months of unpleasant detention, we proposed that he sit down with us to prepare a true-life thriller book - a non-fiction portrayal of his ordeal in the hands of the Thai's and Irdeto, which masterminded his arrest and detention. At that time Rolf was understandably mentally wrung out, significantly malnourished, and medically a mess because of a failure on the part of the Thai's to properly see to his prescribed heart medication. To fund this business venture (we figured around US\$25,000 to get the project off the ground) we went to 9 Australian and New Zealand suppliers asking them to "buy" shares in a company to be formed for the singular purpose of creating a book for commercial distribution. Two of the 9 said yes, leaving us "short" \$20,000 to launch the business. Those who said "no thank you" had various reasons ranging from, "This is not someone to glorify in print" to "What will happen to my commercial business if I am seen to be participating in such a venture?"

An American TV network (3 letters that start with N) showed modest interest until they asked some innocent questions at the Washington (DC) offices of the MPAA - Motion Picture Association of America. This crowd representing movie rights owners had become a formal party to the Thailand lawsuits against Mad Max in January and when "N\*\*" explained what they were thinking of doing, it took the MPAA someplace between 5 seconds and 5 minutes to talk the network out of doing a "TV movie" on this "bandit." My response that they had recently paid for TV movies "glorifying" serial killers and viscous rapists fell upon deaf ears in New York City.

So the effort to create a book and a TV movie lost momentum and after disappointing Rolf and his family when we were unable to deliver as we had hoped, more than a year went by without any Email exchanges.

One of the sub-mysteries in the arrest of Deubel by Thai authorities revolved around how they happened to know - in advance - the exact house he was going to be at and who he was going to be with only hours after landing in Bangkok. Rolf had his theory, we had ours. *His was right.* A fellow in

## Hacker Mad Max arrested.

Tuesday, June 05, 2001

USA, (WASARRESTED) -- A man who allegedly hacked into "hundreds, maybe thousands" of pornographic related websites under the nick name "l33t hax0r" has been arrested on federal criminal charges of unauthorized access to private networks.



Unfortunately, many are capitalising on the "Saga of Mad Max" without his assistance or approval. This site posting is a total fabrication - not one word of truth in anything that appears in this story.

England, well known in hacking circles for being the ring master at a series of hack-related web sites (known as THOIC) was found to have been on the payroll of encryption firms (such as NDS and Irdeto). Here this guy was *pretending* to be the big daddy of all hacking enthusiasts when in fact he and a small cadre of insiders working with and for him were actually routinely monitoring the latest advances in hacking - and promptly sending the data straight to the encryption firms. When "somebody" hacked the THOIC server last December and downloaded more than 1.3 GigaBytes of internal THOIC files, and then made public the evidence that THOIC was nothing more than a sham to catch hackers with their guards down, the THOIC sites lasted less than 24 hours. The fellow running THOIC vanished into thin air and is probably ensconced on a small Caribbean Island living under a fictitious name and spending NDS and Irdeto blood money.

Rolf Deubel insists he was not released because (as some suggested) he "made a deal with Irdeto to turn spy for them and help them straighten out their own security." Deubel's denial is very believable because his 5 months in Thailand cost him his home, everything he owned in the world. Some will recall the THOIC sites solicited money as a Rolf Deubel "defence fund." Some even believe Deubel made money by being in jail because of these donations. Well, it turns out the defence fund donations went to a "trust" (as in "trust me - I am honest") and were "administered" by the same guy we spoke of one paragraph above. He never turned one cent over to Deubel, Deubel's wife or anyone connected to Deubel. He also maintained he "never did receive any money" and that "people talked a good game but when it came time to give money to help Rolf, everyone chickened out." Evidence of perhaps (US) \$50,000 being collected and never accounted for was found in the 1.4 Gb of hacked THOIC server records.

There is one hell of a "Agatha Christie grade novel" in all of this. Rolf's flamboyant dealings and cavalier taunting of Irdeto before he was caught is but a prelude to a gut wrenching thriller that is more likely to make you cry than laugh. The message is plain enough - a smart card thief is no less a thief but that tiny handful of people who understand how to make smart cards do tricks, how to break into a THOIC (or anyone else's) server, and who freely admit "no Email and no web site is safe" have a strong message to tell. The business plan to make it happen is still in place, all we need is the funding to get the ball rolling.

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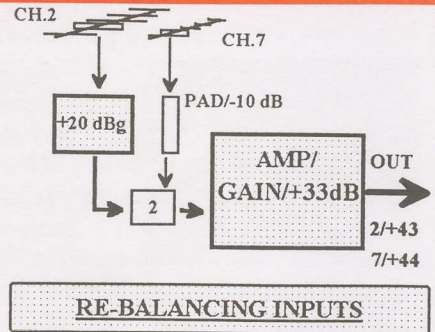
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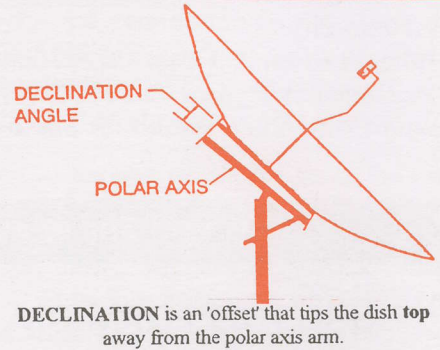
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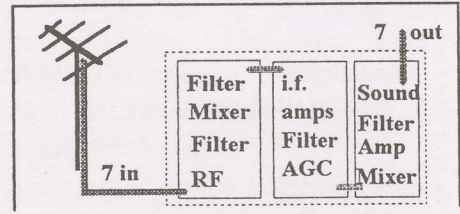
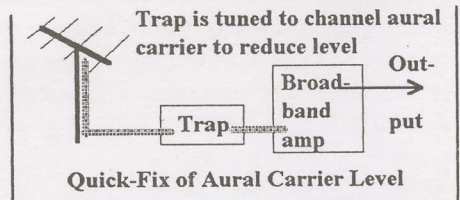
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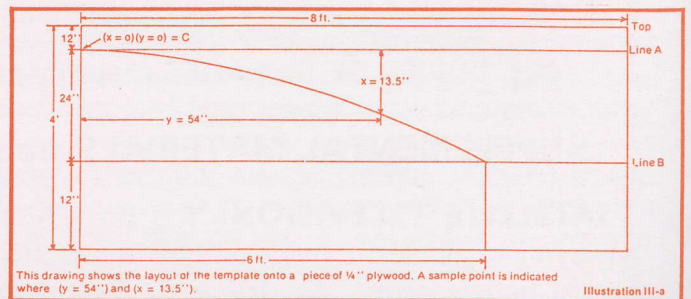
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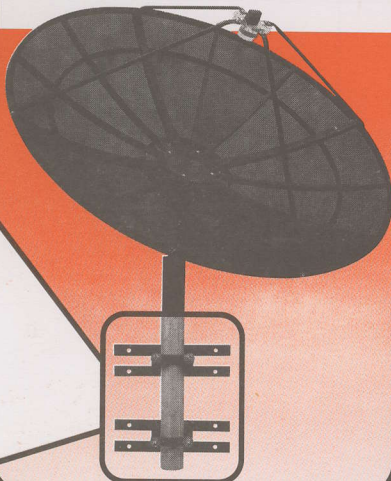


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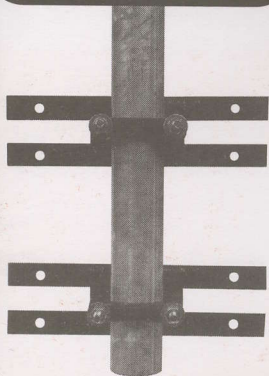
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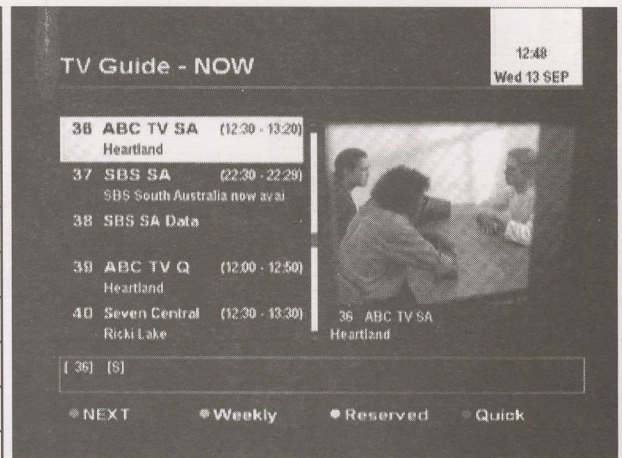


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