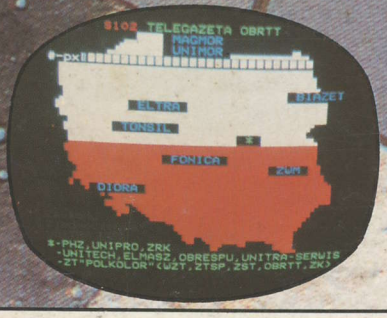
COOP'S SATELLITE DIGEST

APRIL 1984

HIDDEN SIGNALS—

WORLDWIDE TELETEXT

VIA SATELLITE!



AVCOM

500 Research Road • Richmond, VA 23236
804-794-2500

TOP OF THE MONTH

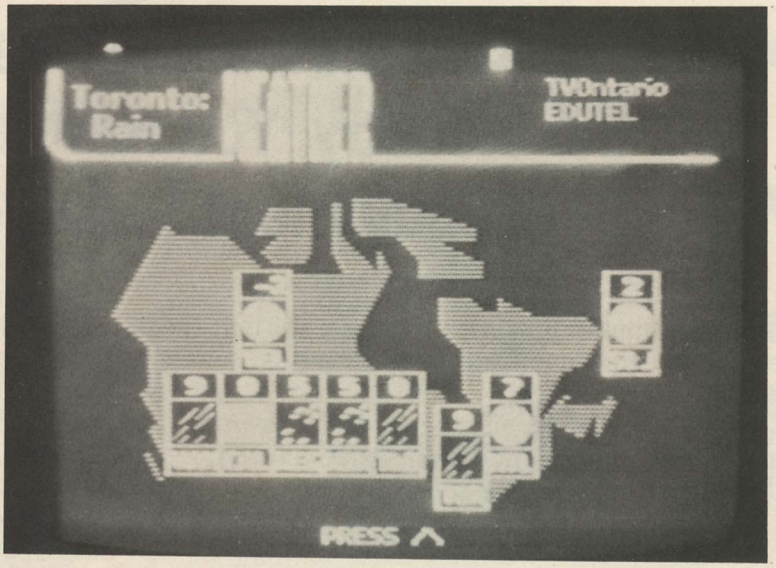
A DIFFERENT kind of video is the subject of an intensive look this month by Canadian pioneer **Mark L. Lewis.** Video text or Teletext is 'hidden away' on a number of unused lines in the normal TV picture transmitted by major networks such as CBS, as well as satellite delivered services such as WTBS and even on 'international satellites' such as Gorizont at 14 west covering Europe, Africa, and parts of Asia. Teletext or 'Videotext' decoder boxes sell for as little as $300 and with them you can dial up the current temperature in Budapest (Hungary), direct from Hungary, the price of gold in South Africa or the program listings for CBC North on ANIK. But there are problems, and a lack of worldwide 'standards,' as we shall see in our preliminary look, here, this month.

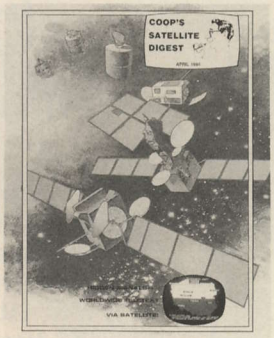
BUILDING SMATV systems for fun, and we assume profit, continues to be a 'hot topic.' In Part 3 of our continuing series, **CSD** looks at how a cable distribution plant interfaces with the SMATV headend, and what disciplines are required.

ARTHUR C. CLARKE reports from Sri Lanka what his 16 foot home dish system is 'bringing in,' and Hughes Aircraft's Space Scientist **Elio Sion** writes about the coming explosion in South American domestic satellites.

COOP writes in his comments section about 'No More Bad Language' and the strange Anti-Japanese TV viewing campaign going on in South Korea where satellite TV 'imperialism' is a hot political subject.

APRIL 1984





OUR COVER/ The next generation of satellites and services is the theme of a current push by Ford Aerospace to develop higher power, globe-circling Clarke Orbit satellites in the latter half of the 1980s. As our 'pioneering report' starting on page 8 reveals, **Teletext,** 'hidden within' the TV signal, **is already worldwide** if you know where and how to look. Artwork courtesy of **Ford Aerospace;** Polish Videotex(t) off-screen photo by **M.J. Stone,** Downend, England via Gorizont at 14 west.

COOP'S SATELLITE DIGEST

COOP'S SATELLITE DIGEST published twice per month by West Indies Video, Ltd., a Turks & Caicos Corporation with corporate offices located at WIV-TV, Grace Bay, Providenciales, Turks and Caicos Islands (West Indies). U.S. offices are maintained in Fort 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 9 AM to 4 PM eastern time Monday-Friday; telephone (305) 771-0505. **CSD**(1) is mailed worldwide, via AIRmail on or about the **1st** of each month. **CSD/2** is mailed via AIRmail and surface mail on or about the **15th** of each month. There are 24 issues of CSD per year. Subscription rates are $75 per year (all copies AIRmail) within U.S.A.; $85 in U.S. funds for Canada/Mexico; $100 per year in U.S. funds for other destinations.

"When You Offer the Best Warranty in the Industry, You Have to Sell Only the Best Equipment."—*Ben Rose,* President, BR Satellite

Our formula for success is simple: sell only the finest TVRO equipment and stand behind it all the way.

That philosophy is just as successful for **our** dealers. Why not put it into practice for yourself, with our help?

Toll-free ordering. Same Day Shipment.

Every product we distribute is in stock at all times. If you call our toll-free number before 2 PM, we'll ship your order the same day. And unlike some distributors, we're happy to ship C.O.D.

The Ultimate Dealer Warranty.

Now you can offer your customers a year-long, unconditional replacement policy on every component of their systems, provided you order it from BR Satellite.

Our warranty is an irresistible sales tool, because it brings the scary, unknown world of satellite TV firmly down to earth.

Immediate Free Replacement Service.

BR Satellite is the only distributor in this industry who will replace any defective TVRO product with a new unit, just by making one toll-free phone call. ***Before*** *you send the defective unit back and at* ***no*** *cost to you.*

We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us. We ask only that the defective unit reach us within 10 working days, *after* you receive the replacement.

At BR Satellite, there is no "turnaround" waiting time. And only a bare minimum of your valued customer's down time.

Optional Additional Four Year "Futureproof"™ Warranty.

For the first time ever, TVRO owners can buy an extended warranty for their systems at the time of purchase, just like they buy for their cars. For a minimal cost, BR Satellite allows you to offer this unconditional warranty to your customers. BR Satellite, backed by one of the world's largest insurance companies, will guarantee all electronic components against any manufacturer defects for a total of five years (including the first year which we cover automatically). Contact us to discuss all the details of this unique plan.

Your customers will agree, it's a small price to pay for "Futureproof" peace of mind.

Famous names.

We offer our free one-year replacement warranty and optional four-year policy on all the fine TVRO lines we sell:

MTI	Arunta
ECI Antennas	Sat-Tec
NORSAT LNAs	Seavey Engineering
Chapparal	Newton Test Generators
Earth Terminals	Satellite Ground Components
Wilson Microwave Systems	ERI LNA Jumper Cables
USS Maspro	Earth Station Accessories
Luxor	Coax-Seal

These are the names your customers will request most. But don't worry. BR Satellite will not sell to *Your Customers*. We protect *you* as a valued dealer and proudly recommend *you* when potential buyers call from your area.

Check our ads–they say **"Dealers Only."**

BR SATELLITE COMMUNICATION
216-11 Kingsbury Ave.
Bayside, NY 11364
212-479-6900

PIONEER MEMBER OF SPACE

1-800-424-2010

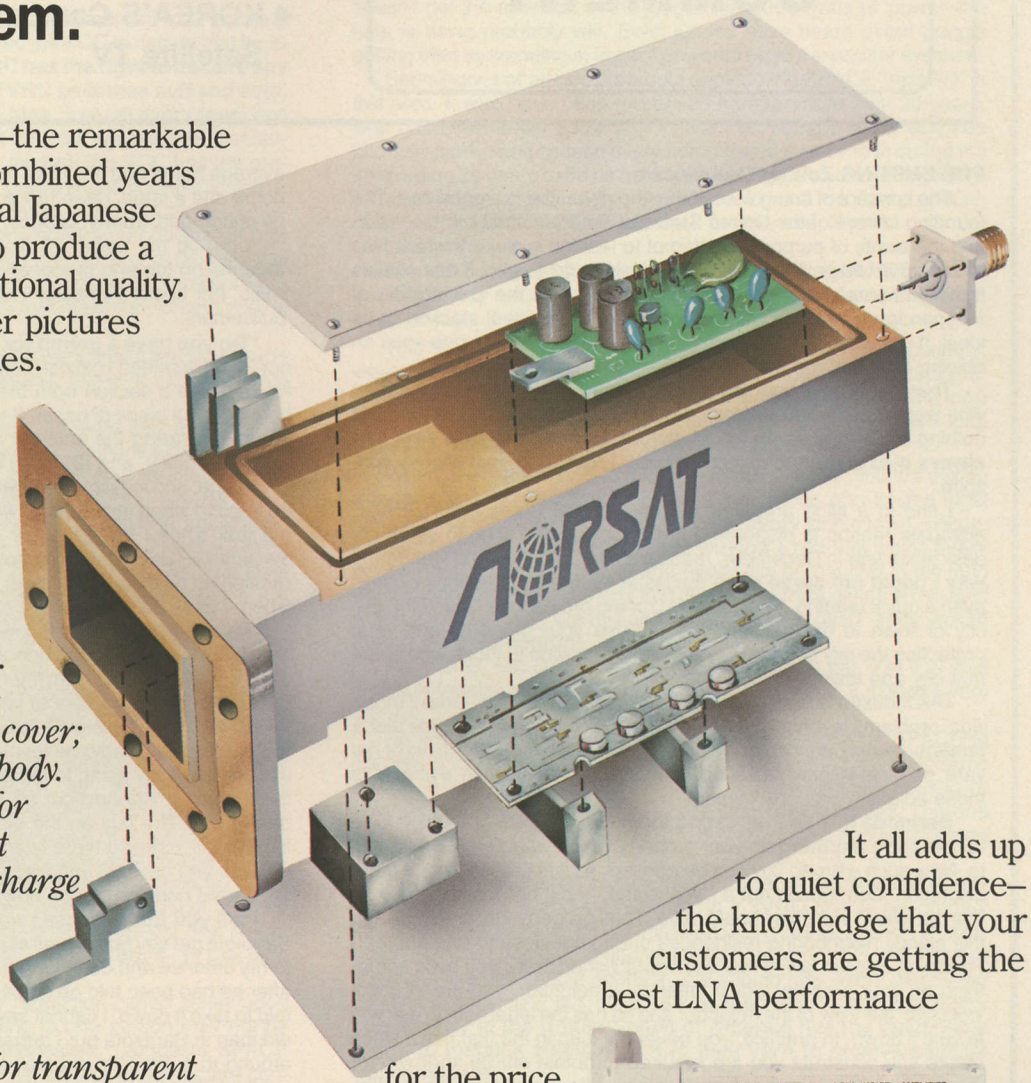
Call Toll Free 9:30-5:30 E.S.T. Mon.-Fri.

BR SATELLITE is the only distributor in this industry who will replace any defective TVRO product with a new unit. We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us.

With Norsat's LNA, Your Customers Will See Less Noise. With Our 1 Year Warranty, You'll Hear No Noise From Them.

Introducing the quiet one–the remarkable Norsat LNA! Norsat has combined years of experience with traditional Japanese manufacturing excellence to produce a low noise amplifier of exceptional quality.

Quiet quality, for better pictures even on today's smaller dishes. Degree for degree, dollar for dollar, the Norsat is simply the quietest, most efficient LNA ever made.



***U**nique all GaAsFet four stage design (no bipolars) with min. 51 db gain.*

***T**otal weatherproofing–precision milled recessed top cover; computer-milled aluminum body.*

***G**rounded input probe for maximum protection against failures due to lightning discharge or high ambient RF fields.*

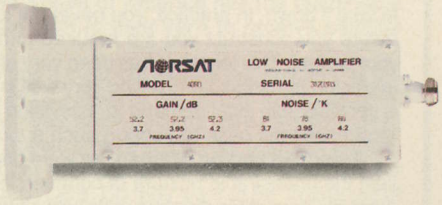
***T**riple sealed and ruggedly mounted type "N" output connector.*

***L**ow VSWR resonator for transparent impedance match into the first* GaAsFet *stage.*

***S**eparate power supply board featuring ultra-stable regulation with built-in protection against polarity reversal, voltage fluctuation, and static discharge.*

***A**vailable in 100°, 90°, 85°, 80°, and 75° noise temperatures.*

It all adds up to quiet confidence–the knowledge that your customers are getting the best LNA performance for the price. BR Satellite is proud to be the only distributor in the Eastern United States for Norsat LNAs, and one of only three distributors nationwide.



Quantity Prices Available.

"We Distribute Trust."

Dealers Only.

NORSAT

COOP'S SATELLITE COMMENT

- **FEDERAL PRE-EMPTION of Zoning Ordinances**
- **NO MORE bad LANGUAGE**
- **KOREA'S Campaign Against Japanese Satellite TV**

PRE-EMPTING Zoning Ordinances

The concept of doing something 'the right way' is a good one. The founding fathers of the United States of America had both the vision and the clarity of purpose to attempt to fashion a country which was based upon ideals. They, clearly, wanted to 'do it right.' If one studies the arguments and bickering which lead up to the Declaration of Independence and the Bill of Rights, one sees ideal stacked upon ideal. If one studies the Constitution, even superficially, one sees an abiding faith that the architects were 'doing it right.'

There must have been **bitter** arguments in all three creations; men who were trodding on unplowed ground, attempting to fashion from nothing something which would endure. **Honest men,** it is said, **can always disagree.** And dishonest men, I must add, can always conspire.

I find in a filing prepared by the General Counsel for SPACE adequate reason to disagree. I have allowed this filing to sit on my desk since late in December, reading it over and over and wondering **why I could not agree** since the issue seemed so blatantly clear to even a quick reading. That issue is 'zoning ordinances'; the 'right' of a city or town to decide how you will use your property, and what protection the city or town can and should provide to those who share that city and town with you.

This industry is faced with a myriad of legal problems. One of those legal problems involves the authority of a municipality to decide that a property owner cannot place a satellite dish (disc) antenna in his or her yard, either at all or where such a contrivance might be an 'eyesore' to those adjacent property owners.

Bermuda has an interesting local law. You are prohibited from constructing **anything** on your property which your neighbor objects to. Now such a broad law can be abused, so it is practiced with great discretion. Bermuda is not a large island, and it has far more people than an island that size should have. Thus property lots are small and this places neighboring residences often very close to one another. Following English law, it has been established that if you build something on your property which 'offends' a neighbor, you are in effect 'polluting' the view of the neighbor and he has the legal right to ask you to take it down. In practice, you never put it up in the first place since before you construct you are required to obtain official approval for your project. This local law has been very effective in keeping satellite television terminals from selling very well in Bermuda, although there is considerable local demand for television diversity and certainly the local economic base to support such a local industry.

American zoning ordinances were originally constructed to prevent the undesirable mixture of commercial property with residential property, or multiple dwelling units with single family dwelling units. As the nation matured the fine print of zoning laws also matured; people who wished to build Gazebos were told that the Gazebos were not allowed because they 'offended' the neighbors; persons who wished to own and operate amateur radio stations were told that the tall towers and large antennas were 'offensive' and they would not be allowed.

I have some personal experience with zoning laws, and amateur radio. More than twenty-five years ago, while living in Modesto, California I wanted to erect a tower for my amateur radio station. The neighborhood I lived in did not have cable television and the average home had a 50 foot tower or mast beside of or on top of the home and a large, deep fringe television antenna on top. The whole neighborhood, from a distance, looked like a porcupine about to strike.

I put up my tower; 70 feet in height. I installed my ham radio antenna on top and proceeded to do what hams do. I talked on my radio. For about 24 hours. There was a knock at the door; it was a policeman.

"Do you have a permit for that tower," he asked. He knew I did not. And I admitted I did not. I asked what type of permit was required. He read me a section from the Modesto zoning law book and then handed me a piece of paper. It was a court order demanding **(1)** that I **cease operating** the amateur radio station, **(2)** that I **dismantle** the tower, promptly, and **(3)** that I **appear in court** in three days time.

Young, and foolish, I declined to do either of the first two. I did show up in court when instructed (I was not THAT foolish!). The Judge told me that since I had failed or refused (he was not sure which) to discontinue using my amateur radio station, and I had failed (or refused) to take down my tower, there would be a trial. I think that was when it dawned on me that I had a problem; a big problem.

Several weeks later the tower was still up. And I had been to my trial. Only I was no longer operating my amateur radio staton; I found that very difficult to do from the number sixteen jail cell where they had locked me up. I was sent to jail because I refused to take down the tower. And only because I refused to take down the tower. I figured that the amateur radio benevolent association, the ARRL, would get uptight about my going to jail and come and get me out. I had called them back in Connecticut on the telephone to tell them what was happening. The guy on the other end yawned several times, and I went to jail. I stayed there twenty four hours, and then re-thought my position and decided that I was not going to win any battles from cell 16. I went home and took down my tower.

I tell you this because I would hate to see some little old man in Sarasota get any false ideas about SPACE or anyone else hopping up to his defense and defending him when he decided to put in his dish after he had been told he could not; or leaving it in after he had been told to take it down. I cannot say that SPACE would not defend a little old man in Sarasota but I rather suspect that by the time SPACE got around to it, the little old man would be a 'former' little old man.

It is difficult to get very many people worked up about something which seems so mundane as 'zoning regulations' unless the people have been directly attacked by such regulations. We can symphathize with the story of someone having to forfeit a sale or two in a town we have never heard of, because of a local ordinance against dishes. We can even get a little hot under the collar when we learn that a man in North Miami was told he has to **move his dish** because a neighbor says it is ugly; and upon investigation (as we did investigate) we learn that the only way the neighbor can see the dish is if the neighbor stands on his tip-toes on top of his garbage cans and peers through a dense hedge which obscures 90% of the dish anyhow.

Clearly, people who don't get along with one or more neighbors, living in an area where dishes are 'regulated,' are asking for trouble if they even think about putting in a TVRO. The fellow in North Miami relied on his local lawyer telling him that the zoning ordinance only applied to the dish **if the dish was 'visible' to a neighbor.** So he put it in, carefully, to insure nobody would be 'offended.' That the local

zoning board refused to hear the evidence that the offended neighbor had to stand on his garbage cans and peer through a hedge to see even a glimpse of the dish did not set well with me. The board took the claims of the neighbor at face value, and slapped the North Miami man with a 'take it down forever' order. Why? Because in **their view** he had violated the ordinance **by not coming to them for advance permission** to install a dish which 'could be seen' by his neighbor. The dish, by the way, could have been a bird bath or Gazebo. Anything that would have offended the neighbor would have been a violation of the zoning ordinance. It is hard these days to think of anything you could put in your back yard that might not offend somebody.

So along comes SPACE with a master answer to a growing problem. SPACE, by counsel, has asked the FCC to decide that by its federal powers of pre-emption, **the FCC has the right to declare any and all zoning ordinances against TVRO antennas null and void.** On the surface that sounds like a nifty idea. Just tell **every town** and **every city** in America that they cannot regulate against TVRO antennas because the federal government through the FCC has the pre-emptive power to regulate all matters pertaining to communications.

Why didn't I think of that, back in Modesto, California some twenty-five years ago? Why did I bother to spend hundreds of dollars I did not have at the time carefully taking dozens and dozens of professional photographs which clearly showed that my neighbor's TV towers were just as much in violation of the local (35 foot maximum height) zoning ordinance as my ham radio tower?

SPACE's Counsel makes an excellent, well reasoned 'case' to the FCC in support of the pre-emption request. Some of the arguments include:

1) It has been the intent of Congress, for more than a decade, to 'foster' the development of satellite communication systems. The FCC, following the will of Congress, has adopted policies and regulations which implement this will of Congress.
2) Local regulations, restricting the use of satellite equipment, have the effect of interfering with these policies. There is a clear conflict here between national priorities and goals, and local regulations. In **most** such instances, the federal goals are pre-emptive of the local regulations.
3) Ordinances which restrict a home owner's access to satellite delivered information raise serious 'First Amendment' questions. The Supreme Court has repeatedly held that television viewers and radio listeners have a 'First Amendment Right' to **receive** programming.
4) Many local ordinances deal with the regulation of property use on the basis of safety, health, **or,** aesthetics. Non-discriminatory enforcement of safety and health reglations are not in contention here. There have been no situations to date where the installation of a satellite dish antenna has been a concern for either safety or health reasons. However, many local communities have adopted either restrictions or bans on satellite dish antennas for reasons of aesthetics; that is, because someone objects to the **appearance** of the dish antenna.

SPACE makes the point that any regulation based solely upon aesthetics ignores that what is pleasing to one person may not be pleasing to another. "It is virtually impossible," suggests SPACE counsel, "to define public taste as far as satellite antennas are concerned and equally impossible to protect something as undefinable and limitless as public taste."

The SPACE filing is filled with legal references, to help the Commission find the basis for pre-emption which SPACE seeks. One of the more pungent references cites **Justice Brennan** of the Supreme Court who found in a similar zoning case taken to the Supreme Court:

> **"I do not doubt that it is within the power of the city to determine that the community should be beautiful . . . but that power may** not **be exercised in contravention of the First Amendment."**

SPACE gets high marks for being creative. The Amateur Radio Relay League, to whom I turned some twenty five years ago as I was heading to jail for 24 hours, has never been that creative in attempting to defend amateur radio operators who, like me in my youth, seem bound and determined to 'topple the earth over' with their high towers and huge antennas on postage stamp size urban lots. The best the hams have been able to do is to argue that the FCC pre-empts matters relating to telecommunications (that argument virtually **always loses** in court) and that the amateur has valuable 'First Amendment' or freedom of speech rights at stake (that argument **loses less often** in court, but well over 50% of the time nonetheless). The basic difference between amateur rado antennas and TVRO antennas is their size and height of course. No self respecting ham would be caught trying to install an antenna that stuck up no more than eight to ten feet above the ground. You can build a pretty decent case for 'safety and health' considerations when the ham crams a 90 foot tower on a 50 by 50 foot lot and then insists on sticking a 40 foot long antenna on top of it! If that doesn't get the attention of the judge, the 1,000 watts of 'power' the ham is using probably will. Even judges have heard about people getting fried by standing in front of powerful radio transmitter systems.

Seemingly, **I of all people** would applaud the SPACE 'initiative' in this area. **I,** who have been a licensed ham for more than 30 years, who has been to jail because **I** insisted on being a ham, who has carefully picked and chosen every home **I** have ever lived in during the intervening 25 years to be as cautious as possible about getting into a situation where an unfriendly neighbor could 'shut me down,' should, of all people pat SPACE on the back for this one. Right?

I cannot do it.

I cannot do it, even though I know that something MUST be done, and quickly, or we will all be paying the price for a decade or more. Here is why.

This 'first strike' by SPACE rings of being 'cute.' It has the kind of legal logic which a young law student loves to draft for his second year professor in law school. It is one of those **"Look here, I found a loop hole"** approaches to what is truly a serious problem. There is a long history of "cute pleadings" going nowhere at the FCC.

When you ask the FCC to rule on a matter like this, you are asking a federal agency with limited financial resources and limited legal resources to get directly into litigation with **every** single town, village, city and burg in the US of A. **You are waving a red flag** which **every** city planner, and **every** mayor and **every** city bureaucrat in the land will respond to. There is no way that all of the municipalities of this land would accept a ruling like this and simply roll over dead. **They would march on Washington!**

No, this is "too cute." Too good, too neat, too pat. Yet it is also probably legally correct. At least as SPACE presents it, it **looks** very correct.

So what do we do? Well, if the legal work done by SPACE **is correct,** if there are no other contradictory Supreme Court decisions lurking in law libraries which the SPACE legal beagles missed or skipped over, then **we have** a heck of a case **for Congress.** This one is clearly too big, too fat for the FCC. They are not big enough to tackle something like this.

If SPACE's counsel is so sure they are right on this one, then every member of SPACE and every owner of a TVRO should be 'drafted' into an industry army which will inundate Congress for support for a bill which SPACE should draft and which Congressman Charlie Rose or someone like him should sponsor. We should rally every person we can find to get a clear cut, **clean law passed** which states that **every homeowner in the United States of America has the inalienable 'right' to install a satellite dish in their yard to receive satellite transmissions.**

Such a law then becomes a clear-cut federal pre-emption, at the Congressional and White House level, or the FCC to in turn enforce. Sure the towns and cities will yell, and sure there will be a hell of a fight on the floor of Congress. But we'd have some very powerful allies in this one. COMSAT's STC, for example, is going to run into much the same problem as they launch DBS. Do they want to be 'frozen out of Pawtuckett' because of a local ban against dishes? Of course not.

Now is the time to call SPACE's hand on this one. **If** SPACE counsel **was serious** with their December 19th filing to the FCC, **let's hear it** from the SPACE board. **Let's hear it** from the dealers and distributors who are being hurt by these unfair zoning ordinances. Let's get a plan drawn up and let's get some action here. Or let's forget about changing the zoning ordinances that are unfair. And let's write off Pawtuckett for now and forever.

COOP/ continues page 56

AVCOM® Update

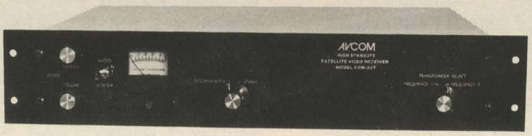
- ✷ Attractive Styling
- ✷ Scantune
- ✷ Tunable Audio with wide and narrow IF switch
- ✷ Comprehensive Remote Control (Standard with COM-2A, Optional with COM-2B)
- ✷ Remote Downconverter
- ✷ Sensitive Signal Strength Meter
- ✷ AVCOM Quality at a Low Cost

COM-2A

COM-2B

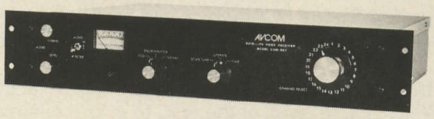
SCPC-100

AVCOM's SCPC-100 allows reception of single channel per carrier transmissions from international and domestic satellites. Audio channels not sent with video information can be received. Features external or internal downconverter.



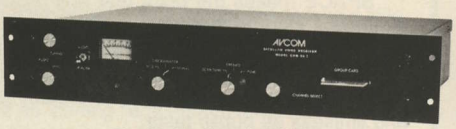
COM-20T

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.



COM-66T

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



COM-65T

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

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

Write or Call

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

AVCOM • 500 Research Road • Richmond, VA 23236 • 804-794-2500

Pioneer Member of SPACE

AIMERS BY DRACO RIGHT ON

AIMER III

The complete answer to satellite dish movement and polarotor control. Up to 64 satellite locations with microprocessor accuracy of position and polarotor. Easy to use — simply turn the knob until the satellite reads out and push "GO TO." The Aimer III does the rest. Built-in power supply — low profile — superb styling.

ACTUATOR GIMBAL BRACKET

Eliminates side and up and down pull on the Actuator. Prevents premature failure of the power drive unit.

AIMER II

Precise antenna movement with push button ease. Built-in power supply, dynamic breaking. A solid solution to low cost dish power positioners.

POWER ACTUATOR

Designed and built for satellite dish movement. Sealed tubes, solid lubrication, gimbal rod end, Timken roller bearings, anti-jamming. Rated at over 2000 lbs. The Draco Power Actuator operates at 12 to 36 volts with self-resetting current protection. Infrared light eruptors are impervious to all electrical interference. Positively the best Actuator built.

FOR MORE INFORMATION CONTACT:

DRACO LABORATORIES, INC.
1005 Washington Street
Grafton, Wisconsin 53024 U.S.A.
Phone: 414-377-0770
Telex: 26886

DRACO

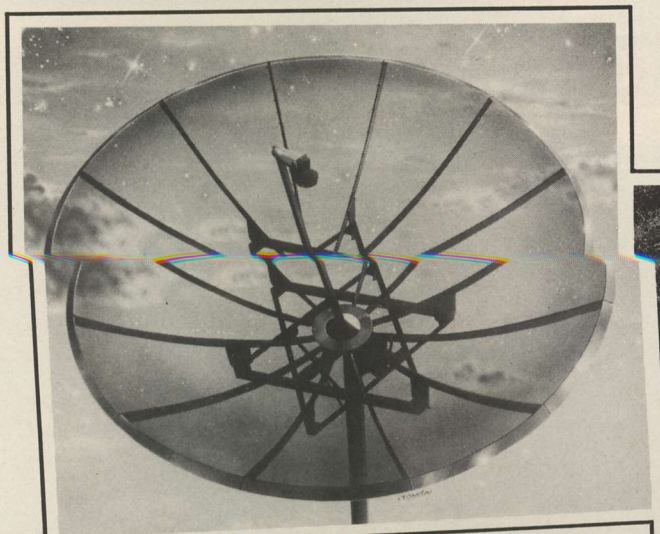
DISTRIBUTORS: WISCONSIN: Delta Satellite Corporation, Cedarburg, WI 414-375-1000, Nat'l 800-558-5582, Wisc. 800-242-2290. **NEW YORK: Satellite Video Services,** Palenville, NY 518-678-9306. **OREGON: Von's Total Television Center,** Eugene, OR 503-342-1618. **OHIO: Satco U.S.A.,** New Philadelphia, OH, Nat'l 800-362-8619, Ohio 800-362-6781. **FLORIDA: United Communications Supply,** Tampa, FL 813-971-1648. **UTAH: Video Link,** Salt Lake City, UT 801-278-2878. **TENNESSEE: Cox Enterprises,** Rockwood, TN 615-354-3471. **CANADA: Ground Control,** Concorde, Ontario 416-669-6366. **Satellite Systems Ltd.,** Burnaby, B.C. 604-430-4040. **Videosat Canada LTEE,** Charney, Quebec 418-832-4621. **TEXAS: Morgan Satellite Systems,** Hughes Spring, TX 214-639-7517.

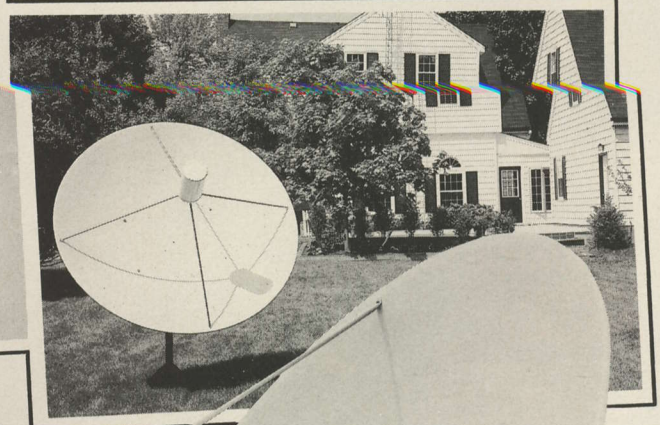
DELTA®
SATELLITE CORPORATION

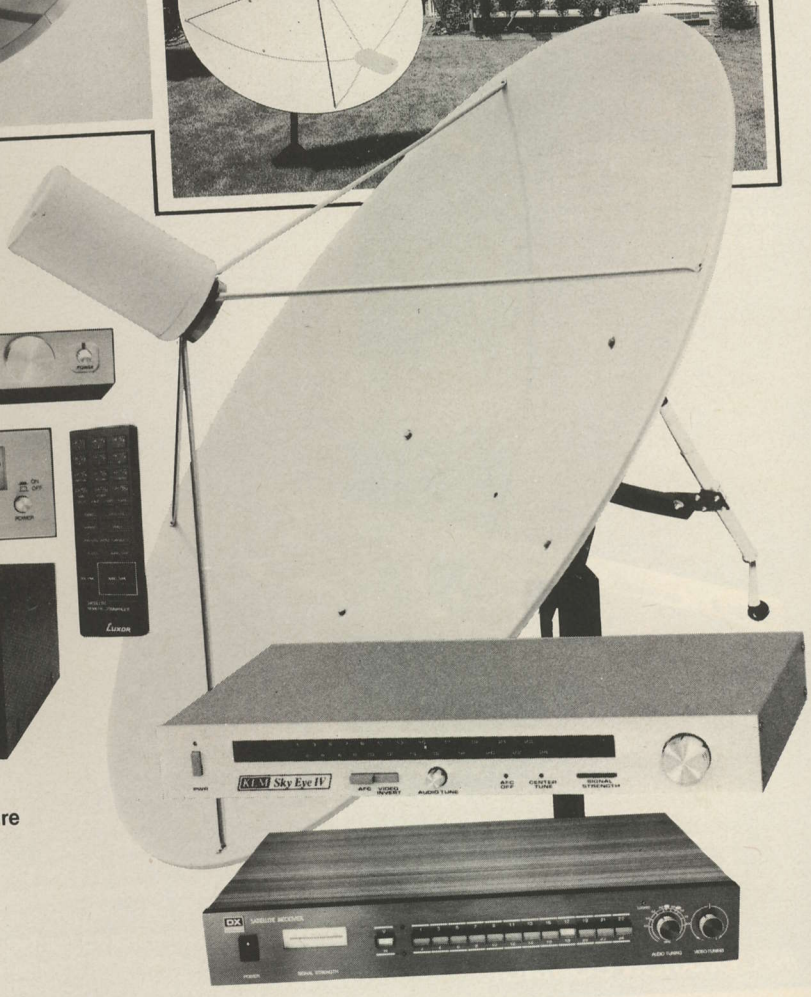
DELTA, The Experienced Distributor

Thousands of satisfied customers have been purchasing satellite equipment from Delta since 1980. The reasons are simple, lowest prices around plus fast delivery and service along with the availability of high demand product lines.

Call today, toll free, for our 52 page catalog and dealer support package.







DISTRIBUTORS FOR:

- Amplica
- California Amplifier
- Chapparal
- Draco
- DX Antenna
- Houston Satellite
- Power Consultants
- International Wire
- Janiel
- KLM
- Lowrance
- Luxor
- Paraclipse
- Tweaker

Order Toll Free

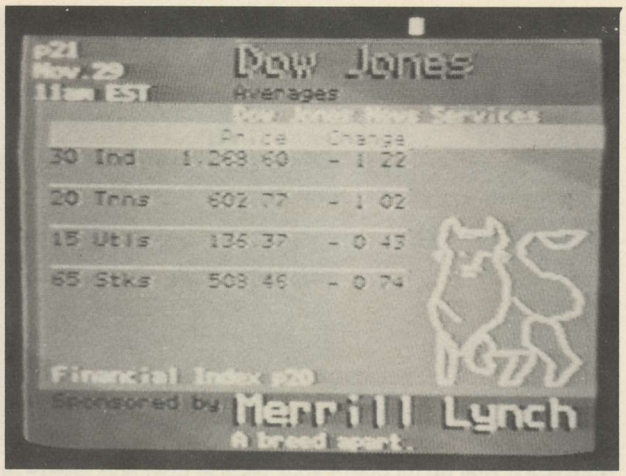
National 800-558-5582

DELTA®
SATELLITE CORPORATION

Wisconsin 800-242-2290

ONE ECHO PLAZA • CEDARBURG, WI 53012 • TLX: 26886/ANS BK 26886 GRAF • CABLE: DELTA SAT

TELETEXT BASICS: SERVICE IS HERE — NOW



Are you ready for teletext? A number of television networks and satellite-delivered services are providing teletext services 24 hours a day, 7 days a week, but very few of us have decoded the contents. This report will tell you what they are, where they are, and most important, how to receive them.

The FCC defines teletext to be ". . . a new form of communication that involves the transmission of textual and graphic data on the Vertical Blanking Interval **(VBI)** — that portion of the TV signal that appears as a black bar when the picture rolls — of the video portion of the TV signal."

If you are unfamiliar with these encoded transmissions, have a quick look. Tune in WTBS F3 TR6. Adjust the vertical hold control on the TV set until the picture starts to roll. See the white dots moving between the frames? **That is teletext.** Did you ever notice the transmission on F4 TR18? Many people thought it was HBO testing its scrambling system, but it **was** Time Teletext. Rather than use the Vertical Blanking Interval, Time **used** all 525 lines of the television field.

At this point some additional terminology may be important. You may be familiar with the term "videotex." Videotex means all graphic and textual materials which can be displayed on a TV screen or monitor. Your kid's VIC 20 or VIC 64 probably can function as a videotex terminal; when connected to a phoneline, and with the proper passwords, the VIC can access data services such as the **Source,** or **Compuserve,** or a couple of dozen other services So your home P.C. (personal computer) can act as a videotex terminal. There are a couple of ways of getting that videotex onto your screen. One way is to hook your VIC or IBM, or whatever, to a telephone modem. The "modem" **mo**dulates or **dem**odulates computer data which is transmitted by the phoneline. Videotex usually connotes a 2-way system; the user's computer terminal transmits commands to the "host" computer. The host then retrieves the information and transmits it back down the phone line.

Teletext is simply a type of videotex. Think of it this way . . . the "tele" in teletext is descriptive of the mode of transmission, by tele(vision) or tele(communications). OK so far? One other thing to remember; teletext, like television itself or like a TVRO is basically a one-way affair. Information is received, but the user cannot transmit.

When most people talk about teletext, they refer to signals transmitted on the VBI of the TV signal, but this is not quite accurate. Text and data can be transmitted by any aural or visual medium. Hence you can transmit "teletext" by means of subcarriers, or digital audio encoding.

It might help to understand how teletext works: It is important to remember that all teletext is computer data. You probably already knew that computers operate on the basis of a coding system of zeros and ones. When the 0's and 1's are deciphered by the electronic circuits, the computer can form numbers, letters, words, and most important, colours and pictures. If you have dabbled in the world of personal computers, you will also know that while Apples, IBMs and Atari's can all do word processing (with the proper software), you can't shove an IBM diskette into an Apple and get the Apple to function with that IBM software disk. Without engaging in too much technological discussion let's just say that while personal computers are all based upon the same premise, they use different microprocessors, or different operating systems to achieve basically the same results. So it is with teletext. There are a number of systems now in the marketplace, and like personal computers, they have significant differences.

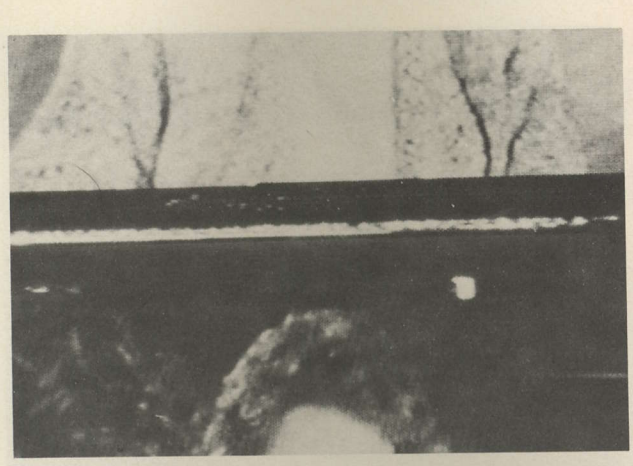
But before we jump ahead of ourselves with a history lesson, there are a few other things you must know. **All teletext decoders are personal computers.** They might not look like an Apple or Atari, but they contain integrated circuitry and in fact, they usually contain **more memory and circuitry** than the average personal computer! The software is usually inscribed right on the IC chips (RAM and ROM), so when you turn the teletext decoder on, it knows what to do; because the "software" is built-in (you don't have to insert a cartridge or floppy disk). Think of a teletext decoder as a personal computer designed for one purpose and one purpose only, to receive information "pages" via transmitted signals. When we talk about the pricing of teletext decoders, later in this article, you will recall that you are getting a sophisticated personal computer.

A short history of Teletext is in order: More than a dozen years ago, television engineers started to realize that they could cram all sorts of **digital** information into the vertical blanking interval (usually lines 13-21) without physically interfering with the TV picture. At first, the VBI was used for special monitoring signals which allowed engineers to perform quality-control checks on the TV signal as it passed from the network studio to microwave links and ultimately to broadcast transmitters.

The public got involved with the VBI signals in the late 1970's when several TV set manufacturers took advantage of **VIR** (**V**ertical **I**nterval **R**eference) signals which were transmitted on the VBI's of various stations. The VIR signals were used for quality assurance and colour fidelity. Several TV receiver makers, including General Electric, reasoned that a set locked into the VIR signals would produce better colour pictures, more consistently on more channels. VIR signals, it was thought, were not as prone to multipath interference as the

by
Mark L. Lewis
717 Parkdale Avenue
Ottawa, Ontario
K1Y 1J5, Canada

Mark Lewis first contributed material to **CSD** in our January 1984 issue; in his 'other life' Lewis is a Canadian communications attorney who closely follows legal activity in Canada regarding TVROs. Here, Lewis drops the 'Esq' and writes as a pioneer user of satellite delivered Teletext services. His experience in making Teletext from satellites work is instructive to all who have been asking **'Just what is Teletext all about, anyhow?'.** Lewis will be re-visiting the progress of Teletext transmission systems, via satellite, on a regular basis in **CSD** in the coming year and as new technology and services evolve, you will learn of it here from Mark Lewis.



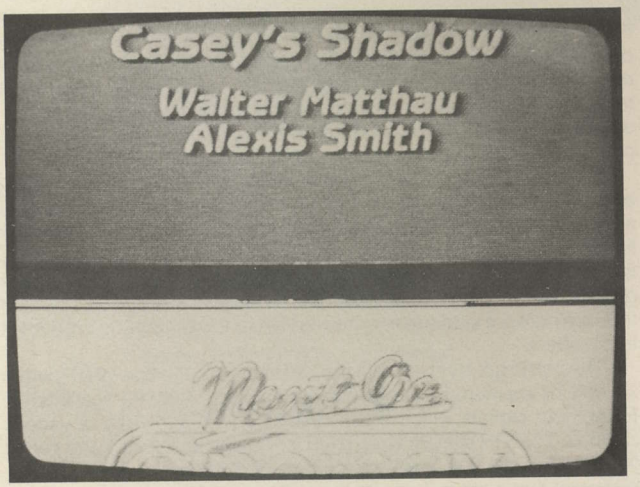
TELETEXT/ Roll up (or down) **your vertical hold and 'freeze' the sync bar near the middle of the display screen. Along the bottom edge of the bar you will see 'dancing' dots of data; containing the Teletext message material** (CBS on D3, WTBS on F3R, etc.).

traditional colour control signals.

Also in the 1970's, the Public Broadcasting Service in conjunction with the National Captioning Institute (NCI) and Texas Instruments, developed a system for closed-captioning of TV programmes for the hearing-impaired. This was a very crude system of teletext. Signals were transmitted on line 21 of the VBI. The viewer purchased a decoder (sold by Sears) or a receiver equipped with a built-in decoder. The decoded captions were superimposed over the picture in the lower portion of the screen. **Closed captioning was a crude form of teletext** because the graphics capability was quite rudimentary. The captioning was usually displayed as a one-line message scrolled along the bottom of the screen, similar to a computer print-out. The captioning materials usually paraphrased the dialogue of the television programme. Word-for-word translations were impractical because the average reader could not comprehend the one-line caption at a rapid rate.

Three networks opted to broadcast closed-captioned programmes: **PBS, ABC** and **NBC.** CBS did not initially opt to use the NCI system because CBS engineers believed that this system was inefficient, and it used up a significant portion of the Vertical Blanking Interval for **low-resolution** graphics. CBS reasoned that if NCI closed captioning proliferated, it would be difficult to introduce **high-speed** data-transmission using high-capacity transmission standards.

By 1978, there were a number of teletext systems under development throughout the world. The British had developed a system (called CEEFAX, or ORACLE or PRESTEL) which was based upon alpha-**mosaics.** The Canadians had invented a system (called Telidon) based upon alpha-**geometrics.** What's the difference? The British system created shapes in much the same manner that you might create a drawing on a computer. On your computer terminal, you can create graphics by typing in the right combination of characters and dots. If you have a computer terminal, you have probably seen the programme which will draw a woman by means of X's and O's. That's a very crude form of alpha mosaics. The Canadian system was more dependent on the computer to assist in drawing pictures. The difference in the two systems is rather striking; the Canadian system could create circles, arcs, and all other geometric shapes. This meant that artists could convert realistic drawings into teletext pictures. The best the British could do was create pictures based upon squares, boxes and jagged lines. The French developed a system called Antiope/ DIDON which share attributes of both the British and Canadian systems. The British, French and Canadian governments poured a lot of money into their respective systems, so an international standards battle broke out. **Each country** wanted **its system** to be adopted as a **"world standard."** Each country knew that the real victory would occur in the United States where there exists a market of more than 86 million television homes in an information-hungry nation. No one wanted to repeat the standards battles of the 1940's and 1950's which resulted in alot of different television transmission standards. The French and Canadians found some common ground but the British were unable to agree on anything, **except that** they wanted everyone to adopt **their standard.** In 1980, several manufacturers, with support of their respective governments, supplied a number of American broadcasters with prototype equipment to conduct field trials. **WETA** Washington D.C. used **Canadian-made** equipment , **KMOX** used some **French** equipment, and **WKRC-TV** Cincinnati, Ohio (no relation to the radio station in the sitcom TV show) used **British** equipment. NBC used French equipment at KNBC. There was a lot of lobbying in Washington, as each faction tried to get the FCC to move toward **one teletext standard.** (Reminiscent of the Quadraphonic and AM Stereo battle isn't it?)



NO DATA HERE/ standard frame bar has 'softer,' less 'busy' appearance.

You have probably noticed that we haven't mentioned an "American system" of teletext or a "Japanese system." There was a Japanese system developed called CAPTAIN, but it seemed to fizzle out in the face of the other international competition. Most American and Japanese companies sat back and watched the other governments and their engineers fight. They figured that eventually they would be involved in the final outcome, and they were right. Committees were formed and a number of American companies including the giant A.T.&T., and CBS and NBC, set out to determine a "protocol" for transmission of Videotex and Teletext. Over a period of two years, a transmission system was developed which incorporated a lot of the original Canadian Telidon system, along with elements of the French Antiope & DIDON systems, and a lot of new twists thrown in for good measure. This meant that much of the equipment used on those original field trials had to be scrapped as the standards evolved. **The new protocol,** known as NABTS (North American Broadcast Teletext Specification) sets down a basic blue-print for teletext transmission, although individual manufacturers or broadcasters have made some minor changes of their own. Meanwhile, during the time that A.T.&T., CBS, NBC, Time Inc. (the parent of HBO, and Cinemax) and others were sitting around the bargaining table, the British started to make inroads in the U.S. with individual broadcasters.

Many teletext observers wanted the FCC to declare that there would be only one technical standard for TV transmission, but the FCC decided to authorize teletext under the "open market" approach. Like AM-Stereo, the FCC decided that the only restriction should be **non-interference with** the regular broadcast service of the originating station.

The Satellite-Delivered Services:

At the time this article was written, the major services on the satellites are: Keyfax, located on the WTBS VBI F3, TR6; Quotrader also on the WTBS VBI; Time Teletext **had been found** on F4, TR18 and F2R TR23 up until December 31, 1983. Time Inc. has wound up its experimental service, however don't be surprised if you see the Time Teletext signal up and running on various satellites from time to

time. Many people thought that the signal on F4 TR18 was a form of scrambling for HBO because digital data which did not really resemble the Reuters transmission system occupied the entire transponder on F4. "Extravision" is the CBS service which can be found primarily on Comsat D3, transponder 10. From time to time it also shows up on TR17 of D3. NBC's teletext service can be found on Comsat D3 TR1. It is reputed to be based upon the NABTS system of teletext, but we have never been able to de-code it, despite the fact that our decoder works on all other teletext services.

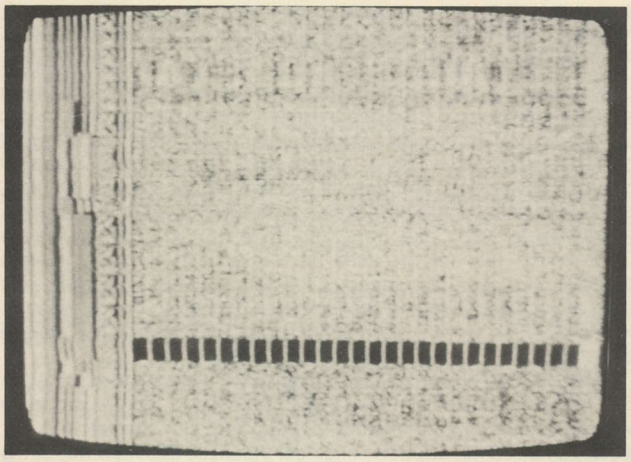
More teletext can be found on Anik B and Anik D, on the CBC channels. The English language channels have a service originated out of Toronto, while the French language channels have a teletext service originated out of Montreal, although on Anik D we have sometimes found French language test slides running on the CBC English language transponder which originates out of Montreal. TVOntario on Anik C3 can be found from 8:30 am EST to 11:30 pm EST with a news and information service. The hours are sporadic on weekends.

What is the content of the major services? Let's have a look. **KEYFAX is the first commercially available service.** It is transmitted on F3 TR6 on the Vertical Blanking Interval of WTBS. The KEYFAX system uses British "CEEFAX" technology which is sometimes referred to in the advertising literature as World Standard Teletext (W.S.T.). However, as we mentioned, **there is no** "world standard" (the British is **one type of** teletext, not a standard). It is an alpha-mosaic system.

The content of the service includes world and national news, sports scores and business news. There is also weather news, and a newsflash feature which allows you to have bulletins displayed on your TV set even while you watch WTBS. Keyfax also includes leisure and entertainment features, and will **probably contain** commodity information later in the year.

The KEYFAX decoder **(see block diagram)** is made by Ayr Electronics of Great Britain. There is an infra-red keypad to call up individual pages. When the decoder is turned on, a menu page is displayed. On the menu page there are numbers which refer to features; NEWS might be found on pages 001 to 019. To receive the news, you would "key in" 001.

When I contacted KEYFAX, their marketing strategy had just been

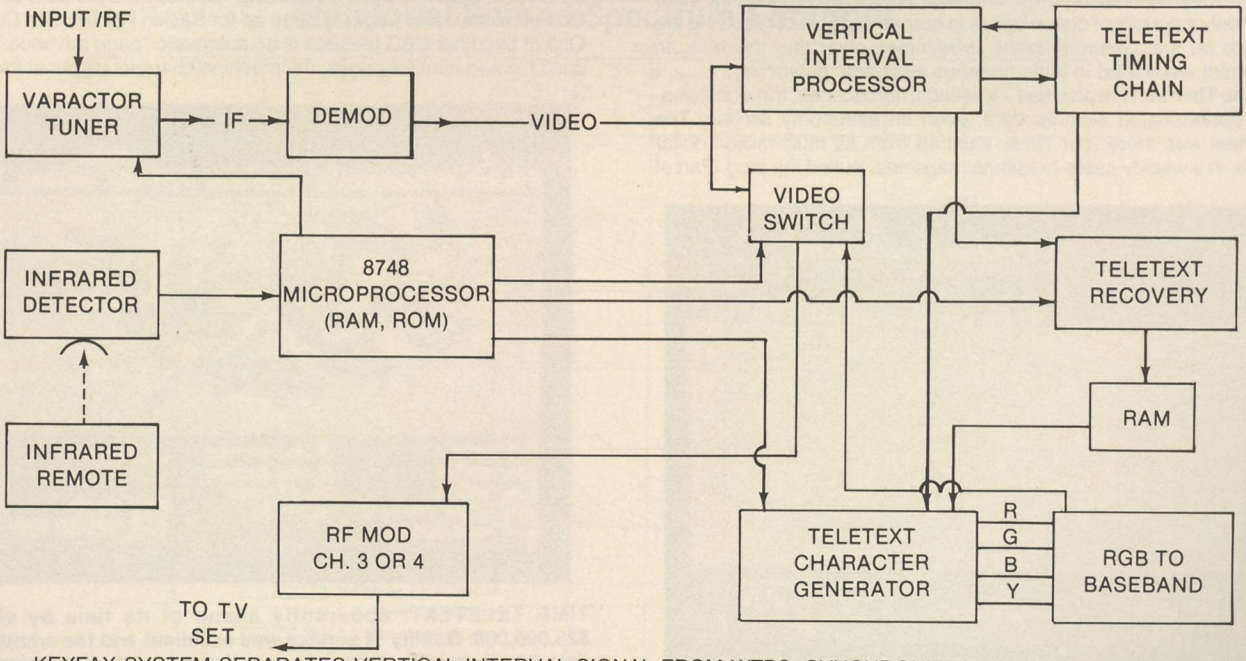


MANY PEOPLE/ thought this TIME, Inc. service on F4/TR18 was scrambled television.

modified. Originally, they were only looking at marketing through cable companies; however, **now it is possible** to purchase a decoder. The pricing of the decoders is around $300. The suggested retail price for the service via cable is $19.90 a month, with half of the fee for content, and half for the leasing of the decoder. Eventually there will be sponsorship of pages in the service. The marketing executive for KEYFAX Teletext is Selman Kremer (we'll list his address and telephone number later in this article.) Mr. Kremer works out of the SSS office in Tulsa, Oklahoma. SSS is a partner in the service, with Keycom of Chicago.

By the way, **in England** the BBC is transmitting **computer software** to home personal computers using the same VBI signal that contains its CEEFAX. It is not known whether KEYFAX intends to transmit computer software, but the technology will permit the transmission.

CBS has made a significant commitment to teletext. Their service is known as **Extravision** and consists of about 50 pages. Unlike KEYFAX, CBS uses the North American Broadcast Teletext Speci-



KEYFAX SYSTEM SEPARATES VERTICAL INTERVAL SIGNAL FROM WTBS, SYNCHRONIZES TO WTBS, GENERATES TEXT DISPLAY FROM PAGE SELECTED, AND MODULATES OUTPUT CARRIER FOR DISPLAY ON TV RECEIVER.

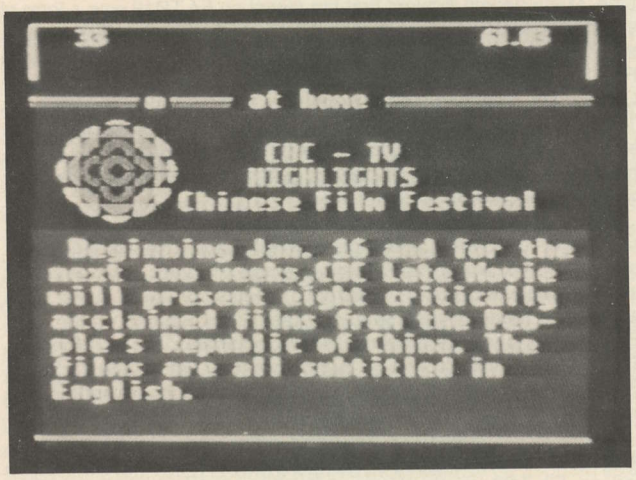
fication (NABTS). That means that the Keyfax decoder will **not work** on CBS. The CBS service has generally the same content as KEYFAX, with a couple of differences. CBS has some fascinating pages related to the communications and entertainment industry. It also has a few pages for the hearing impaired and a listing of programs for the "4 major" networks. On the menu page, there are always 2 news headlines which "blink." Almost every page on the CBS service contains advertising, and despite the lack of decoders in TV-land, there does not seem to be a shortage of advertisers on Extravision. Advertisers include Coke, Ford, and Phillips 66. I happen to like the CBS service, primarily because the pages flash up on the screen quickly (more about the speed of the service later). The other nice thing about CBS is that the service is free of charge. The question is, why is KEYFAX service worth $9.90 a month if CBS is FREE? **Good question!**

The NBC service has been up and running since the summer on D3, TR1. It is reputedly in the NABTS format, but there seem to be some problems with the method of encoding. Our **Norpak** decoder would not lock onto NBC. One engineer theorized that NBC was using some French software, and the NBC database was structured differently than most NABTS databases, which meant that when the decoder was turned on and automatically searched for the "menu paages," it in fact searched for page numbers on NBC which simply were not in their databank. Consequently, the decoder would not "log on" to the NBC service. We are trying to get more information from NBC concerning the problem.

Time Inc. (parent company of HBO and Cinemax) conducted the most expensive and extensive test of teletext. Their service occupied a full transponder (not just the Vertical Blanking Interval) and they had the capability to transmit up to **5,000 pages** simultaneously(!). When the service was good, it was very good. It was primarily delivered via F4 TR18 and F2 TR23 to cable head-ends in Orlando, and a couple of other cities. There, test homes were equipped with decoders, which had the added feature of "down-line loading." That meant that the software for videogames could be unloaded into the decoders.

How good was Time Teletext? As an example, one Saturday night last summer, I had guests over for dinner. After dinner we went up to the room which I call the "electronic playland." We switched on Time Teletext, and got a sports score for a Montreal Expos game, after 8-1/2 innings. We then switched the TV over to the game, and guess what? They were still in the 8th inning! When you realize that there were only a couple of dozen boxes in homes capable of receiving the service on that Saturday night, it becomes clear that this was an important watershed in instantaneous electronic publishing.

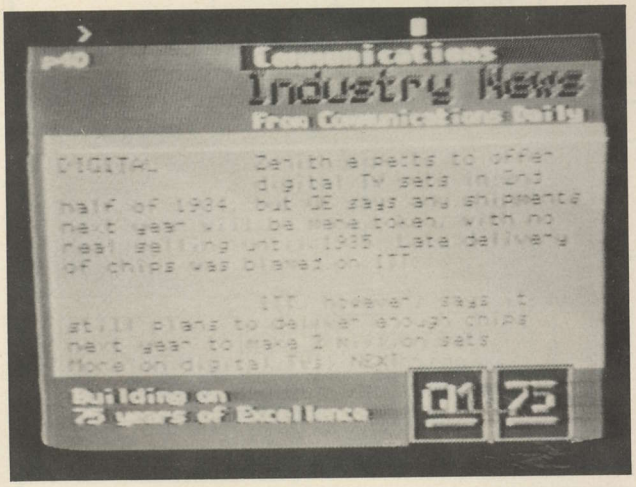
The Time service also had TV listings, horoscopes, travel information, sophisticated weather data, even an astronomy section. The potential was there, but Time, stunned from its multi-million dollar losses in a weekly cable-tv listings magazine, pulled the plug. Part of the problem was the fact that a major Japanese manufacturer said they could produce the decoder boxes for less than $200 in 1983; **and they couldn't.** Time did not want to continue the massive investment until the technology developed. And that's too bad; it was great while it lasted.



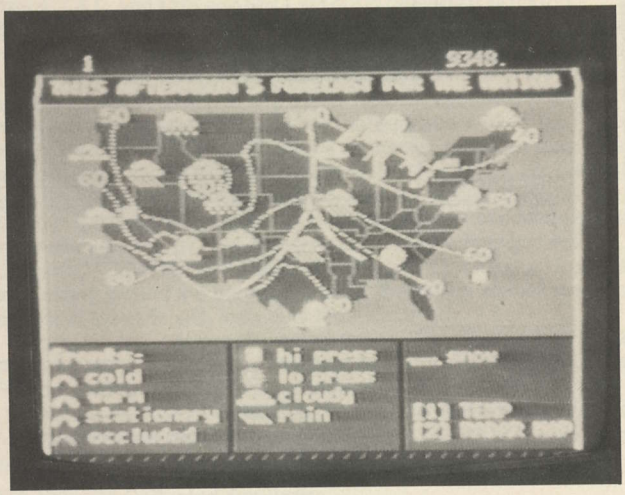
CBC SERVICE/ makes excellent use of background colors (ANIK B and D) **and creates easy-to-read format even on a small screen display.**

(By the way, you may have noticed Time Teletext as one of the signals dual-fed to Galaxy 2 and Satcom 2R located at 74 and 72 degrees respectively [2 degree spacing] around December 19th.)

The Canadian Broadcasting Corporation has multiple teletext feeds on Anik B & D. The French language channels have French teletext originated in Montreal, while the English language channels originate in Toronto in English. The news, sports and weather service is pretty good. The CBC is way ahead of CBS in their use of graphics. For example, with the CBS service, you'll strain your eyes if your TV set isn't a **monitor.** The CBC uses a combination of background colours and type fonts to overcome the problem of print on the electronic screen. Recently some advertising has crept into the CBC service. One of my favourite pages was an ad for Baskin Robbins Ice Cream. One of the other CBC features is an automatic "page advance." You don't have to hunt for pages, the machine changes pages at the rate



CBS EXTRAVISION/ (TR10, D3) **is excellent service covering basic essential data.**



TIME TELETEXT/ apparently ahead of its time by about $25,000,000. Quality of service was excellent and the amount of data transmitted in FULL transponder massive. Unfortunately, the cost of the home decoder units ('computer terminals') **did not come in as expected and the project was scrapped** (for now) **at the end of 1983.**

which an average reader would. Shortly, the CBC will add captioning and headline flashes to its teletext service. As of January 12, 1984, closed captions were running on some teletext channels, but the captions had nothing whatsoever to do with the program content; they just seemed to be testing the captioning equipment!

TVOntario, which is the closest thing to PBS in Canada, transmits VBI teletext during its broadcast day. Some features such as news and weather are only accessible 8:30 a.m.-11:30 p.m. EST, Monday-Friday. It can be found on Ku Band, on Anik C3, TR5 (h). It shares a full-transponder with Super channel (pay-tv). Reports would indicate that you have to live fairly close to the Canadian border, in the east to receive this signal. The content includes news about TVOntario programmes, and news, weather, and business. There is some "educational" material in the service. TVOntario is one of the original stations to use teletext, and believe it or not, was **the first** to transmit teletext from North America to the Australian outback via an early DBS (experimental Hermes) satellite in 1979. Their mastery of the medium is exceptional, especially the colours on their index page. Their video artists are just that. Where CBS is struggling to create pages which are readable, TVO's people are actually simulating computer animation on a weather map which seems to rain or snow on different parts of Canada. The weather map alone is almost worth the price of the decoder.

Although RCA Aurora at 143W is almost below my horizon, and is totally blocked by my house and the house across the road, you **might find** teletext on TR20 and 24. Much of the equipment and engineering was supplied by the same firms which supplied Time Inc. Most of the material is educational. Hours of operation are not known at this time.

Unusual Services:

The Quotrader service is unique. It is teletext to the extent that it is transmitted by means of the vertical blanking interval on WTBS, and can be displayed on a computer terminal. But the similarities seem to end there. Like the Reuters Service on F3, TR18, **Quotrader is not intended for reception by the general public,** and the terminal is proprietary, available **only from** Quotrader. The service provides instantaneous price quotations, bar charts at any time interval from 1 minute to 1 day. You can program the computer for buy/sell orders and automatic stops, and you can monitor your portfolio of stocks or commodity accounts.

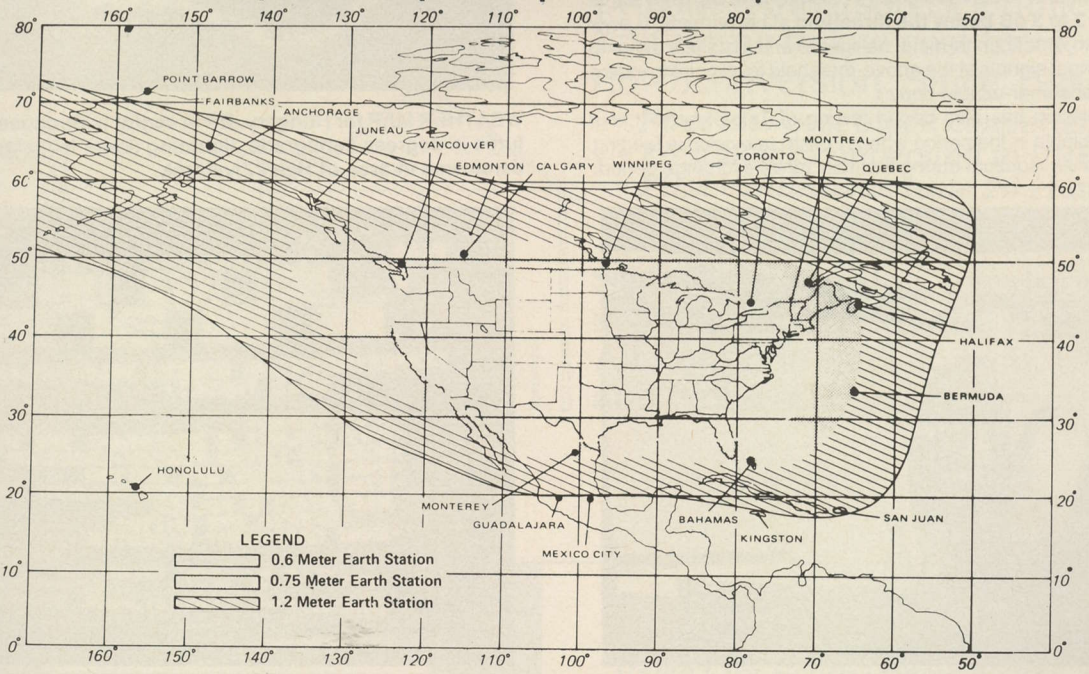
Quotrader runs on a modified Apple II+ or Franklin 1000 or Syscom computer. There are 2 special interface circuit boards for the computer. The boards are priced at approximately $2,400. There is also special software. The service is **also** transmitted on Westar IV TR4. For Westar, they recommend a turnkey system from Equatorial Communications Company. Their system can operate successfully with an error rate of 1 x 10 to the 5th with a dish of 1.2 meters or less over CONUS and Mexico City and the Caribbean **(see map).** While the total number of Quotrader systems out in the field numbered about 200 at the time of writing, they are aggressively marketed in the U.S. and Canada.

Quotrader may also be one of the first satellite services delivered "internationally." They are on Comsat D2, and now delivering the service to Australia on Intelsat.

For further information you may wish to contact Brad Baker at Quotrader 20823 Stevens Creek Boulevard, Suite C3-A, Cupertino, California, 95014 or call 408/446-0848.

Also in that "unique" category is a service known as **Genesis Storytime.** This service is transmitted on F3R TR8 (CBN), but it is not transmitted in the VBI, but instead by means of the subcarrier. A modulated tone is transmitted. To decode the signal, one uses what is essentially a "videotex" terminal. Instead of hooking the videotex terminal to the telephone lines, it is hooked up to the audio output of the subcarrier demodulator. The operating system is **NAPLPS,** which is the videotex version of NABTS. In layman's terms, they are using the North American videotex system rather than the French or British system. There is a significant cost saving involved, and the terminal equipment is more widely available from such sources as A.T.&T., Electrohome of Canada, Norpak of Canada, AEL Microtel of Canada (a G.T.& E. subsidiary) and soon, **Sony.** Terminals cost roughly $1,000 for the Genesis Storytime system. It **might be** possible to get pictures on an IBM P.C., using some special software. Genesis transmits children's stories with graphics and texts. Cable operators are picking up the text using Wegner audio demodulators, and they take the decoded videotex pictures and remodulate them on a full channel of their cable systems. **SSS** is handling the marketing in the U.S. of the service. Thus, using a narrow bandwidth, high resolution TV graphics are transmitted. The president of Genesis, Gregory Stetski, lives in Winnipeg, Manitoba, and can be contacted at (204) 949-1581.

Equatorial Spread-Spectrum Footprint



These contours represent the boundaries within which the Equatorial earth stations will operate within an error rate of 1 x 10^5 or better, with a 3 dB nominal margin to guard against mispointing, rain attenuation, sun noise or equipment degradation. Outside these boundaries, the earth station may receive the satellite signal and appear to operate well but the error rate will be higher. The contours have been generated from spacecraft antenna gain contours supplied by Western Union for 3840 MHz.

You may have noted some cryptic references to the "NABU NETWORK" in columns devoted to "future satellite services." The concept is similar to teletext. A microcomputer having 80k memory receives its software by means of a digital signal modulated on an RF channel. The data is processed through an addressable modem. That means the computer owner can purchase "tiers" of software. At the present time, the NABU computer is available commercially in Ottawa and Vancouver (Canada), and will shortly be launched in Alexandria, Virginia. In those locations the computer will be fed by means of the cable television system. However, last spring **NABU** demonstrated its system using the Anik B satellite. At present more than 35 computer programmes including video games (PAC MAN, POLE POSITION), word processing, stock market quotations and wine guides are being transmitted, and shortly the inventory should exceed 100 computer programs. When you consider that the monthly charge for a single tier of computer programmes is roughly the same as the retail price of HBO, and when you compare the cost of purchasing computer programmes, you will realize that **the NABU people are on to something which could revolutionize the computer industry.** There are rumours that their system may soon work with the IBM PC. By the way, the computer system sells for **under $600** and is very similar to the new Japanese MSX computer standard. Computer software by satellite? Perhaps sooner than you think.

Now that you have a fairly good idea of the types of teletext services now available and their content, you may wish to receive teletext via your TVRO. The list of do's and don'ts is not exhaustive, but there are a number of important considerations.

First, the availability of decoders. As mentioned previously, the service telecast on WTBS is available only with a WST-type decoder (model T100) which is manufactured in Great Britain. It is available for $399, from SSS in Tulsa. The man in charge is Selman M. Kremer, (he is Executive Vice President of Satellite Syndicated Systems Inc., Box 470684 Tulsa, Oklahoma, 74147; telephone 918-481-0881.) **One caution:** they are **not** particularly keen to conquer the TVRO market. They would **rather** market through CATV systems. Their target is 1% of WTBS-cabled homes within 3 years. While that is obviously a large market, the TVRO market is also significant. With some persuasion, they might become more interested in the TVRO market. But, "rumour" has it that the decoders which are now being sold in Cincinnati and **made by Zenith** for Taft Broadcasting's "ELECTRA" teletext service (transmitted on WKRC-tv) will work very well on WTBS. Best of all, they are being sold in Cincinnati for $300. There are 2 models; the DX-1000 and the DX-900. Apparently the model 900 was designed specifically for KEYFAX. There has been some suggestion that the Zenith decoders must be used in conjunction with late model Zenith colour TV's, but I am certain that some enterprising TVRO

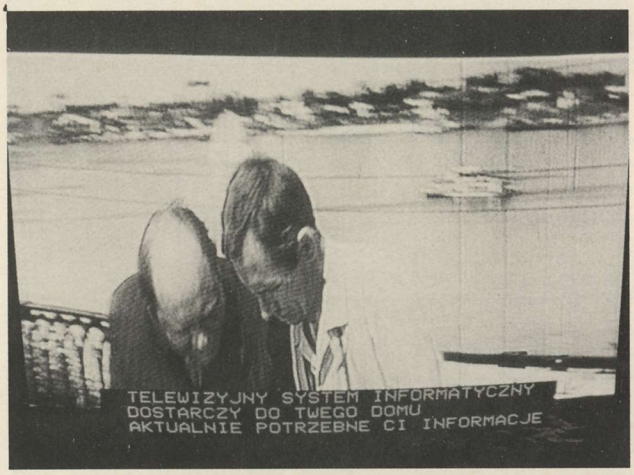
NOT ALL IN USA/CANADA

Although there have been surprisingly few 'claims' from the USSR concerning 'their invention' of Teletext service (Russia did, as every Russian schoolboy knows, 'invent' just about everything else of note), there is nonetheless a considerable amount of Teletext activity operating within the Soviet Block system. Some of this can be seen on Intersputnik (also known as Gorizont) birds, **including** the powerful bird located at 14 west, which makes it into all of the Caribbean, much of Central America and the eastern half of the USA.

Michael J. Stone, residing at Downend, Bristol in England supplies his observations from Gorizont as received on his own private terminal. The most active service seen relayed via Gorizont is from the **Hungarian** television network. This service is part of the almost daily 'Intersputnik News Exchange' one sees on Gorizont early in the morning eastern time. Michael points out that contrary to the results reported by Canadian Mark Lewis, he has been able to get 'solid, good copy' of the Hungarian Teletext signals even when the Gorizont signal is **as much as 2 to 3 dB below the threshold** at his terminal. (Lewis urges that North American terminal designers and installers strive to maintain their input signals at the above-threshold level point to insure error free or consumer-usable copy.)

Polish television has also begun testing of Teletext and it, like Hungary, is available in the period when (Polish) television is feeding daily news data via Gorizont during the daily news-exchange period.

WEATHER MAP for Hungary. BP in center is Budapest; temperatures in degrees centigrade; lightning (lower left) **signifies thunderstorms in area of Helyi Zivatarok.**

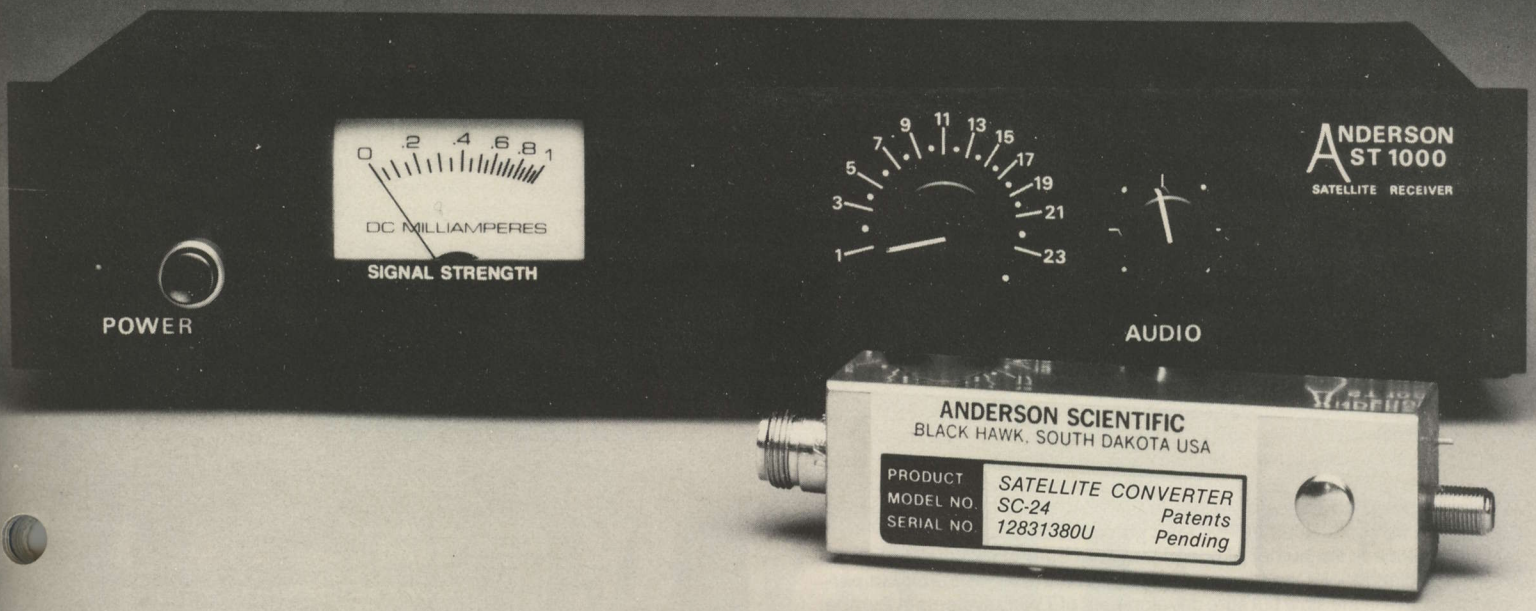


POLISH TELECAPTIONING used for 'news flashes' or for captioning for the hard of hearing.

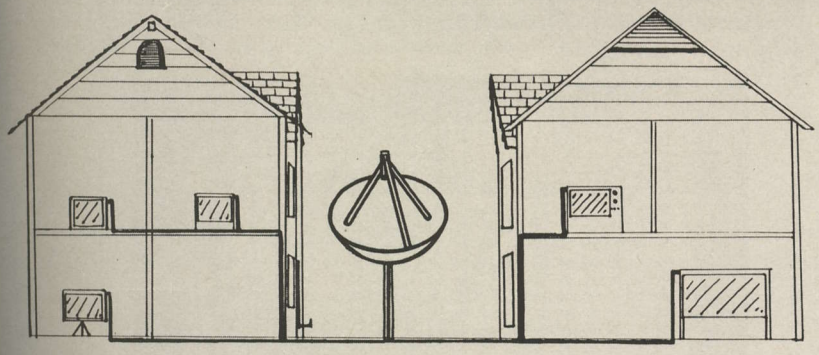
INDEX PAGE/ Polish Telegazeta. Notice use of 'generic name' VIDEOTEX **in line 118.**

BUY THE ORIGINAL

Low Price. High Performance. Patents Pending.



NOT A COPY



Enjoy the quality, the performance, the service, the latest refinements, that only the originators can provide. Anderson Scientific, the first name in low cost block downconversion. Since 1980:

- ***First low-cost block converters.***
- ***First block conversion to UHF band.***
- ***First continuous tune 24 channel system.***
- ***First all channel rebroadcast system.***

Single and multiple television systems for homes and buildings. All from one satellite dish, LNA, and block downconverter.

ANDERSON SCIENTIFIC, INC.
2121 Rand Road
Rapid City, South Dakota 57702
605-341-3781

Note: Radio Semiconductor, Inc. (LOCOM) is licensed by Anderson Scientific to produce the same high quality block downconversion receivers with all the latest refinements.

owner might be able to get the Zenith decoders to work with other TV models.

The decoders for North American Broadcast Teletext Standard (NABTS) which is transmitted by CBS, NBC, Time Inc., CBC, TVOntario and Learn Alaska are at the present time **expensive,** and in relatively short supply. You'll recall in the introduction to this article we mentioned that teletext is a computer system. The NABTS system of teletext uses high resolution graphics. Therefore, in that decoder box is the front end of a TV receiver, plus filtering devices to differentiate the VBI lines, **plus a digital tuner** which will tune VHF and UHF and mid-band and super-band Cable channels, and a computer to decode the data, plus an infrared remote system, plus RGB circuitry for display on a high-resolution monitor, plus a modulator. **All of that adds up to a lot of money.**

I am using a decoder made by **Norpak Corporation** of Kanata, Ontario (an Ottawa suburb). The decoder retails for about $3,000. As you can imagine, that price is enough to cool people off quite quickly. But the truth is, quantities of teletext decoders have not been large to date. Also, the two year negotiated battle over transmission and display standards meant that R&D was continuous, and terminals which should have been production models became prototypes. Because there was something of a metamorphosis of the technology, a lot of extra circuitry had to be built into the boxes. Likewise, these were never really meant to be consumer models; most have been designated for "field trials." In summary, the situation concerning NABTS teletext decoders is somewhat analogous to TVROs in 1979; limited production runs, sometimes unreliable, a variety of different circuits, high consumer prices. **But don't count NABTS teletext out yet.**

Several things are about to happen: First, a number of major manufacturers are working on VLSI. That stands for **V**ery **L**arge **S**cale **I**ntegration of circuitry. Most major functions will be integrated on a chip set. That means there will be a major price breakthrough. Since one chip or a couple of chips will perform the function of many circuits, reliability should be improved. Rockwell International has joined with Norpak of Canada to design VLSI. The Japanese companies led by Mitsui are also interested; as are A.T.&T., RCA/NBC, and a number of other major players. It is rumoured that Texas Instruments has a chip set nearly ready which can be built right into a micro computer. Manufacturers are also getting ready to integrate teletext into TV sets. If the trend which I noted in England last summer carries over to North

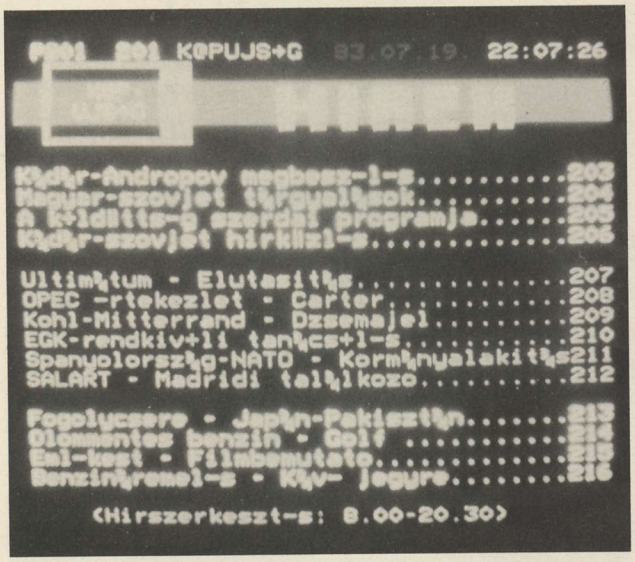
---

Some reception has also been noted during the period when **East Germany** is feeding Gorizont and this may be the best 'target' for western observers since the East German television service is regularly seen late in the morning and early in the afternoon (U.S. east coast time) on transponder 9 of Gorizont at 14 west.

Stone is using standard British CeeFax equipment and has found that while the 'British World Standard' may not be a true world standard, at least for Poland, Hungary and East German testing received to date, it works just fine for these eastern Europe transmission sources. The photos here are in full (PAL) color and unfortunately must be reproduced in less than gorgeous black and white.

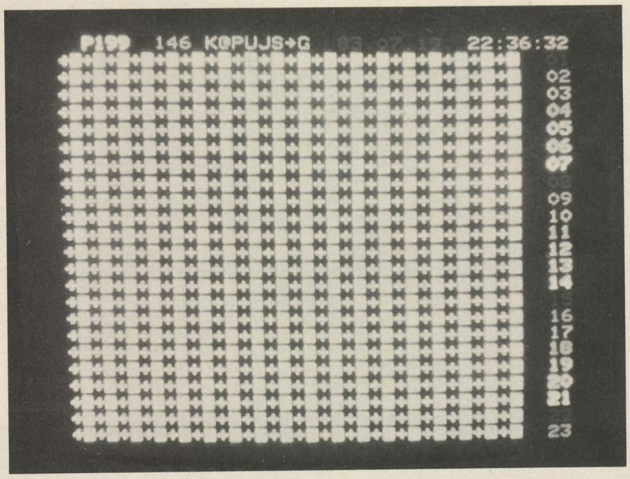
Stone is the author of one of the early European 'Satellite Television Handbooks' and those interested in the English/European perspective in the slow but sure development of TVRO systems in Europe will find this book very informative. Stone is also a consultant in the marketing end of the field and is available to assist American and other companies who need the 'inside presence' of a knowledgeable TVRO enthusiast in Europe.

Readers may contact **M.J. Stone** at **Baugh Farm, Church Lane, Downend, Bristol, England..**

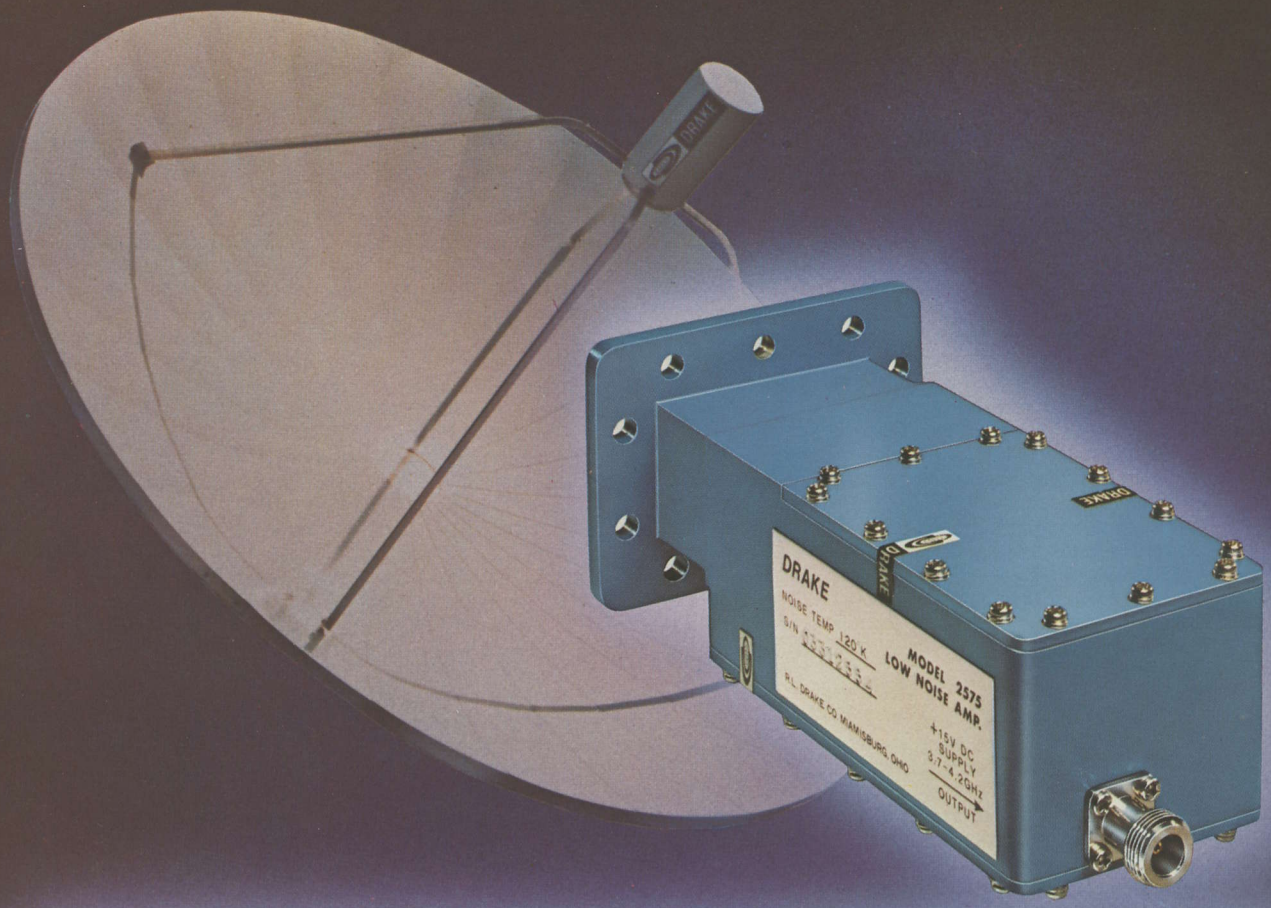


HUNGARIAN NEWS HEADLINES and index page leading to news and sports pages. A few of the Hungarian letters do not print 'correctly' on the UK system as the 'font' for Hungary is slightly different; thus the '1/2' and '3/4' and other occasional odd looking characters.

GERMAN USE of Teletext is also growing; this index page from Germany's ARD/ZDF **network lists page capacities from 15 to 500 (+).**



HUNGARIAN 'CLOCK-CRACKER' display used to set up the receiving unit Teletext decoder and to check reception/error rates. Stone reports his reception via Gorizont at 3875 MHz has better than 99.0% error-free data copy.



THE VITAL LINK

LOW NOISE AMPLIFIER FROM DRAKE

The Low Noise Amplifier (LNA) is the vital link in your satellite earth station, and is often required to tolerate the most demanding environmental conditions. The LNA is probably the most electrically-sensitive component in your system. This means you should take exceptional care in selecting the LNA which will maintain the high performance standards you demand.

Drake LNAs feature an integral bandpass filter and ferrite isolator to reject interfering signals and provide maximum efficiency. Each Drake LNA is tested to assure greater than 50db signal amplification under all operating conditions. Conservative noise temperature measurements assure you of a LNA which meets its specifications on all satellite transponder frequencies.

Drake LNAs are environmentally engineered to withstand the elements. Every Drake LNA is supplied with an individual performance report of noise temperature and gain parameters. Most of all, Drake LNAs are built with traditional Drake quality and backed with Drake's famous customer support.

Drake LNAs are available in three models to complement your antenna selection, signal strength footprint, and receiver requirements.

R.L. DRAKE LOW NOISE AMPLIFIERS

MODEL NUMBER	WORST CASE NOISE TEMPERATURE	GAIN (nominal)
2575	101 to 120 degree K	52db
2574	86 to 100 degree K	52db
2573	85 degree K or better	52db

Chances are you'll specify a Drake satellite receiver, too! We're dedicated to making your earth station picture sharp and clear. The R.L. Drake Company has produced quality communications products for more than forty years. Demand a Drake!

See your local Drake dealer or contact us for further information.

R.L. DRAKE COMPANY

DRAKE®

540 Richard St., Miamisburg, Ohio 45342. USA
Phone: (513) 866-2421
Telex: 288-017

PIONEER MEMBER OF SPACE

America, Sony and the other component TV makers will offer "component" teletext. In other words, the market for teletext is about to explode. By late 1984, cheaper decoders using VLSI could be moving into homes.

There are a number of technical problems which will impact on TVRO systems, and if the TVRO industry doesn't get involved, and quickly, there will be problems, mainly from disgruntled consumers who have purchased TVRO systems in good faith.

First, let's outline the equipment which we used for our tests: The receiver is a Dexel DXP1102. It has an LNC, which was tested at 93K. The dish is a Hastings 10-1/2 footer with metal panels. Reception was rated at "sparklie-free" to the odd sparklie on the test channels. We were taking the modulated video out of the Dexel on Channel 3. Although the Dexel has a "video out" port, which they claim is filtered (it isn't), the teletext decoder didn't have a video input port. So there was **the potential** for some clipping of the VBI **in the Dexel modulator.** We would have preferred to run video directly into the decoder. We were able to run the demodulated video output from the Dexel into a Panasonic NV-8250 industrial model VHS machine, and through its modulator tuned to Ch 3, into the teletext decoder. Our tests showed that there was little difference in performance of the teletext decoder between the 2 modulators.

Here then, are the problems:

The VBI information, which appears as a bunch of "flashing dots" in the vertical frame-bar, are a **precise coding system.** The teletext decoder recovers computer data from those "flashing dots." Then the data is processed, the data instructs the teletext unit where to draw lines, how to colour the pictures, how to display text.

Earlier in the article we made reference to waiting times. Try to visualize teletext as a large magazine which is transmitted page by page, over and over again. If you turn your decoder on, and want to see page 62, you have to wait until that point in the transmission cycle when page 62 is transmitted before it can be displayed. In theory, a teletext magazine on the VBI could contain hundreds, or thousands of pages of information. **However,** if there were hundreds of pages in the service **you would have to wait a long time** before the page you requested would be transmitted in the cycle. In other words, because VBI teletext only occupies a small part of the video bandwidth, you compromise the size of the data base in favour of cycle time. Most VBI teletext services contain less than 200 pages. To keep the waiting time for viewers down to a minimum, key pages (such as the menu page) are included more often in the transmission cycle, so there is a faster response time. That is why the CBS service contains approximately 50 pages and CBC contains about 100 pages. Time Inc., used a **full video channel,** with 525 lines devoted to teletext. As you might have guessed, they had hundreds of times more capacity to transmit pages to their viewers, and the transmission cycle was much faster than VBI teletext.

We also mentioned that there were problems with satellite transmission of teletext. To better comprehend the problem, remember that teletext is a computer transmission system. Instead of using phone lines, or wires, teletext is transmitted on TV pictures. Most computer systems perform quality control functions to ensure that the data received from a remote location is accurate. Teletext is no exception. **"Error rates"** have been established. This is an important aspect of the NABTS teletext transmission system (and all other data systems for that matter). That means the decoder performs certain verification tasks. If there are too many anomolies, the decoder or computer won't display the data. In other words, the machine virtually shuts down if there are significant errors. You may recall earlier articles in **CSD** concerning the Reuters' system. They had stringent standards concerning signal quality, and had reservations concerning allowing TVRO owners to access their system for fear of greater than acceptable error rates. We have the same problem with teletext.

1) Sparklies. This is simply the number 1 problem facing teletext. The sparklies are displayed in the video signal almost identical to the digital data in the VBI. While the decoder can differentiate the VBI data in lines 13-21 of the picture, from the other video information, the sparklies appear in all lines of the picture. That means **if you have sparklies in the picture, you have erroneous information in the VBI.** While you and I know that the sparklies aren't supposed to be there, and we might ignore the sparklies, the decoder thinks that they are data and instructions for displaying pictures. With sparklies, you get errors in the data, and that can cause the decoder to reject all of the data, **and hence,** no teletext picture.

This phenomenon concerning sparklies is not limited to teletext. Recently, I had a look at the Scientific Atlanta receiver for the new NBC (and other networks) **digital radio** transmission system. There was a very strong wind buffetting the dish which was on the roof of a radio station. The LNA was moving. When sparklies (noise) were introduced into the signal, the audio did not get noisy, **it simply got cut off!** With digital transmission, the general rule is, if the data gets through, the reproduction should be perfect, if the error rates are exceeded, **you get nothing.**

Unfortunately, one of the trends in the TVRO installer business in Canada seems to be that of misleading people. Recently a friend of mine was shopping for a TVRO in London, Ontario. A majority of the sales people (some who had been in the TV business for a lot of years and sell on the basis of their fine reputations) tried to sell undersized antennas with LNAs that weren't fit for the job. They tried to con him that sparklies on F3 were a normal fact of life; something that came with TVROs, something you lived with. **Unfortunately,** a few sparklies will virtually kill chances of decoding teletext, now and forever.

If your clients are potential users of teletext (and I would think that most TVRO owners will want TTX), then the dealer/installer has a moral responsibility to make sure that customers purchase and receive sparklie free signals.

When we tried to decode signals with even moderate sparklies, we either got pages with garbled data, or nothing at all . . . the machine would not display pages properly when sparklies were present.

2) Saturation. I would rank this problem second to the sparklies problem. Unfortunately the Dexel DXP1102 is notoriously bad on saturated colours. Despite blistering signals from D3 and Anik D and Anik B, we had a lot of trouble. The saturated reds on the Dexel display as a form of sparklies. Although the saturated colours are in lines of the video signal **other than** 13-21 of the video signal (where teletext is transmitted), for some reason, the decoder was "fooled" and we either got garbled data or not data at all. **Game shows on CBS were the greatest problem.** The Price is Right (for example) uses a lot of saturated colours, a lot of chroma key, and a lot of blinking lights around displays. I literally had to wait until commercial breaks to get the teletext decoder to display CBS pages. One small consolation; during prime-time there aren't as many shows with saturated colours, so you don't run into this problem as often. **But on Magnum P.I. they seem to wear a lot of Hawaiian shirts with saturated reds!**

I understand that a lot of companies are abandoning the 564 circuit, and now are addressing the saturation problem. The industry rule should be, **if there are no sparklies, there should be no saturation.**

3) Modulators. This did not seem to be a severe problem with the Dexel, but it is a potential problem for teletext. The receiver modulator must not only pass the lines in the picture portion of the video, but **it must also pass lines 13-21** without distortion. Unfortunately some manufacturers skimp in this area. If you are a manufacturer and use a brand-name VCR modulator, **you should not assume** that the modulator was designed to pass the VBI. **Some don't.** You can also be easily fooled. While you might think you see VBI signals coming out of the modulator, enough distortion may have been introduced at the time of modulation to create significant errors. As noted, the Panasonic modulator passed through the VBI data but the videotape machine could not properly record and reproduce those VBI signals. Ironically, while we found that the Panasonic VHS machine seemed to record signals containing VBI data, and on play-back, all of the pulses seemed to be in the VBI, we could not recover the data. The reason? **1/2" videotape machines do not record or play back** all **of the lines.** While the picture may appear to be 525 line NTSC, it is in reality a degraded signal with a loss of resolution. That resolution comes in the form of lines which are displayed.

The engineers at Norpak indicated that they even had some problems recording VBI data on **3/4 inch** U-Matic machines which comply with broadcast standards.

TELETEXT/ continues page 22

Don't Try This Stunt At Home.

Mark Fator photographer

This was fun. It was a lot of work too, but it was fun seeing if we could actually do it. It began as a little sketch on the margin of a note pad, and after a great deal of thought and a huge amount of convincing — Mike loaned us his car. We parked a real live Mercedes Benz 300D on top of an absolutely box-stock Paraclipse antenna.

The 3.8 meter Paraclipse was assembled meshless and placed face down in a shallow pool of water. We fabricated a special steel H-shaped rack to provide a flat surface at the balance point. The car's forward weight bias was counter-balanced with 300 pounds of steel plate in the trunk.

The total dead weight was 4,522 pounds. Total deflection under load was 1 inch and when the whole ordeal was over, the hub plate was only .45" closer to the floor than before.

Last year, during a "destruction test," we dropped 5,200 pounds of steel stock on the same antenna; so we weren't really surprised when this stunt worked.

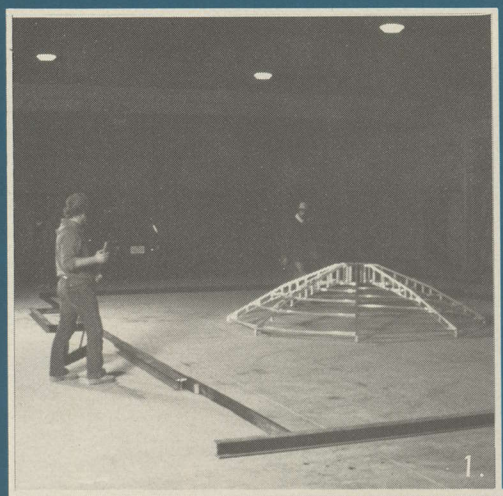
What does it prove? Just one thing: We build a very, very strong antenna.

Paraclipse

HIGH PERFORMANCE
SATELLITE TELEVISION SYSTEM

Paradigm Manufacturing, Inc.
3711 Meadowview Drive
Redding, California 96002
(916) 365-9131

How We Did It.

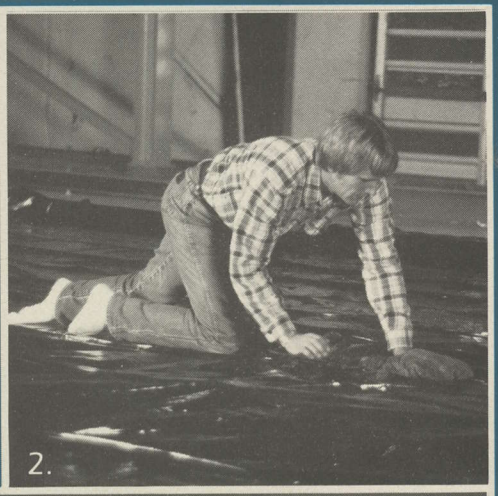

1.

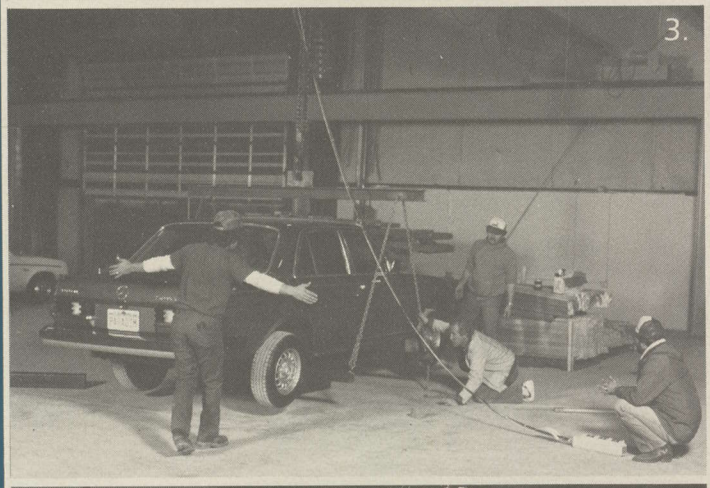
1. The reflective pool required a large open space. Steel I-beams and 2x4's formed the perimeter of the pool.

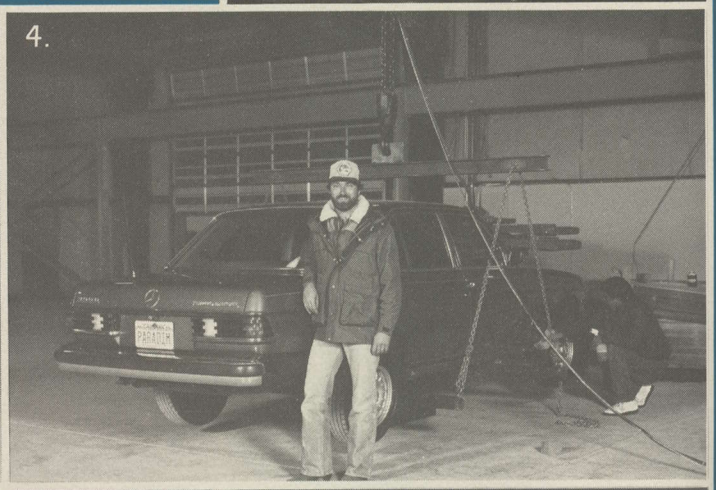
2. John Steven, marketing, cleans the seam between the two 50 ft. sheets of plastic that held the water for the reflective pool.

3. Gene Willyard, production manager, looks for the balance point while Raul Espitia, tool crib mechanic; directs the crane operator.

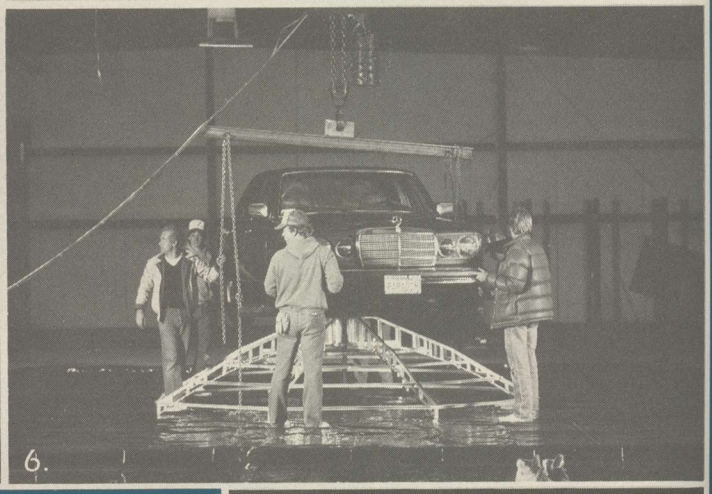
4. Mike Andrews, Paradigm V.P. and car owner, posed for one last shot prior to moving the car to the antenna.


2.


3.


4.


5.


6.

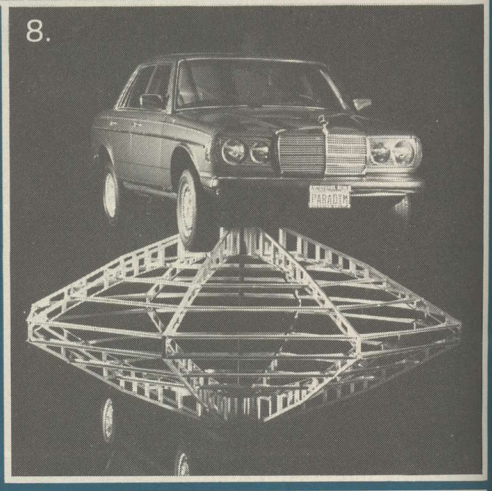

7.

5. The car is inched into place with Mike at the control switch, Gene and Raul steady the load.

6. With the full weight of the car resting on the antenna, we gingerly remove the steel tubes that were used to lift the H-rack. Left to right; Gene Willyard; Toby Elder, powder coating foreman; Bill Ulch and John Steven.

7. A final dusting before the water is turned on, 3½ hours later the car was on the ground.

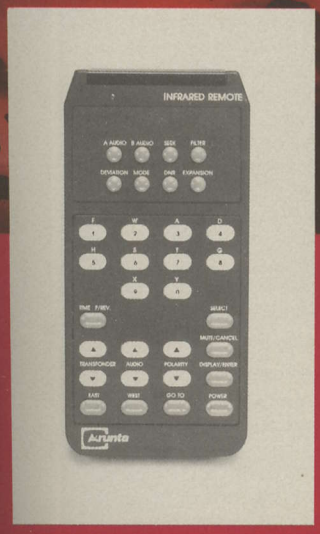
8. That's how we did it. We don't recommend you try this stunt at home. It isn't for the faint-hearted or the ill-equipped.


8.

Mark Fator photographer

Paraclipse
HIGH PERFORMANCE
SATELLITE TELEVISION SYSTEM

PREPARE FOR THE SECOND INVASION



MADE IN U.S.A.

InVader II

EXPANDABLE TVRO SYTEM

InVader II Integrated Components:

InVader II Satellite Receiver
InVader II Stereo Processor (SSP-320)
Invader II Programable Actuator

All controllable with optional Remote Wireless Key Pad (Pictured left)

Arunta
Satellite Telecommunications

P.O. Box 15082 • Phoenix, AZ 85060/3111 E. Thomas Rd. • Phoenix, AZ 85016 • (602) 956-7042

Micro Dynamics Corp.
6153 Airways Blvd.
Chattanooga, TN
(615) 892-3901

Vess Distributing
25 Lower St.
Buchanan, VA
1-800-572-3161 in VA
1-800-368-1314 outside VA

Satellite Wholesale USA
995 Mansell Rd.
Roswell, GA
(404) 587-0923

Echosphere Corp.
2250 S. Raritan
Building A
Englewood, CO
(303) 935-1909

Timberland Lifestyle Systems
RR #2 Highway II
Kilworthy, Ontario, Canada
(705) 689-2324

Video Link Satellite Systems
3028 Sun Drift Dr.
Salt Lake City, UT
(801) 278-2878

Sigma Com
111 Industrial
Whitby, Ontario, Canada
(416) 666-1661

Sky High Satellite Systems
1492 Highway 17 North
Mt. Pleasant, SC
(803) 884-8673

Orbit Distributors
Highway 190 West
Eunice, LA
(318) 457-1670

TELETEXT/ continued from page 18

4) Videoprocessing. As we mentioned, we were not able to evaluate raw video going right into the teletext decoder simply because the Norpak unit did not have an input port. But in the future, **TTX units may have video inputs.** Obviously, the less you process a signal containing VBI teletext, the better the odds that you will not introduce noise or other aberrants into the signal. The problem would seem to be a generous interpretation by manufacturers of "standards" for video output on their receivers. For example: Dexel's specifications claim that the video output is filtered and clamped. Although we did not run the output through a scope, we were able to recover all audio subcarriers from 5.3 to 8.1 MHz when the video output was run through an audio demodulator. That meant that a lot of what was reputedly filtered, got through. Also, video amplification is achieved through 2N2222 transistors. We had some problems with the processed video. Eventually one of the videoamps had to be replaced. We put in 2N2222**A** transistors which are a little faster in switching. There was a significant improvement. Somewhere along the line, **receiver manufacturers had better awaken to the fact that consumers will eventually plug computers,** and teletext decoders, and monitors and yes, "legal" descramblers, **into their satellite receivers.** Manufacturers had better build in proper video ports, and RS232 connectors. There should be a filtered port, and a port for raw unfiltered video. Likewise, more care and attention should be devoted to the actual levels which come pouring out of receivers. In my experience, too many TVRO systems compromise video performance and consequently, what comes out of a receiver bears little resemblance to NTSC or any other "standard." In short, **if data of any kind** is transmitted via satellite, be it in subcarrier form, or encoded video, **the consumer should be able to recover that data without distortion.**

One other point: Sometimes consumers or manufacturers use RF amps to amplify and then split the modulated signal coming out of the receiver and feed multiple TV sets. One must also be careful with the RF amps. In our experience, while you might get acceptable pictures out of the amp which seem to be noise-free, you might also distort the VBI with RF amp "noise."

5) Audio quality. Some teletext is transmitted by means of encoded tones (i.e. Genesis Story Time). Many receiver manufacturers have adopted audio sections in their receivers which make most audio engineers cringe. Until recently, I think most receiver designers have placed audio processing at the bottom of their list of priorities. I have personally seen many receivers which have questionable audio frequency response. The **early** Sat-tec receivers suffered from a poor audio section, which was subject to severe distortion on high frequencies. I had written to the manufacturer for advice, but in the final analysis the problem lay with the basic design of the audio section.

Very few receivers can accurately reproduce audio above 10 kHz. Many receivers have audio response which may contain some top end or bottom end frequencies, but are far from linear in response. The irony is, if an LNA manufacturer put out a product which deviated 10 dB here, 15 dB there, or had high levels of noise, the receiver makers and distributors and dealers would yell and scream. Unfortunately there is a double standard in the receiver industry because the audio sections of receivers often deviate many dB, and are just plain noisy; yet little has been done and there has been little public discussion of the problem. There are some receivers which distort badly on narrow band signals. Others, like the Dexel 1102, advertise subcarrier tuning, but cannot tune the subcarriers on WGN or CBN or WTBS. The Dexel audio section was designed for MTV and the Movie Channel stereo, and 6.2 and 6.8 main channel audio, but just won't work properly on other subcarriers. We wrote the manufacturer, but no one even bothered to acknowledge our letter. There are signs that this is changing as some manufacturers have realized that stereo and high fidelity are major consumer inducements. (Even Dexel seems to be addressing the audio issue in its new receivers.) But the truth is, **many receivers can't tune in subcarriers properly.** In our complaint about video processing, we noted that many receivers have filtered video outputs, so even if you wanted to add an audio processor, you would have to cut right into the circuits of the receiver. The real answer is to provide a wide-band output, and more care and attention must be paid to audio processing, with proper equalization and flat frequency response. One other point: many modulators also skimp on frequency response and that is another reason for providing audio outputs.

If you are a manufacturer of TVROs, you are probably wondering how can you obtain a NABTS teletext decoder to ensure that your receivers will perform properly. At present, Norpak Corporation of Kanata, Ontario makes a teletext video decoder which is a rack mount unit. **It sells for $4,360(!).** They also make a dual mode videotex and teletext decoder which is somewhat more versatile. It sells for approximately $3,000. Apparently, the dual mode decoder does not have FCC type approval, so you might have some difficulty getting one across the border, legally. One of the salesmen at Norpak is Bob Croll, and he can be reached at (613) 592-4164.

To sum up. In the next 5 years, teletext will become a multi-million dollar industry. Electronic publishing has the potential to cater to every taste. Since the cost to transmit VBI signals and create pages is under $100,000 (the cost of 2 TV-minicameras), you can almost be certain that there will be dozens of services up and running shortly. There will be some fascinating partnerships formed between traditional "broadcasters" and print publishers. CBS and NBC are poised to supplement their revenues with teletext. Obviously, people who demand the latest entertainment technology will be likely candidates for teletext. **People living in remote areas,** unable to obtain print material easily **will also demand access to teletext.** As digital audio, computer software transmitted by satellite, and data services are introduced into the home, consumers will demand sparklie-free and saturation-free signals. *Now is the time for the TVRO industry to take action.*

SMATV: Part Three
THE CABLE CONNECTION

GETTING TO Receivers

While the primary technical goal in any SMATV system is to provide a number of high quality, 'exotic' signal services which people are willing to pay money to have in their homes, the job of producing the signals to a high level of technical perfection is hardly over once the headend has been designed and constructed (see **CSD** for February and March, 1984 for parts one and two of this series). Having a clean set of channels at the output 'test point' at the headend is only half the battle; **keeping the signals clean** all the way to the subscriber's TV receiver is the other half.

In parts one and two of this series, we have looked at a broad overview of the SMATV system, and in some detail at the lash-up required to carry both satellite delivered signals as well as terrestrial signals in some mixture to subscriber sets. We will concentrate on the preliminary aspects of the cable television distribution system in this segment of the series.

Cleaning up the signals, if off-air, or cleanly and clearly modulating the signals to standard RF TV channels at the headend insures that you have a high quality product to work with and distribute. However, there are many dangers between the output of the headend and the input to the subscriber TV set(s). It is entirely possible, even probable, that if you do not pay attention to good RF 'distribution' techniques, you can and will 'lose' everything you gained at the headend on the

ODOM.
The one the others copy.

Some enterprising people out there have found that it's a cinch to make an antenna that LOOKS LIKE an Odom.

You simply buy an Odom antenna and copy its shape. To save more time and money, you stamp it out with a press.

You certainly don't waste money designing the master plugs from scratch, by computer, like Odom does. Or hand-layering the fiberglass and resins, like Odom does. And why go to all the trouble of flame-spraying a reflective layer of molten zinc, when you can just sandwich in some aluminum mesh?

Your customers can tell you why. Because they'll see the difference. Not by looking at the antenna, but by looking at their TV sets.

Others may try to copy the Odom shape. But they'll never copy Odom performance. And to your customers, performance is what really matters.

Dial 1-800-643-2950 for the facts on Odom's complete line of TVRO components. In Arkansas, dial (501) 882-6485. It's SOME DISH.

ODOM ANTENNAS, INC.

The one the others copy.

way to the TV set. Let's see why.

1) To connect the headend signals to the subscriber TV sets, we have to install some cable. The cable itself has **one unavoidable characteristic** which we must design around. **Loss.** All cable has 'loss' which is another way of saying that as you carry signals further and further from the headend, towards subscriber receivers, these signals will get weaker and weaker and weaker.
2) To travel from the headend to the TV sets, we must pass through a number of 'passive' components. A cable connector is a passive component. So is a 'line splitter.' And a 'signal tap-off-unit.' **Any device inserted into the line,** between the headend and the subscriber, **can upset the flow of signal.** All devices, including connectors, have some measurable amount of 'loss.' They, like cable itself, 'resist the flow of RF signals' and where there is 'resistance,' there is loss.
3) You seldom travel from the headend all the way to the subscriber's receiver in just one continuous length of the same cable. You may travel part of the way in a 'trunk cable' (typically 1/2 inch or 3/4 inch in diameter), another part of the way in a 'feeder cable' (typically .412 or just over 4/10ths of an inch in diameter, or, 1/2 inch in diameter), and then a final distance in a 'drop cable' (typically RG-59/U, RG-6/U). Each of these cables has its own 'loss factor' and each time we 'transition' from one size cable to another size cable we have some type of 'transition fitting' or passive device between the two non-compatible cable 'sizes.' Each of these devices contributes loss (some of which is on purpose, as we shall see) because each has its own 'resistance factor,' and between two cables of different size we have two different 'amounts of loss' per unit of distance traveled.
4) Unless the cable plant is very-compact, the amount of signal 'power' available to us from the headend modulators and signal processors is far too low to cover the 'distance' we require to get to each television receiver in the system. This means that at one or more locations along the way, someplace after the headend but before one or more of the subscriber locations, we will need to install a 'line amplifier' device. Such a unit is designed to amplify all of the channels on the system **at the same time** (unlike the headend where each channel is processed and amplified **individually**). As you might suspect, it is possible to have 'inter-action' in such an amplifier and we must be certain that the amplifier does not operate outside of its 'operating/gain range' if we intend to keep that inter-action to a minimum. Such inter-action shows up on subscriber television sets as a 'film' or series of oscillating lines on the screen on one, some or all of the channels. We'll see how we avoid this happening.
5) Finally, TV sets are themselves capable of creating interference to other TV sets attached to the same cable distribution system. We avoid this by electronically 'isolating' each television set, making sure that no matter what type of interference the TV set might 'generate,' that interference is not allowed to crawl 'back' into the cable master distribution lines where it can cause cruddy pictures for other subscribers to the system.

TWO Parallel Systems

If your SMATV distribution system can be 'RF powered' totally from the headend, by the available signal power that originates from the modulators and/or individual channel processors, you will need no 'line amplifiers' in the system. This does not relieve you of the obligation to be careful with the design and installation of your SMATV system, since we still have cable and passive device losses to consider, as well as maintaining each television receiver 'in isolation' from all others on the system.

If your SMATV system requires one or more 'line amplifier' units, to insure that the RF power levels for each channel on the system stay strong enough to deliver high quality pictures to the subscriber receivers (at the ends of the system, furthest from the headend), then we are in the 'dual system function' business.

Most 'line amplifiers' are solid state (i.e. all transistor) units, and they operate from an **AC operating voltage** of either **30 or 60 volts** (nominal). There are stand-alone line amplifiers also available which have their own internal 117 VAC power supplies. The advantage of the 30/60 volt units is that as you layout your system you can spot or locate an amplifier where it is required for amplification purposes alone, **without regard to whether you happen to have a convenient source of 117 VAC nearby.** How is this possible?

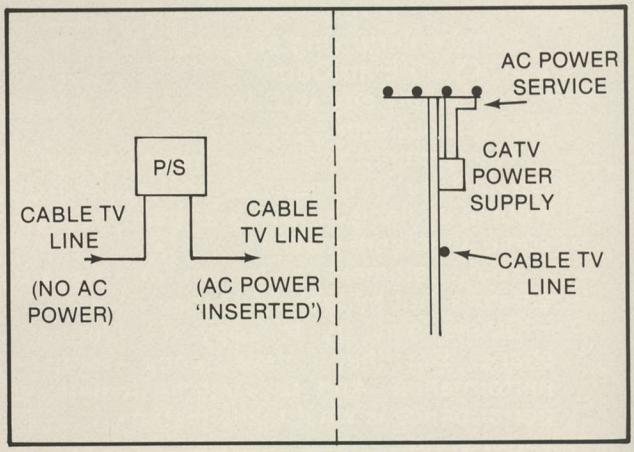
In a 30/60 volt AC powered unit, the operating voltage/power for the line amplifier can be (and is) transmitted through the same coaxial cable, the same fittings and even the same 'passive devices' such as taps, as the RF signals. In other words, the coaxial cable plant carries the AC operating voltage. Here is how that works.

Modern CATV plants sneak up and down alleyways and streets where the pole lines (or buried cable lines) mandate. Getting AC power to each and every amplifier station, through dedicated AC power 'service drops,' would be exceedingly expensive. Since it is technically possible to 'duplex' an AC 60 cycle voltage onto the coaxial cable, and allow the cable to transport the operating voltage, this means that the cable amplifiers can be virtually independent in location to the source and availability of AC operating voltage. We'll see why that is important, above and beyond the costs involved in providing a separate AC (117 VAC) service drop to each amplifier location. Why 30 or 60 VAC?

In most towns and cities, it is **not legal** to transport or carry 117 VAC around town unless you are the power company. Then, strict safety rules apply. The National Electrical Code, which most towns and cities follow and have adopted for their own, specifies that if there is an AC operating voltage of **61 volts or more** being transported anyplace along public thoroughfares, the person or company doing the transporting must follow strict electrical safety codes. This costs money. So CATV line amplifiers have been designed to operate just 'below' the 61 volt ceiling that applies in most areas. Some systems, for design reasons, drop all the way to 30 VAC.

A 'CATV Power Supply' is a large metal box that installs on a pole where a normal 117 VAC 'service drop' can be connected. The coaxial cable, originating at the headend and heading towards some extremity of the community, plugs into the power supply box and then loops through that box and comes back out again. The RF portion of the service on the cable coming into the power supply box has the TV channels operational; these TV channels simply flow through the CATV power supply box with only a minimal amount of disturbance.

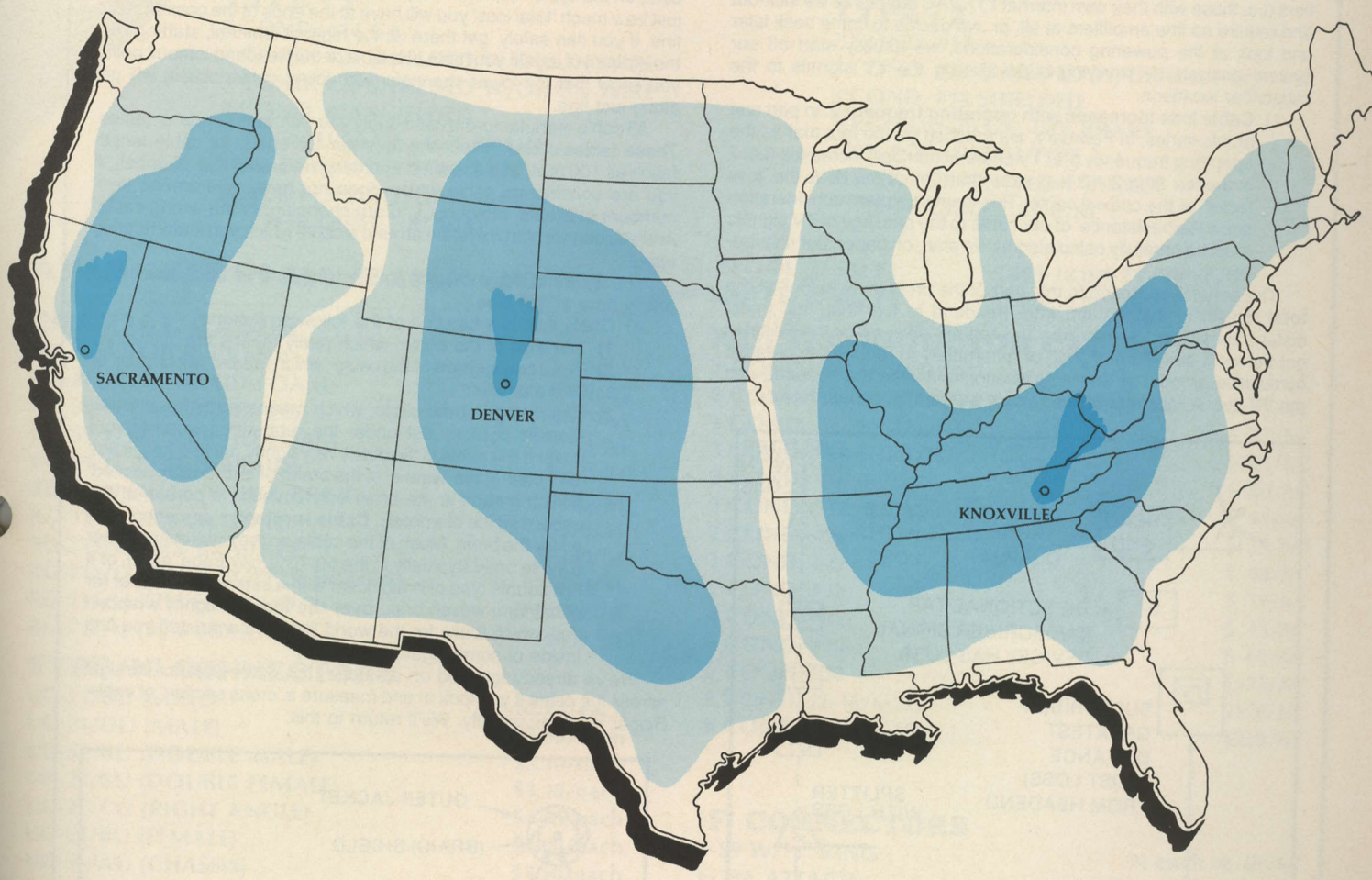
At someplace within the cable plant, such as at the amplifier just ahead of the power supply proper, the flow of power coming to the box from the headend direction has been 'stopped' by an adjustment within the preceding amplifier. Power to run the last amplifier ahead of the power supply has come to that amplifier from another power supply location. But from the power supply location onward, towards the ends of the system, this (new) power supply provides AC operating voltage for the amplifiers that follow. **We diagram this here.**



Our pre-occupation with powering of amplifiers is at this point illustrative; we'll see what is involved in the 'engineering side' before we get done. It points up that there are really two, parallel, functions going on inside of the coaxial cable at the same time. **Number one,** we are transporting and amplifying the broad spectrum of TV channels

THE ECHOSPHERE NATIONAL FOOTPRINT

NOW OPEN . . . ECHOSPHERE EAST



NORMAL DELIVERY NATIONWIDE . . . NOW ONLY 48 HOURS!

ECHOSPHERE WEST T.M.

5671 WAREHOUSE WAY
SACRAMENTO, CA 95826
(916) 381-5084
To order call:
800-338-5477 (WESTERN ZONE)
800-338-5478 (IN-STATE CA)

ECHOSPHERE CORP. T.M.

2250 SO. RARITAN, BLDG. A
ENGLEWOOD, CO 80110
(303) 935-1909
To order call:
800-521-9282 (NATIONAL)

ECHOSPHERE EAST T.M.

10536 LEXINGTON DR.
KNOXVILLE, TN 37922
(615) 966-4114
To order call:
800-223-1507 (EASTERN ZONE)

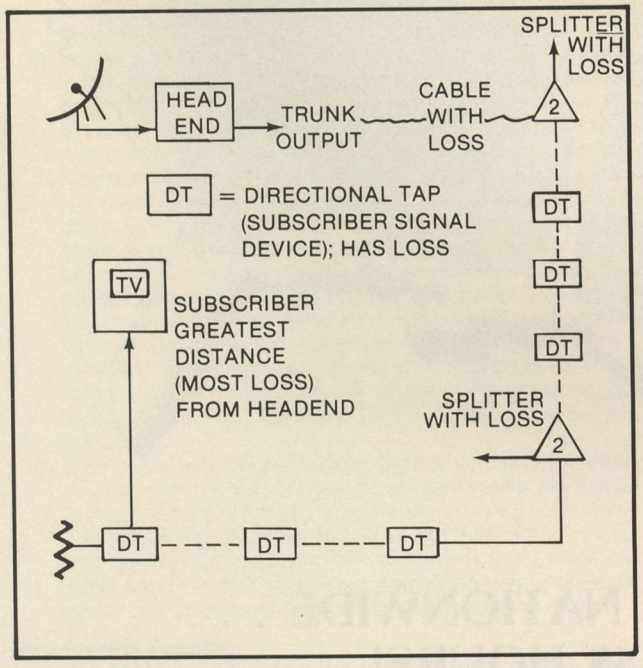
going to the subscriber homes. This requires certain engineering considerations. **Number two,** we are transporting an AC operating voltage for the 'active' (i.e. amplifier) equipment required along the way. And this requires another set of engineering considerations. We end up planning, designing, building and operating two 'parallel' systems that just happen to share the same coaxial cable.

THE RF Portion

Whether we elect to make use of individually powered line amplifiers (i.e. those with their own internal 117 VAC supply) or we luck-out and require no line amplifiers at all, or, we decide to come back later and look at the powering considerations, we usually start off our system analysis by worrying about getting the TV signals to the subscriber locations.

1) **Cable loss increases with operating frequency.** In part one of this series, in February, we touched on the fact that as the operating frequency (i.e. TV channel number) increases (i.e. 7 is greater than 2, 13 is greater than 7), so too does the 'loss factor' of the coaxial cable. This is an important consideration since the 'resistance' of our cable to the passage of TV signals must be carefully calculated as we plan, on paper, our distribution system.

The general approach to this part of the problem is to look at the **total length** of the system, from headend to the final, last (most distant) subscriber 'service drop' (i.e. tap-off). This will be the TV set to get the least amount of signal, or, alternately to require the greatest cumulative amount of 'line amplification' between the headend and the TV set. **A representative** (small) **system is shown here.**



Just as cable losses increase with frequency (operating channel number), so too does cable loss increase with reductions in cable diameter (i.e. size). One-half inch diameter cable, for example, has far less loss than RG-59/U cable; at both TV channel 2, and at TV channel 13 if you compare one cable directly with the other.

This is why when you install a TVRO system the receiver manufacturer will specify to you a 'maximum safe distance' which you can transport or carry the signal coming out of the downconverter to the receiver (demodulator) proper. The manufacturer of the TVRO receiver system has calculated how much signal loss (i.e. resistance to RF) there is, at the IF output frequency of your downconverter, with various types of cable. He may tell you that **if** you use RG-59/U cable, you can have as much as 400 feet between the two units, for example. He will also tell you that if you go beyond his suggested maximum, that you should use a larger cable (one with less 'RF resistance' or loss). This is also why those block downconversion receivers LOCOM, Anderson, Janeil, AVCOM, etc.) which use a **higher IF** frequency (typically in the 200-900 MHz region), or the DX receivers which use a very high IF in the 900-1400 MHz region do NOT allow you to use such lengthy runs of cable from the downconverter to the demodulator; **higher** (IF) **frequencies mean greater cable losses** ('RF resistance').

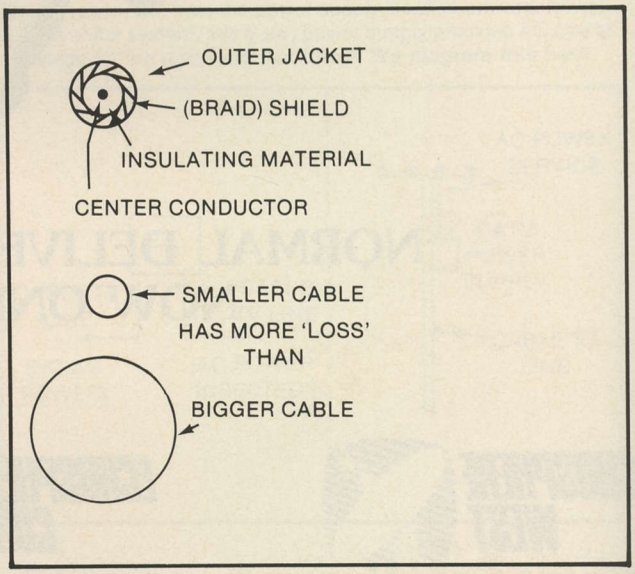
Therefore, the usual practice in making a rough calculation of the 'system loss' between the headend and the furthest 'customer drop' is to take the highest TV channel frequency (such as channel 13) to be used on the system, and to compute the losses at that channel to see just how much 'total loss' you will have at the ends of the coaxial cable line. If you can safely 'get there' at the highest channel, starting with the amount of signal you have available at the headend 'output' point, you know that the lower channels (with lower cable losses) will get along just fine.

All cable manufacturers can supply you with 'loss charts' or tables. These tables/charts reflect the loss per increment of cable length (such as 100 feet) at a specified operating frequency (i.e. channel). If you are considering cable which does not have 'guaranteed loss' numbers available, move on; you are shopping for the wrong cable! And you cannot plan a system around a cable which you know nothing about.

The subject of cable loss is a detailed one, and we'll only touch on it briefly here at this time.

A) Cable loss is a function of the following factors:
   1) The **size** of the cable, which really means the diameter;
   2) The **composition** of the cable, which means 'is it copper' or 'is it aluminum';
   3) The **design** of the cable, which means is the braid (outer metallic portion, just under the rubberized weatherproof cover if the cable is 'flexible') very tightly packed (few if any 'air holes' in the 'weave' of the braid) or is it 'loosely packed' (which means is the braid only covering a portion of the cable's inside diameter). **Cable is rated** in 'percent of cover' for the braid. Much of the cable on the market has either a loose braid (typically in the 50-70% 'coverage' area), or it is a double type of braid cover with a segment of copper (or aluminum) woven braid **over the top** of a tightly wrapped 'foil' which looks for the world like the same stuff you find inside of some cigarette packs.

We've already touched on diameter; the outer distance straight across the cable if you look at and measure a 'cross section' of cable. Bigger is better, usually. We'll return to this.



Virtually all of the 'electrons' that make up the flow of the RF signal travel pretty much on the 'surface' of the cable's inner conductor. That means that like water running down a stick, very little of the electrical (RF) energy penetrates into the center conductor proper. If the center

cz labs INTRODUCES . . .

SATELLITE TOTAL CONTROL CABLE PACKAGES!

TYPE - 1
2 COND. #14 GA.
3 COND. #22 SHIELDED W/DRAIN WIRE
3 COND. #20 SHIELDED W/DRAIN WIRE
3 COND. #18 SHIELDED
1-RG-59/U-20 GA.-60% BRAID
100% FOIL/WITH TYPE 3
BLACK POLYETHYLENE JACKET
FOR DIRECT BURIAL

TYPE - 2
2 COND. #14
3 COND. #22 SHIELDED W/DRAIN WIRE
3 COND. #18 SHIELDED
2-RG-59/U-20 GA. 60% BRAID
100% FOIL-/WITH TYPE 3
BLACK POLYETHYLENE JACKET
FOR DIRECT BURIAL

AVAILABLE IN 330' & 1000' SPOOLS

330 FT. SPOOL @ 54¢ FT.
1,000-5,000 FT. @ 48¢ FT.
5,000-10,000 FT. @ 44¢ FT.
10,000-50,000 FT. @ 42¢ FT.

COAXIAL CABLE

RG-6/U (FOIL & BRAID)	$ 65/M'
RG-8/U (95% BRAID-FOAM)	$210/M'
RG-59/U (96% BRAID-PE)	$ 89/M'
RG-59/U (75% BRAID-FOAM)	$ 65/M'
RG-59/U (FOIL & BRAID)	$ 49/M'
RG-59/U DUAL (FOIL & BRAID)	$105/M'
RG-11/U (96% BRAID-PE)	$210/M'
RG-213/U (96% BRAID-PE)	$240/M'
RG-214/U (TINN. COPPER BRAIDS)	$550/M'
RG-214/U (SILVER BRAIDS)	$1300/M'
RG-217/U (96% BRAIDS-PE)	$600/M'

TYPE 'N' CONNECTORS

UG-21/BU (MALE)	$2.25/each
UG-21/DU (MALE)	$2.00/each
UG-57/BU (DOUBLE MALE)	$3.10/each
UG-29/BU (DOUBLE FEMALE)	$3.10/each
UG-27/CU (RIGHT ANGLE)	$4.45/each
UG-23/BU (FEMALE)	$3.00/each
UG-58/AU (CHASSIS)	$1.60/each
'N' CRIMP MALE	$2.10/each

MULTI CONDUCTOR CABLE

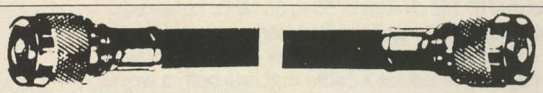
2 COND. #20 SHIELDED	$ 65/M'
2 COND. #18 SHIELDED	$ 79/M'
3 COND. #22 SHIELDED	$ 75/M'
3 COND. #18 SHIELDED	$105/M'
2 COND. #16	$ 80/M'
2 COND. #18	$ 49/M'
2 COND. #20	$ 39/M'
3 COND. #22	$ 40/M'
3 COND. #18	$ 79/M'
4 COND. #22	$ 49/M'
4 COND. #20	$ 69/M'
6 COND. #18	$135/M'
8 COND. (2-18/6-22)	$129/M'
8 COND. (2-16/6-18)	$230/M'

'F' CONNECTORS

F-59 W/¼" RING	9¢ each or 69/M
F-59A ATTACH.	10¢ each or 78/M
F-59 ALM LONG ATT.	11¢ each or 99/M

TOLL FREE ORDER LINE —
(800) 423-2322
(914) 947-1554 N.Y.
-1555

cz labs
P.O. Box 95-55 Railroad Ave.
Garnerville, New York 10923



RG-213/U COAX CABLE JUMPERS
TYPE 'N' CRIMP PLUGS EACH END
COMPLETELY WEATHERPROOF WITH SHRINK TUBING

LENGTH	1-49	50-99	100-199	200 or More
8 Feet	$ 9.25	$ 8.75	$ 8.25	$ 7.75
10 Feet	$ 9.50	$ 8.85	$ 8.50	$ 7.95
12 Feet	$ 9.85	$ 9.35	$ 8.85	$ 8.35
15 Feet	$10.50	$ 9.95	$ 9.50	$ 9.00
20 Feet	$11.75	$11.50	$11.00	$10.75

— ALL LENGTHS AVAILABLE —

conductor is copper, solid copper, you have a relatively expensive 'electron highway' and only the 'outer lane' is used. For this reason, most cables are available with either 'solid copper' center conductors or 'copper coated/plated' center conductors. The difference is in dollars, and perhaps installation ease; seldom in performance, provided the copper plating/coating has been appiied properly.

Totally aluminum center conductors, no copper plating/coating, are cheaper (and frankly difficult to find). They are also far more 'lossy'; they have a 'higher resistance to the flow of RF' and they are therefore to be avoided. Aluminum is not as good a 'conductor' of electricity as copper so we elect to use copper or copper coated cable.

We mentioned the 'center' conductor. Cable has two conductors; a 'center' conductor and an 'outer' conductor. RF is nothing more than fancy electricity moving at a very fast frequency. You do not attempt to send electricity through a single conductor or wire; you must have a second (return) wire to re-connect the device being powered or connected back to the origination point. Electricity, even RF electricity, 'flows' from source to 'load'; and in theory, 'back again.' The center conductor gets the source and the load connected together for the outward bound flow; the 'outer' conductor or 'shield,' as it is also called, connects the two together for the return process.

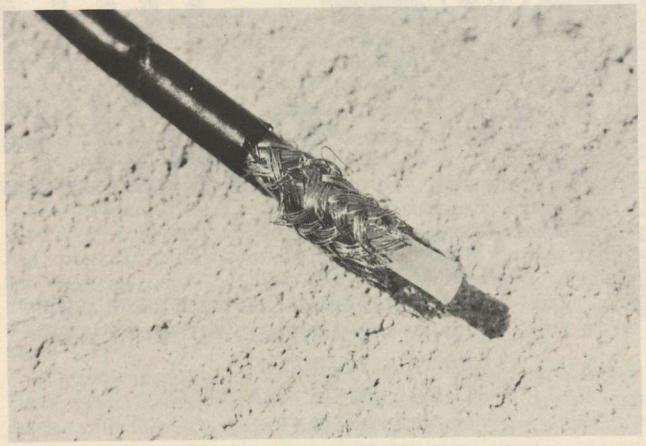
The shield does more. It is called a 'shield' because it also protects or 'shields' the center conductor from contamination; electrical contamination. Everything around you is a potential source of interference to the TV signals. The air conditioners you pass by, the electric toothbrush in apartment 208, even the electrical lines in the project. The shield acts as a 'barrier' so that these interference sources cannot 'leak into' the cable TV lines and cause interference to the TV signals. A '60% braid shield' means that **40% of the center conductor area is** not **shielded;** not protected. That's bad news since the 40% 'open' can allow plenty of 'RF contaminants' to flow into the coaxial cable and get onto the center conductor. The center conductor, improperly 'shielded,' is nothing but a gigantic 'wire antenna' looped all over a project or community. That's why **high braid-shield percentages** are almost mandatory. They keep pollution out of the coaxial cable.

This is one of the reasons why the aluminum jacketed CATV cables are so popular. The aluminum jacket is a **100% shield.** It is like a piece of tightly installed 'conduit,' fitting perfectly tight around the insulation material which separates the center conductor from the outer jacket (shield). Nothing can get through THAT shield unless the shield is cracked or broken or 'wounded'!

It is worth noting that we have the same problems between our TVRO downconverter and our indoor demodulator when it comes to cable 'selection.' If your TVRO IF (the frequency at which the signals travel from the downconverter to the indoor demodulator) is 70 MHz, and you select a type of RG-59/U (or RG-6/U) which has a 'poor percentage of braid,' you are inviting RF contamination to 'leak through' the shield and onto the center conductor. Noise from fence controllers, static from fish tanks, buzzing from fluorescent light starters, even a local TV station in the channel 2-5 operating band (which corresponds to the normal IF bandwidth of 55 to 85 MHz, centered on 70 MHz) can 'leak into' your cable and create interference which the indoor demodulator cannot clean up. Always ask for either braided cable in the **90% up region,** or, select a cable that has both a woven braid AND a tightly wrapped 100% foil braid. This is no place to skimp on your installation!

There is one more cable consideration. Between the center conductor and the shield conductor, we have a form of insulation. The best insulation in the world is 'air.' Pure, **dry,** air. Unfortunately, nobody has ever figured out how to 'suspend' a center conductor inside of a 'shield' in pure, dry air without some form of 'spacer device' to keep the two apart.

Keeping the two from 'touching' one another is not enough (although if they do, you have a 'cable short' and all electrical flow stops at that point). The cable has something called 'impedance'; a fancy term that means the cable has a characteristic which is important to the efficiency of the cable itself, and, to the transfer of energy into and out of the cable at either end. The 'impedance' is a fairly complicated parameter which depends, among other things, on the precise positioning of the center conductor and the shield. They must maintain a certain, carefully worked out, distance from one another. If



LOW GRADE shielding with copper braid (only) **allows you to 'see through' the shield to the foam or solid insulation below; to be avoided.**

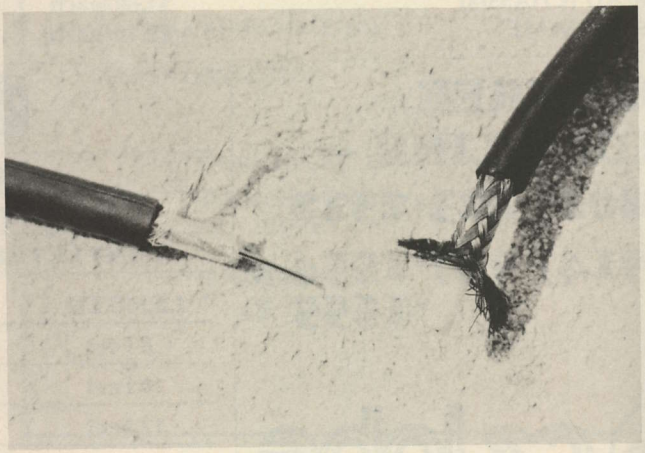
the center conductor 'wanders' inside of the shield, from side to side close to first one wall and then another the 'impedance' of the cable goes to heck in a hand basket, in a hurry. That's not good.

So cable scientists have created a series of chemical formulae to make up compositions which are rigid, lightweight, and not 'lossy.' Lossy?

Remember that the best 'insulator' between the two conductors would be dry air. Not wet air; dry air. If wet air is worse than dry air, would not also **wet something else** be worse than a dry something else? The answer is yes. And that means the insulator product, whatever it is, must be dry, and stay dry, even when it gets wet!

'Foam' insulation is partly air, and partly some sort of chemical. The higher the percentage that is air, the better the insulating qualities, and, the lower the 'loss' of the cable. A sponge is a sort of foam. A sponge collects and holds water. A sponge would be a poor choice for the insulator. Plastics to the rescue; some types of plastic stay rigid even when half of their diameter is replaced with 'bubbles' of air. So we have cables which are manufactured using 'solid insulation,' and, 'foam' insulation. Some of the foamier-foams play on words and call themselves 'air dielectric.' Dielectric is the fancy word that describes the insulation material. Air they are not; **part** air, perhaps.

Foam dielectric cables usually cost more than solid dielectric cables. That may seem odd since if you take away a substantial percentage of the insulation material and replace it with (free) bubbles of air, you would think the cable would cost less. Not so. To manufacture a quality cable with precise little bubbles that don't happen in the



RG-59/U FOIL BRAID (left) **has tightly wrapped metallic foil under the loosely wrapped braid foil. The combination is good, but you cannot use standard F-59 connectors and insure a good connection.**

GET THE PICTURE FROM PATMAR

Custom designed SMATV Systems that outperform all others.

That's because only Patmar offers you such a unique system. You get a Harris 10′ Delta Gain antenna, coupled with a DX receiver and block downconverter, and Blonder-Tongue modulators and amplifiers.

It's an unbeatable combination—and no other system can match it for performance *and* reliability.

Best of all, Patmar makes it easy to install and extremely cost effective. That's why one large motel chain is presently installing the system in over 100 of its properties, offering three channels of satellite TV to its guests. And the system works equally well in apartment complexes, condominiums and developments.

The Harris 10′ Delta Gain antenna is equally at home in the Eastern Caribbean Island of St. Martin (above) as it is in Columbus, Ohio (below).

Patmar also offers a complete line of TVRO products for the commercial and home markets.

All are carefully selected for their proven excellence and cost effectiveness. That's why, when it comes to choosing satellite equipment, there's really no contest. You get more from Patmar.

Call or write for more information today.

Peter Sutro or
Bill Heavener
3 Claremont Road
P.O. Box 769
Bernardsville, NJ 07924
201-766-4408

PATMAR
TECHNOLOGIES, INC.

wrong spot (such as all at one time in a clump, which would leave the cable unsupported and capable of weaving over and touching the outer shield) is quite a trick. It costs more money to 'inject the air' than it does to create a cable that has a solid dielectric; even if the solid one has more material in it.

So the ideal cable we are looking for has the following properties and mechanical considerations:

1) It has low **loss;**
2) It has good **shielding** properties.

Are there other considerations? Yes indeed; several in fact. And they are largely 'mechanical' in nature. Such as?

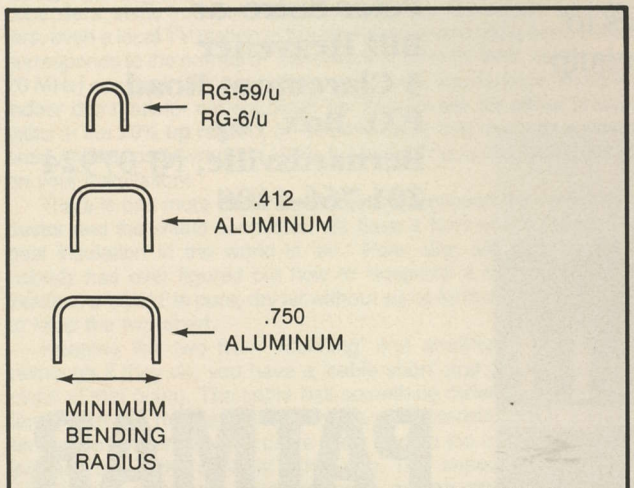
1) The cable has to be **weatherproof.** Remember the moisture problem; even if the insulation between the center conductor and the shield will not 'soak up' water or moisture from the (humid) air, it can still retain the moisture if it gets wet.
2) The cable has to be capable of being **shaped and bent** and fondled during the installation process. It must withstand this abuse and not 'break' or 'crack' or otherwise change shape, or electrical properties.
3) The cable should, in fact must, be compatible with some type of commonly available connector(s). It does no good to have a 'perfect' cable if you can't get or work with the connectors.

Weatherproofing. A solid aluminum jacketed 'CATV type' cable has a weatherproof cover all of its own; the solid aluminum jacket. No amount of rubber coated over the solid aluminum jacket is going to do a better job of keeping out moisture than the solid aluminum jacket. So this type of cable does not have a rubber/plastic jacket? **Wrong.**

A flexible cable, such as RG-59/U or RG-6/U (etc.) MUST have a jacket that keeps the moisture off of the braid. The braid is susceptible to water ingress, and it is susceptible to nicks and abrasions. Both are to be avoided, obviously. So we put a tightly wrapped jacket, rubberized material or plastic, over the shield to 'hold it all together.' And to keep water and dirt and junk out.

So why would we take a perfectly good weatherproof cover such as a solid aluminum jacket and cover it **again** with plastic or rubber? Because aluminum has at least one undesirable property; it oxidizes. Actually, it has two undesirable properties; it is also a 'soft' metal and it can easily be nicked, gouged, or chewed. A properly designed plastic-type jacket can actually be tougher than the aluminum! If the cable is going to get pulled through thousands of feet of conduit, over walls, across attics and what have you, where there lurks rocks and nails and splinters just waiting to chew into the aluminum shell, you are better off springing for the extra bucks and getting a cable that also has a plastic type outer jacket. If the cable is going to be used outdoors in an area where there is salt in the air (such as a seacoast town), or where there are industrial pollutants (Pittsburgh, for example) in the air, you should not use non-jacketed cable. Sooner or later the junk in the air will do a number on the raw aluminum jacket.

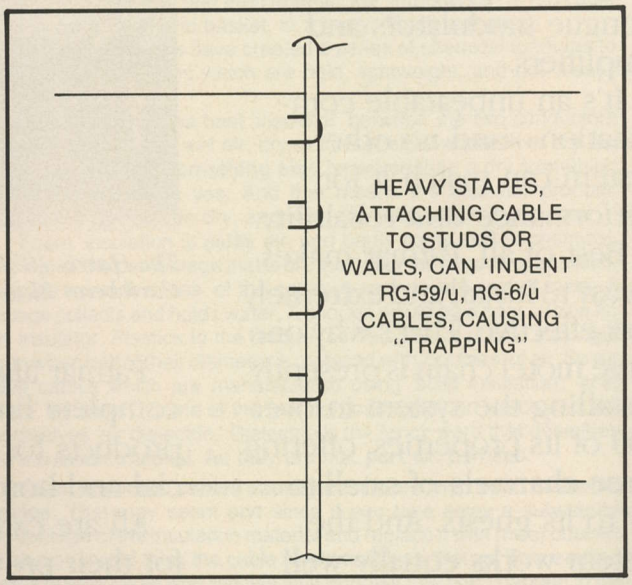
Bending. All cable has a 'minimum bending radius.' That means that you can make a turn with the cable, but usually not an abrupt 90 degree bend, or, worse yet, fold it back on itself. Aluminum jacketed cables have an obvious problem; the jacket will kink or crease and that is not good. Why?



ALL CABLE HAS A MINIMUM BENDING RADIUS.
THE LARGER THE CABLE, THE LARGER THE RADIUS.

Remember 'impedance'; that characteristic that determines the efficiency of the cable, and, the type of equipment which the cable can interface with? And, remember that impedance is determined by the insulation which maintains a precise distance between the shield (outer shell) and the center (inner) conductor? Well, when you kink or crease the cable, you have destroyed its symmetrical (round) shape. Now you have a chunk that is not round, and at that point (where the crease or kink is located) you have a much shorter (closer) distance between the center conductor and the shield. At this point the cable is no longer 75 ohms, and this will adversely affect the performance of the system beyond this point. You also run the risk with a kink of rupturing the outer aluminum shell, and allowing moisture to leak in, or signal to 'leak out.'

Manufacturers of 'hard line' (i.e. that line with a solid aluminum shield) will specify the 'minimum bending radius.' They even provide 'bending tools' which are used if you are going to turn the cable's path and go in a different direction **abruptly.** When you reduce that radius, the cable begins to 'tear' at the aluminum shell and without warning it will kink.



All cable has a minimum bending radius; **even 'flexible' cables.** And the reason is the same. The distance between the center conductor and the shield (whether solid or braid) must be maintained; that round shape must be kept, or there will be an 'impedance bump' at that point. Even RG-59/U (which can bend back on itself very tightly) must be watched; i.e. you cannot run it through an open window and then close the window on the cable, or use heavy hammer-in staples to attach it to a stud. Not if you will crease, or indent the cable in the process.

One of the interesting things that happens when you have multiple indentions on the same run of cable is **'trapping.'** Let's say you run a section of RG-59/U from your downconverter (or cable line) inside to a TV set. You decide to run the cable up a wall and to attach the cable to the wall you use some hammer-in staples. You get slightly carried away, not wanting the cable to slide on the wall run, and really drive the staples home. Now you have a series of indentions, places where the cable's round shape has been crimped.

Each of these locations is a spot where the cable is no longer 75 ohms. The combination of two or more such spots will create a 'trap'; that is, a section of cable which actually **stops the flow** of RF signals **on a particular frequency,** or frequencies. If this was a cable drop, rather than a downconverter run, you might hook up the TV and find channels 3 and 12 were 'gone'; simply disappeared, or very much

Hello Los Angeles !!

HIGH FRONTIER DISTRIBUTION is proud to announce our expansion with the opening of our new warehouse in Van Nuys, California, featuring our full line up of factory direct, quality TVRO components and systems. It's good news for us and good news for you California dealers.

Give Gary McNally a call at 1-800-421-8938

California Amplifier • Chaparral • Drake • DX • Houston Satellite
Janeil • Lowrance • Luxor • M/A Com • Maspro
Microwave Systems Eng. • MTI • Omni-Spectra • Paraclipse • Prodelin
STS • Stardish • Transifier • Vidare

HF

High Frontier Distribution
1445 W. 12th Place
Tempe, Arizona 85281
(602) 966-9824
(800) 382-TVRO

High Frontier Distribution Northwest
976 Industry Drive
Seattle, Washington 98188
(206) 575-0660 (800) 424-4011

High Frontier Distribution Southern California
15746 Arminta Street
Van Nuys, California 91406
(213) 873-2268 (800) 421-8938

weaker than the others. You trot out to the 'line tap' and measure the signal with a signal level meter. Yup, 3 and 12 are there alright. But at the opposite end of the cable, with nothing in-between but cable, 3 and 12 are gone! **How can that be?**

The random selection of staple locations, the heavy handed hammer, have set up 'trap resonances' in the drop line. Channels 3 and 12 (or virtually any other single or multiple channel combination) are 'sucked out' by the unintended 'traps' made up by the crimped cable sections.

If you are running a downconverter line inside, and your IF is the normal 70 MHz (center), you **might** get away with this mistake and never even notice it. Why? Because the particular random spacing you selected for the staples created a trap or traps, alright, but the traps are 'resonant' on some frequency **other than** the 55-85 MHz (70 MHz center) range. So handling the cable, subjecting it to abuse, plays a part in cable selection. You want a cable which will stand up to normal installation wear and tear and you want your installers to be bright enough that they don't abuse it, exceeding normal cable 'limits.'

Connectors. It is unfortunate, perhaps, that to use cable **you must also use connectors.** Connectors are the downfall of many technicians. They simply refuse to learn how to properly install the connectors, perhaps not realizing that the connector must have the same 'integrity' as the cable itself. The connector is an extension of the cable. It has a particular shape, a particular set of dimensions, so that it too will be 75 ohms (or whatever impedance is required to match the cable). And it must be installed properly, following the directions created by the connector manufacturer.

Let's deal with the easy connectors first. The F-59 series connectors are those common 'F' fittings which we all use. Not all 'F' fittings are created equal; a subject we shall visit in coming months in some detail. F fittings designed for RG-59/U **foam** cable, for example, are not the right connectors to use when you have selected RG-59/U **foil-braid** cable. There are small but important dimensional differences between foam (full copper braid) cable and the foil (light copper or aluminum braid over tightly wrapped foil) cable. You can 'force' one to work on the other, but it is an operational mistake to do so. For now, let's simply be sure you understand that an 'F' fitting is not always an 'F' fitting when you grab a pack of them at the local wholesale store and head for a job. **Select the right F connector for the right cable,** everytime.

The tool to install the F connector, called a 'crimper,' will also differ with different types of connectors. Some F fittings have a small, separate metal ring called an 'O' ring which slides over the rubberized jacket and braid, and is attached to the connector proper by sliding the crimpers over the O ring and applying pressure. The O ring collapses under the pressure, and forms tightly around the cable and the support 'ferrule' portion of the connector. This insures a tight, pressurized contact, between the cable's braid and the ferrule portion of the connector.

Other F fittings have an 'integral O ring' which simply means the ring is attached to the connector body, rather than being a separate

OOOPS! This piece of .412 cable got bent too tightly and the crease in the aluminum jacket will spoil the cable's performance.

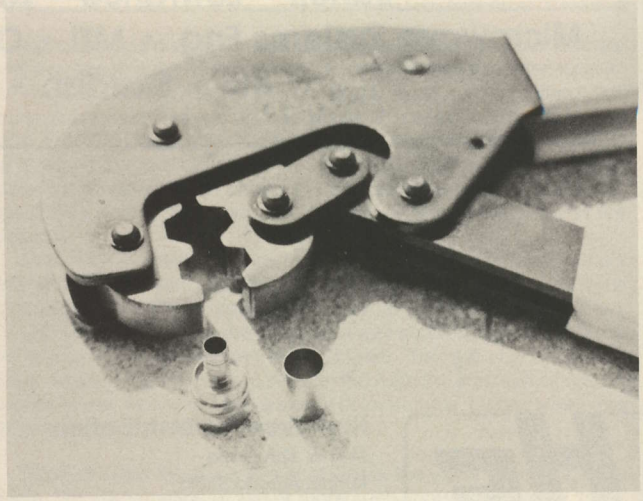
ALUMINUM JACKETED cable has solid aluminum sheath, an inner insulation of air bubbles and plastic (dielectric) **and a center conductor of solid or copper coated aluminum.**

piece. It installs in the same manner; the crimper squashes the ring-portion for a tight, compressed fit.

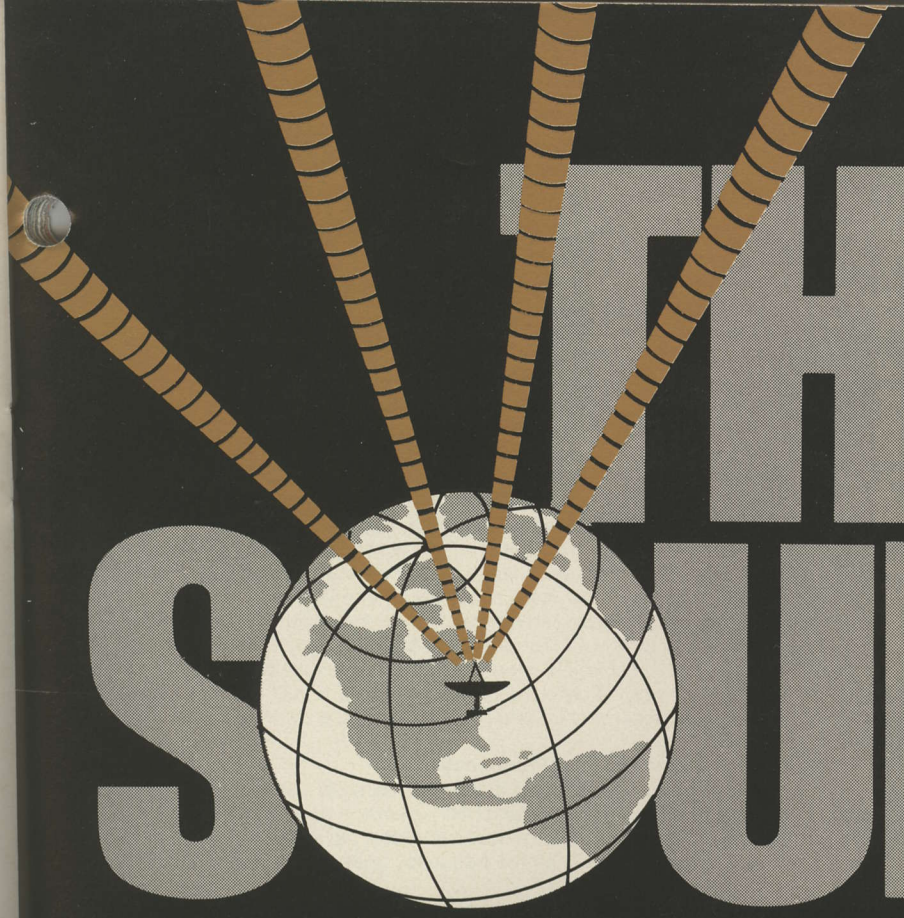
Years ago all O rings were separate pieces. Then they became integral pieces. More recently they have become separate again (although you can still buy any of the types) and rather than being small metal rings, they are more akin to **short lengths** of small **metal tubing.** The larger 'O tubing' is desirable since it provides a larger surface area of pressure between the ferrule inside of the cable's jacket and the braid portion. This increases the strength of the connector proper (i.e. it takes more pressure to pull them apart now), and, it also makes a better electrical contact. We'll see why that is important at a later date.

Connectors for larger flexible cable (such as RG-6/U, RG-11/U and so on) were originally only available in 'solder-on' formats. That meant everytime you installed a connector, you had to drag out a soldering iron or gun and spend 15 minutes putting on the connector. This was not very practical when you had thousands to install, so 'crimp on' connectors were devised. They are simply over-sized F fittings, designed to have the proper dimensional characteristics to fit the larger diameter cable. They require special tools for crimping, or a combination tool that is designed for both RG-59/U **and** RG-6/U (etc.) cables.

Connectors for aluminum jacketed cable are very specialized and there are dozens of different varieties. They look like plumbing fittings, with a body, one or more 'rings' that thread into place, compression



RG-59 CRIMPERS come in many forms; this one is for the 'O tubing' type of 'O-ring' which provides a better mechanical lock on the cable as well as providing improved 'cable radiation' performance.



THE SOURCE

... and the best resource in satellite antennas.

Distributors and dealers—consider the advantages for you and your customers. Now you have more than a source. You have the best technical resource.

First, we are the source for the most sophisticated high performance 11′ satellite antenna made today. Over-engineered, stressed ribs and mesh surface made from aircraft grade aluminum and stainless steel hardware are standard features. Designed as a true parabolic, our 11-footer is made to hold up in the worst of climates, is acid rain and salt spray resistant, and guaranteed to function at reduced spacing in the roughest terrain. With a shipping weight of only 138 lbs. and an installation time of less than 3 hours, it's also designed to save you money and time.

But more than a source of superior hardware, Micona is a resource in microwave technology. We can provide the assistance you need in both installation and systems design, because our people offer close to a century of collective experience in areas from R&D and SMATV to installation and OEM.

There's even more. After two solid years of testing, our products will not only work; they'll keep working. And with the support of a prime supplier of aluminum behind us, we'll be around to support our products for a long, long time.

Micona. A source for the products you need. With the technical resources to back us up.

MICONA ANTENNAS

15 Canton Springs Road, Canton, CT 06019
Telephone: (203) 693-6471

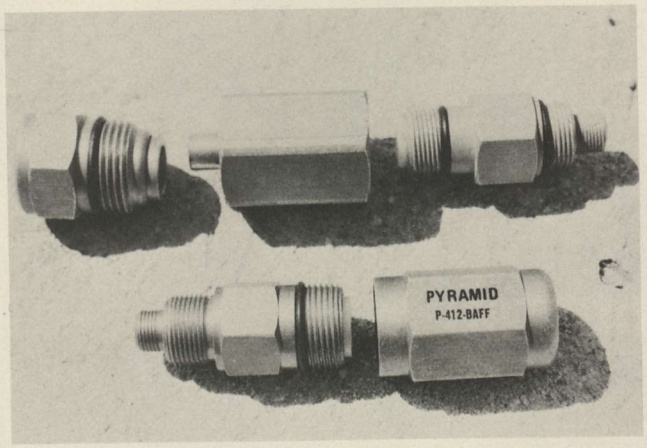
CONNECTICUT: Canton, Burlington, Plainville, West Hartford
OHIO: Cleveland, Cincinatti • **OKLAHOMA:** Tulsa, Norman • **TEXAS:** Wichita Falls

PIONEER MEMBER OF SPACE

sealing rings and a sturdy, formal looking appearance. No two install exactly alike, but there are similarities.

1) The center conductor will be 'bared,' **cut to a specific length,** and slipped into a **'center pin'** in the body of the connector.
2) One or two threaded portions that **slide down over** the bare aluminum jacket and **tighten** (with a wrench) into the body of the connector. In the tightening process, a **collapsing inner ring** digs into the aluminum jacket making a tight mechanical and electrical connection.

The connector has weatherproofing 'O rings' of neoprene or some type of tight rubber consistency which insures that moisture does not run from outside the cable down the aluminum jacket into the innards of the connector. Most connectors come with a set of printed instructions and they must be followed. The typical tools required are a pair of wrenches, and, a 'tubing cutter' or other tool to carefully score through the rubber (if present) plus aluminum jacket so you can get to the center conductor.



CONNECTORS FOR .412, .500 or .750 (3/4") **cable are precision machined and require considerable care while installing.**

A word about cleaning the center conductors. To insure that the 'foam' or other insulation will not 'creep' inside of the cable, it is 'bonded' to the center conductor. In other words, as you strip or carefully cut away the insulating material between the outer shield and the center conductor, you find that tiny bits of the insulation are clinging to the center conductor. This is important in the cable's mechanical integrity, but the copper or copper-coated center conductor will not transfer energy very well **through** that last residue of insulating material.

This is true with both RG-59/U (RG-6/U, etc.) cables as well as the larger aluminum jacketed cables. In other words, you want 'clean, bare copper' showing, not a residue coated center conductor. **Even with F fittings.**

THE COPPER(ized) **center conductor has a residue on it which must be scraped off or you will leave 'several dBs of signal behind' when you install the fitting.**

The general practice is to take a small pocket knife and gently scrape the exposed center conductor of the cable to clean away the residue. A file is not a good idea since you may file away too much and change the shape (and critical dimensions) of the center conductor. Simply scrape the stuff off and you will be in business.

And if you don't?

It is possible to 'leave behind' several 'dB' of signal at say TV channel 13, or a dB or more at even 70 MHz if the RF energy has to struggle through the residue left behind on the center conductor to make the contact to the object the fitting is plugged into. Therefore, even with 70 MHz downconverter runs, **it is wise to clean both ends of the cable's center conductor** as you are installing the F fitting(s).

Well, now you know more about cable than you ever wanted to know! Actually, we have barely scratched the surface at this point and we'll make up for it in a future edition of **CSD.** Because the 'highway' for our signals is cable, it IS important that you understand some of the special nuances that accompany use of cable if you are to be a successful planner and installer of any cable-type system.

CABLE Attenuation vs. Frequency

We have already learned that larger diameter cables are more efficient transporters of VHF (and UHF) television signals than smaller diameter cables. And we know that cable loss, per incremental length of cable, also increases as the frequency goes up. Let's see some numbers.

We'll pick a set of five frequencies which are meaningful to our TVRO systems and the SMATV systems we will be building: 55 MHz, 70 MHz, 216 MHz, 450 MHz and 950 MHz. And these represent?

1) **55 MHz** is the approximate carrier frequency for TV channel 2, the **lowest** TV channel in the spectrum and the lowest TV channel we are apt to carry on our SMATV system.
2) **70 MHz** is the center frequency for our standard TVRO receiving system (although some manufacturers use other 'IF' frequencies).
3) **216 MHz** is the frequency at the top end of TV channel 13, typically the **highest** frequency cable channel we will be working with.
4) **450 MHz** is the lower edge of the popular 450-950 MHz range which many of the lower cost block downconversion receiver systems (Janeil, Anderson, Locom et al) use. It has no direct bearing on our SMATV system **but** since a block downconversion system does lend itself to multiple receivers connected to the same antenna, is that not a small SMATV system 'in disguise'?
5) And **950 MHz** is the **top** or other end of the same 450-950 'block' of channels which the lower cost block downconversion systems use.

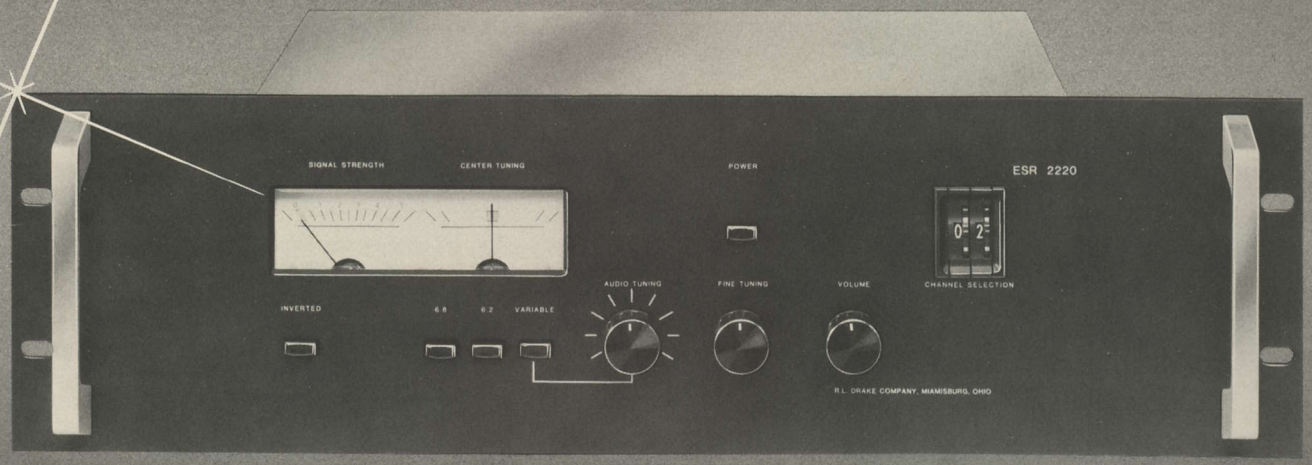
Now let's plug in some numbers using cable which is 'average' in performance, and which is commonly found in the marketplace.

Cable Type	Loss/ 55 MHz	Loss/ 70 MHz	Loss/ 216 MHz	Loss/ 450 MHz	Loss/ 950 MHz
RG-59/U **(1)**	2.5 dB	2.9 dB	5.3 dB	8.8 dB	13.2 dB
RG-59/U foam	1.1 dB	1.7 dB	4.0 dB	6.0 dB	9.4 dB
RG-6/U foam	0.8 dB	1.2 dB	3.0 dB	4.8 dB	7.5 dB
RG-11/U foam	0.6 dB	0.9 dB	2.4 dB	3.8 dB	5.8 dB
.412 aluminum	0.4 dB	0.6 dB	1.8 dB	2.6 dB	3.9 dB
.500 aluminum	0.35 dB	0.5 dB	1.4 dB	2.0 dB	3.2 dB
.750 aluminum	0.28 dB	0.4 dB	1.0 dB	1.7 dB	2.3 dB

All of the above relate to a standard length for comparison; **100 feet of cable,** less any additional losses which connectors or other passive devices in the 100 foot run might add to the cable. A special note about the first RG-59/U cable **(1).**

Generally speaking, there is 'good cable' and there is 'not so good cable.' The not-so-good stuff sells cheaper, and if you peel back the rubberized outer jacket you will see why. Under the jacket is a braided shield. It may be copper looking, or it may be aluminum looking. If the

PROFESSIONAL EARTH STATION RECEIVER



PROFESSIONAL ESR2220 SYSTEM

FULL PERFORMANCE SATELLITE TV RECEPTION

- Thumbwheel Selection of All 24 Satellite Channels • Normal/Inverted Video Switching
- Fixed and Variable Audio Tuning for All Subcarriers
- Signal Strength and Center Tuning Meters • Polarization Switching Logic Outputs
- AFC for Drift-Free Operation • Built-in LNA Power Supply
- Designed for Cable Head-in, TV Stations, Hotels, and Teleconferencing Applications

Write for Complete Details

DRAKE®

R.L. Drake Company
540 Richard St., Miamisburg, Ohio 45342, U.S.A.
Phone: (513) 866-2421 Telex: 288-017

cable has **no** 'foil braid' **under the woven braid,** and we assume here it does not, you will find the white colored dielectric or insulating material the next layer down.

The braid, as we have seen, must 'cover' the insulating material as completely as possible. Remember that a solid aluminum shield is the best (100%) coverage there is. If the braid, by visual inspection, is **loosely woven;** if there are **gaps between the braided strands** which allow you to look through the braid to the white insulating material beyond, you have in your hand a poorly designed, low shielding factor cable. This cable will have higher losses and less impedance 'integrity' (i.e. not be 75 ohms uniformly) and it is not desirable even for short runs at 70 MHz.

A poor braid percentage is easy to see; the air gaps are obvious and the braid is 'tinsel' in feel and generally collapses when subject to even a small amount of finger stress. What you can't simply **look at** and 'grade' is the quality of the insulating material that separates the braid from the center conductor.

The opposite of 'foam' insulation is a solid insulation. Remember a foam insulation is trying to inject air bubbles or chambers into the dielectric to reduce the cable's losses. A solid insulation has no air bubbles and it is tough to cut. You have no way of determining, without chemical analysis, what the insulating material is composed of. It may be anything from high grade plastic to low grade re-constituted plastic food wrappers! Naturally, low grade plastic is to be avoided. Chances are if the cable manufacturer has skimped on the braid shield, **he has also skimped** on the choice of materials for the center dielectric insulator.

'Off brand' cable, which on inspection has a loose fitting, low coverage pecentage shield, should be avoided. For any application, including 70 MHz IF runs. **Our 2.5 dB loss** number for RG-59/U **in the preceding table** assumed that we were dealing with a brand name, high quality non-foam type of RG-59/U. In the real world, you could be suckered into purchasing a roll of cable which has twice as much loss and you would never know it until you got yourself into installation problems. As always, **'Caveat Emptor'** (Buyer Beware). The cable world is filled with charlatans who sell 'pretty cable' at bargain prices. It is no bargain.

Now we need to return to our basic cable plant and spend some time learning how you calculate cable losses, and what those losses mean to the planning of the SMATV/cable system.

LEAVING The Headend

As we learned in the March installment, after we have processed and modulated all of our SMATV system channels properly, they are 'mixed together' into a single cable for transportation to the individual homes or receivers connected to the system. In the process of doing all of this, we ended up with a finite, measurable amount of 'RF signal power,' or signal voltage, for each of the TV carriers to be carried on the system. We learned that as we 'mix' channels together, to get them onto a single cable, we 'lose' power in the mixing process. And that when this is all done, we end up with a certain amount of signal on each channel. We also learned that we can do something called 'tilt' at the headend, to partially compensate along the cable for the differences in cable loss at our two 'extreme-end' channels; such as 2 and 13.

Measurements, done accurately with a tape measure usually, are essential in a cable plant. In a large community system or sizeable development, you can put into service a small one-wheeled machine that you roll along the ground following the path the cable lines will follow. Attached to the wheel is a footage counter and this 'Unicycle without a seat' allows you to measure as you walk.

Most developers, if you are dealing with a developer, have an accurate plot map of the property. Distances are already determined and you can use somebody else's work to layout your cable plant. A trailer park or other 'as-built' project will have to be 'mapped' and measured by you.

First you need to determine how you will route the cable. Ideally, you will follow the same 'pathway' as the existing (or planned) telco and electrical service lines. If your cable service will be built 'overhead' (using the power/telco poles for cable suspension), their maps will be your guideline. A few words about attaching to utility poles.

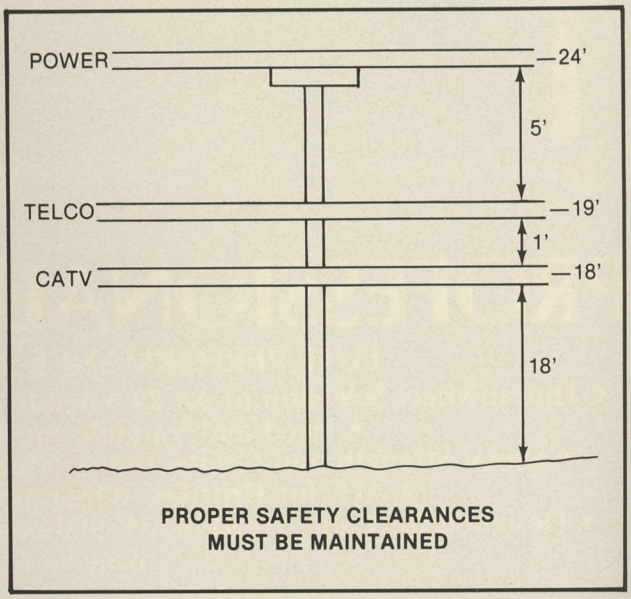
There are agreements and tradition between the local power and telephone utility firms. There are also state electrical safety codes. The safety codes specify that the power service lines will be at the top of the poles, that some minimum safe distance below the power lines you can install the telephone lines. The same rules also establish the minimum 'clearance distance' between the lowest cable on the pole and the ground, or street, below. You take the height of the existing pole and you add up all of these minimum distances; 18 feet clearance, for example, from the road, and, 5 feet between telco and power. That says the pole must be no less than 23 feet out of the ground, perhaps 24 to allow for the 'bulk' of the power company wiring.

Now, if a cable TV line is to be squeezed onto this pole, it must be so located that it does not shorten the minimum distance between the lowest cable and the ground/roadway clearance, nor shorten the minimum safety distance between the power company line and the first 'communications line' (telco or cable) below it. Let's assume we have a 25 foot pole here, above ground. That tells us we have between 1 and 2 feet of 'surplus space' remaining; that cable could sneak in either just below telco or just above telco and still maintain the distances required.

If telco was installed precisely 18 feet above 'grade,' the extra space on our example 25 foot pole will be between telco and power. If telco was installed precisely 5 feet below power, the extra space is on the ground side of telco.

There are something called **'joint pole agreements'** at work here; the power company and the telephone company maintain a master list of who actually pays for which pole. They attempt, in most areas (but not in all areas) to maintain a 50-50 share of actual pole ownership; i.e. who pays to put the pole into the ground to begin with. Each year they inventory the new poles added, compare it to the totals from the prior year, and 'exchange checks.' In most situations, neither one actually pays 'rent' to the other; they simply **split** the pole installation costs down the middle.

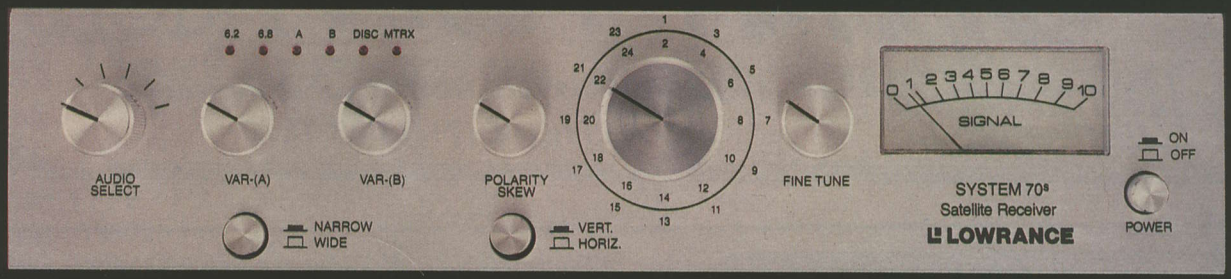
Along comes the cable guy. He is not a 'joint pole owner'; he is a renter. His service is more akin to 'communications' than 'power' so where you have a pole that is jointly owned by power and telco, the cable guy goes to the telco and asks for permission (i.e. a contract) to rent pole space. There are traditions here established over decades of 'joint pole use.' The rental fees are computed as so much, per pole, per year. Rates are subject to review by the Federal Communications Commission, and generally fall between $3 and $7 a year per pole. There is a formal, multiple (multiple!) page contract which telco will trot out for you to sign. It specifies the rental fees, the safety considerations (distance between cables) and something called 'make ready.'



PROPER SAFETY CLEARANCES MUST BE MAINTAINED

We will continue our look at the basic SMATV system, concentrating on the design of the plant proper, as this series continues in the May issue of **CSD.**

CLEAR CHOICE



For a crystal clear picture, choose a Lowrance System 70 Satellite Receiver

Lowrance System 70 receivers truly have no equal for picture quality. Colors are true and vibrant — not that washed-out look so common in other receivers. Lines are clear and distinct — not fuzzy. Low threshold makes 1000-foot runs a snap. And the audio is crystal clear. No wonder that Lowrance, one of the world's finest electronics companies, is proud to put its name on the new System 70 models.

Look over the multitude of easy-use features. With detent tuning, you click right to the channel you want — no fishing around. A polarity push-button with separate skew adjustment makes polarization changes easy and works with the Polarotor 1, Omni polarizer, or a Ferite device. Fixed and variable audio tuning with wide or narrow filter selection makes audio tuning extremely versatile. The System 70 models are equipped with scan tuning, 125 feet of pre-made cables, built-in modulator, AFC defeat and signal strength meter, so installation and antenna positioning are a breeze.

Two Models to Choose From

The System 70ˢ has all the remarkable features of the standard 70ˣ, plus superb stereo reception with discreet and matrix capability. The stereo reproduction will please the most discriminating listener, and it's easy to tune with independent subcarrier A and B tuning capabilities.

For System 70 dealers, we provide outstanding support with product brochures, posters, the popular customer question-and-answer brochures AND the best warranty/service in the industry.

Lowrance System 70ˣ and 70ˢ. They're the clear choice in satellite receivers and downconverters.

Please send me more information about Lowrance System 70ˣ and 70ˢ.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Mail to Dept. #5352044

LOWRANCE ELECTRONICS, INC.
12000 E. SKELLY DR., TULSA, OK 74128

CLARKE'S FIRST INDIAN OCEAN OBSERVATIONS

FIRST RESULTS

When the "Coop's Satellite Expedition To Sri Lanka" **(*)** group visited Colombo and **Arthur C. Clarke** this past November, we installed and left behind a trio of satellite receiving systems. For the **University of Moratuwa** there was a pair of dish systems; a 20 foot **ADM** horizon system, and a **Hero** 25 foot dish system also equipped with horizon to horizon tracking. At the home of Arthur C. Clarke, a 16 foot **Paraclipse.** The electronics included **Intersat, Maspro** and **AVCOM** receivers, most equipped with switchable half and full transponder format, as well as a Hero SCPC receiver for those stubborn Intelsat feeds that insist on transporting the (TV) program audio on a separate transponder from the video.

Clarke's installation, in particular, has been getting a good workout since our visit (see January 1984 **CSD** for a full report on the trip and installations) and with the trained discipline of a scientist, Clarke's observations have been many and in depth.

The general belief has been that this particular region of the world may be the most 'underserved' segment of the globe; that 'regular transmissions' from satellites in the 24 dBw and up (signal level) region were, at best, scarce.

There is significant Intelsat activity over the Indian Ocean, but it consists of only non-scheduled video and then on a Global transmission format in (typically) the 20 dBw 'region.' There are also a pair of domestic satellite service systems; the 4 GHz Indian INSAT bird and the Palapa system which at the moment consists of a trio of birds. And there are a pair of Russian Gorizont family birds. However, with the possible exception of INSAT, none of these satellites are looking into the region of Sri Lanka with signal levels that even come close to the domestic levels which we experience over North America. Truly, this is a 'fringe area' for television service, even in 1984.

11 BIRDS Visible

Data studied prior to the trip this past fall indicated that as many as eleven 4 GHz birds might be visible in Sri Lanka. Through the end of January, Clarke had identified transmissions from 8 of these birds. They are as follows:

1) **Gorizont 5** (53° E), found with video on transonder 9 (audio transmitted as sound-in-syncs, as the inclined orbit Molniya bird favors).
2) **Intelsat V/F1** (57° E), found with video on transponder 19 (all transponder numbers relate to the US standard 24 channel receiver).
3) **Intelsat V/F7** (60° E), found with video on transponder(s) 23/24.
4) **Intelsat V/F5** (63° E), found with video on transponder(s) 23/24.

CLARKE/ continues page 42

*/ See page 44

$AVE-$AVE-$AVE

WE WILL NOT BE UNDER SOLD!

36 Volt Ball Screw Motor Drive

Fully plated, 18" antenna motor drive unit featuring heavy-duty 36-volt DC motor and ball screw-type drive. Molded motor cover, shaft to motor head seal, and 0-rings provide complete weather protection. Easy mounting bracket provided.

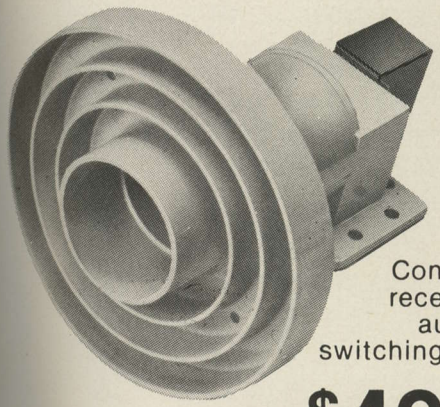
IN STOCK-
ORDER NOW!

$89.50 DEALER PRICE ANY QUANTITY

DIST. PRICE AVAILABLE UPON REQUEST

High Performance Polarizer Feeds

I SERVO MOTOR TYPE



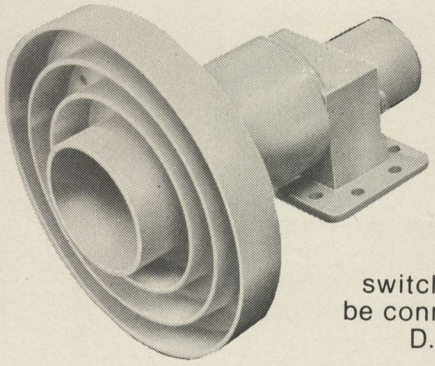
Servo motor controlled Polarizing Feedhorn for precise polarity selection. Painted casting. Designed for universal mounting. Connects directly to receivers with 3-wire automatic polarity switching capability.

$49.50 DEALER PRICE ANY QTY.
IN STOCK-ORDER NOW!

Also available with the following controls:

PUSHBUTTON CONTROL **$19.50** MANUAL **$14.50**

II D.C. MOTOR TYPE



D.C. motor controlled Polarizing Feedhorn featuring the same weather-protected, universal mounting design as the servo-controlled model. Comes complete with power connector and switch assembly. Can also be connected to low-voltage D.C. output of receiver.

WE WILL NOT BE UNDER SOLD!

$39.50 DEALER PRICE ANY QTY

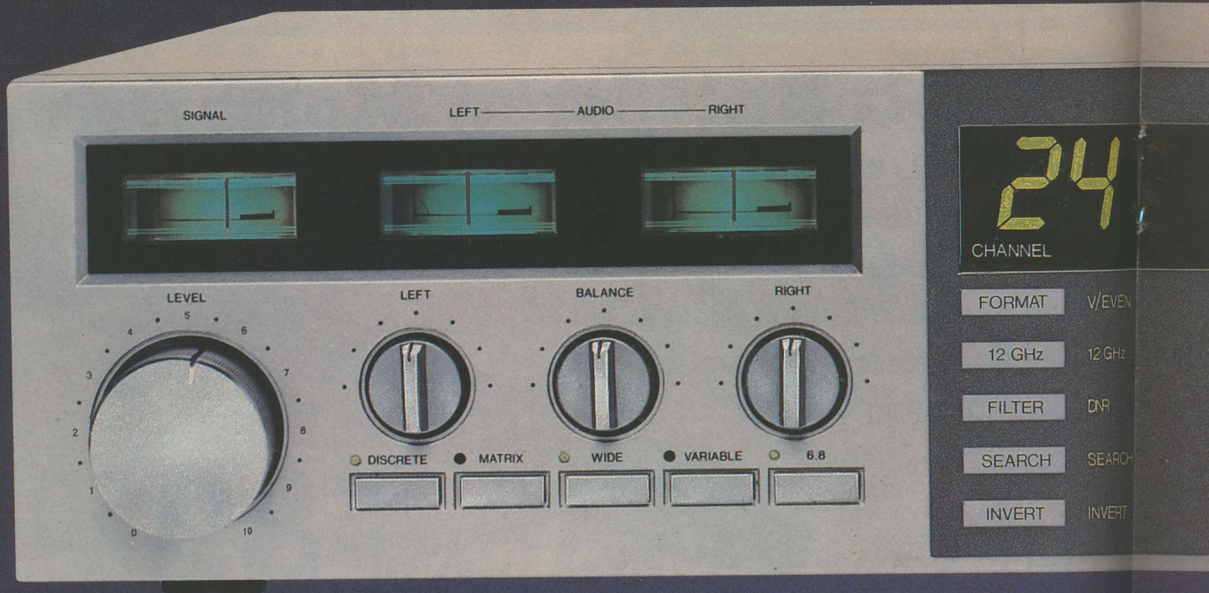
DIST. PRICE AVAILABLE UPON REQUEST.

Call Collect To Place Order **(213) 862-9712**

$AV-More Satellite supplies

10402 FELSON ST. BELLFLOWER CA 90706

At Last...

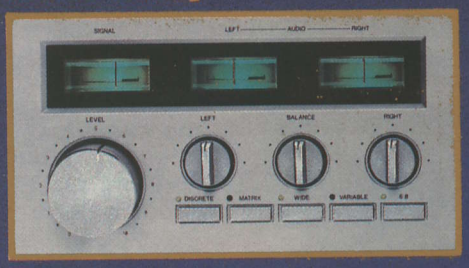


INTRODUCING . . .

The all new - - All in One Super Satellite Stereo Receiver from Boman Industries.

Convenience and style combined with the latest in TVRO technology makes the Boman Model SR2500 the receiver to which others will be compared.

Audio Group



Separate meters showing Signal Strength and Left - Right audio levels are provided with soft green illumination. Left-Right audio channel tuning is adjusted by separate controls. A balance control is provided for attaining that perfect *stereo* effect.

The pushbutton group consists of the "Discrete" and "Matrix" *stereo* buttons. Bandwidth is expanded by use of the "Wide" button. These three controls enhance the reception of all available audio transmissions.

The audio pushbuttons offer a choice of preset 6.8 tuning frequency for most video channels and variable audio for *stereo* or subcarrier reception.

The Detent Volume control adjusts the volume and adds to the attractive design of the *stereo* section.

Function Group

The attractive display panel shows channel number and polarity position in a soft green color.

The Format button transposes the polarity mode when receiving signals from the few satellites with reversed polarity signals.

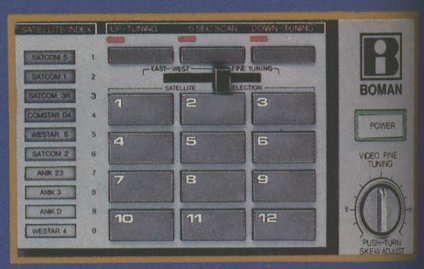
The 12 GHz button changes the operation of the SR-2500 from 4 to 12 GHz when used with appropriate 12 GHz hardware.

DNR function provides a filtering of background noise from the audio thus providing very high quality audio performance especially on weaker signals.

A Search button gives a fast scan of all channels and is of assistance during the initial alignment and orientation of the programmable moving control.

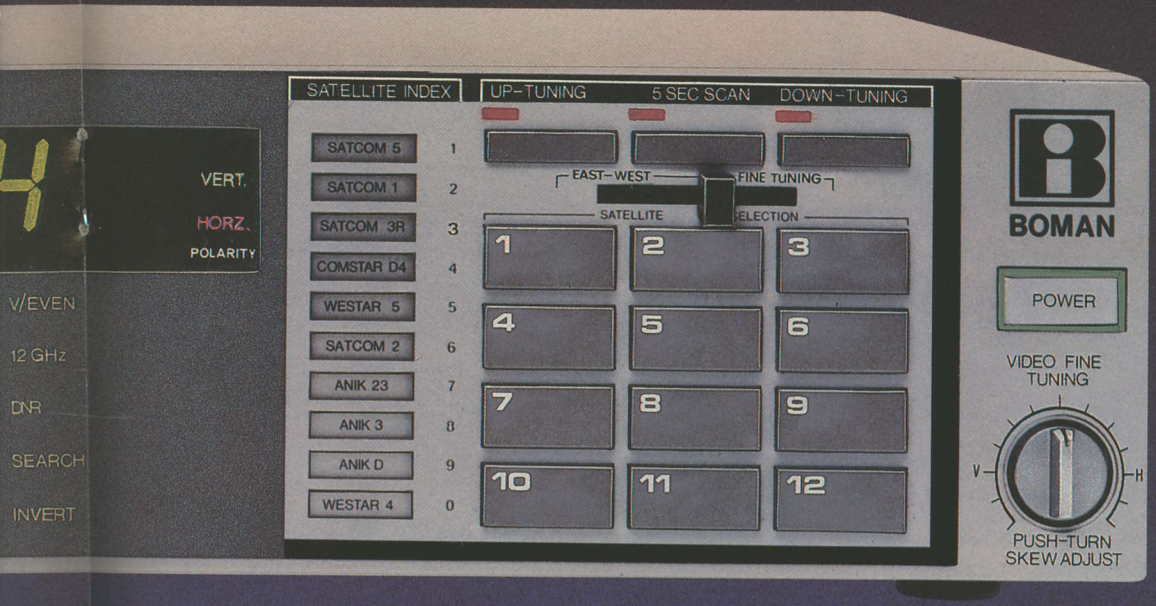
The Invert button is provided for reception of inverted video signals.

Satellite Selection Group



Satellite selection is accomplished with the 12 pushbutton pad

All In One.



The interfaced control then automatically moves the antenna to the pre-programed position.

A removable Satellite Index is provided which indicates the selected satellite. Up to 12 different choices of satellites may be illuminated individually. Additional satellite decals are furnished to provide a maximum of 24 satellite variations.

The East/West fine tuning control is used for that extra special antenna peaking which is sometimes required.

The "UP" and "DOWN" tuning buttons provide manual selection or scan of channels in 1 step or 2 step and continuous operation. The 5 second Scan button allows the user to view each channel for 5 seconds during the 24 channel scan.

Video Fine Tuning and Skew adjustment is made quick and easy using the dual function fine tuning control.

Other features found either inside or on the rear panel of the SR-2500 are:

- Automatic Polarity Switching.
- Command Tone Response: *A "Beep" audio tone is heard when any of the Feather-Touch push-buttons is used.*
- LNA/Down Converter power remains on when the unit power is switched off: *No more LNA/DC warm-up drift.*
- Integrated Channel 3 - 4 Modulator.
- 1 -2 Step Channel Advance Switch.
- Separate Sub-carrier Outlet.
- IF Gain Control.
- Cable Length Compensation Control.
- Parental Guidance Switch.
- Remote Control Switch.

MODEL SR-2500

The ultimate combination of product innovation, user convenience and value . . . ALL IN ONE product.

Use our toll free numbers shown below to order yours today.

Boman Industries 25th Anniversary

BOMAN INDUSTRIES
SATELLITE PRODUCTS DIVISION
9300 Hall Road Downey, CA 90241

Toll Free Number : INSIDE CA. (800) 352-2553
OUTSIDE CA. (800) 421-2533

CLARKE/ continued from page 38

5) **INSAT 1B** (74° E), found with video on transponder 24.
6) **Palapa A2** (77° E), found with video on transponders 7, 9 and 24.
7) **Raduga 10/12** (85° E), found with video on transponder 9.
8) **Gorizont 2/6** (90° E), found with video on transponder 9.

SIGNAL Levels

Equipped with the 16 foot Paraclipse dish, 100 degree LNA and AVCOM 3 (International Grade) receiver, Clarke finds a wide variety of signal levels present. Some of this variation is a function of wandering bird orbits; the Gorizont birds, in particular, follow a 'figure 8 pattern' oscillating north and south of the true Clarke Orbit belt location assigned, directly above the equator. The dish only tracks east and west along the belt, and when the birds are well north (or south) of the equator, in their normal daily pattern, the signal levels suffer considerably, as we shall see.

Clarke uses an arbitrary scale of 0 to 5 with 0 being no detectable signal and 5 being a high quality (noise free) signal. Charts with this report further explain. He also uses a spot-check pattern with regular checks for all 8 of the viewable birds in two hour increments starting around 0630 in the morning (local time) and completing at either 2130 (9:30 PM) or 2230 (10:30 PM). He does this daily, and keeps a record of the observed results. A sample day (January 30, 1984) is **shown here in table form.** Since even in the worst case there would appear to be some detectable signal (signal level 1), the '0' notations probably indicate that at the time shown (his local time) the satellite transponders being monitored were 'off the air.' There is also the possibility, during normal 'programming-off' hours, that the transponders are 'powered down' (i.e. operational power reduced since the transmission only consists of color bars or other test signals).

The wildest variations are found with the Gorizont birds. They also have the widest reported 'flight excursions,' following elongated figure 8 patterns which would take them out of the beamwidth of the 16 foot Paraclipse dish for at least a part of each day. The solution to this is to equip the elevation adjustment on the polar mounted dish with its own **motorized 'jack screw'** so that rather than setting it up by hand, dead-on the Clarke Orbit belt so the dish always tracks along the belt, the operator is able to 'mis-align' the dish north or south of the equator when in the proper azimuth location to follow the bird's wanderings north and south. A few dishes are so equipped (Hero Communications offers such a package as an optional accessory) and in areas of the world where either Gorizont or (some) Intelsat birds are depended upon for reception, this is the 'only way to fly.' Clarke's dish is not, at the moment, so equipped. Thus we (will) see that as the birds follow their figure 8 flight pattern, there are marked changes apparent with the received signal quality.

RECEPTION Aspects

The one **commercially viable** service would, in theory, be the **Palapa** multi-channel, multi-language channels. At the time of observation, this programming is on Palapa A2, located at 77 degrees east. This programming is expected to be moved to Palapa B1 at some near-term future date although the failure at launch of the recent Palapa B2 bird may have some bearing on this transfer. The A2 bird is one of the older 5 watt (maximum output) birds of the same family as our present Westar 2/3 birds; or the older ANIK series birds. The newer B1 bird, on the other hand, is a 24 channel bird with 7.5 watt power levels and with modified antenna patterns which could, **in theory,** result in much improved service for not only Sri Lanka but a wide portion of Southeast Asia.

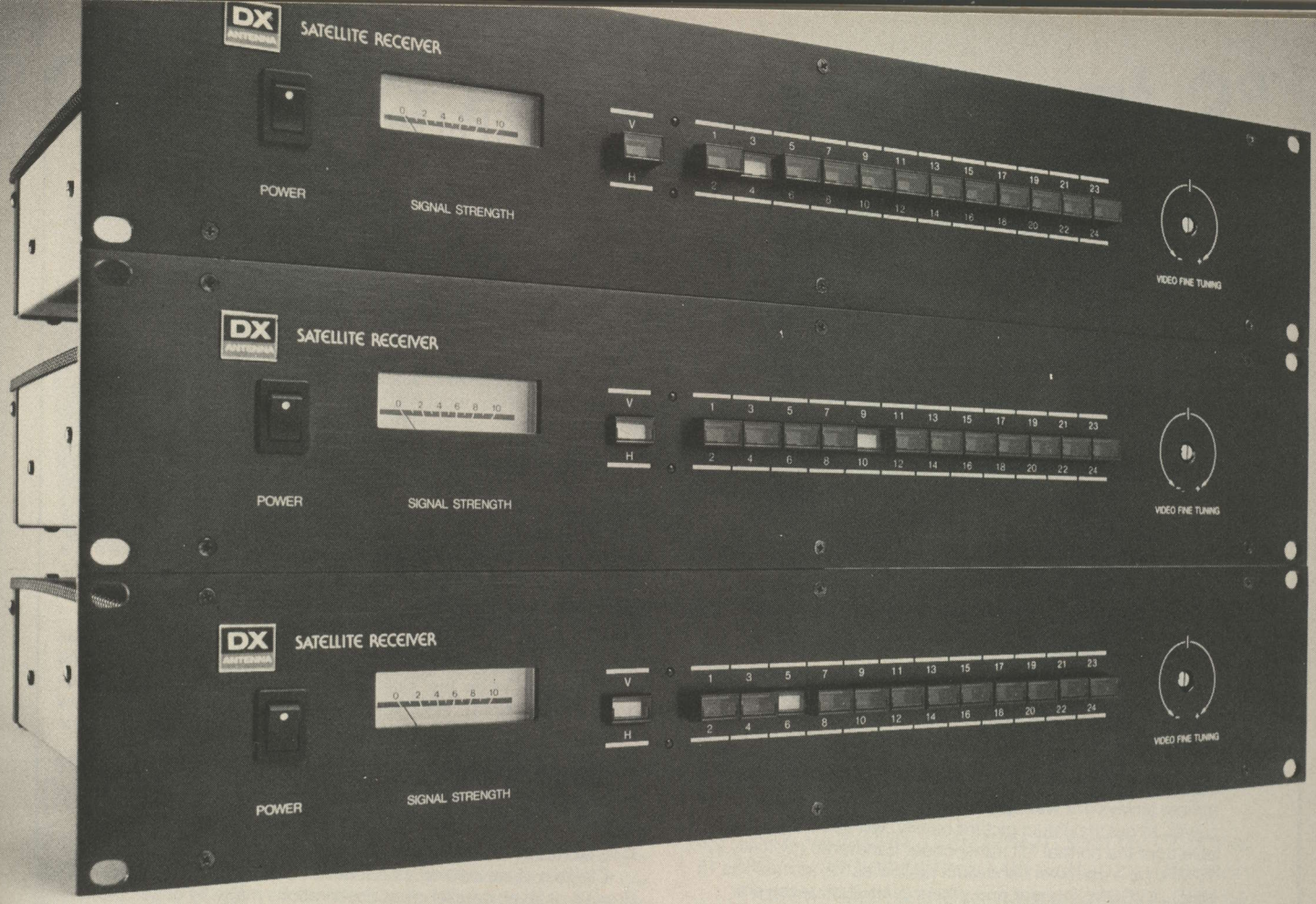
CLARKE's 16' Paraclipse under construction.

Clarke characterizes his A2 reception as 'very poor television' and assigns a signal level reading of 2 (±) to the reception (defined by Clarke as 'Picture Just Recognizable'). **That is not necessarily bad news** since the fact that there is reception there **at all,** and that it is consistent, would indicate that given the right kind of antenna system, and the perfection of the electronics involved, there is every opportunity to produce high quality pictures from Palapa even in Sri Lanka. Transferring Clarke's 0-5 assignment to a carrier to noise ratio, we'd have to give it a 2 to 3 dB CNR. That says that given 6 dB additional antenna or system gain, he would be out of the noise (with no margin) even on the Palapa A2 service. If some of the missing 6 dB comes in the future as service is transferred to the newer B1 bird, that will reduce the amount of additional antenna/system performance re-

SAMPLE DAY/SRI LANKA (January 30, 1984)

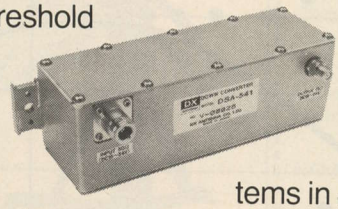
Satellite	Location	Best Signal	0730	0830	0930	1030	1130	1430	1530	1630	1830	1930	2030	2130
			(Local Time)											
Gor. 5	53° E	**5+**	2	3	2	4	**5**	4+	3	2−	0	0	0	0
Int. V/F1	57° E	**3+**	0	0	0	0	0	0	0	3	3	3	**3+**	3
Int. V/F7	60° E	**3+**	0	0	0	0	0	2	3−	**3+**	0	2	0	**3+**
Int. V/F5	63° E	**2+**	0	0	0	0	0	0	0	0	0	**2+**	0	0
Ins. B	74° E	**5**	0	0	0	0	0	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Pal. A2	77° E	**2+**	**2+**	**2+**	2	2	2	2−	2	2	2	2	1	2
Rad. 10/12	85° E	**4+**	3	3	3+	2	0	0	0	0	0	2	3	**4−**
Gor. 2/6	90° E	**5+**	0	4−	4−	**5**	**5**	2	1	0	3+	4	5	5

Note: 'Best Signal' indicates highest level of signal ever attained, not necessarily peaking on the sample day (January 30th) shown.



DX Gives You Big System Quality at Small System Prices.

Now you can have top quality performance for a surprisingly reasonable price. The DSA-643 Satellite Receiver from DX features dual, **block downconversion**—unique for receivers in this price range. The DSA-643 uses a discriminator circuit for signal demodulation; a full 30 MHz bandwidth; and a unique threshold extension circuit. These features add up to a low threshold carrier to noise ratio, commercial quality reception and low cost installation in any system.



DX also provides the DSA-541 Block Downconverter. It features a highly stable ceramic resonator, with a fixed frequency of 2800 MHz. Stability is maintained at a remarkable ±1 MHz over the entire −30° to +50°C temperature range. So you can 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

DX Communications, Inc., A Subsidiary of C. Itoh & Co. (America) Inc.,
116 Midland Ave., Portchester, N.Y. 10573 (914) 939-8880
Manufactured by DX Antenna Co., Kobe, Japan.

quired to make Palapa's multi-channels of multi-language television 'saleable' in the Indian Ocean. For those who are located further towards Indonesia (antenna pattern charts on file for A2 would indicate that Sir Lanka is **at best** in a 23 dBw contour area), things get better and quite rapidly.

Strong reception from the Indian INSAT 1B bird is present all of the time. This happens to be a satellite which has the capacity to provide useful service over a considerable area of the sub-continent and ajoining regions of Southeast Asia plus the Middle East. What is missing here is 'programming content'; for other than sports programming which has universal appeal, Indian television is not known for its 'entertainment value.'

The three Intelsat birds located have a myriad of practical problems for the would-be provider of home terminals in the region.

1) They typically elect to use their **Global beam pattern** antenna configuration; **at best,** this is a 22 dBw region signal on the ground; clearly not sufficient for a 16 foot antenna. (A hemispheric beam with signal levels as high as 26 dBw may be used on occasion but this is unpredictable.)
2) The feeds on Intelsat (at least those over the Indian Ocean) are, at the moment, **not dependable.** They may follow a time-of-day format, but will in those cases consist primarily of news or an occasional sports feature. The forthcoming Los Angeles Olympics aside, the programming is not dependable.
3) Some feeds may elect to send the audio program service on a transponder different from the video transponder. The video is almost always **1/2 transponder format** which means the receiver, to get maximum picture quality, will need to be switchable from the normal full transponder bandwidth (typically 22-25 MHz) to a narrower bandwidth (as low as 12, as much as 15 MHz). AVCOM, Intersat and others offer such receivers.

The Russian Gorizont birds, as well as the Raduga series bird, actually offer a very high quality of television. Their signals are strong, and the programming for an area where very little (or no) regular programming exists is not **that** undesirable. Plays and musical programs are virtually universal and news, even in a 'foreign' language is still capable of being followed, if not completely understood. Unfortunately, any of the above requires that **you have audio** to go with the video. And that is the primary problem with the terminal systems commercially available in the marketplace at the present time.

Russian audio is transmitted using a 'sound in syncs' system. It is a form of pulse, transmitted within the video line itself and to extract it from the carrier you must have a proper pulse-modulation decoder. **No such product exists in the commercial marketplace,** although **CSD** has on three occasions published 'how-to-do-it'' articles with schematics in this area. Clarke writes of his frustration, when the video is 'near perfect,' of not being able to hear the audio from some of the 'fascinating concerts transmitted.' The same problem faces anyone who is interested in providing Gorizont reception from the birds at 53 or 90 east or the Raduga series (Russian) bird at 85 east. There is a (perhaps small) commercial opportunity here for someone with the abilities to produce the 'sound-in-sync' decoders' **(**)** for sale to those systems that require this reception.

This note. Clarke reports that the Intelsat V/F7 bird (60° E) has provided him with 'fairly good video and audio' on occasions, during those periods when the satellite was being used for news feeds (transponder 23/24). And, with the scheduled launch of the new Arabsat bird later in 1984, there will be yet another service available in the sub-continent region.

Those who would follow in Clarke's pioneering footsteps will add to the foundation of information now available, and 1984 promises to be an eventful year in this largely underserved region of the world.

THE Gorizont 'Twist'

Clarke's observations, as a function of time of day versus signal strength or level, parallel other observations made by observers who have attempted to track the apparent figure 8 flight variations from Gorizont **at 14 degrees west.** What is new about the Clarke data is that it provides a first-time look at two Russian satellites which until now have been beyond 'regular monitoring' by properly equipped observers.

Three charts are shown. Each uses the vertical scale to show the relative signal level(s) observed (0 being no signal and 5 being noise free pictures) while the horizontal scale depicts the change in time of day.

Figure One shows the wanderings of Gorizont 1 at 53° E. From Clarke's vantage point, the bird would appear to be closest to the Clarke Orbit belt in mid-day with a decided 'hump' in upward performance betwen 10:30 local time and 1830 (6:30 PM) local time. This bird is **thought** to have an 'inclined orbit' of 0.5 degrees. If we make the assumption that the Paraclipse dish has a 1.1 degree beamwidth, a 3 dB reduction would occur in received signal level when the bird is 0.55

---

* — A videotape presentation created during the Sri Lanka expedition **was** to have been available to the industry this past February/March. Unavoidable delays in the final editing of that taped program have postponed the release date. An announcement of the program run dates and satellite location will be made here in **CSD,** when known.

** — Ron Nelson at Creighton University (c/o Lee Lubbers, S.J., Creighton University Satellite Net, 2500 California Street, Omaha, Nb. 68178) has constructed 'sound-in-sync' decoders for use at Creighton University, and is available to custom-build such a decoder for others who may have limited-quantity needs in this area.

ARTHUR C. CLARKE'S GHORIZONT 5 AT 53° E
FROM COLOMBO SRI LANKA

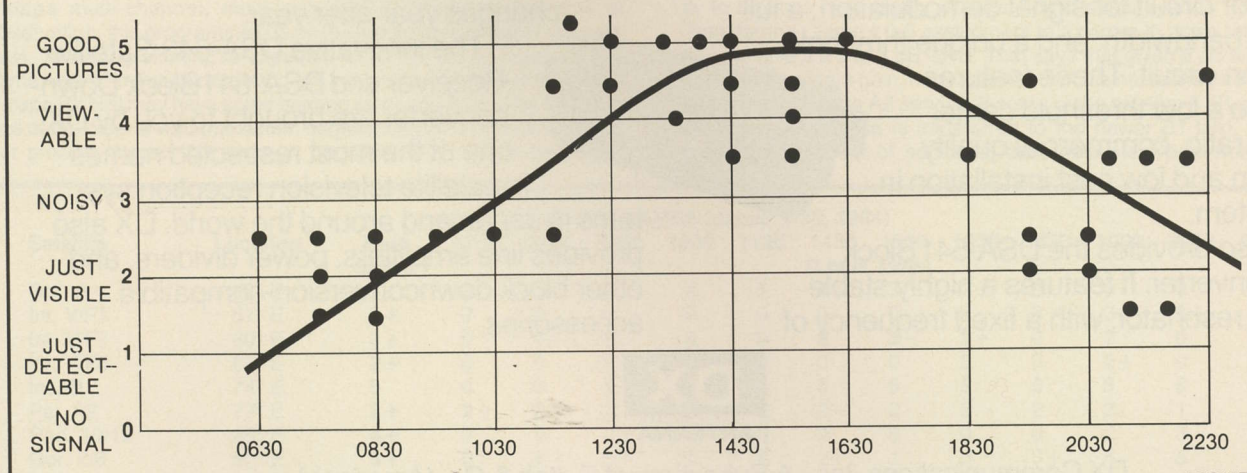


FIGURE ONE

Certified Performance at 2°

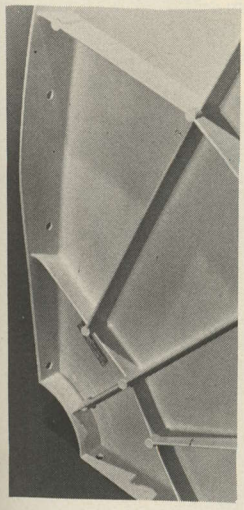
Take your choice!

When 2° spacing becomes a reality in a few years, what would you rather tell this year's customers...

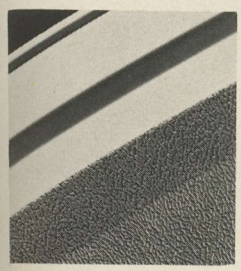
"I'm sorry that your reception is so poor. But, there's nothing I can do about it. Your dish just can't handle 2° spacing."

"Good thing we went with a Channel Master dish back in '84. Your picture is as good today as the day we installed your dish."

Built to perform! Built to last!



Precise SMC molding plus machine-aligned and drilled bolt holes produce a more accurate parabolic shape for better reception—and gives you a 4 petal dish that's faster to assemble!



The handsome scratch and mar-resistant textured surface of our SMC dish diffuses reflective heat that can damage the feed assembly.

The back of our SMC dish shows how unique it really is. Support ribs are molded in right from the start. No need for extra bolt-on supports or oversized back frames here!

Every 10 ft. and 12 ft. system sold by Channel Master dealers comes with written certification that it will deliver the same fine reception under 2° spacing that it does today. (8 ft. system certification is conditional on cross-polarization of adjacent satellites.)

Dealers give this written guarantee to their customers because we give it to them. You'll give the same guarantee to your customers when you use Channel Master dishes.

If you want to know how our engineers can let us make this kind of guarantee and why many other dish suppliers can't, or shouldn't, send us the coupon below and we'll send you the facts.

Phyllis Fisher
Channel Master Division of Avnet, Inc.
CSD484, Ellenville, New York 12428 (914) 647-5000

Tell me more about CM 2° Certification
(Attach business card, if appropriate)

NAME _____

BUSINESS _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE (_____) _____

Please check one: ☐ Consumer ☐ Dealer

Channel Master®
DIVISION OF AVNET, INC.

PIONEER MEMBER OF SPACE

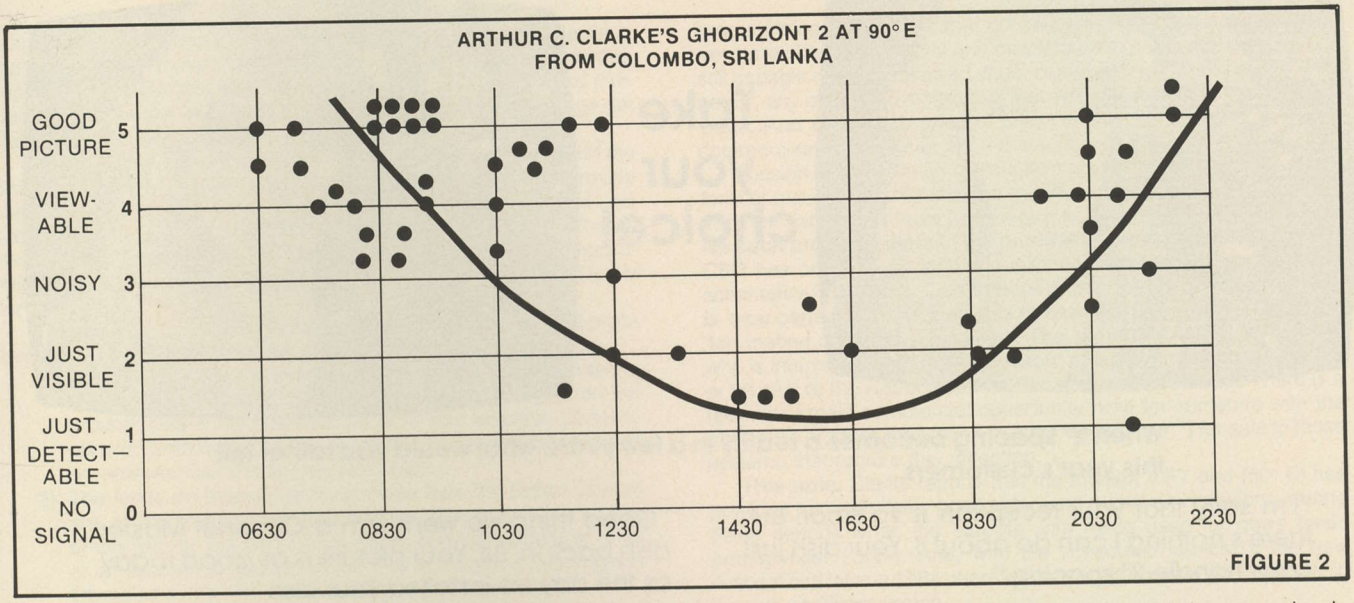


FIGURE 2

degrees away from the Clarke Orbit bore sight of the dish. This would translate to a signal level in the 3 region on Clarke's scale of 0-5. **A further reduction of 3 additional dB** would translate to a reading in the 1+ region, and an off boresight wandering in the region of 0.7 dgrees (a total excursion of **perhaps** plus/minus more than 0.7 degrees). Clarke finds signal level variation of close to 6 dB, indicating that the bird, while apparently never falling totally out of the beam, does go down by approximately 6 dB in the worst (observed) case.

Figure Two shows the same sort of display for Gorizont 2 at 90° E. Note that from Clarke's vantage point, there is an almost inverse relationship with the Gorizont 2 pattern in figure one. The peak reception period, coinciding with the time when the bird is closest to the equator's Clarke Orbit Belt location, falls at opposite ends of the day, reaching minimal signal levels in mid-day. Once again, the variations found are approaching 6 dB in CNR, indicating possible changes in the equatorial position of typically ±0.7 degrees.

In both figures one and two, the solid dots indicate separate observations in the same general time frame on differing days. In **figure three** we separate out just a pair of days for closer study. The arc of the average(s), shown in figures one and two, indicates where the mean distribution of the individual dots would fall if you normalize all of the individual readings and take 'an average.' We have selected, in figure three, to take two days which while following the general pattern nonetheless also indicate some 'slightly strange' sub-patterns. The dates appear in circle form so you can see how the observations fall for the two chosen dates (22nd and 26th of January).

Note that on the 26th the signal did not begin its 'fall off' until quite late in the day; approximately between 1230 and 1430 hours local time. The mean fall off for the full period begins between 0830 and 1030 local time. Also note that there was a pronounced rapid dip followed by an earlier-than-normal recovery to stronger signal levels. In other words, on the 26th, the bird's pattern seemed to have the 'inside' or 'fast lane' track.

On the 22nd, the bird went through a 'double dip,' falling off slightly later than normal, dropping to a low around 1330, rising again around 1600, and then falling a second time around 1630. When it finally did begin the steady ascent upward, it was later in the day than normal as it peaked.

Clarke found some indications that the Paraclipse dish, which is equipped with the 'teflon slab' block that allows you to optimize on circular polarized signals, may have some 'sidelobe pickup' on at least one of the two dish sides. This was something which we noted while in Sri Lanka and if indeed this anomaly is occurring with the dish, it is **perhaps a result of** the circular rotation slab's mounting inside of the feedhorn mouth. Further tests, by Paraclipse, are underway to pin down the exact cause of this problem.

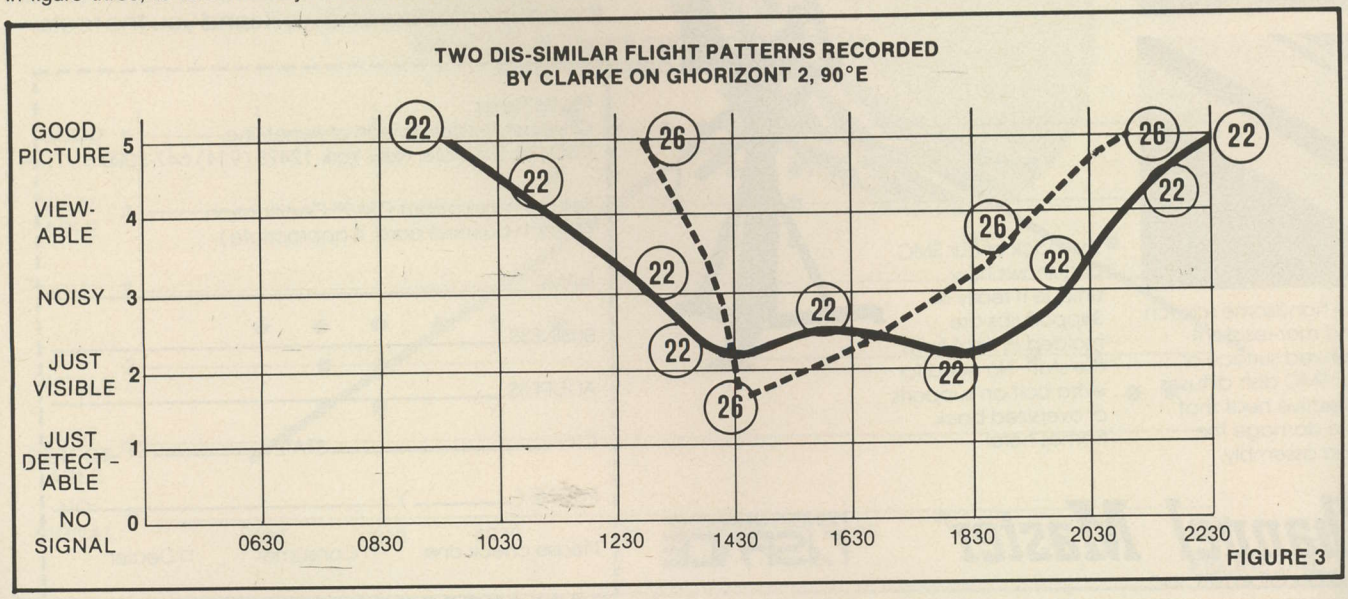


FIGURE 3

THE NEW STANDARD IN DISH TECHNOLOGY IS BROUGHT TO YOU BY WINEGARD®

PERFORATED PERFECTION

NOW, A CLEARLY SUPERIOR SEE-THROUGH DISH

Make the break from mesh to a higher quality see-through dish. Take a look at Winegard's perforated aluminum 10-footer. There's nothing else like it on the market.

Winegard's new dish has a sharp, clean look of quality. It's a new level of dish technology offering advantages other see-through dishes can't deliver. Like 39.5db gain, F/D "Deep Dish" ratio of 0.283, lightweight yet rugged construction, super-simple assembly, anodized protection, high performance and a look of class that your customers will appreciate. What more could you ask for?

A TRUE PARABOLA

The ultimate goal in designing a satellite dish is to create a reflector that is a "true parabola" - providing "near-perfect" efficiency.

Winegard engineers have developed the truest parabolic dish of any of the see-through category. Each petal, rib and outer ring is stretched-formed to a parabolic shape with specs so tight it took months to perfect the process.

Our exclusive extruded rib and locking system has simplified assembly, eliminating the need for hundreds of bolts, nuts, washers and fasteners. Every time you attach a bolt, screw or fastener to a dish you add another stress point, distorting the shape. With Winegard's extruded rib and locking system, the stress is uniform across the dish, maintaining its true parabolic shape and integrity.

WHY SPEND HOURS ASSEMBLING AN ANTENNA WHEN YOU CAN DO IT IN MINUTES?

Winegard's 10-foot perforated dish is shipped in four quarters. Total weight is only 92 pounds. It's easy to handle and transport. All that's required for finished assembly is fastening the main ribs together with 16 stainless steel nuts & bolts; placing four tension-straps into the outer rim; and securing with 8 screws. Just a 20 to 30 minute job for two people.

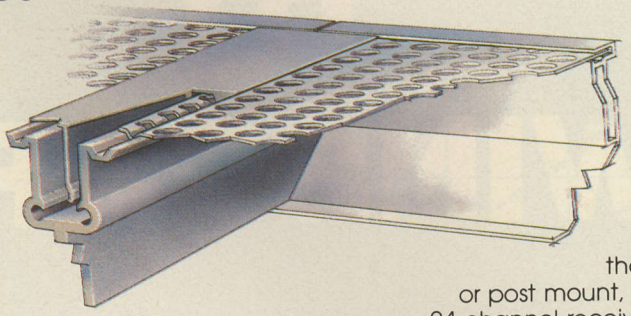
LIGHTWEIGHT BUT RIGID PERFORATED ALUMINUM

Not only is the Winegard perforated aluminum dish lightweight and easy to handle, but it is extremely rugged, durable and well constructed. You can actually see through the perforated petals which are constructed of .040-gauge anodized aluminum. The extruded aluminum main ribs, which provide the basic structural support, are 1/8" thick. The locking ribs are .070" thick and lock the perforated aluminum petals tightly in place. A double-walled outer rim provides an area to insert tension straps at all joints for perfect alignment and additional strength.

Wind-loading capabilities are outstanding with a wind survival rate of 125 mph. And, because the perforation eliminates 36% of the surface area and the anodized surface is pre-etched, the dish reflects very little heat into the feedhorn, keeping the noise temperature of the LNA down.

ANODIZING. . .THE ONLY TRUE WEATHER PROTECTION

Winegard revolutionized the outdoor antenna industry years ago with the introduction of anodized aluminum elements - now we bring this process to the satellite industry. The anodizing process actually penetrates the aluminum with a protective coating that resists rust and corrosion, virtually tripling the life of the aluminum. It's the only permanent protection against adverse weather and ideal for coastal (salt spray) areas.



FOUR COMPLETE 10-FOOT SATELLITE TV PACKAGES

Winegard offers four complete 10-foot perforated satellite systems that include antenna, pedestal or post mount, back-up structure, Polarotor I, 24-channel receiver, LNA, wire and a choice of motorized or non-motorized.

Winegard perforated . . . a new standard of excellence.

THE EXTRA EDGE!

WINEGARD'S NEW 100° LOW NOISE AMPLIFIER

Four GaAsFETs are utilized in the state-of-the-art circuitry designed to meet the rigorous requirements of 90% of all home TVRO installations. Performance and reliability as good as the best! Circuit is fully protected from reverse polarity voltage, surge voltage and lightning.

Model SC-8101 combines extremely low noise figures with low input and output and the gain slope/group delay characteristics vital to TVRO performance. Each LNA is factory-tested for noise figure, noise temperature and gain, and the test results are packed with each unit. Gain figure exceeds 50dB.

Write for detailed literature.

SO PUT OUR LNA TO THE TEST

Try the Winegard SC-8101 on your next installation and compare it with any other 100° LNA on the market.
We guarantee you'll be impressed.

THE WINEGARD CHROMSTAR "10" MODEL SC-1018*

30th Anniversary WINEGARD FOUNDED 1954

* U.S. Patent Pending

WINEGARD®
SATELLITE SYSTEMS
T.M.

PRINTED IN U.S.A. WINEGARD COMPANY • 3000 KIRKWOOD STREET • BURLINGTON, IOWA 52601 • (319) 753-0121

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.

CANCOM, the Canadian carrier which is currently supplying 7 television signals in an Oak scrambled mode to Canadian CATV/SMATV systems on ANIK D, will begin offering 'personal decoders' this June. They are to be priced at $495 **(Canadian)** and there will be a monthly service charge of $24.95 for 7 or 8 signals. Included in the full 8 channel package are ABC, CBS, NBC and PBS services from the USA. Approximately 500 of the new units per month will be available. No distribution sources have yet been announced, but all will be within Canada.

LOSS of WESTAR 6 and Palapa B-2 regarded as 'worst space catastrophe' in history of satellites. Both satellites suffered identical failures during transfer from low earth orbit to elongated elliptical orbit leading to Clarke-Orbit. Some discussion of trying to 'rescue' both birds, still close enough to earth (perigees in 170-190 mile range) for future Shuttle mission to grapple and retrieve, if mechanics can be worked out.

INSURANCE coverage for both losses will come close to $200M, driving up insurance rates by 10% or more on future satellite launches. Insurance underwriting until now has been quite evenly split between US and European carriers; fewer US insurance carriers are likely to participate in future.

WESTAR 6 was to be heavily narrow-band (radio networking) bird. WESTAR 7, schedule for fall of 1985 launch, may now be 'speeded up.' Seven was to occupy new orbit position while 6 was to replace WESTAR 3.

PALAPA B was to handle major expansion of Indonesian PT&T and **offer** additional video and narrow band channels for **non-**Indonesian customers. Palapa 2-A is now on station but is not in routine video use at this time. Older Palapa 1A and B birds are of 12 channel (WESTAR 3) family and were being replaced with upgraded 24 channel birds which are very similar to WESTAR 4 and 5.

RCA has asked for permission to 'modify' July 1986 scheduled SATCOM 6 to allow 6 of the 24 transponders to serve northern Africa and Europe on C band from 67° west. SATCOM 6 has a potential for 'steerable' beam antenna system and it could use one of four six-transponder banks for direct links into Africa-Europe for customers wishing to reach there from eastern half of USA. Signal levels would be in 32-34 dBw region. A rocky road for approval is ahead since SATCOM 6 would be in competition with Intelsat across Atlantic.

NETCOM INTERNATIONAL has leased three of the SATCOM 1R transponders for private video conferencing use as well as broadcast and CATV use. As part of the deal, RCA will supply NETCOM with nearly $500,000 in receive-only terminals to go to selected CATV and broadcast customers of Netcom for F1R use.

INTELSAT, feeling threatened by applications to serve Europe directly from North America via private (Orion, RCA, et al) satellites is rearranging its public relations approach. Claiming they are **'not a monopoly,** but an international organization,' Intelsat is trying to show that U.S. benefits in many ways from present Intelsat system; including fact that virtually all Intelsat satellite hardware to date has come from U.S. manufacturers although US controls only approximately 25% of Intelsat 'stock.' In related exposure, FCC Commissioner Henry Riviera has told audience ". . . the policies which the US follows domestically **cannot simply be exported** to the international arena . . .", cautioning that the US 'free marketplace approach' does not 'fare well' in regions of the world where trade and competition are more directly government controlled.

FCC study, meanwhile, indicates that after careful analysis, COMSAT's rate of return (profit from earnings) in years 1979-80-81 and 82 'exceeded the returns authorized during the (last) rate hearings of 1978.' FCC had approved 11.48 to 12.48% rate of return; **actual** earnings varied from **low of** 16.84% (1979) to 21.38% (1980) over four year period. One of Intelsat/Comsat arguments against allowing 'competition' across Atlantic is that Intelsat would be 'financially hurt' by competition.

USCI, the early-starter in the low/medium power DBS race is out looking for at least $40M in public funds; admits it may require $200M total before 'turning corner' to financial profitability in 1987 projected turn around. Stock market analysts **not** very excited about new stock offering.

GALAXY ONE? Has it been 'over-sold' as 'answer' to C band direct (CBD) DBS proposed by HBO? Claims made by many, including Ted Turner personally, that four foot dishes would produce high quality signals from Galaxy now in question. Several suspect that HBO's original plans to launch CBD/DBS as early as this fall **may be seriously set back** by perhaps year, or more. Now underway; intensive national study to determine just how effective 4 to 6 foot region dishes are with G1 signals.

1985 US Federal budget shows $43M increase in funding for Voice of America 'television and film service,' largest single increase in communications area. Plans to upgrade VOA overseas television service, via **Advanced** Westar bird(s) still alive although there are presently technical problems. Also in budget is $1.7M item to create 'Euronet' global satellite network to link U.S. embassies around world together into system for worldwide news conferences.

BRITISH UNISAT Project all but shut down for now. Construction on controversial high power satellite(s) has stopped and talks between two primary British programming candidates have been tabled. 1986-7 launch date now seems impossible; project may be abandoned totally.

FRANCE has been accused of planning international satellite system, including selling transponder time to non-French concerns on new Telecom (French) satellites, to cross over Atlantic. France denies the stories and says that Telcom 1A, still scheduled for launch this May to 10° W slot (just beyond present Gorizont slot) is too far east to be properly 'seen' in eastern USA. **Not quite true;** Intelsat at 1° W is seen very nicely from eastern USA and AFRTS service to Indian Ocean and Europe is carried on 1 west bird. Telecom 1B will launch to 7° W early in 1985.

JAMAICA and MPAA have settled. JBC, government run television service, has been lifting US programs, in particular movies, off of US domestic satellites for nearly two years. MPAA wanted Jamaica to stop **and** to pay 'royalties' for **past use** of US programs. Jamaica said

Details on page 71.

PIONEER MEMBER OF SPACE

ZEUS
RULER OF THE SKY

We're Number One. Let us prove it.

We will be around for a long, long time.

Optional MICRO-DYNAMICS INC.

The Number One Supplier of TVRO Products.

6153 Airways Blvd. • Chattanooga, TN 37421 • Toll Free: 1-800-845-0813 • In Tenn: (615) 892-3901

'no,' they 'might pay for future use' but would not pay for past use since it occurred prior to Jamaica and US entering into copyright protection agreement. Jamaica won; country now paying for US movies 'lifted' from satellite. But will not pay for past movies.

WOLD plans to shift all Westar 4, TR19 traffic (ABC, et al) to T1 bird at 96 W April 2nd. Transponder assigned is 5, opposite polarity of current ABC feeds found on TR10. CBS scheduled to move to T1 from D3 before summer.

SLIGHT move; TelStar 2, scheduled for launch in August, will now be at 86° W rather than original 88.5 W slot. SBS 4 will also be moved, to 91 W rather than 89 W originally scheduled.

FIRST launch of a **US** satellite, SPACENET I, scheduled for May **on** European/French Ariane rocket from South American launch site.

JAPAN and US have re-negotiated agreement for sharing of telecommunication research and development. Previously, R&D done by Japanese Nippon Telegraph & Telephone was kept within Japan and surfaced only in Japanese telecommunication products sold worldwide. Still being discussed; Japanese purchase of one or more US built 4 or 12 GHz satellites.

AS BELL broke up into separate operating entities, at least one of the new corporations (Southwestern Bell) used satellite interconnection to stage a two-day 'party.' With 57 receiving sites equipped with temporary downlinks and more than 60,000 employees participating, SW Bell used the break-up as an excuse for an educational forum.

LATEST schedule for Ariane lists first of ARABsat satellites for November launch this year.

AMERICAN Hospital Supply Corp. is latest firm to become an authorized master-distributor for Scientific-Atlanta TVRO hardware. The firm will distribute 4.6 meter S-A terminals and the first 60 are going to a hospital conglomerate headquartered in Irving, Texas.

INTELSAT, reacting to competition, now says it will offer 2 foot terminals for 12 GHz 'electronic mail service' via Intelsat V satellites to customers located within spot beams of latest generation of birds. They call them 'micro-terminals' and they will be configured to point through a (glass) window at satellite to south and cost under $2,500 (US) each. Package includes 2 foot dish and 12 GHz receiver; does not include accessory equipment for receiving data and displaying same locally. That's extra.

SINCLAIR Research, the same folks who built home computers for under $100, and first 2" black and white pocket-sized TV receiver, claims they are **capable** of building 12 GHz terminal (antenna, down converter, demodulator and re-modulator) for 'under $175 US.' Firm produces products which export from U.K. into a worldwide electronics market where very little U.K. produced hardware survives.

U.S. Department of Commerce creating task force within International Trade Administration to 'push US satellite hardware'; both satellites and receive/transmit terminals. Goal is to educate worldwide market to abilities of US firms in this field, hoping to win greater export levels for US satellite communications equipment.

SKYBAND, the Rupert Murdoch company formed to launch early low or medium power DBS for North America, has settled with Satellite Business Systems for jumping out of long term contract for five SBS transponders. Skyband called it quits last fall, before really starting, and penalty is reported $12.7M to SBS for canceling contract for transponders.

US FORCES in Germany reportedly now have access to AFRTS feeds from 1 W. The 24 hour per day feed service is now being received on an S-A 11 meter terminal in West Germany, then transported to various US installations in country via terrestrial microwave. S-A terminal was installed by German PTT which is under contract to supply service to US bases.

TELESAT Canada has reached agreement to allow 9 US firms to routinely transit programs and satellite material into Canada. Under the agreement, Canadian downlinks will be authorized to directly access transmissions **rather than** taking services down on US side, transporting across border on terrestrial microwave, and then back up on ANIK satellites.

WPIX, New York City independent station widely carried via terrestrial microwave to more than 400 cable systems in northeast, will come up on a Westar 5 transponder 24 hours per day on May 1st. Carrier is United Video, which also supplies WGN on F3R's TR3. WPIX is similarly programmed to WGN and pair of stations 'share' same corporate ownership. Primary difference is New York City sporting events (Yankee baseball, etc.). WPIX 'anchors' the INN newscasts carried by WGN and others. Choice of Westar 5 bird puzzles many since use of that satellite for cable services is rapidly diminishing to nothing. WPIX may not be there long; opting for a berth on G1 probably although other possibilities exist.

TESTS conducted by Microwave Specialty Corporation on **4.5 foot** Quadalite (Inc.) 'plastic injection molded' TVRO dish revealed some surprises. MSC measured gains of 34.25, 34 and 34.75 dB at 3.7, 3.95 and 4.2 GHz. Tests run at 12 GHz showed the antenna had a beamwidth of 1.25° with sidelobes better than 20 dB down and an average 'gain' of 43 dB. At 3.7 GHz, the 4.5 foot dish had a 3 dB pattern that was approximately 1.8 degrees wide (**either** side of center) and a 12 dB down pattern that averaged 4 degrees **either side** of center. Gain was impressive; mainlobe pattern, function of dish size, indicates that when pointed at F3R, for example, signals from D4 (−3°) and G1 (+3°) would be down **no more than** 9.5 dB.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CSD provides this industry Forum with the understanding that opinions, thoughts and "facts" published are from the writers; no liability for statements extends to the publishers. Address letters to CSD/Industry, P.O. Box 100858, Ft. Lauderdale, FL 33310

FINDING SCPC

After reading an article in **CSD** and **Coop's Operations Manual,** and tuning the numerous SCPC channels from the various satellites, I thought that all I needed was to hook a piece of coaxial cable from the video terminal on my TVRO receiver (KLM SKY Eye IV) to the antenna terminal on my communications receiver (ICOM R-70) and the net result would be an abundance of SCPC channels. I have tuned from 100 kHz to 8 MHz on many transponders that are supposed to have SCPC channels on them, but have received nothing but some telephone conversations on COMSTAR IV. I tuned specifically to Westar III, transponder 2 (3) to pick up feeds of the Louisiana State University Basketball games. By following the procedure listed in Coop's Operations Manual, I do not understand why I cannot find these radio feeds. I have a 13 foot ADM dish and a 110 degree LNA. I would appreciate some help!

Pete Coleman, Jr.
C.D. Coleman Oil Co., Inc.

the new generation

GAMMA FEED

from GAMMA-F CORPORATION

- gives the total feed system in one rugged weather proof assembly.
- is a result of years of experience in satellite communications components development.
- is designed from the complete system viewpoint to optimize the TVRO system price/performance ratio.
- has eliminated all ferrite components for lowest noise performance.
- allows polarization selection that is instantaneous and without loss.
- is easily installed utilizing three mounting screws.

IF YOU ARE ASSEMBLING A NEW TVRO SYSTEM OR UPGRADING AN OLD SYSTEM IT WILL PAY YOU TO USE GAMMA-FEED.
Contact your local dealer or Gamma-f Corp. at (213) 539-6704.

gamma-f corp. 3111 FUJITA STREET □ TORRANCE □ CALIFORNIA 90505
TELEPHONE (213) 539-6704 □ ITT TELEX 429694

A SUBSIDIARY OF *Electromagnetic Sciences, Inc.*

P.O. Drawer 128
Newberry, SC 29108

Your procedure is OK: but the equipment is not. As the current (March 15) **issue of** CSD/2, **and the February issue of** CJR **point out, we have two types of 'SCPC'** (single channel per carrier) **radio transmissions now on the birds. Some years ag, virtually all of these feeds were done using** SSB **(single sideband) modulation techniques. However, SSB through this system is very much frequency limited; you can get a so-so** voice grade **audio channel through but not much else. A second technique, using relatively narrow band** (60 kHz wide) **FM called FM/SCPC has evolved. On Westar 3, transponders 1** (1) **and 2** (3) **you will find multiple FM services; so too on Westar 4, transponders 1 and 3, among others. About the only major users of the SSB/SCPC approach anymore are the telephone circuits you found on COMSTAR. Now, to receive these** (hundreds of) **FM/SCPC signals, you need a special FM receiver which tunes your receiver's IF** (55-85 MHz typically). **Hero Communications** (2470 W. 8th Av., Hialeah, Fl. 33010) **recently introduce a new 'consumer version' of their commercial FM/SCPC receiver at Las Vegas. We expect others to follow shortly. As long as the supply lasts, anyone who wants to learn more about this can write for a** free copy **of** CJR **for February 1984 at CSD, P.O. Box 100858, Fort Lauderdale, Fl. 33310.**

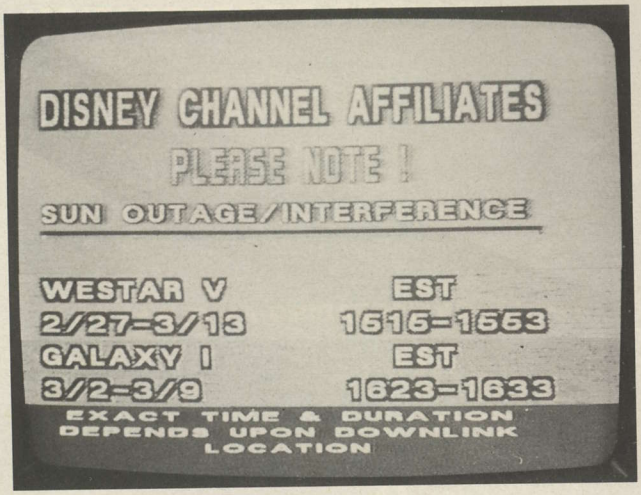
JUST IN CASE

Needless to say I have been following your series of articles evaluating antenna feeds with keen interest. Although we don't have the advertising and promotion clout of the BIG boys, we, nevertheless, always strive to provide a consistently high quality product at a fair and competitive price. I trust your final article, which will include an objective comparison of the feeds tested, will bear this out. In (hopeful) anticipation of an overall favorable evaluation of the Polatron III feed, I have placed an insertion order for some additional advertising to run in the March 1984 issue of **CSD!**

I know I speak for all of the OLD TIMERS in the TVRO industry in thanking you for the consistent high quality of journalism we have learned to count on in **CSD.** It truly deserves its reputation as the Bible of our industry.

Dennis Vander Zyl
President
International Satellite Video Corp.
P.O. Box 5685
Orange, Ca. 92667

The March issue contained our wrap-up segment on antenna feeds tested by CSD **this past fall. The** Polatron III **unit did, indeed, rate highly and we would have no reservations about recommending it** (as we did in March). **The company provides a viable product which offers users an 'equivalent option' to getting involved in the nasty** 'feed wars' **now engulfing** two **of the major feed suppliers.**



CNN IN Melbourne

Just a short note to advise that 'AFRTS Pacific' is alive and well down under on Intelsat IV-A F4 'reserve' at 179 degrees east. The signal appears to be hemispheric, at about 24 dBw in Melbourne. The audio is at 6.8 MHz but very heavily deviated at around 750 kHz. Programming is primarily CNN news and ABC sports; I love watching 'Daybreak' at 10 PM in the evenings!

Peter Duddy
16 Tiffany Court
Montrose 3765, Victoria
Australia

CNN is now being carried as a regular service inside of Japan as well as by JCT (Japan Cable Television) **and is re-distributed off of Intelsat going to Australia** (etc.) **via terrestrial microwave to many cable headends in the Tokyo area. Our Sri Lanka travel group witnessed some of this in test form in November while we were in Tokyo. A 24 dBw signal is workable with a good quality 16/20 foot region dish and as long as AFRTS remains unscrambled, this will be a shot in the arm throughout the South Pacific. The extra-wide deviation** (certainly more than the 250 kHz standard) **employed by AFRTS on Intelsat circuits is** strange **at best; something those in Africa, Europe and the Middle East are also complaining about. Receiver manufacturers take note; you need to be able to capture these extra wide deviations in some parts of the world!**

LESS/ Not More 'Freedom'

I believe you are mistaken in your comments regarding 'possible greater freedom for Aussat' in **CSD** for January 1984. The original charter for Aussat called for 49% public ownership. The present Australian Labor government recently voted to rescind this decision with the result being that Aussat is now 100% government owned. As the enclosed article 'Clipping The Wings Of Aussat' shows, the government's latest move is to also prohibit any commercial, direct broadcasts, from the satellite system.

Once again it would seem that the newspaper/television syndicates, who are well represented on the board of Aussat, have thwarted any development of commercial television distribution within Australia, as they have previously done in blocking cable television. I hope that the enclosed comments are of some use and if anyone would like further information, do not hesitate to write. As a exfrustrated Australian cable television concern, I think we can comment as accurately as any.

Victor M. Rhys-Williams
Marketing Engineer
Building 12
ACC Dhahran North
Saudi Arabia

The fuss over who **would control Aussat, and** how **it would be used, has indeed been frustrating to follow. The material provided indicates that** no private ownership **of the satellite operator, Aussat Pty., Ltd., will be allowed, and, direct commercial broadcasts through Aussat will** not be **allowed. The real problem in Australia is the strangle-hold position of the all-powerful Australian Telecommunications Employees Association. This** 'labor union' **virtually runs all Australian communications and when the union saw that a** privately operated **satellite system** might provide **alternate methods of communications which could operate outside of their control, they started to get support for a change in Aussat. The losers here are free enterprise,** and, **those Australians who live outside of the metropolitan regions where terrestrial TV transmitters offer a diversity of entertainment and information. With the Aussat changes, only the national** (ABC) **network will get on satellite and the opportunity for** HBO/WTBS/ CNN **type services developing within Australia is now someplace between** not good **and** nil. **Pity.**

COLLECTOR'S Item?

Congratulations on producing a 'Collector's Item' **CSD** for January. I marvel at your ability to remember the slightest detail and to recount each experience in an informative, interesting and frequently hilarious manner. You really did an outstanding job covering the Sri Lanka operation and I feel sure Arthur C. Clarke is both happy and

proud.

One thing does concern me. Just what did you do with the 'other' 3,000,000 people in Hong Kong? Their families want them back! Seriously, the colony does have about 6,000,000 people although no one knows if they have ever all been counted. The building boom is definitely winding down. The best indications are the architectural firms that are closing like mad and the remaining ones are reducing their staffs to skeleton levels. That is the type of thing that will dry up new construction starts in a hurry. The present construction (you saw) went through the architect planning stages 3 or 4 years ago.

Your **"Roots"** series has been of interest. They brought back memories of the early TV days when I spent endless days and nights lecturing coast-to-coast on one-night stands to prospective dealers and distributors about how and why they should get into the television business. The banes of my existence in those days were 'the freeze,' the CBS color system and the UHF fiasco. I marvel, now, that I saw it so clearly during the heat of battle. Through thousands of miles and in and out of countless hotels I lugged a miniature version of the CBS color 'wheel,' and later a monstrous factory-built UHF tuner. And then there followed the 'two' CB systems with the first one quietly dying in the 50's, and the second one roaring ahead to almost self destruction in the 70s. And now the fascination and uncertainty of TVRO and DBS: what a fascinating industry!

John W. Lane
Uniden Corporation
4-7-4 Onitaka
Ichikawa City
Chiba Pref., 272-01
Japan

Lane's involvement in the full television cycle, from the early days of tiny 7 inch black and white receivers put out by firms such as Hallicrafters **and** Telecraft **to the present is unique;** he is among the very few **who can lay claim to having been there, actively participating, as the** whole scenario **has unfolded. We tried to** 'sneak' **the extra 3,000,000 Hong Kong residents back to** Provo **with us thinking that maybe our local population** (1,800) **might get a shot in the arm if we** 'dumped' **3,000,000 hard working Orientals into the pot. We reasoned that Provo is almost exactly the same size, land area, as Hong Kong and what we needed to get Provo moving was some more people. We'll keep you advised of progress.**

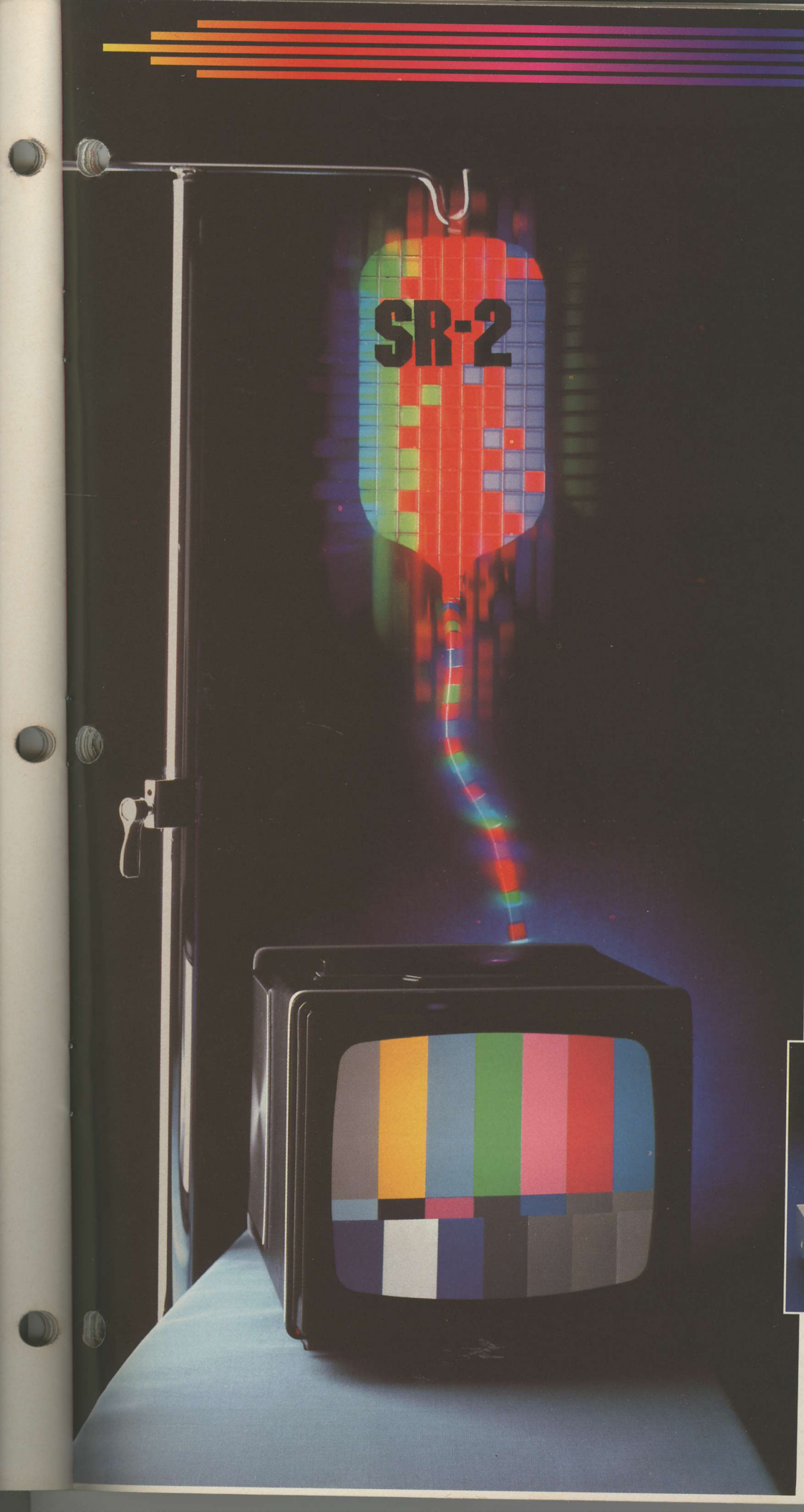
OAK SCRAMBLING

When I attended the Las Vegas satellite convention in March of 1983, it was too early to discuss questions that now plague me. Those questions relate to the scrambling techniques used by the Oak people with their Orion system. I have spent many of my own evening hours using my electronic knowledge as a technician trying to decode their signal, but until now I have been unsuccessful in doing so. I read your article in the March 1983 issue of **CSD,** 'Conversation With Ike Blonder,' and while that was very informative, it did not help me crack the Orion code.

My interest is purely personal and I am not out to go into the business of selling Orion descramblers to others. I would appreciate having more information on this system; possibly a schematic diagram. Any cost would be reimbursed to anyone that can help.

Roman Paskowski
1779 Senwood Place
Victoria, B.C.
V8N 5E2
Canada

Not here. **Our posture on scrambling devices has been consistent; we favor scrambling provided (that should be** PROVIDED**) the firms scrambling are** willing **to offer their services to private, home terminal owners at** reasonable rates. **Oak supplies equipment to the Canadian** CANCOM **service as well as to** ON-TV **over on D4. This is an analog video and digital audio scrambling service and those who have the required talent have not found the video that difficult to descramble.** But, **the audio is digitalized which in itself is not bad news; except that the** 'scrambling code' **can** (and is) **changed several times per hour. That means that** if



The SR-2. Advanced therapy for a healthier picture.

Your customers want a proven prescription for a crisp, clear picture with distortion-free audio. Now you can give it to them with the new second generation SR-2 Receiver System. It's the breakthrough **Rx.**

The SR-2 contains a breakthrough ingredient we call LPLL, the Linear-Phase Lock-Loop Circuit. In the past, LPLL has been found only in commercial electronics. But now, LPLL is the key in providing the video demodulation necessary for a brilliantly healthy picture, noise remission and improved threshold performance.

The SR-2 also relieves other annoying reception symptoms your customers may experience. Our Automatic Video-Gain Control maintains consistent picture brightness no matter what transponder is selected. And the Priority Polarity Control provides maximum signal strength.

For happy customers with a healthy outlook on satellite reception, give a dose of the SR-2. It's a totally integrated electronics package, including remote control that's user friendly in operation and installation.

To give the SR-2 your own personal examination, call us today at (800) 328-7733. In Minnesota, (218) 681-5616.

UNITED SATELLITE SYSTEMS™

St. Hilaire, Minnesota 56754

you somehow got the 'key' **(code) for one instant in time, it might be years before that** same key code **was again transmitted. In between, there would be millions and millions of other key codes used for the audio.** CANCOM is now accepting orders for private (home TVRO) descramblers. **They recently ordered 5,000 of these new** (Personal Decoders) **from Oak Satellite Systems and they expect to start distribution of the units this June. The user price will be $495.95** (Canadian dollars) **and the monthly service fee will be $24.95** (also Canadian). **This will entitle you to swing your dish to CANCOM's service on ANIK D where you will find** seven TV channels **in the scrambled mode; including CBS, NBC and PBS from Detroit. An eighth** (ABC) **channel will be added later in 1984. The new 'personal decoder' units are fully addressable, which means that CANCOM can encrypt any channel or combination of channels or** 'cut off' **those who fall behind in their monthly payments. The next step will be for someone,** in Canada, **to set up an 'agency' to subscribe to the service and take delivery of the personal decoder units for people who live** outside **of Canada. CANCOM is not licensed to serve US viewers, for example, but many of the decoders are bound to find their way 'south.'** CSD **will be happy to list for promotional purposes any firm or individual who sets up to do this since we anticipate a lively business in this area and see no reason to keep the Canadian sources for this equipment** 'secret.' **And, in fact,** we'll sign up **for the** 'first' **unit ourselves!**

NOT Happy

I would like to touch on a subject that is possibly near and dear to many a dealer's and distributor's hearts and headaches. That subject is reliability and quality control. How many times have new or even experienced dealers hooked up a new system only to find when they turned on the new 'superior' LNA or receiver, it did not function or some control did not work?

Maybe the 'state-of-the-art' motor drive would blow fuses or not remember exactly where it was supposed to stop. I know of a couple that broke into pieces! Or how about the dish that looks great in the ads but comes to your door with parts missing or parts that refuse to fit properly. Then there is the one about the 'popular' antenna that somehow did not retain its parabolic curve when it was installed. Oh yes, and for those dealers who are in northern climes, let's not forget about those freeze ups that the manufacturer 'forgot' to warn you his equipment was subject to! Of course there is the infamous one about the instruction manual forgetting to advise you what the correct focal length is for the dish, and where those 'extra bolts' should have gone. And last but hardly least, there is the manufacturer who claims his product is good and his design works; **no matter how many times you have to return it for repairs!**

I realize that some of these 'happenings' could be due to inexperience on the dealers part. Or it could possibly be because the customer was in a hurry when he decided to assemble the system himself; after all, anyone can install a TVRO system. Right! And of course there is no such thing as equipment failure, and this is all an exaggeration? Don't you believe it!

I don't doubt for one moment that there is, has been or will be an unscrupulous dealer out to make a fast buck in this business and swindle some end consumer with bad equipment. And so, wise is 'Coop' to repeatedly issue the stern warning **"Let The Buyer Beware!".**

But why is it in this young, vigorous and exciting industry the dealer has to be so cautious of his distributors and manufacturers that he relies upon? Are they so confident of their products that they don't or will not acknowledge their own shortcomings? Are these watchdog type publishers so worried about losing a paying customer or endangering their public relations, that the major topics covered are only emphasizing the positives of a component's features in detail? Or are the dealer support organizations only good for collecting your membership dues?

I for one would like to see this industry grow to meet Dr. Meek's future predictions. It would be great to know that the dealer or consumer could buy a product and KNOW that it will work. After all, it has been five years now — **we are not just hobbiests anymore.** The consumers that we want to attract expect a system to be reliable and work

Who says the sky's the limit?

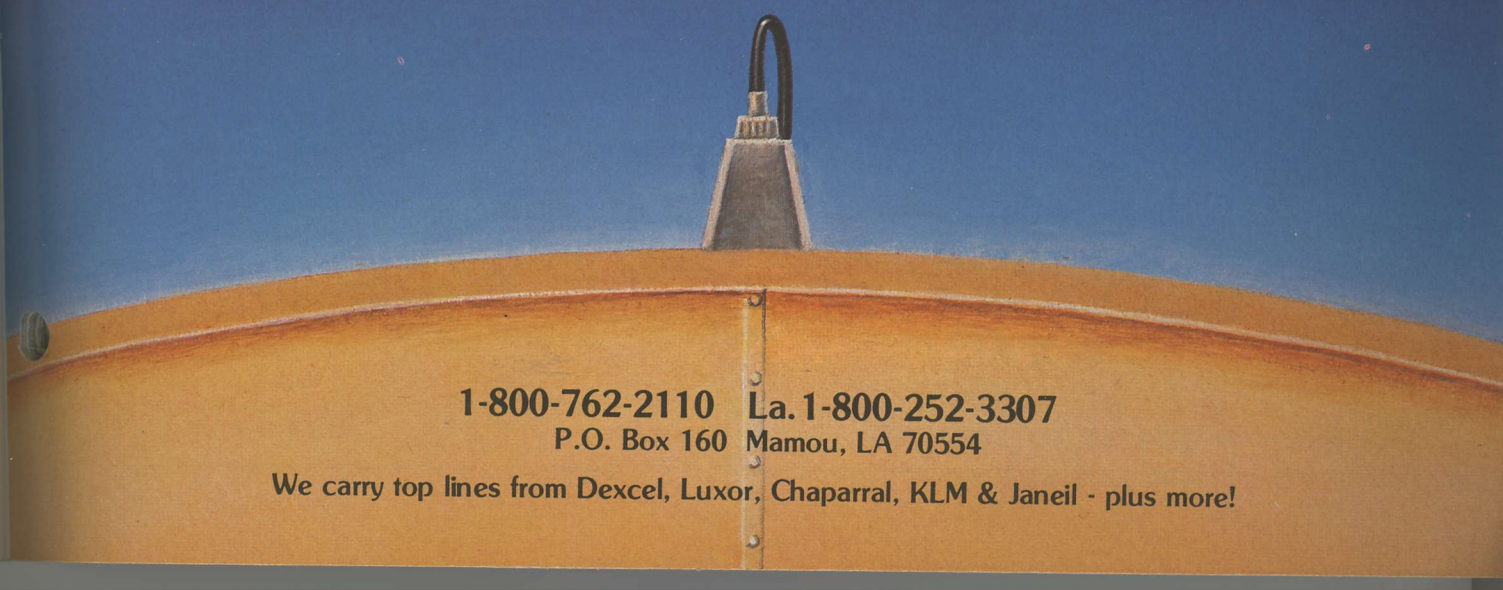
Satellite Earth Stations has expanded the horizons of communications for literally thousands of satisfied earth station users throughout the world. Our unbeatable combination of the latest, state-of-the-art equipment and fast, reliable, personal service has placed us among the top master distributors of satellite receiving equipment in the nation.

We offer you rapid delivery of the most respected names in the satellite systems industry. Our close, hands-on supervision of each shipment is your assurance of never becoming just another "order number". And we follow up on everything we sell with training and service.

If you would like to know more, call today on our toll free number,* 1-800-762-2110. Let Satellite Earth Stations put the world in the palm of your hand.

*In Louisiana call 1-800-252-3307.

SATELLITE EARTH STATIONS



1-800-762-2110 La. 1-800-252-3307
P.O. Box 160 Mamou, LA 70554

We carry top lines from Dexcel, Luxor, Chaparral, KLM & Janeil - plus more!

properly. If our systems all had the reliability and quality which they advertise, our sales potential could be met easier and our industry could grow even faster. We would certainly be taken more seriously by the people and institutions that we would like to help, and acknowledge our existence.

I am not a dealer that is out to 'get even' with an OEM or distributor; that's why I am not 'naming names' of those responsible for the 'junk' that still exists in the marketplace. But, I would like to see those people, organizations, and so on that have the ability to make positive changes in our industry's quality control to begin to police those manufacturers who sell inferior equipment to unsuspecting dealers. After the 4 years of changes which I have seen, I believe we have the potential to achieve the credibility we must have.

I don't need Alcoa/NEC to tell 'me' what DBS is — we've been doing it for five years. But, if we don't take care of our own house, someone else might do it for us. Soon, U.S. manufacturers will be competing against the very equipment they are now importing. Foreign firms apparently know what 'Quality Control' means. Ask Coop or Guy Davis from Uniden about the possible danger of competition from foreign markets. They have the vision to see it coming!

Those who believe the recent STTI/SPACE confrontations are the 'biggest problems' we can expect should wake up. If the manufacturers currently in our industry would correct their own (product) problems and some sort of consumer awareness program were to begin, we might all be able to stay in business. **We created the TVRO industry;** shouldn't **we** now take the steps necessary to see that **we** stay in business?

Roger Sellers
TWS Electronics, Inc.
P.O. Box 250
Roscoe, Il. 61083

In our April 1983 issue of CSD, **we published a** 'Survey Questionnaire' **in which we asked dealers and others to comment on the specific equipment which they had been experiencing problems with. We published the results of this survey in an early summer issue of** CSD. **One full year has now gone by, and the time has come to repeat the process. We lost a considerable amount of advertising when we ran the last survey simply because the survey results did not please all of the manufacturers** (you can do an interesting comparison of who did poorly on the survey in 1983, and the firms that do not advertise in CSD). **Our May issue will revisit the subject and provide a 1984 opportunity for a new look at the subject.**

BUSINESS Ethics

On December 20th I sent a Bank Cashier's Check to **XXX** for eight antennas. The total amount was $1990. On December 26th I talked with one of the owners of the company on the telephone and explained that I wished to cancel the order. I asked, and he agreed, that the check would be returned, uncashed. The check had not arrived yet, according to the co-owner.

On December 30th the check was endorsed and deposited by the co-owner of the company. For a full week after December 30th, I was told on the telephone that the check had **not** been received. I now have figured out that they told me that so I would not 'stop payment' on the check on this end. I had my banker contact their banker and finally on January 26th they sent me a check for the refund. Unfortunately, the check had not been signed. So we called the supplier and then his bank, again. "Send the check through, it will be honored" we were told. We did, and it was not. It came back marked 'insufficient funds.' Since that time we have been promised, daily, a new check. We have also contacted SPACE and many other groups asking for their help. That apparently did not help us as I was then told that I "would have to wait a long time for my money" because "you have caused us a lot of trouble with the industry." The sad part of it is that I like the product, it is fairly priced and I like the people. But I do want my money back!

Thomas Arkfeld
Tom Arkfeld TV Co.
16233 Camelback
Victorville, Ca. 92392

CSD **deleted the name of the supplier since we have only one side of the story at this point. It does illustrate how difficult it may be to do business in the TVRO world when one or more of your suppliers is located half way across the country in Texas. It also points up that even when you send out a** Cashier's Check, **as requested, it is** possible **to** 'stop payment' **on such a check at your local bank as long as the check has not come back to your bank. When you find yourself canceling an order, and you have no experience with the supplier in getting a refund, it is best to take every possible step to insure that you don't end up, like Arkfeld, fighting to get your money returned.**

COOP/ continued from page 5

HOW TO START A WAR In Korea

Back on January 23rd the Japanese lifted into Clarke Orbit a new satellite. They called it BS-2A before it launched and after it was successfully in position it was nicknamed Yuri for lilly. Actually it is Lilly 2-A since it follows in the footprints of a 1978 launched experimental satellite (BSE) which was first called Yuri. As satellites go, this one is a 'little fella' but the Japanese are rightfully proud nonetheless. It was totally designed and built in Japan, and they even launched it themselves from Tanegasima Island. After the recent failure of a pair of satellites which the Shuttle was supposed to launch (Westar VI and Palapa B2) the no-hitch flight of BS-2A seemed even more impressive.

Barely bigger than a tiny dish, the whole satellite measures slightly more than 4 feet on one side and slightly less than 4 feet on the other side. It weighs in at 350 kilograms and on board are a pair of 100 watt output TWT powered 12 GHz TV channel relays. The system will begin regular service around the first of May and through it many Japanese homes (as well as many on the slightly distant island of Okinawa) will have access to their first high quality television. Japan has lots of television (six channels off-air in most locations) but being a montainous country, there are pockets of perhaps 2,000,000 homes or so, total, where direct TV is either poor or non-existent.

In addition to supplying these 2M homes with their first high quality television, Yuri 2-A will also provide Japanese OEMs with a pair of real world DBS type satellite signals which they can use for test and marketing purposes. There is a race on to supply Japanese designed and Japanese manufactured TVRO terminals; 12 GHz DBS terminals to be precise, to those 2M homes. In typical Japanese fashion, Yuri is the best of all worlds; it provides signals for real world testing, it provides a market for the development of real world installations, and it may even provide the Japanese OEMs with an opportunity to make a buck or two. Nothing fuels technological progress like a few bucks left over on the bottom line after all of the expenses have been paid.

Now we all know, because we have been told it is so, that 12 GHz 'beams' are much tighter than 4 GHz beams; that if you can receive 4 GHz beams from Westar 5 or Satcom F3R way down in the Caribbean, or way out in the Pacific, a 12 GHz satellite would not allow any such 'spill over' of signal. It is the nature, we are told, of 12 GHz antennas and beam patterns that 'spill over' does not occur. At least not unexpected spill over.

Which brings us to Korea. You may remember Kora; they are just north of Japan and 'M.A.S.H.' spent nearly 15 years there trying to figure out how to finish off a conflict that really lasted about three years. Korea is very upset about that 350 kilogram package called Yuri. Terribly upset.

Even before Yuri was lofted into orbit, there was a series of editorials appearing in Korean newspapers. Those editorials claimed that Japan was 'back to its old ways,' substituting 'cultural imperialsm' for 'armed imperialism.' If your history is pretty decent, you may recall that in centuries past Japan's rulers did indeed run a little rough shod over Korea. On more than one occasion. The Koreans remember. Boy, do they remember!

At least some of the powers in Korea see 'Yuri' as an aggressive machine; the work of a Japan planning to renew an ancient aggression against Korea. They have figured out that Yuri's signal(s) will be capable of being received over say 50% of South Korea with nothing

more sophisticated than a 1.2 meter dish and a modest electronics package. Knowledge that Japanese television, via Yuri, was just a few months away, sent many high-up officials in Korea into a panic. **Among** their early reactions, we had:

1) An official government statement **decrying the Japanese satellite** and claiming that under international law the Japanese were supposed to formally advise Korea of the satellite's "spill-over coverage" prior to the launch (something the Japanese did not do).
2) In Seoul, Vice Minister of Communications Oh Myung claimed that the Republic of Korea **will 'ban' the importation of TV satellite reception parts** which might be used to pick up Yuri 2-A.
3) In several South Korean cities, civic groups have launched **"Don't Watch Japanese TV"** campaigns. There are bumper stickers, messages on local radio . . . posters and banners proclaiming the Justness of the cause.

Meanwile, down in Tokyo, some engineering type was quoted in the local newspapers as saying 'NHK will be happy to assist Koreans who need technical help in receiving Yuri 2-A transmissions.' You can imagine how that one went over inside of Korea!

I have never seen Korean television. I am told that it cannot compare with Japanese television. I am told that the Japanese television 'habit' of giving massive parts of the weekend over to Samurai Wrestling matches will find countless millions glued to their TV sets in (South) Korea.

Now just for the record, the 1988 Olympic games will be held in South Korea. And also just for the record, there is a push underway to get a (South) Korean domestic satellite put together and launched prior to that event. The Koreans obviously figure they can make some bucks by forcing all of or some of the gigantic Olympic games coverage out of their country on their own domestic satellite. But that is 1988; **Yuri is now.**

Also, just for the record, we **today** have several very competent manfuacturers of TVRO hardware in Korea. They fall into two categories; Korean firms who are marketing here directly (the largest of these recently hit 4,000 TVRO receivers per month being imported into North America) and firms such as **Sat-Tec** who recently began bringing back from Korea their own TVRO receivers built on Korean assembly lines to Sat-Tec specifications. I would have to assign the total market share for Korean produced products to at least the 15-20% region, right now, today. That could go upwards very fast in 1984, or, it could tumble down to nothing once again.

If we have that much 4 GHz technology 'turned on' in Korea, we already have a very substantial 'microwave technology base' in place within Korea. Can you imagine the difficulty facing one Oh Myung as he has his cadre of customs people going through parts shipment after parts shipment coming into Korea, trying to separate out the **4** GHz parts from the **12** GHz parts? Obviously his call for a banning of 'microwave parts imports' is nice rhetoric but just a touch impractical.

So here is my fearless forecast. After the political clamor has died down, somebody in Korea will point out that they can probably create, manufacture and sell, **just inside of Korea,** 10,000,000 or more Yuri terminals. That spells more jobs, more bucks in the economy, and more technical expertise to equip the Koreans for higher level competition down the road in the 12 GHz markets that are coming. And so the political rhetoric will be forgotten, and somebody will figure out a substantial (but manageable) 'tax' to be attached to every Yuri terminal sold within Korea, and the money will go into one or another government slush fund. **Everyone will be happy about this but the Japanese,** who will awaken one day and discover that the Koreans, with less expensive labor and less concern about quality, are competing with them in the 12 GHz world marketplace with products that end up costing perhaps 60% of what the high quality Japanese products cost. And it will all trace back to the launch, in late January of 1984, of Yuri-2A and the insatiable Korean appetite for Sunday afternoon Samurai Wrestling.

GRABBING The BULL By The Horns

Roger Sellers, a dealer in Illinois, writes in this month's Corres-

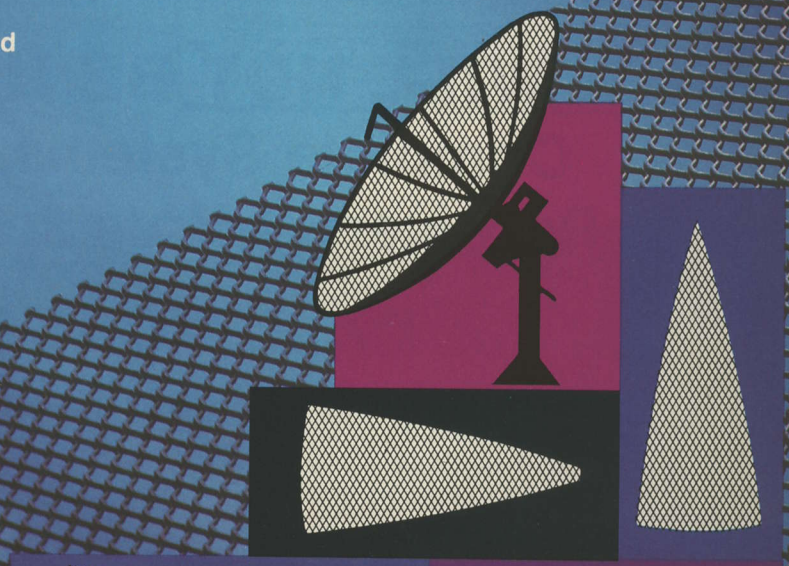
COOP/ continues page 65

METALEX® CORPORATION

Speaks Openly!

Our story has holes in it. Many holes. Holes by design. Expanded and perforated metal to give satellite dishes great advantages over solid dishes!

- Approximately 70% reduction in wind load, for increased stability with less strain on antenna and supporting structures.
- Lighter weight than solid metal or fiberglass. Reduced weight means lighter support structure.
- "See-Thru" Pattern blends into the landscape.
- Better Solar Heat Diffusion decreases amplifier noise.
- Specially Engineered Metalex Expanded and Perforated Metal maximizes antenna gain.



Metalex Corporation World's Largest Producer of Custom Petals in Expanded and Perforated Aluminum and Steel for High Performance Satellite Dishes.

METALEX® CORPORATION

PIONEER MEMBER OF SPACE®

Box 399, 1530 Artaius Parkway, Libertyville, IL 60048 (Chicago suburb).

Manufacturers Inquiries Welcome
CALL TOLL-FREE
1-800-323-0792
(In Illinois: 1-312-362-8300)

COOP/ continued from page 62

pondence section about quality control, or the lack thereof; and what that does to the dealer who is trying to make a buck selling TVROs. **Sellers suggests** that unless manufacturers take greater pains to insure that the equipment they ship works as it is supposed to work, the American market may be lost to import products produced in areas of the world where quality control means something more than a rubber stamp that says 'QC' on it.

Another reader sends along a one sided, single sheet computer generated mailer that headlines:

"Attention Manufacturers: The Time Has Come Today!". This sheet is pushing a new publication to be called **'Home Satellite TV Consumers Report'** and the sheet makes the claim that the rapid growth of our industry has resulted in a flood of products onto the market. It concludes that "the consumer needs a report and guide to be able to make a valid choice of what he/she wants or gets for the dollar spent."

The concept is that manufacturers will provide equipment to the producers of this report and they will test the products. They will also write up the products for their publication. The sheet notes **"This review is strickly** (sic) **for the consumer, not the technician . . .".**

The sheet makes the claim that ". . . over 90% of the manufacturers contacted to date were not only pleased to send their products for testing and review, they also sent additional funding to assure the success of this long overdue publication."

Product testing is hardly a new concept. **Consumer Reports** has been testing hundreds of products per year for decades. **Mechanix Illustrated, Popular Science** and many other well known publications routinely test products. Many of the automotive trade publications test products as do many of the consumer oriented stereo and hi-fi publications. **CSD** began testing products and writing about them some four years ago. I have long regretted that there is no logistical way to test **every product** on the market **every year** or so. There is certainly a need for this kind of testing.

One of the first things one should consider is the qualification of those doing the testing. I searched the sheet looking for some name I would recognize but found none. There were vague references to "engineers, technicians and consumers" doing the testing but nothing specific. A recognized authority, **such as Clyde Washburn,** would have caught my eye. Alas, there was none.

The next thing one should consider are the motives of those doing the testing. Getting accurate data into the hands of the consumer seems like a noble goal. Two lines caught my attention, however.

> **"Those manufactures** (sic) **wishing not to participate will be listed in this publication so the consumer is aware of which manufacturers were** not willing **to have their product tested for this review . . .".**

And then there was:

> **"Products sent become the sole property of Studio A Testing Labs . . .".**

That's an interesting ploy. First you threaten the manufacturer with a 'blacklist' (. . . "those wishing NOT to participate will be listed . . .") and then you retain all of the equipment donated to you.

When **CSD** tests equipment, we offer the manufacturer **the option** of bringing it down himself and then taking it back out himself after the tests are completed. That gets the manufacturer a 'private' review, our own analysis of what is right and wrong with the product. Or, we **offer** to keep it down here, make our comments and then re-visit it every few months at least for test purposes if not in print to see how it is holding up. We found out early that some gear works fine the first week, 90% fine the second week, 80% fine the third week and so on. In a few months it is trash. Manufacturers know we WILL revisit their gear from time to time, and many are more concerned what will happen in time than they are with what happens when the unit is new, out of the box.

I can imagine the reaction of an OEM getting this letter from these guys. The threat of being black listed for not sending equipment is not even hidden. That's a great tact to take when you are brand new in the game.

After getting through a firm's qualifications and motives, you next need to consider how they intend to handle your product. Is this a Consumer Reports type of project? Apparently not since CR goes into

the open market and purchases products with their own money, usually well down the distribution line from the OEM. **We did the same thing with feeds this past fall** and we recently completed buying one or two each of all of the major modulators on the market for a hard look at modulators in a future issue of **CSD.** When you separate yourself from the OEM, totally, you stand a better chance of being in the dealer or consumer shoes since you get no special treatment that way. And that makes good sense.

But another line bothered me in this sheet.

"Make additional support checks payable to: Studio A . . .".

Additional support for what? Here are a bunch of guys trying to write a book, which they undoubtedly will sell for money if they ever get it into print. Their research material consists of 'donated equipment' which ". . . become(s) the sole property of Studio A Testing Labs . . .". If their book fails, they can have a huge garage sale for slightly used TVRO gear. So why do they need ". . . additional support checks . . ."?

There is only one obvious **answer.** They are asking the manufacturers to 'buy them off'; to send equipment **plus** money. The equipment will insure the manufacturer does not get on the 'black list' of non-suppliers. The money . . . well, who says you can't buy a 'good review' when you grease the hands of the writer?

I am certain very few OEMs fell for this ploy. I'd like to think the letter is a badly conceived joke and that somebody with a great sense of humor such as Dave McClaskey will jump out from behind a dish waving a big 'SURPRISE — The Joke's On You' sign before this one gets too far down the road. Alas I'm afraid these people **are** for real, that they **mean** everything their badly constructed and poorly spelled full page computer generated letter said. We have been preaching 'Caveat Emptor' for years; **Buyer Beware.** I wish my Latin was good enough to issue a new warning; **'Seller Beware.'**

ONE FOR THE BOOKS

Going through several ragged cartons which made the trip from Oklahoma to the Turks and Caicos Islands with me in 1980, I happened upon a set of photographs taken during the first industry trade show; held in Oklahoma by yours truly in August of 1979. As I mused through the collection (not properly stored, and with the semi-tropical heat and moisture now largely one large 'glob' of Kodak paper) I remembered that there was more than the simple beginnings of an industry at that first show. There was exciting new technology which the world had never previously seen.

My mind wandered to **Pat** and **Andy Hatfield,** carefully scheduling Andy's annual vacation leave from his full time employment (he worked for a major computer firm) so that the now well known duo could appear in Oklahoma City with serial number one of their AVCOM receiver line. My heart skipped a beat as I found a photo of Tay Howard and myself standing before the entrance way to the South Oklahoma City Junior College where this industry's show tradition began. On the wall was a metal plaque with some engraved words; something about **'May the Spirit Of The Pioneers Never Die.'** Taylor had found that plaque and dragged me to it so we could be photographed with the appropo wording. I also recalled the patience of Robert Coleman from South Carolina as he sat for hours and hours in Oklahoma City carefully teaching people how to build down converters or even LNAs!

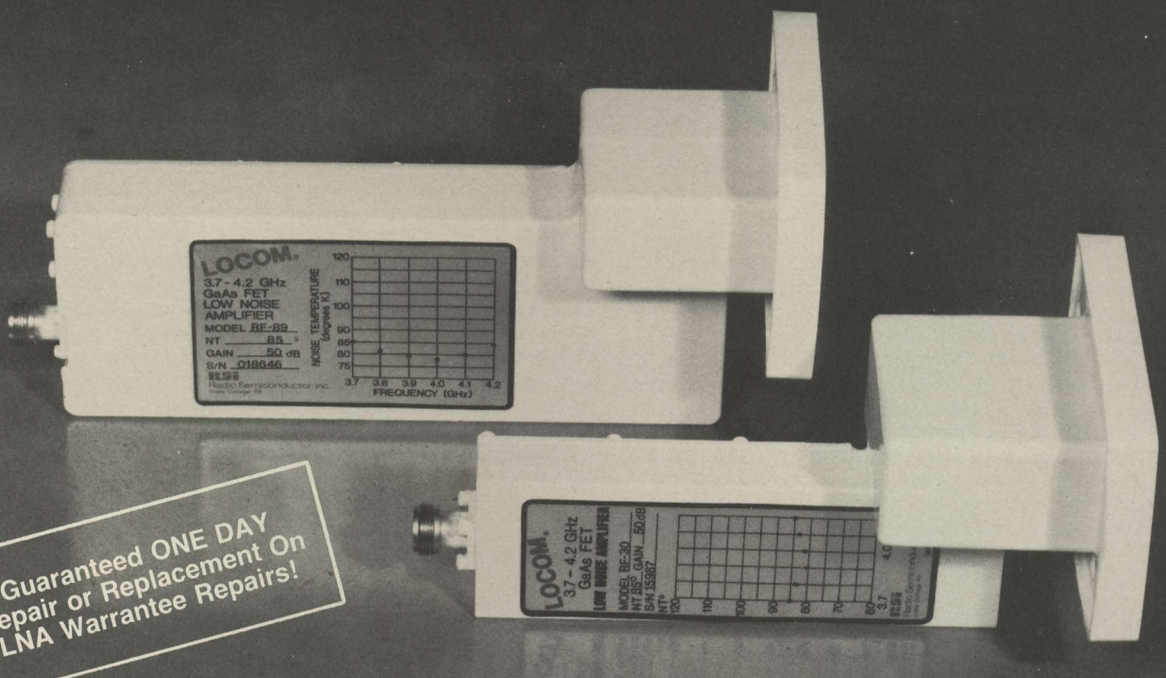
Then I happened across a photograph that really said it all. Provided you knew what the photo meant. There he was; **John Kinik.** With a 3/8" hand drill grasped in his right hand, John was standing inside of a 12 foot dish drilling away. Not very many people realize who John Kinik was, and, what his contribution to our industry was. I think it may be time to set the record straight.

Kinik, a Canadian, had come to California in the late 70's. He was fresh out of the Canadian Tele-Sat program and had played an engineering part in the early development of the initial ANIK series birds. In California, he landed a job with a major producer of satellite equipment, and satellites; Philco-Ford. John's role was not key at P-F, but he was one of those rare individuals who understood how the system worked so he was able to keep people higher up than he from making foolish mistakes in public.

I first met John late in the Spring of 1979. I was visiting with **H. Paul Shuch,** another pioneer in the business (Shuch designed the

LOCOM®
RADIO SEMICONDUCTOR

From the Company that first introduced the Professional HP 8970A test set to the TVRO Industry
(See "Coop's Satellite Digest" Feb. 1983)
comes Professional Reliability!



Guaranteed ONE DAY Repair or Replacement On LNA Warrantee Repairs!

STRESS TESTED FOR HIGH RELIABILITY!

LOCOM LNAs are stress test under the following environmental conditions:

- We perform a Commerical burn-in, on all LOCOM LNAs.
- We analyze the microwave performance, including linearity, gain and bandwidth, at −10°F, on all LOCOM LNAs.
- We analyze the microwave performance, including linearity, gain, and bandwidth, at +130°F, on all LOCOM LNAs.
- We leak test to detect and correct pin-holes (which allow corrosion-related failure), on all LOCOM LNAs.

These professional tests are performed on all LOCOM LNAs to insure that they last, and last, and last.

VERY LOW NOISE!

LOCOM LNAs are the best value for very low noise.

NEW MODEL: 50dB, 120° to 70° NT—Model RF-900
NEW MODEL: 44dB, 120° to 75° NT—Model RF-910

Radio Semiconductor, Inc.
315 Benner Pike, State College, PA 16801 U.S.A.
Tel: (814) 238-2133 / TWX 510-670-3640 RADIOSEMI
(800) 233-3028 (Outside PA)

first **ICM** satellite TVRO receiver), in his San Jose home and Kinik came by. Shuch was testing a new type of dish antenna. It was constructed from a 'kit' and **he had proto-type kit number one.** Kinik had designed the kit and by pooling all of his limited resources he had made numerous trips back and forth to the local hardware stores gradually buying up all of the Reynolds aluminum channel in stock in the county. I'm sure Reynolds' sales execs are still looking at this 'aberration' in their sales curve that occurred in the spring of 1979, in the southern end of the San Francisco Bay Area, wondering how to duplicate it again. Hundreds of people who needed just a single length of 3/4 inch aluminum channel probably had to wait weeks or months for the supply line to re-fill. Kinik started a one-man run on Reynolds materials.

I was fascinated with the antenna. Mind you, if you wanted an antenna in those days, you had two choices:

1) You went to some military/electronics surplus yard and you spent a day climbing over, through and under piles of junk looking for some discarded dish which only had minor holes in it, or dents and dings or blemishes. It usually cost you over $500 and if you found one larger than ten feet in size, you were wildly excited even to the point of forgetting that this one-piece spun aluminum bird bath could not be legally hauled on the highway!
2) You went to Anixter-Mark of S/A or somebody in the big buck antenna biz and you laid down upwards $5,000 for a reflector. You paid extra for the mount and if you wanted a feed and some way to support the feed, well, add another grand.

Here, in Shuch's backyard was a 12 foot dish that John Kinik claimed you could 'build in a weekend.' He bought all of the materials, provided detailed blueprints, and he cut all of the pieces for you. There was one thing he did **not** do; **drill the holes.**

Kinik was one of those guys who insisted on close tolerances and great structural strength. I guess he had spent so many years wandering about Canadian Arctic sites seeing twenty foot snow drifts piled on top of dish antennas that he just naturally felt the dish had to be built like the Golden Gate bridge to survive. If you will look closely at the photo (pg. 73), you will notice that each of the rib support struts is re-enforced about every 6 inches with a perpendicular member. Whenever and wherever two pieces of aluminum joined together, in a rib, in the hub, around the outer rim, Kinik had you drill a hole. Or two holes or four holes, and insert, by hand, a sheet metal screw or a bolt and nut.

"One weekend, 'ay?" we asked John. He assured me that two people, dedicated to what they were doing, with a plentiful supply of brew on hand, could do it. We'd see.

The price was right; just $995 for a 12 footer. And that included a simplistic Az-El mounting system and the support struts for the feed.

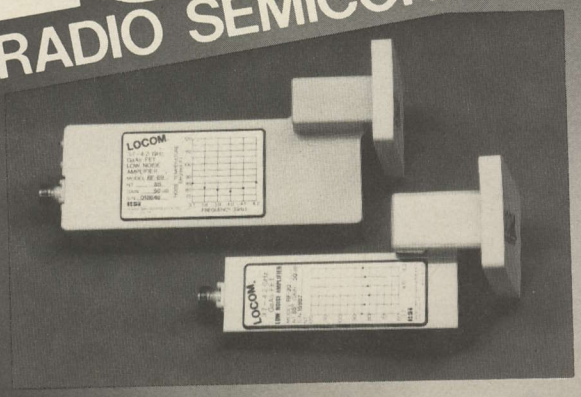
Things looked bright for John Kinik; he had a special technology that nobody else had, at the time, and he was obviously willing to sacrifice himself to get into business. He decided he would ship a 12 foot version of the antenna (a 15 footer would also be offered) to Oklahoma for the industry's first trade show.

There were other antennas there, also, of course. Jim Vines had the first of his Paraframe models on hand; Stormy Weathers (I kid you not; that is his name!) brought a junior (12 foot) version of his USTC 20 foot CATV system, and then to be 'cute,' he threw together a screen mesh version as well. That was, to the best of my knowledge, the first commercial screen mesh antenna offered to the industry. None were ever sold although Taylor Howard had been using a screen mesh 15 footer at his California home since 1976 or so and in the years to follow the 'taboo' against screen mesh would evaporate.

Kinik paid more than a grand to ship his antenna to Oklahoma as 'excess baggage.' He got in a hurry, worried it would not make it as air freight, and finally bit the bullet. When it arrived, hundreds, no — thousands of small pre-cut aluminum parts (and some not yet pre-cut) tumbled from the cartons. The show's antenna display yard was on the second story all concrete roof of a building. You walked from the main meeting area foyer past the small 8 booth exhibit area through some glass doors where there were the half dozen or so antennas on display. Kinik began his assembly just to the right of the doorway as

COOP/continues page 73

LOCOM® RADIO SEMICONDUCTOR BLOCK CONVERSION SYSTEM



Quality Polarotor II Controller available as an Option.

NEW!
BLOCK CONVERTER IN
NEW COMMERCIAL QUALITY
WEATHERPROOF HOUSING

BLOCK CONVERTERS,* LOW NOISE AMPLIFIERS, & BLOCK RECEIVERS*

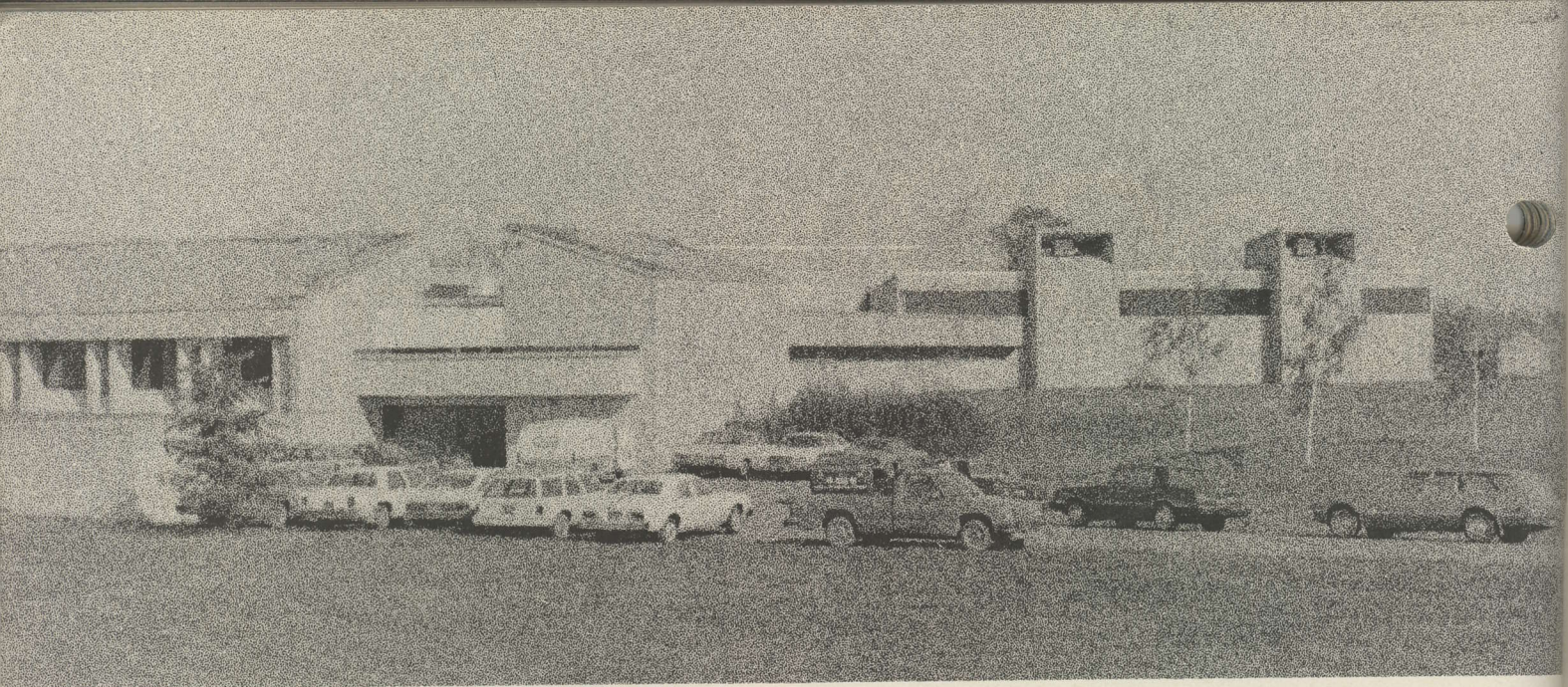
SINGLE DWELLING—NEIGHBORS—SATELLITE MASTER ANTENNA SYSTEMS

for SYSTEM Info Call (800) 233-3028 (Outside PA)

* Manufactured under exclusive license from Anderson Scientific/FIVE PATENTS PENDING

Radio Semiconductor, Inc.
315 Benner Pike, State College, PA 16801 U.S.A.
Tel: (814) 238-2133 / TWX 510-670-3640 RADIOSEMI

Call or Write for
FREE Booklet
"BASIC DESIGN OF
BLOCK INSTALLATIONS"



Corporate Office: 21st Century Park, Clifton Park, NY 12065

We're expanding the quality of our services to meet the quantity of your needs.

NSC™ NATIONAL SATELLITE COMMUNICATIONS™

For More Information: 1-800-833-4485
In New York: 1-518-783-0088

Florida Office: 10789 Satellite Boulevard, Orlando, FL 32809

NOW I ASK YOU . . . WHAT IS MORE FRIGHTENING THAN 'COOP' ONCE PER MONTH?

EFFECTIVE IMMEDIATELY — CSD is now TWICE per month! Subscribers receive CSD (1) on the first of each month via AIRmail. **AND** this is followed by the mid-month version, CSD/2, on the 15th of each month. **NOW** you are never more than two weeks away from 'fresh' Coop reports, reviews, research and commentary. ALL CSD subscribers in the U.S.A. automatically receive BOTH issues; COOP twice per month! Those outside the U.S.A. still have the option of receiving CSD (1) alone, via AIRmail, on the first of the month. **NOTE** on subscription form below U.S. subscribers can elect to receive both CSD and CSD/2 via AIRmail, **or,** CSD via AIRmail and CSD/2 via surface mail (1 $10 per year difference). **Now COOP** is TWICE PER MONTH!

COOP

TWICE PER MONTH!

THE COMPLETE COOP ORDER FORM

CSD ANTHOLOGY

___ **ENCLOSED MY PAYMENT** of $100 FOR CSD Anthology Volumes One **and** Two. Send both via UPS to my stateside (zip-coded) address.

___ **ENCLOSED MY PAYMENT** OF $125 FOR CSD Anthology Volumes One **and** Two. Send both via international AIRmail to my non-U.S. address.

COOP'S SATELLITE DIGEST (CSD) / **Domestic** U.S. Addresses **Only**

___ **$75 ENCLOSED** for 24 issues per year of CSD/CSD-2 starting with April 1984 issue. Send via AIRmail to my U.S. zip-coded address.

___ **$65 ENCLOSED** for 24 issues per year of CSD/CSD-2 starting with April 1984 issue. Send CSD(1) via AIRmail **but** send CSD-2 **via surface mail** so I can save $10 a year.

COOP'S SATELLITE DIGEST (CSD) / **Outside** Domestic U.S.A.

___ **$60 ENCLOSED** / Enter my Canadian or Mexican subscription to CSD(1) **only,** via airmail. **U.S. funds enclosed.**

___ **$85 ENCLOSED** / Enter my Canadian or Mexican subscription to CSD **and** CSD-2, via airmail. **U.S. funds enclosed.**

___ **$75 ENCLOSED** for 24 issues per year of CSD/CSD-2 starting with May 1984 issue. Send via AIRmail to my U.S. zip-coded address.

___ **$65 ENCLOSED** for 24 issues per year of CSD/CSD-2 starting with May 1984 issue. Send CSD (1) via AIRmail **but** send CSD-2 **via surface mail** so I can save $10 a year.

OR **ORDER by telephone; call 305/771-0505** between 9 AM and 4 PM weekdays (eastern time) and use your VISA / Mastercharge Card!

FILL OUT PRECISELY / For Subscription Addressing and Shipping

MY NAME _____

COMPANY AFFILIATION (if any) _____

ADDRESS _____

TOWN/CITY _____ STATE _____ ZIP _____

SEND YOUR ORDER TO:
CSD/Coop's Satellite Digest
P.O. Box 100858
Fort Lauderdale, Fl. 33310

OVER 1000 Pages In The

HOME SATELLITE TERMINAL TEXTBOOK

EVERYTHING you will ever need to know about the home satellite TVRO system. During the first two years of **CSD,** every topic from antenna measurements to LNA design was covered extensively. There are dozens of features on receiver design, LNA installation and selection procedures, dozens more on how the satellite system operates, and how it fails. It's all here in the new two-column **CSD ANTHOLOGY** now available for immediate shipment!

TRACE the beginnings of the home TVRO industry, from the first Taylor Howard and Robert Coleman receiver designs through today's ultra-modern, sophisticated consumer products. The complex text of the original Arthur C. Clarke **'Wireless World'** article, written in 1945 (!) describing how geo-stationary satellites would be designed and function. Follow the development of programming permission battles, the start-up of SPACE, and see how one David Barker article in the June 1980 **CSD** changed for all time the mass production of TVRO receivers!

FROM sun noise outage to a look at the first private terminal receiver product ever offered for sale (1978!); from the first experiments by pioneer Oliver Swan leading up to the development of the Spherical antenna design, to the sleek, sophisticated motor driven spaceage terminals of today. Everything that ever happened in this young, dynamic industry worth reporting is covered in detail and depth in this 1,000 (plus) page 'Textbook'!

Now you have the full first two years of CSD, a textbook of the whole industry on your bookshelf. Year one (12 issues) is bound together with a 16 page foreword by 'Coop' in **CSD ANTHOLOGY/ONE.** Year two (the second 12 issues) is bound together as **CSD ANTHOLOGY/TWO.** Within the United States, either year for $60 or both years for the combination price of $100. Outside the USA, either year for $75, or both years together for $125 (US funds only). Put the industry's number one textbook, **CSD,** on your bookshelf today with this special collector's series of Anthologies.

ONLY 1,000 SETS of this two year dual-volume Anthology were printed. If you think finding back copies of the monthly **CSD** is a difficult chore, wait and see how hard it is to pry somebody loose from their **CSD ANTHOLOGY** after the present supply runs out! **To Order** your copy or copies, **turn page over and use order form there!**

COOP/ continued from page 68

you went outside.

The set-up day came, and went. Kinik was still laying out pieces, hundreds of pieces, all over the concrete veranda. **Day one of the show came . . . and went.** Kinik, by now working in the terribly hot August sun usually stripped down to his jeans, had virtually no top layer skin left on either hand. He left a trail of sweat and blood as he stumbled around the aluminum jungle gym he was building. Several people felt sorry for him and pitched in to help. While others were inside with the air conditioning watching through the tinted glass windows, Kinik, the machine, kept drilling holes and popping bolts; stopping every so often to pull out another hacksaw blade and redress some piece which had been improperly fashioned in his California garage.

Day two came, and went. By now the major structural assembly was completed. And by now perhaps 100 of those attending had volunteered from a few minutes to a few hours of their time to help the tireless John with his project. Side bets were now starting; **would** John finish his antenna, and **would** there be pictures, before the end of the third (and final) day of the 'Seminar'?

Bruised, numb, bone-weary and largely dehydrated by the sunshine, Kinik arose on the last day of the show determined he would have pictures before the show broke up in the middle of the afternoon. Ahead of him was the massive job of getting the dish 'skinned' with the aluminum panels. Alot of aluminum panels. They had to be trimmed, and fitted, and drilled, and attached. Now largely alone, he had outlasted the volunteer help and with the dogged determination of a man possessed, he dug in for the fourth and final day of antenna assembly.

Although the show would close up at 3 PM, John Kinik was determined to have the antenna finally assembled by 12 noon. **He made it, with just minutes to spare.** As he finished, it became apparent that building your own antenna was no simple task. That drilling more than 7,000 holes required several hand drills, fingers that had six or more extra, sheddable layers of skin to take the bruises, palms coated with asbestos and the will of iron. Not to speak of perhaps a gross of 1/8th inch hardened steel bits!

I cannot remember who it was, attending the show, who bought the antenna at the show. I suspect it was somebody from Arkansas. I do remember one unforgettable line that passed back and forth between John Kinik and the buyer, however.

"Will you deliver it?" asked the buyer. Kinik said 'no.'

"Can you take it apart so I can haul it home in my pick-up truck?" the buyer asked. Kinik just smiled. You can picture the smile on his face without knowing the man. Here as a guy asking him to **take apart** what he had just spent 4 days putting together!

"OK," said the buyer, **"tell you what I am prepared to do. If you** give me $100, **I am prepared to get this thing off the school's property before they condemn it and take it themselves!".**

John Kinik. He paid the price to be a pioneer in our industry. The fingers healed. The feeling finally returned to his arms and shoulders. After a few months, the burns from the sun even cleared up without skin grafts! But his employer, Philco-Ford, well, they simply did not understand.

As a 'reward,' Kinik was called on the carpet when he finally returned home to California. He was asked to explain how he, a 'professional in the satellite engineering field,' could be involved in this 'pirate television' thing. **He was given a choice;** give up building and selling home TVRO antennas, from his garage, **or,** give up his job.

Maybe now you can see why if you have joined this industry since 1980 or so, you have never heard the name of John Kinik. You can figure out on your own what his decision was, in the late summer of 1979. Those bruised fingers and hands probably played a part in that decision.

I would like to think that John Kinik will not be forgotten, however. Here was a man who dared to look every other antenna manufacturer in the world in the face and say **"I know I can do it for** less **money, as good as or better, than you do it."** Here was a man, a quiet man from Canada, who figured out several creative, new ways to make aluminum go together as no man before him had ever done. Kinik antennas may not be a household word, but you will see some of John Kinik's pioneering in every Paraclipse or Hastings or Hero or

JOHN KINIK with hand drill on the final day of assembly for his 12 foot dish at the industry's first (STT/SPTS) **gathering.**

Continental (etc.) dish you see in this field today.

Someday I'll tell you the story of the man who created the term 'sparklie.' His name was Cliff Schrock and he, like John Kinik, was a pioneer who got so many of us started before we even knew where we were going.

NO MORE Bad Language

Being wrong doesn't bother me; I am wrong every day about something. Being used? That bothers me. I have been used, and I am bothered.

As you might suspect, I thought long and hard about the 'Comments' appearing in the March issue of **CSD,** relating to the SPACE/STTI battles. I did something I have never done previously with ANY of my 'Comments.' After writing it, I showed it to a close industry friend who just happened to be on Provo for a few days of quiet vacation at the time.

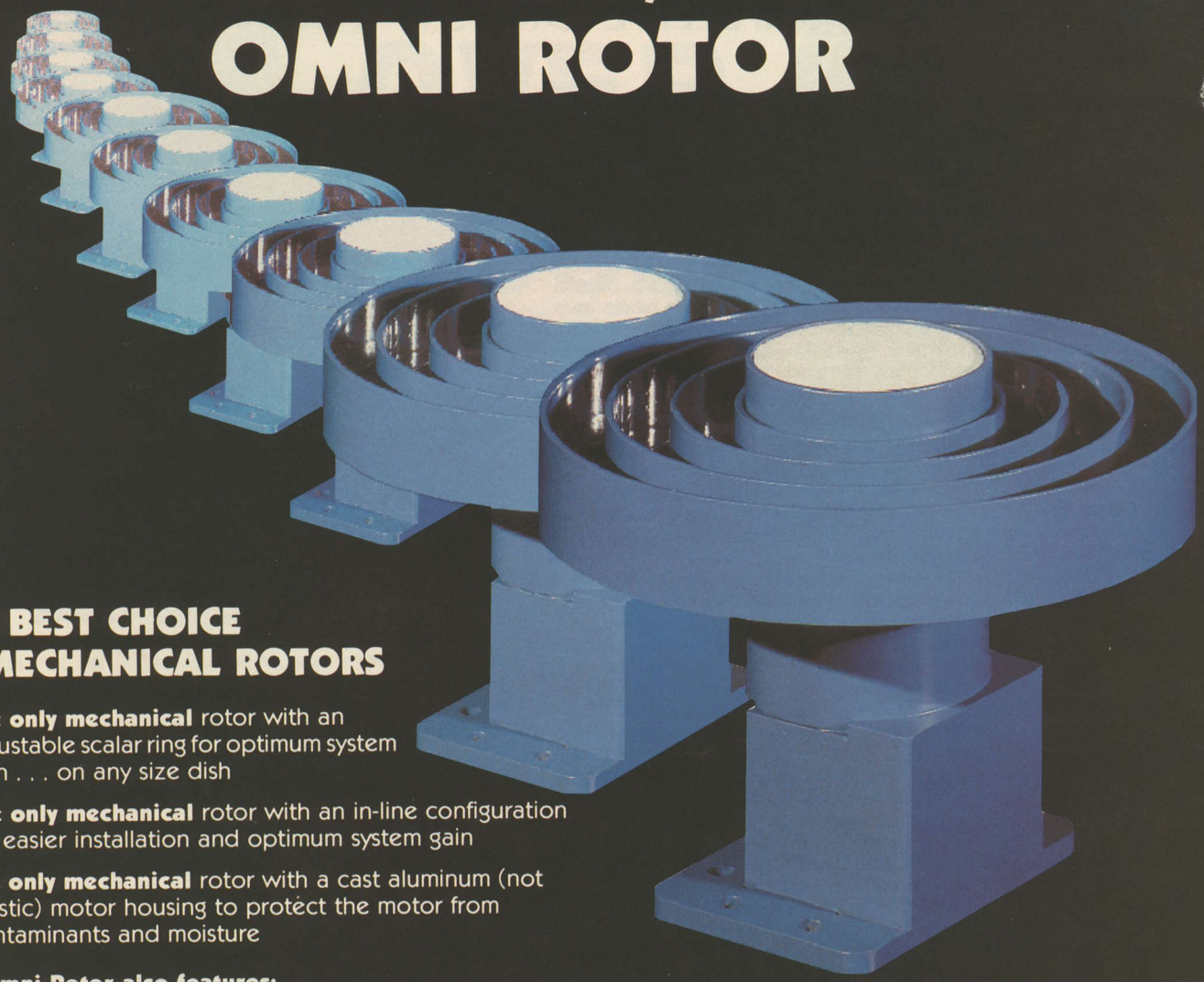
"That will blow the lid off," he suggested, after reading it through. I suggested that was not my intent. I had written what he read, and what you read several weeks later, because I could see no other way to resolve the disputes but to bring **ALL** of the arguments and sides out into the open.

"There is too large a burden here," said I, **"for a dozen or so of us to carry alone."** I was referring to those on the Board of Directors, and just off the Board, who were involved in trying to weigh the various allegations and charges and counter-charges. "I feel it is dishonest, or at least a disservice, for so few of us to be faced with this information and to try to rech the right decision. I'm not sure we are that capable."

I think the one thing that really bothered me, at the time, was that I had been hearing the various charges and claims you read in print in the March **CSD** since at least the Orlando show. And that several powerful people within SPACE had also been hearing them, and yet **to the time I wrote my 'Comments,'** nobody had taken any firm steps to really determine what was true, what was false, and who was trying to gore whose oxen. I knew only that the industry's leaders could not continue to **ignore** these charges if we expected SPACE to survive. I have a special interest in seeing SPACE continue; I started it in August of 1979 and insisted that it stay alive and healthy when the industry next gathered in February and July of 1980. I didn't keep it alive **alone,** but had I given up early, there would be no SPACE today. Nobody likes to see a child die, nor have a favorite plant wither on the vine.

Just days before the March **CSD** went into the mails, far too late for me to 'rip up the issue and start over,' the SPACE Executive Committee met in San Francisco. There, five men, honest and true, waded through reams of paperwork detailing all of the allegations against Counsel Brown. They found no evidence that Brown had unduly profited from SPACE, that Brown was 'in conflict' with any SPACE activity. They did find that his office may have been sloppy in handling such affairs as maintaining a current corporate Charter, but on balance, weighing that kind of omission against the truly outstanding legal work Brown has done for the industry since August of 1979, they

NEW FROM M/A-COM
OMNI ROTOR



THE BEST CHOICE IN MECHANICAL ROTORS

- The **only mechanical** rotor with an adjustable scalar ring for optimum system gain . . . on any size dish
- The **only mechanical** rotor with an in-line configuration for easier installation and optimum system gain
- the **only mechanical** rotor with a cast aluminum (not plastic) motor housing to protect the motor from contaminants and moisture

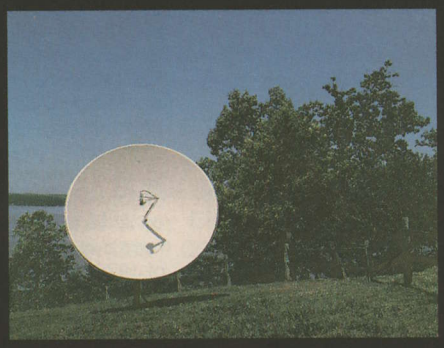
The Omni Rotor also features:

- All aluminum scalar and housing for mechanical rigidity
- 0-180° rotation with fine adjustment
- Virtually zero insertion loss

Until today, installers who favored rotor-controlled feeds had only one choice. Trouble was, there was plently of room for improvement. Now, here's the better alternative: M/A-COM's Omni Rotor.

Omni Rotor is the only mechanical rotor with an adjustable scalar ring, for optimum system gain. The only rotor with an all cast motor housing, to protect your motor from freezeup, contaminants and moisture. And it's the only mechanical rotor designed in-line, to make installation fast, easy and accurate.

Best of all, Omni Rotor is manufactured by M/A-COM Omni Spectra, the most respected name in the Home TVRO industry. Other M/A-COM state-of-the-art Home TVRO products include the Omni Polarizer (with solid state control), 8' and 10' Prodelin reflectors, polar mount, receiver, LNA, LNB and cable accessories.



Take a look at the features of the Omni Rotor, and its price, and you'll agree: There's only one choice in mechanical rotors: Omni Rotor.

Check the adjoining strip for the authorized M/A-COM distributor in your area. Or contact:
M/A-COM Omni Spectra, Inc.
21 Continental Blvd., Box C
Merrimack, NH 03054
(603) 424-4111

M/A-COM Omni Spectra

M/A-COM OMNI SPECTRA, INC.

could not find any valid reason to dismiss the man, nor to ask for his resignation. I must accept their findings since I have no reason to doubt their honesty nor their convictions.

Out of all of this has come the resolve to waste no time in re-establishing a clear and separate General Manager's post for SPACE; a post which perhaps will have been filled as you read this. The SPACE Board, all of the SPACE Board (myself included) has been remiss by not acting on this June 1983 proposal more quickly. Perhaps we might have avoided **some** of what happened this past fall and winter had we been more prompt in doing this.

The Executive Committee, with special wisdom that comes to men under intense pressure, decided late in February that having heard and weighed the evidence, having decided that a case against Brown was not clear cut, the industry should move ahead with its plans to turn SPACE into a broadly based, **multi-talent** trade association. A new office, separate from Brown and Finn, staffed with a profesisonal staff including a new VP and General Manager has top priority. And this makes excellent sense **if** for no other reason than we have far more work to do than the limited resources of Brown and Finn can continue to handle.

Before there was an Executive Committee meeting, there was an **announced** Board meeting, to be held in Washington. After the Executive Committee meeting, it was decided that the Board meeting could wait until the recently completed Vegas show; there was no need to convene a 'special' meeting of the Board prior to Vegas. I was relieved since if the special meeting of the Board had been necessary, that would have indicated to me that the Executive Committee had, indeed, found serious problems with Brown.

What is ahead is a period of rebuilding, on a strengthened foundation. SPACE, I am happy to report, has never been stronger, never more focused on the duties ahead, and never more resolved to see that the industry trade association stay together as a much needed, cohesive unit.

What we just went through was probably a very necessary part of maturity. Like puberty, it was a painful experience and as any teenager knows, the wounds left behind by puberty do not heal quickly. We have excellent leadership in place, plus the will and determination to mature wiser for the experience. SPACE is not perfect, today. But it is far better today than it was yesterday and it will be better yet tomorrow. The time has come for all of the industry to solidly support the SPACE 'effort' since as never before SPACE does indeed represent our hopes and abilities to cope with the future. I plan to do my part and I trust that you will as well.

TURN AROUND In Canada

It always happens; I say something nice about somebody and they blow it. In this case, it is the Canadian people who attempt to regulate satellite television reception. I reported in the March issue of **CSD** that at the first Canadian show held in Vancouver early in February there was a trio of 'federal people' on the stage debating, in a panel, where Canadian regulation of satellite reception was headed. I also reported that this particular trio seemed to have their heads screwed on properly and I saw 'great things' coming out of that public session. Woe is me. I was wrong.

While these guys were debating, their 'leader,' Francis Fox, was crawling around behind the bushes planning an ambush on the satellite wagon train. Here is what happened.

The Canadian Federal Government lost a court case late last year; **CSD** carried a learned analysis by Barrister Mark Lewis on the famous 'Winnipeg Holiday Inn Case' in our January issue. That court case said that under existing Canadian law, a hotel or motel or apartment or whatever **could** intercept and display American satellite signals. Provided.

Provided there was no sur-charge for the satellite reception. It was or had to be simply part of the room deal; like a bar of soap or fresh towels. This was not the Candian Supreme Court ruling in this case, but it was only one step below.

There is a phrase in the present law which says **'broadcasting receiving undertaking.'** That phrase is supposed to define what type of system IS under Canadian regulatory rule, and what type of system is not. The court found that the Winnipeg Holiday Inn's SMATV system was not a 'broadcasting receiving undertaking' and thus it, like others

that made no charge for satellite TV reception, were **not subject to** Canadian communications law. Absent any law or regulation, they were free to intercept HBO or anything they wished for display inside the motel (hotel, apartments).

So along comes Communications Minister Fox with a new bill to revise the old bill. Fox would change the wording of the old bill to 'more properly define' what a 'broadcasting receiving undertaking' is. He says he wants to shut down SMATV and MATV systems that are now able to operate outside of the regulatory law. If the SMATV or MATV firm is carrying signals which the local cable company cannot carry, that will be sufficient to shut them down. In other words, Canadian cable can't carry U.S. satellite signals so Canadian SMATV can't either.

The newly proposed bill totally overlooks the obvious; Canadian cable is getting a bad deal already. They are prevented from carrying, on cable, what individual home TVROs can tune in freely. The regulations do this because there is this terrible fear in Canada that if Canadians watch anything but Canadian television, they will go blind, sterile, or develop Aids or something worse. To protect the Canadians from an outbreak of infectious disease, **all American television programming** is scheduled to come off of services such as CBC; soon. The Canadians will watch Canadian created television, and like it, or else!!!

Actually, this is probably the best thing Fox could do to spur the sale of home TVROs in Canada. Even Fox has recognized that private, home TVROs are beyond federal policing and he has backed down and down and down from his **original position** that private systems could not watch American television. If he continues to strip American television off of virtually all of the Canadian national services, there will be millions of people who are standing in line to buy TVROs in Canada. Take away their tea, take away their hockey, but don't you dare mess with **'The A Team'!**

X RATED Television

One of the definitions of X rated movies that was **considered** for some years was that if a movie had 'no redeeming social value' it would be considered pornographic. X does **not** necessarily mean pornographic, of course, but when the movie folks were trying to get a handle on the ratings system, just about everything that might have some impact on the ratings system got tossed into the ring.

I am told that with limited exception none of the present television fare we see on satellite is 'X Rated.' I don't have a **Blue Max** descrambler (and do not want one, so **please** don't send me one!) and I cannot speak for **its** content. I certainly would consider some of the 'Miss Jones' films pornographic if I ever sat on a jury faced with that decision. **"Deep Throat"** I'd have to think about, a long, 'deep,' time.

What brings this to mind is a project we have been working on down here in the Turks and Caicos for about six months. When it became apparent to me that **CJR** was going to have to be re-named (it came out as **CSD/2** in the middle of March, and will continue to come out as the middle of the month version of **CSD** from this point forward), I did some reassessment of editorial content in **CSD** and what would eventually become **CSD/2.** I went back and forced myself to at least speed-read **every** issue of **CSD** to date (that took me two weeks), and I dug through thousands and thousands of letters which readers have written over the nearly five year span we have been publishing **CSD.** I learned, or re-learned, a great deal.

I have wanted to do a better job, technically, with the 'eastern sky' satellites for more than a year. When you drive up to our place in Grace Bay, you instantly start counting dish antennas. It presently stops at 12 and that seems like a fair place to quit, for now. Then you notice that they all seem to face the same way; towards the southwest. One fellow asked me if the 'trade winds' blew them all that way. Some of our trees down here do lean towards the southwest or west since the trade winds come from the east.

So back late in January I hired, fulltime, a young man who has been helping us out on weekends with WIV-TV and WIV-FM. His name is **Marshall Foiles** and Marshall and wife **Sherri** have been on Provo almost precisely as long as the Coopers. Marshall was first employed in the building trades here, then he spent a couple of years being chief mechanic for the local auto parts shop and garage. Along about that time I got him interested in putting together antennas and in

the winter of 1983 he and this 'old man' single handedly stacked and built the present monster WIV tower which rises higher above Provo than any piece of real estate. After we spent tens of hours lashed together nearly 300 hundred feet above the ocean bolting on antennas and 1/2 inch coaxial lines, we had a certain feeling of trust for one another.

The day Marshall started I handed him a 12 page typewritten list of things I wanted done. By Saturday. Fortunately, I didn't tell him I meant Saturday one year hence so he immediately started breaking every record in the book putting together dishes, taking down rusted antennas, putting up sparkling new antennas, running coax, building a new lab and what have you. At the end of the first month he had several new dishes installed, he had our WIV-FM station actually taking in enough money to pay the electricity bill (his wife Sherri has turned into a top flight radio-time and commercial creator person), and he had a 'Technical Lab' built into one end of what was at one time the nation's first television studio. He calls that 'Lab' area 'home' and he works there for a part of each day.

He has several **CSD** and **CSD/2** projects going in there right now. I have promised him that I won't spill the beans until he is ready so we'll wait another month or two to see what he has up his sleeve for readers. It's good.

One of the early projects was to get us operational, on a routine basis, in the 'Eastern Sky.' That meant getting at least **a pair** of dishes installed with the proper electronics so I or he or you, if you happened by, could turn on a receiver and with no hassle tune in Russia or France or Argentina or what have you from out of the Intelsat/Gorizont family off there over the far eastern Atlantic. We've had several dishes that would 'go east' for quite awhile, but they always seem to end up locked on some mundane domestic satellite for one reason or another; it was clear to me that **if** we were going to routinely monitor the European/African/Asian/South American stuff, **we'd have to dedicate dishes and receivers to that purpose.**

Which brings me back to 'X Rated Television.'

I happen to love the difference one can 'see' when you switch from NTSC (color) to PAL (color) or to SECAM (color). I wish others had the opportunity to see all three operating side by side as I do here. So when we got the eastern sky system running I started hanging around Marshall's Lab playing with the JVC Model number TM-14PSN tri-standards monitor hooked to one of the eastern sky dishes. First to Intelsat and dial up a feed originating in the UK. Great PAL color. Complete with their infamous 'flicker' which every hardened NTSC watcher immediately notices (it eventually goes away as your eyes adjust). Then dial up a SECAM transmission, typically found on Gorizont but on occasion on Intelsat as well. Breathtaking. I was doing this for the upteenth time one evening after Marshall left and was paying no attention to the content of the screen whatsover. I assure you that is possible.

Then I took two steps back and looked again. **Two totally nude people on the screen.** They were not playing Canasta.

I did what any reasonable healthy male person would do. Even a female person would have done the same thing since there was one of each sex on the 'tube' in front of me. **I gawked.** After sixty long seconds of gawking, I reached over to turn up the audio. They were speaking, panting actually, in German. **I had never heard a German lady pant before.** Fascinating.

It turned out I was watching a 'teleplay' originating on the East German **DDR-1** network. On Gorizont. I knew, or had heard, that the Germans were more liberal concerning sex than most Americans. I decided liberal was not the proper word. This was not some 'Playboy type channel' mind you; this was the **national** East German **network.** Two nude people, panting and breathing hard and murmuring something about the wind and the rain and rolling all over a tiny room. A very colorful, tiny room. Love that SECAM color.

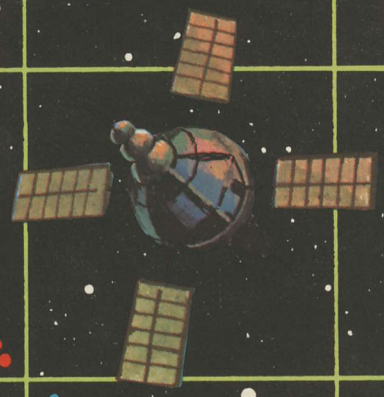
Naturally I decided I should check up on the 'SECAM color' content more often. It took me no longer than a week to figure out that Gorizont regularly closes down their long television day by uplinking DDR-1 or DDR-2 television. I even figured out which days they have 'teleplays.' I also figured out which days they have other stuff, such as a regular evening's live concert from a beer hall someplace in East Germany.

COOP/ continues page 80

Satellite Financial Planning brings Bank Rate Financing on home TVRO systems.

...Another Bill Young Company!

...the Most Complete Three Year Extended Limited Warranty Protection Plan. (Only Four Exclusions) Convenient, Just Call 1-800-932-DISH To Place Your Credit Order



$200 BONUS
TO DEALERS WITH FINANCING AND EXTENDED WARRANTY PACKAGE.

- 100% Financing—No Down Payment!
- 24 Hour Credit Approval in Most Cases.
- Flexible Payments—Revolving Payment Plan 36—48—60—72 Months or LONGER.
- Bank Rate Financing Available Less Than 16.99%*
- Complete Three Year Extended Limited Warranty Protection Package (Only Four Exclusions).

For more information please call Monday thru Saturday 9:00 a.m.-8:30 p.m. EST or send in coupon

Call Toll Free 1-800-932-DISH—All 48 States. In Canada call (301) 964-1990 or 964-1991

FINANCING BY FIRST NATIONAL BANK OF WILMINGTON AND AFFILIATES

The extended limited warranty protection plan provided by Satellite Earth Station Protection Company, Inc. insured by RELIANCE INSURANCE COMPANY.

Dealers...

NOW FOR THE FIRST TIME YOU CAN

start!

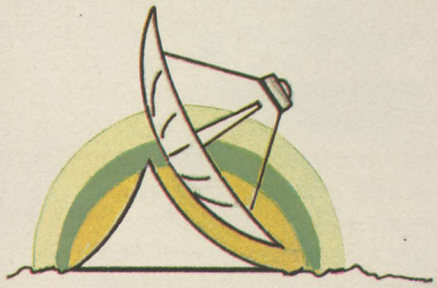
EFFECTIVE MARCH 1, 1984
"WARRANTY NOW OPTIONAL"
"The Extended Warranty Protection Plan is now completely optional. Loans for TVRO systems and other electronic equipment are available, independent of the Warranty coverage."

ADVERTISING 100% BANK RATE FINANCING* PLUS ALL PARTS & LABOR GUARANTEED FOR THREE YEARS.**

- No Down Payment
- No Collateral Needed
- Up To 6 Years and Longer Repayment Period
- Flexible Payments***
- Low Monthly Payments****
- No Complicated Paperwork*****
- All Current TVRO Equipment Covered Under The Warranty Program

*RATE AS OF OCTOBER 5, 1983.

***Upon Approved Credit**
*****Customer Can Change Mode of Payment Without Penalty**
****$40.00 Deductible — See Sample Warranty**
******Illustration: A Typical $2500.00 System with 3 Year Warranty —$65.50 Per Month**
*******Simply Dial 800-932-DISH Instantly Starts the Credit Approval Process**



SATELLITE FINANCIAL PLANNING CORPORATION
1000 Century Plaza, Suite 320
10630 Little Patuxent Parkway
Columbia, Maryland 21044

SATELLITE FINANCIAL PLANNING CORPORATION
1000 Century Plaza, Suite 320
10630 Little Patuxent Parkway
Columbia, Maryland 21044

Please send me information regarding financing and extended limited warranty for the home TVRO user.

Name _____ Telephone( ) _____

Address _____ City _____

State _____ Zip Code _____

COOP/ continued from page 77

That one threw me when I first tuned in since all of the songs were in flawless English.

"Hey, that's not Gorizont; they are singing in English," exclaimed Marshall, who by now was staying 'late at work' most nights. "**Where** are the **skin flicks,** anyhow???". I assured him they would follow. "English on Russian television?". I assured him it was a universal language. He reminded me that 'sex was universal' also. Two points for Marshall.

In all honesty, the East German 'teleplays' treatment of sexual content is in great taste. Aaah, I mean, it is very well done. They obviously have producers and directors who understand **the difference** between a succession of rapid fire zoom-in / zoom-out 'crotch shots' and a careful pan from the lady's shoulder down her side just away from the breast to the lower extremities, finally coming into **proper focus** just as the camera comes to a pan-rest someplace between her navel and her knees.

Now it happens that I do not care for the content of the Playboy Channel. There is something repetitious about seeing the same girl from six hundred different angles always doing the same thing. A person can even get sick of ice cream if he eats too much of it at one time. The East Germans have obviously figured this one out. They actually build the sexual parts into a story and if I can just get more time to work on my **Berlitz** German course I'll tell you what they are saying!

Someplace out there is an executive from Playboy or some other 'erotica' channel reading this. **I'll make you a deal.** You get me the SECAM to NTSC transcoder gear and I'll send you tons of East German 'teleplays' which you can sift through for a totally new perspective on sexually oriented television (no, it won't take properly on an NTSC machine; I've tried!). Maybe the American failure of the Playboy Channel to take hold is more due to the American director's fetish with the camera zoom and crotch shots than it is with the American attitude concerning sex on television. I'm willing to bet most people could look at East German 'teleplays' and not be offended. Aroused, yes. Offended, no.

Which suggests the obvious. If you operate in an area where Gorizont is visible (roughly the Mississippi, east), you may be missing an excellent selling feature in dish systems. Yes, **we** usually use a twenty foot dish (when you've got it, you use it). But, we also get an almost perfect (modest sparklies) picture on a **Hero 13** footer as well and since Bob Behar started pushing his horizon to horizon systems to stateside dealers (**CSD,** March), this might be a neat trick for you to offer since your competitor with just a 'US Domestic Dish Moving System' can't touch those eastern sky signals. We could probably start an entire cult of new television fanatics; people who sit (or lay) down around 4 PM eastern every afternoon and tune to transponder 9, after locking their doors, pulling down the shades, and sending the kids out to the back yard.

EAST GERMANY'S DDR'2/ Good night is not good bye.

EXPAND

your profit picture

with KLM *Component Satellite Earth Stations*

KLM Electronics has expanded the phenomenal popularity of the Sky Eye IV & V receivers by introducing several new technologically advanced receiver systems & accessories designed to satisfy your exploding consumer need, and keep KLM on the leading edge of consumer product development.

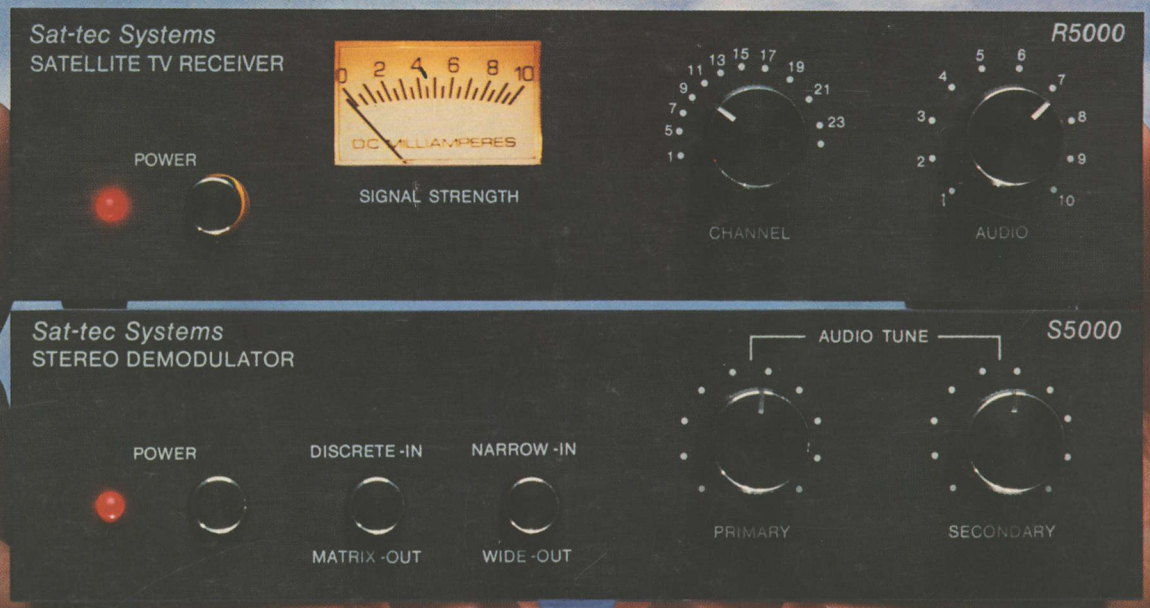
Your customers already know KLM quality, now you can profit from our complete line of Earth Station receivers, antennas, & accessories that add convenience, performance and new capabilities to any installation. The more complete the installation, the more profit for you. KLM has consistantly led the industry in design and marketability with our unique modular product line. The variety of receiver price ranges and our upgradeable system design adds unequalled flexibility when tailoring installations to individual budget requirements.

To top it all off, KLM has implemented a nationwide advertising campaign spotlighting our individual components and integrated systems thru premium circulation Trade/Consumer magazines and newspapers, as well as point-of-purchase support and sales tools to make your merchandising program complete.

So stock up, the customers are coming.

Call your distributor or write us for details.

KLM *Electronics*
P.O. Box 816
Morgan Hill, CA 95037



SAT-TEC TVRO SYSTEMS

dollar for dollar, performance for performance, you couldn't offer your customers a better system

Performance is built into the chassis of SAT-TEC components, not the panel. We *could* modify the panel to *look* more impressive. But that's not the way to get the results your customers want. So we put the quality they demand on the *inside*.

And SAT-TEC components *get results*. The R-5000 receiver delivers unexcelled picture quality. The S-5000 stereo demodulator provides dynamic stereo reception.

SAT-TEC performance is backed up by reliability ensured in extensive quality control that includes unique triple level board tests; receiver burn-in; and final, on-the-air checks.

At SAT-TEC, we've pioneered improvements in satellite technology to develop advanced systems incorporating tomorrow's features for today's market. Because videophiles are far and few, we've targeted our TVRO systems to satisfy the broader spectrum of the market—the group that wants maximum performance at reasonable prices.

What's more, versatile SAT-TEC components are compatible with other related equipment, so you can put together economical TVRO packages that don't stint on performance. Your "do-it-yourself" customers will welcome our current limited foolproof hook-up, too.

Dealers who know us have used our products more than any other in making up TVRO packages. You just couldn't sell a better TVRO system. So when you're looking for satellite TV systems, choose SAT-TEC. SAT-TEC quality *can* be seen.

For more information, contact your nearest SAT-TEC distributor.

SAT-TEC

SAT-TEC SALES INC.
2575 BAIRD RD.
PENFIELD, N.Y. 14526
TELEPHONE 716-586-3950
TELEX 466735 RAMSEY CI

SAT-TEC DISTRIBUTORS: CVS SYSTEMS, Marion, IN, 317-662-0037 • LEWIS CON. CO., Humboldt, TN, 901-784-5070 • SATCO USA, New Philadelphia, OH, 216-339-7779 • SATELLITE RECEIVERS, Green Bay, WI, 414-432-5777 • SATELLITE SALES, Cleveland, OH, 216-461-0000 • SATELLITE TV SYSTEMS, Clemson, SC, 803-654-5569 • STAR COM, Big Spring, TX, 915-263-1012 • WARREN SUPPLY, Sioux Falls, SD, 605-336-1830 • AV ELECTRONICS, Great Falls, MT, 406-761-3283 (800-548-9950) • ECHOSPHERE, Englewood, CO, 303-935-1909 • ECHOSPHERE, Sacramento, CA, 916-381-5084 • NATIONAL SATELLITE, Latham, NY, 518-783-0088. **CANADIAN DISTRIBUTORS:** SATELLITE CANADA, Weston, Ont., 416-475-2266 • C.A.L.E., Regina, Sask., 306-527-0424