Supplement to:

BROADCAST® ENGINEERING Radio

January 1994

COVER STORY

Live from anywhere:

Suitcase uplinks, audio codecs, portable audio production gear and Switched-56 service are all put together in this ultimate remote package, described by well-traveled network engineer Marty Kurcias. A sidebar describes the perils faced by a radio news crew covering relief efforts in Somalia.

E

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Software solutions for talk radio:

Many talk radio stations are computerizing their call screening, but end up simply reinventing the wheel or learning things the hard way. Jack Callaghan, news/talk radio veteran and closet hacker, describes the latest in commercial call-management software that can make call screeners' — and talk show hosts' — lives a lot easier.

M E

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Radio in Transition: Weather services for radio stations

Plenty of new weather services have become available to radio stations. Radio meteorologist Sara Croke runs through the complete range in this exhaustive survey. Whatever your market size, you're sure to find something that gives you a weather edge on the competition, without busting your budget.

M

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M = Management focus

E = Engineering focus

BE Radio

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Circle (1) on Reply Card

EDITORIAL

Welcome to BE Radio

Whirlwind changes are taking place in the broadcast industry. Former enemies, the telephone and cable industries, are now joining forces to bring new and expanded services to their customers. Mega-merger media deals are almost daily headlines. While the media has focused primarily on the changes in the TV side of the business, significant changes also are taking place in the radio business.

Duopolies and local marketing agreements between radio stations have emerged as the equivalent of the highly publicized joint telco-cable projects and mergers. These and other changes have forced radio managers and engineers to reconsider how they do business.

In light of these events, the editors of *Broadcast Engineering* magazine felt it was time to re-emphasize our coverage and support of radio. The result of that effort is a new magazine, *BE Radio*. Published six times a year, *BE Radio* is devoted exclusively to the technical issues in radio broadcasting. It will provide radio managers and engineers the insightful and practical information they need to run profitable and growing businesses. If you're involved in radio, you need *BE Radio*.

Don't worry, we'll continue the *BE* tradition of providing accurate and useful information for both our engineering and management readers. The difference is that in *BE Radio* the focus is on the unique needs of our radio readers. With its easy-to-read style and an eye-catching graphical treatment, *BE Radio* is sure to become your favorite radio publication.

We hope you like *BE Radio*. You can let us know what you think through the *BE* FAXback line. Fax your comments to us at 913-967-1905 or e-mail at 4757418@MCIMAIL.COM. We look forward to hearing from you.

NEWS

Amati/AT&T tests IBOC DAB on-air

Amati and AT&T successfully tested their in-band/on-channel (IBOC) DAB format over the air at WPRB-FM, Princeton, NJ, in early January. The system performed well despite crowded spectrum conditions and ice storms during the test period. WPRB was chosen for its proximity to AT&T's development facility in Murray Hill, NJ, and its worst-case spectrum position, with relatively strong signals in both of its first-adjacent channels. (WPRB operates at 103.5MHz.)

Similar to previous IBOC-FM tests, a separate, low-power, linear RF amplifier was used as a transmitter for the digital signal. Its output was RF-combined with WPRB's existing analog FM transmitter's output and fed to a common (existing) antenna. However, these tests also noted surprisingly successful results when the station's FM transmitter was used for *both* the analog FM and digital signals (mixed into a composite signal by the Amati/AT&T exciter). Successful reception was possible in this mode with the FM transmitter running up to approximately half its rated power. The grounded-grid design of the 10kW FM transmitter used at WPRB may have contributed to this unexpected result, according to Amati engineers.

Reception quality was reportedly good, but limited by adjacent-channel interference as listening distance from the transmitter increased. As a result, the digital coverage was somewhat smaller than the primary analog FM coverage zone. Amati sources cite such coverage-matching as probably the greatest challenge for IBOC systems, because of the substantially lower level at which any on-channel digital signal must be transmitted. The Amati/AT&T system places multiple carriers at one or both edges of an FM channel (only one was used in these tests), 25dB below the FM carrier.

USA Digital develops second IBOC-FM DAB system

USA Digital has announced that it plans to submit two separate IBOC-FM DAB systems to the EIA/NRSC digital radio tests that begin this month, in addition to an IBOC-AM format. The second FM system employs a significantly different implementation of IBOC technology, according to sources at USA Digital. The receiver for the new system is based on silicon architecture rather than the gallium arsenide processor required by the previous format's receiver. (See "Re: Radio," January 1993).

The proponent demonstrated its first IBOC-FM system in various stages of development at several trade events during 1992 and 1993, and showed its IBOC-AM system on the air for the first time at NAB '93. The second FM system has not yet been publicly demonstrated. All three formats have been developed under the umbrella title of *Project Acorn*, with the two IBOC-FM systems distinguished simply as System 1 and System 2.

BE Radio

Live from anywhere

By Marty Kurcias

The Bottom Line: *Radio broadcasters can now provide their listeners with high-fidelity audio from literally anywhere in the world by using a portable satellite telephone in conjunction with Switched-56 technology. Portable satellite telephony itself is not altogether new, but linking it with other technologies is the wrinkle that makes it valuable for remote audio backhaul. The increased fidelity can contribute immensely to the impact of remote radio broadcasts.* $

The rules of the remote game are changing fast. Broadcasters can now take advantage of a number of new tools for backhauling quality audio with great flexibility and from practically any location. The right equipment and some practice are all you need.

A recent case in point involved a series of reports uplinked to National Public Radio headquarters in Washington, DC, from various locations in Somalia during coverage of relief efforts there. You can't get much more remote than that, and if it works from there, it should work from anywhere. The assembly and operation of a successful system requires some effort and learning on the part of the user, but the results can pay off handsomely.

The hardware

The satellite phone used for these backhauls was the *MAGNAPhone MX2020P,* manufactured by Magnavox/Nav-Com and available in four configurations. The model employed on this remote was the top-of-the-line unit, called the Turbo HSD (High Speed Data). It consists of a transceiver unit (about the size of an orange crate), a dish antenna (which looks and folds up like an average-sized umbrella) and a control console (incorporating a keyboard, an LCD screen, a dial pad and a telephone handset).

For occasional use, it is more cost-effective to lease rather than purchase a satellite phone. In either case, call-time also is expensive. International calls (standard voice-quality) typically run $10 a minute, and HSD calls cost $12 a minute. Nevertheless, the system is quite versatile, and for many applications it is worth the expense.

Among the hardware's features are a telephone, HSD, fax, telex and built-in thermal printer. The control console includes the speakerphone and handset, speed dial and directory and automatic call logging and printout. A menu-driven operating system displayed on the 4-line, 40-character LCD screen greatly simplifies and expedites setup and operation. A compass is provided for azimuth-finding. The system even has a help program that walks you through self-diagnostic tests when you encounter problems. Incoming and outgoing calls are accommodated on the satphone's two numbers, and a modem can be connected for access to and from computer systems. The whole system weighs approximately 90 pounds and fits into a single road case.

For high-quality audio transmission via HSD mode, an audio codec also is required for digital audio conversion and data-rate reduction. The codec provides real-time 7.5kHz mono audio at 56kbit/s or 64kbit/s and interfaces to the satphone via a V.35 port. (See Figure 1.)

Now for the tricky part

Normally, satphones should not be operated in a foreign country without the explicit permission of the governmental telecommunications authorities. In Somalia, this was a moot point because there was no government, although the service/hardware provider (Comsat) did provide the proper credentials to present if permission became an issue.

The signal was transmitted back to the United States via one of the INMARSATs (International Marine Satellites) which is used by ships at sea but also is accessible from most continental locations, including the contiguous United States. Four of them are hovering in geostationary orbit above the equator, and the bird of choice in this case was called INMARSAT Atlantic Ocean Region-East (AOR-East), at 15°W longitude. Because Somalia is virtually right on the equator and at about 45°E longitude, the aiming azimuth was 270° — due west. (The Indian Ocean INMARSAT to the east also could have been used, but only AOR-E has the HSD capacity required for 56kbit/s digital audio transmission.)

Because this system could access POTS (plain old telephone service) and Switched-56 networks, the procedure for filing involved first placing a regular POTS phone call to alert NPR's Washington headquarters that a report was ready for filing. An HSD call was then initiated to transmit the 56kbit/s digital audio feed. The HSD service provided in this case offered a voice-grade backfeed from the receiving end that could be used for coordination or for talk-back during

Kurcias is an audio engineer at National Public Radio, Washington, DC. Respond via the *BE* FAXback line at 913-967-1905.

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DESIGNS THAT MAKE THE DIFFERENCE

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2-way interviews. Text files were transmitted directly from laptop computers with built-in modems at 2.4kbit/s via the POTS link. A simple RJ-11 cable connected the laptop to the satphone's control console.

If you know what you are doing, setup takes approximately 15 minutes from road case to transmission. The transmitter stands on legs that unfold from underneath it. The umbrella dish unfurls and locks into place with the turn of several bolts. The control console can be tethered to the transmitter with a cable up to 500 feet long, which allows the unit to operate remotely.

Following a menu screen on the display window, you enter the latitude and longitude of your location, which you must determine from a map. (Mogadishu, Somalia is at 2°N, 45°E.) You then enter the Land Earth Station (LES) you want to downlink your transmission (Southbury, CT, in this case) and select the proper INMARSAT bird. With this info entered, the control-console computer automatically computes the azimuth (compass direction) and elevation (angle to the horizon) at which to point the antenna.

An LED strength meter for the received signal is housed in the top surface of the transmitter, and you need merely shift the unit about until you get the strongest reading. Aiming does not have to be precise to achieve adequate signal strength for communication. The control console also displays the received signal strength numerically on its LCD screen.

Once the antenna is lined up on the satellite, the uplink transmitter can be fired up. It takes a few minutes for the uplink oscillator to stabilize, after which a green LED indicates that you are "locked" and bidirectional communications can begin.

Now you can start dialing. A standard domestic phone number — area code (AC) plus seven digits — tells the LES to automatically route the call to the POTS network; the prefix "56" followed by a Switched-56 number (also AC plus seven digits) puts you on the Switched-56 network. The LES hands the call off to the Switched-56 network through a data service unit (DSU), the standard terminal hardware for that network. You can turn the unit on and off without repeating the aiming procedure. You just wait for the transmitter to lock onto the satellite and then dial away.

Powering

Power can be 120VAC or 240VAC ±10%, 47Hz to 63Hz. The unit automatically senses and selects the proper voltage, so it's virtually impossible to blow it up by mistake.

In the field, the user can configure a number of alternate means to supply power if mains are not available, including portable generators and DC-to-AC inverters on batteries or fold-out solar-cell arrays. For this remote,

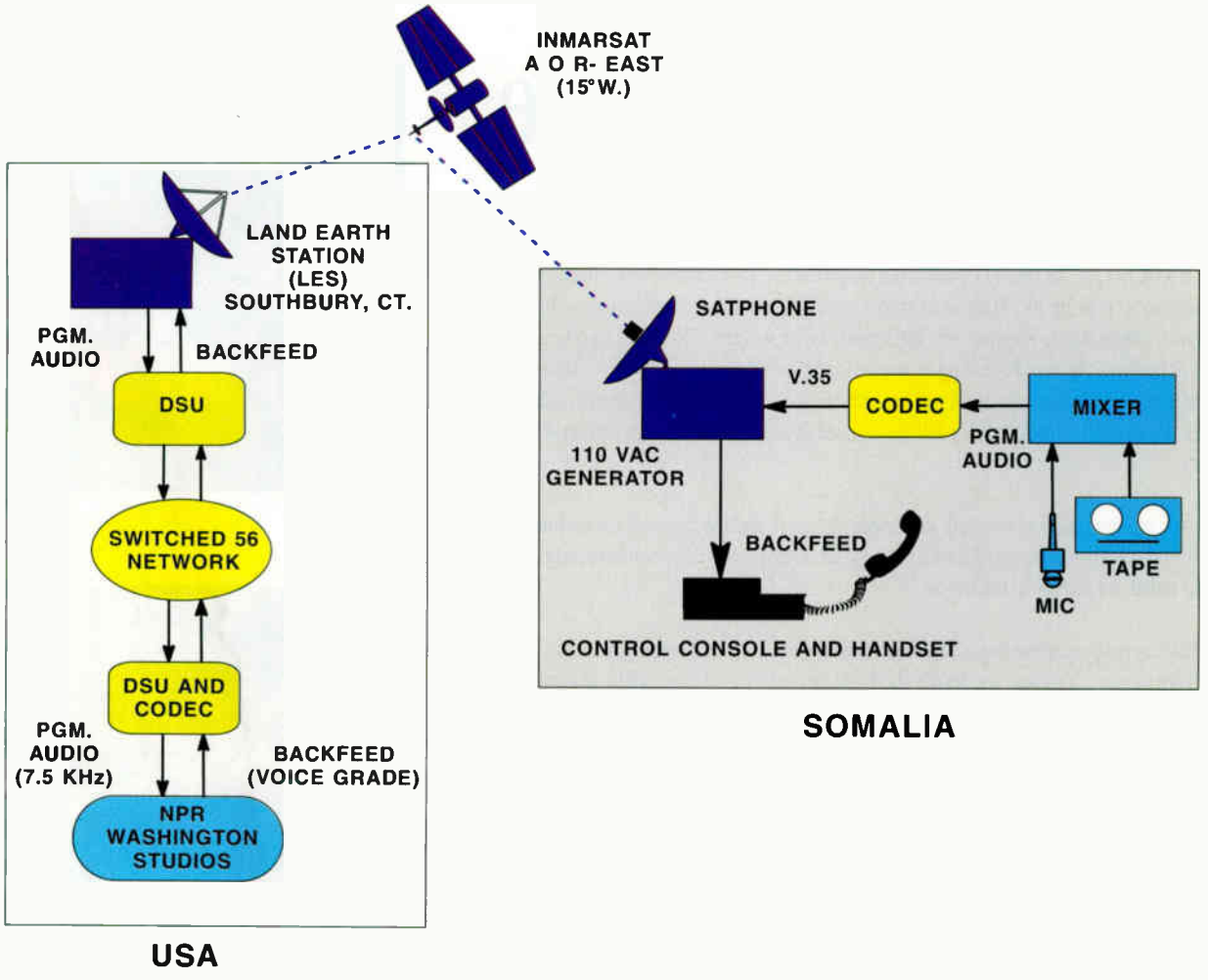

Figure 1. Block diagram of satphone signal path from Somalia to Washington, DC, via INMARSAT and domestic U.S. Switched-56 network.

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Rear view of MAGNAPhone shows codec (black box) connecting to transmit/receive unit via V.35 cable. The black cable at center feeds audio from mixer to codec. The gray cable snaking off to the right connects the control console to the transceiver.

the crew brought along a 550W portable gas generator. It provided more than adequate power to the satphone, which draws 280W in transmit mode, 61W idle. The generator was powered by gasohol picked up during a Nairobi stopover on the way into Somalia. (Somali gasoline was expensive — especially to foreign journalists — and its purity was notoriously unpredictable. Adulterated fuel was responsible for many car breakdowns, which could be hazardous to your health if they occurred in the wrong place and time. In Somalia, that's almost any where, any time.)

Evaluation

The MAGNAPhone performed well throughout its use in Somalia. The few difficulties experienced in getting HSD calls through were apparently the fault of the domestic Switched-56 network or the hardware setup and operation at the receive end.

One caveat, however: Live-to-air interviews are a bit risky because the backfeed to the remote site can sometimes fail, leaving the field reporter unable to hear the studio host. Pretaping interviews is, therefore, recommended.

The MAGNAPhone's ruggedness received high marks. It survived a trip halfway around the world and back, via air and via ground transport on some the worst roads imaginable in rural Somalia. It also performed well under conditions of extreme heat and dust. Although it was usually protected from the elements and was covered at night with a tarp, there were times when it was required to transmit in the middle of a thunderstorm, and it exhibited no problems. The transmitter housing heated up considerably during extended hours of use, but that is apparently normal.

The unit offers many useful features, such as speed dialing, call logging and user access codes. It also includes approximately 100 synthesized-voice announcements, which the system automatically plays when appropriate. (The system also can be set to play back *all* announcements in rapid succession, which is an effective means of annoying field producers.)

An HSD satphone and codec rig like the one described here is useful for quick, quality backhauling from remote locations where access to traditional communications is impossible or unreliable. For good-sounding remotes from practically anywhere, data-reduced digital audio via HSD satellite telephone is hard to beat.

➡ *For more information on remote digital audio transmission equipment, circle (312) on Reply Card. Also see "Coders and Decoders, Digital Audio" on p. 52, "Digital Terminal Equipment, Modems" on p. 54, and "Satellite T/R Components, Electronics" on p. 68 of the BE Buyers Guide.*

Engineer's journal: Somalia

News crews faced some unique and serious challenges covering the Somali relief mission. Here are a few recollections from one radio engineer.

Flying in to Mogadishu on a small charter from Nairobi, we learned that the main airport was closed, so our pilot headed for a small dirt airstrip about 40km outside of town.

There he set the plane down in the midst of a crowd of a hundred Somalis, many armed with automatic weapons. It seems that this airport was the designated landing site for the daily *qat* shipments from Kenya. Qat (or khat) is a plant imported from Kenya and Yemen, and its leaves and stems are chewed to produce a stimulating effect. It is the drug of choice throughout Somalia, sold and consumed openly.

These folks were all hoping that our plane was carrying qat, which it wasn't. The pilot started tossing our gear out of the plane as soon as we hit the ground, anxious to get back in the air quickly. One fellow came pushing forward through the crowd and said he was in charge of this airport — the local warlord, powerbroker or whatever. I stood watch over our pile of luggage and equipment, passing out cigarettes and trying to smile a lot.

For no small fee, we eventually engaged two pickup trucks with drivers and armed guards to transport us to Mogadishu. After a ride made harrowing by the road and the roadblocks, we arrived in the Somali capital.

Welcome to Mogadishu

Somalia had been pretty well laid waste by two years of civil war. No phone, no mail, hardly any water, no public utilities, wrecked vehicles and rubble everywhere. Certainly no banking system, and few shops or markets. Sanitation was ... well, it wasn't. Squalor was. The country was virtually devoid of law and order. Armed gangs of men and boys ruled the roads, stealing and looting for the survival of their clans. Those with the most guns wielded the most power and controlled the flow of food. Relief organizations were constantly looted of money and food stores intended for the starving. Sometimes a clan would even sell food back to the relief organization from which they stole it.

Left without options, relief organizations hired gunmen for their own protection. As journalists traveling around the city and countryside, we also had to contract for protection. One or more armed guards accompanied us wherever we went. Their arsenal consisted of light or heavy machine guns, pistols and clubs. They were known as "technicals," a term also used for vehicles with weapons mounted on them, which were always cruising the streets.

Bound for Baidoa

The first big mission for the Marines was to relieve the town of Baidoa, a town under siege by armed gangs. Covering this would be risky: At least a 4-hour trip on unsafe roads, and a good chance of being looted once we got there. But it looked like a good story.

We traveled in a convoy of three vehicles — seven journalists plus drivers, interpreters and guards. The guards picked up a belt-fed machine gun (an intimidating addition to our arsenal) and retrieved some more weapons from a cache in the bushes alongside the road outside of town. Displaying these weapons prominently was the key to safe passage along the

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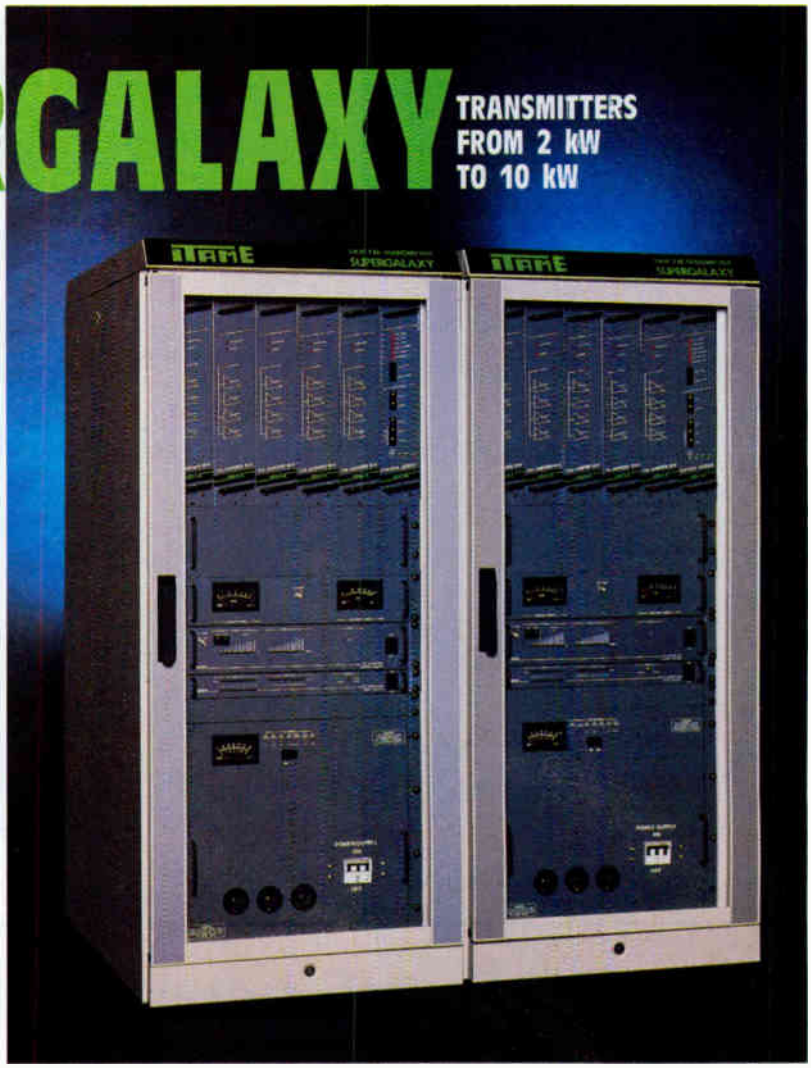

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road to Baidoa. Anyone who thought they might be able to take advantage of us only had to do some quick arithmetic to see that they were outgunned.

The lesson of convoy travel was reinforced for us when we rescued the passengers of a disabled vehicle who frantically waved us down. They were members of a German TV crew, and we took them aboard one of our trucks.

An industrial wage dispute

Late one afternoon in Baidoa, some of our technicals began expressing their desire to renegotiate our original wage agreement with them. With our translator caught in the middle, we stood our ground. They'd go away, then come back with a new argument, each time asking for even more money than the last. After several rounds of this, we told them the discussion was over and to leave us alone, we had work to do.

Well, we were right. The discussion was over. The next thing we knew, several of our "security guards" were in our rooms brandishing weapons. Our producer was on the phone with the network, and one of the guys took the phone and hung it up. At this, one of the reporters jumped up, bravely planted herself next to the phone and vociferously screamed at them to get the —— out. They were not moved, and we all encouraged the reporter to chill out.

At this point our translator was doing his best to try to convey to us that these guys were not going to take no for an answer. He seemed more scared than any of us. But when they set up a light machine gun on its legs in the doorway — pointing inside — it became abundantly clear that it was time to cut a deal.

We ended up offering them about three times the amount they had originally agreed to if they would leave us alone. The notion of "money now" appealed to them, and we breathed a collective sigh of relief when they drove away. The next day we contracted for new guards and transport.

Back in Mogadishu our field producer was accosted outside the airport one day and robbed of a tape recorder, mic and, worst of all, his notebooks containing much vital information. This robbery took place in full view of UN peace-keeping troops, who didn't lift a finger. One of our technicals gave pursuit and for his trouble was pistol-whipped and stabbed in the side of his head. Our intrepid translator did a little private-eye work and was able to arrange for us to ransom back the stolen items. Somewhere in the city, he related, was a room filled with purloined booty — cameras, tape recorders, wallets, purses and jewelry.

For some Somalis, the foreign news media represented a lucrative new source of income. If you couldn't get hired on as a translator, driver or technical, you could sell high-priced gas or rent rooms at New York rates. When troops began protecting food convoys, journalists also became the next best victims for looting. Expensive equipment, lots of cash on hand and the cavalier attitude of some made journalists tempting targets. We couldn't be expected to be around for long, so they probably figured they may as well get while the getting was good. People in desperate situations do desperate things. Somalia was nothing if not desperate. Our experiences were far from unique. Numerous journalists had similar encounters, some with more dire outcomes.

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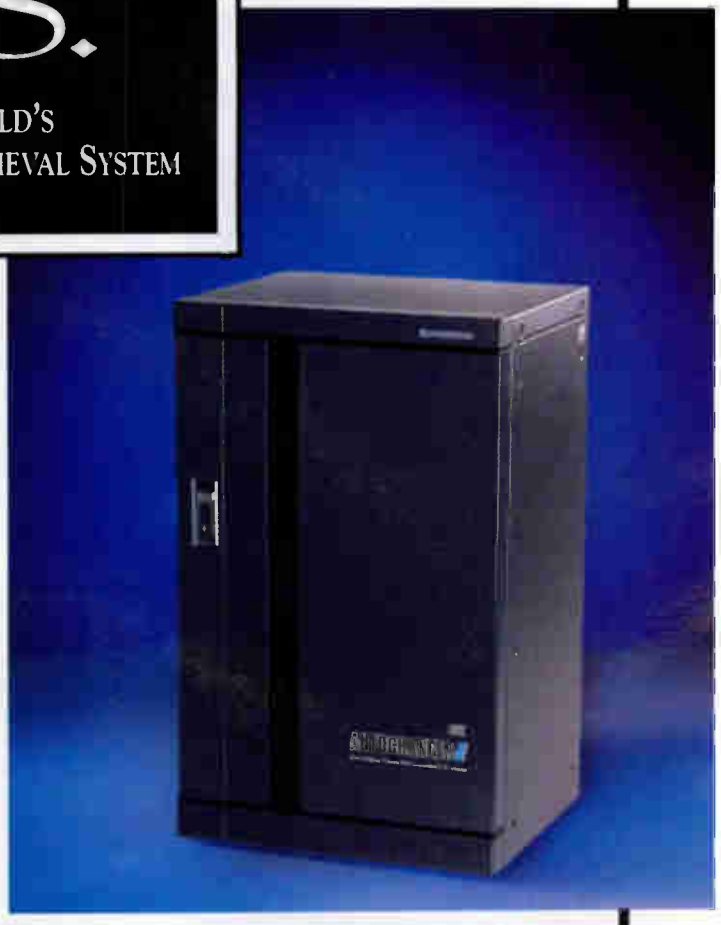
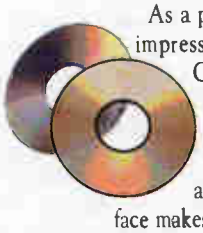


No matter how technologically advanced an industry may become, it's always a good idea to keep things simple. Well, what could be simpler than programming audio by hand? The Pioneer CAC-V3200 Compact Disc Autochanger.



As a professional audio user, you'll be impressed that it provides access to 300 CD's with uninterrupted playback thanks to dual CD players. And they can be connected together to program thousands of CD's. You'll also appreciate that its built-in interface makes it pre-programmable for error-free playback by almost any computer. And its fade-in and fade-out capabilities, pitch control, and analog and digital outputs make it a remarkably ingenious piece of equipment.

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PIONEER
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BE Radio

Software solutions for talk radio

By Jack Callaghan

The Bottom Line: *Talk radio is a popular format, but it's one of the more labor intensive to produce. The call-screening process is a critical, behind-the-scenes element of any talk show, and how well it's handled can really affect the quality of the program. Computers can help, but — as usual — only as much as their software lets them. Running the right caller-management software can have significant impact on how your talk show sounds on the air.* $

"Do something about those pieces of paper on the studio window!" The general manager was right. The sticky-notes-on-the-glass method was a pretty low-tech complement to our high-tech telephone system. Clearly it was time for a computerized solution, but what software to use?

Like many other people involved in talk radio, I had once written a computer program to allow a producer/call screener to communicate with on-air talent. My early custom program was rudimentary, prone to crash and not very user-friendly. I had visions of a spiffy call-screener program bouncing around in my head, but unfortunately had no time to write the code. Certainly somewhere there was a broadcaster who *had* made the time, written that program and was now selling it.

Although I suspect that many good call-screener programs have been written, only a few can be easily found in the marketplace. Supply and demand is probably to blame — it's hardly a mass appeal item. I've found three: *Call Screen Manager, Screener III* and *TalkStar*.

Each of the programs is written for use in the MS-DOS environment, and none is particularly resource-hungry. This is good news for stations on a tight budget, because generally even an old dusty XT-class computer will run them. All three programs provide a method to build database information about callers. Two of them can talk directly to the telephone hybrid system using serial interfaces. They can all go on remote with you. One of them has been to the White House and another has been in the movies.

Callaghan is news director and the designated computer expert at WKNR-AM, Cleveland. Respond via *BE's* FAXback at 913-967-1905.

TalkStar

The primary purpose for call-screening software is to feed the air talent with information about who's on the phone. *TalkStar* author Jim Radcliffe says that's what his customers ask for: "The basic information at a glance."

You may have already seen TalkStar — it was the software used by Eric Bogosian's character in Oliver Stone's movie "TalkRadio." (Radcliffe got an on-screen credit and a few subsequent customers from that.)

TalkStar's genesis was in the mid-1980s. Working at KPLX in Dallas, Radcliffe noticed sister station KLIF was using an off-the-shelf program designed for a different use to display caller information. Having already written the *Oasis Paperless Studio System*, Radcliffe set out to write a program to better serve the news talk format. Like the other programs, TalkStar allows a call screener to type in the caller's name, gender, age, topic, city and zip code. That information is displayed on a monitor near the talent. The age, gender, zip code, topic, time and length of each call also is stored to a database file. Retrieval is easily accessed by a hot-key. Reports can be sorted on the basis of time-of-day, topic or demographics, but screening is halted while reports are run. It will display information for up to 10 telephone lines.

The primary purpose for call-screening software is to feed the air talent with information about who's on the phone.

The graphics version of the program is mouse-aware, features three different font sizes, a large digital clock face, and a distinct icon to indicate cellular calls. It will run on an XT, but Radcliffe recommends an AT-class or higher for database access. The graphics version requires an EGA monitor or better. A dumb terminal is all that's needed to take the program on the road, displaying data to on-air talent at the remote site via phone line connection to the host PC at the station. Because the data flow is only one-way (from station PC to remote terminal), data can even by sent to the remote site via SCA subcarrier. TalkStar sells for $795, and support is free. Users will also receive one free software upgrade.

Of the three programs, TalkStar is the only one that doesn't handshake with the telephone system.

Screener III

On the other hand, *Screener III* from Digitronics is quite chatty with your telephone interfaces, whatever their

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PROGRAM	LANGUAGE	PLATFORM REQUIRED	DISPLAY SUPPORTED	MAX. # LINES	HANDSHAKE TO PHONES	PRICE	RS #
TalkStar	MS-PDS	XT, 286[1]	CGA, EGA	8	NO	$ 795	313
Call Screen Manager	C, C++	XT, 286[1]	monochrome, composite, CGA, EGA VGA, SVGA[2]	20	YES[3]	$ 349	314
Screener III	MS-PDS	XT	monochrome, VGA, SVGA	10	YES[4]	$ 325	315

NOTES:
1. 286 or higher recommended for database searches.
2. Database tools allows custom screen design; multilingual support.
3. Handshakes with Telos interfaces via RS-232A.
4. Handshakes with Telos and Gentner interfaces via RS-232; can be made to handshake with others through Digitronics I/O card.

Table 1. Talk radio call-management software compared.

variety, including that modified speakerphone buried under the console.

When communicating with your telephone system, Screener III will show you exactly how long a call has been holding or how long it's been on the air. When a call is put on the air, the box containing that caller's information changes color so the host won't forget which caller he or she is speaking with. When a call is disconnected, that caller's information disappears from the screen automatically, which can be quite handy. Perhaps even handier is the software's ability to *control* your telephone interfaces. At a remote site, for example, a laptop with a modem can connect to the Screener III host, allowing remote talent to not only see the same information displayed in the studio, but also to remotely pick up and hang up lines (using F-keys). When the Clinton administration invited talk show hosts to camp out on the White House lawn for three days last summer, Screener III went along with CBS talker Gil Gross.

The system's handshaking to telephone systems is handled either through a direct serial connection (to those interfaces that include such a control port) or via a custom I/O card that uses opto-isolators for sensing status, and dry contact closures for control. The I/O card also can be set up for machine control, delay dump or anything else you can run with a relay.

Radio engineer Gary Wachter first started work on the program in 1985 at KTSA, San Antonio. Written in compiled basic, it runs on an XT-class computer, supports monitors from monochrome to SVGA and displays information for up to 10 telephone lines. Caller information can be printed to a running hard copy log and/or stored in an ASCII data file. The stored data can later be accessed with a word processor or database program. Version 3.0.7 is being shipped currently, but a major upgrade should be available in time for NAB '94. The software costs $325, plus $295 for the optional I/O card. Support is free, as are upgrades for the first 12 months, after which they cost $95.

Call Screen Manager

Curiously, *Call Screen Manager* was born from an RF interference complaint. In 1989, mechanical engineer Charlie Case called WHDH, Boston, to complain about RF in his modem connection. The conversations with the station's CE evolved from RF to telephones to computers to, "Hey, maybe you can write something for us..." By mid-1992, Call Screen Manager was on the market.

Although the program communicates only with Telos phone interfaces, it may be the most versatile of the three programs. Version 2.1 has become available, which includes a database tools utility affording the user great flexibility in designing screen appearance and database de-

Continued on page 30

Call screening station in control room at KFYI, Phoenix. Light blue graphics screen (left monitor on lower shelf) shows caller data. This display also appears on host's monitor in studio.

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Weather services for radio stations

Courtesy of Northeastern Communications Concepts, Inc.

By Sara Croke

The Bottom Line: *Every station wants to be the first on the air and the most accurate in reporting hazardous weather. Many services are available to radio stations that can help accomplish this goal. They include dial-up services, satellite services and subcontracting services. There also are a few ideas a station can use to improve weather coverage without spending much money.* $

Let's start simple and cheap. For example, when was the last time you visited with your friends at the National Weather Service (NWS) or other local emergency management officials, such as civil defense directors, ham radio operators or Civil Air Patrol squadrons? Many of these groups already have a 2-way communication setup and have been properly trained in reporting events during severe weather and other natural disasters. Even if you aren't licensed to talk with them on their frequency, you can still listen to them using an inexpensive scanner.

The local NWS office often uses such a channel to talk to emergency personnel and tell them that a watch or warning is about to be issued, and why. This could allow your meteorologist, reporter or announcer to go on the air with severe weather warnings before other radio or TV stations that rely on automated systems triggered by NWS computer-generated alerts.

The "why" information gathered from the emergency communications channel also can be used to put some substance behind the announcements you read on air. With this additional, specific information, your station can help to prevent needless panic and false alarms, or give life-saving, localized information in a timely manner.

You can get all of this for the price of a scanner and a few hours of visiting time. You might invite representatives from these groups to your station to develop a severe weather policy. Most likely, they'll be flattered you asked and will participate enthusiastically.

NOAA weather radio

Another inexpensive idea: Dedicate a source on your audio router to the local National Oceanographic and Atmospheric Administration (NOAA) weather radio station. (There are more than 380 NOAA weather radio stations around the country, using seven narrowband FM channels between 162.40MHz and 162.55MHz.)

Better yet, link your weather radio receiver to an alarm beacon that will fire in the on-air studio when the NOAA weather radio sets off its *tone-alert* — a 1,050Hz tone that precedes the announcement of any NWS watch or warning. With such a system, regardless of the time of day, whether you have someone in the newsroom (or if you don't even have a newsroom), your station knows that a weather alert is being issued. In a fully automated facility, this same alert could put a generic interruption message on the air, telling listeners that a weather advisory has been issued, with more (live) information to follow.

Remember, an NWS *watch* indicates the strong possibility of a given type of severe weather. A *warning* means that the weather event is actually happening and heading your way. As a result, watches are generally issued for substantially larger areas than warnings, so warnings are often accompanied by specific geographic locations to which they are limited. To ensure that you know where any of these locations mentioned in alerts are located, get a radar map from the NWS. It has all the geographic points they discuss when referring to storms. Your news wire service may also have an atlas feature that can help.

Weather over the wire

Speaking of news wires, if your station subscribes to one, it probably includes weather information. Three items can help make this service more useful to you: the ability to choose the areas for which you receive weather data, the capacity to easily change this selection throughout the year (winter weather may come from one direction, summer weather from another), and selectivity in alarming. Regarding the last point, be careful not to alarm too much, lest you fall prey to the "cry wolf syndrome" and thereby ignore a potentially important announcement. Ask your wire service vendor for details.

For specific weather wire service, Contel (through its Government Net-

Croke is chief meteorologist at KMBZ/KLTH, and president of Weather Or Not, a forecasting and consulting service in Kansas City. Respond via *BE* FAXback at 913-967-1905.

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works Division based in Chantilly, VA) is the official public wire carrier for the NOAA *Weather Wire*. This service provides all NWS *public products* (those data services designed for understanding by the lay person), and it allows you to change the products you receive. It also can be selectively alarmed. The array of public products available every day from NWS via this service is enormous, and you will probably want only a few at your station. This important filtering of your data feed can be done by the carrier (following a hard-copy list you send them) or by the customer, using a Contel-supplied controller that is added to its standard terminal equipment.

Dial-up services

With a desktop computer and a modem, the weather world is your oyster. Numerous dial-up services provide access to all NWS public products, and each provider offers some proprietary products. These offer a higher level of weather information than the wire, much of which is still aimed at the non-meteorologist.

A dial-up service provider will sell you software (in MS-DOS, Mac or Windows, typically running $400 to $600) that you must load on your computer before accessing the service. A top-notch, fast platform is recommended to handle the graphics included in these services, although an older model may do in a pinch. A color monitor also is required. Another critical item is the modem. Besides simply being more efficient with your time, a high-speed modem can save on phone charges if the access call to the service provider's computer is not local to you. Service providers offer dial-up data from 2.4kbit/s to 9.6kbit/s, with a few now offering 14.4kbit/s.

The author prepares her on-air weather reports using satellite-delivered graphics data.

Dial-up services offer alphanumeric statistics and forecasts, regional and national plots of temperatures, dew points, precipitation measurements, wind chills or speeds and the like, plus satellite imagery (both visible and infrared) and a range of graphic display maps with conditions and forecast data as much as 168 hours (seven days) ahead. Regional radar pictures may also be available, but these might not be live and may be enhanced by the provider. Most services do not allow zoom-in on radar (although some new software packages do).

Only *live* radar can be used reliably for severe, up-to-the minute, specific-area weather situations. However, non-real-time radar can give you the larger picture of rain and thunderstorm activity from three or four radar sites in your region.

Service providers' fee schedules typically allow your choice of a flat monthly rate, a per-minute-of-connect-time charge or a charge by the product downloaded. Minimum monthly fees may apply in the latter two cases. Software is usually updated at no charge, either while on-line or by sending back the disk. For a radio station that anticipates regular use of such a service, the flat rate will usually offer the best value. In some cases, this rate may be negotiable (if a vendor is looking to break into your market, for example). Typical service configurations might cost $200 to $600 a month.

Regarding phone charges, at least one vendor offers dial-up service to a local phone connection in most cities. Others require a toll call. Still others offer an 800 access line, but then charge back the cost of the calls to the user on its next invoice. Compare these charge-back fees from the service provider with your long-distance carrier's toll charges to the provider's location. Time-of-day also may be a relevant variable in these comparisons.

Satellite services

A desktop computer and a satellite

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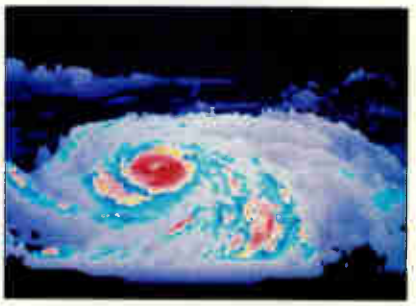
receive terminal also can take you a long way in the weather information business. To access these higher data-rate services (e.g., 280kbit/s), some vendors allow you to use your own computer. Others require a hardware package that they supply. Because access is full-time rather than dial-up, downloading can be automatically initiated by the provider at frequent intervals, or data downloading can be called for by the customer. All of the weather products mentioned earlier are included in satellite services. Additionally, color radar — either live, time-elapsed or images stored every 15 minutes — may be added to your weather package.

If you're wondering what purpose color radar serves for radio weathercasting, ask personnel at stations that use it how they feel. You'll probably hear that it is an invaluable tool for forecasting and, more important, that it helps newscasters and announcers put a picture of the weather pattern into the listener's mind — a traditional strength of radio. For this reason, color monitors displaying radar should be installed in the newsroom and in the air studio or control room.

Configuration options for satellite systems offering radar include local overlays, zoom capability and access to *WSR-88D*, the latest generation of NWSDoppler radar now being deployed into general service. (During its recently concluded development stage, WSR-88D was called NEXRAD, for NEXt-generation RADar. Some people in the weather data industry still refer to it under that earlier name.)



A hurricane displayed in color-enhanced 3-D satellite imagery, a proprietary product of weather data service provider Kavouras.

WSR-88D improves upon "conventional" radar in several significant areas, including accuracy, range and sensitivity. Its Doppler feature refers to its ability to sense the frequency shift of a radar echo received from a moving target. The system interprets this motion in its display, thereby showing air current flow and pointing out when wind signatures indicate severe *vorticity* (localized rotational movement) and possible tornadic activity.

The 88D system also allows analysis of a storm in vertical segments — a kind of "atmospheric CAT scan" — providing great insight for meteorologists into thunderstorm development. For the non-scientific community, the greatest advantage of 88D is its ability to "see through" strong thunderstorms. Previous radar generations could not detect a thunderstorm if it was behind another thunderstorm from the radar antenna's point-of-view. This required the use of several different radars in a variety of locations, in order to see "behind" the first thunderstorm — a process no longer needed with 88D.

The 88D products may be bundled

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Satellite hardware packages vary widely.

with other services, such as public weather wire, alphanumeric weather data, weather graphics, satellite imagery and proprietary products available from most providers. Pricing, flexibility of service and proprietary products are the primary distinguishing features between providers, so explore these well. A typical satellite service package might run $800 to $2,000 a month.

Satellite hardware packages vary widely. Ku-band and C-band services are available, with VSAT systems starting at approximately $3,500 (excluding the computer). More fully fledged systems range from $12,000 to $30,000. Significant pricing variation comes from whether dedicated or off-the-shelf computer hardware can be used.

Subbing it out

Why bother with all of this equipment and staff when you can hire a weather service to provide live weather reports, recorded feeds or both? This is a selling point of some weather companies across the United States, whose services can typically be purchased by daypart or as 24-hour severe weather coverage.

Most of these services are quite reliable and provide a reasonable amount of customization. Ideally, their reports should not sound "canned" but rather as if they are provided exclusively for your listeners. See how many stations a provider currently serves and how many stations each meteorologist at the company handles. Talk with a few of the stations that already use their service. Also check the provider's track record for reaction time to watches or warnings.

Locally known meteorologists and weather personalities (typically TV weathercasters) can also serve a radio station well. The chief caveat involves accuracy when prerecording a forecast. Some weathercasters will record a morning drive forecast for radio after the late-night TV newscast, but if last night's "cloudy and 30°" forecast turns into "sunny and 60°" by morning, you're stuck. Why pay for popularity when you're jeopardizing your credibility? Avoid this by using the TV meteorologist for afternoon drive only, or hire a 24-hour weather service to monitor for overnight changes.

As you can see, there is an abundance of weather information available to radio stations, spanning a wide range of weather data needs and budgets. Certainly, there is no shortage of appropriate solutions.

Acknowledgments: The author wishes to thank the following for their assistance in preparing this article: Bill Bunting and Randy McKee at the National Weather Service, Mike Edwards at Kavouras, and Todd Glickman and Gene Doyle at WSI.

➡ *For more information on weather services, circle (200) on Reply Card. Also see "Weather Data Services," p. 80 of the 1994 BE Buyers Guide.*

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Triple-synchronous broadcasting

Courtesy of Wheatstone

By John Collinson

An old idea gets a new wrinkle.

The plains of eastern Kansas and extreme western Missouri recently became the home of a new synchronous transmitter arrangement. There is nothing new about synchronous transmitters, but this particular test has some unique features.

KNHN, Kansas City, KS, is the flagship. The news/talk station operates on 1,340kHz at 1kW day and night. Approximately 125 miles south is Pittsburg, KS, where KPHN is also on 1,340kHz at 1kW full-time. Both stations are non-directional. A new synchronous transmitter has been located approximately halfway between the two, near Amoret, MO, just over the state line. (See Figure 1.)

Several stations use a main site and one or more synchronous sites at lower power. What's different about this application is its use of two existing, independently licensed co-channel stations with a single synchronous site linking them. Authorized by the FCC as experimental, the Amoret transmitter operates at a maximum of 200W.

Most synchronous sites are fed by STLs or phone lines, requiring adjustable audio delays to fine-tune the audio timing in the interference zones where the signals overlap. KNHN's program audio is fed from Kansas City by a dedicated 56kbit/s DDS telco line to Topeka, KS, where it is uplinked on an analog SCPC satellite channel on Satcom C5. All three stations then broadcast the received satellite signal. (Obviously, this transmission path precludes live announcers at KNHN from monitoring the off-air signal because of satellite and other delays.) Audio delay lines are installed ahead of each transmitter, but any adjustment from nominal has proved a hindrance rather than a help.

Collinson is owner of Modulation Limited, a contract engineering firm in the Kansas City, MO, area.

Dealing with overlap zones

Because AM detectors don't exhibit capture effect like FM, any synchronous AM arrangement creates an interference or "mush" zone where the signals overlap. The area where the 0.5mV/m contours overlap is considered to be the interference zone. In this case, those contours overlap by several miles. Ideally, the individual transmitter powers are adjusted so that these interference zones fall in areas where little or no substantive coverage is desired. As previously established and licensed stations, KNHN and KPHN must keep their powers unchanged, leaving the new Amoret site as the only adjustable element.

Preliminary observations indicate that power reduction at the synchronous site to move the mush zone can result in distinct subjective effects on the received audio, at least in some receivers. In one test, listeners in one of the mush zones monitored the off-air signal on a car radio while the synchronous transmitter was turned on and off. When the Amoret transmitter was switched on, the received signal's volume dropped, but so did the background noise, rather like normal receiver quieting when approaching the transmitter.

When the synchronous site was shut off, the volume from the main site came up, but the signal-to-noise ratio deteriorated. In terms of subjective audio quality, the synchronous transmitter was considered a definite improvement by the listeners.

Any synchronous AM arrangement creates an interference or "mush" zone where the signals overlap.

It quickly became evident that adjusting the carrier frequencies of the two main sites while leaving the synchronous site as the reference was the most effective method of synchronization. Experiments from previous synchronous AM experiments showed that actual phase-locking of the sites is undesirable because of creation of fixed nulls.

FCC authorization requires the transmitters to be within 0.1Hz of each other, which translates to six drift cycles per minute. In practice, this drift rate actually produces a nearly unlistenable signal in the mush zones, however. Tests have shown that frequency stability is vastly more critical to listenability in those zones than the relative powers of the main and synchronous sites. The sites in this

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You'll also appreciate the optional Time-code Card with its chase synchronizer for tight lock with VTRs and ATRs, as well as features like read-after-write and punch-in, punch-out.

And if you need a complete electronic editing system, you can't do better than couple the DTR-90 with Otari's CB-149 editor for flawless digital editing.

For the complete story on this quality-built and affordable R-DAT, call Otari at (415) 341-5900.

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Circle (25) on Reply Card

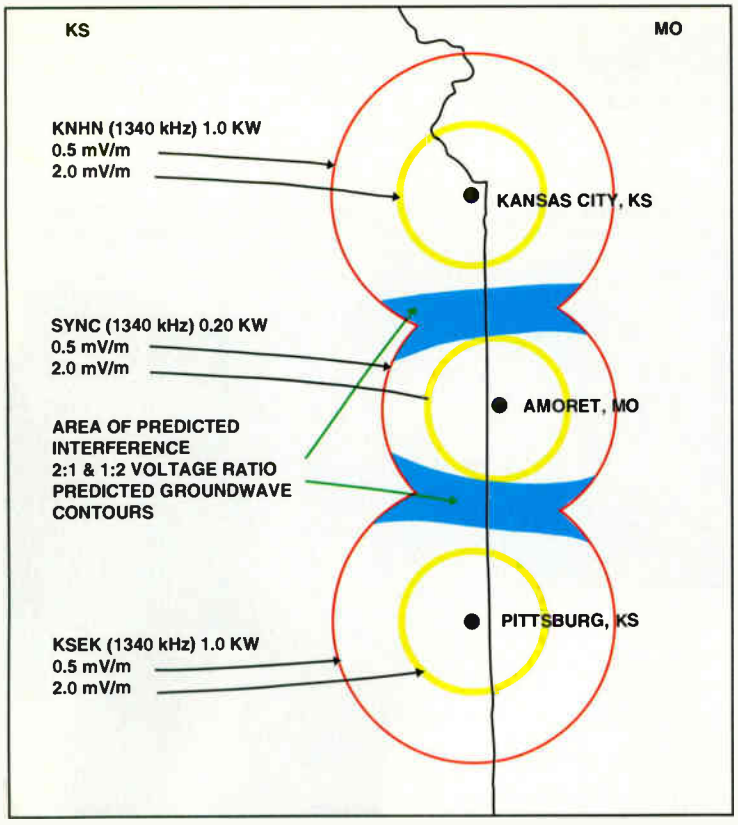

Figure 1. Coverage area of KNHN's triple-synchronous transmissions. Shaded areas indicate interference zones.

test have achieved one drift cycle every 90 to 120 seconds.

The transmitters use outboard, precision (oven-style) oscillators specified to be within 10^{-9} per day (1 part per billion error in 24 hours). Rubidium standard oscillators would have been even more stable, but the limiting factor with the current oscillators is ultimately not a function of their stability but the difficulty in their adjustment. The Pittsburg and Amoret transmitters are vintage tube models, which also required some creative modifications to interface the precision oscillators into their RF driver stages.

The FCC has shown interest in the experiment, indicating that it hasn't written off the AM band yet.

Every six months the FCC requires a report on frequency stability of the sites. Documentation of the frequency stability is provided by a field-strength meter located in the interference zones, which shows peaks and nulls in signal strength as the carriers add and cancel. A chart recorder fed by the field-strength meter documents the beat frequency rate. For routine checks, the field-strength meter fluctuation gives a good indication of the beat rate.

Market impact

The original impetus for the project was a quest to improve KNHN's coverage in the southern parts of the Kansas City area, especially at night. Because KPHN, Pittsburg (then KSEK) was the nearest co-channel station, it was the primary obstacle to any coverage improvements to the south. The FCC agreed to the triple-sync arrangement (including the new Amoret site) if KNHN's owners purchased KSEK.

KPHN has a separate sales staff and could break away from the satellite feed for local breaks with Pittsburg area advertisers, if desired, although this is not anticipated. The synchronous site in Amoret is treated like an FM translator — it is permitted only to follow the programming of KNHN and is not authorized to originate any separate local programming. Although the FCC authorization for the Amoret site is classified as experimental, no termination date was placed on its operation.

Whether the desired coverage improvement in the Kansas City metro area was accomplished has yet to be proved — tests and measurements are still under way. Meanwhile, KNHN has increased its coverage into areas previously unable to support a regional news/talk format. The FCC has shown considerable interest in the results of the experiment, indicating that it hasn't written off the AM band just yet. It may give the commission one more tool to use in its determination of future improvements for radio broadcasting.

There's a Right Way

"I did it right from the start with Computer Concepts' DCS."

I don't sweat when it comes to our spot-heavy morning drive or complicated LMA formats. The reason is simple: First I did my homework. And then I bought a DCS hard disk system from Computer Concepts. In fact, I bought several.

I smile at the thought of multiple program formats and satellite automation, live and live assist. I laugh at complex spot rotations, two-channel crossfades with simultaneous recording and networking to traffic—they're no problem for the DCS.

And Computer Concepts customer support is terrific. Their software experts can even troubleshoot my DCS and upgrade the software remotely, via modem.

No wonder Computer Concepts DCS has turned hundreds of stations into happy customers. I'm glad I'm one of them. Oh, I almost forgot. The price was right, too.

I thought I'd impress HQ by buying the cheapest hard disk system I could find. After all, they all look the same! Their promises sounded good and I wanted to believe.

I found out promises come cheap. But their system wasn't really cheap—not once you added up the little "extras" it took to do the bare minimum. And it still couldn't do all the things our station really needed.

I found out the hard way, at 3 AM when the system we bought crashed. And in morning drive, when missing spots meant dollars down the drain. When I finally reached customer support, they said they were working on software they thought would fix my problem, but they weren't sure when it would be done. Guess what I told them?

Now I know better. We're getting a Computer Concepts DCS. I learned a costly lesson: Get it right the first time. Call Computer Concepts first.

"I should have bought a DCS in the first place."

and a Wrong Way

DCS by **Computer Concepts** CORPORATION

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Phone: (913) 541-0900 Fax: (913) 541-0169

Circle (28) on Reply Card

Extortion or Insurance?

Regarding the article, "Maintaining Satellite Systems" (November 1993), I have two comments:

1. In reference to the recommendation that downlinks should be registered with a frequency coordination company: Once you receive the registration for the downlink (from the FCC) or the license for an uplink, you are protected. Any new microwave (terrestrial) installation is required to protect your installation. Charging a frequency protection fee is basically an extortion. When licensees coordinate new systems, they tell the FCC that they will not cause interference to any existing system.
2. Regarding the statement that "the Ku-band is not shared by terrestrial microwave users, so frequency coordination is rarely a problem:" Under FCC Part 21, subpart J, the Ku-band (11.7-12.2GHz) is shared with the Local Television Transmission Service (LTTS) on a secondary basis.

Howard Fine
Satellite and Transmission Consultant
Reseda, CA

The author responds:

Anyone's perception of the value of frequency-protection payments would be determined by the value to them of the services provided. For example, the frequency coordination and protection company *Comsearch* charges $220.80 a year ($18.40 a month) for protecting a single, receive-only earth station.

FCC registration alone does not protect you against interference. It just requires other users to send you prior coordination letters. If the letter is lost, or you do nothing before the coordination period expires, the new terrestrial user is assumed to be acceptable to you. If any interference is caused to you by the new terrestrial user, you must spend money or time to prove the source and to prove you were there first. Under a protection scheme, however, both you and the coordinator receive letters. It is unlikely both copies will be lost or ignored simultaneously.

As a backup check, Comsearch actively checks FCC applications and Public Notices to make sure that all license filings are covered by prior coordination letters (thus preventing uncoordinated filings), and that all letters are covered by Notices. The coordination specs in both documents also are compared. You could do this yourself, but you'd need to pay to subscribe to Public Notices and devote time to calculate any effects on your downlink(s) plus prepare objection letters.

Comsearch also analyzes the coordination letter data and informs clients in monthly reports whether each prospective case passed or failed the client's protection. To do this yourself, you'd need to buy or write a computer program (or calculate manually) to determine whether each coordination letter violates your coordination. If something were to slip by you, the first notice of a problem would be the interference itself. Your downlink could be unusable while you investigate.

Finally, Comsearch goes to bat immediately for protection clients, especially in investigation of uncoordinated interference. To conduct your own investigation, you'd need to buy or research a database of potential

YOU DON'T KNOW WHAT YOU'RE MISSING

If you don't have an Eventide® VR240 Digital Broadcast Logger, you're missing the easiest, most efficient way to keep track of everything that goes out on your air, and more. There's no bulky, high maintenance, hard-to-use hardware, because Eventide has compressed a complete 8-to-24 channel digital broadcast logging system into one easy-to-use three-rack-space device. There's no need for a tape warehouse, either–the VR240 records up to ten days worth of audio on a single ultra-compact DAT cassette. With the dual-drive option, total unattended logging time stretches up to three weeks. And yes, you can search and play a tape on one deck while simultaneously recording audio on the other.

Without an easy, practical, multi-channel logging system, you're missing what's going on with your crosstown competitors, what your talent (and call-ins) *really* said on the air, when that commercial *actually* ran, who called your contest lines, what the police and fire dispatchers said. The VR240 even records modem, fax, and transmitter remote control telemetry transmissions. The advantages of logging have always been clear. Now the Eventide Digital Broadcast Logger gets rid of the disadvantages.

There's no broadcast logging system as advanced as the VR240. And with hundreds of Eventide-built digital loggers already in service worldwide, there's no other digital logger with our track record of reliable service. So don't miss out—call Eventide or your broadcast distributor for full information on the logger that makes full-time logging practical: The Eventide VR240 Digital Broadcast Logger.

Eventide

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Circle (10) on Reply Card

NEW PRODUCTS

DAW
By Arrakis

• **DIGILINK II**: new features include cross fade and overlap of hard disk audio files, autofill and smart squeeze, auto music scheduling, file search by title, international languages and user-definable screen support, cart rotation, one-touch hot rotation, remote control one-touch rotation, and Pioneer 18-CD player support; Trak*Star multitrack and Trak*Star 2 digital editors released; free software update.

Circle (254) on Reply Card

Broadcast handbook
By Wind River Broadcast Center

• **Broadcaster's Encyclopedia**: large educational volume tailored to help licensees avoid FCC fines; fourth volume in the Broadcaster's BIGBOOK Project; similar in appearance, structure and price to other three volumes.

Circle (251) on Reply Card

Digital cartridge machine
By AirCorp

• **AirCart**: features ASPECT compatibility standard; 48kHz professional sampling rate; 11 minutes of non-compressed stereo audio on 3.5-inch magneto-optical discs; 1/3-rack width design.

Circle (255) on Reply Card

Digital sound editor upgrade
By Orban/AKG

• **DSE 7000**: digital sound editor specifically engineered for radio production; new digital input/output module provides universal sample rate conversion for AES/EBU and SPDIF digital formats and digital effects sends, as well as synchronization to video and word clock signals; the new digital I/O is a hardware upgrade over the standard analog I/O module and is designed to be compatible with any DSE 7000.

Circle (261) on Reply Card

Broadcast processor
By AEV

• **Exclusive FM**: first device of its kind to adopt a 10-band split processing approach; user can personally access every parameter or have the unit perform part of the job by automatically setting some non-critical processing parameters; features several variable gain stages working with different timing characteristics; includes 10 preset settings; more than 250 equalization characteristics can be permanently stored in memory for recall; a preset can be recalled according to a time table, allowing the on-air sound to be modified according to programming moods.

Circle (250) on Reply Card

Radio station journal/directory
By M Street Corporation

• **M Street Radio Directory**: 700-page, 6" x 9" soft cover book lists addresses, phone numbers, formats, facilities, owners, markets and ratings for more than 13,000 stations in the United States and Canada; divided into four sections: the first lists stations by state and city of license; the second section lists all stations alphabetically by call letters; the third lists them in frequency order; and the fourth section is a unique listing of stations in more than 500 radio markets.

• **M Street Journal**: weekly publication that catalogs all format changes, call letter changes, ownership changes, new station applications and grants, station facility changes, translators, and new frequency allocations; it also summarizes the week's news in a newsletter format.

Circle (253) on Reply Card

DIGITAL STL BREAKTHROUGH

Introducing the TFT DMM92: The Better Digital STL System

Would you like to extend the fade margin of your existing analog STL by 20 dB or more? Extend Signal-to-Noise Ratio by at least 10db? Extend STL distance by miles? All with the bandwidth efficiency of 15-level duobinary modulation? There's just one digital STL system that lets you do it all— TFT's new DMM92. It works with your existing composite STL to give you vastly extended performance, and a whole lot more:

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  - Six audio channels, 4 program and 2 voice
  - Co-exists with FM SCA/MUX channels
  - AES/EBU and 32 kbps data channel available
- **More Flexibility** —
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  - Instant plug-in installation with virtually **any** STL
  - Useable for LMA's and duopoly applications
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  - Six audio channels in a 250kHz RF slot
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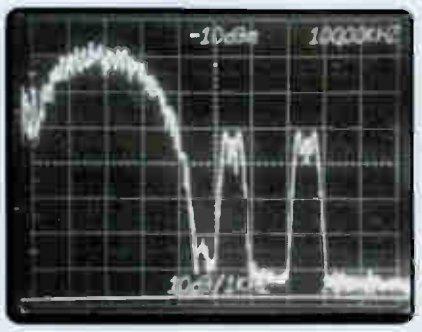
  - Tolerant to co-channel interference

COMPOSITE BASEBAND



2 x 15 kHz, 2 x 7.5 kz, 1 x 9600 baud RS232, 110 kHz and 152 kHz Subcarriers.

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Circle (11) on Reply Card

TFT INC

Continued from page 12

sign. Installation of a monochrome card and a graphics card allows two separate screen appearances, so the talent doesn't see caller information while it's being typed in.

The program is multilingual and can display information in Spanish, German and French. In fact, the call screener and the talent each can be using different languages simultaneously.

Like the other two programs, it allows text messages to be sent by the call screener to the host. Its capacity for an additional full-screen message presents numerous other possibilities, however. It could simply contain a canned message (contest rules maybe), or in a networked environment, it could function as a bridge between a newsroom computer system and the talk-show talent. The information for the full-screen message is stored in a file on the hard disk. A newsroom computer system could be programmed to write to that file via a network link bulletin, news updates, scores and so forth, which the producer could hot-key in to the talent.

The system can display information for up to 20 telephone lines, and it includes a module to duplicate studio display on a laptop at a remote site via modem. There is no inherent provision for telephone system control from the remote computer, but some additional dedicated control hardware at the site can remotely control studio phone interfaces.

One item that's certainly ahead for call-screener software is the incorporation of Caller ID.

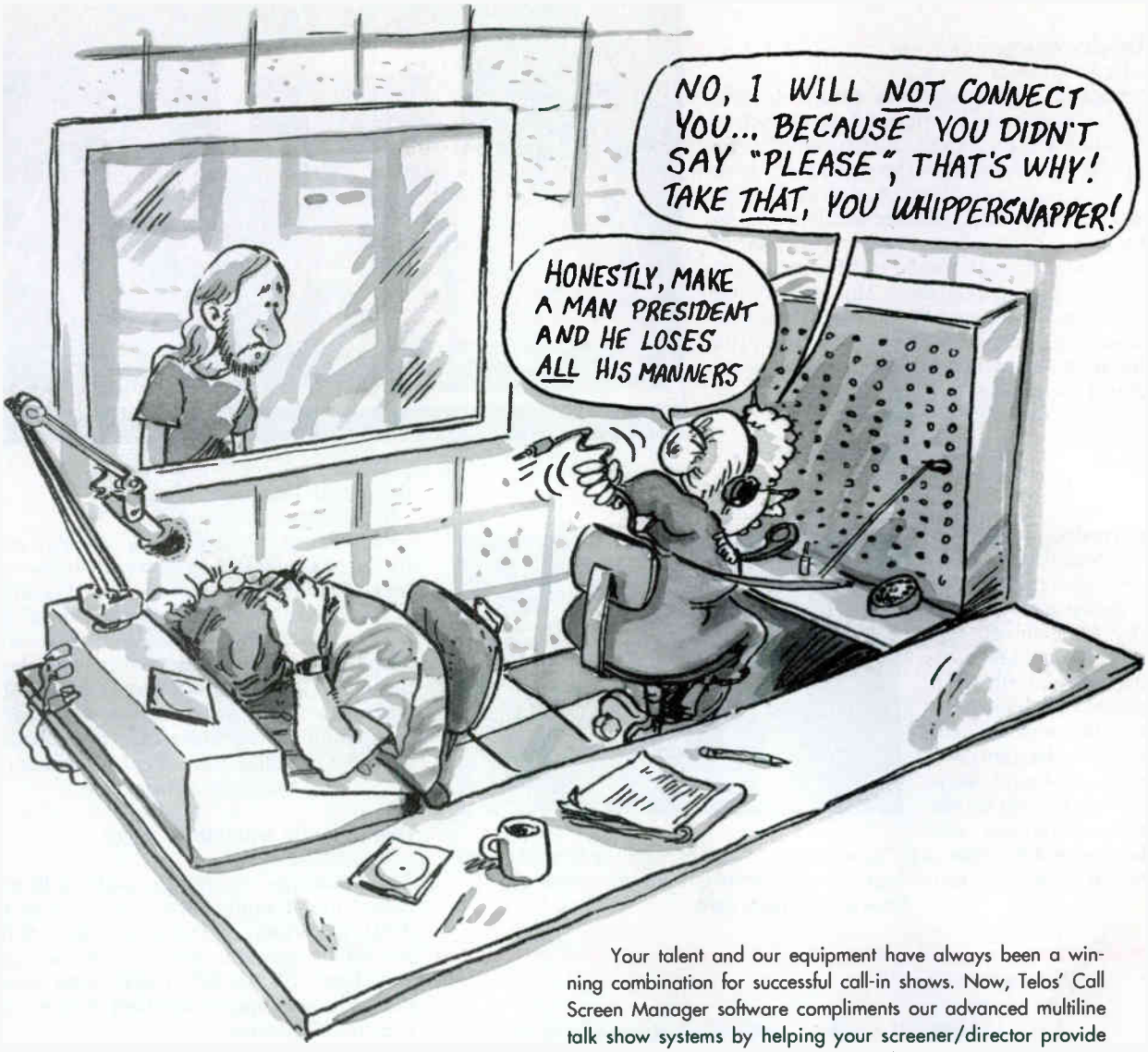
The program sells for $349. Version 1 users can get a free upgrade, and technical support is free.

On the horizon

One item that's certainly ahead for call screener-software is the incorporation of *Caller ID*. The designers of Screener III and Call Screen Manager are both playing with it. Catching the Caller ID data could save the call screener a lot of typing. Comparing that information with the stored database could flag callers who have made you hit the dump button in the past, and make enforcement of once-a-week or other caller limits easier.

As yet, call screening is a strictly MS-DOS universe — there's nothing out there for Mac, Windows or OS2. With newsroom, facility-control, digital audio workstation and program-automation computer systems already competing for space in the broadcast studio, a multitasking platform could provide some relief. The small potential user-base and requirement for extreme reliability probably have kept this from happening yet, however.

TalkStar, Screener III and Call Screen Manager are all available in demo form. Each provides a good deal of function and some elegance for an outlay of $300 to $800.



Call Screen Manager

Talk Show Management Software

Your talent and our equipment have always been a winning combination for successful call-in shows. Now, Telos' Call Screen Manager software compliments our advanced multiline talk show systems by helping your screener/director provide your talent with information on each caller.

Call Screen Manager uses inexpensive IBM-compotible PCs and peripherals and you can choose two different screen views, so information is always displayed in the most useful, easy-to-interpret format. Features include real-time display of line status; full poge and quick messages that may be stored and sent with simple keystroke combinations; a caller information database module with modifiable data fields and report and export capobilities; and the ability to accomplish most critical screener functions from the computer keyboard.

Two versions of Call Screen Manager are available. Host Software provides for a director position and any number of talent positions using a single PC. Remote Software allows communications between the studio and talent located at a remote site via modem.

So hire the best and give them the tools they need. Isn't it time you experienced the pleasure of great phones?

Telos SYSTEMS

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Circle (13) on Reply Card

On-air console

By Auditronics

• **Destiny 2000**: first on-air control board that allows a station to go from total automation to fully live with the flick of a switch; doubles as a production board when the system is in Auto mode; can control CD jukeboxes; works with music, traffic and program scheduling personnel and software, displaying everything in full color; when in Assist mode, touchscreen capability accesses a Main screen, Music library and Spot library for quick and easy additions, deletions or rescheduling; FastTrack feature gives instant access to thousands of announcements, sound effects, jingles, IDs and promos.

Circle (257) on Reply Card

Recording mixer

By Soundcraft

• Soundcraft LM1: fully professional location recording mixer; features aluminum castings and durable gold-plated switching; however, the console is light enough to be transportable; an integral carrying handle also serves as a sturdy support; can be powered by either a DC input, in the range of 8-30V, or from internal rechargeable cells, providing up to 18 hours of continuous operation.

Circle (269) on Reply Card

Digital audio codec

By RE America

• **MUSICAM 660/661**: provides up to 20kHz of audio bandwidth and features mono, dual mono, stereo and joint stereo operation, with selectable bit rates from 56-384kbit/s; applications include network program distribution, remote pickups for sports, concerts, special events, news gathering, STL backup, audio backhaul, recording and post-production studios; automatically adjusts to the network bit rate; standard features include AES/EBU and SPDIF digital interface; two times V.35, X.21 or RS-422 interface; and a front-panel digital headphone jack for monitoring of digital or analog inputs.

Circle (264) on Reply Card

Codecs

By RE America

• **663/662 ISDN MUSICAM decoder/encoder**: capable of multiplexing up to three basic rate interface ISDN lines; can dial bandwidth on demand between 56kbit/s and 384kbit/s; supports both Euro ISDN and American NI-1 (National ISDN-1); bandwidth-on-demand offers complete user flexibility in choosing the program quality and bandwidth; can be paired with the RE 660/661 MUSICAM codecs to provide full bandwidth, bidirectional, stereo programming at any ISDN network rate up to 384kbits; features three network terminal adapters that are tied to an inverse multiplexer; standard features include AES/EBU or SPDIF digital audio inputs and outputs with built-in sample rate converter; unique front-panel mount standard telephone interface that allows for telephone talkback using your own single-line telephone handsets or ISDN-ready telephone handsets.

Circle (265) on Reply Card

Graphical interface

By Computer Concepts

• **DCS Live!**: Microsoft Windows-based graphical interface for DCS that runs on its own computer; features touchscreen capability and on-screen virtual "carts" and "cart machines"; main screen features two play and one record/play machine plus a queue of upcoming events; FlexKey buttonbox is now on-screen and can be customized and stored by individual operators as their own unique files for later recall; can control multiple DCS machines from a central location.

Circle (258) on Reply Card

Digital audio satellite receiver

By ProfLine

• **DA2500**: specifically designed for SCPC point-to-multipoint applications: features include 256kb/s, 4:1 compressed digital audio; C- and Ku-band SCPC operation; frequency agile across satellite band; 1/2 rate FEC; 15kHz audio; fully addressable per channel; auxiliary data; compact design; FCC certified.

Circle (261) on Reply Card

Digital audio encoder/decoder

By ProfLine

• **DA1000**: compresses digital audio data 4:1 without audible degradation; features include high-error immunity; low hardware costs; low coding delay; mono, stereo or multichannel operation; suitable for a wide range of uses; compact design.

Circle (262) on Reply Card

Studio chassis

By Orban

• **8200 ST OPTIMOD**: accessory for use with Orban's OPTIMOD-FM 8200 digital audio processor and OPTIMOD-AM audio processors; designed to optimize the left/right studio-to-transmitter link; protects the STL from overload, providing a well-controlled signal with dynamic control; uses Orban's Class-A VCA proprietary topology to ensure negligible distortion; combines automatic gain controller (AGC), high-frequency limiting and final peak control; user features include a built-in 100% modulation calibration tone generator, variable density and stereo couple/uncouple switch.

Circle (263) on Reply Card

Everything you've always wanted in a radio studio

except the paper, the carts, the logs, the errors...

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- Master Control gives you the peerless sonic performance you expect from a digital audio system and more! It's completely modular, so you can expand it as your needs change.
- In it's ultimate configuration, Master Control provides seamless integration of the entire RCS software line and puts you in control. Of course, all of this is backed by our unparalled support.
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Circle (14) on Reply Card

Event sequencer
By Circuit Research Labs

• **Real Time Event Sequencer Version 2.0**: new features include added seconds, which allow an event to be programmed to the second; control of each month's weekly sequences of events for a year; control of 255 events; and free terminal software; remote synchronizing lets user remote-control input to synchronize the Real Time Event Sequencer's internal clock.

Circle (252) on Reply Card

Aural exciter
By Aphex

• **Model 323**: features enhancements to the compellor and aural exciter circuitry; built-in intelligence controls the attack and release characteristics of the leveler and compressor based on the texture of the input; incorporates improvements, such as harmonics adjustment and lower noise, plus improved servo-balanced input and output; other enhancements include switchable leveling speed and one-button control to select input, output and gain reduction monitoring.

Circle (259) on Reply Card

Add-on monitoring system
By Studio Technologies

• **StudioComm**: family of flexible products that work in conjunction with digital audio workstations to route audio and provide a talkback system; features include control room and studio monitoring, integrated headphone (cue) system and dub (copy) output; communications functions include talk to studio, talk to headphones and slate.

Circle (260) on Reply Card

Digital audio cart machine
By Digital Broadcast Associates

• **dB-CART/MO**: provides linear, non-compressed digital recording on removable media using ASPECT standard; capable of multiple sample rates; equipped with the AES/EBU standard 48kHz sampling rate; can record and playback material as long as 11 minutes per disk using 3.5-inch magneto-optical media.

Circle (256) on Reply Card

interferers in your area as a starting point.

Frequency protection payments are like health insurance—benefits are only needed in case of a problem, but when problems occur, other costs can be avoided. Continuous payment protects your earth terminal investment and the network or remote service it provides to your station. Some users, such as TCI or NPR, consider the fees to be cheap insurance and pay to protect all their downlinks. Each earth terminal user must make his or her own assessment whether the services provided by a frequency protector are worth the money.

Regarding shared use of the Ku-band, I didn't have a copy of Part 21 in front of me when I wrote the article. I stand corrected that the domestic Ku-band is shared with one terrestrial service (LTTS). This service is secondary, and cannot legally cause interference to Ku-band satellite uplinks or downlinks. The market for frequency protection in this band is quite small. Comsearch, for example, does not sell protection services in this band unless the customer insists. Therefore, my statement that "frequency coordination is rarely a problem" is correct for the domestic Ku-band. International Ku-Band, however, does share with terrestrial common carriers.

Greg Monti
National Public Radio
Washington, DC

BE READERS

Let us know what you think.
Fax your comments to the BE editors at the
BE FAXback line:
913-967-1905

Portable DAT recorders
By HHB

• **PDR1000**: uses a rugged 4-head,4-motor transport derived from DDS technology to ensure reliability; features include 44.1kHz, 48kHz and 32kHz selectable sampling rates, balanced XLR mic/line inputs, AES/EBU/SP-DIF digital I/Os and 48V phantom powering; uses nickel metal hydride rechargeable battery technology.

• **PDR1000TC (time code)**: has all the same features as the PDR1000, plus it is equipped to jam sync, convert absolute time to time code, and to record, generate and reference to time code in all existing international standards.

Circle (268) on Reply Card

Wireless mic systems
By Audio-Technica

• **ATW-1235 and ATW-1236**: both systems use the ATW-12 receiver, which features dual diversity operation with two independent RF sections on the same frequency; automatic logic circuitry continually compares and selects the superior received signal, providing better sound quality and reducing the possibility of interference and dropouts; half the width of a standard 19-inch rack mount, two receivers can be mounted side-by-side.

Circle (267) on Reply Card

Microphone mixer
By Audio-Technica

• **AT-MX341 SmartMixer**: microprocessor-controlled, automatic-switching, 4-channel microphone mixer; features two modes of operation to which each microphone can be independently switched via front-panel priority preselect switches; microphone attenuation is factory set at 8dB but can be internally adjusted between 6dB and 20dB; a combination of the two modes can also be used on the AT-MX341; also features female XLR-balanced inputs and a line-level output through a male XLR connector; 7-light LED output level meter on the front panel accurately indicates mixer activity, showing when a mic is on and when the lockout bus is active.

Circle (266) on Reply Card

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