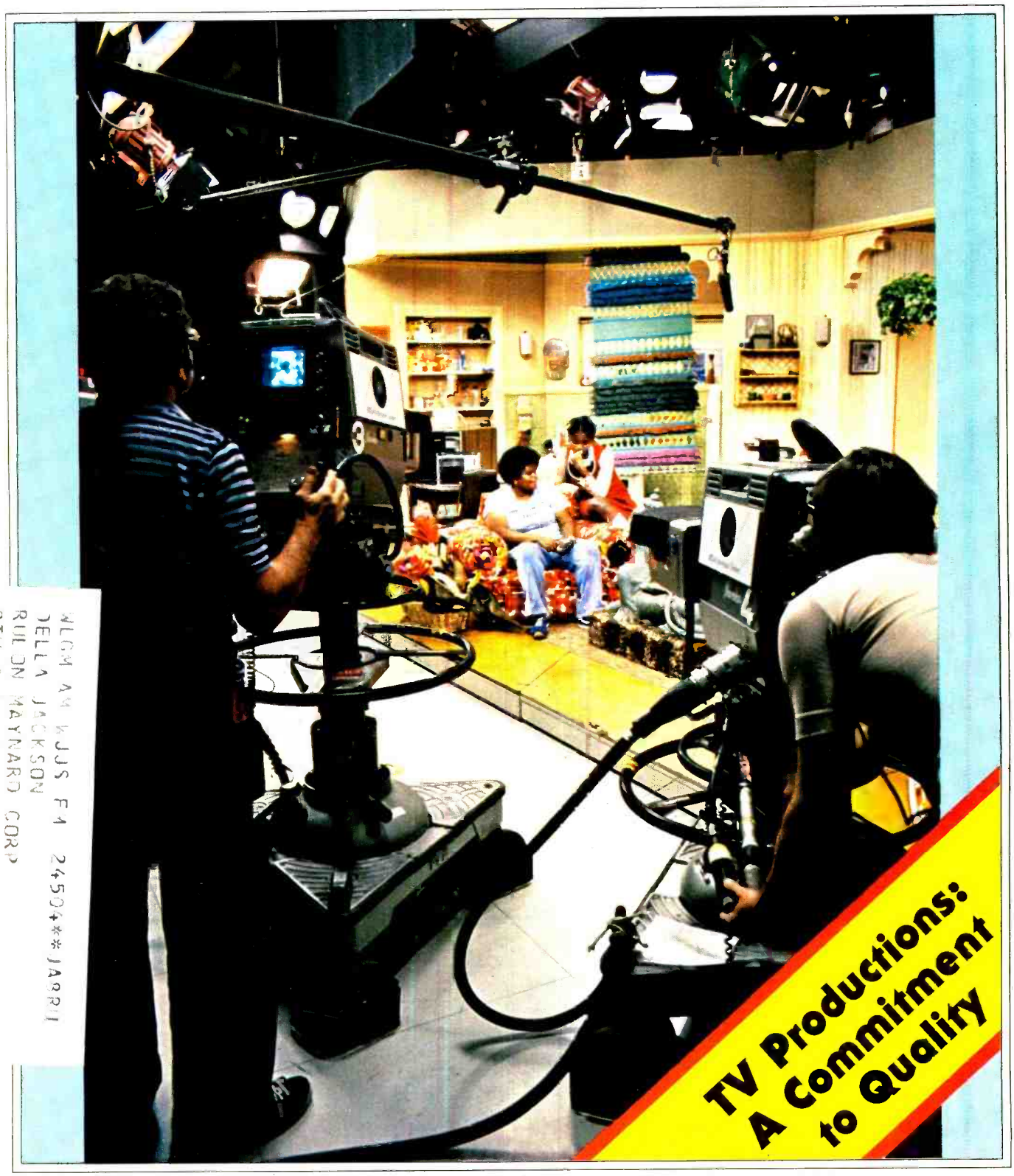
Special Report: Satellite Earth Stations

NOVEMBER, 1978/$3.00

BROADCAST COMMUNICATIONS®

THE INTERNATIONAL JOURNAL OF BROADCAST TECHNOLOGY



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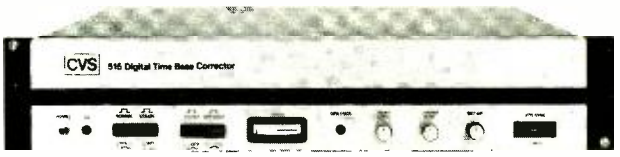
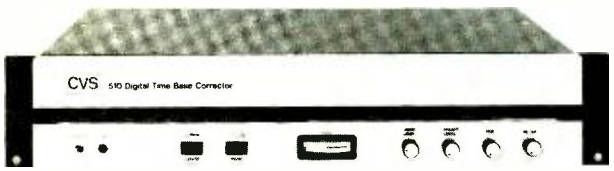
PAL-M



CVS-515 Digital Time Base Corrector

Broadcast quality; has NTSC to PAL-M standards conversion. Features: 2h+ window, Gen Lock, DOC, Vel Comp, and Proc Amp. Image Enhancer/Noise Reducer and 16h window optional.

NTSC



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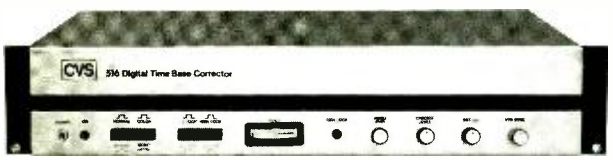
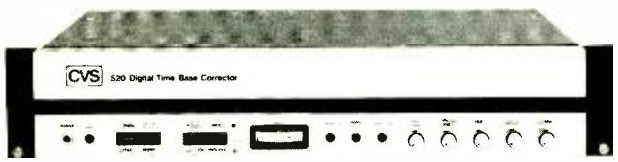


CVS-516 Digital Time Base Corrector

Broadcast quality, specifically designed for heterodyne VTRs. Features: 2h+ window, Gen Lock, DOC, Vel Comp, Proc Amp. Options: Image Enhancer/Noise Reducer, 16h window.



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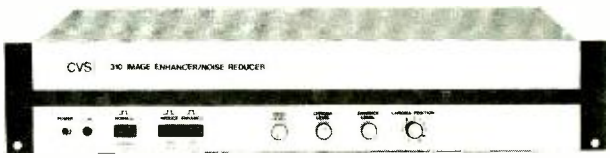

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European Office
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ADVERTISING SALES OFFICES

Home Office:
Gloria Parmenter *Ad Production Manager*
P.O. Box 12268; Overland Park, KS 66212
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(415) 969-3000

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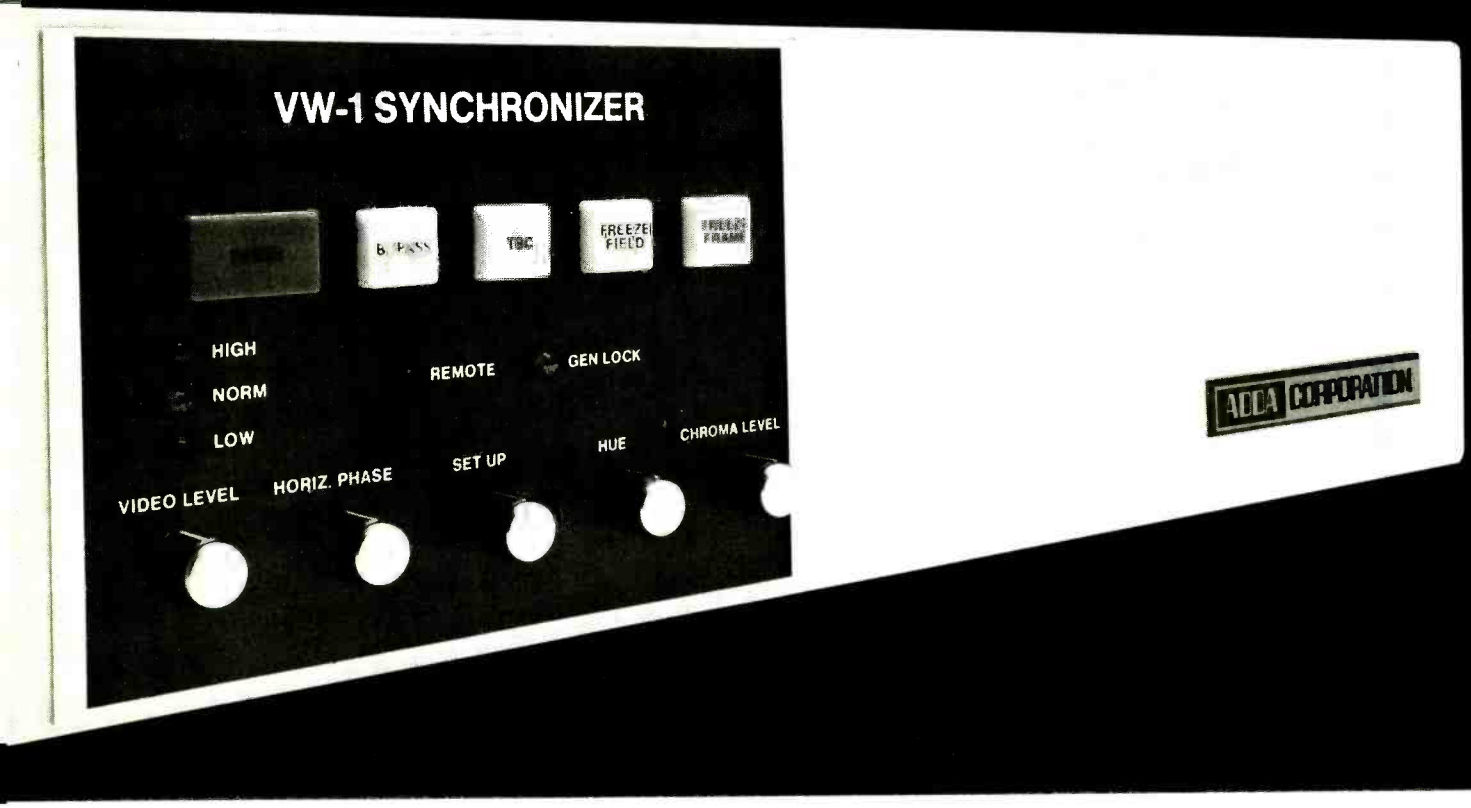

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November 1978 | Volume 1/Number 2

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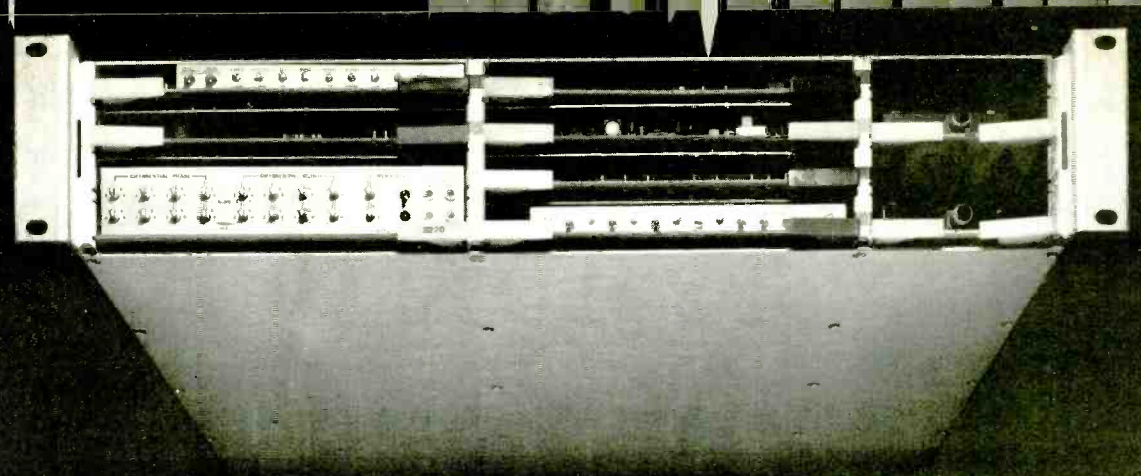
SPECIAL REPORT

VIDEO around the world

AUDIO around the world

STATE-OF-THE-ART

THE COVER
Two cameras are used on the set of *What's Happening*, a television sitcom which is beginning its third season on ABC. *(Photo by Ron Whittaker)*



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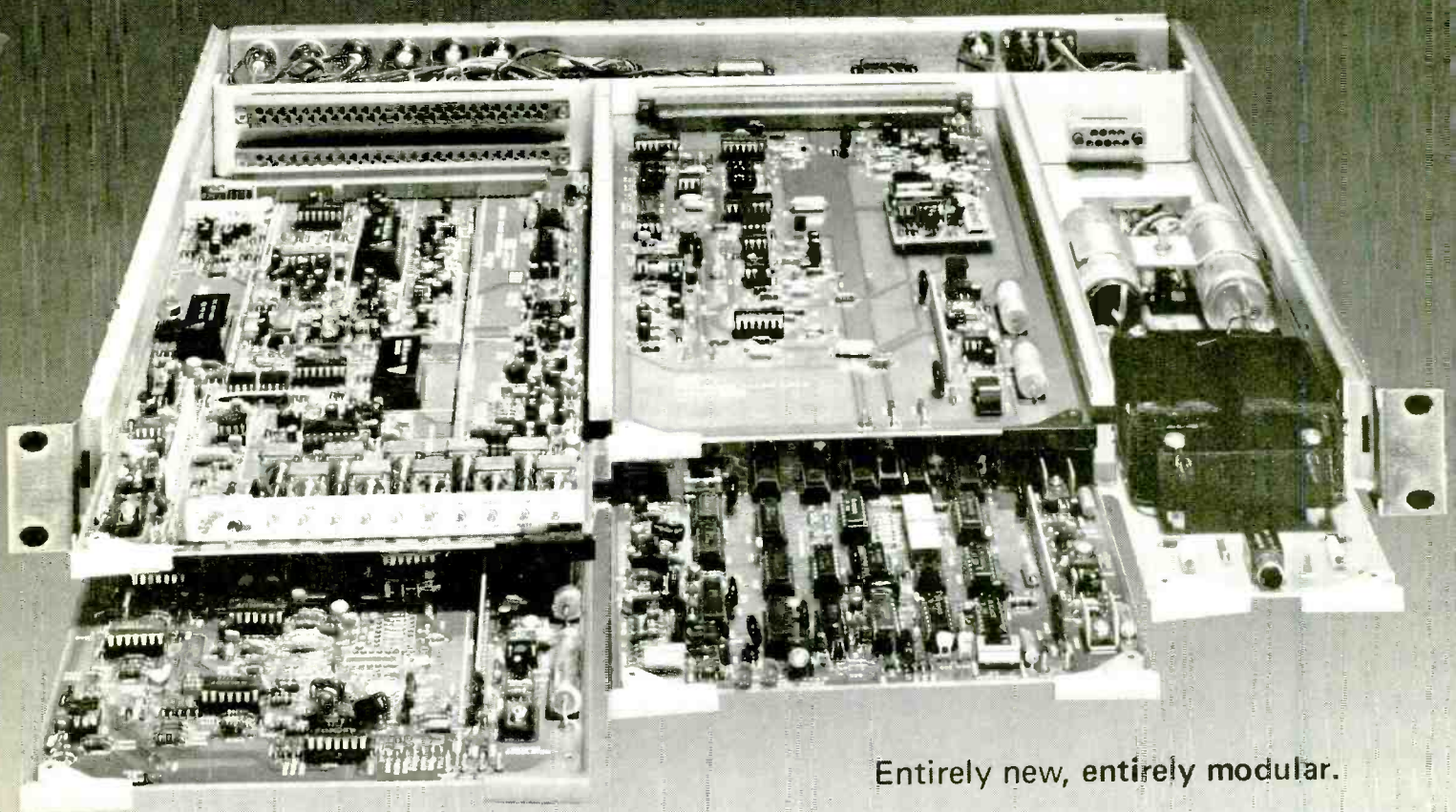

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UNITED KINGDOM

Interest high at IBC '78

By Joe Roizen

While innovations in digital, satellites, and teletext were in evidence at IBC, technical breakthroughs are being saved for next year's shows.

Measured by all previous statistics, IBC '78 was a resounding success. A record 4,000 delegates converged on the Wembley Conference Centre in London from more than 70 countries, and they spent a solid five days touring exhibits or listening to learned lectures.

The new venue, though larger and better equipped for a TV exhibition than the Grosvenor House, still proved too small; and a few exhibitors ended up in remote locations, assigned to Portakabins in the parking lot. Nevertheless, interest was high, traffic was good, and the outstanding nature of the technical papers maintained the IBC tradition of significant information exchange.

With few exceptions, most of the major manufacturers featured PAL/SECAM versions of the hardware seen at the NAB Show in Las Vegas earlier this year. If there are any technical breakthroughs in broadcast equipment, they are being saved for next year's NAB and Montreux exhibitions where both attendance and international impact will be larger.

The British have always been pioneers in television, and their latest innovations were in ample evidence at IBC '78. The two major research branches of the BBC (the UK's national network), and the IBA (the commercial network) each had exhibits reflecting the advanced work they are conducting to improve public television or create new products.

The IBA booth was perhaps the one attracting the most attention because of its digital VTR and ENG satellite link display.

At specific intervals, two colour monitors displayed full-screen moving images in PAL, coming from a one-inch helical VTR converted to digital operation. The pictures, while not quite up to the quality of current one-inch Type B or Type C machines, were impressive. Since IBA also used the occasion of IBC to announce licensing agreements with both Bosch/Fernseh and Sony for the use of their digital VTR know how, they were reluctant to discuss or display the VTR itself (which was located in a mobile van under the Conference Hall).

However, a subsequent visit to the van showed that the recorder was a Fernseh-modified BCN studio machine with some additional card circuitry doing the digital work. The video heads rotate at double speed producing a 2,000 ips writing velocity, but the tracks have been reduced to 2.4 mils with a 1.6-mil guard band. S/N ratio not being as critical in digital recorders, the track width can be narrowed. The sampling rate is 2*f*sc. (8.9 megabits) and error-concealment techniques are used to overcome the effects of switching points and tape defects. As is typical with such video prototypes, no effort was made to digitally record the audio, and some standardization of audio sampling rates are still to be resolved. While the digital VTR may be on the horizon, it's not around the corner as an operational or competitive device.

The IBA's satellite link display was perhaps a more immediate indicator of the future of ENG in the UK and Europe. For the first time on this side of the Atlantic, they had set up a small transportable dish (2.5 meters) on the patio of the Wembley Centre, and zeroed in on the OTS satellite stationed over equatorial Gabon.

An evening ITN news broadcast was beamed on 12 GHz to OTS and picked up on 14 GHz by earth stations at Crawley Court (IBA's research center), Goonhilly Downs (UK) and Fucino (Italy).

Normal terrestrial microwave links were used to distribute the programme to the stations carrying this news insert. Four colour monitors set up in the IBA exhibit showed the high-quality source and return images from OTS ground stations. The major aspect of this operation was that the GPO, which normally has jurisdiction over microwave circuits, was not involved. The implication was that now, UK and European broadcasters can easily set up ENG links via satellite under their own aegis.

The BBC booth featured CEEFAX, CARFAX, and digital noise reduction. As pioneers in teletext services, the BBC has constantly expanded these services to include greater editorial content for viewers equipped with decoders. This year they are experimenting with live news captioning for the deaf by using a stenographic shorthand keyboard (like those used in courtrooms) specially interfaced with the CEEFAX character generating circuitry. Early results show promise, although the system still has trouble with words that sound the same, but spell or mean differently (rain/reign, bare/bear, etc.).

The CARFAX system is being proposed as a special radio service for motorists. Using a network of low-power stations on a single frequency, local traffic messages would activate a special receiver in the vehicle with no manipulation on the part of the driver. Listeners at home would not be affected, although CARFAX components could be incorporated into domestic receivers if desired.

Continued on page 8

IBC exhibitors

Acron Video
AEG-Telefunken
Agfa-Gevaert AG
AKG Acoustics Ltd.
Allotrope Ltd.
Ampex
Asaca
Aston Electronic Developments Ltd.
Audix Ltd.
Autocue Products Ltd.
Avcom Systems Ltd./Telex Communications
Aveley Electric Ltd. (Rohde & Schwarz)
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Berkey Colortran
Bosch-Fernseh (Robert Bosch Ltd.)
Boston Insulated Wire Ltd.
Bradbury Electronics Ltd.
BBC
Calrec Audio Ltd.
Canda Television Equipment Ltd.
Canon Amsterdam NV
CCA Electronics Corp.
Cinequip Lighting Co. Ltd.
CMC Technology Corp.
Alexander Cole Ltd.
Consolidated Video Systems Inc.
Continental Microwave Ltd.
Michael Cox Electronics Ltd.
Crow of Reading Ltd. (American Data, Arvin Echo, Porta-Pattern)
Cue Communications Ltd.
Datatron Inc. International
Delta Electronics Inc.
Digivision Ltd.
Dixons Technology Ltd.
Dolby Laboratories Inc.
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Hitachi Denshi (UK) Ltd.
Ikegami
IBA
IVC
Keeline Productions
Key Electronics
Lee Engineering Ltd. (McMartin, Continental Electronics, Scully, Audicord, IGM, QRK, Time and Frequency Technology)
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LGT-Laboratoire General des Telecommunications
Link Electronics Ltd.
L-W International
3M UK Ltd.
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Vital Industries Inc.

The cost to the vehicle owner is small, $10-$30 depending on the model, and the specific service areas covered would give traffic information pertinent to drivers in the service region. Public trials of the system are now being planned by the BBC in cooperation with the Transport and Road Research Laboratory, other government departments, police forces, and the IBA.

In the noise reduction field, BBC engineers have come up with a full-field store using 32 Fairchild CCDs which measures only 25 X 15 cm on a single card. Two of these 2 megabit units constitute a full frame of memory, and are the core of a noise reduction system which automatically checks for image movements and adjust the noise reduction action to optimize picture quality.

The BBC has also developed a small monochrome hard copy printer which can produce strip paper prints from a CEEFAX transmission.

The impact of the Moscow Olympics on audio and video equipment suppliers was in ample evidence around IBC. At least six manufacturers advertised, some with very visible displays, their appointment as "official suppliers" to the 1980 Olympiad. Ampex had the original contract signed with Soviet television on prominent display in their booth. The Russians are ordering quad VTRs, slo-mo discs, and quantities of videotape for use at the Spartacus Games in 1979 and for subsequent use at the Olympics.

Electroimpex of Hungary had an extensive display of the range of equipment they are supplying to the Soviets for the Games. A $30 million contract includes 70 complete radio and 18 TV studios, colour monitors, commentators units (for the press), and SECAM test equipment.

Thomson-CSF, the largest video equipment supplier to the Games, featured this theme in their stand. They are already delivering on the 100 colour cameras, 40 mobile microwave links, 39 colour telecines, colour monitors, character generators, and the world's largest switching matrix (150 x 300) which Russian TV has ordered.

Marconi Instruments had a highly visible display of monitoring and measuring equipment that they are delivering to Moscow. Test line generators, inserters, and analysers provide continuous monitoring of signal transmission quality. Up to 24 parameters can be measured and compared against predetermined limits. All this equipment will operate on the Soviet SECAM signal system.

NEC is also supplying a major switcher to the Moscow Games, but via NBC. Part of a large switcher for the NBC Burbank studios will be packaged to go to Moscow as part of the engineering package going with the NBC crew. Later it will return for integration into a permanent switching system being installed there.

EMI are another "official supplier" having received a $1 million plus contract to provide cable TV equipment that will cover 10 sports pavillions and enable viewing of sports activities in any venue at the other ones. This was the largest single order for CATV gear that EMI has ever had.

It took a 344-page 8½ x 12 publication to contain the full text of the papers given. They covered the full gamut of currently interesting topics with emphasis on digital techniques, satellite broadcasting, and teletext systems. The digital papers included proposed standards for 625-line PAL signals and some details on the IBA digital VTR. John Baldwin of DICE fame was involved in both of these presentations. Joachim Dierman and Kurt Wallace of Ampex presented a very carefully documented paper cautioning about the need for some concerned planning in the digital VTR area, so that there will be some uniformity in this field.

In the matter of quad versus one-inch helical, Charles Urban of the BBC, who read the paper that he and D. M. Bowd had prepared, displayed some graphic examples of multi-generation quad pictures made with super hi band/pilot carrier systems, which were noticeably better than the one-inch helical, multi-generation tapes. Nevertheless, other proponents of Type B and Type C VTRs gave adequate reasons why either of these two video recording systems were well suited to replacing quad VTRs in the PAL and SECAM countries.

The teletext papers pointed to yet undreamed of potential services that the viewer might get from future improvements in hardware and software. A variety of proposals for subtitling for the hearing impaired were presented by BBC and IBA authors.

The combination of teletext with a home computer opened up all sorts of new possibilities according to J. Hedger, R. H. Vivian of the IBA, and W. J. Overington, an independent consultant. Telesoftware, as they call this system, would provide viewers with an endless array of video games, do mathematical functions, help education, and even assist blind or disabled people in the home.

Several papers covered new or experimental plans for radio services that do not exist now. Station identification, automatic road hazard warnings, automatic receiver switching with subaudible tones, and experience with quadraphonic broadcasts were all presented.

As usual, the IBC papers were first rate; however, the A/V equipment provided for the authors or lecturers left something to be desired. It is somewhat ironic to attend a conference on communications and be confronted by less than adequate visual aids.

The Wembley Centre is 20-30 minutes by tube out of the center of London and so presented a bit of a problem to the delegate who wanted to get to the various social events put on by the organisers or the exhibitors. It took a fat wallet (for cab fares), a hollow leg (for libations), and a rugged constitution (on general principles) to catapult between the hospitality centers around London. The main reception at Guildhall held in vaulted gothic chambers ringed with priceless stained glass windows and other art treasures, seemed to attract every delegate available. Champagne and hors d'oeuvres disappeared rapidly as the chamber overflowed with broadcasters, exhibitors, press representatives and other invited guests. It was a pleasant evening in an awe inspiring setting that dates back a few centuries.

The consensus gave IBC '78 a good rating. The exhibitors were happy, except for the few that ended up in Portakabins in the parking lot. The delegates were satisfied, except for those who wound up paying exorbitant rates for substandard rooms, which were quite a distance from the Wembley Centre.

Since Wembley proved too small, the 1980 IBC is now scheduled for Brighton, a seaside resort which the organising committee has assured everyone, is really equipped to handle the "big show" that IBC is becoming. Let's hope they are right.

UNITED STATES

TV Code revised

The NAB TV Code Board has approved several recommendations affecting present television standards.

Prime-time programming standards and guidelines for children's advertising were among the issues discussed at last month's meeting of the National Association of Broadcasters' Television Code Board, held at Hilton Head, South Carolina.

In a move to reduce the amount of non-programme material presently being scheduled in prime time, the board simplified current standards. (Prime time is a continuous period of not less than three consecutive hours per broadcast day as designated by the sta-

tion between the hours of 6 p.m. and midnight.)

Under the proposed revision, non-programme material (commercials and promotional announcements) broadcast within the main body of a programme is not to exceed two within any 30-minute programme, or four within any 60-minute programme. Programmes longer than 60 minutes shall be prorated at two interruptions per half hour. The amount of time for non-programme material shall not exceed nine minutes 30 seconds in any 60-minute period.

The board also addressed the proposed ban on children's advertising. The Children's Advertising and the Code Authority were directed to recommend policies designed to help clarify aspects of the Children's Television Advertising Guidelines. In addition, the board directed the two groups to review types of separator devices being utilised in children's programmes and their manner of use.

In other action, the board approved the category of pregnancy test kit products for advertising under TV Code standards effective January 15, 1979; and it approved a recommendation endorsing research designed to elicit information from listeners, viewers, and broadcasters on such issues as the inclusion of sex and human sexuality in public service announcements, and contraceptive advertising on radio and television.

The board's recommendations are subject to review and approval by the NAB's Television Board, which will meet in January 1979.

UNITED STATES

Lighting seminar scheduled

Regional lighting seminar scheduled for those involved in TV production.

Imero Fiorentino Associates will hold its 1979 regional Television Lighting & Staging Seminar January 22-24, 1979, at the WFAA Communications Center, Dallas, Texas.

Award-winning lighting and production specialists, including E. Carlton Winckler, David Clark and John Leay, will provide comprehensive and practical instruction for improving picture quality and ease of studio operation.

The seminar is designed for those engaged in broadcast and non-broadcast television production operations.

For further information, contact the Education Division, Imero Fiorentino Associates Inc., 10 West 66th Street, New York, NY 10023; (212) 787-3050.

NIGERIA

Radio service restructured

A new multi-leveled radio service has been established in Nigeria, replacing the national broadcasting authority.

The Nigerian Broadcasting Corporation has been replaced by a new Federal Radio Corporation (FRC), which will provide three types of radio service.

The national service, FRC Lagos, will be based in Lagos and broadcast national programmes in English as well as educational programmes.

Light entertainment will be broadcast by zonal centres and by state stations.

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United States: FCC Report

If you're right you lose, and if you're wrong you lose

The misuse of the well-intentioned Petition To Deny has caused several broadcasters to claim they're forced into payoffs, even claiming extortion. Apparently they're getting caught in the crunch of paying off the petitioner, even though the station knows it could eventually win. The legal expenses required to handle a long-running confrontation would be considerably more than it would take to pay off the petitioner.

At the NRBA national convention in San Francisco, an FCC panel member confronting this question said we can look for the Commission to take a closer look at any alleged or proposed payoff from the broadcaster to the pressure group. But he added that nothing will be done by the Commission to discourage the use of the Petition To Deny. If a bond were required by the petitioner, it might be a new ball game.

And if you're still wondering what has happened to the fee refund promise, the word was out at the NRBA convention that you can look for a specific proposal on fee refunds in January.

On the subject of what's coming in 1979, it's well-established that the Commission will approve AM Stereo. It's a matter of selecting the system and nailing down the standards. In Docket 21313, they are looking for comments on the effect of an AM stereo signal on adjacent channel protection ratios, skywave service, out-of-band emissions, directional antenna operation, and the compatibility of AM stereo signals with existing monophonic receivers. Comments are due December 29.

Meanwhile, the Commission has begun a rulemaking to consider permitting the transmission of programme-related signals during the vertical blanking interval (VBI).

NBC asked for the rulemaking, supported by PBS, ABC, CBS, and other interested parties. NBC proposed that Section 73.682(a)(21) be amended to allow transmission of a digital source identification (SID) signal on line 20 of the VBI. NBC wants to identify the originating network, the city of origination, and the date and time of origination. This would be a verification of network service transmitted, and it would allow faster and more accurate programme ratings, automatic logging, and automatic operation of cable television nonduplication switching equipment.

Based on the evidence submitted, the Commission says it was, ". . . persuaded that such a system was potentially beneficial to the general public as well as the networks and broadcasters."

In the dits and dahs category: A federal appellate court has upheld the FCC's 1976 ruling that certain delayed broadcasts of bona-fide news events concerning political activities were exempt from the equal-time provisions of Section 315. But, according to the Commission, a delay of more than one day "would raise questions concerning whether the broadcast was on-the-spot coverage of a bona-fide event."

And digging further into programme content, the FCC is proposing restrictions on the amount of time an educational station may devote to on-air auctions as well as non-auction fund-raising programming.

Programmes for special linguistic groups will be broadcast throughout Nigeria from the zonal centres. State stations will produce programmes for their own populations, with broadcasts limited to their own territories.

The Voice of Nigeria will continue to operate under the FRC.

On the television side, the Nigerian Television Authority will continue to run Nigeria's television broadcasting.

UNITED STATES

Children's ads— up, up and away!

Television advertising to children does not lead to "rabid children" with rotten teeth, at least according to the CBS Television Network president.

The Federal Trade Commission has misused, and even abused, the research supposed to support the contention that television advertising to children is detrimental and should be banned.

That is what James H. Rosenfield, president of the CBS Television Network, recently told an audience at the Washington Advertising Club.

Earlier this year, the FTC recommended a series of bans on televised advertising to children. If these recommendations take effect, there would be a total ban on advertising in programmes seen by audiences which include a "significant proportion" of children under eight years of age. All commercials for sugared products would also be banned on programmes where children under 12 constitute a "significant proportion" of the audience. In addition, any commercial for sugared products would have to be balanced by separate nutritional and dental messages paid for by the advertiser.

Since issuing its "Staff Report on Television Advertising to Children," the FTC has come under attack by both advertisers and broadcasters, as well as network representatives who feel the marketplace should determine what ads should or should not run on children's programmes.

The FTC has answered the critics by maintaining, according to their report, ". . . young children are generally unable to comprehend the selling purpose of, or otherwise understand or evaluate, television commercials. As to these children, television advertising addressed to them for any product is inherently unfair and deceptive, in a way that cannot be cured by any remedy short of a ban."

Rosenfield finds this hard to accept, maintaining that the FTC is using the facts to distort the truth. More important than the abuse of the evidence, however, is the philosophical basis on which it rests.

"Although it [FTC proposed ban] deals specifically with one medium, television (an incredible bias, by the way), and one audience segment, children, it is difficult to read it without concluding that it depends upon a premise or an attitude, if you will, that is never stated but animates the entire argument: advertising (or product advertising, at any rate) is inherently suspect. And that is because it is irresistible on the one hand . . . and incorrigible on the other. It does not matter what defenses the society or common sense provide; it will move you when and where it chooses. It does not matter whether it is "truthful" by any objective standards — it will nonetheless mislead through other devices. It is therefore beyond redemption."

Rosenfield says this is what the FTC assumes when it proposes the ban of advertising that is lawfully made and

Business Hotline

ROHDE AND SCHWARZ received an order from the Norwegian Broadcasting Authority for 38 FM transmitters with rated output powers of 5 or 10 kW. The company had earlier delivered two transmitters to one of the 11 stations in the Norwegian national network.

EEV is supplying kylstrons and related circuit assemblies for CCA Electronics' new line of UHF TV transmitters. CCA has standardised on EEV kylstrons and circuit assemblies for their 15 kW, 30 kW, 55 kW, 110 kW, and 220 kW transmitters.

HARRIS CORP.'s Broadcast Products Division reported receipt of six TV equipment and five radio equipment orders totalling approximately $13 million. Included in this are orders from Argentina, Portugal, United Arab Emirates, and Nigeria. In fact, Argentina's first colour TV transmitter will come from Harris; it is going to Channel 7, Buenos Aires.

DYNAIR president, E. G. Gramman, recently announced that more than $1 million in orders have been booked for the new Dynair System 21 switching equipment since its introduction at the NAB convention last March. The System 21 is a modular, expandable switching system, available in 10x10 up to 1000x1000 matrix sizes.

PHILIPS BROADCAST EQUIPMENT CORP. announced the sale of a 110 kW UHF transmitter to station WXTV, for installation on the new transmitting tower atop the World Trade Center in New York. WXTV, a Spanish-language station, will reach about 50% more of the growing Spanish-language market in New York with the new Philips UHF transmitter.

AMERICAN DATA announced the sale of a multistage audio and video distribution switching system to the Christian Broadcasting Network in Virginia Beach, Virginia. The Series 900 System, largest ever built by the company, will become the heart of CBN's international and domestic satellite broadcasting networks.

FREZZOLINI ELECTRONICS and HITACHI DENSHI have entered an agreement under which Frezzolini will provide its Frezzi Belt® Battery Packs and "Fast Chargers" for the Hitachi model FP-1020 video colour cameras.

AMPEX revenues for the first quarter ending July 29, 1978 were up 23%, according to a company announcement. Net sales and other revenues for the first quarter totaled $87.2 million, up from the $70.8 million reported last year.

lawfully sold. The FTC seems to believe, according to Rosenfield, that children's advertising, especially for sugared products, will convince children to buy only sugared products, force their parents to support their 'habit,' and eventually lead to tooth decay — and false teeth later in life.

But Rosenfield attacks this premise, pointing out that "there is simply no way to insulate children from advertising on television — let alone in other media."

"We can all remember," Rosenfield said, "when advertising was considered only innocuous. Now it is an awesome and sinister force. I'm not sure how it graduated to this grand villain status.

"And why is it sinister? Because, the theory goes, it creates desires that would not otherwise exist. Never mind that they may be desires that are generally accepted as normal; that they can be satisfied by legal means; or that they are aroused by truthful statements. (Or that the FTC forgets consumer motivation is vital to our consumer economy.)

"Obviously, a purchase decision involves a lot more than advertising. Obviously, advertising is only one of the factors in the decision-making process.

"In any case — whose value judgment is it that the creation, or stimulation, of a desire, within all these conditions of normality, veracity and legality, is wrong?"

Rosenfield attacked the main points of the FTC's proposal one by one. The FTC has argued that young children cannot differentiate an advertisement from the regular programme, especially when both may be animated. While extremely young children may not tell the difference, Rosenfield said studies (some cited by the FTC itself) show conclusively that many children *can* tell the difference between commercials and programming.

"Moreover," he said, "the evidence suggests — including research that the staff cited in other contexts but chose to ignore in this one — that substantial numbers of young children do in fact recognise the selling intent of commercials. In any case, those children too young to understand the purpose of advertising will not be making the family's buying decisions."

Rosenfield also criticized the FTC's contention that commercials have "usurped the parental role of mediator between children and the adult world." He maintained that the parent's role is not threatened by "rabid children, driven by deceptive commercials, compelling defenseless parents to feed them harmful foods."

Rosenfield does agree with the FTC on two fundamental points:

- Children are a special audience, with special needs, requiring special consideration. And,
- Very young children perceive the world in general, and advertising in particular, in ways that are different from those of older children.

But while agreeing with the commission on these points, Rosenfield refuses to support the FTC's way of handling the situation.

Rosenfield feels the quality of children's programming is good, and existing regulation of advertising is adequate. And he does not want the present system changed. On this point, he told the audience that the FTC's proposed ban is "a radical conclusion that clearly will not remedy the harm it supposes to exist."

UNITED KINGDOM

White Paper calls for major overhaul

The government has recommended the creation of a fourth national network to balance the BBC and ITV.

A new broadcasting authority which would buy and transmit material that is inappropriate for use by the BBC and ITV has been proposed by the government. This is just one of several proposals contained in a recently-published government White Paper on broadcasting.

The Open Broadcasting Authority (OBA) would run a fourth national television network on UHF; the three other networks (BBC1, BBC2 and ITV) also broadcast nationally on UHF.

For the past few years, there has been talk of creating a new network that would serve to balance the major institutional networks. The OBA will provide this balance by broadcasting programmes that would not ! appropriate on the BBC and ITV.

Unlike the other networks, which must ensure that their programming is impartial and balanced, the OBA will only have to be impartial. This follows the recommendation of the Annan Committee on the Future of Broadcasting submitted last spring. The Report called for the OBA to be operated by a publisher who would be subject to general regulation, not special legislation. The government White Paper follows these suggestions.

To finance the OBA, the government proposes that the new authority sell both spot and block advertising. In addition, the OBA would receive a government

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UNITED STATES

Radio listeners choose favorites

A study of major U.S. radio markets finds that stations do have a regular listening audience – despite the competition.

"The number of different listening choices, found on a crowded AM-FM radio dial, apparently exerts only a minor influence toward raising the number of different radio stations the average person listens to in a week."

That was the comment of Sylvia Hughes, director of CBS Radio Research, following release of the latest Arbitron reports on radio listening trends in the United States.

The Arbitron reports analyse the listening habits of persons in the U.S. by market size. And, according to Arbitron, radio listeners do not turn the dial very much, regardless of the wide variation in the number of available stations.

For example, in the top-10 markets, the average number of radio stations used per person per week was 2.6, out of a total of 34 stations. In the middle-10 markets, the average number of stations listened to each week was 2.3. And in small markets, the average number of stations listened to each week was 2.0.

The following is the complete table, showing calculations for 30 of the total 168 Arbitron-measured markets. It is broken into the top-10, the approximate middle-10, and the 10 smallest measured markets.

Average Number of Different Radio Stations Listened To Per Person Per Week (6AM-12Mid) Total Persons 12+ Arbitron Metro Survey Area — April/May 1978

ARB-Measured Markets	Avg. No. Radio Stations Used Per Person Per Week*	Total No. Stations Reported
Top 10		
New York	2.7	41
Los Angeles	2.8	44
Chicago	2.6	29
San Francisco	2.7	45
Philadelphia	2.5	27
Detroit	2.9	29
Boston	2.5	30
Washington, D.C.	2.6	34
Dallas-Ft. Worth	2.4	29
Houston	2.3	27
Unweighted Avg.	2.6	34
Markets 75-84		
Lansing-East Lansing	2.4	21
New Haven-West Haven	2.6	26
Harrisburg	2.3	22
Bridgeport	2.6	24
Baton Rouge	2.2	17
Johnson City-Kingsport-Bristol	2.3	28
Austin	1.8	12
Canton	2.4	25
El Paso	2.3	19
Albuquerque	2.3	17
Unweighted Avg.	2.3	21
Markets 159-168		
Fargo-Moorhead	2.1	8
Wichita Falls, Tx.	2.0	7
Altoona	2.1	12
Pueblo	2.0	17
Bloomington, Il.	2.2	13
Lafayette, La.	1.8	8
Medford	2.1	11
Billings	2.0	8
Sioux Falls, SD	2.1	9
Great Falls	1.8	7
Unweighted Avg.	2.0	10

*Slightly understated because stations with minimal audience, too low for separate reporting, cannot be included in average computation.

grant for at least the first few years; and it would receive revenue from programme suppliers who sell advertising in their programmes.

The government also proposes that the Independent Broadcasting Authority (IBA) have control of cable and pay television; community services; and hospital and university radio services.

The government opposes a recommendation by the Annan Report that a new Local Broadcasting Authority be created to control all local and community TV and radio stations (including existing BBC and IBA stations). Instead, the BBC and IBA networks will retain control of local radio and be allowed to expand their services. In a related move, a government levy for commercial radio will be introduced; there is already a levy on commercial television.

The White Paper also calls for the BBC's Complaints Commission and the IBA's Complaints Review Board to be replaced by a stronger Broadcast Complaints Commission. The new, independent commission will have the authority to hear complaints and make comments on "general issues and general trends," according to the White Paper.

Although the government has made several definite, and somewhat controversial, proposals, it failed to clearly define its position on teletext and broadcast satellites — two issues that are becoming increasingly important in the world of broadcasting.

These points, as well as the other major government proposals, are being discussed throughout the United Kingdom, with either favourable or neutral response. However, the future of these proposals may be dependent, not upon industry reaction, but on what happens in Parliament, where a change in power may soon result in still another list of recommendations affecting the broadcast industry.

UNITED STATES

Colour films available

The United Nations puts the past, present, and future on film.

A series of seven television films on *The Child and Its World* is being planned by the United Nations, in cooperation with television companies from 10 countries.

The series is sponsored by the Division of Human Settlements and Socio-Cultural Environment, and the Office of Public Information of UNESCO. Television companies in Belgium, Canada,

France, Hungary, Iran, Italy, Japan, Poland, Spain, and the United Kingdom are working together in the project; and it is hoped that more nations will join the effort.

Suggested themes for the seven films are *Tomorrow: The Child and Its Future; The Space of Knowledge – The Space of Life; The Society of Children; Memories of Childhood; Suffering; Young Workers;* and *Images and Imagination.*

United Nations Television also has available an eight-film series on a variety of subjects for use by television organisations. The series, *Vignettes*, can be purchased outright.

Subscribing television organisations get unlimited, unrestricted, and royalty-free rights to use the films as they want. Film subjects range from historical topics to contemporary issues. The series is available with either English or French optical tracks, and separate international M&E tracks, EBU Standard; in addition, separate scripts in French or English will be supplied. The films, which run from three to seven minutes each, are available in 16mm film and ¾-inch NTSC videocassettes.

For more information on films available from the U.N., write to United Nations Television, Room 809, New York, NY 10017.

UNITED STATES

Third year of satellite service

RCA American Communications continues serving cable and pay TV viewers, and plans another satellite network.

Broadcasting via satellite continues to play an increasingly important role, as evidenced by RCA American Communications Inc., which is entering its third year of operation. RCA now distributes more than 4,000 hours of television programming monthly on its two orbiting satellites.

Eleven different programme packages offer more than a dozen channels of television via the RCA Americom satellite to U.S. cable TV viewers. Four channels are offered 24 hours a day, and five channels of pay TV are offered for up to 12 hours each day. Additional TV offerings are available via satellite on a part-time or occasional basis in both cable and broadcast markets. More than 600 earth stations owned by CATV operators currently receive daily programming from the RCA Satcom I satellite.

Other services provided by RCA include bringing two channels of television broadcasting to viewers in Alaska via satellite; providing private-line long-distance telephone and data communications services to business, and offering bulk services to other telecommunications carriers. RCA is also planning a network for government users to include 20 earth stations; it will be completed by the end of the year.

The total number of terminals used by RCA Americom and others to transmit and/or receive satellite communications via RCA Satcom I and II now exceeds 750 earth stations. As this number continues to climb, so will the need for information on earth-station construction and operation. For this reason, this month's *Broadcast Communications* features a Special Report on Satellite Earth Stations, beginning on page 46 — the first of continuing reports on the use of satellites worldwide. BC

NRBA/United States

Audio feed clarifies message

By Ron Merrell, Editorial Director

Lionel Van Deerlin defends his proposed Communications Act rewrite via satellite during the recent NRBA convention.

It was altogether fitting that last month's NRBA convention in San Francisco would discover an answer to a problem that has plagued convention planners for years: what do you do when your major speaker can't show up for the convention? NRBA didn't miss a trick.

Lionel Van Deerlin, chairman of the House Subcommittee on Communications, was scheduled as the main luncheon speaker. But because of commitments in Washington, he couldn't make it to the convention. So instead, he was piped into the luncheon live via satellite. And make no mistake about it, the superiority of this kind of audio feed was especially obvious.

Gary Worth, vice president of Mutual, introduced Van Deerlin, who addressed the convention from the Mutual studios via satellite to a 10-foot receiving antenna outside the Hyatt Regency Hotel.

Van Deerlin told the audience that he was concerned about the industry leader's status-quo position on the rewrite of the Communications Act.

"Last week," Van Deerlin said, "in continuing hearings on the broadcast portions of the rewrite, I suppose we heard from as diverse a group of people as you could imagine. Broadcasters, public-interest activists, FCC commissioners (with the exception of Jim Quello) all arguing for the status quo. It's disturbing, though perhaps not surprising, to observe how comfortable people have become with regulation. There seems reluctance to accept the idea of change, a natural fear of uncertainty. All witnesses seem to be asking the same question: 'It might work, but can you prove that I'll be better off in a new environment?'

"I recall a recent conversation by Alfred Kahn, chairman of the Civil Aeronautics Board and a leading advocate of deregulation. Chairman Kahn spoke of the widespread notion that the burden of proof must always rest with the advocates of change. He added that even if one is dealing with manifestly irrational, sometimes idiotic arrangements, the advocate of moving in the direction of rationality is called upon to predict exactly how the process will work out, and to prove beyond all doubt that it will work perfectly. I'm not suggesting that we have cornered the market on rationality in the rewrite, but I can think of no more manifestly irrational arrangement than the present FCC regulation of your industry: the radio broadcasting industry.

"In addition to fear of the unknown, an element of self-interest is also sometimes self-evident in opposing deregulation. The Assistant Attorney General put it well. He said, 'Not only is the regulatory process slow, expensive and torturous, it is needlessly archaic and complicated. In fact,' he said, 'the special interests, and here I would include broadcast lawyers and some public-interest lawyers, have a stake in keeping the current system as complex and mysterious as possible.'

"It could be the complexity and mystery of the process which unite Vince Wasilewski and Nick Johnson in urging us to retain the public interest standard as a basis for continued broadcast regulation. And although neither of them was able to define the term, perhaps they'd agree with what Justice Black once said about obscenity: 'Even though they can't tell you what it is, they know it when they see it.'

"Let's look at a simple but distressing fact. In 1934 the present Act was passed; there were just 583 radio stations. Today there are more than 8,000. Yet in the intervening 44 years, regulation has increased, not decreased. Competition has brought more, not less regulation . . . to the point where nearly every aspect of your business is permeated by government rules.

"During our hearings last week, one successful and well-intentioned public interest lawyer suggested that the FCC should closely monitor the business decisions of the radio broadcaster to determine whether he was doing all he could to preserve a unique format. Now this is an example of the certainty that could be provided by the present regulatory scheme. But suppose the government intervenes and orders the broadcaster to retain a particular format, even though it means a sacrifice of revenues that are available to other non-unique stations in his market. Will other broadcasters then ever attempt a unique format?

"And should the possibility of new outlets be ignored in favor of protecting the station which we have thus relegated to marginal status through well-intended but misguided government

Radio great still looking good

A surprise guest, Arthur Godfrey, talked briefly at the opening day luncheon. Godfrey opened by saying, "I'm honoured to be here, and honoured indeed by you. And to answer your question . . . I know the first thing you thought of when you saw me was, he's at that third stage. There's a young man, a middle-aged man, and my God you look good! That's where I am, because I get it all day long. Holy gosh you look great! I keep wondering what I'm supposed to look like." (Godfrey is 75.)

After reminiscing over his introduction to radio 49 years ago at WFBR in Baltimore, Godfrey said, "Radio gives us once again the opportunity to use the imagination. To enjoy Kate Smith . . . before we found out how big she was. How many people thought of me as a six-foot-tall brunette? And look what they found when television came.

"Now as radio comes back full circle," Godfrey continued, "and it's coming fast, here is the opportunity to demonstrate to America how to get away from the horrible preoccupation we have with mediocrity. Just subtly, gently set the example. First of all with our diction and our manner. Establish for us once more the integrity we once knew and of which we were so proud."

orders? My answer to both questions is, No!

"The Bill that Lou Frey and I offered sets forth instead a philosophy which you've heard us discuss before, and which is the bill's cornerstone: we should opt first for competition, and regulate only where the marketplace fails.

"In radio there is ample evidence of competition. Competition offering diversity of choice to the consumer. It's not perfect diversity, but we live in an imperfect world. And government cannot remedy all imperfections.

"Radio has developed to a point where it is vastly different from television. There are eight times more radio than TV stations in the country. TV profits are six times greater than radio's.

"Your industry is fragmented. It is not dominated by major group owners. This is both your strength and your weakness. It is a strength because it demonstrates that competition is working and that deregulation makes sense for you. It is a weakness because it makes it difficult for you to speak with one voice and to be heard and be understood by the public, by the FCC, and by policy-makers.

"HR13015 recognises that radio and TV are different and should be treated differently. The bill offers this industry deregulation, not re-regulation. Not just a reduction in paperwork.

"I am more convinced than ever that the time has come for radio deregulation. Now, not in 10 years. And in all markets, not just the major ones.

"We are gathering ideas for revising our proposed legislation in the next Congress. I've asked the staff to take a fresh look at the restrictions on ownership of radio stations and the need for the Commission having any role over sales and transfers.

"Gradual deregulation could prove to be no regulation at all.

"Your industry faces an exciting challenge. You have a story to tell, and it's a convincing story. But you must tell it. Those of us in Washington who have already been convinced, we can't do it for you. Should you sit back and wait, fearful of uncertainty or someone's self-interest? Should you adopt the familiar political stance of keeping your options open until you see what final form the legislation takes? I think not. You can help shape the new law if you are willing to fight for what you believe in, for what makes sense.

"I've been encouraged by the position of this association, of its board, and its leadership.

"I think we can ask ourselves a simple question: Would deregulation leave the consumer better off? Not all consumers, maybe. That's more than we can hope for in a pluralistic society. But will society as a whole be well served over the long haul?

"With air travel, we have already found that the answer is, Yes. I believe that as we apply that experience to communications, the Yes will be even more resounding."

It was obvious from questions raised during the panel session on the Communications Act rewrite that broadcasters (especially on the radio side) are wary of the proposed fees and the limits set on total station ownership and the number of stations owned in a single market.

According to the rewrite staff members who fielded these questions, the new version of the Act will include a definite fee structure. But while some broadcasters openly warned that the fees could be changed down the line by Congress, the panel could offer no guarantee against future changes.

Also on the subject of fees, there was a confrontation on the suggested use of this money. Repeatedly, broadcasters said they didn't like the idea of subsidising public broadcasting or paying money that would be used as the base for low-interest loans for disadvantaged minorities seeking funds for station ownership. The united response of the panel was that the fees would be fair and that broadcasters shouldn't care where the money was used. Some terrible analogies were made in an awkward attempt to clarify the panel's thinking.

And on the subject of cutting the station ownership limits, the panel members said this was a point that probably would be revised upward.

Obviously, the new Communications Act's philosophy is that radio is so competitive that it needs less regulation on the programming side. Van Deerlin and the rewrite staff made it clear that competition in the marketplace would replace the current regulations. So when the question of public-affairs programming came up, the answer was that if it were viable, the listeners would listen. And as for commercial minutes per hour, after you exceed certain limits, you'll lose your listeners, not because of FCC regulations, but because listeners will tune you out.

Fortunately, the Subcommittee staff is in the process of rewriting the rewrite. And while there are several elements couched in the unknown, the new version will probably be a lot more acceptable to radio broadcasters.

In another section of this issue, *Broadcast Communications* presents its first Special Report on satellites and earth station installations. During the session on satellites, the panel made it clear that satellite technology is already making new services available (and not limited to 5 kHz), and even greater programming opportunities are just around the corner.

The networks, for example, will be able to cover an event in two languages and send the programme, via satellite, to the appropriate stations simultaneously. Fortunately, the technology is ripe for AM stereo involvement. But there are a number of technical and operational considerations that must be addressed. You'll find much of this in current and future articles in *Broadcast Communications*.

For reports on other sessions, turn to our World Forum section of this issue. Meanwhile, the NRBA has proved once again that responsible professional organisations do play an important role in shaping our industry. While the intimacy and rate of exchange of ideas slips as the convention numbers swell, it's still obvious that these conventions do offer exposure to the opinion leaders and the policy makers. And if you dare to stand up and speak, you will be heard.

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CCTV/Canada

Three-way partnership

A second television service on cable is finding support in the CCTV.

The Canadian Cable Television Association (CCTV) has endorsed a proposal by the Canadian Broadcasting Corporation (CBC) that a second television service be established on cable as a means of increasing the diversity of Canadian programme choice and viewing of Canadian programmes.

The endorsement was made at last month's public hearing on the CBC's license renewal. The hearing was conducted by the Canadian Radio-television and Telecommunications Commission.

While supporting this second (or TV-2) service, the CCTV objected to the limited role assigned to them in this new venture. According to statements by the CBC, under the new proposal, cable companies would produce local and specialised services; and existing broadcasters would provide national and local programming services.

The CCTV also voiced opposition to the CBC's position on cable subscription fees. The CBC wants these fees to be regarded as a source of funds for Canadian programming, along with commercial revenues of broadcasters and Parliamentary grants to the CBC.

But if cable TV revenues are to be diverted to Canadian programming, the cable subscriber must be convinced that he is receiving something for his money, a CCTV spokesperson told the hearing.

To accomplish this, the CCTV proposed a three-way partnership between the CBC, CCTV, and independent programme producers to develop a new commercial-free, cable-delivered Canadian service.

A CCTV representative told the hearing, "Unlike some other intervenors, we believe there is a strong case to be made for the additional exposure of the best of CBC programming. The CBC is rightly proud of those programmes that exceed two million people in the audience. But another way of expressing that statistic is to say that 20 million did not see the programme and might welcome an alternate viewing time of a cable replay. But we also believe that there is a significant forgotten element of the broadcasting system: the independent programme producers who have been denied the financing and showing of their work due to the CBC's vested interest in its existing staff and facilities."

The CCTV emphasized to the hearing that it is willing to contribute to the costs of additional television services, if they are considered as a full partner — and not merely a bill collector.

NAB/United States

Committee takes action

Several proposals, including creation of an engineering laboratory, were made at the committee's monthly meeting.

The executive committee of the National Association of Broadcasters has invited the Inter-American Association of Broadcasters to hold its 1979 annual meeting in Washington, D.C. The invitation was made at last month's executive committee meeting.

In other action, the committee authorised the establishment of an engineering laboratory. George Bartlett, NAB vice president, will head an engineering advisory committee to outline full plans for the laboratory. But it has been reported that, among other things, the laboratory will work to improve audio processing techniques. The complete functions and operating budget will be presented to the NAB's full board during its meeting in Maui, Hawaii, next January 14-19.

The committee also authorised several minority task force actions. The NAB's legal department is now preparing an application to be filed with the Internal Revenue Service for the creation of a charitable trust to administer an investment fund designed to promote minority ownership of broadcast stations.

Finally, it was reported that the 1978 convention in Las Vegas netted slightly less than a $500,000 surplus. This figure reflects deductions for staff time and expenses.

EBU/Greece

Paying for television rights

The EBU is concerned over the escalating costs of TV rights to major international events.

The costs and arrangements of bringing the 1980 Olympics to Europe were key topics at the 29th general assembly of the European Broadcasting Union, held recently in Athens, Greece.

The costs of television rights for the Olympics have continued to soar during the past few years. And the cost of covering the 1980 Moscow Games will no doubt reach an all-time high. (NBC in the United States reportedly paid $100 million for rights to the 1980 Summer Olympics.)

The EBU has signed an agreement with the Communications Satellite Corporation (COMSAT) to provide direct satellite service to Europe for the 1980 Winter Olympics in Lake Placid, New York.

Also during the meeting, plans for the third World Conference of Broadcasting Organisations were discussed. The conference will be held in Teheran in February 1979.

Jean Autin, president of Telediffusion de France, was elected EBU president, succeeding Sir Charles Curran. Autin will take office in January. Luis Ezcurra, deputy director general of Radiotelevision Espanola, was elected vice president.

BFM/United States

Lower pay at southern stations

BFM survey reveals financial side of broadcasting.

In a recent issue of their *Broadcast Financial Journal*, the Broadcast Financial Management Association (BFM) has reported on their nationwide survey of broadcast executives. It shows the section of country where your work has a lot to do with how much you are paid.

The survey cites, for example, that East and West Coast radio station managers are paid about 11% more than those in the South Atlantic region, 8% more than those in the North Central region, and 5% more than those in the South Central region. But the survey does reveal that while South Central and South Atlantic regions average lower salaries, the gap between these and other regions is not as wide as reputed to be.

The BFM survey results were based upon responses from the top 10 executive positions among 232 broadcast companies, including small to large markets, and from single-station companies to networks and group operators. Included in the job categories were chief broadcast corporate operating officer; chief broadcast corporate financial officer; general/station manager; chief station accounting or business financial manager/controller; officer or ac-

Continued on page 21

For you, the new breed of video professional, the new breed of professional video from JVC.

If you're a video professional today, you're a tougher customer than ever. So JVC's rugged professional line delivers the quality and features you demand at prices you want to pay.

We know you've got a lean new attitude about the video equipment you buy, no matter how long you've been in the business. Or whether you're in broadcasting...a sophisticated corporate A/V operation...a top production house...or building your first video capability.

And that attitude is, with all the people vying for your video dollar, you want more state-of-the-art technology in equipment that costs you less to own and maintain.

JVC's attitude is basic too. We build in engineering innovations—we don't add them on later. And we do it first. Which means you enjoy better picture and sound quality, easier operation, and sophisticated features you may not even find in equipment selling for twice the price.

For instance.

You wanted faster performance and greater accuracy in 3/4-Inch video editing.

And JVC's new CR-8500LU Recorder/Editor System offers bi-directional fast/slow search from approximately 10 times to 1/20 time, with editing accuracy to ±2 frames.

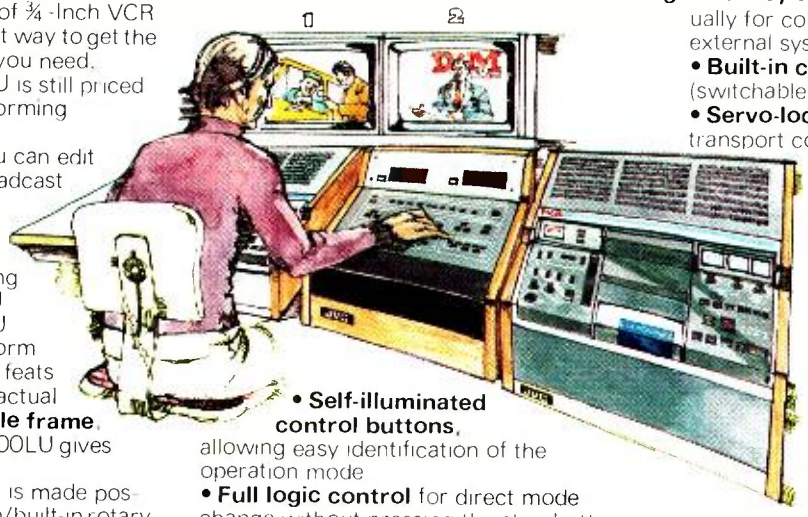
It's a new generation of ¾-inch VCR editing— the fastest, surest way to get the frame-by-frame accuracy you need.

But JVC's CR-8500LU is still priced well below its closest performing competition.

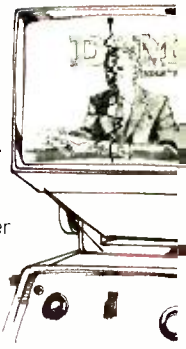
With a single unit, you can edit with full functions and broadcast quality. Even if you don't happen to have special technical knowledge.

With a complete editing system of two CR-8500LU units and the new RM-85U Control Unit, you can perform the most advanced editing feats at approximately 10 times actual speed, then stop **on a single frame.**

Here's how the CR-8500LU gives you that kind of precision:



- **Frame to frame editing** is made possible with the capstan servo/built-in rotary erase head/blanking switcher frame servo design. A design that also ensures true assemble and insert editing with no distortion at the edit points. Plus horizontal sync phase compensation to minimize timing error at the editing points.
- **Variable speed auto-search** lets you perform both high speed and low speed search. You can search at approximately 10 times in fast forward or reverse to find edit points faster. Or slow speed search at 2 times, 1 time, 1/5 time and 1/20 time. Or use the special auto-speed shift feature to automatically slow you down from 2 times, real time, 1/5 time, 1/20 time.
- **Automatic pre-roll** enables you to pre-roll tape between edits, with an automatic on/off switch. Which can come in especially handy during successive assemble edits using camera signals.
- **Self-illuminated control buttons,** allowing easy identification of the operation mode.
- **Full logic control** for direct mode change without pressing the stop button.
- **Remote control** of all operations, with the optional remote control unit RM-85U.
- **Audio level control with meters,** preventing over-level recording without audible distortion, with attenuator. Also, manual audio level controls let you adjust the audio recording level by checking the level meters.
- **Auto/Manual selection for video recording level control,** adjustable by the automatic gain control circuit or manually by referring to an independent video level meter.
- **RF output** to connect an external drop-out compensator.
- **Patented color dubbing switch** for stable color multi-generation dupes.
- **S.C./sync input connector** allows connection of time base corrector and allows for two second pre-roll.
- **Chroma level** can be controlled manually for convenient connection to an external system.
- **Built-in comb-filter** for playback (switchable on-off).
- **Servo-lock indicator** to check the tape transport condition.
- **Counter search mechanism,** permitting Auto-Search of a particular section of the tape.
- **Solid construction for easy maintenance:** both side panels, top and bottom panels are detachable for easy access to the inside.
- **Tracking control meter** for maximum tracking adjustment.
- **Heavy fan motor** for better circulation.



All that with one editing unit. But when you combine two editing units with our new RM-85U automatic editing control unit, you'll enjoy all the benefits of a total-performance system.

Starting with the kind of control only JVC's RM-85U can give you:

- **Independent LED time counters** for player and recorder, read out edit points in minutes, seconds and frames.
- **Edit-in and edit-out automatic control.** Four built-in memories let you control edit-in and edit-out points of both the player and recorder. And once starting and ending points are determined, accurate editing is memory-controlled automatically.
- **Edit shift control** allows frame-to-frame edit point correction.

Lap time indicated for each insert edit length by LED display.

Edit preview mode available, for rehearsals" of actual edits.

Edit-in point search mechanism. After each edit, a Return button rewinds the tape automatically to the edit-in point, so it's easier to check edit conditions.

Auto-shift search mechanism to step down the tape speed automatically, and ensure quick and accurate location of the editing point.

Tape safety guard circuit. Because leaving the unit in the still-frame mode can eventually cause damage to tape or video heads, a tape safety guard circuit places the unit into the stop mode automatically if it is left in the still-frame mode for more than 10 minutes.

• **Selective editing modes**—assemble editing, insert editing for audio channel-1, audio channel-2 or video.

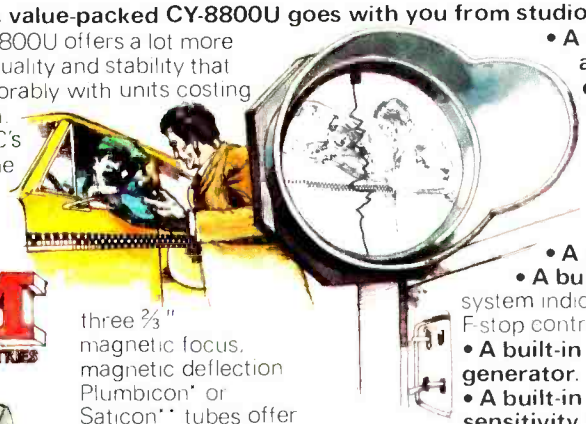
• **Versatile editing capability** offering techniques like "edit-in/out," pre-roll, and automatic pre-roll.

You'll find that nothing in its price class performs anywhere near the CR-8500LU/RM-85U videocassette editing system. And that you'd have to spend a *lot* more on the competitive unit that offers many of the same features.

That's what we mean by giving video people more of what they want, for less than they expect to pay.

You demanded more versatility in a moderate-priced, broadcast-quality camera. And JVC's value-packed CY-8800U goes with you from studio to location.

Our CY-8800U offers a lot more than picture quality and stability that compares favorably with units costing twice as much. Thanks to JVC's technology, the CY-8800U camera, utilizing



three ⅔" magnetic focus, magnetic deflection Plumbicon* or Saticon** tubes offer total flexibility. And a rugged die cast chassis in front and back to hold up under the toughest conditions.

With the **Basic** configuration, it's a compact ENG/EFP camera that's completely self-contained—no CCU required. It's easy to operate, ready to plug into our CR-4400LU/CR-4400U portable recorder, with optional cables available up to 66 feet.

With the **Studio** configuration it's a hard-working studio camera. Just add the RS-8800U remote Synchronizing unit and the large screen, top mounted viewfinder.

And as for big-ticket features, we've built in what the others would let you add on later:

• **A built-in 1.5 Inch adjustable electronic viewfinder** for the convenience of the operator.

• **A built-in battery warning system.**

• **A built-in tally light.**

• **A built-in VSI**—video system indicator for precision F-stop control.

• **A built-in color bar generator.**

• **A built-in +6dB, +12dB sensitivity switch** for low light level applications.

• **A built-in auto white balance.**

• **A built-in fast warm-up capability.**

• **A built-in electrical color temperature adjustment** for different applications (variable from 3000°K to 10,000°K).

• **A built-in filter system** (neutral density) for variable light levels.

• **A built-in level switch** (+50%, 0, −50%) provides ½ F-stop adjustment, letting you fine tune for added contrast.

• **A built-in time lapse meter** to show total hours of camera use.

• **A built-in intercom system** for studio applications.

• **An RGB output,** and NTSC encoding (Y, I, Q).

• **A built-in Gamma control** to fine tune gamma level.

• **An AC Adaptor**—standard.

• **Lightweight—17.4 lbs.—portability.**

• **Optional 12-to-1 zoom lens** with automatic iris and power zoom.

• **Built-in horizontal and vertical contour correction circuits.**

• **Signal-to-noise ratio of 49dB,** F 4/3000 lux.

• **Resolution of 500 lines at center.**

• **Return video** in the viewfinder.

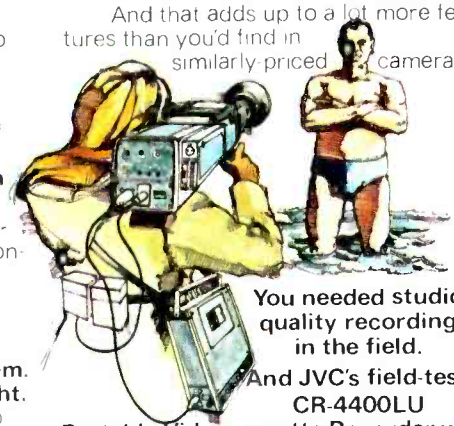
• **A built-in -G circuit** for registration.

• **Minimum illumination** F 1.9/300 lux (+6dB switch on).

• **A comfortable hand grip** to stop and start the recorder. With a switch to operate iris control and a switch for return video.

• **A built-in CCU.**

And that adds up to a lot more features than you'd find in similarly-priced cameras.



You needed studio quality recording in the field. And JVC's field-tested CR-4400LU Portable Videocassette Recorder with automatic editing lets you bring your recording/editing capability wherever you need to shoot.

If you spend time on location in either ENG or EFP applications, you need a portable video system that can shoot, edit, and give you something to show in no time flat. Without awkward equipment hassles.

JVC's CR-4400LU is the one to take along when you can't bring a studio.

Because it's the lightweight machine with heavyweight features.

• **Weighs in under 27 lbs.** So you can take it anywhere, and assemble edit on the spot. You enjoy total flexibility. Complete freedom. Fast results.

• **AEF (Automatic Editing Function)** gives you clean assemble edits.

• **Built-in, full color recording and playback circuitry.** No need to buy an adaptor.

• **Low-power consumption** that lets you operate on a miserly 13.5 watts, for longer battery life. A multi purpose meter checks battery, audio, video and servo levels for precise control of all functions.

• **Flexibility to record with the CY-8800U** or other high quality color cameras.

So if you need a field-tested recording system with the features you want at a price you can afford, check out our CR-4400LU Portable Videocassette Recorder.

*registered trademark of North American Philips Corporation.

**registered trademark of Hitachi Corp.

JVC's new breed of professional video. Backed by an old tradition of JVC quality and reliability.

For the past fifty years, more and more professionals have turned to JVC for innovative equipment they can count on to perform.

Isn't it time you discovered why?

Call your JVC representative for a demonstration. Or write to your nearest JVC office:

58-75 Queens Midtown Expressway
Maspeth, N.Y. 11378
(212) 476-8010

1011 W. Artesia Blvd.
Compton, Ca. 90220
(213) 537-8230

3012 Malmo Dr.
Arlington Heights, Ill. 60005
(312) 593-8997

3400 South Loop East
Houston, Texas 77021
(713) 741-3741

TV reception simulated

JVC Professional Video. The tough new breed.

JVC

JVC INDUSTRIES COMPANY
DIVISION OF US JVC CORP

counting manager; general sales manager; programming manager; chief engineer or technical supervisor; news director; and promotion/community affairs manager.

BFM director Glen R. Banks (KTAR-AM/TV, Phoenix), who supervised the survey project, called the report "a new important analytical review of a heretofore unknown side of the finances of the broadcasting industry."

Copies of the study are available for $50 by writing to: BFM, 360 N. Michigan Avenue, Suite 910, Chicago, IL 60601.

SBE/United States

Finding engineers

The SBE certification programme is designed to reward those with practical, hands-on experience.

On numerous occasions during the recent NBRA convention held in San Francisco, session attendees asked the engineering panels where they could find good, qualified engineers. The question brings up a problem many CEs, station managers, and owners have had to wrestle with over the years.

One source is the Society of Broadcast Engineers (SBE). And hopefully, there's a local chapter in or near your city. What makes this such an excellent source is the SBE certification programme. Those granted grandfathered certification were screened by the SBE, regardless of their record. And those who had not been in the business long enough to qualify under the grandfathering clause were given the opportunity to qualify by testing.

The history of testing around this industry, especially where engineers are concerned, includes archaic questions, questions of marginal relevance, and questions that did not require practical, hands-on experience for a correct answer. But this is not true of the SBE tests. If anything, they are designed to ascertain practical knowledge and an understanding of the state-of-the-art. As this magazine goes to press, at least 1,500 engineers are now certified through the SBE. And in keeping with their desire to upgrade the status of the broadcast engineer, the SBE does not require that those applying for the test be SBE members.

For further information on the SBE certification tests and for names and phone numbers of the SBE's more than 40 chapter chairmen, drop a line to P.O. Box 50844, Indianapolis, Indiana 46250, or call 317-842-0836.

ABU/Japan

Contracts awarded

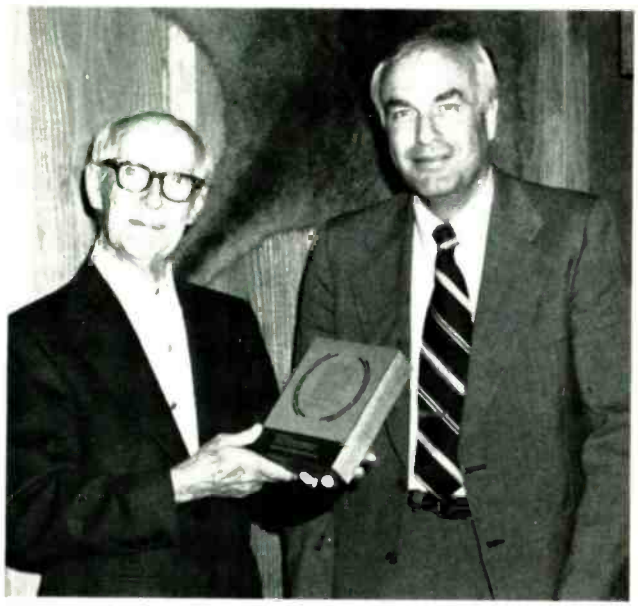
U.S. and European manufacturers are supplying new broadcast equipment to several ABU members.

Members of the Asia-Pacific Broadcasting Union (ABU) recently announced the awarding of contracts to several broadcast equipment manufacturers.

The National Iranian Radio Television (NIRT) signed agreements with Harris and Thomson-CSF.

Rank-Cintel entered an agreement with the Iraqi Broadcasting and Television Establishment (IBTE) to equip three regional television stations with new flying-spot colour telecine systems.

Radio Thailand (RTH) has ordered two colour cameras and three processing amplifiers from Pye TVT. BC



Jimmie Fidler (left) receives a commemorative plaque from Donald V. Kleffman, vice president and general manager of the Ampex audio-video systems division. Fidler, best known for his nationally syndicated radio programme and newspaper column on the entertainment industry, was given the award in recognition of his 20 years as a distributor of Ampex professional audio systems.

Marilyn O'Connor is the new director of special projects for the National Association of Broadcasters — a position created recently within the NAB's public affairs department. O'Connor, who assumed the position last month, had been editor of *Highlights*, the association's weekly newsletter. Prior to joining the NAB, she was director of information for the Association of Media Producers in Washington, D.C. She also served as public relations assistant for two years with the American Broadcasting Companies Inc. in New York City.

Robben W. Fleming, president of the University of Michigan, has been named president of the (U.S.) Corporation for Public Broadcasting. He will succeed Henry Loomis, who is retiring. Fleming has served with the National Academy of Arbitrators, the Securities and Exchange Commission, the National Emergency Housing Program, and the National Wage Stabilization Board. In addition, he has been chairman of the American Council on Education and president of the American Association of Universities. He will join the CPB in January.

Lester W. Lindow, who recently retired as president of the Association of Maximum Service Telecasters, was honoured October 4 at a dinner hosted by AMST directors. More than 100 guests attended the event, held at Washington's Madison Hotel. Among the guests were Lionel Van Deerlin, chairman of the House Communications Subcommittee, and FCC Commissioner Robert E. Lee. Lindow had 21 years of service with the association.

Moving Up

VINCENT E. ROCCO has joined Nurad Inc. as director of microwave television systems; he formerly served as associate director of relay systems at CBS. While at CBS, Rocco was responsible for the design of RF systems and ENG/EJ microwave systems. He also directed the design and installation of ENG and STL systems at all CBS microwave sites.

DAVID ACKER has been appointed president of Microtime Inc., a subsidiary of Andersen Laboratories. Acker, who had been serving as general manager of Microtime, will continue as a vice president of Andersen.

TOM CREIGHTON was recently named sales manager at Ampro Broadcasting. Prior to joining Ampro, he was the eastern regional sales manager for TFT Inc.

DENNIS O'NEEL, new vice president-operations and plant manager at Magnasync/Moviola, will be responsible for all manufacturing operations at the company.

MERTON KNOLD moved from Microwave Associates to the Lenco Inc. electronics division, where he takes over as midwestern regional sales manager.

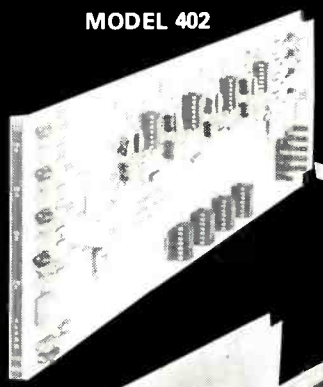
FOR TV STUDIO, HEADEND, TOC or UNATTENDED SITES

di-tech inc.

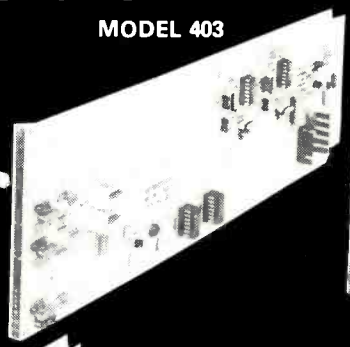
HAS EQUIPMENT FOR YOU

VIDEO PRESENCE DETECTORS

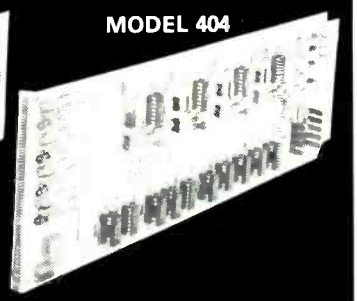
MODEL 402



MODEL 403



MODEL 404

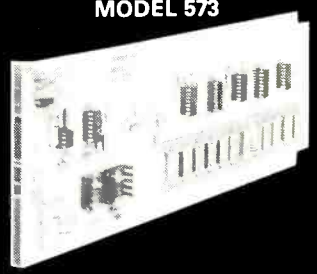


TOUCH TONE SYSTEMS

MODEL 570/572

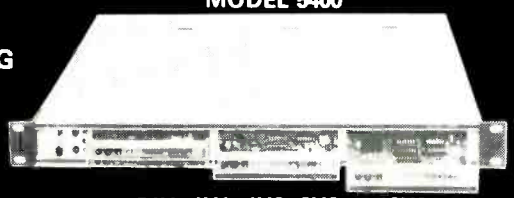
FUNCTIONS 12 Per Card
MAX. 144
Auto Answer or
Dedicated
High Current or Relay
Outputs

MODEL 573



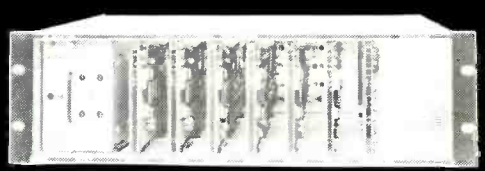
AUDIO/VIDEO ROUTING SWITCHERS, REMOTE CONTROLLED, LOOP THRU INPUTS

MODEL 5400



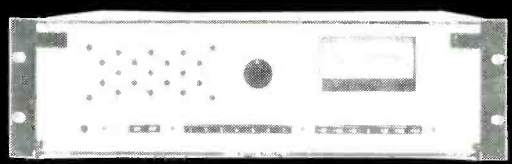
MATRIX: 4X1, 4X3, 8X2 or 12X2

MODELS 5500/5501/5502



MATRIX: UP TO 28X2

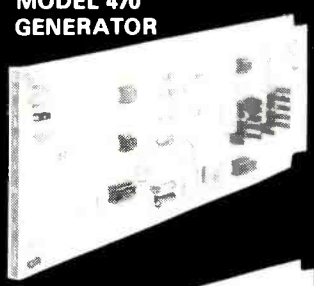
AUDIO MONITOR AMPLIFIER WITH SPEAKER AND VU METER



MODEL 7001

TRANSMISSION LINE SUPERVISION SYSTEM

MODEL 470
GENERATOR

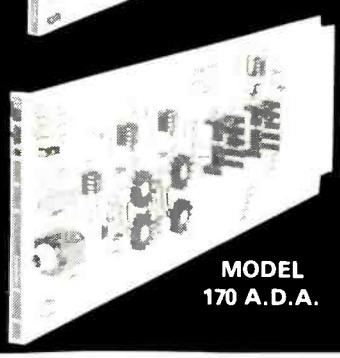


Freq. Range 20 to 100 CPS
(Factory Set)
Level -25 to -35 dBm
(Adjustable)
Alarm, LED & Relay

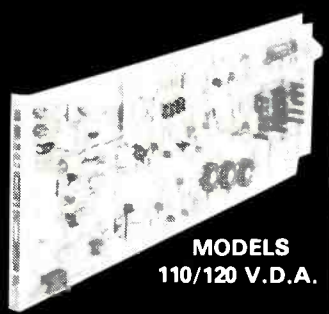
MODEL 471
DETECTOR

AUDIO/VIDEO/PULSE DISTRIBUTION AMPLIFIERS

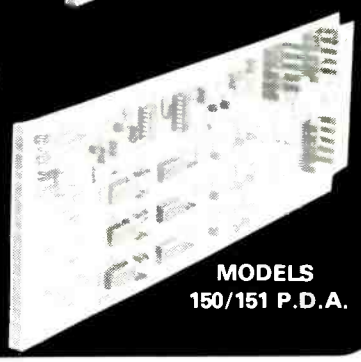
ALL D.A.'s
HAVE 6 OUTPUTS



MODEL
170 A.D.A.



MODELS
110/120 V.D.A.



MODELS
150/151 P.D.A.

311 Wyandanch Ave., North Babylon, N.Y. 11704 TEL: 516 643-4040

Circle (10) on Reader Service Card

We gave you one-inch.

In the last few months, you've had a chance to do some serious thinking about all the new products displayed at this year's NAB Show. Sony Broadcast products. And products by other manufacturers, too.

You've read about them.

You've talked about them.

You may even have seen some of them in action.

And by now, one fact should be obvious.

There's a new dimension in broadcast equipment. One-inch. It's here, and it's here to stay. The SMPTE Type C Standard proves it.

The width of things to come.

Sony Broadcast BVH Series 1" recorders, as we've been saying for some time, are part of a change that will affect every aspect of video production and broadcasting.

But it's one thing to say it. And it's another thing to see it happen.

Because broadcasters and production facilities have taken our one-inch equipment, and run with it.

From coast to coast, Sony Broadcast BVH-1000 recorders are lending their unique advantages to more and more professional video applications.

Advantages like BIDIREX. That gives you full bi-directional search capability in both forward and reverse, with recognizable picture – even at more than 30 times normal speed. And also lets you position the tape reels as if by hand, for the "film" feeling top creative editors demand.

Advantages like single-camera technique. Because you've got 100% post-production creative freedom, you can use the one camera/one recorder setup once possible only with film. No more dependence on "on the fly," editing using production switchers. Yet you still retain all the economic advantages of video.

And other economic advantages, too.

The BVH-1000 costs less to acquire. Takes up less space, so you save room in the studio. Cuts down on maintenance costs. And gives you the dramatic savings of 1" videotape, that costs only about half as much as 2" tape.

With a system this good, we predict you'll go far.

And the advantages of one-inch recording don't end in the studio.

Now there's a fully porta-

Now take it a mile.

ble 1" recorder from Sony Broadcast. The BVH-500.

The BVH-500 weighs just 43 pounds, including tape and battery. Operates for 90 minutes on a single rechargeable Ni-Cd battery. And delivers more than an hour of non-stop recording time from each reel of 1" videotape.

To give you continuous usable video for the full length of that tape, the BVH-500 features auto back-space assemble editing. Which achieves scene-to-scene transitions without picture breakup.

And naturally, there's more. Full monitoring capability. A unique video confidence head, to tell you your RF signal is on the tape. Digital servo system, to minimize gyroscopic error. Built-in SMPTE time code generator. And rugged housing, that stands up to extreme field conditions.

But here's the best part. Our BVH-500 is fully compatible with our BVH-1000.

That means you can record in the field, on 1" tape. Then bring it home and edit or broadcast without converting to another format.

To wrap things up, we've got the best tape.

We gave you a 1" recorder that's revolutionizing studio and field production techniques. The BVH-1000.

We gave you the 1" portable recorder to go with it. The BVH-500.

And in case you hadn't heard, we'll let you in on the best 1" tape to use with your Sony Broadcast 1" equipment.

That's right. Sony 1" tape.

We make all of our V-16 Series 1" High-Band Master Videotape ourselves. That makes us different from just about any other manufacturer of video recorders.

Since we make both recorders and tape ourselves, we know how to produce a tape that gets the most from our equipment. After all, we want our tape to make our recorders look good. And vice-versa.

So for wide frequency range, high signal-to-noise ratio, minimum dropouts, and precision winding, always choose Sony V-16 Series videotape for your Sony Broadcast BVH Series equipment.

That's our story.

Now it's your turn. Write Sony Broadcast, 9 West 57th Street, New York, N.Y. 10019. Or call us direct. In New York, our number is (212) 371-5800. In Chicago, we're at (312) 792-3600. And in Los Angeles, at (213) 537-4300.

We've given you one-inch.

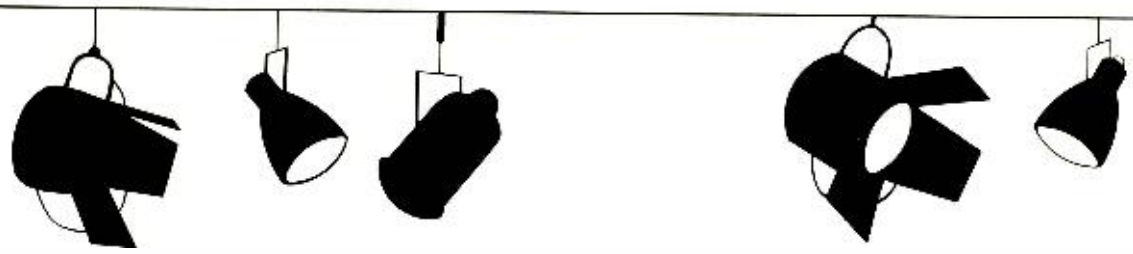
Now, give us a chance to prove how far it can take you.

Sony is a registered trademark of Sony Corp.

SONY BROADCAST

For Literature Only Circle (21) On Reader Service Card

For Demonstration Only Circle (22) on Reader Service Card



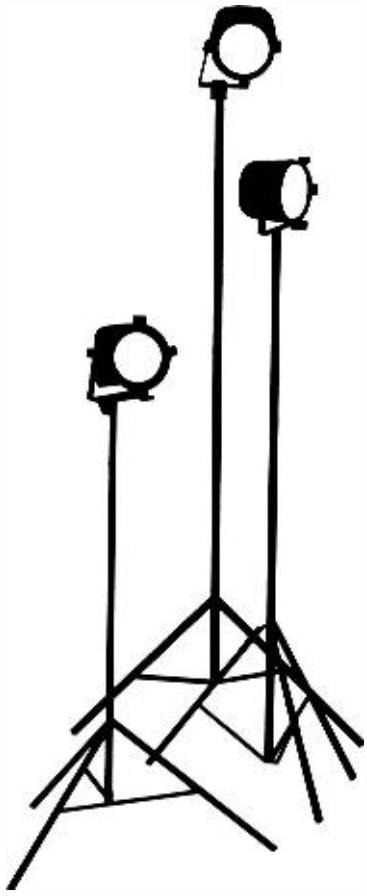
Let's make those shadows work for us

By E. Carlton Winckler

Since we originally fought our way into this business, many of us have aspired to earn the honoured title of "lighting director," or even the more high-toned "lighting designer" appellation. After our first big assignment in lighting, however, we sometimes wondered if the job shouldn't have been more accurately called "shadow director" instead.

Our first attempt at creative lighting forcefully impressed on us the fact that while putting light on a subject is pretty easy, each light causes a very definite shadow to appear opposite the light source. Getting the light from the desired direction and at the right intensity wasn't difficult — sort of fun, in fact — but we hadn't counted on that shadow, and it spoiled the whole effect we had in mind. Thereby, early in our careers, we learned our first big lesson: the real art of lighting lies in controlling shadows and making them an effective part of our composition — actually making the shadows work for us.

Modern lighting instruments provide the lighting director with a great variety of methods for controlling the shape, size, intensity, and quality of light rays; but each unit still causes a shadow!



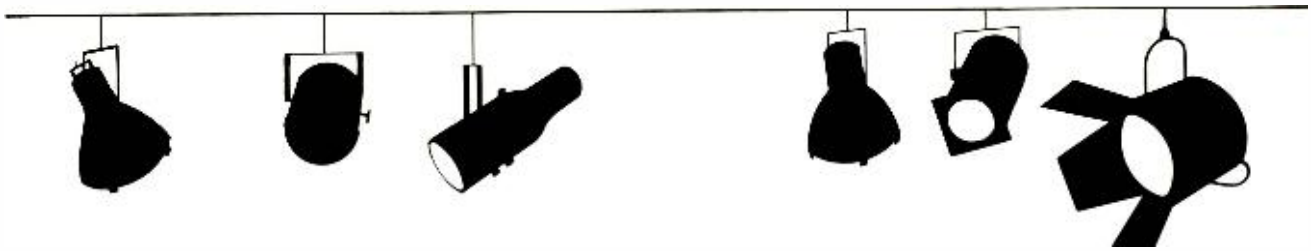
Therefore, the placement of these lighting units in relation to subjects, backgrounds, or action requires careful study, understanding of objectives, and firm decisions on the part of the lighting director. It is he who must plan exactly where he wants the shadows to appear or disappear.

Of course, there are luminaires designed to provide very soft diffuse light which is almost (but not quite) shadowless, and we can light an area entirely with these. When the subject and surround areas are designed for this approach, the diffuse illumination technique is very effective; but it requires other lighting support, and very advanced skills to bring it off.

However, when the subject and its surround are lighted with a single diffuse source (placed head-on to the subject) you may risk the hazard of a "flat picture," since all compositional elements receive equal illumination, and separation is lost between the subject and background. The end result is a very weak, dull, and uninteresting picture which may be unclear on anything but a perfectly adjusted receiver.

Here is where that "other lighting support" we mentioned comes in — as does the skill provided by the lighting director. Without changing the flat diffuse light, he may add a backlight coming from one side of the subject in a manner that will rim light one of its sides

E. Carlton Winckler is the senior production consultant and director, education division, Imero Fiorentino Associates, Inc. (Consultants to the Performing Arts).



a bit, as well as provide a degree of conventional backlight to accent the separation illusion between the picture elements. Thus, we do not lose the softness effect we were aiming for, and the modeling touch provided by the added source gives our composition some definition, creating a more interesting and effective result.

Placing a diffuse source in front of the subject, but somewhat to one side, avoids the flat result of the head-on placement by making one side of the subject bright and the other side considerably darker. Usually, the contrast between the light side and the darker side in this technique appears so great on a receiver that the effect is not altogether visually acceptable.

That "other lighting support and skill" would now provide some low-intensity side/backlight of just sufficient brightness to hold the contrast between the bright and dark sides within the reproductive capability of a receiver. With this "other light support" in action, we obtain the softness effect with practical overtones, which assures a visually pleasing picture on the screen.

Have we digressed from our discussion of shadows by talking about diffuse light techniques? Not a bit! Perhaps you noticed in the *support* additions that one side of our subject became or remained a touch brighter than the other side? Well, the darker side became, in actuality, a very subtle shadow, most strategically placed to give the picture form and strength.

There are still some producers who insist on absolutely shadowless lighting, ignoring the lessons learned by the theatrical producers and designers of the past, who (because controlled beam lights had not yet appeared) were only able to use general light from footlights, border lights, and flood lights. These artists learned that in order to achieve believability and concentrate audience attention on the acting areas, it was advisable to paint *natural* shadows on scenic and decor items, shade out upper portions of the settings, and have the performers wear heavy and distorted makeup.

These artificial distortions are no longer practiced because skilled lighting directors can now use present day controlled light sources to provide natural shadows for modeling, perspective, separation, and direction of audience attention — a great contribution to audience communication.

In our role of "shadow director" we quickly learn that dense shadows can be made transparent (that is, the viewer can be allowed to see details within the shadowed area if we direct some light into it). But we also learn that it is nearly impossible to eliminate or wash out a shadow by adding lighting. We find, to our dismay, that added lights (intended to wash out existing shadows) only complicate matters by introducing shadow patterns of their own.

As our experience in creative lighting grows, we find we must devote time to learning how to convert the "shadow problem" to an advantage. Taking a positive approach, we first trace the light source producing the objectionable shadow and then determine if the light can be eliminated, reduced in intensity, or repositioned. If the source producing the shadow is contributing an important compositional light area, repositioning is the most effective shadow control

Raising the light will lower the

Continued on page 28

Figure 1 If subject must work close to background, normal key and fill lights cast distracting shadows.

Figure 2 Center key light hides subject's shadow directly behind subject. Cross lights from both sides help separate subject from background and shadows fall outside picture area.

Figure 3 "Hard" shadow on background may be distracting.

Figure 4 Adding light in the shadow area makes shadow "transparent" and less distracting.

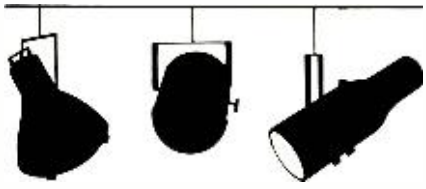
shadow; lowering the light will raise the shadow. Moving the light to the right will move the shadow to the left and vice versa. Masking off a part of the light ray with barndoors, a gobo flag, a partial net, or a segment of diffusion screen may eliminate the part of the shadow most disturbing to our composition, yet leave the essential light undisturbed.

You may say that in altering source positions from our original plan we are compromising just to control that unwanted shadow — and you are right. But herein lies another valuable lesson: all lighting is a series of compromises, and the skill of the truly expert lighting artist lies in trading off a minimum of desired results in return for eliminating serious distractions.

This trading of good *vs.* less good is held to a minimum by the accomplished lighting man because in his careful planning he includes no luminaires which do not have a clear function (like accent, modeling or separation), and he avoids two lights when one will do the job. You will find that the more advanced the lighting man's skill, the more time he takes with his planning and the fewer light fixtures he uses to obtain effective results. This highly skilled artist has learned that "Simple is always better" in lighting.

Cinematographers of world renown have known the importance of shadow control and simple light patterns for many years. They call a multiplicity of shadows "dirty light" and a simple pattern "clean light" — very descriptive phrases indeed! These forceful words emblazoned on our mental check lists during our preplanning periods can pay great dividends through good picture compositions.

In the field of distracting and undesirable shadows, we must mention harsh nose shadows; dark eye sockets; the profile shadow falling on a speaker's chest (especially if the shadow is sharp enough to show moving lips); dark under-chin shadows; backlight shadows on the desk or table; microphone boom shadows; shadow of the head on the background with the top of the shadow above the level of the subject's actual shoulder; multiple shadows of the subject on a background; or any shadow which obscures or confuses action.



Looking at this list of unattractive intruders, we will be smart to check their causation. Harsh nose shadows usually result from a key light too far to one side and perhaps too intense in relation to the other sources supporting or augmenting the key.

Dark eye sockets are often traceable to a key positioned at too steep an angle of projection. This can be a tough problem for the lighting director as it is often not possible to decrease the projection angle sufficiently to cope with the eye problem, without adversely affecting other compositional elements. There is also the possibility that dark eye sockets may be caused by deep-set eyes. In this case, some soft fill light at a very low angle, or a tiny eye "kicker" spot at or below the camera lens position, may be the only solution. (Incidentally, a bit of light makeup applied to the socket area can be a great help with a serious case of recessed eyes.)

The "profile on the chest" shadow, often regarded as the most disturbing of all, almost always results from a cross light or a cross key of excessive intensity. Corrective measures call for repositioning the key more to the front or rear. Let's not forget that the key light is the apparent source of illumination in the scene and may quite legitimately come from the camera angle or opposite it (from the rear, that is) depending upon the supposed position of the imaginery source which motivates the lighting plan. Of course, we always try to have the imaginery source position somewhere from which the key can contribute effectively.

Backlight shadows on desk tops are pretty hard to eliminate if, at the same time, you still want the backlight to perform its separation job. Usually, the best approach is to reduce sharpness by having the backlight project a bit from one or both sides of the subject rather than being on a center line. Sometimes applying a very thin diffusion medium to the back source softens the projected shadow to some degree, although this may cause other problems under some conditions. You might try reducing the intensity of the backlight source, since the sole function of the backlight is separation, and this requires a surprisingly small amount of brilliance.

A sharp shadow of the subject's head on the background simply means that the subject is too close to the scenery. If physical separation cannot be negotiated, a major change in technique is

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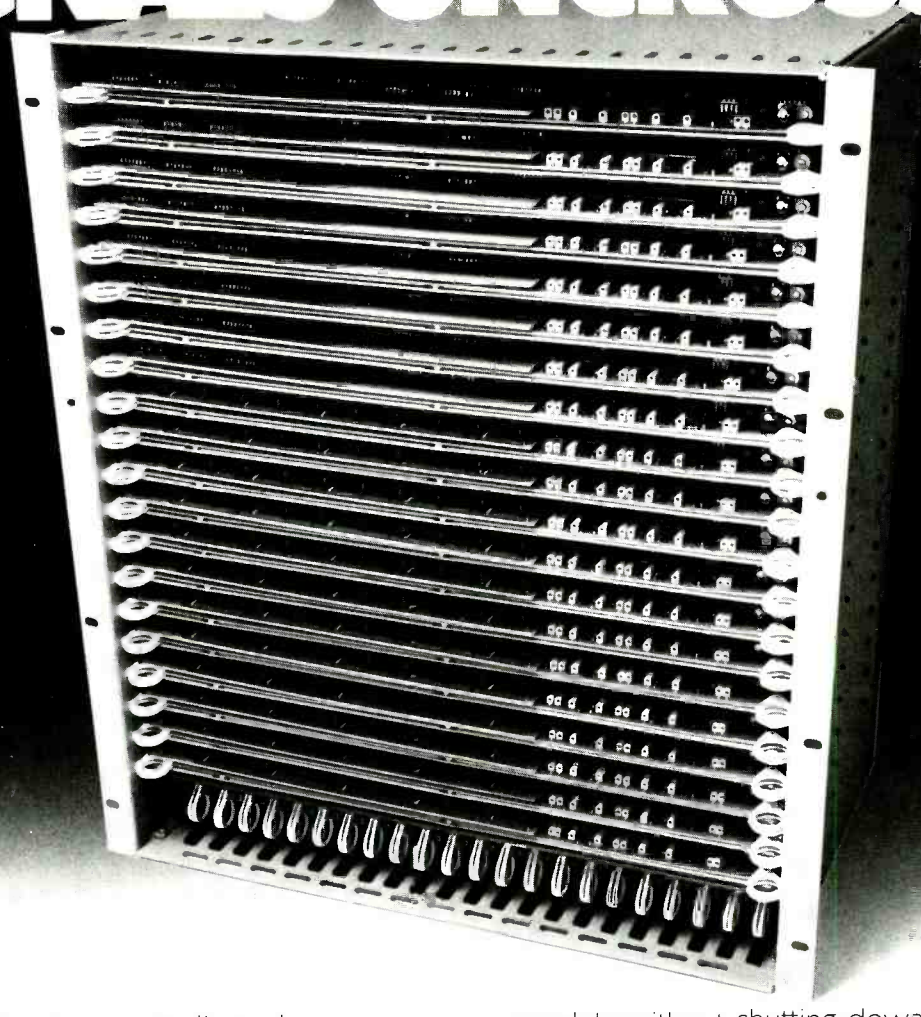
GET YOUR SIGNALS UNCROSSED.



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required wherein the subject and background are lighted from one center source, so that the shadow is directly behind the subject. Separation is provided by crossed sources placed at each side very close to the background, but carefully masked off to avoid streaking.

These crossed sources play the roles of key light and backlight, depending upon subject movement. If the subject remains stationary, separation can be achieved through modeling subject contours. Balancing the relative intensities of the three sources requires both skill and experimentation, but achieving the desired result should not prove too difficult.

Multiple shadows on the background mean too many sources striking the subject — so start turning off lights!

Under-chin shadows usually trace back to key and fill lights at too steep an angle, or to the subject being off his "mark."

Mike boom shadows can cause strong lighting directors to break down in tears. The first remedy is to negotiate with the audio department and the director for repositioning of the boom in order to avoid having it move through key light sources. Alternatively, key lights may be lowered to project under the boom, or raised to go over it; or the number of keys can be multiplied, allowing each to cover a more restricted area of action within the sweep of the boom arm. But don't worry about shadows that fall outside the camera frame, because no one sees off-stage shadows except you. The shadow of the boom that you can't see doesn't hurt communication at all.

Observe another interesting trick of the true lighting artist: he accepts the premise that there is nothing wrong with a subject in motion, between key areas of communication, walking through shadowed areas. Look around at normal life and you may be a bit surprised to observe that few spots on our earth are evenly and flatly lighted; people do move in and out of various shadowed areas all the time.

For the purpose of preplanned communication, our role is to control when and how our subject is in shadows so that we have it, him, or her in clean light for important statements, since we know that a bright object attracts and holds attention better than a dim one. That is why we are lighting directors: to build a light and shadow composition that directs audience attention, as needed, to the right area within our overall composition — be it naturalistic, stylized, or just functional.

It is the relationship between light and shadow areas that provides dimension, separation, and accept to help the overall composition communicate the idea to our viewer. This is, afterall, the reason we are doing the programme in the first place and the objective to which we direct our lighting plans, our lighting placement, and, of course, our shadow directing. BC

Figure 5 (above left) "Dirty" light causes double nose shadow and two background shadows.

Figure 6 (above right) "Clean" light gives single nose shadow and single background shadow.

Figure 7 (at right) Almost shadowless soft light requires background of proper colour or distance from subject since the spill from the soft source is uncontrollable.

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ON LOCATION *Broadcast Communications'* video production editor goes on location to cover the latest developments in broadcasting.

KTLA: A commitment to excellence

By Ron Whittaker

The place was Hollywood, California; and the time, January 22, 1947. Outside, it was a brisk January evening. Inside, in a large film studio auditorium, several hundred people had assembled, including such notables as Bob Hope, Cecil B. DeMille, Dorothy Lamour, William Bendix, Ann Rutherford, and Peter Lynn Hayes. And then these words were spoken into a microphone: "This is KTLA, formerly W6XYZ television, Los Angeles, broadcasting on Channel 5."

With these words, KTLA and television for the western United States were born. In the years to follow, KTLA probably introduced more "firsts" into the history of television than any other station in the world.

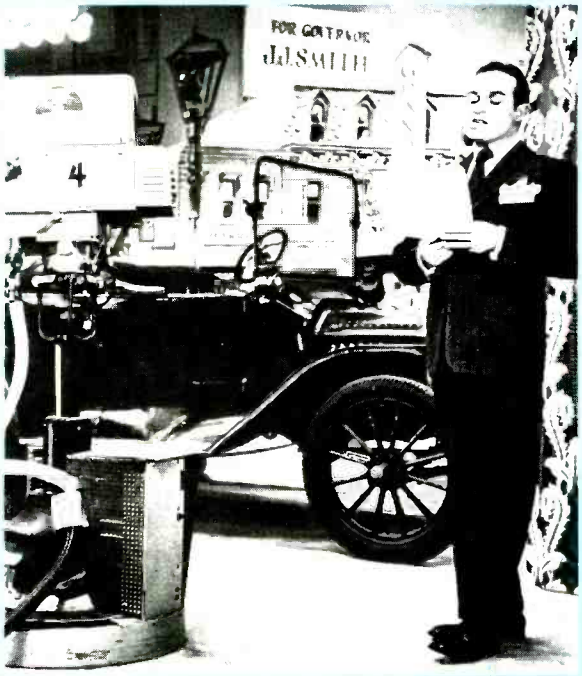
But, by starting only 31 years ago, we are missing an even more important chapter in the history of the visual media, a chapter that goes back 60 years to 1918. This was when the "home of Warner Brothers Studios" was established on a 10-acre site in the heart of Hollywood. Here, on the

Ron Whittaker, Video Production Editor, is the coordinator of television and film at Pepperdine University, Malibu, California.

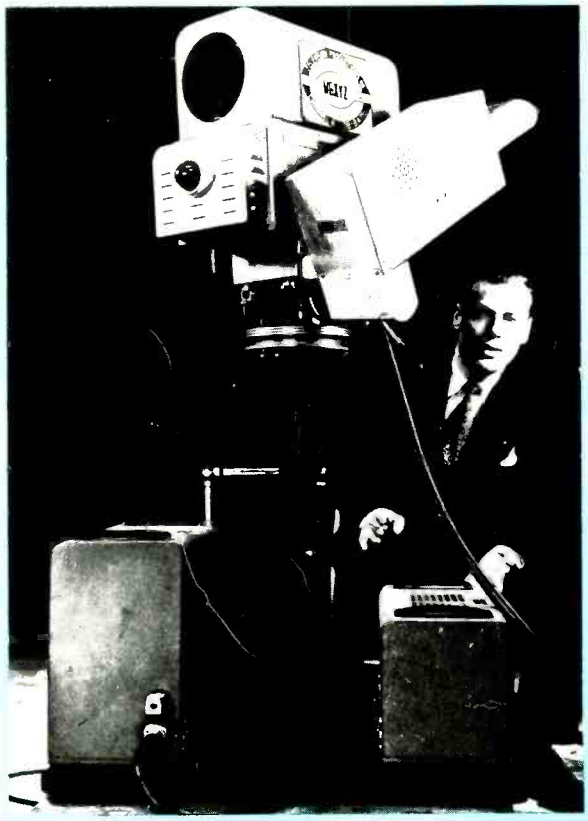
Two boom mikes and four cameras represent the normal complement in audio and video coverage in most of today's taped sitcoms. There are two tapings in front of two audiences: one in the afternoon and one in the evening. In post-production the best segments from each taping will be chosen and edited together for the final product. *(Photo by Ron Whittaker)*

KTLA: A history of television firsts

1939 W6XYZ (an experimental TV station) begins in Paramount Studios.
1942 FIRST telecast from a motion picture studio — *This Gun for Hire.*
1946 FIRST telecast of wrestling, boxing, and other sports.
1947 FIRST telecast of Rosebowl Parade.
1947 FIRST TV commercially licensed station west of Chicago (W6XYZ is changed to KTLA, Channel 5.)
1947 FIRST on-the-spot coverage — Pico Street Explosion.
1947 FIRST man-on-the-street broadcast — *Meet Me In Hollywood.*
1948 FIRST to present *Pantomime Quiz*, winner of the first Emmy.
1948 FIRST West Coast station to televise a President's speech — President Harry Truman.
1948 FIRST to present Hopalong Cassidy, starting the national TV craze.



Bob Hope took time away from his busy radio schedule in 1947 to emcee KTLA's first telecast, live from a Paramount soundstage. With only 300 television sets in all of Los Angeles, there were almost as many people watching the show from the studio audience. *(Photo courtesy KTLA)*



Klaus Landsberg, a 25-year-old electronic genius, helped make possible the first public demonstration of television by NBC at the 1938 World's Fair in New York. Later, he set up KTLA in Hollywood, the first television station west of Chicago. *(Photo courtesy KTLA)*

1948 FIRST telecast of a movie premier — *Emperor Waltz.*
1949 FIRST extended live, on-the-spot news coverage — 27½ continuous hours during the Kathy Fiscus well tragedy.
1949 FIRST live telecast from out at sea — *U.S.S. Valley Forge.*
1949 FIRST regularly scheduled remote programme — *City At Night.*
1949 FIRST kinescope syndication of a programme — *Time For Beany.*
1951 FIRST coverage of an actual police investigation of a crime — Patty Jean Hull kidnapping.
1952 FIRST live telecast of atom bomb blast.
1952 FIRST independent station to cover a major political convention — Chicago, Illinois.
1955 FIRST Los Angeles station to originate color programmes — Rose Bowl Parade.
1958 FIRST to design and operate a flying remote unit — The Telecopter.

same lot that KTLA now owns, motion picture history was made: the world's first sound movie, *The Jazz Singer*, with Al Jolson was filmed and the first film "star" was created — the wonder dog, Rin Tin Tin.

In 1942, 24 years later, Warner Brothers sold the 10-acre site to Paramount Pictures. In addition to the notable theatrical releases produced by Paramount in the years which followed, many television series were produced for CBS on the site: *Gunsmoke, Paladin, Pete and Gladys, Hotel de Parce*, and the *Twilight Zone*.

It was Paramount Pictures and a 25-year-old electronic genius named Klaus Landsberg who started the experimental television station, W6XYZ, in 1939.

And it was under Landsberg's direction that W6XYZ later became KTLA, and many "firsts" were introduced to television.

Just one month after that historic 1947 broadcast, KTLA introduced electronic news gathering (of sorts) by covering (live, of course) the scene of a Los Angeles manufacturing plant explosion. It was this coverage which caused the newspaper industry to start eyeing their new competitor in news and to begin to take the medium more seriously.

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Many other historic, on-the-spot, ENG events followed in the 1940s, including the wreck of the El Capitan steamliner, the Santa Monica Reservoir cave-in, and the Hollywood Park fire.

But, in 1949 television's power in news coverage came to the attention of the whole nation when KTLA did 27½ hours of live coverage of the Kathy Fiscus tragedy. Kathy Fiscus was the little three-year-old girl who fell down a 280-foot abandoned well shaft while playing on a vacant lot. The attention of over 5,000 spectators on the scene and millions of TV viewers across the country was riveted on the vacant lot as unsuccessful rescue efforts continued to the tragic end.

According to Don Patten, who now heads up the KTLA Golden West videotape facilities division, "This tragedy probably did more to cause people to buy television sets and to make them aware of the new medium than anything before or since. I know of one case where there was a television set in the window of a repair shop, and people stood ten-deep outside the window all night long. There was really no movement, just the one stationary camera; but the drama of the live coverage made a tremendous impact."

And then there was the live coverage of the first U.S. atomic bomb blast, using a microwave link that the telephone company and the television networks had given up on, saying that it was impossible. To accomplish the feat, Paramount's Klaus Landsberg planned microwave relay stations on mountain tops, spanning a distance of close to 300 miles; a project that the networks dubbed "Operation Impossible."

By the time April 22, 1952, had arrived, Landsberg had done the impossible; he had set up a television microwave link to carry television pictures to 22 million Americans. As it turned out, Landsberg had to accomplish a number of "impossible" feats to pull off this historic first.

KTLA later developed the first helicopter completely outfitted with television equipment and capable of originating live programming while in flight. During the Watts riots in 1965, the "telecopter" hovered over the confrontation for 27 hours. The Los Angeles Police Department took over a KTLA conference room to monitor the riots by means of the KTLA Telecopter. Its video represented the only clear view of the event. While the police were monitoring the live coverage and directing movements of the telecopter, the picture was being broadcast to the public on Channel 5.

These and many more news exclusives kept Channel 5 at the top of the news ratings for many years. However, as the West Coast O-and-O's became stronger, and they moved away from kinescope recordings and expanded their news departments, it became increasingly more difficult for KTLA, an independent station, to maintain its dominance in news and prime-time programming.

But KTLA has hardly been swept aside by the big three. The top syndicated show in the Los Angeles market is *Liar's Club*, a show that KTLA produces. And for the last two years Southern Californians have favored KTLA's coverage of the Rose Bowl parade over network coverage by ABC, CBS, or NBC.

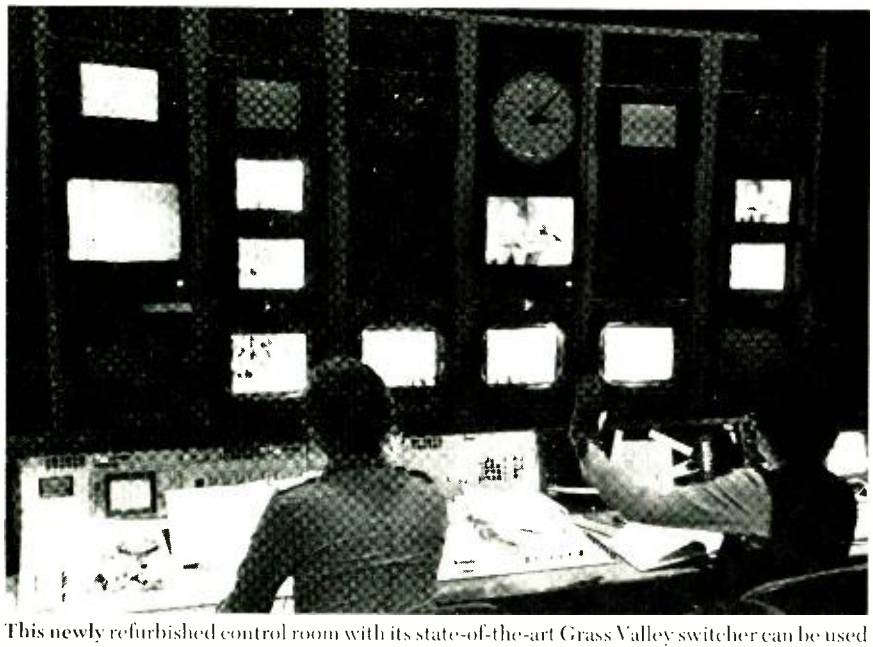
Dipping back into history again for a moment, KTLA was bought by film star Gene Autry in 1964 under the corporate name of Golden West Broadcasters. Golden West was later to own numerous AM and FM radio stations across the country, including KMPC, the 50,000-watt AM station which shares part of the present KTLA lot in Hollywood.

After the historic 10-acre lot was bought by Golden West, film work was gradually phased out in the numerous sound stages and television production took over. This transition was accelerated by the formation of the Golden West videotape division, which leases below-the-line facilities for the production of network and syndicated programming.

Today, the 10-acre site represents one of the largest television production facilities in the world. There are nine sound stages covering almost 100,000 square feet. Recent shows produced include *Sha Na Na*, *Carter Country*, *What's Happening*, *Donny and Marie*, the *Newlywed Game*, *Liars Club*, *Szysznyk*, *The Waverly Wonders*, *Dating Game*, *Dinah!*, and *WKRP in Cincinnati*.

"We have three complete crews that operate five days a week doing sitcoms, specials, commercials, etc., for outside clients," said Lon Wolf, director of engineering. "We can have three shows going on on the lot at the same time. All of the stages are dedicated stages, which makes it possible to leave up the lights and sets throughout the week. With most other production facilities the sets have to come down after the show is taped to immediately move in another show. This means that lights either have to be double-hung (two sets of lights in place for the two shows) or they have to be taken down and reset for each taping."

Dedicated stages also save



This newly refurbished control room with its state-of-the-art Grass Valley switcher can be used with various studios in the 10-acre KTLA studio complex in Hollywood. The 100,000 square-foot, 9-studio lot has been designed so that control rooms and cameras can be readily patched to different studio and control-room locations. *(Photo by Ron Whittaker)*

This audio booth and the new Ward-Beck board were part of the recently completed $2½-million expansion programme by KTLA and its Golden West videotape division. Here, two audio technicians go through a rehearsal of *Carter Country* to determine the show's audio sequence.

tremendous wear and tear on sets, since they don't have to be put up and torn down and stored every two days. And then there is the important advantage for the cast in being able to rehearse in their own set, rather than in an empty room somewhere.

According to Wolf, "We made the decision to expand to three crews (from two the year before) and along with this we invested about $2½ million in refurbishing our facilities. We are now doing seven shows from the lot.

"Each show rehearses in their set without cameras. We then come in with cameras for two days, blocking the first day and doing a dress the next. During the afternoon of the final day we do a complete dress show with an audience and tape it. We'll then break for supper, come back with a new audience, and do an air show. From the two tapings, the best parts will be edited together for the final product.

"Some producers will demand up to five quad machines for their taping, a cut (switch) feed and up to four isos (for possible use in post-production). We will also do ¾-inch cassettes with time code for the off-line editing. The producer then takes all the tapes to an editing facility to do off-line and on-line post-production work."

All but one of the nine studios are over 6,000 square feet. The largest of the nine measures about 15,000 square feet and has a 260-seat auditorium and a 180-degree eye background.

"We used to have three, large, 40-foot Crown Coaches for mobile work," Wolf said, "but we are slowly getting rid of these. We just recently built a new little mobile unit out of a Travco Motor Home, using TK-45 cameras.

"One of our three control rooms is in a 36-foot trailer and it can be used by different sound stages. It also doubles as our colour mobile unit, and we use it for such things as our Rose Parade coverage. However, most of the time it sits in place without the tractor on it and is used as a control room."

In addition to the 14 Norelco PC-70's, the facility has five RCA TKP-45's which can either be hand-held or put on pedestals with studio zooms and used as standard studio cameras.

KTLA has recently moved to one-inch recorders to supplement their numerous quad machines. According to Don Patten, "We're looking to the next two to five years to probably convert from two-inch to one-inch tape."

With the FCC's recent move toward cleaning up the horizontal and vertical interval in broadcast television, many stations are now worried about the performance of their ¾-inch machines. According to Wolf, the one-inch machines — especially the lightweight portable versions for ENG work — solve most of these technical problems.

The rich history of KTLA and Golden West Broadcasters is important to the company's 300-plus employees. Patten said that this spirit "seems to grow out of the early days of KTLA when we were the forerunners of everything innovative in television." According to the company's brochure, the average employee has 15 years of experience.

Wolf, who is in charge of an engineering staff of over 90 people, tries to motivate his people to stay up with the ever-increasing speed of technological change. "We have a major emphasis on in-house training for our technicians and operators; we try to regularly send them to technical schools and conferences. We also try to motivate people, to set goals for their advancement and to make them a part of the whole plan. The way technology is changing, we're all going to be left at the station if we don't keep ourselves up with the state of the art."

At KTLA, keeping up with the state of the art, and even establishing the state of the art, has been a 40-year tradition. BC

During camera rehearsals a profusion of camera, sound, blocking, and talent problems must be resolved in time for taping. Here, director Peter Baldwin (center) with his control-room production crew go through a scene from *Carter Country*, an ABC show which has rather consistently remained with the top-10 shows nationally.

ON LOCATION *Broadcast Communications'* international video editor goes on location to look at the state of British television.

TV innovations keep U.K. in technical spotlight

By Joe Roizen

It all started in England on November 2, 1936, when the BBC ushered in public television by setting up a studio in Alexandra Palace and transmitting TV images on, not one, but two separate systems. One was the John Logie Baird 240-line system using mechanical scanning; the other, the EMI proposed 405-line/50-field interlaced system which was referred to as "high definition" television.

The all-electronic EMI system won, and by 1939, when TV became a victim of World War II, there were 23,000 television sets in use. That was the nucleus of a television service that now blankets the British Isles with almost 100% coverage.

Joe Roizen is International Video Editor for Broadcast Communications and President, Telegen.

The U.K. currently has three operational TV channels, BBC1, BBC2 and ITV. All operations are in colour on the 625-line/50-field PAL standard, in UHF; however, the 405-line monochrome VHF transmitters are still in operation and are provided the same programme material which is converted from the 625-line original image.

To adequately explain British TV it is necessary to separate the BBC and IBA operations, since they are vastly different.

The BBC provides two public television services, BBC1 and BBC2, both of which are supported by license fees that TV-set owners pay to the British Post Office. A license costs a British viewer 9 pounds ($18) for a black and white set and 21 pounds for colour. Last year the BBC collected 234.1 million pounds (nearly $500 million) from the viewing public, who are spared any commercial messages on either BBC1 or BBC2 as a result. Unless, of course, you consider the frequent promos on both BBC channels for what's playing on the other, and a host of BBC services and publications, as commercials. It is, however, nice to watch a movie, a lengthy drama, or sporting event without a single break, even though for most commercial-conditioned Americans, it's hard on the kidneys!

Presenter David Seymour with a beefeater from the Tower of London during rehearsals for Pebble Mill. *(Photo courtesy BBC)*

Jack Scott (left) and David Seymour on the set. Walkway to street in background is often used for singers or dancers. *(Photo courtesy BBC)*

BBC production facilities are mostly centered in London, and their major studios are at White City in the suburb of Shepherd's Bush. The facilities at White City are excellent, from the huge scenery construction facility to the automated news studios where the cameras are all remotely controlled; it is a production center that has turned out world-renowned programmes. *The Ascent of Man; I, Claudius; The Two Ron-*

Technical achievements: BBC

BC interviews James Redmond, director of engineering/BBC, and Bryce McCrirrick, deputy director/BBC.

James Redmond has been with the BBC for 41 years, the last 10 of which he has served as director of engineering. This month, Redmond retires and Bryce McCrirrick, his deputy, will become the new director. Both Redmond and McCrirrick agreed to participate in the **BC** *interview, which took place at the Wembley Conference Centre during IBC. The basic question asked was, "What were the greatest recent technical achievements of the BBC? The following represents the responses from both Redmond and McCrirrick.*

Bryce McCrirrick (left) and James Redmond stand by the latest BBC technical development shown at their stand at IBC '78 in London. McCrirrick takes over from Redmond as director of engineering for the BBC in November. *(Photo by Donna Foster Roizen)*

The greatest single technical impact at the BBC in the recent past has been the movement to an EFP type of production using light vans equipped with two cameras. Five such mobiles are presently in use and they are very popular and very successful with the programme producers.

The BBC is currently doing a police story series and a tycoon-type show which are being shot in real locations. We feel we can compete with Hollywood this way, and make more polished productions. We have even managed to mix film and tape, keeping the same quality, and giving a very smooth look to the productions. We expect to expand this area, and it has been our major technical achievement.

In the ENG area we are just beginning to try this approach. We have a single experimental unit and are currently buying seven more. However, we do have some jurisdictional problems about the use of ENG equipment, which will have to be resolved before we get much more involved in this type of news coverage.

Another area that we are particularly proud of, is the automation of our transmitters for BBC1 and BBC2. We use digital monitoring systems which interrogate the stations and our regionalised maintenance bases are very efficient in dealing with breakdowns.

While we share sites with the IBA, we do have twice the number of transmitters to care for on our two networks. We are also now in the process of automating our radio stations which include an AM network and three FM stereo networks.

One of our greatest sources of pride in BBC engineering is the public coverage we have achieved. We now reach 99% of the U.K. audience on all services and 98% on UHF (625-line PAL colour). We still provide a 405-line monochrome service, but we now think the likely shutdown date of that service will be in 1982.

In the field of public service our CEEFAX system is another source of satisfaction, especially since we pioneered teletext. There are now about 2,000 sets a month going into viewers hands and work on new decoders by Texas Instruments shows a lot of promise. During my inaugural address as president of the British IEEE, I am revealing yet another CEEFAX first: direct live subtitling for the hearing impaired using a Palan-type operator with a shorthand keyboard and a specially interfaced computer.

Our engineering department has continuously developed innovations in both the analogue and digital video field. Among the latest are a Differential Pulse Code Modulation system with sub Nyquist sampling at 2*f*sc. and redundancy elimination.

We have compressed the PAL signal to 34 megabits and find that this works well and will reduce distribution costs. We have also developed a new solid-state telecine using a continuous motion scanner with a line-array pick-up and a field store for image compilation. It is virtually a transparent telecine with very high performance characteristics. The last item I will mention, which we have here at IBC, is the digital noise reducer of our own design. It is a totally hands-off unit which interpolates the TV image and sets the level of noise reduction to optimum in relation to picture movement.

As to the future, the BBC now has two TV networks and four radio networks; it employs over 26,000 people and is not likely to grow much larger. Our emphasis now is on regionalisation with new centers in Manchester, Wales, Scotland, and Ireland. Cost of production has also climbed, so we are asking Parliament to raise license fees from 9 pounds to 12 pounds for monochrome services and from 21 pounds to 30 pounds for colour TV series. If inflation does not get worse, we expect these increases to support us for at least three years.

As a closing comment, Bryce McCrirrick said that he would do all in his power to maintain the high level of technical standards that have been set by retiring director James Redmond.

nies; and the *Rise and Fall of Reginal Perrin* are a small part of the programmes which the BBC produces for both home and foreign consumption.

White City also houses the CEEFAX editorial center, where some 200 pages of the "magazine of the air" are constantly updated with the latest in news, weather, sports, stock market, and other useful information. A viewer equipped with a CEEFAX decoder on the TV set

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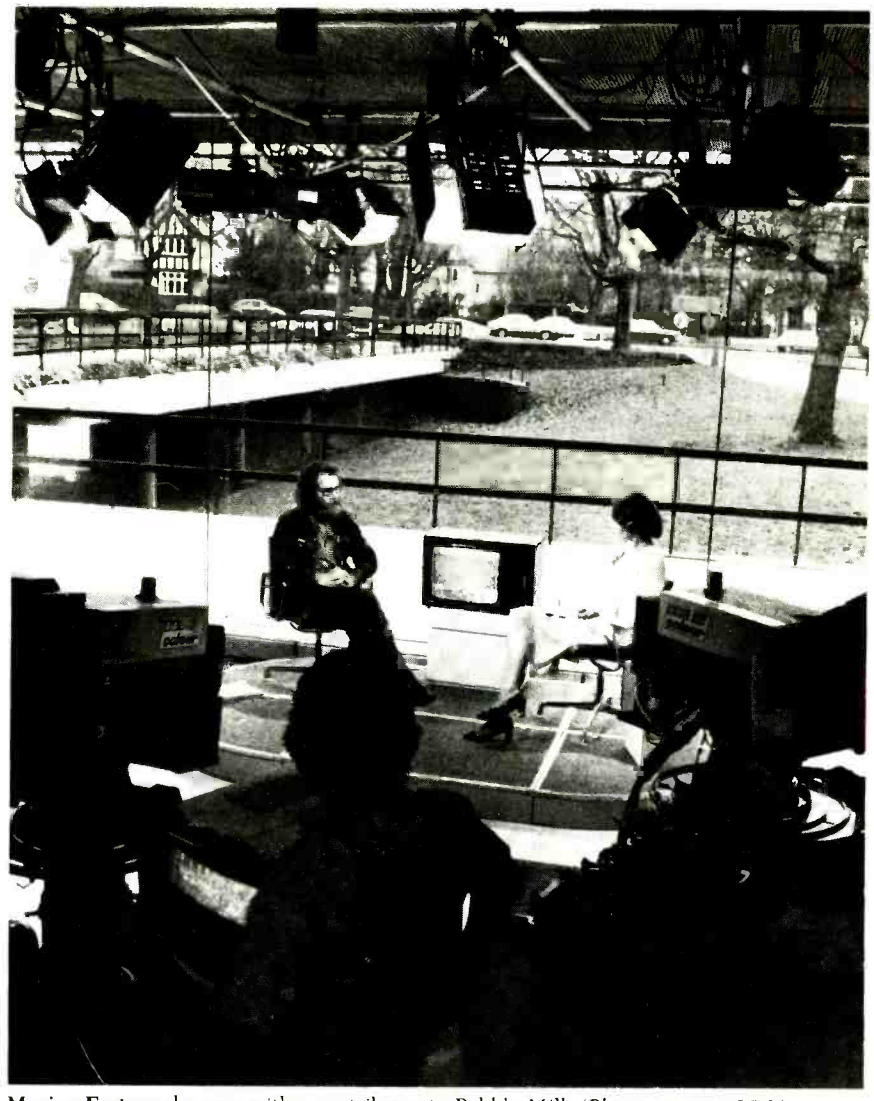
can dial up any of these pages at random when either channel is on the air.

Outside of London, the BBC is regionalised, with TV studios catering to local and network needs. A good example of a regional station is the Pebble Mill studio in Birmingham. The head of this center, Phil Sidey, provided a good resume of the Pebble Mill operation. Built especially for radio and TV, the structure completed in 1971 houses facilities for BBC1 and 2 as well as Radio 1-2-3-4. It is known as the Midlands region, one of the eight in England with one more each in Scotland, Wales, and Northern Ireland.

Pebble Mill produces local shows and some that go on the network. They do a very popular 45-minute live programme at noon five days a week. It originates in the building entrance hall, which has been converted to a TV studio, and it's a "no holds barred" extravaganza. Interviews of visiting super stars, drop-ins from hot air balloons, gliders and helicopters, and all manner of seemingly non-English shenanigans take place, and it's sent over the whole BBC network via London. With a staff of about 800 people, Sidey took pride in the fact that Pebble Mill provides about 10% of BBC1 and 2 programming, a figure far above their relative people count.

Pebble Mill has a 6500-square-foot studio, a 1000-square-foot studio, vintage colour cameras, and quad recorders with minimum editing equipment. There is no ENG gear, no off-line editing, and much as they would like these novelties, the refurbishing cycle is scheduled for 1983. Nevertheless, Pebble Mill produces some fine programmes, including local public service material which helps various burgeoning minorities in this industrial city cope with English life. Sidey (like Redmond) believes that the future will, indeed, see a greater emphasis on regional stations, and a reduction of the current London-oriented BBC.



Marian Foster rehearses with a contributor to Pebble Mill. *(Photo courtesy BBC)*

A mid-morning break for Diane Solomon during rehearsals for the Pebble Mill programme. *(Photo courtesy BBC)*

In the course of a tour of the Pebble Mill facility, a radio studio used for talk shows was visited. Surprisingly, Radio Birmingham has a different approach to this type of programme. They don't use a delay tape that can be stopped if the caller utters some unairable obscenity. Instead they take the callers name and phone number and the show host calls them back. That way they know who it is, and they have never had a slip-up. To maintain spontaneity, if the caller is answering some challenge, a condition they refer to as "provoked response," he or she goes on the air immediately. No problems to date with that aspect either.

The BBC is the oldest and most prestigious television organisation in the

Technical achievements: IBA

***BC** interviews Tom Robson, director of engineering for the Independent Broadcasting Authority (IBA)*

Both Tom Robson and Dr. Boris Townsend, head of Engineering Information Services, participated in this interview which was conducted at the Wembley Conference Centre during IBC '78. Robson directs one of the most advanced research laboratories in the world. Located at Crawley Court in Winchester, it has been the site for such major technical advances as Digital Intercontinental Conversion Equipment (DICE) and the digital VTR. The question posed to the IBA representatives was the same as the one to the BBC: What in your opinion are the most significant technical achievements of the IBA in the recent past? His answers are as follows:

Tom Robson directs one of the most unique technical situations in broadcasting. From his office at the IBA facility at Crawley Court, he supervises a research group, manages an operational group, and monitors some 16 separate TV production companies. *(Photo by Donna Foster Roizen)*

The IBA has always had to maintain the highest possible technical standards, since those established by the BBC were already in place when commercial broadcasting started in the U.K. Even though we had no income from license fees, we could hardly be second best, so we strove for reliability and high performance. On the programme side, the audience ratings give us the edge over the BBC; on the technical side, we have several important achievements worth discussing.

Our greatest operational achievement was switching to colour in 1967. We then had 47 VHF stations operating on the 405-line system covering 98.6% of the population. Since 1967 we have built a UHF 625-line colour network consisting of 50 main stations, 300 relay stations, and 39 radio stations — everyone automated and unattended. So much so that although we have increased our TV services to the public tremendously over the last decade, we still have the same small number of people maintaining this equipment.

A fleet of specially equipped Volvos and Range Rovers, in regional maintenance centers, service this large network at very small proportional cost. To achieve this level of automation, we have developed and built much of the equipment used to control the stations.

To insure that we keep up-to-date on the technical side, we maintain an experimental development department where we have pioneered in digital video work. We have also pushed hard for standards in this field and we have put our experience at the disposal of the broadcast industry through participation in standards groups and through the offer of licensing.

We monitor the technical operation of 15 programme companies and the Independent Television News (ITN) in the U.K. By an Act of Parliament we must assure that the technical quality of our programme producers is adequate; and to this end we issue "code of practice" documents that set the goals. We accept compromises on occasion; for instance, on 16mm news film we don't maintain the same quality demands as on normal programme material. On occasions we have to refuse film of poor quality to be aired.

Our IBA booth has all of our technical advances on display, so there is no need to review them here, but we do provide a parallel teletext service to our viewers which we call ORACLE and which we are constantly improving.

To accommodate some problems in the USA regarding FCC regulations on blanking width, we have modified our DICE equipment to provide proper video signal on East/West satellite transmissions that require digital standards conversion.

The IBA obtains its revenue from the rental of transmitters to the programme companies. This income supports our administrative and technical operation, and we were a bit too efficient last year as we ended up with a surplus of 1.2 million pounds, half of which we had to return to our government.

We are very interested in ENG and EFP operations in the future and have been experimenting with these techniques to determine how they will affect commercial TV in the U.K.

world, and it serves the British public in a manner which seems to satisfy both the viewers and the Parliament. It's hard to do better than that.

In 1952, an alternative television service to the BBC was proposed to the British government and two years later received Royal Assent. By September 1955, ITV was on the air from Croydon and commercial TV was on its way to saturating the "telly" with jingles about Hava-cup-a Typhoo Tea and that ultra English drink, Cinzano.

ITV is also regionalised, with studios and production companies spread around the country. Fifteen separate entities such as ATV, Thames Television, or London Weekend serve their regions and provide network shows. Network news comes from the London-based ITN where the facilities are specially suited to handle transcoding to and from for-

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eign standards and very rapid editing to accommodate fast-paced news.

A centralised organisation called the Independant Broadcasting Authority (IBA) operates all the transmitters, and provides programme and technical guidelines to the production companies. The British Post Office operates the microwave links and earth satellite stations, although with the advent of small transportable dishes, this may change in the near future.

Since ITV does not share in the license fees, their income must be derived from selling commercial time on the air in the U.K., and selling programmes abroad. They are very successful on both counts. Many of their studio production centers are even equipped to originate in PAL and NTSC so as to have a high-quality videotape for the North American market without the need of transcoding. *The Muppets*, *Coronation Street*, and the *Bing Crosby Special* are but a few examples of the many popular shows produced by ITV member studios and shown abroad.

While advertising is their main source of income, they are only allowed six minutes per hour, and no sponsor has any say in programme decisions. They do not buy programmes: they just buy time. The advertising code does not allow commercials for such things as cigarettes, betting, fortune tellers, private eyes, or anything construed unsafe for children. Notwithstanding the limitations of time and placement, 97% of the ITV income is derived from ads, and last year's healthy total was 270 million pounds ($540 million).

In the early days of ITV, there was an anecdote in British television that a broadcasting permit was license to print your own money. However, the government has learned to tax the profits and according to an ITV estimate, they have returned to the UK tax collector around 565 million pounds (over a billion dollars) during their existence.

The incoming call portion of Voice of the People on BBC Radio 4, Pebble Mill, Birmingham. *(Photo courtesy BBC)*

Outgoing call portion during Voice of the People on BBC Radio 4. *(Photo courtesy BBC)*

British television has its own style, geared both the local and national needs. Timing of programmes is not as rigid, in that shows may start 10 minutes to or 20 minutes after the hour. There is much more educational programming during morning and early afternoon hours, especially through the Open University programmes that include college level courses. Sports are heavily covered and it's not unusual to have a few hours on a weekend afternoon devoted to a series of horse races.

American whodunits are popular, and the breaks where the commercials should have been, are easily detected by the fades to and from black, at crisis points in the story line. In general, BBC programming tends to be a little more high brow than ITV, although British sitcoms have served as models for some of the most successful series in America, *All in the Family* and *Sanford and Son* being prime examples. Of necessity, ITV commercials have to be appealing and they are usually witty and visually attractive.

Colour picture quality is excellent, benefiting both from the PAL encoding system and the meticulous engineering care taken by the broadcasters. Visitors to the U.K. are always impressed by this fact, although if they come from 60 Hz areas, they need a few days to get over the 50-field flicker rate.

Both BBC and IBA publish detailed annual reports that are available to the public and which contain very useful information on how to maximize the quality of TV and radio reception on home receivers.

British television is great, but if you are stuck in your hotel room on a rainy Sunday afternoon, and you don't fancy cricket, soccer, or the Archbishop of Canterbury, the "telly" will not be your cup of Typhoo Tea. BC

In the news . . .

Are film and videotape really interchangeable?

By David Busch
Ravenna, Ohio

During the first half of 1978, one NBC Television affiliate led all others in numbers of stories picked up by the network for use on *Today*, *NBC Nightly News*, and for NBC's syndication service.

KGW-TV of Portland, Oregon, averaged 24 stories per month, more than twice the number picked up from the next leading affiliate.

"We really don't have to sell our local news items to the network," says KGW news manager David Linder. "They know our work and rely on our judgment."

Judgment also came into play several years ago when many television stations were leaping to be first in their markets with electronic news gathering (ENG) equipment. KGW carefully considered the cost-effectiveness of the available equipment and sought a balanced approach to news gathering, Linder recalls.

Today, while many stations are still mulling over the question, "ENG or film?", Linder thinks he knows the answer: For the foreseeable future, both types of equipment will remain important news-gathering tools.

"Unlike many news directors who mandate that film will be used to cover certain kinds of stories, and ENG others, I consider the two almost interchangeable," Linder says. "Our RCA TK-76 ENG gear and CP-16 and other film cameras are capable of

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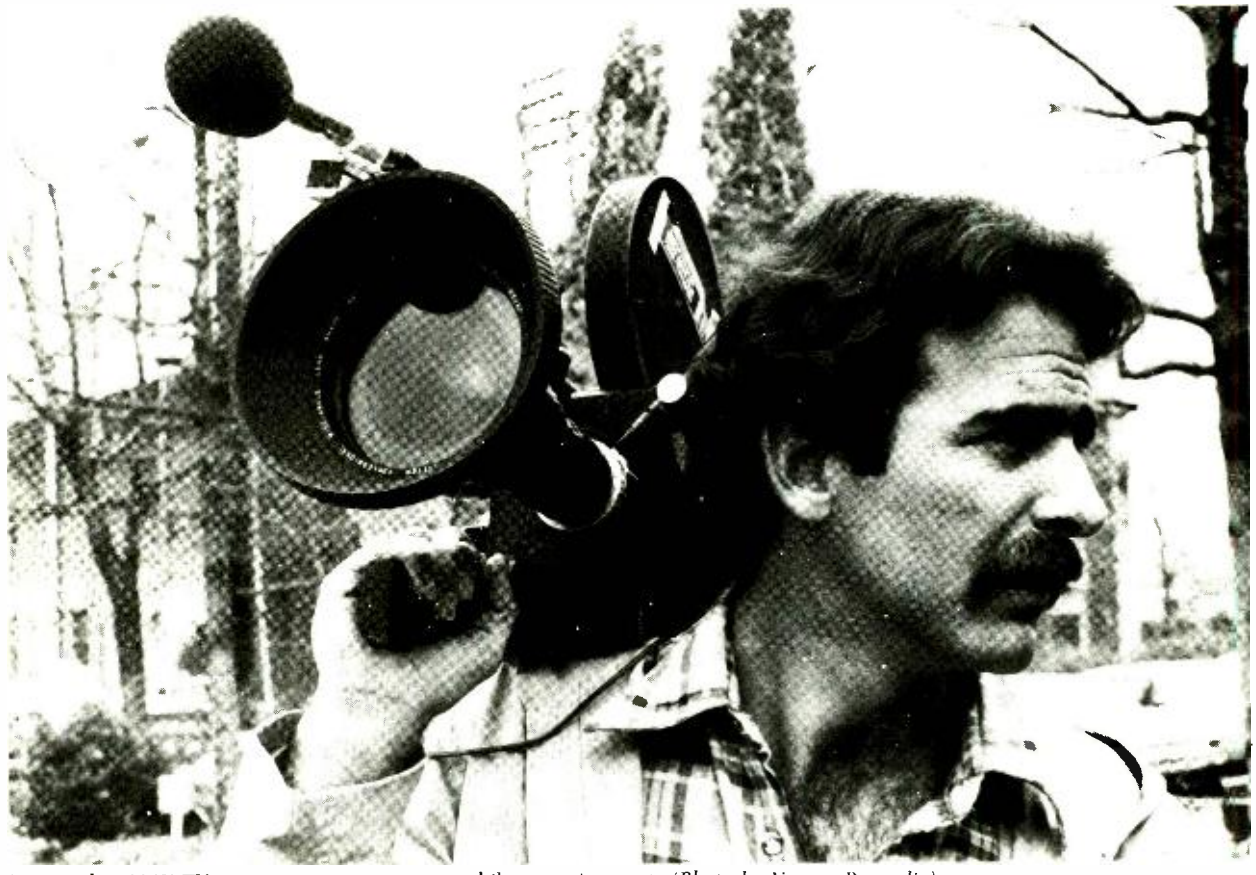

Scott Judy, KGW-TV news cameraman, pauses while on assignment. *(Photo by Noreen Brownlie)*

covering a broad range of stories. I give a slight edge to ENG when news is breaking in the late afternoon, and favor film in unusual, hazardous situations, such as river rapids shooting."

Having the two systems does allow a great deal of flexibility, he points out. When one of two KGW electronic editing stations went "down" recently and the output of the station's three electronic cameras proved too much for the editing equipment that remained, Linder shut down one camera and activated an extra film crew to take up the slack.

"Film editing equipment is so inexpensive, we can maintain editing gear for each crew," Linder says, "so we can never overload our facilities that way."

KGW has seven film crews working

Editing film is often the most creative part of putting together a story, staff photographers at KGW feel. Gene Hering is at the editing bench.

During the confusion surrounding Bill Walton's departure from the Portland Trailblazers, KGW was on the scene almost until 5 p.m. air-time to cover the story with ENG.

"Having the two systems does allow a great deal of flexibility . . ."

days, and three ENG crews. One ENG unit covers the news at night, with additional 'on call' film crews. All but one of the ENG units work from a van with an engineer. Les Badden, the fourth ENG operator, works as a one-man crew with a reporter, functioning much as he did when he was a film cameraman.

"I came here from a small, independent station where I learned to work by myself," Badden says, "so I prefer to handle the ENG gear alone. A lot of things take some getting used to — like the black-and-white image in the finder, the difficulty of creating moods electronically, and the weight of the equipment."

Badden often has the reporter help carry the recorder, and finds he works faster with ENG equipment as he gains experience.

Jerry Schneider, chief photographer for the station, elected to remain as a film cameraman.

"I feel film lets me be more creative," Schneider says. "I like editing with A-B-C rolls, making dissolves, and mixing sound. When I have my LW-16 Frezzolini up to my eye, it becomes like a sixth sense. I know that everything I need to create the mood I want is right there."

Schneider feels even poorly shot film can be assembled through astute editing into a passable news story, but that too often little can be done with electronic reports that have gone awry.

News film crews use radio-equipped cars, while the ENG units generally travel in vans outfitted with two gigahertz microwave units. Time code is embedded in the signal as the image and sound are recorded, so a time code reader in the van can be used to preview appropriate scenes on the way back to the station. Linder limits live news to those situations actually meriting the coverage.

KGW has a half-hour news programme at noon, an hour at 5 p.m., another half hour

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Dave Linder (center) checks out an assignment before dispatching a crew to cover the Walton story. Steve Grad (left) and Lou Gellos (right) broke the story on KGW's noon news.

following the network news at 6:30, and 30 minutes at 11 p.m. "All but the 5 p.m. show are number one in their time slots, with the latter a strong number two challenging for the top spot," Linder says.

The station supplements this hard news diet with its *Evening* magazine show broadcast live — with film mainly and some tape inserts — at 7 p.m. each weeknight.

"About 50 to 60% of the stories we do are filmed and aired the same day . . ." Patricia Joy, *Evening* producer

Hal Lesser estimates he has shot two million feet of film. He once offered to work for a penny a foot of his regular salary. Now he serves as editor for incoming ENG stories. *(Photos courtesy Eastman Kodak)*

Patricia Joy, an instructor at the most recent regional NPPA Flying Short Course, is associate producer of *Evening*, and serves both as reporter and photographer.

"About 50 to 60% of the stories we do are filmed and aired the same day, so we experience the same pressures as the regular news staff," Joy says. "Our pieces are generally longer, and so require an equivalent amount of extra work to meet that deadline."

She generally favors a CP-16 camera, equipped with 9.5-95mm zoom lens, but adds that the station has given *Evening* carte blanche to rent anything extra that might be needed. "If we need a special lens, a helicopter, we just rent it," she says. "We are given a considerable amount of creative freedom.

"The 25-second film 'bumpers' or segues between segments are a particular challenge to photographers," she says.

"One of the viewers' favorites was nothing more than a shot of two men in wheelchairs going like crazy down a sidewalk. The man in the motorized chair was pushing the other, and they were having a ball," Joy recalls.

Evening is produced almost 100% on film, and though the news side generally sticks to Eastman Ektachrome video newsfilm 7240 and 7250 (tungsten) as basic film stocks, photographers at the magazine show are able to choose the best film for the effect they are trying to create.

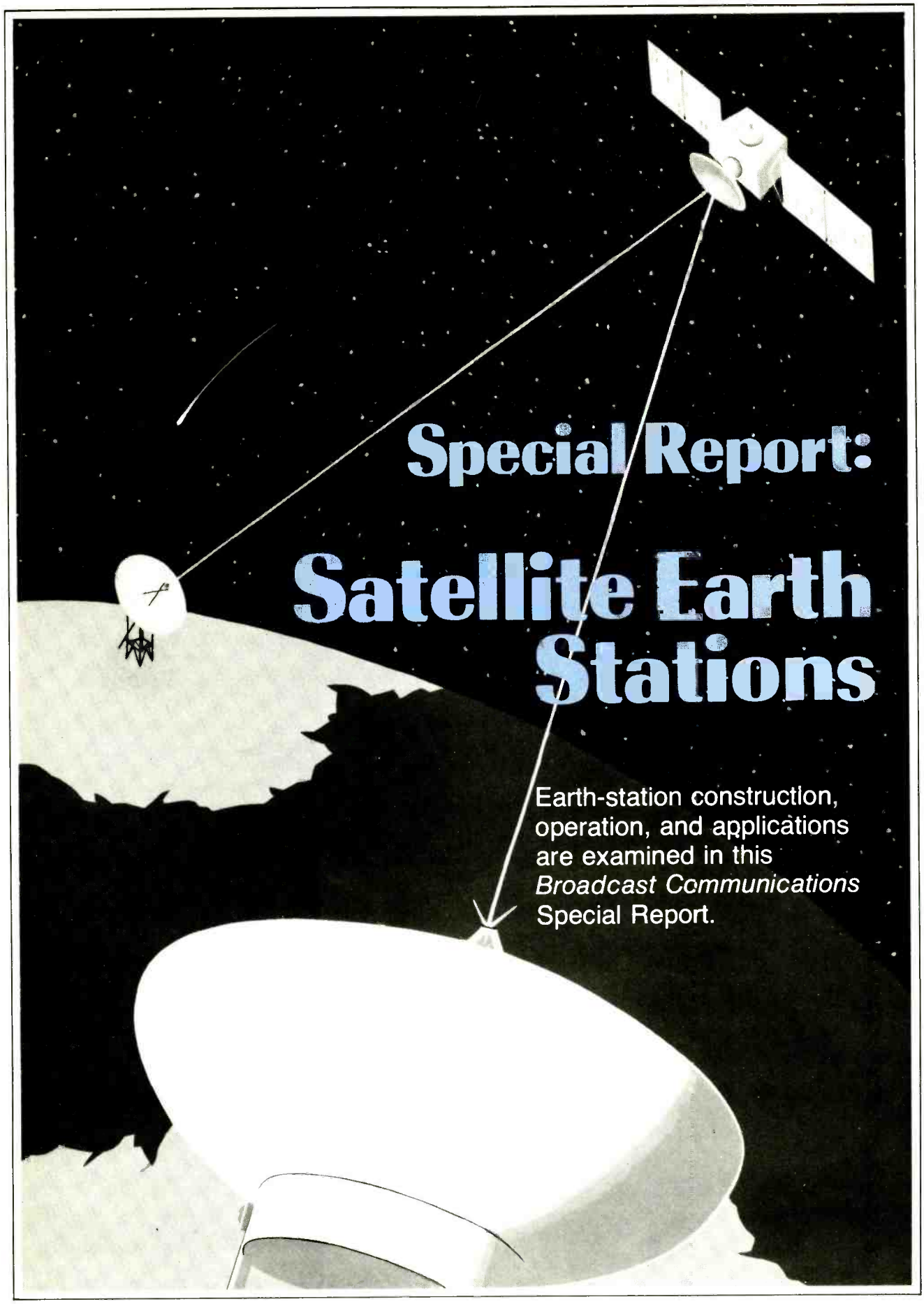
"We also use Eastman Ektachrome video newsfilm 7239 (daylight) for daylight exposure," Joy says.

The lab is equipped with four processors, and functions as an independent lab serving other stations and independent film producers in the area. KGW is just another customer.

The five to eight film stories run on *Evening* each night can vary from several minutes to five or six minutes in length. One piece by photographer Joe Marks on crop dusters in the Willamette Valley was the top entry in the last regional NPPA competition in the Northwest.

Chief photographer Schneider comments, "Here, the photographer is half of the reporting team. He is a reporter, telling the story by means of visuals."

Linder adds: "We have a strong tradition for excellence. We are the only station to have twice won the DuPont-Columbia Award. Still our people can prove their worth by looking at the screen during our news shows each day and tell that." BC



Special Report:

Satellite Earth Stations

Earth-station construction, operation, and applications are examined in this *Broadcast Communications* Special Report.

Engineering Notebook:

There's more to earth-station construction than placing an order

By Raymond Meyers

As broadcasting pulls different technologies into its daily operations, engineering and management are faced with unfamiliar techniques and circuits. One of the new technologies running at high speed in several countries is direct satellite-to-station programme feeds. In this and other satellite articles, *Broadcast Communications* will unravel much of the red tape and explain the technology for engineering and management.

Already there's a growing list of television stations and CATV's that have acquired earth-terminal equipment. In fact, some industry experts are predicting that within the next three years better than 80% of U.S. television stations, and an even higher percentage of CATV facilities, will be joined by many radio stations in setting up terminals to receive and broadcast satellite-relayed programmes.

The rapid introduction of a new technology always poses some interesting problems for the station, and satellite terminals are no exception. While unfamiliar with such systems, the station's staff will quickly discover they are not alone. In most cases, the station consultant and legal counsel knew little about the licensing of earth stations. And the station engineer will probably find himself in a wrestling match with the paperwork.

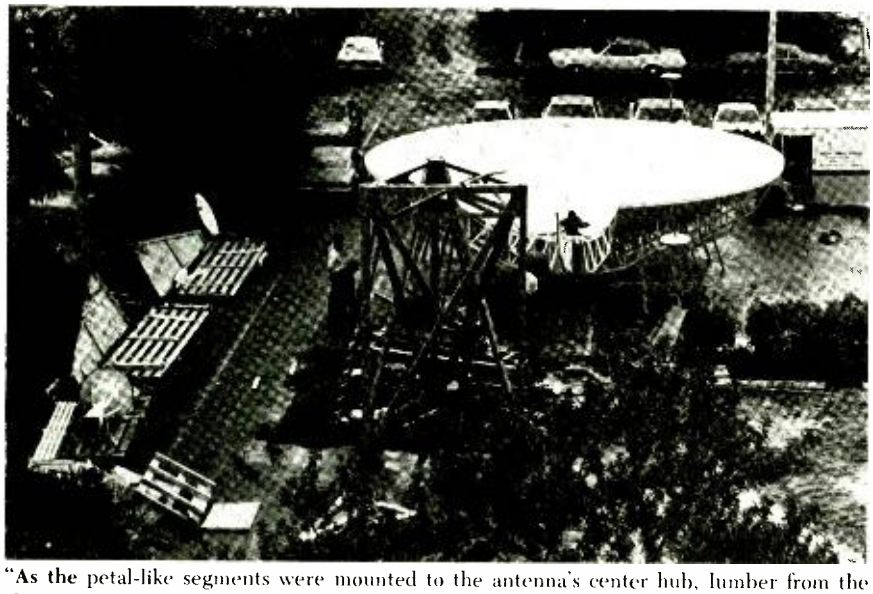
For the most part, though, the station legal counsel will prove adequate to handle the legal guidelines. However, the station will need a consulting engineering firm to handle some of the technical problems. Typical of these firms in the United States are Compucon, Comsearch, S.A.F.E., and a few others. These firms specialize in engineering satellite earth station clearances and approvals.

When your station decides to install an earth station, you should contact a consulting firm and arrange for a frequency coordination study to be conducted for your proposed antenna site. In the U.S., frequency coordination studies are required primarily to assure that the antenna site will be free of interference.

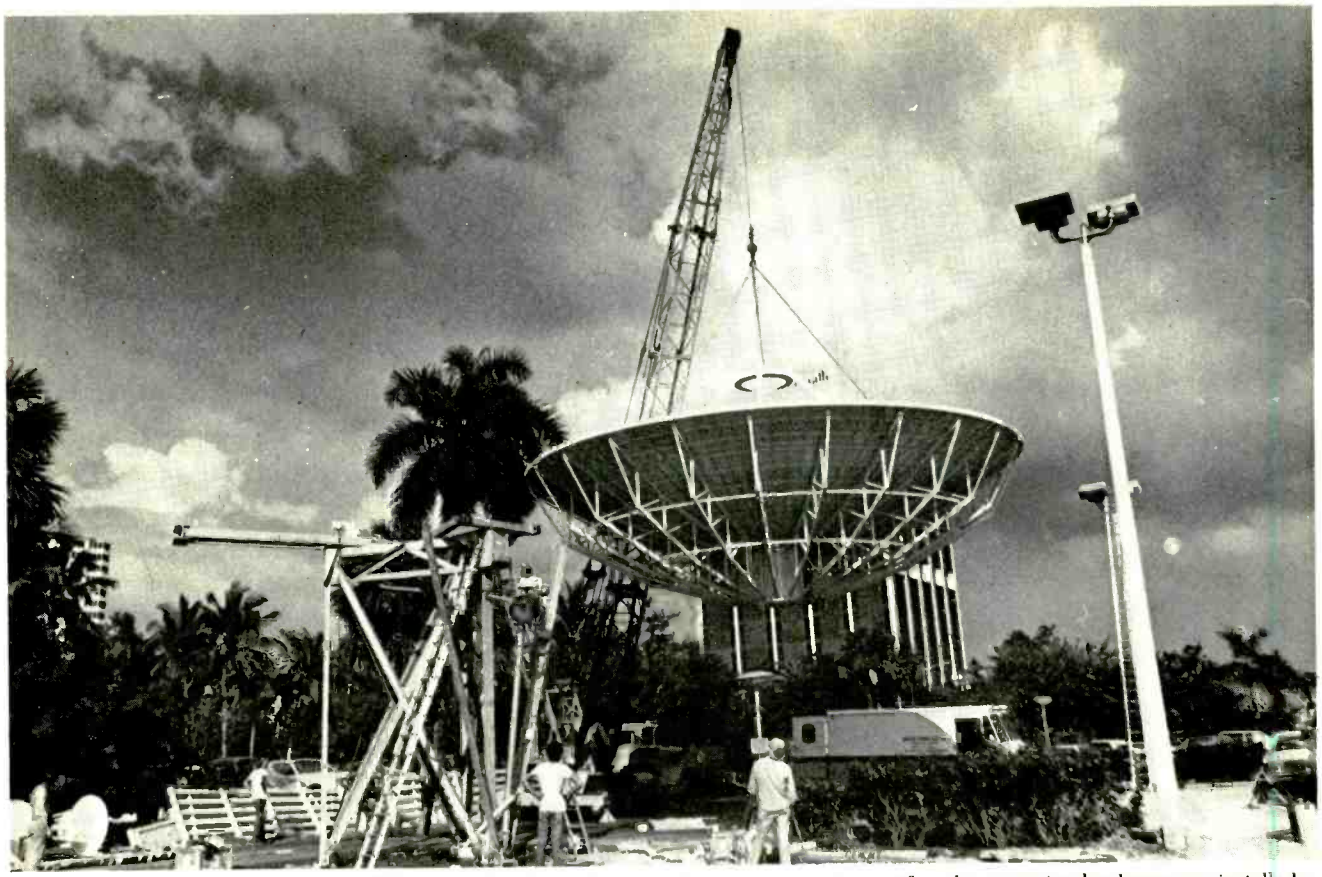
Satellites and telephone common carriers share the same frequency band (4 GHz). And since the telephone companies operate primarily point-to-point over the ground, a vast web of these microwave routes have been created. These terrestrial circuits, compared to the distant low-power satellites, are quite powerful. An earth station sitting in the path of one of these terrestrial circuits would have no chance of receiving satellite signals.

A frequency coordination study starts with the station specifying a proposed antenna location, and in some cases indicating the satellites and transponders

Raymond Meyers is the Satellite Editor.



"As the petal-like segments were mounted to the antenna's center hub, lumber from the shipping crates was used to prevent the hub from tipping over.



A crane was used to lift the antenna off the ground and position it on the support structure. After the mounting hardware was installed, a positioning arm was tied onto the periphery to determine the elevation angle of the antenna.

(on-board repeaters) to be received. The consultants feed this information into a computer to generate a series of overlay maps based on the Geodetic survey 7.5-minute series quadrangle maps. The overlay maps graphically lay out the existing routes of the terrestrial common carrier signals and show their signal beamwidth strengths.

To illustrate the processes involved, I interviewed Jack Cowart, director of engineering for television station WCIX. WCIX is an independent TV station in Miami, Florida, that has just completed an installation of a Scientific-Atlanta receive-only 10-meter (30-foot) earth station. The earth station is located in the parking lot to the rear of the station's studios, which are less than one kilometer (half mile) from downtown Miami. WCIX uses the earth station to receive news features from the Independent Television News Service (ITNS), which comes from New York via the Westar satellite.

WCIX first considered an earth station early in 1977. At that time, Cowart contacted Compucon and initiated a preliminary frequency coordination study for WCIX's studio location. The initial study showed that the site was a virtual freeway of 4 GHz microwave signals. It didn't look promising. A second study was made of their transmitter site 40 kilometers (25 miles) to the southwest. Again the preliminary study looked bad.

When the station first decided to install an earth station, a 10-foot conical horn reflector antenna manufactured by Antennas for Communications was chosen. This original choice was made mainly due to the studio's location near the center of town. The horn-type antennas are considerably smaller than the 9- to 10-meter dish antennas.

With this type antenna, which is very easy to shield from cross signals, WCIX had Compucon make an on-site study. The station's parking lot (the site of the antenna) is located between several high-rise buildings. And the on-site study showed that the site would be satisfactory. However, another problem arose when, at that time, the U.S. Federal Communications Commission (FCC) would not recognise the use of the horn reflector antenna as technically equal to the 9- to 10-meter dishes. Because the horn didn't look like the dish physically, the FCC must have reasoned that it somehow would not perform as well. (Much has changed since then and the horn antennas are now in use in a number of locations, particularly in places where dish antennas won't work due to interference or local zoning restrictions.)

In the meantime, WCIX felt it necessary to find an alternative to the horn since lost time in a highly competitive commercial broadcast market is lost money. They contacted Scientific-Atlanta, who offered a complete installation package.

Since the on-site frequency coordination studies indicated that the dish antenna might also be suitable at the downtown site, WCIX prepared an application on an FCC form normally used by common carriers applying for earth stations. But WCIX stated on the form that "the earth station is for TV station use only and is not part of any common carrier." Without this information, the station might have been asked to file a tariff.

Prior to filing the FCC application, WCIX acquired clearance from the local building and zoning department. Because this is a sensitive area to clear, Cowart decided that the best approach was to have an artist prepare a sketch of

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Geography important in antenna selection

Since WCIX is located at the southeast tip of Florida, another factor enters into the picture. The geographic location of WCIX places it on the edge of most satellite coverage patterns or "footprints," as they are known. In other, more central areas of the country, the satellite signal levels are higher. For this reason, a 4.5- to 5-meter antenna may prove very satisfactory. In South Florida, however, the signals are as much as 3 dB below other areas of the country and the 9- to 10-meter antennas are needed for top picture reception.

At first, before real data could be obtained, consultants and hardware manufacturers alike, were trying to project existing data on signal strengths to indicate what receivers might expect at the edges of satellite footprints. Once the WCIX earth station was in operation, Scientific-Atlanta sent a team of engineers to Miami to take actual measurements. They found that the signal was better than predicted. The measurements were made by first reading the on-axis carrier of the transponder plus the noise level in dB above 1.0 microvolts and then swinging the antenna away and reading just the noise level. In this case, a C+N (carrier plus noise level) of 4 dBm was established as a reference to acquire a ratio of C+N:N. Included here are the results of the study taken August 22, 1978:

SATELLITE	TRANSPONDER	C+N / N	N	C+N REFERENCE
Westar I	6	17.2 dBm	22.2 dBm	5 dBm
	8	17.0	22.0	5
Westar II	4	15.2	20.2	5
Satcom I	2	13.0	18.0	5
	6	14.8	19.8	5
	8	14.0	19.0	5
	14	13.8	18.8	5
	22	12.8	17.8	5
	24	14.4	19.5	5
Satcom II	8	17.5	22.5	5

C = Carrier strength
N = Noise level
dB above luv

When the study was being made, the engineering team was looking for a minimum of 12.0 in the $\frac{C+N}{N}$ column. As it turned out, the only transponder even close was number 22 on Satcom I. However, number 22 was known to be operating at less than full power at the time of the study.

Smaller aperture antennas will present less problems in areas where they can be used. For instance, TV and CATV could use the 4.5- to 5-meter antennas over most of the United States. Data services, such as *The Wallstreet Journal*, are already using 4.5-meter antennas because of the higher noise immunity. Radio broadcasting can certainly use the 3-meter antennas for excellent audio service and audio news associations. The background music suppliers can even use antennas as small as 1.2 meters.

the proposed installation showing the antenna in a compatible setting. Among other things, the drawing included planters with shrubbery around the base.

Other typical items that went into the application for the building permit included specs on the concrete for the foundation, with particular attention to the reenforcement-steel pattern. It also included the results of soil borings to show load-baring conditions of the ground. This information was prepared by a local civil-engineering firm under direction of the building contractor hired by the station. The city accepted the proposal and granted the building permit without further questions.

Processing the FCC application took about 60 days. At that time, the FCC returned a post-card approval form which included the file number and the call assignment.

Once WCIX received approval, the equipment was ordered along with detailed information for the support structure bolt layout. The foundation hole was dug and the reenforcement steel was laid in.

The next move was to install the copper for proper grounding. Cowart feels that not enough emphasis is placed on the importance of this step in the construction of an earth station (or any station for that matter).

First, several copper rods were driven into the ground at the base of the pit. Next, copper strapping was brazed to the copper rods and then woven through the reenforcement bars to the top of the foundation. Here they were tied off to hold them in place before the concrete was poured.

(Careful grounding is particularly important on long runs carrying video in order to reduce 60 Hz and other interferences. Also, the size of the antenna makes the build-up of static charges a potential problem. An excessive charge build-up could damage the low-noise amplifier.)

The antenna, support structure, and accessories were delivered to the site about two months after WCIX placed the order. WCIX used the supervision services of Scientific-Atlanta and brought in a local tower crew and other local contractors to set the supporting structure on its foundation and install the antenna.

Once the support structure was in place, the antenna was unpacked. The Scientific-Atlanta 10-meter antenna was sectioned into petal-like segments. These were mounted on a precision-machined center hub. This arrangement made field assembly easy and fast, and

formed a uniform front surface (which affected antenna gain).

During the on-site fabrication, everything was used, including the packaging material. As a section was connected to the center hub, lumber from the shipping crate was used to support it. If this had not been done, the antenna would have been too heavy on one side and tipped over after the first few petal-like segments were attached.

After the last segment was put in place, a bolt-torquing sequence followed, giving a precise alignment of the antenna. This particular antenna, being a cassagraine type, required the installation of a subreflector at the focus of the antenna. This subreflector is supported by four support legs connected to the front of the antenna. Once in place, the antenna was ready to be placed on the mount.

A crane moved in, and hooks were attached to the lifting eyes. As it lifted the antenna off the ground, the lumber supports fell away in unison. Then the antenna was swung over the support structure, lowered into position, and the mounting hardware was installed. Finally, a positioning arm was tied onto the periphery. This arm determined the elevation angle of the antenna.

WCIX opted for purchasing a remote-positioning package for the antenna, which includes motor-driven elevation and azimuth, and allows remote adjustment of the polarity of the feed horn. (Manual operation of the antenna is available, of course.) By attaching an electric drill to the positioning drives, the antenna can be moved to any of a number of position combinations. This is, however, cumbersome if more than one satellite is to be used on a regular basis.

At the time WCIX purchased their antenna, only slow drives were economically feasible. The slow drive was satisfactory for elevation adjustments, but azimuth adjustments took almost an hour when the position changes were great. Fast motor drives are now more affordable and are recommended.

Remote positioning is reasonably fast and very accurate. The remote control unit has a number of preprogrammed positions available and a push of the proper button sends the antenna off to a new position. (The remote provides for a manual override.) Sensors on the antenna tell the remote unit what position the antenna has reached.

Before going further, a brief discussion about initial positioning is in order. This is the old game of finding true

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WCIX constructed the receive-only 10-meter (30-foot) earth station in a parking lot in back of their studios, near downtown Miami.

north. Apparently, of all the methods arrived at for determining north, the one still considered the most accurate is to place a vertical marker on the foundation at the antenna site. Then observing the shadow it casts as the sun approaches its highest position in the sky (not always at noon local standard time), mark the direction of the shortest shadow. Draw a line from the marker to the end of the shadow. This line points to true north.

Next you'll need the elevation and the azimuth angles to the satellite you are going to receive. If you purchase a manual antenna, a transit level and an inclinometer will put you in the ballpark. With remote positioning equipment, Scientific-Atlanta engineers made the initial reference alignment and then programmed the elevation and azimuth information. The optimum point of reception was found by tracking the receiver signal strength and correcting the position information programmed into the unit. Once programmed, the antenna will always return to this position.

From start to finish, it took WCIX four working days to have the antenna mounted and ready for testing. All that remained was to pull in the control and power cables, connect the remote unit, and dress the cabling.

Electrical outlets were installed at the antenna base to provide AC for drills or other power tools. Also, several JIC (just in case) pairs of wires were pulled with the planned "in use" pairs. Some of these JIC pairs are already being used. Other cables and wires in the PVC include a ⅞-inch pressurized Heliax to carry the 4 GHz to the indoor receiver, two video cables, pairs for remote positioning, intercom, and security, and a pull-rope for future runs.

Once the antenna was installed, the remote wired, and the receiver set up, WCIX notified the FCC that all was ready and commenced to take feeds from ITNS. This official notification was required, although further filings are not. The station also had to notify the satellite operators (i.e., Western Union for Westar, RCA for Satcom) that it was ready to use signals from their birds. This information was needed for the carrier's records.

Since then the station has taken on other feeds, some of which are on Westar and Satcom. Their most recent intentions are to feed remote coverage of out-of-town University of Miami football games to the station via satellite.

WCIX has also reacquired the services of Compucon, which offers a weekly service known as Satellite Earth Station Monitoring Reports. These reports provide a continuing update on the activities of the common carriers with respect to plans for additions or changes in their terrestrial microwave circuits. Such changes or additions could severely affect or block reception of the satellite signals, if left unchecked.

Since the FCC offers protection on a first-come, first-served basis, **and only acts upon new service if a complaint of probable interference exists,** it is vital to keep track of these ever-changing conditions.

The telephone company's increasing use of fibre optics to replace local microwave traffic will give relief to the problem of using 4 GHz for two services that are not compatible. Maybe some day the satellite users will have the band all to themselves.

In future articles on satellites, we will get into radio installations. And we'll see how management views this new service. And you guessed it, we'll bring you guest articles on satellites being used around the world.

Editor's Note: If you have questions or article suggestions, we certainly invite you to correspond with us. Send your letters to Satellite Editor, Broadcast Communications, P.O. Box 12268, Overland Park, KS 66212. BC

Executive Notebook:

How to manage your way into earth terminals

By Dennis Ciapura

As we turn toward the dawn of a new era in video transmission, astute broadcasters and communications entrepreneurs are looking at satellite earth stations as new tools of the trade.

Broadcasters, cable system operators, programme originators, and aspiring common carriers are likely to find satellite links becoming an increasingly important part of their business. As a result, a basic working knowledge of the economics and engineering of satellite transmission is becoming more and more valuable to aggressive broadcast and cable executives, eager to convert new technology into increased profitability.

This article is the first of a two-part series in which *Broadcast Communications* will present a step-by-step review of the planning and implementation of a common-carrier video earth station. While tailored to the needs of the broadcast executive, engineering aspects will be presented in enough detail to impart an adequate understanding of how video earth terminals work, but with more emphasis on the relationship between various technical alternatives and the economics involved.

When you are about to embark on an earth station project, this series will undoubtably help organise your planning. And if you are not yet involved, perhaps the insight gained here will help you

Continued on page 52

Dennis Ciapura is the Audio Editor.

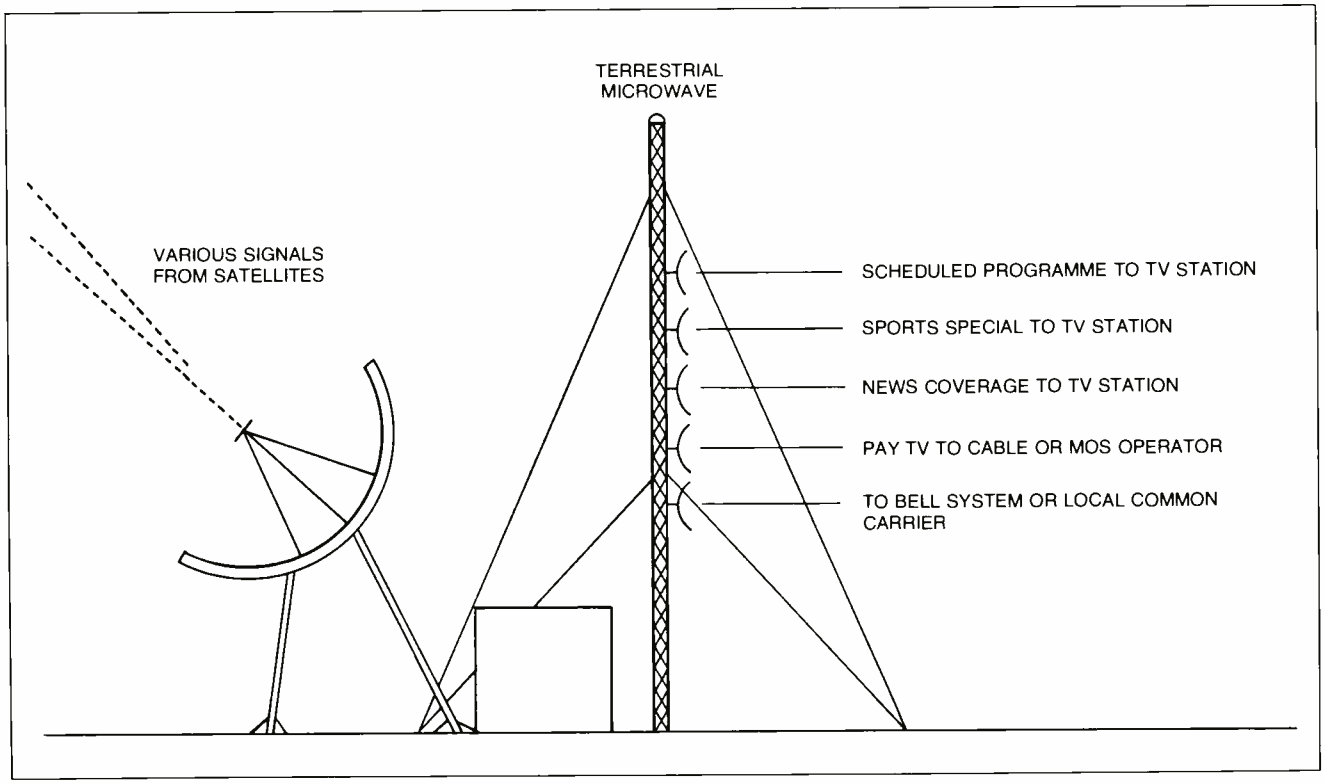

Figure 1 Typical common carrier earth station (downlink in this case). Essential elements are satellite signal acquisition and microwave capability out of the site.

make the right decision when the time comes. The programming and/or business opportunities that make a satellite link an attractive proposition will be obvious. However, the economic and technical considerations can be complex.

Rather than dealing with the abstraction of a hypothetical situation, we will use Greater Starlink, a Detroit common-carrier earth station project, as a model. Greater Starlink in Detroit is a new common-carrier satellite earth terminal, which is being built as a downlink to feed programming to local TV stations and an uplink to provide nationwide access to Detroit area events. As a common carrier operation, Greater Starlink was planned to yield maximum utilisation, and is, therefore, an excellent study model for video programming users and originators considering a satellite interface.

Detroit is an excellent analytical example because for various reasons, it is a very difficult location in which to establish an earth station. Therefore, our planning and implementation checklist will include some of the real-world difficulties that large-market operators are likely to encounter, and some solutions as well.

". . . it is usually economically advantageous to enlist the services of a good consulting engineer . . ."

For organisational purposes, it is useful to approach earth station projects step by step. Mistakes can be costly, and it doesn't pay to proceed haphazardly. Unfortunately, some of the costliest errors are likely to be made early in the game, when new operators are least experienced and most vulnerable.

The first big decision to be made is that of site selection. To be suitable, an earth station site must possess two often-conflicting attributes. First, it must be able to frequency coordinate (more about that later) and secondly, some way must exist to get the video signals out of the earth station to end users.

Figure 1 illustrates a typical satellite receiving, or downlink, system. Most TV transmission sites provide good video egress in the form of a TV tower from which to transmit terrestrial microwave to the end users. But because these sites are usually swamped with pre-existing microwave paths, they may exhibit too much interference potential to be suitable for a satellite downlink. Conversely, an uplink at that location might be an interference problem for nearby terrestrial services. To further complicate matters, planned but not yet existing terrestrial facilities must also be considered; and this brings us swiftly to the subject of frequency coordination.

From the very beginning, it is usually economically advantageous to enlist the services of a good consulting engineer who is experienced in satellite earth station planning to assist with site selection

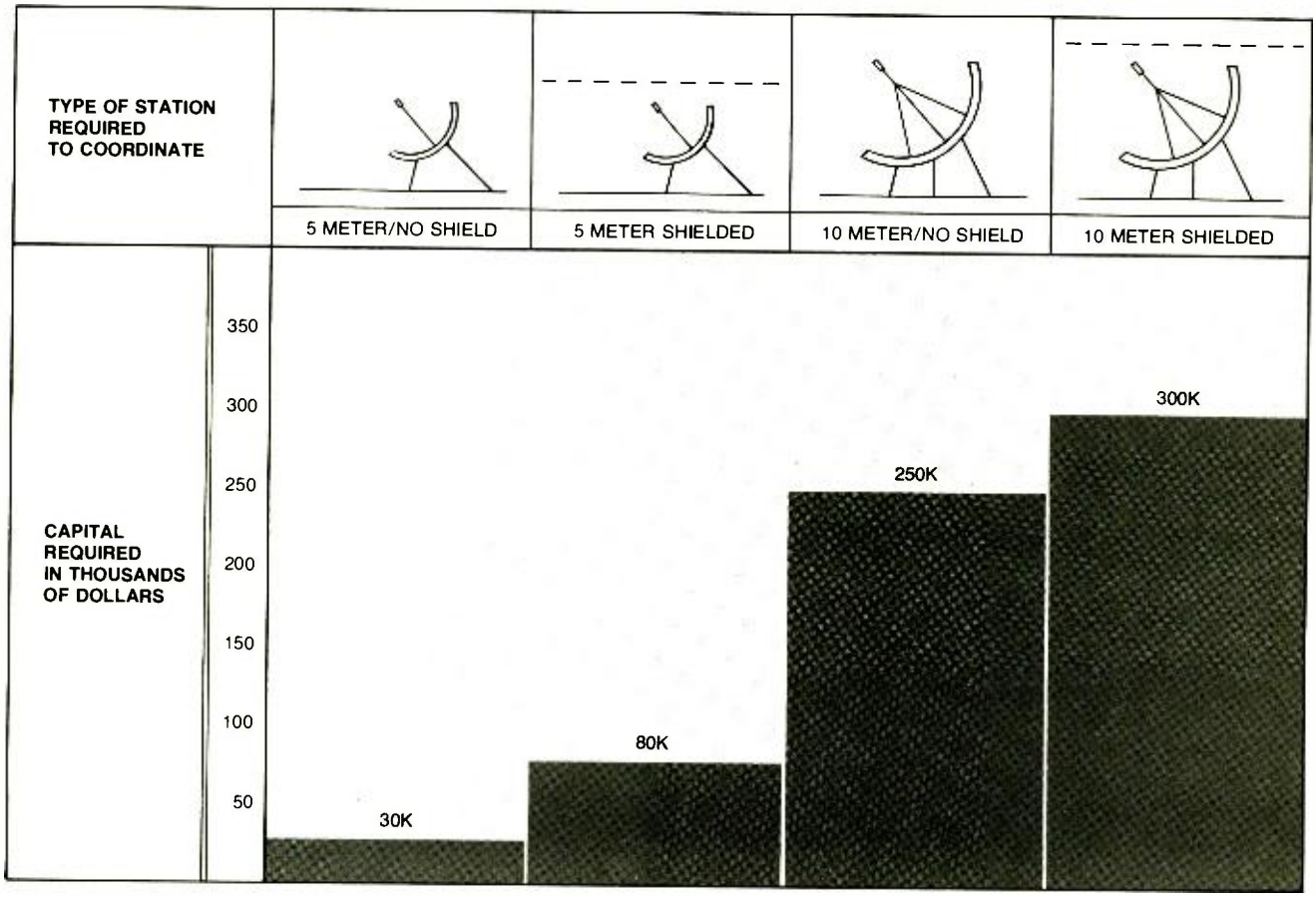

Figure 2 Relationship between antenna system requirements and capital input required for total project, including real estate, earth moving, consulting fees, etc.

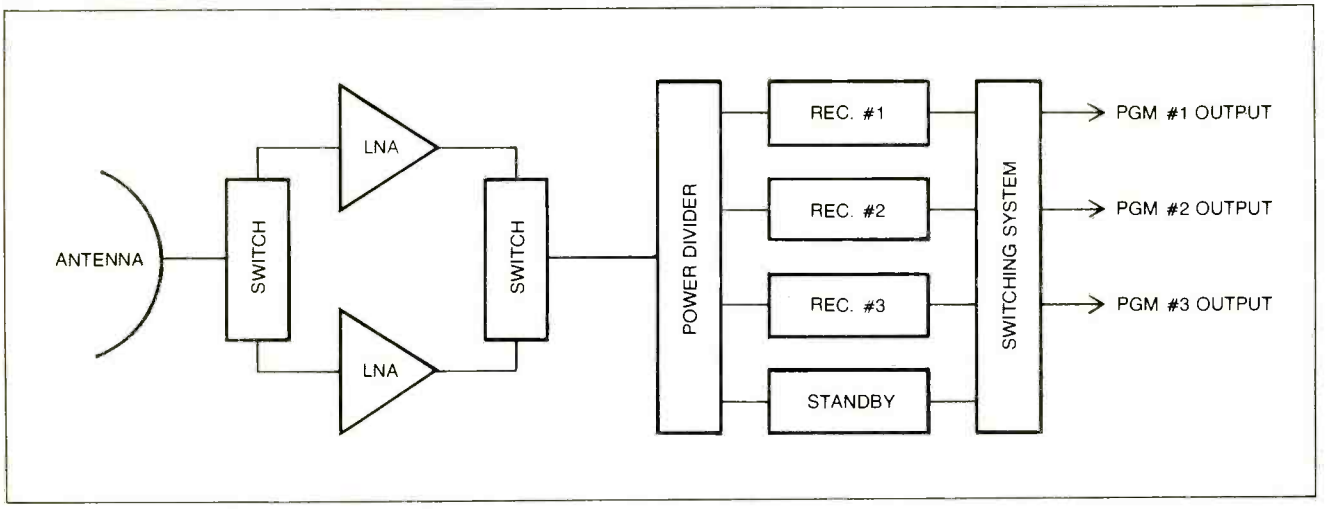

Figure 3 Basic downlink system for a typical common-carrier-type installation.

and frequency coordination. John F. X. Browne and Associates of Detroit handled the Greater Starlink project and selected Comsearch Inc. to investigate frequency coordination for an up- and downlink. The Greater Starlink site is thus far unique in Detroit because it is located near a 305-meter (1,000-foot) tower and yet could be made to successfully coordinate.

Companies like Comsearch, which specialise in frequency coordination, use computer analysis of previously coordinated terrestrial microwave paths in the 4 and 6 GHz bands to determine what interference to expect. A graphic representation also can be overlayed on a map of the area of interest as an aid to site selection. In major metropolitan areas, it is quite possible that many sites are virtually impossible to frequency coordinate. Others may be coordinated, but be unsuitable for a tower location

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Figure 4

Decision Maker's Checklist

- ☐ Locate several sites that seem to have operational advantages.
  - ☐ More than 10 miles from nearest airport, or
  - ☐ An existing tower with reserve capacity.
  - ☐ Ability to see over obstacles at an angle of 30° or less.
  - ☐ Check real estate cost and local building codes.
- ☐ Select a consulting engineer with earth station expertise.
  - ☐ Discuss the sites you have found in descending order of operational attractiveness.
  - ☐ Obtain rough appraisal of coordination problems and construction costs.
  - ☐ Make decision on whether to proceed or look for more sites.
  - ☐ If site is selected, have consultant select a frequency coordination service, submit data, and analyse results.
- ☐ Modify estimate of capital input required if coordination problems crop up.
- ☐ Make application to the FCC.
- ☐ Have engineering consultant make actual measurements at site selected.
- ☐ Modify "go, no-go" decision, if required.
- ☐ Arrange financing, if required.
- ☐ Make final decision on who will supply equipment.
- ☐ Begin to negotiate for real estate.
- ☐ Apply for local permits.
- ☐ Shop for insurance (comprehensive fire, theft, storm and vandalism)
- ☐ Prepare to implement upon receipt of FCC grant:
  - ☐ Close on real estate.
  - ☐ Local permits O.K.
  - ☐ Equipment delivery schedule O.K.
  - ☐ Insurance coverage O.K.
  - ☐ Local contractors scheduled.
  - ☐ Financing O.K.
  - ☐ Press releases and mailing list ready.

because of aviation considerations. Remember, the signal has to get out of the earth station, too. Additionally, it is possible for a site to coordinate a 4 GHz for a downlink, but not on 6 GHz for an uplink.

If coordination problems are not too severe, various forms of shielding may be employed to improve the situation, or a larger antenna can be employed. A 10-meter (33-foot) antenna can operate in a greater interference field than a 4.5-meter (15-foot) antenna because its better side lobe characteristics improve the ratio of signal to interference and noise.

If a larger antenna still does not yield successful coordination, shielding schemes can be investigated. It is possible, albeit expensive, to locate the antenna system in a pit surrounded by an earth berm to shield it from interference. Trees and existing landscape can sometimes be useful, but the impermanence of foliage renders many such schemes untenable. Some types of fine wire mesh and solid metal fencing also can be effective, but care must be taken so that potential interference is not reflected off of nearby structures and back into the earth station.

Figure 2 illustrates the ascending capital investment required as increasing coordination problems require more antenna gain and shielding. As you can see, there can easily be a 10 to 1 cost differential, so consider this factor when real estate costs are analysed. That expensive plot that will work with a 4.5- or 5-meter unshield antenna may be the biggest bargain you ever find.

In some markets, like Detroit, there are no alternatives if performance is not sacrificed; it can become a "go, no-go" decision. Greater Starlink is a 10-meter system with an earth berm. A 5-meter system with a berm would have coordinated marginally, but that alternative was rejected so that broadcast quality could conservatively be specified and stability of performance maintained. Poor earth station performance eventually results in under-utilisation and is not a bargain, much less cost effective.

The question of what level of performance and redundancy to buy is frequently asked, and this is one of those areas where a good consulting engineer can be invaluable. Unnecessary technical overkill can be very expensive; and poor performance and/or reliability can be disastrous.

After the frequency coordination process has been completed for the site selected and the capital requirement has been nailed down, it's a good idea to

have some measurements made at the selected site, just to be sure that there are no unfortunate surprises later on.

Equipment selection really involves two decisions: who and what. Who the equipment comes from can often be influenced by antenna positioning requirements, reflector construction, etc.; so choose carefully and look toward future expansion and which satellite you will have to look at. Figure 3 is a simplified block diagram of a typical downlink and illustrates the normal level of redundancy for a common carrier facility.

To understand why various types of equipment will be required, it's necessary to know a little about how a typical up- and downlink works. Referring to Figure 3, you will see that the 4 GHz signal coming down from the bird is amplified first by the antenna which has a gain related to its size and also thermal noise, which is conveniently specified in terms of degrees kelvin (K°) or noise temperature. The lower the noise temperature, the better the signal quality. Since the signal from the satellite must travel 22,300 miles, it is very weak by the time it gets to the earth's surface; and, it can be easily masked by any significant system noise, which would manifest itself as snow in the video and hiss in the audio. Interference from terrestrial transmissions will have various effects depending upon the nature of the interference and the numbers involved.

Usually, the system designer determines the system gain and noise temperature required, and selects the combination of components required to achieve the performance goals. The next link in the chain is the low noise amplifier (LNA), which also has a rated noise figure, and finally, the receiver itself. The determining factors, with respect to noise, are the antenna and LNA, because the output of the LNA is high enough so that the receiver noise floor is not normally critical.

Obviously, a smaller antenna and lower-noise LNA can yield the same noise performance as a larger antenna and higher-noise-temperature LNA. And this approach is frequently taken when frequency coordination problems don't make the larger antenna and its higher gain desirable for interference protection.

Although there is little chance of the antenna failing to function, the effects of climatic changes must be taken into account, so be sure to include antenna deicing equipment in your budget if your geographical area is likely to produce ice. In any case, a properly installed and protected antenna is not likely to fail, so a backup is not required. But bear in mind that a single dish can only point to one satellite at any one time.

Since LNAs are active devices, they have a failure potential; therefore, redundant LNAs are normally provided (as shown in Figure 3). To be really effective, an automatic LNA switching system should be included.

Receivers also have failure potential, so a receiver backup is also desirable. A cost-effective solution is to use the 1:N system where a single frequency agile receiver serves as backup for a number of on-line units. With this system, we are playing the odds against two receivers failing in a short time span, and the odds are in our favour. However, it's a good idea to have extra modules on hand so that rapid repair of a defective receiver can be achieved. If the backup comes on line, the next failure would leave a channel off the air.

Scientific-Atlanta worked with Greater Starlink on the Detroit earth station. An arrangement similar to that shown in Figure 3 with redundant LNAs and a 1:N receiver switching system was selected.

The next equipment decision concerns test equipment. If the station is co-located with a TV facility, most of what is needed will probably be on hand. A waveform monitor, vectorscope, signal generator, and a spectrum analyser are the principle items required if good performance of the station is to be maintained. There may be a strong temptation to simply install a monitor and subjectively judge system performance by picture quality alone. This can be a dangerous and wasteful approach because performance degradation won't be picked up until signal quality is seriously impaired, negating the value of the performance reserves designed into the system.

Now that we have discussed the various stages of video earth station planning, a checklist can be assembled. Figure 4 is a suggested checklist for busy executives. When decision time comes, you'll know what the priorities are, what to do, and when to do it. In the January issue of *Broadcast Communications*, we'll continue with Part 2, which will cover construction, testing, and operation of the video earth terminal. BC

Radio Nederland: One-way streets aren't good enough

By Ron Merrell, Editorial Director

Compared to international shortwave giants such as Radio Moscow, the Voice of America, or the BBC, Radio Nederland is a relatively small shortwave station. Yet they are ranked ninth among the world's international broadcast stations for total programme hours per week.

But what makes Radio Nederland unique is not the hundreds of thousands of listener letters they receive as a result of their programming. Going on the air in 1928 with a regular broadcasting service, Radio Nederland signalled the beginning of a new type of radio service. The growth of international broadcasting has been slow, but certain. Today there are more than 140 stations on the air around the world. But don't be deceived by the numbers. There is more worldwide interest today in shortwave broadcasting than at any time during its 50-year history. And now the prospects for an accelerated growth during the 1980s seems certain.

As reported in our HCJB article last month, the technological leapfrogging of emerging nations and Third World countries will stir up even more activity on the shortwave bands. As this happens, even the old, established stations will be forced to increase their programme hours to cover the Third World languages.

Radio Nederland's transmissions are in Arabic, Brazilian, Dutch, English, Indonesian, and French. Their Caribbean section provides programmes in Dutch and the languages of the Netherlands Antilles and Surinam.

Typical of shortwave broadcasting stations, they must be concerned with all the variables that affect reception of these languages in their target areas. And while Radio Nederland receives hundreds of thousands of listener reports from around the world, the slow-moving world mail system offers no chance for anything near immediate reaction to changing

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It all started in the Philips Laboratories

Broadcast Communications salutes Radio Nederland for their 50 years of international shortwave service. Even before their regular service began, the station had successfully broadcast experimental transmissions as early as March 11, 1927, from the Philips laboratory in Eindhoven, Holland.

"Hier een experimentele uitzending van het Philips Laboratorium te Eindhoven, Holland, op golfengte 30.2 meter."

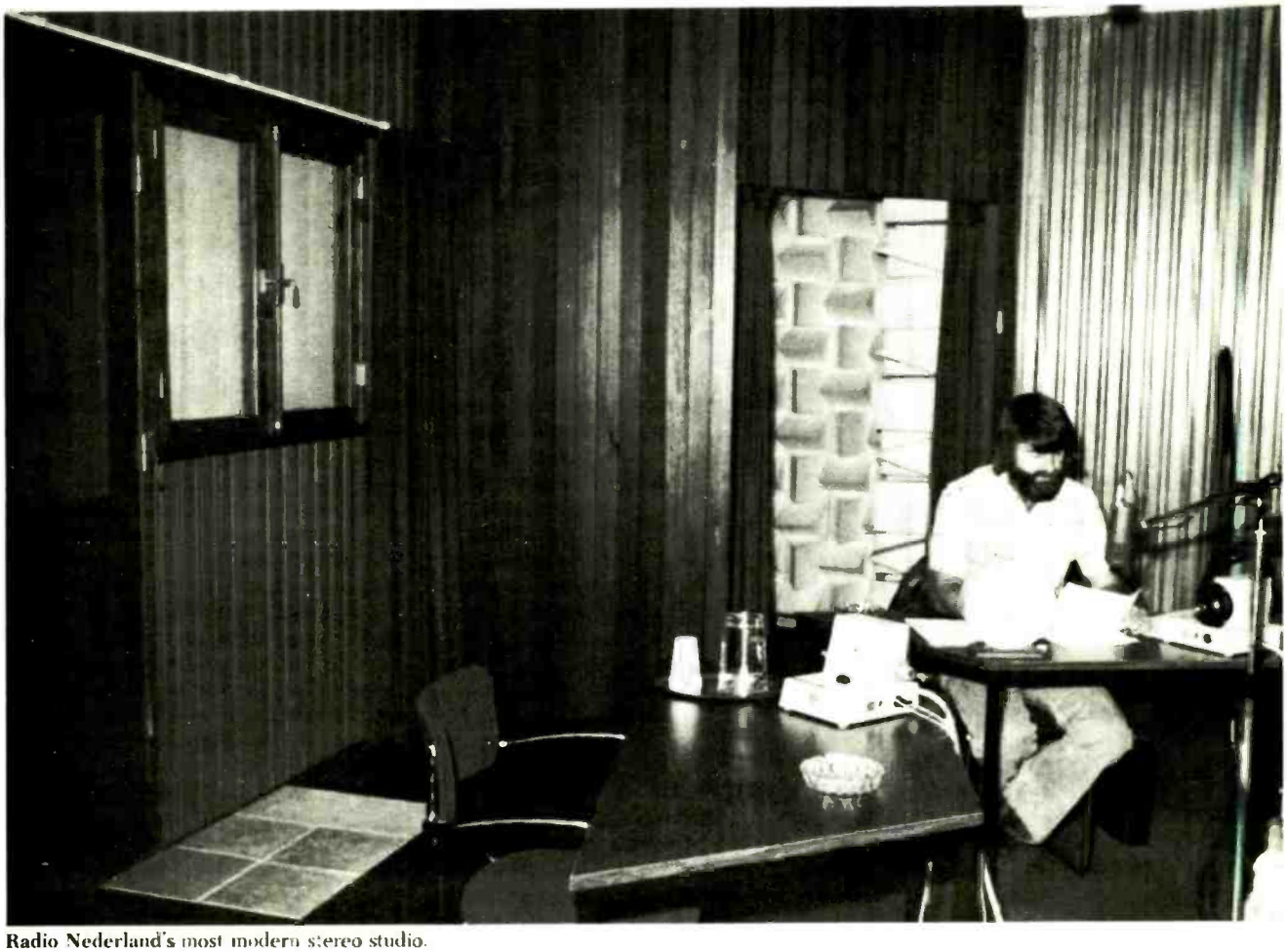
This message was repeated numerous times throughout the night of their first broadcast by a Dutch engineer. Finally, word came from Bandung (now in the Republic of Indonesia) that the message had been heard. And until this day, the feeling at Radio Nederland is that the essence of shortwave broadcasting is to eliminate the distance between continents.

The idea of using shortwave frequencies for communications soon caught on in other countries. A German world service was started in 1929 with an 8 kW transmitter operating in Zeesen. Then in 1932, Great Britain began its Empire Service.

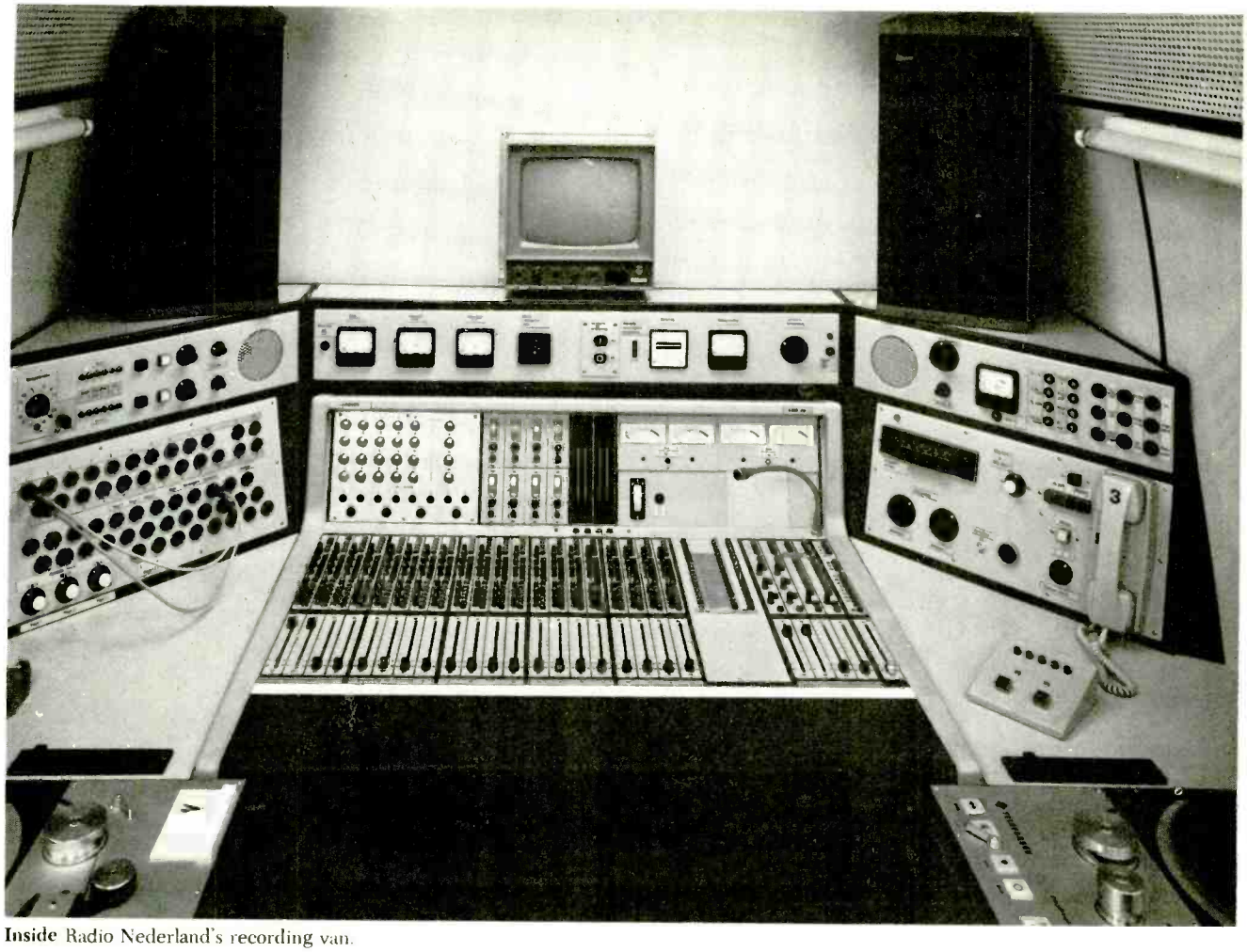
After the early experiments from the Philips Laboratories, the station was set up near Hilversum where a unique antenna was designed. Last month *Broadcast Communications* described a "steerable" array used in Ecuador by HCJB. But as long ago as 1928, Radio Nederland used a rotatable array. The antenna masts were wooden structures mounted on a circular platform. The structure rotated on rails so they could point their signal in any direction. In those days, the station's call sign was PCJ.

Since 1959, Radio Nederland has been among the top three international stations in major popularity polls. In 1965, 1968, and 1973, they were rated first by a worldwide electorate of shortwave listeners.

A look at one of Radio Nederland's seven mono control rooms.



Radio Nederland's most modern stereo studio.



Inside Radio Nederland's recording van.

The USSR leads in total programme hours

Rated on the basis of programme hours broadcast per week, the USSR leads all international broadcast stations with 1,999 hours in 84 languages. The following list was compiled by the BBC and the U.S. Foreign Broadcast Information Service:

1. USSR
2. U.S.
3. The People's Republic of China
4. Egypt
5. Germany
6. BBC (Great Britain)
7. Taiwan

Other leaders of recent international studies include Albania, Netherlands, Australia, and the six Warsaw Pact countries. India tops the list of Third World countries, and the next Third World country to show up on the list is Ghana. With two-thirds of the world's population in the Third World countries, their growing international broadcasting interests will be reflected in channel allocations at the WARC.

band conditions. Radio Nederland's attack on the problem takes three forms.

The station uses worldwide monitoring services that report on both immediate and long-term reception. When prevailing conditions severely affect reception, Radio Nederland is immediately alerted by telegram and telex. The negative effects of poor band conditions on a single band are offset by using adjacent shortwave bands to air the same programmes.

The station also uses relay stations on the island of Bonaire (in the Caribbean) and in Madagascar. The Bonaire station blankets North and South America, as well as the Pacific and West Africa. The relay station in Madagascar mainly serves the African continent, the Middle East, and South and Southeast Asia.

Radio Nederland's home-based transmitters are 100 kW units, while their relay stations run 300 kW. By 1980 they will have four 500 kW transmitters in service.

Complementing their RF power output, Radio Nederland maintains quality-conscious audio recording and production studios. Their radio programmes are produced in the Hilversum studios. They also operate a transcription service. Tapes and discs from this service are made available free to selected broadcasting organisations.

Most transcriptions, which are produced in stereo, deal with topical subjects, as well as Dutch artists and orchestras (such as the Concertgebouw Orchestra). Transcription programmes are prepared and recorded in specially equipped studios and control rooms, using Radio Nederland's top sound engineers.

Their large transcription studio can house orchestras up to 17 people. Currently, the studio is equipped with an 8-track recorder and a 24-channel mixing console. For their top-quality productions, Radio Nederland engineers use equalisers, effects filters, compressors, and synthesizers. And as their arsenel of audio equipment grows, they realise a newer mixing console is in order. Their engineers have already indicated that their new mixer must have at least 36 input channels.

Since Radio Nederland has been involved with international shortwave broadcasting from the beginning, it should be interesting to see how they view the future.

Says Radio Nederland, the question is warranted — and certainly on the occasion of a 50th anniversary — what future is in store for the medium; and which developments may be expected for the stations employing the medium.

To a large extent, they answer the question on the basis of cold statistical facts. Throughout the world, the electronics industry has been reporting a big increase in the sale of radio sets capable of receiving shortwave transmissions. Almost half of all sets sold are equipped with a tuning dial for shortwave bands.

Another branch of the same industry has found that there is a steady increase in the number of shortwave transmitters, and in the power of these transmitters. In 1929, 8 kW was quite enough to reach the world from a transmitter located in Europe. Today, one cannot achieve the same with anything less than 500 kW. There are more and stronger transmitters, more potential listeners, and what's even more important in the eyes of shortwave stations, a growing audience.

But Radio Nederland is greatly concerned about minimal broadcasting from Third World countries. They feel that this situation is symptomatic of a problem discussed often these days: the news and information flow in the world today is mainly one-way. Leading international news agencies are run from industrialised countries. While the Third World is home to two-thirds of the world population, less than a quarter of all international news released deals with Third World events or issues.

Radio Nederland says that so long as only a few Third World nations operate external services, and broadcast to the world in few languages, shortwave radio will continue to be a one-way street and fail to reach the justified expectations of the young nations.

Radio Nederland sums up their feelings about international shortwave broadcasting this way:

"We are aware that shortwave radio is the most easily accessible non-commercial medium for daily information over long distances. A small-minded, parochial concentration on Dutch culture alone would conflict with that awareness and betray a technical development that can serve the cause of human communication much better than it has done in the first 50 years of its application."

Editor's Note: *Broadcast Communications* invites comments and article ideas from all international stations. To keep us up to date on what's happening at your station, write to: Editorial Director, Broadcast Communications, PO Box 12268, Overland Park, Kansas 66212. BC

Digital Sight and Sound

Is digital really free of noise and distortion?

By Harold E. Ennes

Digital sight and sound is a brand new world to many of us, with some astounding claims in modern technology. For example, we hear that digitizing the conventional analogue (continuously varying) signal results in a system that is virtually noiseless and distortionless. But we old-timers in analogue techniques will certainly have to see the proof of such a statement before we will accept it.

The number system used in modern digital technology is the binary, or power of two. A bit (contraction of *bi*nary *d*igit) can be either a zero (0) or a one (1), nothing else. Thus, a single bit can have only two "levels." But a 0 could represent a picture black and a 1 could represent a picture white. Or a 0 could represent minimum audio level and a 1 could represent maximum audio level. Note that a single bit can represent a very limited but useful amount of information.

In our conventional base-10 system, we have numbers 0 through 9, or ten numbers when we count zero (which must be counted). When you reach 9, adding another 1 changes the 9 to a 0 and the 1 is carried to the first column to the left.

In the binary system, 1 is the highest number. So when you add a 1 to a 1, the column changes to a 0 and the 1 is carried to the left as:

$$\begin{array}{r} 01 \\ \underline{1} \quad \text{add } 1 \\ 10 \end{array}$$

You read this 10 as one-zero, not "ten." It is equal to decimal 2, because the far-right column where we started is equal to either a 0 or a 1, whereas the next column to the left is equal to 2. A "1" in this column, therefore, is counted as decimal 2. Adding another 1 gives 11, which is 2+1 = decimal 3. Adding another 1 gives 100 or one-zero-zero, which is equal to a decimal 4. This third space to the left is $2^2 = 4$, so a "1" in this space is equal to decimal 4. When you reach 111, you have gone as far as possible with 3 bits. This is 4+2+1 = 7 decimal. Note, however, that 0 to 7 is 8 "levels" counting 0, or $2^3 = 8$.

As you gathered above, when we need a number or level more than decimal 1, we use a group of bits. This group is termed a *byte*. The number of bits in a byte tells you how many "levels," or characters (such as letters, signs, symbols, etc.), the byte will accommodate. For example, a 4-bit byte will handle 16 ($2^4 = 16$); a 5-bit byte 32 ($2^5 = 32$); an 8-bit byte 256 ($2^8 = 256$); etc.

The analogue signal is "looked at" (sampled) at a given number of times per second. For each of these instantaneous levels, a binary code is generated to represent that level. (The mechanics of this are covered in a future session.) Thus a string of binary numbers represent the original analogue signal.

Obviously, we are faced with attenuation and noise levels in digital transmission as well as analogue transmission. Figure 1(A) represents a typical binary code 101 (one-zero-one) that, in turn, represents a signal level at the sampled time. In electronic parlance, a pulse is a binary 1 and no pulse is a binary 0. Let's assume this code is applied to a transmission circuit where attenuation and noise occurs. In Figure 1(B), the pulses are rounded-off (distorted) and are almost filled with noise. Note, however, that 1

Harold Ennes, Digital Editor, is the author of several digital texts, and radio and television maintenance textbooks.

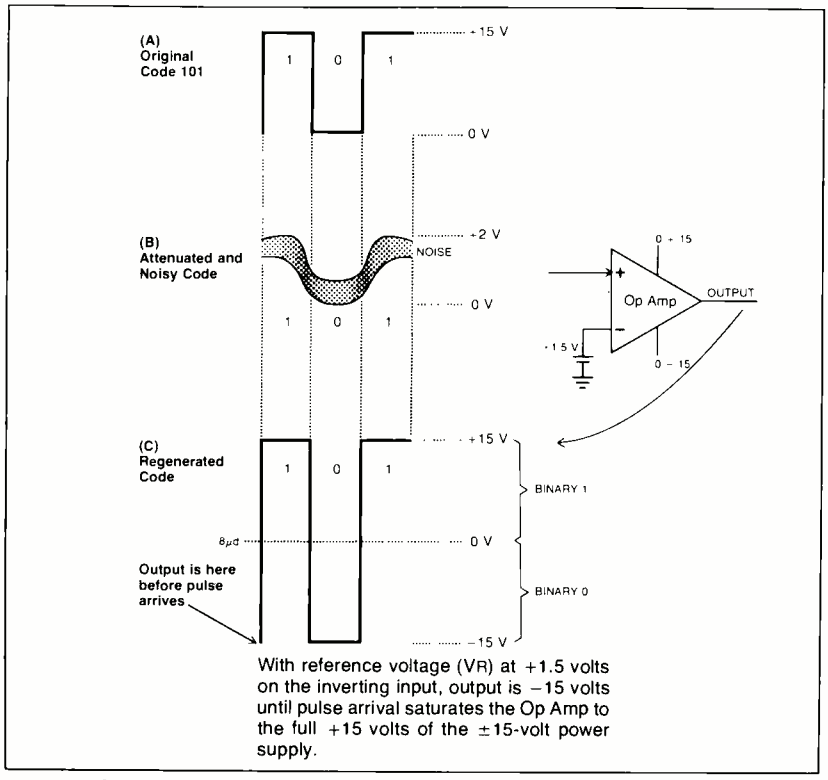


Figure 1 The simplest form of "regenerator" is an open-loop Op Amp. Although practical regenerators are more sophisticated, this is the principle of operation in many cases. The problem of impulse noise will be considered in a future session.

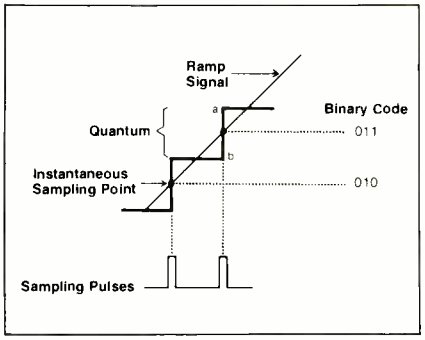


Figure 2 Origin of "quantizing noise." For example, binary 011 can be any level from a to b, or ± 1/2 quantum.

Bits	No. of Levels	P-P Signal to RMS Noise (dB)
1	2	17
2	4	23
3	8	29
4	16	35
5	32	41
6	64	47
7	128	53
8	256	59
9	512	65
10	1024	71
11	2048	77
12	4096	83
13	8192	89
14	16,384	95

Based on rule of thumb that p-p signal to rms noise ratio in dB = 6n + 11 dB

where n = no. of bits in a byte.

NOTE: In practice, subtract about 4 dB.

Table 1

and 0 are still distinguishable. If the 101 can still be "recognised," no distortion or noise will be introduced onto the analogue signal.

The simplest form of digital "regenerator" is an open loop Op Amp. Assume the 101 of Figure 1(B) is 2 volts peak-to-peak, with the base line at ground or 0 volts. This is applied to one input of the Op Amp, with the other input tied to a reference voltage (V_R) of 1.5 volts.

When the signal reaches a few millivolts above this reference voltage, the open loop Op Amp rapidly saturates from −15 volts to the full +15 volts of the power supply, then swings to the full −15 volts upon signal transition in the negative direction. The noise has been completely eliminated, and the code 101 has been restored for further processing in the transmission circuit. In addition to this, the signal may be sampled on the receiving end for just an instant in the middle of each pulse period, further eliminating noise effects between samples.

There is a second kind of "noise" in digital transmission. Figure 2 shows a ramp signal being sampled at a given rate. The level at the instantaneous time of sampling must be held sufficiently long to form a binary word or code for that level. The process is termed "quantizing" and the actual value seen at a given sampling time can vary a maximum amount of ± ½ quantum. (Covered more fully in a future session.) This gives a certain maximum possible error in the quantizing process, but this error is also termed "quantizing noise" and should be understood by the student.

Obviously, the higher the sampling rate, the less the size of the quantum and resulting error or noise. Also, the higher the number of bits in a byte, the greater the "recognition" of extremely small level differences, hence less error or noise. For example, a 4-bit byte will recognise a level one-sixteenth of the maximum whereas an 8-bit byte will be able to "see" a level only one 256th of maximum.

A realisable signal-to-noise ratio on a peak-to-peak signal-to-RMS noise basis in dB can be directly related to the number of bits in a byte. As a rule of thumb, a theoretical value for this is 6n+11dB where n = number of bits. Table 1 is based on this premise. In practice, this does not quite prove true, and a more practical value is obtained by subtracting 4 dB from the values listed in the table. Note that the addition of 1 bit in each case raises the S/N ratio by 6 dB.

Observe one interesting point here. An 8-bit byte would be entirely satisfactory for digital video since the best signal sources have a S/N ratio no more than 50 dB or slightly better. However, to obtain about a 90 dB S/N ratio for audio, 14 bit words would be required.

We will continue this series in easy bytes for your convenience. BC

Microprocessor Workshop

Let's put the microprocessor to work

By Peter Burk

Microprocessors are a lot more interesting if they do something useful! More than one broadcast engineer has commented that microprocessors are nifty, but it's hard to find practical applications at the station. Well, microprocessors *are* useful, even for one-of-a-kind small-scale applications. Frequently, the hardware cost is slightly higher using a micro, but the very short design time, coupled with the ease of making modifications in software, easily offsets this apparent liability.

To make this point, here's a quick project that's tailor-made for broadcasters. It's a little black box that watches over your station and calls you whenever something nasty happens. It'll tell you when you go off the air, lose audio, or anything else that can produce a switch closure or TTL signal. At WKBW, the dialer calls three pagers, beeping out the specific status of eight different alarms. It even calls back after the fault is cleared, sending an "all-clear" signal that means "go back to bed . . . it's okay now."

If you have an application for an animal like this, the programme and interface details are included here. If it doesn't fit your needs, read on anyway, just to see how easy it is to "roll your own" black box. The only limit is your own imagination.

Eight normally high input lines are brought into the 'A' side of the 6820 peripheral interface adapter. A TTL logic low or a contact closure to ground on any of these lines sets the box into action. A one-second delay follows the initial closure, to make sure the alarm wasn't just a momentary condition.

Three bits of the 'B' side are used to control the output. One bit is a 1 kHz square-wave which is used to generate a tone on the telephone. Another bit is a 'key' signal that is used to gate the tone (yes, the gating could be done in software, but the NAND gate is needed to provide sufficient drive anyway). The third bit is used to control the line relay that connects the phone line.

When a valid alarm condition is received, the line relay closes, presenting an off-hook condition to the phone line. After a short delay, the line relay starts pulsing out the first phone number. Now the key output starts gating the tone according to the alarms that are tripped. If alarm 2 is on, two dots are sent continuously: •• •• •• •• •• •• etc. If alarms 2 and 3 are both on, both signals are sent: •• ••• •• ••• •• ••• etc. If all eight alarms are set (heaven forbid!), all eight codes are sent.

When all alarms are clear, a series of dashes is sent to let you know that everything's back to normal.

The signal is repeated for 30 seconds (or whatever time period you choose) before the next number is dialed. The sequence is repeated until the last number has been called.

Any change in the alarm status . . . either an additional alarm setting or one of the original alarms resetting . . . starts the process all over again.

The programme included here is written in machine language for a 6800 MPU. It takes a little under 512 bytes of memory. The interface shown in Figure 1 can be used with a 6800 development system or trainer such as the Heathkit ET-3400, or can be made part of a dedicated one-board system. The author's wire-wrap prototype uses six chips, and is self-contained (except for the power transformer) on a 4½" by 5" circuit board.

Once the hardware is together and working, all that's necessary is to load the programme into memory. The programme is written to run in RAM only, but with some address relocation can be adapted to a more conventional RAM/ROM configuration, eliminating the need for battery backup to preserve the programme.

You'll have to adjust the value at address 0031 so that the tone produced by the output is close to 1 kHz. All of the other time constants in the programme are dependent on this value, so once it's set, all other delay values will be right on the money.

Enter the phone numbers you want to have called, and you're in business! After using the unit for a while, you may want to modify some of the time constants or even some of the decisions about when the box is supposed to call. That's the beauty of a software-controlled system. Just change the appropriate values in the programme and make it do whatever you want.

This is just one small example of what *you* can do with MPUs. We'll try to include additional dedicated system applications in future columns. If you have a pet application you'd like to share, send it to the Radio Editor, in care of *Broadcast Communications*. BC

Peter Burk, BC's Radio Editor, is the chief engineer at WKBW Radio, Buffalo, New York.

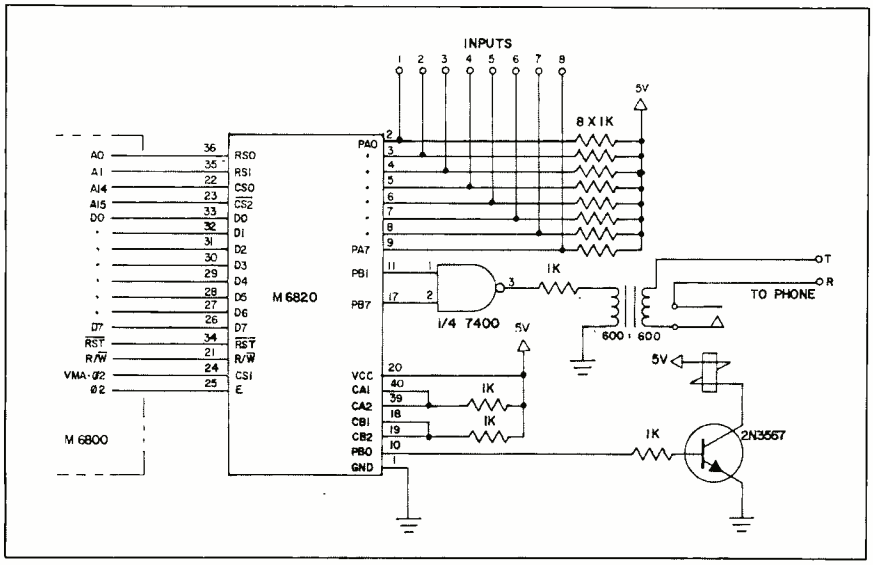


Figure 1 A peripheral interface adapter is used to connect the MPU to the telephone line and the alarm inputs. The circuit can be added to an existing 6800 MPU system or made part of a dedicated system.

Programme Listing

Programme listing for the automatic alarm dialer. The programme runs in less than 512 bytes of memory.

```
0001                            NAM     DIALER  *REV 0.2
0002                    **AUTOMATIC ALARM DIALER**
0003                    **
0004                    **INITIALIZE PIA**
0005                    **
0006  0000  86 00              LDA A   #00
0007  0002  B7 8000            STA A   $8000   A SIDE IS IN
0008  0005  86 04              LDA A   #04
0009  0007  B7 8001            STA A   $8001
0010  000A  86 FF              LDA A   #$FF
0011  000C  B7 8002            STA A   $8002   B SIDE IS OUT
0012  000F  86 04              LDA A   #04
0013  0011  B7 8003            STA A   $8003
0014  0014  7E 01A8            JMP     MAIN
0015                    **DATA  REGISTERS**
0016                    **
0017  001F              OUTREG  RMB     1
0018  0020              DLY0    RMB     1
0019  0021              DLY1    RMB     1
0020  0022              DLY10   RMB     1
0021  0023              DLY100  RMB     1
0022  0024              DLYTOT  RMB     1
0023  0025              INPREG  RMB     1
0024  0026              CNTR1   RMB     1
0025  0027              CNTR2   RMB     1
0026                    **
0027                    **0.5 MS DELAY**
0028                    **
0029  0030  86 18        HMSDLY  LDA A   #$18    ADJUST FOR 1KHZ
0030  0032  97 20              STA A   DLY0
0031  0034  7A 0020      LOOP0   DEC     DLY0    DELAY
0032  0037  26 FB              BNE     LOOP0
0033  0039  39                RTS
0034                    **
0035                    **ONE MS DELAY**
0036                    **                      ENTER W/# OF MS IN A
0037  0040  48          ONEDLY  ASL A           # OF MS *2
0038  0041  97 21              STA A   DLY1
0039  0043  96 1F      LOOP1   LDA A   OUTREG  TOGGLE BIT 7
0040  0045  8B 80              ADD A   #$80
0041  0047  B7 8002            STA A   $8002
0042  004A  97 1F              STA A   OUTREG
0043  004C  8D E2              BSR     HMSDLY
0044  004E  7A 0021            DEC     DLY1
0045  0051  26 F0              BNE     LOOP1
0046  0053  39                RTS
0047                    **
0048                    ** TEN MS DELAY **
0049                    **                      ENTER W/# OF 10MS IN A
0050  0058  97 22      TENDLY  STA A   DLY10
0051  005A  86 0A      LOOP2   LDA A   #$0A
0052  005C  8D E2              BSR     ONEDLY
0053  005E  7A 0022            DEC     DLY10
0054  0061  26 F7              BNE     LOOP2
0055  0063  39                RTS
0056                    **
0057                    **HUNDRED MS DELAY**
0058                    **                      ENTER WITH # OF
0059  0068  97 23      HUNDLY  STA A   DLY100  100 MS IN ACC A
0060  006A  86 0A      LOOP3   LDA A   #$0A
0061  006C  8D EA              BSR     TENDLY
0062  006E  7D 0024            TST     DLYTOT
0063  0071  27 03              BEQ     CONTIN
0064  0073  7A 0024            DEC     DLYTOT
0065  0076  7A 0023      CONTIN  DEC     DLY100
0066  0079  26 EF              BNE     LOOP3
0067  007B  39                RTS
0068                    **
0069                    **GENERATE CODE**
0070                    **
0071  0080  86 FF      CODE    LDA A   #$FF    TOTAL DELAY VALUE
0072  0082  97 24              STA A   DLYTOT
0073  0084  86 01      SEND    LDA A   #01
0074  0086  97 26              STA A   CNTR1   INITIALIZE CNTR1
0075  0088  D6 25              LDA B   INPREG
0076  008A  26 20              BNE     BTSTHD  BRANCH IF ALARMS ON
0077  008C  96 1F              LDA A   OUTREG
0078  008E  8A 02              ORA A   #02
0079  0090  B7 8002            STA A   OUTPUT  TURN KEY ON
0080  0093  97 1F              STA A   OUTREG
0081  0095  86 03              LDA A   #03     300 MS DELAY
0082  0097  8D CF              BSR     HUNDLY
0083  0099  96 1F              LDA A   OUTREG
0084  009B  84 FD              AND A   #$FD
0085  009D  B7 8002            STA A   OUTPUT  TURN KEY OFF
0086  00A0  97 1F              STA A   OUTREG
0087  00A2  86 01              LDA A   #01     100 MS DELAY
0088  00A4  8D C2              BSR     HUNDLY
0089  00A6  7D 0024            TST     DLYTOT  DELAY UP?
0090  00A9  26 D9              BNE     SEND    IF NOT, DO IT AGAIN
0091  00AB  39                RTS
0092  00AC  7E 0100    BTSTHD  JMP     BITTST
0093                    **
0094                    **BIT TEST**
0095                    **
0096  0100  C5 01      BITTST  BIT B   #01     BIT 0 = 0?
0097  0102  27 2A              BEQ     SHIFT   IF YES, GO TO SHIFT
0098  0104  96 26              LDA A   CNTR1   OTHERWISE, STORE
0099  0106  97 27              STA A   CNTR2   CNTR1 TO CNTR2
0100  0108  96 1F      KEYON   LDA A   OUTREG
0101  010A  8A 02              ORA A   #02
0102  010C  B7 8002            STA A   OUTPUT  TURN KEY ON
0103  010F  97 1F              STA A   OUTREG
0104  0111  86 01              LDA A   #01
0105  0113  BD 0068            JSR     HUNDLY  WAIT 100 MS
0106  0116  96 1F              LDA A   OUTREG
0107  0118  84 FD              AND A   #$FD
0108  011A  B7 8002            STA A   OUTPUT  TURN KEY OFF
0109  011D  97 1F              STA A   OUTREG
0110  011F  86 01              LDA A   #01
0111  0121  BD 0068            JSR     HUNDLY  WAIT 100 MS
0112  0124  7A 0027            DEC     CNTR2   COUNT DOWN
0113  0127  26 DF              BNE     KEYON   DONE? IF NOT, KEYON
0114  0129  86 03              LDA A   #03     IF DONE, WAIT 300MS
0115  012B  BD 0068            JSR     HUNDLY
0116  012E  57          SHIFT   ASR B           SHIFT
0117  012F  7C 0026            INC     CNTR1   INCREMENT CNTR1
0118  0132  86 09              LDA A   #09
0119  0134  B1 0026            CMP A   CNTR1   MORE BITS?
0120  0137  26 C7              BNE     BITTST  IF SO, TST NEXT BIT
0121  0139  BD 0145            JSR     HSECDL  IF NOT, WAIT 500MS
0122  013C  7D 0024            TST     DLYTOT  IS TOTAL DELAY UP?
0123  013F  26 01              BNE     SNDHDL  NO? GOTO SEND HANDLER
0124  0141  39                RTS             YES? RETURN TO MAIN
0125  0142  7E 0084    SNDHDL  JMP     SEND    SEND HANDLER
0126  0145  86 05      HSECDL  LDA A   #05     500 MS DELAY
0127  0147  BD 0068            JSR     HUNDLY
0128  014A  39                RTS
0129                    **
0130                    **LOOKUP TABLE**
0131                    **
0132  0150  05          LOOKUP          ADDRESSES 0150 TO 016F ARE
0133  0151  05          *               LOADED WITH TELEPHONE NUMBERS
0134  0152  05          *               TO BE DIALED.  LOAD ONE DIGIT
0135  0153  0A          *               PER BYTE, USING HEX  A FOR
0136  0154  01          *               ZERO.  SEPARATE EACH NUMBER
0137  0155  06          *               WITH ZERO.  FOLLOW LAST NO.
0138  0156  0A          *               WITH TWO ZEROS.  FIRST NO.
0139  0157  00          *               SHOWN HERE IS 555-0160.
0140  0158  05          *
0141  0159  05          *
0142  015A  05          *
0143  015B  03          *
0144  015C  02          *
0145  015D  09          *
0146  015E  01          *
0147  015F  00          *
0148  0160  05          *
0149  0161  05          *
0150  0162  05          *
0151  0163  08          *
0152  0164  09          *
0153  0165  04          *
0154  0166  02          *
0155  0167  00          *
0156  0168  00          *
0157                    **
0158                    **DIAL TELEPHONE**
0159  0170  86 01      TELACC  LDA A   #01
0160  0172  97 1F              STA A   OUTREG
0161  0174  B7 8002            STA A   OUTPUT  TURN ON LINE
0162  0177  86 18              LDA A   #$18
0163  0179  BD 0068            JSR     HUNDLY  FOUR SECOND DELAY
0164  017C  E6 00      DIAL    LDA B   0,X      ENTRY: X = LOOKUP
0165  017E  27 22              BEQ     CDHNDL  IF 0, GOTO CDHNDL
0166  0180  4F          PULSE   CLR A           ELSE,
0167  0181  97 1F              STA A   OUTREG
0168  0183  B7 8002            STA A   OUTPUT  TURN OFF LINE
0169  0186  86 06              LDA A   #06
0170  0188  BD 0058            JSR     TENDLY  WAIT 60 MS
0171  018B  86 01              LDA A   #01
0172  018D  97 1F              STA A   OUTREG
0173  018F  B7 8002            STA A   OUTPUT  TURN ON LINE
0174  0192  86 04              LDA A   #04
0175  0194  BD 0058            JSR     TENDLY  WAIT 40 MS
0176  0197  5A                DEC B
0177  0198  26 E6              BNE     PULSE   NOT DONE? REPEAT
0178  019A  08                INX             ELSE SET UP NEXT DIG.
0179  019B  86 1E              LDAA    #$1E
0180  019D  BD 0058            JSR     TENDLY  WAIT 300 MS
0181  01A0  20 DA              BRA     DIAL
0182  01A2  7E 0080    CDHNDL  JMP     CODE    CODE HANDLER
0183                    **
0184                    **EXECUTIVE**
0185                    **
0186  01A8  CE 0150    MAIN    LDX     #$0150  LOOKUP ADDRESS
0187  01AB  BD 01D6            JSR     CKINP
0188  01AE  91 25              CMP A   INPREG  HAS INPUT CHANGED?
0189  01B0  27 F6              BEQ     MAIN    NO? LOOP TO MAIN
0190  01B2  97 25              STA A   INPREG  ELSE STO NEW INPUT
0191  01B4  BD 0170    LOOP4   JSR     TELACC  AND ACCESS PHONE
0192  01B7  08                INX             ADVANCE LOOKUP POINTER
0193  01B8  A6 00              LDA A   0,X
0194  01BA  27 0D              BEQ     CLEAR   IF 0, START OVER
0195  01BC  4F                CLR A           TURN OFF LINE
0196  01BD  97 1F              STA A   OUTREG
0197  01BF  B7 8002            STA A   OUTPUT
0198  01C2  86 18              LDA A   #$18
0199  01C4  BD 0068            JSR     HUNDLY  WAIT FOUR SECONDS
0200  01C7  20 EB              BRA     LOOP4
0201  01C9  4F          CLEAR   CLR A
0202  01CA  97 1F              STA A   OUTREG
0203  01CC  B7 8002            STA A   OUTPUT
0204  01CF  86 18              LDA A   #$18
0205  01D1  BD 0068            JSR     HUNDLY
0206  01D4  20 D2              BRA     MAIN
0207  01D6  B6 8000    CKINP   LDA A   INPUT
0208  01D9  91 25              CMP A   INPREG  HAS INPUT CHANGED?
0209  01DB  27 08              BEQ     MHNDLR  YES? GOTO HANDLER
0210  01DD  86 0A              LDA A   #$0A    NO?  WAIT ONE SEC.
0211  01DF  BD 0068            JSR     HUNDLY
0212  01E2  B6 8000            LDA A   INPUT   NOW CHECK AGAIN
0213  01E5  39          MHNDLR  RTS
0214                    **
0215                    **I/O ADDRESSES**
0216                    **
0217  8000              *PIA INPUT              EIGHT ALARM INPUTS
0218  8002              *PIA OUTPUT
0219                    *                       BIT 0 = LINE
0220                    *                       BIT 1 = KEY
0221                    *                       BIT 7 = TONE
0222                            END
```

UNITED STATES

Better ratings through sports

This month's World Forum looks at the programming and engineering ideas exchanged during the recent NRBA convention.

Each month this column will be devoted to operating tips, construction ideas, and programming aids. And while we normally will print letters from readers that share this kind of information, this issue will focus on the highlights of the most interesting sessions held during the recent NRBA convention in San Francisco.

PROGRAMMING. On the programming side, Mutual's Larry King said that one reason his talk show is successful comes from screening all callers. This way, only the most interesting types make it on the air. King also said that a selling point for talk shows is that the listeners are listening. With music formats, there's no guarantee the programme is being used for more than background music.

Talking about dealing with advertisers, King said that the handkerchief-waving tradition of the Miami Dolphins' fans started when his station was asked to prove people at the stadium were listening to the game coverage. Previously unannounced, the station asked the fans in the stadium to wave their handkerchiefs when the Dolphins scored.

Sure enough, the Dolphins scored; and as the fans waved their handkerchiefs, a helicopter flew over and took a crowd shot. Copies of the photo were distributed to the advertisers, who were delighted.

During the same session, Norm Woodruff of The Woodruff Organization told programmers that the key to a successful news operation is to allow no news presented before 8:30 a.m. to be repeated after 8:30 a.m., unless something significant had changed or there were further developments.

Woodruff also was concerned that too many stations hire news people on the basis of charm and charisma. Instead, he insisted, we should be more concerned about hiring people who understand local and national government.

The combination of knowledgable news people and not repeating old news should make for a creative news approach. Your news people, said Woodruff, will be forced to be a lot more creative.

Richard Penn of WWWE, Cleveland, told the talk, news, and public affairs session attendees that sports was the key to their programming success. During the football season, the station runs a Saturday afternoon show where the DJ answers calls on football scores and does a complete summary of scores across all leagues around the country. Using call-ins as a yardstick, Penn says it's a very popular programme.

But WWWE's sports involvement runs a lot deeper than that. They do heavy promotions on attendance for the opening day of a season for all sports. In fact, on the Cleveland Indian's opening day this year, WWWE broadcast all their shows from the stadium. And their opening game attendance promotion made money for the station, too. They went to local industry leaders and sold them air time so the industry executives could help encourage listeners to attend the game. According to the baseball team officials, the club figured that WWWE's promotional efforts accounted for an additional 20,000 fans on opening day.

ENGINEERING. On the engineering side, the talk was mostly about satellites and AM stereo. Hardly a session went by without hitting these subjects. In another section of this issue of *Broadcast Communications*, you'll find plenty of details on what it takes to get your toes wet in satellite earth terminals.

During the AM engineering session, Ed Edison, a consulting engineer, pointed out that for a long time stations have forgotten about optimizing transmitter loads. Mostly because of the AM stereo tide that is waiting on the FCC's green light, there's been a renewed interest in maintaining symmetrical reactances at symmetrical sideband frequencies so that the final amplifier in the transmitter sees a symmetrical load.

The load can be made symmetrical by controlling the amount of phase shift between output of the plate circuit of the final tube and the ultimate load. What's needed is to alter the phase shift of the network that matches the transmitter to the line, or common point. That should give you symmetrical load reactions at the sideband frequencies.

Edison says this procedure is just "the frosting on the cake." If you want to do the best job, said Edison, you have to start with a good deal more thought than just trying to rotate the load you have to make it optimum. "The ideal transmitter load," said Edison, "would be one that looked like 50 ohms and no reactance, not only at the carrier frequency, but also at every sideband frequency. The laws of physics just don't permit it. So we normally set transmitters to work into non-reactive loads at the carrier frequency, and we sort of take what we get at the sideband frequencies."

But as Edison warns, you could find some really bad VSWR readings at the sideband frequencies, further complicating your life. While it's possible to get some antennas down to 1.1 to 1 at plus or minus 10 kHz, other antennas operating in the field would show up as high as 3 to 1 10 kHz from the frequency. And the problem is worse at the bottom end of the AM band.

Apparently, the problem is just as bad in directional systems. And here, says Edison, a lot of problems that exist in the field come from applying cookbook engineering to directional phasor designs. But apparently, there is no easy or perfect solution.

Regardless of the headaches and challenges AM stereo will bring, everyone at this convention, especially those attending the AM engineering and programming sessions, was anxious for the FCC to give the go-ahead. Engineers were saying "We've got to prepare for it now," while station managers and sales managers felt "It'll psych up our salesmen."

In future articles in *Broadcast Communications*, you can look forward to updates on AM stereo. And if you're already into the process, drop our editors a line so we can show the industry how you're doing it. Our address is: Broadcast Communications, P.O. Box 12268, Overland Park, Kansas 66212.

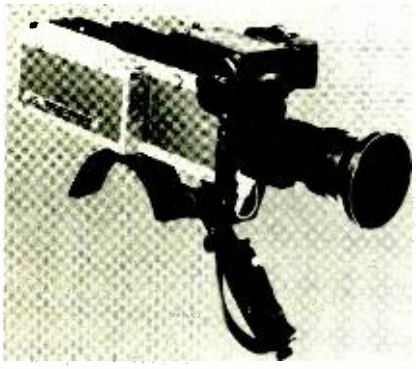
BC

FOR MORE INFORMATION
To obtain additional information on any product in Product Premier, simply circle the number on the Reader Service Card that corresponds with the boldface number following each product name.

Studio/ENG camera (95)

JVC — The CY-8800U is a broadcast-quality camera designed for studio use as well as ENG/EFP applications.

With the basic configuration, the CY-8800U is a compact ENG/EFP camera that's completely self-contained. And it becomes a studio camera by adding the RS-8800U remote synchronizing unit and the large-screen, top-mounted viewfinder.



Other features of the CY-8800U include a 1.5-inch adjustable electronic viewfinder; battery warning system; colour bar generator; auto white balance; electrical colour temperature adjustment; and time lapse meter.

Dialogue replacement module (64)

CONVERGENCE CORPORATION — Foreign language sound-track dubbing and lip-sync dialogue replacement are just two applications for the ADR-100 Automatic Dialogue Replacement Module, a plug-in option for Convergence's Series ECS-100 editing systems.

Operators can now automatically replace audio segments on 3/4-inch videocassettes with a live mike. When activated, the ADR-100 enables initiation of a continuous audio record cycle similar to "looping" or post-sync sound dubbing. The record VTR rolls back to the cue point, rolls forward through the audio in-edit and out-edit points, and post-rolls for one second. The entire process is automatically repeated.

During each cycle, the announcer can monitor one audio channel while his mike provides input to the second audio channel. Prior to the edit point, he will hear three audible "beep tones" at one-second intervals after which the record VTR will go into the audio record mode. During each automatic recycle, the announcer may repeat the recording. When the recording is considered satisfactory, the cycle is manually terminated. The replay cycle permits review of the second dialogue and, since replay does not cancel the edit points, the ADR can be reinitiated over the same points (if desired).

Audio delay line (63)

THE KEN SCHAFFER GROUP — The Eventide BD955 is a RAM-based digital delay line offering delay up to 6.4 seconds. Designed primarily for policing live shows, it comes with a DUMP button which cancels objectionable programme material and, if desired, cuts off the caller.

When not being used as an editing delay, the BD955 may be used as a production tool. Front panel switches allow setting of delay from about 6.5 milliseconds to the unit's maximum delay, a range useful for many musical effects, including so-called doubling, or giving the audible illusion of multiple speakers, singers, or instrumentalists.

Video tips for quad VTRs (66)

VIDEOMAX — A new, long-life tip material that is resistant to noise-generating microfractures, is now available for the Videomax XM series quadruplex video heads. MEGAMITE™, a polycrystalline ferromagnetic spinel, is unaffected by varying tape chemistry, thermodynamically stable, and electromagnetically optimized for quad VTRs, according to the company. It is currently available in RCA low-band, high-band, and super high-band configurations.

Stereo matrixing system (78)

AMPRO BROADCASTING — With AM Stereo nearing final approval in the U.S., and with FM Stereo entering more homes than ever before, the quality of stereo reception on monaural receivers is becoming increasingly important to the broadcaster. And Ampro's Monomax stereo matrixing system is designed specifically to assure quality stereo being received on monoaural receivers.

Monomax achieves this quality stereo reception by matrixing the left and right stereo signals and recording the actual mono sum (L+R) audio onto a single tape track; this minimizes the degradation of the mono signal caused by intertrack phase shifts. The difference signal (L-R) is recorded on the second track, allowing full recovery of the stereo signal upon playback and dematrixing.

Designed as two independent channels, Monomax can be used as a simultaneous matrix-dematrix system around a single recorder, or as two independent dematrix channels for two separate playback units. It can be used with all cart tape decks and reel-to-reel equipment.

Editing Modification Package (76)

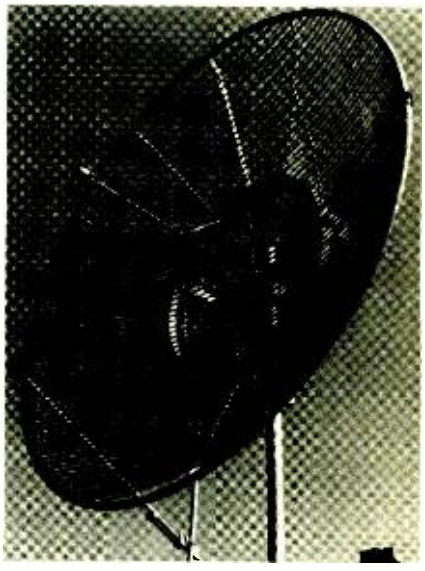
VIDEOMEDIA — A new modification package (VM 95UA) has been introduced for the Panasonic NV-A950 ¾-inch editing controllers. An important feature of the new modifications is the ability to interface with Panasonic NV 9200, NV 9500 and Sony VO 2860 VTRs without mechanical alterations and without affecting VTR factory warranties.

According to Videomedia, the VM 95UA cuts editing time by as much as 40% by providing bi-directional joystick control of all key editing functions; simplified activation of all modes, including pause; single control for all VTR search modes; forward and reverse; and logic reset buttons which enable the operator to cancel logic on either side of the machine.

Other features of the VM 95UA include programmable-previewable timed inserts, start and end; automatic return to edit point; full remote control of both VTRs; automatic assemble; and 2X forward search and cue speeds.

Parabolic antenna (85)

ANIXTER-MARK — The newest addition to Anixter-Mark's line of antennas is the 12-foot Multi-element Grid Parabola line for use in all frequency bands from 350 MHz to 2700 MHz.

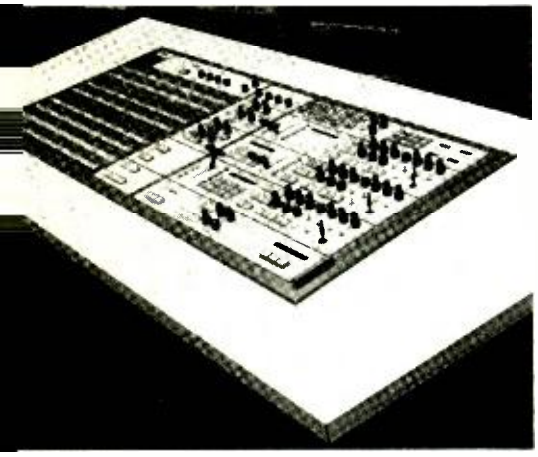


Antenna efficiency is a minimum 55%. Cross-polarization discrimination is typically 35 dB to 40 dB at 0° azimuth; windload characteristics are 25% (below 1000 MHz) and 40% (above 1000 MHz) of an equivalent solid parabola.

Alignment is greatly simplified with the fine azimuth adjust located on a stiff arm attached to the outside rim of the antenna. Heated models are available for climates where de-icing is a requirement.

PAL production switcher (94)

AMPEX — A PAL version of the Duca-Richardson model 4000-E-1 production switcher has been displayed by Ampex.



The 4000-E-1 offers 16 active inputs plus colour black and colour background, along with a wide array of features. Main operating controls are located on a subpanel, the Function Module, that puts each control within easy reach of the operator. Wipe patterns and key sources can be preselected from the compact 15-button keyboard. Keys can be inserted in the mix-effects system; all key sources are accessible through keyboard selectors. And, each mix/effects system processes five levels of video simultaneously, including key and insert video from the key source selected.

Remote-control unit (81)

IGM (DIVISION OF NTI) — The development of a manual-assist, remote-control unit for control of production room elements in the creation of commercials has been announced.

The MARC VII will control seven audio sources, and can manage as many as 84 tracks on multi-track recorders. Consisting of a simple keyboard and a CRT, the MARC VII includes a built-in elapsed time readout which enables the operator to add overlaps and fades, and do multiple starts and special effects at precisely controlled moments.

The new unit can be used simultaneously as a DJ programming assist and a production control. The operator simply programmes as many as 18 events to play sequentially, then switches to the audition channel for production work while those 18 events are aired as programmed. In production of some television commercials, the MARC VII is also useful as a master control.

FM pilot-tone system (91)

DOLBY LABORATORIES — A new FM pilot-tone system, currently being developed by Dolby Laboratories, will enable an FM station to broadcast a number of pilot-tones to identify various characteristics, such as Dolby system encoding and matrix four-channel systems. Special detecting circuits can then be used in FM receivers and tuners to switch on appropriate decoders and indicators automatically.

1-inch helical VTR (93)

RCA — The TH-100 is a new high-performance 1-inch helical scan VTR using the Type C format. Complementing the TH-100 is a portable VTR, the TH-50.

The TH-100 utilizes the NTSC high-band direct FM recording system. By performing off-line edit and production functions, it frees standard studio equipment for on-air time. Cross-talk isolation permits independent use of audio tracks, allowing for stereo programming and multi-language transmission via simulcast techniques. Other features include modular design, complete monitor switching, colour framing, and complete vertical blanking interval recording.

Digital video timer (61)

QSI SYSTEMS — The QSI Video Backtimer (model VBT-1) displays hours, minutes, and seconds on any television monitor to provide cumulative time, segment time, and countdown. When zero is reached counting down, the timer automatically counts up and displays "time-in-the-hole."

Mounting in a standard 19-inch rack, the VBT-1 can stand alone or be integrated into master clock or master ID systems. Time display sizes and screen locations can vary on each monitor. The VBT-1 is powered by 100 VAC, 60 Hz; frequency response is less than 0.5 dB to 8 MHz; differential gain is less than 1%; differential phase is less than 1°; and hum and noise are 60 dB.

Modulation monitor (73)

BELAR ELECTRONICS — The FMS-2 stereo modulation monitor incorporates two independent autoranging voltmeters, allowing the broadcaster to automatically measure the channel separation and crosstalk. In addition, two independent peak modulation meters allow simultaneous monitoring of left and right channels of L+R and L−R.

Features of the FMS-2 include front-panel switchable de-emphasis for noise measurements; pilot alarm with front-panel indicator; balanced audio outputs, +10 dBm; and remote outputs for two or more meters.

Cinema Perspectives

CINEMA PRODUCTS — The fall 1978 issue of *Cinema Perspectives*, published by Cinema Products as a service to the motion picture and television industries, is now available.

The four-colour, 16-page edition features informative stories on news/documentary filmmaking, as well as an article on the use of the Oscar-winning Steadicam system.

Microwave link (70)

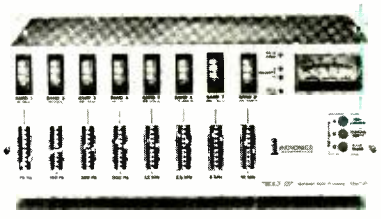
INTERNATIONAL MICROWAVE — The EJ-1013 electronic journalism microwave link is designed especially for electronic news gathering in the 12.7 to 13.25 GHz band.

This all-solid-state, portable, dual-conversion FM system accommodates a video signal, and one or two audio channels over a line-of-site path up to 1 kilometer (.7 miles) using horn antennas. Two circularly polarized horn antennas are supplied.

The transmitter and receiver each consists of two major parts: the RF head and control unit. RF heads, control units, and carrying cases are colour coded to ensure proper coordination between transmitter and receiver.

Audio processor (72)

INOVONICS — Now available is a second-generation multiband audio processor designed to assure optimum transmitter modulation in AM and AM-stereo broadcast service.



The MAP-II features a gated, gain-riding AGC amplifier to erase long-term programme-level variations, and to provide subsequent processing stages with a constant programme level. The 8-band, "open-loop" compressor section is equipped with individual, calibrated

Continued on page 68

input and output controls for full programme equalization flexibility. Selectable high- and low-pass filters allow the user control over bandwidth restriction.

Studio monitor (71)

AUDIO TECHNIQUES — The Little Red Studio Monitor, a smaller version of the company's Big Red and Super Red systems, is ideal for listening rooms, A & R departments, and small mix rooms.

Little Red incorporates the same quality of frequency response, transient response, and phase correlation as the larger systems. The crossover uses the same air core honeycomb wound coils and precision mylar capacitors as in the Mastering Lab Frequency Divider. A mid-frequency and hi-frequency equalizer are included, allowing minor room compensation and tuning to suit individual taste.

Antenna obstruction light (74)

FLASH TECHNOLOGY — The FTB-300 ElectroFlash Beacon is a 300mm white omni-directional flashing antenna obstruction light which has been approved by the U.S. government for use as part of an L-856 Obstruction Warning Lighting System.

The FTB-300 consists of two components: the beacon itself and a power converter. The beacon contains the flashtubes and a minimum of electronics; the power converter contains the power supply and additional electronics necessary to integrate the FTB-300 Beacon into the control and monitor system used in both the FTB-105 and FTB-205 ElectroFlash Beacon systems.

Time delay generator (75)

COMEX SYSTEMS — The model TDG-100 digital audio delay system features wide dynamic range; low noise; no moving parts; digital memory system; and transformerless 1/0.

The TDG-100 has a delay up to six seconds. Input impedance is 600 ohms high Z bridging balanced/unbalanced; output impedance is 600 ohms balanced/unbalanced. The system has CMOS construction and RAM memory.

VO-2860 edit mod kit (96)

EMS INC. — The MK-60 VTR modification kit enables use of Sony's new series VTRs with existing edit control systems. It installs in only 30 minutes with no trace cuts, mechanics, or extensive VTR modifications.

State-of-the-art microprocessor with on-board 1K PEROM programme allows expansion and enhancement of edit control system features, while retaining full VTR design features. The MK-60 features reduced tape damage through computer control of turn-arounds, delays, rolls, and all-torque state changes; reduced edit time through switch-selected preroll; and improved edit accuracy under all VTR maintenance conditions via 62-frame switch-selectable edit timing window.

VTR is independently correctable at the VTR through ±31 frames. Since edit timing is accomplished at the VTR, there is no need to re-time edit system when VTRs are changed or gang-rolled. Computer-programme internal-self-test at the flip of a switch.

Switching system (80)

DYNAIR — The System 21 is a modular, expandable switching system, available in 10x10 up to 1000x1000 matrix sizes. Audio, video, and data can be handled by the system; and the integral microcomputer control provides an RS-232 port for automation control systems interface. System 21 utilizes proprietary, integrated, and solid-state components.

Amplitude modulation controller (84)

DELTA ELECTRONICS — The model AMC-1 amplitude modulation controller automatically controls the modulation level of an AM transmitter to prevent excessive or undesirably low modulation. It also provides up to ±8 dB adjustment to the audio level.

By continuously sampling the modulation levels at the transmitter output and comparing these levels with internal preset minimum and maximum modulation thresholds, the AMC-1 detects conditions of under- or over-modulation. The AMC-1 then uses a digital logic process to adjust the audio level to the transmitter. The audio control circuit is strictly linear so that no compression or asymmetry is added to the programme.

Colour bar generator (86)

LENCO — A new precision colour bar generator, the PCB-320, includes the new SMPTE alignment colour bar test signal with chroma and black set signals.

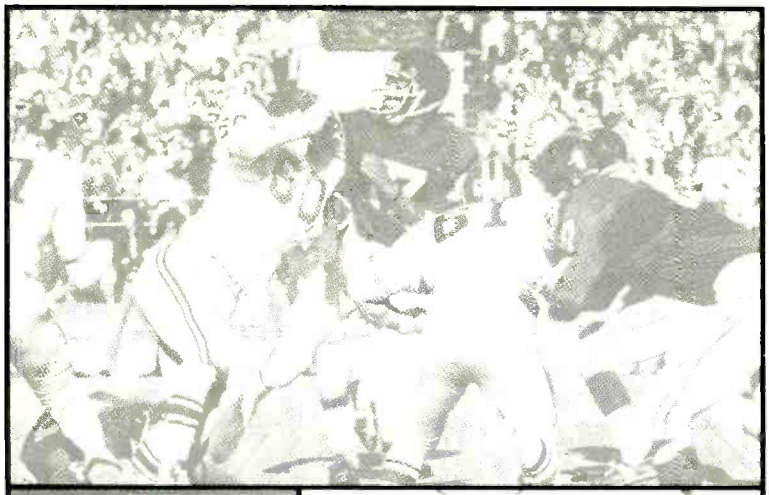
The alignment colour bar test signal (reverse bars) provides a standard method for the adjustment of chroma gain and phase, and brightness of colour monitors. Also provided are a full-field bar signal and the standard split-field signal.

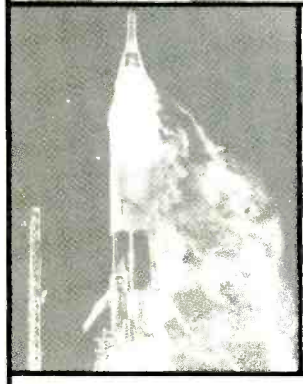
Battery pack (92)

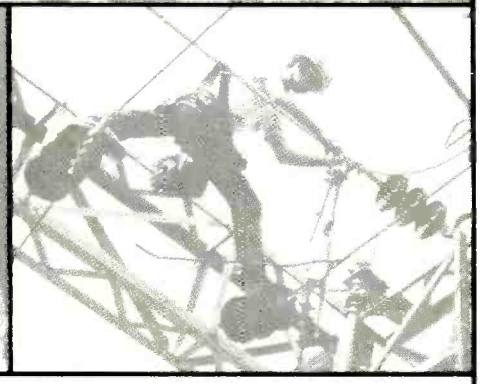
FREZZOLINI ELECTRONICS INC. — The Frezze model FSLA-12-2 is a replacement battery pack for Sony VO-3800 and Sony BVU-100 portable videocassette recorder-players, and for Sony DXC-1600 portable video colour cameras. The FSLA-12-2 is compatible with and fits into the battery compartments of these Sony units.

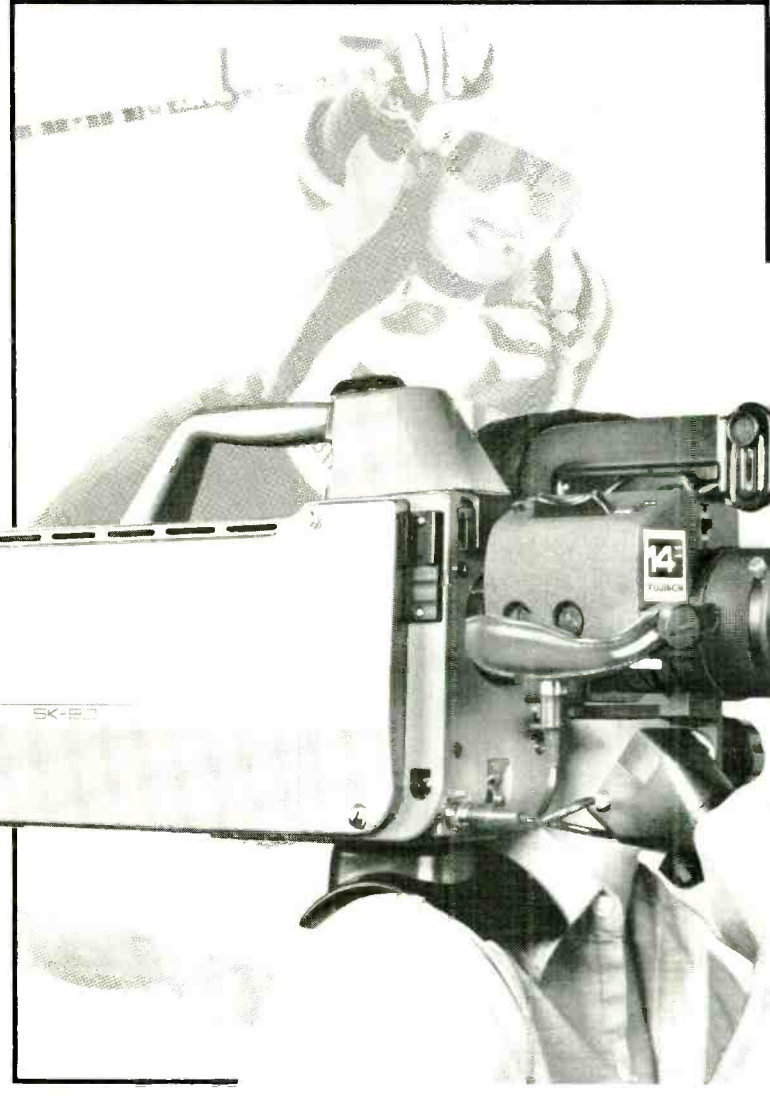
With the battery pack, the Sony VO-3800 runs for 50 minutes, the BVU-100 for 55 minutes, and the DXC-1600 for 60 minutes. Pack power is derived from advanced-design U.S.-manufactured sealed cylindrical lead-acid batteries that provide 12 VDC with a capacity of 2 ampere-hours. The FSLA-12-2 can be recharged with Sony chargers by using an (optional) Frezzi model FAC adapter cable. BC

THIS MONTH'S HALL OF FAME









The HITACHI SK-90

Unsurpassed Picture Quality in a Free-Ranging Portable.

High technology in camera design is Hitachi's business. And the phenomenal SK-90 shines among Hitachi's previous successes.

With the comfortably balanced, self-contained SK-90, you can go on location and shoot action features, documentaries, commercials, training and sales tapes—without worrying about complex equipment, tripping over bulky cords, or staggering under heavy loads—and always producing an image truly worthy of broadcast transmission. The SK-90's sophistication makes it easy for you. Anyplace, anywhere from sub-zero to over 100° F. operating temperatures.

Technological advances? The SK-90 is brimming with them.

A Hitachi-developed Automatic Beam Optimizer (ABO) circuit cuts out the comet-tailing effect common to lesser cameras when shooting highly reflective objects.

Three 2/3" Saticon tubes combine with a smaller-size high index beam splitting prism to deliver better than 500-line horizontal resolution and better than 51dB signal-to-noise ratio.

And, of course, there are all the additional features that assure sharp, crisp pictures and true colors: built-in 2H contour enhancer with comb filter...standard I & Q encoder...switchable color bar generator...automatic white balance...automatic iris...and a built-in Genlock circuit using black burst to lock your SK-90 to other cameras.

Options include a built-in linear matrix masking amplifier for high fidelity color rendition and a complete remote operating unit which lets the camera range up to 1000 feet away on standard camera cable. For an even greater working range of over 3000 feet, a Digital Command Unit/Triaxial Cable System is also available.

Remarkably, the Hitachi SK-90 may be the first affordable, self-contained portable that doesn't compromise. Contact your Hitachi dealer for more details.

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Circle (23) on Reader Service Card

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To win in Las Vegas, you've got to have your act together. And not all the big winners are in the Casinos.

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It's a regular happening because Hilton and Ward-Beck have developed a winning system... top name talent ... and top rated sound.

It feels good to be a winner! Try it. You'll like it!

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