AUGUST 1976

BM/E

BROADCAST MANAGEMENT/ENGINEERING

REPORT ON AUTOMATION INTERFACE INSIDE.

Ward-Beck at the XXI Olympiad

The XXI Olympiad, a dedication to excellence within the framework of competition. A challenge for the athletes. A challenge for the supporting communications equipment.

Ward-Beck is proud to have been chosen by Canadian Broadcasting Corporation to supply WBS 75046 Mobile Audio Consoles to broadcast the 1976 Olympic Games to the world.

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Two computers talking to each other is hardly news as most computer users will tell you. But in the broadcasting industry the interface of business computers with tech op computers is the beginning of a new era. See article, page 44. (PDP-11 computer photos courtesy DEC)

ABP

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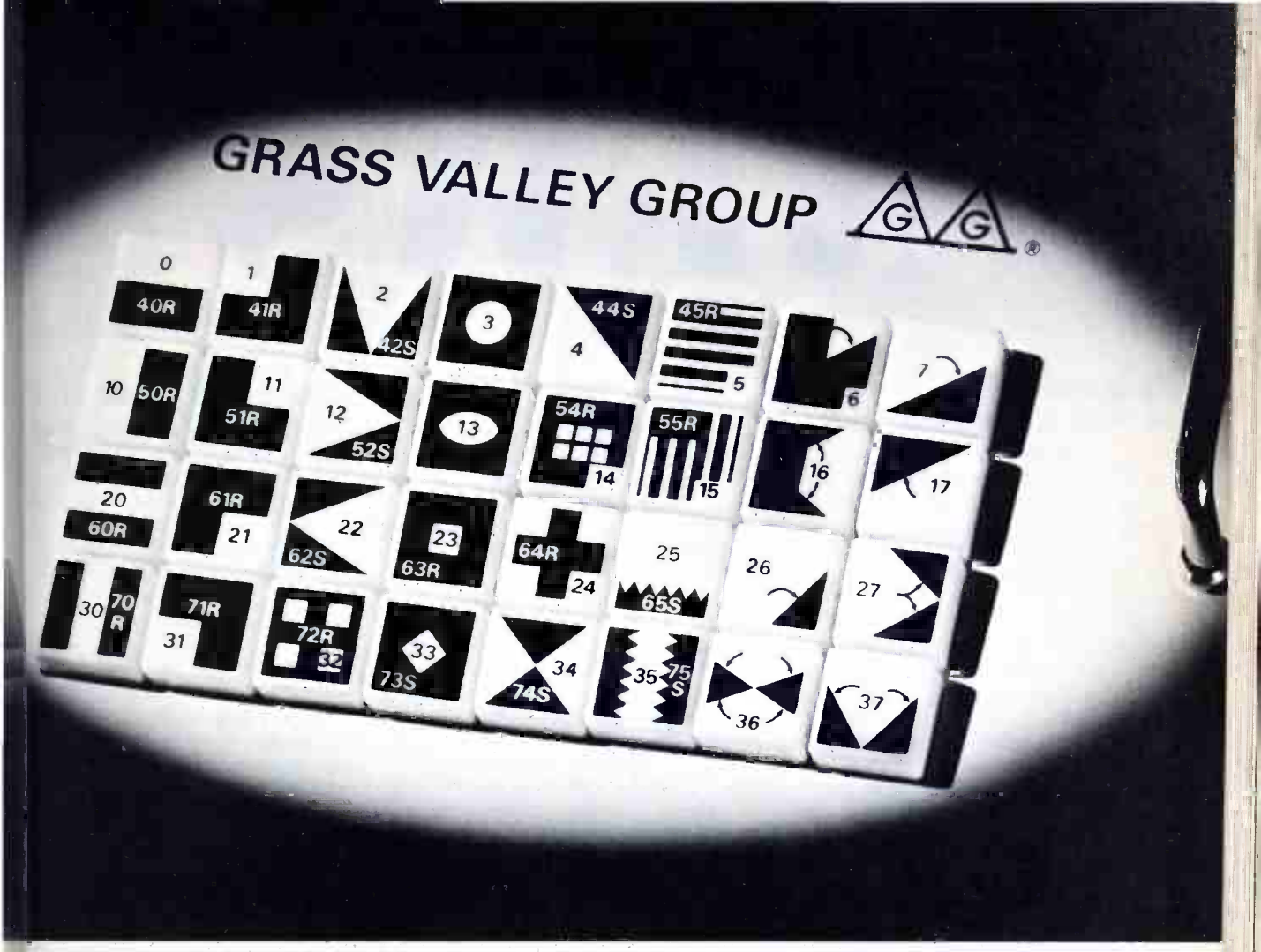

INTRODUCING . . .

Model 1600-7K Switching System With *Rotational* Wipe Transitions

Model 1600-7K is a 24-input, 8-output, production switcher with 3 mix/effects systems, plus program and preset buses with flip-flop mixing. Each mix/ effects system provides both rotary and conventional wipe effects.

Several types of rotational transitions are possible, for example wipes which pivot about a fixed point to produce a clock, windshield wiper, or fan effect. The rotational feature can also be applied to many conventional patterns to produce either a rotational effect or a splitting effect. A square or a group of 4 squares can be made to rotate as they expand in size. Separation of the transition control levers allows *independent* control of size and rotation. Soft wipe and bordered wipe operation is available with most rotary patterns.

Selection of a pivotal wipe is obtained by depressing a unique pattern button. Selection of the rotational mode (R) or splitting mode (S) for conventional patterns is achieved by first selecting the conventional pattern (e.g., a square), followed by operation of a "shift" key. A total of 54 patterns is available.

Model 1600-7K is also available in PAL and PAL-M versions. For additional information on the system, including a demonstration video tape, contact your nearest Grass Valley Group field office.

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BROADCAST INDUSTRY NEWS

Reregulation Marches On As FCC Issues Changes

As part of the reregulation process, the FCC recently made the following rule amendments (among a number of others—broadcasters should make sure they have all releases on rule amendments in this period of tremendous FCC activity):

Freed station operators to put static current drain and lighting components across the antenna terminals *following* the point of resistance measurement;

Eliminated the requirement for AM stations operated by remote control to make antenna monitor readings at the tower every second day, if the station is using an approved antenna sampling system and a type-approved antenna monitor;

Changed the rule to allow station licenses to be kept in binders or folder rather than on the wall, if the licensee so prefers;

Removed a requirement that direct-controlled stations make more frequent base current measurements than remote-controlled stations, if they use a type-accepted monitor;

Added a new section to the rules covering "skeleton proof of performance," and "partial proof of performance," allowed in certain circumstances for directional antennas;

Made more specific the requirements for FM field strength measurements, beyond the earlier statement, "in accordance with good engineering practice;"

Amended remote control requirements for Class D, educational FM stations—since transmitter meters are not required, there is no need for remote control metering. (Report No. 14225).

'Stereo AM' Urged on FC

A petition has been filed with the FC calling for a Rule Making Proceedi to look toward a change in regulatio that would allow AM broadcasters operate stereophonically on a pe missive basis.

The petition, filed by Kahn Comm nications, Inc., a Long Island, N. manufacturer of communications, tel phone, and broadcasting equipmer states that the patented AM ster system, which has been developed ov a sixteen year period, is: "Complete compatible with standard AM broa casting . . . (and) will allow radio li eners to enjoy stereophonic recepti with little or no additional investme in receiving equipment."

The petition cites on-the-air te made over a 3½ year period at n

continued on page

44 TV Markets Receive Live Stereo

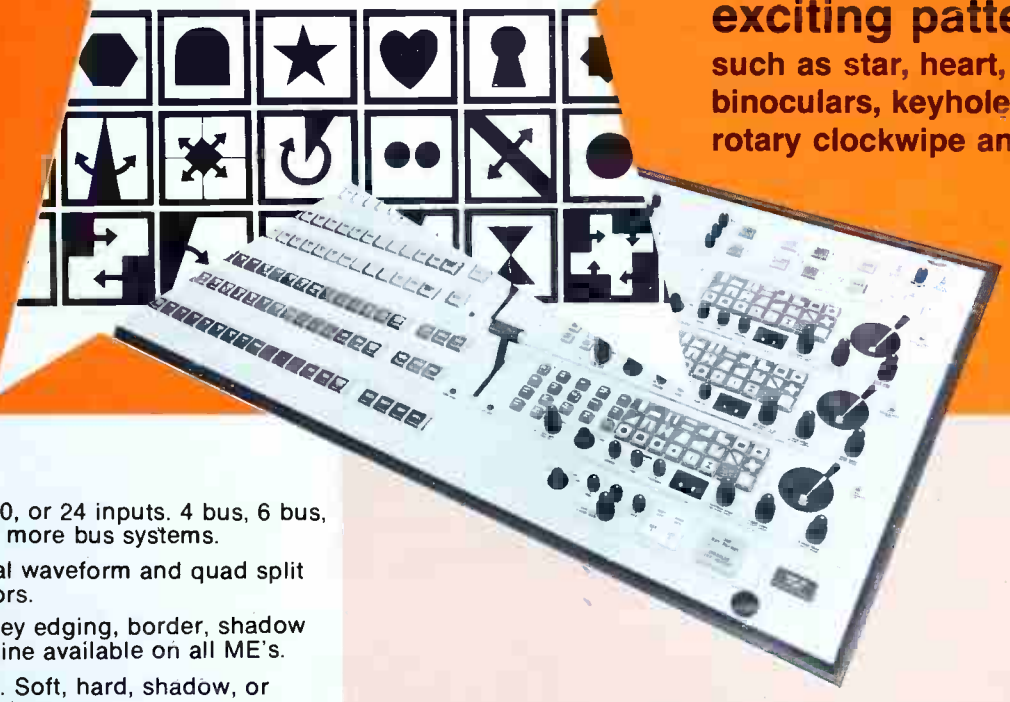
The largest live stereo-network in the history of broadcasting was established for the *Live From Lincoln Center* nationwide television broadcast of American Ballet Theatre's "Swan Lake" on the Public Broadcasting Service (PBS), June 30th. The program reached 44 television markets, representing a potential audience of over 107 million—more than half of the nation's television viewing audience.

The stereo sound portion of "Swan Lake" was distributed by microwave, land line and satellite. The signal was received by cooperating FM stations in the corresponding markets. This stereo network, recently nominated for an Emmy award for outstanding technical achievement, was created by the Lincoln Center Media Development Department, under the direction of John Goberman.

Photos show Mark Schubin, consultant to Lincoln Center before the audio control rack and two Sony audio mix consoles (one for the orchestra, the other production). Recorders are Ampex (for audio) and Sony (video cassette). Stereo channels were located above the video signal (5.8 MHz, L, and 6.6 MHz, R). Subcarriers were set at 0.1V p-p; diplexer was made by Leaming Industries.

VIX-114 production switcher with STAR studded features

Choice of over 80 exciting patterns
such as star, heart, binoculars, keyhole, rotary clockwipe and more



- 12, 16, 20, or 24 inputs. 4 bus, 6 bus, 8 bus or more bus systems.
- All digital waveform and quad split generators.
- Digital key edging, border, shadow and outline available on all ME's.
- Vari-key. Soft, hard, shadow, or see-thru key.
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- Electronic vignette. Adjustable soft pattern edges.
- Superb linear chroma keyer. RGB or encoded.
- New digital, drift and jitter-free proc. amp on output.
- Ready to interface for computer aided operation.
- Many more state of the art and operational features described fully in series 114 brochure.

The VIX-114 series video switching systems are conceived and designed by the largest specialized independent video switching company in the USA. Vital Industries, Inc. is holder of US patents on digital effects and analog rotary effects. Vital VIX-114 series switchers open new vistas in production of television commercials and programs to yield maximum pleasant visual impact.

Do not fear to discover a superior product in the VIX-114 series switchers. Ask to see the demo tape for a sample of what we can do for users of switching equipment.

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radio stations, WFBR, Baltimore, and XETRA, Tijuana, Mexico. The results indicate "complete compatability" for the system with existing FCC rules and other AM broadcasting systems.

Teleprompter Inaugurates Lightwave Era For Cable Television

The first step by the cable industry into the era of lightwave communications was taken on July 9th when the Teleprompter Company switched on line, at their New York headquarters, an 800-foot section of "fiber optics" cable to carry pay-cable programming over a part of the regular haul to subscribers all over the United States.

Coming to the Teleprompter headend in Upper Manhattan by microwave from HBO's midtown programming center, the programs were demodulated and fed at baseband to an LED unit designed specifically for lightwave communications by Bell of Canada. The LED, directly modulated by the signal, injected about 100 microwatts of light into a single glass fiber, about 90 microns in diameter, at a wavelength of 8200 Angstroms, or just beyond the visible spectrum into the infra-red.

The cable, with glass fiber made by a new firm, Fiber Communications, Orange, N.J., and with jacketing by Belden Company's research center in Geneva, Ill., exhibited the characteristics that hold such immense promise for the cable industry (as for all point-to-point telecommunications). The cable loss is about 10 dB per kilometer or 16 dB per mile, compared with about 40 dB per mile for standard coax. The cable does not discriminate against high frequencies: there is no "slope" to compensate for. The cable used in Teleprompter, about a quarter-inch in diameter, easily held six of the fibers (only one was being used in this experimental trial), and could be pulled into crowded ducts that would not hold another coax assembly of anything like the same channel capacity. Moreover, in quantity production the cable will be much cheaper than coax: the base materials for glass are among the most abundant in the earth's crust.

The lightwave signal, too, is immune to interference from electrical and magnetic fields, a great boon to cable operators who must get signals through areas crowded with electrical apparatus.

At the other end of the Teleprompter optical run, a PIN photodiode converted the light signals back to electrical signals, and they continued on Teleprompter's regular delivery route. *BM/E* watched monitors at the Teleprompter headend as they were switched back and forth between the input and the output of the optical section, and saw absolutely no change in quality. The bandwidth of the system as now being used is 20 MHz; however, this can readily be increased almost at will and a single fiber will eventually be able to carry 10, 20, 30 or more cable channels. Alternatively, a cable company could use cabling with 20 or 30 fibers, one for each channel, with simplification of head-end equipment.

Teleprompter plans to expand its use of optical transmission at an evolutionary pace, as expansion needs make it desirable. William Bresnan, president of Teleprompter, said in a statement to *BM/E*: "Many think that lightwave communications is something that won't be here for another 10 to 20 years. They are wrong: it is here now. We have a working application in one of our cable television systems. We hope that others in our industry will embrace this new technology as we have done."

continued on page

CANON'S NEW P18X16B2* 'INSTANT CLOSEUP' LENSES HAVE TURNED WPIX'S YANKEE BROADCASTS INTO A WHOLE NEW BALLGAME". Otis Freeman

Vice President/Engineer, WPIX-TV

When WPIX, in New York bought 5 of our new lenses heir Yankee Stadium installa- it was the biggest news for ers since instant replay.

For a lot of reasons:

P18x16B2* lenses have om access to all range ex- ers. Because they don't have cle through, the director isn't ed to cut away to another camera when he's already he best angle...and he needs to move in for a tight eup.

The lenses also have automatic compensation different light levels, which means there's less to about when the action down on the field is fast furious.

The fact that they've got the best relative aperture in the business is frosting on the cake. P18x16B2 lenses can go from 16 to 216 millimeters without losing aperture . . . where other lenses are already falling off at 160 millimeters.

And to top if all off the extreme wide angle of our new lens gives WPIX the best panoramic shots they've ever sent down the pipe.

If all this sounds good to you, *seeing* what our new lens can do is even better. No matter what kind of camera you're using—or contemplating—call us to arrange a demonstration.

*for 1¼"/30mm Plumbicon†. Also available: PV18x12B2 for 1"/25mm Plumbicon.

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NEWS

IBC and Vidcom in Sept.

Back to back conferences in Lond and Cannes this September will rep sent the latest in broadcast and vid disc developments.

The Sixth International Broadcasti Convention will be held at Grosve House, Park Land, London, Se 20-24 and features a heavy techni program covering automation, el tronic journalism, satellite bro casting and distribution systems p the latest on recording, production a transmission. The IBC exhibit ranks one of the important internatio market places. For more info write S retariat, IEE, Savoy Place, Lond UK, WC2R OBL.

Starting Sept. 23 and runni through Sept. 28 will be the Fi Vidcom held in Cannes (Franc Palais des Festivals. Vidcom, billed the international market of vid communications, will explore the lat in video cassettes, video discs, ca TV, production equipment and du cation equipment. It incorporates M com, the market for communicati programs. Program caters to prod ers, publishers, distributors, and us such as communications specialis training directors, cable TV operato and equipment specialists.

Program details include video company training, in schools and u versities, in information and market and in consumers markets. For m details contact Vidcom c/o Jc Nathan, 30 Rockefeller Plaza, St 4535, New York, N.Y. 10020, (2 489-1360.

RCA CCTV Helps Olympics Coverage

Some 3500 Colortrak and XL-100 sets were loaned by RCA Ltd. Canada to the 1976 Olympics Co mittee to help the press, televis media, spectators and athletes wa the games last month. The closed cuit TV system permitted viewers monitor seven different events as t happened. Sets were distributed am the 27 different locations in Can which were sites of events.

This elaborate closed circuit syst was an additional facility over above that provided by the Canad Broadcasting Corp. and its ORTO al iate as described in *BM/E* in A Eighteen hundred of the sets ser radio and TV broadcasters and others were installed in press rooms newspaper and magazine reporters the Olympic Village (living acc modations for the athletes), in athle dressing rooms and in public loun

continued on page

his is all you need to get moving with Dolby FM

ember the first time you came across
yized cassettes? And how surprised
vere that music could sound so good
ch a convenient form?

now the same principles are being
to improve FM broadcasting. The
ole effect of the Dolby system as used
l is a bit more subtle than with
cassettes. But the overall results are just as important. Dolby FM is cleaner, with sparkling high frequencies free of limiting. And, of course, noise is reduced, which often increases the area of good reception.

The only extra station equipment required is the Dolby Model 334 FM Broadcast Unit. The unit accurately compresses the signal in accordance with the Dolby B-Type characteristics and changes the effective transmission time-constant to 25 microseconds. This allows the station to reduce or eliminate any high frequency limiting required previously.

Already moving with Dolby FM in the US:

140 FM stations now equipped to transmit Dolby FM signals

Signal Recoverability

33 consumer products* now available to receive Dolby FM signals

teners can hear for themselves,
by FM signal is compatible when
ved on their normal equipment
ut Dolby decoding.

ver, some listeners like to take
ntage of every opportunity for
vement. If they use Dolby circuitry
g reception, they can bring the
l even closer to the quality of the
al source material used at the
n.

Naturally, the noise is reduced. But that's not all. Dolby compression is standardized, recoverable compression. By using Dolby encoding instead of the conventional high frequency limiting normally required during transmission, the station gives the listener at home the opportunity of recovering the full frequency range and dynamics of the signal. Furthermore, depending on the amount of limiting previously used, many stations find that Dolby encoding permits them to increase their level – which is good for both the listeners and the station.

If these prospects excite you, we think you will soon be wanting to check out the Dolby Model 334 FM Broadcast Unit. $1,350 and 1¾ inches of rack space are all you need to get moving with Dolby FM – an improvement we think both you and your listeners will appreciate.

*July 1976. The products are tuners, receivers, and music centers with designed-in Dolby decode circuits, requiring no extra wiring, adaptors, or calibration procedures. Write for the latest list of FM products made by Dolby licensees. Technical literature describing these developments is available.

e at NRBA, visit our display at Booths 106/110

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NEWS

TV sets used by media at Velodrome

hospitals areas and rest areas.

This loan of TV sets brought the RCA Olympics investment in eq ment and services to over $10 mill As reported in *BM/E* in April, O made extensive use of RCA broa equipment—16 VTRs, 7 telecines character generators and over cameras. In addition, RCA prov the parabolic antenna for a new sat earth station transmitter installed Montreal's Mt. Royal by Teleglo Canadian Crown corporation whic the Olympics games around the w via Intelsat.

'Trial by Fire' for New Olympic Antenna Syste

A helicopter-borne antenna sy for use in the Summer Olympi Montreal got a surprise trial by when an on-board engineer no what proved to be the early stages fire that consumed the U.S. pavilli the Expo '67 fairgrounds.

As the helicopter hovered ove fairgrounds, Duncan Nicholson, a gineer from ORTO who was testin system for Nurad, noticed the fir immediately radioed the Can Broadcasting Co. ground station range for a live feed. Within a minutes the blazing scene of th was on air and at the same time recorded and edited for national programs scheduled for 7 and 11 that evening.

Kansas City Stations T Learn ENG Under Political Fire

The Kansas City stations will learn to use ENG equipment at the Re can National Convention this m like it or not. All will be involved live action news cams but only K TV is really fully prepared. I have two RCA TK-76s for micr linkup to the studio or for fe into the JVC 4400 portable VTR has gone through a shakedown Of course the stations that are ne affiliates will have their respectiv

continued on pa

The JVC challenge. Who's really No.1 in video?

Challenge is reversing the ed order of the video long dominated by a single at is the nature of the JVC ge? In a word, competition. C products offer a combi- f specs, features and prices stantly amaze the compe- r you, this combination to value. And value is e and more people are o JVC.

act, since entering the lace, nationwide sales of eo products have soared 50 r cent each year. So that VC, the number one value deo. is fast becoming the one product line in the

C is backing its Challenge of the most sophisti- ectronics research and

development centers in the world. Through the engineering teams of its parent, the Victor Company of Japan, a company representing nearly one-half billion dollars in sales in some 100 countries, JVC has made significant contributions to video, including pioneering patents in the development of the popular ¾-inch U-standard videocassette format and introduction of the first successful ½-inch EIAJ color portable system in the country. This JVC team will continue to change the face of video with innovations to come.

And with every product JVC develops, you're assured built-in value. You can look to JVC to get better specs and more features for the dollar.

So when you're considering your next purchase of video equipment–cameras, portable field systems, monitors, videocassette recorders–check first with JVC. We're sure you'll agree there is no better value on the market today.

For further information, contact: JVC Industries, Inc.
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JVC

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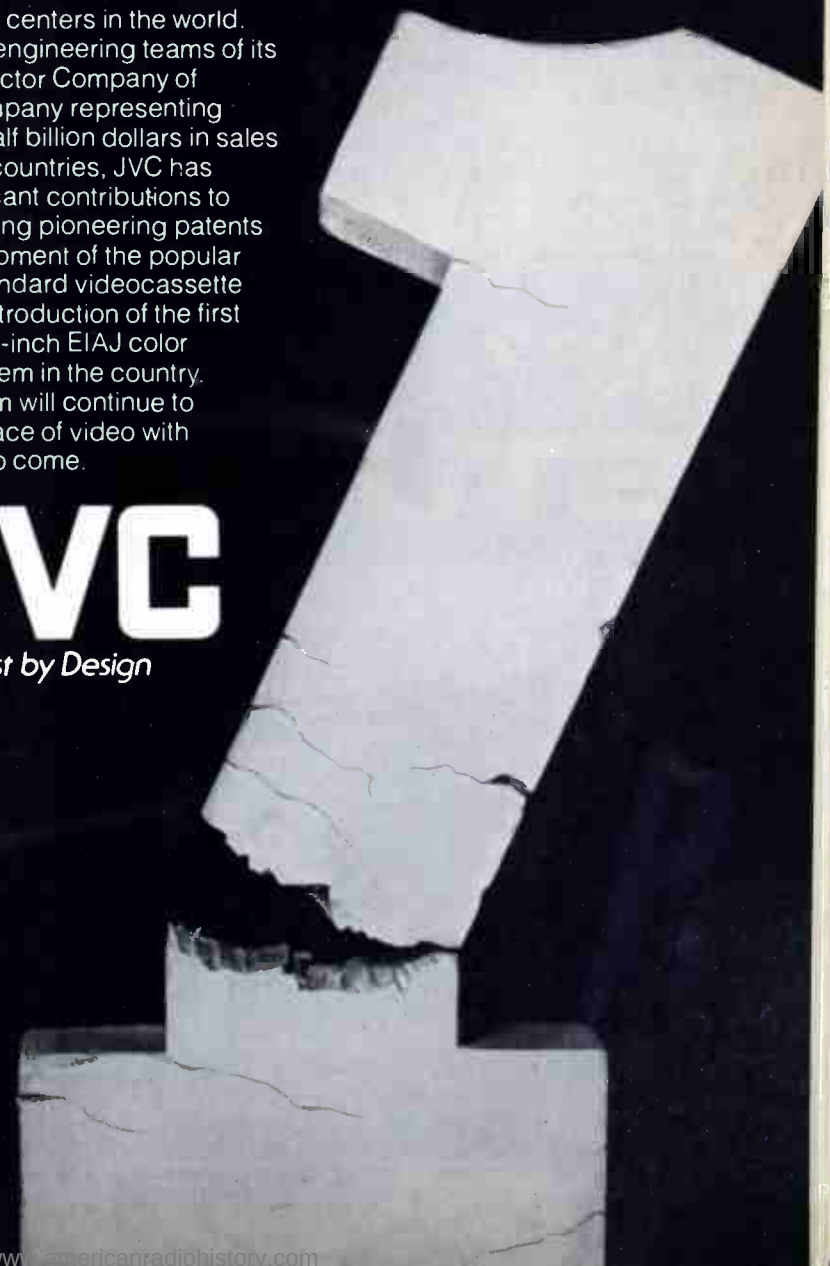


Reader Service Card for Literature
Reader Service Card for Demonstration

work feeds but each wants to supplement that with timely local news.

KMBC-TV also has taken delivery of two RCA TK-76s but it does not have a microwave linkup as yet. (It will use Sony 3800-2850 recording systems for ENG but will also rely on film.) WDAF-TV was not certain what equipment it would use as of late June. It has a Sony Trinicon camera but it probably end up using gear borro from some sister Taft station.

KBMA-TV, the UHF independer KC, has already been in the news

continued on page

Traveling TV Station

The Hughes Television Network, which over the past several years has stamped itself as a creative developer of independent network programming, has contributed to the state-of-the-art of remote TV broadcasts with its use of its HTN-MOD lightweight mobile television broadcasting system.

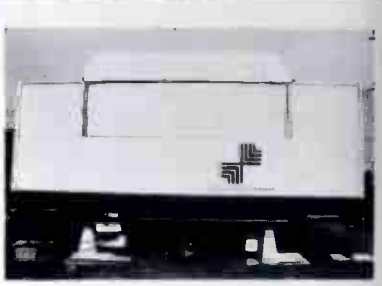
Designed by John Koushouris, HTN Vice President and Executive Producer, the HTN-MOD is a completely miniaturized and modularized television system of enormous flexibility and mobility. It is in Koushouris' words, "A traveling television station." It comprises all the equipment and services of the conventional 14-20 ton remote van in a weight of ¾ tons. It can be shipped anywhere in the world by air for virtual instant transmission.

Parts of the system* will be used in Madison Square Garden and also Kansas City to help cover the Democratic and Republican Conventions. Then all of the elements will be brought together in Philadelphia to cover the gigantic Colgate Federation Cup tennis matches in which players of 32 nations will assemble.

One can best put the HTN-MOD TV system into perspective by envisioning a collapsible camper-trailer that can be pulled by a Pinto as contrasted with a 16-wheeler tractor trailer rig. The pod itself is patterned after a 747 shipping container. Inside it go separate mods containing cameras, VTRs, switchers, etc. When the pod is unloaded at the airport of its destination, two wheels are added and the unit is towed to the on-location site. Then the roof is raised, the ends extended and the gear unpacked and set up for instant operation.

Perhaps the most dramatic use of the system was the coverage of the Ali-Foreman fight in Zaire. A more typical on-site location would be a golf course.

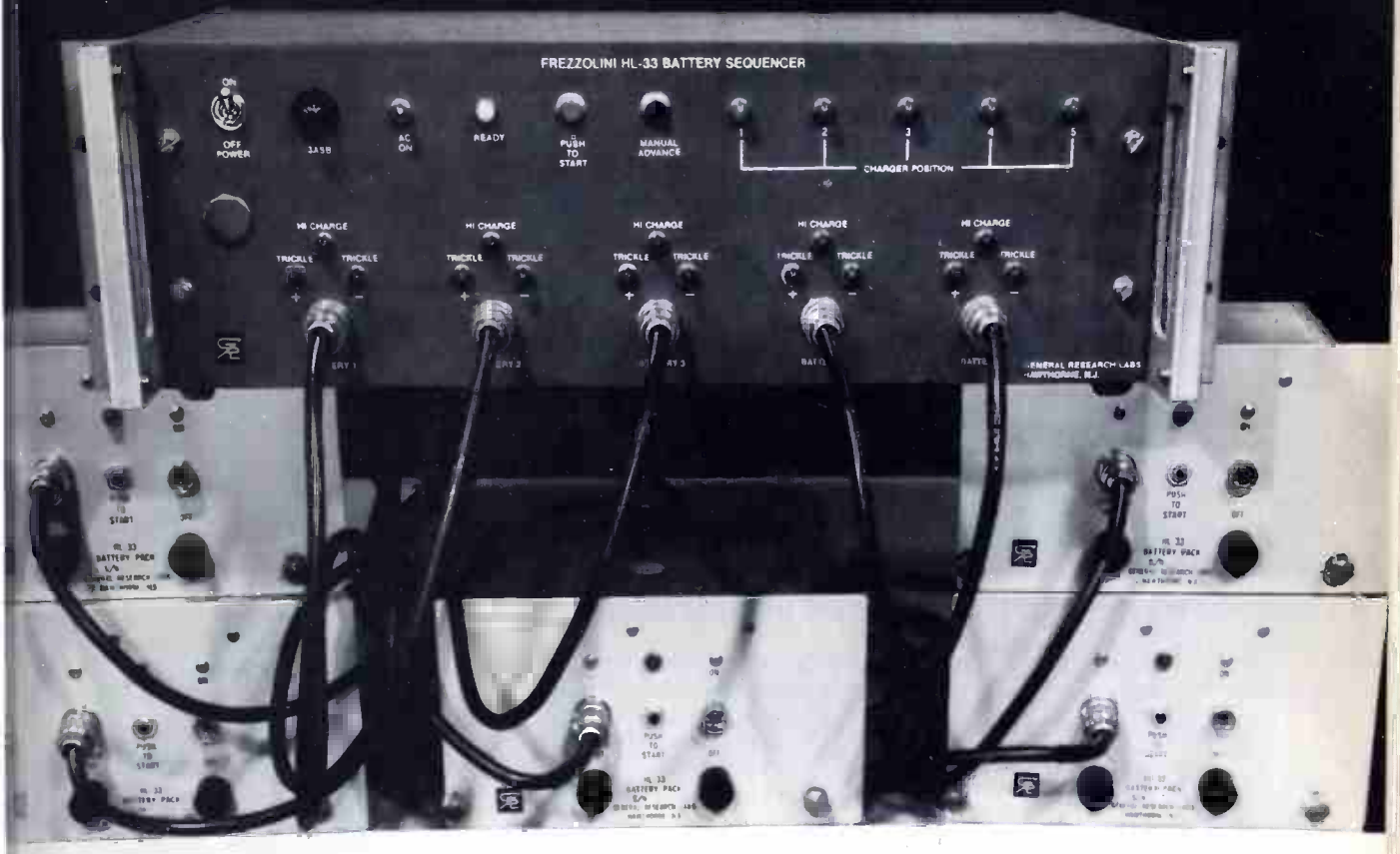
Another key factor in the usefulness of the HTN-MOD TV system is the incorporation of light weight production equipment. The cameras, according to Koushouris,



are in "intermarriage" of Dutch, German and Japanese systems. The Norelco LDH 1 was totally restructured and the Fernseh KCP 40 revised. Both were trimmed to 25 pounds. The Japanese Ikegami HL33 was redesigned to produce a hand-held camera of 12 pounds with a backpack of 18 pounds. The pod is prewired to cut to a minimum unwieldy cables.

*The Hughes supplied equipment will be used by NBC in New York and ABC in Kansas City to provide an exclusive feed to the European Broadcast Union. Since Hughes has a permanent facility in Madison Square Garden and since there is ample room at Kansas City, the pod carrier was not necessary for these assignments.

ews Dep't.: You can automatically charge 5 Ikegami Battery Packs at one time.



Here's how: Just plug in (up to) 5 batteries, push the "Power" toggle switch to "On" and leave them alone.

Save time/save money. Your ENG Battery Pack logistics problem is solved! ***Only one Frezzi Battery Sequencer with built-in charger does the job, automatically.*** **Hook in 5 (or less) Frezzi HL-33/35 Ikegami Battery Packs regardless of their state-of-charge. In 10 hours (or less), totally unattended, the Frezzi Sequencer will bring each Battery Pack in sequence to its full-charge state. When fully charged each Battery Pack will, automatically, go on a trickle-charge rate to maintain maximum readiness for use. When light indicator shows "Ready" simply unhook any one (or more) of the Battery Packs according to instructions, and run. For mobile units or fixed station operation. Call us or write for information and prices.**

Battery Packs, Chargers, Sequencer Chargers, and Complete Systems available. In addition we manufacture for OEM application.

Network proven! Field-tested for 6 months.

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NEWS

cause of its forthcoming satellite ea station that was expected to be used feed GOP convention news to the In pendent Television News Associati The gear is on hand but the FCC h been slow on approvals so as it n stands a portable satellite transmit

New Equipment Stars At Democratic Convention.

Sony BVE-500 editing consoles and BVU-recorder inside NBC EJ Van.

CBS found Thomson-CSF Microcam lighter than some 16mm news film cameras.

New hands-free RF Technology, Inc. wireless mic used by CBS. New Ikeg wireless was used by ABC and NBC. Other convention "firsts" by CBS: a digital "snow remover" to eliminate ne flashes, a 16.2 lb shoe-box microwav transmitter (Farinon) and two ENG sig over one microwave channel.

furnished by Western Union will wheeled in for the satellite hook KBMA-TV itself is not a news sta so the ENG equipment that will be u will be flown in from one of the IT members. The station will have a stu camera on the convention floor f

continued on pag

Who's living together in Washington and making big news? Film and tape at WTOP.

"Film and electronic journalism both have their strengths and limitations," says Dave Daughtry, assistant news director of WTOP-TV in Washington, D.C.

"Each complements the other—and we often use them together on the same story. With great results.

"But we do know there's a lot that we can do easily with film that's difficult for us to do with videotape. For example, we shoot and edit a complicated feature piece on film with an editor or the cameraman himself. Once when we tried to do a five-part series on tape, using IVC one-inch equipment, we found it was much too time-consuming.

"The bulk of our news work is shot on Eastman Ektachrome video news film 7240. We've had good luck pushing as much as two stops in processing, under low-light conditions.

"Not long ago, we covered a story from two locations at the Philippine Embassy, simultaneously. We covered it live on the outside of the building, and we had a film cameraman on the inside filming the Ambassador's news conference. Then, when the film was processed, we were able to do the live report from the outside and roll the film of the inside into the piece. Worked just great.

"Most of the time, we cover an event with both film and the Mini-Cam because once you're set up for a live hookup with the ENG truck, you can't move it around. The film crews have mobility, and get into places we can't reach with the electronic cameras.

"Last December, when that airline crashed into the mountain, we sent out the videotape truck and two film crews. But the truck couldn't get a live signal through the mountains. And we couldn't get the truck up the fire road to the scene of the crash. So we sent up one of our film crews. And got a good story on film.

"So you see, in a market like ours, both film and electronic equipment are necessary. We haven't locked into either one. And using both has opened a new dimension in news coverage.

"You might say, at WTOP-TV, we think togetherness is making good things happen with the news."

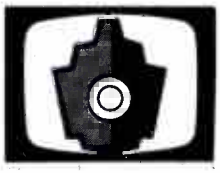
Film is good news.

Kodak

Circle 117 on Reader Service Card

"GENERATES GENUINE EXCITEMENT..."

...says WOTV, owner of first *Compositor I* Titling/Graphics System



WOTV
tv8 • time-life broadcast, inc.
120 college ave., s.e.
grand rapids, michigan 49502
(616) 459-4125 • ☎

April 23, 1976

Mr. Paul Warnock
President
TeleMation, Inc.
P. O. Box 15068
Salt Lake City, Utah 84115

Dear Paul:

The new TeleMation TCG3000 Character Generator has proven to be a very delightful surprise. It seems to measure up to just about all of our expectations and then some. I thought you would like to know that it has generated more genuine excitement and enthusiasm on the part of our employees than any other piece of equipment that I have purchased for the station in the last seven years.

May I extend our thanks to you and to those members of your staff who have contributed so much in the preparation, design and provision of this forward looking equipment and especially to Dennis Fraser, Tom Meyer and Leo Lewis. It was great having those people work with us on this project and we hope that they will continue to support us as we come to be more knowledgeable and familiar with the equipment.

I just thought you might appreciate our words of thanks.

Sincerely,

R. C. Smith
Chief Engineer

RCS:rg

troduced at the '76 NAB, the first *mpositor I* Titling/Graphics System s delivered to Time-Life station DTV, Grand Rapids, Michigan, on ril 17.

e results?

/DTV Chief Engineer R.C. Smith ites that the ***Compositor I*** "has nerated more genuine excitement d enthusiasm on the part of our ployees than any other piece of uipment that I have purchased the station in the last seven rs."

e wish to thank Mr. Smith for his praisal, and extend an invitation all Broadcast Managers and Engi- ers to compare these ***Compositor I*** utures with any other multifont aracter generator:

- Mixed-Font Pages. Some "multi- nt" systems can display only one nt at a time. The ***Compositor I*** ows the operator to mix fonts on single page, within a row or within single word.

- High-Capacity Disk Memory. me character generators require a sk change between font changes, ge storage, and program loading. the ***Compositor I***, all fonts, as ell as the computer program and to 800 composed pages, are ored on a single disk and are ways available — from any yboard location.

- Camera Quality Characters. The ***mpositor I*** obtains maximum aracter smoothness by using char- ter "elements" smaller than the niting resolution of the television stem itself. It incorporates line- y-line vertical resolution and pro- des horizontal elements of only nsec width — in contrast to the 5 to 65 nsec element width typical f other comparably priced systems. he ***Compositor I*** thus provides on- r characters that are virtually in- istinguishable from camera repro- uced artwork.

- Automated Election Reporting. With the addition of the TED (Television Event Display) software package, the ***Compositor I*** automatically compiles, formats, totals, and displays election returns. No additional hardware is required.

- Selection of 28 Colors. With the EC-3000 Colorizer/Background Option, characters and/or backgrounds can be colored any one of seven hues, with each hue available at any one of four luminance levels. Black, white, and two levels of gray are also keyboard-selectable. Each character can be colored separately. Background colors can be changed in four-scan-line intervals and background color can be substituted for character color to provide multi-hued characters.

- Selectable Character Edging. The basic edging option (EO-3000) provides a selection of border, "drop" shadow, or outline; while the EO-3001 Expanded Edging Option adds "slope" shadow and multiple border/outline widths proportioned to the font size.

For more information about the Compositor I, send us the coupon below or call TeleMation Broadcast Sales collect at (801) 487-5399.

TeleMation
the discovery people

Compositor I

Please send additional information on the *Compositor I* Titling/Graphics System.

TeleMation, Inc., P.O. Box 15068
Salt Lake City, Utah 84115

Name_____ Title_____

Station or Organization _____

Address_____

City_____ State_____

Zip_____

☐ Please add my name to your mailing list.

Circle 118 on Reader Service Card

form and also has a brand new 32 ft. van equipped with quads that will be in the Kemper Arena parking lot for video processing.

Also coming in on a loan basis will be portable cameras and video processing equipment supplied by Hughes Television Network for use by the European Broadcasting Union. See the accompanying box for more details.

As we mentioned last month, the three network news operations will be there in force with a lot of ENG equipment of its own. As one local station engineer put it, "I've always assumed that ENG wouldn't be settled until *after* the convention—after we see how the competitive systems perform." Competition isn't allowing such a relaxed approach; ENG will be at KC beginning with the convention.

New EEO Guidelines

In a reaffirmation of its strong stance on equal employment opportunity, the FCC has issued new guidelines, embodying a strengthening of the rules which were proposed in an inc opened on July 25, 1975. The "m program" has ten elements, inclu recruitment techniques, trai efforts, the availability of women minority persons in the work force structure analysis (for licensees wit or more full-time employees), ana of hiring for 12 months, of promot and of apparent disparities betv personnel hired and the presenc minorities in the community. H ever, the threshold for such wr reports was raised from five or r full-time employees to ten or m (Docket 20550; should be studie every broadcaster).

FCC Briefs . . .

The FCC has refused to waive the that **a station must notify a pe called by telephone** in an on-air gram that the conversation is, in being broadcast or is being tape later broadcast; a program produce proposed a program in which brities called individuals, without pre-notification . . . . The FCC r the **limit on the ownership of br cast and cable companies by stitutional investors**—investment insurance companies—to five pe from the earlier three and one per respectively . . . . The Commis turned down four requests for reco eration of the **elimination of the "leapfrog" rules** in December, affirming the right of a cable operat use signals from stations at any tance, even if closer ones have the program.

Studies Find Cable Bett And Worse

The on-again, off-again bright/ future of cable TV received further ification from two reports rec completed.

The good news was contained report by the Arthur D. Little res firm which found that cable ". . . weathered its recent storms and is entering a period of renewed vital The "Impact" study of the ten outlook for the industry estimates nue growth will average 14-18 pe per year through 1980. The grow cable will be spearheaded by pay subscribers and supported by f penetration on existing syst Slower growth is expected i 1980s.

The bad news came in studie formed by the John Hopkins Univ Center for Metropolitan Planni Research which concluded that TV in most urban areas does no vide a service that would make i nomically viable. The study u "demand model" in its computer

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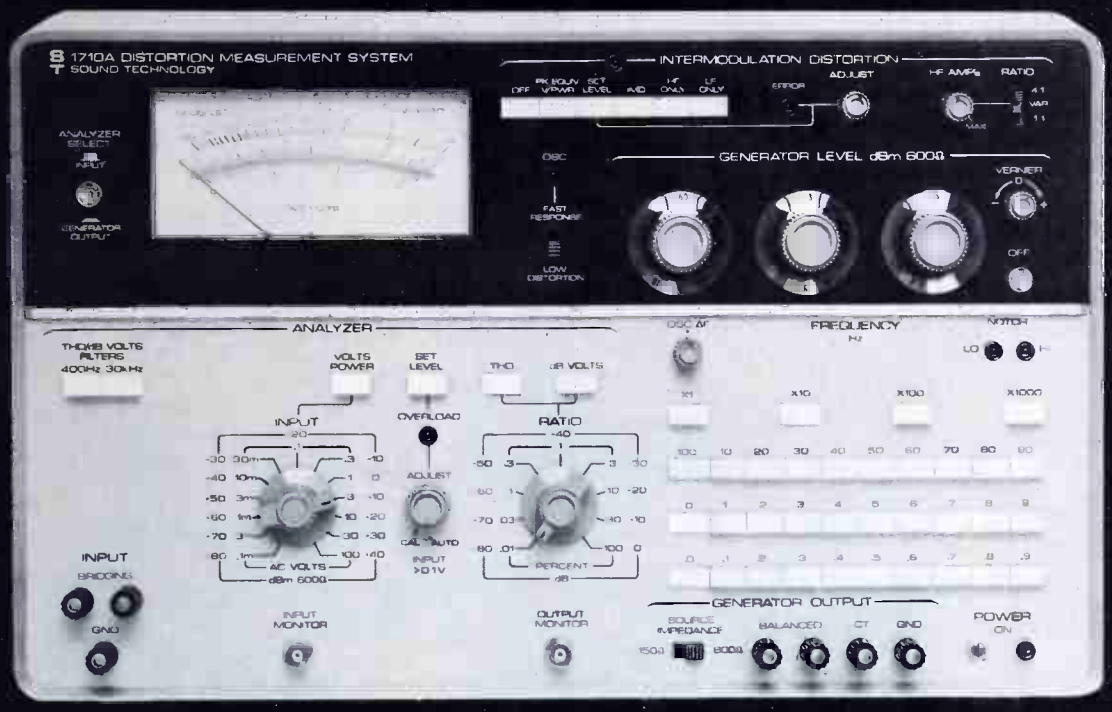

Your new automatic distortion measuring system for balanced measurements

REDUCED OPERATOR ERROR

Here's something you'll like — Sound Technology's new distortion measuring instrument for use in balanced work.

The new 1710A is much more than a distortion analyzer. It's a system. It contains its own ultra-low-distortion generator tracked with the analyzer. It's a system that greatly simplifies measuring — gives you fast measuring with simple operation that reduces operator error.

For example, push the frequency button and you set both generator and analyzer. Push "Distortion" and you have the reading. Automatically. No slow, tedious manual null-searching.

Features in the new 1710A include:

- **a balanced, floating output (600/150 ohms)**
- **a balanced (bridging) input**
- **a high-level +26 dBm signal**
- **+26 to −90 dBm attenuator**
- **distortion measurements to .002%**
- **fast 5-second measuring speed**
- **automatic nulling, optional automatic set level.**
- **both harmonic and optional intermodulation distortion measurements.**

SPECIAL OUTPUT CIRCUIT

In the 1710A you get a transformerless audio generator output that's balanced and floating. No transformer means no transformer distortion. Floating *and* balanced means you can connect to virtually any audio circuit regardless of configuration. And you can set the output from +26 to −90 dBm in 0.1 dB steps.

FAST, SIMPLE MEASURING

Automatic nulling and the automatic set level option (ASL) give you extremely fast measuring and little chance for operator error. You can measure in 5 or 6 seconds. *With ASL you can measure distortion vs. frequency, and distortion vs. voltage or power without resetting level.*

IM OPTION

An additional optional bonus is that the 1710A also measures intermodulation distortion. After you've made a harmonic measurement, just push the "IMD" button. In 3 seconds you'll have the IM reading. With this option you'll be ready for future IM requirements.

CALL/SEND NOW FOR LITERATURE

It's worth while getting the information on this major new distortion measuring system. Call Larry Maguire or Bob Andersen now and get our new product brochure. It's ready and waiting.

SOUND TECHNOLOGY
1400 DELL AVENUE
CAMPBELL, CALIFORNIA 95008
(408) 378-6540

Circle 121 on Reader Service Card

National Radio Broadcasters Conference And Expo Fine-Tuned To Serve All

Some 2000 radio broadcasters are expected to converge on the magic city of San Francisco Sept. 19-22 to attend the 1976 National Radio Broadcasters Conference and Exposition taking place at the exciting Hyatt Regency. On hand to greet them will be over 85 equipment manufacturers and service organizations (programming, reps, etc.) who will either be showing their wares in the exhibit hall or hosting hospitality suites.

The conference committee this year has taken precautions in the scheduling of its "must do" sessions so that there will be ample time to take in the exhibits, hospitality suites *and* San Francisco's incomparable evening life. (Last year, at Atlanta, morning-to-night dovetailing sessions inhibited exhibit viewing.) For one thing this year, there are almost two hours each day (1:30 to 3:15 PM) scheduled for touring exhibits. There is no engineering session on Monday afternoon so that the entire afternoon can be spent in examining the latest radio technology. (There is a special single-day registration available to qualified engineers.)

The sessions themselves are shaping up to be the usual practical shirt-sleeves panels that have made the NRB Conference (and before that the NAFMB conferences) so worthwhile in attending. As the program below shows, interests of sales, management, programming, promotion and engineering are served. To cut down on the number of simul-sessions there is less fractionalization of the program into events exclusively for small market attendees and big market attendees.

A glance at the exhibits/hospitality suites list shows that all of the important names that one does (or might do) business with will be there. A detailed description of products and services of these companies will appear in *BM/E's Survival Guide: San Francisco 1976 National Radio Broadcast Conference* which will be mailed pre-registrants and available at the co ference. For more information on program write National Radio Bro casters Association, P.O. Box 41 Grand Central Station, N.Y., N. 10017 or call (212) 869-8873.

The Program In Brief

Sunday, Sept. 19

9:00 AM Registration; Hospitality Suites Open
6:30 PM Cocktail Reception
8:30 PM Armstrong Awards/FM Pioneers Dinner

Monday, Sept. 20

8:00 AM Registration
9:00 AM General Session
9:45 AM Four Simultaneous Sessions
"Small Market Sales Ideas That Produce Big Results"
"Management Moxie That Motivates"
"Progressive Rock, Progressively Better"
"Engineering Innovations & Trends"
12 Noon Luncheon
1:30 PM Exhibits Open/Tour
3:15 PM Four Simultaneous Sessions
"New, Non-Broadcast Ways to Produce Revenue"
"Research & Ratings—Ferment, Frustration, & Fate"
"Modern Country and City American"
"Engineers Tour Exhibit"
5:30 PM Cocktail Reception and Auction

Tuesday, Sept. 21

8:30 AM NRBA Annual Membership Meeting
9:00 AM Coffee Klatsch
9:45 AM Four Simultaneous Sessions
"How to Change Rep *Vs* Radio Station Into Rep *Plus* Radio Station"
"Blockbuster Promotion on a Firecracker Budget"
"Top 40 That's Tops"
"Engineers Field Trip"
12 Noon Luncheon
1:30 PM Exhibit Opens/Tour
3:00 PM FCC Legal Afternoon:
FCC Commissioners and staff chiefs m up with Washington communica counsels. Audience asks questions
5:30 PM Cocktail Reception and Auct

Wednesday, Sept. 22

9:00 AM Coffee Klatsch
9:45 AM Four Simultaneous Sessions
"Success Stories From Hard-To- Formats"
"Employment Practices You Should P tice"
"Beautiful Music Makes Beautiful Sou on the Cash Register"
AM Stereo, Quad, and All That J (Technical)
12 Noon Luncheon
1:30 PM Exhibit Opens/Tour
3:15 PM Four Simultaneous Sessions
"101 New Sales Ideas That Work"
"Control, Supervision & Motivat Through Systems"
"There's Nothing Middle-Of-The-Roac MOR"
"New Measuring Techniques, Ante Design, Height Vs Power (Technic
5:30 PM Closing Cocktail Reception Final Auction

List of NRB Industry Suppliers

(As of July 9, 1976)

**Hospitality suites only.*

*ACTION
*Aetna Business Credit
Ampex
Ampro Corp.
*Arbitron Radio
*The Associated Press
BCS/Kamen Sciences
Belar Electronics
*Blackburn & Co.
*Bonneville Broadcast Consultants
Broadcast Electronics
*Broadcast Marketing Co.
Broadcast Programming Internatl.
*Kent Burkhart & Associates
Cablewave Systems
Camex Corp.
*Cavox Stereo Productions
CBS Technology Center
CCA Electronics Corp.
*Century 21 Productions & Prgmg.
Cetec (including Jampro, Schafer, Sparta, and Vega)
*Chicago Radio Syndicate
Collins Radio Group
Concept Productions
Control Design Corp.
Cox Data Services
CSI Electronics, Inc.
*Disc-Location
Dolby Laboratories
Drake-Chenault Enterprises
*Eastman Radio
Electro Sound, Inc.
Fax Net, Inc.
Fidelipac
Harris Corp. (Gates Radio Div.)
*H.G. Productions
IGM
Inovonics
International Tapetronics
Johnson Electronics
*KalaMusic
*Dean Landsman Radio Services
LPB, Inc.
*Jack Masla & Co.
Master Control, Inc.
McCurdy Radio Industries, Inc.
McMartin Industries, Inc.
Meloday Productions
Micro Trak Corp.
Moseley Associates, Inc.
*Mutual Broadcast System
Orange County Electronics
Orban Associates
Otari
Pacific Recorders & Engineering
Paperwork Systems, Inc.
*Peters Productions
Phelps Dodge
Phillips Audio-Video
*Progressive Radio Network
QRK Electronic Product
Radio Arts, Inc.
*Radio Programming/Ma
Rapid-Q
RCA Broadcast Systems
Revox
Sansui
Sine Systems
Stanton Magnetics
*Stereo Radio Production Systems Marketing Corp
*William B. Tanner Co.
Telex Communications
Time & Frequency Tech
*TM Programming, Inc.
*Torbet-Lasker, Inc.
UMC Electronics
*United Press Internation
U.S. Army Recruiting C
U.S. Pioneer

Whose automation do they choose half-way around the World?

M, Sidney, and 6KY, Perth, are two of the great radio ations in the largest markets in Australia. They both are ccessful AM stations with totally different formats. They th are using Cetec Schafer automation.

M and 6KY chose Schafer automation because they ew it would perform any task they asked of it, and cause they knew that Schafer stands behind its prod- ts...even 10,000 miles away!

Schafer automation is making stations happy all over the World, so if you're separating your FM operation, or looking for better control of your format and expenses, maybe its time that you looked at Schafer automation.

Find out what Schafer automation can do for you. Call or write the Cetec Broadcast Group today. We've got the facts on the Cetec family of equipment: Schafer automation, Jampro FM antennas, and Sparta transmitters and audio products.

Cetec Broadcast Group

Castilian Drive, Goleta, California 93017
lephone: (805) 968-1561

Title
Name
Station
Address
City
State
Phone

SC 6KY

Circle 123 on Reader Service Card

The Sony BVH-1000. Consider the concept.

The BVH-1000 brings a new, two-in-one concept to professional high band video recording. It meets current broadcasting needs for a top-of-the-line recorder, and does it in an economical package without compromising video or audio quality.

But more than that, the BVH-1000 is the machine of the future. Designed for production and post-production applications, it is a 1" video recorder that can compete with 35mm film techniques.

It wasn't easy, but we have combined transparent picture quality, plus two professional quality audio tracks with advanced editing techniques. That combination simply is not available in any other recorder, no matter what the format or tape width.

Before considering another recorder, examine these eight BVH-1000 features:

1. Exclusive 1.5 head. This completely avoids the problem of missing information caused by head switching of single head machines. It also insures, for the quality user, a continuity of video information, as well as VIRS record/playback, which may be required of all machines in the future.

2. Advanced servo design. The BVH-1000 incorporates drum servo, capstan servo, tension servo, reel servo. This servo system, combined with dual capstan drive, provides highly accurate tape speed and quality interchange, plus gentle tape handling in fast forward and reverse modes.

3. Five motors. These eliminate the use of unreliable and inaccurate belt systems for drives.

4. Standard VH and color framing modes. Both are standard equipment in the BVH-1000. Two high quality audio tracks and a separate cue track, plus 400Hz tone generator are also standard.

5. Biderex search control. Built-in bi-directional search control allows shuttling of the video tape in either direction from 1/3 frame jog to high speed rewind and fast forward. The non-segmented formats allow the operator to see the picture and make fast editing decisions either manually or with computer control.

6. Standard tape timer. This features a special memory that prevents the tape from unthreading. SMPTE reader/generator is a plug-in option.

7. Versatile mounting. A flexible mounting system and built-in wave form select enable the BVH-1000 to be adapted to any number of mounting or console configurations. The BVH-1000 is at home in a small van or big studio.

8. New Sony time base corrector. The BVH-1000 can be used with Sony's new BVT-1000 time base corrector or any other quality TBC. If you don't require time base correction, an optional heterodyne recovery board is available.

This is just the beginning of the BVH-1000 concept. To learn more about the economy, technical performance and specifications, contact your Sony Broadcast representative, or write Sony Broadcast.

Sony Broadcast

Sony Corporation of America, 9 West 57 Street, New York, New York 10019

Circle 124 on Reader Service Card for a demonstration
Circle 125 on Reader Service Card for literature

INTERPRETING THE

FCC RULES & REGULATIONS

Revised Commercial Radio Renewal Application (FCC Form 303-R): Part II

By Frederick W. Ford and Lee G. Lovett; Pittman, Lovett, Ford and Hennessey, Washington, D.C.

Last month's column presented Part I of an analysis of the Commission's new commercial radio (AM and FM) renewal application (FCC Form 303-R); that discussion is continued below.

Part II—Legal

Question 4: Form 323 (Ownership Report) must be submitted with the renewal application *unless* the licensee's last renewal Ownership Report (for the "subject station" or for a "commonly-owned station") is less than three years old and the Report is incorporated by reference into the renewal application. The *Report and Order* prohibits incorporation by reference if any ownership changes have occurred since the earlier-filed Ownership Report. This creates a potential conflict with the recently adopted ownership reporting requirements for large, publicly held licensees which (1) require submission of annual Form 323 Reports and (2) does away with supplemental reports of ownership changes. If no supplemental reports must be filed, can a large, publicly held licensee incorporate a Form 323 by reference despite ownership changes? The Commission must decide this question prior to dissemination of the new 303-R Form.

Question 5: This question merely asks if the licensee is in compliance with the Federal laws concerning interests of aliens and foreign governments.

Question 6: This question requests information concerning the "communications-related business interests of *1.* the renewal applicant, *2.* its officers, *3.* its directors, and *4.* its 25% or greater stockholders. "Communications-related business interest" is defined as an interest in *1.* newspaper publishing companies, *2.* cable television companies, and *3.* other companies undertaking broadcast-related activities. If such interests exist, the following information must be attached to the renewal application as Exhibit 6:

1. Business name;
2. Principal place of business;
3. Description of business;
4. *Extent* and *nature* of connection with this busi by renewal applicant, its officers, directors or s holders.

Question 7: Renewal applicants, including direct officers and stockholders (with exceptions for wid held public companies) must list (1) all suits brought (2) all convictions relating to (a) felonies, (b) crime moral turpitude, (c) lotteries, and (d) anti-trust lations. If any of the above have occurred, com information concerning same must be attached as Ex 7. This is an extremely broad reporting requirement. Commission is contemplating narrowing the scop what must be reported. Renewal applicants should c with their communications counsel to see if Questi has been amended since this article went to print.

Part III—Engineering

The Commission has undertaken a "sampling" p concerning station operating and maintenance Selected licensees will be asked to submit these log review by Commission personnel. Emphasis wil placed on those stations most likely to have more stantive problems (e.g., stations with directional a nas).

Question 8: This question asks if the following re are completed and available for inspection:

1. Equipment performance measurements;
2. Annual skeleton proofs of antenna performance remote control directional AM's); and
3. One partial proof of antenna performance, and skeleton proofs for directional AM's operated by l grade operators.

continued on pa

Tomorrows audio consoles . . .
. . . here today!

THE BIGGEST ADVANCE OF AUDIO CONTROL IN THE LAST 15 YEARS . . .

e input select switches. Noiseless
in / off / program select switches.
e audio mixers. Noiseless cue
ing. Do these things make any
: all? You bet! Probably the
s sweetest low distortion sound
eard from any audio console
lls of price. Not only that but
abies are loaded with features
(you will only find in consoles
or 5 to 10 times more; (2) you'll
id in these consoles . . . period.

r exclusive illuminated Touch Pad
elect switching, thru our, "better than a VU meter", solid state light emitting meters, to the highly reliable & noiseless method of audio control. That's not all. Prices that are almost unbelievably low (compared to what you're used to) and performance that takes second place to **none.**

Want more? OK, how about RAMKO's exclusive SIMUL-Q or our full range gain select on each input, or the cue and monitor mute select patch boards on each channel (except the last one). The plug in amplifier cards or the RF suppression.

Call collect or write today. You'll find it both an exciting and profitable adventure!

MODELS & PRICES

SC-5M Single Channel, mono	$ 780
DC-5M Dual Channel, mono	$1,032
DC-5MS Dual Channel, stereo	$1,252
DC-8M Dual Channel, mono	$1,390
DC-8MS Dual Channel, stereo	$1,880

RAMKO RESEARCH

11355 Folsom Blvd.
Rancho Cordova, CA 95670
Telephone (916) 635-3600

Circle 126 on Reader Service Card

At WTCN-TV, Total Automation is a Reali

At the heart of the station is a CDL Operations Computer System, which handles all the program switching, effects, material verification, run-sheet printing, FCC logging and machine control.

The first installation anywhere to have a *direct-wire link* to a Kaman Sciences, BCS-Traffic/Accounting System, the CDL System commands the receipt of scheduling information from and the transmission of log verification to the Traffic/Accounting Computer.

Another impressive CDL first at WTCN, is the full closed-loop control and monitoring of two Ampex ACR-25 Video Cassette Machines . . . *which don't even have to be loaded in the correct air-play sequence* . . . the CDL Computer sorts that out!

CDL's New System 100 Operations Computer Syste may be configured for "Total" control or may be us initially to perform automatic switching and later expanded into a fully integrated system, with busin computer link-up and ACR-25 closed-loop control

CDL's latest news . . . a System 100 with *direct-link* capability to a DCC "BIAS" Traffic/Accounting Syst

A truly modular approach, the CDL System 100 is today's answer to **Total Broadcast Automation.**

For more information or to arrange for consultation about your specific requirements, please call or write.

CENTRAL DYNAMICS LTD

Canada: 147 Hymus Blvd., Montreal, Que., H9R-1G1 514-697-08
U.S.A. 230 Livingston Street, Northvale, N.J. 07647 201-767-130

FCC RULES & REGS

Although these need not be submitted with the renewal application, they must be maintained locally for inspection.

Question 9: Manufacturer and *type* of transmitters and *actual operating values* must be listed in this question.

Question 10: This question refers to AM's utilization of directional antennas. Present *actual operating values* must be listed as well as *manufacturers'* identity and *type* number of the antenna monitor employed to take the readings. If monitor point values exceed those specified in the AM's license, an explanation of same must be attached as Exhibit 10, including a description of measures taken to alleviate the problem.

Engineering Certification: Questions 8, 9 and 10 must be certified by a "qualified" individual familiar with technical operations. The title "Chief Engineer" has been changed to "Chief Operator" on the certification form. If the job title of the individual making the certification is not among the four listed, the correct title should be typed in.

Part IV—Programming

The Commission's needs ascertainment requirements have recently been amended for existing licensees. See the March 1976 "Interpreting . . ." column entitled "Community Ascertainment Guidelines For Broadcast Renewals."

Question 11: This question seeks to determine if the licensee has included the necessary community needs ascertainment information in its public inspection file. If not, the licensee is required to submit a complete statement explaining why not as Exhibit 11.

Question 12: The renewal licensee is required to attach as Exhibit 12 its Community Leader Checklist compiled during the preceding three-year license term. Of course, this does not apply to those stations which are not required to conduct *formal* community ascertainment interviews (e.g., located in communities with fewer than 10,000 residents and outside of Standard Metropolitan Statistical Areas).

Question 13: This question requires that the renewal applicant attach as Exhibit 13 its three annual lists of community problems, needs and interests that it proposes to serve. If the lists are not attached, a complete explanation is required.

Question 14: Part (a) of this question requires the composite week program logs to be attached as Exhibit 14 of the renewal application. Only *one* copy of the program logs need be submitted. Some renewal applicants may overlook this because an original and two copies of Form 303-R and exhibits must be filed.

Question 14(b) requires information concerning News, Public Affairs and "All Other" programs (e.g., exclusive of entertainment and sports) that have been *1. previously proposed* in the applicant's last renewal application, *2. actually broadcast* during the composite week, and *3. proposed* for the coming license period. The *1. minutes* of operation and *2. percent* of total time broadcast must be indicated for each program type. Note that the time during each program taken up by commercial matter must be subtracted when listing "Minutes of Operation." However, when determining the per-

continued on page 30

centage of total time that such non-entertainment gramming is being broadcast, the "base" figure (e the total hours of station broadcast operation) should exclude commercial matter.

The number of *1.* previously proposed, *2.* actu performed and *3.* minimum proposed future public vice announcements must also be indicated. The C mission expects licensees to engage in "good fa scheduling of PSA's. For example, airing the bul PSA's between 2 A.M. and 6 A.M. would no deemed "good faith" scheduling.

Question 15: This question is new. Renewal plicants must submit as Exhibit 15 a complete listin all composite week *1.* public Affairs, and *2.* Other" programs. The listing should include the fol ing information:

1. Identity of program,
2. Program source,
3. Program type,
4. Broadcast time, and
5. Broadcast duration.

FCC Form 303-R 1976 — Approved by GAO B180227(

UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

APPLICATION FOR RENEWAL OF LICENSE FOR COMMERCIAL AM OR FM RADIO BROADCAST STATION

PART I - GENERAL INFORMATION

1. NAME OF APPLICANT

STREET ADDRESS

CITY | STATE | ZIP CODE

Send notices and communications to the following-named person at the address indicated below.

NAME

STREET ADDRESS

CITY | STATE | ZIP CODE

2. RENEWAL REQUESTED FOR FOLLOWING EXISTING FACILITIES:

CALL LETTERS | FREQUENCY | CHANNEL NO.

POWER IN KILOWATTS

NIGHT | DAY

HOURS OF OPERATION

☐ Unlimited ☐ Daytime only ☐ Limited

Sharing with (specify stations) | Other (specify)

STATION LOCATION

CITY | STATE

3. RENEWAL IS ALSO REQUESTED FOR THE FOLLOWING:

AM DAY	AM NIGHT	FM	
			AUXILIARY ANTENNA
			AUXILIARY TRANSMITTER
			ALTERNATE TRANSMITTER
			SUBSIDIARY COMM. AUTHORIZATION

PART II - LEGAL

4. Is applicant's Ownership Report (FCC Form 323) filed with this application as EXHIBIT 4?

☐ YES ☐ NO

If NO, give the date of filing of the last Ownership Report and the station's call letters of the renewal application with which it was filed.

5. Is the applicant in compliance with the provisions of Section 310 of the Communications Act of 1934, as amended, relating to the interests of aliens and foreign governments?

☐ YES ☐ NO

6. Is the applicant or any officer, director, or principal stockholder (any person owning 25% or more of applicant's stock) an officer, director, or 25% or more stockholder in a newspaper publishing company, a CATV company, or a company engaged in broadcasting related activities?

☐ YES ☐ NO

If YES, attach as EXHIBIT 6 a complete listing and description of these interests.

File No. — FOR COMMISSION USE ON

7. Since the filing of the applicant's last renewal application for t station or other major application, has the applicant or any part the application been made party to, or been finally adjudged gui any court or administrative body with respect to, any suit, actio proceeding, civil or criminal, brought under the provisions of an eral, state, territorial or local law relating to: any felony or oth crime involving moral turpitude; lotteries; unlawful restraints an monopolies, and combinations, contracts or agreements in restra trade; or the use of unfair methods of competition?

☐ YES ☐ NO

If YES, attach as EXHIBIT 7 a full description, including identi tion of the court or administrative body, the proceeding (by date file numbers), the person and matters involved, and the disposit the litigation (if any).

PART III - ENGINEERING

8. Are the following technical reports completed and available for Commission inspection?

YES ☐ Equipment performance measurements for each main a
NO ☐ alternate transmitter made within four months of the date of this application.

YES ☐ For directional AM stations operated by remote contro
NO ☐ Annual skeleton proofs of antenna performance made ing the past license term.
☐ DOES NOT APPLY

YES ☐ For directional AM stations operated by lessee grade operators: At least one partial proof of antenna perfor
NO ☐ mance made during the past three years, and skeleton proofs made the other two years.
☐ DOES NOT APPLY.

9. Transmitters (Main and Alternates)

Manufacturer and Type No.	1.	2.	3.
Use (i.e. Main or Alternate)	(1.)	(2.)	(3.
Total plate current to last radio stage in amperes			
Plate voltage applied to last radio stage in volts			
Efficiency factor, F of the transmitter at operating power			
Transmitter power output in kilowatts			
AM: Antenna or common point ammeter reading in amperes			

10. (a) Directional Antenna Operating Values (AM only)

Tower	Phase Reading in Degrees		Antenna Base Current				Remote Indicator of Antenna Curre			
			Day		Night		Day		Ni	
	Day	Night	Value	Ratio	Value	Ratio	Value	Ratio	Value	
1										
2										
3										
4										
5										
6										

(b) Identify by manufacturer and type the antenna monitor used take the above readings:

(c) Are monitoring point values within limits specified in the license?

☐ YES ☐ NO

If NO, attach as EXHIBIT 10 a complete explanation and s ment of what is being done to correct it.

I certify that I represent the applicant in the capacity indicate below, that I have examined the statements made in response t questions 8 through 10 above, and that they are true to the bes knowledge and belief.

Signature _____ Telephone (include area

☐ Technical Director ☐ Consulting Engineer
☐ Chief Operator ☐ Registered Professional Engineer

nly exception to this program listing requirement is tations which utilize an "Other" program format religious or agricultural).

estion 16: This question asks whether composite non-entertainment programming "varied substantially" from representations made in the last renewal cation. The Commission defines "substantial variation as an *actual* decrease of 15% in any of these three ories: News, Public Affairs and "All Other" programs (this final category is exclusive of entertainment ports), or a 20% decrease in the *total amount* of dcast time devoted to all of these program categories.

estion 17: The number of "60-minute segments" e composite week which contain in *excess* of 18 es must be listed and submitted as Exhibit 17, ing information giving the *amount* of commercial in the particular hourly segment and the *day* and of broadcast.

estion 18: This question asks whether the applt's commercial practices during the past license d varied *at all* from its last renewal application rep- tations. If so, Exhibit 18 must be submitted ex-

continued on page 32

IV - PROGRAMMING

applicant placed in its public inspection file at the appropriate s the required documentation relating to its efforts to ascertain community problems, needs, and interests?

YES ☐ NO If NO, attach as EXHIBIT 11 a complete statement of explanation.

DOES NOT APPLY.

ch as EXHIBIT 12 applicant's community leader checklist for ceeding license term.

DOES NOT APPLY.

the applicant placed in its public inspection file at the opriate times its annual list of those problems, needs and interwhich, in the applicant's judgment, warranted treatment by staand typical and illustrative programming in response thereto?

YES If YES, attach those listings as EXHIBIT 13.

NO If NO, attach as EXHIBIT 13 a complete statement of explanation.

ttach as EXHIBIT 14 one exact copy of the program logs for composite week used as a basis for responding to the questions n. Applicants utilizing automatic program logging devices must ly with the provisions of Sections 73.112(c) and 73.282(c) of Commission's rules.

AM S	Previously Proposed		Composite Week Performance		Minimum Proposed	
	Minutes of Operation	% of Total Time	Minutes of Operation	% of Total Time	Minutes of Operation	% of Total Time
s						
ic irs						
ther rams, usive ner- ment sports						
ic ice ounce	Number		Number		Number	

ch as EXHIBIT 15 those programs in the composite week ded in the public affairs and "all other" program categories s 2 and 3 of the above chart), indicating the title, source, type, description, time broadcast and duration of each program.

he amount of time applicant devoted to non-entertainment ramming (lines 1,2 and 3 of the above chart) during the comte week vary substantially from the representations made in icant's last application?

YES ☐ NO If YES, attach as EXHIBIT 16 a statement explaining the variation

the number of 60-minute segments in the composite week nning with the first full clock hour and ending with the last hour of each broadcast day) containing over 18 minutes of comial matter: segments. List in EXHIBIT 17 each segand the day and time broadcast with headings of "Amount of mercial Time in Segment" and "Day and Time Broadcast".

he applicant's commercial practices for the period covered by application vary from the representations made in applicant's application?

YES ☐ NO If YES, explain in EXHIBIT 18 the variations and the reasons therefor.

the maximum amount of commercial matter applicant proposes ally to allow in any 60-minute segment (Minutes:). State ercentage of hourly segments per week this amount is expected exceeded (%:); and the limits per hourly segment that d then apply under those circumstances to regular commercial ercial:) and to political commercial matter (Minutes:)

ribe briefly applicant's program format(s) during the past 12 hs:

ribe briefly applicant's proposed format:

21. Does the applicant's station duplicate the programming of another radio station?

☐ YES ☐ NO If YES, state:

(a) the call letters of the duplicated station

(b) the population of the community of license of the duplicated station

(c) the population of the community of license of the station for which renewal is requested

(d) the total number of broadcast hours in the composite week

(e) the amount of programming duplicated during the composite week %

22. Attach as EXHIBIT 22 any additional information which, in applicant's judgment, is necessary to adequately describe or to present fairly its services and operations in relation to the public interest.

PART V - EQUAL EMPLOYMENT OPPORTUNITY

23. Attach as EXHIBIT 23 a description of the specific practices undertaken by applicant during the past license term to assure equal employment opportunity for minorities and women and the practices applicant proposes to following during the coming license term to assure equal employment opportunity for minorities and women.

24. Attach as EXHIBIT 24 a brief description of any complaint which has been filed before any body having competent jurisdiction under Federal, state, territorial or local law, alleging unlawful discrimination in the employment practices of the station, including the persons involved, the date of filing, the court or agency, the file number (if any), and the disposition or current status of the matter.

THE APPLICANT hereby waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States, because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. (See Section 304 of the Communications Act.)

THE APPLICANT acknowledges that all the statements made in this application and attached exhibits are considered material representations and that all the exhibits are a material part hereof and are incorporated herein as set out in full in the application.

CERTIFICATION

I certify that the statements in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Signed and dated this____day of _____, 19____

NAME OF APPLICANT

BY SIGNATURE

TITLE

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND IMPRISONMENT, U.S. CODE, TITLE 18, SECTION 1001.

FCC NOTICE TO INDIVIDUALS

The solicitation of personal information requested in this application is authorized by the Communications Act of 1934, as amended. The principal purpose for which the information will be used is to determine if the benefit requested is consistent with the public interest. The staff, consisting variously of attorneys, accountants, engineers, and application examiners, will use the information to determine whether the application should be granted, denied, dismissed, or designated for hearing. If all the information requested is not provided, the application may be returned without action having been taken upon it or its processing may be delayed while a request is made to provide the missing information. Accordingly, every effort should be made to provide all necessary information.

THE FOREGOING NOTICE IS REQUIRED BY THE PRIVACY ACT OF 1974, P.L. 93-579, DECEMBER 31, 1974, 5 U.S.C. 552 a (e)(3).

FCC RULES & REGS

plaining the variations and the reasons for same. Th "old" renewal application sought information only fo *substantial* variations from representations.

Question 19: This question is similar to Question 1 but relates to the *proposed* number of maximum com mercial minutes per hour. A separate indication o maximum *political* commercial matter minutes per ho is solicited in response to recent Commission action a lowing a slight increase in the maximum hourly amou of such matter.

Question 20: The renewal applicant should indicate i *past* and *proposed* program format (e.g., Countr Western, Jazz, Rock, Folk, etc.).

Question 21: Information concerning duplication programming by commonly-owned AM and FM statio is elicited in Question 21. The Commission is seekir assurances that maximum permitted program duplicatio by co-owned stations has not been, and will not b exceeded. Licensees should review the newly decreas duplication maximums for certain AM/FM combinatio

Question 22: This is an *optional question* to be a swered by renewal applicants designed to provide a ditional data or information concerning their prograr ming and operations. The Commission gives an examp of how this question might be used: A renewal applica that believes that its composite week performance w *not typical* of its year-around programming servic would use Exhibit 22 to analyze its programming for selected 30-day period.

Part V—Equal Employment Opportunity

Question 23: All renewal applicants must submit Exhibit 23 a *description* of actual practices undertak during the past three year license term to assure equ employment opportunities for minorities and wome The description must include proposed practices to a complish the same ends for the coming license perio

Question 24: Exhibit 24 must include a listing a description of all complaints (if any) before a court administrative agency alleging unlawful discriminati with regard to employment practices. The descripti must include:

1. Names of persons involved;
2. Date of filing of complaint;
3. Court or agency;
4. File number; and
5. Disposition.

Conclusion

New FCC Form 303-R will, to some extent, simpl the paperwork that must be submitted to the Commissi with a license renewal application. The Commissio instructional Pamphlet (See last month's column) is invaluable reference source for completing Form 303 and for fulfilling a licensee's public interest obligatio

Copies of Form 303-R and the Instructional Pamph have not been printed at this writing, but should beco available in the near future. Certain minor amendme may be made to Form 303-R prior to its final adoptio Licensees should consult with their communicati counsel to determine the extent of these changes prio preparation of data needed for completion of the renew application. BM

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MW-5, five kilowatt transmitter

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Good news for small TV stations, freelance news/documentary cameramen and young independent filmmakers!

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PURCHASE: ⇩ / ⇧	CP-16 (Code #1C216) with one of the lenses listed below:		CP-16/A (Code #1C272) with one of the lenses listed below:	
	YOU PAY ONLY:	YOU SAVE: (off list)	YOU PAY ONLY:	YOU SAVE: (off list)
with Angenieux 9.5-95mm AV30 DA Zoom Lens (Automatic Iris Control)	$6835	$3575	$7685	$3990
with Angenieux 12-120mm AV30 DA Zoom Lens (Automatic Iris Control)	$6105	$2875	$6955	$3290
with Angenieux 12-120mm AV30 Zoom Lens	$5915	$1325	$6765	$1575
with Angenieux 9.5-57mm AV30 Zoom Lens	$6210	$1525	$7060	$1775

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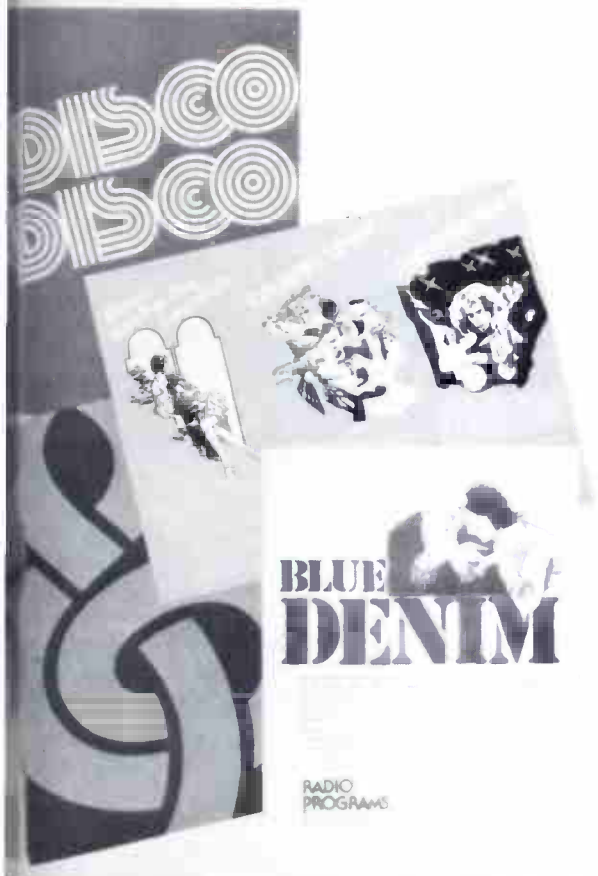
ow To Buy Syndicated rogramming For Your Radio tation

o: how to decide if you need syndication. Included is the most nplete directory of syndicators and their services that *BM/E* could nage. New firms appear and old ones disappear rapidly, but some 'e been there for a long time.



syndicators have buoyant names for their programs, but choice depends on careful listening to a large sample.

ething around a thousand radio stations in the United es, including both AM and FM, buy all the music put on the air, or nearly all of it, from a program licator. Why did so many managements make that ce? How has it worked out for them?

comparatively few firms, eight or ten, supply hly 90% of the syndicated programs used in this ıtry; another 20 or 30 firms are on the fringes. Conly trying to break into the business are new venturin most cases individuals who have been successful rogramming one or more radio stations, who think it be just as easy and much more profitable to sell their s to many stations rather than to one. A few of the comers make it; most find the economics too rough r a year or so and drop out.

What have the old and new successess got that the also-rans did not have? How do you choose a syndicator?

In talks with a number of syndicators, and with stations using syndication and stations *not* using syndication, *BM/E* discovered that the rationale of syndication has some obvious and some not so ovbious factors.

Broadly speaking, as might be expected, a station usually calls on syndication for help when its own programming efforts are failing to get the results the management wants. Or the station may want to change its demographics, get a more "professional," controlled sound: and there are other reasons as the station stories that follow show.

There are any number of success stories that prove syndication is a good route to substantially improved ratings. Every major syndicator will supply a prospect with a list of stations that have "made it" spectacularly after installing that syndicator's programming. It can and does happen. But there are some failures too, and the difference between success and failure seems to rest on a few main factors.

A number of these are actions the management itself must carry through: it is universally agreed that a station management cannot just feed some syndicated programs to the transmitter and wait for the ratings to explode.

First: the management must make a careful survey of the competitive situation in the market and decide what particular style of music has the best chance of success. A number of the larger syndicators will give advice during this part of the enterprise; their experience in "rescue" operations in other markets may well be of great value. But with or without help from a syndicator, the management has to decide early and clearly what the objectives are—what kind of programs it wants, and *why*. This may involve something as simple as filling a gap in local services—if there is no "country" music in the market, for example, there is an obvious operation plan with good probabilities of success.

But the improvement the station aims to make may be along more subtle lines. Suppose careful listening to the "beautiful music" put out by other stations in the market reveals that the music, in the opinion of the station making the survey, is too far in the background, too lacking in excitement, to really hold the audience as it should be held. Or alternatively, the music may be too

obtrusive, too up-front, producing a tendency to tune the station out.

This goes to the heart of the quality that a good syndicator gets into his music. It must be lively, "reaching to the heart," to hold the audience—everyone agrees that the days of straight "elevator music" are nearly over on radio, so that a station still using such music will be vulnerable to competition from more "relevant" programming.

To get it right, the station management has to make a judgment for which there are no simple guidelines. It requires good knowledge of the market and consideration of demographics. For younger audiences, the more up-front music is usually right. To reach a spread of older listeners, something more like "easy listening" may be the ticket. The station's own expertise has to be added to that of the syndicator. There is no substitute for local programming judgment, seasoned by experience in the market the station serves.

With what he wants fairly well established, the station manager must listen with utmost care to samples of the syndicator's music. What the syndicator calls his programs is not necessarily a clear guide to what they are. The usual "format names" give only the most general guidance to character. Broadly speaking, "Beautiful Music", "MOR", "Rock", "Country", etc. have accepted and obvious meanings, but the variations within each are far more important than the classifications. Hearing a good-sized sample is the only way to know what you would buy.

A major factor in quality is the *sequence of numbers* established by the syndicator. Does this sequence supply the lift, the drive, the proper front-to-back alternation the station manager wants? How often will particular numbers be repeated? Is there a good balance between old and new music? Generally speaking, solo pop vocals will be more "up front," more easily remembered, and thus adaptaable to fewer repeats, than instrumental music. But the character of each piece affects this strongly, and the syndicator's taste and sense of good balance, pleasing variety, are the most important factors. The station manager has to judge the music in these specific terms.

Next: the station management must be prepared to use the program in a smooth, professional way. And the station *must* establish a "local" character, an identification with the community, with a strong local news program, with PSA's, local "bill-board" service, community campaign help, or whatever else the community can make good use of, as service from a radio station.

For a "professional" sound, the syndicator of course has some responsibility too. The station management must make sure that the taping of the music is carried out with high attention to fidelity, far more than most stations apply to their own playing of discs on the air. The music must come from low-noise, pop-free discs, put onto 7½ ips tape, at no more than 1 generation from the disc, with duplication at 1 to 1 speed and the best equipment available. Only with tapes made with the utmost care can the full benefits of syndication be realized. The volume has to be balanced very carefully from one number to the next; a sharply different level changes not only loudness but also the apparent frequency response, for a disturbing alteration of quality.

By the same token, the station's equipment for putting the tapes on the air has to be top notch. Tape machines with wide frequency response and very low flutter, distortion and noise are essential. Those are the main essentials. Below are some other factors to consider:

Does the programming allow for adjustment to different parts of the day? The morning drive time, for example, takes a different handling than mid-afternoon which in turn is different from night-time. The changes can be made in two different ways—some syndicators lay out the whole programming day on their tapes, so the station simply plays the tapes in the order the syndicator indicates. Other syndicators supply "segmented" programming, with quarter-hour or half-hour segments that can be played in any order the station wants by setting up two or three tape machines that can be called on randomly. The station management has to decide which method is better for its own needs.

A very important decision which each management has to make: should syndicated "voices" be used along with the music? Most of the larger syndicators are prepared to supply disc jockey talk along with the music using top radio "personalities" who have presumably proved themselves by long experience on the air. The "talk" service, as the directory shows, can be extended to "personalized" ID's, PSA's, weather, time, even commercials—the station sends the copy to the syndicator, and the syndicator sends back the tapes with the top "voices" performing for the station.

BM/E found two totally opposed opinions on the syndicated talk. Many stations, particularly in small markets, welcomed the syndicator's disc jockeys on their air as far more "professional" and interesting than any "voices" the stations could hire themselves. On the other hand, a few station managers were quite definite in finding the syndicated voices too "canned" for their taste; they believed that their listeners would be turned off by a "standardized" quality, and wanted something more particular and relaxed, with which listeners could completely identify. They used the option, offered by a number of syndicators, of taking the programs "unannounced"; as one put it, his own station is the only "personality" he wants to put on the air.

Each management has to decide this one in the light of its own market characteristics and its station "identity." It will take careful listening to the voices themselves and careful consideration of what will "work" in the station's market.

On another front: in analyzing success stories offered by syndicators, it is desirable to look carefully at the market in which the success occurred. What kind of competition was there? Further: is there evidence on how much the station is spending to *promote* its programming? A leading station in Los Angeles, a user of syndication, is reputed to spend about $500,000 a year on promotion; in a certain sense it is "buying" its top position (although it is clear that this would not succeed without excellent programming).

Of course very much smaller promotion costs are appropriate in smaller markets—Los Angeles may be the most competitive radio market in the United States—but every station taking on syndication *must* do promotion adequate to build its audience. Without it, no programming, no matter how good, can succeed fully.

An important reason for going to syndication, me

continued on page

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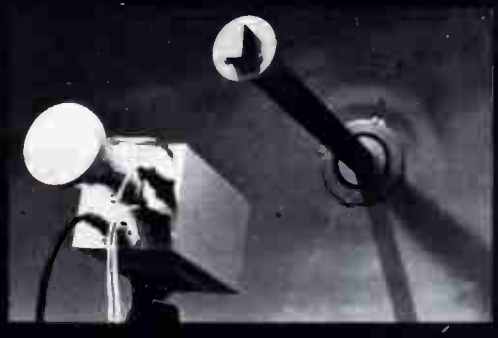
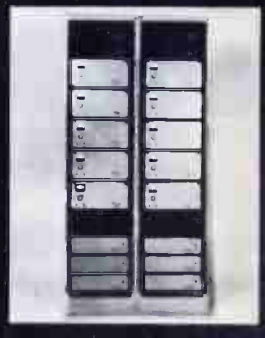




Microwave Associates, Inc. Burlington, Massachusetts 01803 Telephone: (617)-272-3100

Circle 133 on Reader Service Card

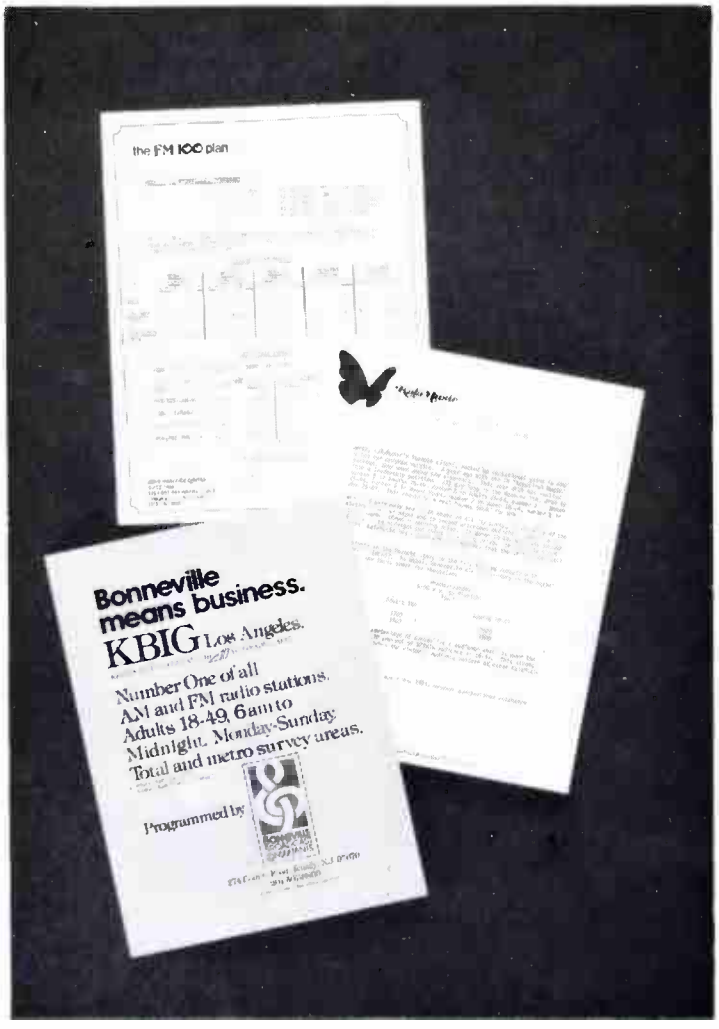
tioned by several station managers, is the great difficulty and expense of maintaining a collection of records large enough for full programming, particularly of "beautiful music." As everyone knows, records wear out pretty fast. A large body of music, both old and fairly recent, which many stations want to program simply cannot be replaced once the original records are worn out—the records go off the market as a result of the record companies practice of concentrating on current hits. couple of program managers told *BM/E* that before syn dication they were spending 75% of their time simpl looking for records, thus short-changing the station c creativity in programming.

The syndicator removes this burden. A couple of thei told *BM/E* that they themselves have a lot of trouble i maintaining a full record collection, but that is the bus ness they are in, the job they are getting paid to do.

A reason for going to syndication which will be eve more relevant next year is the necessity for separate pr

Why They Went To Syndication

The following stories represent a very small sample of the stations that are using syndicated programming, but they cover most of the reasons, the market situations, that convince station managements they should make that choice.



Each syndicator will supply success stories, stations that climbed to the top or near it with the syndicator's music

KEZU-FM, El Dorado, Arkansas

To split the station's programming off from AM sister KELD, manager Jerome Orr chose the Bonneville "Beautiful Music" programs. He says the choice and sequence of tunes met his requirement for enjoyable music, but not background music; the tempo is upbe but easy. He likes the total control of programming h gets; he says the DJs used to vary the quality of the mus they played far too much; the listener can now depend c a consistent sound. The station is doing well.

WEZO-FM, Rochester, NY

Up until July, 1971, this station was simulcasti country music along with AM sister WNYR. Th WEZO became one of the early users of the Bonnevil "Beautiful Music-Easy Listening" format. This combined with a Sparta automation system, used in way that maintains a "live" feeling for the station. Wi 13 stations in the market, program manager Dale Ha nett reports that WEZO is No. 2, just behind 50 k' clear-channel WHAM. WEZO uses strong promotion let listeners know what it is doing; one variation on t syndicated program is a "live interface" during t morning drive time, with local voices to supply freque local information and news.

WASR, Wolfeboro, New Hampshire

This 1 kW daytimer on Lake Winnipasaukee start about seven years ago with IGM programming (la absorbed by Broadcast Programming International), a a Sparta automation system. The qualities the ma agement (Alan Severy and his wife Sharon) want were a known, consistent "product" in the easy liste ing category, plus pro-quality announcers and DJs, n available in their community. Their town of 30 expands in summer to 20,000, with the total mark around the Lake reaching 200,000 in summer, most them city people on vacation. A very smooth, "profe sional" sound is required, especially with competiti from about 22 other radio signals. The choice, Severys say, was right; their station is high in the ratin and their operation has the "polish" they want.

WPRS-AM/WACF-FM, Paris, Illinois

Manager Adlai Ferguson says that at a certain point simply got fed up with having DJs spend their da cueing up records on one turntable after another— wanted to use his air personalities in a more profita way. The 1 kW AM station now uses the BPI Ad MOR programs and an IGM automation system; the kW FM station uses the Modern Country format and SMC automation system, and manager Ferguson happy with the results. The station, in a farming ar also uses a lot of agricultural programming—price crop reports, weather, etc. He enhances his commur "identification," in addition, with a local telephc

mming of an FM station that has been simulcasting h an AM sister, either partially or wholly. Putting the on syndication has obvious economy as compared h establishing a whole new and separate program eration. A number of station managements gave this one important reason for their decision.

The cost of full-time syndicated programming is at a nimum of about $400-$500 a month for stations in the aller markets, and goes up from there to match market . In analyzing cost, the station must look at how ny hours of programming it gets for its money.

Finally: is automation a necessity with syndication? This depends on the way the syndicator arranges his material: some work only with automated stations, others with "manual" *or* automated. Syndication plus automation has obvious advantages for stations in certain situations, as some of the following station stories show. Others want syndication but not automation. The decision on this one, like most of the decisions on syndication, comes down finally on the station's management. Brothers, the responsibility is yours: use it right and the future will be good to you. **BM/E**

-in program: Ferguson says his station was among the t in the country to run such a program. He likes the uence of tunes, and his ratings suggest that his listrs do too.

PBS-FM, Philadelphia

This big-city station has gone through what must be ut the largest number of program-origination changes station ever instituted. Hoping to forge ahead in the nsely competitive Philadelphia market, Edward ehan, manager of this newspaper-owned station ening Bulletin) adopted a "beautiful music" syndator in 1967—and the ratings plummeted. Starting in 8, he "winged it" on his own assembling a large ection of records. Ratings went up spectacularly, ning ahead, he reports, of leading syndicators in the ket. However, by 1972, he was having great trouble ing enough new recorded music to "freshen" the grams, and the ratings began to drop sharply. He tried *ther* syndicator, and the bottom nearly dropped out. y recently, he has gone to the FM100 Plan, and ngs have started to climb. He likes the variety of sic supplied by FM100 and believes that his needs y have been met at last. What lessons did he learn n this roller-coaster history? "In a market as comtive as Philadelphia, the quality of the music and its uencing become vital—the format name is not imtant. You must know how to listen to your own prodand that of your competitors. I think we have it now. cess takes total commitment, total discipline. You st maintain at all costs the *character* of your sta—the station itself is the 'personality.' "

RUF-FM, Gainesville, Florida

This FMer at the University of Florida competes with commercial stations in the area. One big problem the lack of consistency, of uniform high quality, that ulted from the use of a stream of student operators, ich is part of the rationale of the station. To get more trol of the "product," the management took on the ster Broadcast Service, and is now well pleased with quality of what they are putting on the air.

KCI-FM, New Haven, Conn.

Here is another "beautiful music" station that gave up ng to keep a record collection up to date and in good pe. Manager Bill Patrick says the attrition of his ords was so high that going to syndication is actually ing him money. He has adopted the Master Broadcast vice programming, which lends itself well to his non-automated operation. The music is in quarter-hour segments; by setting up three tape machines with three different reels, Patrick can switch between No. 1 and No. 2 for controlled variety, keeping No. 3 for fill-in. He works it this way because he wants to be as "live" as possible; he gets all the room he needs for the station's informational programming.

KDAB-FM, Ogden, Utah

Manager Mike Scott started out with syndication. His station went on the air in July, 1975, using syndicated programming from Peters Productions that he calls "soft rock." This choice resulted from a careful study of the market before the station ever went on the air. The management surveyed the market for "gaps," and wanted something in which they could have immediate confidence for general quality and as the needed class of programming. Their advance planning clearly was well done; the station, reports Scott, climbed to No. 1 in Ogden, No. 3 in the state before its first year was out.

WASK, Lafayette, Indiana

Here is another station that went to syndication after a careful study of their market. Manager Jerry Collins says the study, completed in early 1974, showed a "country" music gap—no station in the market was supplying this kind of music. He listened to the main syndicators with "country" and decided that, for him, Peters Productions had the best—he liked their "sound" the best of all checked, and the way they sequenced their programs. His decision and choice gave the station the jolt it needed: ratings have climbed several places on the list since the syndication went in, in July, 1974.

WRCH-FM, Hartford, Conn.

Program Manager Lee Manson took on the FM100 "beautiful music" programming in 1974 because he liked the tunes and the way they are sequenced; it is the kind of music, he says, that gets to the hearts of people, gives them a lift. The program uses a lot of "up tempo" music, and has clearly helped WRCH to advance several steps in the ratings.

The stations described, as already noted, are a small fraction of those using syndication; and not all the major syndicators are mentioned here either. No judgments are intented by these facts; *BM/E*'s interviews were governed mainly by easy availability of management personnel at the stations during the period of the survey. As the directory of syndicators that follows shows, the station's choices are wide, and the variety of things he can buy is large.

Program Source Directory

Bonneville Broadcast Consultants
274 County Rd.
Tenafly, NJ 07670
201-567-8800
Type of Service
Full-time programming or shorter libraries. Also: special programs for holidays; 4-channel programs; custom ID's/logos; time announce with one to four voices; market studies; total review of station performance; promotional ideas; written air checks; etc, etc.
Format Names — Type of Music
1. Beautiful Music/Easy Listening (Unannounced)
2. Classic MOR
3. Traditional MOR (In preparation)

Broadcast Programming Intn'l
PO Box 547
Bellingham, Wash. 98225
206-676-1400
Type of Service
Full-time programming or shorter libraries Custom ID's, logos, PSA's, news intros, etc, if wanted. Market Studies; format selection; air checks; consultation on full station performance.
Format Names — Type of Music
1. MOR (Announced or unannounced)
2. Beautiful Music (Bright n' Beautiful; Sounds for all Seasons; Easy Listening)
3. Rock-Album Oriented (Announced)
4. Rock "Gold" (Unannounced; intro-outro data supplied for these rock oldies)
5. Country (With country DJ's)
6. Spectrum (A mix of unannounced categories from soft MOR to lush instrumental)
7. Concert (Library of short classical pieces — back announced.)

Century 21 Productions
2825 Valley View Lane
Dallas, TX 75234
214-243-7621
Type of Service
Full-time programming. Also: Jingles, ID's, PSA's, commercial production, etc.
Format Names — Type of Music
1. "Z-Format" (contemporary music in separate demographic varieties — teens, young adult, adult, etc. — for mix wanted by station.)
2. "Progressive Country" (country hits new and old.)
3. Specials (6 to 8 hours, interviews rock stars plus music.

John Doremus Inc.
Hancock Center
Chicago, Ill. 60611
312-664-8944
Type of Service
Special 1-hour programs (see below). Five to 30 55-min. each music programs weekly with comments by John Doremus. Production services (writers, producers, actors) for any program idea. Production of commercials, ID's etc.
Format Names — Type of Music
1. "The John Doremus Show" (music and comment.)
2. "Your Passing Parade" (Stories, interviews, people and events — fro antiquity to present — narrated by Jo Doremus. Five to 30 shows weekly 55 minutes each.)

DIR Broadcasting Corp.
445 Park Ave.
NY, NY 10022
212-371-6850
Type of Service
90-minute and 1-hour live rock concerts some quadraphonic — on tape.
Format Names — Type of Music
1. "King Biscuit Flour Hour" (90-minut taped live rock, available twice a month)
2. "Best of the Biscuit" (60-minute tap live rock; available once/month)
3. "British Biscuit" (Live rock, 60 minut taped in Britain; once/month)
4. "Conversation" (two-hour special, interviews rock stars, plus music; Four/year)

Drake-Chenault
8399 Topanga Canyon Blvd.
Canoga Park, CA 91304
213-883-7400
Type of Service
Full-time programming, mostly rock, "History of Rock," "The Golden Years Country," and other specials.
Format Names — Type of Music
1. Hit Parade (Current rock hits)
2. Classic Gold (Older rock hits)
3. Solid Gold (Older hits)
4. TX 40 (Top 40 tunes)
5. Great American Country (With top country DJs)

Super Soul (New format with "soul" music)

e FM100 Plan
in Hancock Ctr.
te 7606
cago, Ill. 60611
?-787-3900
e of Service
l-time programming. Also: custom ID's, A's, etc; format consultation, market veys, air checks, performance surveys,

mat Names — Type of Music
'Beautiful Music" (Announced or Jnannounced)
Productions
Box 2049
ttsdale, Ariz. 85252
-946-2093
e of Service
-time programming (except as noted). mats can be mixed: start day with one switch once or twice to others.
mat Names — Type of Music
'Disco Disco" (Programmed in 10-minute disco-style sweeps with one une fading into another)
'Rock Stars" (Current rock performers. Jnannounced)
'Rock Hits Today" (The "hot" tunes; weekly 3 hours for addition to other formats)
'Rock Decade" (Hits of past ten years — proven popularity)
'Soul Train" (Current "soul" hits)
'Rock Softly" (Leaning rock toward MOR — hit music without hard tunes)
a Music
e 334

Industrial Bk. Bldg.
Kalamazoo, Mich. 49006
616-345-7121
Type of Service
Full-time programming. Programming produced for station WQLR — syndicated by station management to other stations.
Format Names — Type of Music
1. "Good Music" (In careful blend: scheduled on computer to avoid too frequent repetition. Each tape has two quarter-hour segments to be played in order, then a "fill" segment. Unannounced)

Master Broadcast Services, Inc.
PO Box 61
Morrisville, Pa. 19067
215-295-0413
Type of Service
Full-time programming. Also: weekly tape schedule, custom ID's, Xmas specials, engineering suggestions, etc.
Format Names — Type of Music
1. "Beautiful Music" (Supplied in segments on tape. Two tapes set up for AB roll, plus C for fill-in. Unannounced)

More Music Enterprises, Inc.
Suite 2000
5315 Laurel Canyon Blvd.
N. Hollywood, CA 91607
215-985-3300
Type of Service
Full-time programming.
Format Names — Type of Music
1. "The Great Hits" (Contemporary music combining up, mixed, and down tempos — allows user to shift mix as he wants)
2. "The Performers" (Progressive MOR, with four air personalities — Lou Burns, Dave Hill, John Peters, Jay Stevens)
3. "The Economy" (Low-priced oldies library plus weekly current updates)

Parkway Productions, Inc.
7979 Old Georgetown Rd.
Washington, D.C. 20014
301-656-9609
Type of Service
Classical series — produce about 40 hours/week. Also: some "salon" music. Commentary afternoon shows — Martin Bookspan. Do all taping and duplication. Also some live recording St. Louis and Baltimore Symphonies.
Format Names — Type of Music
1. Daily, 2 hours each ("Matinee," "Cameo Concert," "Starlight Concert")
2. Weekly, 2 hours each ("First Hearing," "Vocal Scene," "BBC Promenade," "In Recital," "Listening Room," "St. Louis Symphony")

Peters Productions
8228 Mercury Ct.
San Diego, CA 92111
714-565-8511
Type of Service
Full-time programming. Also: ID's, commercials; consultation on all areas of programming and sales; marketing plans, with jingles, graphics, etc. Each format includes voice tracks; promotion and sales material including newspaper art, presentation folders, sales tapes, etc., etc.
Format Names — Type of Music
1. "Country Lovin' " (Adaptation of country music with modern sound)

continued on page 42

PROGRAM SOURCE

2. "The Great Ones" (Adult, contemporary MOR; a blend of uptempo MOR, contemporary, standards, hit instrumentals)
3. "The Love Rock"
4. "Music . . . Just for the Two of Us" ("Beautiful Music" with flexibility for different markets)

The Programme Shoppe
6362 Hollywood Blvd.
Hollywood, CA 90028
213-461-3121
Type of Service
Full-time programming featuring strong air personalities.
Format Names — Type of Music
1. "Rock Unlimited" (Blend of current, and recent and old "gold" rock, with 5 air personalities; Steve Lundy, David Prince, Kris Stevens, Brian Cummings, Bob Shannon.)
2. "Big Country" (Blend of country classics and new hits, with 5 personalities; Jason Mc Call, Chris Lane, Bob London, Chuck Roberts, The Nighthawk.)
3. "The Great Air Show" (The "new MOR"; softer sound)
4. "Gentle Persuasion" ("Beautiful Music," announced or unannounced)
5. "The Classic Experience" (A library of 1500 hours of classical music, voice tracks available.)

Radio Arts
210 N. Pass Ave.
Burbank, CA 91505
213-841-0225
Type of Service
Full-time programming; automated or l
Also; specials — two-hour interview –
plus music programs, host Johnny Gre
with music stars (Liza Minnelli, Tony
Bennett, etc.).
Format Names — Type of Music
1. "The Entertainers" (Adult MOR, ble of "upfront" and "back" music, with mostly vocals for foreground. Based listener preference study involving more than 5,000 replies to questionnaire, available announced unannounced.))

Radio Programming/Management
15552 Arbor Pl.
Southfield, Mich. 48075
313-557-3246
Type of Service
Full-time programming — designed for automation or normal. Also: marketing consultation, format selection, custom voice production (ID's, local spots, etc air check critiques, etc.
Format Names — Type of Music
1. "Beautiful Music" (Supplied in segments, station establishes sequence. Available with voice trac announced or unannounced: can b used with "live" local announcer.)
2. "Contemporary Beautiful Music" (T hits of last ten years, plus "soft" M vocals. Tempo, number of vocals p hour, etc., can be regulated by stati Can be used with "live" local announcer.)
3. "Progressive MOR" (Top current hi with best of past hits. Can be regulat by station for sequence desired. Available with or without custom introductions.)
4. "Rock N' Gold" (Best gold-rock hits past 7-10 years. Can be regulated station for tempo, rock-gold ratio, length of cuts, etc. Selections introduced or backsold.)

Radio Programs Inc.
2773 E. Horseshoe Dr.
Las Vegas, NV 89120
702-732-8670
Type of Service
Full-time programming for automated live use. Also: voice ID's PSA's, etc.; market consultation, format selection.
Format Names — Type of Music
1. "No. 1 Country" (Current hits plus b of recent years. Announced or unannounced. New material weekly
2. "The Music Mint" (Assortment of e listening" and "beautiful music," wi sequence determined by station. Unannounced. Instrumentals and vocals on separate reels.)
3. "No. 1 Easy Listening" (Aimed for young adults. Chart tunes chosen f an "easy listening/MOR" sound. Announced or unannounced.)
4. "Blue Denium" ("Casual," aimed a 25-35 market. Current chart hits se weekly — basic library. Announced unannounced.)
5. "Blue Velvet" ("Beautiful music," standards alternating "uptempo" w soft quality. Starter library and wee shipments. Announced or unannounced.)
6. "Star Trak" (Specials, ½ hour

continued on page

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ator ($200).

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- **Parallel Outputs**—Each module operates independently and has separate rear-panel outputs.

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Total Automation: Where It Is Today. Where Will It Be Tomorrow?

". . . after all these years" Business Computers are talking to Technical Operations computers and a rush to go "total" is on at a number of stations.

Last year there was just one TV station, WTCN, Minneapolis, (*BM/E*, Aug. '75) that could claim to be "totally automated." As of this writing WTCN is still the only "on-line" and operating station that possesses "total automation." By the time you read this article, however, WNEW-TV, New York, WTTG-TV, Washington, D.C., WBBM-TV, Chicago, KNXT-TV, Hollywood, and WNAC-TV, Boston, may all be operating "total automation" systems.

KTLA-TV, Los Angeles, and WIIC-TV in Pittsburgh are also very close to initiating "total automation" systems. Moreover, the various manufacturers of automated technical operations systems and the suppliers of business computer systems report nearly a score of additional stations that will be well on the path to "total automation" within the near future.

The 'Big Three' manufacturers of technical operations automation systems, Vital, Grass Valley, and CDL, have all worked closely with BCS, BIAS, Cox Data Services, and Jefferson Data Systems to establish the necessary protocol for interfacing their respective computers. Many are just awaiting common customers. In addition the technical operations people have established protocol with some business systems such as the CBS-Grass Valley interface which is about to be completed at both KNXT and WBBM. Demonstrations of several interfaces were performed at the NAB show, Chicago, this past March (*BM/E*, May '76.)

What is really going on here is not properly described as a "rush" since it has taken a number of years for things to sort themselves out. Automated business systems and automated technical operations systems have been around for a long time. They have not, however, been talking to each other until quite recently. The impetus for the dialogue has been provided by a number of factors, the most important of which has been the desire of station management to, at last, "achieve a closed circuit for all TV operations."

The early vision called for the sales order to trigger a chain of events that would continue, with minimal human intervention, all the way from traffic, through broadcast and logging, to billing. Had it all been that simple, "total automation" would now be the rule, rather than the exception.

Broadcasting is, after all, a complex business and practiced by thousands of different people in different ways. Though the similarities from operation to operation are many, the differences are legion. Getting t business computer to talk to the technical operatio computer is not as great a problem as determining, s cifically, what they ought to say to one another.

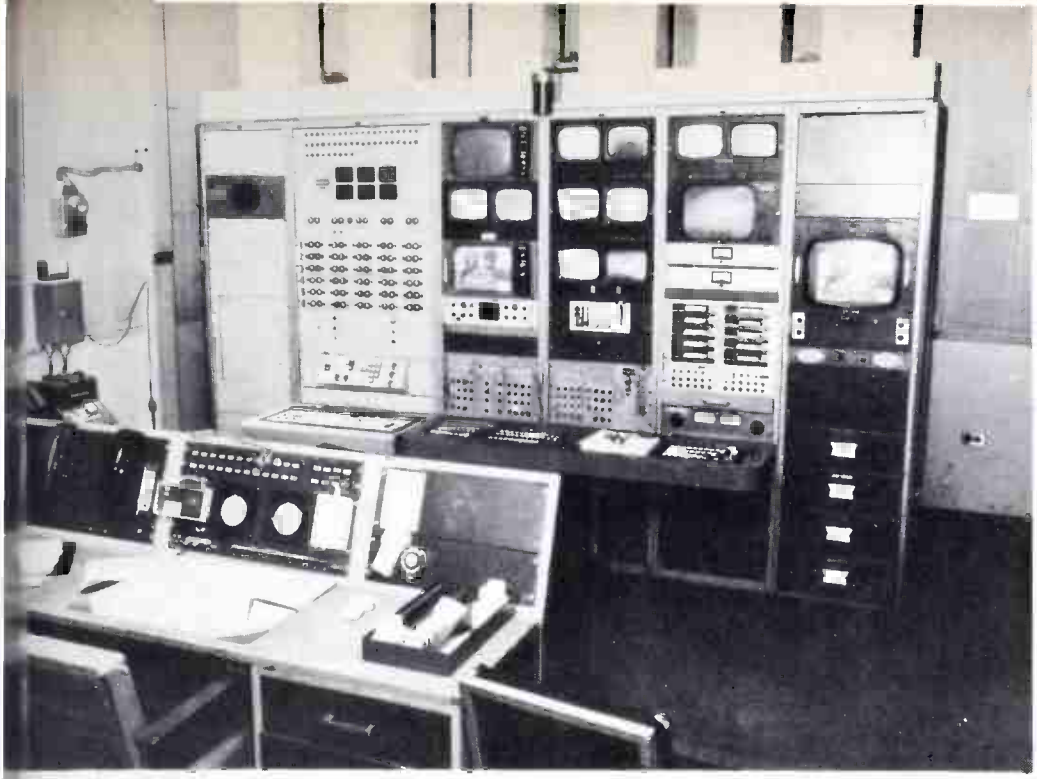
A case in point is WIIC in Pittsburgh. WIIC was usi the Cox Data Services' business automation system a already had a Grass Valley APC-2000 system. Each w being used successfully and the idea of interfacing t two systems was being worked on as far back as the ea 1970s.

The Grass Valley system used a PDP-8 minicomput and the Cox Data Services system used a Nova II. Co Grass Valley and station personnel worked together e tablishing protocol and determining how the two syste would ultimately control the various operations a complete the numerous tasks. Andrew Jackson, Ch Engineer at WIIC, said, "If I hadn't of come in (M 3rd, 1976) it would have been installed and gone on-l and been working. But when I arrived they asked me n opinion and I asked, 'What'll your system do?' a that's when the proverbial fan got dirty."

The system developed by Cox, Grass Valley and Jac son's predecessor was fine, but Jackson, through h previous experience in a Miami station, and havi worked on radio automation systems, had a list of thin that he thought the system should do that had not be included in the early concept.

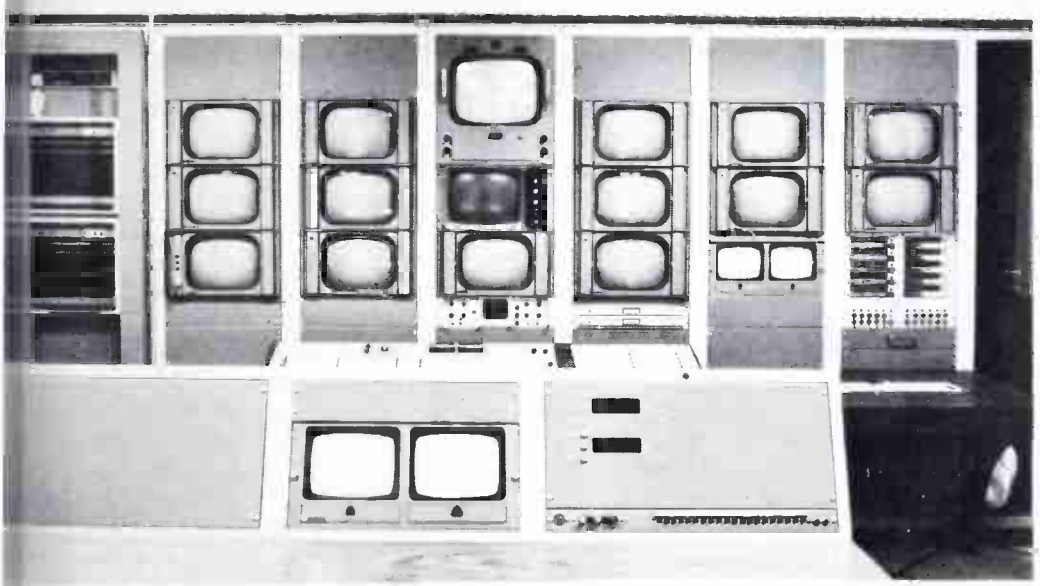
Among the things Jackson wanted was to upgrade t PDP-8 to a PDP-11. With the PDP-8, WIIC could sto only 256 lines of information in core. The PDP-11 w store information sufficient for an entire day's progra ming. He also wanted "automatic protection," for c tain categories of commercial spots. "We wanted to de ignate 15 min., 30 min., or 1 hour of protection. " other words," said Jackson, we wanted protection, " that we do not have two automotive dealers within minutes of each other and we want the computer to this automatically and we want it to show up in mast control," in case of a manual override.

All of this involved modifying and/or writing ne software and resulted in a delay before going on-lin Then, WIIC was hit by labor trouble and IBEW worke went out on strike. One of the issues in the strike, so it alleged, is that prior to the interface the schedule, pre-log, prepared by traffic was typed into the mast control computer five times a day by IBEW workers a they did not want to lose control of the keyboard as th



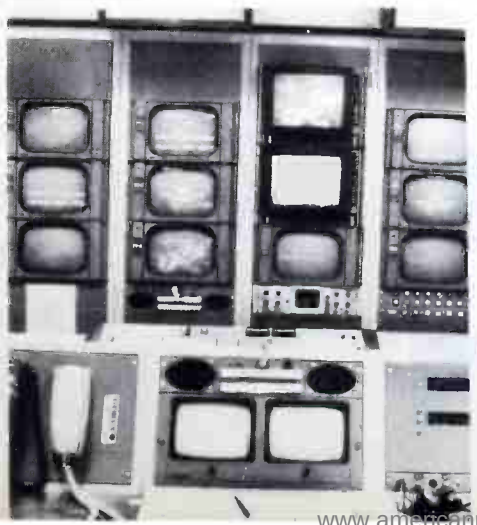
Special note: On June 27th, the BCS system and the CDL systems were interfaced and WNEW-TV, New York, became the second station to achieve "total automation."

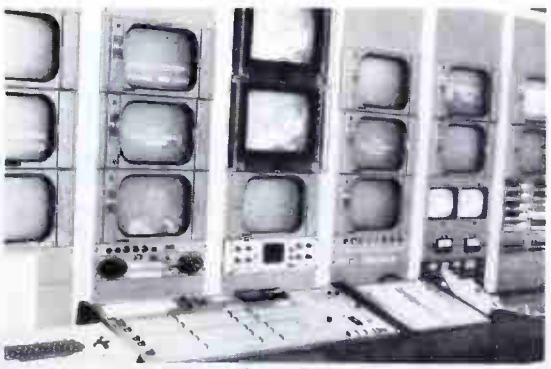
WNEW-TV's old master control. Equipment had to be removed and functions handled at alternative sites until the CDL automation system could be installed.



The new WNEW master control room, prior to going on-line. It took many months of planning and smooth organization to complete the transformation without disturbing on-going operations. Minicomputers for controlling the CDL system are in two racks at left of photo.

› CRTs eground) provide operator with a dout of the eduled events. ıstant checks and ıparisons are de between the ted schedule and data on the CRTs. uld any failure of system occur, a ıual override can executed instantly.





For several months prior to the installation of the BCS business system, the schedule prepared by traffic was typed into the CDL system using CDL terminals in traffic. Last minute changes are handled by the keyboard in master control (lower left).

will when the computers are hardwired.

The delays and the strike have not been all bad, however, since someone can always think of something else they would like to do with an automation system if they have time. In this instance, said Jackson, "Maybe it (the strike) was a blessing in disguise." Prior to the strike they had the projectionist and the videotape operator tell the computer where the material was, and then the computer operator would put in this information "and sometimes, something would get lost in the translation." Now, the way they are working it, the computer operator is making the machine assignments and determining "if it's a film which film projector, and if it's a cartridge, which TCR."

Now the projectionist and VTR operators take the and pull their commercial load or program load in quence and "then they stand back and look up a computer readout and say, 'O.K., now I'm holdin Colgate; where does this thing belong?' " The mach assignment is on the sheet and all the operator ha know is how to follow the instructions.

One of the reasons that WTCN was first to go to "g automation" was that it was in the process of movin a completely new plant. In effect, all the construct and installation could be carried out free from in ference from on-going operations.

It has not been that way at other stations. Most, fact, must plan for the changeover with all the care, s and logistics of a military maneuver.

Once the decision is made to go for total automat sufficient lead time must be allotted for all the neces reconstruction and renovation. The actual interface the machinery will probably be worked out beforeh by the suppliers, as in the KTLA case where Ga Valley has installed a data line between a switcher their plant and the BIAS computer system in Memph The two systems will dry-run for some time before t actual changeover at KTLA.

Automation systems 'prefer' video cart machine

Meanwhile, back at the station, decisions are m regarding the architecture of the system and additio machinery required. The usual plan calls for the c struction of a parallel control system to the current s tion system. If a new switcher is required, space will assigned for it, usually in a control room adjacent to t existing master control. All the wires required for mas control are laid leading to the new master control lo tion, from the various telecine islands, VTRs, c machines, audio booth, and character generators.

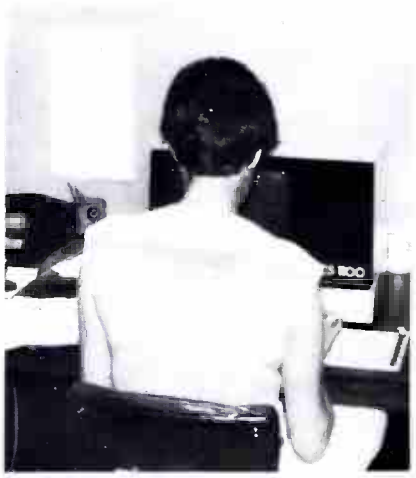
Automation systems "prefer" to work with video c machines so a station, if it has none, will usually p chase a pair of either the RCA TCR-100s or Amp ACR-25s. One reason for this preference is that c machines have computer based technology that t automation systems can talk to more easily. Anoth reason is that fewer wires are required to control the machines. At NBC headquarters in New York, for i stance, the cart machines are controlled by two co necting wires as compared to the fifteen wires requir by the film islands.

During the early days of planning for a total au mation system at WNEW-TV, Chief Engineer, B Kelley and Dick Munroe of KYW-TV, generated so ideas that eventually blossomed into a system develop between CDL and Ampex that is known as ARC (Automatic Remote Cassette Handler). The ARC system has a number of unique characteristics, chi among them are ADA and IDA.

Essentially, what happens is this: The ACR-25 can loaded with 24 cassettes in random order. Each casset has a material identification code encoded on its leade Then ADA (Automatic Data Accessory) interrogat each tape by reading the identification recorded on t "pre-roll" segment of the cue track. The ADA th creates a table of contents listing the status and conte of each bin. This is stored in the ACR-25's memory u and also transmitted to the master control switchi computer which receives the table of contents and co

continued on page

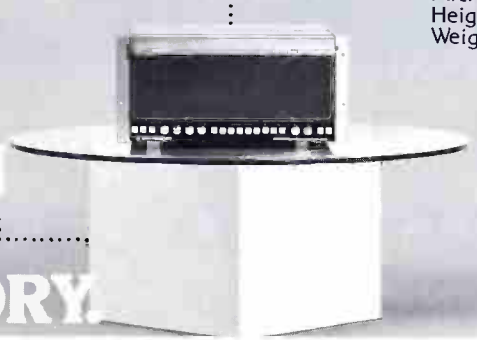
The PDP-11 that provides the computing power for the business system from BCS is housed in a special room in traffic. The construction of this room with special environmental controls was an accomplishment in itself.



In addition to the CRT terminals in traffic, here a worker uses a CRT terminal in sales/service for its purposes in requesting avails and entering sales information for traffic.

1974
NEC introduces the FS-10B.
Height, 6 feet 9 inches.
Weight, 550 pounds.

1975
Micro Consultants introduces the DFS 3000.
Height, 9 inches.
Weight, 58 pounds.



GREAT MOMENTS IN DIGITAL VIDEO HISTORY.

A SMALL FRAMESTORE SYNCHRONIZER IS DEVELOPED.

ND MICRO CONSULTANTS IS THERE WITH THE DFS 3000.

hen our competitor NEC developed the first digital framestore chronizer in 1974, they helped revolutionize the process of locking n-synchronous television signals. It was a great moment in digital video tory.

w Micro Consultants has revolutionized the digital framestore nchronizer itself, dramatically reducing its size and cost and increasing capabilities. Another great moment in digital video history.

e pioneering NEC unit occupies a full 8.1-inch rack and weighs over a arter of a ton.

e new DFS 3000 occupies less than 9 inches of rack space and weighs portable 58 pounds.

e NEC unit dissipates 1000VA of power. The DFS 3000 dissipates 250VA.

ere's more. Micro Consultants gives you all the important options, cluding sync pulse generator, video compressor, and joystick control. ey're plug-in modules, too. Which means you can have them from the art, or add them later as your needs change.

u'd think the DFS 3000, with all its advantages, would cost a lot more. costs about one-third less.

e day you install a DFS 3000 in your station will be your great moment in gital video history. Make a start. Call your Micro Consultants presentative. Or write us at P.O. Box 10057, Palo Alto, California 94303.

The digital video people

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pares it to the schedule. When the numbers of the contents match up with scheduled events a play list is compiled that is then relayed back to the ACR-25. The ACR-25, now informed of the scheduled play list, then plays back the cassettes on time in the order given; regardless of how the cassettes were loaded.

IDA (Identification Data Accessory) functions to keep personnel informed as to which event is playing and which event is scheduled to play next. This information can then be compared with the schedule to double check that the next scheduled event is, in fact, correct. If it is not, a correction can be made to conform to the actual schedule.

Another feature of the ACR-25 that some engineers cite as an advantage is that if a cassette contains a spot that is scheduled to play again in a short period of time, the random access capability of the ACR-25 permits it to return to that cassette time and again if called for. The TCR-100, on the other hand, plays its contents sequentially, bins 1 through 24. A cart that is scheduled to play, for example, in both the 5th and 15th positions, must be removed after its first play and replaced in the new position.

Some stations like WIIC, however, consider this an advantage rather than a drawback. Since the TCR-100s are open faced, the labels of the carts are always visible and numerous checks can be made to assure that things are in their proper order. With IDA, according to Jackson, the warning provided is on too short a notice.

Regardless of the cart machine selected, it appears that they are the source machine of choice by most engineers and systems designers. Gil Wyland of CBS states, that as far as WBBM is concerned, with the cart machines and an imminent move to a complete ENG operation, "everything will be on one medium; we're getting film the hell out of there." As he sees it, "the industry is very far down the road, maybe three or four years, for when film is going to be an off-line operation." There is, of course, some controversy on that point.

One criticism of film equipment when it comes to automation is the absence of an automatic material identification system. RCA, however, is considering the possibility of developing some such system for its TCP-1624 film cartridge player and as long as film remains the prefered medium for distributing commercials many stations will opt to retain a substantial on-line film capability. It should be noted that the TCP-1624 already has a keyboard device that allows the operator to type in material identification and inform the computer system of contents and sequence.

Once the equipment is selected, purchased, and installed, the technical operations computer will have to be provided with a description of this layout. The software will need to account for, know the location of, and understand the capacity of each piece of equipment. This equipment profile is central to software. Bill Kelly says that one thing engineers should be aware of is, that once the system goes on line, new equipment will require some fairly expensive and sometimes, time consuming rewriting of software. It is best to have the details of the system architecture completed well beforehand.

When the technical operations side of things is completed there is usually a period of trial when the new system is run parallel to the old system. Pending a successful shake-down cruise, the final step is the connection of the new system to the transmitter. This operation in itself is usually very simple, and as Andy Jackson said, "at WIIC it involved pulling a couple of wires and reattaching them from the new switcher to the transmitter."

The interface with the business system will vary from station to station depending on what the station has in the way of an automated business system and how they want the interface to work.

The biggest problem confronting the technical operations/business system interface is how the business system formats its data. All the technical system really needs to know from the traffic system at the outset is the name of the event, the medium it is on, the time it is to be aired, and some sort of house "ID" number so that the item can be recognized.

Some of the business systems have been fairly inconsistent, according to Bob Hueffed, vice president and general manager of CDL, "to keep their formats in keying in the information and retrieving the information as close to the English traffic vernacular as they can."

So, if traffic enters, "put a 5 second tag instead of slide on the end of this 30 second VTR," engineering has to take that and interpret it into VTR and slide projector language. An instruction of that sort would translate into three separate events for the technical operations computer.

With some business systems, particularly those that use distant computers, either on-line or through batch or distributive processing configurations, in-house data processing capacity is usually limited. This often requires the technical operations computer to use some of its storage capacity to hold contractural information not essential to operations.

Though this information will be handy for printing the

continued on page 6

Automated Breaks in an Economy Package

For a station that would like to run those profitable and complex breaks that automated stations are running, but doesn't want to extend itself into the area of expensive cart machines and computers, the Video Spot Assembler, from Recortec is a possible alternative.

The VSA is a microprocessor based, special purpose editing controller that works with two VTRs to assemble complex spot reels. Using a system that identifies each event with a two digit code, the operator can assemble on a single reel up to 100 "breaks" consisting of 8 spots each. Each break can contain "repeated events" and "single events" and will run these events automatically when called for by break number.

The "repeat" events are pre-recorded on a "catalog-reel," grouped according to length. This "catalog reel" is used to automatically assemble a basic spot reel of all repeated events for that day in their scheduled sequence. "Single" events are then inserted into the proper breaks where they are required.

Eventually, with a savings in manpower and time, all spots are recorded and grouped into breaks that are aired in sequence as called for by the schedule.

The VSA is priced at $8,950 and designed to interface with VTRs of the AVR-1 and AVR-3 type. Other VTRs will require the R-MOD (Reel-Servo Modification kit).

the wraps are off!

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FM LOUDNESS AND CLARITY without compromise!

MOSELEY ASSOCIATES announces the MODEL TFL-280 AUDIO LIMITER*

[F]or FM mono, stereo, quad — FM SCA — TV Audio • Excellent Leverage — greater than 50:1 • Extended Control Range — [o]ver 35dB • Clipping not routinely produced • Fast AGC attach times — less than 20 microseconds • Very low harmonic [a]nd intermodulation distortion • Optional plug-in audio low-pass filter • Operation over wide temperature range • No Test Mode — run proofs thru TFL-280

[L]oudness and clarity without compro-[m]ise...the Moseley Associates TFL-[2]80 Audio Limiter precisely controls the [m]odulation levels of FM and TV aural [t]ransmitters. FM monaural, stereo, [q]uadraphonic, FM SCA, TV aural are all [p]roperly processed. This frequency-[c]onscious limiter cleanly solves the problems associated with the transmission of pre-emphasized audio, including the ringing (over-modulation) produced by low-pass audio filters. Using agile limiting circuitry, clipping and its attendant problems are essentially eliminated. Monolithic semiconductor arrays, wide-band operational amplifier circuitry and distortion-reducing techniques are some of the technological advances incorporated into the TFL-280. Other features are accurate metering of limiting, optional plug-in audio low-pass filter, operation over wide temperature range, and thorough RF shielding and filtering of complete unit.

[T]he TFL-280 Audio Limiter, when combined with the Moseley Associates SCG-9 [S]tereo Generator, make an unbeatable combination for FM stereo. If your FM [t]ransmitter is at a remote location, add the Moseley Associates PCL-505/C Composite [A]ural Studio-Transmitter Link for totally uncompromised performance.

The TFL-280 will be unveiled for the first time in Booth 109 during the NRBA Convention in San Francisco. See us there — or contact our Marketing Department for Product Bulletin 255 describing the TFL-280.

* PATENT PENDING

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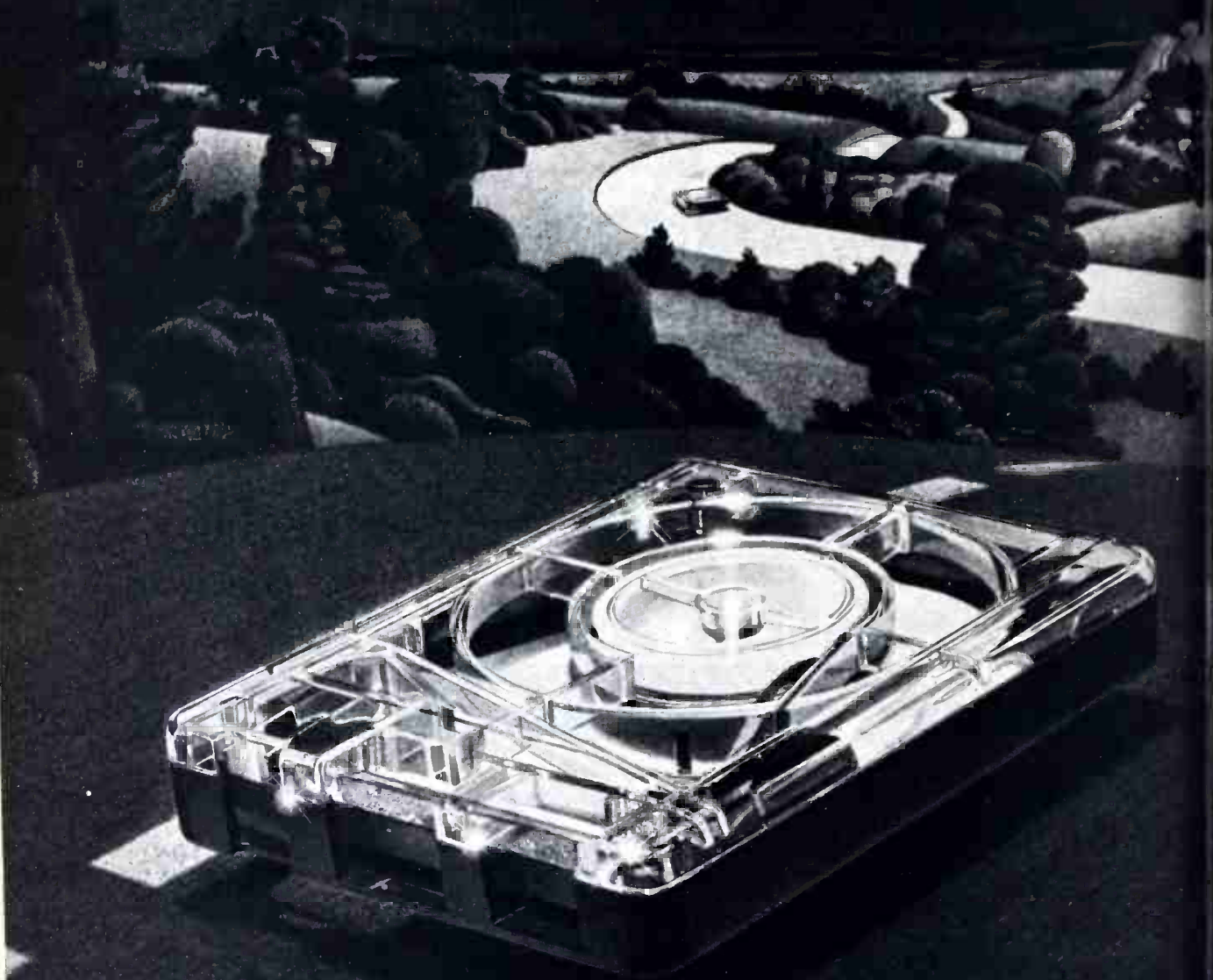

Think of it as a car.

Because, in a sense, it is like a car. All of the major components are assembled to get you from point A to point B. With efficiency and precision. For example, the constant-force, foam pressure pad assures unvarying head to tape contact over the life of the cartridge. The positive, non-slip brake mechanism locks the tape, rather than the hub, assuring accurate cueing and timing. And, to assure you of premium performance, each cart is individually tested—100%—for wow and flutter, electrical output, tension, and other properties. And because we manufacture the entire package—from tape to packaging—we can assure you of the highest possible quality control.

The Audiopak A-2 by Capitol Broadcast Cartridge. The car you drive probably *isn't* as reliable as the A-2.

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Election Eve Reporting: Making It Count With Computers And Character Generators

There may be no 'sure winners' in politics this year but in broadcasting it's a landslide for character generators.

Reporting the elections in 1976 promises to provide the American public with more data and analysis than ever before. Two instruments have made this possible: the computer and the character generator.

It wasn't too long ago that election eve reporting of results was a tedious evening of television and viewers frequently went to bed in the early morning hours still unaware of the outcome. Now, within a few hours of poll closings, network news organizations and national wire services are providing reliable predictions and declarations of winners; sometimes based on what seems to be an impossibly small percentage of returns.

Moreover, with the development of sampling techniques and demographic profiles of precincts the viewer is getting more data to help understand the import of voting patterns. Television news organizations are offering analysis of women voters, ethnic voters, income groups and various historical patterns in various regions, districts, and neighborhoods.

All this boils down to numbers, names, and more numbers. Time was when a station would have to set aside a sizable budget for the construction of special sets, tally boards, and then hire or reassign numerous personnel on a temporary basis to tally just the votes in the various races.

Now, with computers and character generators, broadcasters are handling greater quantities of data and more types of statistical reporting with speed, ease, and clarity never before possible. Tony Mattia, 3M marketing coordinator for the Mincom Division which manufactures character generators, said, "This year we're probably going to see 70% of the election reporting handled by video graphics. Sure, you're going to see the talent, but more and more, the focus will be on the tally screen."

Stations, regardless of size, are able to improve their election eve coverage simply because of the wide variety of video graphics apparatus available. These machines can range from extremely simplex, storing only a few lines of information, to complex units aided by various memory storage devices with page after page of information. Some character generators are controlled by microcomputers or powerful central computers programmed to provide information that brings into focus all the nuances of modern political struggles as expressed in statistical data.

In its simplest form the character generator can, with enough storage, list various races, the candidates and keep a running tally of returns as the totals are called in to the news room from various counting locations.

Formats For Races Set In Advance

The races are formated in advance and the names are entered. Vote totals are typed in by the operator as the night progresses. If the station chooses to report the results only periodically, the character generator is also used to provide occasional messages supered over the evening's programming in crawl format either advising the viewers to "Stay tuned for election coverage beginning at 10 PM" or as election update information consisting of changes in the standings such as "Congressman Boondoggle now leads by 4% in the 14th Precinct. Stay tuned for complete results."

This rather pedestrian method of using character generators, however, is giving way to more complex reporting utilizing computers interfaced with the device. Such interfaces are available in a number of ways. Some character generators are equipped with special computer hardware and software packages specially developed for the election and some are interfaced with station computers normally used for business operations but containing election software designed by the supplier of the business system. Others are interfaced with computers operated by regional institutions, private and public, like banks and colleges. There are also a few firms that specialize in offering election reporting services that consist of either designing the software for reporting the data or arranging for the use of both software and hardware.

Storage Capacity Key to Election Reporting

The Mincom Division of 3M reports a brisk sale since the NAB show of its D-3000 character generators and Tony Mattia, marketing coordinator, attributes much of this to the up-coming elections and the demands being placed on stations to provide quick and efficient video graphics.

The D-3000 character generator itself has internal storage capacity of 4-pages in random access memory. A page consists of 10 lines of 22 or 24 characters each. Normally, 4-pages of storage would be insufficient for storing the amount of data generated during election coverage, but the 3M system has an optional storage system. The character generator can be equipped with the D-4000 Random Access Disc Memory which stores up to 1,000 pages of data on each "floppy disc."

ELECTION EVE REPORTING

The simplest mode of operation using such a system would require that each page be formated prior to election eve, listing the various races and candidates. This information can be stored on as many diskettes as required. A typical format would list the title of the race (i.e. 1st Congressional District) and each candidate with his or her party designation. In cases where the number of candidates exceeds the number of lines on a page, sequential pages may be used and recalled automatically.

Use of the D-3000 and the D-4000 Random Access Disc Memory becomes designated the D-3400 system and includes a number of features in addition to the expanded memory that are helpful in reporting the elections. In this configuration the D-3000 becomes the primary I/O device for entering data into memory, editing it and commanding the display functions. The D-4000, however, is also equipped with a D-4050 Address Keyboard, for the purpose of assigning addresses to the various pages of data in memory. Because of the simultaneous 2-channel video output feature in the D-3000 and the nature of Random Access Memory of the D-4000, it is possible to constantly update election returns even while one page of returns is on air since any other page can be displayed at the same time on a separate monitor for editing and preview.

When using a system like this, it is suggested that incoming election returns be given first to the character generator operator so that it can be entered into the system and readied for use at the call of the director or talent.

Essentially, this system provides a good way to present video graphic renditions of statistics. The life brought to the presentation, however, is largely dependent on the genius of the operator and the thought that goes into format preparation. Provided the news director and other station personnel can come up with interesting ways of presenting available information the viewer will get dynamic coverage of the elections.

Computers Help Provide "In-Depth Analysis"

Basically, any good character generator with sufficient storage capacity can be used to present statistics efficiently for election eve reporting. But, in this day of statistical consciousness, "a la" the Harris, Gallup, and numerous other polling organizations, the audience is prepared to expect more than a simple tally of voting results. People are interested in how various segments of the population are voting and on what issues the election is turning. They want to know how different regions view the various candidates and they are interested in such comparisons as can be drawn by looking at results from a number of vantage points rather than simply "who's winning."

To accomplish this "in-depth analysis" television news organizations have to be able to "massage" the results in a number of ways. This is where computers come in. Computers, of course, come in all sizes and capacities, and they require software that will express the results conveniently and meaningfully.

Several of the character generators can be had with special computer capabilities attached and software packages especially designed for election reporting. 3M, Mincom Division offers a microcomputer, the Data-

continued on page 55

5 Good Reasons to See the Datavision D-3000 Video Character Generator Before Making a Purchasing Decision.

r D-3000 Character Generator produces video-type
h excellent clarity (1120-element character
olution). Each letter is smooth and precise.
And, now you have a greater selection of type fonts
. including Upper and *Lower Case*, selected math
nbols, and accented foreign language characters.
When used with the optional D-4000 Random Access
mory you can store up to 1,000 pages on each
v-cost diskette. With our new Animation Mode
tional), you can play out full frames at a rate of 6 or
per second from the D-4000 Memory, creating
deo motion pictures".
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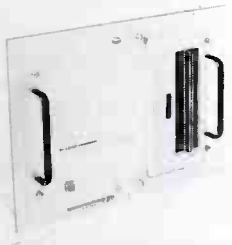

1 Smooth, True Characters.

2 "Most Asked For" Features.

3 1,000 Page Random Access Memory.
(Optional D-4000 Unit)

4 Costs Less.

5 Easy/Fast Operation.

Datavision Video Products
MINCOM DIVISION 3M COMPANY

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FOR TODAY'S GREATEST VALU IN A STUDIO TAPE DECK, YOU'VE GOT TO COME TO A (PARDON THE EXPRESSION) HI-FI COMPANY.

Traditional broadcast and recording-industry suppliers, with their low-volume high-profit operations, are in no position to make a tape deck like the Pioneer RT-2022 at anywhere near its price.

Even though the RT-2022 competes with their best in versatility and performance.

It's a 3-motor, 3-head, 2-track deck, with speeds of 15 and 7½ ips. Its design is completely modular, with transport, controls and electronics on three separate chassis. The head assembly is interchangeable, so that 4-track heads can be snapped in for either quarter-track operation or quad. For quad, a second electronic section can be mounted.

Perhaps the most outstanding feature of the RT-2022 is simultaneous sync monitoring for live overdubbing. Another is the built-in calibration oscillator (1000 and 10,000 Hz). It's front-panel controlled, just like the continuously variable bias and the multiple EQ. Head alignment is accessible right through the head cover. Some hi-fi machine!

If you're a professional whose budget is limited so is your choice.

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LECTION EVE REPORTING

sion, M-8, with election reporting software. Though e Vidifont, Mark IV, from Thomson-CSF, does not me equipped with special computer devices or soft- are specifically for the election, it is designed to inter- ce with a computer for the purpose of election report- g. TeleMation offers special software and mini- mputer options with its Compositor I titling and aphic system, which it has dubbed TED-1, Television ent Display System. Chyron and RCA also have stems that will be employed in the up-coming elections d during the conventions, though they chose not to close details at this time.

Each manufacturer, however, was careful to explain t the additional capacity available through computer erface should not be construed solely as relating to the ections. The interface, once established, could give the oadcaster additional power for utilizing their character nerators 365 days a year. In addition to using the ded power for large quantities of fast breaking weather d sports data, a few of the systems are powerful ough to be used for conducting some station business utines.

The heart of the 3M system is the display director hich is a microcomputer terminal. It includes, in ad- dion to the computer functions, a teletype style key- ard and a 5 in. CRT monitor. Through I/O con- ctions the terminal interfaces directly with the charac- te generator.

A peripheral floppy disc recorder is provided for stor- ge of program formats and up to 10 remote entry termi- ls can be connected as well as a line printer and one mote display director. Any portion or all of this op- nal equipment may be required for reporting election sults, depending on the volume of data generated by e particular races.

The software for this system allows the operator to rmat 100 separate races with a maximum of 26 candi- dtes per race. According to Larry Plummer, Director of Egineering for Comtek Consulting Corporation, who lped design the software for this system, the basic rmats that will be used are prepared ahead of time and red on floppy discs. The night of the election the sults are entered through any one or all of the possible e entry terminals. Votes can be entered incrementally cumulatively at the operator's option. "That process

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e 3M MC-8 microcomputer contains election reporting ftware.

ELECTION EVE REPORTING

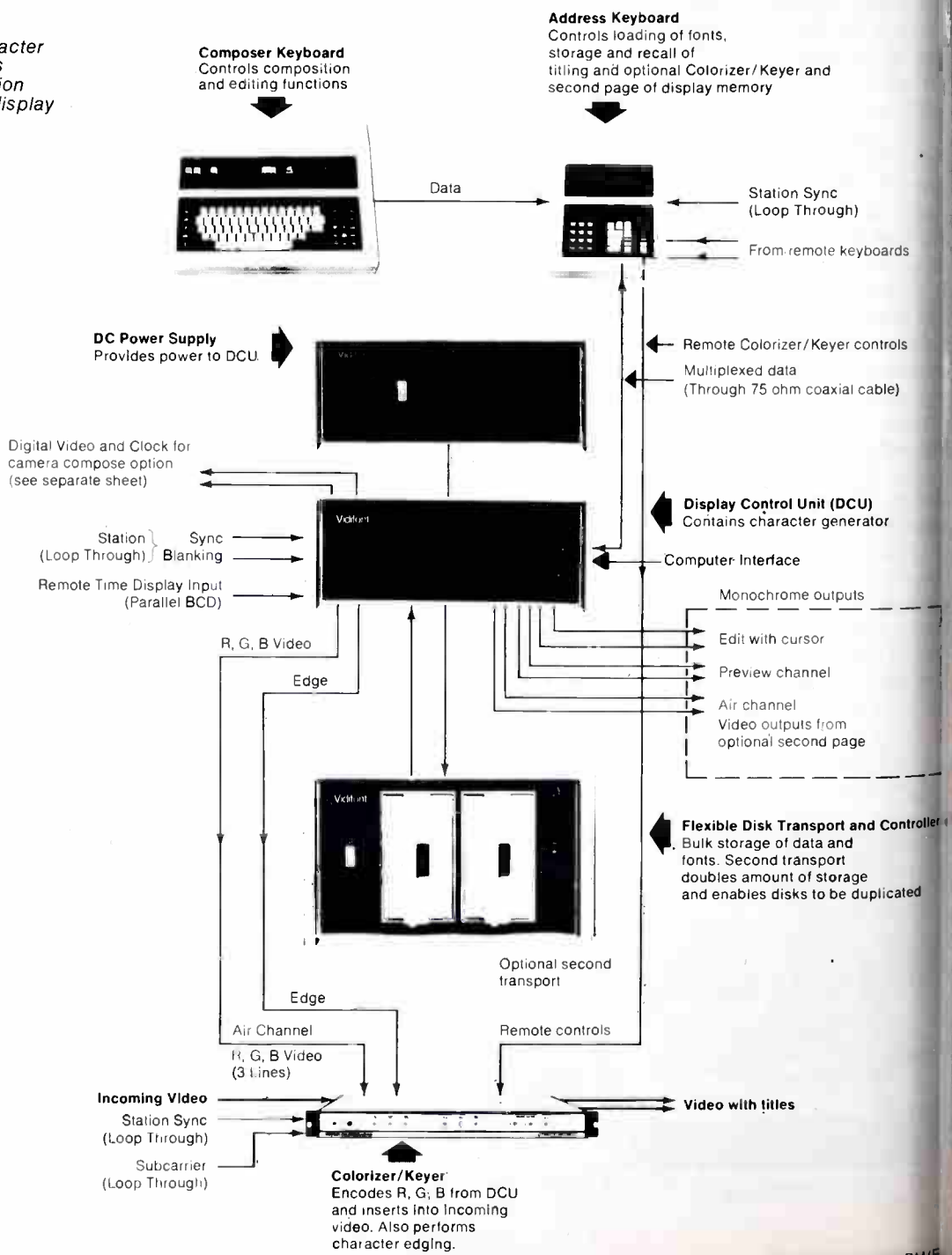
of entering new numeric information or new vote totals for each candidate is handled wholly separately and apart from the process of . . . making a presentation on air," said Plummer. "They don't interfere with each other at all."

The system also has the ability to display pre-determined "strings of races," so that if you want to look at all races for the House of Representative," for instance, the computer will "think of it as a single race and sequence through multiple pages of data and display the data as if it were a single race." The program also automatically lists candidates in descending order of their recorded vote count, thereby eliminating any need to alter the files to show new race leaders. In addition to the 2-line heading for the race, each candidate's name and party affiliation is listed along with vote total and percentage of the total reported votes. The 3M system wi also interface to other computers either in-house or via modum data set if so desired, and 3M will recommen people to the user for help with the necessary software.

TED-1 is TeleMation's preferred method of handlin election returns and consists of one or more Compositor character generators interfaced to a minicomputer, 100-Display Selector Panel, Teletype keyboard-printe tape-reader punch and standard computer programming Voting information is entered into the TED-1 System vi the Compositor-1 keyboard(s) and the teletypewriters b responding to computer-generated questions. Th system's minicomputer groups this information in pages with each page containing the latest data on one contest as follows:

Name of district
Name of election contest
Type of voting poll (precincts, district, etc.) and percentage reporting

Basic Vidifont character generator system is interfaced for election reporting through display control unit.



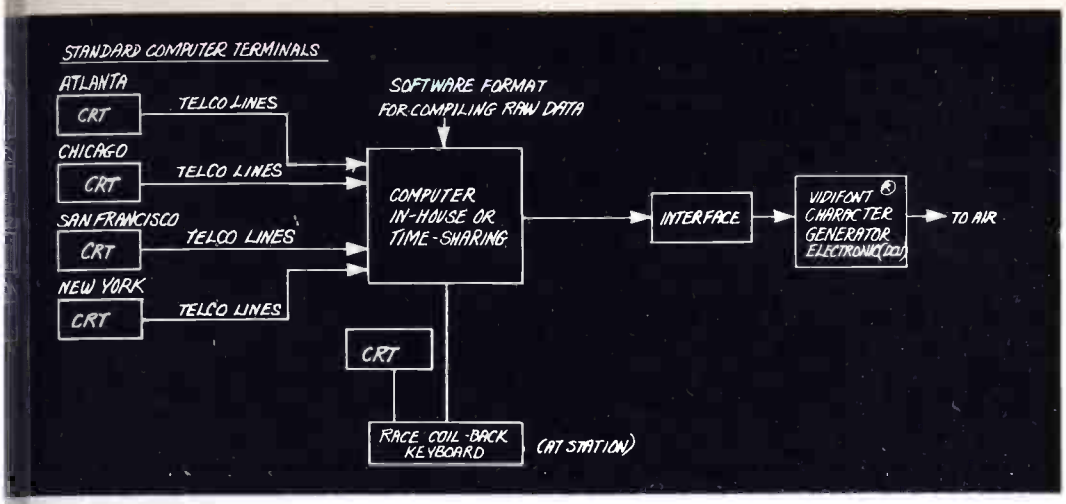


Diagram showing basic Vidifont system computer interface for covering national elections.

Names of candidates, with party affiliation of each
Number of votes for each candidate or percentage of total vote, depending on which is selected for display. Candidates are automatically arranged according to the number of votes received, with the candidate receiving the most votes listed first.

ike the 3M system, each page is assigned a "call e" and can be quickly displayed by entering that . To preview the material prior to air, however, a ond Compositor-1 is needed. Key voting polls or dis- s may be placed on separate pages for trend analysis. he TED language is a "high level" language which mands the operation of the system by first querring operator in simple English and then translating the lish responses into machine language. Another h level" language, "BASIC" is provided with all Systems and allows use of the computer for other tions without interferring with the original TED pro- n.

he Vidifont Electronic Character Generator Systems Thomson-CSF, are also approaching the elections in h the same way. The Vidifont system, however, will be sed by CBS for both national party conventions and up-coming Presidential elections. Coupled with CBS puters and huge memory storage capacity the Vidi- system will offer a formidable demonstration of the er of character generators when interfaced with puters.

ftware is Available Separately

tations that already have character generators and puters but do not have them interfaced are ignoring a y valuable potential. If they want to realize this poten- assistance is available from a number of firms that cialize in election services.

omtek Consulting Corp. of Wichita, Kansas, offers erform the interface between computer and character erator with the general capabilities described for the system. Larry Plummer worked closely on the 3M em and offers a similar software package through ntek for use with Chyron, 3M, and Vidifont character erators. Almost any character generator with the dard sort of capabilities as the three brands men- ed, can be interfaced, for about $15 thousand. This s the MC-8 Microcomputer, software, and floppy c storage as well as the interface. Comtek also pro- es operator training. According to Plummer, Comtek es to develop a high level language in the near future that will make it possible for operators to do some simple programming of their own, using English language instructions.

As it stands now, the software offered by Comtek is frequently altered to accommodate special requirements of stations. Such alterations have included design of the system to allow two stations operating in separate major market areas within a state to have simultaneous access to the same data base but to receive output formatted separately for each station.

Election Reporting Service, Tuscon, Arizona provides significant services to broadcasters especially for the election. Essentially, ERS arranges for use of a large computer on a time-sharing basis and completes the station hook-up over telephone company lines, and the interface with the station character generator.

ERS has been active mostly in the Southwest but is beginning to branch out into other areas as demand for their services increase. As Will McLain, Director of Election Reporting Service, describes it, ERS strives to provide the station with "network quality reporting." ERS selects a computer within local telephone line distance of a station and arranges for the link-up with the station.

Using its proprietary software, ERS collects data from several locations and sources, then tabulates the results "instantaneously." The results are readied for the station's character generator and transmitted via telephone lines and coupled through a data phone.

Results may be printed for commentator evaluation, and coupled with historical data for comparison. The titler may be of almost any manufacture and its normal functions are not interfered with. The exact format and style, whether crawl, lower-third or other is still commanded by station operations. The list of possible formats is extensive and any or all of them can be used depending on station demands.

Other software sources for election reporting services include several of the business system suppliers such as Cox Data Services and PSI. These programs are available to clients of the companies and can be quite inexpensive. The PSI election program cost a mere $80, though it is limited to a simple tally type presentation.

The only predictions we care to make about this year's elections are that the big winners are going to be the character generator manufacturers and, hopefully the viewing audience which is going to receive better and more extensive coverage of the 1976 elections than ever before. **BM/E**

Meet the TK-46 from RCA.

Successor to the world's most successful TV studio cameras.

Chronology of a winner.
The TK-46 is a new camera.
But far from unproved.
It is actually the distillation o
years of brilliant camera performance. With features introduced to the industry on t
TK-44 and its successors.
Features proved in more tha
1,300 of these cameras. In the
largest camera universe of any
manufacturer.
Features improved, where possible, for the TK-46. To ma
the worthy successor to the wo
most successful TV cameras.

Feature	Year Introduced	69	70	71	72	73	74	75	76
High Efficiency Prism Optics		●	●	●	●	●	●	●	●
Wide Range Voltage Regulation		●	●	●	●	●	●	●	●
Comb Filter and Coring		●	●	●	●	●	●	●	●
Chromacomp		●	●	●	●	●	●	●	●
Electromechanical Lens Cap		●	●	●	●	●	●	●	●
Small Diameter Mini Cable			●	●	●	●	●	●	●
Joystick Remote Control Panel				●	●	●	●	●	●
Internal Bias Light		TK-44A			●	●	●	●	●
Extended Sensitivity					●	●	●	●	●
Scene Contrast Compression					●	●	●	●	●
Compact Camera Control Unit				TK-44B		●	●	●	●
Simplified Set-Up Controls						●	●	●	●
Automatic Color Balance						●	●	●	●
Automatic Iris Control						●	●	●	●
Automatic Centering Control						●	●	●	●
Indoor/Outdoor Switch						●	●	●	●
Super Quiet Switch						●	●	●	●
Out of Band Aperture Equalization							●	●	●
Shared CCU with Portable Camera Head								●	●
New State-of-the-Art Preamps							TK-45		●
Tilting Viewfinder									●
Simplified Control Panel Layout									●
Accident-Proof Set-Up Controls									●
Simultaneous In/Out of Band Aperture Equalization									●
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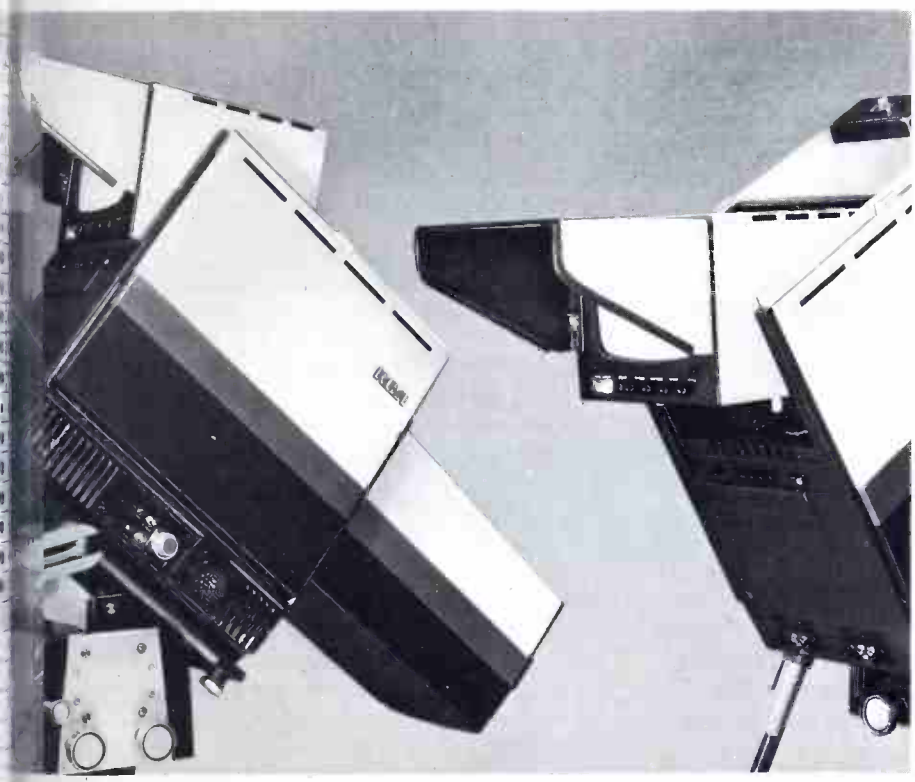

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A Proposal To Improve Radio Coverage In The U.S.:

High-Power Stations At Low-Frequency

By Paul H. Lee

Following a study which showed large areas of the western U.S. with very poor radio broadcast service, the FCC has opened an inquiry to seek ways of improving coverage: Put more stations on the clear channels? Let the "clears" raise power to 100kW or 1 megawatt? The author of this article argues for another plan—a series of very-high-power stations on the unused 150 to 285 KHz band.

Editors Note: Comments on the clear channel inquiry, Docket 20642 are due Sept. 21. The FCC reports few replies so far. Make your views known.

The reopening of the Clear Channel Proceedings by the Federal Communications Commission has caused much interest and speculation among broadcasters, especially among the clear channel broadcasters, who have much at stake. Should the remaining twelve unduplicated clear channels, which the FCC has protected from encroachment for over a decade, be "diluted" by assignment of Class IB or Class II stations thereon, to provide coverage for areas which do not now have it? Or should these channels remain unduplicated, with the Class IA stations thereon being permitted to go to "super-power" of 500 or 1000 kW? What role can FM play in providing coverage to areas of the United States now lacking in coverage?

This article will touch only briefly on some of the economic aspects, and will concentrate on the engineering aspects of providing improved aural service to this country.

Recently, the FCC, as part of its study of radio coverage, has thoughtfully provided maps of existing FM coverage of the United States. One map shows the 1 mV/m areas, and the other shows the 50 uV/m areas. Both maps show very clearly what we here in the western states know, that the eastern states are quite saturated with FM coverage, whereas the states west of the Mississippi River are very lacking in FM coverage. There are vast areas of plains, prairies and mountains with few cities and towns of sufficient size to support a radio station commercially, so FM is not the answer to this problem. Yet people live in these areas and they deserve to have coverage.

Nor is local nor regional AM the answer. Such stations must be limited in service area, especially at nigh to avoid interference with distant co-channel station Further, a tabulation of the AM Clear Channel statio makes it obvious that their distribution is very i equitable. Only KFI, Los Angeles and KSL, Salt Lak City, among the "clears" can be classed as weste stations. All the rest are in the east or the midwest. Th there are vast areas of the west without adequate A service, especially at night.

Is the best approach to this problem raising the pow of the twelve Class IA stations, of which KFI and KS are two, or is there a more sound engineering approac which will provide improved AM service to the enti country?

I believe there is a much more effective and practic solution to the problem. There is a forgotten portion the frequency spectrum, from 150 to 285 KHz, which used in Europe, ITU Region I, for high power broa casting. In this hemisphere, ITU Region II, this portio of the spectrum is allocated to the fixed services. Liste ing in this band will show some use by the military, beacons, and by the old-time A-N radio range station The need for the latter is greatly diminishing due increased use of VHF by the airways.

This low frequency band (LF) has a great advanta for high power AM broadcasting because of the great diminished effect of ground conductivity on grou wave propagation. Many broadcast engineers are awa of the advantage of a 550 KHz frequency vs one of 16 KHz. The FCC's ground wave curves in Section 73.1 of the Rules show this very dramatically. What they not show, and what may not be known to many broa cast engineers, is the even more dramatic effect of goi even lower in frequency, down to 150 to 285 KHz.

Figure 1 shows this effect clearly. The

Mr. Lee is president, P.H. Lee Associates, Inc., consulting engineers of Thousand Oaks, CA.

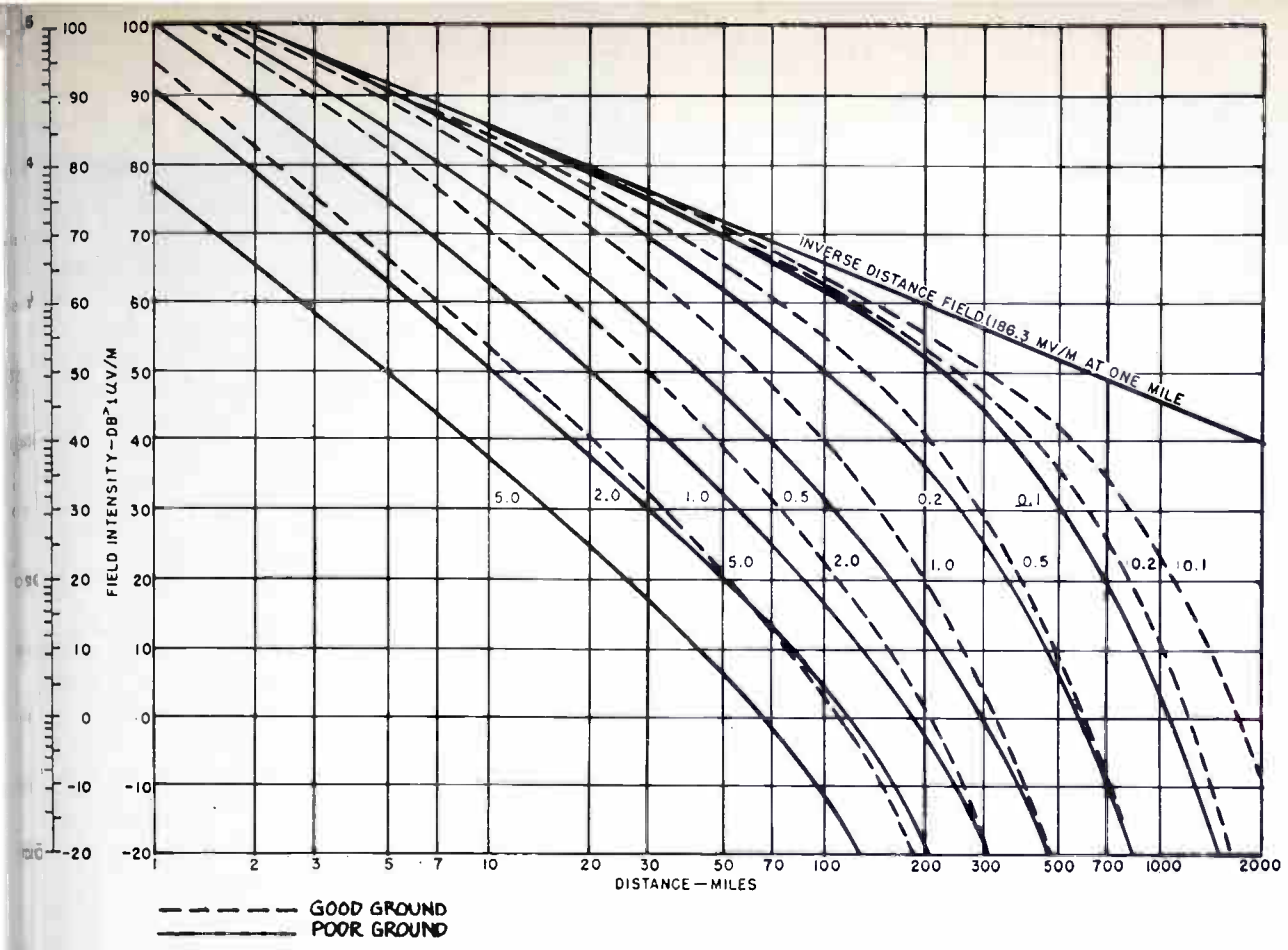

Fig. 1. Curves show the great advantage of the band below 285 KHz over the present broadcast band in groundwave coverage, over good ground (broken lines), and over poor ground (solid lines). For example, at 1000 kW, at 200 KHz the 0.5 mV/m ground-wave contour is 730 miles from the transmitter; at 1000 KHz it is only 190 miles out, over good ground. The corresponding figures over poor ground are 315 miles and 82 miles.

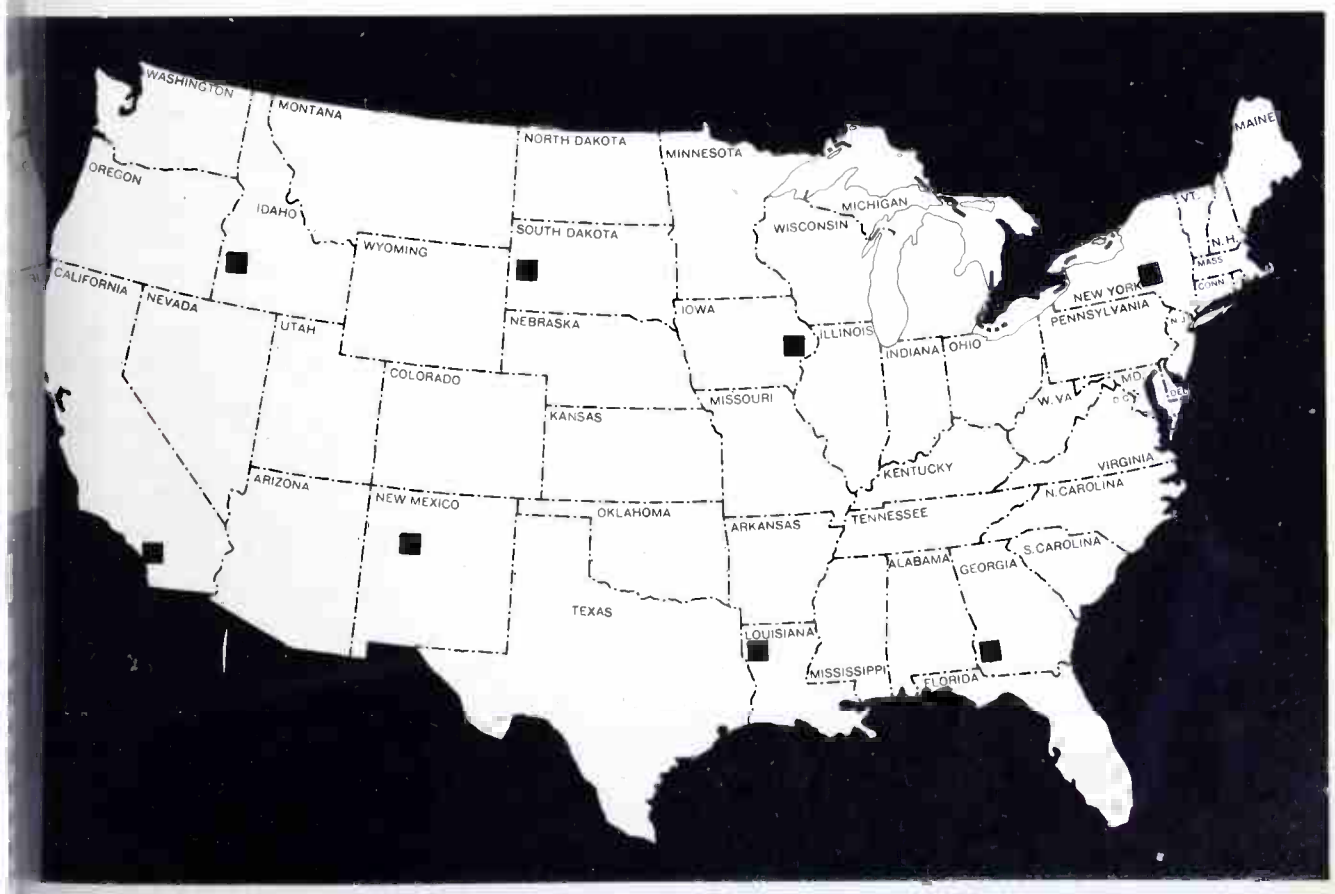

Fig. 2. Map shows how eight strategically-placed high-power stations on the LF band could provide service to the entire United States.

curves are taken from a Signal Corps publication which has been in existence for many years (unclassified), TM11-499, "Radio Propagation." They are based on the same basic formulae by Norton as are the FCC's curves. They show ground wave field intensity vs distance for various frequencies. For greater ease in use they are based on an unattenuated field at one mile of 186.3 mV/m for 1 kW. For a power other than 1 kW, it is only necessary to add or subtract the required number of DB relative of 1 kW, on the left hand scale, to find the resultant field intensity.

To illustrate, assume kW radiated power over good ground, and note that at 200 KHz the 0.5 mV/m ground wave contour will fall at 200 miles from the transmitter, whereas at 1000 KHz it will fall far short at only 53 miles! Over poor ground the difference is even more drastic, with the 0.5 mV/m contour at 200 KHz falling at 82 miles, whereas at 1000 KHz it falls short at only 16 miles!

If power is increased to 1000 kW, at 200 KHz the 0.5 mV/m contour will fall at 730 miles over good ground, whereas at 1000 KHz it will fall at only 190 miles. Over poor ground, at 200 KHz it will fall at 315 miles, whereas at 1000 KHz it will fall far short at only 82 miles. If a taller tower than one-quarter wave were used, with a higher radiated field, the results would be even better. Does anyone need further proof that this LF band is the place for super-power broadcasting? To increase the power of the present Class IA stations in the existing MF band would be very wasteful of power and facilities, for it would not provide the national coverage of which group of super-power stations should be capable, b would only serve to make an existing interference situ tion worse.

Fig. 2 shows how eight strategically located sup power LF stations could cover the entire United Stat with non-fading signals. This is not a new concept, b any means. Research in the old *Proceedings of the IR* turned up an article by W.H. Wenstrom in June 1931, which he discussed the advantages and disadvantages o LF vs MF high power broadcasting, and showed clearl how LF is the answer. He proposed a group of seve stations, for national, non-fading coverage. Why nothin ever developed from this concept in those days we ca only guess, but those knowledgeable in the frequenc allocation field have suggested that it was due to pressu by the aviation interests who at that time were pushin for the LF A-N radio ranges, inasmuch as VHF had n yet come into being, for aviation uses.

Implementation of this concept would require that th FCC initiate action by the United States government obtain action at the forthcoming World Administrat Radio Conference in 1979 to have the 150 to 285 KH spectrum allocated for broadcasting in Region II. Th would be a very desirable action from the standpoint o the clear channel broadcasters.

One may ask what types of antennas would be re quired. In these days of tall towers for TV broadcastin tower height is not so great a factor as in former year Towers of 1500 or 2000 feet are fairly commonplac Fig. 3 shows tower heights in feet vs frequency i KHz over the band in question. Past studies and researc

continued on page 6

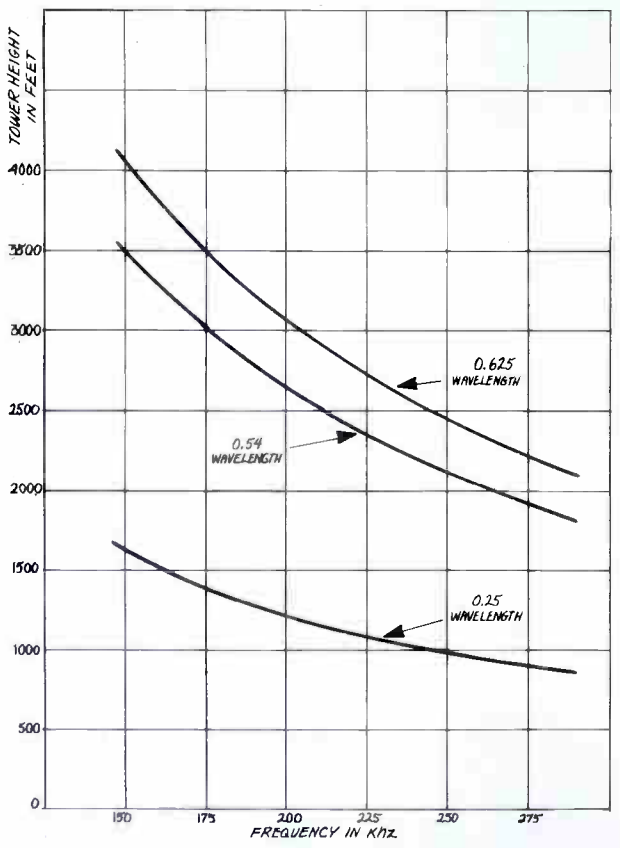

Fig. 3. Antenna heights for frequencies in the LF band, using standard 0.25 wavelength to 0.625 wavelength designs (see story).

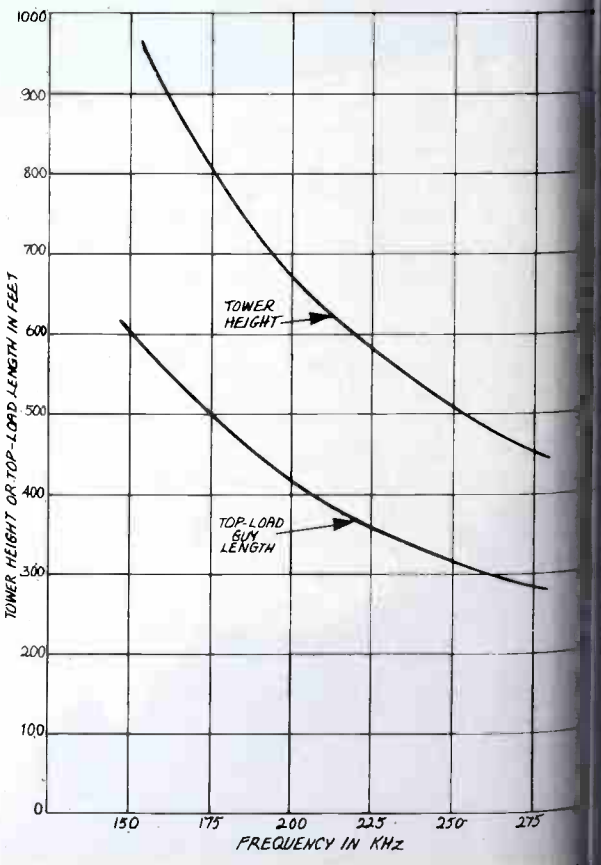

Fig. 4. Antenna heights for frequencies in the LF band, usin special antenna design of the VOA in Munich, which has to loading to reduce height (see story).

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HIGH-POWER STATIONS

have shown that the height of 0.54 wavelength is the optimum for minimum ground wave vs nighttime sky-wave fading. Also, it is quite commonplace to use top-loading to allow the use of shorter towers with reasonable efficiency.

A good example of this approach is the Voice of America's 1000 kW station at Munich, Germany on 173 KHz. (cochannel with Radio Moscow). This powerful station uses a tower 837 feet high, top-loaded by twelve 512 foot cables which make an angle of 55° with the tower. On 173 KHz the measured base impedance of this radiator is 29.5 + j135 ohms. The unattenuated field at one mile is 178.9 mv/m. This is not an unreasonable height for an antenna at this frequency. The ground system consist of 360 radials that extend out to ¼ wavelength, with 180 of them extending out to ½ wavelength. A description of this installation can be found in the *Proceedings of the IRE* for August 1954, pages 1222 through 1235. Figure 4 shows antenna dimensions vs frequency.

There is also an antenna called the "NORD," used by the U.S. Navy for multi-channel RTTY fleet broadcast at LF. It is basically a folded unipole, with three top-loading guys which are tuned to ground at their far ends. By adjustment of the guy tuning the required bandwidth can be obtained with the use of a tower of approximately ⅛ wavelength. This approach eliminates the base loading coil or *helix*, which is always a source of high voltage problems in a high power LF installation. The input impedance of the NORD, due to its folded feed, is ductive (R + jX), and it can be matched to the tra mission line with vacuum capacitors. Guy insulat problems are diminished also.

The transmitting plants of super-power stations p duce tremendous field intensities close in to the site. this reason, these plants require location in rural ar away from population centers to avoid environmer problems. Without actually visiting the existing plants clear channel stations, one can nevertheless be fairly s that many of them have been subject to residential industrial encroachment in the years since they w built, and are not now suitably located for conversion 500 kW or 1000 kW operation. Thus, new plants wo be required, and they might as well be built for transmission as for MF transmission.

Existing Class IA stations could be converted to Cl IB's with channels being duplicated to provide limi regional coverage in areas now lacking. But a m sound means engineering-wise for providing natio coverage would be the use of LF as outlined here. In band 150 to 285 KHz 13 channels with 10 KHz spac could be provided. If 9 KHz spacing like that in Eur were used, 15 channels could be provided. The Uni States could use 8 of them, with the remainder be allocated by international agreement to Canada, Mexi and other western hemisphere countries.

This LF approach to super-power broadcasting is which merits serious consideration by the clear chan broadcasters, and one which should be pursued by FCC through I.R.A.C. to the next world ITU c ference. BM

TOTAL AUTOMATION cont. from pg. 48

log, during the period when only technical operations are affected, most manufacturers of computer controlled switchers would prefer not to use their storage capacity for this type of information. On the other hand, though it may make the software for technical operations a little more tricky, storing contractural information is no major problem. In fact, some stations that have technical automation but not business automation, have required that the technical system be able to handle some traffic functions.

As it stands now, the interface has made it possible to realize, at least the original concept. Sales orders are entered into the traffic computer and scheduled. As the inventory is exhausted the broadcast day is compiled. Then, it is transmitted automatically to the technical operations computer and machine assignments are made, media is located and loaded, the events are cued and aired and as the data for an "as-aired" log are compiled and transmitted back to the traffic computer for reconciliation with the pre-log and the "FCC" log is printed and invoices completed. But the demands on the systems have grown.

With the "closing of the circuit" some things have been made possible or, at least, easier. Media inventory and film and videotape amortization programs are more feasible. Some engineers are talking about some sort of "automatic" filing system to help keep track of everything and to be certain that nothing gets lost. In some instances, the reconciled log will be so accurate it is expected that the engineer will merely have to sign it the end of the day to satisfy all FCC reporting requi ments. Already people are talking about fewer errors a therefore, fewer make-goods.

In some systems, especially the hardwired systen the computers are in continual conversation and if son thing should go wrong, the man in master control query the traffic computer immediately to see whether not running a make-good would pay off.

As rapidly as things are moving, much still remains be done. One of the most important future steps automation will be the integration of networks a locals.

In the opinion of Glenn Sirkis, of Cox Data Servic much of the potential of automation will depend on t type of network/local station integration. He belie that much is to be gained by having the nets prov some sort of cueing data for local automation syste "Somewhere in the vertical blanking interval seems the most likely place," said Sirkis. He recommends t chief engineers and industry groups get together and st working out standards to perform this net/local interfa Another person who feels this way is Steve Smith KCMO-TV, one of the first people in the industry thoroughly study automation. Smith says that he is ea to go "total automation" but not until the networks their act together and start to send some type of signal down the line. Smith believes that any syst operating on "clock time" is bound to have a lo trouble.

As one computer said to the other, "We've co long way baby, but we've got a long way to go." BM

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Ed DiGiulio Speaks Out: "Let's be fair in our comparisons of ENG with news film."

In a recent interview, Ed DiGiulio (president of Cinema Products, the developer of the famous CP-16 and CP-16R news film cameras) asked for more objectivity by both magazine editors and chief engineers when it comes to evaluating the role of electronic news gathering. "Don't be guilty of knee-jerk reactions," he remarked.

BM/E: Mr. DiGiulio, you've obviously been aware of the extensive coverage *BM/E* has given to ENG during the last 18 months. Do you feel we have gone overboard?

DiGiulio: Certainly ENG is an important topic which you must cover. I do object, however, to what I term an innate or knee-jerk bias in favor of electronic cameras. I have participated in a number of panels discussing ENG developments at SMPTE and other meetings but I have never dealt with the gut issue. Plainly and simply, TV managers and engineers are electronics oriented. Up until now they've been forced to use film for news. All at once they have an alternative and they seem to be going wild in throwing film overboard.

This pro-TV bias is long and deep—and perhaps natural. After all, TV is still a first generation industry. That is, the guys who started it all are still active and calling the shots. But the prejudice against film is almost irrational. Did you know, for example, that for 20 whole years KNXT here in Los Angeles wouldn't buy a film processor . . . It kept hoping film would go away. What I'm objecting to is unbalanced editorial coverage.

BM/E: But news is news. Examples of how electronic cameras are being used in news is news. How film cameras are used is not. You've got to expect the emphasis on ENG, do you not?

DiGiulio: Yes, but I don't think the kind of articles you are running are objective. Certainly the decision by CBS to make KMOX-TV an all-ENG news operation was rational and intelligent. The experiences gained could be very helpful. But there never was a re-evaluation. Instead, CBS people have gone around telling everyone to convert now to total ENG based on misleading economics. And you've helped their publicity mill.

BM/E: What do you mean misleading economics?

DiGiulio: Nobody can argue with Joe Flaherty and his charts and figures because he set the accounting rules! You can't really amortize both ENG and film across five years and prove ENG is cheaper because the film investment has already been made—the argument presupposes you start from scratch and pick one or the other system which just can't be so. We know, as a matter of fact, that KMOX-TV still buys film—if not for news, for documentaries or other purposes. It seems to me a discussion of economics can't give you a choice of *either* ENG *or* film when in fact both media are needed. Every station has some film equipment and you can add a film camera for $7-8000. You can't get into ENG for less than about $50,000.

Another factor is obsolescence. Who's really paying for camera development? Can the industry afford the Microcam after getting only two years out of Minicams? I'm afraid broadcasters are leading ENG camera manufacturers down the primrose path. How are manufacturers going to recover the cost of the earlier versions? There's going to be a hell of a shake-out coming. The total world mark can't support 16 or more ENG came manufacturers.

BM/E: You do agree though that the ENG cameras are doing a good job

DiGiulio: Certainly the $35,000 II gami Minicams and the RCA TK-7 are good cameras as are the more e pensive ones—and perhaps some the new models shown at this yea NAB show will be as good or bett But I do get incensed when I re about Channel 9 in New York winni a news award using a basically limit low quality electronic camera.

BM/E: That was a particular cam manufacturer awarding the station a you didn't read about it in *BM/E* though we did earlier report on t station's experiences using inexp sive cameras. We always try to mak clear as to whether a station is achi ing 16mm quality or not or at w light levels a camera will operate. some smaller markets, if all are us lower-grade equipment they can away with it.

DiGiulio: That's my point! Does the FCC care about color quality? has technical standards on stabil etc., why not color fidelity? Bro casters showed an interest in Super few years back but they rejected it not comparable to 16mm. Now t eagerly accept something less just cause it's electronic. That's wha mean by bias.

BM/E: Hopefully these stations use non-broadcast quality will grade. Right now they boast they instant news at less cost than f Isn't that a valid approach?

DiGiulio: I wonder if all these gl ing accounts are really valid. Certa ENG cameras are valuable for ins fast breaking news—and ENG necessary breakthrough on score—but does every story call fo

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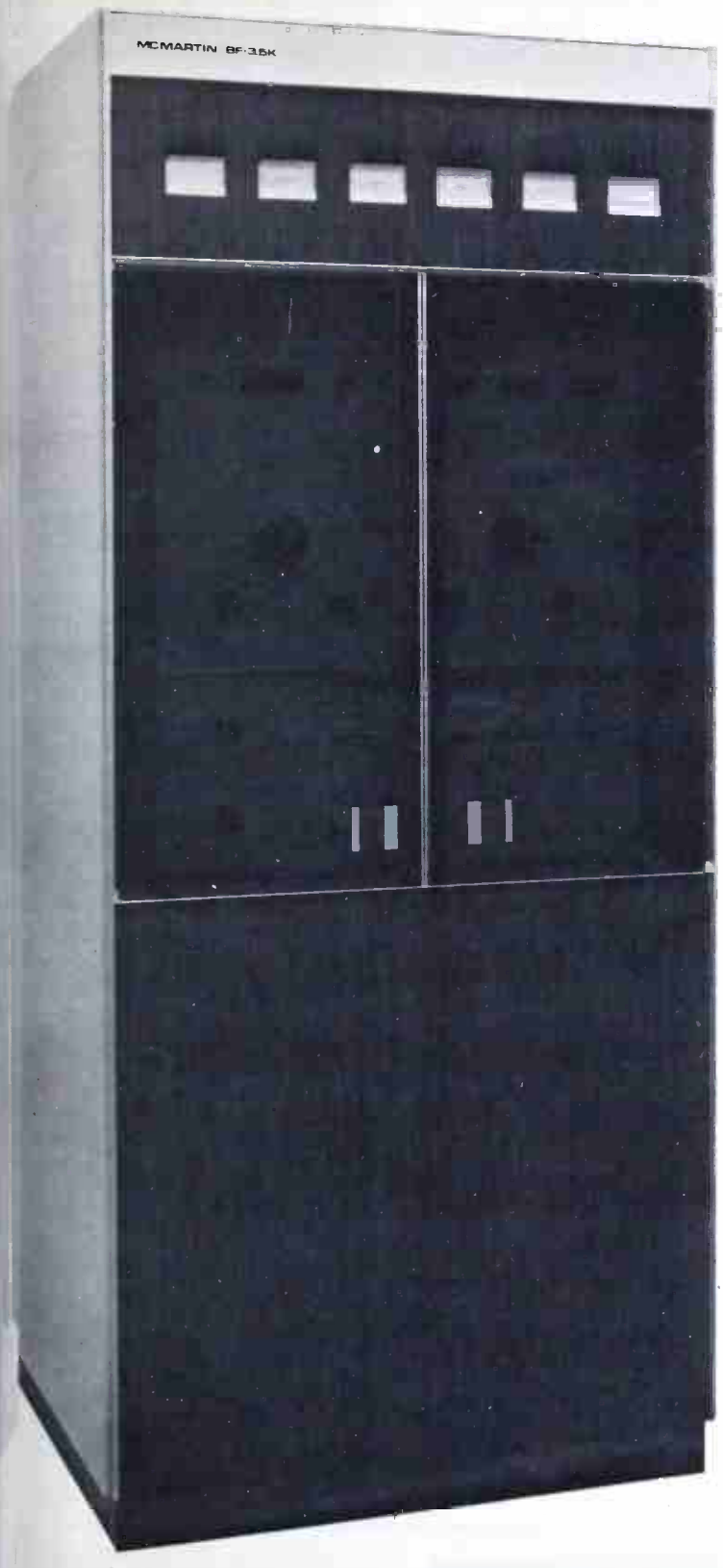

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electronic camera? ENG cameras were ideal for covering the LA cops stake-out/shoot-out at the SLA hideout but it was the one man roving film camera that captured Squeaky Fromme's attempt on President Ford's life. ENG camera systems may be mobile but they're not exactly portable. The film camera has a tremendous flexibility that won't be matched until the video camera comes with a built-in microwave transmitter or tape recorder and that won't be for some time.

When you look at the cost of covering an event live versus the cost of covering an event for later playback, you'll find a big difference. One should take a hard look at these cost differences.

BM/E: Your point on flexibility is well taken. Do you feel film equipment is more rugged than electronic cameras?

DiGiulio: Well, you can literally throw a film camera into the trunk of your car. Electronic cameras need to be handled a little more gingerly, I'm sure you'll agree. I watched ENG camera equipment manufacturers turn white when their cameras in inexpert hands are headed into the sun—a burned out Plumbicon can cost thousands. I've seen tape lose contact with tape heads when the recorder is in motion. When you take into account portability and insensitivity to environmental factors, film cameras look pretty good.

You can't pick your environment when covering the news. The real situation may not tolerate ENG cameras. It's your job to tell the folks that!

BM/E: You feel there will always be a role for news film then?

DiGiulio: I can foresee a day maybe 8-10 years from now when electronic systems will be as light and flexible as film system but for quite some time we should expect a mix. Stations that have gone heavily into ENG such as KSTP, St. Paul, which you write about, continue to buy film cameras. It's more important to know how to get the story than to use the most exotic equipment. Don't forget Eastman Kodak sold more news film in 1975 than ever before.

Look, ENG will grow, there's no doubt about that. My company will be participating in that growth. As you know, we came out with the Steadicam stabilized camera system (incorporating the Brown Stabilizer and using a modified RCA TK-76) at the NAB show (see *BM/E*, June, Page 62 for details). We'll adapt the Steadicam-TV system to more video cameras. The stabilizing support system and the CP-developed ultra bright 3 in. monitor, which can be viewed (with both eyes) even when bright sunlight is impinging directly on the viewing screen, will help promote ENG. We'll be part of the ENG scene even though we'll continue to manufacture the finest 16mm news film cameras. Our Steadicam-TV system featuring the modified TK-76 video camera is available exclusively through Cinema Products and RCA. And, as you may know, we're also authorized to sell the exciting new TK-76 ENG cameras without the Steadicam system. So, I don't want to come across as some rapier trying to cut the legs out from under ENG. My only point is that there are some shortcomings, some limitations to today's ENG equipment and that broadcasters ought to receive a balanced account of the situation from the trade press. I believe that broadcasters would be making a big mistake by committing their station to a *total* ENG news operation. I think that good equipment and dollar sense dictates a balanced approach—a marriage if you will, of the best features of ENG and 16mm film. **BM/E**

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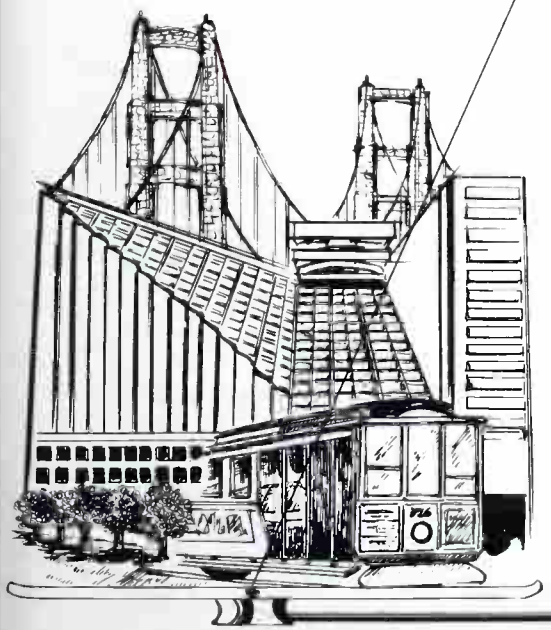

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GREAT IDEA CONTEST

If you haven't done so already, send in your ideas for BM/E's most popular feature. Remember, there is no limit on the number of ideas that one contestant can submit. And don't forget to vote on all published ideas.

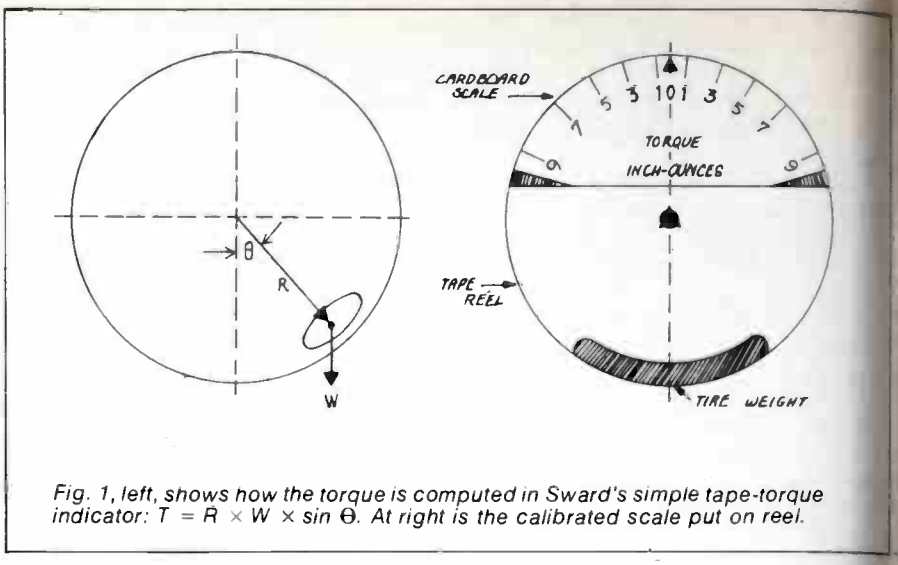


Fig. 1, left, shows how the torque is computed in Sward's simple tape-torque indicator: T = R × W × sin Θ. At right is the calibrated scale put on reel.

16. Simple "torque wheel" for measuring reel torque on audio tape machines.

Wayne Sward, Engineer, KALL/KALL-FM, Salt Lake City, Utah

Problem: To adjust feed and takeup reel torque on audio tape machines quickly and accurately without resorting to strings and expensive spring scales.

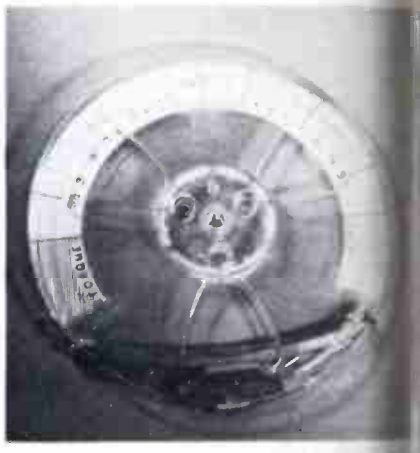
Solution: A torque reel was fabricated by gluing a 3½ ounce lead automobile tire weight onto an empty 7-inch plastic tape reel. A cardboard scale was fastened to the tape reel and calibrated to read directly in inch-ounces of torque, both clockwise and counterclockwise. The tire weight was accurately weighed on a scale at the local Post Office, giving a weight W. With the center of gravity of the weight at distance R from the center of the reel, as shown in Figure 1, the torque exerted is given by:

$$T = (R) \times (W) \times (\sin \Theta),$$

provided the tape machine is mounted vertically.

The torque reel is used by placing it on the feed or takeup spindle of a vertically-mounted tape recorder. The weight is placed vertically down and the position of "0" on the scale is marked with a piece of masking tape temporarily stuck on the recorder front plate. The recorder is then energized and the torque adjustments made until the reel torque measures within the recorder manufacturer's specifications. A higher maximum torque may be measured by using a heavier weight or a larger tape reel.

Caution: Do not allow the weight to rise above a horizontal line through the reel center during torque adjustments: a spinning unbalanced weight may damage the recorder!



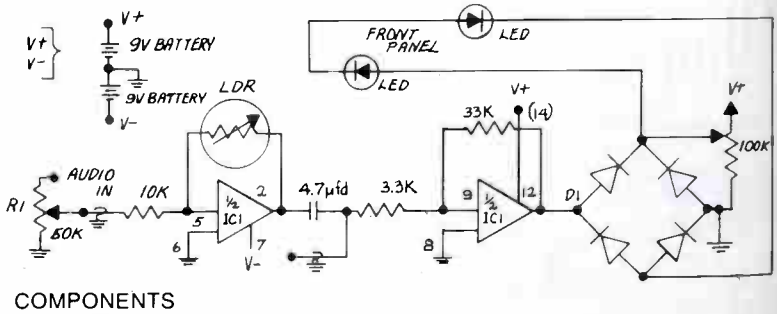
Torque reel simplifies torque adjustment of tape machines

17. Inexpensive High-Quality Audio Compressor Using LED and LDR.

Hue Beavers, CE, KRIZ, Phoenix, Ariz.

Problem: To design an audio compressor of broadcast quality using inexpensive components.

Solution: The heart of this compressor is an LED and LDR (light-dependent resistor). This pair serves as the gain rider in the circuit. LED's are quite inexpensive and easy to obtain. Coupling this with their frequency re-



COMPONENTS
IC1—1458 OP AMP (DUAL 741)
D1—BRIDGE (RADIO SHACK 276 1151 OR EQUIV.)
LDR—PANCAKE CdS_2 (RADIOSHACK 276-116, CLAIREX CL-605L)
R_1 50K AUDIO TAPER POTENTIOMETER
R_2 100K MINIPOT
LED'S—"JUMBO" PAK YELLOW, GREEN OR ORANGE (NOT CRITICAL)

Hue Beavers shows how to design an audio compressor using inexpensive components.

onse from DC to ultra audio frequencies, light emitting diodes are ar ideal as radiators of light that ries linearly with applied audio volt-. The cadmium sulfide photocell DR) serves as recipient of this light d has an inverse illumination-sus-resistance property.

Other elements of this compressor cuit are familiar, no doubt, to many perimenters. Referring to the schetic, it is seen that the op-amp used a dual 741 or 1458. One half of the 58 is the gain-controlled stage. The R is the feedback resistor of this ge. The second half of the 1458 is a ear amplifier used to drive the LED. ther than drive the LED directly m the output of this stage, a bridge tifier is used to rectify the AC dio) to a pulsating DC. In this way, 1458 is partially protected from the r short circuit the LED represents ile conducting. In actual use, there a second LED in series with the pritry unit. This second unit is mounted the front panel, providing a relative ication of the amount of limiting curing at any given time. (A 0-10ma C current meter could have been ed.) It can also be seen that there is a tentiometer R2 connected to the "+" output of the bridge rectifier. is serves as a threshold adjustment LED conduction.

As this circuit is dealing with audio d subaudio frequencies, layout and ring is not critical. Perf-board conuction with flea clips for ties points ideal. If space is at a premium, the tire circuit may be constructed on a pin Experimenter's IC Socket dapter. (Radio Shack #276-024)

Care should be taken to wire the idge rectifier correctly. Failure to do is will result in an inoperative LED d no compression.

Coupling the LED and LDR together may be accomplished in many ays. If a light-tight enclosure is used r housing, the LED and LDR may mply be placed physically close together. It should be remembered that u need maximum illumination from e LED on the sensitive surface of the DR. For optimum performance, the ir should be fastened together with a nall section of heat shrink. This will iminate much of the outside light akage and assure maximum light ansfer.

When the unit is completed, connect vo 9 volt batteries as shown in the hematic. With no audio or input gnal applied, adjust R2 for a dim, arely visible light on the front panel ED indicator. This sets the threshold f limiting. In this way you are assured w level audio is treated in the same anner as loud passages. At this point ake the input and output connections

continued on page 72

to the compressor. For proper operation input audio should be high level, such as the output of most pre-amps. The "tape out," audio available on most receivers and amplifiers, is more than sufficient to drive the compressor. When audio is applied and the gain control is advanced, expect 1-1.5 volts audio output. The front panel LED should be flickering and varying in intensity with relation to the loudness or amplitude of applied audio. Provided everything is functional, observation (on a VU meter or other suitable indicator) will indicate processed audio with high average content.

The attack time is such that the unit will not qualify as a "peak limiter." The attack time is rapid enough, however, to prevent excessive tape saturation or overmodulation: it is in the neighborhood of 5 m/sec and is dependent on the amount of compression. The LDR takes about 2 seconds to recover fully after 30 dB limiting. For lesser amounts of compression, release time is correspondingly faster.

The amount of compression used is certainly an individual choice. As a guideline, it is recommended that music with large dynamic ranges be compressed only lightly so as not to upset the color and sonic balance of the work. Most popular music, on the other hand, may be compressed more. Poorly mixed or improperly recorded programming often benefits greatly from the use of compression.

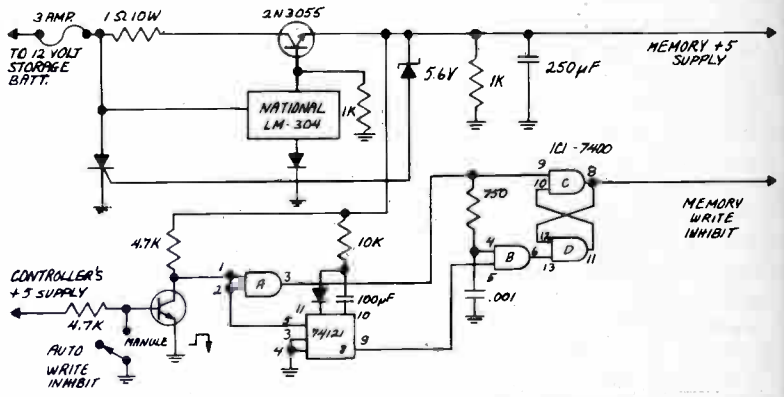
18. Extending the back-up battery on an automation system from 20 minutes to two hours or more.

John Hartwell, Production Engineer, KHSL-AM, Chico, CA

Problem: To extend the 20 min. back up battery to two hours or more, leaving capability to work on the digital controller without powering down the memory on an IGM RAM Automation system.

Solution: Install a second +5 volt regulator to power only the memory, and change the back-up battery circuit over to power only the memory's +5 volt regulator.

I used the circuit in the figure provided for this modification. The +5 volt regulation is accomplished with a national LM-309 regulator with a diode in its common lead so that the voltage of the regulator is one diode



John Hartwell shows how to extend the back-up battery on an automation system.

›p higher than 5 volts. This over-ltage is dropped in the base-emitter ıction of the 2N3055 transistor that ısed to increase the output current of LM-309. Over-voltage protection accomplished by the 5.6 volt zenor ›de and SCR, so that when the +5 ›es above the 5.6 voltage level the ıor diode will conduct, firing the R thus shorting out the input volt-to the regulator and blowing the 3 p fuse and protecting the MOS mory. The rest of the circuit in the ıre allows for the monitoring of the ital controller's +5 volt supply and ibits any power-up noise pulses m changing any of the data stored in memory. The 74121 one-shot pro-es the necessary delay so the con-ller's power-up reset pulse will not ect the memory.

n order to put this idea into use on IGM RAM Automation system ne modifications must be made to mainframe (DR.NO. 7513-9021), memory board (DR.NO. 7513-11), and the RAM I/O control board R.NO. 7513-1051).

1. On the mainframe wire the +5 t regulator that will supply power to digital controller to the +12 volt ulator that supplies the battery's ekle charge, thus bypassing D3. en connect the input to the mory's +5 volt regulator through the existing battery switch.

2. Move the +5 volt power on the memory board from AA2, BA2, and CA2, to AB2, BB2, and CB2, and add the necessary wiring from the regulator to the audibuss.

3. Modify the memory board by disconnecting IC-70 pins 13, 10, 5, and 2 from IC-70 pins 12,9,4, and 1, then reconnect them all to IC-72 pin 12. Then connect IC-72 pin 13 to BN1 of the audibuss with a .001 bypass capacitor to ground. BN1 of the audibuss now becomes the write inhibit line and must be connected to the added circuit as in the figure.

4. So that when the digital controller's power is restored the clockskin flip-flop will reset (normally reset when the memory clear switch is closed) the following must be done on the RAM I/O control board. Disconnect D20 from the memory clear switch and connect it to the Power-up Master Reset line. Break the trace between IC-19 pin 1 and IC-20 pin 1 and add a diode across the break, cathode going to IC-20 pin one. Then add a 1K resistor from IC-19 pin 1 to ground.

Coming in September
THE SOURCE

A note about Great Idea No. 8 Videotape Delay

Al Szaglak of WKTV showed how to use AVR-2's for videotape delay. He reported Ampex 1200s wouldn't work because of uneven tape tension. Recortec, Inc., 777 Palomar Ave., Sunnyvale, CA 94086 writes that if Ampex 1200s are modified with Recortec's Reel Servo Modification (R-MOD), tape tension will be improved so that these transports can be used for four seconds of delay.

(John Linebarger, WREG-TV, also writes that Szaglak's method does not work with RCA VTRs.)

19. Hand-held demodulator for determining signal-free periods when reading antenna tower currents.

Ken Blake, CE, KOXR, Oxnard, CA

Problem: To reduce the time spent playing 'Modulation Roulette' when reading base currents of towers in a

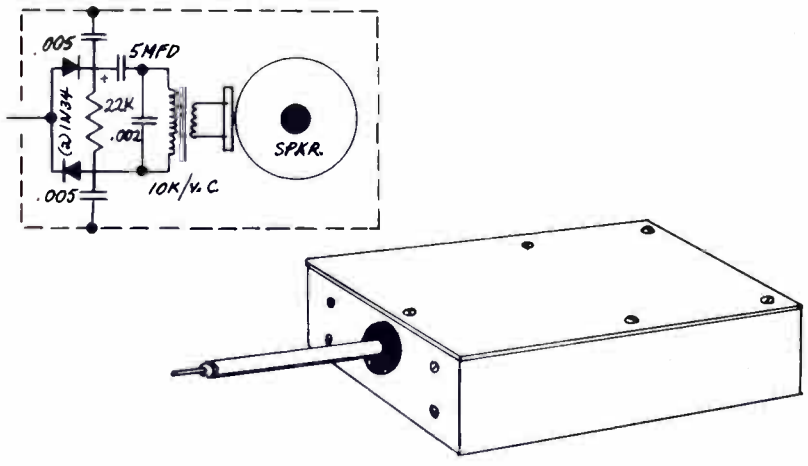
continued on page 74

directional array during normal programming periods, by using a device that shows when the carrier is unmodulated (per FCC rules).

Solution: A demodulator was built in a small enclosure which fits in one hand and contains a speaker. Head phones are impractical as they make the device very unhandy to use or carry. It is compact enough to be carried with the tower keys and, when reading the meters, held in the hand while touching the probe to a convenient ground (such as a bolt head on the tuning unit cabinet).

As indicated in the schematic the unit is enclosed in a metal 'handi-box' measuring 2¼" × 3¼" × 1¼" A $^{13}/_{16}$" punch was used to make a hole in one end behind which a piece of rigid insulating material was bolted and a hole drilled concentrically for mounting the probe which is a 1½" length of ¼" metal rod drilled and tapped for a 6-3 thread. A needle type test-probe t was screwed onto the end. A prob could be more simply made of a 2" bo filed to a point. The top face of the bo was cut out leaving a ⅜" border fo mounting a 2⅛" by 3⅛" piece of per board behind which the 1¾" speak was placed. Some of the small hol over the speaker cone were enlarge by drilling.

The component values specifie provide adequate volume and clari with our 5kW and 1kW powers. higher power should cause ove loading a pot can be substituted for th diode load resistor and/or a seri padder can be inserted between th probe and the diode junction to lim the RF.



Hand-held demodulator by Ken Blake for determining signal free periods when reading antenna tower currents.

20. Readily-available high-accuracy calibration source for RF bridges.

Frank S. Colligan, A.D. Ring Assocs., Washington, DC.

Problem: RF bridges are highly r liable instruments but no instrument infallible forever. Occasionally o needs to check the resistance ca

tion of an RF bridge especially
en a common point thermoammeter
been behaving suspiciously. In ac-
dance with Murphy, the time of
atest need always seems to be
hin 15 minutes of sign-on time.
olution: An excellent source of
istance calibration is contained
hin the modern-day antenna moni-
at the input ports. The inputs are
terminated in precision 50-ohm
stors that are well within 1% of 50
ns. The RF bridge may be checked
measuring these input ports on the
enna monitor. As a precaution be
e the antenna monitor selector
tons are set to read the usual in-
mation on the particular input the
dge calibration is being checked on
given time. The value of 50 ohms
guaranteed when the rest of the
nitor circuitry is bridged across the
minating resistor.

RECTORY cont. from page 42

programs combining interviews with
music — featuring popular music
stars.)

ereo Radio Productions
01 Hadley Rd.
Plainfield, NJ 07080
1-753-0444
oe of Service
l-time programming. Also: format
sultation, market studies, ID's
omotion plans, engineering
ommendations.
rmat Names — Type of Music
"Beautiful Music" (Supplied on 10½
reels, each in four segments, 12 to 14
minutes each. Station can run A-B.
Includes "beautiful music" orchestras
of BBC on exclusive contract.)

Productions
49 Regal Row
llas, TX 75247
4-634-8511
pe of Service
ll-time programming. Also: marketing
search, sales development, commercial
oduction services, total format
oncept."
rmat Names — Type of Music
"Beautiful Music, Series 1000-C"
(Sequence and blending adjusted to
market, with mix of uptempo
instrumentals, slow instrumentals,
vocals. Package includes ID's, bridges,
promos, etc.)
"Beautiful Music, Series 2000-S"
(Allows for control of intensity in
difficult market situations)
"TM Stereo Rock" (Rock aimed at
young adults — not hard rock)
"TM Country, Series 4000-C" (Blend of
old and new country hits)

*Some special-program suppliers: Good
usic Co., Hollywood; Ray Norman Pro-
ictions, Glenwood, NJ; O'Connor Crea-
e Services, Universal City, CA; Pro-
essive Radio Network, Bronx, NY; Pur-
ll Productions, New York City; Wm. B.
nner, Memphis, TN. A full-time pro-
ammer we missed above is Concept
oductions, Sacramento, CA.*

BROADCAST EQUIPMENT

For more information circle bold face numbers on reader service card.

Portable SMPTE Time Code Generator TCG-80P, measures to only 1¾ in. × 9 in. × 8⅞ in., and is designed specifically for ENG. Allows on-the-spot edit code indexing of 'wild' videotape footage and is powered by an external 12V dc source, 110V ac, or self-contained optional rechargeable NiCa battery. KAITRONICS **300**

Multipurpose Audio Test Set Model 4400, consists of a generator and a receiver. The generator section incorporates a multi-waveform function generator, pink noise source, log sine wave sweeper and comb generator; has facilities for tone bursts, a +30 dBm balanced output capability and very low distortion. The receiver section

contains an autoranging digital level meter reading in dBm RMS, an autoranging digital frequency counter, a spectrum analyzer, a band pass, band reject, high pass, low pass filter and a four channel digital memory to store response plots. Under $3000. AMBER ELECTRO DESIGN, LTD. **301**

Video cassette changer-programmer, Video Movie Player—6 (VMP-6), is designed for market needing more than three hours of automatic unrepeated programming. Plays from one to six ¾ in. cassettes repeatedly, or on schedule, to a built-in 24-hr. timer. Cassettes play in automatic rotation, returning to the first cassette whenever an empty bin is encountered. Cassettes are automatically rewound and can be tone programmed to advance to the next cassette at any time, or go into a "wait" function while external source provides programming such as announcements or commercials. Player is intended for CCTV, cable, or industrial markets. $3,495. SYSTA-MATICS, INC. **302**

Fill Light of compact, die-cast design is equipped with a high brightness reflector that delivers 135 fc at 10 ft. covering a 12 ft. × 10 ft. area. Options include 4-leaf barn door, and uses a family 500-, 750-, and 1,000W, 120V lamps. BERKEY COLORTRAN. **303**

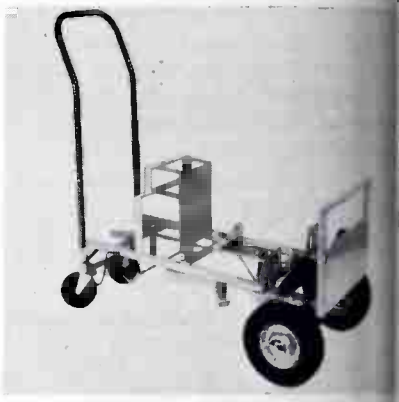
Audio cartridge tape reproducer, Type 20, has been designed to accept all NAB standard A, B, and C size cartridges. Measures 3½ in. high × 10⅛ in. wide × 13⅛ in. deep. Available in mono and stereo and are customarily stacked one above the other for desk or custom studio panel mounting. Furnished with a primary (1 kHz) cue and optional secondary (150 Hz) and tertiary (8 kHz) cue. Cue tone detectors use reliable L-C networks to provide relay contact output information. Precision head assemblies consist of 3 independent, non-magnetic tape guides and head mounting blocks with screw adjustments for height, zenith, and azimuth. Beaucart Division, UMC ELECTRONICS CO. **304**

Video Noise Meter, Model VNM-428, permits rapid, accurate measurement of signal-to-noise in any standard video waveform, using only general purpose oscilloscope with bandwidth of at least 5 MHz. Stable design and built-in calibration insure accuracy to better than ±0.5 dB throughout range of 20 dB to 55 DB, with SNR shown directly on a

large LED display. LENCO, INC. **305**

Equipment protector, will clean up transient-surge overvoltage on ac power lones, and provide protection for electrical and electronic equipment. The model ACP 100C will protect equipment from the destructive overvoltages arising from switching inductive loads, power company switching, contact arcing, static discharge, induced lighting and continuous overvoltage conditions. The 100% solid state dual stage protector during hazardous transient overvoltage co ditions automatically operates in 5 ns control up to 10,000W of transie overvoltage energy to within a sa level. TRANSTECTOR SYSTEMS. 3

Video Crash Cart, features rugg frame of welded, tubular steel, d signed to transport and protect the So



VO-3800 video cassette recorder, tw extra cassettes, AC-3000Ac adatpe the backpack for an Ikegami HL-33 HL-35 camera, plus 50 ft. of co necting cable. CAMERA MART. 3

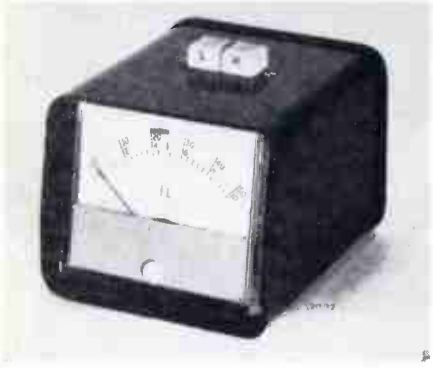
Precision color picture monitors NTSC and PAL Television standard models 670A-1 and 671 (PAL), use 17 in. Trinitron® to present an e hanced picture using a variable apertu control. Consistency is achiev through use of simple-to-conver Trinitron, excellent clamp stability a a highly regulated EHT. Less than change in raster size will occur w large APL changes; blanking and bla level are extremely stable too. Facto set for an accurate white balance D6500 deg. but adjustable to u standards. $2690. TEKTRONIX. 3

Solid state 10W UHF translato have been type accepted by the F and combine an existing 1W transla and a newly developed 10W UHF a plifier, containing hybrid-contain UHF amplifier modules. The UHF a plifier provides a minimum 1f 15 gain, requiring only approximately 3 mW of drive to reach its rated outp High gain figure insures that the dri translator is operating in a power regi where it will not continue excess intermodulation or sync distorti ACRODYNE INDUSTRIES, INC.

Dual Purpose light meter designed television studio use is calibrated "low" and "high" range buttons. range covers 0 to 50 fL, and is c

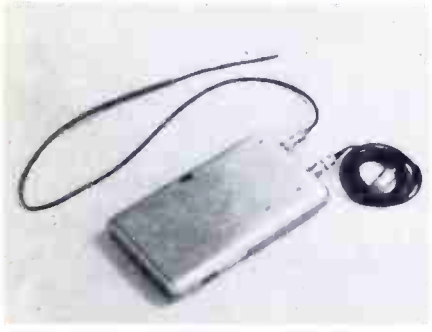
continued on page

PRODUCTS



brated to suite raster light for setting peak white color and monochrome monitors. The other range is scaled from 0 to 10 fL, and is calibrated for continuous light so that it can be used for rapid checks and comparisons of set lighting. POWER-OPTICS, INC. **310**

Wireless microphone system uses wallet-sized, 14 ounce transmitter which can be easily concealed on the body to provide complete freedom of movement. Circuit design techniques assure that the amplified sound will be

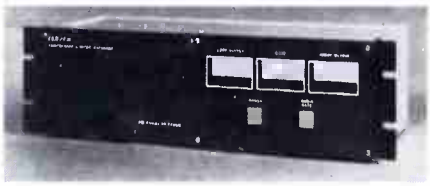


true high fidelity without any signs of fading, interferences or channel cross-talk. Fadefree reception is obtained by the automatic diversity switching of two antenna systems for optimum signal selection. Operates in relatively unused 947-952 MHz frequency band. 50 mW of transmitter output power permit the ultra-sensitive receiver to pick-up a usable signal within a minimum 500 Ft. range. Up to 15 channels may be used. Flat audio response from 50 Hz to 15 kHz and SNR greater than 60 dB. Two versions are available, RM-100 and RM-102. THOMSON-CSF LABORATORIES, INC. **311**

Video filter has a unique response in the dc - 10 MHz frequency range which provides a flat frequency output when used with an ordinary envelope detector in vestigial sideband transmission as found in television broadcasting. This Nyquist-Slope Video filter provides amplitude equalization at baseband and can be universally used without adjustment with detector circuits tuned to any VHF or UHF channel. COMARK INDUSTRIES, INC. **312**

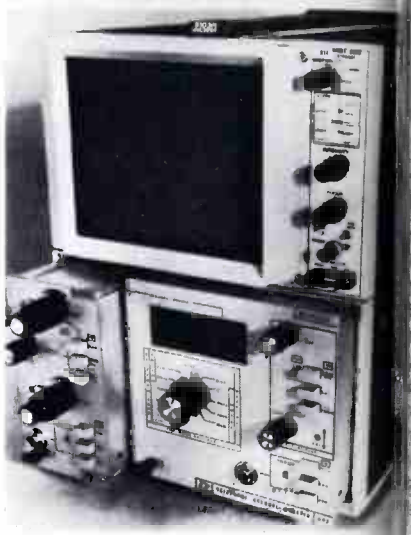
A **dc to ac inverter** designed to meet power and environmental conditions such as those required for microwave tv transmitting equipment on board mobile vans has been introduced. The equipment is designed to operate over a wide range of input voltages, especially low voltage as may be encountered in extremely cold weather or in the event of alternator failure or discharged vehicle battery. ADVANCE CONVERSION DEVICES COMPANY. **330**

Stereo Sound Britener, designated Spotmaster CLE-FM, combines compressor/limiter/expander functions in one compact unit. Employs unique signal processing that simultaneously provides automatic level control and overmodulation protection. Requires only two controls: The Average/Peak



Ratio control and, The Return R control; has three switch selecta models, Normal, Limit Only, and Te BROADCAST ELECTRONICS, INC. 3

Audio analyzer system with a co bination of measurement modes, cluding stereo phase and level



ferences is offered in one compact i strument. The ROR 300 System p vides a digital readout, for each type measurement, in addition to the strument's scope display, so point-b point as well as swept measureme are possible. It is suited for portable u in field maintenance with its built frequency meter, level meter, noi meter, and distortion meter. Numero models with various configurations a prices are available. W&G INSTR MENTS, INC. 3

(9 × 3) "Mic-Splitter," is designed split up to nine microphones, thr different ways. Each unit has thr outputs for every input. Other featu include male and female "XLR" ty connectors, Sescom transformers w isolation resistors, phase reversal a ground lifter switches. $1045. SI COM. 3

PRODUCTS

16mm film viewer, the Maier/Hancock MH-1000, can be ordered to operate from right to left, with sprocket teeth away from the operator. FILMKRAFT SERVICES. **323**

Sideband adapter for the analysis of TV transmitter frequency response when used with 7L12 or 7L13 spectrum analyzer, allows analysis of television transmitter carrier frequencies of up to 1 GHz. Connected with either spectrum analyzer the 1405 generates a composite video signal, the picture portion of which is a constant amplitude sine wave signal that sweeps from 15-0-15 MHz. In addition to sideband testing, instrument will perform numerous other test. TEKTRONIX, INC. **324**

Video Light Show converts audio input (music) into standard color video signal with intricate, digitally controlled patterns that respond to music or other audio source. Unit can be keyed to another video signal for mixing and/or broadcast. $725. VISIONARY ELECTRONICS. **325**

New Oscilloscope, Philips PM3261, features a digitally delayed timebase, enabling accurate location of events in pulse trains. This high frequency instrument has a 120 MHz bandwidth, 3 ns risetime vertical amplifiers; main and delayed timebase with 5 ns/division maximum speeds; clear front panel design; high speed, high sensitivity triggering beyond 200 MHz and weighs just 20 lbs. PHILIPS TEST & MEASURING INSTRUMENTS, INC. **326**

A digital strobe for the exact measurement of turntable speeds which can be adapted to measure tape recorder speeds as well, has a three digit display

that is capable of measuring speed variations of up to ±.01%. The Digital Strobe can be quickly installed by anyone and will not interfere with normal operation of the turntable. Speed variations may be monitored and converted while turntable is in operation. WOODARD ELECTRIC, INC. **327**

NEWS continued from page 20

lation rather than the more common average-cost type model.

In a study, "Estimation of an Urban Cable Demand Model and Its Implications for Regulations for Major Markets," supported jointly by the FCC and the Tele-communications Program of the National Science Foundation (NSF), findings indicated that there is not enough demand where there is basically good reception and a number of signals available.

According to the study, the real impediment to the development of urban cable is not federal regulation, but the higher market costs and reduced demand.

One of the few points of agreement in the conflicting studies was that pay TV appears to have the best future.

Theta-Com Drops Cable Line

Studies, such as the two reported above, could leave one wondering whom to believe. Theta-Com, a subsidiary of Hughes Aircraft and a major manufacturer of cable television equipment, has apparently made up its mind and decided to phase-out its CATV equipment operations.

James J. Sutherland, Hughes vice president and Theta-Com board chairman, said that the company will no longer actively pursue sales of cable TV products. It will, however, continue to provide spare parts and maintenance for existing customers and continue its AML microwave product line.

The decision, said Sutherland, was made because CATV operations have not been profitable for some time and conditions in the CATV industry do not indicate an improvement in this situation in the foreseeable future.

The AML product line will continue but be moved to the Los Angeles area.

FCC Amends Fraudulent Billing Rule

A new statement of the rule against fraudulent billing says, in part, that no licensee shall "knowingly issue or knowingly cause to be issued" any bill, invoice, affidavit or other document containing false information about the amount charged for broadcast advertising, about the quantity broadcast, or about the time of day or the date broadcast. A new subsection of the rules prohibits licensees from giving a *program supplier* any document with such false information. The FCC reiterated its seriousness on the subject of fraudulent billing, but said it might not find a violation in cases in which t licensee did not have knowledge, a the false billing resulted from an occ sional mistake, not indicating a patte or where reasonable diligence on t part of the licensee would not have u covered the matter. (Docket 20499)

$199 USA TV Camera

GBC Closed Circuit TV Corp., long importer of cameras for closed circ TV (and particularly surveillance) a plications, has begun production of new high performance low cost unit its Princeton, N.J. plant.

Because of increased demand changing world conditions—GB expects to sell 10,000 annually—t company says it can build a prod with more features and better spec a low cost than can off-shore supplie The new solid state CTC-3000 cam has 600 line resolution, 10,000 to automatic light compensation, a justable white clip, automatic volta regulation, and a 16mm f/1.6 "C mount lens. It sells for $199.50. T separate mesh vidicon tube is still i ported.

KPLR-TV Gets License to Use Earth Station

Hal Potter, vice president and gene manager of KPLR-TV, St. Louis, a

ced that the FCC has granted the
on a license to operate their brand
$100,000 Earth Station.
PLR's Earth Station is thought to
e first installed at a television sta-
in the United States. The first
dcast using the Earth Station is
duled to carry the St. Louis Stars
er game, live, from New York, via
ite on July 2nd.
mediate use of the Earth Station
be for The Independent Television
s Association (ITNA) which
ies ten independent stations with
nal and international network-
ty news.

Push for Small Dish

ntly completed tests of small dish
er 10 meters) earth receive anten-
conducted by Channel 100, a sub-
ry of Optical Systems Corp., and
ern Union, via its Westar satellite,
extremely successful according to
ipants.
th Channel 100 and the NCTA
push the acceptance of small dish
nas before the FCC.

B Blasts FCC on rness Rulings

the FCC found 8 of 13 California
stations and a West Virginia sta-
in a separate action, in violation of the fairness doctrine, the NAB accused the FCC of overstepping its authority regarding the rights of broadcast journalists to exercise their "best judgement and good sense."

In the California case seven activists groups complained to the FCC that the radio stations failed to fulfill their responsibilities under the fairness doctrine by airing certain paid announcements by the Pacific Gas and Electric Co. The complainants held that the spots were controversial in that they pertained to the construction of and use of nuclear power plants and, as such, the stations did not provide adequate time to opposing viewpoints.

In the West Virginia case, WHAR-AM, Clarksburg, was found to have violated the fairness doctrine for failing to cover "adequately the subject of strip mining," a subject of vital interest to that audience.

The NAB sees the FCC order in the California case as a "radical departure" from its own Fairness Report which states, in part, "we (the FCC) firmly believe that the public's need to be informed can best be served through a system in which the broadcasters exercise wide journalistic discretion," and that the FCC role is limited to determination of reasonable action and good faith.

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