16-01-98 9AM

Bob Cooper's

JANUARY 19 1998

SatFACTS

MONTHLY

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

IN THIS ISSUE

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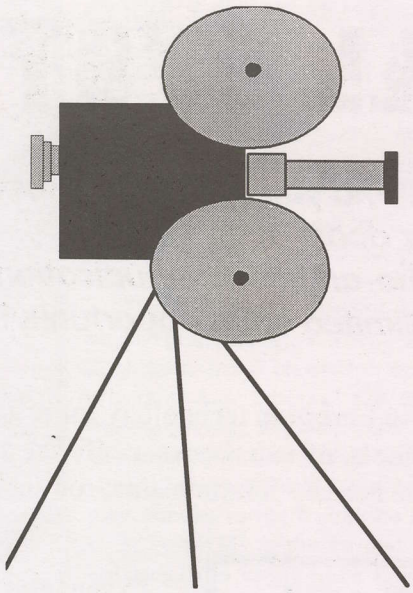

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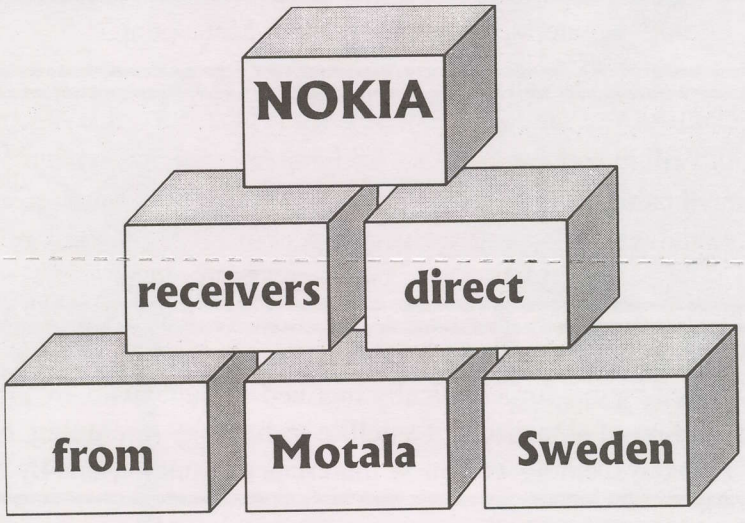

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This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no long define a person's horizon. In the air, all around you, are microwave signals carrying messages of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

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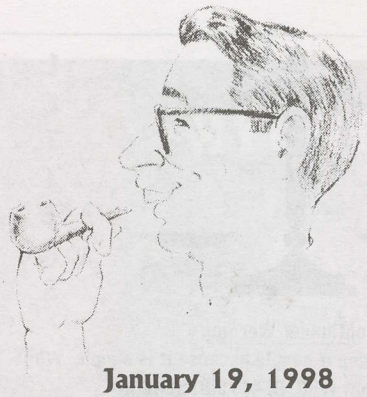
COOP'S COMMENT



January 19, 1998

For several months there have been second hand reports that a European group has "broken" the Irdeto conditional access system. One report relates some quantity of pirate Irdeto cards (perhaps 50) found their way into eastern Australia (SF December, p. 4). One individual who was asked to "test" a pair of cards tells me his results were less than impressive.

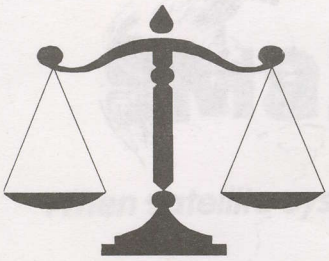
The history of satellite TV programming piracy goes back to 1982 when a US firm (Oak Industries) created a system to encode programming. Initially, the system was used only for medical and other special topic transmissions. Nobody paid much attention until Oak sold the encoding system to a Canadian firm that was anxious to secure broadcast TV programming from unauthorised viewing eyes. Within six months Oak Orion decoders were being modified in quantity to gain access to the forbidden programming.

BSkyB (UK) is the largest single user of an encryption technology in the world. Their authorisation cards have been routinely "broken" by Europeans not anxious to pay Mr. Murdoch for his programming. It is a strange commentary on the European Union that while it remains illegal for pirate BSkyB cards to be sold in England, it is not illegal for them to be sold in say Denmark. It seems that within Europe, the community, there are always a few countries where the laws do not stop piracy as long as the piracy products (cards) are not sold directly within a country where the cards are illegal. So if you want a BSkyB pirate card, you go to Denmark or Germany. If you want a card to break into a German pay TV system, you go to England. All of this keeps the wheels of European Union commerce whirring briskly.

Comes now a report that some clever Europeans have cracked Irdeto in a totally new way. The claim is they have taken a Nokia d-Box and reloaded the factory software so that no Irdeto access card is required. That's right - Irdeto reception without a card.

Just how much of this is true remains to be verified. What we are being told is that "shortly, perhaps before the end of January," it will be possible to purchase a modified d-box from an English source which, they claim, "will work anyplace in the world to provide Irdeto reception without the necessity to purchase a card or pay for the programming."

My first suggestion is that you exercise caution if somebody offers you such a product. The price for a modified d-box has not been shared with me but assuming it really does what they claim, US$1,000 would probably be on the low side. Why caution? If there is indeed a way to obtain Irdeto protected reception without an Irdeto card (or even CAM equipped receiver), it is obviously all being done with creative software. Irdeto people will not play dead; they will find a way to close this hole in their security to shut down the d-Box modified units. That will start a cat and mouse sequence that will go on until either the Irdeto system is abandoned (as indeed, Oak abandoned Orion eventually) or the pirates close up shop because they have run out of places to stash their booty. My second suggestion is that you totally ignore the "business opportunity" to get involved in distributing these boxes. I can tell you from my own experience the rewards are far too small to justify this sort of lifestyle.



LETTERS

Another Bootloader Warning

"I will keep it simple because it is simple. While checking out I180, RF4175/975LHC at approximately 5AM Sunday December 14th, I got zapped with my D9223. This signal has what I believe to be 3 digital audio channels and I have never been able to 'get in' but hope springs eternal. After loading the required parameters, the screen said 'No authorisation key'. No change there. I was reaching to re-enter another set of numbers to check when the screen flashed and I saw the much feared phrase 'Bootloader waiting for signal.' I raced to the mains cord and yanked out the antenna L band cable but I was too late. I was zapped by the 'bootloader in the sky' and now my D9223 is a useless pile of expensive ICs. I tried a hard factory reset, alas it is disabled. If I enter 2, then 9, I end up in a 'commercial bootloader status' display. I can enter the usual frequencies (such as the California bouquet) and it will lock but there is no sound or video processed; just a thin, turquoise line down the left hand side of the screen. On resetting it always returns to RF950, FEC 7/8 and Msym 28.3465. As an aside, at about 4 weeks prior on another Sunday morning while I was on the California bouquet the receiver froze up and I had to leave before it returned. Several hours later it remained locked on EWTN but no receiver controls did anything and I had no video or audio. On this occasion I turned it off for two hours and it came back normally. Let me tell you - staring at 'Bootloader waiting for signal' is not very entertaining!"

Francis Kosmalski, Auckland, NZ

We repeat our message of December. By now SA MUST realise that significant damage can be done to receivers that are accidentally in the line of fire of a "bootloader" data stream. Services that send updated information via their data stream to waiting network receivers must be able to configure their bootloading data so as to not inflict harm on innocent, not-part-of-network receivers that quite by happenstance are tuned to the downlink frequency during a bootload. We hold SA morally if not legally responsible for the damage to receivers so "hit." Come on SA, get a handle on this before someone starts a class-action suit for defective merchandise in Australia.

Where is Jay Mather?

"I have been contacted by Havelock High School who are keen to set up a low power FM transmitter like we use at Pakuranga College. The manufacturer, Jay Mather, is no longer telephone listed and perhaps someone can help"

Gordon Lawrence, Pakuranga College tel 09-534-7159

We too have people looking for one of Jay's FM band 300mW transmitters; does anyone know where he is?

PROGRAMMER PROGRAMMING PROMOTION UPDATE

JANUARY 19, 1998

Worst possible AsiaSat 3 news: The bird did not fly. Long enough. Far enough. Fourth stage "second burn," programmed for 120 seconds thrust, quit after initial 1 second burp. The satellite failed to reach geostationary transfer orbit. The fall out of failure will be devastating to many; story on p. 8.

Preparing for Echostar 4 (scheduled to 148W around 1 April); while any reception of its Ku beams 'down here' is likely to be fortuitous, the relevant MPEG2 details will be: Msym 20.000, FEC 3/4 and encryption by Nagravision. This satellite has no forecast footprint outside of North America but Mexico, Hawaii are included so there could be some "spillover."

Bad news - possibly good news. NHK is quietly scheduling rollout of PowerVu format multi-channel service to replace analogue single channel (PAS-2, 4035/1115Hz) feed with April time schedule. Bad news - it is PowerVu. Possibly better news - NHK is considering FTA (like EWTN is FTA) news and documentary programme channel in the bouquet as well as second channel available only to CATV/SMATV.

STAR + ESPN play rough. Announcement published in Filipino newspaper and trade press warns Filipino cable TV operators not to purchase "Digital Satellite Decoders" from a Metro Manila firm that appears to be sourcing Pace DVS-211 family IRDs and smartcards in Indonesia. Advertisement warns, "STAR TV and ESPN STAR Sports will use digital fingerprinting and other anti-piracy methods to identify and then deauthorise these unapproved DSDs without prior warning." Cable operators with authorised IRDs for various Indovision digital bouquet services are subject to surprise visits by STAR/ESPN reps who demand to see and check serial numbers on authorised receivers. If a receiver cannot be accounted for, the rep has the authority to shut down the cable system's full package of programme channels from the bouquet. Having reported that, possible Philippine source for Pace IRDs: tel 63-2-893-2088, fax 63-2-893-4927.

GWN digital mess. GWN went with Telstra's choice of SA PowerVu on PAS-2 Ku-band along with Imparja. GWN wanted ABC (WA) feed to go with them but ABC has separate deal with Optus for Aurora platform feed. However, as ABC is a FTA service there appears to be nothing ABC can do to stop GWN from including ABC in their GWN bouquet on PAS-2. GWN's B-MAC feed contract runs out end of January, may be extended month by month until sufficient GWN receivers for PowerVu (9234) are in place. See p. 6 here.

French TV5 exploring possibility of adding either teletext and/or subtitles to programming for Pacific feed. TV5 is part of Euro-bouquet which is NDS designed system; possibility that subtitling data will go straight into data stream to facilitate synchronising titles to on screen material. One additional possibility - Chinese subtitling as well.

Australis/Galaxy received A$20 million which they hope will keep company operating for several months. Australis now attempting to do-deal with Optus to combine Optus cable with Australis satellite as single source package for consumers.

CNBC/ABN merger now "official" under banner of "CNBC Asia" with February 2nd start date. ABN will disappear.

Not on I180 after all. Taiwan's Space TV Systems claims they are linking to Brewster, Washington with Taiwan originated programming using TRDS-5 not previously reported 180E. Bandwidth is 38.5MHz, contract runs to 2003. You know - almost nothing Space TV Systems has told us has been correct!

Caught In The Middle

"One year ago (January 1997) I travelled to Sydney to meet with Galaxy and submitted a 21 page proposal to act as their representative here on Norfolk Island. In March we were given verbal assurance of our appointment but nothing in writing. In August a representative of Galaxy visited us and said we would have to purchase a sizeable quantity of receivers (which was worrying). Then nothing further. I then contacted Austar and they said no - Galaxy had warned them off of Norfolk. As one third of our population are New Zealanders, we approached Sky NZ and were told no - they can only operate on NZ territory. Consequently all Galaxy installations on Norfolk are mainland sourced receivers obtained through friends and relatives. We have no idea why Galaxy treated us in this manner and I think the sooner Galaxy disappears from the scene the sooner we may be able to have a sensible relationship with whomever inherits the reins. We are the only qualified technical installers here, have done many systems including government work. But Norfolk Islanders do not identify with FTA C-band services available (although many are easily accessed) because most are in a foreign language, there are no movie services and very little sports coverage available. "

Charles Shaw, Norfolk Satellite Services
Norfolk Island 2899 South Pacific

The saga of Galaxy will read as a black chapter in the history of pay TV decades from now. Norfolk might best be served by a properly designed cable television system which could as a commercial user contract for programming services not available to home subscription. Sport and movies are available (i.e., ESPN, Hallmark, even HBO) if not for private use. There are approximately 1,500 people on Norfolk - marginal but 'doable' for cable TV.

YES JIM - There is a Santa Claus

"Received December SatFACTS December 23rd - what a XMAS present! After reading SF, I immediately placed the 2.05 chips back in my Hyundai and sure enough - Hallmark was back. I had been misinformed by Alfred Kung at Pacific Satellite that Hallmark had gone encrypted; his fax is attached. But thanks to Stu McLeod's SatFACTS article, I got into the first menu and 'wow!'. My receiver is now in the manual mode and instead of waiting and waiting, the TP number comes up within a few seconds using the 2.05 chip. If one arranges the TP numbers according to satellite and polarity, the reception switching is now virtually instant. I agree the 2.05 may not be as sensitive as the 2.25 but the trade is well worth while. I have one remaining problem - between 10AM and 6PM the reception quality is down here. The best reception is between 9PM and 6AM with the Hyundai. I am using Chaparral Corotor II, Sidekick II C-band and Ku wideband LNBs. Should I install a digital rated extended C-band LNB?"

Jim Ruhe, National Stationary Supplies
Honiara, Solomon Islands (fax 677-21653)

Problem sounds like heat - LNB is getting sun-baked! Get it under a shade cover.

HARDWARE EQUIPMENT PARTS UPDATE

JANUARY 19, 1998

Economic chaos in Thailand (devaluation of baht currency more than 40% since July) cited as reason for postponement of Thaicom 4 satellite (C + Ku to 120E) until "at least 2000."

Insurance rewards for faulty design. Indian Space Research Organisation (ISRO) hoping to collect US$65 million after abandoning InSat 2D in orbit. Satellite was launched in June, developed power supply short in October shutting down transponders. Indians build their own satellites, had cost of US$40m for design and construction, $62m for (Ariane) launch. Indian track record for satellites is not great; they collected US$64m (InSat 1A) in 1982, $72m (InSat 1C) in 1988 and also have pending US$65m claim for partial loss of InSat 2C.

642 geosynchronous satellites were in orbit as of December 1 according to NASA/Goddard "catalogue."

More bands. First there was C-band (3.7 to 4.2 GHz, now 3.4 to 4.5 GHz), then there was Ku (from 10.5 to 12.75 depending upon where in the world you are located), then the promise of Ka-band (20-30 GHz). Next? "V-band" which would use 40/50 GHz. How small are V-band wavelengths? One-fifth the length of Ku which is 1/3rd the length of C. A "big" antenna at V? 30cm (equivalent to 4.5m at C-band!). PanAmSat has announced a 12 satellite V-band network with at least one Asia-Pacific bird requesting 124.5E. When? "Sometime after 2000."

Tough luck Charlie. SA is telling people , "If you use your D9223 receiver for 'ad hoc' tuning of 'unauthorised' PowerVu frequencies, and the receiver gets 'zapped' by a bootloading sequence, that is your fault for being tuned to an unauthorised PowerVu channel." They demand A$525 to correct damage done by bootloader sequence. The line to bring civil suit against SA forms on the left.

Another S/A warning. The D9234, being sold for EMTV, GWN and other new consumer services, will NOT do more than a single bouquet at a time (like the old 9222). The ONLY thing consumer friendly about this new model is the remote you get to hold in your hand. The price certainly is not (A$1,370 + tax).

Panasat 520 repairs are possible (see p. 32, December). Spares stocked at Antares Electronics Pty Ltd (tel + +61-7-3205-7574); pricing - power supply module in range of A$125.

Canal + mystery solved. Why can't anyone access it even using reported Sagem ISD 2050 (I180, 4091LHC, 34.368 and 3/4)? Answer - it is in MPEG-1 and Thomson "decoder" for it is "size of a kitchen cabinet" according to Steffen Holzt in New Caledonia. Better days are coming - they plan conversion to MPEG-2 "late in February."

GMA Philippines contacts: GMA 7 Complex, EDSA, Diliman, Quezon City, Philippines tel 63-2-928-7021 and E-Mail Trigs@tworld.net.ph.

Chaparral not dead. New products include MicroPak Vision C-band LNBF, C-band LNB for 3.4 - 4.2 GHz. Additional integrated feedhorn/LNB products and digital IRD for "select" (not specified) world markets. If you need technical help with past or present Chaparral products, try Reed Mulder at E-Mail rmulder@chaparral.net. Closer to home, official distributors are Acesat Satellite in Australia (tel 61-2-9704-2978) and Telsat Communications Ltd. in New Zealand (tel 64-6-356-2749).

TNT/Cartoon service feed on PAS-2 (B-MAC, NTSC) was scheduled to shut down January 16th. Replacement is PowerVu digital, has been testing on 4148 Vt in reconfigured Hong Kong bouquet since late December.

Official Cutover Dates For HACBSS

HOW AUSTRALIA'S ABC Is Doing The Transition To Digital

Code named "The RABS Project," Australia's Optus is now well into the conversion of B-MAC (analogue) transmission systems to digital multi-channel MPEG packages. The system has been in the serious planning stage for 2 years, the first test signals went to air six months ago and now Optus is working towards a schedule to complete the conversion (see next page).

The original plan was for an Optus created (and named) Aurora platform to be the home of *all* new MPEG digital services. Aurora is on an Optus satellite, of course. Someplace between the planning and implementation, significant inroads were made by both Scientific Atlanta (as an MPEG hardware supplier) and PanAmSat (as a service provider with satellite space competitive to Optus). Now, wonder of all wonders, the RABS project will utilise not only Optus but also PanAmSat and even Palapa satellite space. Here's the detail.

ABC Digital Distribution

Presently ABC is distributed on 5 regional (B-MAC) beams; when the conversion is complete, it will be on a national beam (Optus B3, T2 and T7 [Vt] initially) with five separate MCPC packages. Regional designations are changing per the table (below). The NT and WA MCPC packages will uplink from Lockridge (Perth); the SA, NE and SE multiplexes from Belrose (Sydney). Additionally, the NT programme will continue to originate in Darwin, be backhauled to the ABC studios in Perth and then be sent to Lockridge for uplinking. As well, the SA will be created in Adelaide, the NE in Brisbane and both will be backhauled to the Sydney (Gore Hill) studio, combined with the SE service from the Sydney studio and sent to Belrose for uplinking. Telstra will provide the backhauls through terrestrial SDH networking to the Perth and Sydney studios.

Each ABC video service multiplex will have six audio channels (as they do in the B-MAC format); SE will have three additional: FM (2), L and R TV audio, RN, RR, JJJ (2) and PNN. The SE zone of JJJ plus PNN will also be available nationally to the DTH audience.

Was called CA [H]	Will be called NT
Was called CA [L]	Will be called SA
Was called WA	Will be called WA
Was called SE HACBSS	Will be called SE
Was called NE HACBSS	Will be called NE

The ABC SE service will be the foundation (base) service; on a state basis, it will be downlinked, modified with local programming, delayed for time zone adjustment, and uplinked for DTH. The SBS and TAL (former QSTV Queensland) will also be utilising the Aurora platform within the multiplex platform (it is not clear whether TAL will be available outside Queensland).

Transition

B-MAC analogue service will terminate to approximately the table schedule shown on the next page. Each regional feed includes a 60 day dual illumination period. Note the schedule shown is "ideal" and some adjustments (typically slippage to later dates) can be expected.

Subscriber management (authorisation of individual DTH and other receivers to receive specific region multiplexes) is a new element. Regional spot beams previously restricted viewing to DTH viewers in a designated geographic area. Now, with national beams, in theory *any* DTH terminal could access any ABC multiplex from throughout Australia. The CA (conditional access) and SMS (subscriber management system) will prevent this. An EPG (electronic programme guide) is also planned but still being developed, on a region by region basis.

Surprise - PAS-2!

The long established "TV Interchange" service has moved from Optus to PAS-2 Ku. The PAS-2 Ku service is "temporary" and will ultimately be transferred to PAS-8 Ku following successful launch and deployment of PAS-8 in the latter half of 1998.

Interchange is presently in a FTA PowerVu MPEG-2 format (PAS-2, 169E, vertical). Early reports to SatFACTS relate all three SCPC signals produce a C/NR of 6.5dB in New Caledonia on a 3m solid dish and 0.6dB Gardiner LNB. By comparison, other PAS-2 Australian origin Ku band signals are 3 to 4 dB stronger (i.e., GWN and Telstra bouquets).

And Palapa C2

To the north-west of Australia, in the Indian Ocean, are a pair of Australian mandated territories destined to

Why PAS-2?

The "official" explanation relates that as Interchange involves the transfer of programming material between news sources, and many news sources are outside of Australia, the move to PAS-2 makes it possible to "exchange" materials internationally directly.

(Australian) ABC Transition to Digital Service Schedule

South Australia	21/11/97: 93 day encoder delivery & install	25/2/98: Telstra backhaul operational Gore Hill	18/3/98: 2 month transition/ dual illumination	18/5/97: Cease CA(H), CA(L)	21/7/98: Cease WA	20/8/98: Cease SE HACBSS	30/9/98: Cease all analogue HACBSS Optus B1
Northern Territory	21/11/97: 93 day encoder delivery & install	25/2/98: Tests 3.7m dish, IRD at Ultimo	18/3/97: Start dual illumination	18/5/97: Analogue to digital cutover			
Western Australia		25/2/98: Telstra NT backhaul ready at Gore Hill	23/3/98: Start dual illumination	20/4/98: 2 month transition	20/6/98: Analogue to digital cutover		
SE Australia				20/4/98: Start dual illumination	16/5/98: Tests 3.7m dish, IRD	20/6/98: 2 month transition	20/8/98: Analogue to digital cutover
NE Australia		25/2/98: Start dual illumination TJSE, PNN				20/6/98: 2 month transition	30/8/98: Analogue to digital cutover
PAS-2 Ku Service	1/12/97: Start dual illumination	31/12/97: Cutover date to PAS-2	(TC I/C on PAS-2)				
Cocos Island (service via Palapa C2)			5/1/98: 75 day delivery, install encoder	23/3/98: 4 weeks ABC test	20/4/98: 2 month transition	20/6/98: Analogue to digital cutover	

gain access to ABC, SBS and perhaps other services. Christmas Island (10.3S, 105.4E) and Cocos (Keeling) Island (12.5S, 97E) are to be fed (starting April) through Palapa C2; an interesting viewing opportunity for those beyond Optus (or PAS-2/8 Ku) reach.

Meanwhile at GWN

Non-Aurora platform GWN (Perth) has begun converting B-MAC terminals to PowerVu 9234 (or specially softwared 9223) units. The full 9234 price is A$1,370. Through January 31, a 20% discount ($274) is available. Any previously registered GWN B-MAC viewer is also entitled to a Government rebate of $750 if approved by GWN management (after checking of the GWN B-MAC data base). A new buyer of the D9234 is entitled to no discounts and the full $1,370 price applies (+ 22% sales tax if no Government Tax Exemption form has been supplied). The S/A distributor, by the way, makes a whopping $54.80 by selling you the receiver.

The exact status of NT's Imparja remains uncertain while the telecaster sorts through legal issues raised by its decision to go with PowerVu on PAS-2 and not Aurora on Optus. The relevant tuning parameters at press time are (all PAS-2):

12.300 Vt, Msym 10(.109), FEC 1/2 for Imparja and ABC (NAB) [CA at this time]

12.262 Vt, Msym 16(.200), FEC 1/2 for ABC TV, ABC Radio, SBS TV, GWN TV, ABC TV + radio and GWN TV + WAFM [TV CA at this time]

"The Sky is Falling"

AsiaSat 3- WHAT HAPPENED?

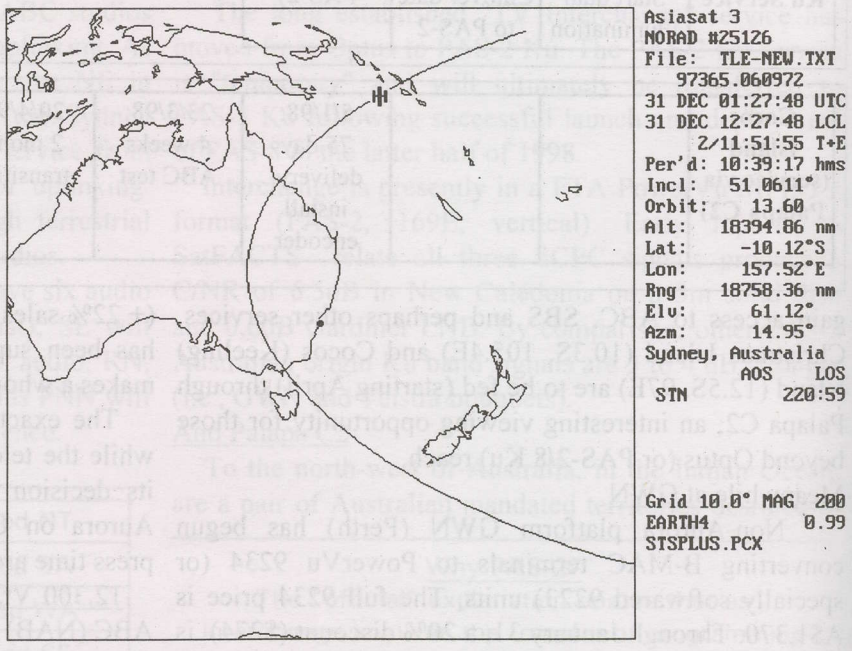
Christmas Day, 1997 - Filled with anticipation and excitement the AsiaSat team was ready to receive their Christmas gift. After years of planning and last minute delays, the launch day for AsiaSat's third satellite had finally arrived. For AsiaSat it was a historical day. They were about to reinforce their dominant position above Asia by sending a new high power satellite to the most watched point in the Asian skies – 105.5 East.

The Baikonur SpacePort and Cosmodrome in Kazakhstan has seen many such historical days. It was from here that man first ventured into space. Today it is the launch facility for the MIR support vehicles, and later this year the first element (a cargo section) of the International Space Station will be launched. The 1998 schedule was set to beat all launching records, with twelve commercial liftoffs, nine under the Russian national space program. The successful launch of AsiaSat 3 was needed to close a successful year of Proton launches and pave the way for the busy schedule of 1998.

The workhorse for the Baikonur launch schedule is the Proton rocket. The Khrunichev Space Center, which builds the Proton, were naturally pleased that the previous eight Proton launches had been successful. They had recovered from the series of mishaps that plagued the launcher in 1996 when a Raduga satellite and later an interplanetary probe to Mars were destroyed by booster malfunction. AsiaSat 3 had been ready to fly two days earlier on December 23rd but in an unprecedented move, underlining the launch's value to Moscow, the launch was postponed. Gale force winds at 10-12 km above the earth were a risk to the Proton and it's payload. "It was the first time in the 30-year history of using the Proton heavy booster that a launch was postponed due to bad weather," Alexander Lebedev, commercial director at the Khrunichev Space Centre told a news conference. In the Soviet years the directive from Moscow was to launch regardless of any risks posed by bad weather. This policy changed when Russia became a commercial launch operator. A Proton launch earns around $70 million US Dollars which in recent years has focused the Khrunichev Space Centre on risk-avoidance.

At 2:19 am Moscow time (2319 GMT) the Proton, with AsiaSat 3, lifted off with a text book launch. All systems were functioning correctly and the successful launch was reported soon after. AsiaSat's company representative, Peter Jackson, told the Itar-Tass newsagency that the Russian Proton was chosen for the launch because of its high reliability at a reasonable price. Jackson added that AsiaSat might continue to use Russia's space services in the future.

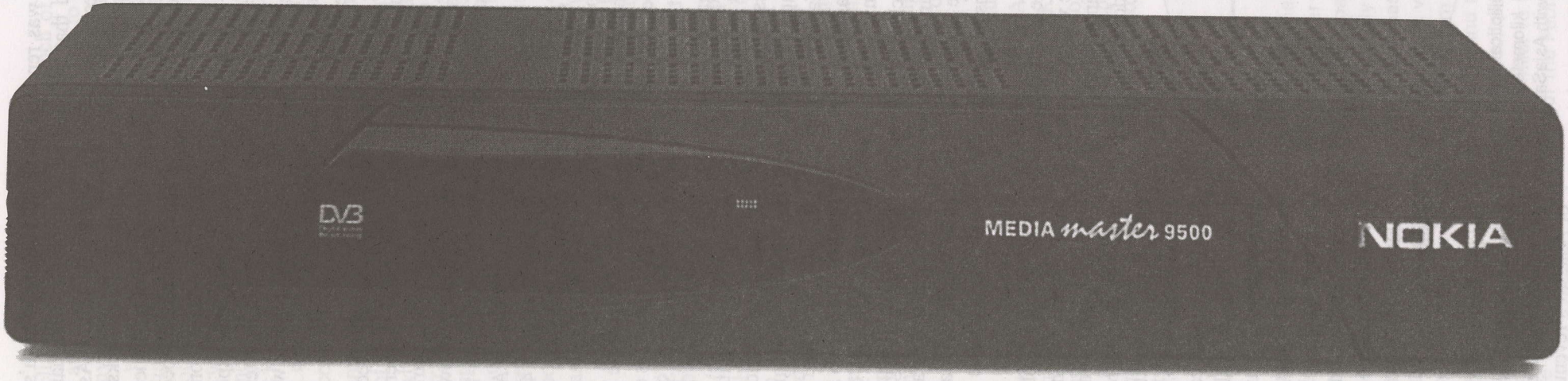
The climb through and then out of the earth's atmosphere was uneventful. All systems were working well for the first hours of flight. At 8:39 am Moscow time (6 hours and 20 minutes into the flight) a booster burn that was due to last two minutes fired for only one second and then switched off. An emergency separation procedure of the payload followed putting AsiaSat 3 into an uncalculated elliptical orbit of 51.6 degrees. There was initially press reports that the satellite would fall back to earth but a statement from AsiaSat deputy CEO Bill Wade confirmed that the satellite was well outside the earth's atmosphere and that there was no possible way it could fall back to earth. The Khrunichev Space Centre issued a statement saying the satellite had deviated from its correct orbit and that the centre was trying



Six days after launch, AsiaSat 3 was just passing over the Solomon Islands at an altitude of 18.394.86 nautical miles. The track then passes over eastern Australia, south of New Zealand.

by Mark Fahey, Freemans Reach, Australia
mfahey@bigpond.com

The Nokia Mediamaster DVB 9500 S.



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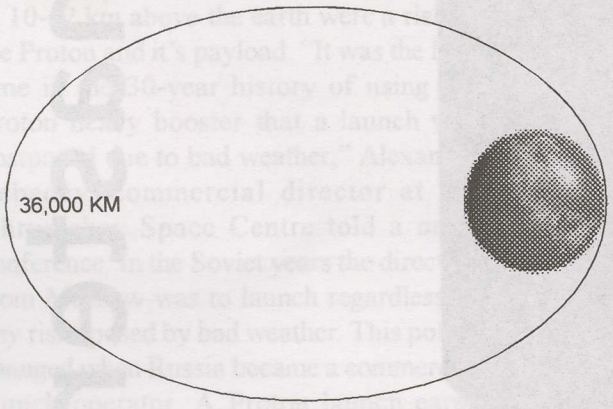
to guide it to its correct path. Later it was reported that AsiaSat 3 was lost. AsiaSat confirmed that the satellite was fully insured and that documents to receive an insurance payout were already submitted to the insurance company. AsiaSat also announced that it intended to order a replacement AsiaSat 3 in the near future.

The Itar-Tass newsagency reported – "It is possible but hardly probable to bring the spacecraft to its calculated orbit. AsiaSat is now 36,000 kilometers away from the Earth in its apogee and about 200 kilometers away in perigee, while the required parameters are 36,000 kilometers and 10,000 kilometers, respectively". It was also reported that the satellite has a large reserve of fuel, which could be used to try and place AsiaSat 3 into it's desired orbit. This was soon discounted when it was calculated that the satellites fuel reserves were not sufficient for the correction operation.

Telemetry data from the Proton clearly shows that a burnt down gas generator in the fourth-stage booster unit caused the failure. In fact this booster unit manufactured by the Russian Energiya Company has also been blamed for the 1996 loss of the Raduga satellite and the failed probe to Mars. The commissions that investigated the first two incidents recommended that Energiya improved quality control over its manufacturing processes. Itar-Tass reports that it seems no drastic measures to improve quality have taken place to date. A new commission has been established, and until its findings are presented the launches of Proton's with the questionable booster have been frozen. It is likely that this will effect the 1998 launch schedule. Alexander Lebedev, deputy director of the Khrunichev Centre has claimed that the booster "was reliable enough" and that they do not intend to make formal claims against Energiya.

Konstantin Lantratov, spokesman for the Khrunichev Space Centre has announced that the satellite will orbit the earth for the next few months, gradually loosing altitude and then eventually falling back to Earth. He added, "Not all parts will burn in the earth's atmosphere". The American Hughes Corporation who manufactured the satellite is planing to constantly follow AsiaSat 3 and control it as much as possible. Peter Jackson of AsiaSat says that the falling satellite is of no immediate danger to the residents of Earth. He explained that specialists would ensure its safe travel in orbit for several months until the spacecraft exhausts its fuel reserve. It is expected that a controlled "knocking out of orbit" will be attempted and AsiaSat has assured that everything possible will be done to ensure the safety of this operation.



Six days after launch, AsiaSat 3's orbit is elliptical with a apogee of 36,000 kilometers and a perigee of 200 kilometers. Over the next few months the perigee will decrease with AsiaSat 3 eventually landing back on Earth.

On Monday 29th December the Hong Kong stock market closed sharply higher than the previous week. The notable exception to this market rally was the biggest looser of the day - AsiaSat. Following the launch failure the market sold AsiaSat stock with falls of 19.22 percent. However the volume of trading in AsiaSat hardly indicated a panic selloff. The loss of HK$13.45 was on the trade of just 1.1 million shares.

AsiaSat 3 was to be located at the "hot spot" in the Asian skies, 105.5 degrees east. The most watched satellite in the Asian region – AsiaSat 1, currently occupies this position. It is estimated that over 53 million dishes are aimed at AsiaSat 1, making it a prime piece of real estate for either national or international broadcasters. The popularity and desirability for programmers to be at 105.5 east is due to AsiaSat 1 being Star Television's main free to air platform. The Star TV free to air viewing audience was estimated at 220 million in late 1994 and in recent years it's appeal and viewer figures have grown dramatically. AsiaSat 1 transmits eleven Star free to air channels in English, Hindi, Arabic and Chinese languages. The programming ranges from Hindi soaps on Zee TV to music videos on Channel [V]. Star also broadcast two analogue encrypted pay channels – Star Movies (Hollywood movies with Asian subtitles) and Zee Movies (Hindi Movies). AsiaSat 1 has always been a desirable platform for any programmer (especially free to air with income from commercials) wanting to maximize their Asian penetration, though with AsiaSat 1 there has always been a hitch. Under an agreement with AsiaSat and Star TV, AsiaSat can not provide capacity on AsiaSat 1 for any international television service other than Star. This clause in the 12-year contract remains valid as long as Star maintains a minimum of 8 transponders on AsiaSat 1 or a minimum total of 18 transponders on AsiaSat 1 and 2. Because of this contract clause the other users of the much sort after AsiaSat 1 transponders are broadcasters such as Pakistan and Myanmar TV who program only for domestic audiences.

On the face of it the Star TV contract would appear to limit AsiaSat's commercial growth but in reality the deal has worked well for them. Star TV has accounted for 50% of AsiaSat's revenue in recent years. The deal was struck

in the early pioneering days of Asian satellite broadcasting and has offered stability to both AsiaSat and Star over the years since. If you have picked up any satellite trade magazine over the past six months you would have seen the glossy full and double page advertisements inviting programmers to join AsiaSat 3 at the hottest point in the Asian skies. The Star TV deal that restricted new entries to AsiaSat 1 did not apply to the replacement satellite, and AsiaSat have been busy letting everyone know it! AsiaSat 3, replacing it older sister offered both more power and transponders as well as a much greater coverage area that included Australia, New Zealand and areas of the South Pacific. AsiaSat 1 is limited to a power of 37 dBW and 24 C-band only transponders (6 backup) while AsiaSat 3 is fitted with 28 C-band and16 Ku-band transponders. The AsiaSat 3 spacecraft is a HS601HP (high power model) with an effective radiated power of 40 dBW on C-band and 53 dBW on Ku-band. Added market flexibility was also to be offered with two separate high-powered Ku beams for East Asia and South Asia as well as a steerable Ku beam for covering other regions such as Australia.

Interestingly like AsiaSat 3, the satellite now called AsiaSat 1 was also originally a failed launch. This bird was originally called Westar 6. Space Shuttle Challenger (flight STS-11/41-B) launched it along with Palapa B2 in February 1984. Both satellites were placed and then stranded in a near-earth orbit after their boosters failed to ignite. Eleven months later the satellites were returned to Earth by Space Shuttle Discovery (flight STS-19/51-A). Astronauts Gardner and Allen using considerable determination and persistence recovered the satellites during EVAs (spacewalks). This marked the first time that an object placed into orbit by one vehicle had been recovered by another.

AsiaSat purchased the recovered Westar 6 at a "used car bargain" price. The satellite had been refurbished by Hughes and re-launched as AsiaSat 1 by a Long March 3 rocket from Xichang in April 1990. The launch pioneered China's entry into launching commercial satellites. By December of 1991 the satellite's transponder capacity was fully leased.

The failed launch of AsiaSat 3 is of major concern to AsiaSat who wish to maintain their reputation of being a market leader. They also suffered problems following the launch of AsiaSat 2 with the degradation in power of the Ku-band transponders. AsiaSat's 1997 Interim Report mentions that this insurance claim is progressing slowly and that advice regarding the commencement of arbitration is being obtained. It would seem that the insurance claim on AsiaSat 3 is a clear-cut case and hopefully the company will not have to suffer similar delays.

AsiaSat's strategy committee hedged their bets with the AsiaSat 3 launch and purchased an in-orbit satellite in event of a delay or launch failure. AsiaSat G, formally known as Gorizont 30, Rimsat 2, Rimsat G2 and Statsionar R2 has been located at 122 degrees east. This location was where AsiaSat 1 was to locate following its replacement. AsiaSat 4 due for launch in late 1999 will be located at the 122 degrees east position. AsiaSat G being a Gorizont platform is in inclined orbit and of little real use to AsiaSat other than baby-sitting the position, ensuring the slot is secured from squatters until they move or launch a stabilized satellite to this location.

AsiaSat's expansion plans have been delayed but there will be little or no change in their earnings until they manage to launch a replacement for the failure. AsiaSat 1 is expected to perform beyond the year 2000, allowing for a replacement AsiaSat 3 to be built and launched prior to the end of AsiaSat 1's operation life.

AsiaSat while having a run of bad luck is not alone in being plagued by problems. In recent years competitive platforms JCSAT 3 and Palapa C1 have both suffered power-related Ku-band problems similar to what AsiaSat experienced with AsiaSat 2. These problems have resulted in reduced Ku-band capacity in the region while C-band continues to have heavy usage. While the loss of AsiaSat 3 is disappointing it's only a minor set back, 1998 holds many exciting times for satellite enthusiasts and professionals.

News Clippings at Deadline

The likelihood that the Optus Aurora project will be utilising yet another brand and model of receiver increases as sources at Optus indicate a selection of a Comstream receiver has been made. Australis/Galaxy presently utilises the Pace DGT400; the ABC Interchange, GWN and apparently the Imparja services have chosen the Scientific-Atlanta D9234 model. Five receivers were originally evaluated by Optus on behalf of Aurora; models were submitted by Hyundai, Nokia, Pace and UEC/Panasat. Nokia and Pace reportedly withdrew their entries when specialised Aurora software requirements were announced. Hyundai later withdrew as well. In the end, it came down to the UEC/Panasat (in a form not yet seen in the marketplace) and the Comstream. Aurora has chosen the Divicomm uplink package and this software has "special bits" in it which make receiver design difficult (an audio glitch is not yet resolved, for example). Reportedly, the Comstream receiver will be built in Wales, packaged in a case similar to the Pace 800/900 series units. Optus has been under some pressure to make a decision ahead of the February Satellite Show, "*even if the glitches are not yet solved.*" Aurora on-air target date: June or July.

"Devastating - we may never recover"

AsiaSat 3 - A LOST OPPORTUNITY

For much of 1997, AsiaSat - the corporation - has been placing regular full page advertisements in trade publications extolling the virtues of to-be-launched AsiaSat 3. The text said:

"Hundreds of thousands of dishes in Asia stare up at orbital position 105.5E, and that's exactly where AsiaSat 3 is going. If you want to put your programming right in front of Asia's face, put it on AsiaSat 3."

AsiaSat 1, a "second hand bird" when initially turned on as As1 (see p. 11), creates two separate beams: north (12 horizontal) and south (12 vertical). North covers China, south includes India. AsiaSat 3 was designed to produce one homogenised beam extending from Australia-New Zealand on the south-east to Egypt and the eastern Mediterranean to the north-west. As1 has a maximum eirp of 37 dBw with 8.5 watt transponders; As3 was to produce boresight (centre of beam) 40+ dBw from 55 watt transponders.

AsiaSat 1 was "first" to deliver free to air television to Asian viewers in 53 countries. If a cable or SMATV system has more than one satellite dish, the first is always focused on As1. If a home dish is fixed (without a motorised tracker), chances are it is fixed at 105.5E. And as Mark Fahey relates here (p. 8 to 11), as long as As1 is at 105.5E, a contract between Murdoch's Star and AsiaSat prevent As1 from carrying any "international" (FTA or pay-TV) services in competition to Star TV. That is why the non-Star users of As1 are *national* TV services such as Pakistan. Murdoch, in exchange for agreeing to use transponders on As1 (and later As2) insisted that his Star TV alone would be the provider of "international entertainment television" on As1. This agreement was to automatically expire when As3 replaced As1. And according to knowledgeable sources inside of AsiaSat, significant new "international programming firms" were lined up waiting to climb aboard As3 simply because being there would guarantee them access to hundreds of thousands of dishes already pointing at 105.5E. So let it be clear that at least one major player in the Asian satellite world was not anxious to see AsiaSat 3 replace AsiaSat 1.

The Contract World

In the satellite world it is called "the neighbourhood." What it means is that if you are a programmer, and you can lease transponder space on a satellite that is widely viewed by your potential audience, you will gain quicker audience numbers than if you are off on a lesser viewed satellite and dependent upon viewers making adjustments to their antenna systems to be able to tune in your programming. It is called "being in the best neighbourhood." As1 is the "best neighbourhood" in Asia. *Today*. As3 was to guarantee 105.5E would continue to be "the best neighbourhood" for another decade or more. As3 was first designed (1994-5) and constructed (1996-7) to provide the optimum balance of international coverage plus a mixture of C and Ku-band transponders to ensure 105.5E would stay "the best neighbourhood." The timing was near perfect - As3 went into serious design at Hughes just as it became clear that analogue TV broadcasting was on the fast track to history; digital TV would within five years or less replace analogue world-wide. As3 could be designed for that transition, to be digitally state of the art. Moreover, As3 could take into the digital realm all of its existing analogue clients. As3 was to be a "bridge" to the future.

Satellite operators have moderate success if they simply get into orbit; they have phenomenal financial returns if their satellite turns out to be "the best neighbourhood." AsiaSat 3's pre-launch C-band loading was in the region of 85% which translates to "full." A host of new (never identified by name by AsiaSat) programmers had signed up to be a part of the 105.5E neighbourhood. Behind each of these new programmers was an extensive, several years-in-planning business plan. For most of these new to 105.5E programmers there could be no "fallback" plan. There was only one "best neighbourhood" in Asia. The business plan for

By The Numbers

An internal AsiaSat study reports that as of December (1997) there were 1,220 satellite transponders (C and Ku) available in the Asia + Pacific region. Through December 1998, an additional 508 transponders are scheduled for launch but, for each year through 2007 the region's transponder needs will grow by 546. Older, existing satellites will retire taking 54 transponders with them during 1998; another 123 will "expire" during 1999. Before the AsiaSat 3 loss, they forecast a shortfall of "several hundred" transponders by the end of 1999. It is not simply the 28 C-band and 16 Ku-band transponders that are lost from the "pool," but rather the uniqueness of the AsiaSat 1 marketing edge against all competitors in Asia. A replacement As3(R) could be ready by the last half of 1999. It may not be enough.

Location	When ?	C-band Power	C-band reaches Australia	C-band reaches NZ	# C-band TRs	Present C-band loading	Satellite	Summary of competitive position
76.5E	'97	60 watts	90%	no	28*	<50%	ApStar 2R	Major benefactor of As3 loss; NZ is loser here
78.5E	'97	55 watts	92%	no	25*	<50%	Thaicom 3	Massive internal problems; unlikely to directly benefit (NZ losses)
(91.5E)	'98+	unknown	possible	no	unknown	none	Measat 3	C-band not important to Measat
100.5E	'95	55 watts	yes	yes	24	>80%	AsiaSat 2	Has room for additional digital services as analogue users convert
(105.5E)	'99?	unknown	possible	possible	unknown	none	AsiaSat 3R	May not rebuild with same coverage pattern as original (see text)
113E	'96	21 watts	yes	yes	30*	>75%	Palapa C2	Has not been aggressive securing programmers from outside Indonesia
(118E)	2000+	unknown	possible	possible	unknown	none	Palapa C?	Potentially a major player as B4 is replaced with next generation
(120E)	2000+	unknown	possible	possible	unknown	none	Thaicom 4	Unlikely to launch before 2002+; financial problems
(122E)	'99?	unknown	possible	possible	unknown	none	AsiaSat 4	Troublesome coverage for India, could be major player

each of these new to 105.5E broadcasters is now worthless.

The options to bridge around a failed AsiaSat 3 are few. First, you need a C-band bird that is capable of covering roughly the same area as As3 intended to do. The Australia coverage is the most expendable although in the process of going south into Australia the coverage into Indonesia and the bottom tip of the Malay peninsula is improved. The location options range between 75E (poor coverage into Japan, only a part of Australia) and 140E (poor coverage for India). The centre of this "magic" ring is 107.5E. Australia "works": from 80E through 140 (+). New Zealand, of no particular importance to any C-band satellite planner, works from 100E to 140 (+).

Second, the satellite's transmitting antenna coverage (the beam or pattern) must reach into those regions which the programmer targets for audience. The table (above) summarises the players and their ability to act as a replacement for As3. In fact, no satellite that exists today or is scheduled during the coming three years is capable of doing what As3 was designed to accomplish.

Does this mean the new programmers who were intending to use As3 will simply "tread water" until a replacement is available (latter half of 1999 at the earliest)? Not necessarily. Programmers have commitments of their own - programming they have acquired and must use to a contracted schedule. They will pay for their programming rights in most cases even if they are unable to use the programming because of a failed As3. In this instance it is likely they will seek temporary transponder space, scale back their promotional activities, and limp along in a less desirable location until As3R is available. The most likely beneficiaries of this would be ApStar 2R and Palapa C2.

There is no guarantee As3R will be rebuilt to the design of As3. There was a moment in the analogue to digital transition where the design of As3 was "right." That moment may have passed and starting fresh in 1998 with a new blueprint for As3R may well result in significant modifications to the "R" design. For example, if the programmers who were waiting to climb on board As3 had no real interest in Australia (New Zealand) coverage, why include it in the "R": version at all? In 1995 as As3 was being designed, coverage south of the equator may have seemed like a good idea. In 1998, with ever changing market conditions, this may no longer seem like a proper design approach.

The loss of As3 is effecting a wide range of programmers, equipment sellers and potential users. The promise of Indian television (Zee TV, El TV and others) for viewers from Fiji to Australia was much anticipated. Cable systems (operating or planned) were anxious for the availability of Star's Prime Sport and Star Plus services.

Supplier reaction to the loss of As3 include these comments from Bay Satellite's John Lynam:

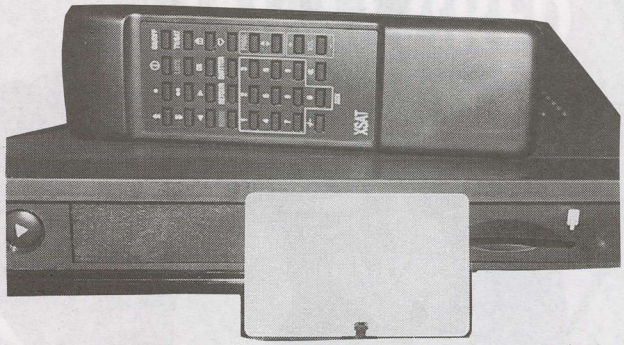
"What the industry needs most is a basic bouquet of programming which satisfies casual viewers in terrestrial TV deprived areas. As3 would have provided a sport, movie and several general entertainment channels, in English, with modest size dishes, a low cost analogue receiver and probably a single polarity feed system. This is a major setback for a struggling, young industry in the Pacific. We will be paying for this loss for several years and the opportunity may be permanently lost."

Performance Testing
XTC CDTV200 MPEG RECEIVER

The primary reason why someone might wish to invest in a French built Xcom model CDTV200 digital receiver would be to gain access (with an appropriate Access CA card) to the 177E Ku services from Space TV Systems (Taiwan) or the triple-X rated North American Exxxtasy + Erotica. The receiver is well built, has a reasonable sensitive front end, and runs cool. However, it is not the easiest receiver to initially set-up and is designed to cover only Msym rates between 15(.000) and 30(.000). This eliminates use for any SCPC services.

Space TV Systems claims they are supplying an Acer Taiwan built IRD for their 177E Ku service; that may be true but this unit came directly from them after December 1st. Earlier SatFACTS reports had listed the Xcom receiver along with a model from Thomson as being suitable for this service. However this note - regardless of where you obtain the receiver proper or what receiver it is, without the Space TV Systems supplied access card, the receiver is quite useless (for either Space or the adult North American package).

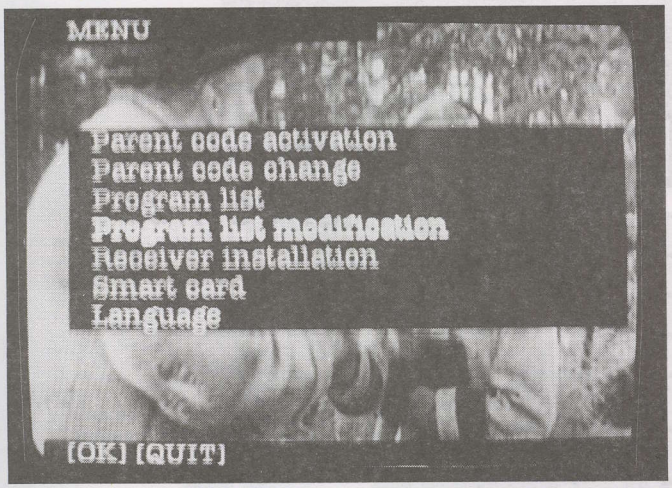
The CDTV200 accepts input signals in the 950 - 2150 MHz range and as noted below allows you to loop the

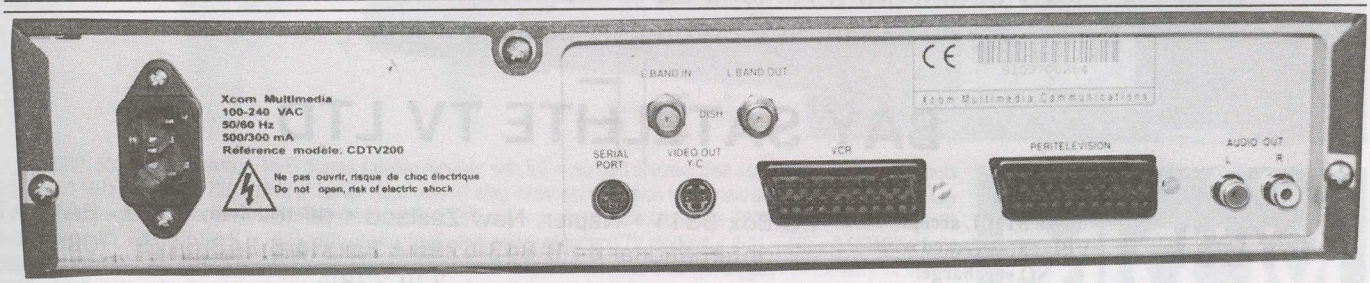


Xcom remote is well thought out, receiver card slot is at front right behind door; "magic" authorisation card had no product name on it (white object).

L-band signal through the twin F connectors to a second receiver (such as an analogue unit). The receiver does not have a UHF modulator, will not support DiSEqC or teletext nor EPG. It does have two SCART outputs, stereo audio (RCA jacks) and S-VHS output. The price in Asia and the Pacific is unknown as there are apparently no distributors handling the product here. One UK source is listed (**1**/ p. 18) with a list price of 395 sterling. That would be before shipping and

ADDING new parameters (for a new bouquet) to the menu (below) involves selecting program list modification (left), then new bouquet (right)





One appreciated feature on an otherwise unspectacular rear deck - "L Band In" and "L Band Out" which means you can loop through the CDTV200 to a second receiver

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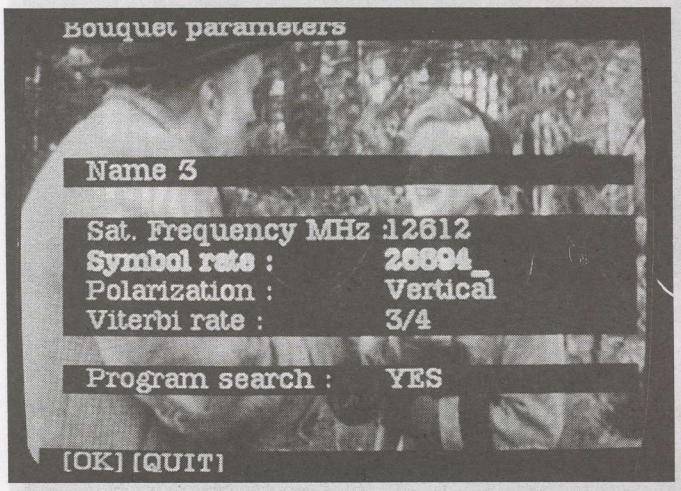
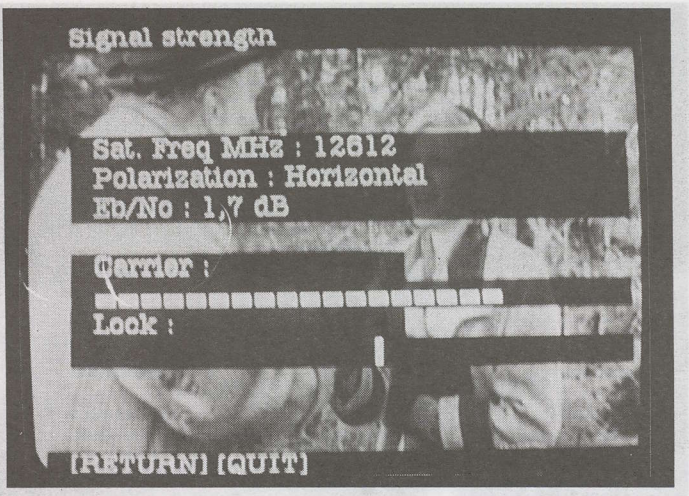




FIRST you give the new bouquet a name (we called it 3 since two others had been previously loaded), the correct input frequency (LNB LO is separately set), Msym and FEC. Move the cursor down to program search and strike the "OK" button on the remote. You can watch it find the signal (right) on the signal strength display (a nice touch) with a horizontal bar that indicates carrier level (a very generous display) and a bar below that indicates signal lock (see text).

handling of course and you would still need to deal directly with Space TV Systems (see SF December 15, p. 32) for the authorisation card(s). In ten lots, the Space TV Systems price of US$700 comes out about the same.

Our July-October reports here of the trials and tribulations of Space TV Systems included a detailed analysis (July, p. 6) of the on ground signal levels (versus required dish size) for this service. We reported at that time a 3.1m solid Ku-quality dish was producing suitable bit error rate reception in (northern) New Zealand. This was true through October, the last time we had reason to check the reception on this service.

Alas, try as we might in mid-December (using two separate 3.1m solid dishes, 4 different feeds and 3 LNBs), the best we could do with everything finely tweaked was obtain a brief lock. Where previously we measured a 8 dB carrier to noise ratio, now it was never more than 5.5 dB. After eliminating that our receive systems were faulty, we telephoned Intelsat Operations Control (USA ++1-202-364-4000, for future reference) and learned the I702 2A Ku spot beam was now operating at 41.5 dBw boresight centre. Six months back, they were claiming 46 dBw; an important (in fact, fatal) 4.5 dB reduction. Then we asked Bob Kelleher at Antares near Brisbane to check - he found the 177E signal 4 dB below previous measurements. Next stop, Steffen Holzt in New Caledonia. Steffen says it is presently usable on a 3m solid in Noumea - previously a 2.1m would do the job.

Easy come - easy goo. So much for 177E Ku into New Zealand. And as Garry Cratt at Av-Comm points out, too bad also for the Thailand "Thai-5" FTA service which recently signed on to be distributed through the Space 177E MCPC as well. Even those close to boresight (near the Queensland and NSW border) will be near to threshold with 1.2m antennas (so much for the earlier 75 cm claims).

To check the receiver, we then reset it for C-band and 3940 vertical on As2 (Hallmark, 26.655 and 2/3). Why this one? Well, as SatFACTS for December reported, when KIBC was added to the previous Zak Net carried Hallmark feed, the Hyundai 2.25 version and all Nokia's lost Hallmark. We also reported that Hallmark was utilising the CDTV200 for its cable headends and the addition of KIBC had not caused the receiver any problems.

After entering the Hallmark parameters, the CDTV200 immediately locked; a piece of cake. It did have some difficulty deciding whether it wanted the Viaccess card from Space TV Systems inserted into the slot; after a while it decided it liked it better with the card out (with the card in, the video "jerks" when there is a sudden scene change). The video quality is however somewhat "soft" and the baseband output looks more like medium grade VHS tape running in the LP position than digital television. Usable but hardly great quality. On occasion the audio level drifted way up and then way down. At first we blamed this on a transmission problem, until we connected a second (not Xcom) receiver to Hallmark for comparison (which was - no volume changes on the comparison receiver).

This is not a bad receiver, but lacking access to the Space TV Systems MCPC bouquet you need it for, there is probably no good reason to rush out to buy one. As with virtually every aspect of the Space TV Systems project, there is uncertainty that this is even the *correct* receiver. Our test unit was purchased from Space TV Systems, with a subscription card, early in December - after they had announced they were shipping Acer brand receivers. When dealing with this Taiwan programmer, buyer beware.

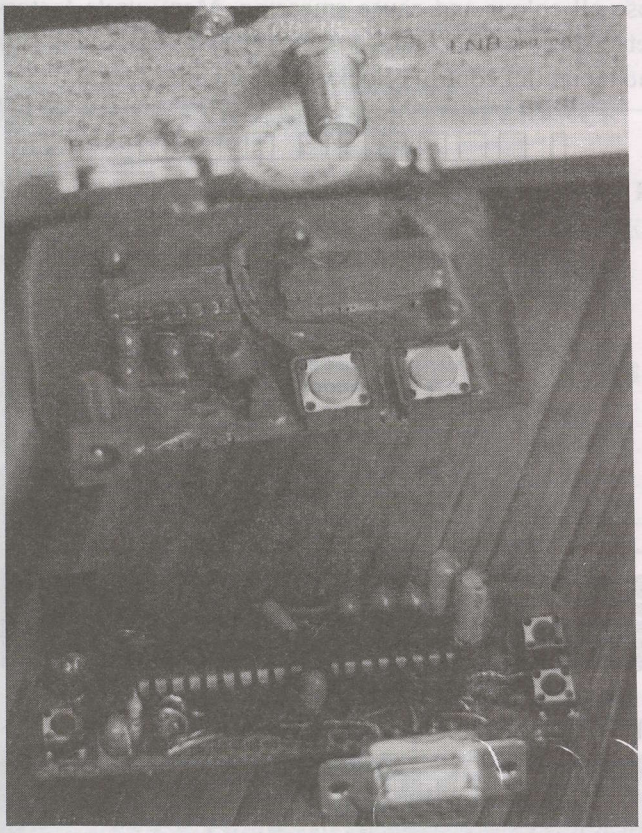
1/ European source: Satellite Direct, 271 King St., London W6 9LZ; Tel. ++44-181-563-2001. Our test receiver purchased directly from Space TV Systems.

NOKIA UPDATE TO FACILITATE NTSC TO PAL CONVERSIONS

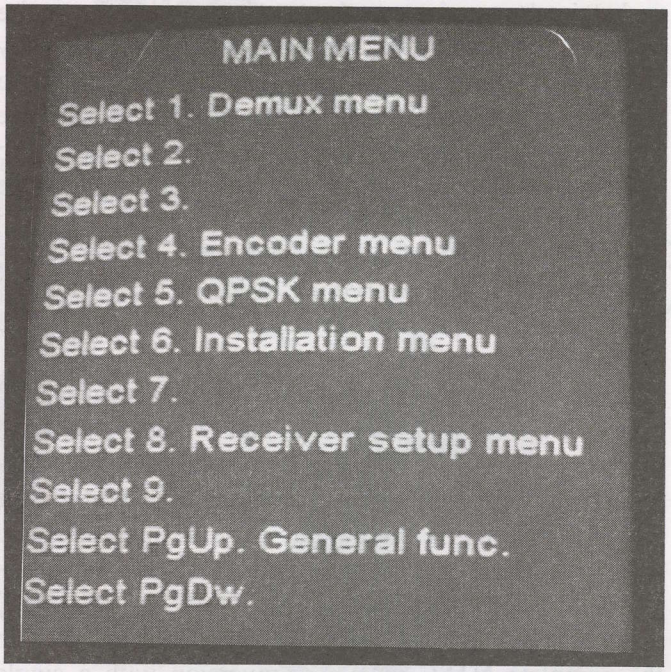
The objective is to avoid using the remote control for the NTSC to PAL 50 hertz conversion. Past reports have dealt with using the now infamous red screen menu to force the Nokia to do tricks with NTSC services, including PowerVu. Unfortunately, anything involving the red screen menu is a test of the user's sanity and willingness to be frustrated.

Clearly, what is needed here is some way to store the commands which the user must administer through the red screen menu, and to bring those commands into play on demand when attempting to correct an NTSC signal. Ideally, I thought, if we had one button to push to expedite the NTSC conversion software command sequence, the user would not have to learn (and master) the complex and tedious red screen menu routine at all. Result: A truly consumer level user friendly Nokia that will do NTSC as easily as PAL.

And while we were creating such an *expediter*, why not also provide for one-button call-up of the "RS Error Indicator" display so you could check the reception quality of the digital signal without going through yet another red screen menu routine?



NTSC to PAL red screen menu "*expediter*" is built on PC board that plugs into RS232 port on Nokia



The premise is simple enough. The Nokia will access NTSC services and display them as 3.58 NTSC but only after entering a string of commands through the red screen menu. If those commands are written to a small microprocessor and accessed by pushing one button, one time, you eliminate the command entry procedure. A microprocessor plugs into the RS232 port and arrives in your hands ready to plug in and operate having been pre-loaded with the command sequences. And as noted, a second command sequence is included to call up on screen with the push of a second button the RS Error Indicator - which tells you instantly the actual quality (and margin or headroom) of your reception.

I knew what I wanted, but am not conversant in machine code language. A friend took my concept and created the unit shown here (the photo shows the plug-in device on the RS232 port, potted against adventurous duplicators as well as an unpotted unit). I am also indebted to a team that signs on Internet as "Rod-Ed." You guys were on the right track (whoever you are!) to get the Nokia working on NTSC 3.58; only you didn't quite go far enough with your data strings. I've improved on this work after tens of hours of trial and error and can report it is now possible to command the Nokia to

Robin Colquhoun and his merry band of Nokia after market creators are close to making the Nokia series receivers respectable for consumer use. Robin may be reached at 64-9-630-7127.

produce NTSC input as PAL output that can be appropriately recorded on a PAL format VHS recorder.

There are three ways to accomplish this goal using a plug-in board. Number one, you could take DC voltage from the Nokia to operate the plug-in expediter. The downside of this approach is you must locate a suitable voltage point inside of the Nokia, rewire the RS232 socket in the receiver, and pray that you don't require warranty service! (This modification would certainly void the warranty coverage.) The second way is to supply an external 9 or 12 vdc supply to operate the plug-in microprocessor. This is the cleanest way to go and for added convenience, a 9 volt battery could be substituted for an external supply. The third way is to use a DB9 or DB25 plug and select subminiature surface mount parts to cram everything inside of the plug itself. I like the concept, but not the cost of this idealised approach.

The original version (shown as the encapsulated plug-in on the rear of the Nokia) had two miniature push button switches. The first was for reset. When the Nokia mains power is turned on a command is sent to the Nokia that turns on the comms port. In operation, you tune to a blank channel (see SatFACTS December, p. 14) and push the button. Now return to the NTSC channel and the Nokia will have been commanded to do the complete NTSC to PAL conversion with a single button push rather than the long and tedious red screen menu routine.

A later version added a third button which when pushed calls up the on-screen RS Error Indicator. This is a very helpful assist when you are trying to peak a system, or check to see how much headroom (margin before reception loss) you have on a particular service. My experience is that if the RS indicator reads 50 or above, your will not experience mosaic tiles or reception drop-out. The highest I have recorded was 120 on a PAS-2 Ku service here on a 1.6m dish. The indicator seems to work identically on C and Ku bands, by the way.

The final version adds a fourth switch to create true NTSC 3.58 (and not the 50 hertz NTSC that earlier red screen menu commands created). The difference here is a hybrid NTSC that runs at 50 hertz (the nominal PAL hertz rate) and NTSC in the broadcast standard 3.58 (60 hertz) format. You can record the 60 hertz version on an appropriate VHS machine.

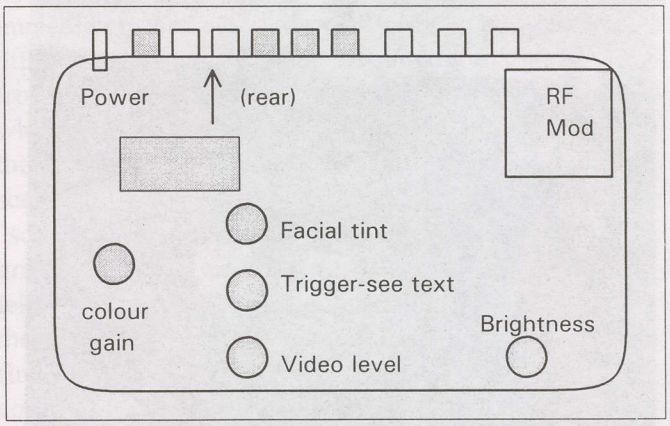
The photo her shows the original prototype covered with an epoxy resin to ensure the board does not break away from the DB9 plug accidentally. This version had the RS indicator switch and NTSC to PAL reset. This expediter version required connecting and disconnecting an outboard power supply to restart the board proper (not desirable). The second version, before epoxy covering, adds the power up reset button to turn on the expediter. The board draws around 20 mA.

The plug-in board is to shortly be available as an after-market item for Nokia users from Av-Comm Pty Ltd (E-mail cgarry@avcomm.com.au; telephone ++61 -2-9949-7417).

TWEAKING THE CYPRESS HDM-3A Vidiplexer

By Stu McLeod, 3 Norrie Place, Tamatea, Napier
New Zealand (fax or telephone 64-6-844-3706)

While generally it is advisable to leave "factory settings" alone, I have found after working on several of the Cypress HDM-3A Vidiplex decoders that on screen performance can be improved (or made much worse!) with some tweaking. There are five adjustable pots inside (remove top carefully - see illustration below). The "trigger level" is very touchy and if you decide to touch it, do so first and then reset everything else to the new trigger level setting. If you get this wrong, you can lose all colour and cause smearing. Many units factory set display yellow faces which is easily corrected with the facial tint control (clockwise for whiter faces).



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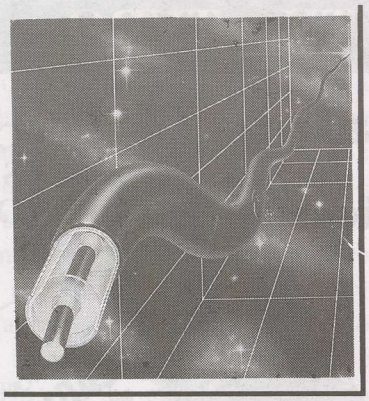
Literature: Ileen Feinberg Technical: Dave Dann, Tracy Warren, Steve Shafer, Glyn Bostick

The CABLE Connection



Amplifier Distortion

Any amplifier adds a measurable amount of "distortion" to the signals amplified. Distortion results from the non-linearity of the amplifier and try as designers might, there is no such thing as a perfectly linear amplifier.

Distortion is defined as a change in the signal waveform while the signal(s) passes through the amplifier (from input to output). With appropriate test equipment, you can compare the "waveform" of the input signal against the waveform after the amplifier and detect degradation.

Non-linearity increases with amplifier gain and with the amount of "power" passing through the amplifier. Therefore, to minimise distortion, amplifier designers try to keep the amount of gain (in dB) to a low number. The "power" is a function of the number of individual carriers (TV or FM channels in our business) that goes through the amplifier. The quickest way to increase distortion is to operate an amplifier with too much gain, and with too many signals (power) passing through it.

An amplifier passing only one TV channel in theory causes no distortion because it takes two or more signals for most forms of distortion to occur. Intermodulation distortion (abbreviated *intermod*) takes place when a non-linear amplifier operating at too much gain creates new signals. These new signals scatter about the passband of the amplifier and end up interfering with the original (desired) signals that appeared at the amplifier's input.

Intermod depends upon how non-linear the amplifier becomes and how many signals are passing through the amplifier. The number of "spurious" signals generated by the amplifier's non-linearity and the power or level of these spurious signals is difficult to quantify except by on the spot measurement at an offending location. You know you have intermod when:

1) You see a faint impression of a second picture image "drifting" behind or over the intended picture;

2) When you tune a TV set through the spectrum (of channels) and find "garbage" (lines rather than snow or noise) on channels which you are *not* using in the system;

3) The audio on a TV channel has a "swishing" sound as if an interfering carrier was drifting back and forth over the sound proper;

4) A channel or group of channels "roll" (will not maintain vertical hold) even though they appear strong on the receiver.

Spurious signals generated in a non-linear amplifier can also be verified with a spectrum analyser. A normal analyser check of a TV spectrum will show the desired video carrier, a colour sub-carrier and an audio carrier for each channel. Spurious signals, intermod, appear as secondary "blips" on the display screen. Their placement will be random, and they may not be totally frequency stable on the display (moving left and right randomly).

Quick Check

Because an amplifier "goes non-linear" when it is being operated with too much gain and/or too many signals passing through it, you can verify the intermod by doing either of two things:

a) Reduce the number of signals going through the amplifier (not always practical), or,

b) Reduce the amount of amplifier gain.

If the amplifier has a gain control (all semi professional and professional products do), simply turn the gain down a small amount at a time while observing the reception on a TV set *after* the amplifier. There will be one very abrupt (hair trigger) point with the gain setting where the pictures will suddenly lose all signs of intermod. The safe level to then operate that amplifier would be 2 to 3 dB *lower* output than the hair trigger intermod point.

When two or more amplifiers are operated in series (in "cascade" in the trade), first determine the earliest point in the amplifier "string" where the intermod is visible. By working backwards towards the signal origination source an amplifier at a time, you will discover a location where the *input* to an amplifier is clean (free of intermod) but the *output* has visible intermod. When this location is found, reduce the gain control for that amplifier and then retrace your steps back towards the end of the cascade (amplifier string) to verify that no other amplifiers are operating in a non-linear manner.

You cannot "see" intermod with a signal level (field strength) meter except under very severe intermod conditions. You can "see" it on a spectrum analyser but in this instance the best "instrument" is a TV set that goes along with you (battery operated). Intermod "beats" (interference) can be seen drifting or clashing with the desired channel(s) of reception on a TV screen far sooner than you can measure it with most common test equipment.

Not All Channels Affected

It is possible for intermod to appear on something less than the full compliment of channels. This occurs when the input to an amplifier is "unbalanced" in signal levels between the various channels being amplified. Suppose you are amplifying ten channels, one of which is

stronger than the rest. The extra power of this stronger channel creates intermod which affects the other nine channels in the amplifier. The solution is to reduce the signal level from the offending "too strong" signal so that it appears at the input of the amplifier at the same level as the other channels. If you are unable to do this, the only solution remaining is to turn down the amplifier gain until the intermod stops.

Unfortunately, this reduces the levels of the weaker signals as well as the too-strong signal and you may not have adequate amplification for the weaker signals having reduced the amplifier gain to eliminate the intermod. Which brings us full circle back to the first suggestion: Selectively reduce the level of the too strong channel so the amplifier gain can be operated at a higher level.

In a pure cable environment, each channel at the headend has its own output level control. A channel that runs too high in level in a cable system can be corrected by turning down the output level for that one channel alone at the headend. In a SMATV or MATV environment, it is not uncommon to install a single all channel aerial for the off-air VHF stations, perhaps amplify them with a masthead amplifier, and then dump the amplified output into a cable distribution system which may have one or more additional "line amplifiers." Seldom will such an installation have "balanced" signal levels from the off-air channels and unless this is corrected subsequent amplifiers will be forced to operate "around" the unbalanced condition.

(Individual channels can be attenuated using tuneable traps which are installed and set up using either a signal level meter or spectrum analyser. Tuneable traps, however, have the disadvantage of being very sharply tuned and can if not precisely set up cause "ringing" or phase distortion in the received signal. If the too strong signal[s] is located in one VHF TV band [such as Band I] while the weaker channels are in another band [such as III], a band splitter [high-low separator or combiner] can be employed to selectively attenuate the offending [too hot] "band.")

Distortion can also be corrected by replacing an offending amplifier with a more robust amplifier - one capable of handling more signals (at the same level or higher levels) before encountering intermod. Unfortunately, most MATV (master antenna television) amplifier products are not "rated" by the number of channels they can amplify versus the gain of the amplifier. Thus it becomes a bit of trial and test to determine the capability of MATV products on offer.

Cable television line amplifiers are always rated by gain and by the number of carriers they can amplify without intermod distortion. It might surprise you to learn there are US$100 price range 60+ channel "apartment house amplifiers" capable of delivering 115 dBuV. Sometimes your problems are solved simply by "shopping" in a new catalogue!

SatFACTS Pacific/Asian Region Orbit Watch: 15 January 1998

Analogue Free-to-Air 57E to 80E

Sun Music	**57E/703** 1395R
RTNC	1352R
Gemini	1220R
AsiaNet	1170R
WorldNet	1095R
NEPC	1085R
TVi	1025R
Muslim	975L
ESPN Feeds	**64E/801** 1134R
E-TV	1093/L
ViJAY TV	965R
Home TV	**68.8/Pas4** Vt1310
ABN	Hz/1365
Sony TV (Hindi)	Hz/1240
Doordar & Iran TV	Vt/1116
CNNI	Hz/1065
TNT/Cart.	Hz/1040
ATN	Hz/995
MTV Asia	Hz/965
Tests	**78.5/Th3** Hz/1585
MCOT	Hz/1180
HSTV	Hz/1200
TVT	Vt/1280
Army TV	Vt/1390
RAJ-TV	Vt/1510
UB TV	Vt/1534
Contin.TV	Vt/1565
AsiaNet	Vt/1605
TK Rossija	**80/Exprs.** 1475RHC
Feeds	1315RHC
VTV4+	1275RHC
ACT/TB3	1225/RHC
TV Center	1025/RHC

Anal. Free-to-Air 80E to 113E

Russia 3	**80/Exprs** 1025R
RTR 1	**90/S6** 1475R
Orbita I	1275R
RTR II	1234R
Orbita II	1215R
VTV	**91.5/Me1** Hz/1440
Doordar.1 National	**93.5/In2b** 1030/Vt
Doordar.1	1160/Hz
Doordar.9	1080/Hz
Doordar.7 Telugu	1070/Vt
Doordar.9 Kanada	1180/Vt
Doordar.1	1268/Vt
Doordar.	1310/Vt
Doordar.3	1348/Vt
Doordar 4	1388/Vt
ORT 1	**96.5/S14** 1475R
Madagas-car	1325R
Tv Azer.	1275R
ERTU Egypt	**100.4/As2** 1508/Hz
TV Shopping	1490/Vt
Mongolia, Iran/plus	1470/Hz
WorldNet	1265/Hz
CCTV4	1190/Hz
RTPi	1170/Vt
RTR	**103/S21** 1475R
Vrk/Apt	1275R
CFI	**113/C2** 990/Hz

JcSat 3 128E
Occassional video tests reported 4085/1065 Vt.

Anal. Free-to-Air 113E to 148E

Brunei, feeds	**113/C2** 1010/Vt
MTV Asia	1030/Hz
TPI	1070/Hz
TV Indosiar	1090/Vt
ABN	1110/Hz
ANteve	1130/Vt
CNNI	1177/Vt
SCTV	1190/Hz
GMA	1240/Hz
TV3	1250/Vt
ATV Australia	1270/Hz
TVRI	1310/Hz
RTM	1330/Vt
Gujarat +	1350/Hz
RCTI	1408/Vt
CNBC	1530/Hz
Test Card	**128/Jc3** 1070Vt
CETV SD	**134/Ap1A** 1330Hz
CETV2	1250/Vt
CETV1	1170/Vt
CNNI	**138/Ap1** 1170/Vt
CCTV7	990/Hz
Orbita-I	140/**S7** 1475R
NTV	1425R
ORT1	**145/S16** 1475R
RTR Russia	1275R
Test Card	**148/Me2** 1070/Hz

Worldstar Radio Sat
Asiastar 1 to 105E (12/98); downlink 1.451-1.492 (GHz). Audio channel capacity: 576 @ 16Kbit/s.

An. Free-to-Air 150E to 180E

CNBC (inactive)	**150/C1** 990/Hz
CNNI	**169/Pas2** 1183/Hz
CNN Feeds	1155/Hz
NHK	1114/Hz
TV Shopping	1400/Hz
Feeds	**174/I802** 984R
Feeds	973R
Feeds	**177/I702** 984R
Feeds	963R
Feeds	**180/I701** 1430R
Feeds	1175R
RFO	1105R
Feeds	1020L

PALAPA C1 150.5E

CNBC	990Hz
Tests	1030Hz
Tests	1140Hz
Tests	1220Hz
Tests	1330Hz
Tests	1360Hz

Palapa C1 not reported last 60 days

Encrypted Analogue

BBC (BMAC)	68.8/Pas4 1286Vt
Discov. India	**68.8/Pas4** 1365/Vt
ESPN	1290/Hz
ESPN (d)	**113/C2** 1030/Hz
HBO Asia (d)	1150/Hz
Discovery (d)	1430/Hz

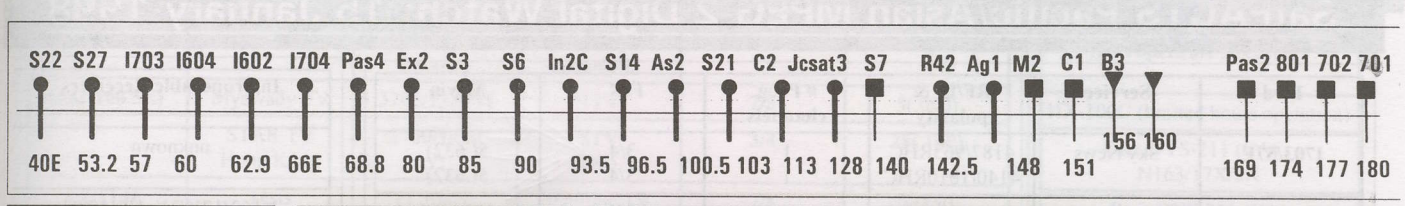
NON MPEG-2 DIGITAL SERVICES

People's Net (GI 1.5)	**113/C2** 1220/ Hz
RPN-9 (SA 1.5)	**142/G2** 1225L
Fox/ Prime (SA 1.5)	**169/ Pas2/** 1161/Vt
Filipino Channel (GI 1.5)	1314/Hz

(a) B-MAC encrypted, no access available; **(c)** MPEG encrypted, access may be possible; **(d)** B-MAC, access for DTH possible some geographic areas.

JANUARY jennet ALERT

Frequencies to "watch" during next 30 days: Optus B3 Hz, 12.689; Optus B3 vertical transponders T2 and T7 (region of 12.341 and 12.661) for new MPEG signals. Palapa C2 3760 Hz for signs of new service. PAS-2 3930 Vt for signs of new service. 122E (AsiaSat 1G) for possible use of 3675/1475 LHC. 128E at 4085/1065 Vt for tests from JcSat3.



OPTUS B3 156E (Ku only)

ABC WA	1358/Vt B-Mac
Imparja	1355/Vt B-MAC
GWN	1300/Vt
Net 9, Sky	1233/Vt B-Mac
Austar test Mpeg2	1389/Hz
Optus test Mpeg2	1326/Hz
Aurora Mpeg test	1264/Hz
Imparja N.T.	1214/Hz B-MAC
ABC N.T.	1169/Hz B-MAC
Galaxy	1137/Hz Irdeto Mpeg 2
Galaxy	1073/Hz Irdeto Mpeg 2

Optus A3/152E(a)

ATN7png	1297/Vt
ATN7png	1430/Vt

a/occasional use

Palapa C2 Ku (seen South equator)/113E

Test bars	11.148/Vt

MeaSat 2 148E

Tests	1070Hz*

* Colour bars , audio 6.8; C-band covers Aust, NZ

OPTUS B1 160E (Ku only)

Data	1402/Hz
QSTV	1377/Hz B-Mac
SE ABC HACBSS	1370/Vt B-Mac
SE SBS HACBSS	1344/Vt B-Mac
NE SBS HACBSS	1339/Hz B-Mac
NE ABC HACBSS	1313/Hz B-Mac
Sky Channel	1296/Vt B-Mac
ABC Radio	1276/Hz (digital)
OmniCast	1270/Vt (FM/FM)
ABC feeds	1247/Hz Pal
Sky Nz (sport)	1245/Vt VidCrypt
Net 9 feeds	1220H B-MAC
Sky Nz (Orange)	1218/Vt VidCrypt
Net 10	1182/Vt E-Pal
Net 9	1180/Hz E-Pal
Net 10 feeds	1155/Vt Pal
QTQ9	1145/Vt
Net 7	1120/Vt E-Pal
Net 9 feeds	1091/Vt Pal
Aurora MPEG-2	1076/Hz (tests)
CAA air to ground	1009/Vt Nbfm

PAS-2 169E (C + Ku)

CCTV	1433.5/Vt (Sa9223)
Napa feed	1407/Hz
Value Ch.	1400/Vt
Discovery PowerVu	1374/Hz (Sa9223)
Napa feed	1370/Vt
AB Asia, feeds	1335/Vt
ABS/CBN	1314Hz (GI 1.5)
Baccarat	1290/Vt
WCE-TV, feeds	1250/Vt
MPEG-2 PowerVu	1249/Hz (Sa9223)
CNN+ (1/2Tr)	1183/Hz
FoxSports	1160/Vt (SA 1.5)
Feeds	1150/Hz
NHK	1115/Hz
Feeds	1105/Vt
Napa feed	1065/Vt
NBC Mux MPEG	1057Vt (Philips)
MPEG-2 PowerVu HonKong	1002Vt (Sa9223)
TCS Sing.	967/Hz

PAS-2 Ku

GWN	12.263V
MediNet	12.286V
Telstra Bendigo	12.300V
Napa TC	12.415V
HiLife	12.582H
MTV Asia	12.604H (MPEG)
ABC Interchge	12.629, 638, 646 Vt

Intelsat 801 174E

Feeds	963R
Feeds	984R

Intelsat 702 177E

Feeds	963R
AFRTS	973L (PowVu)
Feeds	984R
Space TV Sys	12.612H (MPEG)

Intelsat 513 177W

Feeds	963
Feeds	984

(513 Ku)

Service	RF Freq.
US Nets	10.980V
NBC	11.015V
Feeds	10.510V

Ku Services
Intelsat Ku band services shown here are boresighted to Japan and nearby Asia, have not been reported south of equator.

TDRS5 / 174.3W

Fuji TV	1305 Hz
BBC World	1163Hz MPEG

Intelsat 701 180E(W)

TVNZ	955/Dmv 3000
TVNZ	964/Dmv
TVNZ	972/Dmv
TVNZ	980/Dmv
TVNZ	988/Dmv
Occ Vid.	1,020**
TVNZ	1,030
SCPC	1,054 **
RFO Tahiti	1,105
SCPC	1,126
SCPC	1,136
Vidiplex	1,220
Feeds	1,254
NHK(e), NBC	1,270
TVNZ	1,293/e
10 Oz MCPC	1,385 (PwRvu)
CNN USA	1,430
Baccar.	1,439 **

* RHC & LHC
** LHC only
e/ encryption

(701 Ku)

NHK	11.135H
CBS	11.475H
CNN	11.508H

UPCOMING SATELLITE LAUNCHES

Gorizont 33 (last of series - honest!) launch via Proton - late January?
Chinastar 1 to 87.5E February 20

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 January 1998

Bird	Service	RF/IF & polarity	# Prog channels	FEC	Msym	Interoperable Receivers
I703/57E	Sky News	4187/963RHC 4140/1010RHC	1 1	3/4 3/4	5(.632) 5(.632)	unknown
I704/66E	CFI	4055/1095RHC	4	3/4	27(.500)	N163/17X/2X, HS-100C
PAS4/68.5E	ART/RAI, BBC	3966/1184Vt	2	3/4	5(.632)	e3
	BBC World	3996/1154Hz	1	3/4	6(.620)	DMV, e3
	Channel 0/TVSN	3743/1407Hz	4	3/4	28(.100)	? (MPEG-2, Iredeto)
	CCTV	3716/1434 Hz	6	3/4	19(.850)	Pv9223, N163/2X, HS-100C
Thaicom 3 78.5E	UTV	3920/1230 Hz	6TV (#1)	3/4	27(.500)	HS-100C, Philips, probably others (some chs now CA)
	UTV/MCOT	3880/1270 Hz	8TV (#2)	3/4	27(.500)	HS-100C, Philips, probably others (some chs now CA)
Measat 1/91.5	India Bouquet	12284/12346Vt	10+TV?	7/8	30(.000)	Philips
As2/100.5E	Chinese tests	12.295Hz 12.329Hz	1TV 1TV (BTV 1)	2/3 1/2	6(.103) 6(.930)	HS100C, e3
As2/100.5E	Laos TV	4143/1007Hz	1TV	2/3	2(889)	HS-100C, N163, e3
	European Bouquet	4000/1150 Hz	6TV, 12 radio (#3)	3/4	28(.125)	DMV, HS-100C,Gng, N163, /17X/2X, N2000, P400**(b)**, P500, Pn520/630, Sk888
	Hubei TV (HBTV Main)	3854/1296 Hz	2	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	Hunan TV (SRTC)	3847/1303 Hz	1	3/4	4(.418)	HS-100C,N163/17X/2X, N2000, Ph3950/11
	Guandong TV (GDTV)	3840/1310 Hz	1	3/4	4(.418)	HS-100C,N163/17X/2X, N2000, Ph3950/11
	Inner Mongolia TV Zizhiqu	3828/1322 Hz	2	3/4	8(.397) (1-China) (2-Mongolia)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	APTV London	3800/1350 Hz	1	3/4	5(.631)	DMV, HS-100C, N163 /17X/2X
	BBC Radio	3793/1357 Hz	?	?	?	(Comstream ABR200/202)
	WTN Jerusalem/ London	3790/1360 Hz	1	3/4	5(.631)	DMV, HS-100C, N163/17X/ 2X
	WTN London	3786/1364Hz	1	3/4	5(.631)	DMV, HS-100C, N163/17X/2X
	WTN HK	3775/1375 Hz	1	3/4	5(.631)	DMV, HS-100C, N163/173/2X
	Liaoning TV (Service 2)	3734/1416 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	Jiangxi TV (JX Sat TV)	3727/1423 Hz	1	3/4	4(4.18)	HS-100C, N163/N17X/2X, N2000, Ph3950/11
	Fujian TV (SETV)	3720/1430 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	Quinghai TV Zenghou	3713/1437 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	Henan TV Main	3706/1444 Hz	1	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
As2/100.5E	Sky Racing	4020/1135Vt	3TV	1/2	18(.000)	Pace DVS-211 (CA)
	EMTV	4006/1144Vt	1TV, 2 radio	3/4	5(.632)	HS-100C, N163, Pv9234
	Hallmark/KIBC	3940/1210Vt	2TV	2/3	26(.655)	HS-100C, e3
	STAR TV (Hong Kong)	3900/1250 Vt	5TV (#4)	3/4	28(.100)	HS-100C, Pace DVS211(CA), DMV, N163*/17X+/2X
	Hei Long Jiang	3834/1316Vt	1TV	3/4	4(4.18)	HS-100C, e3
	JSTV	3827/1323Vt	1TV	3/4	4(.418)	HS-100C, e3
	AHTV	3820/1330Vt	1TV	3/4	4(.418)	HS-100C, e3
	"QQQ" China (Shaanxi)	3813/1337 Vt	1, 1 Radio	3/4	4(.418)	HS-100C, N163/17X/2X, N2000, Ph3950/11
	Guangxi GXTV	3806/1345Vt	1, 1 Radio	3/4	4(418)	HS-100C, N163/17X/2X, N2000.
	Rebar TV Taiwan	3785/1365 Vt	5TV (#5)	3/4	18(.000)	Pv9223 (CA) [Video inverted?]

Bird	Service	RF/IF & Polarity	# Prog. channels	FEC	Msym	Interoperable Receivers
(As2/100.5E)	Myawady TV	3766/1384Vt	1TV	7/8	5(.080)	HX-100C (limited hours operation)
	STAR TV Hong Kong	3700/1450 Vt	8TV (#6)	3/4	28(.100)	Pace DVS-211 (CA). N163/17X/2X
C2/113E	Tests	11.500Hz	multiple TV	7/8	26(850)	Pace DVS-211 (CA)
	Star Indovision	3500/1650Hz 3580/1570Hz	20 TV (#7)	7/8	26(.850)	Pace DVS-211 (CA)
	Indovision	3460/1690Hz	6TV	7/8	21(000)	Pace DVS-211 (FTA?)
	MegaTV	3780/1370Vt	5TV (#8)	3/4	27(.500)	N2X/DVS-211(CA)
Thaicom 1/120E	Thailand terres.	4120/1030Vt	6TV	2/3	27(.500)	unknown
AP1A/134E	AXN	4060/1090Vt	4	7/8	28(.330)	unknown
AP1/138E	Reuters	3732/1418Vt	1TV, data	3/4	5(.632)	N163/17X/2X
Palapa C1/150.5	Indovision	4117/1033Hz	10TV	7/8	26(.850)	same as 3580 C2
Optus B3 156E	Galaxy	12.438Hz 12.373Hz	20+TV (#9)	3/4	29(.473)	Gng, P400, P500, Pn520, + Pn630, Sk888 (c)
	Aurora Test	12.564Hz	up to 6TV	2/3	30(.000)	e3, HS100C, PV9223
	Optus Vision	12.626 Hz	16TV, 8 radio (#9A)	3/4	29(.473)	(when testing is over, only IRDs with CAM)
	Austar	12.689Hz	tests-up to 10TV	3/4	29(.473)	e3, HS100C, P400, P500, PN630
Optus B1 160E	Aurora (MPEG test)	12.377Hz	5+ TV (#10)	2/3	30(.000) [27(.500)]	N163/17X/2X, Pv9223, HS-100C
PAS-2 169E	ABC Interchange	12.646 (.638, .629)Vt	1 TV (each)	3/4	6(.980)	Pv9223, Hs100C, e3
	Telstra Bendigo	12.300Vt	3TV, 2 radio	1/2	10(.138)	Pv9223/9234, (CA)
	Mediasat	12.286Vt	1TV	3/4	6(.610)	Pv9223, HS100C, e3 (some CA)
	GWN Perth	12.263Vt	2TV, radio	1/2	13(.404)	Pv9223/9234, HS100C, e3 (CA)
	MTV Asia	12.605Hz	8TV	1/2	22(.490)	Unknown- Asia beam only
	Hong Kong PowerVu	4148/1002 Vt	8TV (#12)	2/3	24(.430)	Pv9223, HS-100C(*), N2X* (some FTA)
	NBC Hong Kong	4093/1057 Vt	7TV (#13)	3/4	29(.473)	HS-100C, Gng, N163/17X/2X, P400 (b), P500, Pn520, Pn630, Sk888
	JET Singapore	3962/1188 Vt	2TV (1-Ntsc, 2-Pal)	1/2	13(.740)	Pv9223 (CA)
	ESPN (USA)	3860/1290Vt	4TV, 2 control	7/8	26(.470)	Pv9223 (CA)
	CCTV China PoerVu	3716.5/ 1433.5 Vt	5TV (#14)	3/4	19(.850)	Pv9223, HS-100C, N163/17X/2X (FTA)
	TCS Singapore	4183/967 Hz	2TV (#15)	1/2	6(.620)	Pv9223, HS-100C N17X/2X (FTA)
	ITJ-Japan	4.174/976 Hz	1 TV	3/4	5(.632)	HS-100C
	AAR-ART/ RAI Int	4153/997 Hz	3TV (#16)	3/4	5(.632)	HS-100C, Pv9223, N17X/2X, (continues FTA)
	PAS-2 feeds	3940/1210 Hz	2TV(NTSC)	2/3	6(.620)	Pv9223, N2X, HS-100C
	California PowerVu	3901/1249Hz	8TV (#17)	3/4	30(.800)	Pv9223, HS-100C (*) N17X/2X (*), (some FTA)
	Disney/Aust.	3804/1346Hz	1TV	5/6	21(.093)	Pv9223 (CA)
	Discovery Singapore	3776/1374 Hz	7TV (#18)	3/4	21(.093)	Pv9223, HS100C, N2X (occasionally Ch. 2 FTA)
	Satcom 1-6	3743/1407Hz	6TV	7/8	19(.465)	Pv9223(CA)
	Unknown test	3718/1432 Hz	3TV	2/3	6(.620)	e3
I702/177E	AFRTS	4177/973 LHC	8TV, 12 radio & data (#19)	3/4	28(.000)	Pv9223 (CA)
	SPACE TV Systems	12.612/1312 Hz	8TV,10 radio (#20)	3/4	26(.694)	XTCCDTV200 (All but 1 now CA?)

PAS 2 C – 3942/1258 H 3 6620 2/3
4174/1003 H 3 3632/3/4

Bird	Service	RF/IF & polar.	# Prog. Chs	FEC	Msym	Interoperable Receivers
I701/180E	TVNZ Gennet (feeds)	4195/955RHC 4186/964 4178/972 4170/980	1TV(CA) (BBC Gennet) 1TV(CA) (APTV/Tokyo+)	3/4	5(.632)	DMV, HS100C, N17X, 2X, e3 (for non CA chanels when active; not all chanels active all of the time)
	Americas(radio)	4175/975LHC	3+ radio (?)	2/3	3(.680)	e3, (CA)
	TVNZ CRY	4120/1030RHC	1TV	3/4	5(.632)	(see TVNZ above)
	Canal Plus	4091/1059LHC	1TV (?)	3/4	34(.368)	Sagem ISD2050 (?), CA
	Unknown	4088/1062RHC	unknown	3/4	28(.100)	e3, (CA)
	TVNZTL	3857/1293RHC	MTV Europe	3/4	5(.632)	HS100C, e3 (now CA)
	10 Australia	3765/1385RHC	6TV	7/8	29(.900))	Hs100C, e3, Pv9223 (4ch CA)

Bouquets: **1)**Thailand UTV: (1) CNN, (2) TTV, (3) ESPN, (4) HBO, (5) Ch. 5, (6) itv; **2)** Thailand UTV/MCOT: (1)MCOT , (2) UTV Sports (3) test, (4) TTV News, (5) test, (6) Live, (7) Channel B, (8) Discovery; **3)** European Bouquet. (1) Deutsche Welle, (2) MCM, (3) RAI International, (4) RTVE, (5) TV5 Paris, (6) [when operating] Deutsche Welle special programme channel with MediaNet VBI included [lines 10-15, requires DMV M2/Pro/Txt board inserted in 3000 series receiver]; Radio (1) DW#1 (stereo), (2) DW#2 (stereo), (3) DW#3 (stereo), (4) YLE (left) & RCI (right), (5) SRI (l) & WRN (r), (6) REE, (7) DW#1 (stereo), (8) DW#2 (stereo), (9) DW#1 (stereo), (10) NN RA6, (11) NN RA8; **4)** STAR TV Hong Kong. (Now all but [5] apparently CA) (1) Sky News London , (2) Sports Contribution, (3) Channel [V] International, (4) Star Movies Japan [NTSC], (5) Star Plus Japan [NTSC] ; **5)** Rebar Taiwan. (1) "U1" [movies], (2) "U2" [news], (3) "U3" [sport, cartoons, general entertainment], (4) "Rock TV", (5) Rock TV **[FTA]**; **6)** STAR TV Hong Kong. (1) Channel 6, (2) ESPN Contributory, (3) Racing Ch., (4) Star Movies SEA, (5) Star Chinese, (6) NBC, (7) CNBC, (8) Sky News, (9) VIVA Cinema; **7)** Indovision. (1) HBO Asia, (2) STAR Movies SEA, (3) Film Indonesia, (4) MGM Gold, (5) ESPN Asia, (6) STAR Sport, (8) Channel 'V' International, (9) Channel 'V' Asia, (10) RCTI, (11) STAR +, (12) Discovery, (13) STAR Movies and NBC Asia, (14) Phoenix Chinese, (15) CNN, (16) BBC World, (17) CNBC, (18) Cartoon + TNT, (19) Preview 1, (20) Preview 2; **8)** MegaTV. (1) CNNI, (2) Discovery, (3) ESPN Asia, (4) HBO Asia, (5) Cartoon + TNT, [(6) MGM Gold, (7) Cinemax (6-7 may not be operating]; **9)** Galaxy. Presently 20+ programme channels. **9A**) Optus Vision tests of 16 programme channels, programming decisions to be finalised; **10)** Aurora. (1) SBS NT, (2)SBS NE, (3)SBS, (4) Sky News, (5) ABC WA ;**12)** Hong Kong PowerVu. (1) CTN 1, (2) CTN II, (3) TVBI Hong Kong, other feeds [NTSC], (4) TNT/Cartoons [PAL], (5) **Ad-hoc II** [NTSC], (6) **ABN**, (7) CTN II, (8) CTN; **13)** NBC Hong Kong. (1) CNBC, (2) CNBC Mandarin A, (3) NBC Asia, (4) colour bars, occasional feeds, (5) CNBC Mandarin B (6) NBC "2" Asia/Taiwan, (7) Colour bars, "future" use; **14)** CCTV China. (1) **CCTV4** , (2) **CCTV3** [(3) **CCTV 9,** (4) **CCTV4,** (5) **CCTV5,** (6) **CCTV8, (7) CCTV tests** ; **15)** TCS Singapore. (1) **TCS Test**, (2) **TCS Default** [repeats channel 1]; **16)** SCPC3. (1) ad-hoc use, (2) AAR/ART, (3) RAI International; **17)** California PowerVu. (1) **CMT**(NTSC), (2) **CBS feeds**, others including CTV Canada (NTSC), (3) ATN Asia TV Network(NTSC), (4) **EWTN** (NTSC) global Catholic radio, ch. 2, (5) **BBC World** (NTSC), (6) **Bloomberg Financial** (NTSC), (7) Golf Channel (NTSC), (8) Chile(NTSC); **18)** Discovery. (1) Disc. Aust/NZ, (2) **Disc. default**, (3) Disc. Japan, (4) Disc. SE Asia, (5) Disc. Taiwan, (6) Disc. Philippines, (7) Disc. China; **19)** AFRTS. (1) News, Sports [ACII, CW, RR, 9.6 kbps, TV], (2) Spectrum [Urban, 64 kbps], (3) AFN Pacific [TV], (4) Channel 1 - Mirror [TV], (5) AFN Korea [contingency, 1.536, TV], (6) The Jim Lambert Test Channel [!!!], (7) EPG, voiceline, (8) EPG, u/i voiceline, (9) AFN Atlantic [Top 40, HR, NPR, TV], (10) AFN Americas [Top 40, TV], (11) AC1, (12) Country, (13) Adult Rock, (14) NPR [US National Public Radio], (15) Urban, (16) Pure Gold, (17) Top 40, (18) Hard Rock (19) Contingency. **20]** SPACE Systems (177E, Ku) claims to be back on the air with 5 CA Taiwan programming sources (see p. 32, here) plus North American sourced adult channels Erotica and Exxxtasy (all CA), and, Thai TV 5 International FTA. Acer Computer receivers are said to now be available along with one year subscription cards that will function through December 31, 1998.

MPEG-2 DVB RECEIVERS: [Data here is believed accurate; we assume no responsibility for errors in this volatile area!]

DMV/NTL 3000. Skandia Electronics Pty Ltd (tel 61-3-9819-2466)

Grundig (Gng) DTR1100 (badged Panasat 630, believed no longer in production). Av-Comm Pty Ltd (tel 61-2-9949-7417)

Hyundai-TV/Com. Model HSS-100C is officially available from Skandia Electronics (tel 61-3-9819-2466), and Bay Satellite TV Ltd (tel 64-6-843-5296). Current version of chips 2.25. Skandia is the master distributor and other sources are reportedly through Asia.

Hyundai HSS-100B/G. New January 1998; software version 5.0, see HSS-100C sources.

Nokia 9500 S (V1.63). This version is no longer available although it had ability to identify Msym and FEC parameters of unknown carriers. (V1.7X) was a German language "d-Box" version originally imported by OPAC; it functioned with the same parameters as the V1.63. (V2.X; 2.233/e3, 2.034 and others perhaps not yet identified) are current (after June/July) software versions that allow virtually unlimited stacking of bouquets and programmers and for at least the 2.233 version also allows limited red menu correction of NTSC glitch (see SF#36, p. 6). e3 is current Asia-Pacific factory version. Factory supplied sources known include: AV-COMM Pty Ltd (Tel 61-2-9949-7417); SCITEQ (61-8-9306-3738); Telsat (64-6-356-2749). AV-COMM also has macro-command IR remote that expedites 'red menu' operations for e3 version 9500 S. (see SF#36. p. 32).

Nokia "d-box" (V1.7X) suitable for C-band use. Instructions, on-screen prompts may be in German. Be careful when buying this one!

PACE DVS-211. Officially available only through Sky (racing) Australia (Bob Pankhurst tel 61-2-9451-0888].

PACE DGT400. Through Galaxy offices, Australia.

PACE DVR-500. Bay Satellite TV Ltd. (tel 64-6-843-5296); also supplied by NBC to affiliates.

Panasat 520 (Pn520). OPAC Pty Ltd (tel 61-2-584-1233); no longer available.

Panasat 630 (Pn630). Antares Satellite (61-7-3205-7574); no longer available

(Panasat) 642. A notation - The (642) will not be released except in South Africa and only after start of 1998

PowerVu D9223, 9234. Scientific-Atlanta (Sydney) Tel 61-2-9452-3388; BaySat (tel 64-6-843-5296), Telsat (64-6-356-2749)

Samsung VS-2000 (ver 1.31). Pacific Satellite (tel 61-7-3344-3883)

SK888. Skandia Electronics Pty Ltd. (tel 61-3-9819-2466)

XTC CDTV200. (For Space TV Systems); only source James Tzeng at (USA/tel) + +1-714-529-9988 or fax + +1-714-529-9989

WITH THE OBSERVERS

AT PRESS DEADLINE

January 8th advisory from Optus Sales Manager Jeff Davies urges WA DTH dealers to not sell S/A (PAS-2) package receivers and to hold onto "RTIF" (discount) vouchers until May '98 availability of new Aurora receiver (see p. 11). Optus says they will keep GWN service on B-MAC until May. Details in CTD for January 21. (TS)

A number of new services have appeared during the past 30 days; unfortunately, some scheduled to begin transmission did not do so.

TVNZ I180E has added 3857/1293 RHC at standard Msym 5.632 and 3/4; CA, appears to be where MTV is now linked from Europe.

Hallmark reception with a Nokia? Red screen menu to PIDs and enter video 32, audio 33, PCR 32 and you are away.

Laos TV (which should be of interest to Australia) now in SCPC AsiaSat 2 4.143 Hz with unusual Msym of 2.889, FEC 2/3.

New equipment: Hyundai HSS-100B/G with version 5.0 software has now replaced HSS-100C ("C" for China) version 2.25 in the Pacific market. Of interest, the new software has many of the characteristics which Stu McLeod described in the December SatFACTS. Electrical changes: Totally new tuner (L-band signal processor). Operational: Will locate FEC number if unknown. We'll have a performance analysis in a future issue.

PAS-2 Ku service to New Caledonia: On 3m solid dish with 0.6 dB Gardiner LNB, Hyundai 2.25: 12.263 GWN bouquet (9.5 dB); 12.286 MediaNet (8.2 dB); 12.300 Telstra Bendigo (9.2 dB); 12.629 ABC Interchange (6.5 dB); 12.638 ABC Interchange (6.5 dB); 12.646 ABC Interchange (6.5 dB). As a 3m Ku band dish is not common, these would seem to be beyond DTH reception possibilities (**Steffen Holzt**).

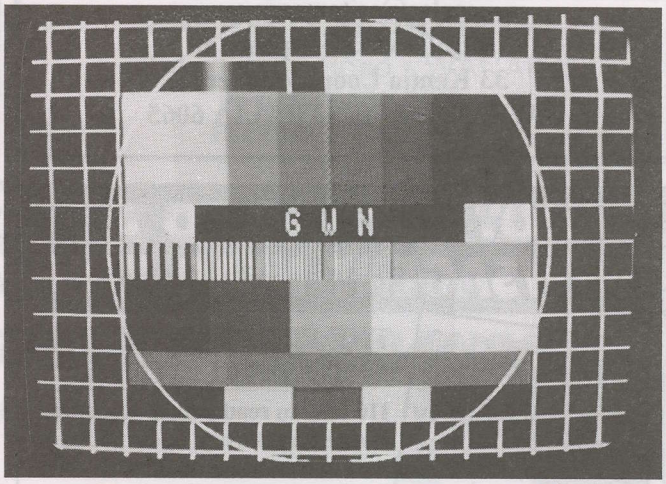
10 Network (Australia) 6 channel interchange from USA (I180E, 3764 RHC) has changed MPEG settings to Msym 29.900 and FEC 7/8. Programme channels 5 (news feeds) and 6 (Globecast bars) remain FTA.

TNT B-MAC (NTSC) analogue service scheduled to shut down January 16 (PAS-2, 3932/1218 Vt half transponder), replaced with Hong Kong 4148/1002 PowerVu bouquet programme channel (#4); Msym 24.430, FEC 2/3.

Thai TV 5 Global Network feed on 177E Ku (12.612 Vt), within the Space Systems CA service, has not been reported to date by any observer. If you have reception from this service, details please including your dish size, LNB and receiver model.

David Pemberton (NSW) reports VTV 1(-3) Vietnam TV P5 when testing on Thaicom 3 recently (3465/1585; Australian beam).

TVN Chile is latest California bouquet addition on PAS-2; programme channel 8



GWN Perth on PAS-2 Ku (12.263 Vt) is PowerVu CA although radio channels are FTA

TNT/Cartoon Network, which shut down actual programme feed October 1 on Palapa C2 (3760 Hz) turned off otherwise not in use uplink signal January 1; watch this transponder for signs of a replacement service.

AsiaSat 1G is official rename for Gorizont 30 now moved to 122E from 161E where it was briefly used by Filipinos. Test carriers reported 1475 LHC (old Raj-TV powerhouse

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for February 15th issue: February 3 by mail (use form appearing page 34), or 5PM NZST February 4th if by fax to 64-9-406-1083.

channel); bird is inclined, is at 122E to keep others away until AsiaSat 4 can launch.

Thaicom 1 at 120E is now officially 1A.

Intelsat 804, heading for 64E, has been successfully launched with test signals likely by end of January.

ChinaSat 8 is being targeted by Chinese sources to go to 115.5E; launch date and transponder line-up not verified. Intelsat 805 is presently scheduled (1998) to same location. TDRS (data relay) satellite launches announced: TDRS 8 to 147W in 2000; TDRS 9 to 172E in 2001. (Russian) Yamil 101 to 75E late in 1998.

Reports persist of occasional video feeds on JcSat 3 (128E), 4085/1065 Vt. Can anyone determine a "schedule" or pattern to this?

Also, reports that Chinasat 6 (125E) testing on 4140/1010 Hz have ceased but a possible digital signal is found at 3809/1341 Vt. Any verification?

Nobody is reporting any sign of S-band signals from Indostar/Cakrawarta 1 in vicinity of 107E. Have they begun testing yet?

Kababayan TV programming scheduled for December did not make it (As2, 3940 with Hallmark within Zak Net). No official word as to when the service will start. We reported their schedule available via fax at 63-47-252-6145; this is their fax number but polling is not available here.

WorldNet's long present I180E service (analogue PAL, FTA, 3975) has ceased; only WorldNet service in area is on As2 (3885 Hz). Southern Fried Rock (KLOS-FM, Los Angeles) has moved to 3720 RHC, audio subcarriers 5.4 and 5.6.

John Lynam (NZ) reports AFRTS Americas radio digital bouquet I180 on 4175/975 LHC (left - not right) with Msym 3.679 and FEC 2/3 (Be very careful browsing here with a D9223! [see p. 2]). Service does not appear to be PowerVu; programme line-up includes news, sports, AFN Pacific.

Luo Shi Gang (China) reports digital service from AsiaSat 2 Ku: 12.329 Hz, Msym 6.930 and FEC 1/2, plus, 12.295 Hz Msym 6.103 and FEC 2/3 (CTS Taiwan).

Notice PAS-2 Levels Dropping?

It may not be not your system. Especially affected have been C-band vertical signals with horizontals a close second. Basically, PAS-2 is full and there remain too many analogue (power hungry) signals on the satellite. PanAmSat is under great pressure to make additional PAS-2 spectrum space available and until PAS-8 is functional (last quarter this year) and some of the PAS-2 customers can be shifted to the new satellite, on ground levels can get no better than they are today; possibly they will go lower still.

In a nutshell, the available power is very close to maximum consumption most day parts (the loading does vary through the day) and as additional signals pass through the satellite, power is reduced on the pre-existing services. PanAmSat, of course, doesn't volunteer this information.

Where 2.5m dishes previously worked, now a 3m is marginal and a 3.7 is recommended. If you are experiencing drop outs on PAS-2 signals that were previously solid, first - go back and check all of your dish parameters (pointing accuracy, feed accuracy [in particular cross pole nulling]) and the stability of L-band connections. In commercial installations, consider upgrading by 3 dB in dish size. For home DTH installs, go up a minimum of one full size from the antennas you were installing 12-15 months ago. And pray for an early launch and activation of PAS-8!

AT Sign-off

"Friends of Austar"

The test signal on Optus B3 (12.689Hz) since mid November has been a form of corporate tease; or, blackmail. Austar is the non-metropolitan region MDS, cable and would-be satellite DTH provider for Australia. During most of the press coverage and turmoil surrounding Galaxy, Austar has been the forgotten player.

Austar depends upon Australis/Galaxy for their programming. They, like Foxtel, are downwind from the original Galaxy programming package and would be in a world of hurt if for some legal, financial or corporate reason the Galaxy feeds on Optus B3 simply stopped. In the chaos that presently is the Australian pay TV world, Austar has managed to stay out of the dirty in fighting. Until now.

Austar paid Australis a reported A$5 million early in December for a quantity (nearly 10,000) of Pace DGT400 IRDs. Australis described them as "outmoded" which may have been a surprise to Austar as well as Pace. That Australis had 10,000 spare IRDs, stuck in a warehouse *and paid for*, should have been a surprise to everyone.

Resolution (some still call it rationalisation) of the Australian pay TV world involves reducing the number of competitive players, centralising the programming, marketing and technical teams by dramatically reducing redundant staffs, and renegotiating the programming deals with offshore providers to get better per channel per-home pricing.

Galaxy is really in three separate businesses. They may seem complimentary, but they are not. *First*, they are a network creator. This involves securing programming rights contracts from a host of services and creating channels to sell. In the most simplistic case, they simply plug into a satellite feed (such as CMT) and shove it back out on Optus B3 as a Galaxy channel. In the more complex cases, such as TV1, they have to build a programme schedule half hour by half hour seven days each week. The *second* business is their distribution system; Optus B3 (two transponders), and MDS. Every single new customer is a technical challenge; decisions about which delivery method is best (terrestrial microwave or satellite), which equipment at each location (size of antenna, type and quality of outdoor electronics, how each customer will be wired up for service). The *third* business is the providing of programming to others; competitors (such as Foxtel) in some cases. *Each* of these businesses requires separate management decisions, plus someone conversant in all three areas at the top to make sure appropriate priorities and corporate support are assigned to each. This would be a world-class challenge if Galaxy had no competition. Unfortunately, they have had two serious competitors (Foxtel and Optus) who individually and in concert have ripped Galaxy to shreds.

For Galaxy to survive it must decide which of these three businesses is the "core" activity. The business area which has been most damaging to them has been the distribution end; *selling to consumers*. And it breaks down into two parts: MDS in metropolitan regions and satellite everywhere else. Remember that some bright person at Galaxy decided that to compete with cable TV, they had to offer MDS and satellite TV installs for A$19.95 at one point. They went several hundred million dollars further in debt because of this marketing "coup."

Austar, the not metropolitan pay TV company, on the other hand has largely stayed out of the TV network creation business and they to date have not offered their programming (which they don't create nor own anyhow) to third parties. Austar has simply been a distribution of service company. One focus, one area of expertise.

If Galaxy wanted to "sell" or somehow dispose of their money losing distribution business (Optus B3 DTH customers, and, MDS), it would make sense to sell the DTH portion to some firm that has strong abilities in the on ground hardware install business. That's where all of the big costs are located and if it is possible to trim overheads and subscriber operating costs, it will come from a firm that has that special expertise. The Galaxy MDS business, for example, might best be run by a terrestrial antenna firm; someone like - say - Hills Industries.

Another area of possible profit not yet tackled is in the IRD area. Nobody builds or assembles digital IRDs inside of Australia at the present time. If somebody began to assemble IRD kits from an Asian supplier - such as Sun Moon Star - then immediately the firm building the IRDs would gain a 22% pricing advantage over any foreign built IRDs. There are a number of Australian firms with the skills to build IRDs from "kits" prepared in Taiwan or Korea. And if changes in the ownership of the Galaxy DTH service resulted in a change in the present bias for Pace IRDs at Galaxy - well, between Austar and the existing Galaxy business plus the promise of Aurora and perhaps others, it might turn out that Australia would be better served by a "home grown IRD" product.

Out of the Galaxy business failure springs new business opportunities for second generation providers to profit from mistakes and move ahead with business plans that don't begin on the false premise that you have to give away a satellite DTH system that costs you $1,100 for $19.95. Galaxy was soft in the underbelly and mired in the awe of an exciting new technology. The next generation guys will be hard nosed and tough. But when they get done, there will be profit on the bottom line and a stable business. Like it should be.

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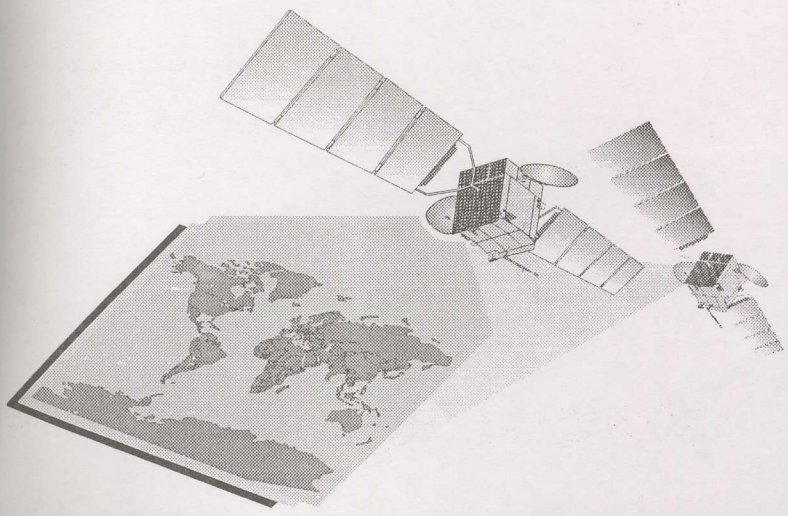

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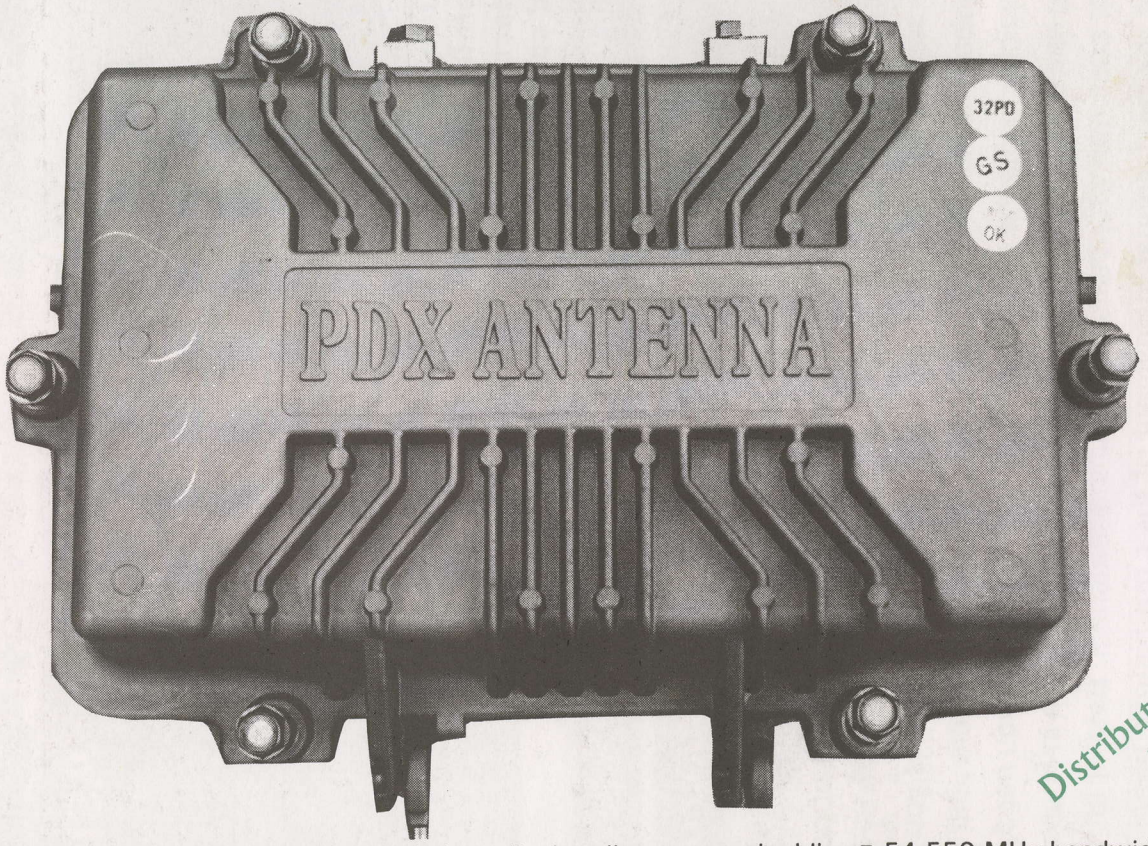

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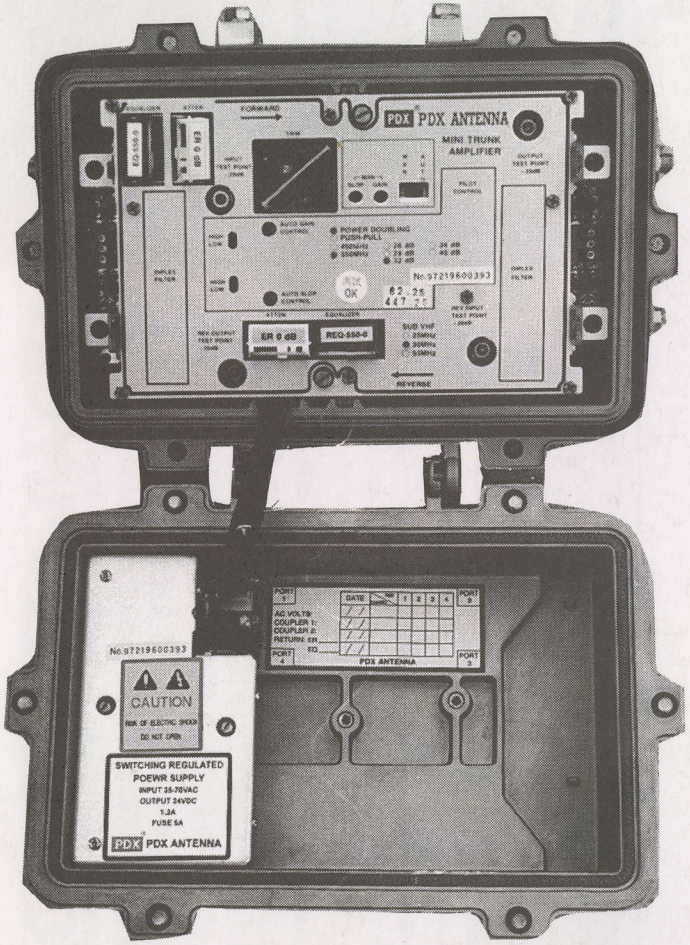

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