



**SATELLITES-
Have We Gone Too Far?**

#17

CATJ

SEPTEMBER
1978

OFFICIAL JOURNAL
OF THE
COMMUNITY ANTENNA
TELEVISION ASSOCIATION

CA-2500

A MOVE TO QUALITY

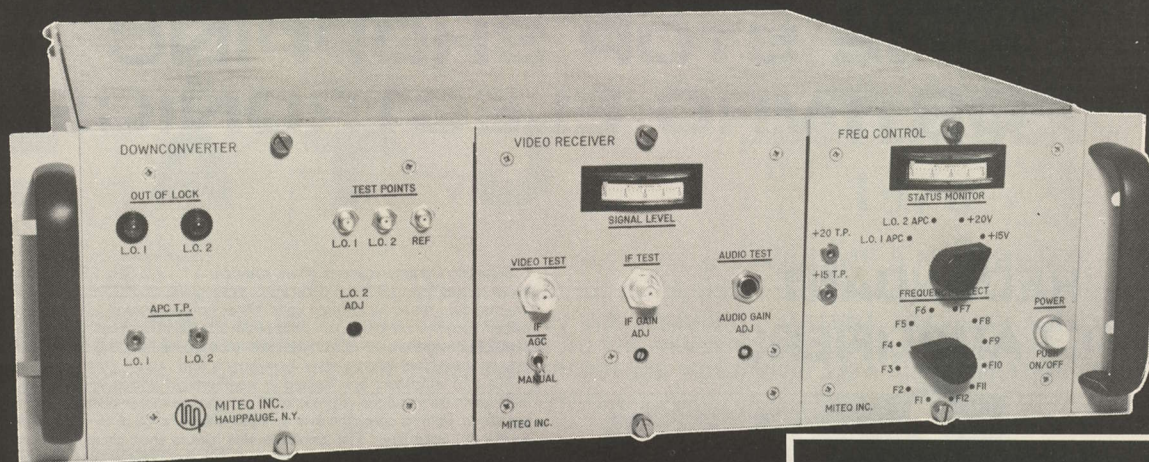


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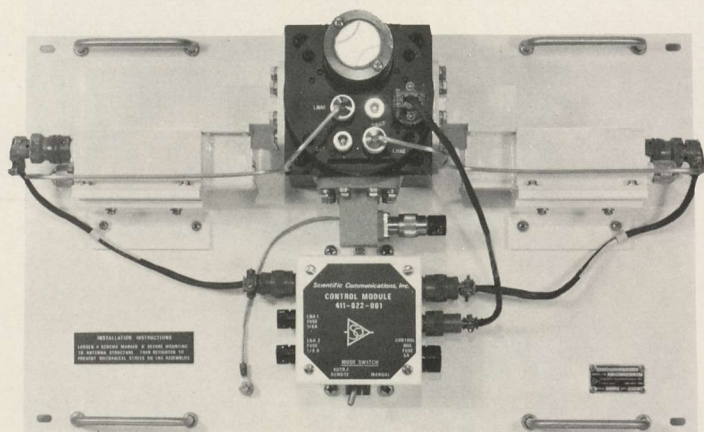
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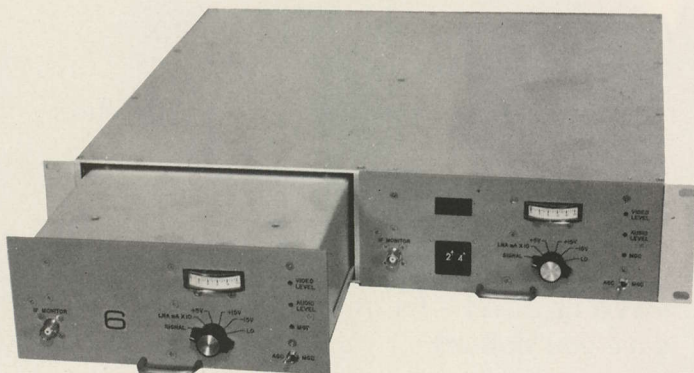
REDUNDANT FET AMPLIFIERS



The SCI Model SCF-306 Series Redundant GaAs FET Low Noise Amplifier Assembly provides amplification of RF signals in the 3.7 to 4.2 GHz frequency range. The assembly consists of two GaAs FET amplifiers, a low loss transfer switch, and a transfer switch control module. The entire system is mounted on a single plate designed for mounting near the antenna. Interface connector pins provide system status information for remote monitoring.

The two LNA's are in a redundant configuration. Either LNA may be "on line"; that is when the amplifier is connected between the RF IN and RF OUT ports of the transfer switch. The other LNA is "off line" and operating. The input and output RF ports of the off line LNA are terminated at the test ports of the transfer switch. The off line LNA may be tested or replaced without affecting the normal operation of the on line LNA.

SATELLITE VIDEO RECEIVERS



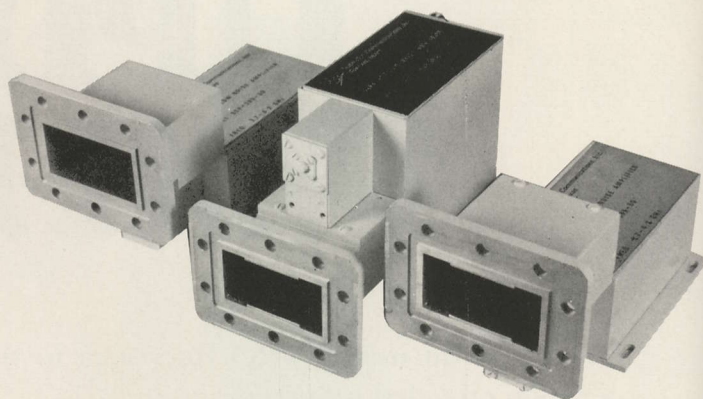
Scientific Communications offers standard 3.7 - 4.2 GHz FET amplifier models at guaranteed noise figures from 1.3 to 3.5 dB at 25°C. Waveguide input (CPR - 229G flange) and type "N" output are standard on all 50 dB gain units. Other options include 115 VAC or 15 - 28 VDC (positive or negative) operation, other gain values from 20 to 60 dB and fault monitor circuitry. All models employ specially designed bias networks for maximum power handling capability and optimum gain stability over wide ambient ranges.

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MODEL	FREQUENCY RANGE (GHz)	GAIN (dB min.)	FLATNESS (+ dB max.)	NOISE (1) FIGURE IN (dB max.)	VSWR IN (max.)	POWER OUT AT 1.0 dB COMPRESSION (dBm Min.)
SCF-395-50	3.70-4.20	50	0.5	2.6	1.25:1	+10
SCF-395-50A	3.70-4.20	50	0.5	2.0	1.25:1	+10
SCF-395-50D	3.70-4.20	50	0.5	1.8	1.25:1	+10
SCF-395-50S	3.70-4.20	50	0.5	1.5	1.25:1	+10
SCF-395-507	3.70-4.20	50	0.5	1.3	1.25:1	+10

(1) at 25°C

GaAs FET AMPLIFIERS



The SR-4000 and SR-5000 Satellite Video Receivers provide quality picture and sound reception of satellite television transmissions. They have been specifically designed to cost/performance criteria for CATV earth stations.

The SR-4000 is a fully agile, synthesized 24 channel selectable model. The transponder number is selected by thumbwheel switches on the front panel with LED readout of the selected transponder number.

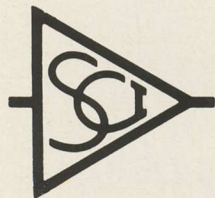
The SR-5000 is the fixed channel version with provision for transponder selection by a crystal change and retuning.

Both units are compact with module interchangeability between unit types except for synthesizer / L.O. source modules. They each have phase-locked loop demodulators to provide excellent FM threshold performance.

The compact design of these units allows two complete receivers to be mounted in a standard 19 inch rack only 3½ inches high. This feature minimizes the rack space required for multiple receivers when several satellite transponders are to be utilized.

A unique feature of these receivers is the availability of a second subcarrier demodulator. This feature is pre-wired on all units so that the addition of a printed circuit card can provide a second subcarrier for audio, slow scan TV or other software which may be offered by the programming originators.

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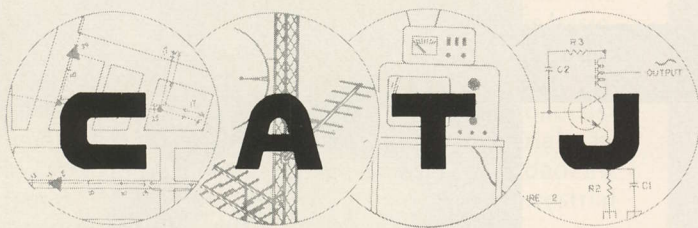


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SEPTEMBER 1978

VOLUME 5 NUMBER 9

PUBLISHED MONTHLY, AS ITS OFFICIAL JOURNAL, BY THE COMMUNITY ANTENNA TELEVISION ASSOCIATION, INC., OKLAHOMA CITY, OKLAHOMA, AS A SERVICE TO ITS MEMBERS AND OTHERS PROVIDING CATV/MATV SERVICE TO THE TELEVISION VIEWING PUBLIC AND BROADBAND VIDEO/AUDIO DATA COMMUNICATION SERVICE.

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CATJ subscription rates \$14.00 per year for non-CATA members, \$10.00 per year for CATA member-systems; \$10.00 per year for industry employed personnel for at-home delivery. In Canada, \$16.00 per year for CATV systems, \$12.00 per year for system employees. Foreign rates upon request.

Third class postage rates paid in Oklahoma City, Oklahoma, U.S.A.

The Community Antenna Television Association, Inc. is a nonprofit organization formed under Chapter 19, Title 18 of the Statutes of the State of Oklahoma. As such, no part of its assets or income shall be the property of its members; such assets and income shall be devoted exclusively to the purposes of the Corporation.

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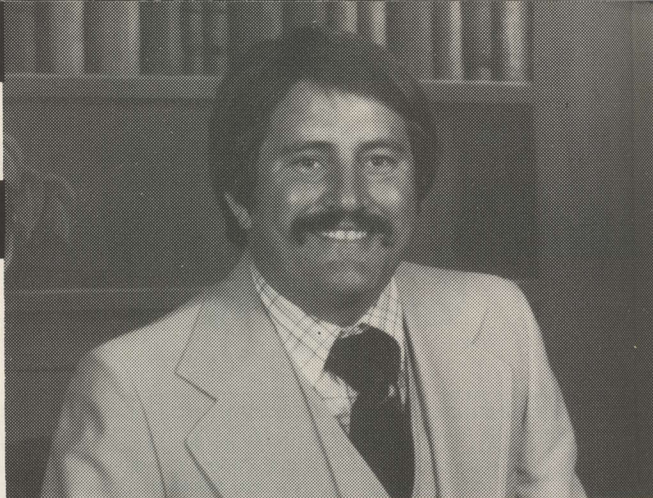
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—OUR COVER—

WHERE IS TOO FAR? This special issue explores the current status of the satellite explosion in CATV, exemplified by the front cover view of the 'CATA-Gang' erecting the CCOS '78 Up-Link terminal at Oklahoma's Eufaula Lodge this past July 15th.

CATA [™] TORIAL

BEN CAMPBELL, President of CATA, Inc.



Time For Some Action

If Washington sources within the FCC can be considered accurate, the FCC is at last planning to come to grips with a number of cable/satellite matters which are begging decisions.

Before the Commission, in one form or another, are applications to bring to the satellites common carrier relay service of San Francisco/Oakland KTVU, Los Angeles KTTV, Chicago WGN and New York City WOR. The time has come for the Commission to stop ducking the issues presented by these applications.

Three years ago this month (my how time flies when you are having fun!) the first satellite transmission of cable programming began at HBO. Then 21 months ago the Commission approved satellite common carrier carriage of Atlanta's WTCC and at the same time approved cable use of 'small' TVRO antennas. Those two actions, twenty one long months ago, were the **last significant decisions** made by the FCC in the fast moving satellite transmission area.

Since those decisions were reached the FCC has 'changed hands' and a new set of personnel are in charge. To date the new personnel have avoided doing much of anything.

The Commission's agenda is controlled by the Chairman of the FCC. He has the power to put items on the agenda, or take them off, as he feels they merit attention. He also has the power to keep items off the agenda when he feels 'the timing is bad' for approval, or non-approval as the case may be, of an item about which he may have some strong personal feelings. Many important agenda items get left off the vote list for this reason alone.

The new regime at the Commission has made a number of industry appearances at which they have warned cable that we had better be prepared to accept whatever competition as might develop when there is 'substantial deregulation of competitive transmission system', or, 'as new technology comes into being'. Nobody has ever elaborated on what these new forms of competition might be... one is supposed to make up his own list it appears from the growing developments that we daily hear about.

It occurs to us that while the Commission seems verbally committed to turning the forces of competition in the media marketplace loose upon one another, their actions... **or inactions as seems more**

appropriate... suggest that they are themselves afraid to come to grips with competition within an industry.

A case in point are the pending applications to add one or two or three or even four additional independently programmed broadcast signals to the satellites. Atlanta's WTCC has been all alone on SATCOM for 21 months now. Ted Turner has shown what a man with imagination, guts and the will to win can do when he is given just a tiny bit of bureaucratic freedom to experiment in the unknown. We all love Ted Turner and respect what he has done for this industry; but Ted's had it all by himself for about six to eight months too long. The time has come for some competitive services to join WTCC on the bird.

Not surprisingly Turner pretty much shares this sentiment. He is not battling against the addition of another indie or two on SATCOM. Nor is the common carrier operator he utilizes to bring WTCC nationwide; Southern Satellite Systems. In fact one of the oldest pending applications before the Commission for adding an additional indie is from Southern Satellite; they want to bring up San Francisco's KTVU.

So where is the problem? If there are not sentiments within cable against there being more indies on the bird, where are those subtle lobbying pressures coming from? That's the difficult part to assess. There seems to be no concerted, orchestrated effort to keep the matter off the Commission agenda; rather there seems to be simply a failure on the part of the FCC's bureaucracy to sit down and face the issue.

What is the issue? Is it a question of allowing more indie signals up there? Or is it more complex than that?

Again it is difficult to pin down the single answer; there appears to be several answers, all not very persuasive when they stand alone. The MPAA and the NAB are against there being more indies on the bird; but their opposition seems to be more a matter of form than substance. They oppose the concept simply because... that's what they are paid to do. There are even groups within NAB that suggest WTCC should not have a 'monopoly' on satellite distribution and they favor an 'open sky' policy.

When you strip away the arguments against allowing additional services on the bird, as a matter of policy, you end up with the intra-industry squabbles that are before the Commission. Several carriers are proposing to bring up Chicago's WGN. There the

Commission must decide (1) which carrier to allow up with WGN, or perhaps (2) if WGN should be allowed up with one carrier on SATCOM and one over on WESTAR. KTVU, on the other hand, is basically a one-carrier-application; Southern Satellite. Which is where **that** problem may be... should one carrier be allowed to have two or more broadcast signals on the bird? If not, why not? Terrestrial carriers are not limited as to the number of broadcast signals they transport; why should non-terrestrial carriers be so limited?

The most complex issue before the Commission is the ASN/Americom Satellite Network proposal to bring up on WESTAR II, with the assistance of Western Union, three indie signals. The competition says ASN is not a common carrier; that ASN should not be allowed to bring up anything. ASN says the FCC's own rules do not require a 'transporter' to be a common carrier. The FCC's Common Carrier Bureau reportedly agrees with the position that ASN is not qualified to transport signals; the final word from the full Commission is not yet in.

Here's what we would like to see the Commission do; and soon.

Number one—They should **approve** Southern Satellite's carriage of KTVU. It is not controversial and it will provide competitive (and west coast alternatives) to WTCC.

Number two—They should **approve** United Video's request to bring up WGN; the arguments against United's application are mostly silly and hardly substantive. This will give us three indies for those markets where three indies are allowed, and it will strengthen the competition with WTCC with a central time zone station.

Number three—They should tell ASN that they **like the concept** of there being competition **between satellites** and approve ASN carriage of Los Angeles KTTV, New York WOR and a third indie of ASN's choice; **as long as** the third is not one already available on satellite (WGN times two is wasteful of valuable transponder space we feel). **But...** ASN should be granted only **"Special Temporary Authority"** to provide this service conditioned upon their being properly qualified as a common carrier within 12 months time. In the interim ASN should be declared an "agent" for Western Union who will for now act as the "real" common carrier.

What will this do? It will get six indie signals into the air on two separate birds. This will create competition amongst the satellite carriers and ultimately such competition will be good for cable. This will also spur some systems to install second terminals; the second being dedicated to WESTAR II and with the terminals in place the competition between satellites will increase even further.

All of this needs to be done now. While cable interest in new satellite services is still high and before WESTAR gets so filled with non-cable services that there is no room left for enough cable services to make a WESTAR terminal worthwhile.

The new regime at the Commission says they are dedicated to competition. Now let's see if their actions are as bold as their public utterances.

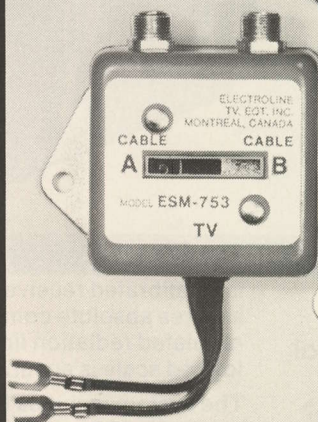
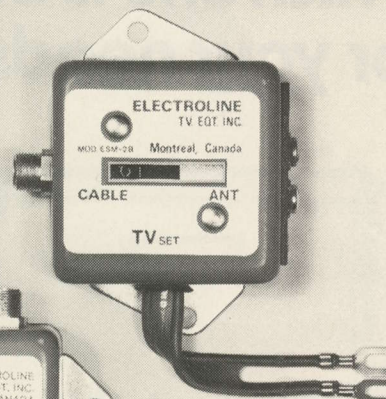
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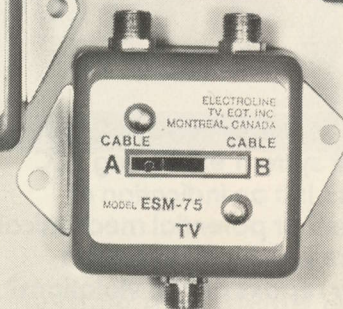
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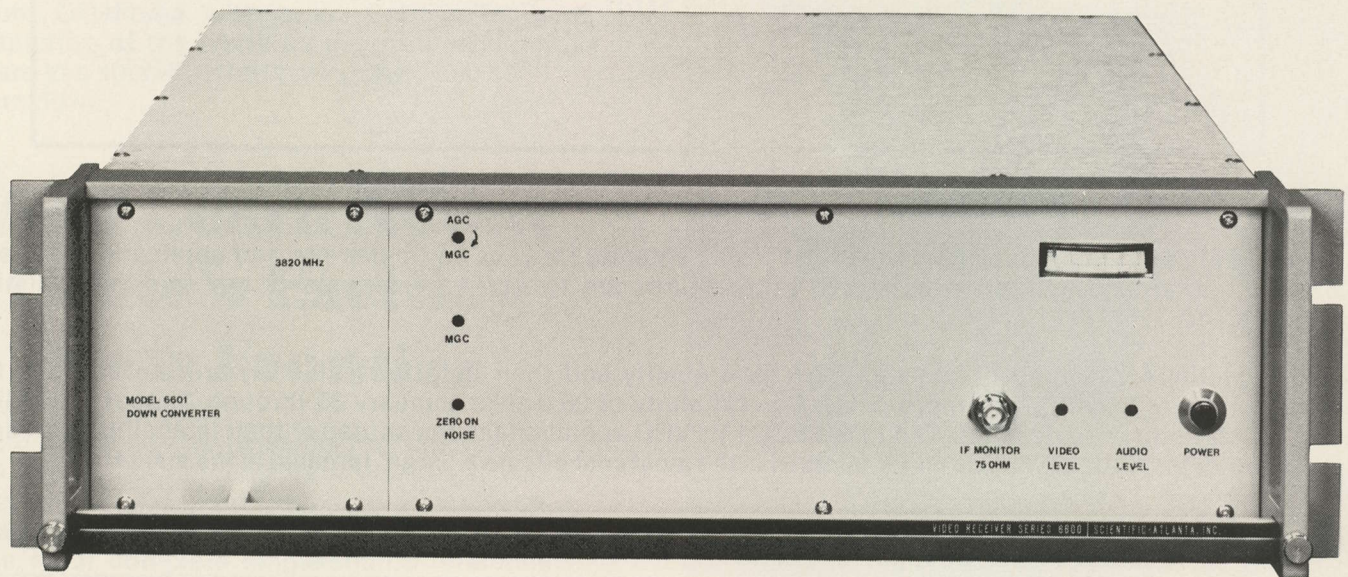
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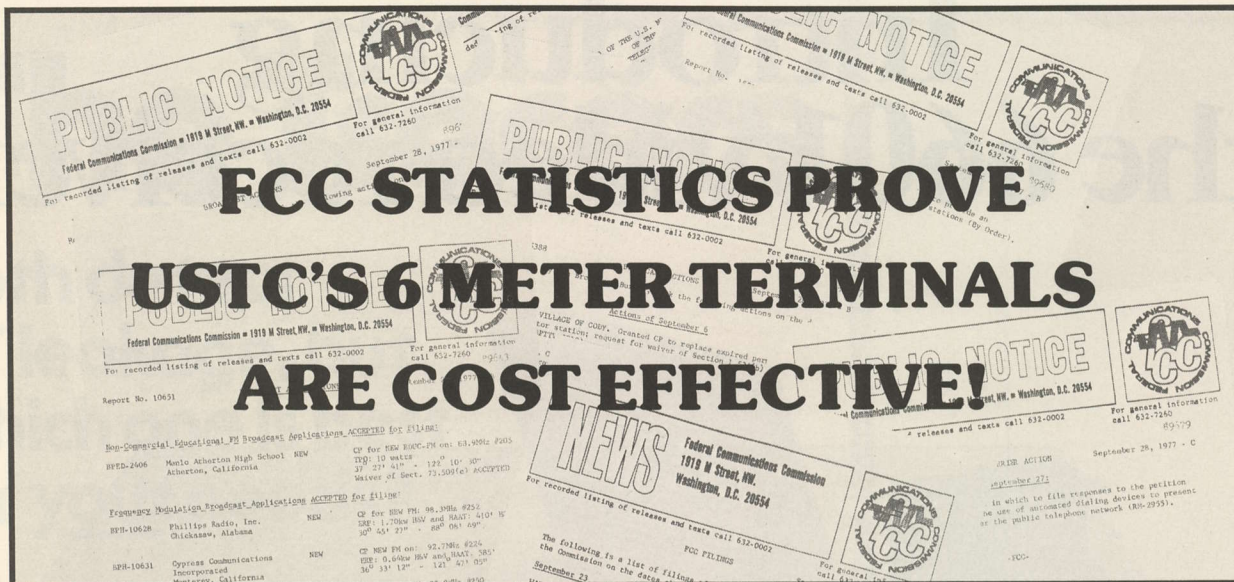
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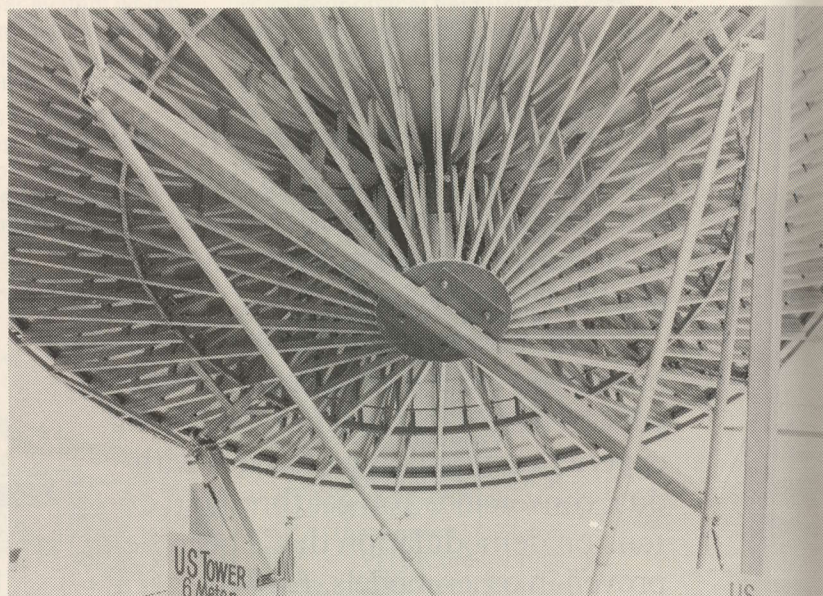


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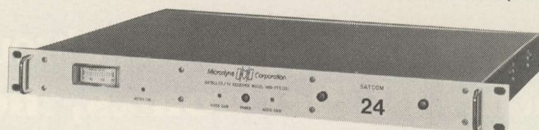
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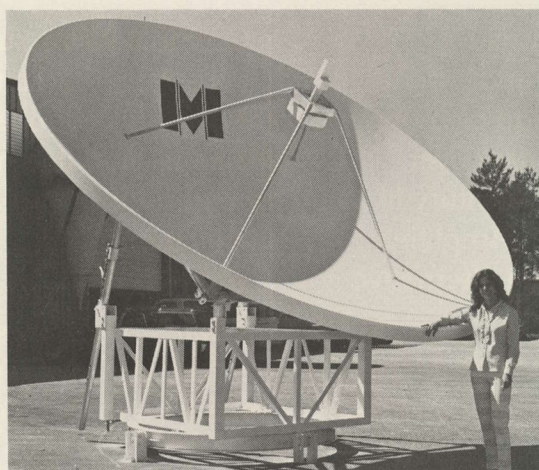


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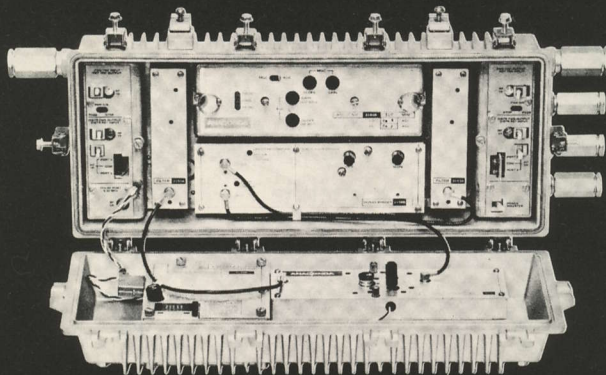


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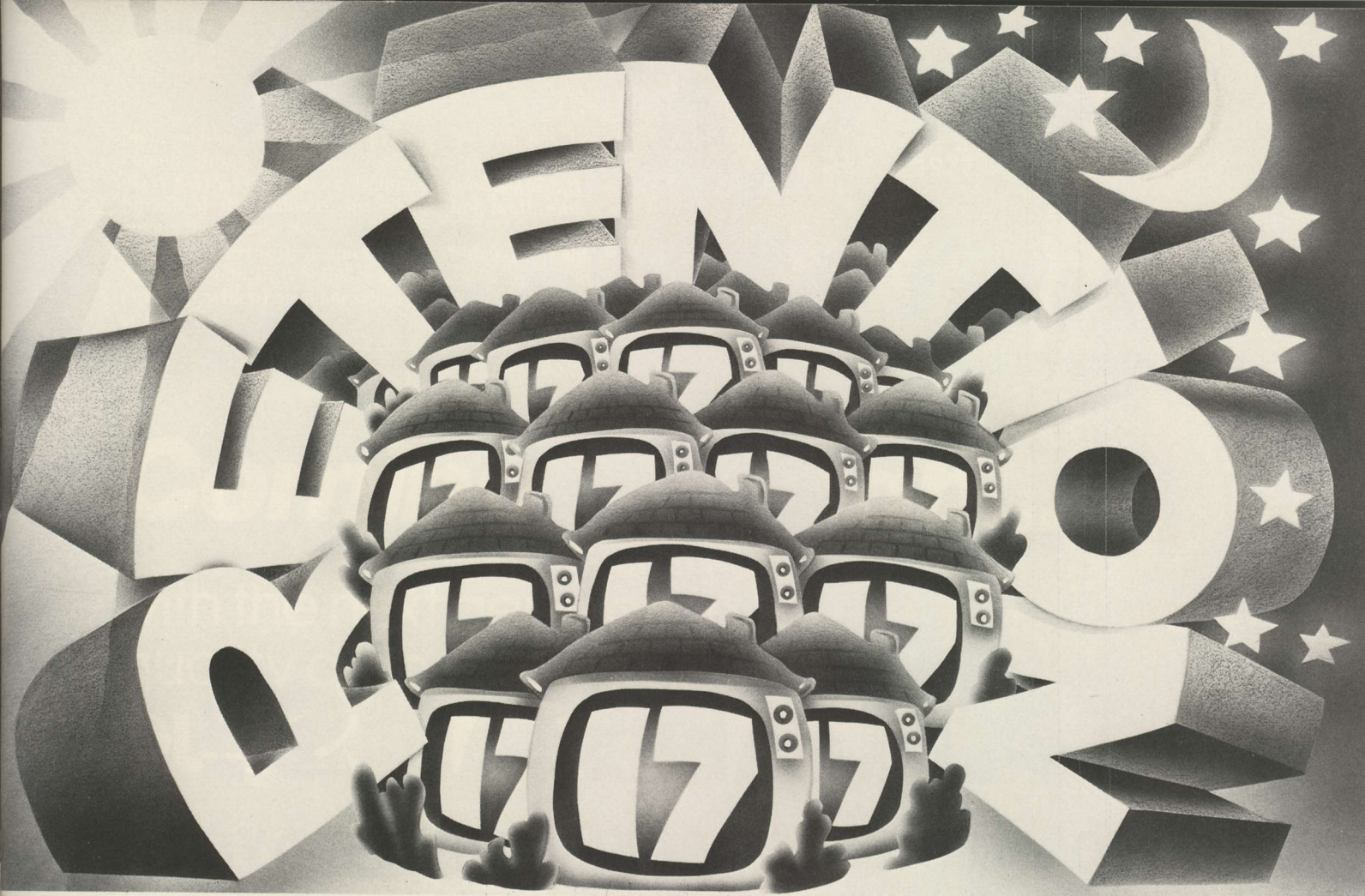
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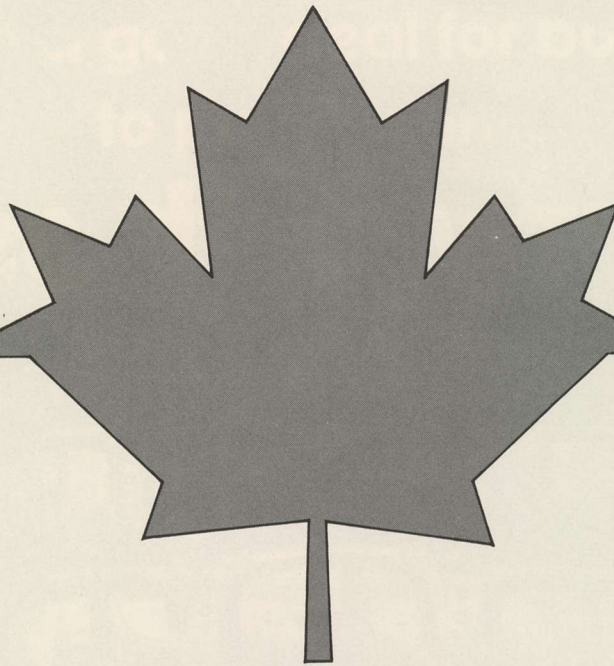
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Putting It All Together

UPDATE '78—AN INTENSIVE REVIEW OF SATELLITE TELEVISION TECHNOLOGY AND OPERATIONS IN THE FALL OF 1978

A "special issue". What does it all mean? Is there really that much left to be said about satellites, television receive only terminals, and the services they provide?

Noted industry journalist Paul Sylvan Maxwell, long ago retired to the peaceful quiet of the upper Colorado mountain country, reportedly considered special issues as devious creatures of a publication's advertising sales department; "conceived" said Maxwell "primarily to pressure borderline advertisers into getting into an otherwise dull issue". In the general CATV trade press Maxwell's observations might well be candid and quite correct. In CATJ they fall short of the mark; just as we believe the industry itself may be falling short of the mark with satellite terminals and services. In our own defense of the "Maxwell Supposition" CATJ has no advertising sales department and a department that does not exist cannot be creative enough to dream up special issues. In defense of the CATJ editorial department, "dull" has never been our style.

In spite of our best efforts to cover the onrush of satellite technology, as we viewed the results of the mid-July CCOS (something we could do by locking ourselves up in a room with twenty hours of 3/4 inch color video tape made at CCOS) we found that we had missed the mark in several areas in the past 12 months. Time and time again we found ourselves over-estimating the capacity of the industry to create new uses for satellite services, and under-estimating our own abilities to grasp and function with those uses. We found ourselves not fully understanding the explosive nature of the satellite mystique and unsure of the impact that ever decreasing terminal prices is bound to have on our own use of the satellites.

We found the same petty supplier concerns that frustrated cable operators twenty years ago

as all band transmission became a reality and the same indecision of ten years ago that hampered the industry's one and only golden opportunity to become a local medium of expression.

We found, and today still find, small cable system operators professing that satellite transmission is great for the big boys not too rich for their blood. We listened patiently to operators with 600 customers charging \$10 a month for five or six or seven channels of off-air service, one employee, and a plant fully paid for ten years ago as they professed "Why I simply cannot afford to put in a \$15,000 earth terminal".

As we sifted through the seven foot tall stack of paper we have accumulated in less than a year, all dealing in some way or another with satellite transmission of television signals, it became increasingly clear that our biggest problem with satellites is not any pricing consideration or technical problem with the equipment and services. Our biggest problem is simply our failure, as an industry on the forefront of an earth girdling communications revolution now barely underway to understand the depth and long term ramifications of that revolution.

Satellites are like the sun. They are as technically perfect instruments of communications as man can create. They are always there and they are always reliable; petty present problems with F1 aside. They so change our own concept of what we do, who we are, and our position in the communications stream that it may well be impossible for a person with twenty hard fought years in this industry to accept the magnitude of change before us.

We have before us, awaiting our editorial pleasure, a detailed description of a new series of nine geo-stationary satellites now under construction in the USSR. By 1981 all nine will be operational; circling the globe in the same fashion our own free world Intelsat satellites now cover the globe. Of these nine satellites,

PHOTO CREDITS—we are indebted to Jim K. Vines of Parafilm for sharing with us several of his outstanding photos taken during CCOS '78; approximately ten of which appear in this issue.

seven will be operating in the 3.65 to 3.90 GHz region and two of these will be **purposefully placed** in geo-stationary orbit so as to **provide direct transmission into North America**. The transmission powers will be, by SATCOM, WESTAR and ANIK standards, very high; sufficiently high that modest rooftop antennas and relatively inexpensive home receivers will find excellent reception possible.

It is the nature of the satellite business that what was blue sky yesterday may well become green spending stuff today. Will the pay cable service of the future include ballet transmitted directly from Moscow to America cable connected homes via Russian Stationair satellites positioned so as to reach directly to U.S. cable headends? If English experimenter Steve Birkill can today sit in his backyard in Sheffield with an eight foot terminal and receive direct reception of World Cup Soccer games transmitted via Intelsat from Argentina, can such direct feeds to your own cable headend be far away?

Satellites change all of the rules. The economic rules, the technical rules, and yes...even the political rules. Technically we are almost there. The operator without a terminal of his very own at his system headend is not only penny wise and pound foolish...he is courting almost certain franchise disaster in the years ahead. When all band gear came along in the late 1950's, operators converted to it because it was better...far better...than anything they had previously had at their disposal. Yes, there were those who waited for "the gear to improve" and "the prices to come down". Judging from the poor operation of a "few" older systems we have visited recently, some of these people are still, sadly, waiting.

Cable is a business. A business designed to make for its owner and operator a **fair** return on a **fair** investment. Any return beyond 'fair' is an invitation for someone else to jump in and contest the right of the present franchisee to continue to operate in his community. If you have more than 250 subscribers, and your accountant tells you that you can't afford one of the entry level TVRO terminals, fire your accountant and forget about that extra trip to Hawaii this year. And put your money into a terminal...it will be the smartest thing you have done since you initially decided to enter the CATV business.

And that's our special issue for this month. It is special because it attempts to show the dynamic, far ranging, very fluid transition our industry faces **today**.

The Newly Promised Services

There is a general feeling amongst the satellite **operators** that cable people play things a little too loose. RCA in particular, which has the majority of the experience with CATV services to date, is often put on the spot to defend or verify

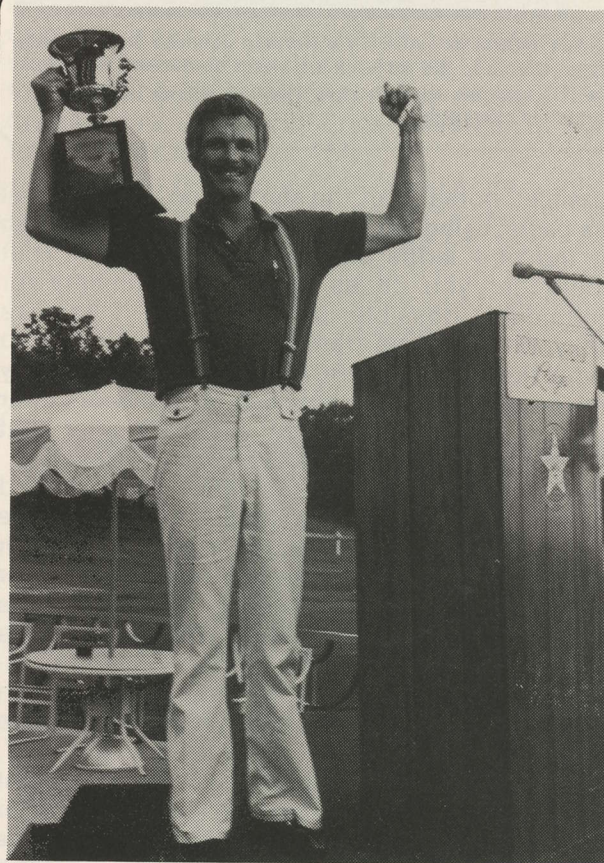
what amounts to premature announcements made by would-be satellite transponder users.

"I understand why they do it" notes RCA's Ralph Graff "but I wish they would be more careful about how they do it". Graff is referring to the often repeated CATV industry habit of 'going to the trade press' with promises and stories of services long before any arrangements have been worked out with RCA (or any other applicable carrier).

The rules are rather clear cut. They state that you, as an intended user of a satellite common carrier, cannot sign a binding agreement with the carrier and 'hold onto' a transponder unless you begin actual service within 90 days of the contract signing date. This precludes you from signing up today, for example, for a transponder which you don't intend to use until say a year from today. That 90 days is the maximum period of time—out front—that you can sign with RCA for transponder use. Of course you could sign up today and start tomorrow if the mechanics of getting you up could be worked out in twenty four hours.

Some users, such as the new VISTAR service to be detailed shortly, might approach the announcement business a little differently. "It is

CCOS '78



THE CHAMP AND HIS AWARD—WTCG's Ted Turner, for having the guts and fortitude to tackle an uncharted course and bring off the impossible was awarded the first CATA award ever given; the Kyle Dean Moore "Chairman's Cup". Turner was right at home with CATA people—they too were not afraid of tackling seemingly impossible challenges.



CRAZY NORMAN—ACE TV's Norman Johnson from Crested Butte, Colorado did 90% of the video production work from the ITC van. We tried to keep Norman locked up after dark and failed miserably.

possible” notes Graff “to start out on an occasional use basis, using one of our walk in the door and go on the bird tariffs on file with the FCC.” That would get you on as quickly as humanly (or technically) possible; perhaps even, if you are lucky, on the same transponder you will end up on for the long pull. “RCA feels, however, that any announcement of new services should come after there is a signed contract and only after that contract has been accepted by RCA”.

The would be users have different ideas and Graff notes “We understand where they are coming from; they are trying to make a big splash to nail down as many advance commitments for service from cable operators as possible before they actually go into service”. Graff and others remember with icy chills a number of well intentioned outfits that have come into RCA with everything from verbal commitments to take transponder service to ‘formal letters of intent’. “Many of these people have asked us to put out news releases stating that we were on line for transponder service” notes Graff. “Fortunately we have always stuck to the policy of making such announcements only after the actual contract is signed and accepted by RCA”. One such incident involved a company that was scheduled to ‘sign the contract tomorrow’. When the next day dawned the company had a different type of

announcement to make; it had dis-banded during the night.

“RCA Americom” notes Graff “is still a profit seeking company; not a profit making company”. Graff’s point is that RCA, unlike many of the present day users of its satellite service, is still some ways from being profitable. “There is evidence that many if indeed not most of the transponder users have been profitable almost from the moment they pulled the switch to on”.

There have been many new services promised. A surprisingly high percentage of those promised have actually made it to the bird. But several have not. . .yet. The most controversial of those promised, but not yet delivered, is the **ASN** or **Americom Satellite Network** offering. When we dug into the ASN offering (see **CATJ** for April, 1978) we felt that their first big hurdle would be making it on WESTAR II for the NCTA convention. Well, they did and from there it has been delays piled upon delays. There is still no ASN service on WESTAR and at this moment it would be difficult (if indeed even possible) to forecast when (or if) they will in fact make it up on the bird.

The issue **may be headed** for an early resolution; perhaps as early as the first couple of weeks in September. Here is where it stands as we head into that period.

- 1) ASN through Western Union seeks to provide satellite signal service on WESTAR II from Los Angeles channel 11, Chicago channel 9 and New York channel 9. They also plan to offer at the same time a ‘movie channel’. The package would be available to your system as any one, two, three or all four channels. Rates and other details were adequately covered in **CATJ** for April.
- 2) **ASN seeks to do this without being declared**, by the FCC, a **satellite common carrier**. This means they seek to avoid the long, drawn out FCC hearings and bureaucratic run around that characterized the first service offering in this area; the approval back in December of 1976 of Ed Taylor’s Southern Satellite Systems (and his carriage of Atlanta’s WTCG).
- 3) Taylor and others have objected to this ‘end run approach’ by ASN; they have filed volumes of comments with the FCC intended to keep ASN off of WESTAR with the service; or, alternately, if the FCC decides that ASN does not need the formal common carrier status SSS has, then SSS says “**Let us off the hook and we’ll provide new channels of service also**”. In effect, SSS is asking that the FCC decide whether a company needs to be a common carrier to bring onto the satellite **broadcast signal relay service**. Taylor professes to not care which way it goes (“**I can see advantages to both. . .**”) but he insists that anyone providing essentially the same service at least be operating under the same FCC rules.
- 4) ASN’s Frank Merklein thinks that Taylor “**. . .is filled with sour grapes**”. Taylor re-

sponds that he is only a consumer of sweet grapes. Merklein notes **"It is a damn shame that Ed Taylor has chosen this route to fight us. We could have been on the satellite three months ago if Taylor hadn't done this."** Taylor responds **"Look here. . .we filed at the FCC over 13 months ago for permission to add San Francisco KTVU to our service. They have still not allowed us to add KTVU. We simply want to be treated the same as anybody else providing the same basic service. If ASN can simply announce and then go up without any formal FCC approval, then we should be able to do the same thing. That's not sour grapes . . .it's just good business."**

- 5) Finally, the Commission has in truth passed this and other related issues back and forth from 'in' basket to 'out' basket for several months. Taylor's remarks concerning his KTVU offering are an excellent case in point. Not only is his KTVU offering stuck in the Commission's innards but a similar set of applications to bring Chicago's WGN up on the bird are also stuck in the same bowels at 1919 M Street. The Commission has dodged the issue for both internal (i.e. personnel and personality) reasons and external (i.e. strong lobbying pressure from NAB, MPAA and some of the sports organizations) reasons for far too long. Before the FCC 'broke' for their annual month long vacation in August, they 'set up a calendar' and placed the 'satellite related common carrier matters' on that calendar for either their first or second week back; in September.

And that's where it is today. Well, almost.

ASN has, we can report, moved ahead with definite plans to activate their service as soon as the Commission does act. **"We remain optimistic even if we are frustrated"** notes ASN's Bill Bauce. During the recent CCOS '78 Bill Bauce took to the television cameras to ask for **"...100 cable operators who feel they would take our service if available to contact us for inclusion of their company name on a mass telegram to be sent to the Commission requesting that they get off the dime and pass on this issue. If they finally approve it, as we are in hopes they will do, then we'll move ahead promptly to deliver the service. If they turn us down, at least then we have a decision which we can take to court for an appeal process. But as things stand now we can't move one way or the other; we are dead in the water"**. ASN has made arrangements with an antenna supplier, a receiver supplier and an LNA supplier to offer (today if you want it) a lease package of equipment for a terminal. They have also completed engineering and supply arrangements to install at the appropriate Los Angeles, Lake Geneva and New York City area uplink sites of Western Union a trio of 500 foot towers to pull the respective signals out of the air for uplink feeds.

That's not all ASN has been doing. There is the small matter of their making plans to add the

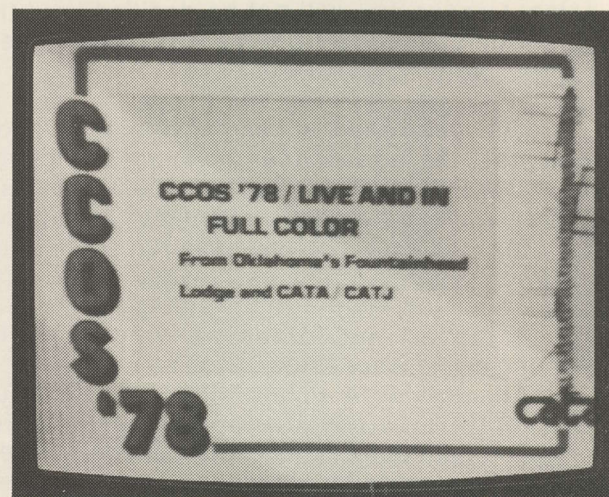
Theta Cable 'Z' channel as a stand along pay service via WESTAR; perhaps as soon as this month (September). ASN went to Theta and said **"Look, we can take 'Z' channel nationwide"**. And the folks at Theta reportedly responded **"We are in the midst of planning for an extensive southern California microwave expansion to put 'Z' before another 100,000 homes; if you will put it up on WESTAR that will be far easier (and cheaper) for us than expanding the southern California microwave terrestrial system"**.

'Z' runs as a \$9.95 per month service in Los Angeles with 52% penetration of the basic subscribers; that works out to around 50,000 'Z' subscribers. 'Z' is going to \$10.95 per month in Los Angeles very soon. ASN will simply be another 'affiliate' of 'Z' and ASN says they'll charge your cable system \$3.50 per month per subscriber for the "ASN 'Z' Channel Service".

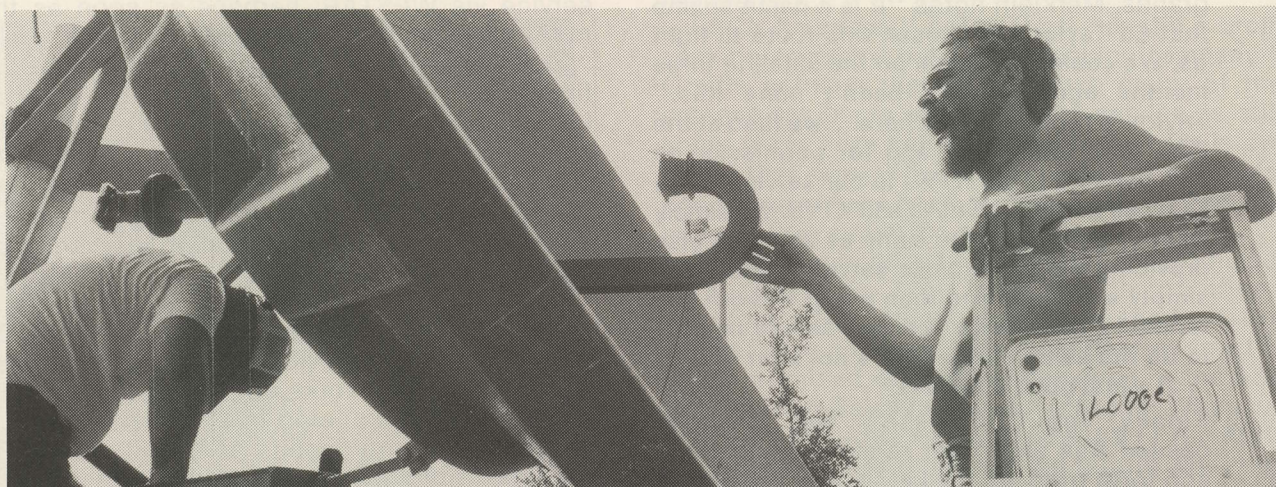
"We felt that the FCC's delaying action in handling our request for the three indies was going to eventually kill ASN" notes Bill Bauce **"So we decided to launch a WESTAR feed service using a major movie package as quickly as was possible. 'Z' has proven itself in the Theta system in Los Angeles and we know it will do very well elsewhere in the country"**. For the WESTAR feed 'Z' will start at 8 PM eastern and run for approximately 7 hours per day, seven days per week. 'Z' premieres 2 new movies per week and runs other titles as well. As an aside, this late August development was made without the assistance of 'vocal' Frank Merklein; he is no longer associated with ASN.

Caught in the same FCC muddle are applications to bring San Francisco's KTVU and Chicago's WGN up on SATCOM F1. SSS has a hold on transponder 18; Taylor's been sitting on it for more than the 90 day limit but then he has some special early day privileges which later

CCOS '78



UP AND BACK—the CCOS '78 "logo" appeared between programs and kept viewers advised of what to expect next on the history making uplink.



RAISE IT UP! Conneticut's Ken Charles, a tireless volunteer worker at CCOS '78, prepares to 'seat' the feed on the CATJ Lab ten foot experimental terminal which was demonstrated at CCOS while USTC's Danny Weathers (left), another tireless volunteer digs for a bolt to mount the feed.

applicants do not have. Transponder 18 is where KTVU will eventually be when the Commission approves the service offering of SSS. This is also the transponder for the approximately two-hour-per-day Home Theater Network G and PG movie offering mini-pay service due to begin service on September 4th. For a complete rundown of the HTN offering, see **CATJ** for **February, 1978**. The HTN program was originally scheduled to begin service around June first. Then it was moved back to July and finally it has settled (we assume) on the September 4th start date. The push backwards had nothing to do with the offering, the FCC or RCA; this time it was simply a matter of the cable operators who will utilize the service getting equipped to handle it. Getting TVRO equipment is still a pain in the neck...as a companion update here indicates.

If KTVU will be on transponder 18, and 18 is the last of the available horizontal transponders, where does that leave WGN? On vertical, but the actual transponder will not be decided until the carrier gets approval from the FCC, and, signs a contract with RCA.

As the data chart accompanying this report indicates, the transponder assignments for the SATCOM F1 channels are pretty well stabilized. After a round of musical channels this spring, systems can now pretty much figure on their contract program services staying where they now are for the indefinite future. About the only 'up in the air' situations pending with the existing carriers are summarized as follows:

- 1) **Atlanta's RCA uplink station**, which currently provides the uplink services for Southern Satellite's WTCG carriage, is likely to be replaced by an uplink terminal **owned by Southern Satellite Systems** on December 27th. SSS's Ed Taylor in fine tuning his own business has apparently determined that he will be money ahead and more operationally

flexible if he owns and operates his own Atlanta uplink.

Shortly after the expected switch to an SSS uplink on December 27th, Ted Turner's WTCG is planning to **break into the uplink feed** in Atlanta (starting 1 January) and **cut out all of the strictly local Atlanta area commercials**. Those car dealers, political and so on advertisements will be replaced initially by public service announcements and possibly later on by national advertising sold by the Turner people strictly for the uplink audience. Turner notes "One of the problems we have run into is created when Atlanta area car dealers, for example, are carrying their bargain basement prices via WTCG into places such as Hawaii. The Hawaiian car dealers don't like being told they are ripping off the island residents because their prices are \$2,000 higher on a \$5,000 car than Atlanta prices. This move will solve that one."

But...it is a matter for FCC approval since the standard off-air signal, now fed complete with all of the commercials from WTCG, will be 'modified' for the uplink. The FCC rules at the moment don't allow tampering with the off-air signal and the copyright folks may not like the idea either. If Turner can pull this one off, he'll have made major inroads into the future form of off-air uplink signals.

- 2) **SHOWTIME's mini-level of pay**, Front Row, is ready for debut sometime this month (see **CATJ** for **August, 1978**). Provided the hardware required is delivered on time. Initial indications are that the Front Row, after a faltering reception at NCTA where it was announced, may prove to be the sleeper SHOWTIME has been looking for. It could have real impact on the SHOWTIME balance sheet and will be watched closely by everyone in the industry with an interest in lower levels of pay programming.

- 3) **HBO's ultimate use of transponder 20** (which Madison Square Garden is vacating this month) is still apparently up in the air. **What is known** is that RCA has completed installation of a third 'dedicated microwave channel' service between the New York City central terminal office and the Vernon Valley (N.J.) uplink site; this third channel being the pathway through which HBO will be sending whatever it is they have in mind for their third channel. Tests of the new terrestrial microwave path have been underway since early August; you may have caught the increased color bar activity on the channel.
- 4) **Madison Square Garden** will start its new season of expanded programming on vertical transponder 9 in the latter portion of September. MSG is into a new set of children's programming plus they plan to do a substantial schedule of Notre Dame basketball this fall and winter. A plan to televise approximately 25 of the Yankee baseball games this summer didn't fly; one game made it and then the pressures of other baseball team owners sat upon the Yankee owner's heads and the agreement was scrapped.

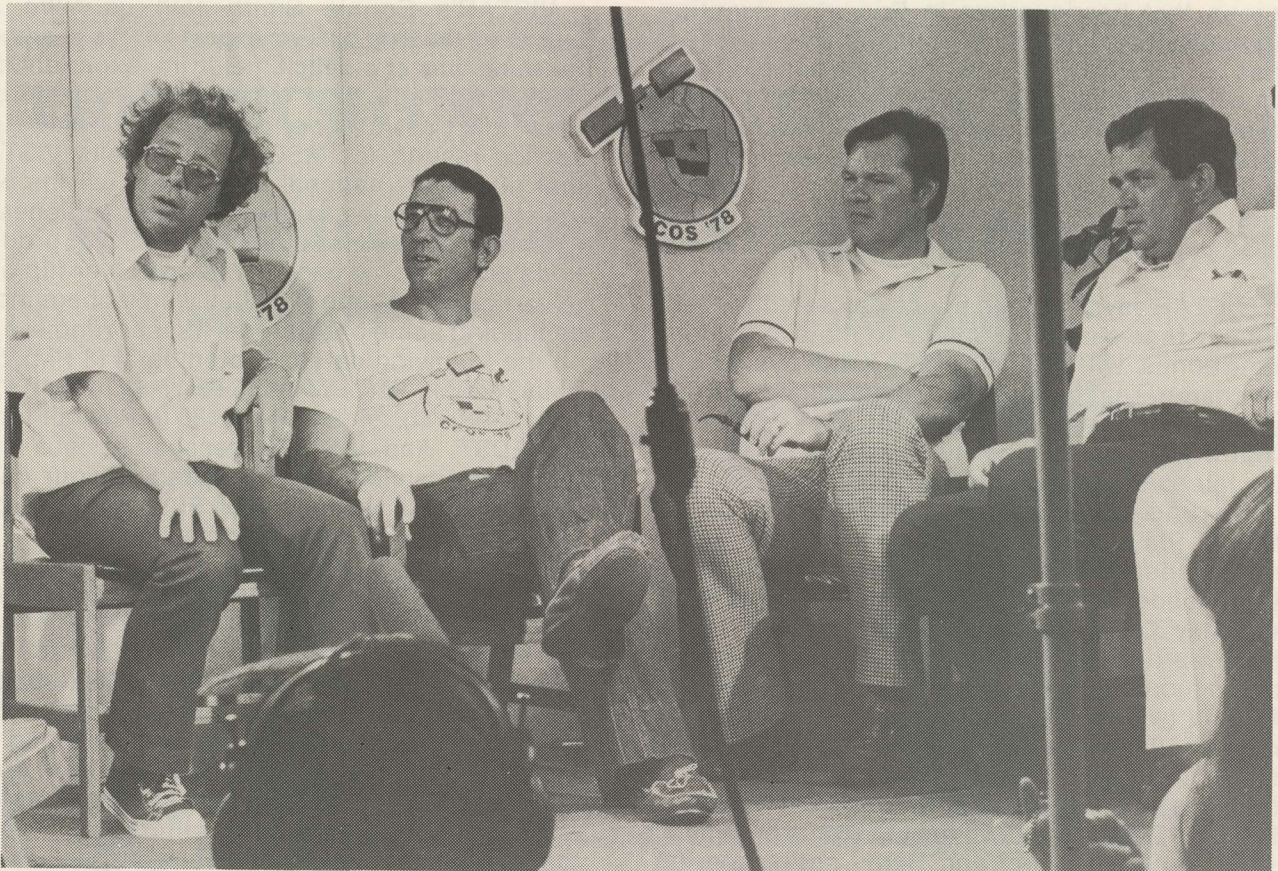
Not all of the satellite using industry seemed pleased with the MSG move to

vertical transponder 9. Theodore R. Chesley, System Engineer for Cox Cable TV of Spokane (Washington) was typical of those queried by CATJ with this response: "**We, like everybody else affected, are not happy with MSG's cavalier attitude about switching to an odd (vertical) transponder. In essence, they have said 'Gee, it is just a few thousand more bucks folks!'. If the EIRP contour maps are accurate, we should experience about a 2 dB carrier level drop when they appear on 9, from their previous signal level on transponder 20.**"

In defense of Madison Square Garden, they really did not have much of a choice. The 1977-78 season was in the nature of an experiment. It went very well, and by the time the decision was made to carry it on another season and to expand the schedule the horizontal transponders were either all gone or very expensive. For an occasional (i.e. non full-time) user such as MSG, the only place left was a vertical transponder. But they probably won't be alone there, as we shall shortly see.

- 5) Finally, in the "news concerning existing users" department there is the announcement from **SHOWTIME** that they are expanding their schedule so that it, like HBO, will average 12 hours per day on a seven day a

CCOS '78



TIRED/TIRED/TIRED. Tony Bickel (left, with the Phyllis Diller hair style), Cooper, Big Ralph Haimowitz and RCA's uplink genius Don Pidgeon on the set of the CCOS studio taping a segment that explained how the 11 meter terminal actually got into operation.

CCOS '78



ACE'S ACE—Dana Atchley (III) provided the expertise, equipment and manpower to bring off more than 20 hours of 'impromptu' video production for CCOS '78.

week basis. There may ultimately be more here than meets the surface announcement; oriental wisdom suggests you need to keep a close eye on John Sie and his compatriots in New York.

So much for the established satellite folks. Now what about the new comers; those who are promising (ahead of their signing with RCA) to do great things for the satellite programming business? The most immediate of these is **VISTAR**; a group that headquarters in Princeton Junction (honest—there is such a place!), N.J. VISTAR has plans to do what several others had **promised** to do some time ago; to put onto the bird an extensive schedule of entertainment and sports which will be advertiser, not cable customer supported. And they plan to do it as early as October first on vertical transponder 5. For the record, RCA says no transponder has been assigned yet.

VISTAR says their ten hour a day satellite feed, frankly time-slotted to appeal to the two eastern time zones, will be available to cable systems at **no charge**. That is, no buck or three bucks or even a dime per home per month. All they require is that **if you take their service, you take it full time**. No fair cherry picking the sporting events.

Starting on October first they plan to be up from 3 PM eastern to 1 AM eastern daily; again on transponder 5. If you can't remember what the transponder 5 footprint looks like, see **page 62** of the **May CATJ**. That's as close to what "RCA believes it looks like" as anybody has available at the moment. Basically, except for far southern Florida (where the map suggests it dips to 31 dBw or slightly below) it is (like 9, which has the same footprint) in pretty good shape. Their ten hours per day will break down this way: (1) from **3 PM to 6 PM** daily they will run **children's programs**, such as Bozo, Laurel and Hardy and so on; (2) from **6 PM to 9 PM** daily they will run **'family' programs**; some of the oldies but goodies including 'Life of Riley', a group of country and western

music shows and so on; (3) from **9 PM to 1 AM** they will run **sports**. Lot's of sports, both live and recently taped. Saturday and Sunday schedule will be heavily laced with movies in the 3 PM to 9 PM time slots.

In the sports area, VISTAR has entered into an agreement with the Canadian Football League (CFL), the American Soccer League (ASL) and they have a handle on some Roller Derby events. It is reported but unconfirmed by either side that they may also be working on some National Basketball Association (NBA) and World Hockey Association (WHA) events. They plan to make the VISTAR channel, in so-called prime time, the 'sports channel for cable'. Here they will of course be head to head with Madison Square Garden. And their approach of how they will charge may end up being the approach ultimately employed by Madison Square Garden Events as well.

As noted, VISTAR is not going to charge your cable system anything—not one thin dime—for use of their programs. They are going to make a go of it by selling commercial time within the programs and sporting events they bring to you via satellite. Within each hour they are setting aside eight minutes; **six minutes of which they will sell** on a 'cable-network' basis and **2 minutes of which they will offer to your system** for you to sell, if you have the inclination to do so (there is **no requirement** that you do so).

VISTAR's Connie Smith told us "**We are braced for the long pull; we expect to have to operate for some time at a deficit.**" But the experience of MSG in selling some 'experimental commercial time' this past season, plus the national rating service results for MSG tune-ins tells VISTAR that ultimately national advertisers will be willing to stand in line to reach a cable audience. If you want to preview some of the VISTAR productions and have the capacity to switch or flip over to vertical transponder 5, they were scheduled to be feeding some pre-October 1st sporting events on the following dates: September 4 (8 PM), 5 (8 PM), 9 (2 PM), 10 (2 PM and 5 PM), 16 (10 PM), 17 (2 PM), 23 (8 PM), 24 (2 PM) and 30 (8 PM); all times are EDST. And VISTAR, because it is a non-broadcast service, can be added to your cable system at will **without prior FCC approval**; provided you have an earth terminal license.

Then there is the appearance of the "**TCS Satellite Network**", an offering of a group known as Total Communications Systems. TCS is starting off by offering Penn State University football games and later this year college basketball to cable systems nationwide. The first game to be so offered is scheduled for Saturday evening the 9th of September at 10:30 PM (eastern time). TCS, like Fanfare's coverage of southwestern conference sporting events, will be video taping the day's game and then rushing it back to the studio where it will be uplinked to the network on the Saturday evening of the game. The schedule looks like this: **September 9th**—Penn State vs

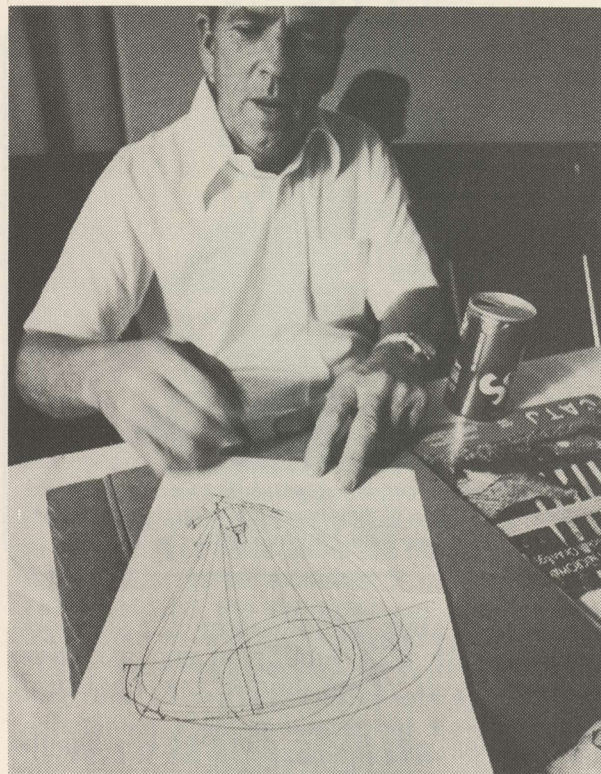
Rutgers; **September 16th**—Penn State vs Ohio State; **September 23rd**—Penn State vs Southern Methodist; **September 30th**—Penn State vs Texas Christian; **October 7th**—Penn State vs Kentucky; **October 14th**—a special one hour review of the Penn State season to date; **October 21st**—Penn State vs Syracuse; **October 28th**—Penn State vs West Virginia; **November 4th**—Penn State vs Maryland; **November 11th**—Penn State vs North Carolina State, and, on **November 25th** a tentatively scheduled game between Penn State and Pittsburgh; provided the folks at ABC do not elect to have the date of the game changed.

What transponder might you find all of this good Penn State action on? Well, that is one of the problems still facing the folks at RCA. Remember that unless your satellite programmer is using a transponder pretty much **full time**, RCA is unable to assign a transponder very far in advance. RCA sources indicate that transponders 18 and 20 are both possible; or, perhaps the games will be fed on a vertical transponder. It might even start out on one and then switch to another during the fall season. Such are the reasons why every CATV terminal needs at least one, programmable, all-channel tuneable receiver in its headend!

What About The "Sick Bird"???

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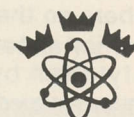
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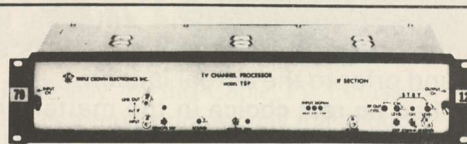


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AFC/MICRODYNEs man about antennas, Howard Hubbard, describes the features of their new 5 meter fiberglass antenna to Guy Roumain of Tele-Haiti, Port-Au-Prince, Haiti.

followed by a stark white, search out someone connected with RCA Americom and ask them "What are you doing about the health of SATCOM F1?"

The official party line is that **"F1 is a healthy bird, operating normally"**. Strong evidence suggests to the contrary, at least that **was** the bottom line on the mounting pile of evidence this past June and early July. To a man RCA is adamant that there is nothing wrong with F1 and whatever signal level differences as the cable industry may have spotted after the shift from F2 to F1 were **"totally expected simply because of the different footprint patterns of the two satellites"**.

RCA first got into trouble by providing, unofficially we admit, copies of their "predicted footprint contours" to various members of the CATV industry. Pretty soon the "predictions" became "the real world" and system planners began to take the footprint maps as "gospel". As we have subsequently determined footprint contour predictions are just that; predictions based upon computerizing the static antenna test range results made of the bird while it was still on the ground prior to the actual launch.

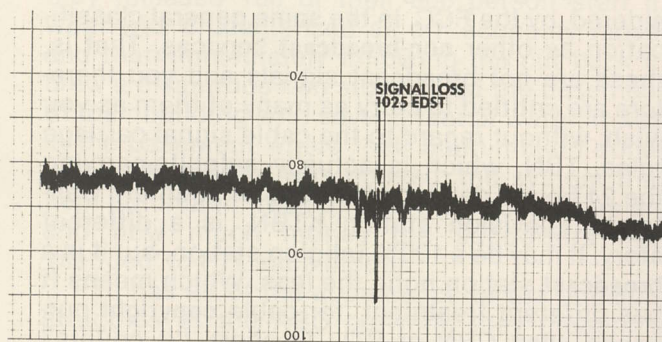
Yet RCA had no real choice in the matter; they had to provide EIRP data simply because Comsearchs and Compucons of the world **had to have** real (and assumed to be hard) numbers for the preparation of CATV FCC applications. In a sense, the FCC can be blamed for this mess; by insisting that every individual terminal prepare a detailed license application form that must (by rule) include an analysis of the expected C/N and S/N parameters for the terminal in a specific location, the FCC in effect said to RCA **"Give up your numbers so the computations can be made"**. RCA did this, apparently never considering the possibility that by doing so they might be incurring some obligation (if not outright responsibility) for the accuracy of the numbers provided.

When the CATV industry shift from F2 to F1 was made on June first many systems were surprised to find the F1 signal level was apparently was not as good as F2. Where this really hurt was when the CATV systems had designed terminals around the "predicted" signal level contours from F1 and the predictions proved to be low; often by as much as 2-3 dB. If you were designing your terminal around the FCC's requirement that your system have a 3.0 dB "margin" (i.e. excess signal above the sparklie noise print or threshold of your receive system), and, when you got to F1 with the antenna you found your initial estimations or predictions of signal level from F1 had been high by say 2.5 dB, suddenly in the real world you ended up with very little (if indeed) any "margin". That proved to be the crux of the problem. **But not the only problem.**

F2 was a rock-stable and rock-solid, dependable bird. **You knew** you could **count on** the signal level to be present, typically to within ± 0.4 dB, day in and day out. F1, at least through the early part of July, had little of this dependability. In defense of RCA F1 was during the latter part of July and early August acting much more tame; but the erratic service nature had not completely disappeared. The instability manifested itself as either sudden drops in signal level (often as much as 10 dB) or just plain total outages. Some were brief (see strip chart illustration here) while others proved to be quite long; on the order of 5 minutes or more.

And through all of this there was mounting evidence that RCA did not have F1 "bore-sighted" where RCA said it was bore-sighted. That is, those portions of the United States that had expected improvements in signal level from F1, over F2, found they had the same or a worse signal on F1 while other areas expecting reduced signal levels on F1 found quite often they were experiencing improved signal carrier levels on F2. Again the problem was simply that lacking adequate information to plan with, CATV terminals were running shy of the expected margins. Many system operators with 4.5 meter terminals installed were wishing after the fact that they had gone ahead with a six meter terminal.

Is the bird itself "ill"? Crimson and white skin colors aside, that **remains** the sixty four dollar question today. RCA admits **only** that they are continually conducting tests. Testing was particularly vigorous during the latter portion of June and into early July. Some of the tests are hardly static (i.e. measurements made while the bird is left in a stationary position); certain test sequences involve purposeful rocking of the satellite "yaw"; a test that deviates the satellite's bore-sighted position by moving the bird back and forth (as in a rocking chair) on its vertical axis. All non-static testing is done by carefully firing one or more of the hydrazine mini-rockets on board in both a timing sequence and for predetermined (by a computer) length of time. RCA



LOSS OF TRANSPONDER 8 SIGNAL—July 4th was another one of those days when F1 seemed to have multiple problems. Between 1000 and 1030 EDST several transponders dropped in and out intermittently; here CBN on transponder 8 is lost for a few seconds at 1025 EDST (recorded CATJ Lab).

“almost admits” that during at least one of these testing periods the “yaw” got out of hand and the spacecraft “rocked” back and forth in an erratic fashion for perhaps ten minutes time. This was the now infamous June 21st test sequence which was noted by cable operators from coast to coast.

The skeptics in the industry believe RCA does have a problem; in spite of the “everything is healthy” pronouncements from RCA headquarters. “Let’s face facts. . .the RCA Americom people have been saddled with a very difficult problem. They admit they are short on real world data to analyze what their real contour might be. They were forced into releasing predicted EIRP contours by the nature of the CATV licensing scheme. They have a \$25,000,000 investment in F1 and their image is at stake worldwide. They are torn between resolving the problem quietly—the option they like best—and admitting they have one or more problems. I’d hate to be saddled with that problem myself” notes a highly placed engineer at a competitive satellite manufacturing facility.

If everything really is OK, why is RCA continuing the tests? RCA has clammed up about further testing apparently aware that even the announcement or admission of additional testing merely fuels the fires of skepticism.

Dr. Igor Leliakoff, an expert on satellite stabilization techniques and in particular body-stabilized satellites such as F1, at Ford Aerospace in California offers these thoughts on what “might” be the problem:

“The SATCOM stabilization system is very susceptible to any imbalance in errors. The effect of solar radiation pressure, for example, is particularly critical if one solar panel were not fully extended. This partial deployment of a solar panel, as a possible spacecraft problem, would make the spacecraft rotate about the line of sight to earth unless corrections are made by thruster firings. Just as an example, if one panel were 50% deployed, the hydrazine gas thruster firing rate might have to be increased to as much as 200 to 500 firings per day, as opposed to a normal 10 to 20 per day. This in turn would have a substantial effect on spacecraft lifetime in orbit because of the increased rate at which the hydrazine gas is used for stabilization; leaving that much less for ‘station keeping’.”

The normal SATCOM rotating about line of sight to earth (or yaw) is about 1/2 degree maximum. The period of rotation should match the 24 hour day; in that way the spacecraft is kept pointing at the proper bore sight (or center point on earth of its transmitting antenna pattern) throughout the full day.

RCA says there is nothing wrong with either solar panel nor have they utilized more hydrazine gas for ‘station keeping’ than they had initially been programmed to use when F1 was originally launched in 1975. But the testing goes on.

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RCA AMERICOM PRESIDENT Andy Inglis, appearing during the televised dedication ceremonies for PTL on April first, said that "RCA has a special relationship with the religious satellite broadcasters".

The Religious Transponders

There are now three religious programmers on SATCOM F1. RCA Americom acts like they enjoy a special relationship with the religious groups.

Characterizing the three groups now on F1 requires some generalizations rooted in the secular world. PTL ('People That Love') occupies transponder 2. It is headed by Jim Bakker, a fire and brimstone preacher who has visions of reaching the entire free world with satellite television for Christ one day soon.

CBN ('Christian Broadcasting Network') was the original religious broadcaster on the bird; they occupy transponder 8. CBN is more middle-of-the-road than PTL; it is led by Pat Robertson who reminds the casual observer of Steve Allen 'in cloth'. His style is smooth and polished and he has a quick mind and scholarly approach.

TBN ('Trinity Broadcasting Network') is the newest religious telecaster to the bird, having come on board in May. Trinity occupies transponder 14 and it is headed by a former associate of PTL's Bakker named Paul Crouch. Trinity's Crouch is pure Hollywood; his carefully coiffured grey hair is matched by a dress style and a mode of operation which sets him apart from both Bakker and Robertson.

Religious broadcasting is a business. But it is a business operating under special rules. The FCC gives religious undercasts and broadcasters special permission to do things other (commercial) broadcasters cannot do. The IRS treats religious operations with special rules. Even other businesses treat religious businesses with special. . .well, reverence.

The religious satellite broadcasters take money directly out of your town; more so perhaps than Super 17 or HBO or SHOWTIME (etc). They may not take more money out (and then again they may), but what they do 'receive' goes directly to them, not through you as a middle-man.

The programming of CBN and PTL is considered, by the FCC, in the same general classification as other **non-broadcast** services. That is, these are not broadcast signals and you therefore are entitled to carry as many of them as you wish; without regard to the cable signal carriage rules. TBN, which is actually satellite-carrying the 24 hour a day programming of southern California television station KTVB, is a different story. It may be a 100% religion station, but it is a **broadcast** station none the less. Which means it has different treatment, for cable **copyright** purposes, than CBN or PTL. In short, "it counts" against your copyright signal carriage count and it counts in the eyes of the copyright rules as a "full independent broadcast station". That can hurt the cable operator who is facing increasing copyright fees as his station carriage mounts, and for that reason Trinity's KTVB is seldom seriously considered for cable carriage. So why is Trinity on the bird then?

All of the religious satellite users have broadcast station interests. CBN has the most ambitious program in this area, followed by Trinity and then PTL. CBN operates combination secular and religious broadcasting properties in several cities, including Atlanta, Boston and the Norfolk area. Trinity has its KTVB, serving the Los Angeles/southern California market, plus channel 21 in Phoenix. Trinity has several other affiliate stations pending at the FCC, as we shall shortly see. PTL has a single outlet in Canton, Ohio and plans more including one in the Charlotte, North Carolina home market where they headquarter.

There is considerable competition amongst the three operations for audience and prestige. Viewers of Trinity's service are often confused by the Trinity program titled 'PTL—Praise The Lord'. Is that not the same as the 'PTL Club' that comes out of Jim Bakker's organization? Trinity's Paul Crouch began his religious broadcasting with Bakker. Crouch conducted a program titled 'PTL' and then one day he picked up stakes and left Bakker; taking with him the program title. Bakker was reluctant to give up his most popular show 'title' so he retained the name (PTL) but changed its meaning; it now stands for 'People That Love'.

The 'PTL Club' is perhaps the most visible religious program in the American home these days. PTL syndicates the program through approximately 150 television markets by purchasing time in the early morning time slot (or closer to prime time in the larger markets) and he pays for this purchased time by openly soliciting support for his program over the air. PTL, it is said, has a \$3,000,000 'nut to crack' every month and it is growing. PTL recently expanded into several South American countries with a Spanish version of the same program and it is now seen in Brazil, Argentina and elsewhere on a daily basis.

PTL admits to financial problems. Early in July they released 100 of their 300 person staff in what was characterized as an 'economy move' and then immediately following the cut back in crew a disastrous rain storm filled the basement of their building with several feet of water. It was in the basement where their multi-million dollar computer system was housed; the system that kept automatic track of who their supporters are and how much money the supporters had 'pledged' to PTL each month.

PTL has all of the appearance of the mid-60's struggles of the ABC network; they present a brash, upstart appearance seemingly teetering someplace between chaos and financial disaster. Their growth in just a couple of years has been phenomenal; it is that growth that perhaps is the greatest cause of concern. If they were in the secular business world one might suggest that they are ripe for a take over by more experienced, seasoned business people. Because they are in a special business world with special rules their near term fate is less certain.

CBN has the direction and business sense of a seasoned veteran. Their on-the-bird programming is less spectacular than PTL, but it is also more polished and their requests for support are not nearly as overt as PTL. Because they operate full broadcast stations in several large markets and these broadcasting properties combine both

secular programming and religious programming, CBN has a cash flow base which has more potential than PTL. CBN also would appear to have more 'money leverage power' than PTL; they have properties which established banking outlets can identify with a firm base that secular business people can more readily understand.

CBN originally intended to put their channel 27 in the Norfolk area up on the bird. When they came up just 13 months ago that was their master plan. The not so friendly folks in the copyright business killed that; whereas CBN wanted to make their satellite feed of channel 27 available to cable systems for either no fee or a very small fee the copyright folks insisted that any secular programming carried by channel 27 **must be paid for**, by the cable audience, at the **prevailing copyright rates**. CBN balked, and then created the current 12 plus 12 hour per day satellite feed. The satellite feed is new for 12 hours and then repeated for the next 12 hours; seven days a week.

Trinity's use of the satellite is for apparent different reasons than either CBN or PTL. The latter two admit, quietly, that their satellite feed costs are recouped between 60 and 70% per month by donations received from cable-only viewers. That says that both are still losing money on their satellite service, but both apparently feel that as the cable use of their



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TELEVISED COVERAGE of Full Gospel group's 25th annual proceedings was carried extensively by Trinity Broadcasting outlets through F1's transponder 14.

services expands they will gradually reach the break even point. Both feel it is good for their images to be on the bird, and as long as they are competitive what one does the other must do; for now. Trinity recognizes that because their satellite feed is a full broadcast service they cannot hope to crack the big donation dollar market which PTL and CBN have cracked via cable. Trinity is more interested in the satellite being a system whereby they can inter-connect their affiliated television stations. At the moment the Trinity 'Network' consists of only two stations; channel 40 in southern California and channel 21 in Phoenix. However, Trinity has affiliate applications pending before the FCC for channel 31 in Denver, channel 22 in Seattle, channel 43 in Oklahoma City and channel 45 in the Houston area.

Trinity also has their eye on yet another broadcaster related area; translators fed by satellite. And here is where another religious group, to now not directly involved in the religious broadcasting business, enters the picture.

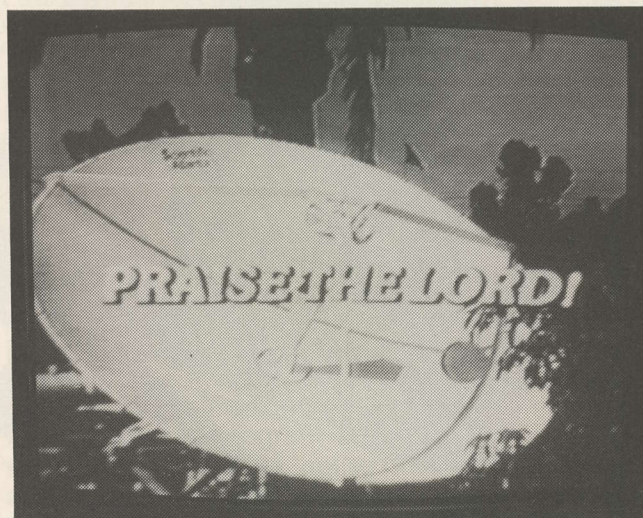
That group is the **Full Gospel Business Men's Fellowship International**, headquartered in Irvine, California. FGBMFI, as it is known, is a twenty-five year old layman's ministry begun by a California cattle rancher named Demos Shakarian in 1953. The group recently held its 25th international meeting, at the Anaheim (California) Convention Center and during the course of that gathering, which attracted some 15,000 members of the 600,000 member organization, Shakarian unveiled his plan to expand God's ministry via television. **"We are in our last days on earth"** began Shakarian **"and now due in large part to the sudden development and use of a whole new technology, we have at our disposal the tools to create one last, great revival. . ."**

Shakarian, like officials of PTL and CBN and Trinity, speak quietly of their being **"...no more than four more years before..."** and then they stop. They all seem to agree that within four

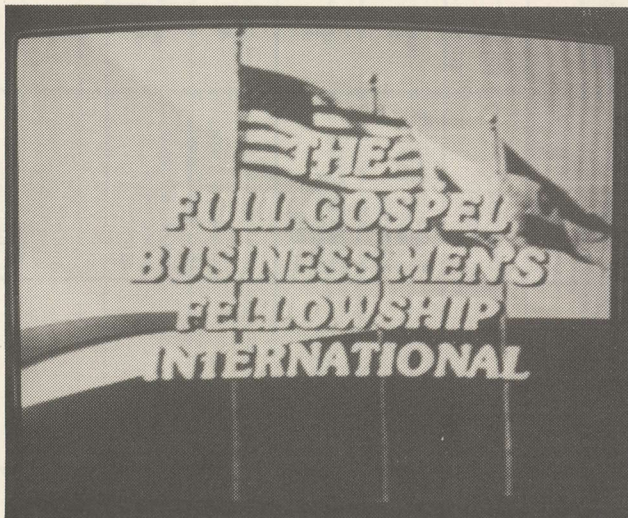
years, perhaps sooner, some cataclysmic event is going to overtake mankind on earth. There is a constant message of urgency in their statements and television's reach is essential to their plans.

Shakarian believes the FCC was moved by the Holy Spirit to create the rule making of last December which now allows 'translators to be fed by FM microwave' (see CATJ for March, 1978). At the July meeting of the 25 year old group a major portion of the sessions was turned over to proposals to create a national 'network' of UHF translators to carry the word of God via satellite. At a plenary session held the afternoon of July 6th various speakers, all members of the fellowship, outlined how local FGBMFI chapters (there are 10,000 chapter offices worldwide with the largest concentration in the United States and Canada) would return to their respective communities to raise the funds to support a local 100 watt UHF translator and six meter satellite television receive terminal. Shakarian's son Steve, a leader in the group and seemingly the man in charge of the group's headquarters in Irvine, explained that the typical satellite terminal fed UHF translator would cost around \$60,000 per installation plus perhaps \$6,000 per year to maintain and operate. Booklets prepared for the session explained how the system would work, how local groups would re-coup their initial \$60,000 investments (through the use of 30 seconds per hour of broadcast time for local messages) and the booklets ended with 'pledge forms' upon which local chapter groups could 'bind themselves to the project'. At the end of the afternoon long session **335 chapters placed their names on the dotted line** and signed up for one-each \$60,000 satellite television station.

That evening, in reporting back to the full (15,000 member) assembly Demos Shakarian announced the Board of Directors for Full Gospel had voted a \$90,000 interim fund to the group's project **"to hire a full time administrator**

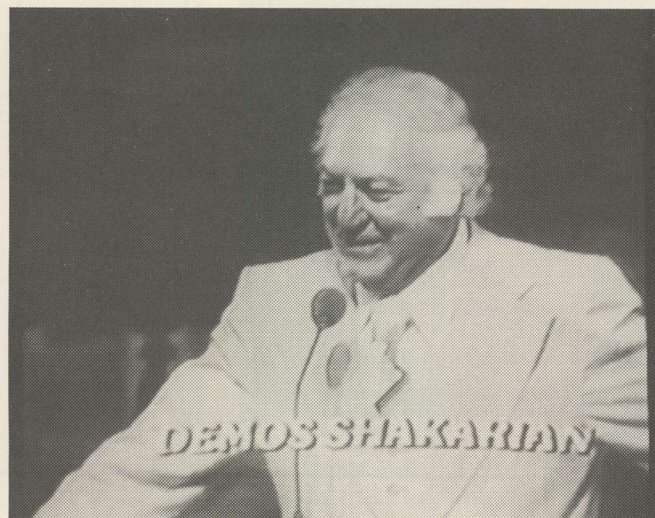


PRAISE THE LORD—the original 'PTL' is the program title carried by Trinity's Paul Crouch. Here in opening sequence Scientific-Atlanta 5 meter terminal set up for convention is shown in front of the Anaheim Convention Center.



FULL GOSPEL MEETING attracted reported 15,000 plus delegates from all 50 states and throughout the world.

and provide the legal and technical expertise needed to make the program fly". The group is hardly without technical or legal expertise. In the technical department it numbers amongst its members such as George Metcalf, a 15 year veteran of NASA (National Aeronautics and Space Administration) and Patrick Fisher, an executive with CAN-TEL Communications International, a Canadian company headquartered in Sidney, British Columbia. Metcalf is the fellow responsible at NASA for operations and main-



DEMOS SHAKARIAN, the California cattle rancher who founded Full Gospel 25 years ago following a vision still leads the group.

tenance of all of the worldwide NASA space communication facilities; he even spent several months overseeing the installation of the Moscow/Washington satellite connected 'Hot Line'. Fisher knows about as much as everybody around concerning small receive terminals for the worldwide terrain mapping and world resources plotting LANDSAT satellite systems. Both are pretty heavy fellows and both are dedicated members of Full Gospel.

Let's see now; 335 satellite/translator terminals

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CATJ 1978 Satellite Transponder Use Chart

Transp.	COMSTAR 'C' 89.7°W 'B' 95.0°W	WESTAR I 99.0°W	ANIK I 104.0°W	ANIK II 109.0°W	ANIK III 114.0°W	SATCOM F2 119.0°W	WESTAR II 123.5°W	COMSTAR 'A' 128.0°W	SATCOM F1 135.0°W	12CH/24 CH. RCVR
1		MUTUAL RADIO AUDIO CH'S (4)					ASNIWOR- 6.8 AUDIO OCC. VIDEO 6.2 AUDIO		VIDEO (OCC.) 6.8 AUDIO	1
2		FDFM					SCPC		PTL VIDEO 6.8 AUDIO	3
3		SCPC				SCPC/FDM AUDIO TO ALASKA	VIDEO (OCC.) 6.2 AUDIO			5
4					VIDEO (OCC.) CBC 6.8 MHz AUDIO	VIDEO (OCC.) 6.8 MHz AUDIO	ASNIWGN 6.8 AUDIO OCC. VIDEO 6.2 AUDIO	NOT OPERATIONAL		7
5					SCPC/FDM AUDIO	SCPC AUDIO			VISTAR VIDEO (10-1-78) 6.8 AUDIO	9
6		VIDEO (OCC.) 6.2 MHz AUDIO					SCPC/FDM AUDIO		WTCG VIDEO WITH 6.8 AUDIO; UPI SLOW SCAN 6.2	11
7		PBS VIDEO (RESERVED) 6.8 MHz AUDIO					ASNIKT TV VIDEO 6.8 AUDIO VIDEO (OCC.) 6.2 AUDIO	SCPC/FDM AUDIO		13
8		PBS VIDEO (MOUNTAIN) 6.8 MHz AUDIO				NBC CONTRACT VIDEO 6.8 MHz AUDIO	SCPC/FDM AUDIO		CBN VIDEO 6.8 AUDIO	15
9		PBS VIDEO (EASTERN) 6.8 MHz AUDIO					SCPC/FDM AUDIO		MADISON SQUARE GARDEN VIDEO 6.8 AUDIO	17
10						VIDEO (OCC.) 6.8 MHz AUDIO	SCPC/FDM AUDIO		SHOWTIME/west VIDEO—6.8 AUDIO	19
11		PBS VIDEO (PACIFIC) 6.8 MHz AUDIO					SCPC/FDM AUDIO			21
12		VIDEO (OCC.) 6.2 MHz AUDIO				NOT OPERATIONAL	ASNIHOLLYWOOD 6.8 AUDIO VIDEO (OCC.) 6.2 AUDIO		SHOWTIME/east VIDEO—6.8 AUDIO	23
13										
14								SCPC/FDM AUDIO	KTNB/Trinity VIDEO—6.8 AUDIO	
15									VIDEO (OCC.) 6.8 AUDIO	

'C' LAUNCHED
AS RESERVE
BIRD

COMSTAR 'B' SERVES
AS SECONDARY BIRD
FOR SYSTEM

ANIK I IN RESERVE STATUS
ANIK II IN SECONDARY STATUS



WASHINGTON ATTORNEY Jim Gammon (left) with Trinity's Paul Crouch discuss Trinity's applications for four 'baby sister stations', translators fed by satellite, for four markets filed for by Trinity recently.

at \$60,000 each. **That comes to \$20,100,000 to be invested.** "And this is only the beginning" notes Steve Shakarian. **"Our goal is for no fewer than 1,200 such terminals. . . and soon."** In the secular world that is a pretty fair piece of business for some hardware suppliers. It should not surprise you to learn that at least two 'small earth terminals' were in operation at the Full Gospel 25th convention in Anaheim. One was the 5 meter terminal of **Scientific-Atlanta**; brought on site at the behest of the folks at Trinity who have an existing business relationship with the Atlanta firm. The other was a six meter terminal from **USTC**; the Afton, Oklahoma manufacturer of steel and aluminum earth terminals for the cable industry. USTC's Maynard 'Stormy' Weathers has a special interest in the Full Gospel program; Stormy is a member of the group and he has been close to the project since it was first conceived early this year. The same meeting brought out representatives of at least two of the translator manufacturing firms; Television Technology Corporation out of Arvada, Colorado was on hand as was the largest supplier in the translator world; EMCEE. Both were after a piece of the action.

Not everything about the Full Gospel program showed as much organization as the orchestrated program July 6th that resulted in 335 chapter pledges to construct terminals. The FGBMFI booklet spoke primarily of utilizing the programming services of PTL; the Jim Bakker operation from Charlotte that is having its own problems these days. Bakker had been scheduled to address the group; a combination of his problems made that impossible. He was later scheduled as a stop gap measure to address the group via satellite television. Even that fell through at the last minute. **Use of the PTL service in its present form is impossible** of course; PTL is **not** a broadcast service and the FCC's December 1977 ruling limits translators fed by microwave (or satellite microwave) to operating with real broadcast signals at their inputs. PTL did have a plan to

handle that problem; they were talking, back in late April during the NCTA convention, of renting a second transponder from RCA and using it to feed their Canton, Ohio UHF broadcast station back out through the bird for translator service. Another plan involved PTL getting a station on the air in Charlotte, and then using that broadcast signal to feed a second transponder. Still a third plan involved PTL **taking their existing cable feed off of transponder 2**, and replacing it with a feed from their existing Canton station. That would probably cause many (if not most) of the existing cable systems carrying their signal to **drop feed** since conversion of the transponder 2 feed to a **broadcast classified signal** would have serious copyright impact upon the cable systems.

Sitting out in the lobby of the Anaheim Convention Center, during the full week of the FGBMFI gathering was a portable television studio; set up by the folks at Trinity Broadcasting. Trinity's KTBN did numerous 'remote telecasts' from the convention center, including coverage of the appearance of Oral Roberts and other noteables in the religious broadcasting field. During the July 7th coverage from the center, Trinity's Paul Crouch may have tipped his own hand in the competitive religious broadcasting world. He brought on camera their Washington attorney **Jim Gammon** (of Gammon & Tierney) and their as an exercise in Crouch 'showmanship' Gammon and Crouch signed-off on four FCC UHF translator applications. The applications, which Crouch called **"for Trinity baby sister stations"**, were for the cities of Denver, Seattle, Oklahoma City and Houston. Crouch noted that the FCC had **not** acted on the Trinity applications for the "full high power Christian television stations" so Trinity was going ahead and applying for UHF translators, to be fed by satellite, on the same channels as the full power stations **"as an interim way of bringing Christian service to these communities"**. Crouch also noted that translators were a big part of the Trinity service plan; leaving the **impression** he would be open to any overtures from FGBMFI to handle for the Full Gospel group their "feed needs" for the by then pledged 335 translator stations.

Full Gospel's Shakarian is in a bit of a strange spot. He had gone, he said, to Jim Bakker at PTL early this year to **"work out a contract"** with PTL whereby **"PTL would supply the programming (via satellite), and Full Gospel would supply the translator stations/earth terminals"**. Everyone seems to agree that such an agreement does exist. Yet Shakarian is **on** the Board of Directors for Trinity, and Full Gospel **also utilizes** the services of Trinity FCC attorney Jim Gammon. It is a curious situation since Trinity is ready and willing to be a satellite carried full (religious) broadcast service, capable of going directly on translators while PTL is not.

Crouch, for his part, carefully steered away from any direct mention of the Full Gospel

satellite fed translator plan during his live convention center coverage of the 25th gathering of the group. But throughout his oratory he was eluding to just such a plan constantly. Meanwhile late in July the first actual application for a UHF translator to be fed by satellite hit the FCC Public Notice file. That application, filed by a group known as **Upper Peninsula TV Systems, Inc. of Iron Mountain, Michigan** seeks FCC permission for 100 watt UHF translators to serve the Iron Mountain area on channels 53, 56, 59 and 64. The channel 53 translator would carry KTBN from Trinity while the channel 64 translator would carry PTL's WYAH from Portsmouth. Channel 56 would carry Chicago's WGN and channel 59 would carry Detroit's WKBD; the latter two to be delivered to the translator company by terrestrial microwave.

The Full Gospel plan is not without its detractors; even within the religious broadcasting community. **Pete Warren** and **Alex Blomerth**, operating International Christian Television and Satellite Technology For Christ out of El Paso are particularly piqued over what they consider "profiteering" of the Full Gospel group. "We have priced out all of the equipment required for a 100 watt UHF translator station and we come to the conclusion that they may be padding their terminal/station costs by as much as \$15,000 each" laments Blomerth. Full Gospel for their part does talk, unofficially of course, about "\$15,000 in engineering and administrative costs per installation". Warren notes "If somebody really wanted to shave costs, using an existing tower for the translator transmitting antenna and an existing building for the equipment, and a 5-10 mile coverage translator transmitting antenna...he could put in one of these terminals using a 4.57 meter antenna and a 100 watt translator for around \$22,000." Warren and Blomerth were sufficiently angered by the Full Gospel high-dollar approach that they prepared a long, detailed "Fact Letter" setting out what they feel the real costs should be; a letter which they are planning to distribute directly to the Full Gospel chapters nationwide.

Meanwhile the Blomerth/Warren operation in El Paso (see CATJ for January 1978) is finally making progress on their own over-the-air religious television station. Their channel 14 is now under construction and they are thinking of an on-air date of around the first of December this fall. "We will program both secular and religious material" notes Warren. It is an 'open secret' that they have talked at some length with both Ed Taylor of Southern Satellite and Bill Bauce of ASN about molding their new station's program schedule into a satellite uplink feed. And so when another year has rolled by it is entirely possible that there will be another broadly based religious channel available on satellite; only this one, unlike those now there, will combine both religion and non-religious programming into a program schedule which may ultimately be more attractive to cable audiences.

And finally, in the religious area, there is the story of the chap who walked into the New York City offices of one of the two U.S. satellite operating companies; in November of 1976. "I'd like to buy an hour of satellite time" came the request. He didn't balk at the then-one shot one hour rate of \$1,800. "And when would you like this one hour?" asked the satellite operator type.

"Christmas Eve...December 24th" came the reply.

"And where do you want the program brought down?" asked the satellite man, working thru his check sheet and order form.

"Down???" came the response. "What do you mean DOWN?"

"Well, the satellite relays the signal. It takes the earth transmission and turns it around and sends it back to earth from space" explained the satellite man as patiently as he could.

"Does it HAVE to come down?" asked the time buyer. "I mean...can't some of it go into space?"

The satellite chap took a deep breath. "Well actually most of it does go right by the satellite and I guess you'd have to say it goes on into space. Only a small part is actually intercepted by the satellite and sent back to earth."

"Well that's the part that I am interestd in" responded the buyer. "How much does that part...the part that doesn't go through the satellite...cost?"

"Ahhh...well, the rate is the same either way. \$1,800 for an hour. Now where do you want your

Can you use a Trap that costs only \$2.90?

VITEK offers two different models at that price... and either one will provide 50dB rejection.*

If you are interested in keeping your Pay-TV Security costs down and can use either of our Special Mid-Band Channel G or H Traps, here's how you can save money without compromising on your security.

1. Order a quantity of 1,000 or more traps for either of the two channels (G or H) and you pay only \$2.90 each. (In quantities of 500-1,000 the price is still only \$3.25 each.)
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*50dB is the minimum attenuation over the broad temperature range of -20°F to +120°F.

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VITEK

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signal delivered; Atlanta, San Francisco, Los Angeles...?"

"I want it delivered to God" said the man.

The satellite representative took a deep breath and onto the order form where one is supposed to note the terrestrial point of delivery of the satellite delivery he wrote down G O D.

"I think that's a capital G and a small o and d" offered the buyer". "And here is your \$1,800" he noted pulling 100 dollar bills out of his wallet.

And sure enough, on schedule he delivered a one hour tape to the satellite company office and indeed it did go via satellite transmission on Christmas Eve in 1976. The man promised to come back and buy another hours time "as soon as I get a reply".

LNA Progress And Equipment Update

As reported in the **August CATJ CCOS '78 Report**, if there is one bit of technology news bounds to excite the pulse of those people within our industry who are charged with seeing that equipment for the TVRO explosion gets out, on time, in the proper form...the announcement by **Hewlett Packard** that they are now in the 85 degree Kelvin GaAs-FET device field with an "off the shelf" 1/2 micron GaAs-FET has got to be the news of the year.

Now we have nothing against either Japan's **NEC** or the recent confirmation from **AVANTEK** (see this month's **TECHNICAL TOPICS** section) that they **too** are now making their own 1/2 micron low noise GaAs-FET devices. But if you have closely followed, as we have, the trials and tribulations of the LNA suppliers...if you talk with people like Earl Davis of RF Systems who seems to constantly have "14 TVRO antennas installed and NO LNAs to go with them..." then you have some concept of the importance of having the 'big HP' in the GaAs-FET field.

The LNA crunch is not over. But at least now, or shortly here after, if an LNA supplier is complaining that he can't make delivery the reason is probably not his inability to acquire the GaAs-FETS he needs. This has been an almost totally frustrating 18 months; **waiting** for a major U.S. supplier **with no LNA product of its own** to get into a position where it was ready, willing and

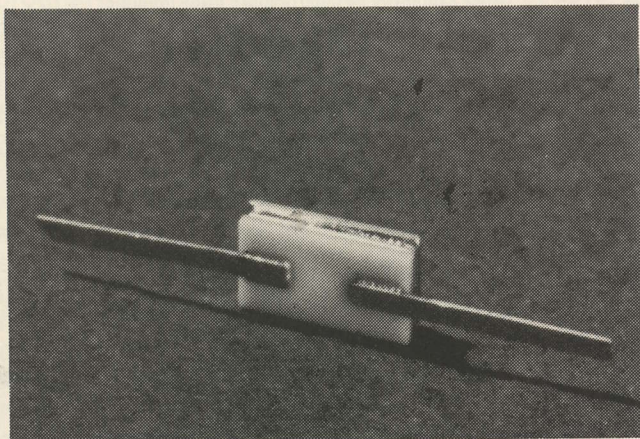
able to ship GaAs-FETS "on demand". Who knows...one of these days the price of LNAs might even actually come down!

The new HP model HP2201 is a packaged device. It sells for \$325 in 1-24 quantities, \$295 in 25-49 quantities and the price keeps on dropping as you get into the OEM areas. These prices are comparable to those prices that NEC users have been paying with the obvious advantage that HP's plant is a whole lot closer to the states than NEC's, and, HP (unlike NEC) claims to be able to ship almost at will. There is more good news for the devoted GaAs-FET technology buff. These are **not** selected devices; that is, HP 'claims' that their yield on the HP2201 is sufficiently high that they are not into a grading process with the units. An initial order from a European manufacturer took several hundred of the new 85 degree Kelvin devices. Our information sources using NEC's imported GaAs-FETS tell us that a "supply of several hundred would amount to several (perhaps four) month's imported production from NEC". That apparently says something for the HP capability in this area.

A chart here breaks down the HP2201 parameters. There will be, later on (when is not known at this time) a companion chip version; the HP2001. There are also, for those who missed the earlier announcements in the various microwave-field publications, **two other HP GaAs-FETS** also available; at substantially lower prices. The **HFET 1101** is a 2.2 dB (195 degree K) device with a "typical noise figure" of 1.8 dB (150 degrees K) at 4 GHz and 9.5 dB of stage gain. It sells for \$105 each in small quantities. And there is the **HFET 1102**, a 1.7 dB (140 degree K) max, 1.5 dB typical (120 degrees) device with 11.0 dB of stage gain that sells in small quantities for \$150. Remember that it takes an 85 degree K GaAs-FET transistor to create a 120 degree noise figure LNA (give or take a few degrees — it depends upon isolator and other losses plus the input match to the first stage); so a 150 degree device will typically produce a 185 degree LNA.

So there is **light** at the end of the LNA tunnel. If you have a chance, you might let HP know how much you appreciate their getting into this field. They are still a bit unsure why the world needs an 85 degree U.S. produced GaAs-FET and we would sure hate for them to put this whole product lint on a back burner while the LNA industry geared up to the onslaught we see ahead in 1979.

Which brings us to the balance of the equipment analysis. Gear, any gear, is still in very tight supply. The recent increase in FCC application activity by CATV systems when coupled with other newly emerging present day and soon-to-be users of TVRO hardware is keeping the supply lines long and tempers short. We know of several antenna suppliers who routinely go without a receiver in their own shops for days or even weeks on end now; being





forced into 'loaning out' their own shop receivers to some customer someplace who simply 'must' get on the air.

People (meaning firms) keep announcing new receivers; seemingly left and right. And the faster receivers are announced, the longer the delivery cycle becomes. Not all receiver suppliers seem to be having this problem; but most are. If you find yourself in a tight for a receiver, perhaps the best advise is to go through the pages of CATJ and call every receiver manufacturer you see advertising here. You might strike pay dirt with one that you had originally decided not to buy from. Remember that old song "If I can't be with the one I love, then I'll love the one I'm with"? Plug "receiver" in and start humming.

There are a couple of new commercial receiver suppliers on the market. RF System's parent corporation, COMTECH, is about to pop with a couple of new models which Earl Davis claims will run rings around anything else on the market today. Just deliver them Earl; that's enough rings for now. Scientific-Communications, Inc., the LNA People, have finally determined that you can manufacture both receivers and LNAs and not go out of business because the competition that buys LNAs from you (because they don't make any themselves) gets mad at you. SCI has wrestled with that problem for several months, first fearful about even offering a receiver and then deciding that they would only offer it on an OEM basis; that is, they would manufacture their design for some one else; such as an antenna supplier that had no receiver of his own. After a troublesome debut in New Orleans and more fruitful demonstrations at the Full Gospel convention in Anaheim in July and CCOS later that same month, SCI has taken the bull by the horns and dropped into the receiver business directly. We saw the first proto-type SCI receiver at the CATJ Lab back in February (we can now reveal) and have seen it back here since then in final form. It is compact, works well, and has some interesting innovations. A substantial quantity first-production run is now underway with October deliveries planned.

Another non-receiver supplier that has done some work in this area is none other than (are you ready for this?) USTC in Afton, Oklahoma. Stormy Weathers had a 12 channel step-tuned receiver at the Full Gospel convention in Anaheim in July; only Stormy insists that this is not for the cable market; only for the Full Gospel satellite fed translator system market when it materializes (see separate report here on the religious transponders). The receiver was front-panel inscribed "USTC/FELLOWSHIP ONE Satellite Receiver" and it steps through the twelve transponders it is tuned to with user-settable pots that pre-set the varactor tuning voltage for the 12 transponders you want. We played with it...found it worked very well. When we suggested to Stormy that he would probably



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**LOW NOISE
BROADBAND
MICROWAVE GaAs FET**

HFET-2201

TENTATIVE DATA AUGUST 1978

Features

LOW NOISE FIGURE
2.4 dB Typical NF at 10 GHz
3.1 dB Typical NF at 14 GHz

HIGH MAXIMUM AVAILABLE GAIN
14.5 dB Typical $G_{a(max)}$ at 10 GHz

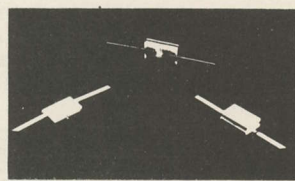
HIGH OUTPUT POWER
12 dBm Linear Power at 10 GHz

CHARACTERIZED TO 18 GHz

HERMETIC MICROSTRIP WIDEBAND PACKAGE

HIGH TRANSDUCER GAIN TO 18 GHz

0.5 MICROMETER GATE



Description/Applications

The HFET-2201 is a gallium arsenide Schottky gate field effect transistor. It features a rugged, hermetic, microstrip compatible package that is designed for consistent broadband or narrow-band operation over the frequency range of 2 GHz to 18 GHz. The device's superior noise and gain performance, coupled with its wide dynamic range capability make it ideally suited for such applications as ECM, wideband surveillance, and warning systems.

In addition, its characteristics lend themselves to ease of circuit design in applications such as radar and communications equipment.

The HFET-2201 is packaged in the HPAC-170. The part is capable of meeting the environmental requirements of MIL-S-19500 and the test requirements of MIL-STD-750/883.

Electrical Specifications $T_{CASE}=25^{\circ}C$

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
I_{DSS}	Saturated Drain Current, $V_{GS} = 3.5V$, $V_{DS} = 0V$	mA	25	50	90
V_{GSP}	Pinch Off Voltage, $V_{DS} = 3.5V$, $I_{DS} < 500\mu A$	V	-0.5	-2.0	-4.0
g_m	Transconductance, $V_{GS} = 3.5V$, $\Delta V_{GS} = 0V$ to $-0.5V$	mmho	20	32	45
$G_{a(max)}$	Maximum Available Gain $V_{GS} = 3.5V$, $V_{DS} = 0V$				
		f = 8GHz		16.0	
		10GHz		14.5	
		12GHz		12.5	
F_{MIN}	Minimum Noise Figure $V_{GS} = 3.5V$, $I_{DS} = 15\% \text{ loss (Typ. 7.5mA)}$				
		f = 4GHz		1.2	
		10GHz		2.4	2.8
		14GHz		3.1	
G_a	Associated Gain At N.F. Bias				
		f = 4GHz		14.1	
		10GHz	8.0	9.2	
		14GHz		8.0	
P_{1dB}	Power at 1dB Compression $V_{GS} = 3.5V$, $I_{DS} = 50\% \text{ loss}$ (0 dBm Input Matching, Tuned for Max. Output)				
		f = 10GHz		12.0	

be able to sell all he could get made for his cable customers he said he was perfectly happy with his existing relationship with his present receiver suppliers. The 12 channel receiver was listed at around \$3600 on the Full Gospel satellite/translator system break down we happened to catch a glimpse at. Keep on truckin' Stormy.

The unintentional "hit of CCOS" in the receiver area was the August report mentioned "Northern Satellite Systems" private terminal receiver designed by the Yukon's Rod Wheeler and Oklahoma's infamous bad boy Steve Richey. The little \$2,700 receiver tunes all 24 transponder channels, has a front panel calibration scale for ANIK, SATCOM and WESTAR and a front panel switch that selects between 6.2 and 6.8 MHz aural sub-carriers. The unit has a built in 250 mA LNA supply, regulated to 12 volts, and a tuning meter on the front that lets you tune in the manual mode to the zero or center mark on the discriminator and then switch on an AFC switch that holds the tuneable receiver on channel. Richey tried to soft peddle the receiver as not being good for any CATV user and Wheeler, the guy who really owns the rights and controls the marketing, was most adamant that he was not going to allow the unit into the U.S. cable market. At CCOS, industry super-engineer Sruki Switzer took one long, hard look at the receiver and asked Richey "Steve, why don't you go out and get a real job...like the rest of us?". For now the

SUMMARY OF TERMINAL SALES

Through our Satellite Technology News column appearing monthly in CATJ we have been 'tracking' the progress of the TVRO segment of the cable industry since January of this year. Our "statistics" portion of that column reports monthly on the new applications before the FCC, the license grants of the Commission in this area, and how terminal prices and channel usage changes.

Our data is compiled by monitoring FCC releases; when a TVRO application goes on 'public notice' the Commission releases basic data about each application. This includes the antenna manufacturer specified by the applicant, the cost of the terminal, the channels requested and so on. We have not previously published our compiled data which indicates the relative 'strength' of each supplier in this field; nor indicating how various terminal suppliers stack up against one another in various categories of pricing.

The danger with this data is many-fold. Assuming that we know how to add and divide accurately, the opportunities for error shift to the accuracy of the applicant's own application and the ability of the FCC to 'copy' that data into their public notice release forms.

We have studied the 28 week period running from January 30 through August 7, 1978. In that 28 weeks 347 applications for TVRO applications landed at the FCC. These 347 applications accounted for 864 'channels of service'; an average of 2.489 channels per applicant. That added up to \$12,672,848 in 'reported business' according to Commission records. In case you are interested, that divides down to \$36,521.18 per terminal.

Numbers. 'Neutral numbers' so far. Now what about the performance of the individual suppliers in the field? We have divided the terminal suppliers into ten categories. Two suppliers show up twice in this breakdown; the ten meter terminals from Scientific Atlanta and Andrews are listed separately from their respective 5 and 4.5 meter terminals. The areas we have 'measured', again from the FCC's data, are in five categories. Beyond that you are on your own!

Category: Total Channels 'Sold'

Rating (*)	Company	Antenna	Channels Sold
1	Scientific Atlanta	5 meter	353
2	Andrew/Hughes	4.5 meter	223
3	RF Systems	6 meter	71
4	USTC	6 meter	63
5	Harris (RMS)	6 meter	59
6	Prodelin	4.5 meter	49
7	Microdyne/AFC (**)	5 meter	15
8	AFC	'Horn'	13
9	Scientific Atlanta	10 meter	4
10	Andrew	10 meter	2

*—Ratings are simply numerical sequential listings from the statistical base. **—Microdyne joined the antenna business with an AFC manufactured 5 meter fiberglass dish in approximately week 14 of the measured period.

Category: Total Terminals 'Sold'/License Applied For

Rating (*)	Company	Antenna	Terminals Sold
1	Scientific Atlanta	5 meter	141
2	Andrew/Hughes	4.5 meter	90
3	RF Systems	6 meter	30
4	USTC	6 meter	27
5	Harris (RMS)	6 meter	23
6	Prodelin	4.5 meter	14
7	Microdyne/AFC (**)	5 meter	9
8	AFC	'Horn'	8
9	Scientific Atlanta	10 meter	4
10	Andrew	10 meter	2

*—Ratings are simply numerical sequential listings from the statistical base. **—Microdyne joined the antenna business with an AFC manufactured 5 meter fiberglass dish in approximately week 14 of the measured period.

Category: Dollar volume per company

Rating (*)	Company	Antenna	\$\$ Business Reported
1	Scientific Atlanta	5 meter	\$5,381,738
2	Andrew/Hughes	4.5 meter	3,051,194
3	RF Systems	6 meter	979,831
4	Harris (RMS)	6 meter	976,545
5	USTC	6 meter	741,281
6	Prodelin	4.5 meter	414,175
7	Scientific Atlanta	10 meter	385,772
8	Microdyne/AFC	5 meter	274,250
9	AFC	'Horn'	274,238
10	Andrew	10 meter	193,824

*—Ratings are simply numerical sequential listings from the statistical base.

Category: Average cost per TVRO channel delivered

Rating (*)	Company	Antenna	Dollar Cost Per Channel (**)
1	Prodelin	4.5 meter	\$ 8,453.
2	USTC	6 meter	11,766.
3	Andrew/Hughes	4.5 meter	13,682.
4	RF Systems	6 meter	13,800.
5	Scientific Atlanta	5 meter	15,246.
6	Harris (RMS)	6 meter	16,552.
7	Microdyne/AFC	5 meter	18,283.
8	AFC	'Horn'	21,095.
9	Scientific Atlanta	10 meter	24,228.
10	Andrew	10 meter	38,577.

*Ratings are simply numerical sequential listings from the statistical base.

**—Found by taking total cost of terminal and dividing by number of channels applied for.

Category: Average channels per terminal sold

Rating (*)	Company	Antenna	Average Channels Per Terminal
1	Prodelin	4.5 meter	3.500
2	RF Systems	6 meter	2.867
3	Harris	6 meter	2.565
4	Scientific Atlanta	5 meter	2.504
5	Andrew/Hughes	4.5 meter	2.478
6	USTC	6 meter	2.333
7	AFC	'Horn'	1.857
8	Microdyne/AFC	5 meter	1.667

*—Ratings are simply numerical sequential listings from the statistical base.

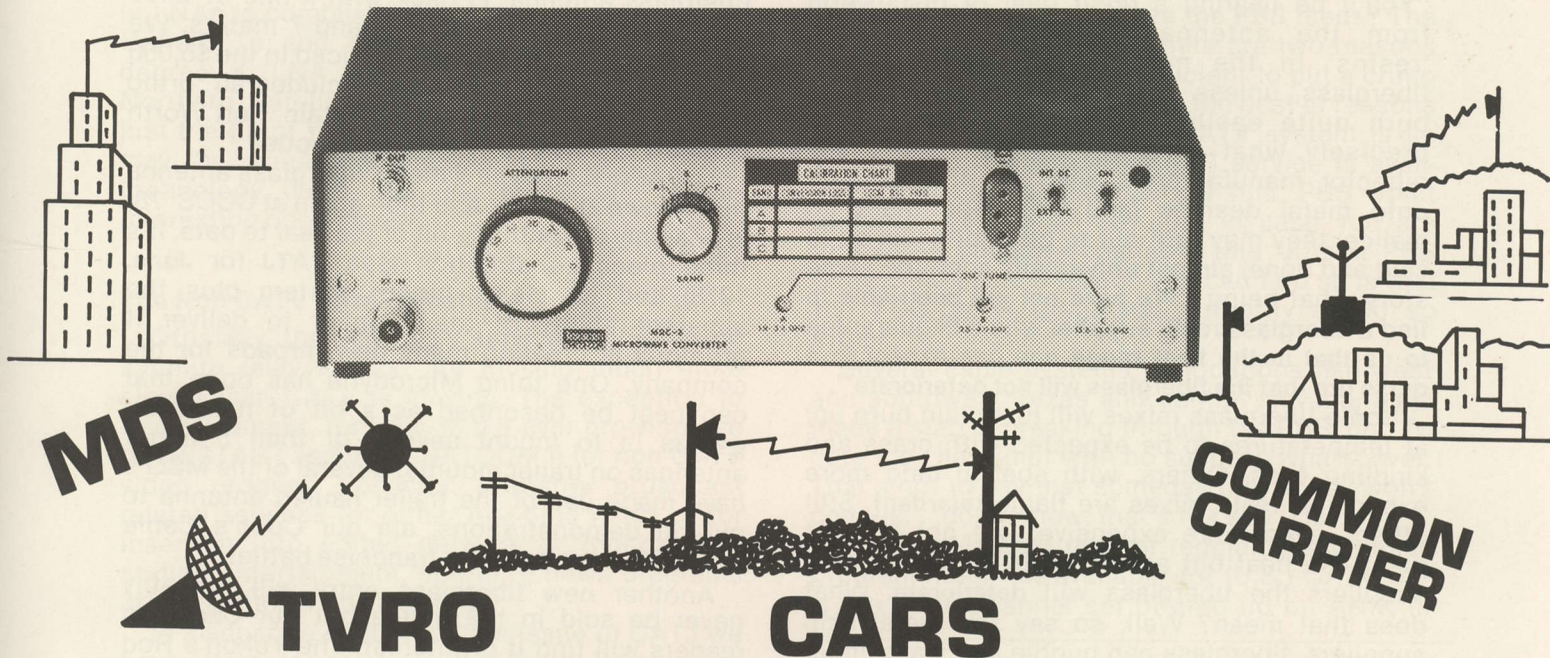
receiver's production is all tied up for Wheeler's immediate needs in Canada so the question of whether it will be sold (that is, delivered) for U.S. cable use is a moot one. Again, we've seen it play and have played with it ourselves at the CATJ Lab. We can't see a cable operator wanting one

for his system. . .but for playing around, well, like the private terminal user, that is an entirely different matter.

Finally there was at CCOS, as reported in the August CATJ preliminary report on this year's gathering, a new "master" and "slave" approach

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Texscan's microwave down converter permits measurement in the MDS (2.1 GHZ) TVRO (3.7 GHZ) and CARS (12.7 GHZ) band with existing VHF test equipment. Spectrum analysis, signal strength and even microwave sweeping are possible with the MDC-3.

Available as an option are three bandpass filters which speed and simplify the measurement process. The filter kit is required for sweep operation. The MDC-3 has a calibrated insertion loss and adjustable local oscillator for each band. Other frequencies are available.

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receiver from a Texas outfit known as **SATCO**. Our comments of last month (see page 17, **August CATJ**) would only be redundant. For systems with more than a single TVRO channel to demodulate down to baseband, the receiver's master plus slave approach with a single down converter for multiple channels just might be worth looking into.

And then there are the antenna wars. In our June issue report on the NCTA meet, we noted "You'll be hearing a great deal of discussion from the antenna suppliers...concerning 'resins' in the months and years ahead; fiberglass, unless properly resin-prepared, will burn quite easily...". Sure enough that is precisely what is being touted. The TVRO reflector manufacturers who are still hanging onto metal designs (and we mean them no malice; they may turn out to be right when all is said and done) almost universally echo the same story. That being "**We have not yet been able to find a fiberglass resin supplier who will guarantee to us that in the heat range one can expect in a grass fire that the fiberglass will not deteriorate**".

Some fiberglass mixes will just plain burn up; at temperatures to be expected with grass and kindling fires. Others, with special (and more expensive) resin mixes are flame **retardant**. Still others, even more expensive, will not burn at grass fire heat but according to the metal skin suppliers the fiberglass will **deteriorate**. What does that mean? Well, so say the metal skin suppliers, fiberglass can buckle and warp under heat. Sort of like developing a giant case of warts or the hives.

Headend fires are not unknown. Our favorite story in this area involves an antenna supplier who shall go nameless and an installation in Arkansas last March. Seems in the process of installing a TVRO antenna a careless crew member managed to burn down around 15 acres of Arkansas pine including the property surrounding the headend. It's a hilarious story—ask your favorite TVRO antenna supplier about it. If he balks at telling you it he's probably the guy that did it! As TVRO antenna stories go it ranks right up there with the famous dropping of a Prodelin 4.57 meter fiberglass antenna off of the roof of the Disneyland Convention Center in December of 1976.

Most of the antenna wars are price conscious. Everyone is looking for ways to reduce the user cost of the TVRO antennas. **Anixter-Mark**, not previously in the TVRO antenna field, is finishing up heavy tooling (around \$100,000 worth) to bring into the marketplace this fall a 5 meter metal (**petal**) antenna. Pricing in the \$5,000 range will include an ortho coupler, mount and feed. They claim they will be able to offer a high quality metal antenna for this type of price primarily because they will have invested in tooling that will stamp out the parts in production line assembly form. Anixter-Mark also has a very interesting 3 meter (**not for CATV** - yet) spun dish

that many of the private terminal guys have been buying. With feed and mount it nets out for around \$1,500 and they promise to have an ortho coupler for this antenna by November; a \$300 option. The best part may be the delivery — from 3-5 weeks depending upon when you order it. We'll have more to say about both of the A-M antennas as the fall progresses.

Fort Worth Tower, after missing the NCTA show with a previously promised 7 meter fiberglass antenna, is back with a line of **three** fiberglass jobs; one each 5, 6 and 7 meters. We understand the 5 meter job is priced in the \$5,000 price range but whether that includes an ortho coupler feed or not we are uncertain. Fort Worth possibly is not yet into a **delivery** mode.

The **AFC/Microdyne** 5 meter fiberglass antenna first shown at NCTA, and then again at CCOS '78, is possibly the antenna-hit of the year to date. It's three piece construction (see **CATJ** for **June, 1978**) and its clever mount system plus the apparent ability of the supplier to deliver it promptly is creating many new inroads for the company. One thing Microdyne has done that can best be described as a bit of marketing genius is to mount several of their 5 meter antennas on trailer mounts. Several of the MSO's have made use of the trailer hauled antenna to put on demonstrations, ala our Coop's Cable Column of last April, for franchise battles.

Another new fiberglass entry will probably never be sold in the states but our Canadian readers will find it of interest. The Yukon's Rod Wheeler, having designed and constructed his own 4.5 meter metal reflector (see **Coop's Cable Column, August**) decided that once was enough for that exercise. Consequently Rod has put together molds for a fiberglass antenna which he is packaging with his new private terminal receiver for sale in **Canada**. Canadian's looking for Wheeler will find it in care of the Whitehorse Yukon cable system offices.

During the past 8 months CATJ has been keeping close tabs on the way the various TVRO terminals have been bought. We've put together some statistics, which appear here, showing (from FCC file records) just how well each of the antenna suppliers is doing, and of perhaps greater interest (to us anyhow) how each antenna supplier averages out on a cost-per-channel basis with his product. By taking the total FCC reported cost of the TVRO terminal, dividing into that dollar cost reported the number of channels the terminal will initially deliver (that measures the number of receivers involved), we come up with a "**Cost-per-channel**". We don't claim this proves anything...concretely...but it is food for thought.

In the final analysis, equipment is **still** hard to come by, and because most suppliers are concerned that the rapid advance of technology could catch them with parts on hand for 100 or more receivers that may suddenly become operation or cost relics they are approaching

each receiver run of a semi build-to-order basis. That keeps off-the-shelf delivery tight and it creates massive juggling problems of the scarce inventory. With the probable start up of religion-nourished UHF translators fed by satellite signals, the Holiday Inn program and others now taking shape, the crunch on hardware will last, we feel, for another year or more. We see substantive (but not revolutionary price, reductions ahead for antennas (especially if the 12-13 footers hit and are approved for CATV use), in LNAs (a combination of the availability of HP GaAs-FETs and the rapid growth of 200-300 degree K LNA markets) and receivers (the Northern Satellite Systems \$2700 tuneable is just the tip of the iceberg; a year from now that may be considered 'expensive'). For TVRO technology buffs the year ahead will be an interesting one indeed!

The Non CATV Developments

Officially, the non-CATV services going to the satellite relay service are moving much more slowly than CATV is moving. The exception to this statement, for now, is the ever growing use of WESTAR I and II and SATCOM II for **non-CATV** video program services; primarily broadcast related services for either real-time feeds or for insertion into edited network or independent station entertainment, sports or news programs at a later time in the relay day.

In a separate section of this issue of CATJ we have attempted to show all of the existing users of video for the five primary domestic satellites of interest; WESTAR I and II, SATCOM I and II and ANIK III. Video feeds via satellites generally fall into two general categories. Inspection of the chart elsewhere in this issue will reveal that if **all** of the 'regularly scheduled' video transponders plus **all** of the 'occasional use' video transponders are in service at one time, there would be something approaching **40 separate video program channels** in operation. In truth, on a busy Sunday afternoon in the midst of the professional football season the number of transponders likely to be in use at **any one time** on the five satellites in question may well number thirty plus. And ten (or more) of these are likely to be carrying pro football games or programs directly related to that afternoon's professional football schedule.

Such 'busy' times aside, just how are the non-CATV video services being utilized, and by whom, today? The heaviest 'regularly scheduled' program services user is the **Public Broadcasting System**, or PBS, which is presently operating on three of the WESTAR I transponders. A fourth transponder is due in service this fall. PBS utilizes its transponders to feed 'real broadcast time' network feeds to its 150 plus satellite connected terrestrial transmitters from the Virgin Islands on the east to the west coast on the west. PBS stations on the ground take the appropriate feed from the appropriate transponder

to coincide with their own terrestrial time zone. It will be possible, with all four PBS transponders in operation, for a devoted Sesame Street fan, for example, to watch the **same program** from beginning to end four times in four consecutive hours. The same holds for other PBS programs, for the full broadcast day at PBS. Ultimately, starting in 1979, regional PBS feeds limited to the re-distribution by stations within a single time zone or a single region of the country will be added to the PBS lineup.

Can a cable system utilize the PBS feeds? The answer is no, it may not. There are two reasons why but, the first one is sufficient to put a crimp in your plans even if you have the best of reasons to wish to do so; i.e. your CATV system is so located that no terrestrial PBS service is available. **And that reason?** Simply this. PBS won't authorize you to do so. Just in case you are interested, lacking a change in this 'official' PBS policy, the second reason you can't do so is that the FCC won't grant you authority to do so either.

Several cable systems, in locations like west and southwest Texas and central Nevada, have made a stab at breaking through the PBS 'no'. To date they have met with no success whatsoever. That's not to say that someday this policy won't change. . .but for now, that's the way it is.

The next largest user of regularly scheduled programming, not available for (U.S.) CATV use is the three channel set offered up on ANIK III

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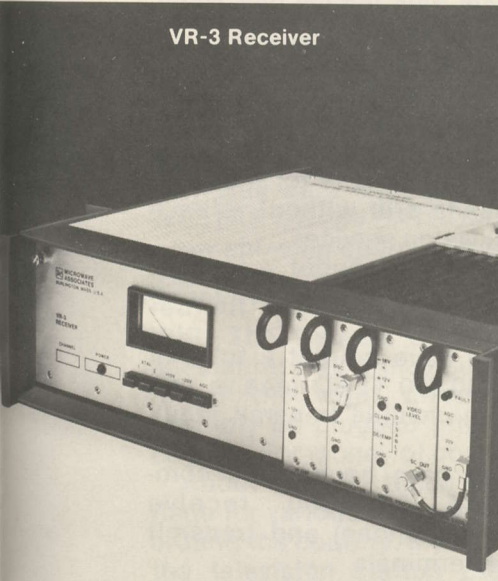
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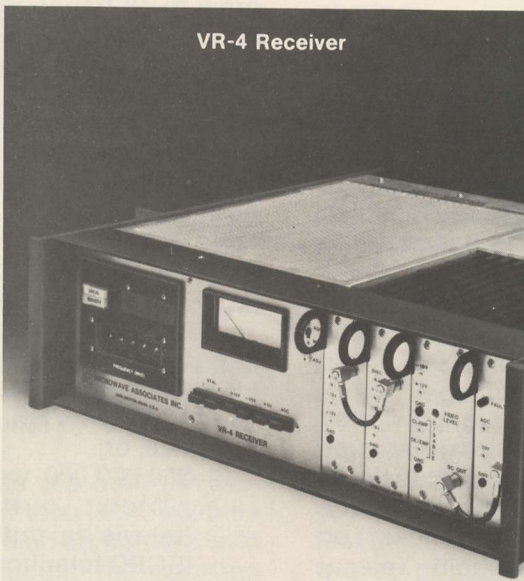
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TYPICAL WESTAR FARE, other than PBS, are sporting events fed from their origination point to the terrestrial transmitter site (here a feed for Los Angeles KTTV).

by Telesat of Canada. Here, as the chart shows, one channel of French language television and two channels of English language (essentially Canadian network CBC) programming is transmitted for what averages 18 hours per transponder per day. As the separate report appearing here (see "And In Canada?") indicates, the Canadian policy implemented by Telesat is basically no policy at all. That is not to be confused with "anything goes" as a policy; rather it means that absent **specific consent and policy approving a particular use** of the Telesat birds, "nothing goes".

The Canadian cable systems are prevented from using the satellite. Or the signals now on the satellite. Moreover, the Telesat lack of **positive policy** makes the Canadian space **experiment** just exactly that; the longest on going experiment in the satellite field. Telesat seems to like it that way; it is almost as if they **fear** there developing any regular, paying customers for their satellites because then they might have to quit conducting experiments and start running the system like a business.

Viewing of Canadian ANIK signals, even on an experimental basis here in the states, **is a breach of law** and regulations on both sides of the border. Approximately one year ago when a totally different satellite program, LANDSAT (a satellite program that maps the earth resources) wanted to create data links between a couple of northern U.S. based remote **4 foot** uplink data terminals and an ANIK bird, for the pure scientific purpose of monitoring 'river and stream flow' on two U.S. tributaries, it took something like 3,000 hours of formal 'negotiations' between the U.S. and Canadian governments just to procure the necessary written agreements so that a pair of SCPC data channel uplinks could spit data into ANIK for monitoring purposes at a Canadian LANDSAT data accumulation site.

The Canadians are fiercely proud of their **domestic** satellite system; even if they haven't

figured out what to with it yet. They insist that it stay domestic; that is, Canadian. That includes any and all uses **and users** of the services on ANIK. Telesat justifies its huge annual budget by conducting more and more experiments, dabbling in providing radio, telephone and television service to the far northern portions of Canada (at least to the 80th parallel when the curvature of the earth blocks further north use), and designing more expensive and more sophisticated experiments for their latest 'toy' ANIK 'B' to be launched this fall. By generous low-ball pricing, ANIK 'B' will cost Canada no less than \$50,000,000 **to launch**. The ground support facilities being retro-fitted for the new 11 GHz downlink and the new 14 GHz uplink will add millions to this expenditure. The 6 GHz up and 4 GHz down portion of ANIK 'B' has no early practical use; there are already **36** similar transponders in orbit with a **peak** load that fills perhaps **six** of these. In November those 36 will temporarily grow to 48 transponders plus the six new transponders in the 14/11 GHz band.

Critics of the whole of the Canadian Telesat program, and ANIK 'B' in particular, point out that just the space vehicle and launch costs, \$50,000,000 conservatively, might have done **any** of the **following** individual projects for those far northern areas in Canada **still without** reliable radio, telephone or television service:

- 1) \$50,000,000 would have bought a total of **3,333** complete \$15,000 earth receive terminals, or;
- 2) \$50,000,000 would have bought a total of **1,250** complete \$40,000 TVRO receive and 100 watt VHF (TV) channel transmit facilities, or;
- 3) \$50,000,000 would have bought **200** completely outfitted \$250,000 receive (television radio, telephone) **and transmit** (SCPC telephone) terminals.

It will of course do none of these. Rather it will add to the already 600% overkill of existing transponder-in-the-sky capacity and it will provide Telesat with 6 brand new 14/11 GHz transponders to further 'experiment with'.

The Canadians have no policy for U.S. use of their existing three channels of television service. Which is of course understandable... they have virtually no policy for the use of the same three channels by the Canadians themselves. So when someone gets you in a corner at a CATV trade show and says "I've got this great plan to bring down Canadian TV signals for use on American cable systems"... check the guy's ID. He probably just got off a bus from Hoboken.

The next most frequent regular user of the satellites holds out some promise for CATV system use. That's **Spanish International Network**, or SIN as it is so cleverly abbreviated. SIN is up on WESTAR II, along with a host of occasional feed video news and sporting events. SIN has in fact already allowed **limited** CATV use of its programming (see **CATJ** for **February**, 1978; page 36). SIN programs between 6 and 12 hours

per day in the Spanish language with programming that originates either at one of the half dozen SIN "network" affiliates here in the United States, or, via a terrestrial microwave link that drags Mexico City's flagship station XEW northward to the U.S. border where it gets hauled into a Texas uplink site for Western Union.

SIN is generally first class Spanish programming. Highlights are bull fights, boxing, soccer matches and their '24 Hora' news program that originates at XEW. It is also soap operas, variety shows, serials and the occasional English movie dubbed into Spanish or run with Spanish subtitles. Because it is a pure 'network' feed it drags at the station breaks; there are usually none. The SIN feed is **programs**, not a **broadcast schedule** per se. Virtually every month at least one or two or three cable systems apply to the FCC for permission to carry SIN programming. Once you get it (which is actually simply permission to access WESTAR II and SIN in particular), **then** you have to go to work with the officials at SIN to arrive at a 'rate'. There is no rate card for this and those who have been there before you wish you Vaya Con Dios. In English "Lot's of Luk!" is a rough translation.

Which brings us to the non-regularly scheduled transmission; of which at peak times there may well be a dozen or more spread between WESTAR I, II and SATCOM II. There are even still a few showing up from time to time on SATCOM I also RCA vows that will only last until they can retro-fit their various earth terminals (see **"And With The Carriers"**, another segment of this special report). It may surprise you to learn that under the right circumstances you **could possibly** be plugged into **some** of these feeds. **Legally.** For money of course.

About 50% of these feeds are contract carriage for various independent television stations around the country. **If** you had an agreement **with the television station** producing the sporting event, a similar agreement **with the satellite common carrier**, and **FCC permission** to access the satellite and to carry the 'cherry picked' sporting event on your CATV system, you'd have access to a pretty fair number of sporting events per week. If you rolled all of them together into one grand total per week, we count between 8 and 15 events per typical week. It varies of course with the season.

There is some precedent in this area. This past summer **'Visions'**, the Alaskan (Anchorage) MDS system that has had so much press in other CATV publications, contracted with Western Union to take a 'World Soccer Cup Finals' **series of feeds** via WESTAR. The soccer matches originated in Argentina, were brought to the states via Intelsat and were then relayed on to the

'Visions' earth terminal via WESTAR. 'Visions' did most of the preparatory work itself, with an assist from the legal types at Western Union; it shows what could be done if a person set his mind to the task at hand.

But the balance of the 'occasional' video feeds are not for CATV eyes. Not until you have all of the necessary **written** permission to be watching **and using** the transmissions which so proliferate on the U.S. domestic carrier birds.

Which leaves us with one unfinished piece of business; the Holiday Inns system for providing in-room movie and entertainment programming via satellite. When initially announced (see **CATJ** for **May 1978**, page 64) the service was to be carried on transponder 16, sharing in some strange way the Fanfare movie feed with Fanfare sports to be carried on an undetermined vertical transponder. And the service was to be for a wide variety of competitive inns, with Holiday taking the lead but others such as Sheraton et al sharing.

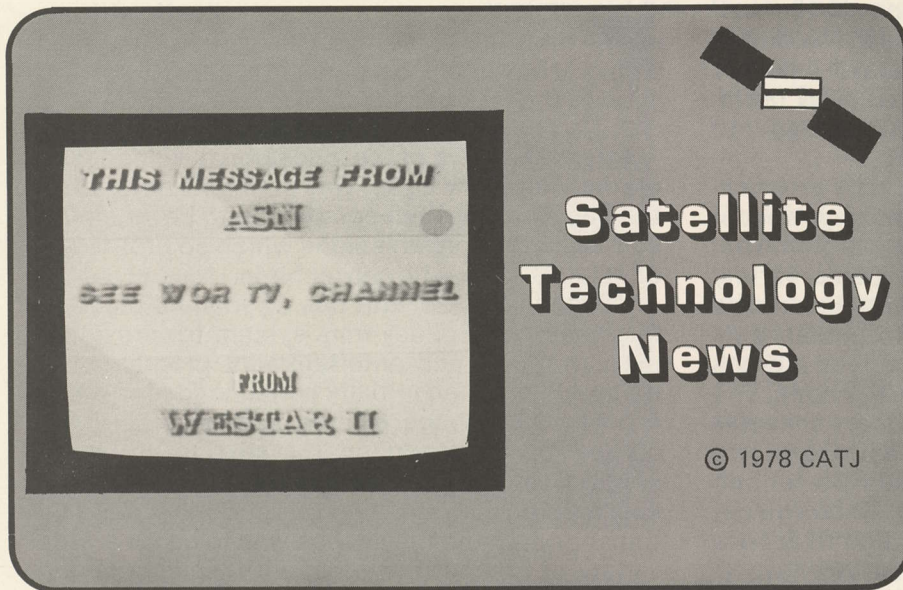
Then in our July issue (**page 60**) we updated that report with the notation that 'upon further investigation' Holiday had determined that they would 'go it alone' without sharing the service (or costs) with other ('competitive') motels.

Where is the program today? Holiday Inns has assigned a management team to the project and while they are still talking about being operational 'early in 1979' **it appears more likely** that it will be **April or even May** of next year before it is turned on. At the present time there is a five meter AFC/Microdyne trailer mounted terminal at the flagship Holiday Inn in Memphis where TVRO demonstrations are underway. **Officially**, the terminal is in Memphis to test whether or not a site which a computer study could **not** get acceptable interference free pictures could in fact get such pictures (**yes, it can**). Unofficially, it is also pointed out that in mid September the Holiday Inn folks are holding their annual 'franchise affiliates' meeting and on the agenda is the matter of 'affiliate approval' of the satellite interconnection program. A rather ambitious demonstration is planned as the hundreds of Holiday Inn franchisees gather in Memphis. Most observers see the mid September meeting as pivotal (if not crucial) to final approval of the program at Holiday.

The service, when up, will amount to 12 hours per day (roughly 4 PM to 4 AM eastern), fed on a vertical transponder on F1; primarily movies but not limited thereto. The initial number of terminals involved will number in the 100-200 region; not an insignificant amount of new antennas, receivers and LNAs in an 'industry' already strapped for hardware.

And... there is more to this report.

Our followup appearing in the October issue of CATJ will include in-depth looks at "The Problem In Canada", "The (common) Carrier View", "Smaller Than 4.5 Meter (CATV) Terminals", "The Private Terminal (Explosion?)", and, "CATJ Lab Tests Of The 1.83 Meter Dish (for video reception)". All of which proves that **even a 'special issue'** is not big enough to hold all that needs to be said in one place at one time as the satellite world continues to expand around us!



September Stats

FCC activity for the month of July continued to set new records in the development of the CATV industry's rush into satellite technology. The following new 'records' were set during the month of July: (1) most **new terminal** applications—73; (2) most **new terminal** FCC grants—61; (3) largest **number of channels** requested—237; and (4) the highest number of **channels per application**—3.25.

The five meter sized terminals regained their lead in the 'terminal size' category; undoubtedly the result of the new Microdyne/AFC fiberglass antenna adding its weight to the previously available five meter Scientific Atlanta antenna. With additional 5 meter antennas becoming available it is doubtful that 'other antenna sizes' will ever again regain the 'size lead' for any period of time.

A surprising drop has occurred in the requests to carry the religious ser-

vices. For some months CBN has either led the tally or been a strong second in the applications received by the FCC. Baring some mixup in the FCC tallies the drop from the lead position in April and June and a strong second in May to a decisively weak third spot in the July applications is an indication of something; only we are not sure quite what!

Other than the five trend setting program services tallied in our TVRO Statistics box score each month here are some of the other services mentioned in the month of July: (1) **KTVU** Oakland/San Francisco—3; (2) **WGN** Chicago—3; (3) **Fanfare**—2; and, (4) **PTL, SIN** (Spanish International Network on WESTAR II, **KTTV** (Los Angeles channel 11 proposed by ASN on WESTAR II) and **WOR** (New York channel 9 proposed by ASN on WESTAR II) one each. Again, the FCC **no longer** requires applicants to list each and

every service they wish to carry on their initial applications; and there is good reason to conjecture that the actual number of services to be carried by the 73 applicants this month exceeds the 3.25 channels per applicant indicated.

Based upon an average terminal price of \$35,685 and 73 applicants, this month's summary amounts to \$2,605,005 in "business" for the TVRO suppliers; and annualized volume of \$31,260,060 for new installations. To this must be added additional equipment purchased by **existing** system operators as they add new satellite program services now coming on the bird(s).

Faster TVRO Processing

The Federal Communications Commission's Bill Lombardi advises that as of July 5th the FCC's computer system is now 'on line' for the processing of TVRO applications. **The result?** Lombardi expects as many as 150 applications to be approved in the month of August! And he further expects all future applications to be turned around in 60 days time with 45 days as a goal.

There is more good news; something to take note of if you have not **yet** submitted your application. Effective immediately the applicant need only submit **an original plus two copies**; previously you had to submit original plus nine copies. The new Commission computer system allows them to generate their own extra copies as needed for processing.

The most significant impact of this faster processing is going to show up, we feel, in the hardware availability area. Systems that had been 'planning' on the 100-150 day turn around for application processing may suddenly find their applications back in their hands before they have the gear on hand. Keep in mind that you have 90 days to construct and make operational a terminal **after** receiving your CP (license).

Lombardi reports that the new computer system will be most helpful, he feels, when the expected onslaught of Holiday Inn TVRO facilities and satellite fed translator systems begin to show up at the Commission's doorstep "around the first of 1979"

Sun Outage Time

It is getting close to the time when you should be keeping a wary eye cocked on your reflector surface; and noticing where the shadow from the feed/cassegrain reflector falls over the antenna surface. **Sun outage is just ahead.**

When we last had sun noise outage, back in the early portion of March, all CATV terminals were looking at SATCOM F2 which for most of us had a higher elevation angle above the horizon than our present F1 does. And, it was more easterly than F1.

Both of these factors play an important part in determining the precise

CATV TVRO STATISTICS—AUG, 1978

Applications Filed/FCC	May 1978	JUNE 1978	July 1978
1) 11 meter	0	0	0
2) 10 meter	4	2	1
3) 6 meter	18	20	12
4) 5 meter	12	22	36
5) 4.5 meter	19	24	24
Total Apps	53	68	73
Cost Max.	\$106,412	\$96,412	\$87,412
Cost Min.	5,000	\$22,500	\$19,900
Avg. Cost	\$37,120	\$34,024	\$35,686
Channels Requested	124	217	237
Average Channels	2.3	3.19	3.25
Requesting WTCG	36	38	43
Requesting CBN	31	40	29
Requesting HBO	36	32	48
Requesting MSGE	10	15	12
Requesting SHOWTIME	6	13	11
Avg. Cost Per Channel	\$16,139	\$10,666	\$10,980
TVRO's Licensed/FCC	38	57	61

Note: Data compiled from FCC sources, adjusts forward one month with each issue.

dates when the sun, in its daily east to west movement across the sky, will line up exactly behind the geo-sync orbit point for F1. When that happens, solar activity on the sun's surface plus within the sun will combine to produce a 'noise outage' at your CATV terminal. For most of us the actual outage period will run around 15-21 minutes of degraded reception with total outage lasting for a couple of minutes on each of two-three days.

With F1 lower on our horizon, the time in October when the sun outage can be expected will come later than in 1977; dates in the middle to latter portion of October will be common. And with F1 further west, rather than the outage happening from 1:30 to 2:30 (as a time frame) the outage will be in the 3:30 to 5:00 PM time span for most systems. If you have never witnessed a solar outage, you might want to check with someone like Compucon to determine the exact dates at your location and then take a peek. Watching otherwise good signals get buried in thermal noise is a little bit exciting. **If you happen to have the ability to chart-record the passage of the sun** (by recording the thermal noise through your receiver) we would like to hear from you; we are attempting to enlist a group of volunteers to do this from several spots in the country.

The Listings

While this issue of CATJ contains an extensive satellite listing by satellite listing of video transponders in service, for those concerned only with the satellite activities on primary-for-CATV bird SATCOM F1 here is an abbreviated version of that information.

The present line-up on SATCOM 1 and the services they provide or are scheduled to be providing by October first is as follows:

Transponder	Service
2	PTL
4	(broken-no service)
5	VISTAR(*)
6	WTCG
8	CBN
9	MSGE(**)
10	SHOWTIME/mountain, west
12	SHOWTIME/east, central
14	KTNB/Trinity
16	FANFARE
18	HTN(***)
20	HBO/reserve
22	HBO/mountain, west
24	HBO/east, central

And the asterisks. *-VISTAR is scheduled to begin 10 hours per day on transponder 5 October first with limited evening sports during September; see 'The Newly Promised Services' report this issue. **Madison Square Garden Events switching from prior transponder 20 to new (vertical) transponder 9 this month. ***-Home Theater Network scheduled to begin G, GP movie mini-pay service September 4th.

'Weathervane' On A Sub-Carrier?

A new 24 hour per day full time weather information channel designed to be transmitted to cable systems via satellite on a (6.2 MHz) sub-carrier of an existing video carriage transponder is planned for 1979 operation by a group that has been working with Southern Satellite's Ed Taylor.

The new 'Weathervane' service will involve a staff of 8 accredited meteorologists and a considerable backup staff which will prepare graphs, maps, charts and audio commentary of weather on a local, state, national and even worldwide basis for display via the cable service. One of the unique aspects of the new exclusively-for-cable weather service will be a toll free '800 number' which viewers may call for customized weather reports and predictions for specific locations (of their choosing) around the world. The service will be an on-going 'real-time' service with constant updates and no repeats. Provisions for local system inserts (2 minutes out of each 30) and automatic 'cueing' of the local inserts by the cable system's equipment are included in the program.

Charges for the new service are expected to be in the nickle per home per month region. Service start date will be dependent upon the availability of a 6.2 MHz sub-carrier on the San Francisco/Oakland KTVU (indie) transponder which is currently before the FCC for approval.

First Mexican TVRO?

Tentative approval (meaning verbal but not yet in writing) has been granted by the Mexican SCT (FCC) for a earth receiving terminal. The user is not, however, going to be using the terminal (initially at least) for CATV signal delivery.

Spanish International Network (SIN) is offering on WESTAR II a number of hours daily of live television programming from Mexico City. This includes both film features, live drama and sporting events as well as news. The XEW created '24 Horas' newscast is one of the most professionally done news segments in Western Hemisphere television today, and it is this '24 Horas' feed which the first terminal in Mexico will be receiving.

The SCT is still somewhat unsure exactly how the arrangement might work; under Mexican law all microwave communication systems are installed either by the government and owned by the government, or, installed (and paid for) by the user but owned (i.e. donated to) by the government. The preliminary approval for the first Mexican terminal is along those lines; the end user will purchase, install and pay for the terminal **but it will be owned by the government**. The user (who prefers not to be identified at this time) is hopeful that before the terminal is installed that the government ownership requirement may change since the terminal will be for receiving purposes only (the rationale for government ownership is that normal microwave 'systems' have both transmit and receive capabilities).

the Time Zone Corrector

The TD-100 by CRC Electronics, Inc.

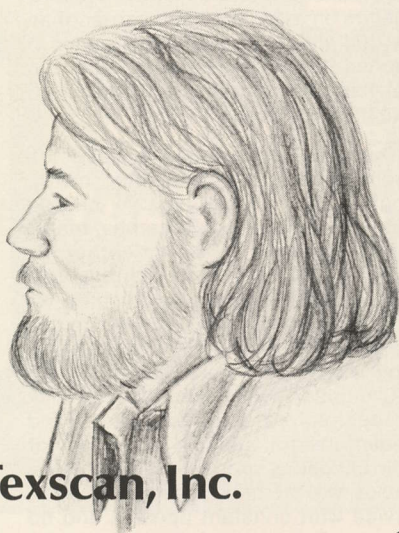
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R. Stelle's Technology Corner



Raleigh B. Stelle - Texscan, Inc.

RALEIGH B. STELLE, III—now a regular with CATJ. Most people in the CATV industry, and certainly the majority of the technical/operational types, know and have met Texscan's Raleigh B. Stelle. Raleigh is one of those unique individuals who learns well and teaches better. His Texscan test equipment seminars have been carried on throughout the industry for years (as many as a dozen a year). For three years running (including 1978) Raleigh's contributions to CATA's CCOS have been just this much shy of yoeman. He comes early, helps with the equipment set ups, conducts a seminar or two on test equipment procedures, and stays late to help with the tearing down.

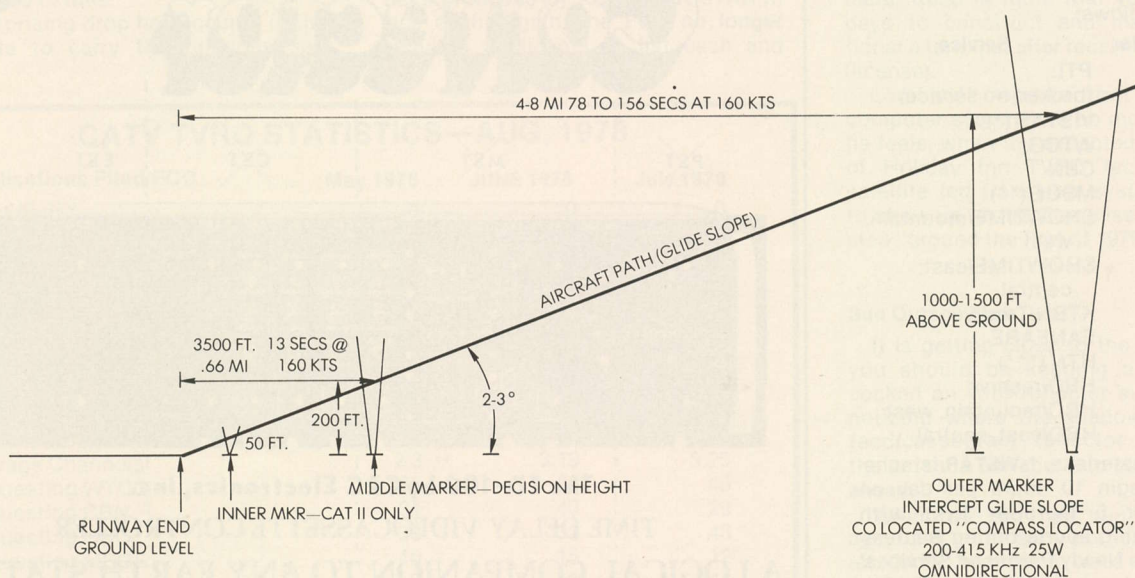
Starting this month in CATJ Raleigh becomes a staple. His main thrust each month will be test equipment, test equipment procedures and the FCC's rules as they relate to testing. Raleigh invites your specific questions and as time rolls on he has agreed to expand this column to include a few questions and answers each month. Address your test related questions to: Raleigh B. Stelle, c/o CATJ, Suite 106, 4209 NW 23rd, Oklahoma City, Oklahoma 73107.

RADIATION

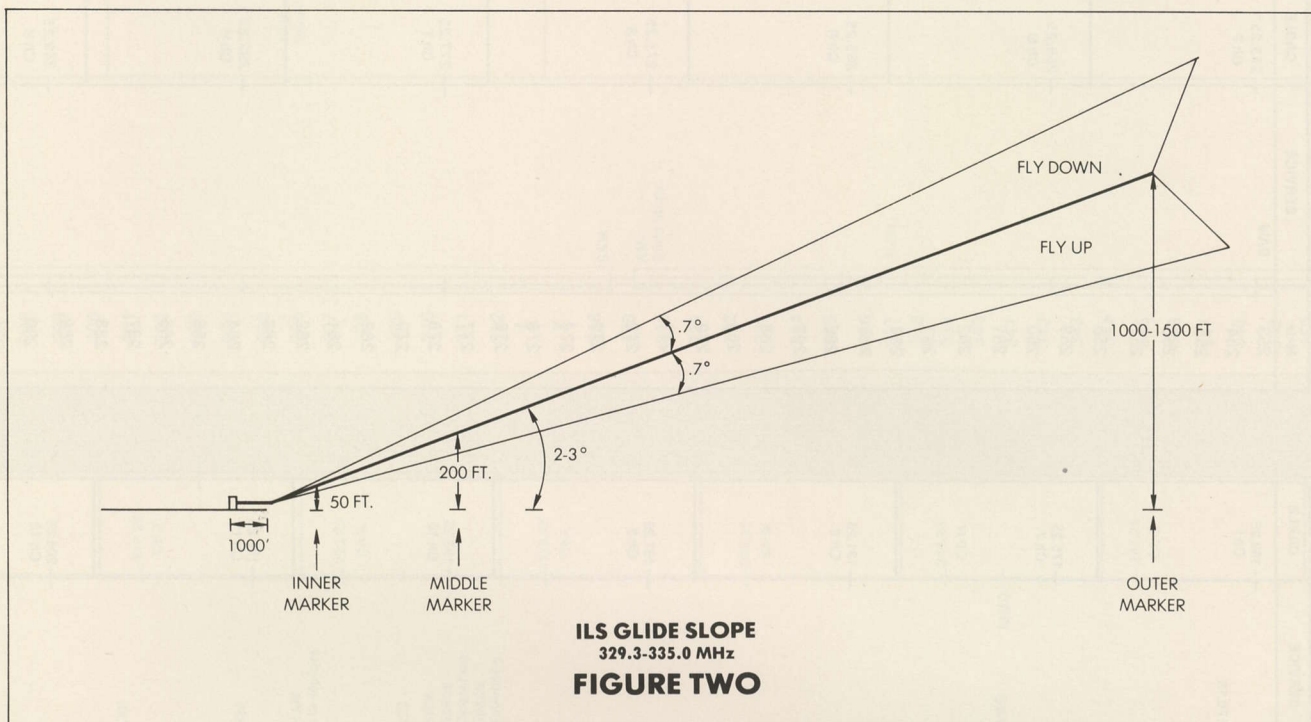
Effective January 1, 1978, new rules were put into effect regarding the radiation limits and frequency coordination for signals carried on your system. The key frequencies are the guard band (74-76 MHz), 108-136 MHz, and 225-300 MHz. As an appendix to this report is a frequency chart compiled from a readily available source¹ and presented in graphical form.

Before we tackle the complexities of radiation modes, location of leakage sources and troubleshooting in the system, let's examine the nature of the services which will be disturbed by a radiation problem. The immediate need is to protect the Aircraft Navigation ILS (Instrument Landing System), and the air traffic control communications system. The RF portion of the ILS system consists of a 75 MHz marker beacon system which is **amplitude modulated**.

The **OUTER marker** normally indicates the point at which the localizer course **intercepts** the glide slope. The **marker beacons** operate with a maximum power output of 3 watts into an antenna system which directs the energy **upward**. The antenna system is designed to create a field which is 2400 ft. by 4200 ft. at a height of 1000 ft. above the ground. A jet on approach at 160 kts (184.86 MPH) will be in the cone for about 8.9 seconds if he is **on** the localizer centerline. The outer marker identification is two dashes per second continuously. The outer marker is usually located about 4 to 8 miles from the approach end of the runway. **See Fig. 1.** Other markers also on 75 MHz indicates proximity to an airport and denote heights at which a decision is required. That decision is to either complete the approach and land or to execute the



ILS MARKER SYSTEM
75 MHz
FIGURE ONE



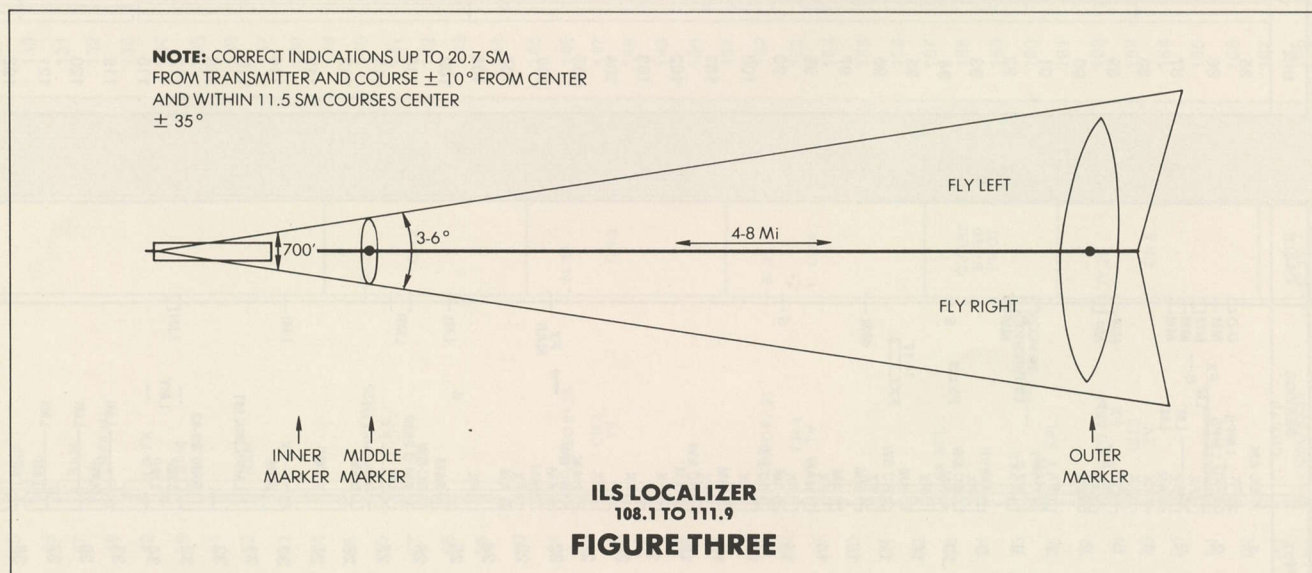
The **localizer** is a directional beam which provides course information to appropriate missed approach procedure. These points are normally at 200 ft. above ground for the middle marker and 50 ft. above ground for special Category II operations.

The **glide slope** is a narrow beam signal providing continuous descent information to approaching aircraft. The operating frequency range is **329.3 to 335.0 MHz**. The cockpit indication is a bar which commands the pilot or autopilot to either "fly up" or "fly down" to maintain proper alignment on the glide path. Aircraft on approach intercept the glide slope at the appropriate altitude at the outer marker. See Fig. 2.

direct the approaching aircraft to the runway. It is useable under certain conditions up to 20.7 statute miles from an airport, and to volumes including the course center-line $\pm 35^\circ$ (within 11.5 SM) and at altitudes between 1000 and 4500 ft. above ground level. This beam tapers to provide a "window" 700 ft. wide at the runway threshold. The localizer operates by amplitude modulation and on a frequency of 108.1 to 111.9 MHz (20 channels, each paired with a discrete glide slope channel). See Fig. 3.

The Non-Precision Approaches, such as VOR, VOR/DME and ADF, operate in a similar fashion except that they are not so precise as the ILS and

do not have altitude (glide slope) information. Only the VOR/DME approach provides measured distance information for these approaches. Otherwise, distance is calculated based on groundspeed and time from the final approach fix to the missed approach point. Since this can produce considerable error due to inaccurate wind information, barometric altimeter height control and a less sensitive directional control, it is easy to see why these approaches are termed non-precision. The approach minimums for this type approach are much higher than for an ILS precision approach. VOR's also operate in the 108-118 MHz frequency range.



FREQUENCY CHART CODES

AN — Aeronautical Navigation
Beacons, Ranges, TLS, Radar, Etc.

BC — Broadcast - AM/FM/TV/SW(AM)
CB — Citizens Band
HAM — Amateur

FX — Point-to-point (No Mobile) - Dis-
aster (d) Aeronautical (a) Police (p)
SAM — Government/Military

LM — Land Mobile - (P) Public Safety
(D) Disaster (I) Industrial (T) Trans-
portation (DP) Domestic Public (R)
Remote BC

MHz	SERVICE	CABLE
1	BC AM	
2	FX LMPS	D-D
3	FX LM	MM
4	FX LM	MM
5	FX LM	MM
6	FX LM	MM
7	FX LM	MM
8	FX LM	MM
9	FX LM	MM
10	FX LM	MM
11	FX LM	MM
12	FX LM	MM
13	FX LM	MM
14	FX LM	MM
15	FX LM	MM
16	FX LM	MM
17	FX LM	MM
18	FX LM	MM
19	FX LM	MM
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21	FX LM	MM
22	FX LM	MM
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26	FX LM	MM
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28	FX LM	MM
29	FX LM	MM
30	FX LM	MM
31	FX LM	MM
32	FX LM	MM
33	FX LM	MM
34	FX LM	MM
35	FX LM	MM
36	FX LM	MM
37	FX LM	MM
38	FX LM	MM
39	FX LM	MM
40	FX LM	MM
41	FX LM	MM
42	FX LM	MM

MHz	SERVICE	CABLE
85	CH 6 TV	
86		
87		
88		
89		
90		
91		
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94		
95		
96		
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98		
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MHz	SERVICE	CABLE
169		
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171		
172		
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183		
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MHz	SERVICE	CABLE
253		
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255		
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266		
267		
268		
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MHz	SERVICE	CABLE
43	LMI	
44	LMP	
45	LMP	
46	LMP	
47	SAM	
48	LMP/LMI	
49	LM FX	
50	SAM 50.0	
51		
52	HAM	
53		
54	54.0	
55	VIDEO 55.25	
56	CH 2 TV	CH 2
57		
58		
59		
60		
61	VIDEO 61.25	
62	CH 3 TV	CH 3
63		
64		
65		
66		
67	VIDEO 67.25	
68	CH 4 TV	CH 4
69		
70		
71		
72	FX SPL	
73	MAR	
74	74.6	
75	75.4	
76	FX SPL	
77	VIDEO 77.25	
78	CH 5 TV	CH 5
79		
80		
81		
82		
83	CH 6 TV	
84	VIDEO 83.25	CH 6

MHz	SERVICE	CABLE
127	AM	172.25 Ch B
128		
129		
130		
131		
132		
133		
134		133.25 Ch C
135		
136		
137	SPACE RESEARCH	
138	MA(s) SP	
139		
140		
141		
142		
143		
144	AMC 143.90	
145	144.0	
146	HAM 2 meter (AM, FM, SSB)	
147	TV AUDIO	
148	DUPLX 432	
149	AMC 148.15	
150		
151	LMP	
152	LMT	151.25 Ch F
153	LMI	
154	LMI	
155	LM-P	
156	LMP	
157	MMC	
158	AMC 156.8	
159	SAM	
160	LMI	
161	LMP	
162	LMT	
163	MMC	
164	LMR	
165	LMP 162.0125	
166		
167		
168	LMR 166.25	

MHz	SERVICE	CABLE
211		
212		211.25 Ch I3
213		
214		
215		
216		
217	LMI	
218		217.25 Ch J
219		
220	220	
221		
222	HAM 1 1/4 Meters	
223		
224		223.25 Ch K
225	225	
226	SAM	
227	Space Operation	
228	Space Telemetry	
229		
230		229.25 Ch L
231		
232		
233		
234		
235		
236		235.25 Ch M
237		
238		
239		
240		
241		
242		
243	AMD	
244		
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250		
251		
252		

MHz	SERVICE	CABLE
295	SAM	
296		295.25 Ch W
297		
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302		
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306		
307		
308		
309		
310		
311		
312		
328	SAM	
329		
330	AN. Slide Slope	
331		
332		
333		
334		
335		
336		
337	SAM	
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349		
350	SAM	

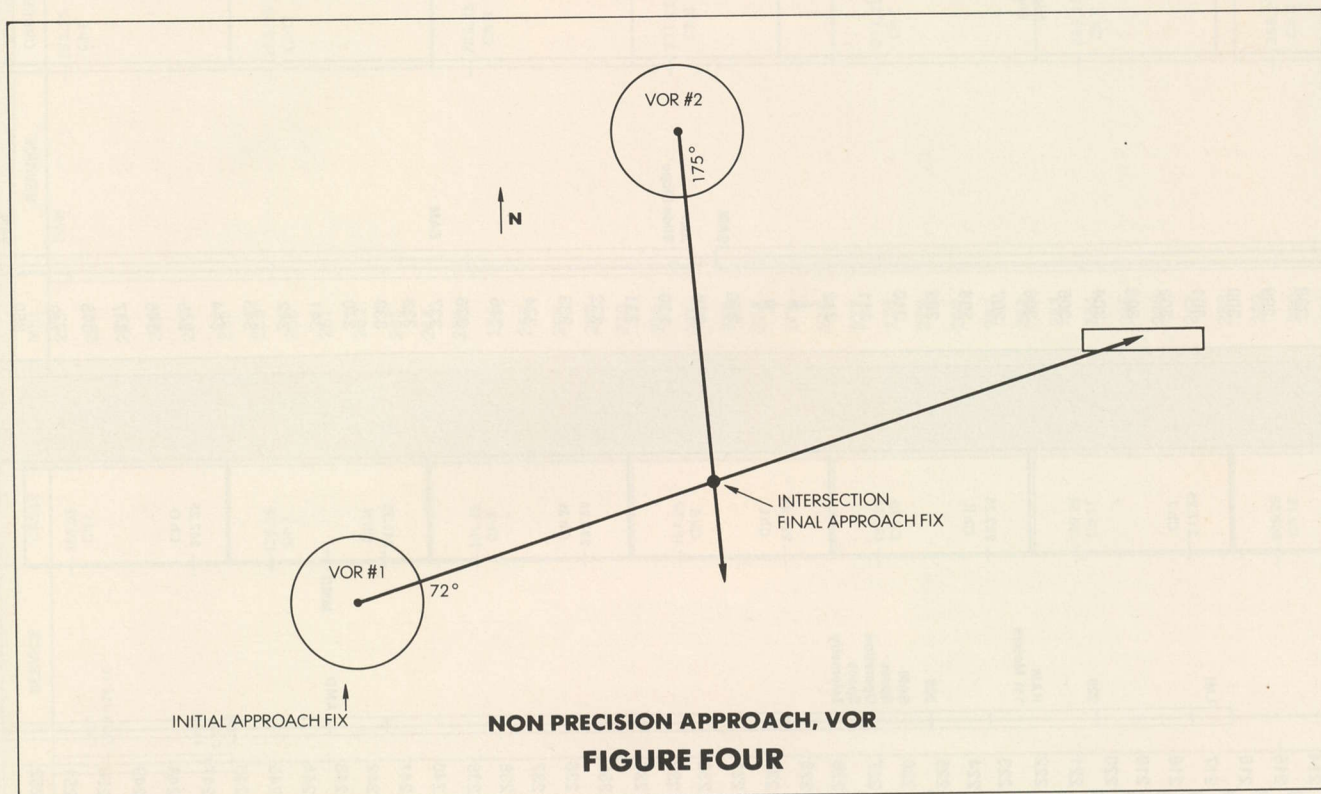
FREQUENCY CHART CODES Cont'd

AM — Aeronautical Mobile - Ground To Air-Air To Air (D) Distress (C) Civil Air Patrol

MM — Marine Mobile - (d) Distress (C) Coast Station (S) Ship

MA — Meteorology - Satellite (S) Radio Astronomy (R)

SF — Standards Frequency
SA — Satellite (N) Navigation
SP — Space (O) Operation



The communication band, 118-136 MHz is almost equally vital. The pilot has extremely precise and well established procedures in the event of communication failure. Via the communications channels, the pilot receives clearances, altitudes and heading information, traffic and weather advisories. In the approach segment of the flight, the vectoring and altitude information is vital! Remember, distance is being consumed at 269 ft/sec. or 3.06 miles/minute! (These are minimum numbers, based on an approach speed of 160 kts.)

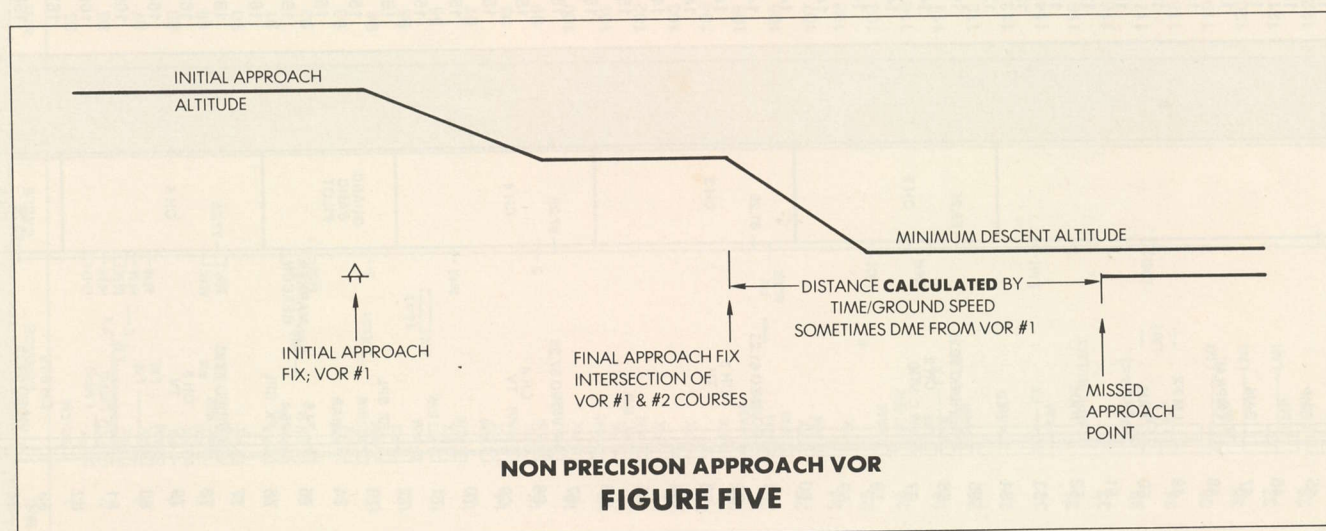
Communications are of paramount

importance during radar controlled approaches. The highly publicized PAR (Precision Approach Radar) or GCA (Ground Controlled Approach) is no longer in use by civilian airports. The military, however, uses those techniques extensively. A communications interruption of 1 to 2 seconds can be disastrous when PAR is in use. Civil airports do sometimes offer ASR (non-precision radar approach) approaches which have high landing minima and usually are reserved for loss-of-navigation cases. The controller and pilot communicate constantly during both types of radar approach. The communi-

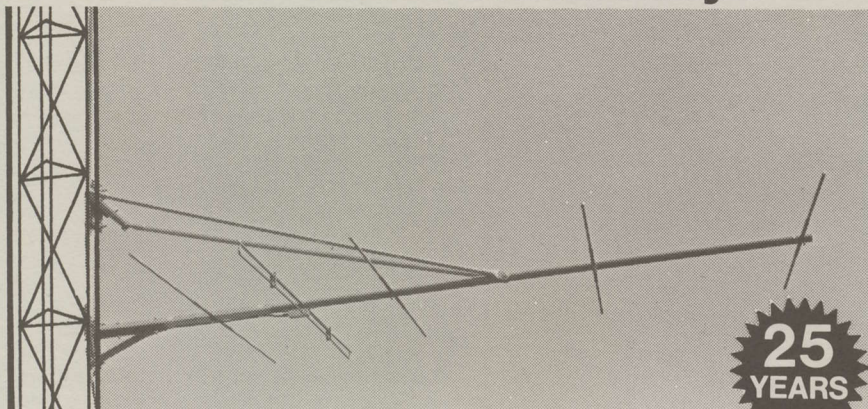
cations frequencies involved are 118-136 MHz and 225-400 MHz, with the higher frequencies being used by the military.

It is obvious that interference generated in these frequency bands is potentially disastrous. As yet, no major incidents have occurred due to interference from cable systems...but, Murphy's Law says...If it can happen, eventually it will!

Next month we will look at The Cable System as a potential source of destructive radiation to air-navigation and air-communication systems.



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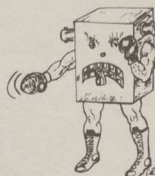


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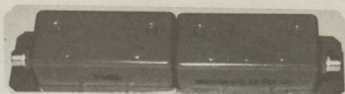
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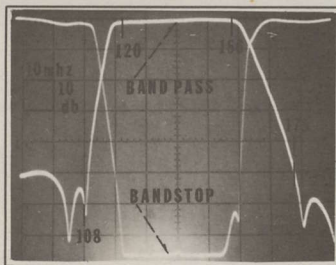
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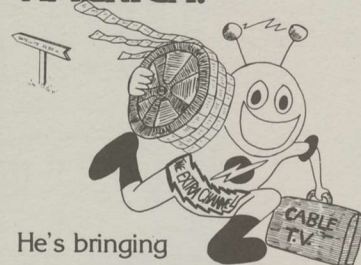
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Coop's cable column



**bob cooper editor in chief
CATJ**

Weekly On The Bird

Most of the telephone calls and letters received here after CCOS '78 seemed to agree the television medium is indeed a very useful and perhaps forceful medium by which the cable industry can conduct its internal business affairs. Like any first effort of the magnitude of the CCOS uplink there were of course technical glitches and personnel bugs. All of these could be corrected with infinite time and money; a luxury that you simply cannot afford on a once-a-year shot.

The technical accomplishment of CCOS's uplink aside, the most impressive thing to me had to be the manner in which the seminar program participants handled themselves before the peering eye of the 1 inch IVC plumbicon cameras. To a man, almost without exception, people who were selected to be in the seminar sessions came across well, relaxed and with a minimum amount of amateurishness. And let's face facts...almost without exception this was a first-time experience for the 80 or so seminar session participants; we all spend a great deal of time watching the tube but very few of us spend any time inside the glass envelope.

A few participants expressed advanced fears to us concerning how well they would do; a natural anxiety but in most cases an unfounded fear. Not everyone can be a Johnny Carson or a

David Brinkley; and truthfully the situation calls for being relaxed, not professional. The viewing audience is generally speaking small, primarily made up of other cable people with whom you would be comfortable in person so why not via the tube?

Out of CCOS '78 came the proof I had been searching for that this industry does a lousy job of communicating within our own industry. We have four or five magazines and a bevy of trade shows that would do pride to an NBA league team schedule. But, with rare exception, we spend most of this media-time talking to rather than talking with one another. There is a subtle but important difference, I feel, between the two and I am just naive enough to believe that a better industry might result if we choose to focus on that difference.

The tool to do this is so obvious we keep tripping over it. The bird.

Starting in October (possibly the week of the 16th to the 20th) we will be directing your way a weekly one hour program via SATCOM F1. The program will be called "CATJ's Satellite Magazine" which will probably be shortened to simply "Magazine" or even "CSM" before long. This one hour per week shot will be released to the industry through some readily-receivable transponder (such as 20 but a definite announcement on this will be another month) at a hard-scheduled regular

time (such as noon eastern) on a regular day each week (such as Thursday or Friday), CSM (see—I'm doing it all ready!) is to be produced here in Oklahoma with the cooperation of the University of Oklahoma, and it is getting onto F1 with the support, cooperation and direct assistance of Ed Taylor at Southern Satellite Systems. Ed, like us, feels that unless we as an industry try new and innovative approaches to our own fast changing technology we cannot hope to survive as a competitive medium.

Now back to the communication problem. The whole premise of CSM (OK—I give up) is to provide a forum through which the industry can talk with itself. Note it says with not to (itself). CSM is a vehicle for expression, dialogue and just a bit of 'hard news'. The later item is the kind of stuff you read Cablevision or VUE to pick up on. We don't intend to be competitive to the twice-a-month news magazines although the weekly format suggests that there could well be a few minutes of their line of hard news included in the CSM telecasts in the interest of staying current within the industry. The forum will work something like this. We have already begun putting in the can (that's TV production talk for pre-taping) short magazine-like features dealing with field strength meter use (Raleigh Stelle of Texscan has consented to do around a dozen five to ten minute pieces for us on test equipment procedures), TVRO site trouble shooting, and system powering. Pretty dry stuff when it comes to the controversial world we all live in...but the stuff that the industry is made of, and needs to get back to.

Then we are scheduling some long visits with pioneers such as Oliver Swan in Arizona; with the help of ACE TV's Dana Atchley we will be visiting Oliver this fall and taping several hours of Oliver's magic in the rural back country of Arizona. We will be putting out 20 to 30 minute segments from this visit and inserting them into CSM as feature reports over a several week period. In a way we'll be expanding the confines of our CATJ in-depth reports to video reporting where you as an industry person can become a form of participant in our visits with the people who make this industry click.

So far we are talking to you, not with you. So here's our first crack at solving that one. Many state and regional associations have been inviting CATA's Executive Director Steve Effros to appear at their meetings and participate in a panel or address the group. We'd like to see more of this...not because Steve represents the 'CATA view' but more because everyone needs to hear both sides of the various issues before us so that an informed decision can be made when required. We recently sent out a letter to all state and regional associations setting out the ground



"Now I can reach population pockets without emptying my own."

"Loleta had 195 potential subscribers, Hydesville, 190. That's plenty if you can reach them economically," says Sam Shults, President of Redwood Cable Vision in Fortuna, California. And that's exactly what Sam did. He reached these and other small communities economically and profitably with a Hughes AML microwave system feeding 50¼ miles of aerial distribution. Even though receiver sites range from berry patches to the second floor of a dairy, service requirements and downtime have been minimal since installation in 1972.

Sam says he opens the receivers so seldom they're often covered with cobwebs.

Hughes AML receivers are cable powered and designed to work outdoors from -40° F to 120° F. Although Sam is transmitting nine channels, AML systems have 40-channel capacity with VHF input and VHF output. So when Sam added two channels to his transmitter in 1976, he didn't even have to touch his AML receivers.

These and other advantages of AML microwave are the result of fourth-generation proven design by Hughes. There are now more than 6000 video channels being distributed by Hughes AML receivers around the world.

For more information on Hughes multi-

channel microwave systems, write Hughes Communications Products, P.O. Box 2999, Torrance, CA 90509. Or call (213) 534-2146. We'd like to help population pockets fill your pockets.

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rules for their participating in CSM. Here is what we said:

"If you will bring Steve Effros to your meeting and assist him in locating someone in your area with 3/4 inch (live) Sony tape production equipment... such as a porta-pak system... Steve will use that equipment while your guest to create a video tape report on your meeting for CSM. The tape, forwarded back to CSM, will then be edited into the next available CSM uplink program and in this way the views of your state area or regional meeting, on matters affecting our industry today, will be shared nationally via satellite with cable operators

from coast to coast...".

Now we are talking **with** one another; not merely to one another. Now we are providing a forum whereby **all** cable operators, attending their own state or regional meetings, will be able to voice their concerns, beliefs and fears about the issues before this industry to all of the industry, **on a national basis**. It is a rather bold, new step in communication. The camera and the microphone are powerful tools and after some thirty years of helping the broadcasters spread that power around the time has come for us as an industry to try, in our own small way, to capture some of that force for our own.

Having created the forum and having suggested a mechanism whereby state and regional associations (and their members) can participate, let's carry this one step further. **Let's suppose that the North Dakota association meets without benefit of Steve Effros.** Is Effros mandatory to get access to the CSM forum? No, not at all. We happen to believe that as our 'roving correspondent' he will assure a degree of cohesiveness to the project which may be difficult to acquire if everyone wings it on their own, but if North Dakota decides to tape a report to CSM and send it along on 3/4 inch Sony format tape, it will be considered for CSM use on its own merits.

in'no·va'tor

(in'ō·vat·ōr)

n. One who begins or starts something new.

LRC Electronics has been the innovator of many CATV connector and connector related developments. LRC was first with the hex crimp and the attached ferrule hex crimp on connectors. A problem in the European market led LRC to the development of the entry extension connector, another first. LRC was also first with 1/4 inch crimp rings. And when the need for tamper proof traps became evident LRC was first with the Security Shield.

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Having stepped down from the "Effros requirement", how about stepping down one further step to the local system level. Can a system owner or manager or engineer not go into his own studio, turn on the cameras and tape a comment or two of his own for CSM? Affirmative once again. It is dialogue amongst the industry we are interested in; not the mechanics of how it arrives here. Could not a system with what the system considers to be an innovative bit of local origination or a clever technical tip or innovation also share it with the industry via CSM? Again a positive answer. That's what we hope CSM will grow into as it matures; a veritable "magazine for the cable industry".

Having brought the individual systems into the CSM format can we afford not to extend the same privileges to the suppliers to the industry? Again the answer is obvious. Yes of course suppliers should have the opportunity to "make their points" on CSM.

We'll have some shakey moments at first; just as we did with CCOS. There will be the doubting Thomases who will rub their crystal balls and see the whole project failing; perhaps miserably. We, however, have the same spirit and dedication about "CATJ's Satellite Magazine" as we did with the CCOS '78 uplink project and the will to see it through. We have prepared a set of guidelines in pamphlet form for anyone who might be interested (initially or down the road a piece) in participating in or contributing to CSM. This sets out the technical formats, the rules (there are a few) and it explains how you should submit material for airing on CSM. It is free to anyone writing to me here at CATJ; simply request a copy of the "CSM Operations Pamphlet" and we'll get you a copy.

For nearly thirty years the cable industry has been generously providing our own medium to enhance and expand the fortunes of others. The CCOS '78 uplink demonstrated how well the same medium can be put to work for **our industry's** enhancement. Now let's all get behind CSM to build on the first efforts of the CCOS '78 uplink. It is simply too good an opportunity to pass up.

TECHNICAL TOPICS

Enjoyed Being On TV

"I really enjoyed the opportunity to share some of the work we've been doing these past years with the operators through CCOS '78. I was pleased at the number of folks who 'tuned in' and apparently got some insights into financial planning for their own systems. Needless to say your accomplishments in putting it all together and on the bird caught the eyes of the entire industry and strongly demonstrated the ability of the industry, particularly CATA, to utilize the full capacity of the technology the industry has fostered. So what the heck are you going to do next year to top this?"

Gary A. Dent

Gary A. Dent & Associates
Dallas, Texas 75208

What about CCOS '79? Would you believe two birds? Why stop with two when we might use three or four! One thing for sure...it gets tougher and tougher to top ourselves as the years go on. Sooner or later we are going to catch up to technology.

Launching A CATA Satellite

"Another super-successful CCOS is behind us and I for one am already wondering what crazy ideas you will dream up in your nightmares for CCOS '79. Somewhere along the line we should run out of 'Can You Top This'; but I wouldn't bet on it.

I know we tried to thank everyone who contributed to the success of the satellite uplink terminal but I am sure we probably missed a few here and there. Most importantly as we all glow

in the warm rays of CATA's success, is to take note of all of the little sacrifices and acts of total unselfishness that made this impossible dream come true.

The CCOS participants, both cable operators and associates—and even the few people who were on vacation and not even a part of the cable industry—gave freely of their time and labor to put the uplink antenna structure together and raise the 11 meter dish into position. Many of the CATA associates came out to the uplink site and would wait around for hours as we labored to identify defective parts that we needed to replace to make the uplink operational. These people provided the test equipment that was required from time-to-time, and even more astounding, would actually tear down the equipment they had brought to CCOS for demonstration and sale to provide us with parts to get the uplink operational. I can recall numerous occasions when nobody at the station area had the specific item that was needed but somehow knew somebody else attending CCOS who might have the item needed; and they would go and get that person out of bed at 4:30 in the morning to try to locate the replacement parts. In every instance the party awakened from a night's sleep and arose and came up with the parts required without complaint about the strange hour or the personal loss they experienced to do so.

A very special thanks is due Don Pidgeon of RCA American Communications, Inc. who's only function should have been to verify the quality of the uplink signal when it was finally

ready for the uplink to SATCOM I. Don jumped into the center of the fray as soon as he arrived at Fountainhead and pulled it all together from the structure erection through operation and then afterwards the breakdown of the antenna after programming was completed. If there was any one individual who could be named as indispensable it would have to be Don Pidgeon. Without his knowledge and experience it could not have been done. Don, like many of us, worked continuously over the five day period with little or no rest, standing side-by-side with us through frustrations, personal risk and near exhaustion. I know of any number of people in the cable industry who feel Don must be the best satellite engineer in the world today. RCA is certainly fortunate, and must be very proud, to have this man on their payroll.

There were so many other people who made contributions; some large, many more small, and all important. We who worked on the project know who you are and we thank you from the bottoms of our hearts for your generosity and support.

And then there must be extra-special mention for Tony "Diller Hair" Bickel who proved how wrong those few people were when they said it could not be done. I know there must have been times when even Tony felt the non-believers might be right; but he never gave up and maintained an amazing pace from beginning to end. Trying to sum it all up in a few words I would have to say this was an **experience** of a lifetime. It simply proves that

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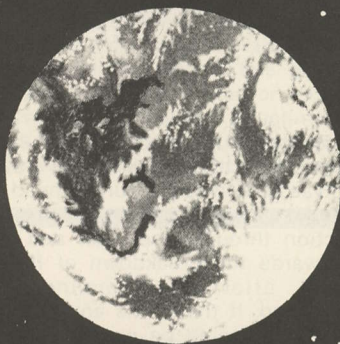
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when you have a lot of technical knowledge, unfailing labor and toil, and a touch of magic, that even the impossible can be accomplished.

I certainly don't want to overlook the other areas of CCOS that so well complimented the uplink terminal effort. The television crew headed by Dana Atchley from ACE TV certainly deserves a big order of plaudits for the excellent job they did in putting their end all together in the face of many unusual adversities. They have every right to be proud of their accomplishment of producing more than twenty hours of television from the barest of tools and the most unskilled of participants.

The seminar participants did their usual fantastic job; even though most of them had never before been faced with twin TV color television cameras peering into their inner souls under searing studio lights. They made the programs enjoyable, informative and the famous Cooper atmosphere kept everything lighthearted and even entertaining. The technical crew headed up by Gayland Bockhahn kept the terrestrial system running smoothly and the advance planning they had done for the in-house distribution system and the exhibit hall made things much easier for everyone concerned. How you manage to get all of these people to volunteer their efforts year after year is in itself amazing! Pete Warren and Alex Blomerth from International Christian Television would have done more than their part by providing that wonderful \$200,000 color television production van; but when Pete and Alex worked side by side at every step of the way with us to get the video production gear 'tuned up' and with Pete's very knowledgeable help in the uplink electronics area, well, they are truly great Christian gentlemen.

There really isn't any way to pass along to Celeste Rule and her office staff sufficient thanks or recognition for the outstanding job of keeping so many loose ends from being frayed or tattered.

Congratulations Coop; you did it again. However if the rumors I hear about your planning to launch a CATA satellite during CCOS '79 in Wisconsin are true...well, don't call me; I'll call you!"

Ralph Haimowitz
CATA Director, District 4
Sebastian, Florida 32958

The problem with publishing your letters Ralph is that you never leave room for any great 'lines'; you use them all. Tony Bickel feels uncomfortable with a 1979 launch date for a CATA satellite but he doesn't rule 1980 out. We all know that in 1979 we will be in Lake Geneva, Wisconsin and that's not an ideal location to launch from. There is a move underway to schedule CCOS '80 at Cape Kennedy/Canaveral. However the speculation that this indicates we will be launching our own bird in 1980 is the sheerest of wild guessing; for now.

Did They Like Me?

"Applied Data Research sincerely appreciated the opportunity to participate in CCOS '78 and to put on a seminar session dealing with CATV system use of low cost computer technology. We received an excellent reception and are off to a good start in the industry thanks to CCOS. We look forward to being active in CATA and we will certainly be at CCOS '79. The idea of the uplink was tremendously innovative and it showed what an organization can do when it puts its mind to the task at hand. As an aside, if a VTR tape copy can be procured from my uplink presentation, we would appreciate having some copies. It might make a good sales tool, if I was any good that is!"

Joseph A. Mannino
Applied Data Research Inc.
Princeton, N.J. 08540

You did just fine Joe. It will take us a few months to sort out the tapes but they are all mastered on 3/4 inch Sony format and later this fall some segments will be available on either 3/4 inch Sony or 1/2 inch Betamax format for those who may be interested.

Wants Richardson Address

"We tuned in portions of the CCOS Seminar on the satellite and were very interested in the low-cost Gunnplexer portion. I didn't get the address of Bob Richardson who did such a great job explaining how to put the Gunnplexer video packages together; he mentioned that he was coming out with an extensive 'Gunnplexer Cookbook' later this fall. Can you tell me how to get in touch with Bob Richardson?"

John Swelnis
Mt. Lebanon CATV
Pittsburgh, Pa.
15228

We've had more letters and telephone calls about the Richardson seminar sessions than any other single uplink program. For those who want to contact the very talented Richardson, his address is: (Bob Richardson), P.O. Box 1065, Chautauqua, New York 14722. For those in a hurry, his telephone number is 716-753-2654.

Other Requested Addresses

Many others have called or written for full names and addresses of other people who appeared in the CCOS uplink program. Here are a few of the more frequently requested names and addresses:

- 1) **Rod Wheeler** from Whitehorse, Yukon (he's the fellow with the \$2700 non-CATV 24 channel tuneable receiver for private terminal use) can be reached at **Northern Satellite Systems Ltd., No. 203, 4103 4th Avenue, Whitehorse, Yukon Y1A 1H6, Canada.**
- 2) **Oliver Swan** had some \$175 high current capacity (20 watt) solar cell arrays. You can reach Oliver at **Swan Antenna Company, P.O. Box 5378, Bisbee, Arizona 85603 (602-432-5526).**

- 3) The session dealing with TVRO system proofing mentioned using a **coaxial switch** to allow you to switch between a vertical and horizontal feedline on an ortho-coupler equipped terminal antenna. One such switch available is the **Microwave Associates MA7524-PND**; a one input/two output port N fitting switch that is good (that means flat) through 12 GHz. Contact **J. Duke Brown** at **Microwave Associates, 63 Third Avenue, Burlington, Ma. 01803.**

Make Their Own GaAs-FETs

"I recently read your July issue of CATJ and found the Satellite Technology News section of particular interest. On page 59 you indicate that according to your sources 'nobody is using U.S. manufactured GaAs FETs in the first stage of a 3.7 to 4.2 GHz LNA'. I would like to take this opportunity to point out that Avantek **does produce** 3.7 to 4.2 GHz LNAs which utilize **U.S. manufactured GaAs FETs**, and these are in fact Avantek-manufactured GaAs FETs. All production 1.5 dB (120 degree K) noise figure amplifiers manufactured by Avantek use Avantek GaAs FET devices.

Avantek is, of course, known in the CATV industry for its family of test instruments. What some of your readers may not realize is that Avantek is also a major supplier of transistorized LNAs for both wideband and narrow-band applications. Since 1965 Avantek has supplied state-of-the-art amplifiers to the communications industry. In 1968 Avantek established an in-house semiconductor facility to supply its own device needs. In 1974 we began supplying LNAs to the industry using our own GaAs FETs. Avantek also markets transistors and we **recently** introduced the first GaAs FET to that line of devices. We hope you will be able to adequately expose your readers to this additional data regarding the state of (TVRO) LNAs so they might consider purchases with the appropriate confidence in U.S. technology."

Robert C. Mullaley
VP, Telecommunications Division
Avantek, Inc.
Santa Clara, California 95051

Correction noted. The U.S. ability to create 1/2 micron GaAs FETs with adequate parameters to allow the GaAs FETs to be utilized in 120 degree Kelvin LNAs is a key development in the future of large scale production of LNA devices for TVRO applications. The LNA remains the most critical part of the TVRO installation and while your own ability to produce GaAs FETs is welcome news indeed, we are as a fast developing user of TVRO services not out of the woods yet. We'll know when the crunch is off... LNA shipments will become 'off-the-shelf' and prices will drop to under \$1,000 for 120 degree K units. Anyone care to guess-timate how far we are from that point?

Federal Register Defended

"Your Satellite Technology News section is excellent and virtually the sole source of current transponder activity information. However your polemics are occasionally difficult to pass by without comment. In particular, your editorial comment in the June issue that someone '...assign a gal 2 hours per day to go through the (Federal) Register just to pick out the CATV related material...'.

Frankly, I have my own, personal subscription to the Federal Register because it is the quickest, least expensive and most convenient way to find out what is going on in the Government—including the FCC! Because all Federal actions must be published in the FR, it is a foolproof way to not miss anything. It is also very well indexed—within each issue and annually. It takes me about 15 seconds to check if there is a CATV related material in an issue. To suggest that the process takes two hours is a disservice to the Federal Register people who really attempt to cut down on needless federal paperwork and produce a well indexed, reasonably readable publication."

A.M. Tony Rutkowski
Cable Television Bureau
Federal Communications Commission
Washington, D.C. 20554

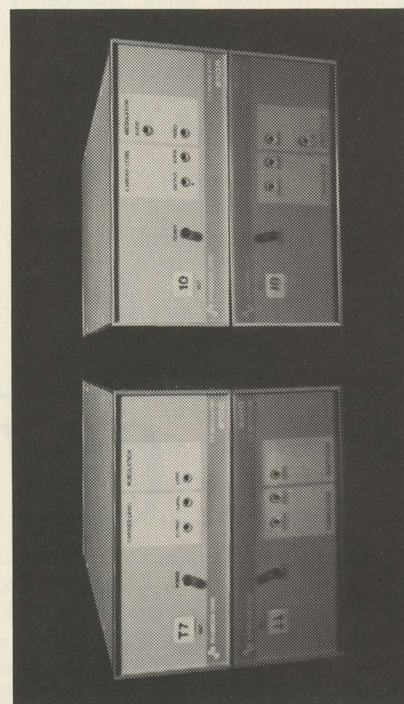
Good grief Tony. We stand corrected. We'll modify our June comment to now read "...a federal bureaucrat totally familiar with the Federal Register can locate matter relating to CATV in the FR in 15 seconds time; but for the rest of us, two hours is about par". Fair enough?

Coop's Poop

"My main complaint with the CCOS '78 uplink telecast was that there was too much of 'Coop's Poop' on the schedule. Otherwise it was great".

R.V. Golby
Chicago, Illinois

In defense of the frequent appearance of Coop on the telecast. He was scheduled to be on the 'Private Terminal' session and one 'How's The Health of F1?' session. That was it. However he was also responsible for seeing that come hell, high water, or busted IPA stages that the whole shindig came off relatively smoothly. To insure that there be no 'dead air' time on the bird or during the 8:00 AM to 1:30 PM period Bob went into the studio on the Saturday and Sunday prior to the CCOS and taped several 20 minute interviews with various people such as Steve Birkill of England, Rod Wheeler of the Yukon, Guy Roumain of Tele Haiti and so on. These were held in the production van as 'emergency tapes' to be utilized in the event of some technical failure in the video production area. It turned out that all of these got run at least once at some point in time as 'panic fill material'; a decision usually made by the program producer Dana

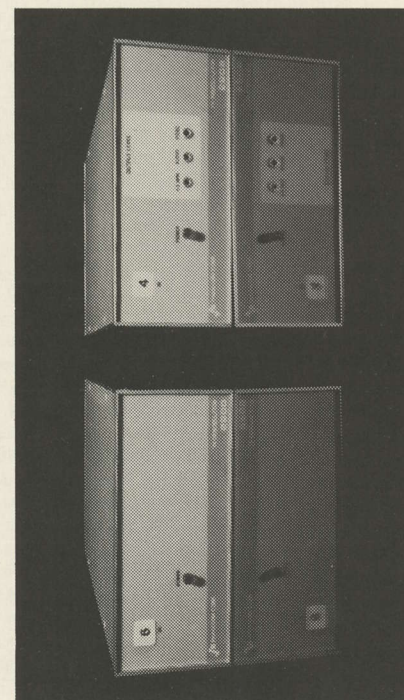


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Atchley III when some emergency arose. We figured having something up was better than dead air. But too much Coop, like too much rich food, is probably not good for anyone's constitution!

Free Ideas Prevailed

"Here are my impressions of CCOS '78. In 50 words or less...the most exciting, business show of any kind that I've ever seen...a place not only for making contacts but also for exchanging ideas...dynamic yet un-

pretentious; not a place for stuffed shirts to hang out...a uniquely decentralized style and format...CCOS '78 had soul!"

Being able to watch the seminars on my lodge room TV with a cassette recorder at my side was one unique thing about CCOS. The decentralization seemed to enhance the CCOS shirt sleeve atmosphere. Ted Turner's remarks at the CCOS bar-b-que had what CCOS itself had...soul.

As a source for new ideas CCOS was eclectic. Free trade in ideas prevailed. In the year that follows cable operators will be able to sort out what they heard,

especially from some of the 'star' personalities."

Jim K. Vines
Paraframe

Park Forest, Illinois 60466

Jim Vines is one of those people who are pushing the limits of satellite technology these days. Vines has working 10-15 foot redwood framed screen grid reflectors which he plans to offer with 0.1 inch tolerances (it can be done) for 4 GHz private terminals this fall. As Jim progresses we'll keep you advised of yet another approach to 'lower cost antennas' in the TVRO field.

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In recognition of the untiring support given to the nation's CATV operators, and their never-ending quest for advancement of the CATV art, the COMMUNITY ANTENNA TELEVISION ASSOCIATION recognizes with gratitude the efforts of the following equipment and service suppliers to the cable television industry, who have been accorded ASSOCIATE MEMBER STATUS in CATA, INC.

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 Applied Data Research, Inc., Route 206 Center CN-8, Princeton, NJ 08540 (M9) 609-921-8550
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 MICRODYNE CORPORATION, P.O. Box 1527, 627 Lofstrand La., Rockville, MD 20850, (M9 Satellite TV Recs.) 301-762-8500
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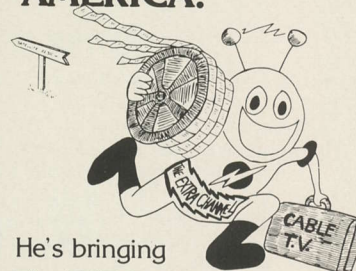
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United Video, Inc., 5200 S. Harvard, Suite 4-D, Tulsa, OK 74135 (**S9**) 918-749-8811
Van Ladder, Inc., P.O. Box 709, Spencer, Iowa 51301 (**M9, Automated Ladder Equipment**) 712-262-5810
VIDEO DATA SYSTEMS, 40 Oser Avenue, Hauppauge, NY 11787 (**M9**) 516-231-4400
VITEK ELECTRONICS, INC., 200 Wood Ave., Middlesex, NJ 201-469-9400
WAVETEK Indiana, 66 N. First Ave., Beech Grove, IN 46107 (**M8**) 317-783-3221
WEATHERSCAN, Loop 132, Throckmorton Hwy., Olney, TX 76374 (**D9, Sony Equip. Dist., M9 Weather Channel Displays**) 817-564-5688
Western Communication Service, Box 347, San Angelo, TX 76901 (**M2, Towers**) 915-655-6262/653-3363
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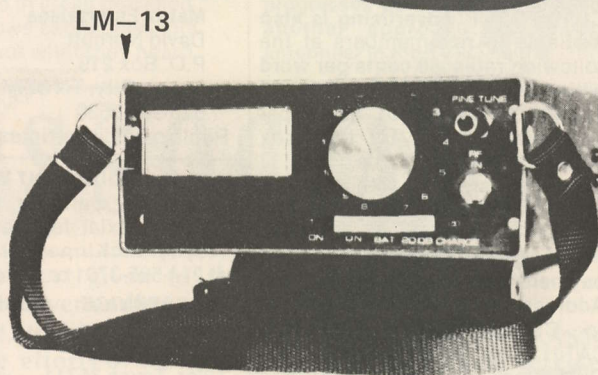
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DT-9R

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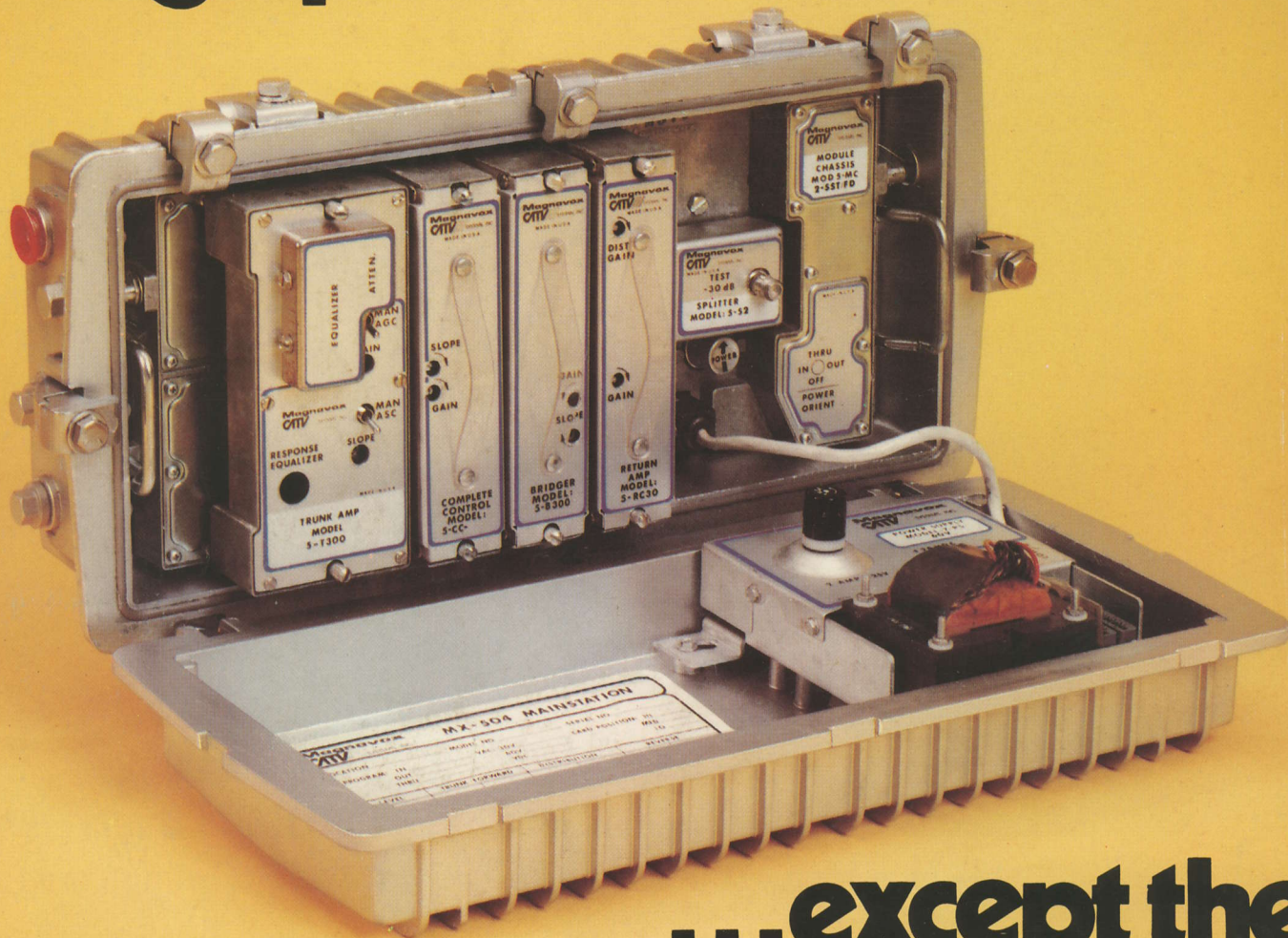
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