
# COOP'S SATELLITE DIGEST



MAY 1983


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## TOP OF THE MONTH

**SHOWS.** And all of the hype and excitement and adrenalin that flows before, during and after one of the major industry events. There's plenty (perhaps too much) talk about what happened at the recent STTI Las Vegas show in this issue, and some prognostications on what the remaining shows in the balance of 83 have in store for us.

**INSTANT** fame if not instant millionaire status. We thought you'd be interested in following with us the story of how a quiet nuclear physicist from California set up shop in a backwater sidelot at Las Vegas with a small, uncluttered little circuit board and a four foot dish. And suddenly found himself being courted by the industry giants. It's everyone's dream; discover something which holds the promise of making the industry change overnight. Get famous. Have people call you 'Mr.' and watch your bank account grow. It's amusing, and even a little sad to watch what happened to inventor Bob Taylor in Las Vegas. And that, also, is here this month.

**FM** via satellite. Stereo transmission, sent to you via the bird, can be 'shared' with thousands around you for not very many bucks. We look at how you design and implement a satellite fed local stereo FM service in this isue and draw the conclusion that **not all** of the pieces you need are really here yet. But we are close.

## MAY 1983






**OUR COVER — Is Ed Grotsky of Arunta Engineering** (Phoenix) **pointing the way to the birth of a six-foot dish industry with his Las Vegas display? Many left Vegas feeling that the six footer** had **arrived, and not a few of the major marketing concepts for 1983 are built upon the emergence of the six footer as a viable 'low-cost/ price-leader' package. Our report on Las Vegas** (page 18 here) **explores the six foot myth and where it seems to be headed.**

**COOP'S SATELLITE DIGEST**

**COOP'S SATELLITE DIGEST** published monthly by West Indies Video, Ltd; a Turks & Caicos Corporation with corporate offices located at Grace Bay, Providenciales, Turks & Caicos Islands (West Indies). U.S. offices are maintained at Ft. Lauderdale, Florida. All mail including subscriptions, advertising inquiries, reports and letters should be addressed to CSD, P.O. Box 100858, Ft. Lauderdale, FL 33310. CSD office hours in Ft. Lauderdale are Monday-Friday 9:00 AM to 4:00 PM. Telephone (305) 771-0505. CSD is mailed worldwide on or before the 1st of each month, first-class (airmail). Annual subscription rates are $50 (US funds) for USA, Canada, Mexico; $75 (US funds) elsewhere. Entire contents copyright 1983 by West Indies Video, Ltd; Robert B., Susan T., Kevin P., and Tasha A. Cooper.

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# COOP'S SATELLITE COMMENT

- SHOWS, again.
- CANADA's Million Terminal Market?
- MIS-USING The Media

**UPDATE on Zoning Problems**

If my mail is any indication, nobody seems to be tackling the 'TVRO Antenna Zoning challenge' head on except for the group in Arizona. I can hardly believe that others are not organizing to battle local and even state regulations that promise to 'outlaw' home TVRO antennas but the evidence suggests this to be true.

Under the tutorship of **Ed Grotsky** of **Arunta Engineerng** (Phoenix), the Arizonians have formed the 'Arizona Satellite Television Association'. They created the first 'state trade association' because in Arizona a number of towns and cities have adopted or are adopting local zoning laws which make it virtually impossible for a person to have a satellite antenna in their yard. My spies tell me that dozens, perhaps hundreds of other towns and cities all over the country are doing the same thing so it seems incredible to me that people in Florida or New York would sit idly by and watch this happen without forming some sort of trade group to combat this encroachment on private rights.

In Arizona, the group was instrumental in getting the Arizona Superior Court to decide that a satellite antenna in the yard of a Scottsdale resident was **not** any of the following:

1) **Not a structure** (structures require special building permits and the residents in question are not requesting a building permit);
2) **Not offensive** (and hence does not violate zoning regulations).

Inspite of this court decision, the Scottsdale City Council voted 100 percent against the installation by citing the following reasoning:

1) People should **abide** by the zoning ordinances;
2) Cable television will be available **'soon'** in the area and hence the fellow does not 'need' a home satellite terminal;
3) A person who has normal VHF television reception may find his reception **'poorer'** because a neighbor installs a TVRO;
4) Someday, in the future, dish antennas will be **'smaller'** and the big antenna in question will no longer be needed.

The Scottsdale ordinance is about as discriminatory as any you can imagine. First of all, they will allow a dish up to three feet in size. That's fine for 12 GHz DBS but it hardly settles the present 4 GHz needs; 'Taylor Video' and other clever engineering aside. To install any dish, you have to file an application with a $200 fee and then the application must be reviewed at a public hearing, as well as before the Planning Commission, and, the City Council.

The same city of Scottsdale routinely allows ham radio antennas to be seventy feet in height and as big as the builder wants them to be; without any 'special permission'. In the case in question, the installer worked out a way for the TVRO antenna to be 'hidden' from view so the neighborhood would not be 'blighted' by the 'ugly dish'. That got the **Planning Commission** to change its position and approve the antenna. Then the **City Council** did a reversal and vetoed the Planning Commission; 6 - zip.

Scottsdale is hardly an isolated case, in Arizona. The new state association has identified more than a dozen municipal entities that already have or are considering similar '3 foot limit' ordinances. A group of perhaps a dozen satellite people have pooled $500 to form a non-profit corporation, and trade association. They are meeting on a regular basis, together and with attorneys, to try to head off any more Scottsdale type incidents.

When a municipality adopts a regulation that stops TVROs, **you lose that municipality as a potential selling place.** Everyone in town is now "off limits". Bang, all at once. If you seek to challenge the decision by going to court, you have big court fees ahead and you will lose six months to maybe six years of valuable selling time. All of the time this matter is on appeal, the town stays 'off limits'.

Probably any local regulation like this is appealable. Probably the people who talked the municipal folks into adopting such an ordinance know this. But if they can keep you 'out of the market' for six months to six years, they can get their cable systems built, and grab the market for themselves while all of this is going on.

The arguments against such ordinances are obvious. Freedom of choice heads the list. Discrimination against those who want freedom of choice is a strong second. When Scottsdale's City Council lists four reasons for their decision, and three of those reasons have absolutely nothing to do with zoning, you can pretty well see for yourself who is behind their actions. **"Cable will be available soon".** Uh-huh. **One** cable system, offering **one** set of channels which **they** have selected. That's certainly freedom of choice alright. For the cable company. Not for the potential viewer! **"VHF television reception may be affected by satellite antennas".** Right. It may also be affected by a guy mowing his lawn next door, a garage door opener down the block, and the kid across the street playing on his swing set. Or the Seven-11 neon sign on the corner. **"Dishes will be much smaller in the future".** Sure they will. But not at 4 GHz.

A seventy foot ham antenna tower, laced with big yagi antennas clear to the top, is a thing of beauty. To another ham. But hardly to the guy who lives next door and who ponders the possibility that a strong wind may send the 40 meter beam crashing through his bedroom ceiling at an inopportune moment. Have you ever been stuck in the rear by a 66 foot chunk of 1 inch tubing? That has to be a great experience. Yet in Scottsdale such antennas require no special permission. Why are they allowed when a six **foot** TVRO is not? Because they present no 'commercial threat' to the local cable company.

**The Scottsdale City Council is clearly on the take.** They have been 'bought' by the local cable folks and even the most elementary examination by an unbiased outsider would reveal that they care not a whit about local zoning; only getting their campaign chests filled by local contributions. Cable contributes alot. The local TVRO industry does not.

If you think you have clear sailing in Charlotte because nobody has proposed such an ordinance there, yet, think again. The Arizona Cable Television Association is busy sending out 'advisory notices' to other state cable associations in the other 49 states. The cable guys figure they have found the 'victory key' here and they will flood the country with such ordinances in the coming year. They are doing it right this very moment.

**The issue here is money** (isn't everything in life, ultimately, reduced to money!). The cable folks are not dumb; they know that if decisions such as Scottsdale are appealed, **sooner or later** the decision will be turned around. But they are counting on two things: that to turn the decision around will buy them time to wire the community and get established, and, that be being the dis-organized industry that we are, it may take additional time before we get our act together and get organized well enough to fund the appeals necessary.

**Much or all of this can be avoided** at the outset if you take the aggressive role and meet with the city councils **before** they get such an ordinance on the books. The new SPACE (202/887-0605) 'Zoning Handbook' is an excellent tutorial place to begin. Talking wth Ed Grotsky (602/956-7042) about how they have formed a state 'TVRO Trade Association' is also advisable. Finally, keeping us all advised of progress, by keeping **me advised** with letters, copies of press reports and the like, will see that there is the maximum possible distribution of information. If you continue to hide your head in the sand and hope the cable guys leave you alone in your area, you are apt to awaken one morning and find more than a 66 foot chunk of 1 inch tubing sticking into your bedroom ceiling.

**MOUNTIES CALLED Off**

I love history. Man keeps making the same simple mistakes over and over and over again and I suspect most people make these mistakes because they don't care enough about history to go back and see what previous generations have done or how it turned out.

The history of the Canadian TVRO industry is filled with just about every mistake you can imagine. I hope somebody in Canada has kept a running diary of the events because setting it all down in sequential order would do a great deal to teach the other 150 or so nations of the world what can happen if you aren't smart enough to recognize the inevitable.

Canada launched **the first** 6/4 GHz domestic satellite. Canada almost **didn't** launch ANIK 1 (or A) because they got into a squabble with the US Government just ahead of satellite launch time and the US Government threatened to not launch ANIK for Canada. They resolved that one by agreeing, in Canada, that their first (and subsequent) ANIK satellites would not be used for transmission of any material to the USA; except in a 'dire emergency,' or, except when both nations agreed to a joint scientific endeavor using an ANIK.

Canada wasted their first family of ANIK birds. Because of a cumbersome internal organization created to run ANIKs they allowed more than half of the transponder capacity on ANIK 1 and 2 and 3 to sit there unused while the birds gradually ran out of station keeping fuel. For a short period of time, before Western Union launched the first US domestic satellite, ANIK **was used** to connect CONUS (continental USA) with Alaska. As soon as Westar 1 was launched, this traffic moved to the US bird and when SATCOM 1 followed closely behind ANIK use for the USA became nil again.

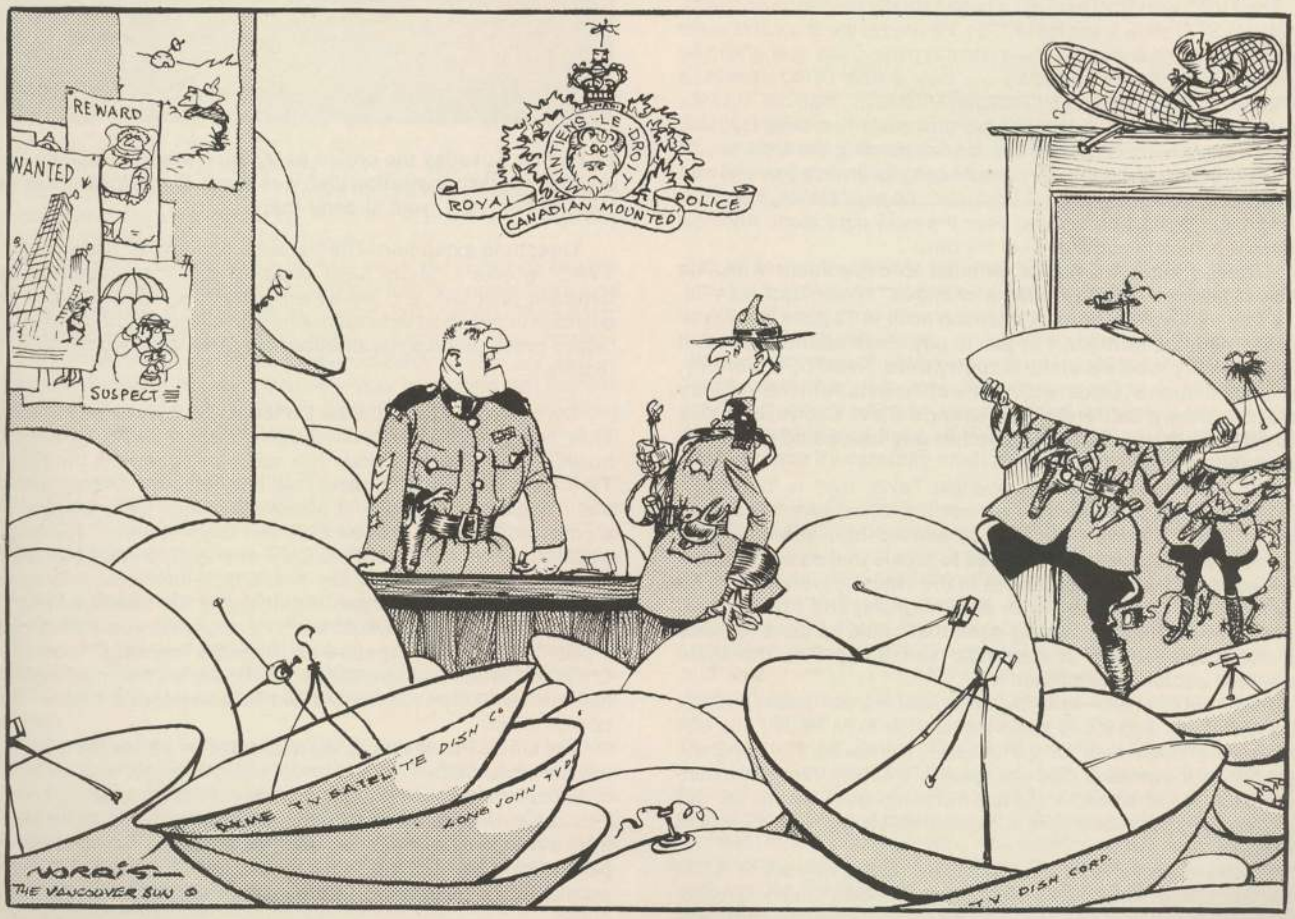
The first satellite television I ever saw came from an ANIK. ANIK 2 to be exact. I was in Atlanta at the time writing a story about Scientific Atlanta (fall of 1975) and they had a ten meter dish demonstrating ANIK reception. I was impressed.

Unfortunately, the Canadians were not as impressed as I was. ANIK 1 and 2 were primarily intended to provide television, radio and telephone communications to the far northern portions of Canada. There are still not that many people living there, but the people who do live there suffer by virtue of being very isolated. ANIK was supposed to resolve that for them.

Unfortunately for the people running ANIK, by the time they got much of a programming schedule running on ANIK 2, RCA was in bed with the likes of HBO and Ted Turner and as the first Canadian ANIK dishes started to spring up in the smaller northern communities, the Canadians there discovered that just a few turns of the azimuth turnbuckle away from ANIK they could watch the Braves play baseball or Tina Turner in Las Vegas.

The people who operate ANIK, TeleSat of Canada, have always had a very narrow view of how their system should run. First they told the would-be users of ANIK services that they could not own and install their own TVROs. Only TeleSat could do that. It should go without saying that TeleSat had a pricing plan that was artificially high

**COOP CONTINUES/ page 58**




*"We've come a long way, from getting our man to collecting dishes."*

# BOB TAYLOR's VIDEO 'DOLBY'

# INSTANT FAME . . . QUESTIONNABLE FINANCIAL STATUS

His name is Bob Taylor. His background is nuclear physics. An immigrant to the United States, he found himself teaching physics at some of the better known centers for higher education in his newly chosen country. Places like MIT. His interest in electronics was slight, if at all.

But Bob Taylor was a quick learner and he has an inquisitive mind. And once he finds himself intrigued by something, he 'gives it everything he has' according to his wife. Bob Taylor was clearly the primadonna of the Las Vegas STTI show. His story is straight out of the great American textbook of folk heroes and the realization of the great American dream. "Give me your tired and your oppressed and your hungry" says the plaque on the Statue of Liberty. Bob Taylor would add ". . . and your nuclear physicists."

The TVRO world for Bob Taylor began shortly before the Anaheim, California STTI show in the fall of 1981. He read of the show and found himself interested enough to buy a one day pass. Once at Anaheim he found himself filling out an entry blank for a free TVRO system; a complete system, donated by National Microtech. Was not America the land of opportunity? Weren't his chances of winning that free TVRO system as good as anyone else's attending the show?

Taylor was not on hand when the drawing for the free terminal was made. It would be several days later when he would learn, from Rick Schneringer, that he had indeed been the lucky participant. And now he had a complete terminal all of his own.

**"I guess since he had a terminal to experiment with, his interest level in TVRO problems changed"** remembers his wife. That free terminal would mark a turning point in Taylor's life. Taylor recalls **"With the terminal, I began to pay close attention to what the technical problems of the industry were. I read** CSD **monthly, several times, and I talked with some of the people in the industry here in Southern California. I got to know Steve Crowe, Bob Luly and others. I guess I was just another guy fascinated by all that was happening."**

With the trained mind of a scientist Taylor tried to zero in on problem areas he saw in the hardware side of the industry. **"The more I read** CSD **the more I became convinced that antenna drive systems were a problem. I decided to tackle that as a problem. I also wondered why the receivers in the industry were having so much trouble functioning with weak signals, and I questioned whether everything was being done that could be done to make the receivers perform at maximum sensitivity. The threshold extension problem fascinated me."**

Threshold extension. In the big dollar, commercial receiver world it means that you add into a basic receiver an extra circuit; one that reduces the 'noise floor' of the receiver, increasing the 'apparent' sensitivity of the receiver. The end result, in a decent threshold extension circuit, is that a picture that has moderate sparklies in it with**out** threshold extension becomes a noise free picture **with** threshold extension.

Threshold extension. If you had a clean picture with say an 8 foot dish, but noisy pictures with a 6 foot dish . . . adding threshold extension held out the possibility that you could make a six foot dish play where previously only 8 footers produced acceptable pictures.

**EARLY on Tuesday the crowd assembled around Satellite Concepts 4 foot demonstration dish was small. But Norman Gillaspie** (second from right) **was already there.**

**Threshold extension.** The last area, perhaps, of 'black magic' in TVRO receivers. Many have **claimed** that their receivers had threshold extension, and since there is no truly universally accepted definition of threshold extension, who is to question such claims if the 'added circuit' made some improvement **(ANY improvement!)** in the receiver.

Taylor's company, **Satellite Concepts,** was a late show entrant. They barely made the cut-off and their display ended up without a booth, stuck off in the corner of a side parking area at the Riviera. Taylor and wife Christine, plus Paul and Beverly Newman decided that it might be fun to attend a show and show off a product. The product would be an approach to dish drive systems. The display would be table top and the literature they prepared would be a simple single sided sheet of paper run off in a hurry at a local copy house.

Just days before the show, and the young firm's dedicated display to drive systems, Taylor would finally focus on the threshold extension problem. **"The show opened on Tuesday morning"** recalls wife Christine. On Sunday night Bob decided to test a small circuit board he had been thinking about. Bob called his little board a 'Linear Phase Locked Loop.'

The **L**inear **P**hase **L**ock **L**oop was tested on a small dish. Small by anyone's standards. Four foot small. Using a Dexcel receiver he had on hand, Taylor wired the small circuit board into the receiver. Then he installed a switching system so he could instantly compare the performance of the receiver with, and without, the **LPLL.** Satisfied with the performance, he hastily built ten of the circuit boards and prepared another type written sheet. His product line had just grown by a factor of two.

Things started slowly on the first display day. The four foot dish

was a novelty and Bob Luly had first demonstrated a four footer at an STTI show in March of 1982, in Fort Worth. Most of the old timers had seen a four footer play so the attraction was not as great as it might have been early on. Most of the early reports we heard were referencing the quality of the four footer against the many six footers on display. Nobody had focused on the electronics at that point.

Shortly after lunch, on Tuesday, that all changed. Bob Luly was one of the first 'industry experts' to take a close look at what Taylor had.

**"I couldn't believe it. Here was a man offering a circuit board for $23 which turned his four foot pictures into pictures that compared directly with all but the best of the six footers. I instantly offered to buy up** all **of his boards."** Luly had been through it all before, himself. His initial mesh antenna, displayed for the first time in San Jose in July of 1980, had brought every would-be promoter in the world out of the woodwork. **"I instantly saw what was going to happen to this guy. He was going to get gobbled up by some sharp talking promoter. There was** no question **in my mind that his circuit worked. The difference between LPLL** 'in' **and LPLL** 'out' **was dramatic."** A somewhat wiser Luly had gone through a similar learning experience at the Omaha STTI show in the summer of 1981. That was when Bob introduced the first all electronic polarization rotation system. **"I recalled in a terrible flash of memory all of the days and weeks I wasted listening to one promoter after another tell me how** they **were going to sell millions of** my **polarization systems and how all I had to do was sit back and watch my bank account grow. I knew it was about to happen to Taylor and I felt sorry for the guy."**

Taylor probably needed a friend at that moment. Even if he didn't realize that perhaps 'the easy part' was over and the tough part (getting his product to market, protected) was ahead.

Tuesday afternoon became a whirl-wind of blurred incidents. First Luly, with Taylor's permission, sought out a couple of the larger marketing types attending the show. He explained to each what Taylor had and said that he was assisting Taylor in getting it (the circuit) placed in a situation where Taylor would realize the most financial gain.

Taylor himself stayed with his outdoor booth and continued to demonstrate the circuit. He suddenly found himself demonstrating it constantly, to large crowds, and he found virtually everyone in the crowds clamoring to buy his boards. Like Luly, some were asking to buy all 10 that existed. Taylor told each that he had allowed Bob Luly the balance of the afternoon to look for a single buyer who would pay Taylor for the **rights** to the LPLL circuit.

The attention heaped on Taylor was awesome. Word spread like wildfire and virtually every receiver supplier with any marketing sense trooped by to look at the switch 'in' / switch 'out' display. Then each, almost on cue, would take Taylor aside and talk with him privately.

By mid-afternoon Luly had convinced David Fedric and Horton Townes of **Satellite America** that here was something that might fit their marketing program. Fedric in turn asked one of his receiver OEMs, John Ramsey of Sat-Tec, to take a look at the display. John obliged.

After a quick inspection of the Dexcel test set up, Luly, Taylor and Ramsey took one of the remaining boards and disappeared into a hotel room to wire the circuit into an existing Sat-Tec receiver. The model chosen was of course one that Satellite America was selling.

Luly recalls **"Taylor knew his circuit, and Ramsey knew his receiver. Between the two of them, they decided the best place to add in the LPLL and then they made educated guesses on the various resistor and capacitor values needed to interface the board. John ripped the parts he needed out of another brand new Sat-Tec receiver. It was quite an experience watching all of this happen."**

The crowd, when Ramsey, Luly and Taylor returned to the four foot dish with the quickly adapted Sat-Tec receiver, had grown substantially. Perhaps fifty people crowded and pushed and shoved to get a closer look at what was happening. Very few had any inkling of the importance or details of the tests, but it only took a brief study of the excitement painted on the faces of Taylor, Luly and Ramsey to determine that something significant, indeed, was going on here.

For Taylor it was a devastating few minutes. He admitted, freely,

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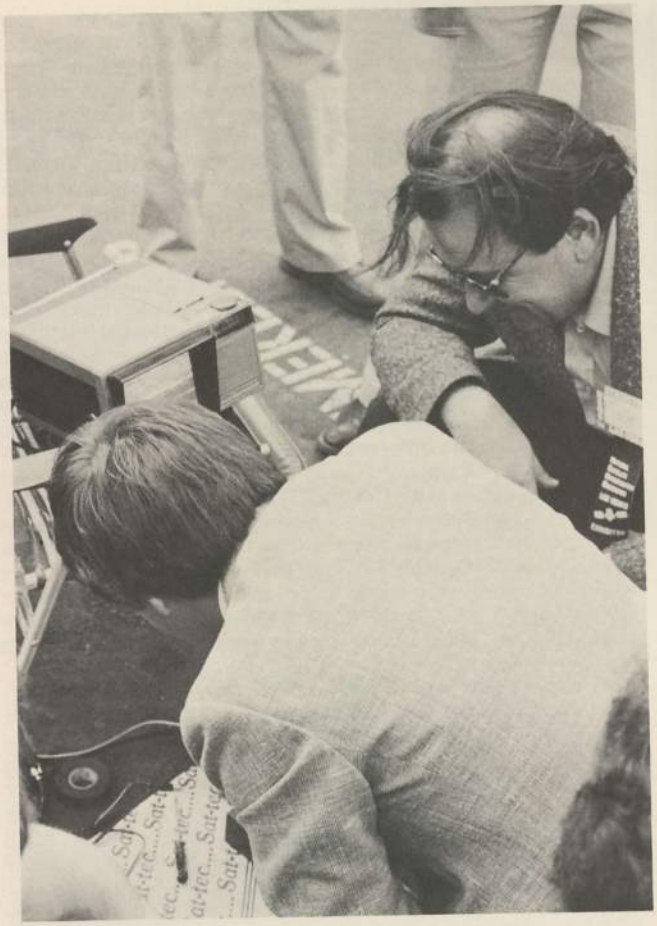
that while the theory told him that his LPLL circuit should improve virtually any receiver out there, he had developed the board in some haste and wired it into the available Dexcel receiver without an opportunity to perform test-surgery on other receiver units. **"I worried that we had not spent any time** really **thinking about the proper interfacing on the board to John Ramsey's receiver. I knew that if we really sat down, without pressure and without a big crowd of people pushing us from all directions that we could get better performance by carefully analyzing the receiver we were adapting to."**

Ramsey had a different worry. "I was the guy that designed and developed the first 'divide-by-two' PLL circuit. I remembered, vividly, how it only took a month or so for **that circuit** to be copied by everyone in the industry that was using the low cost PLL approach." John's development of the PLL system, in the fall of 1980, had been a substantial step ahead for the industry. The low cost Phase Locked Loop devices in use by the industry to turn the IF signal into video (and audio) were working very hard at the standard 70 MHz (IF) frequency. John's divide by two approach had lowered by a factor of two (to 35 MHz) the effective operating frequency of the PLL. The result had been more stable, better pictures. At virtually no increase in price.

So with the crowd of curious pushing and shoving and jockeying for position, Ramsey sat on the ground in his business suit before the tiny four foot dish and did back and forth testing. First he wired in his standard receiver and everyone who could get a look at the tiny 7 inch monitor tube calibrated their eyeballs. Then he unhooked that system and wired in the modified receiver. **"I couldn't believe the people standing there trying to peer** into **the modified receiver"** John remembers. He found a piece of cardboard, and laid it down over the

**'GET YOUR NOSE out of here' scowls Ramsey as he attempts to adjust the modified Sat-Tec under a piece of cardboard. Taylor is counting sparklies.**



**TAYLOR** (right) **and Ramsey** (hunched over) **check reception on a standard Sat-Tec receiver on the four foot Taylor dish.**

receiver. **"I had to be able to get inside the receiver to tune some of the basic manufacturing alignment points. We had added the circuit board** without **benefit of having a TVRO system present and I had to actually 'match' the Sat-Tec to the add-on board in front of that crowd."** John's skilled hands went to work and because he felt it necessary to work out of public view, the crowd was treated to a piece of cardboard on his lap, and the receiver and his hands underneath. No test equipment; just a look at the picture on the 7" tube!

"It improved the picture. No doubt about it," John would later tell Dave Fedric in the Satellite America suite. Mac Fedric would want to know 'how much?'. "Not as much as the Dexcel, certainly" was John's response. "But," Taylor would add, "working there on the ground, surrounded by would-be circuit thieves we didn't have a chance to really optimize anything!" Bob Luly would recall that as he, Ramsey and Taylor had hastily wired the LPLL board into the Sat-Tec before the tests, there were many educated guesses about selecting resistor values to interface to the LPLL board. "Ramsey and Taylor were amazing to watch. Ramsey asked Taylor 'How much voltage do we need here,' indicating a spot on the LPLL. Taylor would mention a number and John would snip a resistor out of a nearby receiver and stick it into the circuit. These guys really knew their respective circuits!"

It was an excited group that returned to the Satellite America suite. Fedric wanted to know just one thing. "Is it enough better for us to turn the six foot dish package we are now offering into a 'national' product package?" Fedric was experienced enough to recognize that his Las Vegas introduced $699 package (including six foot dish, receiver, but less the feed assembly for the antenna) was **not** going to play in **all** 48 states. He hoped the LPLL circuit of Taylor would give him some 'head room' with the more marginal coverage areas in the USA; such as the northeast or southeast.

Nobody knew the answer.

**"This is not a proper evaluation"** suggested Ramsey. "It did make an improvement. Maybe, if we were very lucky and we did everything just right the first time, this is all of the improvement we can expect" Luly suggested the other possibility. "Or, maybe there is more improvement there if you had the chance to work on it in your own lab without a crowd of potential thieves standing nearby!"

Taylor was still several feet off the ground. He was having some difficulty accepting that all of this excitement had been caused by a small (less than palm sized) circuit board he had finalized less than 48 hours prior. **"I would like** to see as many people as possible share in the benefits of this technology, if it is **really** better" he suggested. "What would happen if we licensed a number of different manufacturers to use the circuit? Wouldn't that help the industry overall?"

Ramsey suggested that whether Taylor licensed them, or they 'stole' the circuit by purchasing the first Satellite America/ Sat-Tec units to be shipped with the circuit inside,the result would be about the same. "We are in an industry where there are no secrets. Not for very long, anyhow!"

Fedric. **"You mean we can't protect the circuit?"**

Ramsey. "Well, the first thing we do is get the part number off of the key parts. Then maybe we can add some additional circuits around the primary one just to throw the copiers off. But no matter what we do, it won't be a secret very long."

Fedric. **"Then we have to try to buy as much lead time as possible. Can we get a 90 day jump on everyone else?"**

Ramsey. "If you will allow me to build up a sufficient inventory so

**VIDEO DOLBY/ continues page 13**

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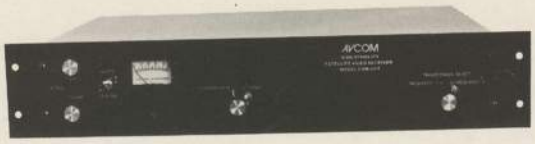


## COM-20T

AVCOM's COM-20T High Stability Satellite Video Receiver is the answer to your need for a highly stable and reliable receiver for cable, private cable, radio stations, TV stations, BIZNET, News, Weather & Music Services, and other dedicated applications. The COM-20T can be factory or field adjusted to a particular transponder and will remain on frequency without attention. The COM-20T is normally supplied with a remote downconverter and tunable audio. Optional configurations include fixed-tuned audio, internal downconverter, and downconverter switching for multi-channel capability. Styling matches AVCOM's popular series of rack mount receivers.

## The COM-60 Series for Cost-Effective Multi-Channel Installations

COM-66T

COM-65T

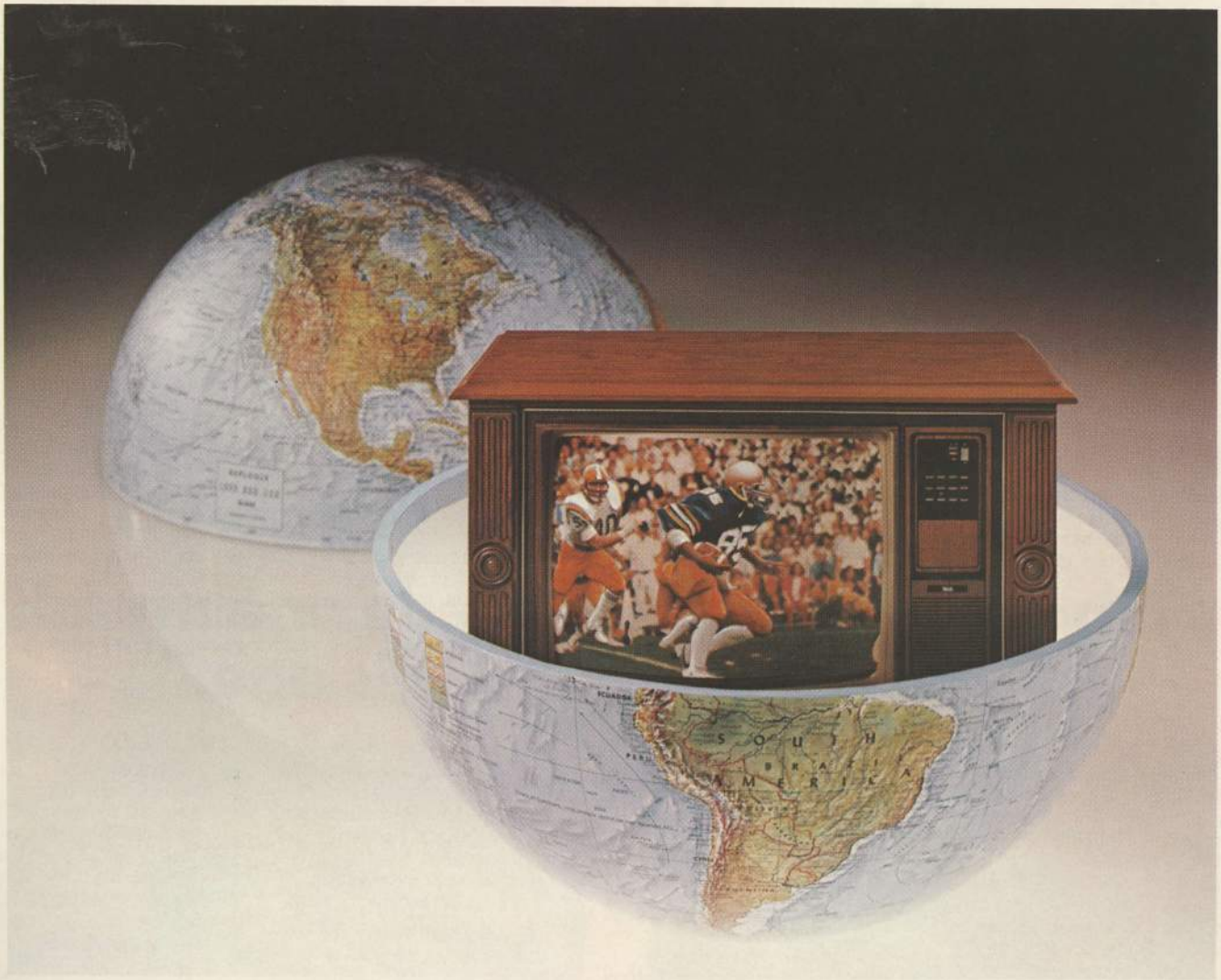
✷ Commercial Quality ✷ Compatible with SA's 6650 system ✷ Rack Mount, standard

✷ Double Conversion ✷ Flexible Downconverter (Use any degree and brand LNA) ✷ High Stabilit

NEW!

**AVCOM's Toll-free *OrderLine* 800-446-2500** (Orders Only)

All other inquiries phone 804-794-2500.



# SYSTEM 7 OPENS IT UP.

**Lowrance helps open up the satellite market with an exciting new pair of satellite receivers.**

The System 7$^{XL}$ is the new inexpensive Lowrance receiver with excellent performance and reliability. Features include detent tuning. Signal strength meter. Built-in modulator. 125 ft. of cable. Weatherproof downconverter. Fixed and variable audio. And more.

The System 7$^{AR}$ combines all the above, plus adds stereo decoding and a remote control as standard.

Lowrance also gives you the selling tools to keep the market open. With dealer support that includes merchandising aids like color posters. Consumer TVRO question and answer brochures. Product brochures. Plus a video tape. All specifically designed to help you sell more earth stations.

When it comes to satellite receivers, demand the brand that helps increase sales . . . Lowrance.

**LOWRANCE ELECTRONICS, INC.**


**Yes! I want to know more about the Lowrance System 7 Receiver. Send me more information today.**

**Name** _____

**Address** _____

**City** _____ **State** _____ **Zip** _____

**LOWRANCE**

**LOWRANCE ELECTRONICS, INC.**
**12000 E. Skelly Dr., Tulsa, Okla. 74128**

# "I was sick and tired of undependable earth station controllers.

Peter E. Kent
President

# I'm an engineer, so I made one myself! I'll stand behind this one."

The best earth station controllers on the market are programmable, reliable, easy to operate and priced right. When I looked closely, I soon found several design flaws which could have been corrected before they were put on the shelves.

It annoys me to see a product on the market before it's thoroughly tested. As an engineer, I expect things to work and keep on working. After all, that's what engineering is all about.

My wife sometimes says I'm stingy. She's right, but I also understand that quality costs less in the long run. So, I keep an eye on every penny and I make sure that our products are the very best.

My engineers and I carefully designed and tested the Surveyor Eleven– a reliable, dependable, convenient and reasonably priced satellite locator.

Here are the features that make the Surveyor the best on the market today:

1 **2-Year Warranty** I know the Surveyor Eleven works, so I'll give you a two-year warranty on parts and labor. See what our competition offers.

2 **Reliability** No other controller uses a true closed loop servo system which gently starts and stops the motor. You get much longer life from your motor, gears and actuator.

The Surveyor Eleven prevents motor burnout by limiting maximum torque and by delaying reversing power.

3 **Safety** The Surveyor Eleven has UL Registered 90 VDC motor drive circuits.

The red LEDs tell you when your actuator has reached the adjustable maximum limits.

Both red LEDs light up if a control wire is disconnected, saving you the expense of a service call.

4 **Fail-Safe Memory** The Surveyor Eleven never loses its memory during a power outage. Just set it and forget it. You don't have to remember to change the back-up battery every year.

5 **Locks on Target** The Surveyor Eleven is immune to miscounting from stray noise pulses.

It's also so accurate (within 0.030 inches of dead center) that it doesn't need fine tuning.

Settings won't drift because our circuits compensate for line voltage fluctuations, temperature change, aging and noise pulses.

6 **Optional Remote Control** The optional remote control unit brings the convenience of the Surveyor Eleven right to your easy chair.

7 **Easy Operation** The Surveyor Eleven is simple to install, simple to program and simple to operate. One knob selects up to 12 satellites.

This earth station controller has something entirely new. All the same reliability features you have come to expect in the Surveyor Seven are now in the new Surveyor Eleven–plus three new features that put us further ahead of the pack:

1 **Skew Compensation** The Surveyor Eleven automatically and accurately compensates for skew and the backwards Westar satellites.

2 **Polarization** You can set the Surveyor Eleven to horizontal, vertical or receiver/remote polarization with the turn of a knob. No need for a separate box.

3 **Scan** Exclusive to the Surveyor Eleven is the Scan function. It allows you to search through all 24 channels for the one you want without switching from horizontal to vertical polarization.

**Kent Research Corporation**

**We won't sell anything until it's just right.**

## SURVEYOR ELEVEN™

**Kent Research Corporation** 1900 Burdett Avenue Troy, New York 12180 518/272-6870

**DOLBY/ continued from page 8**

that we have a lot of product to ship, virtually all at once, we might get 90 days. But if we dribble them out as soon as we have the first proto-type batch ready, somebody will get their hands on one and virtually beat us to the marketplace with our circuit."

Bob Luly. **"Remember what happened** with David Barker's image reject mixer he displayed at San Jose, in 1980? He made a deal with KLM and it took them a few months to get rolling. In the meantime others jumped on the same circuit and some of those actually beat David and KLM to the marketplace. It could happen here, again. I am more concerned with Bob Taylor's interest in this. He designed this. It is his baby. He wants to see it used by as many people as possible. But, he would like to be paid for that use."

Taylor. "That's true, but I had no idea that this was as important as it may be. Now that I know how important it is, I am perhaps as concerned that it get used as widely as possible for the betterment of the industry as I am concerned about getting paid for it."

Luly. **"Don't be so generous.** David Barker was generous. I was generous. And look what happened. Yes, many people got to benefit by our technology. But in the process, people who had **nothing** to do with **the creation of that technology** got rich while Barker and I, who made it possible for them to market this technology in the first place, did not benefit. If **anyone** benefits from it, then **you too must benefit."**

There followed another half hour of talks ending with the preparation of an agreement between Taylor and Satellite America. Would the technology be 'shared' with others? The concensus was that it would, through sub-licensing agreements between Satellite America and other receiver suppliers.

**"What we have here, possibly, is the video equivalent of 'Dolby' "** suggested an observer. The problem is that 'Dolby' is able to extract licensing fees because of two reasons; one, they had good patent protection going in, and, two . . . they did an excellent job of promoting the name 'Dolby.' It is almost a synonymous term for 'audio noise reduction.' Those who came along later, with circuits that may function as well or even better, have had a tough time making any progress in the marketplace because **what** they offered was **not 'Dolby.'** Perhaps we can call this 'Taylor Video'?"

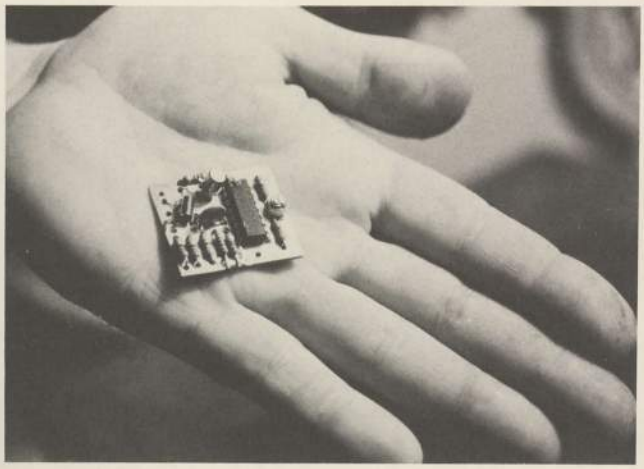
By Wednesday morning the story of **'Taylor Video'** had swept the remaining nooks and crannies of the Las Vegas show. Numerous manufacturers (AVCOM, Birdview, and many others) would all make tests.

Readers should remember that AVCOM sensitivity (to recover good looking pictures from weak signals) is legendary. If 'Taylor Video' would turn a Dexcel into an AVCOM, for example, there are substantial benefits to be derived for Dexcel. Obviously more extensive testing under more controlled conditions, is ahead. For now, that 'Taylor Video' improves many receivers, **some substantially,** is enough to know. That I may take a relatively low-cost receiver and turn it into 'extended threshold performance' is certainly a substantial increase in the industry's marketing opportunities.

**The 'Taylor Video' cirruit** is an IC device that attacks the primary shortcoming of the standard PLL demodulator circuit; the lack of 'linearity.' The best demodulator circuit in the world would be 'totally linear.' A standard PLL is not totally linear. It is not even close. Bob Taylor has designed his own highly linear phase locked loop using 'Quad Shottkey Microwave Diodes' in the mixer and a doubly balanced mixer circuit. The resulting, highly linear circuit, has a 'wide locking range.' That's important since modulation formats and signal levels presented to the receiver vary widely. Taylor has not necessarily discovered anything 'new.' He, like Ray Dolby, has simply concentrated on refining what was already known, and, dealt with the shortcomings of the existing demodulator circuits. He has applied the best of modern day parts-technology and engineering to improve the situation. Anymore that we might say about it at this point will run the risk of cutting seriously into the '90 day lead time' hoped for, and envisioned, by Satellite America's Mac Fedric.

Oh yes. It almost went unnoticed. But as Bob Taylor prepared to sign the agreement between himself and Satellite America, it was pointed out to Dave Fedric that the complete terminal, given away in a drawing in Anaheim in the fall of 1981, had been won by the gentleman preparing to sign the document. That terminal inspired Taylor to want to know more about TVROs, and their problems. Indirectly, it led to Taylor sitting in a suite at the Riviera Hotel in Las Vegas, 18 months later, selling to the man who donated the terminal that got him started some startling new technology.

Fedric. **"You cast your bread upon the waters . . ."**



**"BEFORE YOU photograph the board" suggested John Ramsey, "let me mark out the IC part number with this pen." Taylor holds up the board for view. It won't do you much good to blow this up 100 times; the numbers are gone!**

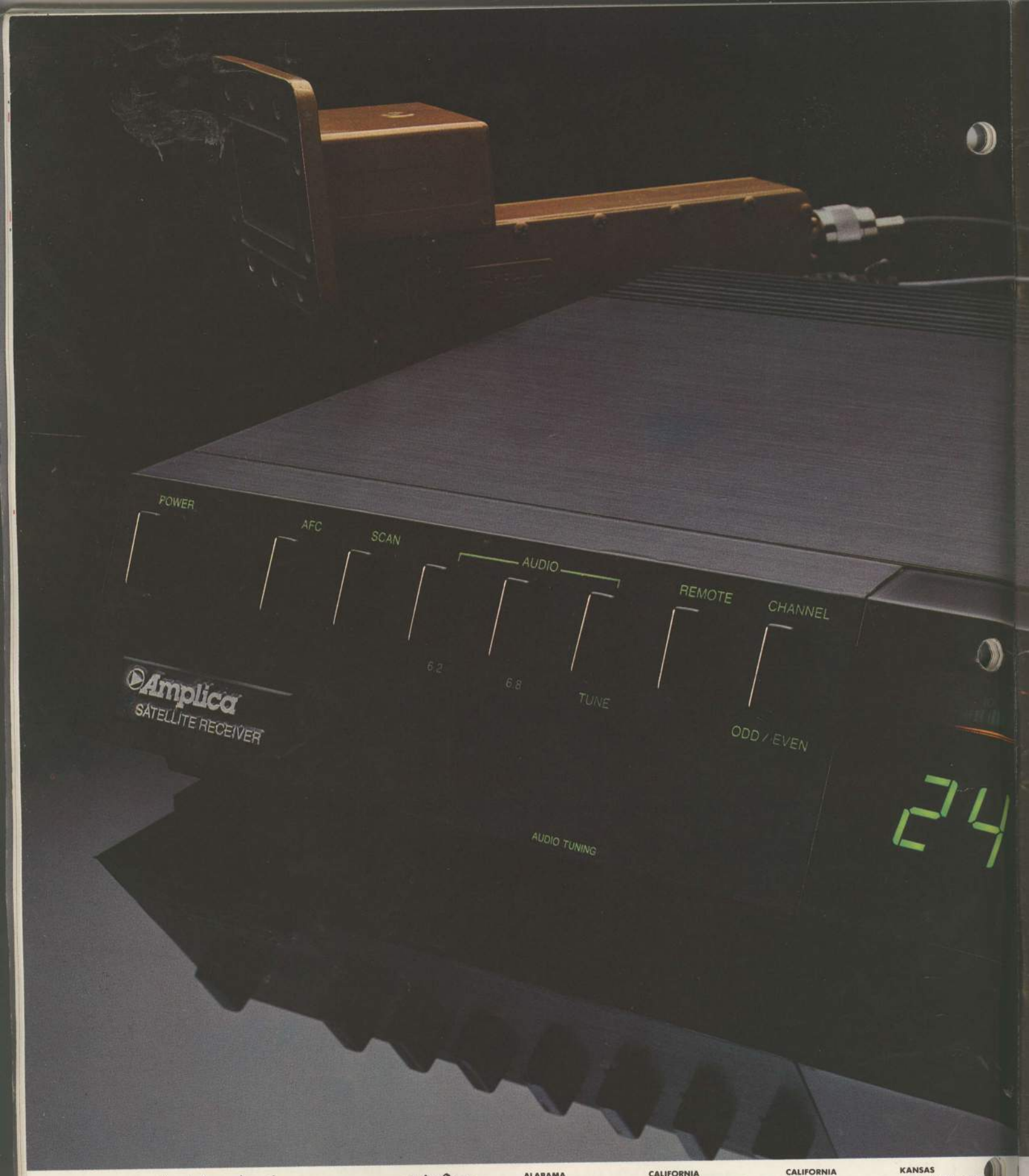
**COOP congratulates Bob Taylor for designing the** 'Taylor Video' **circuit, in front of his tiny four foot antenna display in Vegas. Yes, that is Norman Gillaspie on the far right!**

---

**ANOTHER African Inquiry**

I have been fortunate enough to obtain a copy of a booklet listing you as a source of information for TVRO systems. I am interested, local laws permitting, in importing and selling satellite TV systems. Our location is 28 degrees east and 26 degrees south. Is direct satellite reception of American services feasible from this location? What would such equipment cost? Prices should be quoted "C.I.P. Port of Johannesburg" and include information on the weight and size of crates. Our local TV system is a PAL format.

J.P. Levinsohn
Lumber Sales (Pty) Ltd.
P.O. Box 60035
Langlaagte 2103
Transvaal
Republic of South Africa




## And here's where you can get it first.

**ALABAMA**
Long's Electronics
2700 Crestwood Blvd
Birmingham, AL 35210
205/956-6767

**CALIFORNIA**
A Appliance Warehouse
900 Antelope
Red Bluff, CA 96080
916/529-0200

**CALIFORNIA**
Paradigm
6911 Eastside Road
Redding, CA 96001
916/244-9300

**KANSAS**
Mark IV Fiberglass
(Hawkeye)
15455 Metcalf
Stanley, KS 66223
800/255-0050

Use of this equipment, as part of a TVRO system may violate Section 605 of the Communications Act of 1934, as amended, through the unauthorized interception and divulgence of radio communications, or, the but not limited to construction, placement and use.

# ANOTHER FIRST.


## Introducing the RC-20.

The RC-20 is the first LNC satellite receiver system with infra-red remote, LED readout and detent tuning. It offers your customers a number of important advantages over other LNC systems. Including higher quality performance. Much easier installation because there are fewer parts. And all the popular features people want in a system. Which gives you much more to sell. And because the entire system comes from Amplica, you'll never have to send out to more than one place if it ever needs to be serviced.

### Our first first.

In 1975, Amplica introduced the first family of production GaAs Fet LNA's for satellite communications.

They revolutionized the industry by bringing amplifier costs way down and solid-state reliability way up.

Today, we're the largest supplier of GaAs Fet amplifiers to the consumer and commercial satellite TV marketplace.

**COMSAT**

### A strong support system.

In January 1982, Amplica joined forces with Comsat, the leader in global satellite communications. Our combined resources can provide you with component and systems knowledge unequalled in the satellite communications business. And with Comsat behind us, you can be sure we'll be behind you for a long time to come.

For complete specs and information about the RC-20 or any other Amplica product, just contact us at (805) 499-2621/22/23 • TWX 910-336-1291.

**See it at the Summer C.E.S. Booth 3600.**

**Amplica, Inc.**

950 LAWRENCE DRIVE, NEWBURY PARK, CA 91320
A COMSAT COMPANY

**YORK**
onal Satellite Comm
Plaza 7
Latham, NY 12110
800/833-4485

**OHIO**
Satellite Reception Systems
145 North Columbus Road
P.O. Box W
Athens, OH 45701
614/594-2524

**OREGON**
Wespercom Electronics
63393 Nels Anderson Road
P.O. Box 7226
Bend, OR 97708
503/389-0996

**TEXAS**
Starcom Satellite Systems
1009 Gregg Street
P.O. Box 1287
Big Spring, TX 79720
915/263-7512

**UTAH**
Satellite TV Specialists
5665 South State Street
Salt Lake City, UT 84107
801/262-8813

**WISCONSIN**
Amateur Electronics
4828 West Fond Du Lac Ave
Milwaukee, WI 53216
800/558-0411

**WISCONSIN**
Delta Satellite, Inc.
1003 Washington Street
Grafton, WI 53024
800/558-5582

use of radio communications for one's own benefit where there is no entitlement to its receipt. The customer is responsible for compliance with all local, state and federal government laws and regulations including

# Here's a special value from Comtech!

## Our 650 Model Satellite Video Receiver for only $995


Comtech has designed the 650 Receiver with the user in mind. Among its features are:

**A self contained LNA power supply**

**Remote control capability,** for channel selection from the comfort of your armchair.

**Digital channel select,** with an easy-to-read LED display.

**MGC/AGC switch, control and test point,** permitting you to align the antenna to insure optimum antenna positioning.

**D.C. Block,** for operation of a cable powered LNA, with external voltage for an LNA with a standard power cable.

**6.2/6.8 MHz PGM demod,** with optional demods that permit you to expand your capabilities.

If you want a top quality video receiver at this special low price, contact Jeannine Hillier at (602) 949-1155, or write to

**COMTECH Data Corporation**

*A SUBSIDIARY OF COMTECH TELECOMMUNICATIONS CORP.*

350 North Hayden Road Scottsdale, Arizona 85257

# NEW FROM DELTA

# STARDUSTER

## THE COMPLETE SYSTEM WITH A FULL 8 FT. DISH!

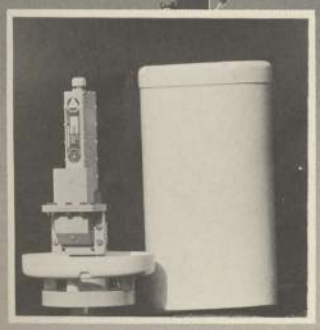
Common sense and good engineering combine to make Starduster among the most powerful 8 ft. receiving antennas available today! Unlike most 8 ft. antennas that really provide a 93 in. receiving diameter, Starduster provides a full 96 inches. Starduster's one piece spun aluminum deep dish construction reduces terrestrial interference, adds stability, shortens the focal point and assures you of a contour that meets exact standards.

### THE DISH

- Full 8' aluminum dish
- Aluminum LNA quad-pod
- .090 thick aluminum
- Full rolled edge for strength

### THE MOUNT

- Precision declination adjustment
- Extra wide 4 point dish support bracket
- Pin point tracking accuracy
- Heavy duty deck mount (optional)
- Apoxy powder paint virtually mar resistant
- 360° swivel action
- Heavy-duty steel
- Zinc plated screw jacks
- Full roller bearing operation
- Zinc plated hardware
- Neoprene spacers between mount and dish



**LNA ASSEMBLY**

- Made from rugged ABS plastic
- Plenty of room to mount down convertor
- End cap for easy service access
- Polarotor I Servo controlled polarity changer
- 120° low noise amplifier

### THE RECEIVER

- On/off power switch
- Video polarity switch
- Large signal strength meter
- Variable audio tune
- Channel select
- Modulator
- Video/audio output jacks
- RF output
- IF input

COMPLETE SYSTEM **$1099**

**CALL TOLL FREE 1-800-558-5582 / IN WI 1-414-375-1000**

**DELTA SATELLITE, INC./GRAFTON, WI 53024**

TLX: 26886/ANSBK: 26886 GRAF CABLE: DELTA SAT

WE SHIP ANYWHERE IN THE U.S. AND CANADA.

# LAS VEGAS SWINGS

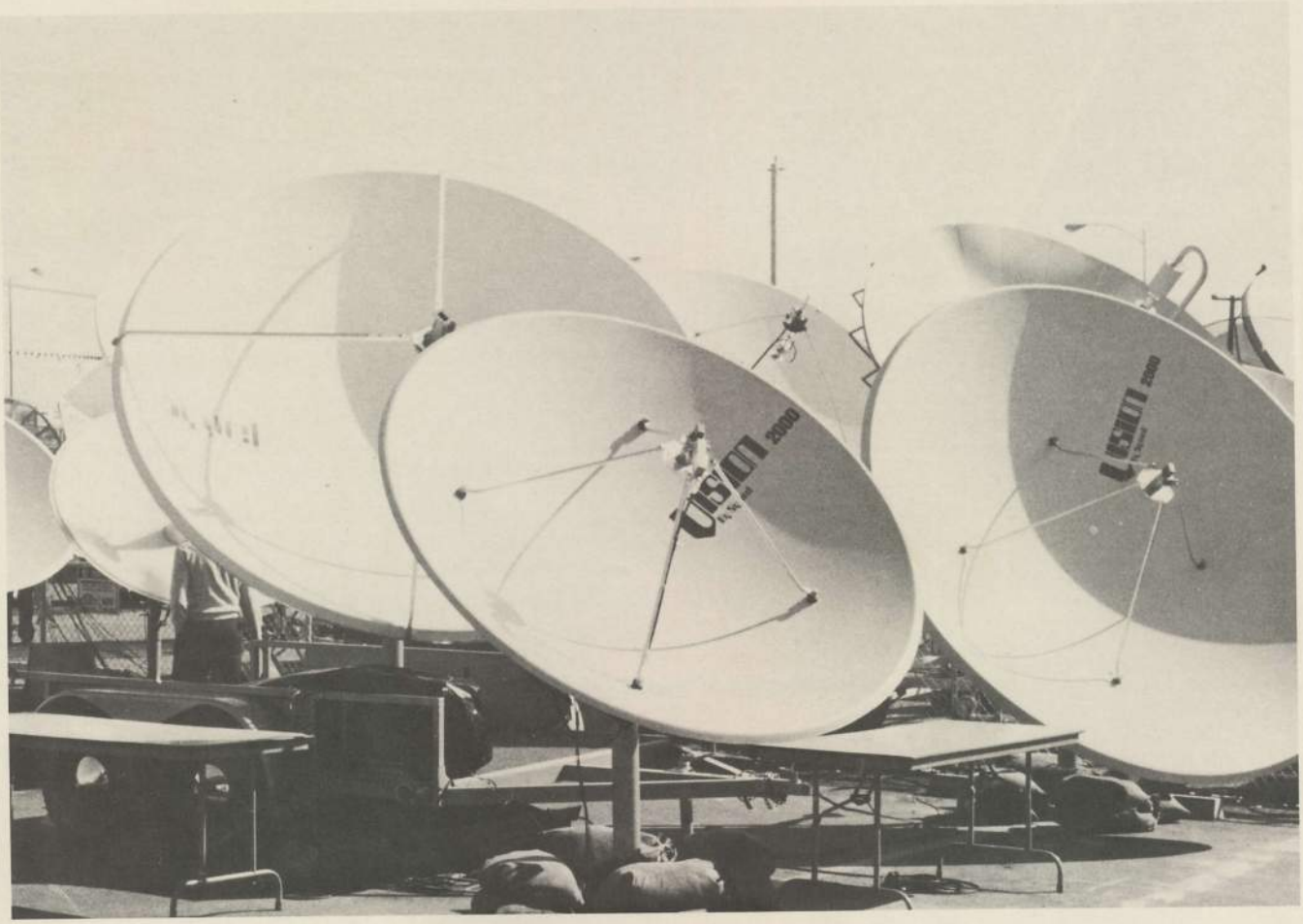
# THE INDUSTRY SWOONS

One hundred sixty four exhibitors . . . filling 260 booths or exhibit areas, plus the undisputed claim of the largest collection of home (and SMATV) antennas ever assembled in one place at one time. P.T. Barnum would have been proud. And right at home.

**The Las Vegas** STTI 'event' was a haven for hucksters. You could buy everything from six foot bird baths to little gadgets that modified your Alliance polarization rotors. You could lay down more than 8 grand for a three bird SMATV multiple feed spherical dish or you could lay down $5 for a wide selection of printed literature that promised you fame, wealth and the 'secrets' of home satellite TV. And if you somehow got through the seemingly endless array of booths and antennas and you still have a half dollar left, there were the ever obliging slot machines and crap tables. We worried in the March **CSD** that the industry might not be ready for 'Vegas.' Now we wonder, in retrospect, whether Vegas was ready for the satellite crowd.

The antenna lot was so big, and so cramped, that only a masochist would have attempted to count the dishes there. From almost any vantage point you could find they were virtually impossible to photograph with anything approaching a standard camera lens. So we didn't try. Overhead Winegard floated a helium filled derigible and if you wondered about the stunt pilot dragging the banner around overhead, you can forget about the guy in the plane. It was an oversized radio controlled model promoting a displayer.

Nobody, least of all STTI, seemed to have a handle on the number of attendees. If you took the official proogram alone, and counted the number of people associated just with the 260 booth/exhibit spaces,




you came to more than 700. If you added in wives and children you topped 1,000 with ease. And those were the personnel there to **sell.** On the buying side, a crowd topping 3,000 was easily evident but the constant ebb and flow of people and planes into and out of the Vegas (ever under construction) airport bringing one and two day attendees probably makes that number 50% low.

If your cab driver was the talkative type, he would tell you on the ride from the airport that the host hotel, the Riviera, was four months behind with $800,000 plus payments to a union (pension) fund that loaned them their latest infusion of cash. **"They are hurting"** he would go on "but there are others in worse shape here. The (name of hotel) laid off 1,200 employees just the other day. **This town is not in good shape."**

When money gets tight and hotels fall behind on their mortgage payments, a group such as the satellite groupies can get some good deals for a show. Clearly, STTI was pushing at the very outer edges of the capacity of the Riviera through the entire show. From the badly over crowded antenna lot to the 950 seat capacity meeting hall in use


**STEVE BIRKILL (left) dropped by for a couple of days from England. Steve is now situated in the west of England, near Wales, and preparing to take command of the European SMATV and home TVRO marketplace with a suitable line-up of equipment. Stories that Winegard had a spy camera in their dirigible could not be substantiated.**

the first day, it was 'elbow to elbow' everyplace. But nobody seemed to mind. This was, afterall, Las Vegas!

**News item.** KLM President Peter Dalton announces that his company shipped a record 2,600 plus satellite home receivers during the month of February. Dalton adds **"This tells us that there will be a booming spring and summer ahead for 1983."** To check this out you talk with as many manufacturers you can find. The mid-winter blahs . . . when all of the sales dry up and the manufacturer sits there waiting for his telephone to ring. Did it happen in 1983? Not at all.

Why, in 1983, is the market different than it was in 1982? Or 1981? Or way-way back, in 1980? What happened to the mid-winter slowdown?

Take a tractor and a drill, and punch a three foot deep, 6 inch diameter hole in the ground. With a sack or sack and a half of concrete, we have our 3-1/2" pipe in the ground. Throw in some calcium powder to speed up the drying process and you have a dish in and operating in a day; even when it is 20 or 30 degress outside.

**"People want satellite TV.** The price has dropped enough, and there has been enough publicity all over that they are no longer ready to wait. Our time is here. The waiting is all over."

If we managed to get through the winter without a slow down in system installations; if KLM **alone** shipped 2600 plus receivers in February, just what is the forecast for the industry for the upbeat, coming summer months?

**"Great.** If we aren't installing an honest 10,000 terminals per month as an industry by August, it won't be the fault of the sales department. We're ready!"

**"This is the damndest thing** I have ever seen and I have been in the retail business for thirty years. The product is in relatively short supply. The stuff you want you can't get, and the stuff you don't want you can't get either. Yet the prices keep dropping. You tell me how a man can have no hope of having surplus inventory for as far as he can see into the future, but he keeps dropping the prices. I simply do not understand it!"

**"I sold my first terminal 11 months ago.** This week, just before coming to Vegas, I installed my 74th terminal. All of this is in a single rural county in Colorado. I use direct mail to get leads and I saturate the area every month or so. I drive home that I guarantee satisfaction, that I warranty the complete system for a year, and that I deliver the best vlaue for the money. There are 13 orders waiting for me when I get home. I never leave a job without putting $1,000 in my own pocket after all expenses. This has been the greatest year of my life. A man can get hooked on this very quickly. If he just keeps his head about him, and stays connected to good quality products. The quickest thing that will kill you is junk. Stay away from junk!"

There was junk in Las Vegas. A lot of junk!.

**"Hey, did you see that antenna over there?** The brown one? Go talk to that guy about his polar mount. He thinks you align east and west with your elevation jack! He really believes that's how you do it. His whole antenna mount has been designed 90 degrees out of true and he wonders why it won't track!"

**"Go look at the plastic antenna.** No, I don't mean fiberglass. I mean plastic. The ribs are plastic. The hub is plastic. I leaned against it and a bubble on the screen surface popped out on the opposite side. Can you believe that? A plastic dish!"

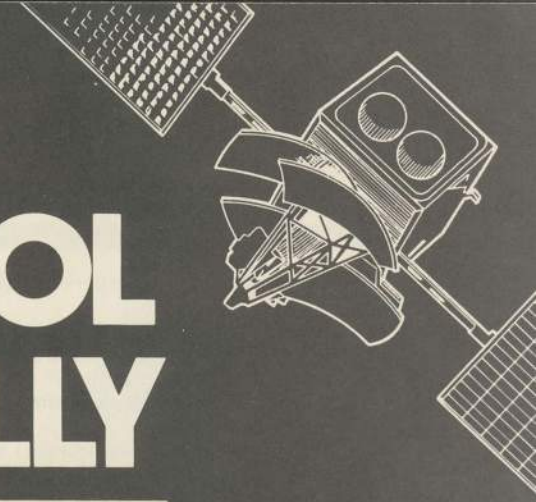
And there were people who have learned what works, and what does not work. And where the value has to be.

**"I could see it coming.** The hardware on the dish had to be impeccable. No rust. No bound up nuts and bolts. No friction from badly machined parts. So this model of our 8 footer has all Teflon surface to surface parts. The hardware is all stainless steel. The drive is acid bathed and zinc chromate primed. Then it is zinc plated. People are becoming aware that quality has to be in **every** part. Every single part or the dealer is going to get pushed out of business by warranty call backs. Yet we still can offer this 8 footer with the Polarotor II for $595 dealer cost. We'll be at a capacity to ship 2,000 of these per month by July" **(Steve Bland; Hoosier Electronics).**

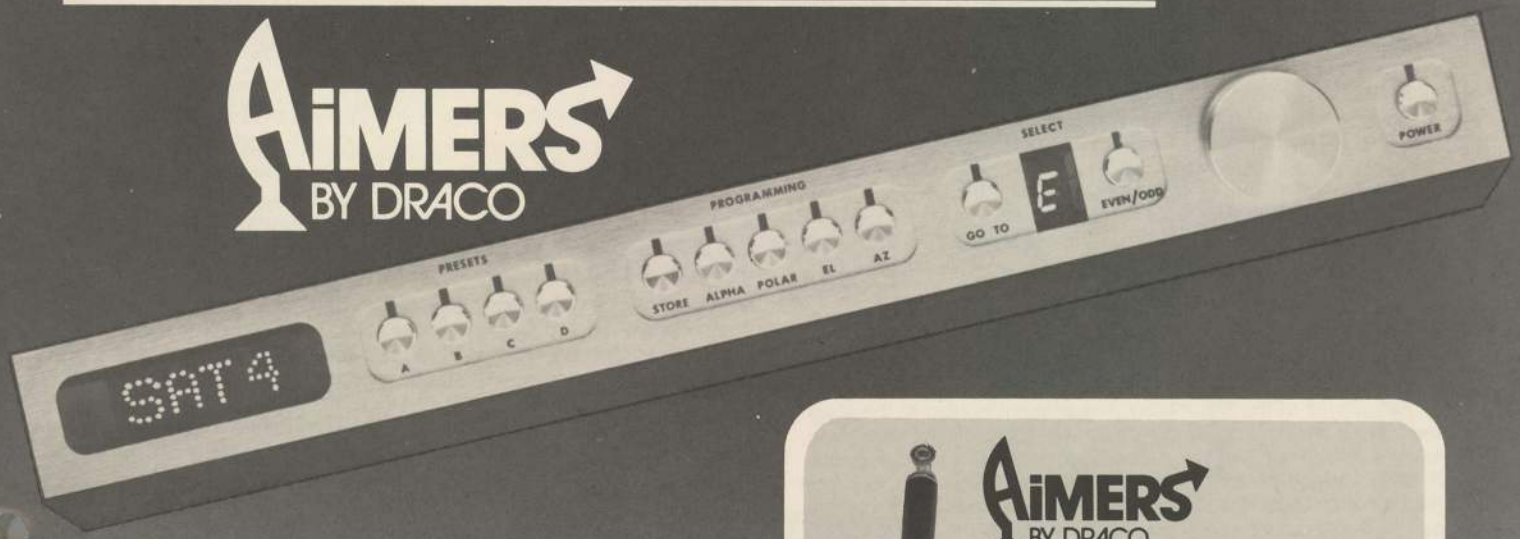
"Let me tell you what the hottest LNAs I've found are today. The California Amplifier 70 degree units are tops. They really do outperform the 80s from the other suppliers and the price is right. If I have a tough installation, I always specify the Cal Amp units. That's no

**SHOW/ continued page 22**

# DELTA OFFERS TOTAL CONTROL AUTOMATICALLY



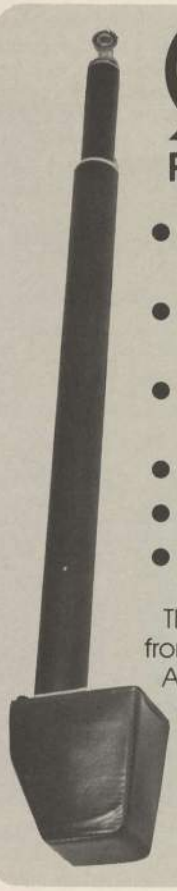
AIMERS BY DRACO




## AIMER III

Total control is the only way to describe the Draco Aimer. All satellite locations can be easily programmed. Items such as Alpha-Numeric read out, single control power and automatic thermal protection make Draco Aimers the best satellite locators you can own.

Simple to use - select a satellite, choose an even or odd transponder, push GO TO. The rest is automatic!



AIMERS BY DRACO

## POWER ACTUATOR

- Designed for Satellite Antenna use.
- Anodized aluminum tubes for corrosion prevention.
- Extra strong crush proof outer tube.
- Completely weather proof.
- Built-in Position Sensor
- Modular Construction

The Draco Actuator was designed from the very beginning for Satellite Antenna use. Years of experience with Satellite Dishes in the most severe operating environment, coupled with mechanical engineering, makes the Draco Actuator the best you can own.

| | |
|---|---|
| AIMER III CONTROLLER | **$399** |
| AIMER POWER ACTUATOR | **$250** |
| TOTAL SYSTEM PRICE | **$649** |

QUANTITY PRICING AVAILABLE

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WE SHIP ANYWHERE IN THE U.S. AND CANADA.

**SHOW/ continued from page 19**

testimonial, that's just hard learned experience" **(Ed Grotsky; Arunta Engineering).**

"Yes, we now offer a stainless steel option for our hardware. No question; there are areas wher the corrosive elements in the air attack the regular hardware. Even the plated stuff seems to get it in just a matter of months." **(Bob Behar; Hero Communications,** and, **Dave Johnson, Paradigm Mfg. Co.).**

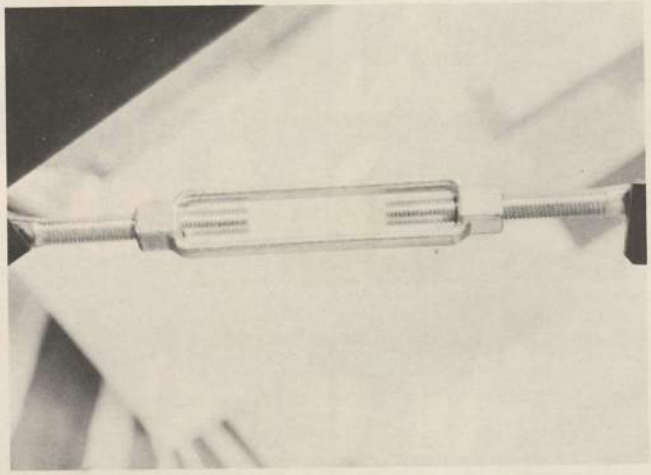
That satellite television was finally rising as a major new electronics industry in North America was plainly evident. Case in point. The elite **National Geographic Magazine,** working on and off on a feature on satellite communications in general for more than a year was finally wrapping up the topic at the Las Vegas show. A crew including feature writer and photographer (the same fellow who shot those breathtaking Mt. St. Helens before and after views) stuck it out for several days trying to understand the wealth of what they were facing. When would this off-handed recognition of what the industry is doing appear in print? "Not before very late this year" was the educated but by no means certain response. TIME, Inc. / HBO will love that when it happens.

**Trends.** If there was a 'show trend,' it had to be the emergence of the six foot dish format. Was it viable? You could walk all over the lot and see several dozen six footers hooked up and playing. The smart ones had pictures **at** the dishes, **and perhaps** inside as well. There is something about standing **next to** a small (six foot) dish and watching television from **that dish** that no amount of booth-hype can capture on the exhibit hall floor.

Virtually all of the major marketing efforts unveiled at the show were built upon the promise that six (or 7 or 8) foot dishes were going to open up tremendous new marketing opportunities for the dealers. Nobody seemed to have a clear handle on just what a six to 8 foot package might best retail for, installed, but the general view was that some will low ball for $1499 and others will go all the way to $2495. What was plain is that small dishes **are here,** the FCC's pending decision on satellite spacing not withstanding, and some brave souls might be tempted to try five and even four foot versions in the months ahead.

**"I used to worry** about whether a customer would accept a

**PIONEERS. If it passes all of the appropriate tests and editing desk approvals, the photograph being taken by this** National Geographic **photographer may end up worldwide one day soon. Those who started it all back at the first really commercial (Miami '80) SPTS SHOW . . .** Taylor Howard **(left),** Coop, Jamie Gowen **(ADM),** Royden Freeland **(International Crystal Mfg. Co.),** John Ramsey **(Sat-Tec),** Andy Hatfield **(AVCOM)** and Clyde Washburn **(Earth Terminals). The photographer mumbled that shooting Mt. St. Helens was more fun. Now-now. Let's have no puns about hot rocks.**



**STAINLESS hardware began to show up on some antennas; including this piece on Hoosier Electronics 8 foot dish. At least a few of the antenna suppliers are starting to get the message; if it can rust, get rid of it!**

system that didn't produce **totally clean** pictures on **all** of the F3R transponders" offered one system designer. "I don't worry anymore. They will. If you stop and analyze which ones are apt to be weak, and what those transponders carry for programming, the biggest loss is WTBS for most areas. So PTL, or CNN, are a little weak. So the weather channel is a little weak. CNN2 booms in all over and there is always SNC. How many people buy a terminal just because of PTL? Not many. And you can get all the information you need on The Weather Channel in just a few minutes time. So it is a little noisy. You aren't going to sit there for hours trying to watch a movie!"

**"Sure, we'd love to have** all 100 channels noise free on our six foot dish. But we have to be realistic. We also sell dishes up to 13 feet in size. There has to be some value in a person spending more money. He gets more channels, and he gets more noise free channels. Not even the cable system I subscribe to has perfect pictures on all channels. I understand that and if I want to watch the program on a less than perfect channel badly enough, I watch it, I don't complain. I think most people are that way. Give them a decent selection, say 30 plus, noise free channels, and they'll put up with some noise on the rest if they have to. Afterall, they also know that if they spend a thousand dollars more with us, they'll get even more pictures perfect. We can't all drive a Cadillac but we'd all like to have a car. It's just that simple."

We looked over as many of the operating six footers in the Riviera lot was we could. There were a few that stood out as clearly having squeezed the last fraction of a dB out of their systems. The **Arunta Engineering 'Sky King 6'** shown on our front cover this month was one of those top performers. We talked with Ed Grotsky about the product and the acceptance.

Arunta began hauling a six footer to shows about a year ago. Interest was slight if there at all. Arunta's Grotsky. **"We were premature.** We happened to have a good reason for the six footer in Phoenix; potential zoning problems. We saw early that if we had an antenna that stuck up so the neighbors could see it, and object, that we were going to have problems with local zoning ordinances. This forced me to look hard at every part of the system to see if there wasn't someway to compensate for a smaller sized aperture."

**Satellite America's Dave Fedric.** "The six footer makes more sense for the one man dealership than any other antenna. A fellow can load several complete systems in the back of his pick-up truck and head out in the morning. By dusk, if he is good, he has three installed, is back home with his family, and he has a thousand dollars or more in his pocket for his day's work. The six footer makes tremendous sense to us as a national distributor as well. We can ship hundreds and hundreds of complete terminal systems at a time in one truck. We have approached this almost like a delivery route problem. Our truck heads off with enough antennas for an entire sales distribution area, makes several stops a day dropping off product, and in a circular pattern ends up back at the distribution center. We can store more six

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footers in a warehouse you can stick on a small, corner commerical lot, **now,** than we used to store in a huge rail siding warehouse. The six footer makes it so much easier for everyone. This is the year of the small antenna!"

In all of this excitement over 'small' antennas, has caution been thrown to the winds? Let's review the progress to date.

1) **The size** of the antenna directly affects the amount of signal received from the satellite(s). Everyone knows what happens when you don't have enough signal from the antenna; the pictures become noisy and the sound starts to 'crackle.'
2) **An installer** can compensate for 'slightly' noisy pictures and sound by improving the quality of the electronics. A better (lower noise) LNA will help, for example, but the amount of improvement from a 100 degree LNA to an 80 degree LNA is not dramatic (around .23 dB in improved system noise temperature, best case).
3) **A system** designer can fiddle with the receiver proper to improve the 'apparent' quality of the (weaker) signals. The bandwidth of the receiver (IF) can be narrowed to improve the signal to noise ratio, but in this exchange there is some sacrifice in video 'quality.' The receiver can add some form of 'threshold extension' (see **"Bob Taylor's Video 'Dolby' "** in this issue) to expand the noise 'floor' of the system, but this also **can result** in some sacrifice in high resolution video.
4) **The efficiency** of the antenna (feed) can be improved upon, but unless the antenna designer is willing to modify the dish 'shape' to favor a modified cassegrain feed system (see **CSD** for April, page 24; Harris Delta Gain) merely adding a 'splash plate' or 'backfire' feed is **not** the ultimate answer to maximized antenna efficiency. Without modifying the dish shape, antenna efficiencies in the 65% region are possible. With modification of the dish surface shape, efficiencies in the 75% region are possible.
5) **No matter** what is done with the antenna's shape, and the cleverness of the design of the feed proper, there are 'elevation look angle' problems with a dish in the 6 (or 8 foot) class. As the satellites drop lower and lower towards the horizon, and the dish is forced to point lower and lower to find the bird(s), the antenna's feed system begins to receive 'earth noise' coming from the ground (trees, buildings, etc.) located out in front of the antenna. Even (most) of the ten-eleven foot antennas suffer 'earth noise degradation' at look angles in the 12/13 degree and under range. The smaller the antenna, the greater the 'earth noise problem.' The antenna designer can **improve** this situation by modifying the feed **and** dish shape (as Harris does with their Delta Gain) but the low look angle problem cannot be totally resolved by antenna re-design. All small dishes 'suffer' this degradation at lower look angles; some more than others (a function of feed design).

Pictures from six footers are hardly new. Coop demonstrated a working six foot system using a Prodelin terrestrial 4 GHz dish **in 1977.** Reasonably good quality pictures are, however, a new development.

Inspite of all of the claims made by the various hardware suppliers involved, the real reason we are seeing better pictures today on six footers than a couple of years ago is simply that we have more powerful satellites in the sky. Prior to F3R, W4/W5, F4 and ANIK D, six foot terminals (or even 7/8 foot terminals) were a curiosity of the backyard experimenter set. With the advent of new, and in some instances higher power, satellites, there has simply been more signal arriving on the ground for the terminal designers to work with. In its last days, the F1 bird (replaced by F3R in December of 1981) had very few true 5 watt output transponders left operating. W1, 2 and most of the present W3 transponders seldom if ever are run at their full '5 watt rating' by Western Union.

There is no way to identify **exactly** how much better the newer birds are than the older birds. But a 3 dB improvement, in bird power, is a good average on a transponder by transponder comparison. In some instances, the improvement is closer to 5 dB. This is hardly insignificant. In its most simplistic analysis, **when you put 3 dB more signal in the sky,** coming back to earth from the satellite, **you can take 3 dB out of the receive terminal** and still be where you started.

The easiest way to 'take 3 dB out' of the receive terminal is to reduce the size of the antenna. Let's see how that stacks up. A 70% efficient dish at 4 GHz has the following gain:

1) **10** foot size — **41.7** dB
2) **9** foot size — **40.3** dB
3) **8** foot size — **38.4** dB
4) **7** foot size — **37.0** dB
5) **6** foot size — **35.8** dB

Allowing for small variations (± .3 dB) this is what you have to work with when designing a 'system' to function with the existing satellites. First notice that the gain reduction between a 70% efficient ten footer (41.7 dB) and a 70% efficient 6 footer (35.8 dB) is hardly inconsequential; 5.9 dB (or 6 dB to round it off).

We know where we can find 3 of those dB, on the average. That's in the satellites themselves; remember, they are on the average (transponder for transponder) about 3 dB 'hotter' today than they were in 1981/early 1982. And, on the **most favored** transponders (3, 7, 11, 15, 19 and 23 on F3R; virtually all of the W4 transponders when compared to the older 2.5 watt nominal power level from the previous W1 bird at 99 west), we approach **5 dB more signal today** than 'before.' That is, before the newer birds.

If, in the average case, we can depend upon a 3 dB improvement over older birds, and we average 6 dB lower initial signal pickup with a six foot dish (versus a 10 foot dish), we have now narrowed our 'missing balance' to 3 dB (6 dB-3 dB = 3 dB). That much improvement is a feasible goal with the electronics itself. But it is not an 'easy 3 dB' to find.

If we narrow up the receiver IF bandwidth, we might find between 1 and 2 dB of the missing signal. We might. If we employ something such as the 'Taylor (Dolby) Video' discussed in this issue, we might find another dB or so of 'apparent' improvement. The improved LNAs will also help, but not dramatically.

When we get all done, we **could** stack up a 1981 vintage ten foot system against a 1983 vintage 6 foot system and find that a + 1 dB to -2 dB system to system comparison (with the 1981 vintage system receiving the **1981 vintage** satellite signals).

What does this really tell us about the six foot terminals?

1) **They will work.** But they are very much dependent upon getting maximum gain and maximum efficiencies out of **every part** of the system. A 55% efficient six foot antenna, for example, will have not 35.8 dB of gain but rather 34.0 dB of gain. That's a very important 1.8 dB!
2) **Low look angles** (eastern seaboard) will be more of a problem than with larger antennas, and antennas that attempt to 'shroud' the earth noise so it does not get into the antenna pattern (and contribute unwanted noise to the signals received) will be the next generation designs. **If.** If the six footers do well in the mid-west and east, and people find that they would do well in the east as well **IF** they could control the earth noise problem.

The six foot revolution is really one that demands better control of every part of the receiving system. This may seem to run counter to the 'cheap' six foot system approach since normally we find high quality performance only in the larger systems with better quality control for all system components. That's the real challenge here; to develop high quality everything at lower-quality ('world market') pricing.

If the industry's equipment designers can overcome this obstacle, not only will there be a viable 6 foot market but those who stay with the 'larger' antennas will benefit as well. Better electronics, at 'world market' lower pricing for six foot systems, will make the larger systems play with near studio quality pictures; something that just a few years ago required twenty foot antennas.

Just for drill, where might the six foot size go? Is that the end of the line?

Consider these numbers.

1) A 70% efficient . . .
   A) 5 footer will produce 34 dB of gain (the same as a **55%** efficient 6 footer);
   B) 4 footer will produce 32.5 dB of gain (the same as a **55%** efficient 5 footer).

Since we are only interested, here, in those antennas that have

been shaped and combined with feeds for maximum realizable efficiency, the 70% efficient version are respectively 1.8 dB (5 foot) and 3.3 dB (4 foot) **lower in gain than** our 'reference' six foot model. Those who witnessed the quality of the pictures on the Bob Taylor **four foot** system in Las Vegas know that at least on the most favored transponders (again, 3, 7, 11, 15, 19 and 23 on F3R, etc.) the pictures were **not** totally clean, but they were very good. That was with the 'Taylor Video' circuit, on a Dexcel receiver **(see page 6 here).**

The present generation of satellites is going to be with us for six to seven years. We cannot, therefore, count on additional 'bird power' to assist us in reducing the antenna size appreciably below the present 6 foot plateau. Too bad; that 3 to 5 dB was a big assist at no expense to us!

The incentive to get the size down to 6 feet antenna diameter has been two-pronged. First of all, smaller helps the marketing aspect. But once you reach the 'tiny' six foot size for 4 GHz terminal reception, would you really open up much of an **additional** market **if** you pushed and shoved to 5 feet or 4 feet? Probably not. If you would push to 2 feet? Yes, now you have something.

Second of all, the pricing plus the ease of transport. Six foot dishes stack up for transport. Hundreds will stack in the back of a pick-up truck. That's good. They can be 'crated' in sets of 25 or more and still be moved around with relative ease. They can be stored in a warehouse and not consume much space. A drop to five feet or even four feet won't change **that** picture appreciably.

Therefore logic suggests that the six foot evolution was a fortunate side effect of the new satellites with the greater available satellite power(s). It got the industry down to a terminal/dish size which met most of the marketing objectives. And it didn't tax the equipment designers too severely. Everyone made the transition without being pushed beyond the breaking point.

What remains is the inevitable 'shake out' that must follow every new plateau of industry development. Not all (in fact very few) of the present six foot antennas will produce the magic 70% efficiency. Those that hang down there in the 55% region will slowly but surely be sorted out in the marketplace, and they will fail. With some more pushing and shoving we can solve the earth noise problem provided the marketplace in the western 2/3rds of the country proves the viability of the six foot size. Those who try six footers in the east will find spotty results; adequate service in some installations, poor or unsatisfactory results in others. There is, surely, a giant 'learning curve' ahead for all participants.

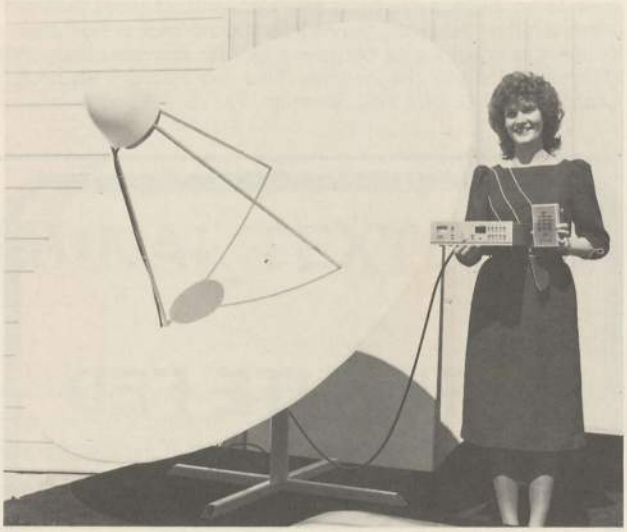
**ELSEWHERE in Vegas . . .**

Addressing the growing market for specialized communication receivers, **AVCOM of Virginia** introduced not one, two or three . . . but, six new receiver models at Las Vegas. The **COM-2A** and **2B** units are basically updated versions of the established COM-2 unit. Polarization control switching is available. The **COM-20T** is an extremely stable receiver that features a very unique down converter which is field adjustable to a single channel of operation. That concept is that if you are pulling off the bird narrow band audio, text or data signals, you need a receiver that refuses to drift. Unlike most of the home receivers and many of the commercial receivers which cannot be set, and forgotten, on a single transponder that does not have a video signal to AFC-lock to, the 20T says solid to perhaps 100 kHz. The **DATA-18** is a special receiver designed for Reuters and other video-formatted data transmissions. It is also designed to be 'drift-free' so the receiver can be put in, field adjusted one time, and forgotten. The **SCPC-24** has been designed to be the lowest cost single channel per carrier demodulator package available in the industry.NPR, Mutual, RKO, ABC and other radio network receive sites will find this a cost effective answer to narrow band audio reception problems. **Additionally,** the receiver is ideal for Intelsat transmissions where the audio may be transmitted on the high-'half' of a transponder, separate from the video, or, on another transponder altogether. Finally, the **SCPC-1000** is a receiver designed primarily for use with **Intelsat** systems that hide program audio or other narrow band audio transmissions away from the normal sub-carrier offset format.

**Arunta Engineering** displayed a series of new filters including a terrestrial interference model that traps out 60 or 80 MHz Bell or other microwave junk, an Intelsat format filter for one-half transponder reception, and a 'threshold extension filter' which they claim will help reduce sparklies on weak signals. All three filters operate at the standard 70 MHz IF and have standard F input and output connectors.

Those who may have noticed that polarization rotation systems have trouble following or tracking properly between the extremes of F3R and F4 now have an answer. The problem is this. A vertical signal is vertical at the bird, as it leaves and heads back to earth **only for** those systems that are **directly north of the bird.** That is, those locations that fall on the same longitude line as the bird itself. For locations east of the bird, the bird's vertical signal is shifted to the right (clockwise as seen by your feed, after reflecting off the reflector) and for locations west of the bird, the bird's vertical signal is shifted to the left (counter-clockwise as seen by your feed). Horizontal signals shift by the same amount in the same direction.

Polarization rotation systems that are tied directly to your receiver for automatic shifting to vertical, or horizontal, make the false assumption that all vertical signals are truly vertical, and all horizontal signals are truly horizontal, regardless of where the bird may be. **Professional Electronics** (2512 Lexington St., Kenner, La. 70062) has a solution for the OEM/ distributor or dealer who wants to insure that his customers have polarization tracking which stays properly pole-aligned no matter where the bird may be in the sky. They call it the **Polarizer-Driver Circuit** and it automatically corrects for 'skew' or non-vertical and non-horizontal polarized wave fronts as your dish moves and your polarization incoming wave-angle shifts across the sky. All you need is a receiver with a ±15 volt source, and, a polarization switching system.



**GLS/ Great Little System from Automation Techniques features single piece spun metal dish (on left!).**

**National Microtech** selected Vegas to unveil their new Q-1 receiver and downconverter. The unit has a separate downconverter and includes an audio signal strength meter as well as the normal video signal strength meter. The audio tunes through the sub-carrier range.

**Antenna Technology Corporation/ Video Electronics, Inc.** (3488 South Highland Drive, Las Vegas, Nv. 89109) brought the cost of multi-beam antennas down to the SMATV ballpark by showing a new 3 meter **Simulsat-3** model which is capable of simultaneous reception from virtually the full orbit arc. Equipped with feeds for three separate satellites (adaptations increase this number), the unit lists for $8,500 which certainly makes it compatible with three separate SMATV grade antennas without the hassle of three separate antenna pads, and foundations. Performance, they say, is equivalent to individual 3.5 meter antennas.

**California Amplifier** (3481 Old Conejo Rd., A3, Newbury Park, Ca. 91320) continues to baffle some of the competition because they are still turning out 70 degree range LNAs at a time when (according to the best LNA manufacturer gossip) "the exceedingly low noise GaAs-

FETS required for the extra low noise LNAs are virtually impossible to obtain delivery on from the established Japanese suppliers (NEC, Mitsubishi)." The story goes that there was a period, last fall, when LNA builders could get their hands on 50 to 60 degree GaAs-FET devices in quantity. Along about the end of November, this ample supply of high grade GaAs-FETs dried up. Various reasons were given or reported, including ". . . all of the really hot ones have been taken over for military work . . .," and, ". . . the GaAs-FET suppliers lost the 'formula' for making these ultra low noise devices . . .". Regardless of where the truth may be, California Amplifier continues to ship extremely high quality units according to field users and some of the competition is befuddled by it all.

**Automation Techniques** (1550 N. 105th E. Avenue, Tulsa, Ok. 74116), perhaps the least publicized of the 'major' producers of TVRO receivers, has expanded its product line to include complete systems. The GLR ("Great Little Receiver") series products are now joined by the 'GLS' (the 'S' stands for systems) which include 6, 7.5 and 9 foot one piece spun aluminum dishes and polar mount, a 'unique' feed and LNA plus polarizer package. Automation Techniques is one of the first US TVRO suppliers to move into Europe in an aggressive way and they may do more to shake up the established S/A type receiver suppliers who are planning to make Europe a big market for $3,000 plus price range **'receivers'** than anything else likely to happen in Europe this year.

If you have a bunch of systems out there using the older style polarization shifting system (the Alliance U-100 or Lance LC-100A TV antenna rotors), and you have noticed that the 'click to click' steps of these rotors is just too far 'between clicks' for accurate setting of the LNA/feed when you change birds, hear this. **Hopson Electronics Laboratory** (P.O. Box 774, Sherman, Tx. 75090) has an answer. Their **'Satellite Antenna Polarization Rotator Modification Package'** modifies the rotor quickly and simply so that rather than stepping in ten degree steps, the rotor now steps in 3.3 degree steps. This results in a total of 110 degrees of rotation from stop to stop rather than 360. They also provide a new decal for the front of the rotor, which helps your customers better understand the polarization shifting function of the system.

**The Winegard Company** has introduced a new home TVRO receiver; model SC-7032. The new unit includes a built-in LED indicator system for their (optional) motor drive unit so as you operate the dish drive the dish's position is automatically tracked for the user on the receiver front panel.

Finally, if the little things bother you, perhaps keeping all of those wires and cables neatly wrapped together as you head from dish to house and around the house is a source of agitation. **Teknasat** (P.O. Box 99070, Stockton, Ca. 95209) has one of those small aides that may make life easier for you; **'Kable Keepers.'** They have spiral-cut some ultra-violet resistant plastic into long spirals that have a similar look to Chinese Finger devices you used to play with as a kid. The concept is that you spiral-wrap a bunch of cables together at strategic intervals to keep them from wandering off in directions on their own. They make a neat installation possible, are quick to use, and can be unwound and re-used in just a few seconds time. Who says good things have to come in big pacjages!

**MINNEAPOLIS Ahead**

Less than eight weeks after you will be reading this report, the next STTI show will be open for business in Minneapolis, Minnesota (June 24-26).

# SATELLITE FED

# FM STEREO RE-BROADCASTING

**HEAR It**

While certainly the majority of the interest in satellite reception revolves around the video fare, one must not overlook that there is a substantial amount of other data/information and even entertainment on the satellites these days. Much of it is relatively inexpensive to acquire the use rights for and some of it is 'free' for private use anyhow.

Since we last visited this subject in some detail (way back in the summer of l980), the amount of radio networking available on satellite has exploded several thousand times over. On a regular basis, until the current bases are covered, we'll look at what is available to the **non-videophile,** and how you go about receiving these various 'hidden' or extra services.

There are two approaches to the non-video or entertainment services. One is that you acquire or build the necessary equipment to enjoy it on your own, privately, in your home. We'll look at that in subsequent portions of this series. The other is that you set out, by plan, to receive one or more of these services and then **share** them with as many of your 'neighbors' as possible. That's where we will start this exercise.

Since mid-February WIV-FM (stereo) has been operating on Providenciales. This is our first station for a planned three station network that will eventually 'blanket' our coral island chain with a minimum of a single stereo FM service channel. As the market grows, we plan to add additional FM service channels to cater to some of the smaller 'splinter audience groups' who may have musical tastes that differ from 'MOR' (Middle of The Road) offerings.

**COMING Down**

Most people are aware that several of the video transponders also carry one or more extra audio sub-carriers; and that these sub-carriers are programmed with music or other audible fare which has no relationship (on a program basis) with the television on that transponder. This is possible because a transponder has a bandwidth that exceeds the bandwidth that must be dedicated to television and its matching audio channel. The typical transponder needs only about 50% of the available 'spectrum space' to handle the video and program audio. In fact, that is one of the reasons why Intelsat gets away with squeezing **two** separate television program singles into a single transponder; half for each of two video carriers. That left over space represents a 'surplus inventory' situation for the company that leases the transponder from the satellite operator and like any good businessman the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**FM STEREO/ continued from page 26**

transponder operator wants to 'move' his surplus inventory.

There is, however, no such thing as a free lunch. That means that while the **space** is available to accommodate extra, additional, sub-carrier service channels, when you actually create and operate such additional channels, you must pay a price. That price is that each additional sub-carrier must have some 'power' to operate. Not the power that you plug into the wall to acquire, but the power which is available to the transponder itself up there on the satellite.

If a transponder, such as F3R (WGN) transponder 3, is rated by RCA at 8.5 watts 'saturated power output', that means that RCA has told the user (United Video) that no matter how many separate, discrete 'carriers' or sub-carriers United sends through transponder 3, the **total power available** to **all** of those carriers **is 8.5 watts.** If United sends one video carrier all by itself, with no audio; that video carrier can use all of the 8.5 watts. If United sends one video carrier plus a matching (program) audio carrier, that power must somehow be apportioned between the main (video) carrier and the program audio (sub) carrier. It turns out that as a general rule of thumb, .75 dB of the available power is lost to the video carrier each time a sub-carrier is added. That's worst case, but it represents a pretty accurate real world situation.

Since a video carrier is usually not worth much without a matching audio sub-carrier, virtually every transponder you tune in will be at least 0.75 dB weaker than its true stand-alone potential because there is at least one audio sub-carrier along for the ride. Now if you take the United/WGN transponder, which has not one but as many as six sub-carriers, you begin to see how the video carrier can get chopped down in strength pretty rapidly by the proliferation of audio sub-carriers added to the normal single (program) audio sub-carrier. It turns out that the example, WGN/United, is one of the strongest pure F3R transponders on board the bird so they can afford to 'give up' or 'lose' several dB to sub-carriers and still not fall below useful video threshold levels at most receive locations. WTBS, on the other hand, has never been particularly strong on F3R (at least not for the eastern 50% of the country and into the Caribbean/South America), so when they (recently) added a few extra sub-carriers, it really hurt an already not very pleasant situation.

Transponder renters make money by adding sub-carriers. They rent out these sub-carriers just as they rent our the main carrier. They don't charge as much for a sub-carrier as they do a main carrier, but they charge enough. Since the price they pay for the full transponder is fixed, and since their charges they make to video carrier users is for the most part regulated on a 'rate-of-return-basis' (the common carrier services are, at any rate), they can quite effectively 'slip in' some extra net revenues by charging for the sub-carriers on a separate basis. It is **similar to** the yellow page advertising by the telephone company; not nearly as regulated as the telephone service itself.

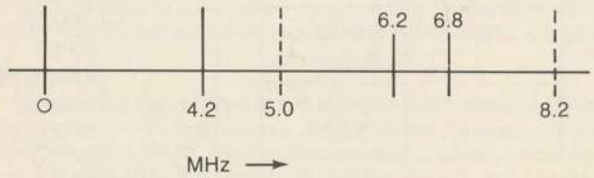
But what about the people who rent the sub-carriers? How do **they** make any money?

First of all, like the video carrier user, there is a service to sell. It may be an information service (news, stock reports, commodity reports) or it may be an entertainment service (all Jazz radio network, country and western radio network, all rock radio network, and so on). If you take the sub-carriers found on WGN at the present time, you find a wide range of musical tastes being catered to. In fact, the chances are you will find music here to fit almost every known musical taste that attracts 1% or more of the American population. And most of the true splinter group musical interests are now available on other transponders (such as, The Jazz Network, due up shortly on CBN/TR8). There is even an all-news **radio** service, created by CNN, on a sub-carrier of CNN-2 (TR15). Most of the bases are covered.

At the receiving end, we have customers that vary from cable systems taking (and we assume, paying for) music network feeds to pipe to their subscribers, to full FCC licensed broadcast stations who operate in a semi or fully automated mode. Such radio stations usually have an engineer who drops in every now and again to make sure the electronics is running correctly, a sales staff or one or more, and a local part-time announcer who integrates local commercial announcements and the required station identifications into the 24 hour musical network service fed to the station via satellite. Since most of the available services are transmitted in stereo, with the left hand channel audio on one sub-carrier and the right hand channel audio on a second sub-carrier (or some slightly more complicated/electronically multiplexed format), the local station affiliates have a first class, clean, stereo sound to distribute locally through a local (FM) broadcast transmitter.

The automation part works in a couple of ways.

In addition to the stereo music, on a pair of channels, the master NCR (network control room/center) location also transmits tones to the affiliates. These tones can be in the audible (hearing) range, in which case listeners hear the tones being transmitted, or they can be in a sub-audible format. A sub-audible tone is there alright, but it is typically 'below' the hearing range of the human ear, and/or the typical audio equipment so it is not actually heard by the ear. In either case, the tones are a signal to associated and inter-connected equipment at the local radio station to 'do something'. For example, perhaps the network stereo service is 'formatted' so that four times per hour a sub-audible tone is transmitted. That tone is received by the local stations receiving equipment and 'detected' electronically. The presence of the tone triggers a switching function in the station. That switching function in turn starts a cartridge tape machine or a reel to reel tape machine which inserts over the local transmitter a local station ID, a local commercial or some other message. The duration or length of the local message has been timed to the network's format so that when the network is ready to start transmitting music again, the local message is also over. A new tone comes along (or the first, sub-audible tone stops) and the station's electronics neatly switches




**AUDIO SUBCHARGERS ARE PLACED AT TOP END OF TRANSPONDER BASEBAND (T.C. 6.2, 6.8).**

back to the satellite feed. Without anyone being present to press any buttons or insert any local messages, the messages get on the air anyhow. Neatly, quickly, and efficiently.

The station simply 'stacks up' commercials on tape and during the course of a 24 hour day it runs through the proper pre-programmed taped commercials in sequence. The station 'sounds live' and the commercials run even though nobody may actually be in the station all day long. Ain't automation neat!

**And the satellite makes it possible** for hundreds or even thousands of stations to all be doing their own **'local** thing', plus all be carrying one single, **national** network feed, **all at the same time.**

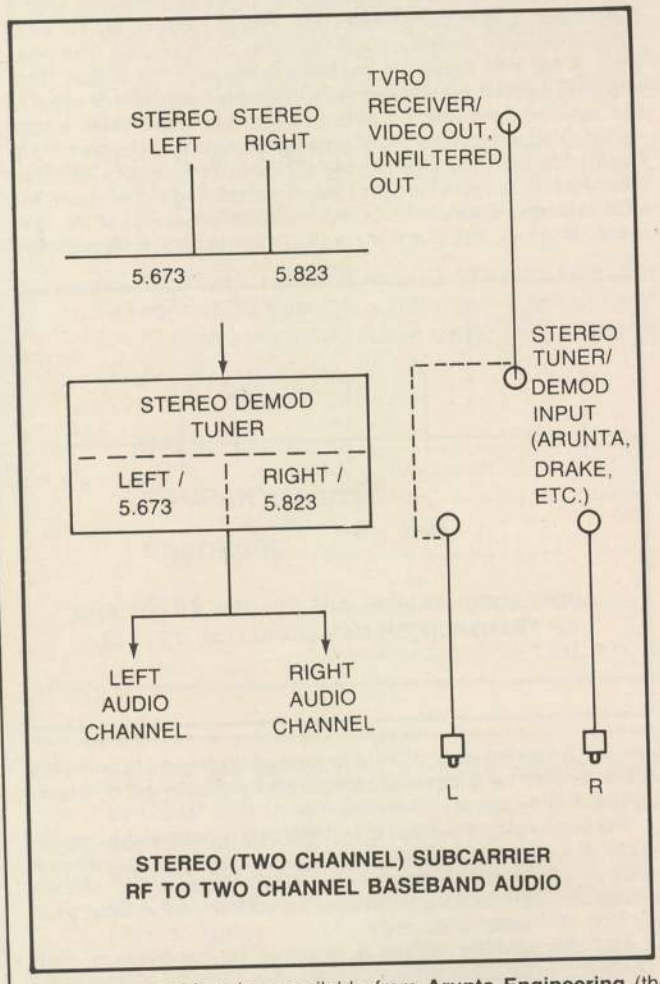
When we decided to put WIV-FM on the air, we were not sure what the local reaction might be. Our first problem was deciding which of the various musical services we would 'use' from the satellite. We finally selected one of the 'MOR' services feeling that it had been designed by people wise in the ways of radio demographics to have as broad an appeal as possible. When you are the first local radio service, and the first FM stereo service as well, you want to make as many people happy as possible.

Our second problem was how to configure the equipment. The total radio audience, nationwide, was going to be under 8,000. And that would require three separate transmitters, all inter-connected via some form of 'microwave' or link system. There is almost no limit to the amount of money you can spend on such equipment so the danger is that you get sucked into buying far more equipment, or far more complex equipment, than you need.

The satellite feed was already available; a ten foot Harris Delta Gain dish was in use on F3R at the Providenciales WIV transmitter 'Tower Plaza' location. Adding WGN to be able to 'extract' the appropriate audio sub-carrier was only a matter of adding an additional TVRO receiver.

The receiver chosen was an **AVCOM** COM2. This choice was predicated upon two factors; we had an extra one sitting on a shelf (that probably was enough reason all by itself!), and, we knew that Andy Hatfield of AVCOM was planning to introduce a highly stable single channel (field tuneable) down converter for that receiver line shortly. We'll visit the stability aspect of all of this shortly.

A standard TVRO receiver, in virtually any format, does not produce stereo reception of the sub-carriers (yes, there are some new receivers from Intersat and others that offer this feature but they were not available to us at the time the system was planned). There is,




**STEREO (TWO CHANNEL) SUBCARRIER RF TO TWO CHANNEL BASEBAND AUDIO**

however, an add-on box available from **Arunta Engineering** (the SSP-316/318) as well as a recently introduced similar 'box' from the **R.L. Drake Company** (model SA24 multi-mode Stereo Adapter). They function in this way.

If you go to your basic satellite receiver, you have one or possibly two outputs available which are carrying to you the various 'hidden' sub-carrier services. All receivers normally have a video output (a few do not, offering only re-modulated RF/modulator outputs). Many also have an 'unfiltered' or 'baseband' output as well. The sub-carriers are transmitted by the uplink higher-than the video carrier. They are typically found just below and just above the normal 6.8 (6.2) MHz TV program audio sub-carrier. To be able to tune them in with an adapter box such as the SSP316/318 or SA24, you have to plug into the satellite receiver at a point where these hidden carriers are available at 'full level'. If your receiver offers a 'baseband' or 'unfiltered' output, this is the place to jack into since these outputs have no internal-to-receiver 'filtering' in the line to attenuate or 'roll off' the hidden sub-carriers that appear above (**in frequency**) the video carrier. If your receiver neglected to offer these output 'spigots' you are not dead; only 'wounded'. The **video output** from the receiver also has these sub-carriers present, but if the video output stage has been designed properly, the sub-carriers found here will be considerably 'weaker' than they would have been had you been able to plug into a 'baseband' or 'unfiltered output' jack. Why? Simply because the video output, to insure that the video is not garbaged-up by any of the extra signals found inside the receiver, should have 'filtered' (as in attenuated or made weaker) all of the frequencies in the range where the sub-carriers are normally found. In our case, the COM2 had the appropriate output. And into that output we plugged our cable to connect into the input of the SSP-316 processor.

Now we are ready to go looking for stereo. If you happen to have a receiver with a tuneable audio section, and if your receiver is equipped with some form of 'wide' and 'narrow' switch, you have probably already discovered that you can tune in on your TV sound these extra sub-carriers. But your TVRO receiver can only tune in **one** of these sub-carriers at a time, so while you can hear the sub-carrier, you can only hear half of a full stereo service at a time; either the 'left hand channel', or, 'the right hand channel'.

With the SSP series or the SA24, you can now tune in both of these two, separate, channels on their typically two sub-carriers or in their 'multiplexed' (both channels on one basic sub-carrier) format. So you have one 'goes inta' (from the TVRO receiver to the stereo processor), and logically you have a pair of 'goes outa' (two channels of stereo music, going to an outboard system such as a stereo amplifier and speakers).

When you are going to rebroadcast that stereo music, you are now in the 'big leagues'. You may well connect that output to a stereo amplifier and speakers for **local** 'monitoring' but that will hardly serve the area around you; very far. The thing you need now is an FM (stereo) transmitter.

**An FM stereo transmitter,** operating in the normally-reserved-for-FM frequency band of 88 to 108 MHz is 'compatible' with everything from $9.95 Radio Shack hand held FM receivers to the fanciest FM tuner/receivers available. Now what is an FM stereo transmitter?

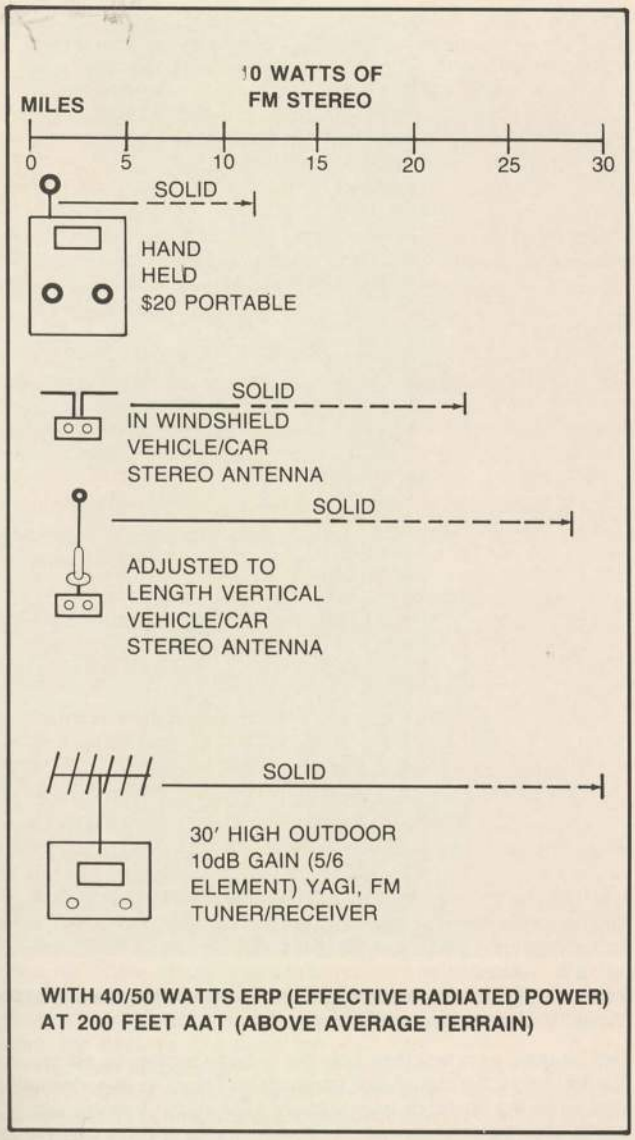
Basically, it is a modulator, and an amplifier. You are familiar with modulators because you have one or more to turn your TVRO video and audio signals into something you can tune in on a standard TV channel. A FM stereo modulator is no different than a TV modulator; except of course it is modulated not by a separate video and audio signal on a TV channel, but rather it is modulated by two separate audio channels in the FM broadcast band. The amplifier portion is simply a power booster; something that will allow you to increase the power of the modulator so you can drive down the road and still hear the FM stereo service on your car FM radio.

The FM transmitter field is a little forboding at the moment. This is another, tactful way of saying "It needs a Keith Anderson, or a John Ramsey" to bring the prices down! WIV spent the better part of the year researching the available transmitter packages. We even considered buying one or more old, as in surplus and being retired from service, 'exciters' one finds advertised in the back pages of **Broadcast Engineering/Management** magazine or **Broadcasting Magazine.** There are probably some 'bargains' here in the under $1,000 class; but they are often 'tube-type' exciters and that spells no end to problems with maintenance plus they require extra amounts of AC power to operate.

**An exciter?**

Every transmitter starts off with a relatively low power stage. The modulator, like your VCR or home TVRO modulator, does the hard work. It creates the twin channels of music, on a precise frequency (such as 92.5 MHz). If it is a good piece of equipment, it gives you sufficient operator controls that you can adjust to about any type of operating environment. And it has built-in protection circuits so that you won't harm the transmitter/exciter unit by doing something dumb. (Dumb can be defined as turning on the transmitter but forgetting to attach the output of the transmitter to an antenna!)

**After the modulator proper,** the package has a few stages of power amplification. That takes the perhaps 1/100th of a watt modulator signal and boosts it to perhaps 1/2 watt in one stage, and then to 10




watts in a second stage. **This package,** with ten watts of stereo output, is called an 'exciter'. In the broadcast world, an exciter is designed to 'drive' or 'excite' a larger and more powerful amplifier or chain of amplifiers. To get to 100,000 watts of radiated power, it all starts off with a small exciter. **WIV only needed an exciter.** A ten watt transmitter was, we calculated, all we needed to provide island wide or perhaps two or three island-wide service.

There are many of the ten watt 'exciters' around. Since they do the hard work of creating 'clean stereo' (you can have problems with noisy stereo because of a poorly designed exciter, just like you can have problems with noisy television because of a poorly designed modulator), they are not cheap. Not at the moment anyhow (come on John and Keith!).

For sometime we had been talking with Arunta's Ed Grotsky about his plans to build a relatively low-cost stereo modulator. Grotsky cared not very much about the 'market' for FM stereo **exciters,** but he was interested in what he thought might be a market for a stereo modulator which SMATV systems could use. Since he already had on the market the SSP series of stereo FM processors (with which you get the input to drive a modulator; two, hopefully clean, stereo audio channels), the FM stereo modulator seemed like the next step to Ed. That product is still on the drawing boards but we mention it here because if there are those who see a need for such a product, a word or two to Grotsky might get it off the back burner.

There are commercial FM stereo modulators, for cable, available. CATEL is one brand name. They run you about $1,000 or so per FM 'channel' but you are still in the modulator class at this point. An exciter is not what you have. It is still in the under 1/100th of a watt (closer to 1/1000th of a watt) region. So finding a suitable FM stereo, cable modulator is not exactly the answer to all of your equipment problems. You will still need to boost the modulator power high enough to get you into the 'over-the-air' mode.

Once you have the exciter nailed down, the only thing left between you and beautiful music in your car is a transmitting antenna. Once again, you can spend far more money than you need to by simply not following good common sense.

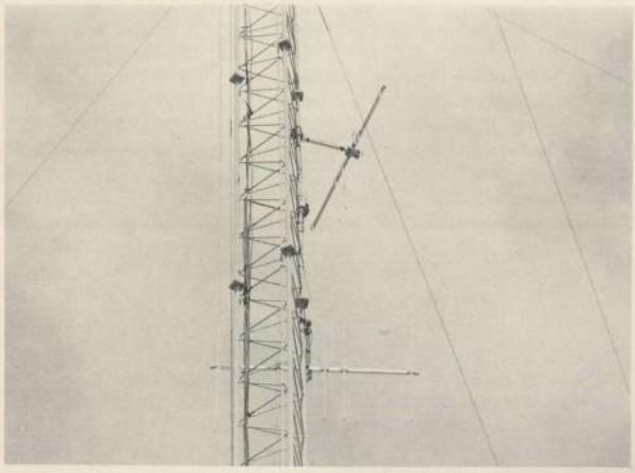
FM band broadcast antennas, even for the little (FCC licensed) ten watt educational FM band stations, are in the $1200 up class. In our case, that seemed like a terrible case of overkill. Our WIV Tower Plaza location is in approximately mid-island. We have about 8 miles of populated island to the west, another 8 to the northeast. Beyond that eight to the northeast is an open expanse of water, and then 14 miles away another island with people on it. Still further, some 22 miles out, is yet another island with yet more people.

So we spent $150 and bought a pair of Jerrold J55-FM yagi antennas. These are MATV type yagis which you can find at virtually any Jerrold distributor. They have a common 'F' fitting on them so you can go directly into the antennas with standard cables and connectors.

One antenna we pointed west, vertically polarized to favor hand held/whip antenna portables and car radio antennas. The second we pointed northeast; also vertically polarized. We could have used four antennas (two vertically polarized, two horizontally polarized) had we wanted to cover both local (vertical) and distant (horizontal, to rooftop outdoor antennas) receivers. Using CATV type 75 ohm (.412) aluminum jacketed cable, we ran 140 feet of cable from the output of the FM exciter/transmitter to a two-way hybrid, outdoor Jerrold (STC-3) line splitter. That divided our power into the twin, identical, J55 antennas.

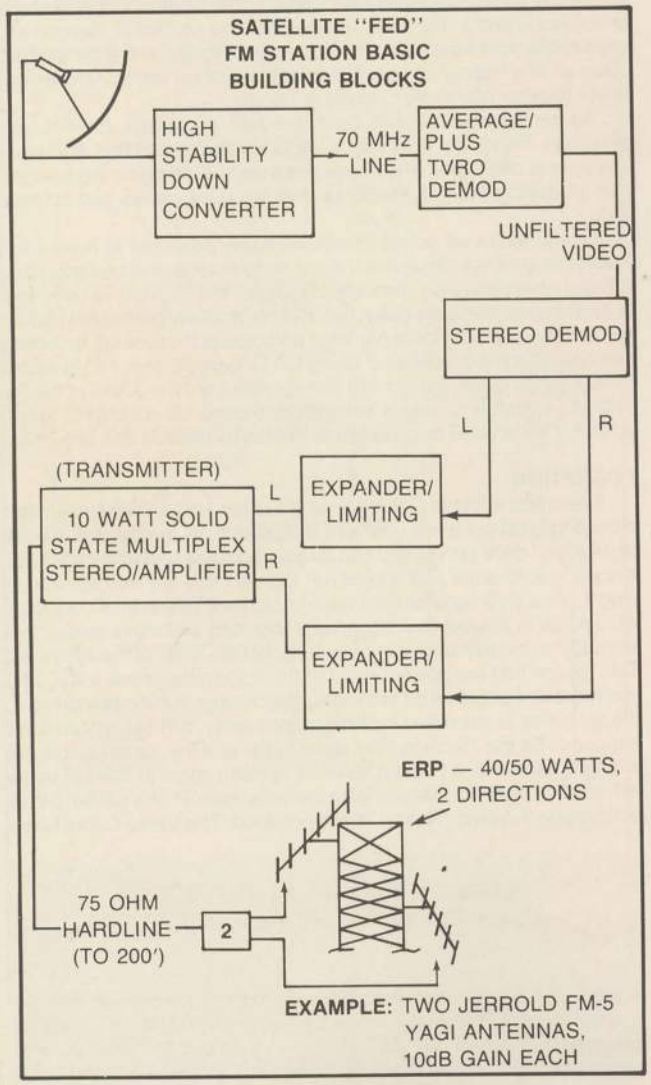
**OPERATION**

Setup on the Versa Count Model V422 ten watt exciter/transmitter proved to be about a two hour job. Not difficult, as the manual is quite helpful, and once set up, you can forget about this part of the package since it is solid-state and should run forever. You are well advised to plug it into a Sola constant voltage transformer, however, if your local AC service is subject to voltage variations and switching spikes. We worried that the transmitter might not accept the 'load' of the J55 yagis. This means that the power output of the transmitter is ten watts, and you hope and pray that all ten watts, after losses in the cable going to the antennas, is 'accepted by' the antenna array. If the antennas don't happen to be the 75 ohms they claim to be, or if the transmitter is not willing to 'load into' a 75 ohm antenna system, some of that ten watts will 'bounce' right back at you from the antennas. That is called 'SWR' or Standing Wave(s) (Ratio). That's not good. The Versa Count has a



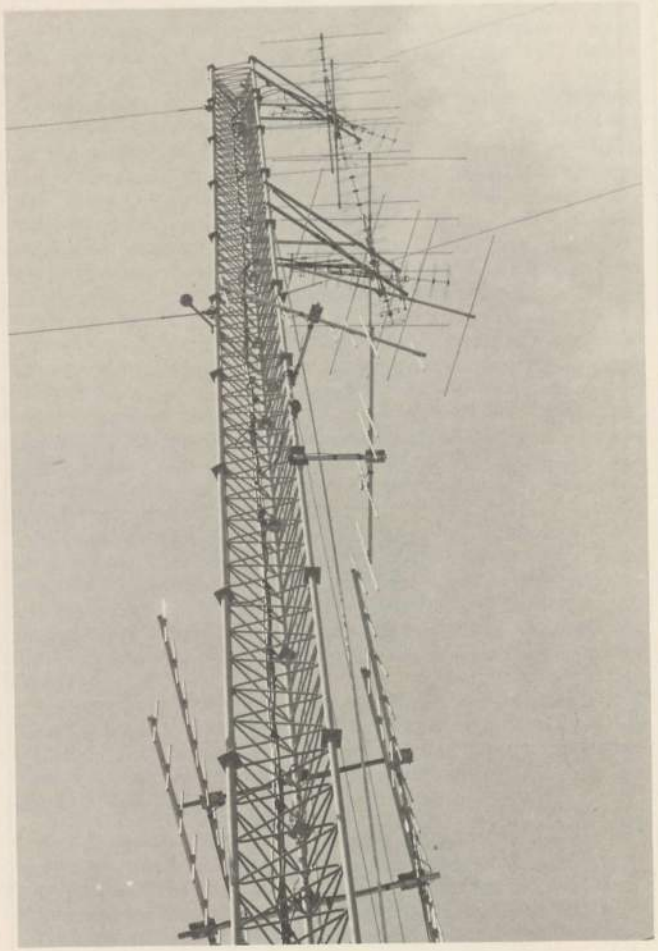
**PAIR of J55 antennas just above 100 foot level on WIV's multi-purpose tower. Antennas are vertically polarized to favor portable and auto FM sets.**

built in metering system that allows you to switch and monitor just about every function and stage in the transmitter; from the low power modulator right through to the amount of stereo music modulation on each of the two channels. Plus, it allows you to set the meter to read forward power (ten watts) and 'reflected power'. The reflected power is the ouch part. If you have some, they have very cleverly given you an internal adjustmen to tweek upon to reduce the reflected power to a safe level. This is pretty standard in two-way radio (VHF and UHF) transmitters but it is not found that often in 'commercial broadcast' gear. Somebody at Versa Count was thinking. When we first checked the 'reflected' power we had about 1 watt coming back from the antennas. That was well within the safe 'limit' established by the manual (3 watts) but by tweeking on the 'matching network' control we quickly brought it down to 0 watts reflected. That's better. All ten watts




was now being accepted by the transmission antennas.

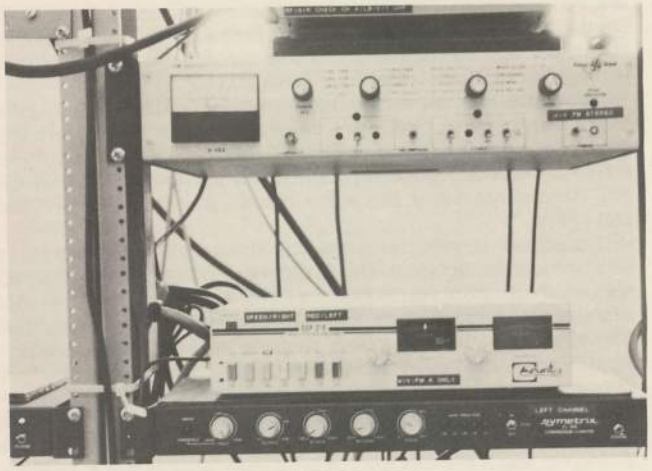
Part of the set-up exercise covered by the Versa Count manual involves adjusting the incoming audio stereo channel levels to a prescribed amount of 'modulation' as referenced on the front panel metering. You can do this with an outboard audio signal generator (essentially, an audio test set that gives you known amounts of audio signal, a tone, on precise frequencies), but that hardly helps if after you do this you plug into the output of the SSP or SA24 units and now have a brand new and largely unknown amount of audio to feed into the transmitter. The satellite folks typically transmit a 1,000 cycle tone a couple of times per hour, for about two minutes time. They do this to 'hold the channel' open while the local stations have automatically 'switched away' for their local announcements. This tone, it turns out,



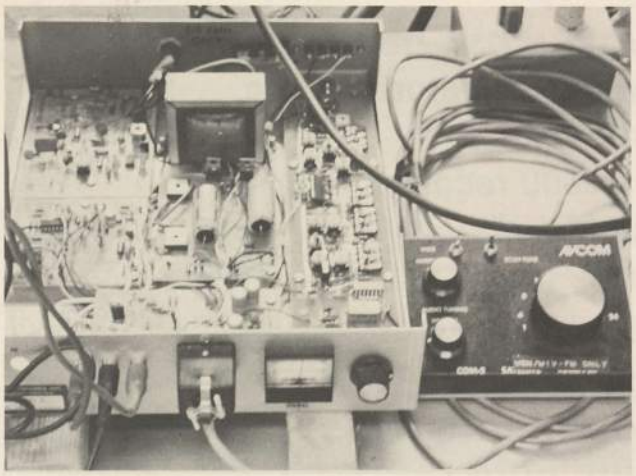
**TOP 50 FEET of WIV tower loaded with transmitting antennas for three TV channels, one FM channel.**

can be used as a test tone from the satellite system to set up your transmitter/exciter modulation parameters. This is an important exercise since the sound or quality of your FM stereo transmission depends upon the care you exercise in initially setting up the transmitter.

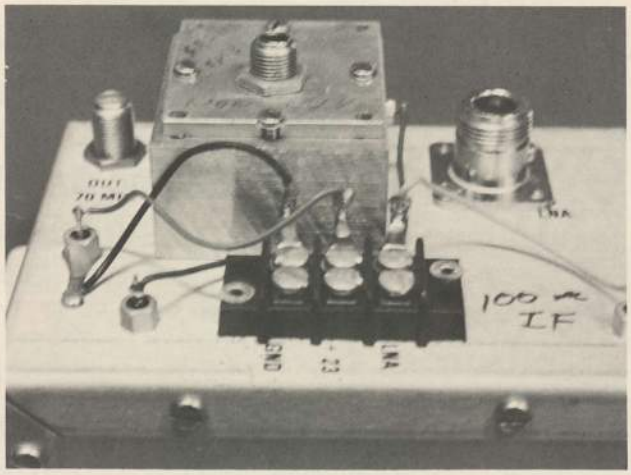
Once you have done all of this, all that initially remains is for you to get into your car and see how far you can go and hear your signal in full quieting, beautiful, stereo. We ran out of road in both directions.



**VIRTUALLY COMPLETE FM station . . . Versa Count V422 10 watt solid state exciter, Arunta SP-316 stereo processor.**



**COM-2 RECEIVER runs with cover off for improved ventilation and improved stability. (Top of case was subsequently modified to allow air flow.)**



**COM20T down converter prototype in use at WIV-FM has mechanical tuning block on top; transponder is set to a single channel at down converter and left alone.**

Undaunted, we grabbed a $16.95 Radio Shack hand held FM portable and set out in a boat towards the next island over. When we got there, we still had full quieting FM. Since these $16.95 portables are about as cheap as anything anyone is ever likely to use for serious listening, we decided our ten watt service, split into two directions, was doing just fine.

**SET and Forget?**

The integration of local commercial announcements aside (a subject we'll leave to a later date), the next question becomes simply 'what do you have to do to keep it running'?In our case, we had plenty of learning ahead.

After about four hours of enjoyable music we started to notice some noise creeping into the reception. Running back to the transmitter, we found that our COM2 receiver had 'drifted' enough that we were no longer properly tuned for noise free reception. We also noticed that we had placed the COM2 on a shelf where the afternoon sun was beating on it without mercy. We moved it to a lower shelf and out of the sun.

This time we got perhaps 15 hours of service before we had to retune the COM2. Since the whole concept was to have a system that ran, forever we hoped, **without attention,** this was clearly not going to be a satisfactory situation.

The drift, which could be compensated for with the COM2 manual tuning control, **could be** happening in the receiver proper or it could be in the down converter (mounted in a box at the dish). We felt certain it was the down converter since typical home TVRO receivers of any brand are not known for their **long term** stability. (That doesn't bother you as a home viewer; you change the channels or transponders frequently anyhow. And the 'short term' stability is good enough that you don't have to retune while watching a program. But for set once and forget it use, there are problems.)

**Andy Hatfield offered a solution.** He was just finishing the design on his new COM20T down converter package. It is field adjusted to a single transponder with a mechanical tuning slug and Andy promised us it would stay within 100 kHz of the set-to frequency. We tried one out.

For the first four days, we were in heaven. The system stayed almost totally rock stable except for some minor wanderings that we traced to heat build up in the demodulator proper (which we solved by taking the tightly encircling top off of the COM2 demodulator). Then the down converter suddenly jumped, a half transponder or more, and we were back to ground zero. This one apparently was a malfunction in the down converter itself, and not a product 'drift' function. That it ran four days, through sun up and sun down conditions and didn't need attention, had proven to us that the COM20T was indeed a very stable machine. Not having to run to the transmitter a couple times per day to touch up the receiver tuning was certainly appreciated.

**NOISE Free?**

When you tune your TVRO receiver to a sub-carrier channel and listen in the 'narrow band' position on your TV set to the sub-carrier sound, it may well sound noise-free to you. But, when you take that same audio and send it into a stereo system that is designed to reproduce the full audio spectrum (say 20 Hz to 20,000 Hz), you will probably discover that you have some 'noise' in your sub-carrier audio. Unless you have a very healthy main carrier signal to begin with.

We did not have that much signal available even though our WGN signal was hanging on the very edge of sparklies (but just above noise) on the Harris Delta-Gain dish. What sounded clean on the **TV set speaker** had hiss and some noise on the **stereo system.** There is only one answer here; more signal to begin with.

With that in mind we are in the process of installing a planned for (FM aside) 20 foot antenna for F3R, at the Tower Plaza site, and with the additional 6 dB or so this antenna will produce on WGN, we'll have noise-margin to burn.

One way around this with a marginal system is to use the DNR (dynamic noise reduction) button/circuit on the SSP processor. That cuts out the high frequency noise, but unfortunately it also cuts down the high frequency musical offerings. It, in effect, gets you no noise but in the trade off you go from 'hi' fi to 'lo' fi. Not a good trade.

**COSTS and Payback**

The Versa Count transmitter from Continental Wholesale Electronics (Frank Mestre at 305/822-1421) will set you back about $3500. Not cheap. The stereo processor and FM (J55) transmitting antennas will cost you another $500 or so. With a 'surplus' TVRO receiver and feed around, you can be on the air for not much over $4,000.

If you are outside of the United States (or inside and don't get caught doing it!), you may be able to sell one commercial message per hour for $5 each. If you sold 50% of your 'availabilities', or twelve per day, you'd have a gross income of 12 x $5 or $60. That works out to $1800 per month which works out to $21,600 per year. Against a $4,000 investment. You should be contracting with the folks who provide you with the satellite service as well of course, and you can count on giving up about ten percent of that gross income to them. Try hiring disc jockeys and supplying them with records for anything approaching that! And, the automated station equipment to insert the commercials will typically set you back about as much as the rest of the gear. It still looks like a good deal!

**AHEAD . . .**

We'll look at the many other forms of non-video information available on the satellites, and explore how you can either show your customers how they can get additional enjoyment from their satellite systems, or create some new, additional, income sources for yourself.

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501-673-3575

**CALIFORNIA**
Hopson Labs West
209-952-8762
415-697-9008

**COLORADO**
**WYOMING**
**UTAH**
Electro-Tec
1-800-525-0173

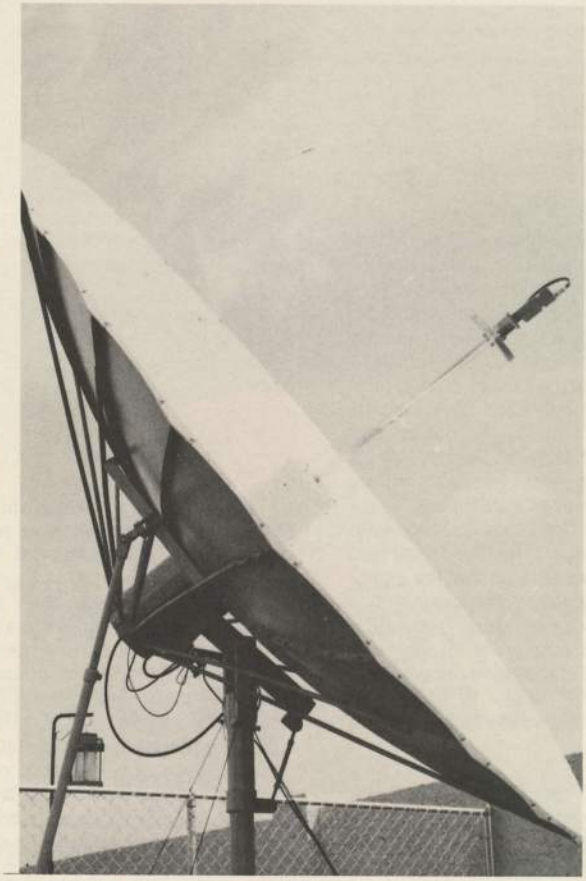
**FLORIDA**
Total Video
1-800-841-8506

**NORTH DAKOTA**
Dean Messner
701-223-6907

**SOUTH DAKOTA**
Halvorson-Long
605-263-3864

**KANSAS**
Kansas Wholesale Ant.
316-943-0712
Commodity Markets
316-225-0505

**10½-Ft. Hastings Prim Feed**



| 1 Monthly | 3 Month | 10 Lot | 100 Lot |
|---|---|---|---|
| $759 | $695 | $667 | $639 |

**VIRGINIA**
**NORTH CAROLINA**
**SOUTH CAROLINA**
**WEST VIRGINIA**
World-Sat
800-446-9828

**IOWA**
Meyersons Dist.
402-463-3145

**GEORGIA**
Total Video
1-800-841-8506

**Stocking Distributors**

**WASHINGTON**
**IDAHO**
Dickson Radio
509-738-2375

**MICHIGAN**
Jarry's Antenna
313-982-6852

**MINNESOTA**
**WISCONSIN**
H Communications
715-392-2543

**ARIZONA**
Satellite Store
602-939-7410

**MISSOURI**
Demint Radio
314-374-7586

**NEBRASKA**
AZC-TEC
308-848-2285
Meyerson-Dist.
402-463-3145

**NEW YORK**
**OHIO**
**PENNSYLVANIA**
Cornell Energy Systems
216-881-3535

**TEXAS**
Hopson-Lab
214-892-0116

**PAN HANDLE**
Sat-Cable
806-372-1401

# HASTINGS ANTENNA/MARKETING

**847 West 1st • 800-228-4007 • Hastings, Nebraska 68901**

# INDUSTRY AT LARGE

## CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

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### WHOLESALE ON TV?

Enclosed is a letter which I mailed to Don C. Adamson of the satellite distributed **Sat-Scene Magazine** program, after talking with him in Vegas. I'd appreciate knowing what Coop thinks of this. The letter follows:

'I enjoy the 30 minute Sat-Scene show each week. But I am unhappy with the wholesale prices that are aired as commercials within the program. As a retail dealer, it makes my job very hard when the general public at large sees low-ball prices on the television program but lacks the knowledge to understand the difference between poor and good systems. Our company would like to see the prices taken off the air and then given out only to those qualified buyers who supply their tax exempt number, a business card or at least a letterhead. People buying systems over the air, with no installation experience, often end up with systems that do not produce good results. This word quickly spreads and hurts the whole industry; as opposed to those who purchase from competent retailers with the knowledge and skills necessary to make proper installations.

'I was asked in Las Vegas if I would be willing to pay $100 a year to keep prices off the air, and I said yes. However, I feel it is in the best interest of home satellite TVs future and I would hope that the manufacturers and distributors advertising would see that continued price advertising can only hurt the industry; and they would correct the problem on their own. Needless to say, our company will not again buy from a firm that will sell to the general public at the same price as they sell to us.'

I hope **CSD** will publish this letter, and that others will voice their comments, pro or con, this practice.

James R. Griffith
Sky Power
Hi-Way 24 West
Downs, Kansas 67437

**This is** not **a** new **problem; only the format is new.** SatGuide **had it first. As a consumer publication, it got into trouble by accepting low-ball advertising pricing from distributors. They finally dropped priced-advertising.** Sat Scene Magazine **is a weekly television program found on Saturday afternoons on TR18. It is all about what you are doing in this industry** (selling and installing systems) **and is very worthwhile to watch. They have to pay for their overhead which runs to more than $3500 per week. Not cheap. Since the show is 'free' to anyone who wants to tune-in and watch, they try to support it with advertising. One of the values of television advertising is that it can accept hot new advertising data almost up to air time. The long lead times found in publications is missing. Advertising directed to dealers and distributors is a natural since the program deals with the inner workings of this industry. But there are obvious problems when a manufacturer offers LNAs for $250 a pop in any quantity, and consumer viewers tune in and see their $700 retail** (or whatever) **LNA 'part' being freely offered for far less. Can** Sat Scene **survive if it loses the advertising of this, or any, type? We don't know. That's a tough question.**

### WANTS Tests

I think it would be a good idea if a test was done by **CSD** on LNAs, receivers, antennas now on the market. This information could be constantly updated as new products come on the market and every six months or so a new listing could be printed telling readers which units rate best, what the good and bad points are, and so on. Of course this might cause some manufacturers to get angry if their products tested poorly and **CSD** might lose some advertising in the process. But that would also force suppliers to get their acts together or get out of the field!

An open invitation should be issued to all suppliers to send equipment to **CSD** for review and test. Those that refuse could be listed with a simple 'no response'; and readers could draw their own conclusions.

Otto A. Weinhauf
Box 400
Macklin, Sask
SOL 2CO
Canada

**Otto is a recent subscriber to** CSD **so he can be excused for not being aware of the way we handle testing. We have an open invitation to test equipment. We ask that any firm contemplating sending equipment first check with us, providing complete factory data on the unit prior to sending anything. We prefer to check two separate units on new products from new companies in the industry, obtaining the second unit on our own without any assistance from the manufacturer. The recent April issue gave our judgement on the best-of-class for three different size antennas, for example. And while many of you are reading this, a gigantic pile of approximately 30 TVRO receivers is undergoing noise figure and dynamic range testing at a western Florida testing 'retreat' sponsored by ROBS; an industry group.** Testing goes on constantly. **Organized testing, as you suggest, ala a** Consumer Reports **approach, is desirable but not practical. Perhaps the best 'testing' is done by dealers such as yourself; people who constantly feed data back to us.**

### CONVERT FROM CABLE

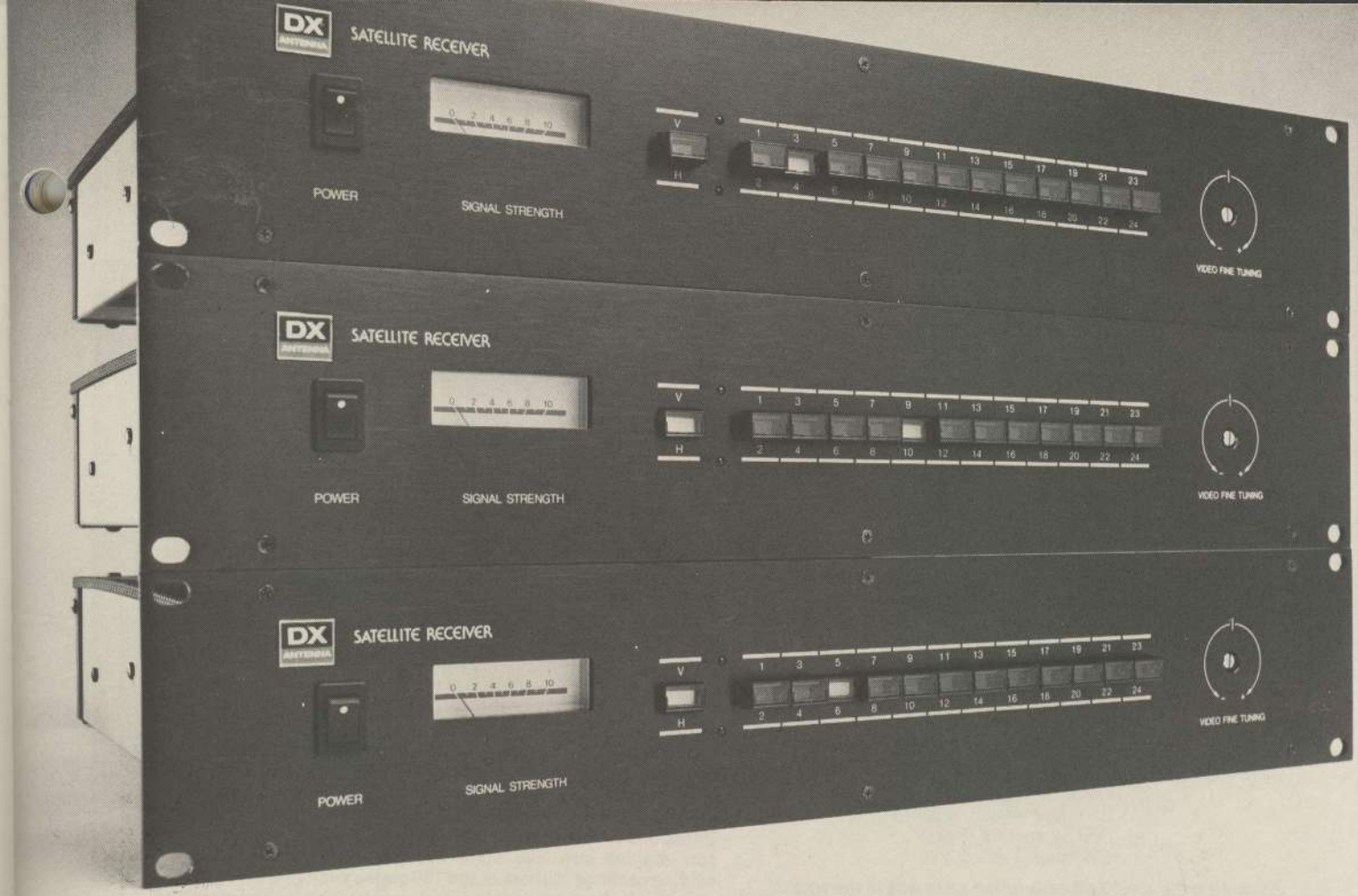
I would like to have a simple antenna system that I can install at my home. I was a subscriber to Fremont Cable Television for more than a year and enjoyed the programs of WTBS, HBO, Showtime and many more that were only available on the cable, from satellite. However, the cable service got poorer and poorer and I refused to pay for it unless they came and fixed it. The cable company took me to small claims court and I lost. Now I want to have the same programs again but I will not subscribe to the cable system here as long as their pictures are so poorly delivered into my home. Can anyone help?

Robert Briones
4728 Nelson Street
Fremont, Ca. 94538

**Perhaps a dealer in the East Bay area will contact Robert to see is he is in a position to benefit from a home TVRO system.**

### NOISE SOCCERY

I feel that LOCOM did a good 'BS' job on the subject of noise temperature calibration (**CSD**, 2/83). There is no question, the HP




# DX Gives You Big System Quality at Small System Prices.

For commercial quality SMATV reception at a surprisingly reasonable price, select the DSA-643 Satellite Receiver from DX. The DSA-643 features dual **block downconversion,** which permits inexpensive installation in multiple receiver applications. Utilizing a discriminator circuit to demodulate the signal, a full 30 MHz bandwidth, and a unique threshold extension circuit, the DSA-643 provides a low threshold carrier to noise ratio and truly commercial quality video at a price that's affordable even for small systems.

The DSA-541 Block Downconverter features a highly stable ceramic resonator as the local oscillator, with a fixed frequency of 2800 MHz. Stability is maintained at a remarkable ± 1 MHz over the entire − 30°C to + 50°C temperature range. This allows you to install the downconverter out of doors, at the dish, without concern for frequency drift caused by temperature changes year after year.

The innovative DSA-643 Satellite Receiver and DSA-541 Block Downconverter are brought to you by DX, one of the most respected names in satellite television reception systems in Japan and around the world. DX also provides line amplifiers, power dividers, and other block downconversion-compatible accessories.

DX ANTENNA

C. Itoh & Co. (America) Inc. DX Marketing Group, 270 Park Avenue, New York, NY (212) 953-5217
Manufactured by DX Antenna Co., Kobe, Japan.

8970 is a great instrument. We bought it also; the issue, however, is the noise source! The facts are as follows:

1) The best available calibration, on a HP hot source, is ±0.15dB. This is because . . .
2) NBS (National Bureau of Standards) has no PRIMARY noise source for bands other than the military (allocated) bands. Therefore, all 3.7 to 4.2 GHz work must be interpolated from adjacent (military) bands; even at the NBS!
3) The only absolutely credible noise source for reference must be a COLD load, where termination temperature may actually be measured via a thermocouple, and, VSWR may be checked to verify any uncertainty from that cause. Having done this, and when used in conjunction with a 3 port waveguide transfer switch (of known characteristics) and a room temperature (thermocouple monitored) termination of equal quality, the hot source may NOW be substituted at waveguide level and as close to absolute determination of its ENR made as is possible.
4) The waveguide-to-coax adapter is an obvious source of error in the use of a HOT source, and was carefully ignored in the HP (and **CSD** report) data. The National Bureau of Standards has conducted exhaustive studies on variations due to merely remating connectors. They tell us that even this step will knock accuracy statements into a 'cocked hat' unless the calibration is done at waveguide . . . and . . . the waveguide, once established is never (ever!) removed from the circuit under test. Which brings us back to the fact that the NBS does not calibrate waveguide at 3.7 to 4.2 GHz!

Clyde Washburn
Earth Terminals
One Microwave Plaza
Cincinnati, Ohio 45242

**Assuming the ±0.15 dB calibration error was in the 100 degree area, we would have an absolute accuracy 'window' of from 87 degrees K to 114 degrees K. We pointed out on pages 46 and 47 of our February** CSD **report that absolute accuracy, to a real world noise temperature number, was at least that inaccurate. Of all of the points raised by Clyde, the most valid one we see** (and it bothered us while at LOCOM as well) **is the mating and unmating of connectors from one LNA to another LNA; from the test station sources. When you start trying to read tenths of a dB noise figure variation between LNA units, the amount of torque** (i.e. tightness) **of the connectors from one set up to another can throw you for a loop. Our bottom line on LNA noise temperature in February was that dealers should** always **insist that they know whether the LNA's stated noise temperature is sold to them on a 'best case'** (i.e. noise temp quoted is the best anyplace in the 3.7 to 4.2 GHz band, for that LNA), **'average case' or 'worst case'. It has been the tradition to sell LNAs based upon the** worst case **noise temp.** However, **we have had reports that** some **of the recently introduced off-shore LNAs being brought in have measured their claimed 120 degree temp only in the** middle **of the band; one checked reportedly was 180 degrees at one end of the band and 170 at the opposite end. That may be an isolated case, but dealers using low priced LNAs should be concerned about just how noise temps are measured, and what the stated noise temp means** (i.e. best, average or worst cases) **before they plunk down their money. A small terminal with a 120 degree LNA that has a 120 temp in the** middle **of the band certainly is not going to have as good pictures on the edges** (transponders 1 and 24) **if the noise temp rises to 180 on the edges!**

## REUTERS SDS SERVICE

After reading the February '83 **CSD** report on Reuters, I was wondering why you didn't mention anything about their Small Dish Service or 'SDS'. Their literature advertises a 2 foot dish system for use with their transponder 18 wideband service on F3R. Since the thrust of your article was to encourage users to consider Reuters business service for commercial installations, I am puzzled why no mention was made of this service, and whether it requires some sort of special equipment. Their Chicago sales office insisted we would need a 13.5 foot dish; their local office said we could do it with a 6 foot dish, and their SDS brochure tells me a 2 foot dish! Someplace in all of this there is some truth. But where is it??? The TVRO industry could help Reuters, and ourselves, profit if we were in a position to offer this service. But first we need to know what it is and what the requirements are!

Charles Turner
Turner Satellite Systems
RR1
Neoga, Il. 62447

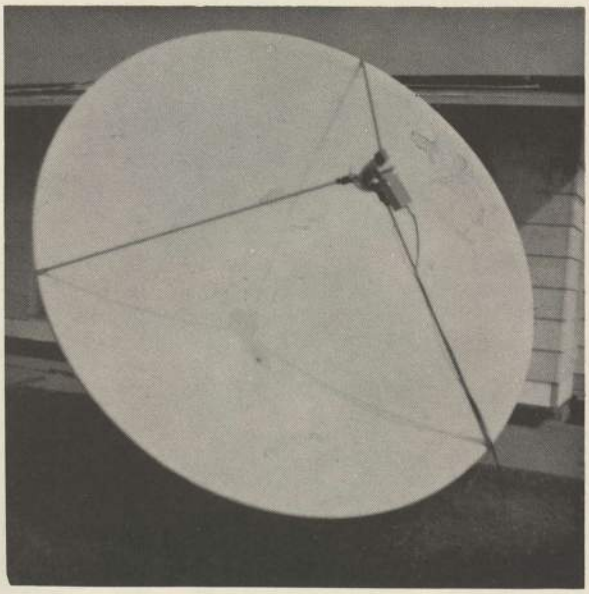
**We didn't 'neglect' to mention the SDS service; we purposefully omitted it. When the four industry people visited Reuters** (as reported in **CSD** for February 1983) **we tried to get information from them regarding the SDS package. Basically, they use a technique known as** 'spread spectrum' **to send the data. This involves slowing down the speed of the data, and condensing the total amount of data available, in exchange for reducing the size of the dish** (i.e. system sensitivity). **It's not a bad trade because you still end up with 100 'pages'** (i.e. screens full) **of data available for instant access. This could include news, weather, market statistics, domestic money market reports, energy market reports, gold market reports and so on. Frankly, when we got kind of excited about being able to offer a** 'mini-Reuters-service' **with virtually any size dish, the Reuters people kept trying to change the subject. They did suggest to us that legal problems aside** (and you **can't** toss them aside in the **real** world, only in 'conversation'), **the SDS or mini service would play on big dishes far outside the USA** (such as South America) **even when the basic transponder 18 reception was way-way down in the noise. You can imagine how** little signal **it might take with the SDS-mini service package to recover the 100 pages available using spread spectrum, when you consider how much** television **you would get in Illinois with a two foot dish! Translate that same quality of TR18 television reception to some distant point, such as Caracas, with a big dish . . . . and you'd still have the technical capacity for SDS-mini Reuters service. We left confused about the SDS service; they have it, but we were pointedly told they are** not **really interested in selling it. Universal's** Harrington, **among the four visiting and no slouch in data retrieval, probably came closest to answering our puzzlement when he suggested that there are two possibilities; either the system has bugs in it and they want to hold off a major push until the bugs are gone, or, the system works so good that in Reuters view it might cause many of their** big-**system,** big-**cost customers to scale-down to the** less expensive **SDS system** if **it became known that you don't have to have a 13.5 foot** (or whatever) **foot dish and thousands of dollars in special electronics to make it play. We asked several times for a direct answer about SDS and never got it. Your guess is as good as ours.**

### MORE/ Reuters

I enjoyed the **CSD** article (February 1983) on the Reuters News Serivce. I also have had a time convincing Reuters that our TVRO equipment is compatible with the Reuters data terminal. Our company was asked to set up at the State Fair in Springfield, Illinois and offer the Reuters service to six radio stations (including WGN radio from Chicago). John Ray of the Illinois State Department of Agriculture put us in contact with the Chicago Reuters office and Charles Walters. Two weeks prior to the fair we ran an error count test to see how good we would do. After the test was performed, we received a 'go ahead' from Reuters and set up at the fair. The equipment we used was the Intersat SRDC-4 receiver, an Avantek 100 LNA, and an 11 foot ADM 'mobile unit' expanded to 13 at site. After tweeking our equipment we were operating with an error rate of approximately 00001 about every 8th readout while the other seven would read 00000 (no errors). Mr. Samuelson with WGN radio told me we were the first company to set up such a system at the fair and we were invited back for the next fair. By the way, the Intersat people at St. Peters, Mo. are some of the finest people to work with I have found in this industry. It is a shame that as we grow we have to put up with unethical and even downright dishonest people when there are fine folks like Don McLaughlin, Dave McClaskey, Guy Davis and Jim Haley at Intersat. We will keep you

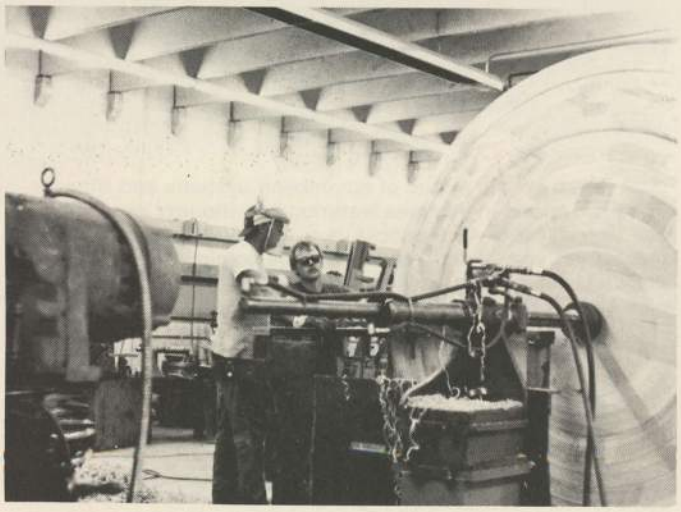
# SPUN PARABOLIC ANTENNAS

Because of the precision spin process our Parabolic Antennas are more accurate for more efficiency.

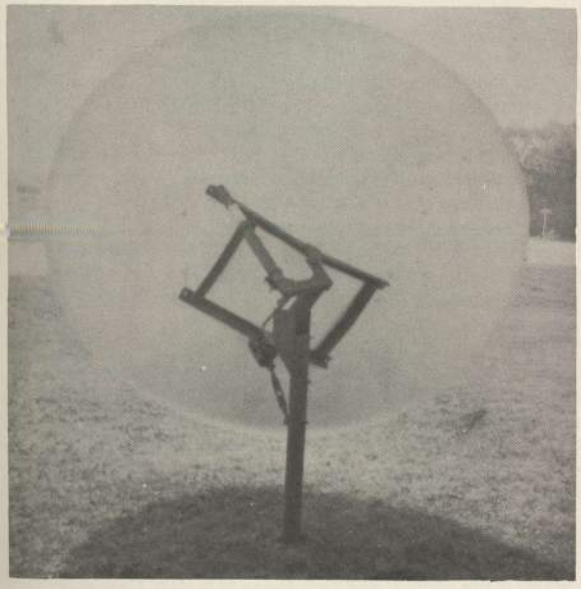


Manufactured in volume by the efficient Spin Process for more accuracy. 9' Antenna will out perform many 10' and 11' Antennas. Easy to haul, install and adjust. The efficiency of our Antenna allows a smaller antenna to work better. The smaller size is more acceptable in a home owners yard.

Available in 9′, 8′ or 7′-6″ in steel or aluminum in a focal length of 36″ or 43″.



Well engineered Polar Mount



The most respected names in commercial antennas are made by the Precision Spin Process. Our Antennas have been used commercially in cable systems and by a TV station for Rebroadcast.

DISTRIBUTORS: We manufacture over 2000 antennas a month in steel and aluminum and have most sizes in stock. We would like to supply you in 100 unit lots, with our mounts or to attach to your mount. Our antennas have been used extensively all over the US and Canada.


DH SATELLITE TV
P.O. BOX 239
PRAIRIE DU CHIEN, WI 53821
PH (608) 326-6705

informed of our progress with Reuters.

Gary J. Rhodes
Rhodes Satellite Connection
1703 S. Banker
Effingham, Il. 62401

**Reuters did a seminar session at the Vegas STTI show. That encouraged us because we feel that if they'll take the time to analyze the tremendous market potential they have by making use of dealers such as yourself in this industry, their 'sphere of influence' could double overnight.**

**WHAT DID He Say?**

It is difficult to address a letter to the ubiquitous "Renaissance" man without overloading the document with complimentary comments. Anyhow, you are a quick study, the technical content is usually accurate, in layman's language, there is little repetition of favorite phrases, paragraphs start with various words and grammatical textures, controversial issues are met head on; etc. etc., etc.

Bob, all you lack is good judgement in financial matters, discrimination in picking your friends, the proper place to live, and the will to sit down and write the all American novel to seize your place in the literary skies. How about a murder mystery centered on the lingering deaths of prominent citizens with one common characteristic — they all were pirating HBO via satellite!

Enjoyed your report on B-T in the March issue. If business improves, will try a trip to the Turks and Caicos — sans fishing, and scuba diving.

'Ike'
I.S. Blonder
Blonder Tongue Labs, Inc.
One Jake Brown Rd.
Old Bridge, NJ 08857

**A report on the status of scrambling systems and Blonder Tongue's efforts in this area featuring 'Mr.' Blonder appeared in our March issue. All Ike lacks is a million dollars in tax free income per year, being free of 800 plus employees, and a new color television set in his kitchen to take his place in the electronics sky of retired great inventors.**

**14 DAYS DOES NOT MAKE EUROPE**

I read with great interest your report in the December **CSD** of your trip to Europe and your quick study of the television services available there, plus your opinions on what would sell for television service there. I was born in France, and you are correct in asserting that the French people do not like Americans. They don't like the British either. They live in a very closed national community and they like it that way! When I was 15, we moved to Denmark. I worked in electronics and spent two years in the Danish Army in Communications. Later I had my own radio and TV service shop business, and we installed 'communal aerial' systems bringing in distant German terrestrial programs using towers up to 250 feet in height.

For the past six years I have lived in Mexico where I manufacture amplifiers and other electronic items. I am also very interested in satellite systems and met you at the Omaha 1981 show as well as the recent Atlanta 1982 show.

People in Europe do, indeed, have another mentality from Americans. And that extends to how they use television. First of all, they are very critical of quality of reception. They are also critical of the programming quality, and the technical quality. Most European countries, as **CSD** readers know, use the PAL system. This system gives a fantastic 'range' of colors and a higher definition than the American NTSC system. The French use their own SECAM system, which is even better for color and definition than the PAL system. I have encountered many Europeans who have returned from a stateside visit who felt that the American television was terrible! They usually said the color was miserable, the programming childish and the commercials horrible. European countries, do, indeed, control their own national TV services. But they usually have committees choosing the programming and they try to make the total programming choice as broad as possible. They have very little advertising, and that is usually clustered in natural between-program breaks. I know that one thing about American television that really aggravates Europeans is the incessant commercial breaks and especially those that come at the climax of a program. Europeans do not consider that to be in good taste!

As far as your views on the proliferation of 'sex' in Europe, I am afraid that you are right. But, that is again (as you noted) a 'foreigner's point of view'. I know that many foreigners consider Denmark to be a pornographic country. Denmark decided many years ago that when something is forbidden, everyone wants it. So they simply allow it out in the open, on the theory that after the initial thrust of sex-sex-sex, everyone tires of it and it just becomes another not so terribly important facet of life. I don't think that Danish people of today are any more crazy about sex than the typical American is. Yes, there are lots of sex and porno shops in Copenhagen. But who do you see inside of these shops buying up armloads of materials? Mostly foreign tourists!

You noted that people in Europe do not watch very much television. Again, you are correct. Even where people have five or six channels to select from, they don't watch alot of television. There is a general theory, widely held in Europe, that if you sit down and watch too much television, you get silly! I have repeatedly heard people say to someone sitting in front of a television set "Don't you have something better to do?".

I share that attitude. Here I have reception from 7 Mexican channels plus all of the services from 5 or 6 satellites. I watch CNN news when I feel the need to know something, a good movie when I on occasion see one listed in **SatGuide**, and the weather channel a few times per week because I am a private pilot. My children may watch a program or two a week on Nickelodeon. But we often go days without turning on our television sets at all. And I think that is the way many Europeans are conditioned as well. Europeans prefer to read a good book (there are more books read, per capita, in Europe than anyplace else in the world!), study something new to them to broaden their education, or travel. Most countries have libraries which offer free courses in everything from mathematics to sewing, electronics to sports. These library courses are widely utilized and that's what people do rather than turn on the TV the minute they arrive home from work or school and stay glued to it until bedtime!

The typical American tourists are not well received because they are ill prepared for their visits. For example, I remember seeing an American couple standing in a square in Copenhagen holding a map. He asked me to point out on the map where they were. I thought he had a map of the city in his hand until I looked more closely. He had a map of all of Europe and he couldn't even find Denmark! On the other side of the coin, I watched a guided tour recently here in Mexico with a Swiss tourist and an official Mexican government tour guide. It took the Swiss tourist about two minutes to discover he knew far more about the place they were visiting than the official guide and soon, with respect, he was the guide!

Many European people look upon the United States as a young, brash, and not very sophisticated country. When you consider that America recently celebrated its 200th birthday, and Copenhagen celebrated its 800th birthday, you realize how much deeper the roots are in Europe. Within Europe, people understand and appreciate their own heritage. They don't want to lose their identity or their heritage. The opposite side of that is that Danes don't want to see Scandinavian programming (although they accept German programming quite willingly) because they fear of being Swedish dominated.

As you can perhaps see, there is more to bringing American television to Europe than the simple technical feat. You must understand the mentality of the people, and their sense of humor. I fear that American programmers, dreaming of cashing in on the European opening of cable and satellites, may have a rude awakening ahead of them.

Guy Markus
Baja del Club 28, Col. Reforma
62260 Cuernavaca, Mor.
Mexico

**Many of the Europeans we spoke with suggested that Americans are 'shallow', incapable of in-depth commitment to virtually anything. We may not share that view, but there is some merit in the charge when you consider that American families are now utilizing television for an average of 6.5 hours per day seven days per week, 365 days per year. When you subtract out time to go to school/work, sleep and eat, you shortly conclude that doesn't**

# The Immaculate Reception– now available for your existing system.


**The Avantek Simulchannel™ Receiver system is now available with integral downconverter to save you space and dollars.**

With Avantek's new downconverter, in the AR1000 Simulchannel™ Receiving System, you can share one downconverter with up to five receivers, all in a single mainframe. You've saved space over self-contained receivers, and *reduced per-channel cost* at the same time.

This system is fully compatible with your current equipment that has LNAs installed on the dish. It's based on our proven AR1000 video receiver, but instead of putting the downconverter at the dish, as we would in a new installation, we've made it a plug-in to fit the rack-mounted mainframe. The downconverter occupies the first slot, leaving room for five additional receivers.

The mainframe includes touch-pad tuning control that allows each receiver to be easily set to any of 24 transponder channels. And since each receiver is a plug-in unit, they can be added as needed.

We invite you to compare cost and quality of adding channels any other way. And if the specifications confuse you, just take a look at the picture. Then you'll know how much you're getting for your money.

## New Optional Feature

If your receivers are located remotely, another Avantek innovation will be of interest. We've added "refresh memory" to our tuning control so that if the power is lost, the receiver memories won't forget what channel they're tuned to. It holds the information until power is restored—up to 24 hours—so there is no necessity to reset channel allocations.

In all, these are just some examples of Avantek's continuing engineering program that builds customer benefits around sound product ideas. Avantek is a complete supplier of products for the CATV Industry providing state-of-the-art electronics for quality satellite TVRO and test equipment to maintain a quality system.

**Avantek**

**3175 Bowers Avenue**
**Santa Clara, CA 95051**
**(408) 496-6710**
**Telex 34-6337 TWX 910-339-9274**

**leave much time per day to do much else! Even if you eat AND watch television at the same time. On a much smaller scale, we must report with some sadness that here in the Turks and Caicos, where there was no television prior to our establishing a national system, we find that native families are, indeed, using television almost as many hours per day as the stateside average now.** Worst of all, **from zero watching to 6 or so hours per day, there is the** attitude **that television** MUST **entertain them, transfixed to the tube, whenever they turn it on. There is an almost total failure to tolerate** ANY **programs which are not to their personal liking. And this comes from a people who 12 years ago had no roads, no stores, no vehicles and of course no outside contact with the world! David Brough, the Canadian chap who pioneered satellite / US / Canadian network TV into the far northern, remote regions of Canada years ago told us once that he was not sure, in retrospect, that he did the isolate Eskimo families any** 'favors' **by introducing television to them. As an example, the native children, content with Muk Luks** (hide boots) **quickly became 'hostile' when they couldn't obtain jeans and tennis shoes on demand. Americans are rightfully proud of the country's accomplishments in the relatively short span of 200 years. We may not find that the way we portray ourselves on television commands that much respect worldwide, however. It could be an interesting balance of century ahead!**

**LIVE From Europe**

I am writing to express my admiration for Coop's efforts to get satellite technology into the hands of the world's people. I am convinced that easy access to information keeps America free, and may help others to free themselves.

I was fascinated by your evaluation of European television (December **CSD**) and your prediction that 1983 will be the year that C band TVRO takes off in Europe. As a member of the Armed Forces stationed in the United Kingdom, I sorely miss the diversification (and yes, the quality!) that is provided by American television. My sense of loss is heightened by the fact that I owned and sold (as a dealer) TVROs before leaving the states. Foolishly, I even sold my own personal system holding on only to a weatherbeaten H & R Communications 12K antenna. While reassembling my system (with a Washburn receiver and 100 degree LNA by Avantek) I've witnessed just how tough it is to import high technology into Britain. I have also discovered there is an enormous pent up hunger for TV American style among the GI's and the population at large. It doesn't make them feel any better when I report to that that the Armed Forces Radio and Television Service is now uplinking its service via Intelsat, but because of a World War II era agreement with Her Majesty's Government, no downlink can be installed here for American base use of this service!

I have had very little luck chasing down Intelsat Global beams with this 3.6 meter antenna, but I can and do demonstrate strong 14 west Ghorizont reception, including the stuff that has been stolen off of American DOMSATs. That delights my fellow expatriates. To find out what I would need for a saleable Intelsat system, I rang up Steve Birkill at his Sheffield home (that's one advantage to being over here!). I had just read the story in **Satellite TV News** in which he explained some of the technical difficulties facing anyone who attempts to tune in Ghorizont with an unmodified American receiver. He was in the middle of writing his recently released book, but was kind enough to come to the telephone and talk TVRO nevertheless. He told me that I would need as a minimum a 4.5 meter dish, a 100 degree LNA and an extended threshold receiver to sell Intelsat pictures.

Back to the problems associated with importing high technology into the UK. The first problem is being so far away from your supplier, and all that entails. Long phone conversations trying to straighten out an order or tracking down equipment equals huge phone bills. Shipping costs, custom duties and time lost in transit make for higher system prices and lower sales volume. In addition, TVRO accessories and miscellany are almost impossible to come by. For example, it took three months from the time the LNA and receiver arrived here until I was 'on the air.' All of this was for a lack of a piece of 213/214 cable with N connectors on both ends! A British microwave specialty company wanted an outlandish sum of money for double male N connectors. And when I asked for pricing on quantity of one, they laughed at me. Meanwhile, I had nothing with which to demonstrate. Imagine how long it would take to get equipment serviced here! I'm sure Coop is familiar with this sort of problem in the Turks and Caicos; but I didn't expect these problems in a 'modern industrialized' country.

But enough of my problems. I really wrote to tell you how much I look forward to receiving **CSD** each month; especially the 'Comment' section. Coop's efforts to look beyond the superficial in wondering why people do (Turks and Caicos) and do **not** (West Germany) watch television are fascinating. This is especially true when a little history is thrown in (which is a little more relevant to me than most, perhaps, since some of my ancestors were on those slave ships that sailed past the Turks and Caicos). I guess that is why I was of two minds when I read Bob Behar's story on bringing the first satellite TV to South Africa; although I didn't allow my feelings there to get in the way of enjoying his informative report.

I would very much like to hear from others who are interested in tackling the European market. Perhaps by my being here, having a background in TVROs, and an intense interest in seeing the market develop, I could be of some assistance to others. I think the idea of holding a trade show run by North Americans (with local coordination and cooperation) is an idea that ideally suits the market and situation. There is a virgin, interested market here and if excessive government regulation and interference can be avoided, it could be ripe for the harvest. I am hopeful that my experience with satellite reception on both sides of the Atlantic will enable me to participate in this.

Bill Bruner
Box 5197
APO New York 09179

**Bill speaks the truth. Having a knowledgeable, experienced satellite TV person affiliated with you, on the eastern side of the Atlantic, can spell the difference between success and slow starvation for those firms interested in forging a link across the ocean. If I were trying to get started in Europe, from North America, I'd write to Bill and ask him how we might get together as a team.**

**FROM TD-2 TO DRAKE ESR-24**

I got interested in TVRO about five years ago; one of the follows at the local ham club was doing some experimenting with geo-stationary satellites. He had a surplus 8 foot dish and a surplus TD-2 from Ma Bell. We saw PTL and HBO, without any sound and also . . . without an LNA. Not useable, but it **was** satellite TV! Well, I was hooked. I found my own TD-2 and eventually a surplus 7 foot dish. And an H-P 614 signal generator for the tunable LO. I was almost in business and the fact that the dish had no mount, and it had a 1 foot hole in the center only seemed like minor problems. I quickly discarded the TD-2 and H-P generator and met Robert Coleman who it turned out was only 12 miles away. I bought some of Coleman's circuit boards and began scrounging for parts. It took me a year and a half, in true 'ham' fashion, to locate all of the parts at bargain prices but eventually I had them all. That's when I noticed that the prices on commercial gear had dropped rapidly, and I decided to scrap the homebuilt project and I plunged for a Drake receiver and Avantek 120 LNA. The first thing I got was the local telephone company. The second thing I got was the local Bell microwave link. So was the third. It turned out that I was located right in the middle of their path and there was NBC fulltime plus two occasional video channels, plus a bunch of telephone circuits. Nuts. When it all washed out, I had 8 watchable transponders on F3R. I could put my hand over the feed mouth and everything would go away . . . except the NBC feed! Talk about interference . . .

Well, fate stepped in. In a strange way. My house burned down. That was the bad news. The good news was that I saved the Drake! So I moved to temporary quarters about a mile north and splurged on a 10 foot glass dish from Long's. Now I was able to get everything! Alas, when the house was rebuilt and I moved back in November, there was AT&T all over again. Only now it was worse (bigger antenna?).

All of my efforts to rid this location of AT&T have failed to date. I tried to shield the antenna with window screening. No good. I've planted some trees in my back yard but they will take years to grow. I might add that I am 15 miles from the AT&T tower, 8 degrees off of their path boresight between Greenville and Spartanburg.

I would like to solve the problem. I have considered bombing the AT&T tower, but they would only rebuild it. Any ideas?

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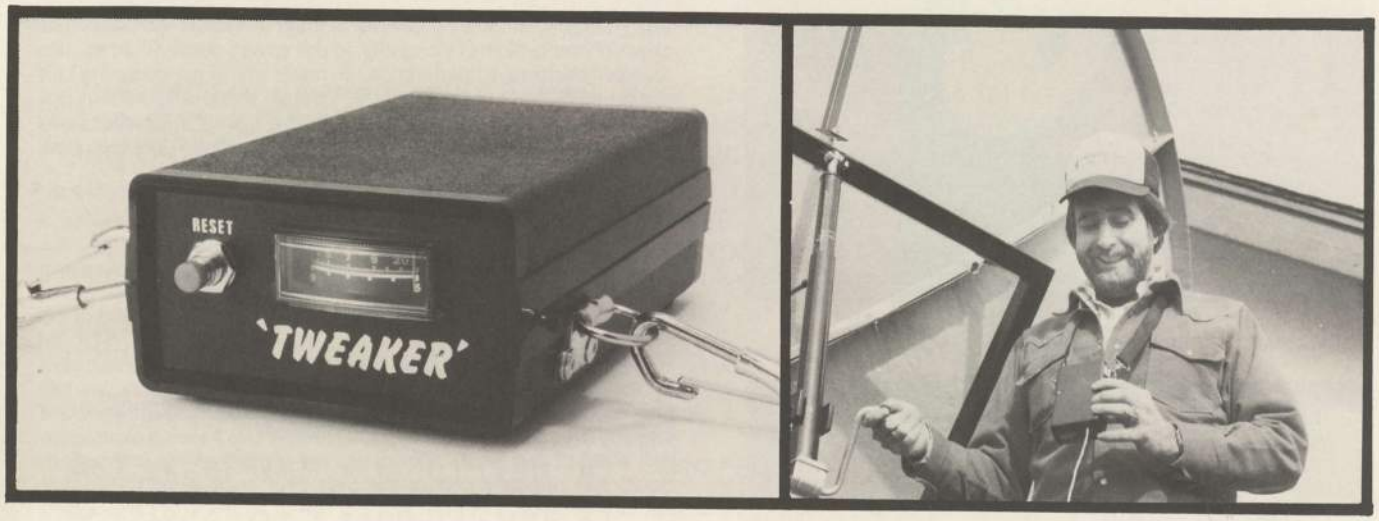


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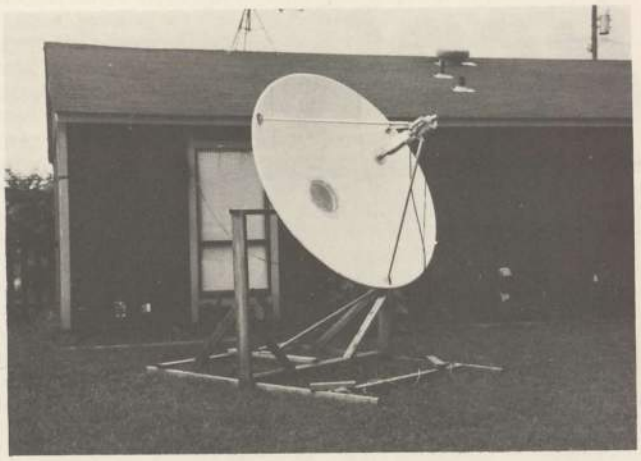

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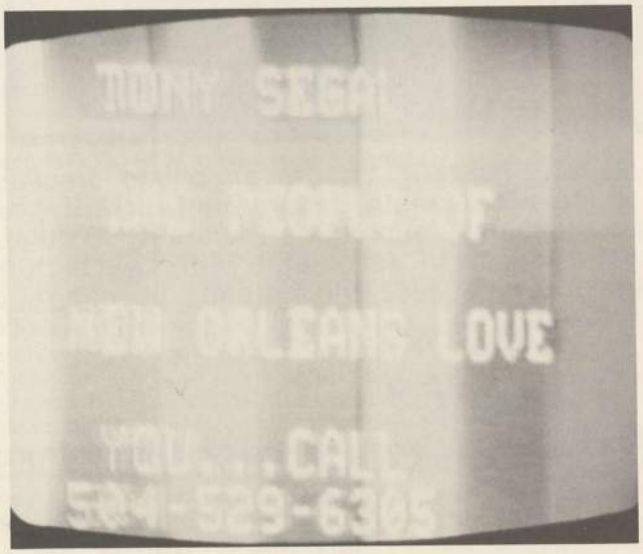

**BELL microwave interference at his location** (HBO should look so good!)

**That's the trouble with Bell; they are so big that they can replace anything that might get bombed. Usually overnight. Worse than that, everyone with a telephone will end up paying for the rebuild since they get to add bombed out tower replacement costs to their rate making base as a cost of providing service! If your 8 degree off of boresight path looks towards Bell's 15 mile distant tower, you need to calculate the angle of arrival of the signal to your dish, at the F3R position. A screen wire** (aluminum) **RF 'fence' built up to be a couple of feet higher than the angle of arrival** could **help, but it will probably** not **totally eliminate the problem. The most effective barriers to terrestrial microwave are chunks of earth. Many installations have taken a bulldozer and heaped up ground to create an earth-shield for the dish. That may not be practical for you, but it is a possibility. Tell your neighbors you are building a hill in your back yard. There are IF traps** (Microwave Filter Company, East Syracuse, NY; Arunta Engineering, Phoenix, Az.) **that** can **help but unfortunately you may have to retune the traps with each F3R transponder affected since Bell channel loading on the ±10 MHz offset** (60 and 80 MHz in your IF) **terrestrial channels varies the point where the** actual **crud is centered. You pay a double penalty with traps; the price, and, without some coaxial switching the traps stay in the 70 MHz IF line at all times. They do degrade the picture** (but the trade off is worth it if they get rid of the interference, or make the pictures tolerable), **and on those channels which have no Bell interference, you'll see the degradation** (loss of video detail and definition). **Maybe you should move to an island that has no Bell circuits!**

**ANOTHER SC TERRESTRIAL PROBLEM**

We have run into a large sized problem and hope somebody can help us. We have a customer who wishes to purchase a 13 foot Janeil dish, 120 LNA, Drake ESR 24 receiver, and a Vector Jr. remote. A site check on the customer's property, which covers some 10 acres, has revealed microwave interference no matter where we locate the Luly testing dish! We have determined, through the local Southern Bell office, that the interference is coming from a site some 12 miles away and the beamwidth as it crosses over the property is 2,214 feet wide.

The following has been suggested:

1) Dig a hole and surround the site on 3 sides with 15 feet of earth;
2) Erect a 15 foot high fine mesh copper screen on three sides of the dish;
3) Erect the dish close to the house, thereby using the house as a screen;
4) Find a spot where the local trees would act as a shield to the back of the dish.

We tried suggestions 3 and 4 and with no luck. We have also tried to filter out the interference but that didn't prove satisfactory. We are now considering whether we might run a cable from a neighbor's property over about a one mile path. However we have no experience with a run of this length and do not know whether this is practical. Could one remotely control the dish over such a long line run? Perhaps somebody has run into this sort of problem, or can suggest some equipment on the market which would clear up the interference.

Fred E.R. Foster
Southeastern Satellite Systems, Ltd.
Lexington, S.C. 29072

**Long before we would even** consider **running one mile of cable, and figuring out how to control the dish drive and polarity over such a long run** (you can't simply extend the control wires; the resistance of the wire will shut you down), **we'd opt for number one. But there is more to this than meets the eye. Many installers report that they have found sites that check out with interference with the Luly antenna are, in fact clean, when a** permanent **dish is installed. Before Bob Luly jumps us, there are** also **reports to the contrary; sites that check out clean on the Luly turn out 'dirty' when the final dish is put in. The answer here is that the** feed system **of the dish has** EVERYTHING **to do with the vulnerability of the dish system to terrestrial interference. You indicate the interference is coming from behind the dish** (" . . . find a spot where the local trees would act as a shield to the **back** of the dish . . ."). **One of the problems with any type of dish utilizing a screen mesh is that the mesh is not a total** 'wall' **to signals entering from the rear. The Janeil, and the Luly, both have this affliction. So too would virtually any fiberglass dish since the reflective surface buried inside the glass is actually some** more **screen mesh. And the glass part doesn't contribute to blockage. It is transparent to the flow of microwave signals. If the property is absolutely flat, like a Kansas wheat field, you can't very well get the antenna below 'average terrain' without digging a hole. But if it rolls some, there should be at least the opportunity to set up the Luly in a depression where the terrain behind the dish is higher than you, and affords some natural 'ground shielding' to the signals from the rear. To test, before digging a hole and building a dirt shield, locate a nearby location in the same line as the terrestrial microwave and the customer's house and set up behind a hill or knoll. If it cleans it up, then you know that a dirt mound will work on site as well. Provided. Provided there is not something high enough between the shielded antenna** and **the satellite to act as a** 'backwards reflector' **to bounce the terrestrial signal**(s) **back at you from the same direction as the satellite**(s) **proper. A building** (metal sided) **or tall trees would possibly cause this to happen. If you experience it largely on** one **or** two **satellites,**

Lady J

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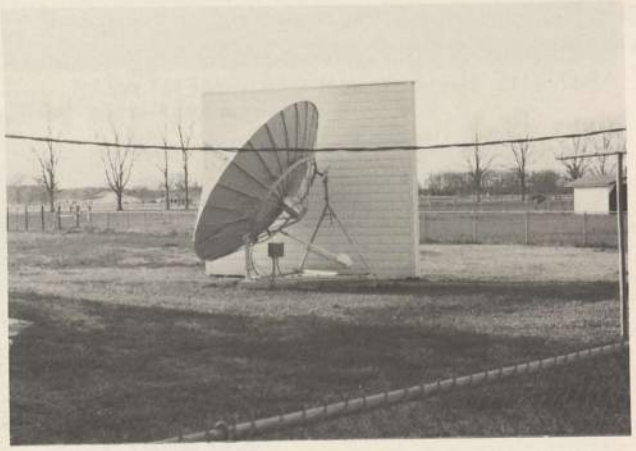
**there is hope. If you can put your hand over the feed mouth of the dish and the TVRO signals quit, but the terrestrial is still there, you have it bad. Real bad. If both quit, you have a chance. Good luck!**

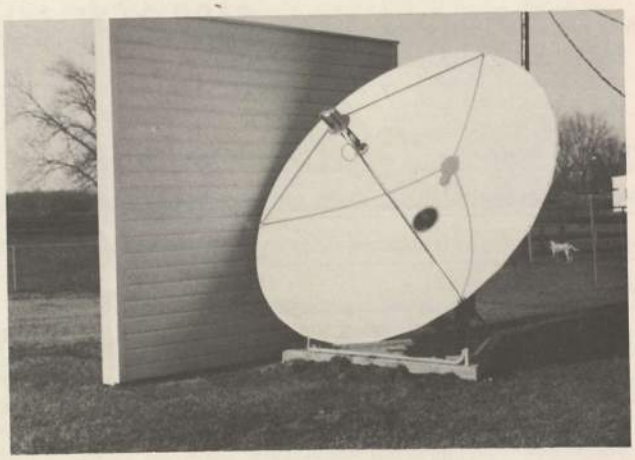
**BUILD A Wall**

Just thought **CSD** readers might be interested in what it took down here in Louisiana to beat 'Ma Bell.' The structure behind the earth station antenna, in the photo here, is exactly what it looks like; a wall!

When we installed the earth station we encountered a severe case of interference; microwave from a Bell Telephone Company tower located in Natchitoches, transmitting on both polarizations on a total of 14 transponder-equivalent channels. We tried IF filters and they didn't do the job. However, after we erected this metal wall the interference all disappeared and we spent less than $200 for the aluminum siding wall; actually cheaper than the filters!

Winn Electronics, Inc.
P.O. Box 1275
Natchitoches, La. 71457





**There's a neat, new product here for somebody. Knocked-down, pre-fabricated aluminum siding walls with a frame and an anchoring system to tie it to concrete. Readers should note that on this particular** (we suspect F3R) **bird heading, the interference is coming towards the dish from almost a 90 degree angle. That's usually the** least difficult **direction to cure so if these fellows had it at a 90 degree heading, you can imagine how really strong the Bell stuff is at this location!**

**FROM The Past**

In the July and August issues of **CSD,** there is a brief description of 'SCDN' equipment, using a new type of feed probe, low amplification LNA and a special downconverter. I have searched all later issues of **CSD** and have failed to find any later information. Can you advise which company is marketing this equipment?

I have a possibly useful circuit worked out for allowing people in say a PAL area to enjoy reception from an NTSC transmission, in color. Would it be useful to readers? Finally, is the Automation Techniques 'Dish Stretcher' system of any use down here on say the 15 dBw contour of F1 where we have a 4 degree look angle at the bird?

Terry L. O'Connor
ABLE Electronics
P.O. Box 41
Riverwood, N.S.W. 2210
Australia

**The company now marketing this equipment, or the closest equipment there is to that originally described in the July and August** ('81) **issues of CSD, is** Anderson Scientific, P.O. Box 800, Black Hawk, SD 57718. **A circuit for 'cheap' standards conversion, one format to another, would be** VERY **interesting to readers. As would a circuit that allows somebody to take apart the CBS developed two-for-one interlaced system now in use on the Pacific Intelsat to transmit two US programs to Australia full time. The AT** 'Dish Stretcher' **is a threshold exension technique developed by Automation Techniques. We'd like to be able to comment on its usefulness, but have never had the opportunity to test it. See** 'Bob Taylor's Video Dolby' **in this issue of** CSD.

**TVRO As An Educational 'Tool'**

I have been following the progression of satellite technology for quite some time. **CSD** has helped a great deal in understanding what is on the 'cutting edge' of this new technology. I am interested in the possibilities of using satellite technology in the field of education. There are a few Universities with TVROs, but as far as I know they are not using them **directly** as a teaching tool. Is there anyone out there who can direct me to a College and University where the terminal is used on a regular basis to help people with their education?

J. Erik Dice
Staff Technician
University of SW Louisiana
US1, Box 43372
Lafayette, La. 70504

**We have been** told **that there are educational institutions utilizing TVROs to bring in Spanish, French and Russian language transmissions to assist language study classes with their teaching programs. We suspect that there are some schools using the daytime transponder 16 educational transmissions (F3R) as well. But specific we do not know. Can anyone help Mr. Dice? A copy of any information sent to him, to CSD, would be appreciated.**

**UPDATE and Correction**

If anyone who read my article in the February issue of **CSD** (page 22) is having difficulty finding the French Symphonie bird, be advised that I found them at about 10:30 AM in the morning (ET) a couple of degrees south of the equator when the photo published (**March** issue of **CSD,** page 42) was taken. I have looked for this transmission several times since, and have failed to find it. It may not be active on the 'western transponder' every day, or the 10:30 time may have been a fluke. I would be interested in hearing from others in North America who have found the western hemispheric beam of Symphonie operating.

I have kept a check on the 1 degree west Intelsat bird, carrying the AFRTS transmissions, to try to determine just how far south of the equator it may be (or how far north). I kept track of it for 8 hours one day and it did not seem to be moving at all. That would seem to indicate it is nearly stable (within 0.5 degrees) and is not 'figure 8ing' by the ten degrees that some have reported. The transponder in use, by the way, is the equivalent to US DOMSAT receiver 5; about the same place one finds one of the Brazilian channels, or Venezuela. There does seem to be a problem with the audio however. While it is 6.8 MHz, when one uses the narrow bandwidth position in the AVCOM receiver to clean up the noise, the audio becomes very distorted.

**INDUSTRY/ continued page 51**

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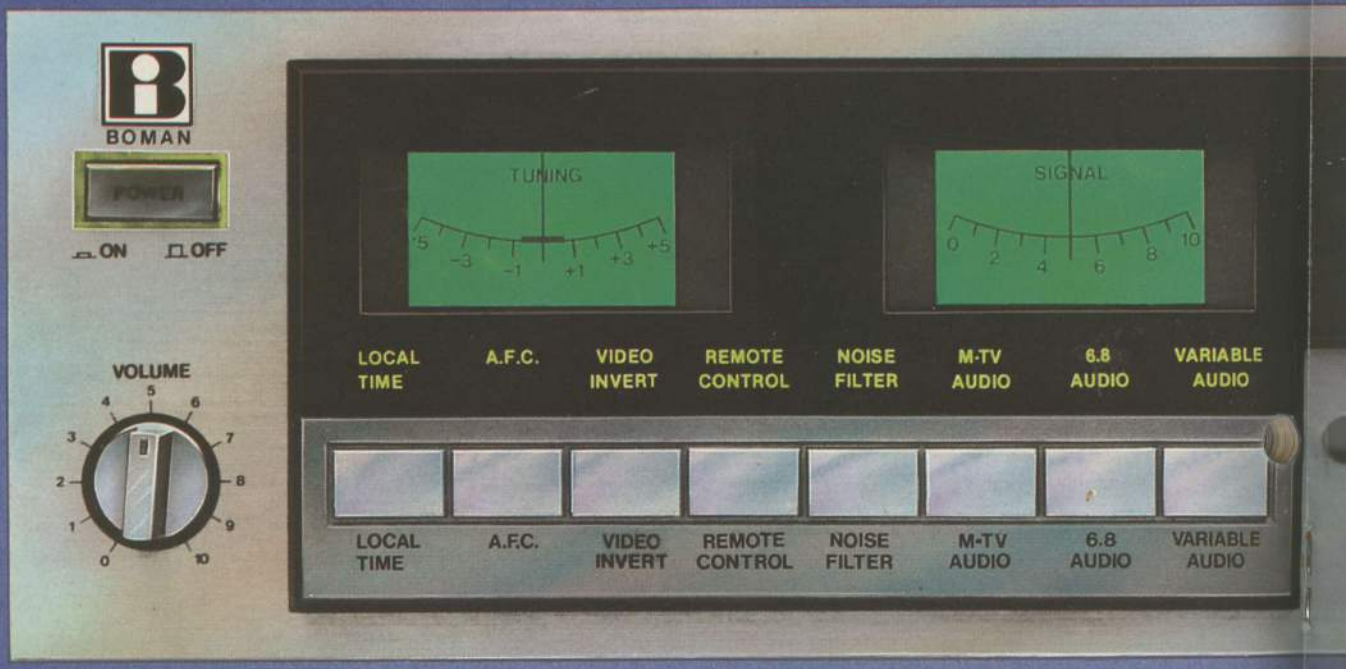


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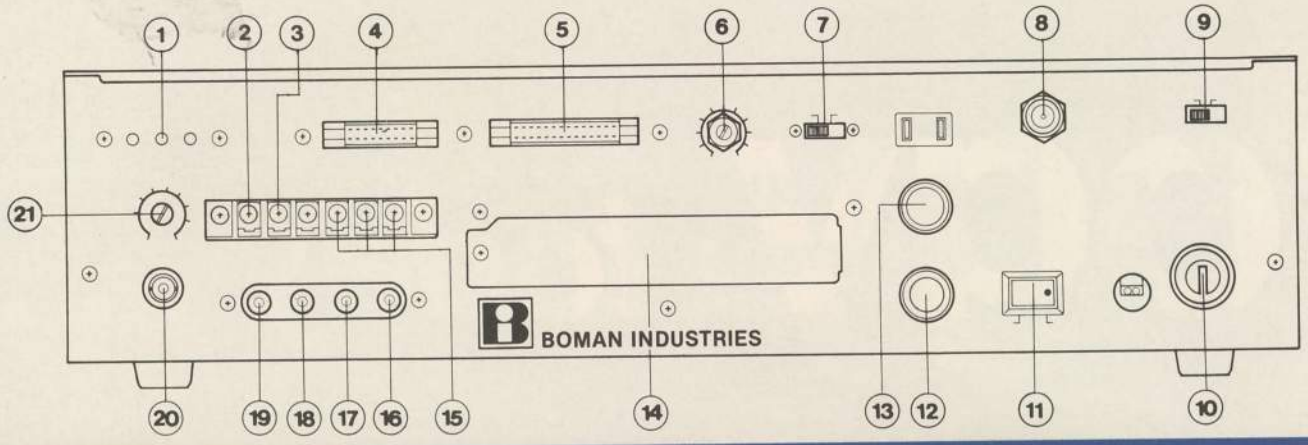


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**INDUSTRY/ continued from page 46**

Finally, on page 22 for Feburary, my table lists f/D of dishes versus the distance you can move the feed to provide north and south tracking. The bottom line should read .5 (f/D) rather than the .4 printed.

John Drew
50 Canterbury Road
Mystic, Ct. 06355

**We finally obtained a verification of the 'drift,' north and south, of the Intelsat bird located now at 1 west. It is stable to within 0.008 degrees which means we can forget about having to track it in that mode anymore! Operation of Symphonie, at least the technical control, recently was handed off from France to (W) Germany. Symphonie is really a joint French/German bird although the French have gotten most of the use and credit for it over the years. The replacement birds, scheduled for 1983, have apparently been pushed back to sometime in 1984 because of a squabble between the contract-builder and the French. They are nursing what is left of a pair of very tired birds hoping to keep them operational until the fresh troops arrive on station.**

# TRANSPONDER WATCH

## RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

**CERTAIN** that US will need 3,000 plus full satellite transponders by year 2,000, NASA moving ahead with plans to create experimental 20 GHz down/ 30 GHz up satellite as test for military. Casual arithmetic of available orbital spaces, number of transponders that could be warehoused at each such orbit spot, indicates that only way US could have 3,000 useful transponders would be for 'next band up' (20 GHz/30 GHz) to be exploited with satellites.

**ALCOA-NEC** says they are 'on target' with program to be major supplier of 12 GHz DBS receiving terminals when market is ready. Firm also announced that electronics, designed by Japanese parent-partner NEC, will not be assembled offshore but rather will be built in USA. Target goal of $350 per home terminal has not changed.

**INTELSAT** attitude towards its monopoly of the skies may be changing. In past, international carrier has steadfastly turned away proposals by others that private competition be allowed for international communication routes. Slightly changed stance now suggests Intelsat is accepting competition as inevitable and because they are already in position to serve potential customers, adapting their own operations to competitive offerings rather than continuing to battle inevitable.

**PRIVATE CABLE** chief John Raines of NCSA went to Congress to ask that new laws being formed give new SMATV/private cable industry opportunity to compete fairly with established technologies such as CATV. Raines pushed for Federal pre-emption of local zoning laws which attempt to put SMATV out of business, federal pre-emption of state laws which attempt to regulate SMATV as cable systems, federal pre-emption of local or state laws which grant cable access to apartment complexes but preclude SMATV from offering services, and, equal (SMATV) access to the CARS (Community Antenna Relay Service) microwave band used to inter-connect cable headends to various 'hubs' of distribution within cities.

**JUNE 3rd** is latest target date for launch of important European ECS-1 bird by Ariane. Set back or failure of Ariane would seriously hurt Europe's entry into the international cable TV world since ECS-1 (to be named Eurostar 1 after launch) is first bird with transponder capacity and mission assigned to possible cable uses.

**TUSSLE** underway in Japan to decide whether Government or private industry will be responsible for future satellites and launches. Next generation Japanese satellites will be larger and require more sophisticated H-1 series launch vehicle. Unfortunately, problems with development of vehicle make it seem likely that vehicle will not be ready when new 24 transponder birds are ready to fly. Alternative is for Japanese to rent launch space on Shuttle or Ariane. H-1 program is government backed and private industry there points to apparent delays in program as proof that private industry should take over development of launches for future. Government has both pride and monopoly issues at stake.

**FOUR YEAR** goal of creating, launching and turning on joint Mediterranean and North African satellite system is being floated in Europe and Middle East.

**SWEDEN** and Norway have agreed on funding split for two-channel Scandinavian DBS bird scheduled now for Ariane launch in latter part of 1986. Bulk of funds will come from Sweden.

**FEDERAL EXPRESS** is involved in plan to provide high speed satellite communication service links for data and text materials to perhaps 15 cities. Program is called DTS for Digital Termination System and it is in partnership with space communications firm ICOM.

**SECOND** sports network, built upon successful foundation of ESPN, is in works at Group W (Westinghouse). Plan is to use Group W transponders leased on board new Hughes Galaxy 1 satellite due to launch in June.

**HUGHES** has received patent for 'satellite cluster' concept; multiple satellites flying in formation, within 500 feet of one another, operated by master control station that flies in center of pack. Individual transponder packages could be modified, exchanged, or replaced while master 'mother ship control' would stay in place permanently.

**UNITED KINGDOM** may have national DBS television as early as first quarter of 1984. Intelsat has decided to modify last two of the V-A series birds (F14 and F15) to allow wideband Europe to North America data links, while at the same time approving a plan to allocate trio of 72 MHz wide 12 GHz downlink transponders for use by UK's proposed national DBS service.

**INTELSAT** has also approved full time lease to Robert Wold organization of half transponder for video relay between North America and Europe. Wold plans to sub-lease space to cable and other television services for direct interconnection across Atlantic.

**EARLY WARNING?** SBS 12 GHz bird (SBS-1) is having some problems getting downlink antenna to point correctly and stay pointed. A back-up system is in use to operate bird at present time. Unfortunately, there is no back up . . . to the back-up and the bird is still in first 15% of expected life.

**FCC** unable to finalize their controversial 4/3/2 degree spacing proposal. FCC had hoped to release final decision in April; it may be end of summer now. Best **bets**? Commission will set target date goal of 1990 or 1991 when all 4 GHz birds will have to be spaced at some spacing lower than 4 degrees. How much less? Probably 3 degree spacing initially, followed by 2 or 2.5 degree spacing by 2,000. But like Yogi Berra says, 'It ain't over until it's over . . ." and until FCC puts last

version on paper and releases it, everyone continues to guess. Those worrying about usefulness of 6 and 8 foot home dishes in immediate future need not worry. 1990 seems like a long ways away.

**USING WESTAR V** transponder under lease to M/A COM, a new 'oilman's telephone company' for relatively small 4 GHz terminals (4.5 meter) is getting underway through a Houston firm. Concept is that offshore oil rigs, north slope of Alaska rigs and remote oil centers will have direct telephone service to headquarter offices and links will also provide fulltime CONUS monitoring of remote drilling operations, and give drilling rigs access to computer studies and analysis of their progress.

**PIONEER** US DBS firm, USCI, will start construction shortly on 5 channel uplink facility near New York City. Firm hopes to have DBS signals in air by this fall, covering roughly northern 9% of USA (only).

**TEST,** international teleconference, supported by Intelsat, was held April 3-4. Papers describing future of and problems with international teleconferencing were presented with simultaneous (Intelsat) uplinks from Tokyo, Australia, Canada, UK, and USA.

**YET ANOTHER** satellite delivered news service attempting to get off ground. United States News Agency conducting tests on Westar 4 and hopes for 20 TV stations to participate in daily satellite-exchange of news tape materials.

**DBS** hopefuls are forming their own trade association. Immediate goal is to insure that USA as nation is properly prepared for this summer's important orbit-spot-assigning RARC talks. Second goal is pressing need for standardization of transmission formats for DBS. As things now stand, each DBS operator can decide how wide or narrow his signal will be, where his audio will be, how he will transmit color and so on. Group hopes that they can agree on single set of 'transmission standards' so that DBS ground receiving terminals can be compatible from one service to another.

**FCC** Chairman Fowler has re-stated FCC policy on being of assistance to premium program suppliers who are concerned about program 'theft'. "I consider self-protection entirely appropriate and indeed essential, in light of our policy to rely, where possible, on marketplace forces rather than government intervention. . . .".

**HIGHLY** critical report issued by National Telecommunications and Information Agency arm of government has been sent to Congress. In it, NTIA pleads that more high level government attention be paid to 'high technology, sunrise field' of satellite communications. Report summarizes concern that US may be losing lead in development of space communication systems, in air and on ground, because of poor interest levels by government proper. Examples cited of opposite effect include Japan where federal high level agency, and funding, constantly monitors progress of space communications worldwide, and then directs Japanese industry to best 'market' opportunities.

**CATHOLIC** Network is now to be found on Westar 4, transponder 11, under sub-letting agreement with Robert Wold. Schedule is 12:30 to 3:30 P.M. ET.

**SOUTHERN BAPTISTS** will launch their own Baptist TelNet operational in mid 1984 on new Southern Pacific SpaceNet 1 bird. One of primary hardware suppliers will be Starview subsidiary of Craig, Pocahontas, Arkansas.

**AMERICAN** diplomat kicked out of Moscow was reportedly sent home because he was using or attempting to use maritime Intelsat satellite to relay information out of USSR and directly to USA. Soviet TASS Agency reported Russians confiscated portable Marisat transmission system equipment.

**SATELLITE** failures continue to be very expensive. Landsat, image-mapping bird depended upon for detailed earth analysis by dozens of countries, was launched last July. In September an important transmitter on board failed. Now back up transmitter has also failed leaving specialized $2-5M receiving terminals installed for bird n Sweden, Italy, Australia, India and Japan without service.

**FAILURE** of The Entertainment Channel (F4/TR8) to attract significant cable viewers and $30M plus loss by parents RCA and Rockefeller closed down the service March 31st. Some talk that TEC will come back as advertiser supported cable channel.

**PHASORLINK** firm tested controversial digital scrambling technique on ANIK for a week, leaving behind trail of self hyping press releases but little of substance. Canadian firm claims system is perfect


for forthcoming DBS.

**FCC APPROVAL** of US programmers wishing to carry service to international regions on DOMSAT birds has COMSAT/Intersat in dithers. Commission said OK to various services to contract with users in Costa Rica, Caribbean, Atlantic and Canada. MPAA most upset of all, claiming approval will undermine movie distribution outside of USA. FCC noted ". . . revenues to be lost by Intelsat are too small to cause them economic harm".

**BORROWING** page from Steve Birkill's **CSD** notebook, new firm calling itself Orion Satellite Communications (no relation to Oak's Orion) asking FCC for permission to build, launch and operate pair of private 12 GHz birds to 37.5 and 50 west. Birds would be positioned so as to be able to reach as far east as Cairo (Egypt) and west to Houston. Backers are all big in cable TV industry and group proposes to lease/sell transponders to those who wish to inter-connect Europe and North America. Intelsat understandably upset and large FCC, Congressional and court battles are ahead. Below surface, plan has earmarks of being cable industry tool to allow feeding of US cable programming to Europe, and vise-versa, in latter half of this decade.

**AMERICAN** plan for important summer Regional Administrative Radio Conference (RARC) firming up; they'll plan to ask for 8 DBS orbit locations with total capacity of 72 DBS channels. Canada and others will oppose US plans and considerable battle is ahead. Some lesser-developed-countries will opt for reserving orbital spaces that they freely admit may not be used for decades, if ever. US will argue only those ready to 'ride on the bus' should be given 'tickets'.

**F3R,** the 'lost RCA satellite' that disappeared during critical launch phase in December of 1979, may be spotted. Super sensitive military radar spotted object with near-earth perigee of 5,000 miles and far-space apogee of 22,300 miles which MIT says fits last known space path of F3R. The cable bird disappeared from tracking station monitors during motor burn phase that would have kicked bird from relatively low orbit to proper Clarke-Orbit. Until recent radar discovery, best theories had bird blown into pieces too small to detect. RCA has already collected $70M plus insurance for bird, says that **if** it is F3R, it belongs to insurance companies, not them; doubts bird could be contacted and controlled without expending whatever fuel as may remain on board.

**KLM President** Peter Dalton reporting on record receiver-shipment month during February past seriously questions industry pundit predictions that home systems might total 50,000 during 1983. Dalton suggests "150,000 plus terminals, in 1983, seems realistic to me".

**M/A COM** has agreed to supply antennas to General Instrument for the forthcoming DBS packages being assembled by GI. A $600M 'order' placed with GI in February, by pioneer DBS firm USCI, has been the largest single order of satellite hardware placed at one time, to date. Dishes 1.0, 1.2 and 1.8 meters in size are involved and M/A COM's Prodelin will build them.

**NATIONAL** Microtech is moving into the SMATV field; has retained Eagan & Associates, a satellite consulting firm with extensive

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SMATV interests, to guide it into new venture.

**NEW** 7.3 meter antenna was shown at NAB show in April by COMTECH Antenna Corporation. Antenna has polar mount, dual-axis drive, optional microprocessor controlled horizon to horizon coverage; gain of 48 dB(i).

**POPULAR** television actor Mike Farrell, 'BJ' of the late M*A*S*H program, has become an investor in Pennsylvania LNA manufacturer LOCOM. Farrell recently visited LOCOM to inspect the firm's technology (as photos here show) and was treated to extensive tour as well as opportunity to visit with workers and try his hand building an LNA.


**'BJ' gets description of LNA from LOCOM's Kingsley Hastings (left).**


**HE's IN 'MY' CHAIR! LOCOM employee gladly gives up her seat to Farrell.**



**IBM** has agreed to use a transponder on Hughes Galaxy II bird for satellite linked teleconferencing. Hughes will also install up and down-link terminals at three IBM locations for the system. Galaxy II is scheduled for a fall launch this year.

**OAK INDUSTRIES,** smarting from poor financial year and dropping of ambitious plans to build and operate own DBS system, may be heading in different direction. Firm is reportedly planning over the air STV ventures in Venezuela and Brazil and notes that "with advent of DBS, over the air (single channel) STV may no longer be necessary". Oak says there is 'huge overseas market for American programming; especially feature films'.

**ALL THREE** US networks have objected to attempt by AT&T to raise charges for monthly 'Satellite TV Service' (STS) to $150,000 per transponder from present fees of just over $100,000. ABC presently uses some or all of day part of D3 transponders 8 and 13; CBS uses some or all of day part on transponders 10 and 17; NBC uses TR 1.

**UPI** is backing itself up with approximately 1,000 of the small 2 foot dishes that will receive 'slow speed' UPI transmissions via 'spread spectrum' technique from Equatorial Communications. Spread spectrum technique is successfully used by Reuters to feed their SDS terminal system from transponder 18 of F3R. UPI previously announced purchase of 1,400 of the Haris 3 meter Delta Gain antenna packages for 'high speed' news wire service.

**UNITED** Satellite Communications, Inc. (formerly known as United Satellite TV) landed $45 million equity investment from Prudential Insurance Company. USCI still plans to launch DBS like service using ANIK C series bird this September. USCI will shift to G-STAR bird after launch in spring of 1984. ANIK service will allow them to get started, in northern tier of states, and then switch to full USA coverage with first national 12 GHz DBS package. USCI has also contracted with General Instruments to purchase large quantity of 1 and 1.2 meter 12 GHz terminals.

**IN LARGEST** sale of satellite transponders to date, MCI communications has set aside $200 million for acquisition of 24 transponders on Hughes Galaxy 2 (September 83 launch) and Galaxy 3 (June 84 launch) birds; half of the total capacity available on the two birds. MCI is challenging AT&T for long distance telephone, data and private line services and figures satellites will make it more competitive.

**BELL MEANWHILE** is backing off of its heavy use of COMSTAR birds for telephone service, claiming that the quarter second delay caused by path up and back is making customers unhappy. INTELSAT resolved this, more or less, with 'echo cancellation' systems. Whether Bell has other reasons for rapidly transfering telephone service back to terrestrial paths is unknown, but at least one insider suggests Bell is really clearing satellite circuits for expanded use by television networks as new TelStar 1, 2 and 3 birds are launched starting this summer.

**STC,** the COMSAT version of DBS, may not be ready for you to help make 12 GHz terminal installations afterall. Latest marketing plan by STC is to enlist aid of small, rural telephone and electric coops to do installation and maintenance work. STC has made big pitch to these firms and seems to be avoiding dealing with established service industries in planning their own service network.

**RCA** says it will try to build its own Ku band (12 Ghz) satellites around new 40 watt solid state transmitter systems. That would give it a 3 dB 'edge' over some of the other 20 watt systems under construction, and if their solid state approach proves better for long term reliability, they'll still be transmitting long after more conventional traveling wave tube based systems have bit the dust.

**REAGAN** administration is pushing hard to get NASA and Shuttle launch business into private sector, and phase government launching out of the picture by 1990. Government would in effect turn Cape Kennedy installation into private operated base while retain Vandenberg location in California for military satellites.

**PREVIOUSLY** announced Chinese satellite system (two birds, the first at 70 east) will have both 4/6 GHz and military 7/8 GHz on board. Military portion is something of a surprise to western satellite watchers. Chinese plan to use terminals as small as 5 meters, and as large as 15 meters on ground. Presently there are no more than 2,000,000 telephones in country with over 1,000,000,000 people and while system will tie together entire nation's telephone and television network grids, it will also give government ability to push ahead with

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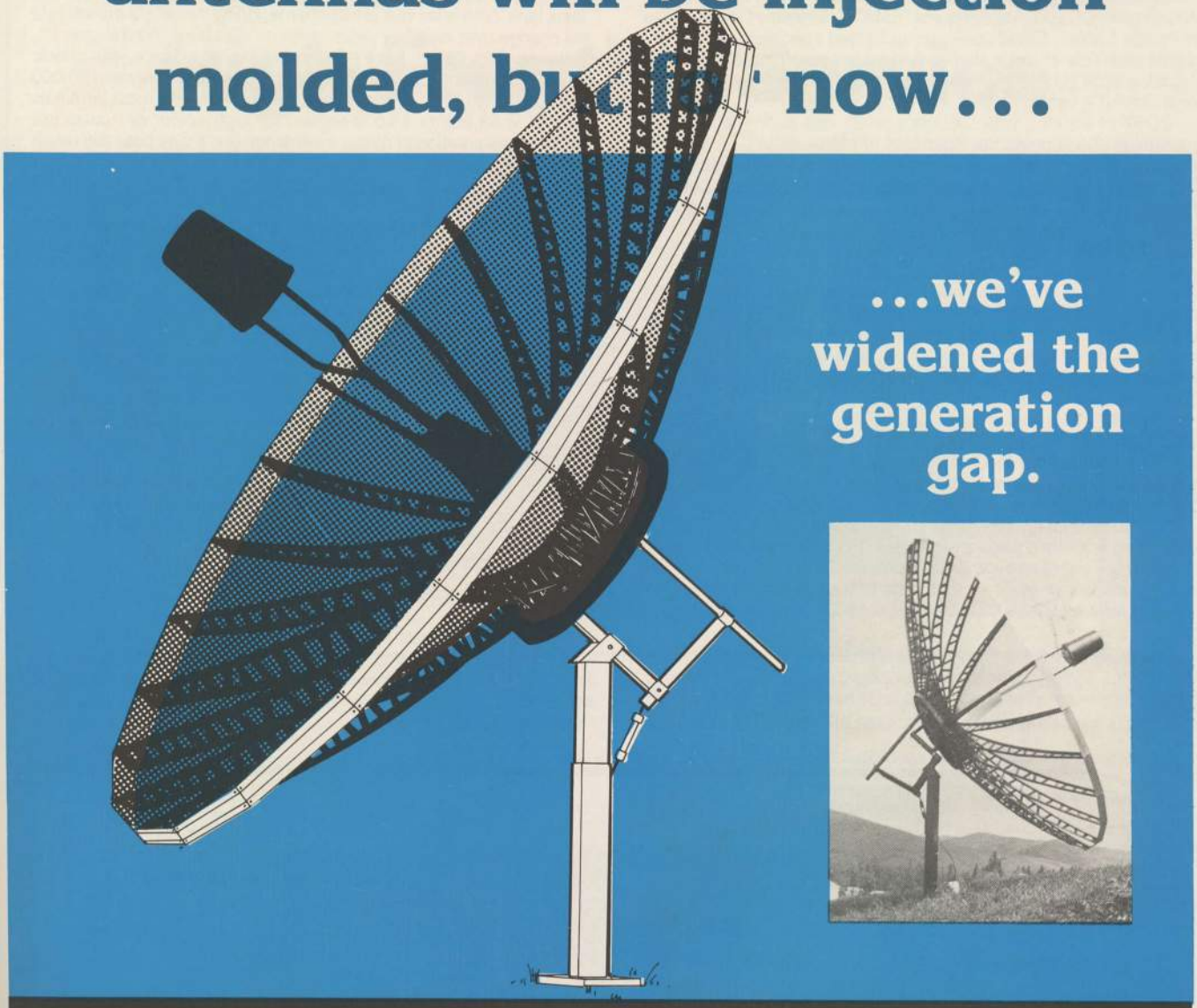


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plan to make Mandarin 'official', common language.

**SMATV?** Send a check for $45 to NAB, 1771 N Street NW, Washington, DC 20036 and request "SMATV: Strategic Opportunities in Private Cable". Broadcaster group funded special report that includes cash flow analysis studies and makes recommendations that (broadcasters) get into SMATV/Private cable market 'to stay ahead of local cable TV firms'.

**COST** of insuring your satellite against loss during launch and positioning phase going up. After loss of Indian INSAT-1A bird this year, and Ariane launch losses, most insurance sources that cover such things are talking about premiums amounting to 12.5% of total insured value. Another untimely loss or two would drive rates up even higher.

**EUROPEAN** satellite TV market continues confused, perhaps suffering pangs of too much opportunity all at once. Complicating focusing problem is sudden open road policy for cable TV in UK and other European countries. Recent availability of US news services and selected network shows (see **CSD** for March 1983) via AFRTS Intelsat feeds has fueled new interest from private sector, but 20 foot plus terminal size required, and high price of all TVRO hardware in Europe, is holding the lid on.

**APPARENT** final assignment of transponders, on board ECS-1 (first European 11 GHz bird) has occurred. Of ten transponders available, two each will go to UK, Germany and one each to Belgium, France, Italy, Netherlands, Norway and Switzerland. Now it will be up to each individual nation to decide how to utilize the space allocated.

**FRANCE** may have given over control of highly erratic Symphonie birds, flying in figure 8 pattern at 11 west, to Germany as part of joint effort now being shared by two nations. Control of two birds apparently does not affect use by France of birds to feed television service to overseas territories (see **CSD** December 1982; February and March 1983).

**CANADA** may have finally hit paydirt with ANIK program. First ANIK-C bird, carrying premium TV programming for Canadian cable industry, is about 'half sold out' but already has more than $55 million in contracts from program suppliers. Cost of bird, and launch, estimated at $65 million.

**IF YOU** have a spare $2790 and are anxious to know how one 'think tank' calculates **our** private/home TVRO industry's growth rate will change over next few years, write to VDC, One Washington St., Wellesley, Ma. 02181. Here's synopsis **before** you send your check: (1) 1983 shipments of home TVRO packages will be between 30,000 and 50,000; (2) Further price drops are not likely and most terminals will sell in $3,000 to $5,000 region; (3) high equipment costs are inhibiting the creation of dealer inventories and many potential retailers are discouraged from entering business as long as equipment costs stay up; (4) distribution patterns are 'sporatic' with too much competition in some areas, no competition in others, at dealer level; (5) a lack of ready financing at retail end discourages buyers from purchasing systems. If you think that's **inside** information you MUST have, for $2790 they'll tell you more!

**PIONEER** 12 GHz terminal manufacturer Orrox has closed down Ku band facility. Firm says it spent more than $3 million on R and D and marketing, finally decided it cannot compete against off shore 12 GHz receiver pricing nor can it hold on with products and marketing until expected boom in 12 GHz terminals in 1985 or 1986.

**BROADCASTERS** were told that COMSAT's STC 12 Ghz DBS plans can go ahead. Court of Appeals in Washington had been asked by NAB to enjoin STC from proceeding with STC/DBS plans, NAB will appeal.

**MARRIOTT HOTELS** is latest to join national in-room TV via satellite program. Using 5/6 meter class terminals from S/A, Marriott will offer customers HBO, ESPN, CNN2 at more than 100 locations nationwide.

**INTELSAT** had growth of 18.3% during 1982 while demand for television transponder time outpaced overall growth by leaping ahead 42%.

**POSSIBILITY** exists that new Western Union/NASA TDRSS bird may allocate a couple of channels to allow Voice of America and US Information Agency to get into the TV business. Plan would allow US agencies to transmit television programs **directly into Europe** at 4 GHz from TDRSS bird where cable and other viewers (including

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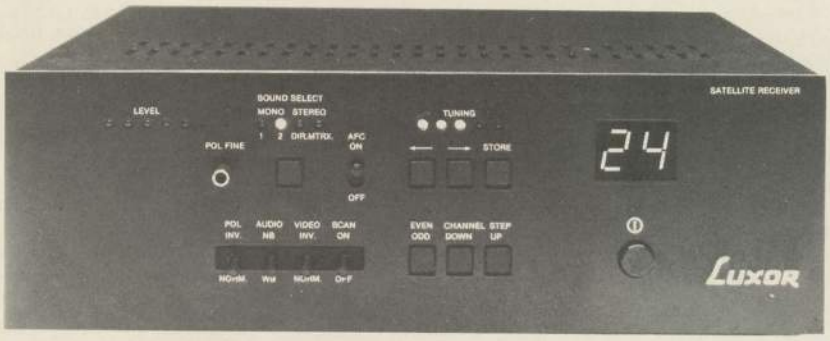


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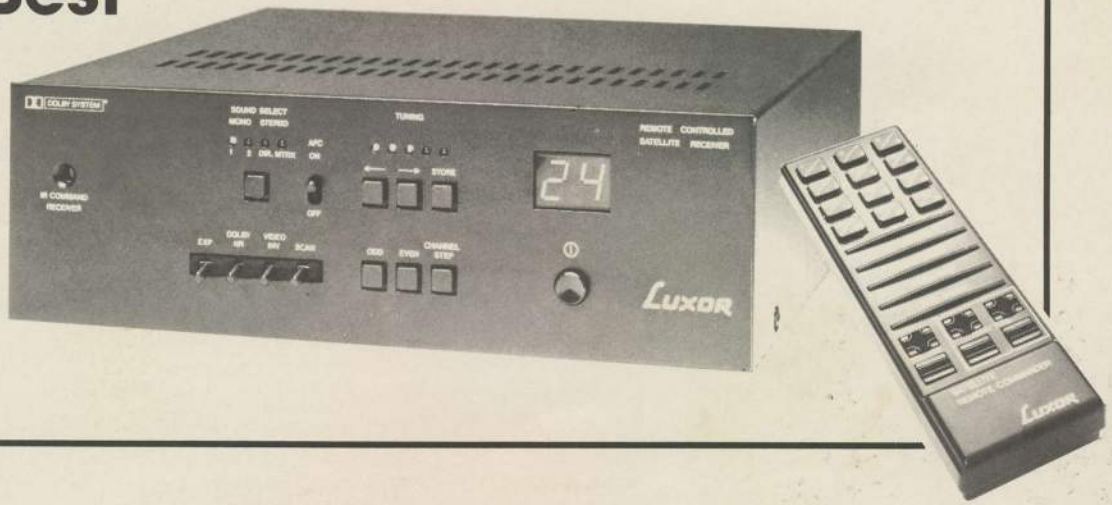


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private terminals) would have access. Only secondary problem present is that both agencies are largely in 'radio' business and are not equipped to handle television programming at present time.

**LATEST** thing in satellite investment opportunity may be 'Teleport'. Concept is that site in ten to thirty acre size is carefully selected, adjacent to major market. Site will house multiple uplinks (ten meter class typically) and via terrestrial microwave inter-link with major communication centers (broadcast stations, others) in core of metro center. Teleport offers uplink and downlink time, for hire to 'any bird at any time'. Centers now announced, and/or under construction for Chicago (three uplinks initially), New York City (total of 17 uplink antennas planned) and Columbus, Ohio.

**SATCOM 1R** went into orbit via Delta launch early in April and is now stationed at 139 west. For a short period, F1 will continue to operate at 135 west although that spot will be vacated by F1 in favor of Hughes Galaxy 1 late in June. F1R is not expected to carry much video, dedicated primarily to audio, data, and digital services.

**ALSO** launched in April, Intelsat F6 in the Five-A series. This bird will have an Atlantic Ocean station. F6 was lofted by an Atlas Centaur rocket.

**THOSE** first 30 Ku band TVROs bought from M/A COM by French Matra group will be installed in French theaters and other public places for videoconferencing and special pay-per-view theater events.

**JAPAN's** CS2A satellite arrived safely 'on station' at 132 east. Bird has 8 transponders on board, two on 4 GHz, and is considered 'experimental'. CS2B, for 136 east, will launch from Japanese Tanegashima site in August.

**FURTHER** evidence that conservative face of COMSAT/Intelsat may be changing; newly elected COMSAT Treasurer is William Karnes who comes to satellite firm from PLAYBOY Enterprises, Inc. where he held similar position.

**UNITED VIDEO** planning a new sub-carrier weather service including charts and maps and frequently updated reports using WGN TR3 on F3R.

**ALTHOUGH** major adjustments are likely, latest Ariane/ESA announced schedule places Intelsat V (F7) up in August (after planned ECS-1 in June), F8 of same series in November, F9 of same series in January of '84 followed by first launch for American DOMSAT, Westar 6 in March of 1984.

**MEXICO** will go ahead with Illuicahua domestic satellite program inspite of depressed Mexican economy and international credit problems. Mexico got support for nearly $130M in cash from US Export-Import Bank.

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**COOP'S COMMENTS/ continued from page 5**

and when people compared the $50,000 TeleSat 4.5 meter dish terminal to a stateside $12,500 terminal (cable system price), they often failed to see any difference . . . except the price. That led some Canadian folks to try to 'sneak' into Canada some blackmarket US terminal hardware. A chap named **Rod Wheeler** (see **CSD** for June, 1980) was the first to brave the Canadian authorities. He installed a home built 6 meter dish, a Microdyne receiver and an SCI 150 degree LNA one day in the summer of 1976 and hooked up WTBS (WTCG) to a cable system serving around 4,000 homes. That lasted three days and then the Canadian mounties rode in with a government order demanding that Wheeler shut it all down.

Wheeler chose not to defy the Canadian mounties; he hooked his six meter terminal to a tundra sled and tractor and pulled it across the frozen ground to his log cabin home several miles out of town. Then he applied to the Canadian government for an experimental license to 'receive' satellite TV signals and was even granted a set of call letters for his 'receiving terminal' (VE9DX). Wheeler today is still very much a part of the home TVRO industry, as a part of something called **NORSAT** in British Columbia. If you ever get the opportunity to meet Rod, ask him to tell you about the time they installed a 4.5 meter Andrew dish in a Yukon town right under the nose of a special mounted police team sent in to confiscate the terminal. And you think you have problems with your local zoning board!

While Wheeler was dodging the mounties and freezing his fingers

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| Specification | Pico-Savac SAR-10 3 Meter | Typical 3 Meter | Typical 3.6 Meter |
|---|---|---|---|
| dbi Gain | **41** | 39.5 | 41 |
| 3db Beam Width | **1.55°** | 1.75° | 1.60° |
| Reflective Surface Tolerance | **.003** | .035 | .030 |
| Surface Area (sq. ft.) | **81** | 81 | 112 |
| Approximate Weight (Lbs.) | **205** | 250 | 350 |

Pico-Savac, Inc. will knock you out with a 3 meter dish that works like a 3.6. It's lightweight at 205 lbs., guarantees 2° spacing, and has a gain of 40.6 to 41 dbi from 3.7 to 4.2 GHz. The Pico-Savac SAR-10 3 meter dish accomplishes all this and more with 40% less surface area than a typical 3.6 meter dish.

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off trying to shove bolts into 4.5 meter Andrew dishes in 60 below temperatures during the winter of 77, another Canadian named **David Brough** was taking a different attack path on the Canadian authorities. Brough hadn't really focused on satellites in 1977, but he had figured out a way for people in small northern Canadian communities to have better TV than the stuff TeleSat/Anik was sending north. Brough was operating at various clandestine walk-up flats in the Toronto area videotaping everything **American** he could get off the air or via local cable TV. Brough even figured out a way to turn a 2 hour Betamax machine into a reel to reel 10 hour machine just so he could load up ten hours of TV programming on a Beta format machine. Then he would dupe the tapes into a few dozen copies, and send them off into the backwoods of Canada in unmarked containers to small mining and logging camps, and fishing villages. At these locations, they would play the tapes back on specially modified Beta machines, tied to 1 or 5 or 10 watt VHF 'transmitters.' Brough made money on all of this by getting a contract with the small camps and communities to supply them with ten hours or more per day of television programming, and then supplying the equipment to make it work and the tapes that fed the system. Oh yes. Brough was operating **outside the law** since he was copying and reselling television programs without any approval of the program copyright owners, and, also because his 1, 5 or 10 watt transmitters were not licensed by the Canadian government.

The Canadian authorities tried to shut him down several times. In one incident, in Pickle Lake, Ontario, the Canadian feds sent a 'SWAT' team into the community to take physical possession of the local transmitter. The Canadian feds had gotten uptight in this instance because Brough's ten watt station, which probably cost him under $3,000, was far more popular than a local $100,000 ANIK installation that the government installed. The difference was simple enough; the Pickle Lake people wanted to watch American television and not some TeleSat selected programming that taught them how to weave baskets in their spare time.

The SWAT guys got into town and found the transmitter in the kitchen of a local home. They loaded it up into their jeep and headed back towards the dirt strip they had landed on. Halfway back they were met with a solid line of human beings; men, women, and children. The men, and some of the women, they tell me, were 'armed' with axe handles and other terrible weapons. The line stretched across the road and the hundred or so people were not going to budge. After an hour or two of standing off, with neither side moving, the SWAT guys made a call back to headquarters. They were well advised to return the 10 watt Brough transmitter to its kitchen home. After they did that, the line across the road melted away and the SWAT guys left Pickle Lake; empty-handed.

In **another** Ontario town the Canadian SWAT guys got in, and out, without getting stopped. But two days later the local ANIK fed TeleSat receiving site and transmitter mysteriously blew up because somebody left a few sticks of lighted dynamite around the site. Wisely, the SWAT people returned that confiscated transmitter. **Before** they tried to rebuild the blown up ANIK system.

Buoyed by his success with the Canadian authorities Brough moved out of his clandestine Toronto walk-up flats and into the open. For several months he was a regular subject of Canadian newspaper reports, on CBC radio and CBC television. Each time they 'picked on' David they tried to make him look like a fool; a man fighting with windmills. But as he will tell you, each time a story broke on him, he heard from a half dozen to a dozen more remote Canadian communities who wanted his service.

At its peak, Brough probably had 70 such transmitters running, up to three channels in a community in some cases. And he was buying more ½ inch videotape than anyone in Canada. He thumbed his nose at the Canadian authorities who seemed hapless (and helpless) to shut him down. They remembered Pickle Lake and the dynamited ANIK site, and after trying to discredit him for a year or more, they finally realized that he was onto something big.

I saw a couple of fellows at the recent Las Vegas STTI show sporting 'PICKLE LAKE TV' hats. I liked their sense of history and told them so.

Late in the fall of 1978, Brough saw my article in **TV GUIDE** about a home TVRO and he came to see me. When he returned to Canada, he set out to convert as many of his communities as possible to satellite

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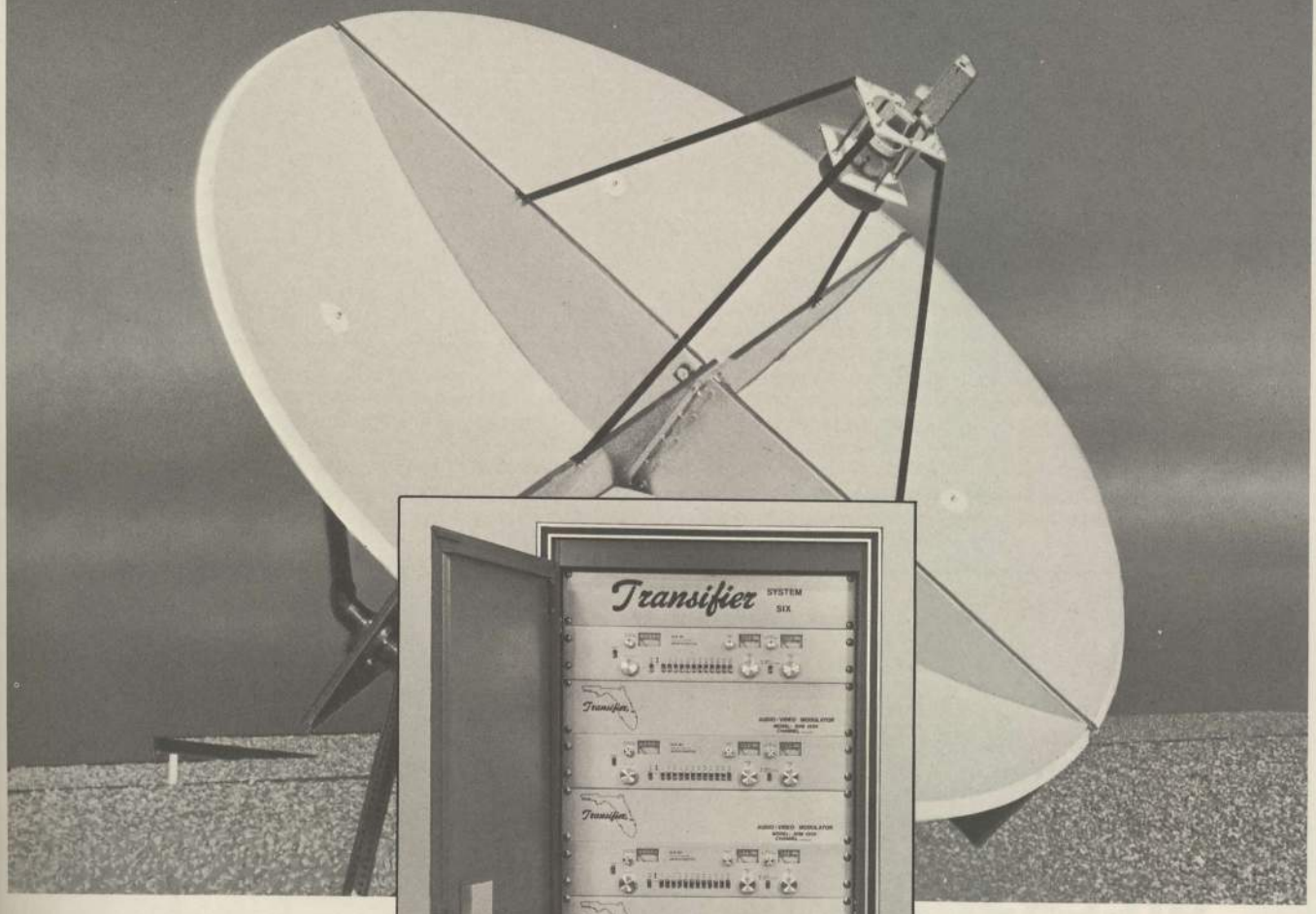

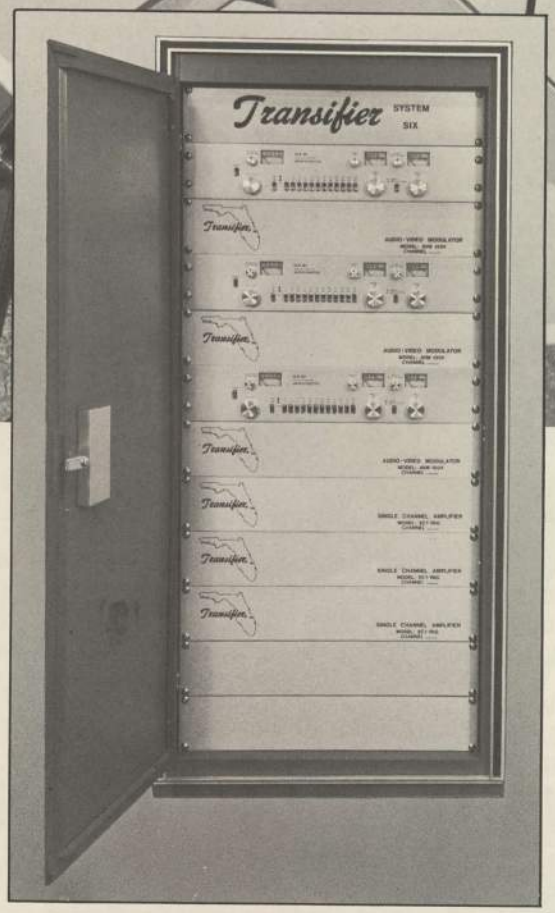


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fed service. In true Brough form, he did it far cheaper than others and pretty soon he was building antennas and receivers on his own to shave costs further. Brough is still in this business today; he operates **Commander Satellite Systems** in Mississauga, Ontario.

All of this, Wheeler and Brough, happened **before** Canadians really decided that home TVROs were a nice gadget. These were just a couple of guys doing their own private things; but these were things that forced the Canadian authorities to grapple with the question of private TVRO ownership long **before** the issue was raised to the south, in the US of A. The Canadian authorities bungled it badly. First they adopted the attitude they trotted out to handle Wheeler. A private person **could** get a one year experimental license to receive domestic TVRO signals (i.e. Canada only). Wheeler cheated. He watched HBO. But he couldn't **share** that reception with anyone else. Then Brough came along with the wholesale application of converting his tape fed 1, *5 and 10 watt transmitters to satellite. No, they didn't pick up and* rebroadcast the ANIK signals as a rule. Not when WTBS and others were just a few degrees away. To short circuit Brough, they issued policy statement after policy statement which said, in effect, "You are illegal if you operate a transmitter without a license," and "You are illegal if you pick up and rebroadcast any non-Canadian satellite signals." The authorities saw to it that these policies got lots of **press** but with virtually no exceptions did they prosecute anyone who did either, or both, of those things. They remembered Pickle Lake and the dynamite blast.

**On Tuesday, March 1st,** the Canadian government finally threw in the sponge. Almost nobody in Canada was surprised when Communications Minister Francis Fox announced that there was a new 'Official Canadian Government Policy' regarding TVROs. From that date forward, the Canadian government no longer considered it illegal if a private individual, or a bar/tavern, or even a motel or a hotel installed a TVRO. It was not even going to be illegal to watch 'foreign' (which in Canada means US) television with that terminal. The mounties were at last called off.

What Fox and the Canadian government finally did was accept the lessons of history. More than twenty years earlier they had **attempted** to shut Canadian viewers off from American TV by adopting rules and regulations which made it almost impossible for Canadian cable systems to carry many of the available-to-them US broadcast stations. They did this by specifying in engineering terms the minimum signal quality levels which Canadian cable systems could deliver to Canadian homes. They made these engineering numbers so 'stiff' that a Canadian cable system, 90 or more miles from a full power US

## Satellite dishes for taverns now legal: Fox

**By Bruce Ward** Toronto Star

OTTAWA — Tavern and bar owners can now use satellite dishes to pick up television signals without fear of federal prosecution, federal Communications Minister Francis Fox has announced.

television transmitter, was going to find it almost impossible to get sufficient signal from the American station to **legally** be able to run it down the cable. That prompted the Canadian cable folks to develop huge 300 foot parabolic-like screen antennas which in some instances made it possible to carry distant American terrestrial signals from stations up to 300 miles distant!

When US satellite signals became available, many of the smaller, more remote and rural Canadian cable operators threw caution to the winds and plugged in anyhow. They did this inspite of the fact that Canadian cable systems operate with federal licenses and they were placing their license to operate in immediate jeopardy when they began carrying WTBS et al. But they did it anyhow because all around them people like David Brough were installing equally illegal 1, 5 and 10 watt transmitters that were plugged into the WTBS et al US satellite signals.

**Minister Francis Fox has thrown in a well worn sponge.** But he has done so because he realizes that the former policy was forcing good Canadian citizens to become lawbreakers in their own living rooms. Some are saying that like the Prohibition era in the states in the 30's, the policy was doomed from the very beginning.

The practical impact on our industry can be immense. But it is not the sudden opening of a flood gate **for US** manufacturers and exporters. While in Vegas I talked with a considerable number of Canadian TVRO manufacturers and distributors and dealers. One, from the Toronto area, told me that on March 2nd he seriously considered running out and buying one of those rolled-number machines where the customers take a number when they come into the store, and then wait their turn to be waited upon. "There were probably sixty people in our store at the peak point all wanting a TVRO installed tomorrow!" he told me.

The first, immediate buying group are the 'Tavern Owners.' TVROs are very visible in Canada; perhaps 5 to 7% of the 'taverns' in the more populated areas have them. They specialize in watching ESPN, USA sports and other sporting events. Sports goes well with beer, even in Canada. When Francis Fox specifically said that 'taverns' could have TVROs without fear of government retaliation, the tavern owners headed for their nearest neighborhood satellite dealers. Nobody seems to know what the size of this market may be but I would estimate there are 10,000 or so 'quick sales' here.

Right behind the tavern owners came the horde from the motels and hotels. There is still a problem here; a problem that also affects the tavern guys although they are choosing to ignore it. **Programming rights.** When Fox said that homes and taverns and hotels/motels could have their own TVROs, he **also said** that they would have to get 'permission' from the programmers to 'carry' or use their programs. There has been a bunch of flack within Canada, coming from the Canadian cable guys, over those pioneering motels and hotels who have been (for a year or two now) carrying HBO, Showtime, WTBS and so on into their rooms with 'illegal' dishes. The cable guys feel they are being treated unfairly since they, as cable folks, are not allowed to sign up with American programmers such as HBO, while right in the middle of their cable plant there is a Holiday Inn that is 'stealing' HBO off F3R and showing it to room tenants.

The tavern guys are not worried about this one. A few, perhaps half or more, of the motel and hotel guys **are** concerned. In the text of Fox's new policy statement one does not find any indication that the Canadian government is going to act as a police agent for HBO et al; in fact one reads the Fox statement and sees a total avoidance of any possibility that HBO will get **any help** from the Canadian government. In effect, he is telling people that without programming rights, they are still in jeopardy. **But not from his government.** Just from civil suits. The suits will have to be brought in Canadian courts, and they will have to be inaugurated or supported by HBO and others who don't like the Winnipeg Holiday Inn Downtown using their service.

I talked with some Canadian attorneys about this one and each told me that under the 1982 adopted Canadian constitution, HBO is almost sure to lose that one in court in Canada. I guess HBO will have to count on its scrambling to protect it in Canada.

Fox also said that SMATV systems don't need a federal license to operate, either, provided they don't jeopardize the financial success of the established cable systems. That is going to be an interesting issue.

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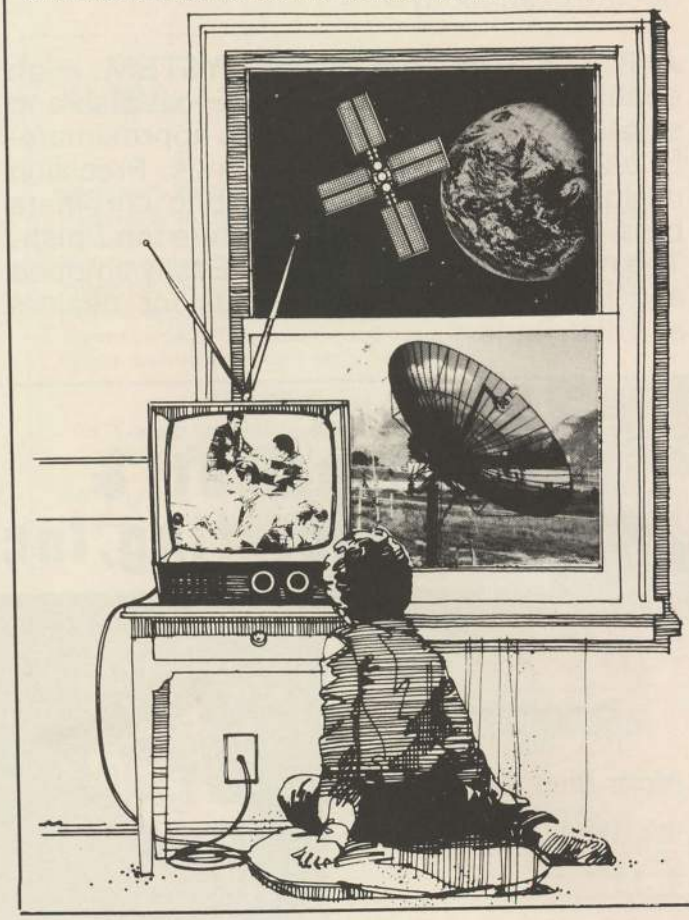
I talked with one Canadian TVRO installer who was pricing 100 lot receivers from **AVCOM** and **DX** (the block down converter units we discussed in our April issue), in Vegas. He was ready to start installing 'several dozen SMATV installations.' How would he avoid the wrath of the Canadian cable guys, who could under the Fox ruling, take the SMATV operators to court because they felt 'financially threatened' by the SMATV operators? He had several plans, including only putting in the TVRO fed SMATV systems in those complexes where cable was **already** available, and where cable was a part of the 'rental scheme.' That is, in condos where cable, like water and electricity, come with the 'flat.' It is not an option. His SMATV system, offering perhaps 12 US **satellite** signals, would be an 'optional service.' People could sign up, or pass it by. He'd simply put in is own (second) cable distribution plant in the building and then go door to door selling his product. He figured he could get 50% sign up quite easily. I wished him luck.

If there are 10,000 additional taverns opting to TVROs, there are probably 5,000 multiple dwelling complexes also suitable for TVROs, in Canada. And then there is the 'home front.'

**Nobody will even guess** what the potential market may be for home TVROs in Canada. Fox talked about this, in a backhand way, when he released his March 1st statement. He said that the growth of 'illegal TVROs' was threatening the economic viability of the Canadian cable and broadcasting industries. He suggested that if Canadians were going to buy TVROs (at motels/hotels, in homes and in taverns) and watch American satellite TV, he was going to 'change the rules' and allow **some** American television, **via satellite,** into Canadian **cable** homes. With as much as 75% of Canadian homes in front of cable service these days, Fox believes that the best way to head off a TVRO in every front or back yard is allow the forbidden American fruit onto the cable services. What he is not going to allow onto Canadian cable is American **premium** programming; HBO and so on. USA Net, ESPN, WTBS and others that sell advertiser supported services will shortly end up in the Canadian cable homes; **legally.** Premium programming (movies, etc.) will not. That will have to come from the new Canadian premium service suppliers that are loading up on the 12 GHz ANIK C bird, that went into operation this past February 1st.



In short, Fox wants to head off home TVRO sales by making it possible for Canadian cable systems to offer **the same non-premium** programs as US domestic birds offer. He figures that a home owner will opt to pay an extra $2 to $4 per month for a half dozen to dozen American satellite **(non-premium)** programs rather than paying $1,995 for an installed six foot dish for his yard. He may be right in the long run. What about American premium programming (HBO and group) versus the new 12 GHz Canadian premium programming? Fox knows that HBO and group will be scrambling in a year or two, and he figures **when that happens,** cable versus home terminals will sort out pretty quickly.

But that is all tomorrow. What about today?

Some place the market for Canadian homes buying TVROs at $1995 at a million plus. If that number seems outlandishly high, you don't understand the slightly paranoid view of the typical Canadian viewer who knows that American television is far more exciting than Canadian television. In those Canadian homes where all of the Canadian national services are available, **and all three of the US networks are available,** they tell us that 85% of the viewing done in the evening is done on American programming channels. That's a pretty stiff number for Canadians who believe **their** television should dominate **their** broadcast culture, to accept. But it **is** a real number.

A million dishes in Canada? In backyards? Perhaps.

Unfortunately, for Canada's would-be-watchers of F3R et al, the manufacturing capability of Canadian TVRO suppliers is, by American standards, very much on the light side. It appears that perhaps they **could** support an industry installing as many as 500 to 750 terminals per month, today. That's a drop in the bucket compared to the real market size. Several firms, including Brough's Commander Satellite Systems, are gearing up for large scale 6 and 8 foot antenna production. A few, such as Wheeler's Norsat, are talking about turning out 1,000 receivers per month. M/A COM Canada manufactures LNAs but they are in the strange position of producing an export product which Canada badly needs exported. Canada needs to maintain its 'trade balance' with the United States, and the Canadians typically import far more American goods per year than they export to the USA.

That causes import/export balance problems which Canada tries to solve by shoving us their surplus crude oil and other goods which don't go through a manufacturing cycle. It is a very difficult tightrope to walk, and the trade imbalance has made the Canadian dollar worth far less than the American dollar for a number of years. A firm such as M/A COM Canada is under intense pressures to ship goods into the USA to help that trade balance situation.

Which means we find M/A COM shipping LNAs into the states, while Canadians are buying up Amplica, Drake, Avantek and Dexcel LNAs to haul back to Canada. And here comes the dollar crunch.

If you exclude shipping costs, and you pay the import duties and tariffs and insurance and other fees associated with shipping a US manufactured product into Canada, the product ends up costing an average of 155% of the US price, in Canada. That means a Chaparral feed that distributes for $135 in the states ends up costing $135 times 1.55 or $209 in Canada. Plus shipping costs and retailer markup. Those like Brough who are spending big bucks to get full scale antenna production going on Canadian soil have the right approach to the combination import-duty-fee plus shipping cost problem. But gearing up for antennas, a mechanical process, is far different than gearing up for LNAs or receivers.

I am told that in **some** instances, a distributor in Canada can bring in goods from Japan or the far east and pay a lower rate of duty than the same goods brought in from the USA. That should suggest to you something very important that **could happen** as a result of the new Fox enunciated 'open satellite policy' for Canada.

We have seen the Japanese and far eastern electronics industry mostly stay out of the North American marketplace (DX and a few other aside) until now. For one thing, the market has not been large enough to support **their kind** of intense marketing and distributor programs. For a bigger reason, as long as the **US policy** on private terminal use is up in the air (witness the SPACE concern that we get ourselves into an anti-trust case with HBO and others to establish our position), you are **not** going to see Sony and Panasonic jumping in with big promotions and products.

I think it is entirely possible that when the dust settles from the Fox statement, and the new Canadian policy begins to gather marketplace momentum, that we may see the first large scale introduction of Far Eastern 4 GHz satellite communications gear in the world. I hope I am wrong, but that 55% duty/import fees 'barrier' between the USA and Canada is going to be a tough hurdle to jump for US manufacturers.

In any other industry, established and running smoothly, it would be only a short time before we saw US firms setting up Canadian manufacturing subsidiaries. As I look over the prospective firms inside the USA, doing the bulk of the receiver-business, I see little likelihood that any of these will jump into Canada and set up shop. I hope I am wrong, but I fear I am not. There are several reasons for this. Inspite of the close ties that exist between the USA and Canada, Canadian law does not make it attractive for many US manufacturers to do business

# Bars can use satellite dishes to pick up TV

**Continued from page A1**

pubs, but unscrambling the signal for legitimate subscribers is expensive.

"It will be up to the bars and the CFL to work it out," a communications spokesman said.

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there. About the only way a US company can function in Canada is to be so huge that it has the legal and paperwork resources to keep up with a myriad of special laws and conditions that apply to 'foreign owned' corporations doing business there. There are such laws in Canada to insure that Canada is not the "51st State" of the USA. About the only way a small to medium sized US concern can set up shop in Canada is to give the majority of the new corporation over to Canadian ownership. That is typically not attractive; you are trading a 55% trade barrier for a 49(-)% ownership position.

There are ways 'around' some of this messiness (such as bringing into Canada partially wired or partially assembled circuit boards with final assembly done in Canada), but at best such approaches merely chip away gently at the 55% duty package that applies to finished goods. This is not a lesson in setting up shop in Canada so we'll stop with the gratis consulting service for now. Suffice to say when Fox opened the door to perhaps 1,000,000 Canadian TVRO terminals, he was doing far more than merely tossing in a sponge in a battle he lost several rounds ago.

Just how far and how fast the Canadian TVRO industry goes will depend on two factors. Number one, the equipment supply. Prices (primarily on US built gear) are already very high, even when the gear is 'smuggled' into Canada under the front seat of a Toyota. With the demand far exceeding the available supply, it will probably go even higher. That will be even further encouragement to Japanese and other Far Eastern manufacturers to jump in. I'd give them six months at the outside to arrive with their neat little boxes. The second factor will be the unsettled questions that pervade the programming rights issue. Fox took the Canadian government out of the circle when he in effect said that his government was not going to be an enforcement agency for 'foreign programmers' who feel their program rights are being violated. HBO, ESPN, WGN and others have already been in court in Canada; **and lost.** And that was back **prior to** the late 1982 adoption of a new Canadian Constitution which most agree is even less friendly to non-Canadians. I can see some sentiment to get some test cases into the Canadian court system to establish a precedent, but if I was HBO, I'd just let it go for now, hoping that when I finally got my scrambling going the problem would resolve itself. If nobody starts a massive legal battle in Canada over this one, and the newly born Canadian home/tavern/motel TVRO industry has a year to run without a bridle, it will be all over. You will never stop it a year from now.

All of this **can come** into focus at the forthcoming STTI Can-Am '83 trade show in Minneapolis June 24-26. STTI's Schneringer had no idea that Canada's Fox was going to hand him this once-in-a-lifetime opportunity when he set the location and dates for the June show. Schneringer should do two things; send Fox a nice 'present' for handing him the potential for several thousand Canadian show attendees, and, follow that up with an invitation to Fox to speak at Minneapolis.

For those who are seriously considering exhibiting at Minneapolis, this 'free' advice:

1) **If you have any interest** in the Canadian market, take the time to carefully investigate what you can and cannot do with your product when it needs to be shipped across the border.
2) **Hire a good attorney** qualified in cross-border transactions (Detroit and Buffalo have a bunch of these guys) and spend some money getting some advice on how you can 'beat' the Canadian 55% accumulative tariffs. Do this before you get to Minneapolis because your competition will be doing this also.
3) **Make a trip to Canada** and visit the scene of activity before you formulate your marketing plans for Minneapolis. Deals will be made and won, in Minneapolis, because the (US) sellers understand the Canadian problems. Not because you have a receiver that is $10 cheaper or 2/10ths of a dB hotter.
4) **Figure out exactly** what you could do with a 'royalty arrangement' in Canada; where you provide the technical know-how to get somebody else (using their own money) set up building a product very similar to yours, in Canada. Understand how royalty arrangements are made, and how you need to be protected. Get some good advice on having your royalty payments, should you license someone to build your products there, shipped outside the USA to an international banking center such as the Cayman Islands. If you don't need it at home

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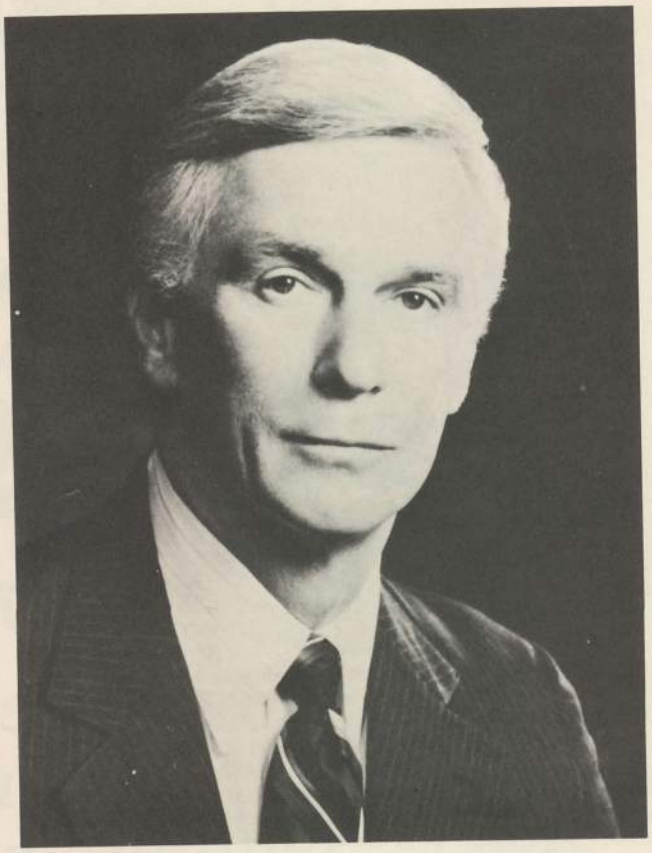
**WELCOME Aboard Commander**

There certainly are a few 'perks' associated with being the publisher of a trade journal such as **CSD**, and I must honestly admit that I enjoy them when they come along. Case in point. At the Las Vegas STTI shindig St. Louis based **Intersat Corporation** announced their proudest new 'affiliation'. It seems that former **Astronaut Gene Cernan** has joined Intersat as a technical and marketing consultant. In effect, Commander Cernan is now part of the Intersat 'team'.

On Vegas-Monday, Intersat held a small, private, party for Gene. It was his birthday and Kevin and I were invited. Kevin, to be 14 this summer, has many varied interests. When he isn't running the national TV network for me, he builds electronic kits and doodles in his 'Robotics Notebook' dreaming of the ultimate Robot he will one day design and build. His fantasy at the moment is to build a robot that he could take to a satellite show and program to wander around the antennna lot and exhibit hall aisleways unattended. Sort of an electronic Hank Turek, and he idolizes people like Cernan.

The Commander blew Kevin's mind when he told him he had read about him in **CSD.** I had to put an anchor on his foot to keep him on the ground the rest of the night. But the best part was ahead. The Commander and Intersat's McClaskey and Davis had arranged for Kevin to accompany a small party to a very special airshow that was being staged on Vegas-Tuesday by the world-famous **Thunderbirds.** They are the ultra-precision Airforce flying team (six planes) which demonstrate ultra-sonic speed super-tight flying maneuvers. About a year ago four of the six planes in the then-Thunderbird group crashed, all at once, when the group leader mis-cued and headed straight into the ground at some tremendous speed; and the three guys flying with him just feet away from his wing tips followed him 'in'. The Vegas-Tuesday show was the first public display of the newly re-built Thunderbirds since that tragedy. And it was in honor of Cernan, and his birthday.



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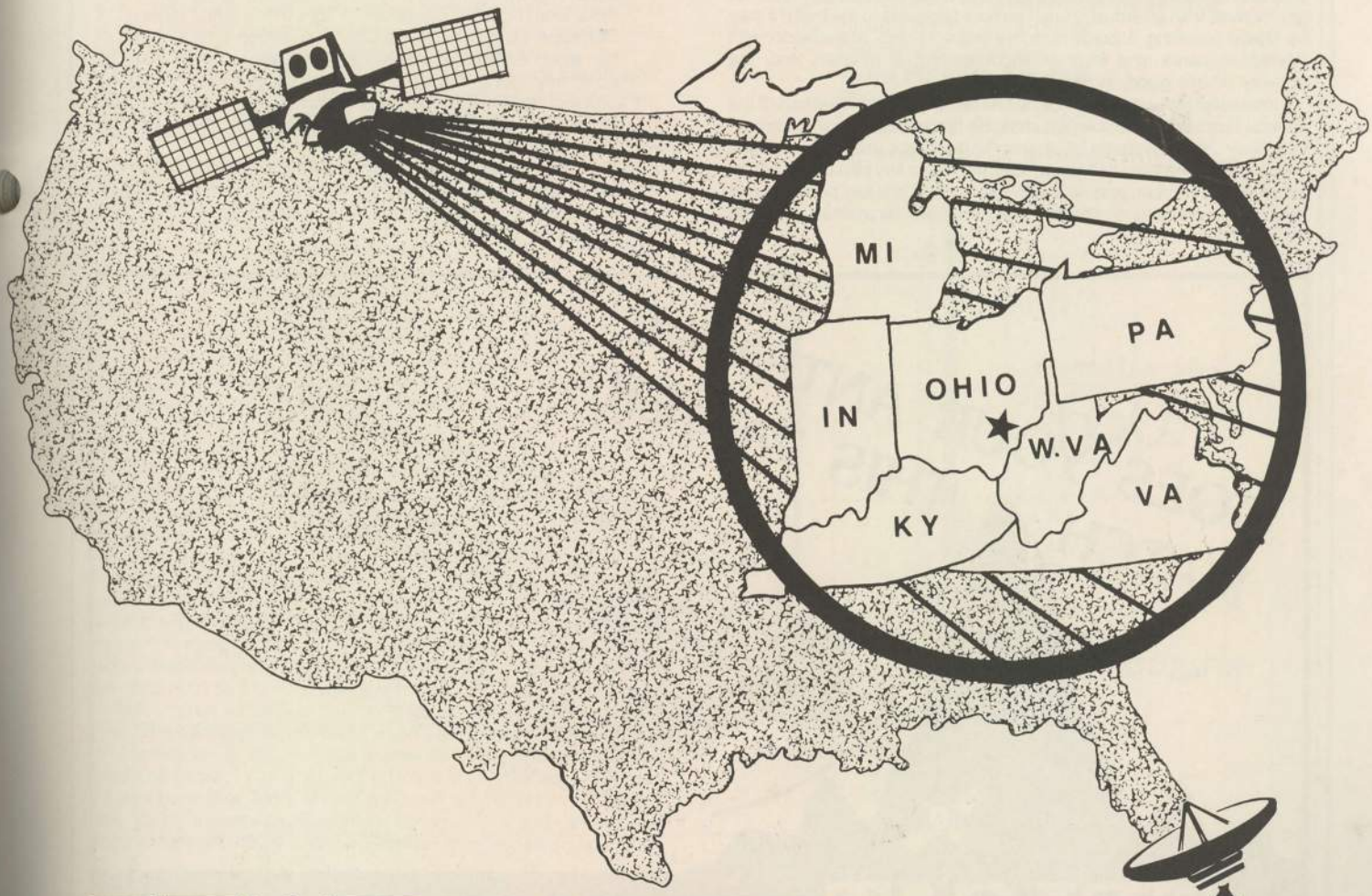


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**Cernan was the 'last man' to walk on the moon;** Apollo 17. He was also the Lunar Command Module Pilot for Apollo 10 and he established a record as the youngest man to walk in space during a flight of Gemini 9 back in 1966. He is now retired from the Astronaut program (he hardly qualifies for Medicare yet!) and has a number of business interests. Intersat is one of those interests.

Getting to meet, talk with and know Cernan is a 'perk'. Not everyone gets that opportunity and I doubt I would have had that chance if I wasn't publishing **CSD.** That's neat for me but it hardly benefits you. What does benefit you is having a person of Cernan's stature involved, directly, in our industry. We are facing some very difficult legislative and regulatory years ahead. We have as foes some suitable groups, including the movie industry (MPAA). If and when we end up in Congress having to explain our actions, and defending ourselves, you can be sure that Charlton Heston and a wide range of other 'movie celebrities' will be trooped to the 'witness table' to explain to Congress why movie actors are starving because people like you and your customers are watching their movies 'free' from the satellite. It will be very helpful to us all, as an industry, to be able to call upon equally impressive 'celebrities' such as Commander Cernan to offset the impact of these stars sitting at the MPAA 'witness table'.

Equally important, for now and not the future, is that Cernan is not your average man in the street. For the Commander to allow himself to get involved with an industry such as ours suggests to me that we may be finally reaching a point of some maturity. His association with Intersat amounts to a form of endorsement; of Intersat, and, the industry. That's good. In fact, that's great!

Intersat promises me that Gene Cernan will be an active part of the Intersat team from this point forward. He is especially keen on something they called 'Systems Integration' in the space program, and he is bringing that expertise to Intersat. Cernan was a key part of man's first exploration of space, and now with Intersat, he is a key part of man's "second exploration of space". Space communications. Welcome aboard Commander!

**PROGNOSTICATIONS/ Score One**

Out of the Las Vegas gathering so openly discussed in this issue of **CSD** came the decision by the Board of Directors of SPACE (our national trade association) that there would, starting with 1984, be not one but rather **two SPACE trade shows** per year. Only I knew, as I sat listening to the Board discussion, that the April issue of **CSD** (weeks away from going into the mails, but already written and at the printer) would draw the same conclusion as the Board was drawing.

The show circuit, clearly, is out of hand. On top of the announced shows for 1983 are rumors that still other, new-to-show-business entrepreneurs and new show-related liaisons are trying to find slots in the busy annual calendar. There is more than a little greed showing here and perhaps not much other justification for heaping more shows on top of more shows.

There are three good reasons to hold a show. I'll list them:

1) **The sponsor of the show needs the money.** This one works only if the sponsor of the show is broadly enough based that the proceeds of the show somehow benefit **all** of us. SPACE qualifies here. Inspite of the fact that we all need money, as individuals or would-be show entrepreneurs, we don't qualify under this heading.
2) **The show is needed for educational purposes.** I note that a mid-western University is planning to hold a show in June. I doubt they qualify by my criteria. Canada, as a geographic land area, would qualify; especially in light of the latest rantings of Canadian Communications Czar Fox. When a new region of the world embraces a complex new field such as satellite communications, a show or two is an excellent way to get the new industry off the ground in the right direction. Europe could use a good, old American type of show. Sadly, they won't get one this year.
3) **The industry deserves a show.** Like any industry, we all like to get together, show off our wares, blow our horns and generally act like high rollers. We can use **one** such show a year. Two is pushing our luck.

In my judgement, any shows held for any other reasons, or held any more often than will meet the minimum qualifications listed here, are self destructing. The Board of Directors of SPACE, to the man, apparently feels the same way. At the SPACE Board meeting in Las Vegas only a handful of topics was addressed. The key topic was a discussion on the industry funding a rock-solid anti-trust case against the movie suppliers on the satellites. General Counsel Brown argued that as more and more of the 'premium movie' suppliers scramble, there would be hard times ahead. He had done his homework and argued persuasively that 'a people who fail to protest when something they deserve is taken away from them' will eventually 'be without anything.' He was also telling us, indirectly perhaps, that the premium movie suppliers, closely aligned with or owned by the cable system MSOs, were simply not going to deal with (as in 'accept money from') **individual** home TVROs. He noted "We have held onto that illusion, and that hope, since 1979. The industry will be four years young this August. They are never, willingly, going to sell their services to home TVROs."

Mounting an anti-trust case is a massive exercise. It involves very big dollars. It is very dangerous to start such a case when you are not sure you have the funds available to see the case through. SPACE has been in touch with the U.S. Department of Justice, repeatedly, and the trade association has received some encouragement for initiating such a case. Brown feels the industry has a good chance of winning such a suit, and through the courts getting the premium service folks into a position where they **have to offer** their service to home TVROs on the same terms they offer the same services to cable system operators. But, alas, it comes down to bucks.

Way back in February, SPACE went to some of the Pioneer members and asked their financial support. Without giving away any numbers, it was decided that twenty firms (twenty is not a relevant number here!) had to kick in a certain amount of money per month to fund the suit. Ten promptly signed up. The next ten became a considerable hurdle. When the SPACE Board met in Las Vegas there was 'solid support' from perhaps 14 such sponsors. The last six became the target of the Board's anti-trust suit task force. At the end of the show, two more had been signed up. The four missing supporters represented a not insignificant amount of 'missing' money.

Even those on the Board who were not inclined to support the effort financially voted for the suit. As one commented to me "I think this is the right thing for the **industry** to do, now; I am not so sure it is the right thing for **my company** to do. Now, or ever."

With the finances so close, but still out of reach, for the anti-trust suit, the board moved on with the agenda and finally came down to the matter of the annual SPACE trade show (this coming November in Florida). After reviewing the financial situation from the last (first) SPACE trade show, it became apparent that if SPACE had **two** such shows per year, in 1983, SPACE would today already have a good handle on raising the funds necessary for the anti-trust suit. One noted "We would not be sitting here fretting about raising the missing dollars if this show, in Las Vegas, had been a SPACE show. We'd simply take the receipts from this show and fund the suit for the whole industry!"

You can guess where the discussion went at that point. 'Is there a motion to expand the number of SPACE run industry trade shows from one to more than 1, in 1984?' came the question. There was such a motion. 'And a second.' Several were offered. 'Any discussion?' There was none. And so the vote was taken.

Which brings us back to the first 'good' or 'valid' reason to hold a show; **'The sponsor of the show needs the money.'** And the fine-print clarification of that; **'. . . the proceeds of the show somehow benefit all of us . . .'.** If the SPACE Board of Directors are right (we had best hope they are!), an anti-trust suit will benefit all of us who hope that this industry can endure the coming years, and carve out for itself a meaningful chunk of the worldwide communications spectrum pie.

Unfortunately, the SPACE two-show-per-year format will not happen **until** 1984. There is a timeliness for the anti-trust suit which I am not at liberty to discuss in print. Suffice to say our chances of winning, or our chances of striking a mortal blow to 'the enemy,' diminishes with each passing week and month. Now is the right time. 1984 may not be; George Orwell's prediction aside.

COOP/ continued page 78

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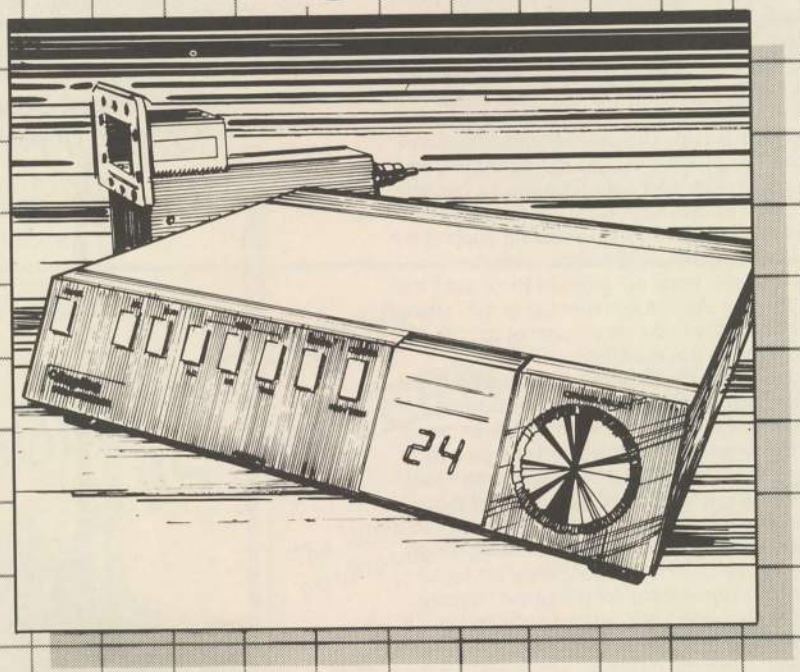


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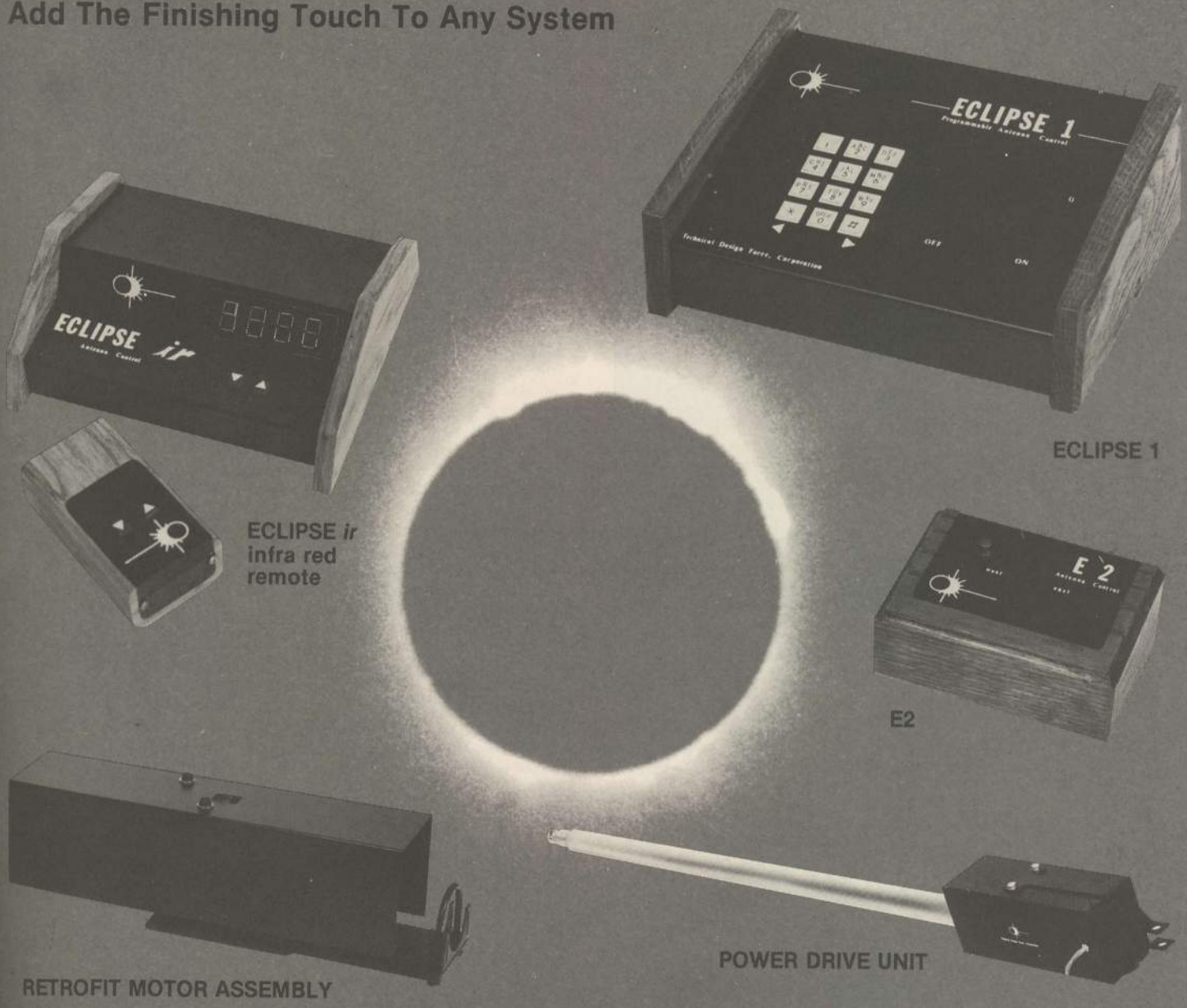


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**COOP/ continued from page 75**

SPACE will hold a pair of shows in 1984. One will be in the spring, in a western location (yes, Las Vegas is a possibility) and the other will be in the fall at an eastern location. The shows will be approximately six months apart. That pretty much fits my prediction in the April **CSD.** What will happen with the remainder of 1984, and beyond, is open to conjecture. Since I am batting close to 1,000 percent on my 1983 crystal ball, let me suggest a scenario which might develop. There is more here than my ego at play; I've talked with dozens of suppliers about this issue and believe I see a consensus forming. If that consensus holds, we can strike a blow for structuring a **sensible 1984** (and beyond) show schedule by simply getting more people involved in the dialogue that needs to be floated within the industry.

I suggested that if SPACE adopted a two-show schedule (fall and spring) in 1984, that the real loser here would be Rick Schneringer's STTI. I also suggested that Rick was not making the best decisions he could by doubling up on the SPACE show this fall with a Nashville show just weeks in front. I'd like to suggest a way out of this problem that Schneringer has created for himself.

First of all, STTI will be holding a show in Minneapolis in June (the 24-26th). They are calling this one 'Can/AM '83.' This year, and this year alone, that one makes excellent sense. Why? Because with the virtually total relaxation of Canadian home and commercial TVRO regulations (**see elsewhere** in this month's **Coop's Comments**) this is 'the year' for a heavily Canadian accented show. In fact, the Can/AM '83 show fits nicely my second 'good reason' for holding a show; **'The show is needed for educational purposes.'** Certainly the opening of the Canadian marketplace is a significant event. And with the mass interest Canadians are showing in having home TVROs, the show is well timed and reasonably well located. (Holding it **in Canada** would suit Canadians better; but the truth is that most Canadians would like an excuse to visit the states, and, if you have ever tried to ship a show display of 'sensitive commodities' across the border into Canada, you know the wisdom for doing it **just below** the border!).

Hard on the heels of the STTI Las Vegas show, the Minneapolis show (barely 90 days later) will be a hardship on some suppliers. I suspect a few will consider not going at all. I judge that would be a mistake. The suppliers who will feel the 'pain' will be those who try to make the mid-June CES show in Chicago, **and** then rush up to Minneapolis for 'Can-AM '83.' That's a tough one to call. If I had a TVRO product that was not getting proper distribution through our own industry distributors, I'd make CES. If I was a company such as Channel Master that sells to the CES crowd anyhow, I'd make CES. If I had an adequate distribution program already, I'd stay home and concentrate on getting ready for Can/AM '83.

Which brings us to the September 5-7 Nashville STTI/SIBCO (Satellite International Business Conference). With some date shuffling, we are now almost precisely two months in front of the SPACE Florida show. There have been other intervening shows for the growing industry during the summer, including some that are well run and usually well attended. This is Labor Day Weekend. That's an ouch. Can you imagine how much fun it might be driving to Nashville over 'that' weekend! Or getting flights into a relatively small airport on 'that' weekend? Or, fighting the big summer crowd in Nashville during the last 'summer weekend' of the year in the city proper. Like I said; that's an ouch.

**If I** had made the mistake of jumping into Nashville just to get the jump on the SPACE industry trade show, and I now saw that SPACE was serious about two well spaced and one supposes well run shows per year, **I think I'd opt to cancel the Nashville gathering.** I'd even do it 'in the interest of industry harmony' and it would not be a bad idea to make an announcement that said something like "After careful consideration of the state of the industry, the number of shows planned by the industry in the coming years, and the growth of the industry's problems . . ." etc.

Then if I were Schneringer I'd get in bed with David Wolford at **SatGuide** and create one big, annual, super-duper show that would fit my third category. Which for those with a short memory was **"The industry deserves a** (big) **show."**

More and more of the STTI approach has been towards the end user, or the guy who wants to pay for his own first terminal by buying

**three wholesale** and selling **two retail;** keeping the third for himself. That's the kind of audience that **SatGuide** reaches and Wolford has probably been chomping at the bit to get into the show business anyhow. With STTI, **SatGuide** could put together a big, annual show that is a huge extravaganza attracting perhaps 10,000 or more people. It would be a fun show, with name entertainment, huge consumer oriented booths and a program that spent as much time describing the satellite **services** as it did talking about LNAs and the like. Everyone would have a good time, and both STTI and **SatGuide** would make money. And the timing?

Summertime. In some big, huge, mid-western park one year, the east coast the next year, and the west coast the third year.

For a show like this to be a success, it would have to attract plenty of show business personalities. Wolford's **SatGuide** could arrange that. Speakers would be rounded up to discuss the programming services, present and future, and even the 12 GHz folks would like to participate since they will be trying to snare several hundred thousand people their first few months in operation. To keep it just a little bit attractive to the would-be dealer folks, the show should have hands-on training sessions, put on by the manufacturers, on system installation. Start a fresh, new system installation every hour or two, on a schedule, and let people who wanted to see how systems are installed pile around a couple of guys who start off by opening up several crates and stacking up their material in neat, little piles. After watching a couple of these sessions, a first timer would have an excellent idea of what it takes to make a terminal go in and work.

A show like this, held once per year, designed to attract a very big crowd, makes excellent sense. If STTI and **SatGuide** don't like the suggestion, I'd be happy to talk with somebody else about how it could be done. I'm not above consulting with a reputable firm that has show experience if the industry doesn't see the wisdom in my 'no charge' consultive suggestions here.

**With a SPACE show** in the spring of 84, a 'super-duper semi-consumer show' in the summer, and another SPACE show in the fall, we just about have the bases covered. If the CES shows (January and May-June) continue to hold a fascination for those industry suppliers who are not happy with their present distributor relations, they squeeze in without harming anyone.

Like it or not, the North American share of this marketplace is not going to remain the significant 'share-of-market' forever. Yes, the European people putting on the first crop of 'shows' **this** summer and fall have fallen prey to the big time S/A ilk folks. And yes, their 1983 shows are going to be well attended but badly mis-directed for home and SMATV terminal folks. But they'll get their acts together in 1984, or 1985 and then finally Europe will amount to something. A few of the manufacturers here in the states, such as Automation Techniques and ADM are already making considerable inroads in Europe (and the Middle East) and as firms such as AT and ADM get product out into the field, people will start to realize that you don't need a $5,000 receiver and a $20,000 antenna to make good quality pictures on Cyprus. So by 1984, like it or not, there will be some 'industry trade shows' in Europe and elsewhere which **are** worth attending. Not for dealers, certainly. And not for stateside distributors. But for the original equipment manufacturers, attention to the market outside the USA will become very important indeed.

All of which says that we must get some order in our own show schedule or Europeans and Asians and Africans and South Americans will look at our dis-array of shows and come to the conclusion that it doesn't make **any difference** when they hold their own shows. We can help direct this in a sensible direction by simply establishing certain show 'periods' or 'dates' as **key North American** dates. By setting March (SPACE), July (STTI) and October (SPACE) as 'holy periods' we can head off others outside the USA trying to squeeze up on us with their own dates. No European show entrepreneur with any brains is going to try to schedule a show too close to an 'established' North American date, if he is hoping to 'court' the American manufacturers as exhibitors to his own show.

Everyone in the industry has a stake in **how many** shows we try to hold, **where** we try to hold them, **and how they are run.** There are now two primary show sponsors in the North American show circuit. You'd do yourself a favor by letting both SPACE **and** STTI know your own feelings so that they can do a better job of serving you.

**MIS-USING THE Media**

One of the less pleasant moments I experienced at the Las Vegas STTI show occurred as I was sitting talking with Andy Hatfield (AVCOM) about some of his new receivers. Mike Brubaker of R.L. Drake and **'another chap'** walked up and the four of us entered into a conversation. Well, it was sort of a conversation.

**"You are going to get yourself killed"** the fourth fellow said to me. I allowed as how we all had to go sometime. **"I mean it. If I don't do it, I know two brothers from** (name of state) **who will".** My response was that if nothing else, I tried to be as fair a reporter as was humanly possible. And, if that ruffled some feathers now and again, people shouldn't be getting themselves into situations that brought others to me to help them get out of those spots.

The conversation **deteriorated** from that point. The fourth chap launched into a detailed battle plan to invade Provo with a 'U Boat' and claimed he had more volunteers to come and wipe me out than the boat would hold. Mike Brubaker was obviously uncomfortable, and when I failed to see the humor in the death threat Andy Hatfield very bluntly changed the subject.

The fact is that I don't hesitate to report mis-deeds when they are brought to my attention and I have what I consider reasonable proof that the fellow reporting the problem to me is not attempting to 'mis-use' the press. I intensely dis-like being a 'court of last resort' between suppliers and dealers, but since nobody else seems to be willing to speak up when there is a wrong being perpetrated, I guess I am stuck with that task until either the industry gets some type of business ethics standards, or as the threat said, 'I get myself killed". Frankly I like the first option better since my estate would hardly carry Kevin and Tasha until they are old enough to make it on their own, and my insurance load is light. I'm not sure any of my policies would pay off anyhow if a mysterious 'U Boat' slipped inside Provo's reef and our home was shelled from sea. I'd better check on that.

I guess when we jumped on a guy out in Oregon, back in mid 1980, for selling TVRO receiver kits that were badly mis-represented, or when we jumped on an outfit in Florida that was touting a $995 receiver package in December of 1979 or so, until the present time, I have been a champion of the poor guy out there tempted to send money off for mis-represented products. I can't recall anyone we ever jumped on 'appreciating' us but then I doubt many crooks pray for the safe keeping of the cop that sent them to the slammer every night either.

My biggest problem is not the death threat. I hope. My biggest problem with trying to keep people from being ripped off is clever people who set out to 'mis-use' the press. **CSD** in this case. Every week or so I'll receive a letter from somebody who wants me to help them get some type of restitution from some supplier. About 10% of those letters check out. That is, maybe one in ten stands the test of verification of the 'facts' reported. Usually the writer of the letter has had some type of beef with a distributor, or manufacturer (it is about 50-50) and unable to get the satisfaction he has demanded from the distributor or manufacturer, he loads onto me copies of all of his letters and a detailed letter telling me how he needs "Coop's help". That's fine. Death threats notwithstanding, that's one of the reasons I'm around.

But when nine out of ten don't check out, that suggests to me that people may be trying to 'use' me to get the distributor or manufacturer to agree to do something which the unhappy buyer really has no right asking be done. Let me cite a case in point.

Last fall, in a couple of issues, we reported on an incident that occurred in Omaha at the SPACE show. A dealer from Missouri had gotten angry with TeleCom, a receiver manufacturer located in California. He had two of the TeleCom receivers and he claimed they didn't work properly. He had returned them for warranty repair, had been charged a fee for 'updating' and then claimed they worked no better, or even worse, after they came back. Then the dealer attempted to 'turn the receivers in', for a cash refund, at the Omaha SPACE show. An ugly incident followed and everybody got very mad. The two receivers ended up on public display with a nasty sign on them.

We checked on the incident, talked with several people who saw it, and reported it. Not to jump on TeleCom, but rather to point out the

**COOP/ continued page 88**

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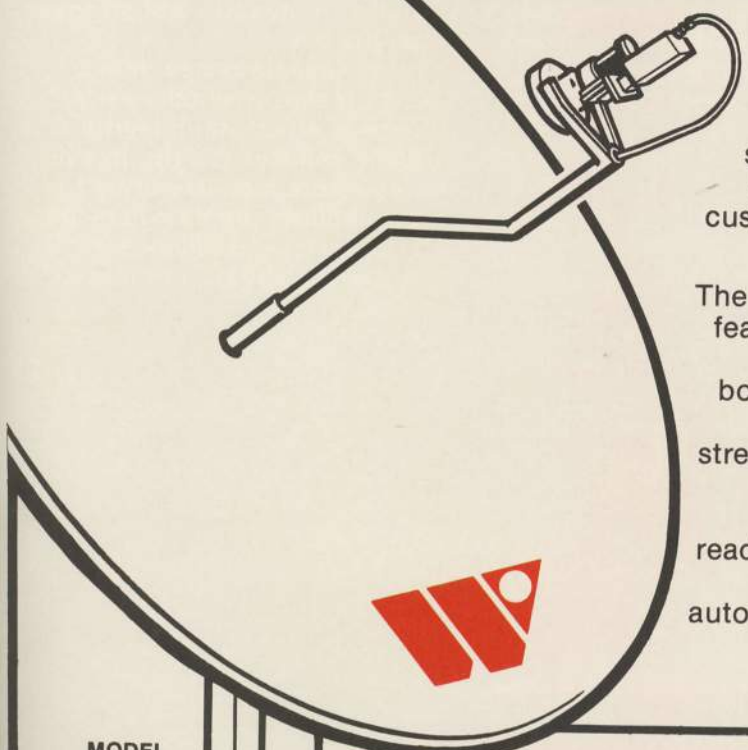

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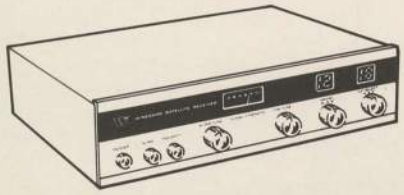

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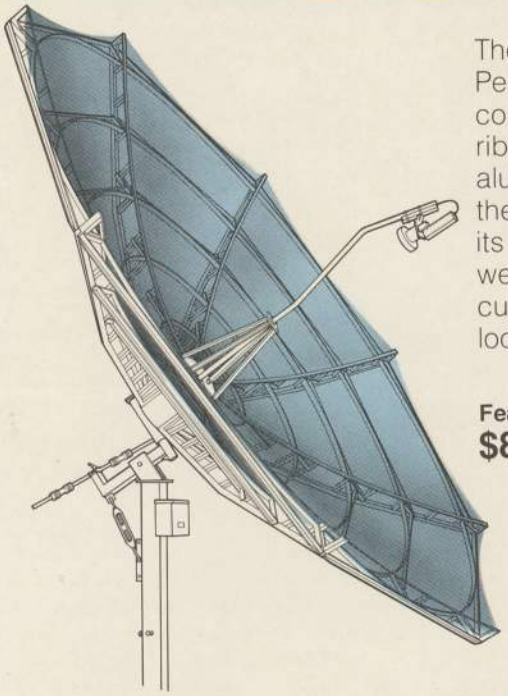

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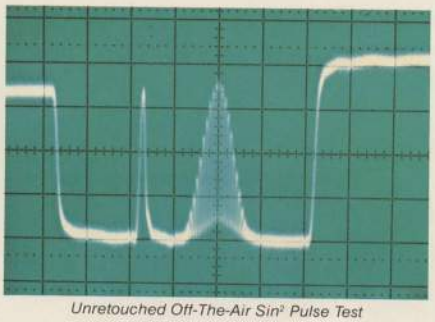
An EARTH TERMINALS receiver provides cleaner pictures with less granularity. Truer colors that don't smear. Less sparkling snow on weak programs. Complete absence of herringbones and waves. Superimposed lettering that doesn't tear at the edges. In fact, you haven't seen video this exciting unless you've been in a television studio. If you own a quality video projector, you'll be even more impressed.

### Quality You Can Measure

Broadcast engineers are impressed with the accuracy of EARTH TERMINALS receivers too. Our VITS Sin² Pulse and video SNR test results are incomparable; actually the equal of most commercial grade receivers. We can also handle tough signals like Reuters data transmissions that give other receivers fits. It's no wonder then, that after exhaustive testing, some cable companies and television stations use EARTH TERMINALS receivers as their main source of satellite program material. They know value when they see it.



*Unretouched Off-The-Air Sin² Pulse Test*

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All this technical sophistication is really quite easy to get along with. Precise automatic fine tuning tunes every channel the same way every time. You don't have to be an expert to get perfect pictures. EARTH TERMINALS receivers come with a remote control that selects channels individually, adjusts audio volume at your convenience, and automatically signals the rest of your system to supply the proper antenna polarization through an even/odd channel switch. And it fits in the palm of your hand.

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There are plenty of satellite receivers that cost less than ours, but nearly all of them need bigger antennas and more exotic Low Noise Amplifiers for a picture free of sparkling snow. If you're on a budget, you can save money in other parts of the system by paying more for our receiver and come out even. You get high fidelity video in the bargain. If you're simply after the best picture money can buy, we can make it very affordable. Either way, give us a call or write us for the details.

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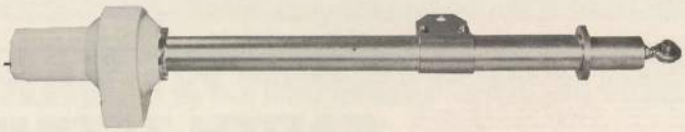

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**COOP/ continued from page 80**

frustrations of being a dealer. Publication of the report brought several letters, including some from other dealers who said they had experienced similar problems with TeleCom. More letters were printed in **CSD,** including a letter defending their actions from TeleCom's Jim Bertonis. Finally we had another anti-TeleCom letter in our recent March issue from yet another dealer who felt frustrated because he was 'stuck with' some TeleCom receivers which the dealer claimed performed too poorly to satisfy customers; even in the hot footprint area of northeastern Oklahoma.

I talked with Jim Bertonis and Vince Finelli of TeleCom in Las Vegas. Jim started the conversation with a terse question. **"Why are you down on TeleCom?"** he asked. The suggestion was that I was picking on the firm. We discussed the whole series of events starting with the very first TeleCom receiver they gave to me for test at the Washington (DC) spring of 81 show (it didn't work; no wonder, it was not complete!) right up to and including the letter appearing in the March issue of **CSD** this year. That spanned some two years in time.

Now you can hardly expect most people to have the candor to admit that they may have been shipping an inferior quality product. Bertonis had more than the usual 'pride of authorship' in his receiver models and spoke candidly about the perhaps 1600 TVRO receivers the firm has built (and I guess shipped) since they went into business two years back. Jim came up through the ranks at Blonder Tongue, doing design work, and I guess that qualifies him to design TVRO receivers. **"We** (Vince and Jim) **would like you to see our newest model; to judge for yourself how it works"** Bertonis suggested. We were standing outside, next to Ed Grotsky's ARUNTA Sky King 6 foot antenna display and Arunta had its own receiver operating on the dish. The pictures were the kind people would salivate over in the Caribbean, but I knew that Arunta was hanging on the ragged edge on the weaker transponders nonetheless since even a superb six footer was pushing it on TR21 and others that normally lag behind the stronger signals. **"Go get a receiver and we'll hook it up here"** I responded. They both disappeared out into the street and dug into the trunk of a parked car. TeleCom was not exhibiting, according to the program, so they were parked nearby to talk shop.

I always like to test equipment (antennas, LNAs, receivers) under the **worst** conditions. It does no good to see how great WGN or MTV look when their signals are so strong that some aluminum foil and chewing gum would suffice for an antenna. Other than a four foot antenna stuck back behind the rest of the operating antennas, I couldn't think of a more demanding situation than a six foot there in Vegas. I also like to test equipment alone; or perhaps with Tom Humphries hovering nearby. I don't like to do it in a hurry, and I don't like to do it without some test equipment. The bright Vegas sun, beating on the picture tube, is a very effective 'mask' for noise and crud, as well, and what I did do was more to accommodate TeleCom than it was pass judgement on their new receiver.

After the usual hassle of finding the right cable and connector adapters in the Arunta tool box, we were in business. Yup, there was satellite television there alright. I tried to select a pair of channels, one high and one low, to do an 'A' (Arunta) / 'T' (TeleCom) comparison. Some idiot with a scanning receiver kept drifting his VCO through the full spectrum and I quickly discovered that the TeleCom had a very sensitive blacklash to the dial. If I held my hand just 'so', and kept a delicate amount of pressure on the fine tuning knob, I could get the picture to stay out of the scanning receiver crud long enough to do a check. Then we tore it all down and went back to the Arunta. The same two signals were, to my eye, clearly 'clearer' on the Arunta. I tried to convey this in a delicate way to Bertonis. He wanted to try another check, using another set of channels. We started over and did it again. This time I used the digital data signal from Reuters on TR18 for the high end check pointing out to Vince and Jim that the vertical bar at the far left hand edge of the picture was an excellent 'video stability readout'. Check to see whether that full screen height bar is straight, if the black portion has ragged edges, and if there is any sign of instability (jitter) on the bar from top to bottom of screen. We all 'fixed' our eyeballs on that on the TeleCom receiver and then took the unfortunate three minutes or so it took to re-hook up the Arunta. Vince thought the two receivers (Arunta and TeleCom) 'looked about the same'. I wouldn't have come to the same conclusion.

Before we got done, a small crowd had gathered and fortunately most of those standing around didn't have any idea what we were doing or who we were. Both Jim and Vince made a couple of interestng points that I accepted at face value.

**BERTONIS and FINELLI with their new receiver piled atop an Arunta in the parking lot of the STTI show.**

**"That fellow in Oklahoma, the one who wrote the letter published in the March** CSD, **probably would** not **have written that letter if the earlier letters had not appeared in the magazine".** That seemed plausible.

"People are funny. They see something at a show and they get excited and order a couple. Then they get home and decide they don't want what they ordered. When it comes back in they now sit and try to figure out how to get the supplier to take it back and send back their money. When **CSD** 'jumps' on somebody like us, that simply encourages other people who have bought from us to try the same 'angle' to get their money back. Publishing letters like that makes it very tough on the suppliers because it brings all of the 'nuts' and 'cranks' out of the woodwork".

There is no question that there are people who would be swayed by some published report that a dealer, someplace, is having problems with this or that receiver. That's human nature.

**"People get paranoid about keeping some receivers which they read may not be good enough. They don't even take the time to find out whether they like the units or not; they figure they had better get their money back before the company folds up. It's like a run on a bank!".**

I admired Bertonis and Finelli for seeking me out and putting on their demonstration. That took a certain amount of 'fiesty' guts. And they have a very valid point when they suggest that the publication of one or more letters regarding the integrity of a product or supplier can and does start others thinking about their own relationships with that same supplier. I have, of course, been very much aware of this from the very beginning of the industry and bend over way backwards to try to not be 'sucked in' by someone who is attempting to 'mis-use' the (power of the) 'press' to gain an unfair advantage with a supplier.

To continue to be as fair as humanly possible, I'll continue to check out the best I can reports before launching them into print. When I make a mistake, I'll say so, as I have done in the past.

But the real check valve in this whole situation is the dealer himself. If you are not in a position to judge the technical quality of a product, or the performance of a product, at a show or in a demonstration showroom for yourself . . . and yet you commit to buy one or 1,000 of something without having had the opportunity to properly evaluate that product in a real world, in-field environment, **you have nobody but yourself to blame** for having made that purchase. If you are smart enough and experienced enough to properly judge a product, and you still get stuck, then that's why I am here. To try to help you sort it out. Death threats notwithstanding.

**COOP/ continued page 92**

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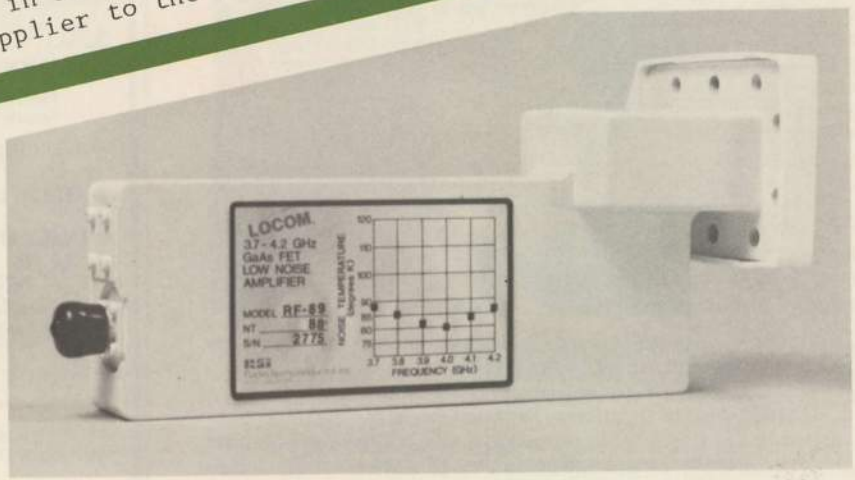


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**COOP/ continued from page 89**

**'NO SHOW' Better?**

If there was a bitter disappointment to me at the Vegas show, it was the unfortunate set of circumstances that surrounded the much pre-publicized LOCOM LNA seminar session on Tuesday morning. I'm as much responsible as anyone and I want to take the responsibility for what happened. At least part of that responsibility.

Kingsley Hastings of LOCOM had called me in February to ask if I would appear on stage with his staff, and a fellow from Hewlett Packard, to demonstrate how with the HP noise figure measurement equipment one goes about checking LNA noise figures. I said yes I would because I felt that after our February issue treatment of noise figures, I wanted to see what type of questions we might get from the attendees.

Those of us scheduled to appear on that 11:15 AM session assembled back stage about 30 minutes early. Kingsley had one chap filling a fish bowl with water while the HP man was plugging together the $20,000 testing station. Nobody seemed to be in a panic except Kingsley and he operates in overdrive most of the time anyhow. He was back in a darkened corner scribbling notes on a pad of paper.

At the appointed time we all went out to the stage and Kingsley started the presentation. I was asked to introduce the subject which I did and then I sat down. The next thing I knew Kingsley was introducing the star halfback from the National Championship Pennsylvania college football team.

Kingsley is more than a little proud of his state, and he is very keen on providing jobs for the people in his area. Pennsylvania has been especially hard hit by unemployment since they have a large percentage of the nation's coal mines and factories. Neither has fared well in a depressed economy. So I was still not alarmed when he launched into a description of how LOCOM people are dedicated workers because they appreciate having work so much. I still recall the little hand drawn Japanese flag that is on display in the LOCOM assembly area. I asked about it when we visited there in December, and was told that it served as a reminder to the employees of where their jobs would go if they didn't do their very best every day.

**At the point in the session** where I expected the HP man to take over and demonstrate his noise figure machine, Kingsley instead held onto the podium and asked questions of the HP man. Using two mikes, they bantered back and forth about how important it is for cables and fittings to be tight, calibration of the system to be accurate, and so on. I glanced at the noise figure display, which by now I understood, and had to look twice to assure myself it was reading 400 degrees Kelvin, or some such idiotic number. A loaf of bread had a lower noise figure than that!

When it became apparent to me that the HP guy was not going to demonstrate anything, I apparently was not the only one to come to this conclusion. Several people in the back of the 950 seat auditorium were leaving. That was one way to beat the long lines at lunch.

The session literally dragged on. The highlight, a demonstration of LNA noise temperature measurements, didn't happen. I could scan the faces in the audience and tell there was something between disappointment and anger out there. I was not very comfortable sitting there and when Kingsley orchestrated a grand finale by having two of us drop an LNA into the gold fish bowl to indicate how LOCOM LNAs could take the moisture, I was quite sure I would rather be on Provo fishing.

After the session was over I tried to piece together what went wrong.

Kingsley had enticed me to appear by offering to donate to the **CSD** lab here on Provo as low a noise temperature LNA as they could produce. That number happened to be 65 degrees. I was, as he knew, involved in some 6 and 8 foot dish testing programs and the 65 degree LNA was going to be a very useful tool in finding out where the earth/feed noise was going to jump up and bite us in the behind.

On stage, we **were** going to test for noise figure a pair of LNAs. The 65 degree unit, which after testing he was going to present to me for the lab, and a 100 degree unit since that more typified the run-of-the-mill LOCOM units.

What I didn't know, until the seminar session was over, was that Hewlett Packard's noise figure test machine was on the fritz. It

apparently happened while the machine was in transit from LA to Las Vegas. The HP man couldn't figure out what was happening (the machine self tested and calibrated alright, but no matter what device you stuck in the line, it told you it had a 400 degree temperature noise figure!). LOCOM, after the morning seminar, arranged for one of their factory units to be hand carried from State College to Las Vegas on a red eye flight. It also didn't work although it worked fine in State College. It would later turn out that a plug (cable recepticle) inside the 'main frame' of the unit had bounced one too many times between LA and Vegas and it was poorly seated. No matter what sub-assemblies they plugged into the main frame, the results were the same. Normally the main frame is an almost passive device that doesn't do anything that can screw up measurements. Not this time.

Frankly, if Kingsley had shared this with me prior to the 11:15 AM seminar, I think I would have suggested that he simply tell the audience what happened. Kingsley didn't want to make HP look bad so as an alternative he made himself look bad. The rest of us on stage didn't fare very well either.

I don't fault HP for their problem. I can't really fault Kingsley for his desire not to throw mud on HP's reputation. But I do think there may have been a better solution than pinning a Japanese flag on the curtain and reminding us all what was going to happen if we didn't keep our American noses to the grindstone. (For our Japanese readers . . . he didn't **really** do this. **That's just a bit of American humor!)**

Meanwhile I am told that the AVANTEK booth, where they were measuring noise figures on LNAs, was doing a reasonable business. My time in Vegas was so short I didn't get by their booth to talk with them. I heard about a fellow who builds his own LNAs and who brought three of his units by the booth for noise figure check out. According to the story, one of those checked out below 70 degrees. I understand a prominent LNA manufacturer promptly offered this fellow a job!

LNA noise temperature measurements should not be dismissed just because the LOCOM seminar session turned out so rotten. The problems are perhaps illustrated by the fact that a lousy cable plug was poorly seated and that threw a $20,000 test station into a dither. I hope somebody tries again to demonstrate in public what this 'black magic' is all about, say at the forthcoming Minneapolis show. It is a very worthwhile learning exercise that we all need to experience.

**SUPER/ Super Stations**

The FCC recently decided to act upon some old (some date back to 1978) requests to allow US satellite service signals to be distributed and used in non-US areas. They approved WTBS going to some cable outlets in Canada (that certainly fits the Fox program for Canada) as well as Bermuda, the Cayman Islands and elsewhere. WGN got approval for use in Haiti, Cayman and other locations including Costa Rica. In all, more than a dozen initial applications were approved.

The FCC has been under some pressure to allow US domestic satellite signals into Canada and regions of the Caribbean as well as Central America for many years. **We all know** that even with a ten foot dish in many areas of the Caribbean and Central America you can tune many of the stronger US transponders. So the FCC 'approval' does not create any new 'technical opportunities'; only some legal, business opportunities.

The procedure to gain such approval works this way. First the would-be satellite signal user has to go to the signal supplier; such as Southern Satellite Systems for WTBS. They work out a 'contract,' but the implementation of that contract is predicated upon approvals from third parties.

Then the carrier (SSS is our example) takes it to the FCC where the Commission approves it 'in principal.' **This is still a conditional approval** at this stage.

With FCC approval, the parties then go to the Government of the nation involved, and gets its approval. When that comes through, there is one more step.

**Now the almost-approved agreement** goes before Intelsat. The FCC, in opening up use of US domestic satellites to foreign points, said in effect that such approvals would be granted provided Intelsat could **not** provide an equal or better service for an equal or better price. On a case by case basis, Intelsat has 90 days or so to either 'top' the offer between SSS and the foreign user, or simply forfeit its right to

**COOP/ continued page 96**

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|---|---|---|---|---|---|
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| Antenna Gain at 4 GHz | 40.4 db | 42.8 db | 44.5 db | 46.5 db | 48.4 db |
| Beam Width (-3 db) | 1.75° | 1.33° | 1.° | .8° | .7° |
| First Side Lobe Exceeds FCC | 32-25 Log 0 | 32.25 Log 0 | 32-25 Log 0 | 32-25 Log 0 | 32-25 Log 0 |
| G/T at 20° Elevation (with 100°K LNA) | 21.04 db | 22.06 db | 24.08 db | 25.7 db | 27.6 db |
| F/D Radio | 0.30 | .30 | 0.375 | 0.375 | 0.365 |

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This is such an important breakthrough that now, hard to serve areas such as the Caribbean can have superb performance on virtually all of the **U.S. DOMSAT** birds. As important as this may be to your fringe area installation business, there is more good news. The **PRICE.** Our 10 and 13 foot antenna with horizon to horizon motor drive and additional high quality features is priced less than any other low performance antenna of comparable size.

**Interested?** Of course, you are, because **Hero Communications** pioneered big world-class antennas and you know we have our act together. And now, Hero Communications pioneers **small** world-class antennas. Now, that's a hard act to follow!!!!

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**COOP/ continued from page 93**

provide that service link.

There is, of course, no way that Intelsat can beat 6 to 10 cents per subscriber home rates that SSS charges for WTBS. Or provide the kind of footprint that SSS provides for WTBS in most of the Caribbean, Central America or Canada. That, finally, puts the offshore user in business.

Intelsat and the US COMSAT are not overjoyed by all of this. They have attempted, through their local (i.e. national) members to exert pressures on the local (national) governments to keep the governments from approving such foreign uses of US DOMSAT birds. That goes way back to step three listed previously here. In some cases they have been able, using diplomatic pressure, to keep the local (national) governments from approving the use of US DOMSAT birds in that country. But in most instances the local would-be users are well placed politically themselves, or may even be partially owned by the government, in which case they are anxious to grant their stamp of approval.

All of this is but another example of the games being played by Intelsat to hold onto their 'exclusive rights' to provide international telecommunication services via satellite. They are losing in Europe (Eurosat), they will soon be losing ground in the Middle East (ARAB-Sat) and they are now losing ground in the Americas.

Using US domestic bird signals for cable (Haiti, Cayman, Canada) or scrambled over the air broadcast (Bermuda, Dominican Republic) is a tricky business. Advertiser supported services, such as WTBS, WGN, WOR, ESPN, USA Network and CNN are fairly simple to negotiate with the stateside suppliers. The premium move service folks are just as big a problem offshore as they are to the home terminal folks within the USA. They simply will not deal.

But that is not stopping enterprising firms from using these signals, anyhow, in areas throughout the region. A cable system recently activated on the island of Dominica, for example, offers eight channels of service via satellite **including** HBO and Showtime. The operator of **this** system told me has was 'banking' his HBO and Showtime payments in a trust account for the eventual day when these programmers would be prepared to accept his money. **"I do not want to steal from them; on advice of US counsel, we are banking their payments in a bank in the Bahamas and someday they will decide they want it."** He hopes to have 1500 homes hooked up in a few months at about $35 American a month.

While HBO and Showtime profess that they cannot sell their services outside of the USA (and also cannot sell their services to private terminals **inside** the USA), they are also telling their larger customers in the cable business (such as ATC, Cox, Westinghouse, et al) that everything possible is being done to protect the integrity of their products. To the movie companies from whom they buy, they promise that they will not sell to private homes inside the USA nor to anyone outside the USA.

I am amused, to say the least, when I hold in my hand a printed flier from a recently turned-on cable TV company that is wiring the multi-million population city of Santo Domingo in the Dominican Republic. I print it here. It shows that on 'canal' (channel) 3 we have WTBS, 5 we have USA Network, 6 we have CNN and ESPN sharing the dial on a split day schedule, 8 we have WGN, and on 12 we have ARTS/MTV and Nickelodeon on a shared basis. Oh yes, down in the lower right? Yup. That says **'Muy Pronto'** (Very soon) . . . **HBO.** That's the same HBO you know and love. Subsequent to the printing of this leaflet HBO showed up on 'canal 8' replacing WGN. The fellow who handed this to me has written in 'canal 8 ya!' or channel 8 yeah!

You may not find that as amusing as I do. Let me elaborate why I am amused. This cable company, you see, is owned by a consortium of investors. **A few** of the investors are local, 'DR' (Dominican Republic) business people. Some of **these** DR business people are influential in government. That helps. But the amusing part . . . the majority of this cable company is owned by a well known, up front, stock-exchange-traded multiple-system-operator cable TV company. One of the really biggie cable firms. A firm that probably supplies a million or so 'premium cable homes' to HBO throughout the USA. And here they are ducking around in the middle of the Caribbean with a cable system that American money and expertise is putting in . . . **using HBO outside of the USA!** I love it.


I can just see Jack Valenti's face when he reads this. I wish I were there. Not that Jack's office is unlikely to read something here they don't already know. The local theater owners in the DR have been up in arms, protesting to government and the press, that the new HBO 'canal 8' is bringing in American movies months before the theater release chain gets the same movies to them. It has been incidents like this that has forced Valenti's Motion Picture Association (of) America (MPAA) office to rush off into Congress demanding help from US law makers. It has been incidents such as this that finally got to President Reagan and caused his staff to agree to word the Caribbean Initiative Act (see **CSD** for March '83; page 76) in such a way that any nation that allowed its government run broadcasting system to 'mis-use' US satellite signals might forfeit that nation's right to use of the 'Act.'

The Santo Domingo cable system, a single example of what I am talking about and hardly the only such example I could cite, is 'getting away' with this 'legalized piracy' because the 'pirates' in this case are big time (cable) operators. I'm told that the Santo Domingo folks **are indeed** paying HBO for the subscribers. They do it by 'padding upwards' their subscriber counts in their domestic US systems. Say you have a selection of systems in Montana, Idaho, and Utah that have between them 40,000 HBO subscribers. Now you add 15,000 new subscribers, to HBO, to those from that area to cover the homes taking HBO in Santo Domingo. That keeps the big time cable operator **dollar-square** with HBO, but it hardly satisfies the MPAA which is screaming because its international members are playing movies to empty theaters. It will be interesting to see how this particular big time US cable operator keeps his books if and when the Santo Domingo system reaches its subscriber potential of say 200,000 homes. How do you hide 200,000 Santo Domingo HBO viewers amongst a 40,000 HBO subscriber base in three Rocky Mountain states? I guess they employ creative bookkeeping.

There is a message here whether you like that message or not. Let's say you want to put in a cable or over the air subscription television system into Fragglesnare Island. You get local approval and you get the FCC to approve your satellite use. But you don't feel comfortable showing HBO (and/or Showtime) without paying for it; and, you are equally uncomfortable sticking $4.50 per subscriber per month into a numbered bank account in the Bahamas telling everyone **"That is for HBO** (Showtime) **. . . someday."** What do you do? Well, you find a cable operator someplace who is hungry. You say to this guy "I'd like to have you be my partner in wiring Fragglesnare Island. You help me with the technical part, I'll put up the money. Then we'll use HBO (Showtime) and you add the Fragglesnare Island subscribers to your subscriber base here in Left Overshoe, Nebraska. HBO (Showtime) will get paid, and if anybody jumps us we can prove we are paying for the service and tell them to look at the Santo Domingo system owned by 'XXX' because they do the same thing there; on a much bigger scale."

Then your only problem will be the MPAA and Jack Valenti. But you'll be in good company.

# You could spend more but you won't see a better picture . . .


## KLM's Sky Eye IV Satellite TV Receiver

Superior design and engineering mean unsurpassed performance at a very reasonable price. Picture quality, electronics, ease of operation and installation compare with units costing much more. The **KLM Sky Eye IV** features slide-rule tuning, signal strength LED bar, "Center Tune" LED, AFC and video polarity control, fully tuneable audio (5.5-7.5 MHz), and remote downconverter. State-of-the-art single conversion/image reject circuitry, with SAW filter, produces sharp, clean, bright video that makes even big screen and projection TV look better than you've ever seen it before.

**Complete UPS SHIPPABLE systems, too**

KLM's new high performance **X-11** antenna features slide-in screen panels and double-reinforced aluminum support ribs for high strength, low weight and windload. The matching **Polar-trak** mount delivers all the satellites, horizon to horizon. Motorized model with KLM's exclusive Tangential-Drive makes jackscrew designs obsolete. Switch satellites from inside the home with KLM's **Polar-trak** or **Memory-trak** remote consoles. X-11 antenna and Polar-trak mount can be assembled by two people in 2½ hours. Both are **shipped UPS!**

**MADE IN U.S.A./ONE YEAR WARRANTY.** KLM's receivers, antennas, and systems are built at its own manufacturing complex in Morgan Hill, California. KLM stands behind all its satellite TV components with a full 1 year warranty.

**KLM electronics, Inc.**
P.O. Box 816,
Morgan Hill, CA 95037
(408) 779-7363

# Sat-tec . . . R-5000

***The Leader in Satellite TV***

## *Contemporary styling, state-of-the-art performance, down to earth pricing*


Sat-tec's R-5000, a receiver designed for today's marketplace with tomorrow's features. Features customers demand, like; signal meter, contemporary styling, unexcelled picture quality, tunable audio, built-in modulator option, channel-lock AFC, baseband video output, rugged weatherproof downconverter, current limited "idiot-proof" hook-up, digital limiter/discriminator detector and reliable uni-chassis construction. Our years of accomplishments in the satellite TV industry has given us unique insight into reception techniques and customer demands. The R-5000 incorporates the latest technology as well as the subtle details that only experience can develop.

Extensive quality control checks such as our unique triple level board test, receiver burn-in as well as a final actual on-the-air check out assures reliability, for years to come.

The R-5000 — never has so much been experienced for so little. From Sat-tec, the name you've known first, since the beginning of Satellite TV.

Easy wiring is a Sat-tec exclusive, the down-converter can be up to 500 feet away from the receiver and only a pair of RG-59 cables are used — no troublesome multi-conductor wires or soldering! And, a real lifesaver are our current limited outputs, wrong hook-ups won't damage anything and there's not even a fuse to blow — it's the installer's dream!

**Sat-tec Sales Incorporated**

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