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Bob Cooper's

MARCH 15 1995

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific Ocean Region

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Systems for Filipino, Hindi, Mandarin, Tamil speaking homes

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How motels Can kick out Sky and get rich

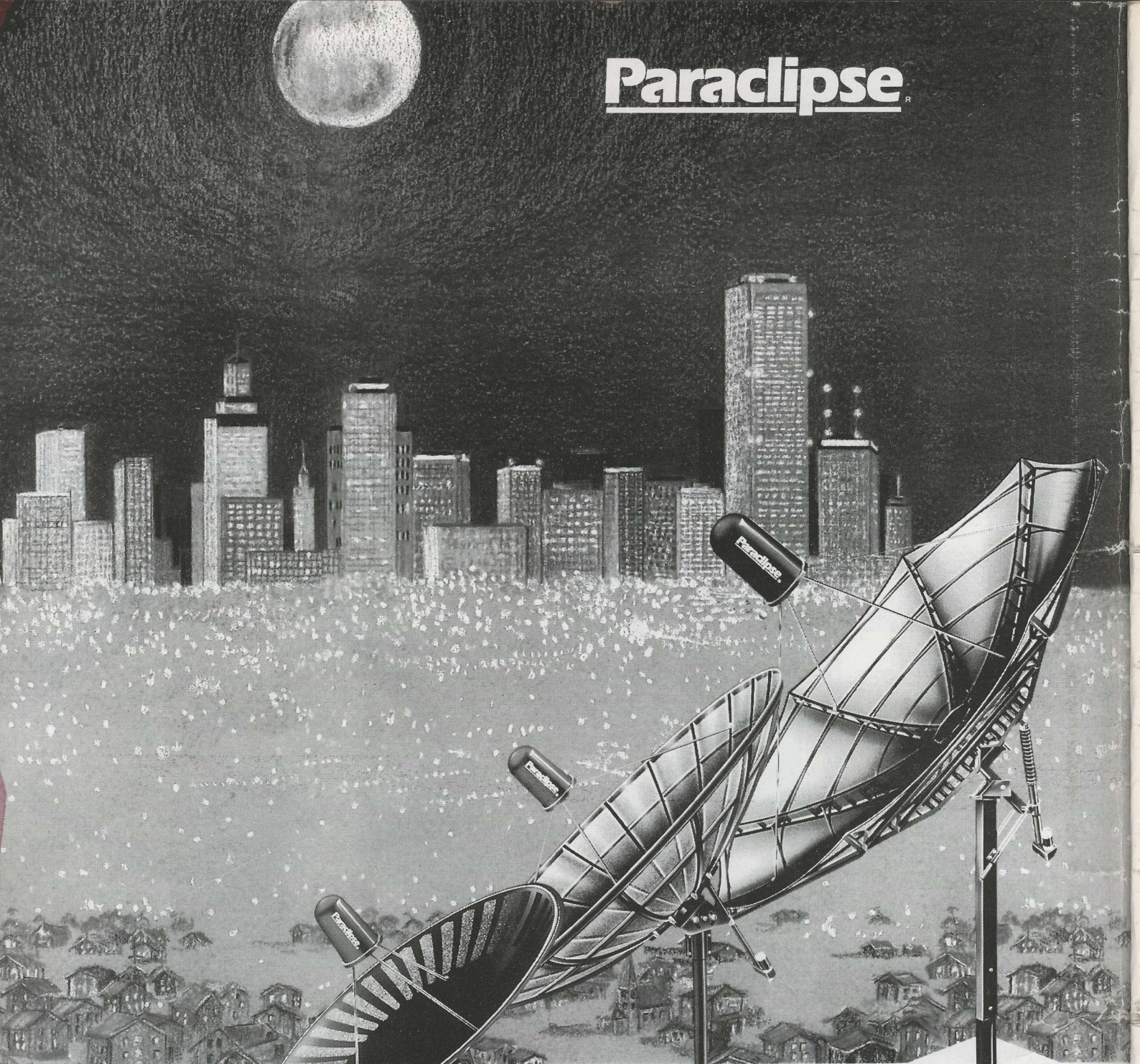
DIGITAL RECEIVER TEST:
The Filipino Channel in glorious, living digi-colour

- ✓ Latest programmer news
- ✓ Latest satellite operations
- ✓ Latest SPACE Pacific news
- ✓ and Coop's Comment

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Editor/Publisher:

Robert B. Cooper
(ZL4AAA)

Office Manager:

Gay V. Cooper
(ZL1GG)

Reaching SatFACTS

Tel: 64-9-406-0651

Fax: 64-9-406-1083

Mail: PO Box 330
Mangonui, Far North
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ERRATA

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COOP'S COMMENT

When ApStar 2 blew up shortly after launch from China's Xichang facility late in January, a crowd of VIPs from many of the American cable programming firms watched in horror as their dreams of reaching all of Asia from a single satellite disappeared in smoke and fire. They, like the 6 Chinese on the ground who died when debris rained down, were victims of China's latest space mishap.



MARCH 15, 1995

There are an estimated 15,000 cable television systems in India alone; hundreds more are coming on line weekly. Getting programming to these systems, as well as thousands more throughout Asia, has become a quest for the likes of ANBC / Super Channel. We reported in the February 23rd issue of our Coop's Technology Digest publication ANBC was talking with Indonesia concerning use of their (November 1995 scheduled operational) C1 satellite. Days after our report, ANBC announced they had signed a programme distribution deal with Murdoch's STARnet on AsiaSat 2 which has a hoped-for September 1995 start date. ANBC, split after June into ANBC Asia Financial News (one programme channel) and NBC Super Channel Asia (a second channel), in Philips digital format on PAS-2, will reach into India and beyond courtesy of STARnet using NTL 'DigiStar'. User pricing is still being worked out, for both outlets.

Meanwhile Asian home-grown product is mushrooming across the sky. Rimsat (G-1) at 130E is now full while Rimsat G-2 at 142.5E is down to one remaining, not leased transponder (and several programmers bidding for it at press time). RAJ-TV, Madras on transponder -1 (3675 MHz) G1, plans to expand to 18 hours daily in mid-April. Asia TV Network on -1 G2 is already 24 hours daily and has added Hindi movies, soaps and music to their original music videos. G1 and G2 are pointed north, away from the (south) Pacific and only their 'Global' transmission pattern comes into most of 'our' (SatFACTS) coverage region. We can but envy the 12 transponder service for Asia radiating from G1 + G2 and for now settle for the two Global pattern channels that also reach south of the equator.

Now that Rimsat has real customers paying real money for transponder space, the next generation Rimsats (called Express class) will correct the lack of 'southern coverage'. The future is bright indeed.

In Volume 1 ♦ Number 7

THE Direct To Home CONNECTION: Complete home dish system packages for Hindi, Tamil, Filipino and Mandarin speaking home viewers. (page 2)

THE CATV CONNECTION: How a 50 room motel can take in \$132,000 in cable service fees in two years by becoming a 'neighbourhood cable TV' system. (page 5)

DIGITAL RECEIVER TEST (part 2): Putting the General Instrument DSR 1500 to work on PAS-2 Filipino Channel Feed. (page 9)

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-ON THE COVER-

Bryon Evans (right), assistant Terry Wright of Pacific Antennas at Whangaparaoa 'factory'

DTH / Direct To Home ETHNIC PACKAGES

The influence of various ethnic groups in the Pacific is significant and the number of people of Chinese and Indian descent important to both the economy and cultures of the region. And while English is either the official language or the language of commerce, within the ethnic 'communities' Mandarin, Hindi and Tamil are often preferred.

Because of the wide area coverage of satellite television, all three languages (and others) are now available to residents of virtually every portion of the Pacific. For business people interested in creating niche marketing plans for the sale of home satellite dish systems, a full understanding of the non-English language services available and the equipment required to receive these services is essential.

SPACE Pacific has been working with both the ethnic programming services and with equipment suppliers in the Pacific to create a cost effective suggested approach to the packaging of equipment and programming which can be 'sold' to these ethnic groups. Every installing dealer who sells and services DTH systems will always be free to establish his or her own marketing plan and pricing schedule. Some will do this using techniques which will bring both satisfactory service to their clients and profits to their business; others will make mistakes and hopefully adjust their programmes to correct for their initial judgements.

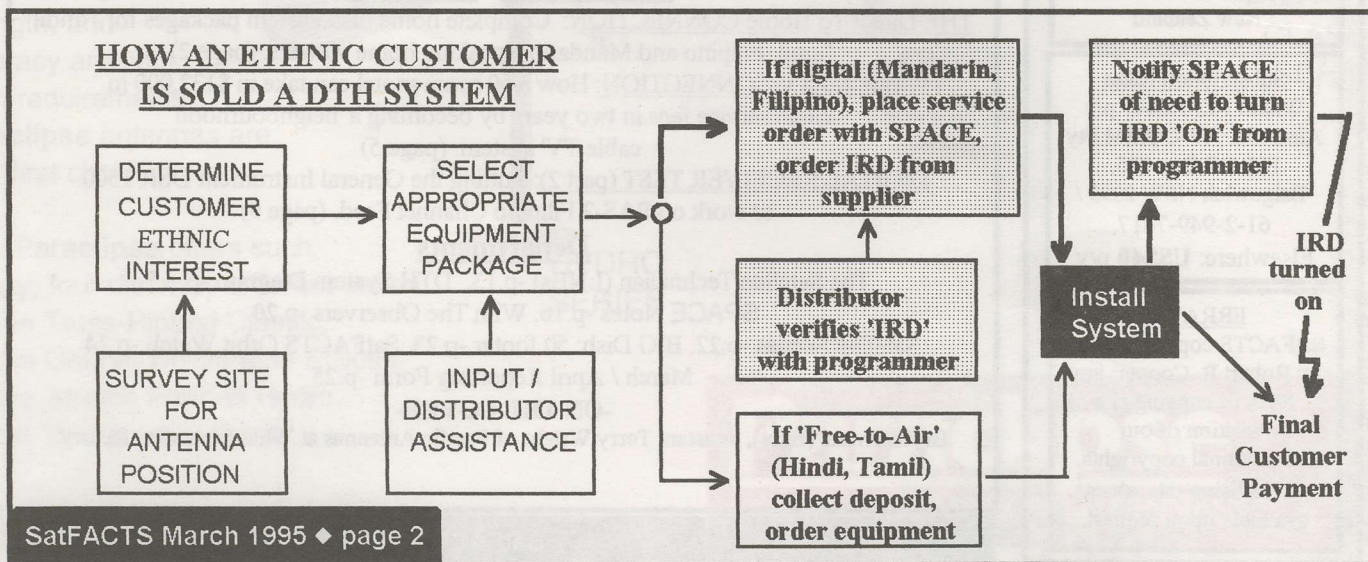
The information to follow here is by way of example. It shows which ethnic services are available to viewers throughout the Pacific, today, and it also suggests a standardised pricing system which will be a guide to

installing dealers who will be selling this equipment. The pricing is based upon the use of American built hardware (from antennas to receivers) and certainly those who prefer to purchase from Taiwan will find ways of cutting costs (if not also the quality of their installed product). The pricing also reflects the two-stepping of equipment from America through New Zealand based distributors to New Zealand based installing dealers. Australian pricing should not vary greatly other than for the adjustment between the relative values of Australian and New Zealand dollars. For installing dealers elsewhere in the Pacific, freight between your supplier in either Australia or New Zealand will be an additional cost factor.

The suggested retail pricing shown here is based upon:

- a) Original American manufacturer costs
- b) Plus (container) freight to New Zealand/Australia
- c) Plus a reasonable distributor mark-up
- d) Plus overland freight to the installing dealer
- e) Plus a reasonable dealer charge for the installation of the system (i.e., the dealer's labour content)
- f) Plus a typical dealer mark up.

Readers who qualify as installing dealers can obtain quotations for "Wholesale to Dealer" pricing by contacting either or both of the sources referenced here. Distributors who wish to be publicised in subsequent updates of this report should contact SatFACTS directly. The intent of this report is to provide a basis for dealer planning, not to publicise an individual distributor or distributors. SPACE will, however, be

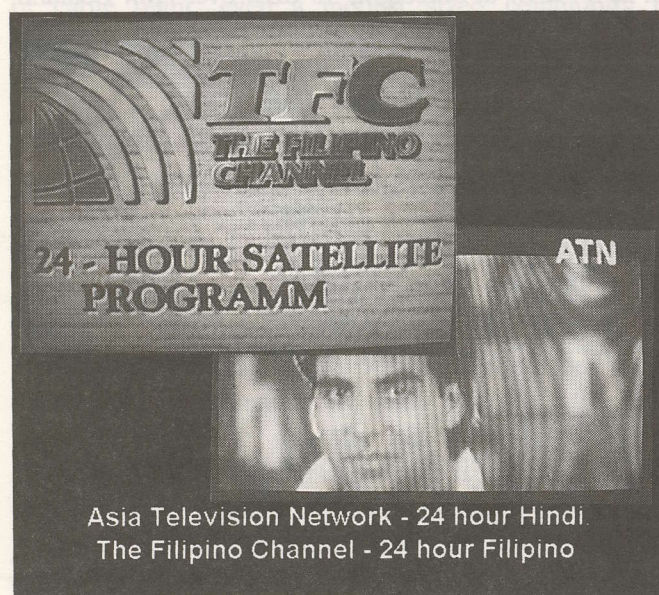


publishing the "suggested installed user price" shown here in a consumer guide to DTH booklet to be published early in May.

FILIPINO SERVICE

The ABS-CBN Network provides a 24 hour per day digital service on PAS-2, transponder 14H. The primary customer base for The Filipino Channel (TFC) is the 2.5 million Filipinos living in North America. There, cable TV systems receive the PAS-2 feed and offer TFC as an optional (viewer selected) service at a subscription rate of US\$8 to US\$10 per month. The customer cable service fee is split between the cable operator and ABS-CBN.

TFC is unique because on average 30% of its programming is in English. This includes sporting events (live basketball coverage, for example, of the Filipino professional basketball league games), newscasts, game shows, cooking shows and talk shows. Thus the service's appeal extends beyond those who



Asia Television Network - 24 hour Hindi
The Filipino Channel - 24 hour Filipino

SPACE SUGGESTED FILIPINO PACKAGE

3 metre dish on 3.5"/8.7cm OD steel pole with fixed azimuth and elevation adjustments (done by installer at time of installation), 25 degree or better LNB installed on (Chaparral) Super Feed or equivalent. 30 metres RG6/U coaxial cable, General Instrument DSR 1500 Digicipher receiver providing NTSC video and baseband audio output. Suggested installed price for consumer: **NZ\$8,638** (+ GST). For installations requiring PAL output video, add NZ\$500 for standards converter. System packages available at suitable installing dealer discounts from: Pacific Antennas, Ltd., PO Box 265, Whangaparaoa, NZ: (64-9-424-0841) and Telsat Communications Ltd., PO Box 1537, Palmerston North, NZ (Tel. 64-6-356-2749; Fax 64-6-355-2141).

speak the national language and is of some interest even to those who only speak English.

TFC is transmitted using General Instrument Digicipher 1 and this, at this point in time, requires the GI 1500 receiver (see page 9, here). The receiver is available in the Pacific from Maser Technology Group and has a price of US\$2,520 to the dealer.

Tests conducted by SatFACTS and SPACE Pacific assure us that within the PAS-2 New Zealand footprint a 2.4 metre dish provides flawless reception. In Australia, with a 36 (37 in Sydney) dBw footprint, dishes down to 1.4m should work (no Australian TFC tests have yet been reported). A 3 metre dish should be adequate in Vanuatu, New Caledonia and Fiji.

HINDI SERVICE

Asia Television Network (ATN) operates 24 hours per day on Gorizont at 142.5E. The service has headquarters in Bombay and has entered into an aggressive self promotion programme throughout Asia in recent weeks.

The original programme content was music videos; 24 hours per day, in Hindi. There was admittedly limited interest in this content. Now, however, the service has added a minimum of three Hindi language movies per night starting at around 8PM New Zealand time and claims a library of more than 2,000 films. This is being augmented with Cricket and other sporting events. Already in the Auckland area the handful of private dishes owned by Indians reports considerable interest in additional dishes from within the Indian community.

The present Gorizont satellite at 142.5E has a slight inclined orbit path and a system package must include an elevation actuator. The (SPACE) suggested package here includes a receiver that both senses changes in signal level and repositions the elevation actuator to keep the satellite peaked "on dish boresight" at all

SPACE SUGGESTED HINDI PACKAGE

3 metre dish on 3.5"/8.7cm OD steel pole with fixed azimuth but equipped with 24" motor driven actuator arm for elevation to allow tracking of slightly inclined orbit satellite. 25 degree or better LNB installed on (Chaparral) Super Feed (or equivalent) equipped with (right hand circular) polarisation slab. 30 metres RG6/U coaxial cable, 30m actuator direct burial powering cable and Chaparral MC-115 receiver with automatic signal sensing / actuator drive circuits or equivalent. Dish will automatically track satellite motion and require no user interfacing; system will provide PAL output video / audio. Suggested installed price for consumer: **NZ\$5,191** (+GST). Optional Palapa, Intelsat, PAS-2 capabilities + Ku. See Pacific, Telsat under Filipino.



CHINESE TELEVISION NETWORK Zhong Tian

times. Eliminating the automatic tracking and allowing the viewer to manually track will reduce the net to dealer (and ultimate consumer); a decision each dealer will have to work out individually.

The 142.5E footprint is very uniform throughout the Pacific and even at the extremes a dish of 3.7m would be at or above threshold.

ATN is in PAL, free to air analogue, and will not encrypt. Additional programme channels are being considered. Note that this particular package with a relatively minor number of optional extras becomes a full dish tracking (analogue) system for the region from 118E to 183E which would include the (late 1995) Palapa C1, Rimsat at 130E, PAS-2 at 169E, Intelsats (174, 177, 180, and 183E), as well as Ku band.

(Chinese) MANDARIN SERVICE

The Chinese Television Network Zhong Tian ("timely information") 24 hour service is transmitted on PAS-2 transponder 2H in Scientific Atlanta MPEG 2. The service is distributed throughout Asia and North America. The cost to New Zealand DTH viewers, through SPACE, is in the range of US\$20 per month. A

SPACE SUGGESTED MANDARIN PACKAGE

3 metre dish on 3.5"/8.7cm OD steel pole with fixed azimuth and elevation adjustments (done by installer at time of installation), 25 degree or better LNB installed on (Chaparral) Super Feed or equivalent with right hand circular polarisation slab. Thirty (30) metres RG/6U coaxial cable, Scientific Atlanta D9222 IRD receiver providing NTSC video and baseband audio output. Suggested installed price for consumer: **NZ\$6,727** (+GST). For installations requiring PAL output video, add NZ\$500 for standards converter. See Pacific Antennas, Telsat under Filipino.

second 24 hour programme service, Dadi ("fashion and entertainment") is scheduled to be available 1 January 1996. Central China Television (CCTV) is also carried on PAS-2, 2H, using the same Scientific Atlanta MPEG 2 format. Space has not completed negotiations for use of CCTV but it looks promising by June. A second D9222 will be required for CCTV (see SPACE Notes).

The S/A D9222 receiver is a commercial CATV version, expensive, and slow on delivery. It could also be used for Country Music Television (PAS-2, transponder 1V) and others to be announced, but each S/A service requires a separate receiver.

Like The Filipino Channel, within New Zealand a 2.4 metre dish is suitable, down to 1.4 metres in Australia, 3 metres elsewhere.

TAMIL SERVICE

RAJ-TV's signal on Rimsat 130E is quite awesome. The super power (3675 MHz) transponder is as powerful as 44 dBw at boresight, 33 dBw over New Zealand, slightly higher for most of Australia and available through the full Pacific. RAJ-TV operates from a recently completed Madras (India) studio, produces soaps, uses (Tamil) movies and variety programming which it sends on tape to a Manila uplink. RAJ has announced a new 18 hour per day schedule (0000 -1800 UTC) effective 14 April. The service is free to air and is advertising supported.

The system is the least expensive of all because no tracking is required, and the satellite has a strong signal.

AS A DEALER -

The first step is to contact one of the package distributors listed. Wholesale (i.e., net to dealer) pricing is available only to recognised dealers.

The next step is to calculate your own variations, if any, to the packages and then go and see some sales prospects! SPACE Pacific dealer members (see pages 16 and 26 this issue) can obtain Tamil, Hindi, Chinese and Filipino sample programming tapes to use as a sales aid.

SPACE SUGGESTED TAMIL PACKAGE

3 metre dish on 3.5"/8.7cm OD steel pole with fixed azimuth and elevation (done by installer at time of installation), 25 degree or better LNB installed on (Chaparral) Super Feed (or equivalent) equipped with (right hand circular) polarisation slab. 30 metres RG6/U cable, BEC 8902 receiver (or equivalent) with user remote control. System will provide PAL output baseband video plus audio. Suggested installed price for consumer: **NZ\$2,914** (+GST). See Pacific Antennas, Telsat under Filipino.

THE NEIGHBOURHOOD CABLE TV SYSTEM

A new revenue stream for motels, hotels

CABLE: It's A Business

In its most simplistic form, a cable television system is a revenue producing device that allows multiple families to 'share' in the programming received from multiple programming sources not normally available to the individual homes. The programming may be restricted, by contract, to cable-only distribution, or, the cost of accessing the programming on a single home basis may exceed the value of the programming.

Traditional cable TV systems are designed to serve entire communities; all of Gisborne, for example. At an installed cost of upwards from US\$6,000 per kilometre of cable plant, even a modest sized community of 20,000 people can involve US\$1 million and more. It is not a business activity that usually attracts small entrepreneurs.

There are early 1,500 motels or camping grounds operating in New Zealand. Many are considering or will consider adding satellite programme channels. Like the addition of Sky pay TV programming, there are capital costs associated with adding satellite services. Unlike Sky, it is possible with careful planning to avoid the significant (typically NZ\$6 per motel room per week) charges for programming by using satellite rather than Sky. One example of a totally cost-free (i.e., no charges for programming) 13 channel service is shown here.

A motel that installs Sky programming is restricted in a number of ways; a motel may not, for example, run lines out of the motel and into neighbouring homes to 'share' the motel service with homes at the motel rates (which average 40% lower than home rates).

A motel adding satellite delivered programmes has two options in distributing the new programmes within the motel facility:

1) 'Squeeze' the new satellite channels into the existing (master antenna) distribution system already in place at the motel, or,

2) Rebuild the motel system to allow it to handle additional channels (by replacing amplifiers and other equipment with higher channel capacity equipment).

For a motel to make maximum use of the programming coming on line, it should plan for not only 1995 but beyond.

Most Sky engineered motel systems use equipment (modulators and signal processing equipment) which was never designed to allow true cable TV standard "adjacent channel operation." This failure on the part of

Sky Engineering to adequately plan for their own expansion from 3 channels to five (and one day to more than 5) will be an albatross that will hinder expansion of Sky's growing channel package in the future.

HERE IS THE PROBLEM

A true "cable television" system carries different programme services on all of the available VHF (very high frequency range) channels. In New Zealand, there are 11 VHF channels; in Australia 13 (including 0 and 5A). There is no valid technical reason why, with proper cable system 'headend' engineering, all 11 (13) of these channels cannot be used simultaneously.

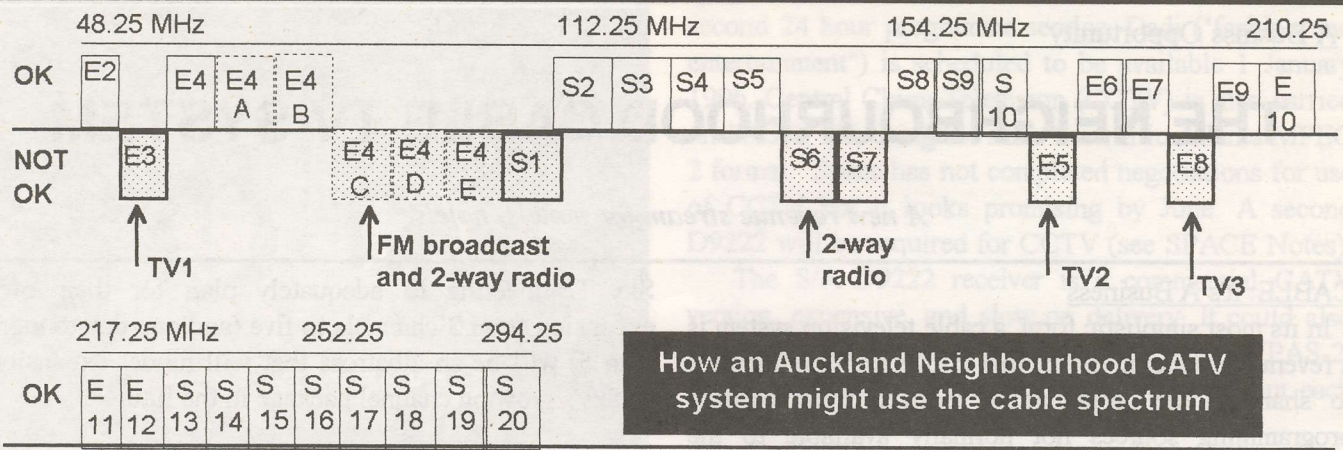
However, when Sky and other (non-broadcast) channels are introduced into a cable (MATV) system using low-cost (i.e., Hills Industries et al) modulators, the poorly designed modulators will actually occupy two channels; one for the real programme being cable transmitted, a second channel by the 'garbage' generated by the low-cost modulator. Virtually all modulators used by Sky (and others installing videotape fed and even earth satellite programming) start off with these low-cost, low-grade modulators. The rationale for this level of decision is basic: do the job as cheaply as possible. However, in the process, the MATV system

MOTEL-VISION CHANNEL LINE UP

TV Channel	Service	Frequency
E2	TV1 (Aust.ABC)	48.25 MHz
E4	TV2(Aust. '7)	62.25 MHz
S4	TV3(Aust. '9)	126.25 MHz
S5	HP (Aust. '10')	133.25 MHz
S8	MAX (Aust.SBS)	154.25 MHz
S9	BBC World (*)	161.25 MHz
S10	Prime Sports (*)	168.25 MHz
E6	Star Plus (*)	182.25 MHz
E7	Channel V (*)	189.25 MHz
E9	Asian TV Net	203.25 MHz
E10	Chinese Chan.(*)	210.25 MHz
E11	Zee Indian TV(*)	217.25 MHz
E12	Raj-TV	224.25 MHz

* / AsiaSat II

SatFACTS March 1995 ♦ page 5



How an Auckland Neighbourhood CATV system might use the cable spectrum

By utilising CATV grade modulators, 17 VHF TV channels will fit into the example system (above; for Auckland, New Zealand) between 48.25 MHz and 230 MHz (channels E2 through E12, above). Channels below the line (shaded; E3, E4C etc.) are avoided in this system because of possible 'direct pickup' interference from local transmitters. Each system will have its own "OK to Use" and "Not OK to Use" channels. TV sets or set-top converters (right) will tune these channels in motel rooms, homes.



JERROLD (GI) cable viewer set-top converter/remote

will often lose two channels for each new programme source added. And now that satellite is offering a dozen or more new programming choices, those lost channels suddenly have become very important.

NOT MATV - CATV!

When motels, hotels and other public hospitality businesses decide to add a satellite dish and place satellite programming into their rooms, they are making a capital investment. Like the swimming pool, spa tub room and trampoline, they hope the satellite TV reception will increase occupancy and thereby increase revenues. From this viewpoint, the satellite service is simply an attraction and it has no direct 'earning power.' But suppose the satellite system could earn money, on its own?

There is another approach, one now finding many supporters in New Zealand where it is perhaps being pioneered. Here is how it works.

- 1) Rather than buying a cheap, low-grade satellite system and adding a few free to air channels to the motel sets using low quality modulators, the motel owners are installing CATV grade satellite antennas and receivers and selecting CATV grade modulators.
- 2) Each motel system is being treated as a money earning investment in its own right because now the motel system will serve not only the rooms of the facility, but it will also branch out into the neighbourhood where cable lines will pass hundreds of homes (and even competitive motels) all of whom will be offered access to the 'Motel-Vision' service for a fee.

REASONS TO NOT USE CERTAIN VHF CHANNELS

While many (most) modern TV receivers are capable of being programmed to receive (tune) virtually any PAL-B TV channel between 45 and 300 MHz, and in a motel use environment can be so programmed for the Motel-Vision cable TV channels in use, cable system operators will usually prefer to provide or offer a set-top converter to the in-home subscriber. The converters are cable system programmed to receive any group of channels the cable operator elects, allowing him to 'tier srvcies' by not providing access to certain channels which are offered as 'optional' services available for an extra fee. Cable systems will routinely avoid placing programme services on TV channels which might have outside interference from nearby transmitters in the region. In Auckland (NZ) for example, illustrated above, channels E3, E5 and E8 are left unused by this cable system because local TV transmitters broadcast there. Similarly, channels E4C, E4D and E4E are avoided because of possible interference to cable reception from FM broadcast stations, and, S1, S6 and S7 are avoided because of possible 2-way radio interference.

In this way the motel's satellite TV service accomplishes two business goals:

1) The motel is no longer forced to deal exclusively with the Sky Network (3,4 or 5 channel) service at the typical motel rate of \$6 per room per week (\$25.80 per month per room). A motel with 50 rooms instantly saves itself \$1,290 per month (if it selects satellite services for which there is no use fee).

2) Simultaneously, the 'Motel-Vision' system is producing revenue from homes and other motels in the area. If, for example, a 'Motel-Vision' system had 50 homes subscribing at the Sky established home rate of NZ\$11.50 per week (5 channels) or \$49.45 per month, the Motel-Vision system has a revenue of \$2,472.50 per month.

Thus by saving itself \$1,290 per month plus by earning \$2,472.50 per month from just fifty subscriber homes, the Motel-Vision system has \$3,762.50 with which to pay off its capital costs for the CATV-grade satellite system it has installed.

Our motel system has gone from a low-grade Sky quality delivery of a maximum of 5 'premium' channels to a CATV grade quality delivery of 8 (see page 5 here, listing in lower right corner) to as many as 20 premium channels all delivered to the motel as well as the neighbouring homes.

FROM BUSINESS EXPENSE TO MONEY EARNER

The MATV system at the motel just became a CATV system. A capital investment that might increase motel occupancy, like the trampoline investment, turns into a revenue producer. Try doing that with a trampoline.

In a traditional, community-wide cable TV system, there is the expectation the system will serve all of the town or suburb within a reasonably short period of time. This expectation puts pressure on the system entrepreneur and builder to get a sizeable area "cabled" in a relatively short period of time.

In a 'Motel-Vision' system, the motel owner goes into the project fully aware that he is going to make this system earn him money before he commits to extending the cable lines further out into the community. In a very small town, the system might initially serve everyone in town at the outset.

The Motel-Vision operator begins by eliminating monthly payments to Sky Network for his existing 3,4 or 5 channel service. And he replaces the Sky service with perhaps 12 satellite delivered services. Now, Sky's reps won't be pleased with the service cancellation, and they will do their best to convince the motel operator that he will lose customers to those motels down the street which have a 'Sky TV Here' sign hanging out in front. Sky will also do its best to convince the motel operator that their 3 (4 or 5) channels of programming are superior to the motel's selection of say 12 satellite channels. The motel operator has several aces in his hip pocket.

1) In our example system shown on page 5 here, none (not one) of the services has a monthly fee. They are all free to air.

2) However, the motel operator can select (at his option) additional channels above and beyond those shown here for the payment of a fee such as US\$1 per month (per home) for the ANBC Financial channel and the NBC Super Channel. Or Country Music Television

A MODEST MOTEL-VISION SYSTEM - THE COSTS FOR A 15 CHANNEL SYSTEM

Section of System	Item(s)	Cost to cable system (NZ\$)
Headend	TV1,2,3 CATV grade signal processors	\$3,119.
Headend	TV1,2,3 professional off-air antennas	\$1,172.
Headend	2 - 4m satellite dishes, 1 - 3m	\$8,100
Headend	12 CATV grade satellite receivers	\$21,600
Headend	12 CATV grade modulators	\$14,016.
Headend	3 dish feeds	\$750.
Headend	5 LNBs	\$1500.

Headend	2 equipment racks	\$700.
Headend	2 channel combiners	\$825.
Headend	cabling	\$400.
Headend	Output amplifier	\$700
System	Field strength meter	\$1,500
Cable Plant	2 kilometres of initial CATV 'plant'	\$15,000

**Total cost of system as described:
NZ\$69,381
(See text for description of return)**

MOTEL-VISION EXAMPLE SYSTEM REVENUE AND RETURN ON INVESTMENT

Number Subscriber Cable Homes	Gross revenue at NZ\$40 per month	added to	Money motel saves by not paying Sky monthly	Gross-Net revenue per month	Less operating expenses for cable system	Actual net revenues	Number of months to pay the system off
38	\$1520	plus	\$1290	= \$2810	(-) \$152	\$2,658	26.1 months
50	\$2000	plus	\$1290	= \$3290	(-) \$200	\$3,090	22.5 months
70	\$2800	plus	\$1290	= \$4090	(-) \$280	\$3,810	18.2 months
90	\$3600	plus	\$1290	= \$4890	(-) \$360	\$4,530	15.3 months
110	\$4400	plus	\$1290	= \$5690	(-) \$440	\$5,250	13.2 months
130	\$5200	plus	\$1290	= \$6490	(-) \$520	\$5,970	11.6 months
150	\$6000	plus	\$1290	= \$7290	(-) \$600	\$6,690	10.4 months

for as little as US\$0.30 per month per home. In other words, in addition to the 12 satellite delivered free-to-air service channels listed here, there are (or will be by the end of this year) an additional 40-plus available-for-a-fee channels of programming from which the Motel-Vision can select to 'fatten' his channel line up. Sky may have a difficult time competing with this package of programming.

3) Unlike his present Sky motel contract, our Motel-Vision operator is free to resell his programming

reception to his neighbours (homes and commercial establishments alike) by simply running an appropriate CATV grade cable into their home or place of business. The Sky service is like a trampoline which you never actually complete paying for. It costs money to buy it, and it costs money to keep in the motel. The satellite programming, contrary, earns money from day-one for the Motel-Vision operator.

In our example system (typical costing shown at bottom of page 7) we have invested NZ\$47,301 in the 'headend' (equipment at the motel office which receives and processes the 15 channels [including TV1, 2 and 3]). And, by stringing out 2 kilometres of cable which in our example 'passes' 180 homes (passes: goes by, and to which the homes could connect) we have our potential customer base ready to subscribe to the service. The total cost including the 2 kilometres of cable 'plant' comes to NZ\$62,301.

RETURN ON THE INVESTMENT

Although Sky is presently charging NZ\$11.50 per week (\$49.45 monthly) for its full five channel service, there is an extra 'marketing advantage' to coming into the community with your 15 channels of Motel-Vision at a flat \$40 per month. It helps make Sky look worse to the home subscribers when you can offer them 15 channels versus 5 for \$9.45 less per month.

Note in the table here that our Motel-Vision system could (with the combination of moneys saved by not paying Sky [50 rooms at \$25.80 per room per month] and revenue from 110 homes) pay off the full system in just 13.2 months. In months 13 - 25 the Motel-Vision operator would net after operating expenses NZ\$47,520 in actual receipts from his cable customers plus save his own motel \$15,480; a total 'net' of \$63,000.

As the system begins to bank that much money, the Motel-Vision operator should instantly begin expansion of his system; a point at which we will begin our part two of this series in the April SatFACTS.

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GI's DIGICIPHER DSR 1500 RECEIVER

Part Two of Two, by Coop

A Brief Review

Compressed digital video (CDV) is upon us. Its most ardent fans predict all television will be transmitted in CDV format within ten years. All television, including all terrestrial TV, all VCR and camcorder formats; everything.

CDV has come to the Pacific via satellite. On Intelsat we have France's Canal Plus, the BBC (1 and 2) to TVNZ and Australia using it daily. On Rimsat 142.5 we have the promise of MCPC by June. On PAS-2 we have Country Music Television, Chinese Television Network (two programme channels), and ABS-CBN from the Philippines as well as limited access Central China Television, Prime Sports and Encore. On Optus B1, we have a pair of transponders dedicated to pay TV distribution using CDV.

CDV is better for a host of reasons, not the least being that typically six to ten separate programme channels can fit into a transponder that formerly held but a single analogue programme channel. With CDV, the capacity of the satellites increases up to ten fold.

CDV receivers are totally unlike our existing analogue receivers. At the present time you cannot purchase a CDV "adapter" to convert your analogue receiver to CDV reception. If you wish CDV, you must purchase a CDV compatible receiver.

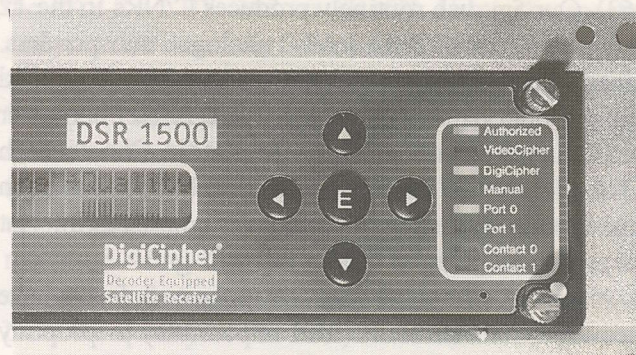
CDV is a new technology and several different "formats" have evolved. Unfortunately for the user, at this time if you purchase a CDV receiver it will be "format sensitive"; that means a GI DigiCipher can only be used (in CDV format) with a transmission that is also DigiCipher. Or a Scientific Atlanta (D9222) receiver can only be used with the S/A format. By sometime in 1996, some receivers will be format transparent; but not today. Can today's receivers be modified or upgraded for the "universal" CDV format later on? Most suppliers say "yes" but decline to say how expensive that might be. Or how long you might have to wait to have it done. General Instrument says it can be done in the field; S/A says the receivers will be returned to Canada for conversion.

SatFACTS arranged through General Instrument New Zealand supplier Maser Technology to test and evaluate a DSR 1500 receiver. The receiver was ours for one month. The only December-January available DigiCipher service to us was on PAS-2; the ABS-CBN network from Manila (Philippines).

CDV allows programmers the ultimate in control. They call it "conditional access" and it means each receiver has a unique electronic address. Owning a CDV receiver will produce no programming in your home, motel or cable system unless you have made commercial arrangements with the programmer. This means you will turn in your receiver's electronic address to the programmer, having agreed to the fees involved, and they in turn will send a "message" through the satellite that allows your receiver to process the programming. Lacking this approved "conditional access" your screen will stay blank.

The ABS-CBN Test

In SatFACTS for February (No. 6) we described the procedures leading up to programme acquisition. The receiver has a combination of factory and user defined "software" which allows you to enter through a front panel keyboard appropriate receiver parameters. First you must define the "band plan" or transponder frequencies for the satellite of interest. The receiver memory allows you to define 15 separate "plans" and in the memory are so-called "standard plans" (such as they use in North America with their Domsats). Unfortunately for POR users, neither Optus nor Intelsat nor PAS-2 are "standard" so you begin by redefining the transponders. Each transponder has a centre frequency number and using the keyboard you enter the appropriate numbers for each satellite. The 1500 has a pair of input ports for the LNB provided IF signals and you also define which port (connector) is in use. If the signals are analogue (the 1500 has a first-rate analogue processing system), you select and the receiver memorises the audio subcarrier frequencies.



GI DSR 1500 DigiCipher (3rd down) authorised (top; LEDs).

EDIT_XPNDR	Xpndr	H/V	Frequency	Display
◀▶	1	H	990.00 MHz	L Freq

DEMOD	→Finetune	→Filter
◀▶	0.00MHz (manual)	27MHz

ALARM	Sat	→Xpndr	→Chnl	→Retune	→Level
◀▶	---	2	(3)	dsbl	└-----

All entries from keyboard; in LCD display examples: Edit mode, transponder fine tune, and fault (alarm)

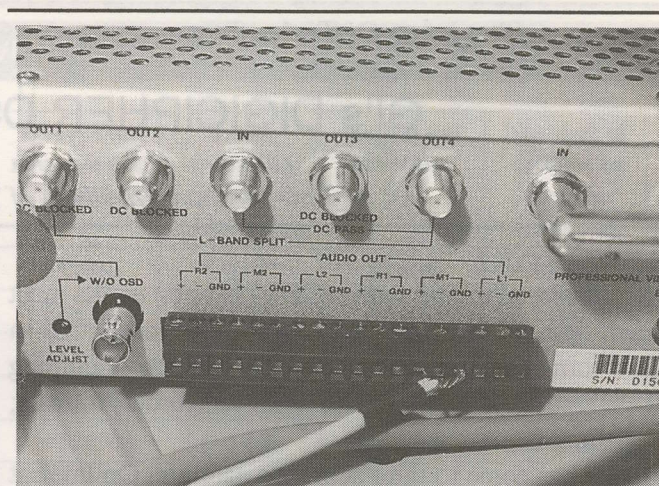
Within a normal satellite transponder (between 20 and 36 MHz on Intelsat; 27 and 54 MHz on Optus B1; 27 and 64 MHz on PAS-2) in the CDV format there is room for more than a single "programming channel." The 1500 has up to 15 separate DigiCipher defined programming channels available within each transponder; you keyboard enter the correct "Channel" to match the assignment of your programming source. ABS-CBN uses "channel 5" within transponder 14 on PAS-2. There is no audio subcarrier in CDV; the audio is contained within the digital video data stream and when you have the receiver functioning on video there is automatically audio on the receiver's rear panel connector strip. If the programming is transmitting in stereo, quad, or providing separate language channels you will find all of the relevant audio signals available on the rear deck.

ABS-CBN Co-operation

Patricia Daza at ABS-CBN (Tel 63-2-921-3759; Fax 63-2-924-2732) was our contact. They agreed to include the electronic address of our DigiCipher receiver within their transmissions from late in December onward for the test period. At GI Ron Kurth arranged the loaner receiver via their San Diego facility. GI has a new Sydney office and North Carolina based Jeff Pierce is now in charge (61-2-449-9129).

ABS-CBN's horizontally polarised MCPC signal is located on a downlink frequency of 4,087 MHz (IF of 1063). Our 5m dish routinely produces C/NRs in the 12 dB region for most of the PAS-2 analogue transponders. Using a Promax AE-566 Spectrum Analyser equipped with the optional CV-355 (950-1,750 MHz) converter from Gough Technology (Ross McKay in Christchurch at Tel 64-3-379-8740, Fax 64-3-379-6776), it was soon apparent our 5m dish with its circular polarised (Intelsat type) feed was going to be a problem.

As those who have circular polarised feeds have discovered, it is difficult (read impossible) to properly separate the linear vertical from the linear horizontal signals on PAS-2 using a circular feed (see SatFACTS



DSR 1500 rear deck output connection options

February 1995; p.13). ABS-CBN with its centre frequency of 4,087 MHz is unfortunately close to the ANBC downlink signal centred near 4,107 MHz; close enough that with a circular feed the analogue products make life unpleasant for the CDV signal.

Now, in actual fact, the CDV signals are able to slice through most analogue interference and even share the same transponder without ill effects. But to make our own tests more appropriate, we first made measurements using the circular polarised feed and then changed the feed out for a new ADL RP1-CKu feed. This feed gives you proper linear vertical and linear horizontal polarisation selection (on C and Ku) using the polarisation "skew" control on a standard receiver (note that the DSR 1500 has no control voltages for the control of a rotating feed probe; you must provide this through an alternate receiver). And, while we anticipated some reduction in Intelsat circular polarised signals with the RP1-CKu, our ultimate loss when compared to the ADL fully circular feed turned out to be less than 2 dB. We detail this because everyone who updates their existing systems (or technology) will face the same problems.

With the RP1-CKu in place, peaked for horizontal polarisation and pointing at PAS-2, you simply dial up the appropriate transponder, then dial up the appropriate (video) "programme channel" and in our case within two seconds two front panel lights came on: First, the DigiCipher light which indicated we were tuned to a DigiCipher signal, then the "Authorised" light (photo, p.9). There it was, from a totally blank screen to a very high class digital video picture in the blink of an eye.

I am really going to miss analogue. No sparklies, no noise, no bleeding colours, no buzzing audio on saturated colours. Just perfect, rock steady pictures. Utterly boring. But more importantly, totally perfect for consumers.

Does that mean the pictures are "studio perfect" at all times? Almost. There are some occasional artefacts

which will undoubtedly be sorted as the technology matures. In 30 minutes of intense watching you will probably see a couple of mysterious "reddish-orange flashes" that dart across the screen very rapidly (this effect, GI's Kurth advises, is most probably caused at the ABS-CBN studio and he denies it is an artefact of DigiCipher). In several hours of watching you may also see a brief video mosaic where a segment of the image turns into a fleeting chequer-board pattern. Blink at the right time and you'd miss both of these artefacts.

On the audio side, something seems "wrong" at first. Unless you are a CD music buff. There is no background hiss; when the programme audio is quiet, the speaker has no noise; none. A quiet scene is eerie and you may reach for the remote control to see if mysteriously the mute button was pushed. Analogue audio may never "sound" right again.

How Much Signal Required?

The CDV activists insist that CDV is "more robust" than analogue. They claim that CDV will produce "perfect pictures" at low C/NRs and in the presence of significant interference (including analogue services within the receiver passband). Remember, there is no such thing as

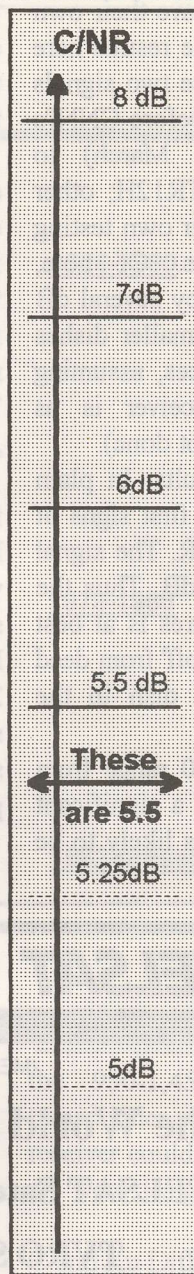
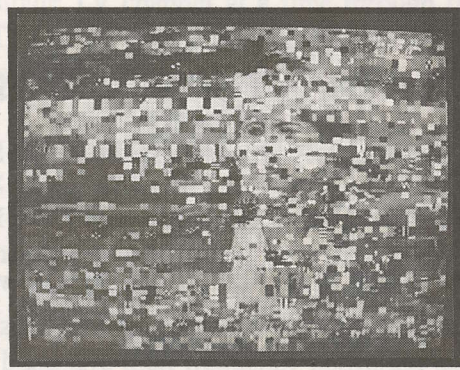
'TFC' below at 5.5 dB C/NR; no picture digits lost.



'TFC' at 5.25 dB C/NR has chequers



At 5.0 dB C/NR, close to gone.

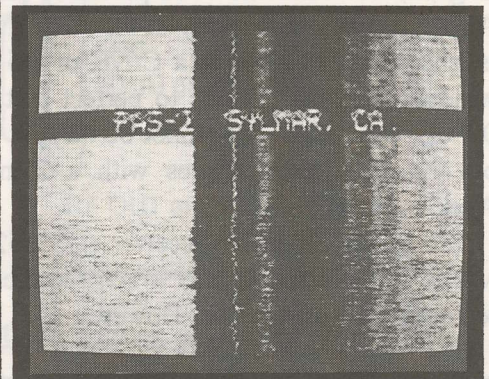


ANALOGUE vs. DIGITAL

Analogue CNN at 8 dB C/NR represents



threshold. Below, PAS-2 test card on TR16H at 5.5 dB C/NR; obviously



degraded. Left, 'TFC' at 5.5 dB C/NR is still digi-locked; a decided improvement over analogue at this C/NR.

However, at C/NR just 0.25 dB lower (left) first "chequers" appear in video indicating loss of digital data in receiver noise.

At 5.0 dB C/NR (bottom, left), the TFC signal is virtually obliterated by chequers and in the next step only 'analogue noise' is present.

an "imperfect digital picture" since it is "perfect" or nothing at all.

Which brings us to an interesting set of test results. On PAS-2 at the time of our tests the only reliable horizontal polarisation analogue signals were CNNI and the PAS-2 / CBS feed on TR16H. Using the spectrum analyser we carefully determined the C/NR of the CNNI, PAS-2 and ABS-CBN CDV signals. Then we "bumped" the dish a notch at a time to take it off the satellite in 0.5 dB steps. With each "bump" (measurement point) we re-verified the C/NR for all three signals. As we went along we took photos of the reception using the same DSR 1500 receiver for both channels and we share the interesting bits here with you. Note the quality of the PAS-2 test card analogue video at 5.5 dB C/NR where the ABS-CBN signal still had "lock." (i.e., still producing blemish-free reception).

This notation: CNNI and ABS-CBN have their own initial power levels through PAS-2 and the results here are valid for the comparison between these two signals only and only in mid-January which was before CNNI's main feed was reduced in level (1 March) to accommodate the second CNN feed on TR12H; other CDV signals on PAS-2 would require their own testing to develop a similar set of numbers. Of note, ABS-CBN's MCPC signal level is lower by several dB than CTN/CCTV and CMT. Thus even smaller dishes should work for these other digital services, assuming only the Scientific Atlanta D9222 receiver is as 'sensitive' as the GI 1500 (a test we have not done).

Some may disagree with our test results: In plain English, we found the 1500 produces the first signs of ABS-CBN signal recovery at a 5 dB C/NR. The signal is 'chequer-board free' at a C/NR of 5.5 dB. Thus the window from no pictures to perfect pictures is at best 0.5 dB. Obviously you cannot be very far 'off' from dead on and still have pictures with a 2.4m dish in the Auckland area.

This is an expensive receiver (US\$2520 range from Maser Technology Group) which requires a significant learning curve to operate. However, as it is likely to be

used primarily on only a single transponder and at most a handful of "programme channels" within that transponder, it will only be the installer who will have to learn the 'control navigation' tricks.

The receiver is large, heavy, and hardly consumer attractive. In a cable headend it will go into an equipment rack; in a Filipino language DTH user home, it could easily be buried (although with plenty of ventilation) and essentially forgotten once tuned in and functional. The output is NTSC analogue and will require either a standards converter plus modulator or a TV monitor capable of NTSC for proper use.

ABS-CBN 24 Hour

This Manila based terrestrial network creates a full-time satellite service feed designed primarily for Filipinos living overseas. In Hawaii and California where several million Filipinos now live cable TV systems have contracted for the ABS-CBN feed via PAS-2 for distribution to their customers. On average, 30% of the 24 hour day is in English including news, sports, and variety shows. This is a good 'alternate service' and if we were designing a SMATV/CATV programme menu, it would be on an 'optional tier.'



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The SATELLITE technician

The LNB and The Receiver

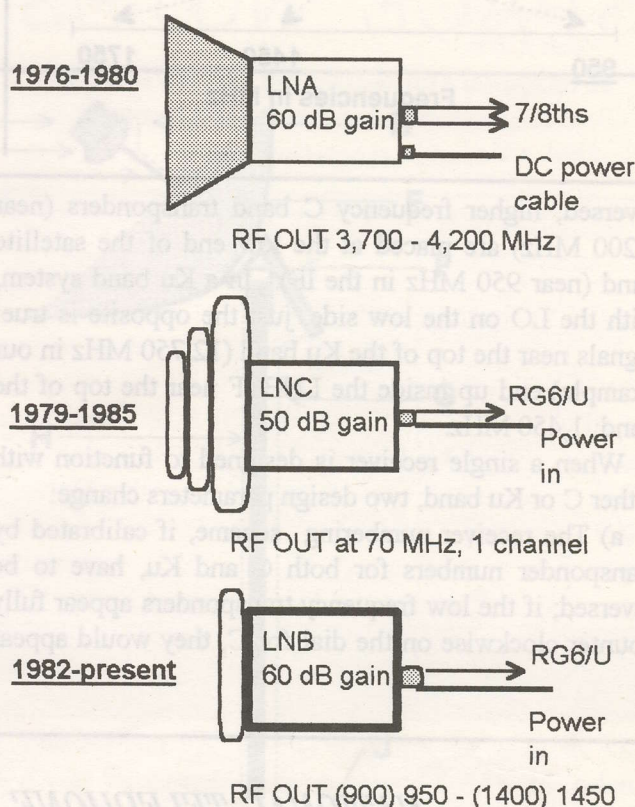
Television signals transmitted via microwave frequencies present a number of technical challenges to the receiver designer. Microwave frequencies do not travel well within coaxial (or other forms of) transmission cable and to interconnect the signals received at the feed antenna to the receiver, often over several hundred metres distant, required some careful planning.

The first (mid 70s to early 80s) "TVRO" systems used a signal preamplifier located at the antenna (called a Low Noise Amplifier, or LNA) to boost the received signals by as much as 60 dB. Once amplified, the received signals were then carried to the indoor receiver through sizeable (7/8ths inch [22.2mm] diameter) coaxial cable to the receiver proper. The first frequency conversion stage was located within the receiver. This worked reasonably well at C band but then-future growth to Ku would be a different problem since no then-known coaxial cable of any size was capable of carrying the 12,000 MHz signals very far without great loss.

Early in the 80s the LNC was developed. It added a frequency conversion stage to the LNA and at the time universally converted one transponder at a time to an "IF" (intermediate frequency) of 70 MHz. The LNC was an important step because it allowed the receiver design to build standard 70 MHz input receivers eliminating any real microwave technology from the receivers proper. The firms who best understood microwave, the low noise amplifier designers, in turn concentrated on the gain function and the conversion from microwave to VHF in the LNC conversion.

With a 70 MHz IF, the antenna mounted LNC could "send" only a single TV channel at a time through the coaxial cable. This proved to be a technical problem as single dishes were asked to simultaneously receive up to 24 separate TV programmes at a time, each on its own frequency. Early attempts to "split" the C band frequencies at the antenna for multiple down conversions were largely unsuccessful.

And so the LNB was borne; low noise block downconverter. Now the satellite band (3.7 to 4.2 GHz, later 500 MHz segments of the Ku band[s]) were amplified at C band and then frequency converted as a "block" of frequencies to a broadband IF; 900 to 1,400 MHz was an early standard, later modified as 950 to 1,450 MHz. This allowed a standard to be established for satellite receivers, tuners really, that tune through



the 950-1,450 MHz frequency range a satellite transponder at a time. At this point (1985) virtually any receiver could be exchanged for any other receiver since all were designed to tune the same (IF) band.

C and Ku Differences

An LNB works in this fashion:

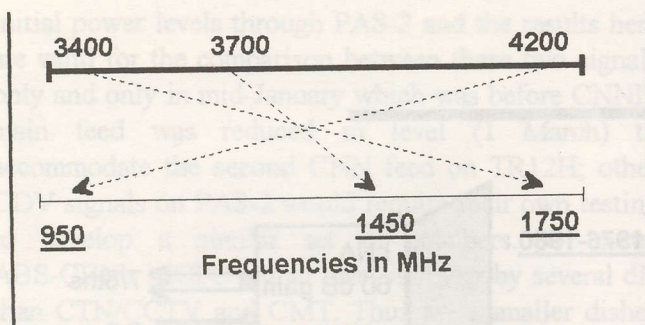
1) Within the LNB is a device called a local oscillator. This oscillator creates a signal (carrier) within the LNB and this oscillator signal is 'mixed' (beat or heterodyned) with the incoming satellite signals in either the C band (3,700 - 4,200 MHz) or Ku band (such as 12,250 - 12,750 MHz).

2) If the local oscillator (LO) is higher in frequency than the satellite band, the system is called high-side injection. All C band LNBs use high side injection and the LO operates on 5,150 MHz.

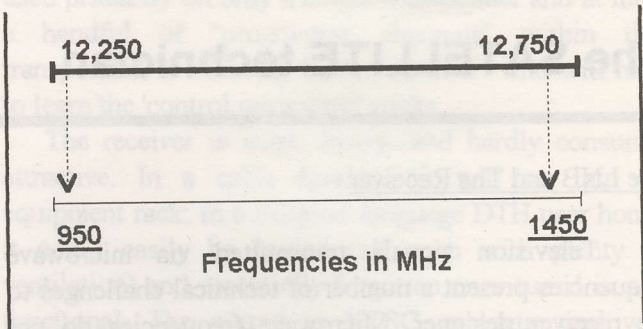
3) If the LO is lower in frequency than the satellite band, the system is called low-side injection. All Ku band LNBs use low side injection and in our example of 12,250 - 12,750, the LO operates on 11,300 MHz.

In a C band system, with the LO on the high side, the satellite signals sent down the RG6/U coaxial cable are

HIGH SIDE LO - C band LNB



LOW SIDE LO - Ku band LNB



reversed; higher frequency C band transponders (near 4,200 MHz) are placed at the low end of the satellite band (near 950 MHz in the IF). In a Ku band system, with the LO on the low side, just the opposite is true; signals near the top of the Ku band (12,750 MHz in our example) end up inside the LNB IF near the top of the band; 1,450 MHz.

When a single receiver is designed to function with either C or Ku band, two design parameters change:

a) The receiver numbering scheme, if calibrated by transponder numbers for both C and Ku, have to be reversed; if the low frequency transponders appear fully counter clockwise on the dial for C, they would appear

fully clockwise for Ku unless the receiver planned for this.

b) The receiver video requires an 'inversion' switch since the entire signal appears 'backwards' for Ku if the receiver is set up for C.

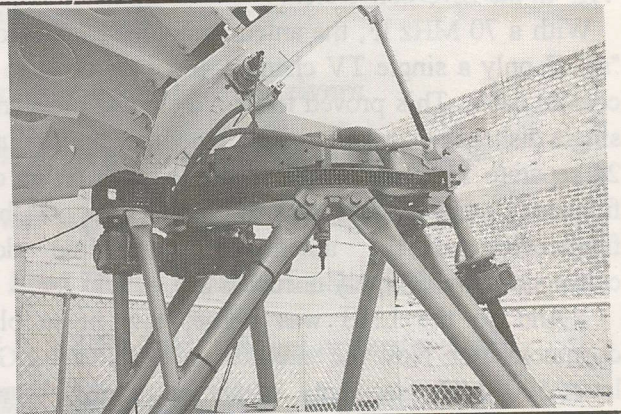
C and Ku receivers are typically equipped with a switch to correct for these differences. Receivers without a switch can gain back at least right-side-up video by reversing the polarity of the video signal at the detector; a ten minute job (with a new switch added) for a technician.

Note that when Palapa C1 and AsiaSat 2 with extended C band appear later this year, receivers will need an IF range from 950 to 1750 to cope.

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ELEMENTS OF THE HOME DTH SYSTEM

The parts that make up a DTH (direct to home) satellite receiving system have been standardised to make possible the selection of individual components from a variety of competing suppliers. Only the 'IRD' (integrated receiver decoder) portion required for digital format reception is unique to a single supplier, at this time. Within a year, installers and consumers will have a choice of competing IRD units as well.

A - LNB or low noise block downconverter. Mounts to antenna feed (C) and provides amplification of the received signal plus converting the satellite band (C or Ku) to the standard 950 - 1450 MHz 'IF'.

B - RG6/U low loss cable connecting LNB output to receiver (I).

C - Feedhorn; the actual 'antenna' that collects satellite signal captured from space via the reflector (E).

D - Feed support arm, holds feed antenna at appropriate 'focus' of dish.

E - Reflector, captures satellite energy, focuses to 'feed' antenna.

F - (Optional) actuator 'arm', motor to move dish pointing through sky.

G - (Optional) actuator power cable.

H - Antenna support pole; typically 3.5" OD 80mm thick steel post.

I - Receiver, accepts 950 - 1450 MHz IF signal from LNB through RG6/U cable and processes, one channel at a time, to video and audio output.

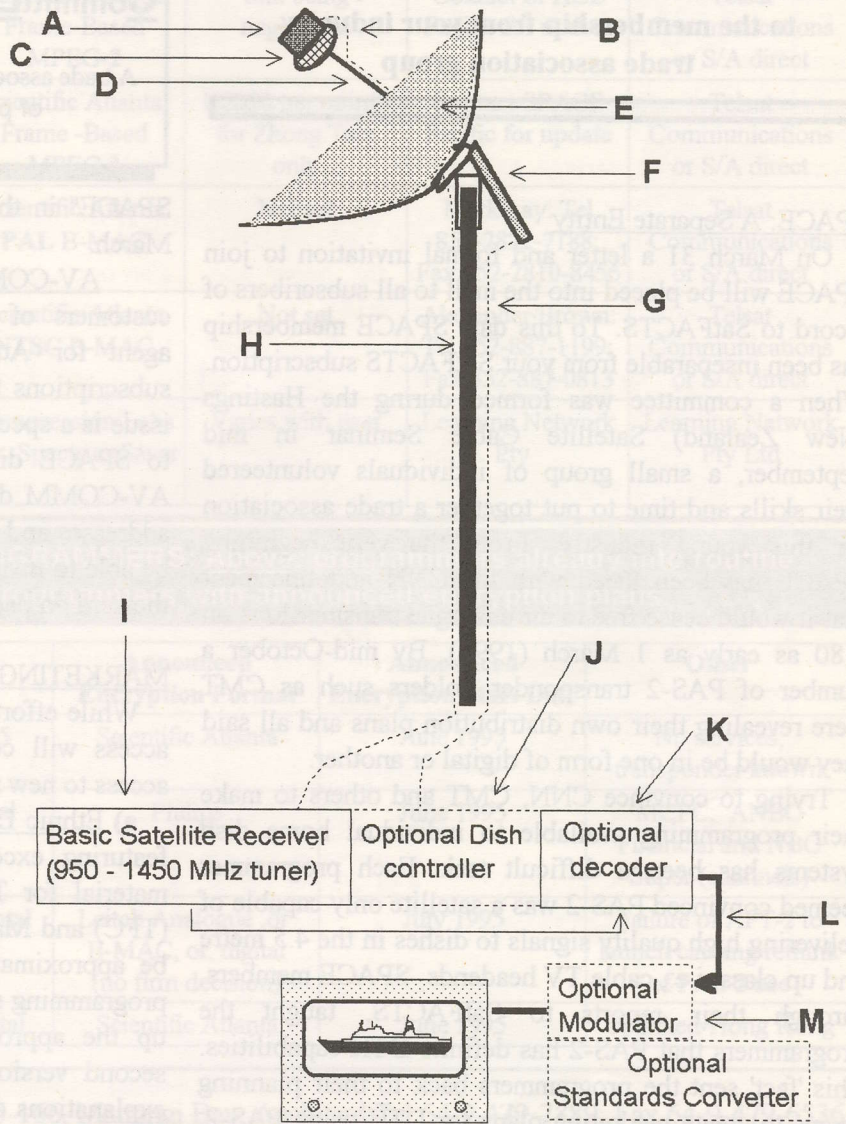
J - (Optional) dish actuator power supply and movement controller.

K - (optional) signal decoder for scrambled (pay to view) services.

Note: I, J, K may be combined inside of receiver portion.

L - Cable(s) to TV set, VCR.

M - (Optional) RF modulator, (NTSC - PAL) standards conversion.



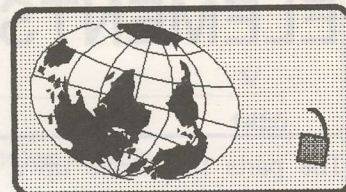
3 metre dish being installed in suburban Auckland for Hindi family

SPACE NOTES

A technical and marketing advisory memo
to the membership from your industry
trade association group

SPACE Pacific

Satellite
Programme
Access
Committee



A trade association for users, designers, installers, sellers
of private TVRO systems in the POR.

SPACE: A Separate Entity

On March 31 a letter and formal invitation to join SPACE will be placed into the mail to all subscribers of record to SatFACTS. To this date SPACE membership has been inseparable from your SatFACTS subscription. When a committee was formed during the Hastings (New Zealand) Satellite Cable Seminar in mid September, a small group of individuals volunteered their skills and time to put together a trade association for this young industry. From the very beginning SPACE has been faced with the CNN announcement that it would cease free to air analogue transmissions on I180 as early as 1 March (1995). By mid-October a number of PAS-2 transponder holders such as CMT were revealing their own distribution plans and all said they would be in one form of digital or another.

Trying to convince CNN, CMT and others to make their programming available to individual home dish systems has been a difficult task. Each programmer seemed convinced PAS-2 was a satellite only capable of delivering high quality signals to dishes in the 4.5 metre and up class; i.e., cable TV headends. SPACE members, through their reports to SatFACTS, taught the programmers that PAS-2 has definite DTH capabilities. This 'fact' sent the programmers back to their planning rooms to create marketing plans for DTH using PAS-2. Some, such as ESPN, still ignore this fact of life. Others, like CMT, have adopted per-home fees for access to their service.

The SPACE founding committee promised a functional trade association by 1 April. It will not miss this date by much and hence the "invitation to join

SPACE" in the mail to all subscription readers on 31 March.

AV-COMM Pty CUSTOMER NOTE: Many customers of AV-COMM Pty. Ltd., our SatFACTS agent for Australia, have entered their SatFACTS subscriptions through Garry Cratt. On page 26 in this issue is a special registration card which you must send to SPACE directly to receive the invitation to join. AV-COMM does not provide us with your names and addresses and the only way we will know you exist and be able to invite you to join SPACE is for you to return the card on page 26.

MARKETING PROJECTS

While efforts to secure additional, new programming access will continue at SPACE, members will have access to new marketing aids during April and May.

a) Ethnic Language Demo Tapes: A VHS demo tape featuring excerpts of programming and promotional material for Tamil (RAJ-TV), Hindi (ATN), Filipino (TFC) and Mandarin (CTN). The total tape length will be approximately one hour divided between the four programming services allowing a seller of TVRO to cue up the appropriate portion and 'demo' reception. A second version scheduled for June-July will include explanations of a typical DTH system required for each service so your customer can see both the equipment and the reception for the service of their choice. This tape will be available only to SPACE Installing Dealer members.

b) "What Is Satellite TV All About???" is a 24 page consumer booklet designed to explain satellite TV

Contacting SPACE Pacific

SPACE Pacific is a trade association for people owning private satellite dishes or involved in the industry that supplies these systems throughout the Pacific Ocean Region (POR). Subscribers to SatFACTS are automatically enrolled as provisional members at no charge until 31 March 1995; after that date SPACE Pacific membership will be optional to those subscribing to SatFACTS. The primary target area of SPACE to date has been to negotiate programme use rights for private dish owners and to urge programmers to recognise and sell their services to private dish systems. SPACE can be reached % SatFACTS, PO Box 330, Mangonui, Far North, NZ.

Programmer	PAS-2 Transponder	Encryption Format	Cost Per Home Terminal	Programming Representative	IRD Hardware Representative (*)
ABS-CBN: The Filipino Channel	14/Horizontal IF 1058 MHz	General Instrument Digicipher I	US\$15 per month	SPACE Pacific	Maser Technology Group
Country Music Television	1/Vertical	Scientific Atlanta Frame-Based MPEG 2	US\$50 per year	SPACE Pacific	Telsat Communications or S/A direct
CCTV: Central China Television	2/Horizontal IF 1422 MHz	Scientific Atlanta Frame-Based MPEG-2	Still being negotiated	Contact SPACE Pacific for update	Telsat Communications or S/A direct
CTN: Chinese Television Network	2/Horizontal IF 1422 MHz	Scientific Atlanta Frame -Based MPEG 2	US\$20 per month for Zhong Tian only	Contact SPACE Pacific for update	Telsat Communications or S/A direct
Discovery Asia	4/Horizontal IF 1370 MHz	Scientific Atlanta PAL B-MAC	Not set	Mark Lay: Tel 852-2822-7188; Fax 852-2810-8456	Telsat Communications or S/A direct
ESPN Asia	5/Vertical IF 1288 MHz	Scientific Atlanta NTSC B-MAC	Not set	Alexander Brown: Tel 852-887-1199; Fax 852-887-0813	Telsat Communications or S/A direct
NTU: National Technology University	3/Vertical IF 1383 MHz	Compression Labs Inc. SpectrumSaver	Varies with user	Learning Network Pty	Learning Network Pty Ltd

STATUS OF ENCRYPTED PROGRAMMERS: Above, programmers already into routine encryption. Below, programmers with announced encryption plans.

Programmer	Satellite and transponder	Announced Encryption Format	Announced Encryption Start Date	Other
AllAsia	Rimsat G2/142.5	Scientific Atlanta	June 1995	No services, transponder known
ANBC/CBNC	PAS-2 13/Vertical	Philips	June 1995	MCPC: ANBC Financial and NBC Super (channels)
CNNI	PAS-2 10/Horizontal	Leitch Analogue ,or B-MAC, or, digital (no firm decision)	July 1995	Failure of APT-2 to launch causing rethink of PAS-2 use
TNT/Cartoon	PAS-2 2/Horizontal	Scientific Atlanta	June 1995	Uplinked-Hong Kong

* / Maser Technology Group: PO Box 65-166, Mairangi Bay, Auckland Tel 64-9-479-7889; Fax 64-9-479-6536
Telsat Communications, Ltd: PO Box 1537, Palmerston North Tel 64-6-356-2749; Fax 64-6-355-2141
Scientific Atlanta/Toronto, Canada (Atten: Diane McDonald): Tel 1-416-299-6888; Fax 1-416-299-7145
Learning Network Pty: 7 Martin St., S. Melbourne, Vic. 3206 Tel 61-3-699-7144; Fax 61-3-699-4947
SPACE Pacific: PO Box 330, Mangonui, Far North, NZ Tel: 64-9-406-0651; Fax 64-9-406-1083

reception to prospective buyers of home dish systems. The booklet uses four-colour photographs and is written for a completely non-technical person explaining the equipment and the services available. The booklet will have a place for dealers to 'stamp' their business name, address and telephone number. This booklet will be available only to SPACE Installing Dealer members.

In our April 15 SatFACTS we hope to be able to formally announce the SPACE / SatFACTS 1996

Satellite Cable Seminar event venue. If you are into planning ahead, circle January 24-26 (1996) and plan to join us in Auckland for the most exciting 3 days perhaps in your lifetime; not an idle claim.

ANOTHER Programme Access Glitch

In this report for February we related that contrary to the original announcements, MPEG 2 based digital

transmissions are not going to be instantly compatible between differing transmission formats. We said that a General Instrument 1500 receiver will not decode a Scientific Atlanta MPEG transmission; i.e., a system installed for The Filipino channel will not decode The Chinese Network (nor Country Music Television) although all three are found on PAS-2.

There is more bad news.

Scientific Atlanta has advised us, through Country Music Television:

"(Our) IRDs (digital receivers) cannot be used for more than one service at a time and could not be switched from one service to another without being re-addressed, a very complicated process. Bear in mind the D9222 IRD is a commercial rack mounted unit. It is not specifically designed for home use, although it can (be used by a home system)."

How bad is this revelation? Pretty bad for home systems; unimportant for cable TV.

A home wishes CTN Mandarin language service, transmitted on PAS-2 TR2H(horizontal). The uplink is in Hong Kong and it is Scientific Atlanta equipment. There is room on the TR2H MCPC uplink for six separate programme channels at this time. CTN uses two of these six; one for Zhong Tian, one for Dadi. As was discussed

in February SatFACTS (see Coop's Comment, p.1) Dadi is not presently available 'down here.' Also on this MCPC Hong Kong uplinked carrier is Central China Television (CCTV). A home wishing Zhong Tian and CCTV will require two separate (S/A D9222) receivers. Moreover, neither of these receivers can be used to subscribe to Country Music Television (CMT) which is on TR1V in S/A digital format. That will require a third receiver. And when Turner's TNT/Cartoon channel becomes available in June-July on TR2H out of Hong Kong, that will require a fourth receiver!

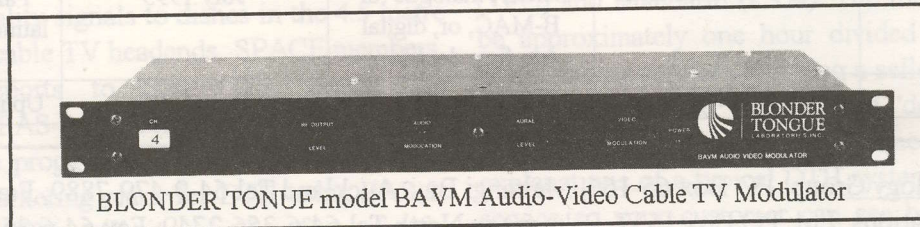
S/A won't even talk to us about why they have configured their MCPC in this format; nobody, of course, would ever accuse them of doing it on purpose so as to force the sale of additional receivers! We must also point out that the S/A D9222 is absolutely useless for analogue reception; it is only designed for S/A format MPEG. At least the GI D1500 also works (very) well as an analogue receiver.

Consumer receivers, capable of receiving several different programmes with the same MPEG 2 format are coming, but possibly not until well into 1996. In the meantime, a customer for any of the S/A format digital channels will be paying large dollars for a limited-use piece of electronics.

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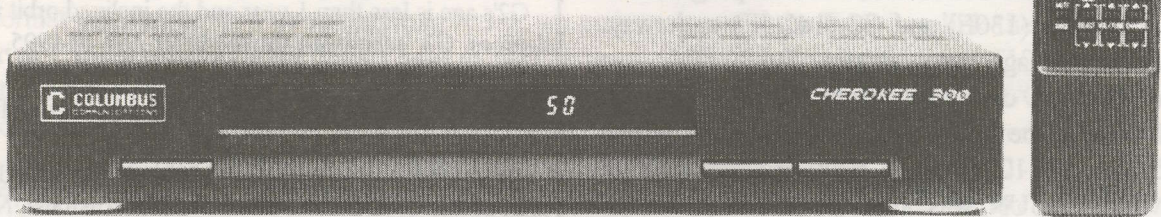
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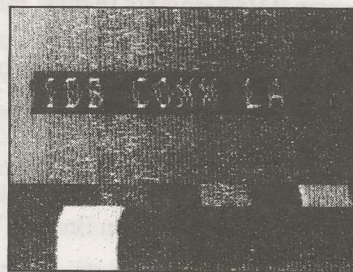
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WITH THE OBSERVERS

SCHEDULED LAUNCHES FOR POR

April: KoreaSat 1 (Ku spotbeam on Korea)
May-June: PAS-4 to 72E (C and Ku)
July-August: AsiaSat via Long March to 100.5E
Insat 2B to 74E
November: Palapa C1 to 113E

Shane Wilson (Mareeba via Cairns, Qld) was first to report to SatFACTS operation of the new Palapa B2P STARnet service (IF of 975 on his receiver, vertical). Shane also reports new Indian language programming on Rimsat G2 (142.5E) with an IF of 1225 but notes "very weak, holds colour." This should be SUN TV's new Telugu language service. Shane uses a 3.7m dish, 20K LNB and Cherokee 300 receiver.

There are dramatic increases in 'Indian programmer' use of Rimsats G1 (130E) and G2 (142.5E) underway. New Tamil language programmer Eagle TV was scheduled to begin operations from G2 27 February; Gemini TV was to be on G1 3875 (IF 1275) and Udaya on G2 3925 (IF 1225) with new programming in Kannada dialect. SUN was already on G1 (3725; IF 1425) in Tamil and AsiaNet on 3825; IF 1325, in Malayalam. Unfortunately, only TR-1 (Russian TR6) at 3675 (IF 1475) is capable of true high powered Global beam operation (and reach into areas south of the equator). See boxed report here; a detailed look at RIMSAT operations in April SatFACTS..

Rimsat (the corporation) has just gone through a major reorganisation ordered by a US court following a

SORTING OUT THE RIMSATS

Rimsat G1 (130E) and G2 (142.5E) are Russian Gorizont birds under lease by the American based satellite operations firm. In Asia, Tim Brewer is VP and offices in Hong Kong (Suite 1408 Princes Bldg., Central, Hong Kong: Tel 852-2521-7461; Fax: 852-2845-9175).

G1 was launched in November 1993 and has 6 C plus 1 Ku transponder on board. It has modest inclined orbit (+/- 0.7 degrees) at this time.

G2's age is less than 1 year and the inclined orbit is +/- 0.4 degrees. G3, scheduled for the latter half of 1995, plans to be located at 83E.

Both are 'standard Gorizont' and have the following capabilities:

TR-1 (R6) / 3675 MHz: High power spot (43 dBw), or, high power Global (32 to 34+ dBw over Australia, NZ).

TR1+ (R7) / 3725 MHz: Zonal beam 31 dBw maximum (<18 dBw most of Australia, NZ), or Global (25 dBw).

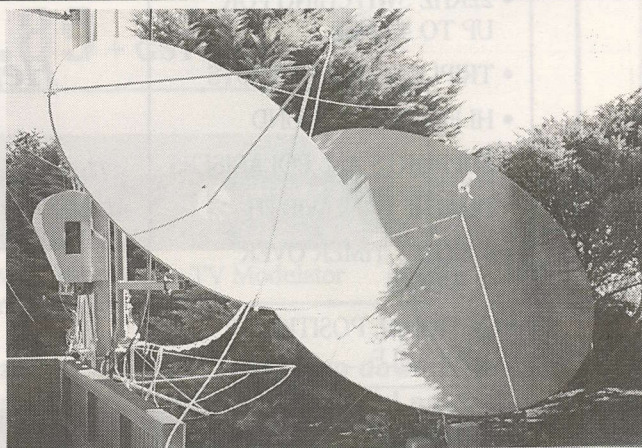
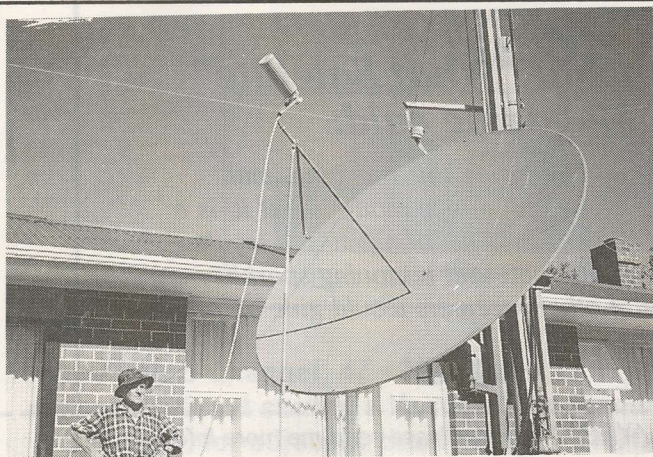
TR3 (R8) / 3775 MHz: Hemispheric 33 dBw maximum (<18 dBw most of Australia, NZ).

TR5 (R9) / 3825 MHz: Same as R7.

TR9 (R10) / 3875 MHz: Same as R8.

TR12(R11) / 3925 MHz: Same as R7.

SatFACTS is indebted to Tony Dunnett (Auckland) and Tim Brewer (VP, Rimsat) for this data.



Jim Smillie, Timaru, NZ built this 2M dish himself ... and now has two dishes to keep track of the satellites!

WITH THE OBSERVERS: Reports from Pacific Ocean Region (POR) satellite dish operators relating to reception, equipment changes, programming trends as related to SatFACTS using our POR Observer reporting form (page 25, this issue). Photos of satellite reception, equipment, personnel invited. When snapping TV screen photos: Use ASA 100 film, set camera at 1/15th second for PAL/SECAM, 1/30th for NTSC with aperture of F3.5 to 4, camera on tripod or stand. Submitted material becomes property of SatFACTS and none will be returned.

Individual reports cannot be acknowledged except by way of appearing here.

PanAmSat PAS-2 Status At Press Time

ANBC / Super Channel's Robert Wilson updates planning for conversion of present analogue service to parallel digital services. We reported being advised of May target date for launching of two, 24 hour, services to be called ANBC and Super Channel. Wilson believes it will be "at least June" before this happens but confirms new-to-Pacific Philips CDV format will be employed. He suggests launch date may be built around availability of Philips digital receivers and if they are late, the switch to digital will be delayed. ANBC service will include "at least 10 hours per day created in Hong Kong" using Asian and Pacific reports and sources giving service definite non-American flavour. The twin services will be carried by Australis / Galaxy in Australia and will also be an optional 'tiered service' on AsiaSat 2's STARnet package when it is available in approximately September. Wilson can be reached at temporary Hong Kong office: Tel 852-2527-2339, Fax 852-2865-2231. CMT's C band feed (TR7V) switched from PAL to NTSC at 0005 UTC on the 24th of February. Since 1 March the C band service has been transmitted intermittently and according to CMT "could go at any time." It was originally scheduled to come up on TR1V in MCPC from the PAS-2 Sylmar uplink site in January. However, the MCPC package was required for use by PRIME Sports and Encore and this equipment is now in use on TR9V. When S/A delivers a replacement uplink package to Sylmar, the CMT service will appear on TR1V. The S/A package is capable of uplinking six separate programme channels on TR1V, simultaneously, so there is room for additional (S/A) format services as well there. In Hong Kong, we now understand the PAS-2 uplink there is carrying both the pair of CTN services (Zhong Tian, Dadi) as well as the Central China Television (CCTV) service on TR2H. Of the three remaining MCPC video 'channels' now unused out of Hong Kong, Turner's TNT/Cartoon Channel is reported to be planning a service feed using one of these spaces; June start. No word from Turner who will handle the service orders or what the costs will be. Try Elizabeth Eldridge at (Tel) 61-2-957-5255, (Fax) 61-2-957-5161. CNNI has told callers recently "Because of the failure of Apstar 2, we are re-evaluating our plans for encryption on PAS-2; it will be several months before we have a decision." They had announced, in December, plans to use the analogue Leitch system. Asian soccer and other occasional use feeds out of Asia are being noted on TR6H (opposite polarity to ESPN, in B-MAC) many evenings; usually in PAL, clear analogue.

A CW (narrow bandwidth) carrier has been testing on TR8H (1115 IF), and another CW carrier has been noted on TR12H (1216 IF) indicating possible new programmers coming on line.

difficult stockholder fight for control of the corporation. All 12 C band transponders are now sold out although an unusual Ku band (11,525 MHz) Ku band transponder with 42.3 dBw at boresight on central Queensland is still available! On C, observers should watch for the appearance of Papua New Guinea's EMTV on 142.5 G2, transponder R10 (3875 MHz / 1275 IF centre in 1/2 transponder format), around 1 April. Will anyone beat Shane Wilson to being first to log this one?

India's government run Doordarshan, now faced with significant satellite delivered competition and cable distribution of programming, has elected to go international. Transmission space has been reserved on PanAmSat 4, Asiasat II and negotiations are underway for additional transponders. Programming will include features on Indian life and culture, news and current affairs; no announcement of the languages to be used. Test of the service may begin in June with full operations by late 1995.

Ken Grady (Wheeler Heights, NSW) converted his 1.8m ground mounted dish from Ku to C with good results on PAS-2; CNNI, ANBC with noise free pictures, CMT with slight sparklies. He has also seen occasional feeds on 8H out of Asia with noise free pictures.

Several observers saw Korea and Japan soccer finals on 8H during late February, TR8H, after 0900 UTC in PAL. For the time being occasional (not scheduled) feeds out of Asia are most likely to be seen on this transponder.

Ricky Dizon of Kampana Television Corporation (Manila) advises, "ATN is about to launch a second channel on G2. AllAsia TV is scheduled to begin use of Scientific Atlanta digital by June on G2." Dizon works for AllAsia so this could be accurate information. Just who the programmers will be is of special interest since



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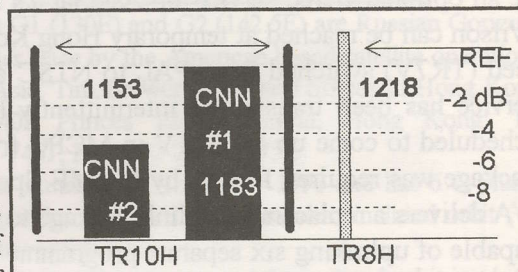
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CNN TESTING ON THEIR PAS-2 TRANSPONDER

CNN plans for serving the Asia and Pacific regions were thrown into chaos by the unexpected loss of ApStar 2. Originally, CNN saw PAS-2 as a transportation system, not a delivery vehicle. PAS-2 was to be used only to interconnect CNN Atlanta with ApStar and Palapa. With the intention of shutting down their Intelsat 180 feed, this would have left the entire Pacific region unserved for DTH or SMATV (CATV) uses. SPACE Pacific protested, CNN reconsidered and in December announced a transponder 10H sharing plan; encrypted analogue (using the Leitch system), and MCPC for internal traffic and backhauls of inward bound material to Atlanta. The ApStar 2 CNN feed was to be PAL / clear analogue, Palapa B-MAC. Late in 1995, CNN hopes to be on PAS-4 for the Indian Ocean region (72E). And then APT-2 died during launch. Since 1 March CNN's TR10H transponder on PAS-2 has been a 'test bed' as Turner engineers try out various 'transponder loading' schemes. One of these is shown here. CNN #2 (test signal) at IF 1153 has been 5 dB lower in level than the primary CNN signal (IF 1183). TR10H covers from 1143 to 1197 MHz IF.

In this configuration (current to press-time) the CNN primary is itself 5 dB lower in level than when it was the only occupant of transponder 12; the sharing of the transponder requires a back off



of the primary signal strength. Many smaller dishes have now lost their high quality CNN reception. Both CNN primary and CNN #2 now look better on reduced bandwidth receivers (20 - 22 MHz) and a full 36 MHz wide commercial receiver will now have 'noise spikes' in the reception caused by having too wide a bandwidth. If your CNN has gone down, now you know why. If Turner adopts this use plan, it won't get any better.

S/A receivers are only sold to users after the programmer has OK'd the shipment.

Gorizont at 140E is likely to be changed out with a newer satellite before the 15th of April. Five Russian satellites are part of a massive shuffle and new bird deployment plan; 145E is not believed affected in this move. The present 140E Gorizont is aged and a newer satellite would allow yet more Indian / Asian programmers to expand their satellite operations. However, only TR-1 (R6) from this location is likely to be available south of the equator.

The Learning Network conducted a live telecast from NTU (Colorado) to users in Australia and New Zealand March 7. The 0000-0200 UTC feed allowed universities and others taking part in the NTU test (using CLI SpectrumSaver on PAS-2 TR3V) to 'feedback' questions and queries for NTU executives to interact.

Optus Ku relay of 6 radio formats originating at Independent Broadcasting Company (IBC) Auckland will commence from July. IBC presently provides news feeds to 51 NZ radio stations using telephone links. The satellite feeds will include rock, country, easy listening, adult contemporary and nostalgia formats; the first use of satellite for relay by a commercial radio broadcaster in NZ.

ANBC's twin digital feeds on PAS-2 will begin with 3 separate language channels with additional audio circuits planned allowing viewers to tune in the language channel of their choice rather than being forced to follow the normal English commentary.

American Christian evangelist Billy Graham will appear on PAS-2 March 13-17 leading a world-wide Global Mission satellite crusade. The transmissions are being downlinked in major population centres throughout the Pacific and videotaped for later same-day presentation at churches and community centres, as the live feeds occur during the middle of the night 'out here'. The details:

- ♦ PAS-2 transponder 6K, vertical, 12401 MHz
- ♦ Receiver IF (11,300 LO) of 1101 MHz
- ♦ March 13: 1300-1500 UTC
- ♦ March 15: 1300-1900 UTC
- ♦ March 16: 1300-1800 UTC
- ♦ March 17: 1300-1800 UTC
- ♦ Audio subcarriers to be used are as follows:

6.2 MHz: English and Spanish; 6.6 MHz: English only; 7.4 MHz: French; 7.9 MHz: (reserved)

This information may reach you too late to observe, but the technical data could be useful in the future for PAS-2 Ku band Australia-New Zealand "occasional video" feeds as the uplink facility at Sylmar will be the source for this series of transmissions and is likely to be so used in the future.

INDIAN (Rimsat) PROGRAMMERS

AsiaNet: Krishna Kumar, Fax 91-471-68563

ATN Television Net: P.K. Dixit, Fax 91-22-287-2753; Fax 91-22-202-3007

Jain Satellite Net: Sadhna Bharadwaj, Fax 91-11-687-3015

RAJ-TV: Shankar Karikar, Fax 91-4486-8195

SUN TV: P. Saravanan, Fax 91-4482-51266

Zee TV: Fax 91-3349-31938

NEED MORE ANTENNA GAIN? HOW ABOUT A 50 FOOTER!

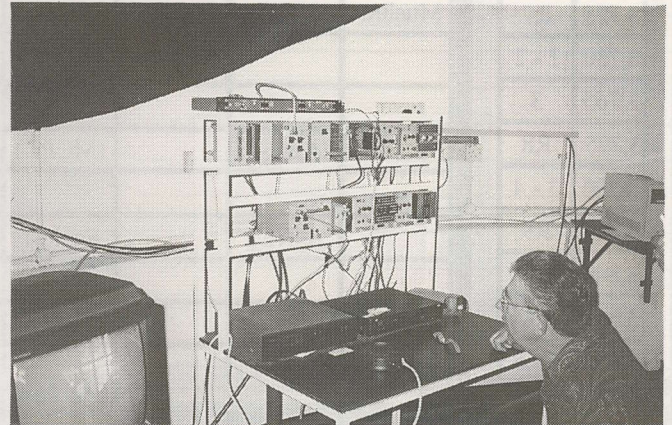
This one cost US\$20,000 - complete

In the nation of Sri Lanka various government and private telecasters offer as many as four channels of programming to viewers equipped with receivers and modest rooftop aerials. A network of VHF (band III) and UHF (band IV) TV transmitters spread around the numerous mountain tops distribute the programming.

When AsiaSat 1's STARnet service began transmitting in 1991, a group of local business people approached the government to acquire permission to broadcast on UHF terrestrial channels using the various STARnet services as a feed source. Of special interest was the BBC World Service (news) channel which in the (then) absence of CNN would be the first full time information service into Sri Lanka.

Unfortunately for the would-be entrepreneurs the AsiaSat 1 signal into Sri Lanka was far too weak to be suitable for terrestrial TV relay. A number of experiments with Indian and locally fabricated fibreglass dishes followed, each dish larger than its predecessors. A combination of poor fabricating skills and an already weak signal began to make the project unfeasible even after government permission to rebroadcast on UHF was obtained.

That was the point where one Uoosoof Mohideen, a Sri Lankan engineer with extensive TVRO system design experience suggested a unique approach to

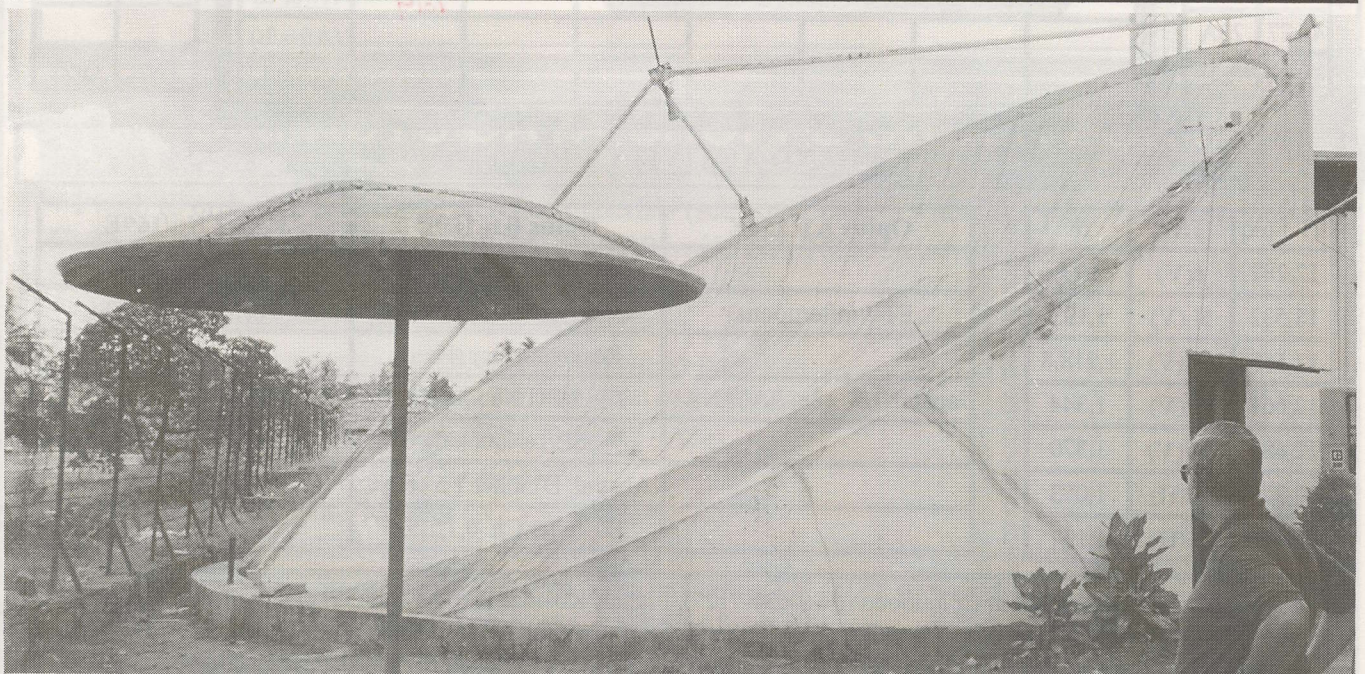


COOP- Inside the 50 footer inspecting reception

making the 18 dBw range footprint signals strong enough for rebroadcast use.

Mohideen designed a 50 footer dish which resembles a small sports stadium. The entire structure is built from concrete and block and inside of the dish several chambers were created to house the reception equipment.

After carefully calculating the boresight pointing for the monster dish it was built with consecutive concrete pours. The final plaster surfacing fine tuned the dish accuracy over the top of a metallic screen reflective layer. The dish now provides 2 channels of STARnet to UHF transmitters with local adverts inserted.



Uoosoof (Fax 94-1-520797), right. Upside down dish in front is umbrella!

NOTES from
22-03-95
Observations on 3.7M

SatFACTS PACIFIC OCEAN ORBIT WATCH: 15 MARCH 1995

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ISSUE 11 of 12

Freq.	TR#
3,675	R6/-1
3,720	1
3,725	R7
3,730	1-2
3,765	3
3,775	R8
3,790	3-4
3,825	R9
3,840	6
3,845	6A
3,850	5-6
3,875	R10
3,894	10
3,915	7-8
3,925	R11
3,930	12
3,975	14
3,980	9-10
4,015	16
4,040	11-12
4,045	18
4,100	13-14
4,135	22
4,165	15-16
4,166	23
4,177	23A
4,188	24

G/102.7	G1/130.0	Gz/139.9	G2/142.5	Gz/145.0	P169:Vt	P169:Hz	I174/177
DublTV	RAJ TV		ATN	DublTV			
Muslim	SUN/Tm	DublTV	JJAY	(tests)			
					Digital 1395	CTN/d CCTV/d 1415	
	ABC-5		(MCPC)				
					NTU/d 1354	Discov/b 1349 1367 SCPC	
	AsNET		Eagle/T				
					ESPN/b 1278	OccVid	
JainTV	Gemini		EMTV	DublTV			
					1205 CMT	Tests	
	Money		Udaya/K				
					1165 Prime/d	CNN1,2 1144	
					NHK	1102 RBN	
					1021 ANBC	ABS/d 1049	
						CBS/etal SCPC 1014	NwsFds
							(Afts/b)
							NwsFds

March 1995 Notes
/d indicates some form of digital; /b indicates B-MAC encryption. CNNI (underlined) indicates totally or mostly unencrypted. Vdp indicates vidiplexed analogue. PAS-2, Optus are linear (vertical or horizontal); others right hand circular (RHC) except for AFRTS on 177E, A-9 I180E (LHC). All RIMSATS are LHCP. For update PAS-2, see p.21 in this issue.

I/180	Patrn
IDB	w/29
Vdp	w/28
KDD	w/29
CNNI	w/29
Vdp	w/26
Vdp	w/26
Vdp	w/26
Wnt	w/29
NHK	w/25
RFO	G/29
A-9	G/25
NZ/d	G/22
TNZ	G/22

1420
1360
1300
1285
1170
1110
1050
985

Ku BAND ACTIVITY UPDATE

RF Freq	TR#	IF
12,282	1(V)	977
12,532	5L(V)	1,193
12,558	5U(V)	1,218.8
12,661	7L(V)	1,344
12,688	7U(V)	1,370
12,376	10(H)	1,073
12,438	11(H)	1,137

Optus A3/ 156E	Optus B1/ 160E	PAS-2 Ku/169E
	TAB radio, data services	
ETV (afternoons)	Occasional feeds, News	IF 1106 / CMT NTSC
	Reserved; Occ. Feeds	
Japan NHK 12m-2AM NZT	ABC National	
	SBS (National)	
	Austral. D'cipher 1.5 NTSC	
	D'cipher Ch. 0,1,2,5,6	

Ku band data courtesy Robin Colquhoun (64-9-630-7127), Francis Kosmalski (64-9-849-3512) and others. Optus A3 reception within New Zealand requires 3m range high efficiency size dish as does TR7L and 7V from B1. 1.2M dish and smaller will produce quality signals from B1 TR5 and 10H, 11H. Digicipher MPEG 1.5 on B1 is in operating mode.

SatFACTS MARCH 1995 POR OBSERVER REPORTING FORM

(Please FAX [64-9-406-1083] or mail to arrive by 03 April)

TELL US what you are seeing, or using for equipment, that is new within the last 30 days. Observer reports (see "With The Observers" page 20) form an important part of the growing body of information we all share monthly.

• NEW programming sources seen since 1 March: (Please list receiver 'TF' or satellite transponder number if known) _____

• CHANGES in reception quality since 1 March: _____

• EQUIPMENT changes at my observing terminal since 1 March: _____

■ My Name _____ Address _____
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- TB9404 / Home Satellite (NZ\$20 world-wide).
- TB9405 / Commercial Satellite (NZ\$20 world-wide).
- ALL THREE / TB9402, 9404, 9405 (NZ\$40 world-wide)
- Coop's Satellite Operations (NZ\$30 world-wide).
- Gibson Navigator (NZ\$30 world-wide).
- Coop's Basic - Fine Tuning (NZ\$30 world-wide).
- ALL THREE / OPERATIONS, NAVIGATOR, BASIC (NZ\$70 world-wide).
- CTD 9412 / STARnet Wants To Put You in Cable TV (NZ\$30 world-wide)

Total amount of order: NZ\$/US\$ at NZ\$1 = US\$0.62 _____

Instructions: Cheque in NZ\$ or US\$ to: Far North Cablevision, Ltd., PO Box 330,
Mangonui, Far North., New Zealand

■ YOUR equipment survey:

Size dish(es): _____; Noise Temp LNB(s): _____

Make/model receiver(s): _____

Make/model standards conversion: _____

■ Friends with dishes (Will be sent literature explaining SPACE):

If mailing, to: SatFACTS Observers, PO Box 330, Mangonui, Far North, New Zealand

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