10/09/02 10AM

Bob Cooper's

SEPTEMBER 15 2002

SatFACTS

MONTHLY

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is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we are entering the 21st century, ancient 20th century notions concerning borders and boundaries no long define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install the appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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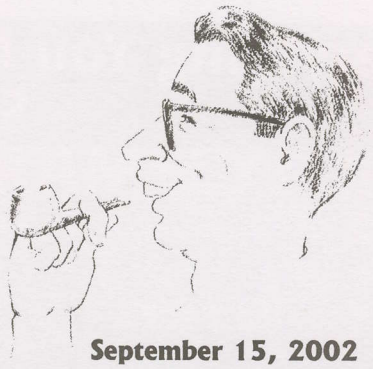
our NINTH year!

COOP'S COMMENT

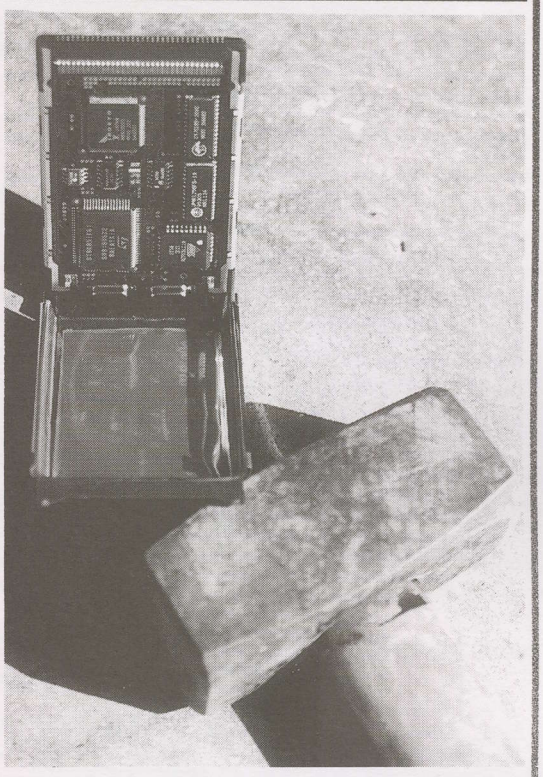


September 15, 2002

The sledgehammer approach. Hit them hard with something very large and powerful.

Sitting in my discard pile are several Panasat 520s, a like quantity of SA B-MAC analogue decoding receivers, a larger quantity of once state-of-the-art analogue receivers (including some end-of-era Palcoms) and a box of LNBs going all the way back into history when 50 degree C was considered a respectable noise figure.

The LNBs are especially troublesome because many of them (from once quality brand names including Chaparral and CalAmp) boast performance numbers such as 20 and even 17 degrees C, and in fact although they function today as they did when new, *each is now useless*.



The temptation to create a gigantic bonfire of outmoded satellite hardware and a litre of petrol is considerable. The 17 degree Chaparral came off a 4.5m Paraclipse mesh dish recently because in trying to receive a SCPC service with a symbol rate in the region of 4.0 it proved to be the weak link. The analyser showed 12 dB carrier to noise, the receiver would load and lock the service but nothing useful happened until the LNB was replaced. "Phase noise" was the culprit. This LNB remains perfectly suitable for (most) MCPC and analogue but as the digital service symbol rate comes down creating a narrower and narrower carrier spectrum, the LNB's ancient 1990 era design becomes a problem.

So it is not that equipment stops working, or that it does not work for any useful purpose. Rather it is that as technology changes we find either new ways to do something, or, ways to modify what we might be inclined otherwise to toss out. The Irdeto "Fat" CAM is a perfect example of this. At the point of manufacture (POM) they went out the door to Irdeto/Mindport for resale to programmers such as Galaxy at around $20. By the time they reached the consumer, $80 - $100. Multicrypt or all-CAMs on the other hand are today's technology and consumer pricing in the $200-plus region is common. The original use of the Irdeto CAM was built around a OTP (one time programmable) EPROM that only recognised and dealt with Irdeto's data stream.

Germans worked out how to remove the (hard-wired-in) OTP-EPROM, install a socket, into which the user can insert any number of programmable or pre-programmed EPROM devices. The original Irdeto (-1) CAM now becomes a user defined versatile CAM capable of handling a wide range of smart card systems. The FatCAM device, after modification, can now replace a modern format CAM for what amounts to pennies - a fraction of the cost of the fancy new versatile CAMs. I think our step by step report (hardly a major project) starting on p. 6 here will change the "market value" of otherwise old, collecting dust, Irdeto CAMs. In this case, saving "old stuff" has rewards that go far beyond merely being a "collector." Now, to find a use for those ex-analogue SA B-MACs.

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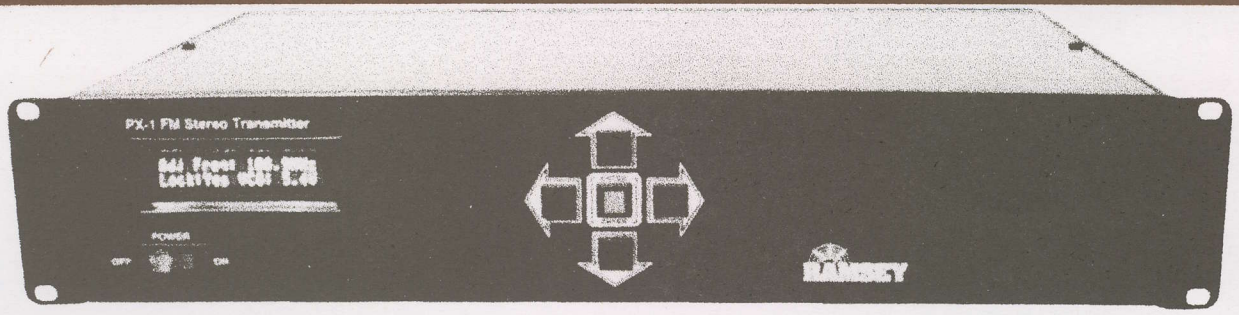

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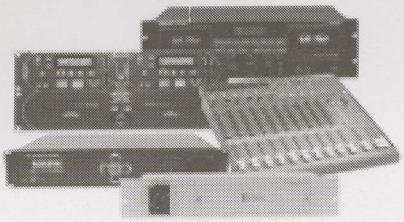

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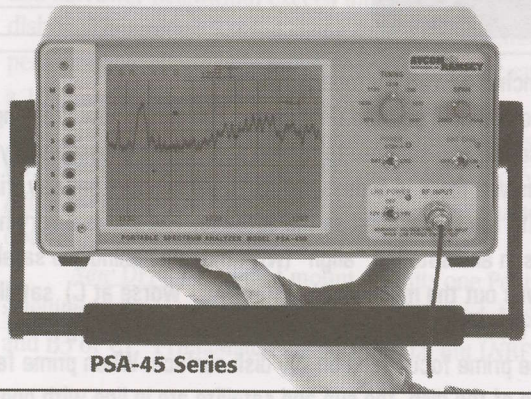

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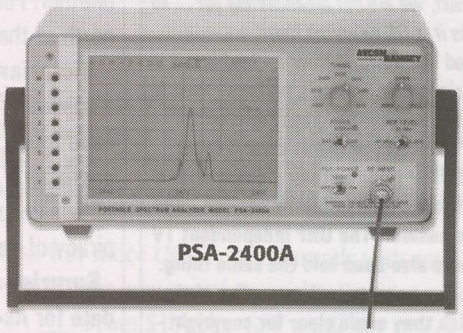

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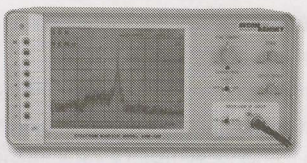

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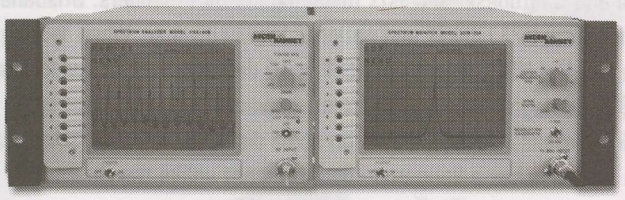

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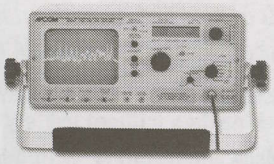

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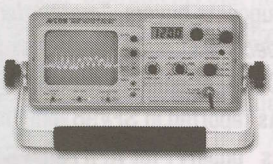

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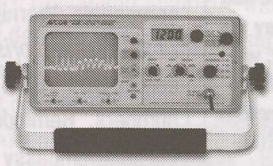

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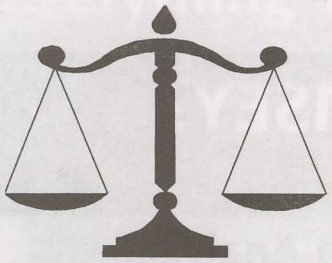

LETTERS

Australia boots NZ out of the Pacific

"I recently sent an Email to ABC Asia-Pacific to tell them how much I enjoy their programming and to ask about when they might have teletext operating as the TT PID is running there. Their response follows:

'Thanks for your note and encouragement. But ...err, what can I say? New Zealand is not in our target audience area. So, I suppose, I should say, please don't watch the service because we don't have the programming rights for New Zealand on much that we schedule. And that is why we are not seeking any re-broadcasters over there to distribute locally...and, in fact, are explaining that to those who are seeking to do so. As for the teletext, we are not broadcasting yet ... so I guess it is OK to watch that!'

The note is signed Ian Wolfe. If New Zealand is not in the Pacific (i.e., 'Asia-Pacific Service'), perhaps I need to ask our schools to correct their geography references!"

Steve Johnson, someplace on planet Earth (I think)

We contacted ABC A-P prior to their sign-on with a request to carry them on our cable-TV service - and received a similar answer. The UHF independent TV stations in NZ have also been told the same thing. We asked Ian at one point to make us a list of the programmes which they could clear for copyright - logic suggests, for example, their own ABC News programming created by them in their studio, should not present a copyright permission problem. He never answered us. NZ 'copyright law' spells out that if a signal is FTA (not encrypted), it is available for redistribution without permission unless the telecaster posts periodic notices in their transmission advising to the contrary (and in this case specifically mentioning NZ in the notice). We've not seen such an advisory to date.

Copy of July?

"I wish to complain that for my renewed SF subscription to start in July, I received a machine copy rather than a printed copy. How come?"

Arnie J, NT

Your subscription ran out with the June issue and in lieu of a July issue you received a 'reminder notice' ("ooops!") advising you that no renewal had been received. When you did respond to the "ooops!" letter, the demand for the July issue had greatly exceeded our supply. Rather than delay the start of your new subscription until August, we made machine copies for you and around 100 others. Moral? When you receive your renewal notice, sit down right then and renew - waiting may cost you an important issue!

CNN direct?

"I have a hotel client refusing to pay the exorbitant rates demanded by Sky NZ for just CNN service. Is there an alternative?"

RS, South Island, NZ

Try John Martin, Television Oceania, tel +61-2-8281 4481, fax +61-2-9212 4464; jmartin@tvoceania.com.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

SEPTEMBER 15, 2002

HUMAX? Mod-series launches SF#98 (October); stay tuned!

Solar outage. It is that semiannual point in time again. The sun is now crossing the equator (from north to south) and satellite terminals pointing at geostationary (above the equator) satellites will for 3 to 5 days, up to 15-20 minutes per day, find their antennas "aligning" with the sun as well as the satellite. The sun is a very high noise source and when the sun and satellite "align" (with the sun behind the satellite) the noise from the sun drowns out the much weaker (C or Ku - worse at C) satellite signals. If you have a prime focus dish, you can "see" the alignment taking place from the shadow cast by the prime focus feed on the dish surface. When prime feed shadow is dead in the centre of the dish, the sun and satellite are in line with one another. For locations south of the equator, outages have begun while for locations north of the equator, later this month (dead on the equator - 20-23rd).

Victorian police have raided another suspected source for MOSC piracy cards in a suburb of northern Melbourne, Mill Park. Using a search warrant, they claim to have found, *"a large quantity of (piracy) smart cards, business records (identifying customers) and equipment used in the manufacture of illegal devices*." Australian law allows jail periods of up to 5 years, civil fines to A$60,500 for those convicted of piracy of pay-TV.

Surprise-surprise. AsiaSat is now suggesting "December- January" as a launch date for As4 to 122E. The satellite is built, ready to go, but AsiaSat has delayed launch because very few (*none* - actually) customers have signed on board. The satellite would be like As3S "only better" for the Australia-Pacific region including Ku band spot beams into Australia at +50 dBw range levels.

Measat 2 "Astro Mux" is now marketing for subscribers in Australia (calling itself A-Skynet). Service requires small dish (90 down to 60cm using spot beam into eastern Australia on 11.602Hz, Sr 41.500, 3/4), has 17 total channels (3 FTA), mixture of Mandarin and Cantonese and lists following contact numbers: Brisbane/ 07 3341-5888; Sydney/ 02 9211-5432 and national 1300 785-432. When looking for this service (see p. 34), LNB(f) polarity in NSW is 15 degrees anticlockwise from *straight vertical* (B3 is 30 degrees clockwise from true vertical). Signal level on 60cm typically 60% (whereas Austar is 100% on same dish). Of interest, smart card for this service into Australia has a kangaroo imprinted - not unlike the Quantas copyrighted logo!

www.myafn.net warning US military personnel, "*Before you buy a PowerVu decoder make sure it is properly coded*." Problem is D9234 PVs are showing up on ebay and other auction sites (not unlike d-Box 2s) but they may not be AFRTS compatible. Warning suggests buyers, "*match the TID number and UA with database of AFRTS-authorised decoders*" and provides fax numbers (DSN 312 328-0624 or comm. 001 703 428 0624) or email to decoders@hq.afis.osd.mil to verify matching numbers. Reminder: As reported in SF#96, only retired military, current military or consular/embassy folks "qualify" for AFRTS/DTS service authorisation. With August 15th switch to Ku band using I802 at 174E, small dish (60-90cm) home systems are now first time affordable and available to US personnel in Korea and Japan; an estimated 15,000 families are suddenly looking for dish systems which ought to make SA happy.

Rumour. Sky NZ planning Christmas season debut of new Pace IRD through Dick Smith stores, probably others. Receiver will be first Sky consumers will "own," include dual RF outputs and possibly provision to read two smart cards simultaneously. No, HDD apparently not included.

Penta a Premium Performer

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Splitters and terrestrial antennas

"It is interesting to see your letter writer (SF#95, p. 4) found signal splitters in his junk box; they sound like junk! Many do not realise that when a splitter is dropped, say 1m to a hard/concrete surface, it is permanently damaged. The shock ruins the electromagnetic structure of the ferrite (core) devices. I am surprised that anyone still manufacturers resistive splitters - all of those offered to us for distribution are ferrite core models. And it is true you cannot judge a splitter by the case - some in quite ordinary cases (our SP275FP for example) are very high quality but their physical looks don't suggest this to be true. Finally on p. 12 of July, it shows not Hills but Fracarro narrow band antennas supplied by Laceys.tv, which I am assuming Fiji TV selected over the Hills and because Fracarro has superior gain and impedance match over a single (design) channel of operation."

Peter Lacey, Laceys.tv, Victoria, Australia

Two Chinese and one Taiwan firm we found on "the web" still offer resistive splitters at very-low prices; with performance to match (or mismatch as the case may be)! As long as some buyers only look at the price, there will always be someone who offers a product for less money than the rest - even if the performance is degraded.

Us? A boo-boo???

"Received SF#96 today and wish to point out a mistake. The LNB(f) for Sky NZ on front cover and those shown on p. 8 are NOT incorrectly installed. The Sharp brand LNBs used by Sky do indeed align for maximum B1 vertical signal at 8PM while the earlier-used CalAmp brands aligned at near 6PM. I had the same concerns when they switched to Sharp, but the probes are illogically positioned inside the waveguide resulting in the strange physical alignment. The installer guys are just doing what they have been told to do!"

Paul Burton, Waipu Cable TV, NZ

Shame on us for not knowing the Sharp brand are factory (probe) mis-aligned! And our apology to those many others who caught us out on the same error. However, we stand by our test results - of ten tested, we always found we could get from 0.5 to 1.5 dB more signal with careful adjustment of the LNB and dish alignment - mis-aligned probe or not.

"I use MC360B meter, 13V selected for peak (Vt) signal, then switch to 18V (Hz) for null of same signal. A word of caution - when batteries in 360B start to go dodgy, you can get erroneous readings on 18V setting - about 5 years into meter's use."

Chris, Napier

Sky in denial

"Reference SF#96 and issue of Sky's use of 60cm dish versus rain fade. I have called them on their free phone and have been told (1) A 76cm will NOT improve rain fade, (2) a 76cm will work WORSE than present 60cm. I can only presume Sky does not want to start replacing 60cm dishes because it would cost money."

Robert, NZ

500,000 (their number) installs versus NZ$40 per antenna change out cost - which is a very low dollar number - comes to NZ$20,000,000. Nope - they definitely do not want to start an avalanche of public demand requesting larger dishes!

HARDWARE EQUIPMENT PARTS UPDATE

SEPTEMBER 15, 2002

Why replace Optus B3 at this time? Good question. B3 was designed for 13 years operation which does not run out until midyear 2007. Companion B1, also 13 years, runs out in 2005. As we reported in SF#96, B3 does appear to have a slight stability wobble, affecting polarisation integrity and that might be one reason for "early replacement." More likely, new owner SingTel is anxious to have Ku links between Australia and Singapore and the way C1 is presently configured, it has 484 MHz of "bandwidth" (versus 810 MHz for Australia, alone) that is "Singapore-capable."

Foxtel's 12 to 14 C1 transponders? Try as we might, identifying 12 (not to speak of 14) with identical or similar beams for Foxtel/Austar use, even using both polarisations, is fraught with assumptions. After taking out those with North Asia capabilities, we find 487 MHz available on the self-designated "National A Beam / New Zealand Beam" -all vertically polarised (Foxtel/Austar presently being horizontal only). Our query as to how this might actually translate to on ground footprint levels goes unanswered by Optus personnel. On horizontal, after removing the transponders with "North Asia Beam" capability, we find but 323 MHz available. Foxtel/Austar presently require 375.6 MHz for pay-TV while Austar uses an additional 62.6 MHz for its Interactive project - 438.2 MHz "bandwidth" total. With Foxtel claiming they will expand to, "as many as 120 TV channels," that suggests no less than 480 MHz total; significantly more than the 323 MHz Optus planning for C1 allocates to horizontal polarisation. Want to know more? Page 20, here.

Et tu, B3? So what happens to B3 after C1 is operating from 156E? Australia claims 152E, 156E (B3/C1), 160E (B1) and 164E. In theory, B3 could be moved to 152 or 164. However, PAS-8 at 166(.5) E also using the same (Ku) frequency band pretty much rules out that location (the two would be too close together for dishes smaller than about 2m - no DTH from that location). Old A3 (launched 1987 with a 10 year life) is still assigned the 152E spot - the likely new home for B3 as well. Another possibility - shifting B1 (which is 2 years older than B3) to 152E and moving B3 in to replace B1 at 160E. Of course this would impact on Sky NZ (and others) presently using B1 - but by 2005 B1 will have to be replaced anyhow.

NZ politicians are beating the bush searching for a "magic answer" that will extend medium speed Internet to rural locations without a direct satellite connection. TVNZ's technical arm BCL is promoting 2 GHz range "AirSpan" transceivers as a 20km link possibility while others are searching for a way to incorporate existing power lines (which already reach rural farms) into the two-way communications arena. The newly elected Government claims to have NZ$90M to spend here and lots of firms are after a chunk of that.

Cam-suits. Apparently some of the creators of multi-encryption format (as in "all" - small "a') CAMs could have a legal problem with "software" they allegedly "borrowed" from Irdeto and SECA (amongst others). Those "a"llcams using open format Linux are safe - it is believed. As Rolf Deubel wrote in SF#96, "*contrary to popular belief the CAM is not a relevant component in a well designed Conditional Access system.*" But - if someone "borrows" Irdeto/SECA/etc CAM-language instructions in designing their own "a"llcam, well, that's a matter of potential copyright violation.

Two at once. Samsung has announced TF4000, with embedded Conax plus twin CI slots and (get this) dual (twin) tuners - receive two channels at once and record one to built-in 40GB HDD (hard drive) recorder. Price? Euro699.

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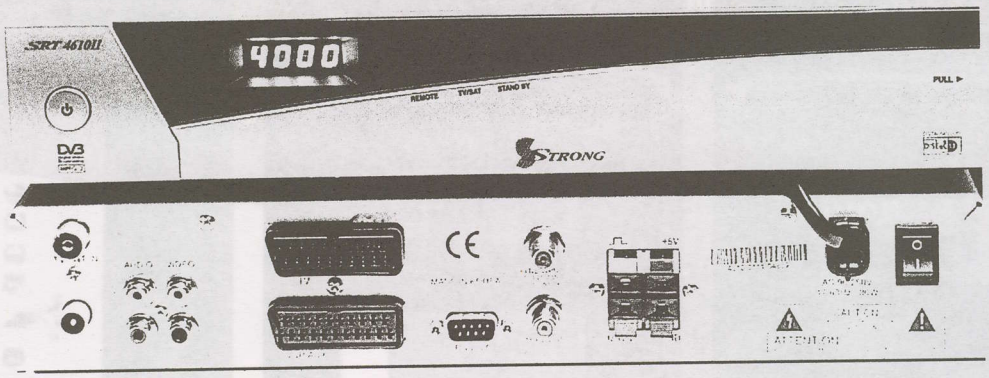

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Rolf Deubel: reviving "junk CAMs" for multicrypt use

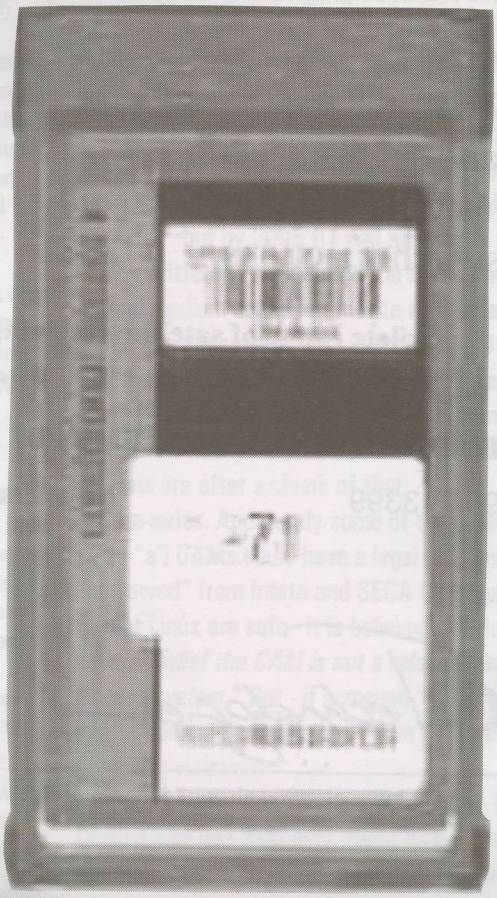
How to rebuild FATCams to do multiple services

THREE to modify (top); one to not (below).

The original FatCAM provided with Pace DGT400/500 and various Panamsat series IRDs was designed to function only with the Irdeto (-1) format of conditional access. The CAM (conditional access module) was physically "thick" leading to calling it a "FatCAM." When this CAM is inserted into a Nokia d-Box (1), 9200 or 9500 IRD, it is limited to Irdeto 1 decryption (assuming a suitable smartcard is also inserted into the receiver).

This report will describe how the Irdeto 1 version CAM is modified to allow it to function with SECA, Viaccess, Cryptoworks, Nagra-Vision as well as the original Irdeto 1.

The photo at the top (3 CAMs) illustrates the versions which can be modified. Left to right, the BetaCrypt (green) C-CAM, The Irdeto) Cam and the most common of all - the Irdeto Blue-Cam. Directly below, a photo of the Irdeto light-blue-CAM which cannot be modified. This version was manufactured during 1998 and with a companion card (such as NagraVision) formed a package. The "stripe" along one side is "light blue" in colour which can help you identify this one version which you do not want.



The original EPROM (Electrically Programmable Read Only Memory; OTP or one-time-programmable) in the FatCAM must be replaced if a different software version (other that Irdeto 1) is desired. The (original) EPROM was the 27C512 - 512 Megabit, creating a 65 Kbyte file size or exactly 65536 bytes (established by the computer relevant value of 1024 bytes per Kbyte[4x2 8]). There were different FatCAM software versions released; the latest known version was CAM 2.3 with software version 1.13F improvements which affected the speed of the channel zapping (older versions "hung up" when zapped continuously).

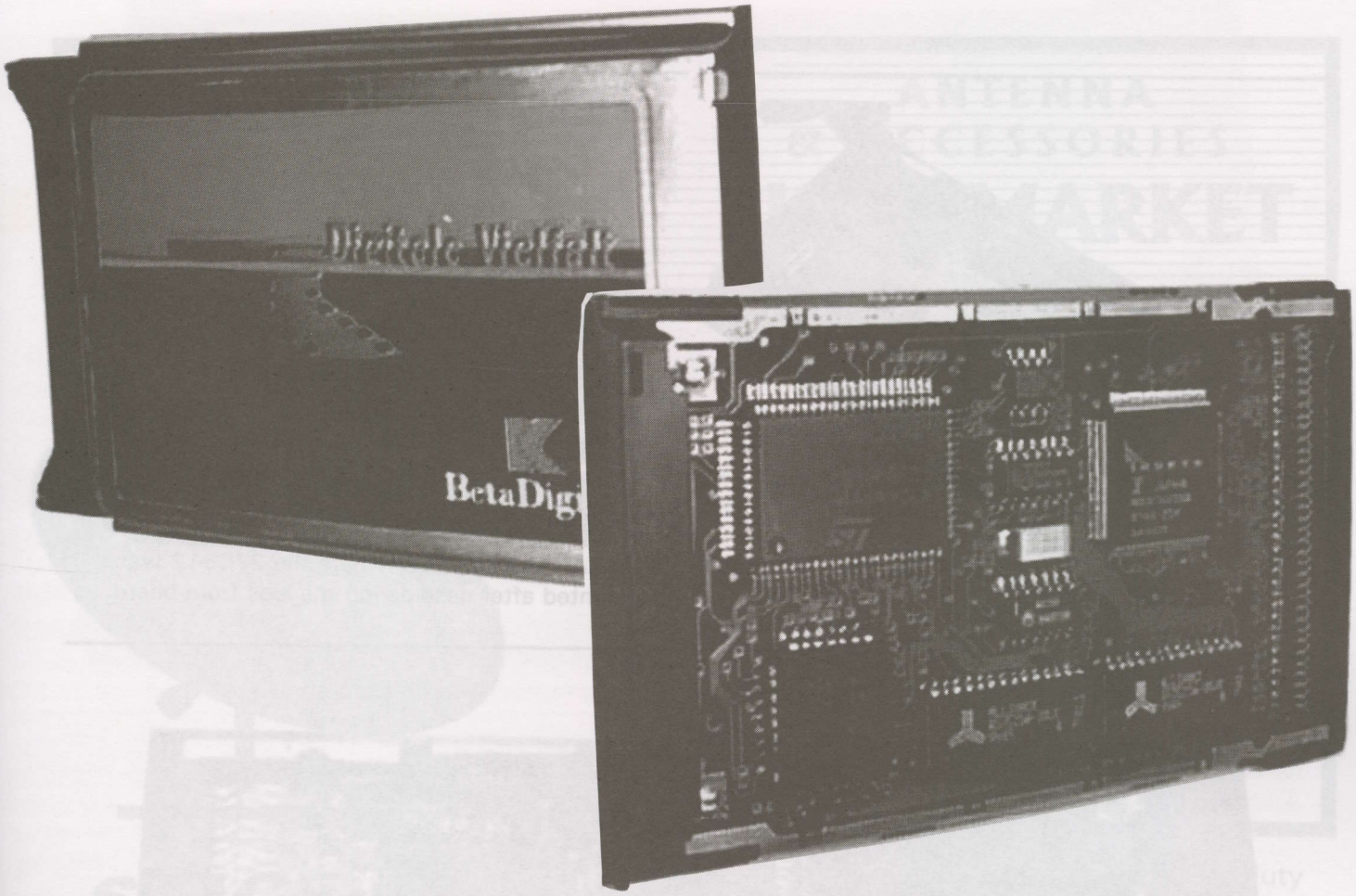
Tools required

1/ Soldering iron with fine soldering tip (40 watt maximum)

2/ Solder vacuum pump and/or unsolder copper wire

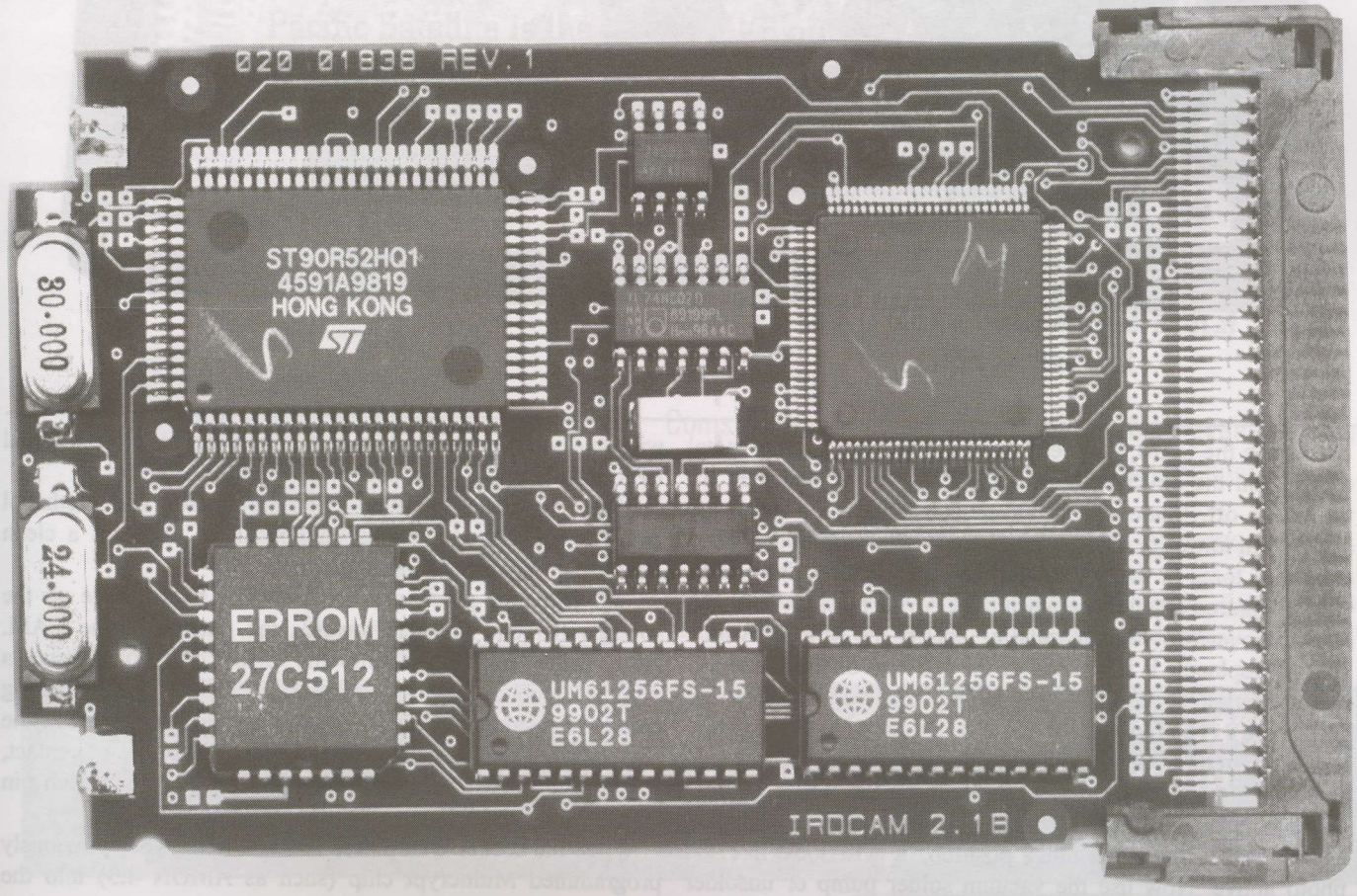
3/ Very fine / thin radio solder

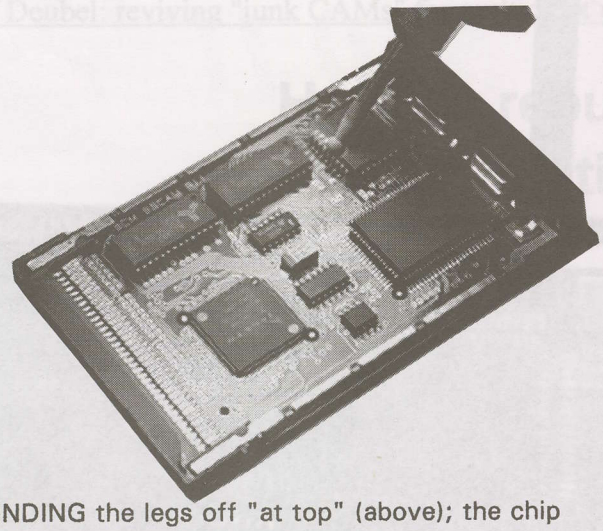
4/ Size 2 screw driver



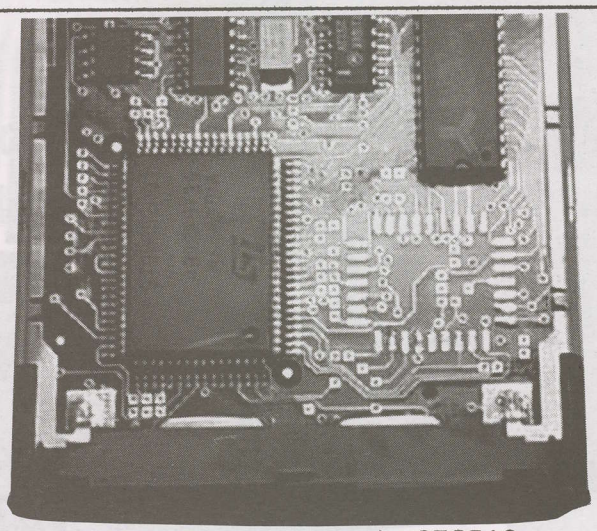
CAM with cover removed (above). Closer inspection of opened CAM (below) reveals 27C512.

5/ small side cutter(s)
6/ High speed hand grinder (such as Drehmel or FEIN)
7/ Cleaning agent (methanol and an old tooth brush)
8/ PLCC32 socket and PLC EPROM 27C512 or 27W512 FlashROM (see text)

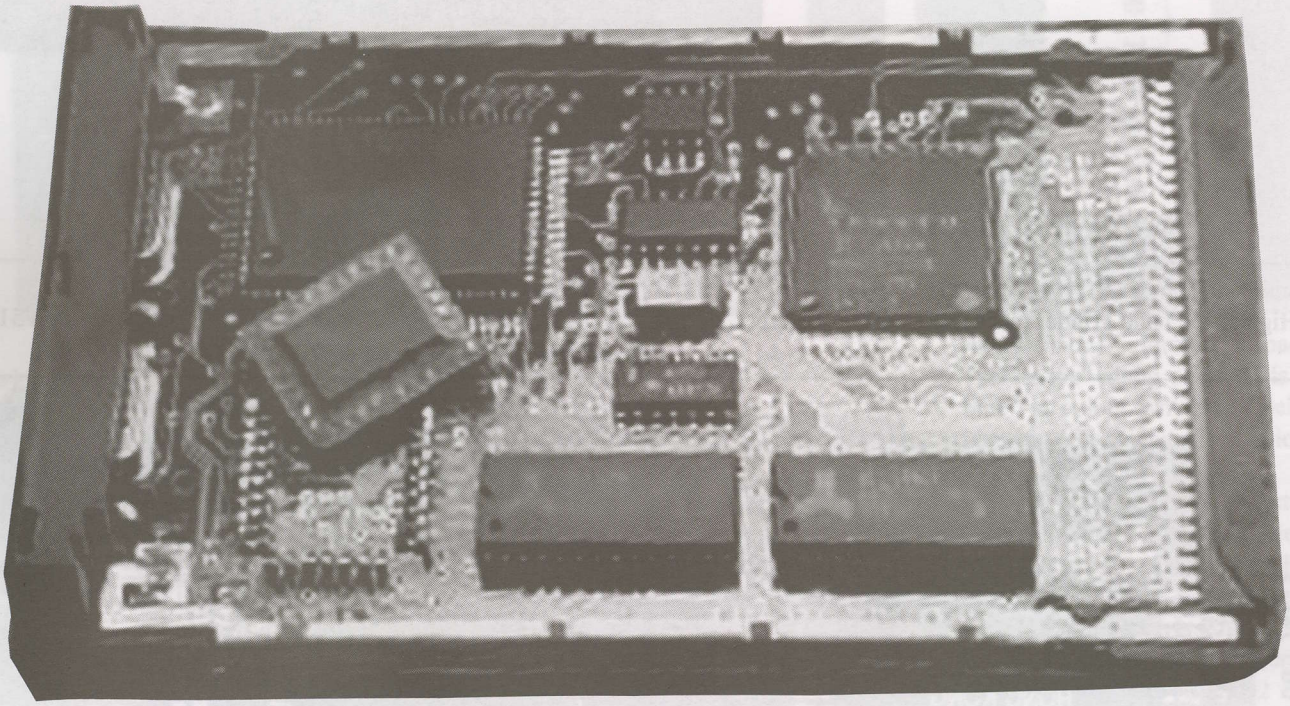




GRINDING the legs off "at top" (above); the chip removed (below).



CLEAN the PC board where the 27C512 was mounted after desoldering the legs from board.



To open the CAM, you need to carefully bend the tiny metal tongues on the cover with a size 2 screw driver and then lift the cover off. Some covers have been glued on requiring a sharp, thin knife (or Exacto blade tool). *Warning*: Do not use excessive force or the cover will bend and dent resulting in an ugly disfigured appearance when the CAM is reassembled.

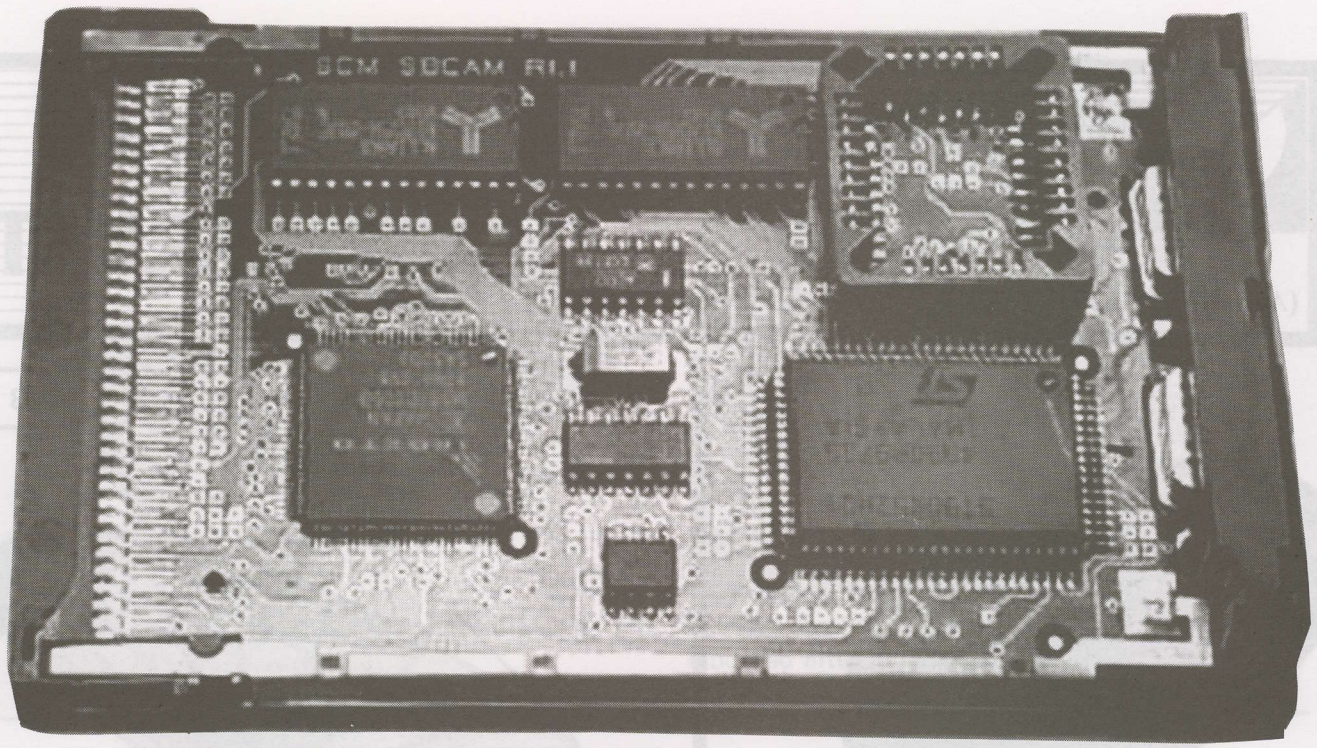
With cover off, you can quickly identify the EPROM which we will replace; it is located at the left end of the CAM PC board (marked here "EPROM 27C512," but yours will not be so marked). The fun begins

Use a Drehmel of FEIN grinder to (cut) the EPROM's legs as close to the top as possible. Be extra careful not to cut into (score) the PC board proper! When you have the EPROM cut out of the original mounting position, it will look like the photo above. Now use the vacuum solder pump or unsolder wire and your soldering iron to carefully remove the original EPROM's legs one by one from the CAM's PC board.

When all legs are removed, clean the contacts with methanol and the old tooth brush (the end result of which is a clean board ready to resolder onto; photo, p. 10).

We will now place a socket onto the board. Line up the socket's flat end (corner) towards the outside of the CAM. Now, solder pin by pin onto the CAM's PC board using a minimal amount of soldering wire ("solder") but making certain the solder runs underneath the contacts adhering the socket pin to the PC board solder point. To be sure of contact, touch each pin with the soldering iron tip to verify each pin makes contact with the PC board.

When the socket is in place, you can insert your previously programmed Multicrypt chip (such as AMON 4.3) into the



REPLACING 27C512 is a socket for your pre-programmed Multicrypt chip (upper, right).

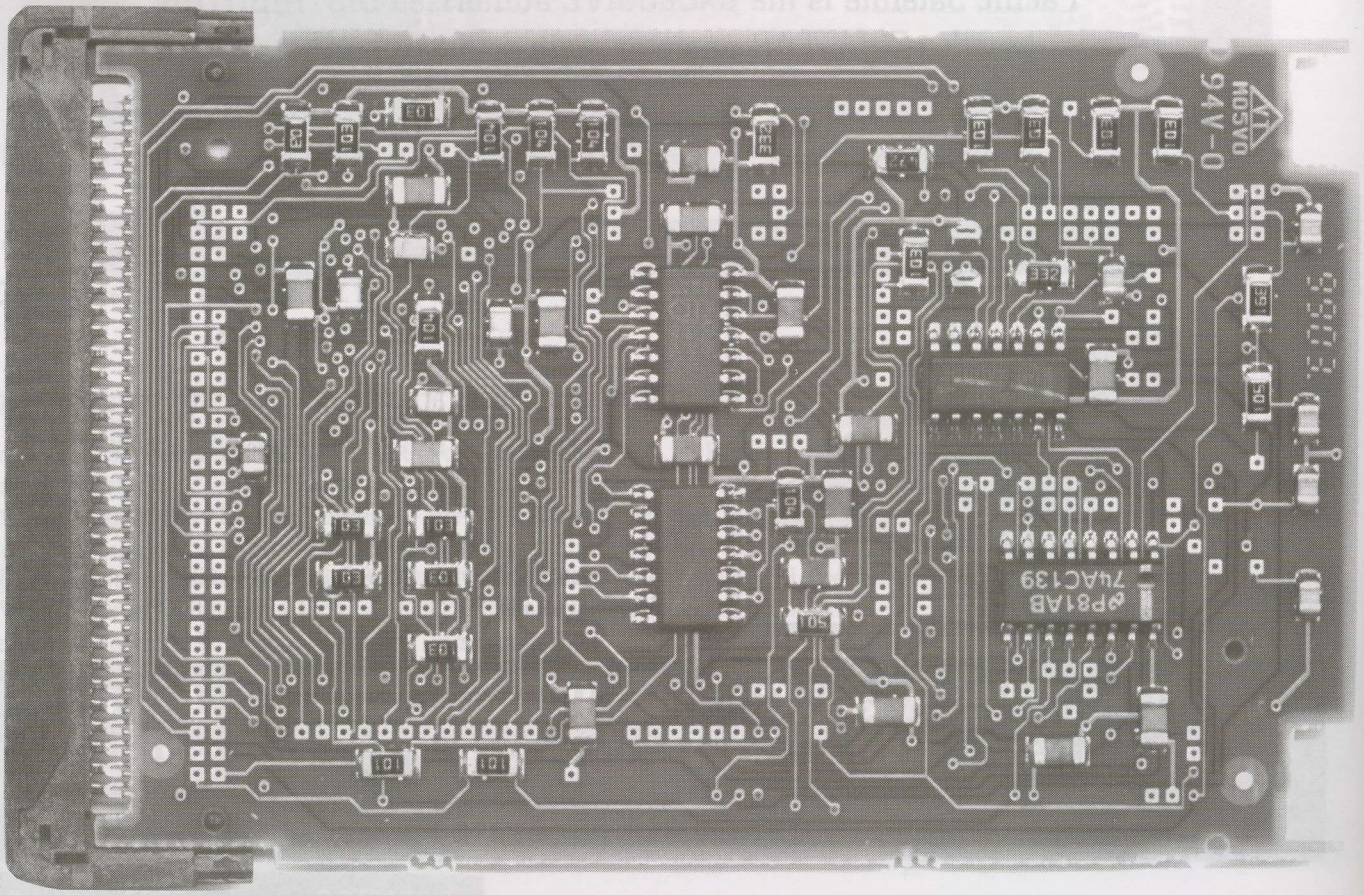
socket and close up the CAM. Note the dot on the chip must match with flat-end corner on the socket.

Which version Multicrypt chip to use?

This is a difficult decision. We have successfully tested DVB2000 version 2.00.0 Beta 8 with Antares Patch and AMON 4.3 (also called ALLSAS4.3) with Irdeto, SECA, Viaccess, Cryptoworks and Nagravision. Do not be mislead by the countless AMON versions >4.3 (such as AMON 5.2) floating around on Internet; they are all fakes as AMON himself states on his website. His own creation ends with version 4.1 but he does endorse Alfredo's patch of his version 4.1 which he distributes as AMON version 4.3. This version seems to provide smoother zapping when changing between different encryption systems.

This is obviously not a major project although *extreme care* should be taken when removing the original 27C512 EPROM so the PC board is not damaged. Remember - you are taking off one "slow "chip" and replacing it with a faster multi-encryption-system more modern chip and the PC board is still required to be functional. For Web addresses and download sites, see SatFACTS #93, pages 14 and 15.

FOR reference: This is the reverse side of the FatCAM PC board.



Receiver review

MediaStar's Simba 201 is Zee-TV and Canal + Embedded

Now that Zee TV's monthly security access code has joined those listed on Internet, the range of interest in owning an IRD that does Mediaguard/SECA is exploding. Canal-Plus's Intelsat 701 Ku-band service has been available for nearly one year as a subscription offering into Australia (and the balance of the Pacific) using the same security system. Europeans have been enjoying the ability to access Mediaguard/SECA using dedicated embedded receivers for quite some time but access to this particular format of IRD has been limited here in the Pacific.

One of the primary advantages to embedded Mediaguard/ SECA is ease of operation and a lower price for the set-top IRD decoder. When you have customers who are interested in one specific service, spending extra money for a multi-format or (all purpose) CAM equipped receiver can be a deterrent to volume sales.

The Simba 201 is a product created for Europe which Jacob Keness of MediaStar Communications International (OPAC) has now brought to the Pacific. It is extremely reasonably priced and as a "dedicated" receiver should find many applications for installer customers concerned only with Canal-Plus (or Zee TV provided everyone understands the Zee cards are grey market and may require monthly updates by a qualified technician to continue functioning). Of course this is also a C & Ku FTA (free to air) receiver as well as its embedded purpose-built functions.

All the basics

The functions you would expect are present: (1) 950-2150 full L-band plus coverage, (2) RCA sockets for video, left and right audio, (3) VCR and TV SCART, (4) Dish mover control functions, (5) Reinserted teletext.

The functions you might not expect include (6) "Freeze" to stop the video motion (perhaps useful on XXL), (7) "Zoom" (users with XXL service are quite ecstatic over this feature). And, if you are going to control a motorised dish, (8) entering your city/town name, your longitude and latitude (available by calling nearest airport/aerodrome) allows the quite amazing in-built computer to calculate your satellite dish azimuth and elevation angles for each satellite within LOS (line of sight) view. This will of course greatly speed up any installation of a polar mounted (or heaven forbid - Azimuth over Elevation or Az-El mount) dish system. If you function in a circle of approximately 50km, it is very unlikely you will need to learn new latitude and longitude co-ordinates for entry here (at

Software version 3007 Simba quick set up

Menu > OK > Options > Local Parameters > Menus Language

With Ch+/- select English. Audio Language select French. English is selected later after download. Don't ask why just do it...

Main Menu > Installation > OK > Antenna and Satellite Parameters > OK,

- Installation Type, Fixed

- Number of antennas select 1 to 4 for DiSEqC switching.

- LNB power supply YES

Press OK. New menu appears

- **Select any satellite regardless** - even Turksat with ch+/- set "yes" for the satellites you selecting.

Press OK. New menu appears

- **Select the dish and LNB** to be used Universal or C-band.

- If 2 dishes or more set DiSEqC etc...

Press OK New menu appears press OK again to move on. Go to "channels or bouquet update" > "in the television list" you'll see 2 columns. "BouquetTS" and "Channels"

- Move to left so that bouquet is highlighted in red.

- Press "Add" (red button) on the remote control and enter the transponder parameters press OK to search.

Repeat procedure to add more channels.

To edit channel list + Favourite list see manual.

Factory default:

OPUS : - Switch on your receiver
- Press OK to access main menu
- Enter OPUS (6787) with the remote
- Wait to see flash on the display (front panel)

- Switch your receiver off and on again using rear panel button

- The Simba SatFACTS tested has older Version 3007 software (preloaded) with the European Satellites only. The Autosearch is by Symbol rate reference, receiver scans 950-2150MHz and matches preset SR's to any transponder found. Korean manufacturers have gone away from this since the "sample" receiver we received was tested. Search procedure is slow if you have more then 5 SR's.
-
- The Sample we have was loaded manually using quick set-up instruction appearing here (left). All new stock arriving with 3010 SW has been preset for Asia/Pacific satellites.
-
- Importer Jacob Keness notes:
- *"I like -*
- *Best OSD I have come across.*
- *Magnifying glass very useful for XXL channel.*
- *Audio language selection menu.*
- *On the RCU press 'list' than 'i' below txt, a detail list of PID data will appear.*
- *On board Teletext active on Cine Cinema and Dubai."*

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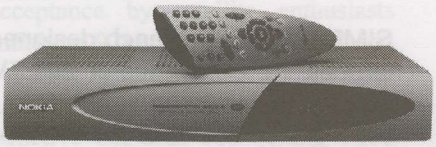

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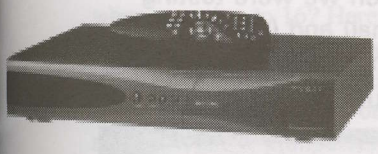

HUMAX RECEIVERS

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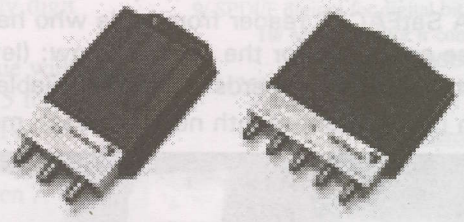

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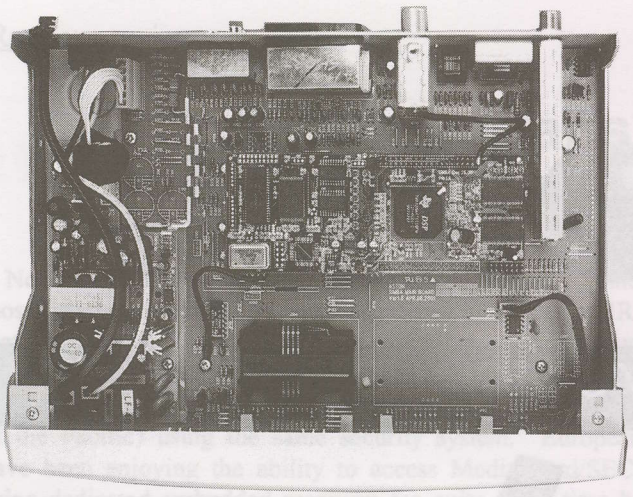
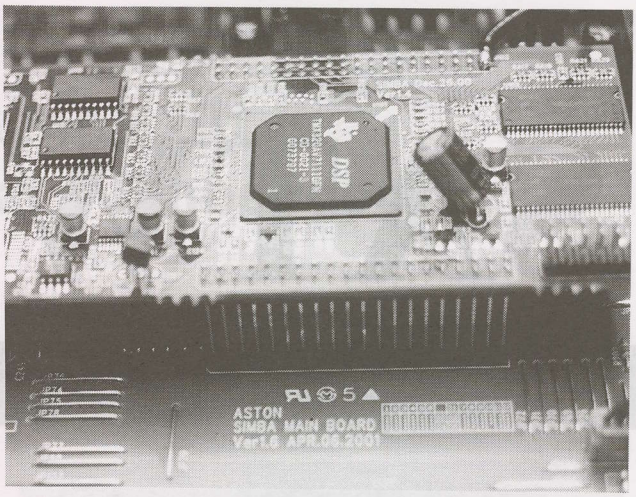




SIMBA 201 is a French designed and marketed, Korean manufactured SECA/Mediaguard receiver capable of processing Canal-Plus or Zee TV services (with appropriate cards). Note master receiver board (on bottom) with Simba 201's special design features on upper board (right).

different new-dish install locations). The Simba 201 is DiSEqC plus Aston TracSat and the older style 24-36 V actuator (or horizon to horizon) motorised dish capable. The Aston/Simba operation's manual is especially thorough with highly detailed step by step instructions for configuring the dish system and the receiver with suitable warnings about "taking short cuts" and attempting to speed up the installation process. There is another nice "extra" feature here - Auto Focus energises a search routine that causes the dish motor system to automatically hone in on the signal you have roughly located. Somebody at the designer level of Aston has a complete understanding of motorised dish system installs - it is refreshing to see that translated to an instruction manual that leaves very little out.

Installation

For those intending to lock onto one or two services, installation is quick and completely friendly. For more complex needs, such as scanning an entire satellite (yes, it does this but slowly), more complex. One nice feature in the full satellite scan routine - press OK and ESC(ape) to temporarily stop and all services found to that point will be saved. Then you can resume the scan (where the receiver left off) by simply pressing ESC a second time. There is nothing to stop you from scanning a full satellite more than one time entering new symbol rates for each pass, of course, and rescanning

There is one shortfall here. To scan an entire satellite you need to enter the Symbol Rate - which is fine if you happen to know it. The memory holds 8 SRs per satellite for scan purposes, which means you won't be catching many of the less popular services (unless of course you pre-enter their SR in the scan sequence before starting).

The OSD (on screen display - or graphics) is a 9+ on a range of 0 - 10; quite breathtaking actually. Teletext (where it is available) works through the RF output (only) and can be viewed directly (on a coloured background screen), or as a "transparent" display overlaid on the video of the (same) channel. The receiver supports programme guides (EPG where available), and offers various ways to sort, list and recall specific channels.

Aston Simba 201 source: MediaStar (Jacob Keness), 24 Bosci Road, Ingleburn NSW 2565, Australia ; tel 61-(0)2-9618 5777, fax 61-(0)2) 9618 5077, Email opac@bigpond.com.au.

SIMBA equipped with an "appropriate" card easily handles the Canal-Plus (I701) and Zee TV (AsiaSat 3S) encrypted bouquets. A SatFACTS reader from India who happened to be visiting when we were testing Simba provided the Zee card used for the photos below: (left) "ZEE Int'l" (International) and (right) "Zee English." Yes, it is true Goldwafer cards are also available in Australia but a warning - they must be "inoculated" with new current-month numbers each month (the cards are not auto updating).

And here's Rolf!

ASCII for dummies; Nokia Remotes. Rolf Deubel answers questions

ASCII stands for American Standard Code for Information Interchange. Computers can only understand numbers, so an ASCII code is the numerical representation of a character such as 'a' or '@' or an action of some sort. ASCII was developed in the 1930s for landline teletext machines and now the non-printing characters are rarely used for their original purpose.

Because ASCII was actually designed for use with teletypes some of the descriptions are somewhat obscure. If someone says they want your CV however in ASCII format, all this means is they want 'plain' text with no formatting such as tabs, bold or underscoring - the raw format that any computer can understand. This is usually so they can easily import the file into their own applications without formatting problems.

ASCII code is displayed in 256 characters which is related to the binary computer value 2^8 which again is related to the old 8 bit computers with 2 way (binary) working solution "ON" or "OFF". All of these on / off combinations make 256 variations and therefor 256 characters

In those days, computer memory was limited (remember the Commodore 64, which had 64KB memory?), so the number 256 alone would have taken up a lot of "space" and designers were looking for a solution to save memory space.

The Hexadecimal system was the solution.... being able to count to 256 by only using 2 digits saved 33% memory space! Wow!

But how does it work? Fairly simple: instead of adding a second digit to the number when crossing the borderline of 10 (see here we already have 2 digits), they counted to 16!

Now - you will say: but 16 is 2 digits, can't you see? Yes 16 is 2 digits in decimal (deci / deca = 10 from the old Greek) but I mentioned earlier the hexadecimal system so it is the deci for 10 but there is the hexa as well which means 6 (again the old Greeks had their hands in the game for name giving); so 6 + 10 = 16

And again you will ask: but how do I get to one only digit when counting to 16? Here is the answer:

When crossing the border of 10 numbers you continue with an A for 10 then a B for 11 and so on until you reach 15 for F and when stepping to 16 only then you add the 1 in front of the next row. BTW computers start counting at 0 and NOT at 1 so 10 digits will be single digits 0 1 2 3 4 5 6 7 8 9 and then A B C D E F and again you get the ten numbers (deci) plus the six letters (hexa)... that's how simple it is!

On page 18 is the ASCII character table and this includes descriptions of the first 32 non-printing characters mostly used these days as control digits for computers!

Dreambox, the ultimate satellite toy?

Years have gone by with the NOKIA brand holding the unofficial record for acceptance by satellite enthusiasts worldwide. Not only the infamous 92xx / 95xx series STB and the notorious German market targeted d-Box (a 9500 derivative) but also the sidelined 9600, with a Common Interface and the less attractive but still well selling 9800 series with embedded CAM, are NOKIA's bread and butter.

Other manufacturers e.g. HUMAX with their 54xx series IRDs tried to break into this niche, especially over a price niveau which lifts the NOKIA into the Mercedes region of satellite set top boxes.

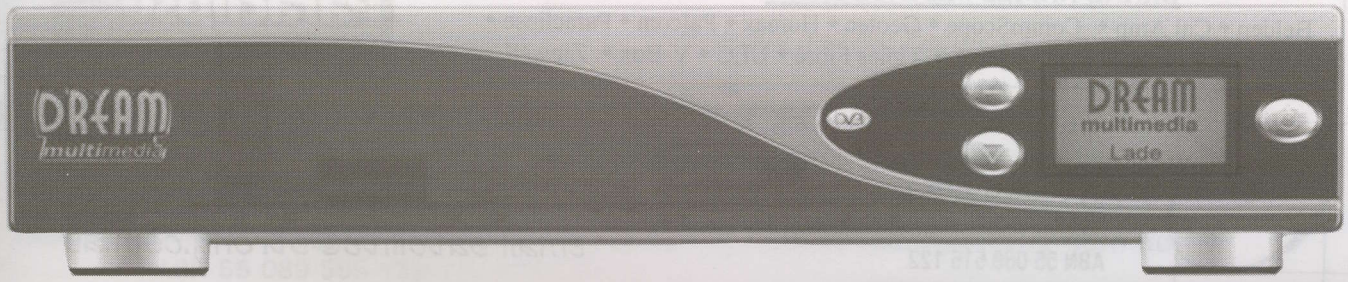
It is again the German market which seems to be able to swallow a virtual unlimited number of satellite receivers, bringing out 2 new toys for the hobbyist: The NOKIA d-Box2 and the soon to be launched DreamMedia Dreambox. Both boxes will have to prove worthiness to SatFACTS monthly, the d-Box2 in our big December report and the Dreambox in the new year, accompanied with a report about the DreamMedia GmbH, established by satellite entrepreneur Dirk Glunz, a former friend of the deceased (super) hacker TRON aka Boris Floricic.

DreamBox Design Criteria

1/ HDD to your own selection up to 100GB
2/ 100mbit lan full LAB access to HDD
3/ mp3 playback
4/ mpeg4 playback
5/ IDE UDMA66 Interface Master/Slave
6/ Compact-Flash-Reader
7/ USB Port, e.g. for webcam
8/ up to 256 MByte RAM
9/ SPDI/F digiout for digital bit stream out(AC-3 / DTS)
10/ MINI-DIN for ir control of your VCR
11/ DiSEqC
12/ 250 MHz IBM PowerPC and all in "Open Source"

For reference:
d-box1 hat 33 MHz
d-box2 hat 66 MHz
Dreambox 250 MHz

AND now Dreambox. Is this the next generation successor to Nokia's d-Box? Specifications are above; we'll have a user report!



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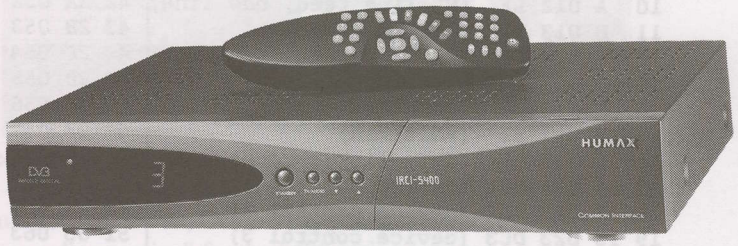

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This month's QUANTITYspecials!
2.3m mesh (Strong) $162; 17K C V/S LNBf (Strong) $25; Ku offset LNBf 11.300 LO (Strong) $30; Zinwell D-10 B3 Buster $454. Ask us about FTA package for WA reception of Vietnam's VTV 3 ch service!!!

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Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040		Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT (end of transmission)	36	24	044	$	$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS (backspace)	40	28	050	(	(	72	48	110	H	H	104	68	150	h	h
9	9	011	TAB (horizontal tab)	41	29	051	)	)	73	49	111	I	I	105	69	151	i	i
10	A	012	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	ESC (escape)	59	3B	073	;	;	91	5B	133	[	[	123	7B	173	{	{
28	1C	034	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174			|
29	1D	035	GS (group separator)	61	3D	075	=	=	93	5D	135	]	]	125	7D	175	}	}
30	1E	036	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177	&#127;	DEL

Source: www.asciitable.com

Queries?

"Reference report on cross pole (SF#96), my 9500 with DVB2000 installed seems to be especially susceptible to the presence of interference, such as cross pole signals. Is there a solution?"

Answer: Some 9500s have tuners which make them more sensitive to weak signals - that's good. But the bad news is the same 'improvement' causes signal break up when there is even a hint of interference (cross pole) present. The solution is not in a change of software (or the tuner) but rather more careful adjustment of your cross pole nulling.

Query

"Is it possible that while Atmel has a 'good name' in the plug and replace RAM world, there are better options? For example, the AMD AM29F400BT-90SC at about the same price is a 4Mb IC while their AM29FO80B-75SC is 8Mb. I realise some are 3V and others 5V (the Nokia is a 5V machine)."

Answer: The Flash is indeed a 4 Mb but the reader made a mistake.... he took the 4 Mb as a 4 MB !!! 4 Megabit divided by 8 are (8 bit make 1 Byte) 500KB = 1/2 MB and 2 of them are? Right: 1 MB. Again the option of 2x 29F800 is the one to go for !!!

The 4MB version was developed in times when DVB2000 was still DVB98 and not really reliable yet (I can still remember installing DVB98 Beta003 on my machine). So one set of 2MB Flash carried the good old "Dreamware" and the second set of 2MB carried Dr. Overflow's experimental DVB98..... flickable by a switch! Again ... nowadays it is NOT necessary and also definitely NOT advisable for "Non Solder Specialists."

Query: *Hi Rolf, just been reading your article in August SatFACTS re: souping up the RAM. Just wondering if you know where I can find the KM416C1000BJ-5 chip? Do normal hobbyist shops like Dick Smith, Tandy, Jaycar stock these items?* (JN)

Answer: The parts necessary for "souping" your beloved IRD are specialised devices / parts and normally not requested by the general public. Therefore hobbyist shops like Dick Smith, Tandy, Jaycar, Conrad and others do not stock these items. However, SatFACTS does *not* intend to extend 'The Parts Store' (p. 30) business to electronic parts and is trying to negotiate with some hobbyist shops to "take over" this new and exciting business to serve satellite enthusiasts. SF will report from time to time on this matter. In the meantime, SF Parts Shop is the only source for these parts as the minimum order from the suppliers is 100 pieces of each item!

Latest news from the Irdeto2 and d-Box2 frontier:

The restless German "hacker society" has a new trick: Smartcard sharing via DSL Internet access. People with permanent or semi permanent DSL Internet access and a d-Box2 can now share a single subscription smartcard with a number of friends via TCP / IP protocol on the Internet. The more and more developed d-Box2 "Open Source" operating system LINUX Neutrino allows a smartcard in an external smartcard reader (e.g. MasterCRD2 programmer) connected to the d-Box2 on board RS232 port to share it's "data" amongst several d-Box2 connected via the Internet in real time!

This is especially interesting for all Encryption Version2 scrambled channels where no solution other than subscription seems available right now! In other words, the d-Box2 works as a smartcard splitter but not in the limited area of your house but more or less worldwide (e.g. African Multichoice Bouquet with Irdeto2 encryption on Eutelsat W4 can be viewed in Europe where the signal can still be picked up)

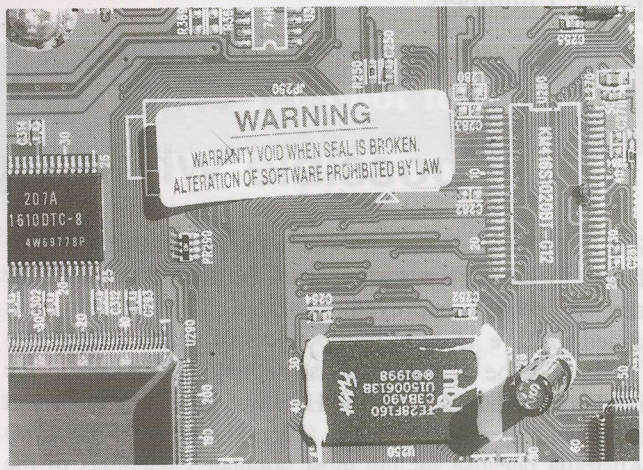
The d-Box2 appears to take over more and more from the old d-Box (9500 series) technology with virtually unlimited options due to the "Open Source" policy involved. SatFACTS plans a "Big d-Box2 report" in our December issue.

Possible tech tip

"'Quick Chip' is a newly available product that claims to speed up safe removal of surface-mount-ICs from printed-circuit-boards. It is applied to the solder on joints to be removed, claims to lower the melting point of solder, making it possible to remove ICs using a conventional soldering iron." (RN, Qld.)

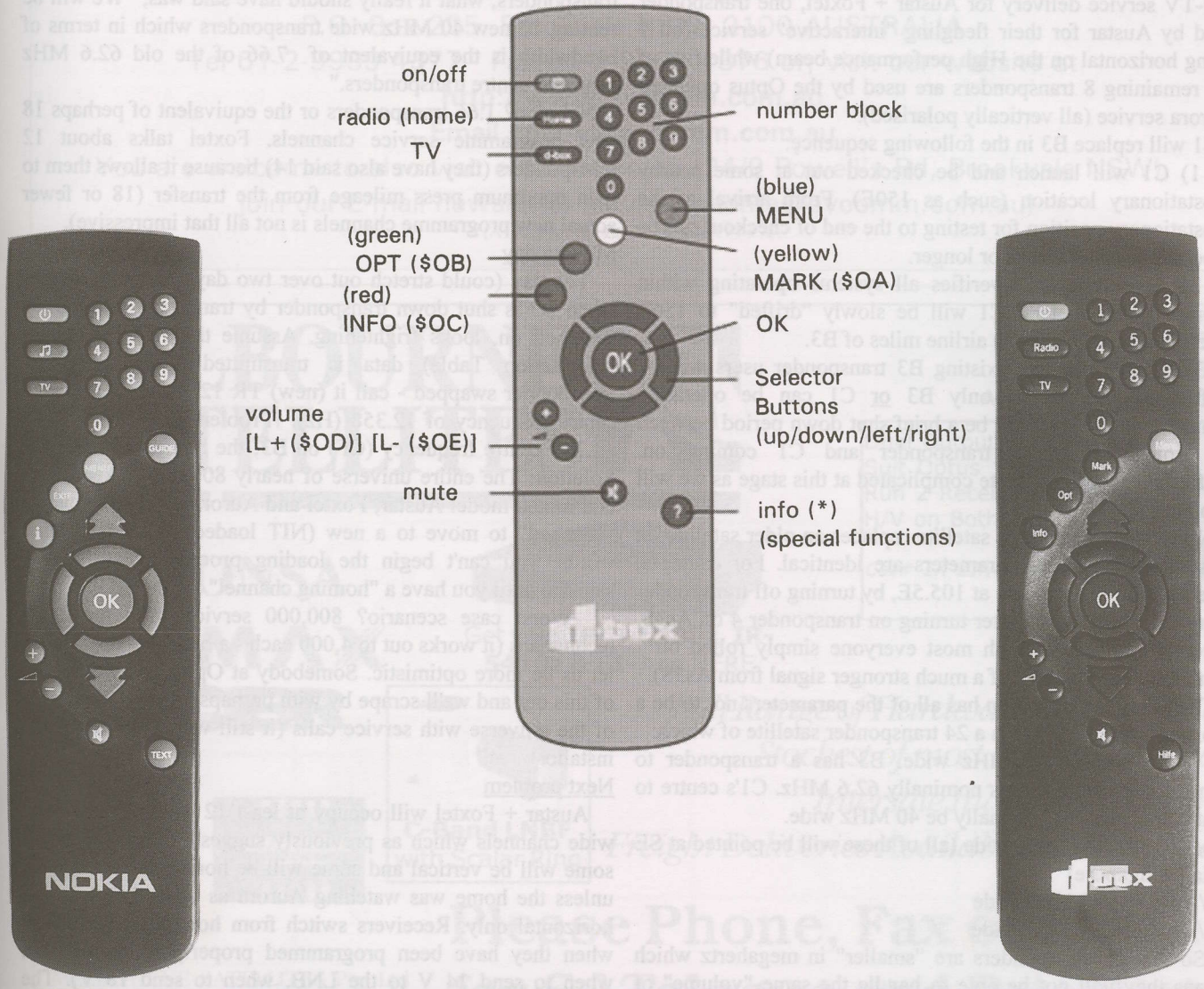
In SF#98

There is an intriguing stick-on label affixed to the main PC board of the current Humax 5410(Z) series receivers. It warns you not to modify the receiver's software because, "(it is) *prohibited by law.*" What they are concerned about is your changing a "copyrighted software" for something that is not under their corporate legal department's control. Is it illegal? If so, where?? And why shouldn't you be allowed to "modify" a



receiver as you see fit after paying for it???? Do you not own it - can you not do with it as you wish? We'll deal with these questions in SF#98, October, as you are taught step-by-step the "upgrading routine" for the 5400 series receivers.

Nokia's d/92/95xx remote functions



The Hexadecimal values are used for (*) special menu input. Remember: Hexadecimal "counts" from 00 to 15 (= 16 digits) and that is why hexa (6) decimal (10) is 6 + 10 = 16. This of course originates in the computer world and reflects the values needed in one-only digit to be displayed. Therefore, 0 1 2 3 4 5 6 7 8 9 A B C D E and F reflect the 16 digits whereby F=15 and 16 would be $10 (the $ in computer language always reflects the Hexadecimal display of values).

Optus C1 numbers

A wild and woolly ride is possible when Optus C1 replaces B3

SingTel's Optus B3 satellite was launched August 28, 1994 and was to have been the third of the new (replacing the Aussat A series) improved satellites. The satellite was designed to have 15 total transponders of which 7 (numbers 9-15) would be capable of something Optus calls the "High-Performance Beam." The HPB was especially important to the development of small dish (60cm) home DTH (pay-TV) in Australia because for the most populated segments of the country the HPB would allow low-cost home systems to function.

Optus B3 is the primary Australia satellite for domestic pay and FTA (free to air, through Aurora) television. Optus B1 is the satellite of choice for coverage of Sky New Zealand's pay-TV service. Presently, B3 has 6 transponders sharing pay-TV service delivery for Austar + Foxtel, one transponder used by Austar for their fledgling "interactive" service (all 7 being horizontal on the High performance beam) while five of the remaining 8 transponders are used by the Optus operated Aurora service (all vertically polarised).

C1 will replace B3 in the following sequence:

1) C1 will launch and be checked out at some nearby geostationary location (such as 150E). From arrival at the geostationary position for testing to the end of checkout can be expected to last 4 weeks or longer.

2) When checkout verifies all systems operating within "nominal" parameters, C1 will be slowly "drifted" to 156E where it will sit within 70 airline miles of B3.

3) One by one the existing B3 transponder users will be shifted to C1, but as only B3 or C1 can be operating simultaneously there will be a brief shut down period between B3 going off on a transponder and C1 coming on. Unfortunately, it gets quite complicated at this stage as we will explain.

Normally, when a new satellite replaces an older satellite, at least the transponder parameters are identical. For example, when As3S replaced As1 at 105.5E, by turning off transponder 4 on As1 and seconds later turning on transponder 4 on As3S, except for a minor glitch most everyone simply rolled on (with the added benefit of a much stronger signal from As3S).

The B3 to C1 transition has all of the parameters not to be a "normal transition." C1 is a 24 transponder satellite of which:

a/ 16 will be 40 MHz wide. B3 has a transponder to transponder centre that is nominally 62.6 MHz. C1's centre to centre spacing will nominally be 40 MHz wide.

b/ 4 will be 80 MHz wide (all of these will be pointed at SE Asia [Singapore]

c/ 2 will be 83 MHz wide

d/ 2 will be 84 MHz wide

So the C1 transponders are "smaller" in megahertz which means they will not be able to handle the same "volume" of traffic as B3. "Volume" means bandwidth and where it may be possible today to load up a single transponder on B3 with up to 16 TV channels, this is in a transponder that is approximately 36% bigger than the new C1 transponders. Which means? Thirty-six percent fewer TV channels per transponder (for example, from 16 to 10 or maybe 11 per C1 40 MHz bandwidth).

Foxtel has taken the lead in ordering 12 transponders; no information as to "which 12" but the options are few. When you load up to 16 programming channels into 62.6 MHz bandwidth centres, the SR (symbol rate) and FEC you select plays a part in the ability of the signal to reach small (60cm) dishes with a suitable rain-fade margin to play when the pathway is occluded.

If you retain the same symbol rate (29.473 currently for Austar and Foxtel) and FEC, but go down to a transponder only 64% as wide as the present B3 transponder, some of the channels will need to be shifted off to another (new) transponder. Thus when Foxtel announced it would lease 12 transponders, what it really should have said was, "We will be renting 12 new 40 MHz wide transponders which in terms of bandwidth is the equivalent of 7.66 of the old 62.6 MHz centre to centre transponders."

Net gain? 1.66 transponders or the equivalent of perhaps 18 new programme service channels. Foxtel talks about 12 transponders (they have also said 14) because it allows them to gain maximum press mileage from the transfer (18 or fewer actual new programme channels is not all that impressive).

Moving day

The day (could stretch out over two days or much longer) when B3 is shut down transponder by transponder and C1 is switched on, looks frightening. Assume the NIT (Network Information Table) data is transmitted within the first transponder swapped - call it (new) TR 12 which will have a centre frequency of 12.358 (Hz). Problem one: There is no 12.358 centre frequency (CF) on B3; the nearest is 12.375.8. Solution: The entire universe of nearly 800,000 mixed brand and mixed model Austar, Foxtel and Aurora receivers must be "coached" to move to a new (NIT loaded) CF. In other words, you can't begin the loading process from the new satellite until you have a "homing channel" for the NIT.

Worst case scenario? 800,000 service calls for 2,000 technicians (it works out to 4,000 each - a busy two days!). But let us be more optimistic. Somebody at Optus has worked all of this out and we'll scrape by with perhaps no more than 10% of the universe with service calls (it still works out to 40 per installer).

Next problem

Austar + Foxtel will occupy at least 12 of the 16 40 MHz wide channels which as previously suggested (SF#92) means some will be vertical and some will be horizontal. Until now, unless the home was watching Aurora as well, they were all horizontal only. Receivers switch from horizontal to vertical when they have been programmed properly to do so (told when to send 14 V to the LNB, when to send 18 V). The present transponder numbers require vertical's 14 volts for numbers 1 through 8 while horizontal's 18 volts applies to transponders 9 - 15. Somehow, in a massive all-network download each receiver must be retaught which transponders require 14 V and which 18 V. Numbers 1 to 10 are vertical on C1, 11 - 20 are horizontal (plus 21-24 which will also be

horizontal but only for people in SE Asia).

But it is the transponder CF (centre frequency), not some man-assigned transponder number, which the receiver's software wants to know when deciding which voltage to send to the dual-polarity LNB(f). And, alas, virtually none of the C1 CFs are the same as any of the present B1s (see table one, here). Yes, B3 TR3 vertical 12.407.1 is essentially the same as C1 vertical Tr3 12.407 - alas, that is an Aurora (not pay-TV) opposite polarity transponder. If Austar/Foxtel could be certain of "seeding" their universe of receivers with this frequency, and then somehow be certain the receivers would switch to 12.407 vertical "for further technical instructions," they might be able to pull off a major part of a 800,000 universe switch over. For the record - 12.407Vt is in use by Aurora (presently on Australia + NZ beam) and could in fact handle this assignment. But the concept of diverting 800,000 receivers to a new, foreign and *temporary* frequency long enough to get the attention of each for "further instruction" (which could only come after C1 has completely replaced all of the B1 Foxtel/Austar transponders) is tough to swallow. Even on paper.

Timing

Entering into this 24/48/72 "hours of infamy" at the wrong time will be a disaster. Aurora a few years back selected the last working day before the 20 day Christmas break began to download new (and very destructive) instructions to Aurora users. We can pretty much write off December (2002) anyhow given the uncertain (but 2003 likely) launch date for C1. Just ahead of a weekend is another bad date given the likelihood that 10% or more of the receivers (remember - that's 80,000 or 40 for each qualified installer - assuming 2,000 installers turn out for muster) won't make the transition without help. Or just ahead of a major sporting event would be another "bad timing" issue, because no matter how much better it works than we fear, there will be many thousands experiencing LNB(f), voltage switching, alignment or defective software challenges.

When and what?

The most obvious question (unknown) is, "*when will this happen?*" Optus truly does not know - their largest potential customer, Foxtel speaking for between 12 and 14 transponders, is having a dreadful time with the (Australian) ACCC concerning a proposed merging of movie and sport buying rights with Optus (Cable). The Foxtel "agreement" to acquire 12-14 transponders is conditional - on the approval by the ACCC of their proposed programming merger. The longer the ACCC takes to settle their mind on this controversial issue, the longer C1 launch is delayed.

SingTel (Optus) satellite personnel are between a rock and a hard place, insisting as we go to press, "*C1 is now completing final testing* (on the ground)" - a stage it has been in for far too long. There remains the possibility, since B3 is still functional, that C1 could be rebuilt for an entirely (not favourable to Australia) purpose if Foxtel fails to take the agreed to transponders. The data recited here is from the Optus "Satellite Network Designer's Guide" covering B3, and, a clandestine "draft" we acquired for a similar document covering C1. And this caution - there is nothing in concrete yet and we might still be using B3 a year or even two from now. *Stay tuned!*

TR#	B3/CF	C1/CF	Ch Width
1	**12.281.9V**	12.305V	**62.6/84**
2	**12.344.5V**	12.367V	**62.6/40**
3	**12.407.1V**	12.407V	**62.6/40**
4	**12.469.7V**	12.447V	**62.6/40**
5	**12.532.3V**	12.487V	**62.6/40**
6	**12.594.9V**	12.527V	**62.6/40**
7	**12.657.5V**	12.567V	**62.6/40**
8	**12.720.1V**	12.607V	**62.6/40**
9	**12.313.2H**	12.647V	**62.6/40**
10	**12.375.8H**	12.709V	**62.6/83**
11	**12.438.4H**	12.296H	**62.6/84**
12	**12.501.0H**	12.358H	**62.6/40**
13	**12.563.6H**	12.396H	**62.6/40**
14	**12.626.2H**	12.438H	**62.6/40**
15	**12.688.8H**	12.478H	**62.6/40**
16		12.518H	40
17		12.558H	40
18		12.598H	40
19		12.638H	40
20		12.700H	83
21		12.458H	80
22		12.538H	80
23		12.618H	80
24		12.700H	80

COMPARISON - B3 to C1 transponders

	Beacon 1	Beacon 2	UPC bcn
B3	12.747.5H	12.749H	12.750V/H
C1	12.747.75 H	12.748.75 H	12.750V/H

Tr #	B3 Antenna	C1 Antenna	TR#	B3 Antenna	C1 Antenna	TR#	B3 Antenna	C1 Antenna
1	NA/SE/NZ	NatA/NZ	9	NatB/HP	NatA/NZ	17		NatB
2	NA/SE/NZ	NatA/NZ	10	NatB/HP	NatA/NZ	18		NatB
3	NA/SE/NZ	NatA/NZ	11	NatB/HP/SE	NatB/N.Asia	19		NatB
4	NA/SE/NZ	NatA/NZ	12	NatB/HP/C	NatB/N.Asia	20		NatB
5	NA/SE/NZ	NatA/NZ	13	NatB/HP	NatB/N.Asia	21		N.Asia
6	N/SE/NZ/W	NatA/NZ	14	NatB/HP/++	NatB	22		N.Asia
7	N/SE/NZ/W	NatA/NZ	15	NatB/HP/++	NatB	23		N.Asia
8	N/SE/NZ/W	NatA/NZ	16		NatB	24		N.Asia

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

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
Thcm3/78.5	SkyChAust	3695/1455V	up to 3	3/4	5(.000)	Finally settled here from As2
	MRTV-Myn	3676/1474H	1	2/3	6(.000)	erratic service
	MidEst Mux	3640/1510H	up to 12	3/4	28(.066)	Now essentially all CA
	Mahar/DD1	3600/1550H	up to 8	3/4	26(.661)	USA religion chs, CMM music FTA
	ME Mux	3569/1581H	up to 4	3/4	9(000)	possibly TARBS?
	Nepal TV+	3554/1596V	3+ in mux	3/4	13(.333)	FTA + CA mux
	3ABN +	3551/1600H	4+ TV, radio	3/4	13(.330)	3 Angels USA, Ch of Hope, + 9 radio
	JAIN TV	3538/1612V	1TV	3/4	3(.300)	PIDs 4132/4133
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(.333)	frequency change
	TARBS	3520/1630H	unknown	3/4	28(.062)	MUX testing
	TARBS/Th5	3480/1670H	6+ TV?	3/4	18(180)	TARBS labell, CA-no SIDs
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	ETV mux	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here; wide beam
	Hyd Dig 2E	3910/1240V	1	3/4	5(.000)	SCPC, OK E. Aust. wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E. Aust wide beam
	Indian mux	3643/1507V	3	3/4	19(.351	New 07/02; corrections 09/02
	Jaya TV	3615/1535V	1	3/4	3(.255)	SCPC; OK E. Aust. wide beam
	ETV Mux#2	3485//1665V	4+TV	3/4	27(.000)	Several new ETV here; Asia beam
ST1/88E	MMBN	3632/1518V	12TV	3/4	26(.667)	Nagravision, some FTA; erratic
As2/100.5E	Euro Bouqt	4000/1150H	6TV, 21r	3/4	28(.125)	FTA TV + radio
	5-Star Med	3951/1199H	3TV	3/4	13(.185)	Macau MUX
	WorldNet	3880/1270H	4+/28radio	1/2	20(.400)	FTA; Now here full time
	Hubei/HBT	3854/1296H	1	3/4	4(.418)	FTA SCPC, teletext
	Hunan/SRT	3847/1303H	1	3/4	4(.418)	FTA SCPC, teletext
	Guan./GDT	3840/1310H	1	3/4	4(.418)	FTA SCPC, radio APID 81
	In. Mongolia	3828/1322H	2	3/4	8(.397)	FTA: #1 Mongolian, #2 Mandarin
	APTN Asia	3799/1351H	1	3/4	5(.632)	Sometimes **FTA**; also 3895Vt
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	Liaonin/Svc2	3734/1416H	1	3/4	4(.418)	FTA SCPC, radio APID 256
	Jiangx/JXT	3727/1423H	1	3/4	4(.418)	FTA SCPC, teletext, radio APID 81
	Fujian/SET	3720/1430H	1	3/4	4(.418)	FTA SCPC, + radio APID 80
	Hubei TV	3713/1437H	1	3/4	4(.418)	FTA SCPC, radio APID 80
	Henan/Main	3706/1444H	1	3/4	4(.418)	FTA SCPC, + radio
	Egypt/Nilesat	3640/1510H	7+, radio	3/4	27(.850)	Thru TARBS Aust, occ. FTA
As2/100.5E	Macau MUX	4148/1002V	5TV	3/4	11(.850)	5 chs TV, FTA, some tests
	Feeds	4086/1064V	1	3/4	5(.632)	FTA SCPC feeds
	Dubai MUX	4020/11430V	4+, radio	3/4	27(.500)	FTA including sport
	Jilin Sat TV	3875/1275V	1	3/4	4(.418)	FTA SCPC, + radio
	HeiLongJian	3834/1316V	1	3/4	4(.418)	FTA SCPC
	JSTV	3827/1323V	1	3/4	4(.418)	FTA SCPC, + radio
	Anhui TV	3820/1330V	1	3/4	4(.418)	FTA SCPC + radio
	ShaanxiQQ	3813/1337V	1	3/4	4(.418)	FTA SCPC, radio APID 81
	Guan/GXTV	3806/1344V	1	3/4	4(.418)	FTA SCPC, radio APID 257
	Fashion TV	3795/1355V	1	3/4	2(.533)	Now Viaccess version 2 CA
	Modelflat	3792/1358V	1	3/4	2(.730)	Off air (new in June) in July
	Myawady	3766/1384V	1	7/8	5(.080)	FTA SCPC - difficult to load
	Saudi TV1	3660/1490V	5+/tests	3/4	27(.500)	FTA MCPC; some testing here
As3S/105.5E	Telstra I-Net	12.596H	no TV	5/6	30(.000)	Signal useful for dish testing - no TV
	Zee bouquet	3700/1450V	10TV	3/4	27(.500)	Mediaguard (SECA) CA; 2 FTA
	Macau MUX	3713/1437H	2TV	3/4	5(.868)	New June 2002; low res MUX
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC; audio now OK
	Now TV +	3760/1390H	up to 8TV	7/8	26(.000)	CA + NOW, B'berg, NOW, Indus FTA
	Star TV	3780/1370V	15(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	21(+)TV	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Star TV	3880/1270H	20(+)TV	7/8	26(.850)	NDS CA (Pace DV211, Zenith)
	HK Mux	3900/1250V	2+TV	7/8	27(.895)	FTA PAL + occ. feeds
	Star TV	3940/1210V	7(+)TV	7/8	26(.850)	NDS CA as above
	CNNI	3960/1190H	8(+)TV	3/4	27(500)	PowVu CA; new SR Apr 29
	StarTV	3980/1170V	12+TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	Star TV	4000/1150H	9(+)TV	7/8	26(.850)	NDS CA w/ **4(Chinese) FTA**
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" testing SCPC
	CCTV bqt	4129/1021H	4(+) TV	3/4	13(.240)	moved from 4115
	Zee Bqt #2	4140/1010V	8(+) TV	3/4	22(.000)	Mediaguard (SECA) CA
Cak1/107.5	Indovision (S-band)	2.536, 2.566, 2.596, 2.626	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs
T'Kom/108E	IndoBqt	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17.500, 3496H/19.615
C2M/113E	TPI	4185/965V	1	3/4	6(.700)	FTA SCPA; NT/NC only
	Anteve	4144/1006V	1	3/4	6(.510)	change from 4055V; FTA SCPC

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(C2M)	**Indo Mux**	4080/1070H	5+ TV	3/4	28(.125)	Global TV - frequent changes in lineup
	Indosiar	4074/1076V	1	3/4	6(.500)	FTA; solid on 3.5m in New Caledonia
	SCTV	4048/1102V	1	3/4	6(.618)	FTA SCPC; NT/NC only
	Indone.Mux	4000/1250H	6+TV	3/4	26(.085)	unstable platform - testing?
	Satelindo	3935/1215H	1TV	3/4	6(.700)	Test card only reported
	Bali TV	3926/1224H	1TV	3/4	4(.208)	Testing June 2002
	Indo. MUX	3880/1270H	3+ TV	3/4	28(.125)	TVRI, others FTA
	GlobalMUX	3760/1390H	up to 12 TV?	3/4	26(.087)	Testing- 12 chs promised; 2-12 tests
	Brunei/Sing	3733/1417H	1TV	3/4	6(.000)	FTA; share time, Brunei-23hrs,Sing1h
	RCTI	3473/1677H	2	3/4	8(.000)	FTA SCPC, Australia, NC OK
	Myawad TV	3706/1444H	1	3/4	5(.924)	may be test; svc has been erratic
Jc3/12	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)	PowVu, some **FTA** (ch # 1,3)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)	CA & **FTA** NTSC: Japan, Taiwan
Jc28/54	**BYU tests**	3.915/1245V	1	3/4	3(426)	not fulltime; very strong NZ, Aust
Meas2	Astro Mux	11.602H	up to 17TV	3/4	41(.500)	Aust East beam - **3 FTA** + 14 CA
	VTV MUX	11.522Vt	3 TV	3/4	9(766)	WA only? Skew path, intended Asia
B3/156	**Mediasat**	12.336V/T2	7TV, 4+radio	2/3	30(.000)	FTA-TBN new 1 Aug; V1660, A1620
	Aurora	12.407V/T3		2/3	30(.000)	Aust, NZ 90 cm
	Aurora	12.532V/T5	Inc Zee TV	2/3	30(.000)	cvrs Aust, NZ 90 cm; CA + ABC Nat
	Aurora	12.595V/T6		3/4	30(.000)	Aust only; - smart card p. 26
	Aurora	12.657V/T7	data only?	2/3	30(.000)	cvrs Aust, NZ 90cm (no TV, radio)
	Aurora	12.720V/T8		3/4	30(.000)	Aust only;* - smart card p. 26
	Austar	12.313H/T9	iTV + here	3/4	30(.000)	Austar Interactive + demos); p. 29, SF#97
	Austar/Optus	12.376H/T10		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.438H/T11		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.501H/T12		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.564H/T13		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.626H/T14		3/4	29(.473)	CA, subscription available Australia
	Austar/Foxtl	12.688H/T15	(some FTA ra)	3/4	29(.473)	CA, subscription available Australia
B1/160	**ABC NT fd**	12.258V	1TV, 3 radio	3/4	5(.026)	V832, A833
	ABC feeds	12.317H	1	3/4	6(.980)	also 12.326, 12.335; ex PAS8 Ku
	Net 7 service	12.397H	1	3/4	7(.200)	Full schedule less commercials
	Central 7	12.354H	1TV + 1 radio	3/4	3(.688)	V1280, A 1281; occ. 2nd TV ch
	Imparja mx	12.360H	2TV + 8 radio	3/4	5(.424)	V1024, A1025, P1024; also try 12.379
	Sport feeds	12.420V	1	3/4	6(.110)	Weekend footy feeds reported-FTA
	Mediasat#3	12.424H	3+ TV	2/3	19(.800)	
	TVNZ DTH	12.483/456V	4+TV	3/4	22(.500)	FTA 4 channels (TVNZ x 4)
	Nine Net	12.512H	1 TV typ.	3/4	5(.632)	testing digital feeds; Sr may be incor.
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(.500)	NDS CA, subscription available NZ
	Sky NZ	12.644/671V	9TV	3/4	22(.500)	NDS CA, subscription available NZ
	ABC HDTV	12.603H	5TV	7/8	14(.300)	also 12..626,.643,.670, 688, & 706H
	Sky NZ	12.707/733V	8+TV	3/4	22(.500)	NDS CA, subscriptions available NZ
P8/166	**ABC A-P**	12.301H	1TV, 2 radio	5/6	5(.858)	Feed, Adelaide; not permanent
	TARBS3	12.326H	13TV + radio	3/4	28(.066)	TPG/EurodecMDS CA, occ. FTA
	TARBS	12.526H	13TV + radio	3/4	28(.066)	TPG /Eurodec MDSCA, **radio FTA**
	TARBS2	12.606H	13TV + radio	3/4	28(.066)	TPG/Eurodec MDS CA; **TRT FTA**
	TARBS5	12.646H	testing	3/4	28(.066)	TPG/Eurodec MDS CA
	TARBS4	12.726H	13TV + radio	3/4	28(.066)	TPG/Eurdec MDS CA; **Thai TV, FTA**
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)	June 2002-Irdeto-2 CA
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)	Dateline west; east PAS2, 3901
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)	PowVu CA
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(.470)	PowVu CA & **FTA**; subscription avail
	ESPN USA	4020/1130H	8+TV, data	3/4	26(.470)	PowVu CA; ch 11 DCP-CCP bootload; new FEC
	Discovery	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA (some audio **FTA**)
	CalBqt/Pas8	3940/1210H	up to 8TV	7/8	27(.690)	PowVu CA & **FTA (EWTN)**
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)	FTA at this time
	FilipinoMUX	3880/1270V	up to 8TV+radio	3/4	26(.694)	**Myx FTA** V1960, A1920 + radio FTA
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(.000)	some TV FTA; radio may require PIDs
	CCTV Mux	3839/1311H	up to 4	3/4	13(.240)	PowVu FTA, replaces PAS-2 svc
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)	was As2; PowVu CA
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowVu, CNN/CNNI now CA
	MTV	3740/1410H	8	2/3	27(.500)	#2, 8 **MTV China FTA;** rest CA
P2/169E	P2/169	12.281V	2+ TV, radio	2/3	27(.500)	PowVu CA, WIN, ABC NT
	WA PowVu	12.637(.5)V	4TV, 8 radio	1/2	18(.500)	PowVu CA, WA only - D9234
	TVB Mux	4026/1124V	up to 8	3/4	22(.000)	CA feeds to pay-TV; #7 TVBS-N FTA
	Fox Bouquet	3992/1158V	8TV/data	7/8	26(.470)	Pv, CA/FTA (**FTA ch3 test card)**
	Feeds	3966/1184V	1	2/3	6(.620)	PowVu (FTA) occ feeds
	Feeds	3957/1193V	1	2/3	6(.620)	PowVu (FTA) occ. feeds
	Feeds	3929/1221V	1	3/4	10(.850)	PowVu (FTA) occ sport feeds
	Feeds	3912/1238V	1	2/3	6(.620)	PowVu(FTA) occ. feeds
	Feeds	3898/1252V	1	2/3	12(.000)	PowVu (FTA) occ. feeds
	Middle East	3836/1314V	4 typ	3/4	13(.331)	**RAI TV, radio FTA**; balance CA
	Feeds	3803/1347V	1	3/4	6(.000)	PowVu (FTA) occ sport feeds
	BBC +	3743/1407V	3	3/4	21(.800)	**BBC FTA**, others CA usually

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(PAS-2/169)	**Feeds**	4040/1010H	1	3/4	10(.850)	PowVu occ FTA feeds
	7thDayAdv.	3872/1278H	1	3/4	6(.620)	Sat, Sun 0030, 0900+UTC ? need verif)
	Feeds	3868/1182H	1	2/3	6(.620)	FTA (occ sport); also try 3863,Sr6.100
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498	FTA-typ NTSC-occ sport, live Shuttle
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)	PowVu CA + **FTA** (BBC gone)
	HK bouquet	3850/1300H	up to 8	2/3	24(900)	was 4148Vt; some **FTA**
	occ feeds	3776/1374H	1 typ	3/4	5(.560)	occ feeds, typ FTA; also Sr 5.600
	Korean Bqt	3762/1388H	up to 3	3/4	11(.570))	Korean MUX, reload June 01
I702/176E	**RFO Poly**	4027/1123L	1TV	3/4	4(566)	SE spot beam
I701/180E	TNTV	11.060&11.514	9	3/4	30(.000)	east spot; 10TV + r each, vertical pol.
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)	3 **FTA**, Mediaguard; also 10.975 weaker
	TVNZ	4195/955RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feds, typ ca
	TVNZ	4178/972RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	AFRTS	4175/975L	3 TV, 3 radio	2/3	3(680)	'DTS' radio, TV audio FTA some IRDs
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feds, typ ca
	TVNZ/feeds	4161/989RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feds, typ ca
	RFO-Canal+	4086/1064L	4TV, radio	5/6	12(.041))	east hemi 20.5 dBw thru 2003+; new Sr
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)	DMV/NTL early vers.,occ feeds, typ ca
	TVNZ feeds	4044/1106R	1	3/4	5(.632)	SCPC, mixed CA and **FTA** feeds
	NZ Prime TV	4024/1126L	1	2/3	6(.876)	PowVu CA; Auckland net feeds
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)	CA, Leitch encoded
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)	New Feb 2002; vert strong NZ, Pacific
	Ioarana	3772/1378L	1	3/4	4(.566)	FTA SCPC; East Hemi Beam-Tahiti
	TVNZ	3846/1304R	1	3/4	5(.632)	SCPC, mixed CA & **FTA**, feeds
	10 Australia	37691381R	4	7/8	20(.000)	PowVu CA & **FTA; #3 TBN**
	USA feeds	3749/1401R	4?	?	26(400)	16-QAM (not MPEG-2 compatible)

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

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. Av-COMM P/L, 61-2-9939-4377.
AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.
Benjamin DB6600-CI. FTA, Foxtel/Austar w/CAM+card. Autosat Pty Ltd 61-2-9642-0266 (review SF#72)
eMTech eM-100B (FTA), eM-200B (FTA + CIx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
Humax F1-CI. Primarily sold for TRT(Australia), does (limited) PowerVu (not Optus Aurora approved).
Humax ICRI 5400. Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available, review SF#76.
Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777
MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777
MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
MediaStar Simba 201. EMbedded SECA (Zee, Canal +); review SF#97. MediaSatr Comm, contacts above.
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. Se SF#95, p. 14.
Nokia 9200/9500. When equipped with proper software, does Aurora, pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
Pace DGT400. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). Units being replaced with UECs.
Pace DVR500. Original DGT400 modified for NBC (PAS-2)/RSA use, with CAM equivalent to DGT400 but more reliable.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version.
Panasat 520/630/635. MCPC FTA, Irdeto capable, forerunner UEC 642, 660. Out of production, spares fax ++27-31-593-370. No longer wotrk with Austar/Foxtel.
Panasonic TU-DS10. FTA + Irdeto CA; one of 2 IRDs approved by Optus for Aurora, but never available in Australia.
Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH(below)- 222; terminated
Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, GWN+ PAS-2 Ku, CMT etc). Scientific Atlanta 61-2-9452-3388.
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-3749)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above).
STRONG Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, Aurora. Strong Technologies 61-3-8795-7990.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84); Strong Technologies, # above.
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faultyP/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel-limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.
Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fx 64-9-814-9447.
Xanadu. DVB compliant special-priced receiver for members of SPACE Pacific (Av-comm Pty Ltd, tel +61-2-9939-4377)

Accessories:

Aurora smart cards. New v1.6 now available, 1.2 no longer available for RABS. Price now A$105, Sciteq 61-8-9306-3738.
PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)

WITH THE OBSERVERS

AT PRESS DEADLINE

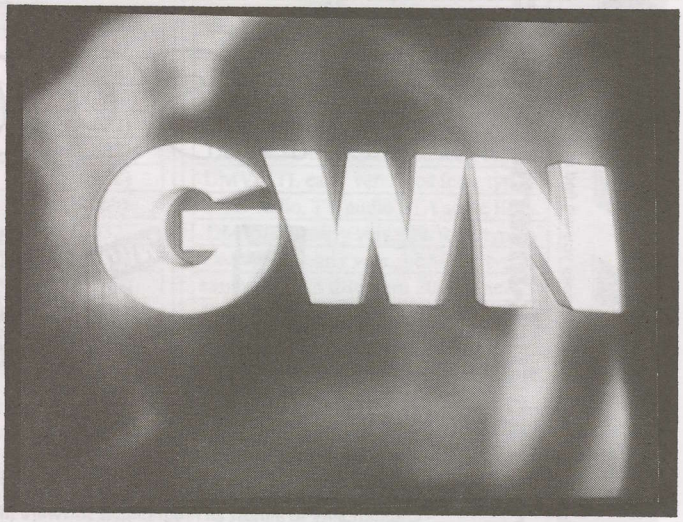
ABC A-P began coverage of AFL finals September 6, will continue to September 28 Grand Final. NRL coverage began September 13, goes through to Grand Final October 6 (7.30PM AEST). Also to be carried - Melbourne Cup November 5 3.10PM AEST. Aurora has moved SBS SE from 12.532Vt to 12.407Vt (B3) and it appears 12.532Vt + 12.657Vt will no longer be Aurora dedicated, soon!

AsiaSat 2/100.5E: "EuroSports is identifier on yet to have video or audio service on 3660Vt (Sr 27.500, 3/4 - the Saudi Mux) but did note teletext in English and other languages as early as August 11 (late in August, this was gone)." (**D. Mitchell**, NSW) "Test card 4148Vt, Sr 11.850, 3/4 (Macau mux), for 'Lian Hua Sat'." (**Arnie**, NT) "Correction: Fashion TV is not Irdeto - but Viaccess and we use Humax VA3210 for reception here." (**Channel 8 Ltd**, PNG) "Saudi Bouquet 3660Vt, Sr 27.500, 3/4 has a new slide announcing , 'Al-Alam News Channel'; PIDs 513/651". (**DM**, NSW) "Macau Mux 4.148Vt, Sr 11.850, 3/4 seems to have dropped in level; was 20%, now 10% and below threshold on 1.8m." (**DM**, NSW)

AsiaSat 3/105.5E: "Indus News testing 4115Vt, Sr 3.331, 3/4 VPID 308, APID 256." (**Arnie**, NT) "EPG for the 4115Vt service says 'PTV' suggesting Pakistan, which it is not. eMTech indicates English and French soundntracks but in fact there is only Indian; teletext is turned on but only blank pages." (**DM**, NSW) "Contact for Zee TV affiliation/viewing is Kaushal Nanavati, tel +91-22-6978223 and fax +91-22-6936132." (**GW**, PNG) "Indus bouquet 3900Vt, Sr 27.895, 7/8 is being abandoned according to crawl over video; moving to 3760Hz, channel 5 (NOW-TV bouquet, Sr 26.000, 7/8). Unlikely 'Indus Vision' also on 3900Vt will stay either - I suspect this transponder may be added to STAR TV Asia collection shortly." (**IF**, Qld) "Indus Music on 3760Hz (Sr26.000, 7/8) PIDs 1030/1031." (**Leonard**, Qld) "Indus Vision now running on 3760 (August 22)." (**Leonard**, Qld.) "Late August lineup for 3760Hz, Sr 26.000, 7/8 is: (1) NOW TV FTA, (2) Bloomberg FTA, (3) Indus Music FTA, (4) ATN World - test card, (5) Indus Vision FTA, (6) Tech TV CA Pv, (7) no service, (8) TAS TV CA, (9) DBN24 for TS1 (CA).": (**DM**, NSW)

Gorizont 33/145E: "Apparently all TV here has been shut down (NTV and TNT were on 3925RHC). (**D. Leach**, NSW) (**Coop's note**: Reported back up late in August.)

InSat 2E/83E: "Correction: New mux 3643Vt is Sr 19.531 (3/4)." (**DM**, NSW) "Several recent changes: DD1 National 3830Vt, SR 5.000, 3/4, has shut down. DD2 3910Vt, Sr 5.000, 3/4 was labelled 'DD2 Metro' , then switched to 'DDTelugu' and most recently 'Hyd Digital 2E" with eMTech indicating English teletext altho not apparent here. The analogue channel 3851Vt, previously 'DD National', is now on-screen labelled 'National Kolkata' (some report 'DD Bangla'). The analogue channel 3929Vt, was 'DD Metro', is now 'Hyderaband' (some report labelling is 'DD Telugu')' and is the same programming as SCPC on 3910Vt. DD Metro replacing DD Teluga 3979Vt, Sr 5.000, 3/4 FTA. " (**DM**, NSW)



GWN Perth is one of quad set services found on PAS-2 Ku but only for those living in Western Australia through Scientific Atlanta D9234 authorisation stream. Will it continue? Stay tuned!

Intelsat 701/180E: "With reference to AFRTS/AFN (SF#96, p. 21, 4175LHC, Sr 3.680, 2/3) - I find on eMTech 100 the following all FTA (audio only): 'Pacific' L = radio, R = TV audio; 'News' L = radio, R = TV audio; 'Sports' L = radio, R = TV audio; extremely strong here - 80% on 1.8m with dielectric plate in feed." (**DM**, NSW) "TF6 on Canal-Plus 10.975, nominally CA, was FTA late in August. My eMTech has never been able to network (NIT) load the two transponders (10.975 and 11.610) but now NIT works fine starting from either one. TF6 carries some USA programming dubbed to French such as 'Bold and Beautiful' soap and 'ER'." (**DM**, NSW)

JcSat2A-8/154E: "BYU-TV remains off on 3915Vt but IRD indicate 91% signal level; no V nor A being transmitted." (**D. Mitchell**, NSW) "BYU-TV was back on air 3915Vt, Sr 3.426, 3/4 on Wednesday the 21st (August). This may be presently on a Wednesday-only schedule (seen last three Wednesdays) although have been noted other days, randomly." (**IF**, Qld.) "PIDs are 4121/4133 and I read Sr as 3.424." (**Leonard**, Qld) "99% Auckland VPID 4121, A33." (**Mathews**)

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 f5.5-f8 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 October 15th issue: October 3 by mail or 5PM NZT October 5 if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

What's the Austar "Interactive" Story?

Interactive nominally means the user of the system has two-way communication with the provider of the "service." For example, if the user has chosen" games" and is playing naughts and crosses, each time they enter a naught (using their TV/satellite remote control) the service provider's computer plays a cross and the game goes on. In more advanced interactivity, perhaps you are reading an "electronic book" on your screen and come across a locational-word which you do not recognise. In an interactive system, clicking (using a remote control) on the word would command the computer at the programmer to provide you with additional data on the selected word. If you were watching an "interactive advertisement" and saw a handsome car you wished to know more about, clicking on the car or a text word as designated for clicking would command the computer at the programmer to give you more detail. In sporting events, clicking on a particular player or statistic creates a "feedback loop" between the user and the programmer which connects to the programmer's computer archives where everything you ever wanted to know (and perhaps more than you wished to know) about a particular player shows up on your screen.

This is one of those, "*say it fast and it sounds pretty neat*," concepts.

So what is "wrong" here? Nothing that money and perhaps one or two generations into the future won't solve.

Challenge one in this "business plan" is human nature. From the dawn of television, "watching TV" has been a one-way activity. The viewer "watches" and the TV set "performs." Nobody asked us to do more except the suggestion that it is permissible to get up and piss during commercials. Pissing = "interactive." Depending upon what country you are sitting in as you read this, between 20 and 50% of all homes have a PC. A PC demands "interactivity" - you *must* touch things like the mouse and push things like buttons to get a response. This is totally alien to people who only get up to piss when commercials are on the tube. Asking the 50-60% who don't have home PCs to activate "act"-and-"get-a-response" skills is a major step - call it a fault - in the "Interactive TV Business Plan." Which is why it might take twenty years (a generation) to work that one out.

Challenge two is content. Why would anyone want to play "Naughts & Crosses" on their TV screen (more than once - the novelty factor) and pay Austar $5 a month for the ability to do so?

Challenge three is cost. "Interactive" means somehow the ADB(SMS)-brand set-top satellite decoder must communicate with Austar-central. That means a telephone call. That costs money. Money atop the $5 a month fee, which *someone* must pay.

Challenge four is the competition of Internet. There is nothing on "Interactive" of interest which is not available on Internet itself. But the Internet version has 100, 1,000, 10,000 (etc.) as much as the Interactive version. The only notable exclusive aspect of Interactive is an electronic programme guide for the satellite (or cable) channels delivered by the provider. It is handy, it is convenient, it is colourful. But is it worth all of the "baggage" which comes with it? The marketplace will answer that one for us.

Austar, like Sky NZ, is betting people will pay money - lot's of money over and above their regular pay-TV statement each month - to be "Interactive." So far this has not happened in the UK where interactive is older than anyplace else on the planet.

Interactive requires at least one dedicated transponder. It is, like TV channel "streams," a user of "bandwidth." B3 Hz transponder T9, 12.314, Sr 30.000 (note that number), FEC 3/4 is Austar's *alone*. There is no Foxtel content here - Austar is paying the A$400,000 per month for use of this transponder for their "interactive" activity. For a firm with under A$14 million in "reserve cash" in the bank (and dwindling daily - see p. 2, here), that's a very big A$400,000 (quick math - 80,000 homes x $5 each per month).

Your investigation: You can load 12.314Hz (12.313.2) with many types of receivers but at this stage only the ADB/SMS supplied by Austar has been firmware (and software-down) loaded to take the transponder's content appropriately "apart" for use. If you don't have an Austar installation with the required telephone modem connection, it really doesn't matter anyhow. At best you are a technical person inquisitive about how it works. Here's how.

A Nokia without the latest (DVB2000) software loads a video server called "FYI" which is a looped "programme" (we are being generous here) that tells you about Austar. An eMTech 100, a Hyundai do more.

(Ch 1) 9oG: (CA and unknown content);

(Ch 2) 9oI: (CA) - programmed with the BBC's "Walking with Beasts" which is like a walk in the park with wild animals. On a UEC 642, access is via the "services" menu while on an ADB, via a sub-menu followed by the green (remote) button.

(Ch 3) 9oJ: As with 9oI, a looped video called "Evidence," accessed with the ADB yellow button.

(Ch 4) 9oK: "Making of ..." and accessed with blue button.

(Ch 21) FYI: (For your information), a 20 minute video loop Austar changes once (sometimes twice) per month, also found on Austar channel 99.

(Ch 22) aHome: (FTA) is a 5 minute loop that loads from the UEC services menu, or plays in a small inserted box on the ADB over the main menu. Content describes Austar's latest services including games (the 1980 generation "Ludi", also offered by Sky NZ).

(Ch 23) aDemo: (FTA) Accessed through UEC service menu, sub-menu on ADB. 5 minute demonstration on using menu for SMS and ADB, how to access interactive services.

(Ch 24) IATV1: (FTA) Accessed through UEC service menu, ADB sub-menu; 5 minute "T-mail" demo/instruction.

More: Individual games, data streams add several hundred "more" channels to those listed here.

Measat 1/ 91.5E: "VTV (VietNam) Mux on 4158Hz, FTA, Sr 9.766, 3/4 (see Measat 2-below)." (**Jacobs**, NT) "There is something there but not enough for my 1.8m." (**DM**, NSW)

Measat 2/148E: "The Aston Mux (11.602Hz, Sr 41.500, 3/4) has promotional slides (their FTA ch 17) promoting (1) C-Skynet (includes map of China), (2) I-Skynet (Indonesia), (3) J-Skynet (Japan), (4) BNE-DTH (possibly Borneo?), and (5) A-Skynet (Australia) with local contact numbers for Australia." (**D. Mitchell**, NSW) "On 2.7m Ku in Perth, 80% on Humax 5400, 11.522Vt, Sr 9.766, 3/4 VTV1, 2 and 3 (Viet Nam). I also see a second carrier at 11.590, possibly data, analogue receiver produces black screen so it is powerful as well; apparently this unusual 'skewed beam' from Measat 2 is not available on Australian east coast?" (**A. Zapara**, WA) (Coop's note: There is a new service here to be 'sold' to Vietnamese emigrants to at least WA - others should check to see how far 'east' this skewed beam goes!) "GMA Philippines on 4085Vt, Sr 3.360, 3/4 testing, very marginal here; went CA August 22." (**Ladd**, PNG) "The FTA Macau Channel on 11.602Hz appears to be the same as the C-band As3S 3713Hz (Sr 5.868, 3/4 on As3S). The on-screen logo includes the letters, 'MM'. Also, the CA channel on A-Skynet labelled 'CTV' seems to be the same as one of the channels on PAS-8 Taiwan bouquet (3860Hz, Sr 28.000, 5/6)." (**IF**, Qld)

Optus B1/160E: "Prime TV has appeared FTA on 12.707Vt (Sr 22.500 with TVNZ FTA) but video quality is dirt-poor and would be watchable only under duress!" (**Robert**, NZ) "TVNZ mux with regional feeds for commercial inserts out of Wellington, Auckland and possibly others now on 12.483Vt as well as 12.456Vt (Sr 22.500, 3/4); NUI FM 12.644Vt, FTA, APID 661, PMT 269." (**C. Sutton**, NZ) "On Satcruiser I load (1) TVNZ CA, (2) TV One FTA, (3) TV2 FTA, (4) 'copy of TV One FTA." (**P. Burton**, NZ) "ATN 7 (Sydney) test card is primary video on 12.397Hz." (**DM**, NSW) "Central 7, 12.354Hz, Sr. 3.688, 3/4 on occasion runs a second video channel here - even in this small symbol rate number." (**IF**, Qld) "ABC muxes (6 total) now on T14, 3 on T15. All use Sr 14.300, 7/8 with mixture of up to 5 programme channels: 12.603 (WA bouquet), (2) 12.626Hz (SA), (3) 12.643Hz (NT), (4) 12.670Hz (NSW), (5) 12.688Hz (Victoria) and 12.706Hz (Qld); some (such as NSW and Qld) have 6th 'ABC Digital Radio' channel as well." (**IF**, Qld).

Optus B3/156E: "ABC National feed apparently gone from 12.407Vt." (**Samuel Thornton**, NSW) "ABC National on 12.532Vt, Sr 30.000, 2/3 VPID 848, APID 849, text 850, SID 504 while SMA RFM radio is APID 1873." (**Bill Richards**, Aust) "Revised channel line-up for Mediasat 12.336 (Sr 30.000, 2/3) on Hyundai is: (1) Vision Asia 1: SET-Asia (CA), (2) Vision Asia 2: Zee TV (CA), (3) Vision Asia 3: Zee Cinema (CA), (4) MSAT Occasional (Globecast test pattern FTA), (5) TRT International (FTA), (6) Trinity Broadcasting Net (USA origin, FTA), (7) Tzu Chi (FTA), (8) TRT FM (FTA audio), (9) VOT (FTA, audio), (10) ABS Radio (FTA, audio), (11) Tamil Radio (FTA, audio), (12) SNG IFB (audio feedback for remotes in field), (13) Access 1 Internet. Of note, eMTech loads this as well but 'stock' Nokia will not!" (**IF**, Qld) "Aurora 12.657Vt may no longer carry TV or radio - did have Optus test card ch 62; *something* about to happen here? 12.532 and 12.407 also in apparent transition-loading modes." (**DM**, NSW) "This will not last! On eMTech 100, when I load 12.313, 'Ch-5-2522' label comes up with FTA Austar 'Movie One'! Obviously a test (and a strange selection of a test source), as this channel is normally only on 12.563 as CA on Austar ch. 38 (could not load this channel on a factory-original Nokia)." (**DM**, NSW) "Using UEC 642 with Goldwafer, found 21 channels on 12.313 that are nominally CA but currently only running blank V and A (no programming). Three of these until recently had BBC's 'Walking With Beasts' (now gone). Home, Demo and IATV1 (demonstration of T-mail service) are also here, FTA on UEC, Hyundai and eMTech. The Hyundai and eMTech load an extra channel as well - 'aGames' as a radio ('audio channel on Hyundai HSS100C) but not in use as I write this report." (**Skunk**, Vic)

Palapa C2M/113E: "Keeping up the tradition of here-today, gone-tomorrow, Quick Channel, Metro TV, TBN and feeds have left 3720Hz." (**Arnie**, NT) Global Vision Mux 3760Hz,

Sr 26.087, 3/4 - channels 2-11 have changed PIDs (need to be reloaded) but continue to have non-interesting promotional slides promising 'service soon'." (**IF**, Qld.)

PanAmSat PAS2/169E: "IHUG 'Ultranet' 12.487Vt, Sr 11.110, 3/4." (**B. Richards**, Australia) "12.281Vt loads on eMTech as (1) Ch 1 ex (Imparja), Ch 2 ABC/NA, Ch 3 ABC Central, (4) WIN West." (**DM**, NSW)

PanAmSat PAS8/166(.5) E: "CTV, 3860Hz, Sr 28.000, 5/6 has been FTA on and off; likewise TTV and FTV." (**Gerald**, NSW) "At one point TTV, CTV, CTS, FTV and Z Channel on 3860Hz were FTA; no more." (**Leonard**, Qld.) "Current channel lineup (late AUgust) 3860: (1) TTV (Taiwan TV) CA, (2) CTV (CA), (3) CTS (CA), (4) FTV (Formosa TV) (CA), (5) test card + feeds, (6) occ. FTV FTA and test card, (7) STV (Super TV - Sony's Entertainment TV) FTA, (8) SET (FTA and in PAL - rest NTSC), (9) Tzu Chi FTA, (10) Power TV, (11) Channel 'Z' (wrestling), (12) Star's Xing TV (Taiwan version) + 30 FTA radio channels." (**DM**, NSW) "ESPN 4020 Sr 26.470 changed FEC to 3/4; much better here. (**KC**, Fiji)

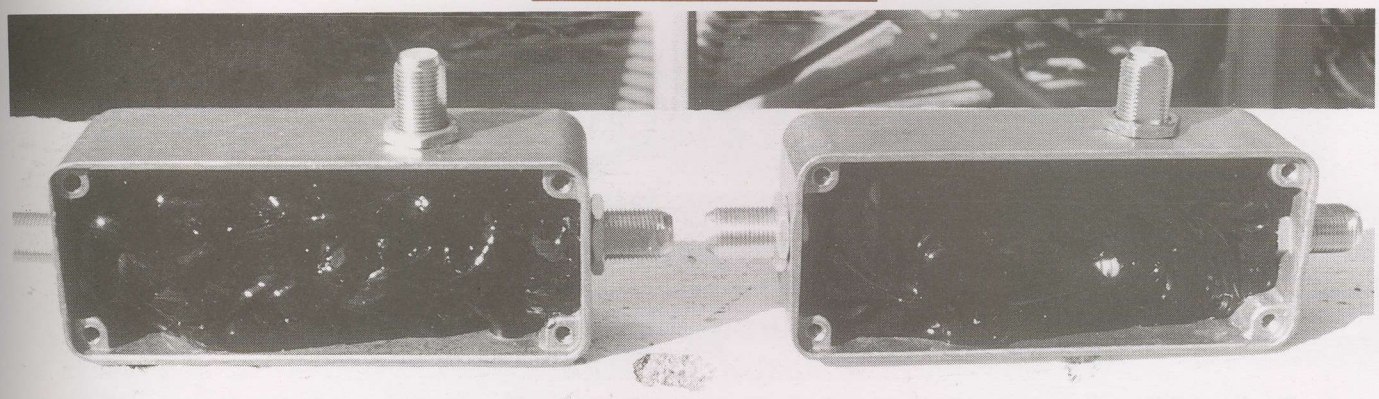
PanAmSat PAS10/68E: "New TARBS mux 4064Vt using MDS CA, Sr 21.000, 3/4 with Video Italia, INN, Alice and Leonardo." (**Zapara**, WA)

Thaicom 3/78.5E: "New country? Nepal TV on 3585Vt, Sr 26.667, 3/4 (in Vijay mux, Asian beam)." (**JL**, PNG) "Nepal TV off, replaced with test card late August."(**Arnie**, NT)"TARBS mux 3480Hz, Sr 18.180, 3/4, was briefly in clear (early August) with additional programming including new audio (APID 660)." (**Charles L.** NT) "Thai Farmers Bank closed circuit feed 3600Hz, VPID 514, APID 670." (**B. Richards**, Australia)

Soapbox: (Views are those of writer, recorded here as received.) "Austar Interactive is a combination of games, information, demonstrations of future offerings. 'iDaily' is many pages of news (similar to UK's original CeeFax or teletext in NZ), weather forecasts (enter your postal code for local forecast). Pace DGT400s can only access the FYI channel which in turn they will lock or stall when accessing (and lose audio). A Hyundai randomly loses audio and equally randomly replaces video with message, 'Please, Wait! Updating channel information'. A Nokia and a UEC (642) work quite well on the channels they are able to load (see p. 29) while the ADB seems to work fine although it is slow to load some of the interactive services." (**Jonah**, Queensland). "With a 1.8m dish and eMTech 100, I can load 138 FTA TV channels on C + Ku. Not bad!" (**D. Mitchell**, NSW) "A local is installing a 3.7m solid Ku rated for Canal-Plus here - I'll report how it works, if it does!" (**F. Kosmalski,** Auckland) "Radio Rhema (religion) claiming they will be on Sky NZ bouquet, FTA, 'before Christmas." (**P. Escher,** Auckland) "I am being told 'NoOneMan' software from Europe has PowerVu decryption - is that possible?" (**Harold L.**, NSW) (Editor note: Verrry unlikely.) "Space Universal offset LNB(f) from Australian Satellite Systems is not usual 9.75/10.75 local oscillator - rather 10.60 substitutes for 10.75 which will move the Austar/Aurora etc. 12.25 - 12.75 GHz region up to 1650-2150. Most receivers will handle that higher input range but cable losses will also be higher - a warning." (**Star**, NSW) "Local WIN-TV has been passing through Network 9 14:9 video pasting a WIN-TV logo within black area at top of screen. But during (locally inserted) commercials, they hold 14:9 creating tall, thin people. When a widescreen programme finishes, they often forget to switch back to 4:3 for several minutes and then

- glitch - they switch in the middle of a programme. Even stranger, when there is a mixture of 4:3 and 16/14:9, they leave 14:9 on all the time. We are paying a tremendous price for 'progress'. " (**Jonathan**, NSW) "My name is John Lee and I am the new regional manager for Arirang TV. This year Arirang wishes to provide free advertising for all hotels that are carrying our signal. Hotels or installers interested in this free marketing assistance should contact me as (Email) johnlee@arirangtv.com." **AI**, NSW "Comet has charged installers $440 for 'missing' decoder boxes. When installer is able to prove he was not responsible for loss (but only after paying for same), Comet does not give him money back - rather they issue stock credits! Reason given - they are currently paying off $600,000 per month +15% interest to complete delayed purchase of 'Mr Antenna' brand with payments through December. If Comet fails to make a single payment, 'Mr Antenna' and 'Brisbane Antenna Services' revert to John Sambell." (**TW**) "TVNZ is testing COFDM (terrestrial) UHF Ch49/695.25MHz, 16-QAM, 2K carriers, guard interval 1/8, code (FEC) rate 1/2 labelled as 'TVNZ DVB-T' but only one video channel presently." (**S. Johnson**, NZ). "I am really pissed off. Several months ago I subscribed to the Zee service on Ku through Optus B3 here in NZ. At most there are a couple of hundred like me here. After 10 weeks the service quit so I called the Auckland office. Ten times. I have receipts for my paid invoices, I am not delinquent. They referred me to their Sydney office where I was told my card was illegal! I explained it came from their NZ office and they were befuddled. Days later, no service. I have done the right thing - paid them money and promoted the service. But this is a lousy way to run a business. I will now go to India (screw these idiots who can't run a business properly here in NZ!) where I can spend US$5 for a Zee pirate card to get their AsiaSat 3S service on my 2.7m dish. If they are not able to handle subscriber problems better than this, they won't be around long!" (**M**, NZ). "Murdoch couldn't guarantee the safe arrival of any spaceship that paid his extortionate (insurance) fees - but he could assure the destruction of any that didn't. For a real stranglehold on the spaceways, Murdoch needed Venus Equilateral's' command of interplanetary communications - and the giant space station, conveniently, was totally unarmed! So Don Channing and the Venus Equilateral crew had two choices - surrender in five days or be blasted out of space! But Murdoch reckoned without Channing's guts and mind - the kind of mind that saw that what was not a weapon could be the deadliest armament of all!" (Extracted from Venus Equilateral, published by Pyramid - 1967 as forwarded by **Sir Arthur C. Clarke**, Colombo, Sri Lanka from a note he sent to Rupert Murdoch in May.) "Wolf Radio (within Sky NZ bouquret) is now gone - replaced with George FM, Auckland." (**P. Escher**, NZ) "Shopping at Sydney HiFi Shop, saw first ever for me PVR (HDD recorder)/S-VHS VCR; A$2,799; and, Sony Plasma (107cm) is being advertised at Harvey Norman for $13,999 and includes built-in tuner -i.e., is not a HDTV monitor like others previously on offer." (**DM**, NSW)

They may look the same - but they don't work the same!



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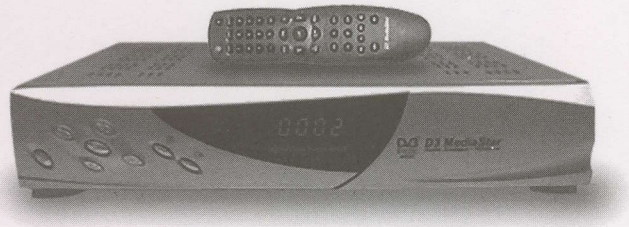

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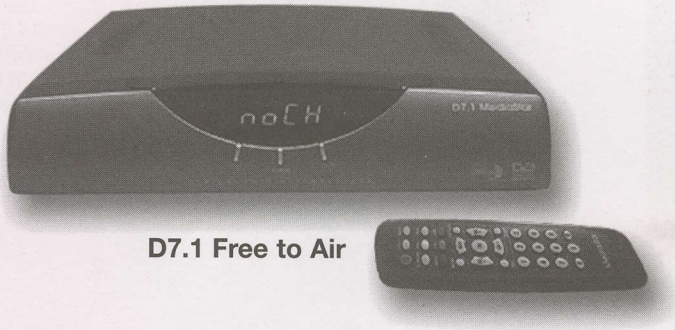

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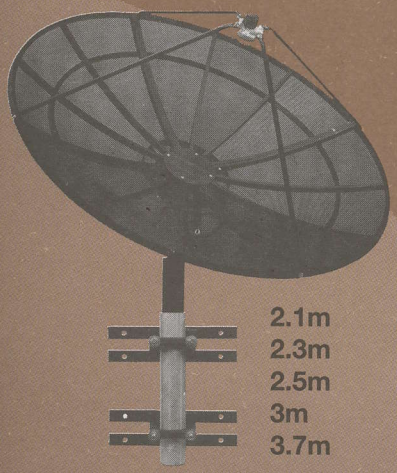

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2.3m
2.5m
3m
3.7m

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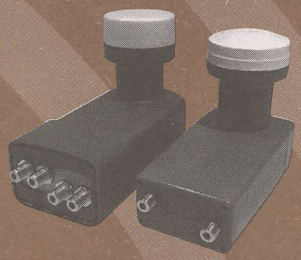

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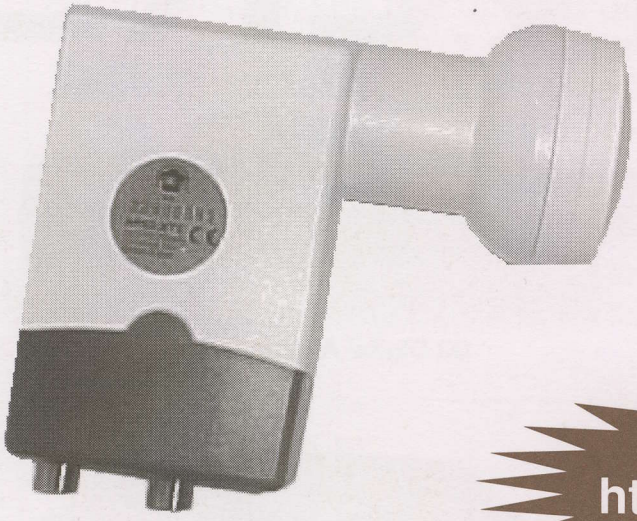

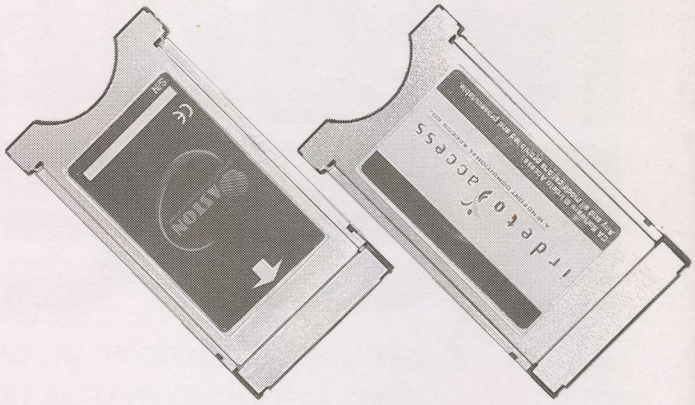

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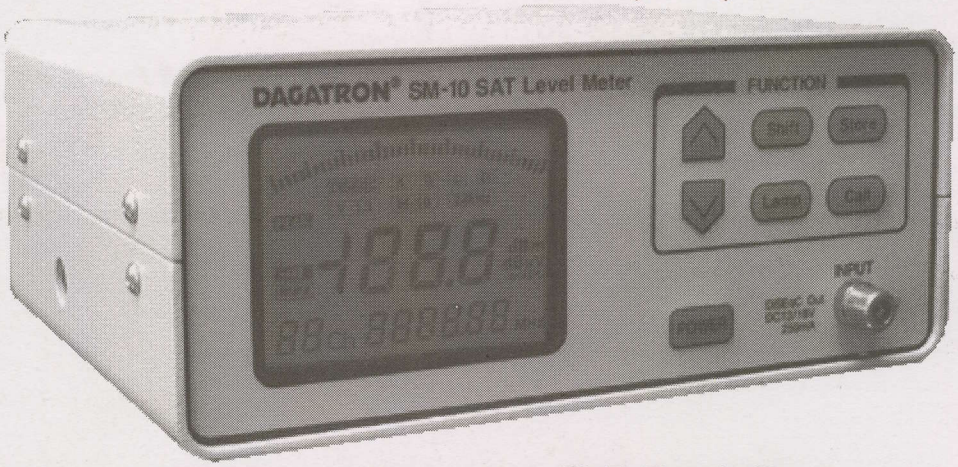

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