

IGM Names New Marketing Director



IGM recently appointed Tom Ransom as Director of Sales and Marketing. Tom will be responsible for the marketing of IGM's newest program automation control systems, as well as the marketing of IGM's famous products, the IGM Go-Cart™ and Instacart™.

Tom is no stranger to IGM. Prior to joining us, he was one of our major OEM customers as the Product Marketing Manager for program automation, remote control, and business automation at the Harris Corporation.

Coming into the company along with other partners when Automation Electronics was purchased by Harris, Tom worked with Harris almost six years, both in marketing and in computer software development. Tom and his partners had started Automation Electronics in 1976, developing a

traffic and billing system known as AUTOTRON and installing the initial system that same year. Even earlier, in 1974-5, Tom and others had developed one of the first traffic systems to work on the IBM System/32 . . . one of the first "office-sized" computer systems.

Today Tom has over fifteen years of experience in programming computer systems. His interest surfaced in high school, and he worked part-time as a computer programmer for Purdue University, West Lafayette, Indiana for five years while majoring full-time in Business Administration with a minor in Accounting. Later he served as Executive Vice President for a consulting firm in Lafayette.

IGM is very pleased that Tom has chosen to join us and we hope that the friends of IGM will take the time to introduce themselves to him at the trade shows and on the telephone. Tom is happily ensconced in a hilltop home overlooking a Bellingham golf course, which he hopes to "dig up" periodically. Since he is an accomplished amateur magician, we look forward to his magic in our marketing.

Look for Tom Ransom's column in future issues of IGM News, highlighting the opportunities for seeing IGM equipment at trade shows and state conventions.

IGM COMMUNICATIONS

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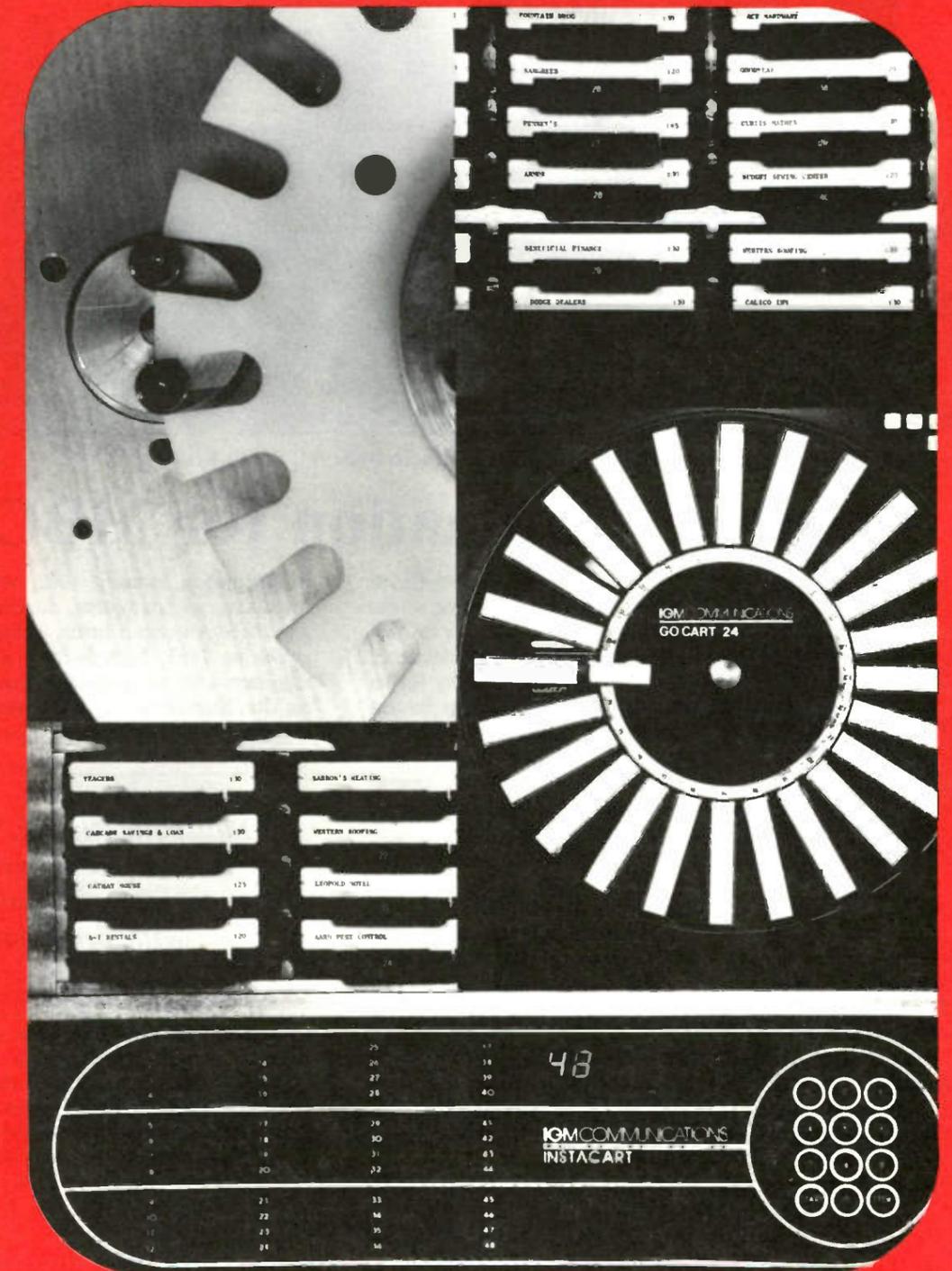
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IGM NEWS

In This Issue:

June, 1986

Custom Automation for MBC, Korea
New State-of-the-Art Cartridge Encoder
New Industrial Controls Division
Tips From the Back Room





Yoido Studio in Seoul, South Korea

Custom Automation for MBC, Korea



MBC President
Hwang, Sun-Pil

In a single generation South Korea has gone from one of the world's poorest nations to the threshold of full industrialization and widespread prosperity for its people. It is the fourth largest market for U.S. agricultural products. In 1978, the country's first nuclear plant went into operation, with eight others to follow.

Its radio and broadcasting systems are keeping pace with the changing face of the country. Spurring the upgrading of its radio broadcasting facilities are

the requirements of the Pan Asia Games of 1987, followed by the Olympic Games in 1988, both to be held in Seoul, just thirty-five miles from the border with North Korea, the DMZ or Demilitarized Zone of the Korean War.

Two radio and television networks serve the country: KBS, Korean Broadcasting System, and MBC, Munhwa Broadcasting Corporation. Munhwa has twenty-three television stations in its network and twenty radio stations, including AM and FM. Television first came to South Korea in 1957, and the MBC facilities were upgraded in the early 1980's. Radio lagged

behind but in January, 1982, MBC drew up its specifications for a new custom system, disseminating them to two Japanese and three American firms, including IGM.

During 1983, Nick Solberg was in close touch with MBC engineers and programmers, making a trip to Korea to confer on site. Subsequently, IGM was selected to design a custom system, consisting of a computer-controlled audio switcher

"Subsequently, IGM was selected to design a custom system, consisting of a computer-controlled audio switcher with provision for . . ."

with provision for twenty stereo inputs to control six stereo Instacarts, six reel-to-reel units, a time announce system, single-play cart machines and studio feeds. The system also required operator control points for seven Korean-made video terminals and a Korean-manufactured line printer. All these terminals print and display Korean and English characters.

Every item placed on air starts and ends at a specific time. In

New Industrial Controls Division

Exploring new arenas for automation, IGM has established an Industrial Controls Division headed by Jack Ketterer. Jack is an experienced Electrical Engineer specializing in control systems. Ketterer comes from an eighteen-year stint with Reliance Electric company of Cleveland, where he managed projects ranging from paper machine startup for Weyerhaeuser, Jamaica, to controls for a Polaroid film coating facility in Massachusetts.

His work involves the marriage of programmable controllers to general purpose computers for speedy control of heavy machine operations, for control of mass storage devices, and accurate heavy-duty number crunching. Using an industrial multibus computer, either the Automate 30 or Automate 40 made by Reliance, and an IBM-PC, Ketterer designs controls for husky tasks.

One project for IGM has been the modernization of the controls for three newsprint winders at Norpac (North Pacific Paper Corporation), Longview, Washington, a source of newsprint for domestic and export markets.

Two of Norpac's three paper machines are the fastest newsprint machines in the world. Keeping them moving accurately has been aided by the new IGM system.

Because prevention of downtime is as critical in this business as it is in broadcasting, the system also speeds repairs by telling the operator exactly where a problem occurs, even specifying which part needs replacement.

Muzak® Uses IGM-SC for Music Transmission

For over fifty years Muzak has provided shopping malls, restaurants, factories and offices with background music.

In the early days the company had its own transcriptions made, then transmitted them to the user via FM radio or phone lines. Today with the most modern, high-fidelity systems they use satellites to transmit music to over one hundred seventy affiliates in the United States, Canada and Alaska, where the scientifically designed background music is disseminated to the end user.

Now . . . since April, 1985 . . . Muzak has added a new format, Foreground Music OneSM, for any retail location where brighter, more up-front music including contemporary hits is desirable. Some lounges use the Foreground Music One, while the adjoining restaurant has the background format.

Presently, the firm makes both formats in Westbury, Long Island, and ships them to the Pittsburgh, Pennsylvania, uplink. There are playback systems for East Coast and West Coast, allowing a time lag for the latter.

To handle their Foreground Music One format Muzak installed a new IGM system, consisting of an IBM-PC, the IGM-SC (Sophisticated Controller), 6 open reels, and 1 Instacart, with the music transmitted directly to Westar V.

The company chose the IGM system because, according to Jim Turk of Muzak, "It is versatile. You can change programs at will. And it has been very reliable, too."

TIPS FROM THE BACK ROOM

This is the first of a series on maintenance, unusual programming methods, and engineering comment, a pot pourri of helpful hints.

HOW TO KEEP YOUR IGM INSTACART SERVING YOU SMOOTHLY FOR YEARS AND YEARS AND YEARS . . .

Keep It Clean. Periodic cleaning of the heads and guides will help to insure reliable audio response and dependable tone sensing. We recommend that you remove all twelve trays from a single stack, allowing easy access to heads. Clean the capstan shaft, too, but avoid letting the cleaning agent run down the shaft and enter the bearings.

Check the pinch roller when you change cartridges (now and then); it's easy since it is mounted on the tray. If the roller is cracked or worn, take a minute to replace it and you are less likely to damage an important commercial cart.

Blow accumulated dust out of the Instacart's electronic chassis with a portable vacuum cleaner. A clean machine runs cooler and more efficiently.

Check power supply voltages about once a month, particularly on older machines, to verify correct D.C. levels. A rise in "AC ripple" usually indicates that filter caps may need some attention.

Treat Instacart trays with care. Remember . . . they are the play tables. If they are bent or damaged through careless handling, they may need repair or replacement.

Maintenance is simple and swift, but pays dividends in better sound.

\$25 AWARD TO YOU, IF...

we use your suggested tip on maintenance, programming, or whatever, in a forthcoming IGM News. Let's help each other to put out a great sound. Mail to: JoAnn Roe, Editor, IGM News, 282 W. Kellogg Road, Bellingham, WA 98226. So we can "get it right," please write instead of phoning.



NEW State-of-the-Art Cartridge Encoder

Replacing an older style encoder, IGM is now selling the new IGM-EN to place FSK (Frequency Shift Keying) encoded logging data on the cue or data track of standard NAB cartridges.

The new encoder permits you to enter the logging information on your TeleVideo™ PT terminal, then request playback to the screen from the recorder playback head for editing. You may choose from as many as nine lines of information, each no more than 55 characters including spaces, thus avoiding the necessity of retyping data for cartridges bearing identical information. It's a time-saver.

When the cartridge is placed "On-Air" by the automation

system controller, the FSK data is decoded automatically and placed on the printed "On-Air" log.

Cartridges previously encoded may be checked any time by inserting them into the playback unit for decoding and display on the terminal.

Best of all, the updated encoder is less expensive than the older one . . . only \$1,499, which includes the encoder chassis and the TeleVideo PT Terminal Keyboard. In the encoder chassis are the system power supply, CPU, memory, system software, and a RS 232 serial I/O port for the terminal, another port for the cartridge recorder.



NAB Show Attendance Up

Nick Solberg terms the 1986 NAB show at Dallas, "One of the best shows in the last five years in terms of attendance and interest."

One difference this year is that exhibits slanted to radio and television were combined, not split into sections. This meant that some attendees involved with television audio systems and

controllers "crossed over" to view exhibits that previously attracted only radio broadcasters.

Tom Ransom feels that the demand for radio automation systems remains high, relatively unchanged for several years. Live assist systems are even more popular.

Of keen interest to visitors to the IGM booth was that each of the new controllers, IGM-SC and IGM-EC, is tied to a standard computer and utilizes a separate audio switcher built by IGM. Positive comments ran like this:

"Why didn't somebody do this before?"

"Divorcing of the computer from the audio switcher is a good idea."

Well . . . now IGM Communications has DONE IT.

Exciting New Orders

IGM Communications is working on significant new orders from CBS Radio O & O stations, WINS, KYW, Radio New Zealand, and others. Recently delivered systems have gone to KABC Top Radio and to ABC Radio Network.

case of short programming, fill material automatically is inserted. A special package was developed to add encoding data in Korean and English to the cartridges used in the system.

Due to its strategic location as a peninsula thrusting southward from the Asian mainland to separate the Yellow Sea and the Sea of Japan, South Korea has been invaded by many nations throughout the centuries. Its music and folk culture have borrowed from the invaders, and the Korean language is Uralic, remotely related to Japanese, Mongolian, Hungarian and Finnish. Most educated Koreans understand English, though, and the influence of the Americans during the Korean War has strongly affected musical tastes.

The majority of radio programming consists of talk shows, game shows, news, interviews, and music — live and recorded — a melange of Korean folk music, country western, rock, jazz, and classical. Indeed, MBC Seoul, from which most programming for the country emanates, has studios large enough to hold a symphony orchestra and hosts performances as live broadcasts. Added to this lively mixture is an emphasis on remote broadcasts, integrating considerable on-the-spot news coverage into the programming. Most material is pre-recorded and placed on cartridges or reels, after careful review.

MBC is considering the addition of other systems in its outlying stations, in cities as diverse as Panmunjom, site of the Korean armistice, July, 1953; Pusan; Taegu, Chungmu and Yosu on the south coast, a resort area with fine hotels and sunny beaches; and Kyongju, the very traditional and beautiful city that was the first capital of Korea at the time Caesar was ruler of Rome. It has been a capital of culture and history for one thousand years. Nearby is Pulguk-sa, the most famous of Korea's classical Buddhist temples, and also the Sokkuram Buddha enshrined in a mountaintop grotto to gaze out to sea.

The regional automation systems would

pick up the majority of their programs from the MBC Seoul headquarters, but insert news and features on local events and news, as well as regional commercials, making the programming more responsive to the differing populations.

Since Rick Sawyer and Nick Solberg installed the systems in January, 1984, MBC has requested a number of enhancements to the system. Through *software programs* IGM Communications has met the needs without changing the hardware. IGM has also supplied to MBC-TV a custom 24-tray Instacart and custom controller for audio

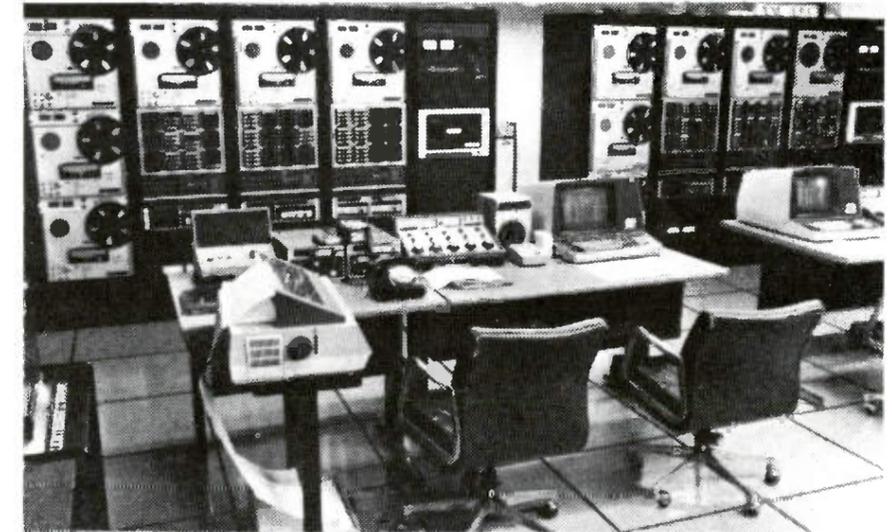
post-production work in the television stations. After two years of operating the automation systems (termed APC systems in Korea and certain other countries, "automatic program control"), MBC is pleased with the programming fidelity, lower maintenance costs and the ability to use their staffs more productively. Before the APC or automation, everything had been operated manually, even to starting and stopping of reels and cartridges.

In addition to its "building block" automation systems, made up of manufactured components such as the SC and EC (see next page), Instacarts, Go-Carts, etc., IGM Communications is proud that its engineers can assist the stations, foreign or domestic, that have unusual custom requirements.

"Through software programs IGM Communications has met the needs without changing the hardware."



DJ Studio for Live Broadcasting



AM/FM APC System

INTRODUCING . . . TWO NEW CONTROLLERS TAILORED TO YOUR STATION

You Never Had A Better Choice . . . Or A Harder One

At last, automated control or flexible live assist that gets on with the job, that manages your station, large or small.

True sophistication is beautifully simple . . . like a sleek hydroplane, a rocket, a fashion designer suit. Everything needed is there, nothing added that is unnecessary.

That's the kind of controllers IGM is introducing this year.

For a station that has a sophisticated format, live assist needs, network affiliation, and wants to use Instacarts, there's the IGM-SC, the SOPHISTICATED CONTROLLER. If your operation has no need for live assist or Instacarts, the IGM-EC, ECONOMICAL CONTROLLER, gives you walkaway time with minimal investment.

Here's what you get:

— The software to handle the commands for controlling your programming. You select the computer, an IBM-PC or compatible for the IGM-SC; a Kaypro, Tandy 1000, or other lower-priced computer for the IGM-EC.

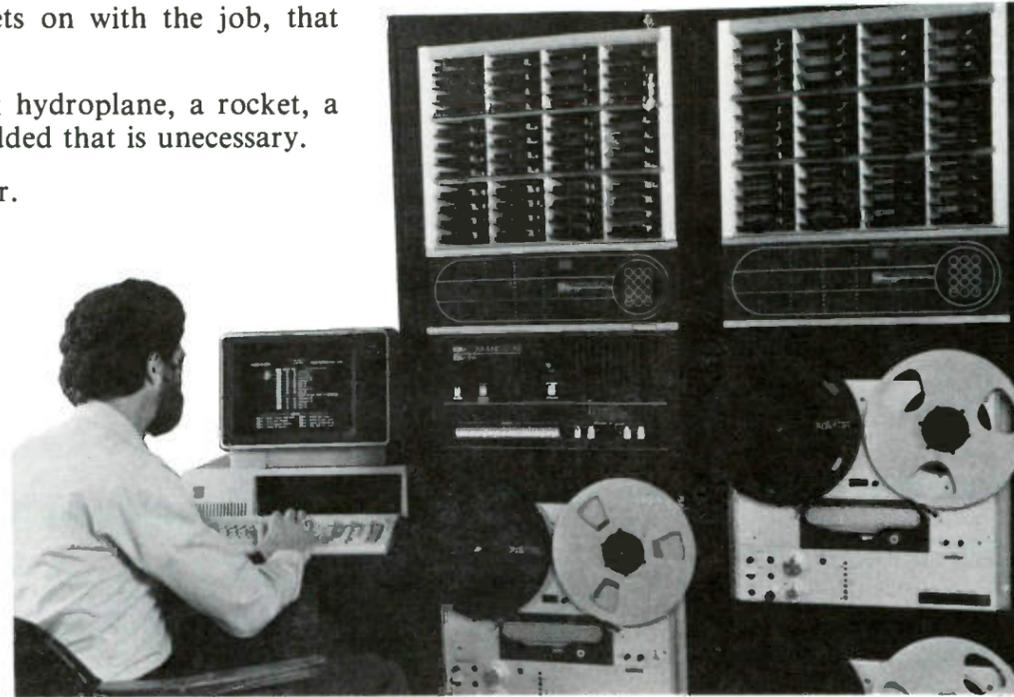
— An audio switcher to facilitate the switching and control of the audio sources.

Your system can be updated as the state of the art progresses. Your software can be modified to accommodate new ideas. Buy your computer "off the shelf" and get local service.

If your station uses another IBM (or Kaypro, Compaq, etc.), you have an automatic backup unit in house, one that can be used for programming the disk for later insertion. If your broadcast terminal fails, just transfer software to the other computer until repairs are effected.

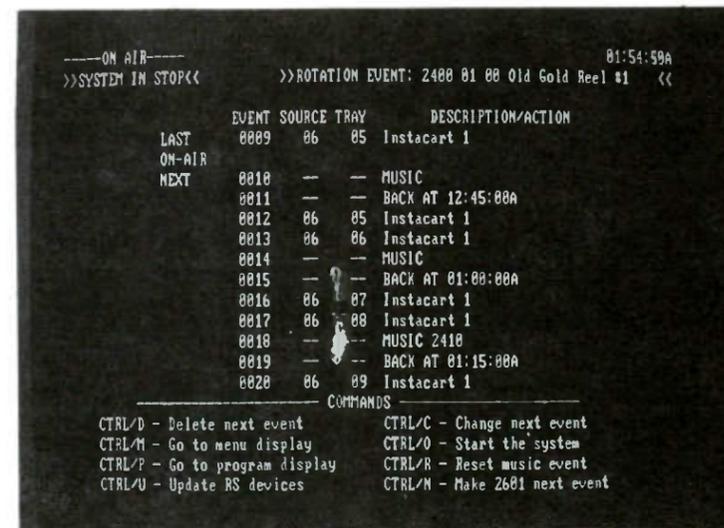
*You only buy what you need. It's like trucking . . .
You wouldn't send a huge van to carry a few items,
you'd send a pickup . . . right?*

IGM-SC — IGM-EC! WHICH SIZE IS FOR YOU?



Through remote terminals, you can call up the programming from home, make program changes or check the status of the SC without physically going to the station.

****ALL OF THIS FLEXIBILITY WITH GREATER CAPABILITIES IS LESS EXPENSIVE THAN OLDER CONTROLLERS. TRULY A SOPHISTICATED CONTROLLER, THE IGM-SC.****



IGM-SC - THE SOPHISTICATED CONTROLLER

This system handles full automation or live assist. Using special software on an IBM-PC or compatible, the controller manages the simplest or most complex tasks. You can have remote monitors, remote controls, operate live, temporarily automated, totally automated, whatever your needs are. You control 16 audio sources which may be expanded to 32 audio sources.

Let's take a typical busy station agenda:

You open up the day with live assist for AM drive time. Using the system as a storage device for commercials, PSAs, etc., (on Instacarts or Go-Carts) — you keep the pace moving live and pertinent to the day's weather or traffic conditions, local interests and commentary.

Mid-AM is a more quiet time, live is not required, automation is the answer.

Your noon newscast is live. Again the system is used as a storage device for items to enhance the live commentary.

Back to automation in early afternoon, you now have time to do production, change the format, program the SC, etc.

PM drive time is again live assist, keeping motorists abreast of the latest traffic and local news, and commentary.

During evening hours, you switch to an automated satellite program, maybe the Larry King Show, then back to music 'Satellite or Syndicator', PSAs, commercials. Fully automated, a one-person night operation.

The SC provides for total English verification logging, 24 hours a day.

You have the ability to talk to other computers in your station.

You can advance-program one full day on individual disks. These are then inserted and await an automatic program load command from the computer. You also can prepare variable day-long formats on a different or back-up computer, place them on disks, then - shortly before air time - update them for timeliness. All this without interfering with on-air programming.

IGM-EC - THE ECONOMICAL CONTROLLER

IF YOU HAVE A RELATIVELY SIMPLE FORMAT, YET NEED WALKAWAY TIME WITH POSITIVE PROGRAM CONTROL, THIS IS IT!

For hardware, all you need is an economical computer like Kaypro, Tandy 1000, etc., one that uses MS-DOS or PC-DOS language. Make your own deal with your local computer store.

The switcher handles up to 12 audio sources and includes interfacing for Go-Carts. This means you could operate:

4 reel to reels	2 Go-Carts
A network feed	2 live studios
2 single cart machines	1 news feed

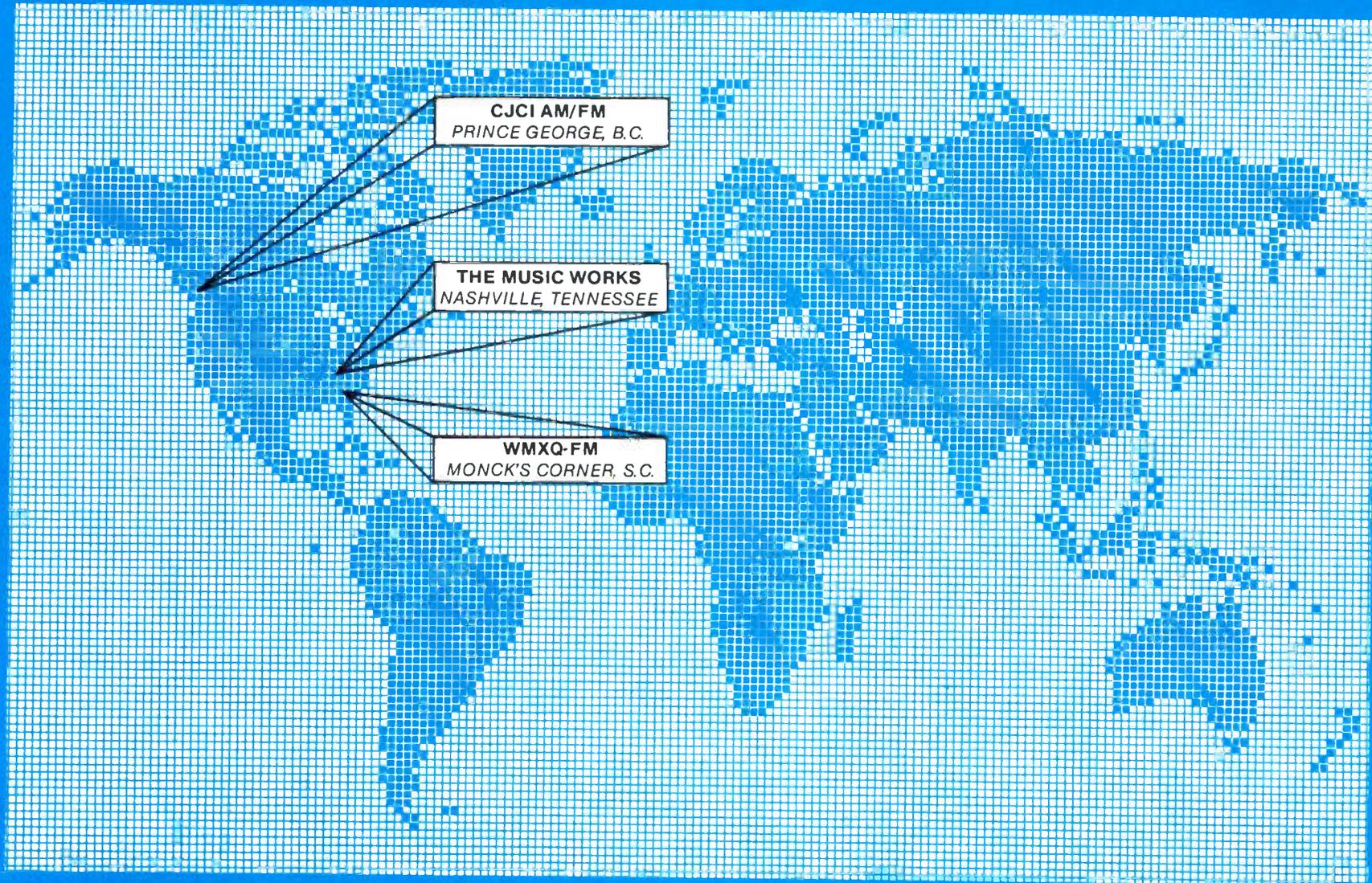
— Probably more than you currently need, so you have expansion room.

DO YOU REALIZE YOU COULD HAVE THE ABOVE HARDWARE AND THE SOFTWARE TO OPERATE IT, A TURNKEY AUTOMATION SYSTEM, FOR LESS THAN \$500 PER MONTH!

CALL FOR MORE INFORMATION: 800-628-2828, Ext. 578.

IGM NEWS

SEPTEMBER 1986



CJCI AM/FM
PRINCE GEORGE, B.C.

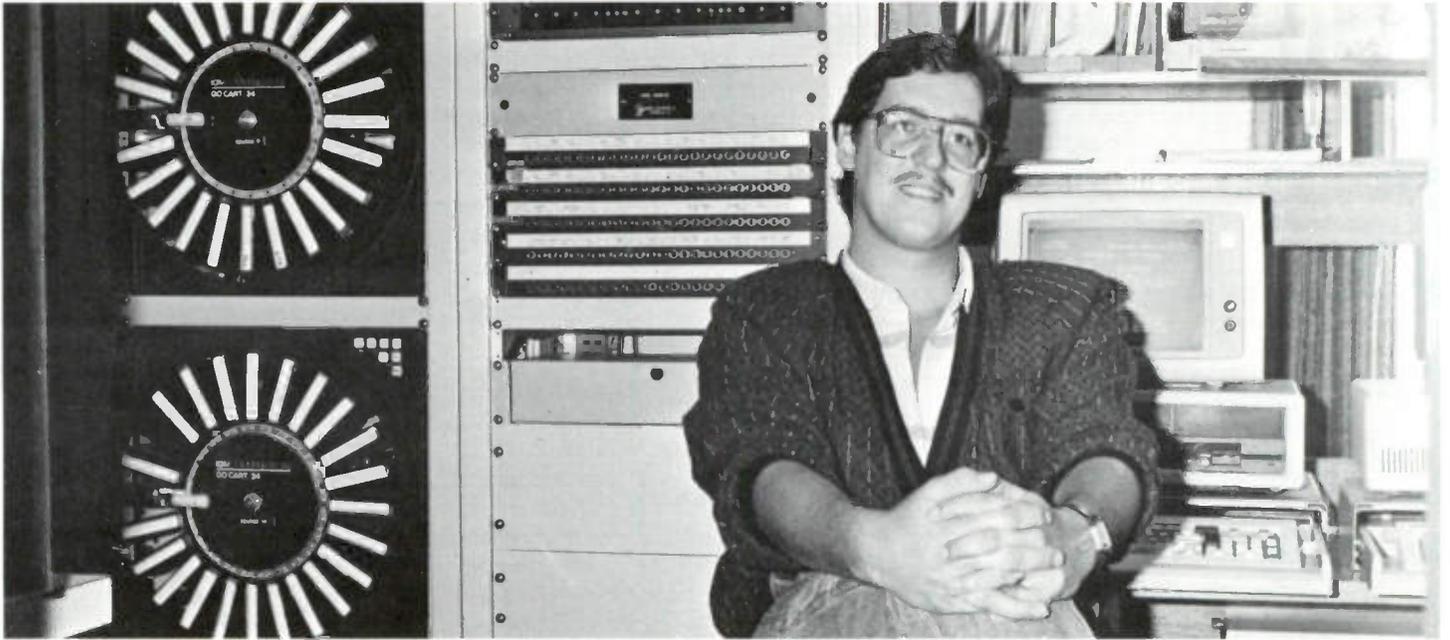
THE MUSIC WORKS
NASHVILLE, TENNESSEE

WMXQ-FM
MONCK'S CORNER, S.C.

IN THIS ISSUE

CJCI AM/FM, Prince George, B.C., Smooth Transition to Automation at CJCI
WMXQ-FM, Monck's Corner, S.C., No Gap When Lightning Zaps WMXQ
The Musicworks, Nashville, Tennessee

IGM's SC and EC Controllers
Tips on Electrical Problems
Bits and Pieces



Bill Russell Program Manager CJCI

Smooth Transition to Automation at CJCI

In moving from live operations to live assist or automation, too often station management simply plunks down a system and coldly orders the staff to use it.

Not at CJCI Prince George. When management decided to automate the AM and FM stations with IGM's new SC controller, President Ron East and Director Stan Davis embarked on an enlightened transitional program to maximize the acceptance and cooperation of staff members.

First he called a general staff meeting to announce that no one would be dismissed, that the company guaranteed job stability.

"Natural attrition usually takes care of any staff reduction in the long run. People start in a smaller market like ours and move on to the big city after they learn their trade better," says East.

East then explained to personnel that, by using automation, their talents could be utilized more effectively. He emphasized that their jobs *would* change . . . for the better. While the automation performed routine functions, each person could enjoy a variety of tasks, e.g., the news person, commercial writer or sales specialist could go on air, do production, and otherwise interchange duties. Diverse skills would make life more interesting, while the station benefited from more efficient use of personnel. Furthermore, the developing *professionals* would earn more money as they became more valuable to the station.

Program Manager Bill Russell says, "I think the day of the specialist in medium and small stations has come to an end. The road to higher profits is to train broadcasters to do more than one job."

He went on to suggest that the broadcast schools should change their ways. Instead of putting students into niches, news production, sales, the schools should encourage students to explore all areas.

CJCI instituted a profit sharing plan and encourages all personnel to suggest improvements for any phase of operations.

The books are open to staff members; they see the true stories of good and bad months. East comments,

"We tell our employees that, if they talk about these figures on the street and our competitors hear our inside information, this will hurt them. They have kept the faith."

***"I think the day of the specialist
in medium and small stations
has come to an end."***

Installation of automation has changed operations radically for the better. Announcers particularly love the freedom and flexibility that the SC controller gives them in live assist, voice tracking and total automation.

Both AM and FM stations are equipped identically: An IGM SC controller, 3 - 24-cart IGM Go-Carts, 5 Revox PR-99 reel-to-reels, 3 Audicord E Series single play decks, Western Information Network (WIN) news, and live studio. With IGM's version 4 software in place on the SC's the systems work



Ron East President CJCI

reliably. "It's a tremendous product," says Bill Russell.

Automation and Live Assist are no better than the programming created by the station, of course. At CJCI Russell, the Program Manager, pays keen attention to making the station "move" and includes gold music with heavy local content — live remotes from businesses and special events, telephone conversations with key people, analyses of regional issues by experts.

Morning Magazine, a three-hour daily production, delves into every facet of central B.C. life. The morning after City Council meetings, issues raised there are reported and commented on, pro and con. Host Bob Harkins, the morning personality, sometimes allows a few telephone calls from the public. He interviews interesting people. Recently his guest was an elderly fellow who once had polio and now was bicycling through Canada. Harkins joined the Railroad Society on a wild ride through the Grand Canyon of the Fraser River, reporting on the movement of an entire old building by raft from down river to a Prince George museum site.

"Since such programs are expensive to produce," says Russell, "we hope to use the available technology through our automation to cut the costs of the talk shows and news services. We welcome any feedback on how others may have achieved this."

Russell is planning to add a second network talk show from Vancouver for airing at night.

A network itself, Radio Station CJCI serves Vanderhoef, Fraser Lake, and Fort St. James through repeaters, plus Smithers as an affiliate with its own system of repeaters. To the south the corporately owned Cariboo Radio Network serves Quesnel, Williams Lake and 100 Mile House. Programming for the Cariboo-Central Interior Radio, Inc., network stations emanates from CJCI with individual stations "floating away" to use local news, PSA's, commercials, their own station breaks, etc. Using a Monroe multiple tone generator gives the network such capabilities without the necessity for a sub-carrier.

Ron East is delighted with the music services of

its syndicator, Drake-Chenault, which developed a Canadianized format to meet federal requirements for 30% Canadian AM content and 15% on FM.

"It's about time we were able to buy these syndicated services. Although we could produce our own music tapes, our costs would be greater and we couldn't easily do the research."

East says that syndicators should learn to better utilize the capabilities of automation in their formats, such as announce services and sophisticated switching.

The CJCI announcers particularly like the SC's flexibility from live assist to fully automated, the clean transitions that are

"The CJCI announcers particularly like the SC's flexibility from live assist to fully automated . . ."

possible in the voice tracking to music airing.

Bill Russell adds that he appreciates the compactness and compatibility of the SC.

"I can write programs at home on my IBM and bring in the disks. We are experimenting with modems . . . to access the on-air PC via modem to re-program the system.

Russell is busy in his spare (?) time placing complete FSK identification on cartridges with the IGM Encoder.

Clearly CJCI, a progressive British Columbia station, has spurred the creativeness of its professional personnel through the friendly interchange with management. Staff members continue to design customized hardware to speed operations and simplify them in all departments. There is a spirit of real excitement and interest around the station, certainly a credit to the open-door policies of Ron East and his directors.



The Syndicators Speak...

This is the first in a series of columns about syndication programming. I'm very proud The MUSICWORKS was tapped to be the very first company in the IGM Spotlight. As the President of The MUSICWORKS I take pleasure from writing and speaking about our services and our people.

But, this is the first column, and you know what they say "kisses from a girl" and "olives from the bottle"... the first ones are always the hardest!



Bill Robinson

Most of you reading this are probably affiliated with a radio station, and that's exactly where The MUSICWORKS began. All of the owners of our company were working at the legendary WIRE Indianapolis. It was the mid 70's and everything good was coming our way...#1 ratings, award after award, and even a little fame.

While I was out on the speaking circuit it became very evident there was a need for some better programming on the air at radio stations across America. It was apparent to us at WIRE that Syndication was a way for us to pay back to the business what it had done for us.

The question was posed, "What would we want from a syndicator if we were buying a format or music service?" The owners and staff of MUSICWORKS...all broadcasters...had all the right answers. The company was then designed around those answers.

We have several factors that make us a little different. The MUSICWORKS is a service oriented company, not a sales organization with a flashy "Dog and Pony Show" and no substantive follow through.

All of our formats are extremely flexible within themselves, so each station can have their own personal blend to achieve the right sound for their market.

The two most used and popular music formats in America are Country and Adult-Contemporary - counting for over 50% of listener preference - so that's what we specialize in at The MUSICWORKS.

The totally unique service we call "Alive Country" has always been one of the mainstays of our stable. This is where we provide the station with an award winning personality - on tape - sounding like they live in your town... and we get the fan mail to prove it. No other syndicator offers a service like this.

For the station with a competent air staff, but lacking in quality library or music expertise, we have COUNTRY 80. This is our biggest seller and it has the perfect blend of Country Hits and Oldies to give the station the competitive edge.

All new in 1986 is the most flexible Adult Contemporary format in syndication, FACTOR 5. The sound of this service can change from market to market depending on the target demographic the operator desires. The elements of FACTOR 5 allow it to be skewed from just outside CHR to just short of MOR.

The MUSICWORKS also has an easy country format called CASUAL COUNTRY. This service has tremendous appeal to the station seeking an alternative sound with mass appeal to audiences and sponsors.

The MUSICWORKS programming is capable of competing in any size market - Large, small or in between.

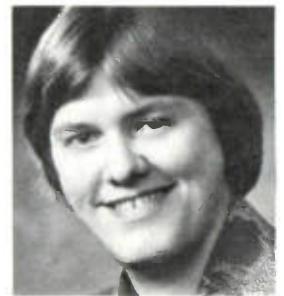
Our tapes are playing in a lot of ARB and Birch markets, and also some real mini-markets. The way we approach our job at The MUSICWORKS is to help each station sound better and do better. We want the listener to perceive that they're hearing an origination from their local station. Just because it's local, or even small town, doesn't mean it has to be less than professional.

The cost of preparing the type of programs or programming we can do in syndication would be prohibitive for all but the very wealthiest of operations. Even those stations that have a tremendous bottom line will probably use some syndication because it's cost efficient. Even the Rockefellers, Vanderbilts and Getty's don't hire trades people to make them an automobile. They buy from a "vehicle syndicator." Simply stated syndicators are mass producers of programming.

Some broadcasters still equate syndicated formats exclusively with automation systems, and automation systems with "sounding canned"...whatever that means. A serious talk with your IGM representative will quickly dispel those fears, and you can find some of the new broadcast hardware can do virtually everything except walk your dog.

In summation, syndication offers radio stations the opportunity to have higher quality programming accompanied by sales and promotional ideas. Each employee of the syndicator comes equipped with one brain at no extra charge. The station that fails to use that expertise is really missing the boat. In most cases all the station has to do is ask. At The MUSICWORKS we even pay for the call.

A perfect example of the calibre of our people—one of our owners and programmers is Gary Havens. Just this month Gary was chosen as the new Program Director of WHN Radio, New York City. We're really proud of Gary, and this choice by WHN owners (EMMIS Broadcasting) reinforces our feeling that we have a real heavyweight working with us.

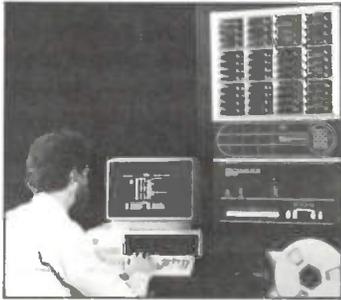


Gary Havens

THE
MUSICWORKS
INC.

After more than 20 years, IGM is still the first choice for Program Automation Systems

5



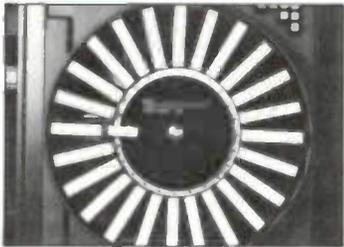
The IGM-SC - A Controller for all Reasons

The IGM-SC is a full-featured program automation controller with the unique concept of using an IBM-PC or compatible as the brain for the automation system. The IGM-SC was developed to meet the needs of most radio stations. It can support a second terminal for use by the announcer, which means that you can either run an automated or live-assist format depending on your programming needs. The IGM-SC, when paired with the IGM-EN, can produce logging from the cue-track of the cartridges. The IGM-SC can manage up to 16 audio sources.



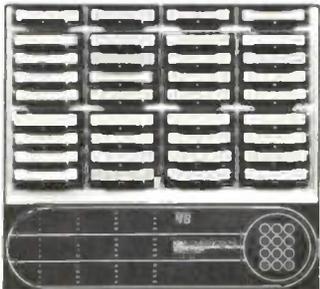
The IGM-EC - The Economical Choice

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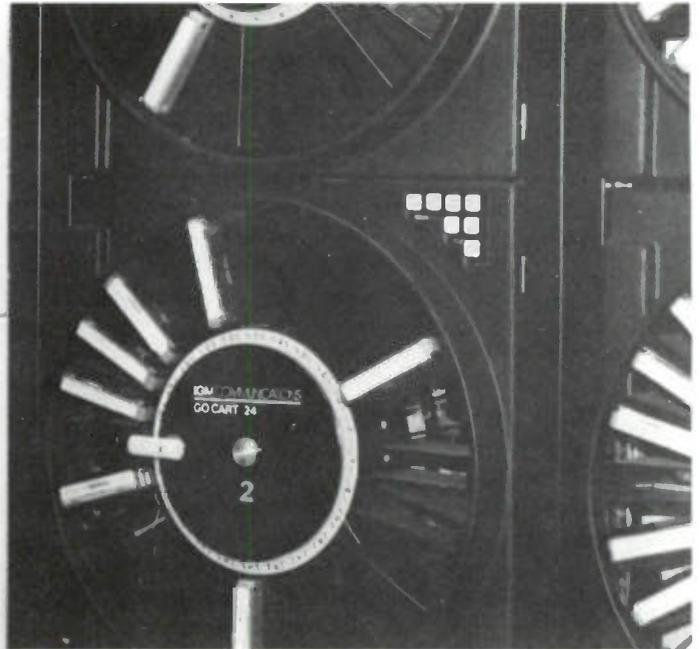
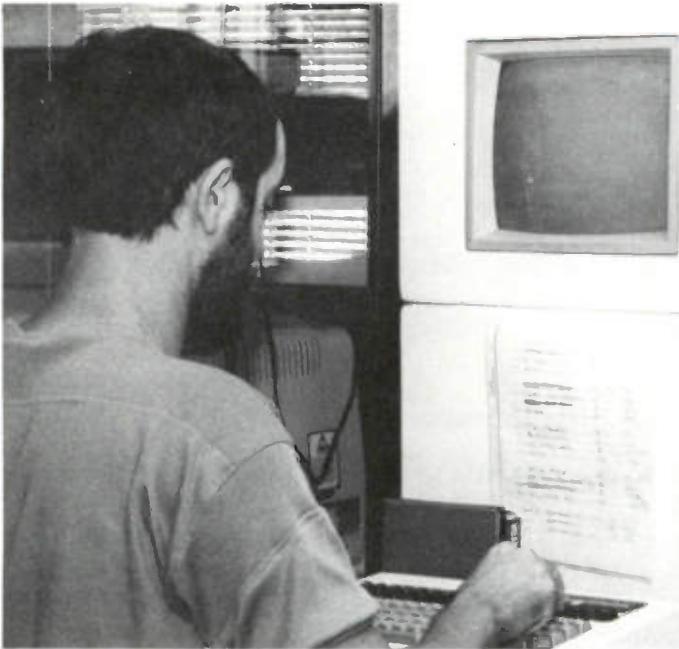
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Wayne White Operations Manager WMXQ

Photo by Allan Leopold

No Gap When Lightning Zaps WMXQ

With diligent attention to detail, radio station WMXQ, Monck's Corner, South Carolina, has two problems under control—first, the reliable airing of a format involving two different satellite sources; and second, operational integrity in the lightning-prone region.

Monck's Corner is on the fringe of Charleston's Top 100 market and snags a sizeable portion of its own Berkeley County of 100,000 potential listeners. Adjacent to two popular resort areas, Lake Marion and Lake Moultrie, as well as the Francis Marion National Forest, Monck's Corner is a sort of crossroads between the ocean beaches and the lake country.

Listeners not only include tourists and sportsmen, but also—on the northern fringes of Charleston and in Berkeley County—factory workers in textile, petro-chemical and other industries, a navy base of young and middle-aged personnel, and farmers, certainly a diverse market.

Market researchers at WMXQ and companion station WJMX, Florence, identified the audiences as 25 to 65, more specifically concentrated between 25 and 45. These are the nation's war babies come of age. They have grown up with Kinsey and Spock, hippies, yuppies, and yuppies; Kennedy, Johnson and Nixon; and lived through miniskirts to universal popularity of blue jeans and back to business suits and ties.

To reach this complex market, where the highest percentage of spending power is concentrated, the station decided on an adult contemporary format carried by Transtar satellite, giving a feeling of totally live operation.

Actually, the station is automated. To manage the precise

switching required, WMXQ selected an IGM Basic III controller plus four 24-tray Go-Carts, one reel-to-reel unit (containing emergency channels only), and six single carts. The news comes from Associated Press via satellite.

Here's how the program format is handled:

Transtar satellite music programming truly is live, of course, provided to affiliates from a central location. To maintain that "alive-ness" WMXQ utilizes five single-cart machines, dedicated to the Transtar control, for liner drops, the lead-ins to various styles of station announcements so each break is in the same voice—"WMXQ 105.5 FM, your 3000-watt FM station," for instance. Other types of liners are up-tempo, down-tempo, or station promos and PSA's made up in the voice of the Transtar announcer on duty at a given period.

"All we do is insert the suitable cart for a particular period," says Wayne White, Operations Manager.

Such cartridges are actuated by Transtar. The sixth cartridge containing the weather broadcasts is controlled by station automation.

Commercials, most promos and PSA's, are on the Go-Carts, IGM's versatile, high-quality cartridge playback units. With simple attention to loading the four units, the station's heavy commercial load is handled easily with no cueing time problems. (Worst access time for a cart system is eight seconds.)

Since Transtar sends closed-circuit information to its affiliates at certain times—music lists, marketing information, and music research—a few Go-Cart positions are devoted to fill music that "kicks in" smoothly to fill those gaps.

"We do some fancy switching at newstime," says Wayne White. "We drop the Transtar feed for 3½ minutes, go to the AP satellite news feed for 2½ minutes, then drop in one 30-second commercial and the weather broadcast before returning to Transtar."

With at least eight sources to access (despite the multiple tasks it performs, Transtar is only one source), the audio switching proceeds flawlessly. IGM's system works so smoothly that, according to White,

"We actually go home and leave the station unattended for the night. The system is so reliable and unaffected by most conditions around it that we really don't need anyone here."

Instead of hiring people to babysit the transmitter, WMXQ installed a remote metering unit at a facility that already operates around the clock, so any conceivable problems would be picked up.

"We cut our part-time hours from 130/week to 40/week. That's tremendous savings!" added White.

The reliability of all automation systems has been tested severely this past year. Since the southeastern states have been so parched, even more dramatic and destructive electrical storms than usual have rumbled across the coastal lands. At one South Carolina station a bolt blew a hole in the antenna; at another several feet of coaxial cable were burned. One station sustained \$13,000 damage from lightning.

WMXQ did not escape totally, either, but feels good about the minimal damage incurred. In late July it sustained several *direct* hits to both the transmitter and the building containing the automation system. Only part of the audio portion of the controller was damaged, and WMXQ was fully in business within twenty-four hours.

"The hits occurred late in the evening and—due to the three-hour time difference—we caught Paul Cogswell of IGM just before he left the office. After his on-the-spot diagnosis and a conference with Rick Sawyer, IGM sent us a complete interface card and audio board via FEDEX. It was here by the next day; in fact, before the station engineer could get back to install it! Now that's service," declared White.

He added that, in his opinion, damage was minimized because only minor components seem to blow out under these extreme conditions, and not the main power supply. He attributes this to good equipment design.

However, the station continues to ferret out remaining problems from electrical storms. Before even going on air the two South Carolina stations installed super good grounding. Three rods were placed ten to fifteen feet below ground at the transmitter site and again at the main operations office. Filters protect against vagrant power surges, too. White observed that, during the recent lightning strike, those components damaged were in units attached to the telephone cables, which were *not* grounded, and now he is working on a solution for that problem.

It is through such careful engineering and maintenance that Radio Stations WMXQ and WJMX are able to enjoy the cost-effective benefits of automation in this unstable geographical region.

TIPS FROM THE BACK ROOM

This month, we asked Rick Sawyer, our Operations Director, about how to protect your automation equipment from damage.

Rick, what actually does the damage when lightning strikes?

Lightning damage in the immediate vicinity can result in two types of damage: direct and indirect. Direct damage is the more obvious result of sudden increases in voltage, which can cause the components to fail dramatically. Power supplies, filters, and communications interfaces (line drivers, receivers, etc.) are the most likely victims. Indirect damage is less likely to be fatal to equipment and is the result of high static discharge, which accompanies lightning strikes. This discharge may not actually damage components, but may "scramble" transmissions, halt processors or destroy data in computer RAM or EPROM memory devices. Often, a simple reset or reloading of programs will correct the problems.

My antenna system is well protected from lightning. Do I need any special protection for my studio gear?

Good engineering practices are as important in the studio as in the transmitter room. The station should have a good earth ground (there are numerous texts on this subject). Seriously, all AC distribution should be checked for correct polarity, third wire grounds, and appropriate breaker ratings. Next, add protection equipment to the line-equipment designed to "catch" and remove high energy transients. IGM has been very pleased with the performance of the ISLATRON units that customers have purchased from IGM for use with their automation systems. (ED. Note: 120 VAC/single phase, 30 amps sell for \$412.)

How can I test the protection systems I already have installed?

Short of inducing a lightning strike yourself (ala Ben Franklin, a risky business, at best), there is no way to test protection systems at your site. Properly installed equipment purchased from a reputable source is your best choice.

If my station is hit by lightning, where should I look for damage in the equipment?

Look for signs of carbon traces, bulging capacitors, darkened insulation, etc. Pay particular attention to inputs and outputs, the area nearest the power transformers, as well as communication lines. Then check power supplies for appropriate DC levels and, most important, AC ripple noise. Next, resume operation, being sure to check thoroughly for hidden trouble, such as scrambled programming in other areas of memory beyond the present time. Finally, if you find no trouble, make note of the time and circumstances, so if something suspicious shows up later, you will have a guide to the original cause of trouble.

Nothing can guarantee total immunity to lightning strikes, but like so many other areas of broadcasting, following appropriate procedures during equipment installation, and purchasing (and installing) protection equipment can greatly reduce your risk of downtime due to lightning.

BITS & PIECES

Beginning with this issue of the *IGM News*, we are adding two new features. This column is one of them. Each issue, I will get an opportunity to share with you news that doesn't fit anywhere else in this newsletter. I will also get to tell you where you can see IGM products and ask questions about automation.

The second new feature is a page that will be set aside for programming syndicators. Each issue we will ask a supplier of programming material to provide a brief outline of their services and to spell out for our readers why they are different from other suppliers. This issue I am pleased to welcome a well-known syndicator, Bill Robinson and Musicworks. We will be asking other suppliers to join us in the future.

The fall is an especially busy time for trade shows. And accordingly, the IGM marketers are spending half their time at the travel agents. By the time your read this, IGM will have made its first appearance in many years at Radio '86 in

New Orleans. You will still be able to find us at the following programs:

National SBE Conference, St. Louis, MO	Oct. 14-16
Texas State Convention, San Antonio, TX	Oct. 24-27
Canadian Assoc. Broadcasters, Vancouver, BC	Nov. 1-4
Seattle SBE Conference, Seattle, WA	Nov. 11-13

I hope that you will take the time to come by and introduce yourself as we go traveling about the countryside.



Director Sales and Marketing

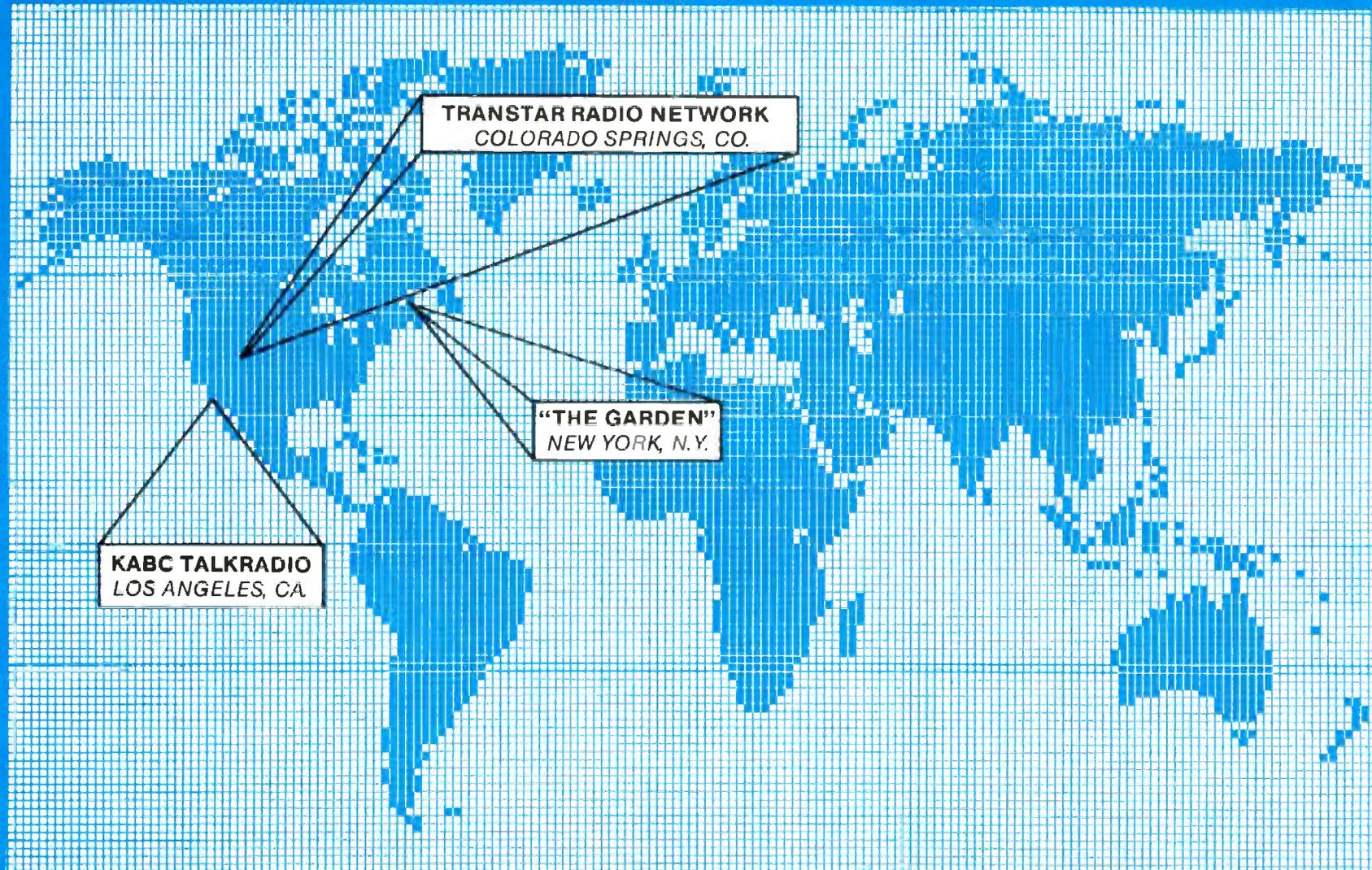
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IGM NEWS

DECEMBER 1986



IN THIS ISSUE

KABC, Los Angeles, CA, *Live Assist for KABC Talkradio*
Madison Square Garden, New York, N.Y., *Instacart and Marc Play "The Garden"*
Transtar Radio Network, Colorado Springs, CO. *Syndicators Speak...*

IGM'S SC and EC Controllers
Bits and Pieces



Popular KABC and ABC Talkradio host on air

Live Assist for KABC Talkradio

It's 9:00 A.M. at KABC. In the smaller of two studios at the network's Los Angeles offices on LaCienega Boulevard, host Michael Jackson fiddles with papers on his desk and makes small talk with a guest fidgeting in a chair across from him.

On the console facing Jackson an elapsed time clock blinks away to zero, indicating that it's time to begin the interview.

KABC Talkradio. It engrosses Los Angeles listeners and as ABC Talkradio, broadcast from KABC's larger studio, feeds 110 affiliates nationwide.

IGM Communications live assist automation helps to make it work smoothly.

On KABC for twenty years, Jackson uses a suave and

“All the host must do is press one green button on the console to actuate the clusters . . . ”

friendly approach to celebrities of local and world stature. In accents hinting of his British origins Jackson manages to cajole, expose, entertain and inform without abrasion. On any day his guests might include the likes of Nancy Reagan, Mayor Tom Bradley, Jack Lemmon, Senator Ted Kennedy, an author of a bestselling book, or an unknown person with an unusual story.

Along with other household name hosts, the Ken and Bob Company, Ray Briem, Sonya Friedman, Jackie Olden and others, Jackson may talk with guests of local importance for

an hour, then swiftly transfer during a commercial cluster to the larger studio, sitting down before a second board to go national as ABC Talkradio, talking with guests of international importance.

Necessarily support equipment for such a loosely structured show must be flexible.

While Jackson and a few regulars are professional radio people, other hosts are not. They are cooks, professors, philosophers, comedians. Yet from the board they are given the task and freedom of structuring the commercial/PSA/ID breaks. It could be a nightmare.

In 1984, KABC's Chief Engineer Rex Newcombe, with the help of Maintenance Engineers Dave Berges and Don O'Connor, installed an IGM live assist system of the simplest variety. All commercials, station ID's, PSA's — everything except the talk shows — are on IGM Instacarts (KABC has four 48-cartridge units).

Groups of such program segments are entered into the KABC computer, cued through to run in break clusters of about three to four minutes. Here is a sample of an actual hour:

TIME	TONE	SLOT	CART	LEN	PROG. ELEM./FUNC.
11:21:00A				5	TLNT CUTAWAY 3D¼
	14	AUTO	5502	60	DELTA FURS 1
	Q	AUTO	165	60	SEES CANDIES
	Q	AUTO	5503	60	GLABMAN FURN 52
	Q	AUTO			
	Q	AUTO			
	Q	AUTO			
	13+ Q	TALK			JOIN TALKNET
				5	STN ID FROM 3D-4
11:29:51A				9	TLNT CUTAWAY 3D-2
	14	246	1154	60	NEWS HDLINE CART
	Q	AUTO	210	60	BIO PRACTICE GROUP
	Q	AUTO	5504	60	CAREAMERICA (589) 1

The KABC Talkradio host has the printed schedule before him; real time entries indicate suggested breaks. All the host must do is press one green button on the console to actuate the clusters, giving the host a brief period to stretch, take a walk or talk off-air to the guest. The elapsed time clock starts simultaneously with the green button, so the host glances at the flashing digits to gauge how much time remains until return to live mike.

The green button is part of a Marc control box provided by IGM, really just a remote start mechanism of the most basic kind. Although the Marc has a couple of other features, hosts ONLY push the green button as needed.

Commercial breaks are set formats, but the host has leeway as to exact time of actuation . . . just as long as all breaks are completed within a scheduled hour. Only the end-of-hour sequence is critical, since it must meet the ABC news feed and station ID.

During the rest of the hour, although recommended break times are listed on the schedule about eight minutes apart, the host does not have to interrupt a guest or a phone caller until a logical pause occurs.

"It all works pretty well now," says Newcombe, "even though human error is an ever-present possibility . . . for instance, our people hastily make a commercial that runs over or under . . . or the talk show host forgets to press the button in time for end-of-hour sequence. But those are aberrations that can never be totally eliminated in a live show."

"To avoid timing problems at the end-of-hour sequence," adds O'Connor, "we try to use agency-produced commercials, because they are carefully timed. This helps us to keep from upcutting the ABC Network News."



Rex Newcombe, KABC Chief Engineer

Typically during the KABC Talkradio programs there are six breaks per hour, totalling seventeen minutes, including the end-of-hour. During the overnight hours this might be cut to

five, depending on commercial load. The national ABC Talkradio is structured separately for feeding the affiliates with switching monitored by an engineer.

O'Connor says, "When we have a new host to KABC Talkradio we coach the person at the board, then sit in for the first two or three shows to watch operations. Essentially all they have to

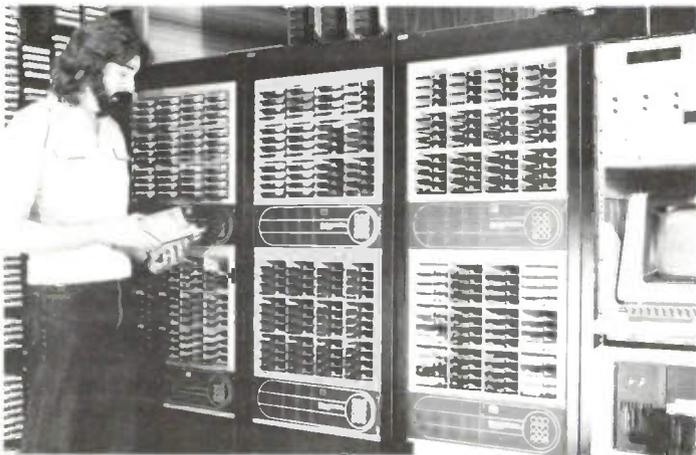
do is watch the time and push the green button periodically. What could be more simple!"

Live assist centered around the IGM Instacart thus handles the housekeeping duties nicely. Periodic updates have kept Instacart technologically current, making it the mainstay of broadcast cartridge automation for almost twenty years. It provides instant random access to any of its cartridges, and puts out quality audio that even permits its use for music playback in some stations.

With the instant access KABC has no concerns about cue-up times and also reserves open slots in the unlikely event that a cartridge position needs repair. Further redundancy occurs because each row of twelve cartridges can operate independently of the other three rows, so a station would have thirty-six carts available even if one entire configuration of twelve would fail.

That's the kind of system a dynamic talkradio station must have, the total flexibility and reliability that permits hosts to concentrate their ingenuity, charm and verve on spellbound radio audiences. The details of operation can be left to KABC's computer and IGM's live assist automation.

"Live assist centered around the IGM Instacart thus handles the housekeeping duties nicely."



Don O'Connor monitors the live assist system

The Syndicators Speak...

This is the second in a series about syndication programming. IGM believes, like the old cliché, that "it takes two to tango." One must have a good format and efficient delivery system.



C. T. Robinson
Chairman of the Board

Satellites have made it possible today for stations in all size markets to sound like big markets without addition of expensive disk jockeys and engineers. Our company, Transtar Radio Network, recognized the possibilities for effective satellite delivery in 1978, opening our services in 1982 with an adult contemporary format.

The Best thing about satellite programming is that it doesn't just sound like live...it really IS

live. Just as stations always have switched from local programming to the news wire, now they can turn on to satellite music and commentary coming to the listener LIVE from a central location — in our case, Los Angeles.

Two factors have made us successful: market research and careful attention to the fine tuning of delivery systems. It is very complex to deliver a good product via satellite, and I think we have demonstrated that we are unique in achieving that. Our ratings are the proof.

Modern technology, including the systems and equipment provided by IGM, assists in smooth delivery. Through a data channel we trigger cartridge playback systems in the customer's radio station. Local stations write the scripts for their weather intros, the tag for station ID's, liners and intros to local news. Then our DJ's record them, so local listeners hear the same voices throughout the programming. Most have no idea that the DJ is in Los Angeles. For instance, our announcer would come with the break: "This is Radio Station RXYZ, Johnson Corners, Heart of the Corn Belt, with local news..." The local station reads its news or actuates a cartridge containing updated news pre-recorded, and a tone goes back to the satellite. "...And now back to Glen Campbell and..."

The local station has CONTROL over what goes into the cartridge positions, its commercials and PSA's, while Transtar has CONTROL over the actuation within the music format of all program elements.

At first, satellites were the saviour for struggling small market stations, who couldn't begin to afford their own market research or hire big name jocks. Now our programm-

ing has moved into large market stations, as well, simply because our central but personalized delivery of well-researched programs is good for them, too. They can spend their energies contacting prospective advertisers, covering regional events live, making commercials that sell products, leaving the music selection and commentary to us.

We are in most of the top fifteen markets now, such as Los Angeles, Miami, Houston, Washington DC, and others.

Today we have four formats and will launch a fifth in February. They are:

Country Music Network

Adult Contemporary

Oldies Channel — music of the 50's, 60's, 70's

Format 41 — a soft adult contemporary format, one of our most successful programs. *Advertising Age* recently listed this format as one of the Top 10 listings for 1987's Hottest Properties, the only full-time syndicated radio format named.

In February Transtar will deliver its new 24-hour program format called "AM ONLYSM." Designed specifically for people who use AM radio between ages 35 and 54, the format will feature familiar favorites by artists like Frank Sinatra, Andy Williams, Dionne Warwick and others. It will contain *no* big band music.

Our President, Gary Fries, says, "Research prepared for us [most by The Research Group, Seattle] clearly shows that, although the upper end of the salable demos — 40 to 54 year olds — listen to AM quite a lot, 'Big Band' music is attractive to precious few of them..."

AM ONLYSM was developed by Transtar in association with a group of AM stations in the top 50 markets and will be programmed under the direction of Chick Watkins, who will return to Transtar from his position as Operations Manager at 55/KOY, Phoenix. The format will be cleared on only one station per M.S.A. market and is available on a first-come, first-served basis.

[For more information on AM ONLYSM, call Gary Fries at Transtar 1-800-654-3904.]

I cannot stress enough that our company is dedicated to strong research and the implementation of the programming. The main reason why our markets are signing with us is that we strive to make our formats the best.

TRANSTAR
RADIO NETWORK

After more than 20 years, IGM is still the first choice for Program Automation Systems



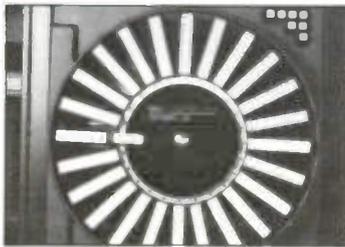
The IGM-SC - A Controller for all Reasons

The IGM-SC is a full-featured program automation controller with the unique concept of using an IBM-PC or compatible as the brain for the automation system. The IGM-SC was developed to meet the needs of most radio stations. It can support a second terminal for use by the announcer, which means that you can either run an automated or live-assist format depending on your programming needs. The IGM-SC, when paired with the IGM-EN, can produce logging from the cue-track of the cartridges. The IGM-SC can manage up to 16 audio sources.



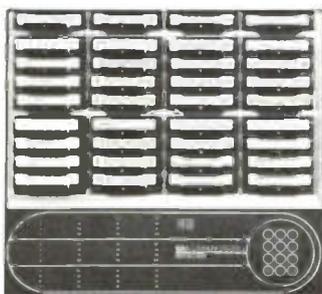
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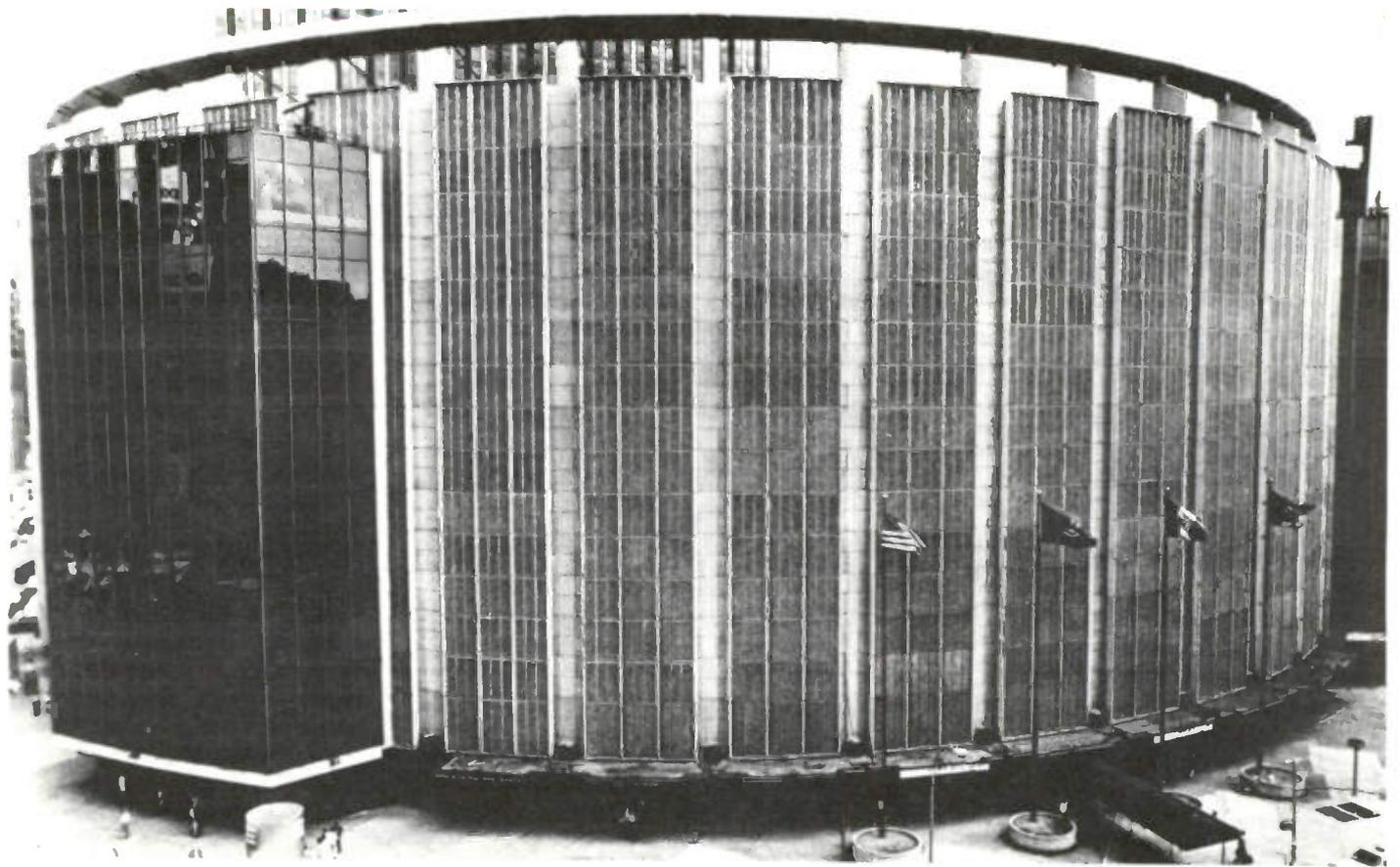
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Instacart and Marc Play “The Garden”

“We didn’t realize at first just how valuable the Instacart would be,” says Chris Hansen of Madison Square Garden, New York City (doesn’t everyone *know* where it is?). “Next year we might add another one to double our capacity.”

The Instacart so familiar to broadcasters continues to appear in situations far from radio stations. In the Garden it’s used as a bank of sound effects and music, instantaneously responsive to the needs of the announcer for hockey games, basketball matches, and whatever else is booked into that famous arena.

Prior to 1986, Madison Square once had a live organist and following that, a number of single or three-cart machines for audience response enhancement. Now at center ice or center court, the announcer has at his fingertips a script showing forty-eight bits of music, commentary, and sound effects. Pressing a button on a Marc remote control box in the announcer’s booth actuates cartridges in an Instacart safely installed in a distant locked office.

When the New York Rangers skate threateningly onto the ice from their dugout during a hockey game, Instacart cartridge #4, for example, is actuated to play the Ranger’s

charge sequence. During time outs for a New York Knicks game, cart #10 might give statistics on a particular player for that team, or the opposing team player.

Before the game and during breaks cartridge #1 or #46 may be programmed to play lively organ music, just as the live organist of old once performed. Some spectators look around for the organist and pipe organ.

“Let’s Go, Rangers!” belts out cart #32, leading an audience cheer. ...And so it goes.





The announcer "plays" the Instacart as the fine instrument it is, with the ultimate flexibility of instant random access to any cartridge the moment he presses the start button on the Marc. If the announcer can anticipate the next required audio, he can enter that cart number for next actuation, eliminating even the tiny delay time of entering two digits into the controller.

Chris Hansen says firmly, "We think it's great. The announcers love it."

It takes a versatile playback unit to give the audio quality necessary for music playback, as well as mere voice. No stranger to radio stations, the Instacart often gives that same flexibility to broadcasters — especially those airing the ever-changing rock hits, where this week's dynamite tune is bumped next week to 20th place by a later craze.

IGM Communications is very proud to be in the Garden. The original Garden at 26th Street welcomed spectators for the first time on Memorial Day, 1879. For eleven years the circus, horse shows, and John L. Sullivan's boxing were its mainstay. But the original Garden had no roof and New York winters can be grim.

In 1890, a smart new enclosed building replaced Garden I. Garden II's main arena seated over 15,000; a theater held 1,200 more and a concert hall 1,500. There even was a rooftop restaurant.

Garden III came along in 1925, at the site of an old trolley barn at Eighth Avenue between 49th and 50th Streets. On November 28th, the first event was an international six-day bike race, and the second was the initial ice hockey game ever played in the Garden, between the New York Americans and the Montreal Canadiens. Some spectators wore evening dress for the event.

Still the popularity and variety of events in the Garden grew, and on February 11, 1968, 19,832 pleasure seekers jammed into Garden IV atop Penn Station to hear name entertainers including Bob Hope and Bing Crosby, and to be able to brag, "I was there when the new Garden opened."

Since playing in the Garden is considered the zenith of anyone's career, IGM is delighted to have its star, INSTACART, helping talented announcers to maintain the upbeat mood by playing in THE GARDEN.

BITS & PIECES

I want to thank all of our customers for making 1986 a successful year for IGM. We are finishing the year with one of the strongest backlogs in years, and we have you to thank for it. We are excited about the projects underway for 1987 and believe that you will be impressed with our commitment to the broadcast industry and program automation.

After Carl and I have an opportunity to rest up over the holidays, our busy travel schedules start again in January. We will be attending several state conventions with our display and portable computer. We are glad to meet past and potential customers at these shows and answer your questions about program automation.

See us in:

Birmingham, AL	Alabama Broadcasters	Jan 16-18
Columbia, SC	S. Carolina Broadcasters	Jan 27-29
Tulsa, OK	Oklahoma Broadcasters	Feb 13-15
New Orleans, LA	Louisiana Broadcasters	Feb 15-17
Nashville, TN	Country Music Brdcstrs	Feb 19-21
Dallas, TX	NAB	Mar 28-31

And, IGM has gone electronic. Starting December 1st, we are now online with several computer mail systems and welcome your comments, suggestions and questions via computer. We will be participating in BPFForum on CompuServe at least weekly and checking our mail daily. We will answer via E-mail or telephone — whichever is more appropriate. We can be reached on the following systems:

CompuServe	72000,107
GENie	TR.RANSOM
MCIMail	TRANSOM
EasyLink	704-983

Best Wishes for the Holiday Season
from all of us at IGM

Nick Solberg

Paul Gagnell

Jim Mills

Kathy Hillier

Brida Wenke

Dan Dypson
Vic Maurer

Dale Anderson

Kathy Nellis

Carol Peterson

Jane Montrossen

Shirley Lahan

Jim Wolnissowski

Wendy Sledge

Tom Ransom

Rex Sanger

Karl Upmann
Jack Rotters

John Brykovich



IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226
(206) 733-4567

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IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226

206 733 4567

IGM-SC™ Price List

26-0102-0250-00	IGM-SC System Includes: IGM-SW Audio Switcher, Complete Provisions for 16 Source Cards 2600 Event Memory RS422 Interface for Instacarts and Go-Carts Digital VU Meters, Silence Sensor Program, Monitor and Sum Amplifiers SC Operating Software Operations and Technical Manuals (Does not include computer system)	\$12,505.00
15-0201-0230-00	RSC - Relay Source Card optional with 12 N.O. Relays	\$350.00
15-0200-0230-XX	USC - Universal Source Card and Cable Note: One USC card is required for EACH audio source attached to the IGM-SW (audio Switcher).	\$350.00
26-0103-0250-00	IBM-PC 256K, 1 Disk Drive, Package	\$2,000.00
26-0104-0250-00	Printer with cable to IBM-PC optional	\$375.00
00-2000-1002-00	Remote Terminal, TeleVideo PT optional	\$499.00
00-2000-0200-00	Uninterruptible Power Supply optional	\$395.00
26-0049-0250-00	IGM-EN FSK Encoding Package optional	\$1,499.00

Specifications and Prices are subject to change without notice.
Price List is furnished as a convenience to the customer
A specific proposal may vary slightly in total due to addition
of required cables and other hardware not shown here.

TGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226

206 733 4567

IGM-SC™ Price List

26-0102-0250-00	IGM-SC System Includes: IGM-SW Audio Switcher, Complete Provisions for 16 Source Cards 2600 Event Memory RS422 Interface for Instacarts and Go-Carts Digital VU Meters, Silence Sensor Program, Monitor and Sum Amplifiers SC Operating Software Operations and Technical Manuals (Does not include computer system)	\$12,505.00
15-0201-0230-00	RSC - Relay Source Card optional with 12 N.O. Relays	\$350.00
15-0200-0230-XX	USC - Universal Source Card and Cable Note: One USC card is required for EACH audio source attached to the IGM-SW (audio Switcher).	\$350.00
26-0103-0250-00	IBM-PC 256K, 1 Disk Drive, Package	\$2,000.00
26-0104-0250-00	Printer with cable to IBM-PC optional	\$375.00
00-2000-1002-00	Remote Terminal, TeleVideo PT optional	\$499.00
00-2000-0200-00	Uninterruptible Power Supply optional	\$395.00
26-0049-0250-00	IGM-EN FSK Encoding Package optional	\$1,499.00

Specifications and Prices are subject to change without notice.
Price List is furnished as a convenience to the customer
A specific proposal may vary slightly in total due to addition
of required cables and other hardware not shown here.

MSP PRICING

MSP • Main Electronic Chassis, Desk Top Control Console, Inter-Connect Cable (10 feet) , Installation and Programming Manual, Rack Mount Kit and Battery Backup System (with Charger)

\$6,850.00

OPTIONAL ACCESSORIES:

Back-fill/Network Board (Required for Network programming done on a real time basis)

\$250.00

Plug-in Relays Required for starting sources not utilizing an active low (ground going) TTL pulse

\$15.00

20 foot Inter-connect cable (Total Length)

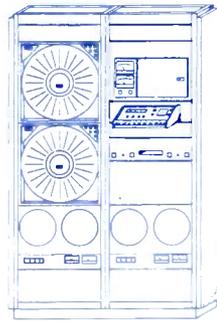
\$50.00

A DIRECT COMPARISON

FEATURE	SMC MSP	BE SAT 16	CETEC 7000 GLS	MEI SATMASTER	SMC Mini PRO I
Memory - Capacity	2,000 Events	2,000 Events	990 Steps	1,000 Events	100 Events
Source Capacity	10	15 (plus Network)	9	3 (plus Network)	10
User Programmable Clock Standard	YES 250 Event-7 day	YES 10 Event	NO Optional at Extra Cost	YES 450 Event	YES 50 Event
Logging Capability	YES	YES	YES	NO	YES
Full Line Assist Electronic Console	YES	NO	NO	NO	YES
Elapsed Time Counter	YES	NO	NO	NO	YES
External Clock Function Standard	Standard	Extra Cost Option	Extra Cost Option	NO	Standard
Subroutine Ability	YES	YES	YES	NO	YES w/optional Extra
Random Access Ability	YES for all 10 Sources	YES	YES	YES For 3 Sources	NO - Requires External Random Access Control
Requires Extra Cost Source Interface Boards	NO	YES at \$400 per source	YES at \$550 per source	NO	NO
Monitor Output and Metering	YES	YES	YES	NO	YES
Price	\$6,850.00 Complete	\$12,425.00 Plus Source Boards	\$12,000.00 Plus Source Boards	\$3,500.00	\$4,650.00 Complete

The MSP is available as a complete ready to operate system. The following are examples of Music Service and Satellite systems:

MUSIC SERVICE BASIC SYSTEM



- MSP Programmer (Rack Mounted)
- 2 - 350RSB Random Access Carousels
- 1 - 721 Dual Cartridge Playback
- 2 - SMC/OTARI ARS-1000 Reel to Reel Reproducers with Exclusive SMC Auto Rewind/Recue and 25Hz Tone Sensors
- 2 - System Racks, Fully Cabled

TOTAL SYSTEM PRICE \$18,450.00

SATELLITE SERVICE SYSTEM



- MSP Programmer (Rack Mounted)
- 2 - 450 Bi-Directional Random Access Carousels
- 1 - System Rack, Fully Cabled

TOTAL SYSTEM PRICE \$14,025.00

Source Equipment Prices

Model 350RSB Mono Carousel	\$2,750.00
Model 352RSB Stereo Carousel	\$2,850.00
Model 450 Mono Bi-Directional Carousel	\$3,250.00
Model 452 Stereo Bi-Directional Carousel	\$3,350.00
SMC/OTARI ARS-1000 Reel to Reel Reproducer with SMC Exclusive Auto Rewind/Recue and Built-in 25Hz Tone Sensor	
	\$1,675.00
Model 721 Mono Dual Cartridge Playback	\$1,600.00
Model 722 Stereo Dual Cartridge Playback	\$1,800.00
SMC Clear Text Logging Package	\$5,500.00
Provides full logging capability to your MSP System, includes Encoding Data Terminal with CRT Display, Decode Electronics and Logging Printer	

CONTACT YOUR SMC REPRESENTATIVE FOR A SYSTEM QUOTATION AND CUSTOMIZED LAYOUT TO SUIT YOUR PARTICULAR NEEDS

States of: North & South Dakota; Ohio; Iowa; Wisconsin; Illinois; Indiana; Michigan; Nebraska and Minnesota

Robert M. Popke
 RADIO AUTOMATION SERVICES, LTD.
 850 Yale Lane
 Highland Park, Illinois 60035
 312-433-1253 or 312-433-1252
 (Chicago Area)

States of: California, Nevada; Utah; Arizona; Oregon; Idaho; Washington; Montana and Wyoming

Jerry Bassett
 BROADCAST AUTOMATION SYSTEMS, INC.
 P.O. Box 101
 Elk Grove, California 95624
 916-685-8660
 (Sacramento County)

States of: Colorado; New Mexico; Texas; Kansas; Oklahoma; Missouri; Arkansas; Louisiana; Kentucky; Virginia; West Virginia; D.C.; Maryland; North & South Carolina; Tennessee; Mississippi; Alabama; Georgia and Florida

Pete Charlton, Don Stafford and Bill Hoisington
 THE MANAGEMENT
 491 Elbow Court
 Weatherford, Texas 76086
 817-441-8052 or 817-441-8045
 (Dallas - Ft. Worth Area)

States of: New Jersey; New York; Pennsylvania; Massachusetts; Connecticut; New Hampshire; Vermont; Rhode Island; Maine and Delaware

Stephen S. Sampson
 SONO-MAG CORPORATION
 1833 W. Hovey Avenue
 Normal, Illinois 61761
 Telephone (309) 452-5313

For all other states, contact: NATIONAL and INTERNATIONAL MARKETING DIRECTOR
Stephen S. Sampson SONO-MAG CORPORATION
 1833 West Hovey Avenue Normal, Illinois 61761
 309-452-5313 Telex/TWX 510-352-2506

SONO-MAG CORPORATION
 1833 W. Hovey Ave., Normal, IL 61761

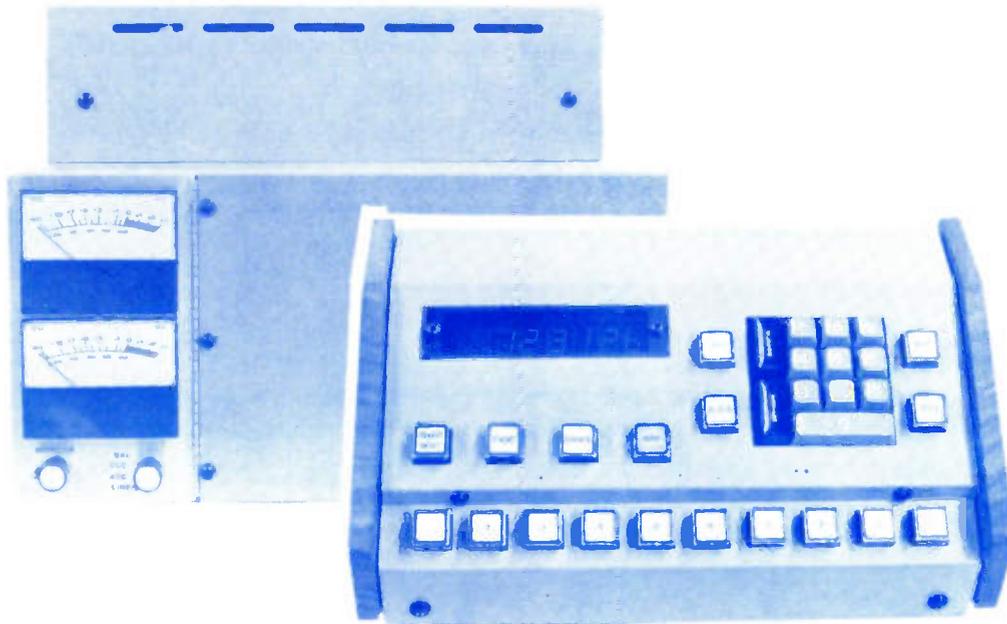
Phone 309-452-5313
 TWX No. 510-352-2506
 PRINTED IN U.S.A. 7/83 15M

The MSP (Music—Satellite Programmer)

from  the most trusted name
in broadcast automation

THE *PRACTICAL* PROGRAMMER FOR SATELLITE OR SYNDICATED MUSIC SERVICES AND FULL LIVE ASSIST OPERATIONS. INCLUDING FULL RANDOM ACCESS CONTROL FOR CAROUSELS AND OTHER MULTI-CARTRIDGE REPRODUCERS

- Provides the features found only in High Level Programmers costing thousands more, including, branching, linking, clear-text logging, delayed starting, under programming protection and special insert abilities.
- Featuring a deep 2,000 event memory with full sub-routine capability and 250 step user programmable clock.
- Directly interfaces to Satellite Receiver Tone Decoders



The programmer that works *with you, not against you*, the MSP from SMC fulfills the need for a *practical* full featured programmer capable of providing live assist functions as well as full automated operation of Satellite and conventional syndicated music services. With its exclusive 'Electronic Console' the MSP is designed to put full remote control at the operator's fingertips and transitions from live to automated operation can be made at the push of a button.

The MSP is a microprocessor controlled computer with all the ability and sophistication expected in any high level automatic programmer, including: Network Join on a real time basis, Backfill Control, full random access control of Carousels and multi-cartridge reproducers up to 99 trays, sub-routines, silence sense, built in 25 Hz filters, user programmable clock, full clear-text logging capability and external time flag for Network delay recording.

The MSP is designed to be connected to any standard piece of broadcast source equipment, Satellite Receivers and their tone decoders, Network Lines and Live Studios without cumbersome black boxes'.

MSP SPECIFICATIONS

Audio Switching Capacity:	10 Stereo Channels	Subroutines:	Up to 999 User Programmable
Audio Input Level:	Obdm	Timed Program Events:	250 User Programmable
Audio Output Level:	+ 18 dbm (clipping) 600 ohm Bal.	Time Flag:	One (external)
Frequency Response:	± 1 db 50 hz to 16 Khz	Time Clock:	Day-Hrs:Mins:Secs (Crystal Time Base)
THD:	Under 1% @ +8dbm	Network Channel:	May be jumper dedicated
Start System:	Dry Contact or TTL Pulse (AL)	Backfill Channel:	May be jumper dedicated
EOM System:	Dry Contact or TTL Pulse (AH)	Logging:	SMC System
Program Capacity:	2,000 Events	Control Head Cable:	10 feet Standard/20 feet Optional
Random Access Capacity:	10 Sources x 99 Trays	Power Supply:	117 or 240 VAC 50/60 Hertz
Silence Sense:	User adjustable 1-20 Seconds	External Port:	RS232C input at high baud rate

FUNCTION CODES

Program Codes (Controlled by Program Flow)

9000 -External Flag Code
9001 -Time Update (Program)
9002 -Auto Start
9003 -Auto Start and Start Next Event
9004 -Auto Stop
9005 -Fade and Start Next Event
9006 -Go into STOP-ON-ZERO mode
9007 -Return from STOP-ON-ZERO mode
902x -Link up to x events (1-9)
95xx -Insert source x into program flow

Clock Function Codes (Controlled by time)

00 -Activate External Flag
01 -Time Update (Program)
02 -Auto Start
03 -Auto Start and Start Next Event
04 -Auto Stop
05 -Fade and Start Next Event
1x -Fade and Start Source x
2x -Insert Source X
3x -Start Backfill Source x Sequence
4x -Start Next Source after x seconds
(1-9) and Cancel preceeding Event

SUBROUTINE CODES

7xxx -Jump to Subroutine xxx (7001 to 7999)
8xxx -Begin Flag for Subroutine

8000 -Return from Subroutine
8999 -Begin Under-Programming Sub

BRANCHING CODES

9200 -Always Branch
921x -Jump to Step Number xxx if day x
922x -Jump to Step Number xxx if not day x

Note: Branching Instructions require 2 events in program memory.

DELAYED START CODE

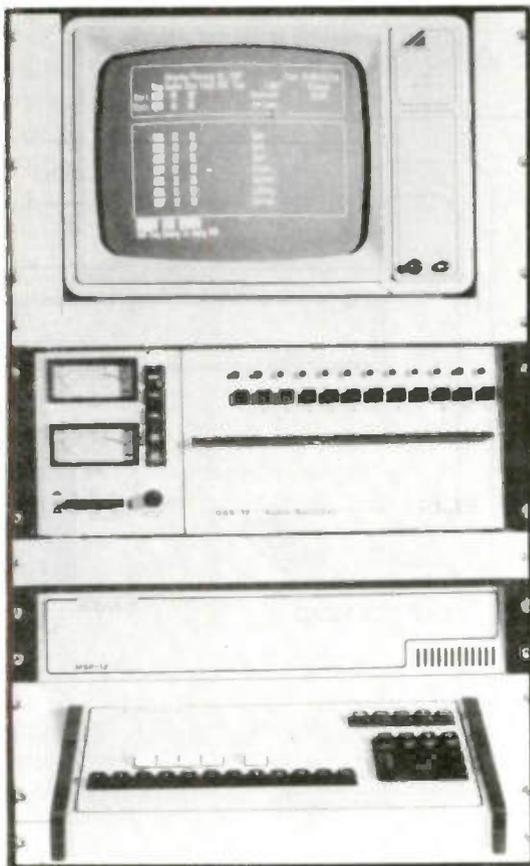
91xx -Delay by x seconds (1-9) Source x

The MSP-12 (Music—Satellite Programmer)

from  the most trusted name
in broadcast automation

THE PRACTICAL PROGRAMMER FOR SATELLITE OR SYNDICATED MUSIC SERVICES AND FULL LIVE ASSIST OPERATIONS. INCLUDING FULL RANDOM ACCESS CONTROL FOR CAROUSELS AND OTHER MULTI-CARTRIDGE REPRODUCERS

- Provides the features found only in High Level Programmers costing thousands more, including, linking, clear-text logging, delayed starting, under programming protection and special insert abilities.
- Featuring a deep 2,000 event memory, expandable to 4,000 events with full sub-routine capability and 250 step user programmable clock.
- Directly interfaces to Satellite Receiver Tone Decoders



The programmer that works with you, the MSP-12 from SMC fulfills the need for a practical full featured 'high level' programmer incorporating all the features of SMC's larger programmer packages. Complete with its full function video operating display the MSP-12 provides live assist functions as well as fully automatic operation of Satellite and conventional music services. With its exclusive 'Electronic Console' the MSP-12 is designed to put full remote control at the operator's fingertips and transitions from live to automated operation can be made at the push of a button.

Up to four control heads, each connected by fiber optic cables, can be used allowing system control from different operating positions. With its microprocessor computer the MSP-12 offers all the ability and sophistication expected in any 'high level' programmer including, Multi-Network joins on a real time basis, Backfill Control, full random access control of Carousels and multi-cartridge reproducers up to 99 trays, subroutines, silence sense, built in 25Hz filters, user programmable clock, full clear text logging capability and seven external time flags for Network delay recording or control functions. With an optional board the MSP-12 can control up to four AMCDS-1000A CD Multi-players providing fully automatic operation using compact discs.

The MSP-12 is designed to be connected to any standard piece of broadcast equipment, Satellite Receivers and their tone decoders, Network Lines and Live Studios without cumbersome black boxes.

The MSP-12 gives every broadcaster, Cable TV and background music operation a very able and cost effective programming control tool.

With its standard 2,000 event memory, expandable to 4,000, the MSP-12 can program a full broadcast day and then some. Events can be time updated or run in blocks and with SMC's exclusive SOZ command (stop-on-zero) the MSP-12 provides semi automatic live assist functions.

With its seven day clock, time instructions may be stored for network joins and we've even included 7 external time flags for delay recording as a standard feature. Time instructions include day-hours-minutes-seconds.

The MSP-12 gives the operator full manual control of up to 12 audio sources including live studios, satellite and conventional networks and remote lines.

Adjustable monitoring facilities are provided for the cue/audition buss and program line. VU meters allow indication of left and right levels of cue or program as well as stereo balance.

Adjustable time delay silence sense action allow for automatic operation advance, selectable on an

individual source basis. In the manual mode the silence sense is disabled.

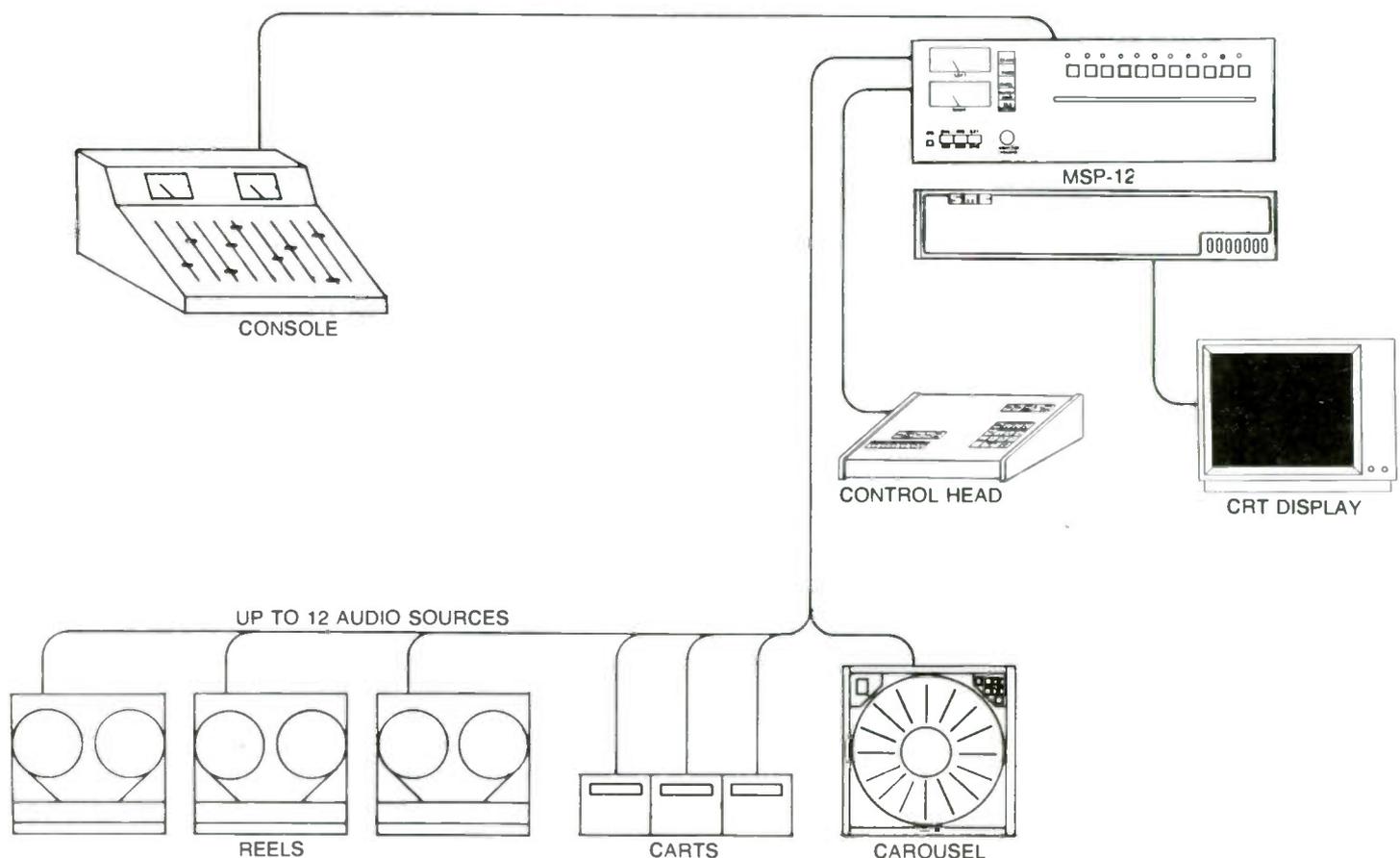
The MSP-12 is fully compatible with the SMC clear text logging system and provides RS232 serial ASCII output to directly drive a logging printer. With optional equipment the MSP-12 will log day, time, channel and tray data, label and any cartridge encoded information in both the manual or automatic mode. Events aborted by silence sense action will be noted.

Simplified user-installation of the MSP-12 is engineered into the unit and complete step by step instructions are furnished.

Carousels can be directly connected to the MSP-12 for full random access control without the need for external sub-programmers or expensive interfaces. Model 350RSB Carousels can also be used without modification.

The MSP-12 comes standard with 12 source boards which can be optioned to easily accept most standard source machines. Any cartridge tape machine with secondary (150HZ) cue tone capability can be used with the MSP-12.

BLOCK DIAGRAM OF TYPICAL LIVE ASSIST INSTALLATION



The MSP-12 has balanced outputs (600 ohms) that can be connected into a channel of the studio console.

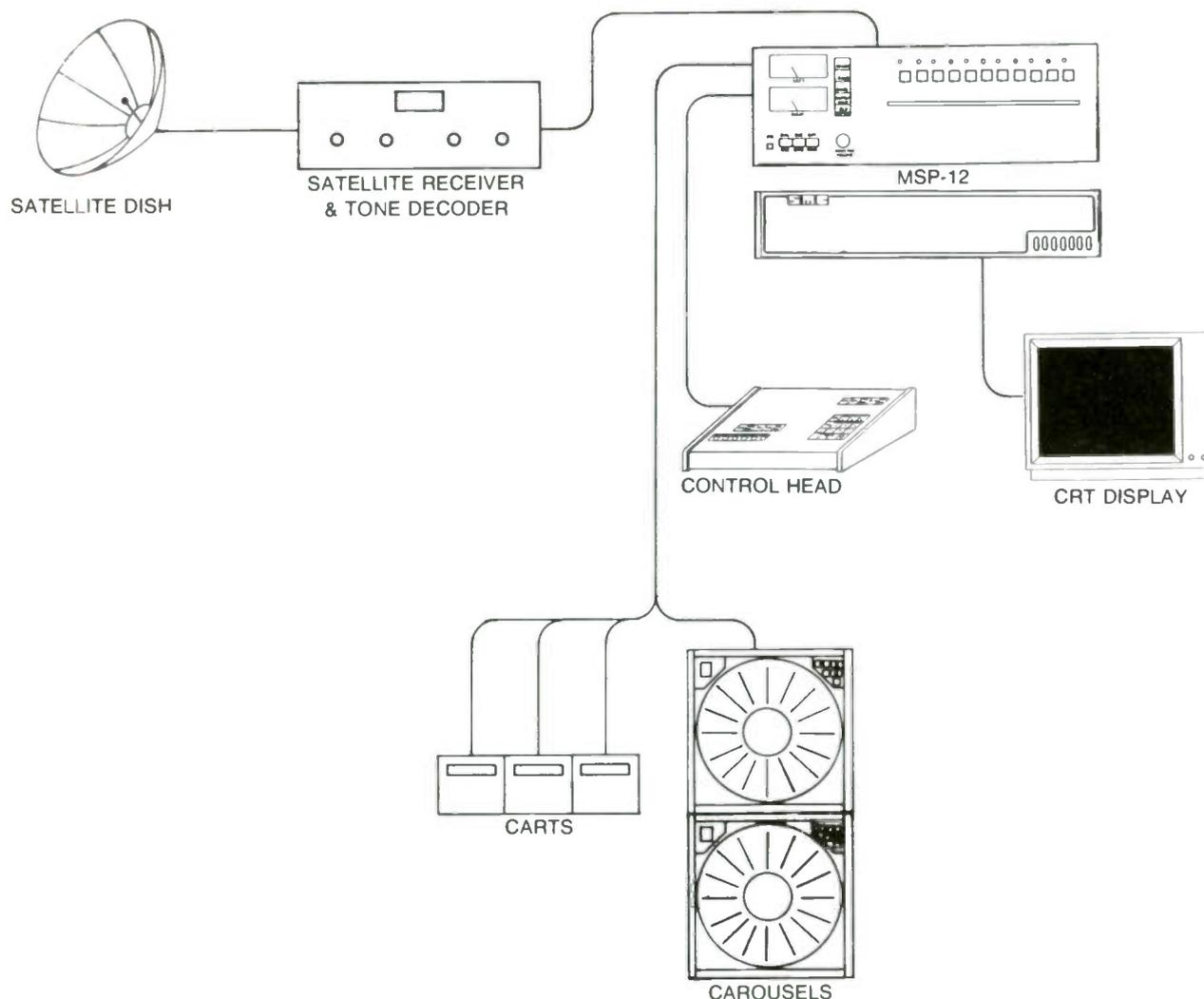
Operator controls on the MSP-12 include 12 individual "Start" buttons with Fade and Cancel buttons in the Manual Mode.

In the automatic mode, the MSP-12 will play the events programmed in its memory and update at any time command stored.

In the SOZ mode, the MSP-12 will play events programmed until a "zero" is detected, where it will stop and await the "start next" command.

With its multi-function and subroutine ability the MSP-12 can virtually run any format or sequence you could conceive (see specifications on back page).

TYPICAL SYSTEM FOR SATELLITE PROGRAMMING



The MSP-12, when connected to your Satellite Receiver with appropriate tone decoders, will run station IDs and custom material, provided by your Satellite service, superimposed on the music intros and outros as directed by the Satellite program service, through individual commands.

Satellite systems require the ability to program commercial announcements and single play sources either in conjunction with or independently from the Satellite audio. With its 12 source capability the MSP-12 will allow for an adequate number of audio sources as the station's growth requirements may dictate.

MSP-12 SPECIFICATIONS

Audio Switching Capacity: 12 Stereo Channels
Audio Input Level: 0dbm
Audio Output Level: +8dbm nominal; +18dbm (clipping) 600 ohm Bal.
Frequency Response: ±1db 50hz to 16Khz
THD: Under 1% @ +8dbm
Start System: Open Collector Transistor or TTL Pulse (AL)
EOM System: TTL Pulse (AH) or (AL)
Program Capacity: 2,000 Events (4,000 Optional)
Random Access Capacity: 12 Sources X 99 Trays
Silence Sense: User adjustable 1-20 Seconds

Subroutines: Up to 998 User Programmable
Time Program Events: 250 User Programmable
Time Flags: 7 External
Time Clock: DAY-HRS-MINS-SECS (Crystal Time Base)
Network Channel: Any
Backfill Channel: Any
Logging: SMC system - RS-232 Serial Output
Control Head Cable: Fiber Optic - 10 meters Standard (20M or 30M optional)
Power Supply: 117 or 240 VAC 50/60 Hertz
External Port: RS-232C Input at high baud rate

FUNCTION CODES

Program Codes (Controlled by Program Flow)

F00X- External Time Flag (1-7)
F000- Program Time Update (Sequential)
F100- Auto Enable (Return from Manual Mode)
F20X- Auto Start (Return from Manual Mode and start next event after 1-9 secs)
F300- Auto Stop (Return to Manual Mode)
F40X- Start Next Event (after 1-9 secs) and Cancel previous event
F50X- Delayed Start (1-9 secs) Will not step programmer at EOM (Talk over function)
F60X- Link up to X Events (1-9)
F700- Fade and Start Next Event
F800- Start Backfill
F999- Do Nothing Flag

Clock Function Codes (Controlled by time)

F000- Simple Time Update (Sequential)
F00X- External Time Flag (1-7)
F100- Auto Enable (Return from Manual Mode)
F20X- Auto Start (Return from Manual Mode and start next event after 1-9 secs)
F300- Auto Stop (Return to Manual Mode)
F40X- Start Next Event (after 1-9 secs) and Cancel previous event
F700- Fade and Start Next Event
F999- Do Nothing Flag
XXXX- Make Step XXXX Next to Play
JXXX- Insert Subroutine XXX and Make next to play

SUBROUTINE CODES

JXXX- Jump to Subroutine XXX (000 to 998)
BXXX- Begin Flag for Subroutine

RTN- Return from Subroutine Flag
J999- Begin Under-Programming Sub.

OPTIONS

Source Board Options

OPTION A - Balanced Input Option (not required for SMC standard sources)
Specify when required for external sources

OPTION B - EOM One-Shot Option (for use with TRANSTAR format which provides held contact)

OPTION C - SMC Logging Decoding (provides logging decoding for non-SMC cartridge source machines)

DPI-1 Circuit Board (Disc Programmer Interface) Expands MSP-12 to connect up to four AMCDS-1000A CD Multi-Players

Control Head Rack Mount Panel

CRT Rack Mount Panel

SONO-MAG CORPORATION

1833 W. Hovey Ave., Normal, IL 61761
Phone 309-452-5313

PRINTED IN U.S.A. 5/87/5M

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ALLIED
Broadcast Equipment

ESP-2 THE NEW GENERATION

In 1978 SMC introduced a totally new concept in program automation — The ESP-1. Designed to execute the most complex formats, while maintaining operational simplicity. The ESP programmers immediately became the standard by which competing systems were measured.

With thirty years experience in automation SMC has been the pioneer and technical leader in the industry.

- In 1970 SMC introduced The DP-1, the first digital programmer, which to this day has never been rivaled in the number of systems sold, 95% of which are in operation today.
- In 1975 SMC unveiled the industry's first microprocessor controlled programmer, The DP-2, which revolutionized the ability of automation programmers to perform the functions theretofore only possible in 'live' operations.
- 1978 saw the introduction of the second generation microprocessor controlled ESP-1 programmer.
- In 1980 the ESP programmer became available with a full video operating display.
- The MINI-PRO-1 was introduced in 1982 bringing microprocessor technology to a smaller, satellite and live assist programmer package.
- The MSP (Music-Satellite Programmer) was introduced in 1983, bringing features found only on larger programmers to the satellite programmed stations.

Now, The ESP-2 brings fiber-optic technology to the automation industry along with these important features:

- The ESP-2 control head and remote controls are fiber optic linked to the programmer permitting cable runs up to 300 feet without RF pickup.
- Seven day programmable digital clock including step addressable functions and eight external time flags.
- 4,000 event standard memory (expandable to 8,000) including full sub-routine ability.
- 20 individual video displays, all formatted in plain English for operator ease. ESP's exclusive Help Mode Functions permit the user to define each sources' operating limits.
- ESP is 20 source ready, no extra cost source cards are required. All sources are random access ready.
- The ESP-2 is priced thousands of dollars under any competing video based programmer.

Operation of the ESP-2 is simple and intelligent. Each display presents and calls for data in plain English, enabling operators to fully understand each function.

Examples of each operating mode are shown on the following pages.

Now and Next Data is displayed in each operating mode. This permits the operator to always have the important NEXT TO PLAY data available when the display is in other modes.

The 10 programmed steps following the 'NEXT' data are displayed when in the DISPLAY MODE.

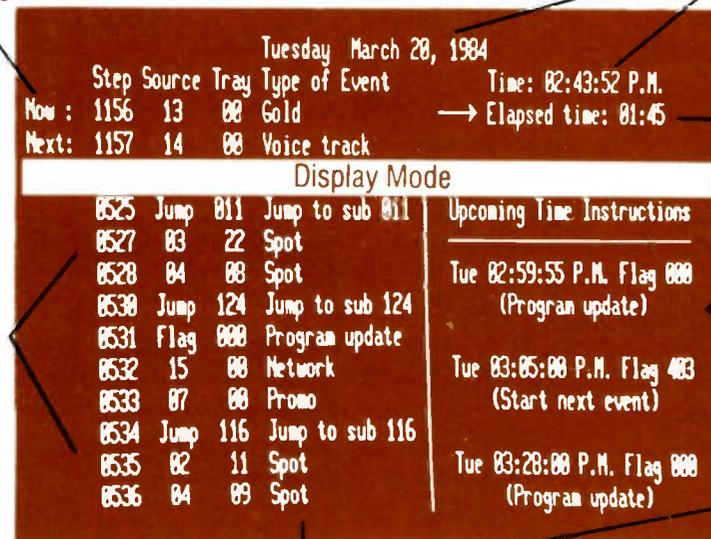
User selectable labels identify each programmed source and flag instruction.

Real Time Digital Clock Displays DAY - DATE - YEAR - HOURS - MINUTES - SECONDS.

Elapsed Time Display resets to zero each time a source begins "on air".

The next 3 time instructions are displayed when the programmer is in the AUTO MODE.

Special messages, such as linked, under-programmed and sub-routine calls appear at the bottom of the display.



Manual and Semi-Automatic functions are performed with the keys in The ESP-2 Live Assist Section.

Display Function Keys bring up each programming mode on the Video Display for programming, editing and operational functions.

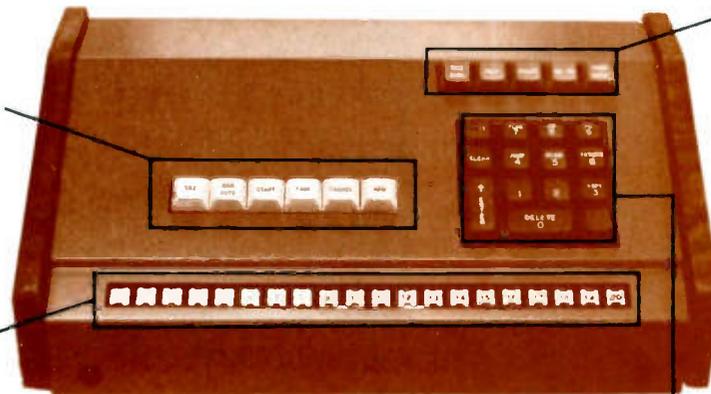
Remote Control Source access keys permit starting any individual sources from one or more operating positions.

Data is entered or edited in each operating mode through the Data Key Pad.

Divided into four operating clusters, The ESP-2 keyboard permits full system programming, live assist and remote control to be performed from any operating point.

Several control heads and CRT displays may be utilized in different station areas and connected to the programmer with a single fiber optic link.

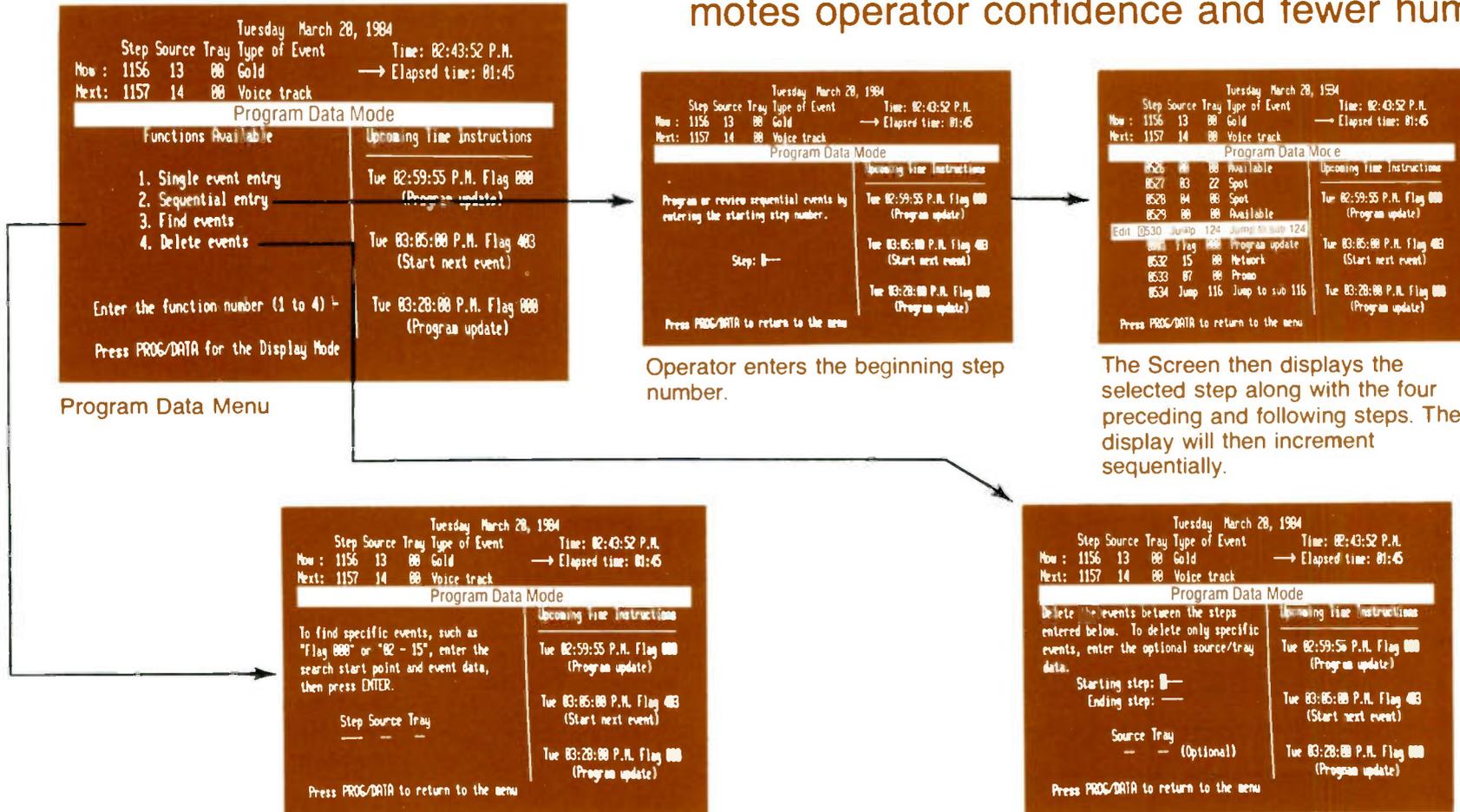
Note: Control head pictured is optional Remote Control Head. Basic head excludes remote source access and live assist keys.



ESP-2 VIDEO D

PROGRAM DATA MODE

Logical step-by-step programming in plain English promotes operator confidence and fewer human errors.



Operator enters the beginning step number.

The Screen then displays the selected step along with the four preceding and following steps. The display will then increment sequentially.

Any individual source, source/tray or flag stored in the program memory may be located and identified by step number.

To facilitate partial program or format changes any portion of the program memory may be deleted without effect on other memory data. Steps containing only specific source or source/tray data may be deleted.

ISPLAYS

TIME DATA MODE

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Time Data Mode

Functions Available	Upcoming Time Instructions
1. Enter events	Tue 02:59:55 P.M. Flag 000 (Program update)
2. Change or review events	
3. Delete events	
4. Set time and date	Tue 03:05:00 P.M. Flag 403 (Start next event)

Enter the function number (1 to 4)

Press TIME/DATA for the Display Mode

Tue 03:28:00 P.M. Flag 000
(Program update)

Time Data Menu

INSERT MODE

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Insert Mode

Enter the event to be inserted, then press ENTER. To delete an inserted event, enter 00 - 00.

Source Tray

Upcoming Time Instructions

Tue 02:59:55 P.M. Flag 000
(Program update)

Tue 03:05:00 P.M. Flag 403
(Start next event)

Tue 03:28:00 P.M. Flag 000
(Program update)

The exclusive SMC Insert Mode permits insertion of last minute or emergency material into the program flow without effecting other segments. Program will resume in proper sequence after inserted step has played.

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Time Data Mode

Program a timed event by entering the day, time and flag, then pressing ENTER.

Day Time Flag

Upcoming Time Instructions

Tue 02:59:55 P.M. Flag 000
(Program update)

Tue 03:05:00 P.M. Flag 403
(Start next event)

Tue 03:28:00 P.M. Flag 000
(Program update)

Press TIME/DATA to return to the menu

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Time Data Mode

Change or review timed events by entering the starting time, then pressing ENTER. To change or review specific events, also enter the optional flag data.

Starting time:

Flag: (Optional)

Upcoming Time Instructions

Tue 02:59:55 P.M. Flag 000
(Program update)

Tue 03:05:00 P.M. Flag 403
(Start next event)

Tue 03:28:00 P.M. Flag 000
(Program update)

Press TIME/DATA to return to the menu

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Time Data Mode

Delete the events between the times entered below. To delete only specific events, also enter the optional flag data.

Starting time:

Ending time:

Flag: (Optional)

Upcoming Time Instructions

Tue 02:59:55 P.M. Flag 000
(Program update)

Tue 03:05:00 P.M. Flag 403
(Start next event)

Tue 03:28:00 P.M. Flag 000
(Program update)

Press TIME/DATA to return to the menu

Time instructions are entered by day and actual time in hours, minutes and seconds along with the corresponding flag code. Instructions for all days are entered only once, for all seven days of the week.

Time instructions may be reviewed and edited at any time. Those instructions for a given day or between certain hours may be reviewed selectively.

Time instructions and those with specific flags may be deleted without effecting other time instructions contained in The ESP-2 time memory.

GO TO MODE

Tuesday March 28, 1984
 Step Source Tray Type of Event Time: 02:43:52 P.M.
 Now: 1156 13 00 Gold → Elapsed time: 01:45
 Next: 1157 14 00 Voice track

Go To Mode

Enter the step number of the event to be made next to play, then press ENTER.

Step:

Upcoming Time Instructions

Tue 02:59:55 P.M. Flag 000
(Program update)

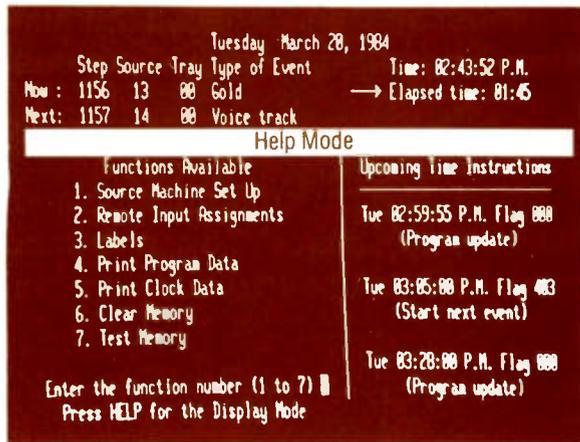
Tue 03:05:00 P.M. Flag 403
(Start next event)

Tue 03:28:00 P.M. Flag 000
(Program update)

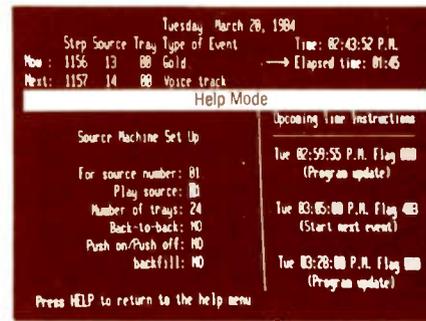
Press GO TO for the Display Mode

The Go-To Mode allows the operator to change the step that is next to play. The first valid (non-zero) step following the step specified will become the next step to play and the display will return to the Operating Mode.

HELP-MODE



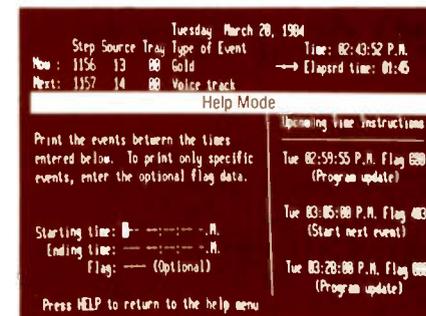
The HELP MODE, an SMC exclusive, permits the user to command The ESP-2 to execute programming instructions as the station's format may dictate. In case of a source machine failure, another source may be substituted without the necessity of changing countless memory instructions. The various displays demonstrate the versatility of The Help Mode.



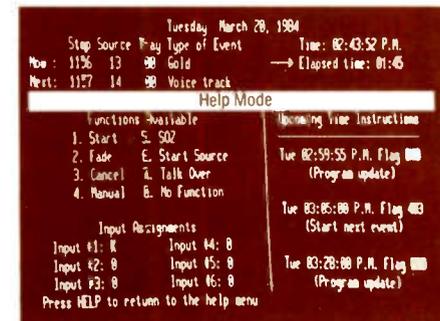
Source Machine Set Up allows the programmer to define the operating limits for each audio source. It can also be used to re-route instructions in case of temporary machine failure.



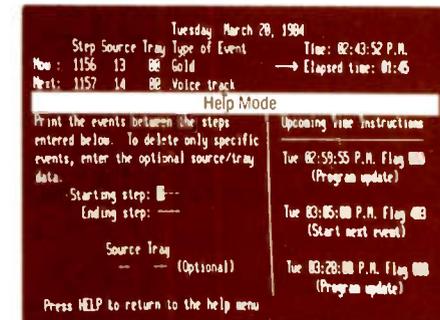
Any label from this display may be assigned to any source number. The selected label will appear with the assigned source in each display.



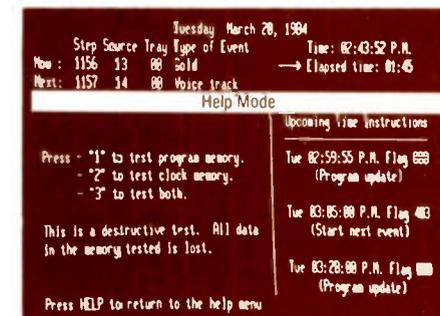
Any portion of the time memory can be printed or displayed along with flag data contained in those Instructions.



Remote Inputs can be enabled to perform special function from the menu above.



All or any portion of the program memory can be printed out on optional printer or displayed on the display screen. This is a most useful tool in checking programming instructions.



As a diagnostic tool, The Memory Test function will display any memory location numbers which are defective and will indicate on which memory IC that step is contained for ease of servicing.

Offering the industry's most cost effective programming tool, the ESP-2 will operate any format, be it fully automated, satellite fed or live assist, in any combination.

The ESP-2 4,000 event memory (expandable to 8,000) allows programming days in advance. With its 682 step, seven day, user programmable clock, time instructions for up-dates, network joins or external time functions are performed with ease. Time instructions and display include day-hours:minutes:seconds.

The ESP-2 gives the operator full manual control of up to 20 audio sources for live assist operation or in semi-auto operation. The SOZ command (stop on zero), another SMC exclusive, permits running blocks of steps in the semi-auto mode allowing any combination of live and automatic operation the user desires.

Network joins are made at precise times and two or more networks may be programmed with the ESP-2, with or without backfill. Network delay recording using any one of the eight external time flags may be reliably performed with the ESP-2.

Adjustable monitoring facilities are provided for the cue/audition buss and the program line. VU meters allow indication of left and right levels of cue buss or program line, as well as stereo balance.

Adjustable time delay silence sense action allows for automatic program advance, if desired. In the manual mode, the silence sense is disabled.

Fully compatible with the SMC clear text logging system, with optional equipment, the ESP-2 will log time, channel and tray data, label and any cartridge encoded information in either the manual or automatic modes. Those events started by external commands, delay instructions as well as those events aborted by silence sense action are noted on the log.

The ESP-2 is designed to be directly connected to SMC Model 450 Carousels and Model 350RSB Carousels without interfaces. (Older model Carousels or non BCD versions may require interfaces)

Each ESP-2 automation system is custom designed for each customer's particular application. Your SMC representative can advise you and configure a system to meet your requirements.

As an option, your system can be fully checked out at your location by an SMC factory field engineer who will train your station staff in programming and maintenance techniques.

The ESP-2 will replace outdated programmers and with appropriate interfaces your existing source equipment, in most cases, can be utilized.

ESP-2 SPECIFICATIONS

FUNCTION CODES

PROGRAM CODES (Controlled by Program Flow)

- F000 - Simple Time Update (Program)
- F00x - External Flag (1-8)
- F100 - Auto Enable (Returns from Manual Mode)
- F20x - Auto Start after x (0-9) seconds and start next event
- F300 - Auto Stop (Return to Manual Mode)
- F40x - Start next event after x (0-9) seconds and cancel previous event
- F50x - Delayed Start — 0-9 Seconds will not step programmer at end of EOM
- F60x - Link up to x events (1-9)
- F700 - Fade and start next event
- F800 - Start Backfill

CLOCK FUNCTION CODES (Controlled by Time)

- F000 - Program Time Update
- F00x - Activate External Flag (1-8)
- F100 - Auto Enable (Return from Manual Mode)
- F20x - Auto Start (Return from Manual Mode and start next event after x (0-9) seconds
- F300 - Auto Stop (Return to Manual Mode)
- F40x - Start next event after x (0-9) seconds and cancel previous event
- F700 - Fade and start next event
- F8xx - Start and insert into Program Flow Backfill xx (1-20) sequence
- F9xx - Insert Source xx (1-20) into Program Flow and make 'Next To Play'
- xxxx - Make step xxxx (0000-7999) 'Next To Play'

- Memory Capacity: 4,000 events (expandable to 8,000)
- Word Length: 16 Bit
- Sub-routine: Up to 999-user programmable
- Control Capacity: 20 sources x 99 trays - BCD arming
- Audio Switching
 - Capacity: 20 stereo channels
- Audio Input Level: Odbm
- Audio Output Level + 18 dbm (minimum) 600 ohm Bal.
- Frequency
 - Response: ± 1 db 50 hz to 16 khz
 - THD: Under 1% @ + 8 dbm
- Silence Sense: User adjustable 1-20 seconds
- Timed Program
 - Events: 682 User Programmable
- External Time Flags: 8
 - Time Clock: Day-Hours-Mins-Date-Year (Crystal Time Base)
- Network Channel: Any source
- Backfill Channel: Any source
- Logging: SMC System
- Control Head Cable: Fiber-optic to 300'
- Power Supply: 117 or 240 VAC 50/60 Hertz
- External Port: RS232C input at high baud rate
- Video Display: 17 lines x 72 characters

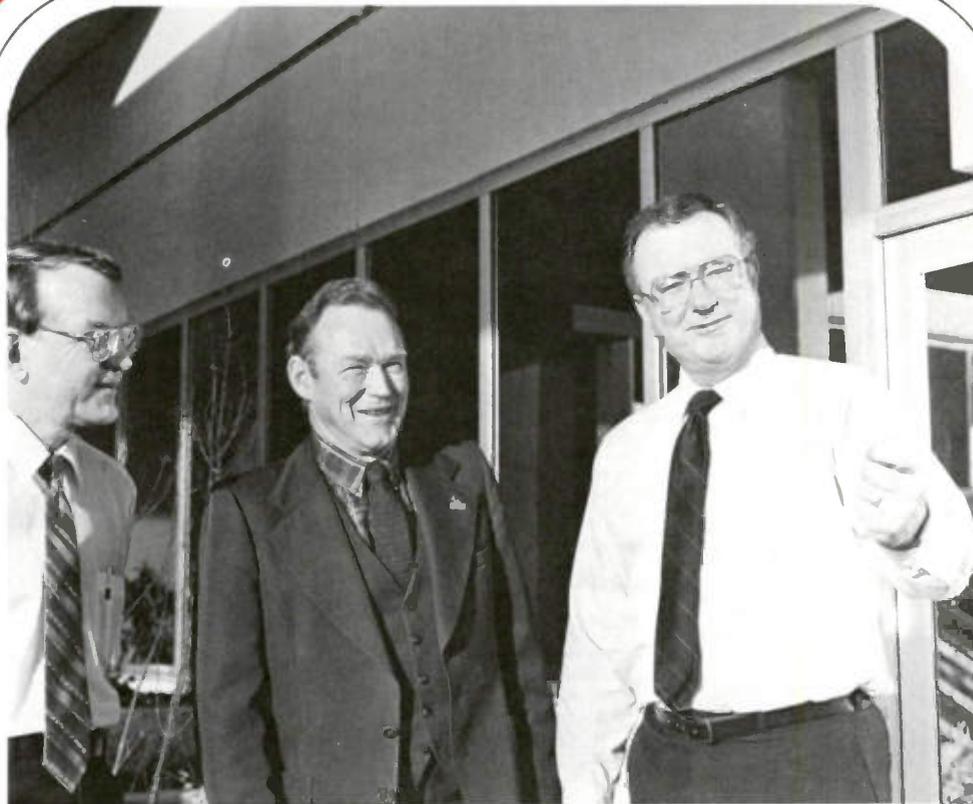
SUBROUTINE CODES

- Jxxx — Jump to Subroutine xxx (000-999)
- Bxxx — Begin Flag for Subroutine xxx
- RETURN — Return from Subroutine xxx
- B-999 — Begin Under-Programming Subroutine

SONO-MAG CORPORATION
1833 W. Hovey Ave., Normal, IL 61761

Phone 309-452-5313
TWX No. 510-352-2506
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IGM NEWS



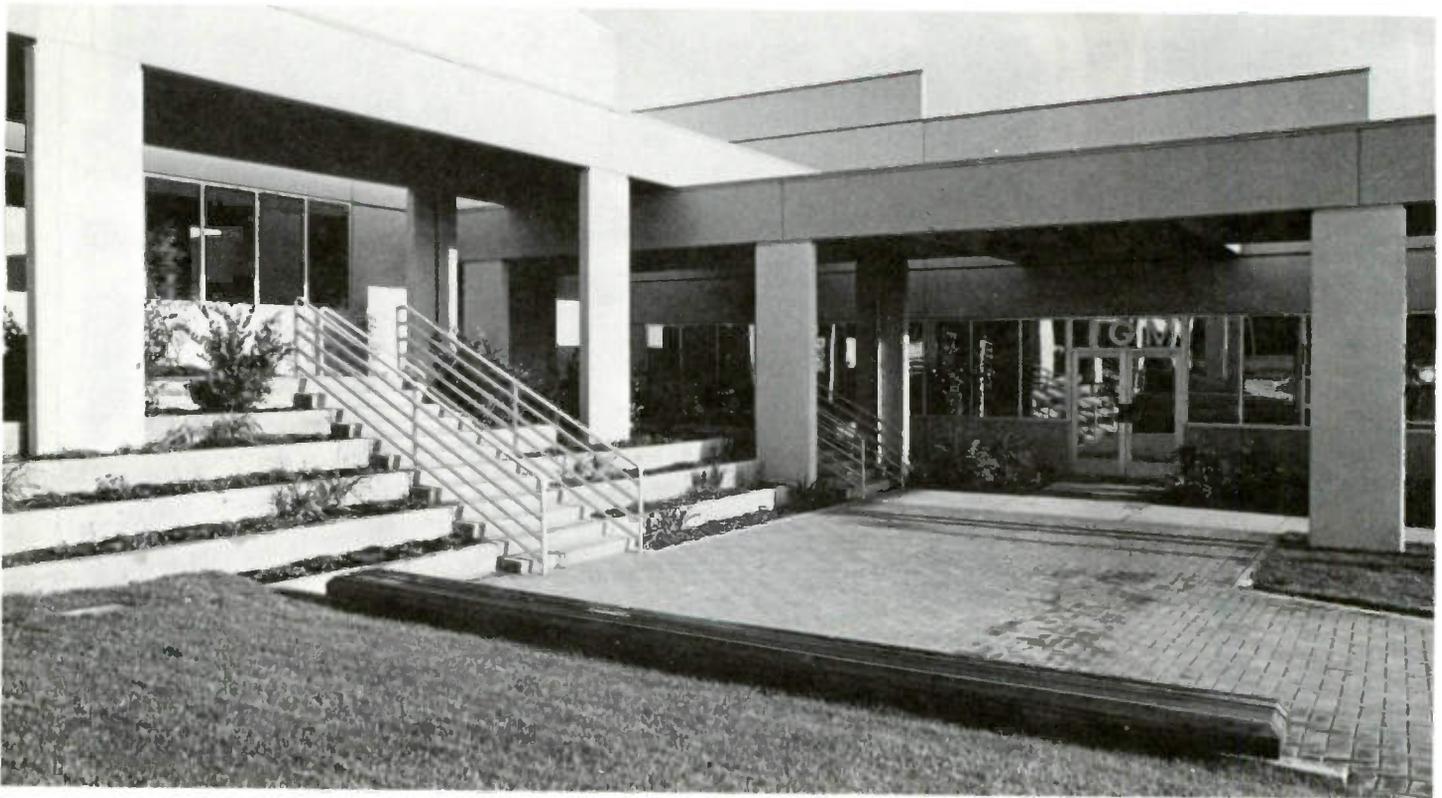
Almost sixty years after its birth, IGM Communications today retains its position as Number One in the production of automated playback systems for radio (recently serving television stations, too). The IGM INSTACART and GO-CART have racked up an unbeatable record for reliability and audio playback quality. Redesigned with new electronics and a handsome new case — the INSTACART still is the standard of the industry since its introduction in 1969.

The production of Instacarts, Go-Carts, and new IGM System Controllers has enabled IGM to move into sophisticated new quarters in 1985, at the Cordata Complex of Bellingham. To keep you informed, we are reinstating the IGM NEWS. ...READ AND ENJOY...

In This Issue:

March, 1986

**Voice of America Updated
IGM's Modern Plant
New Controllers: IGM-EC & IGM-SC
Bits & Pieces**



IGM's Modern Plant

In its brand new building IGM installed the latest Computer-Assisted Design (CAD) devices for circuit design and hardware production. To maintain the close tolerances required of quality systems, many machine tools used in metalworking are computer-controlled, too.

What such control means to the customer is greater reliability of IGM systems, plus easier troubleshooting in the field. Often, problems can be solved simply by inserting a new component, a one-minute repair.

For electronic design, IGM uses an Intel Development System with support units such as in-circuit simulators and logic analyzers. On a CRT the design engineer has the ability of working out designs visually, of trying out ideas on screen where they can be modified or reworked. Jim Wolniakowski, Director of Engineering, says:

"Instead of actually wiring up a circuit board, only to find that wires have cross-talk or there is physical interference between components, our computer engineer lays out a circuit and plays 'what if' to better the design."

"On a CRT the design engineer has the ability of working out designs visually, of trying out ideas on screen where they can be modified or reworked."

To change a circuit layout is as simple as erasing a line on the graphic display and re-entering new data. The in-circuit analyzer tells the operator what will happen if this layout is followed, giving outputs, etc. Since the circuits are analyzed before they become real boards, they fail less often and can be designed more densely to perform more tasks.

In the drafting and production section, CAD speeds drafting processes, spinning off sub-assembly drawings from the main drawing far faster than the old, laborious, measure-

and-draw-it method. Instead of cutting and wasting expensive metals, the production department's machinists receive drawings that already have been computer-analyzed to be sure components fit, that holes are precisely aligned.

Precision production means fewer surprises during assembly with resultant savings. On Instacart, for example, one can appreciate that, since the cartridge only moves 1/16 inch to contact the capstan drive shaft, the components must not deviate even fractionally to become 1/4 inch or 1/32 inch or the unit would malfunction.

Since radio station engineers today are not expected to be electronic engineers, especially in small town locations, the reliability of IGM's automation and simplicity of maintenance must originate at the factory. This is now and has been the aim of IGM Communications ever since it began original manufacture (not merely assembly of components) of broadcast station equipment in the late 1960's.

IGM's success and longevity has been aided by its understanding of the individual radio station's problems. In 1928, the original owner of IGM, Rogan Jones, Sr., bought stations KXRO Aberdeen, and KVOS Bellingham,

"IGM's success and longevity has been aided by its understanding of the individual radio station's problems."

Washington. By the mid-1950's Jones (an idea man who spawned notions as fast as his aides could cope) organized International Good Music, Inc., forerunner of IGM Communications, to create and "bicycle" reels of music to subscribing radio stations around the world. Sound tracks included smooth commentary and announcements so skillfully produced that listeners in Podunk Junction or City Radio truly thought the announcers were live from the local station.

When better equipment was required for automation of playback units (reels, cart devices, etc.), IGM invented control systems. Eventually the manufacturing arm became a division.

In the late 1960's an ex-aerospace designer, Ernie Burkhart, designed the revolutionary INSTACART. For the first time broadcasters could instantly access any of 48 broadcast cartridges, randomly and back-to-back in any order. Updated in 1983, the Instacart never has been seriously challenged and is as prized today as ever. So reliably has the unit performed that out there somewhere are #3, #4, etc. (KGMI Bellingham recently surrendered #1 and #2 for updated Instacarts, even though they were in daily use!).

Following the untimely death of Rogan Jones, Jr., and the disarray caused by this sudden event, Ernie Burkhart went on with the IGM product line after selling off the International Good Music syndicated service. The firm's name became IGM Communications, strictly an equipment manufacturer.

A new era of increasingly imaginative automation ensued. GO-CART was added and is a current favorite of many stations. It's a modestly priced 42-cart or 78-cart playback system, providing swift access to its cartridges and high quality audio playback. Both Go-Cart and Instacart are used for music as well as commercials, PSA's, etc. A 24-cart Go-Cart came along. Various control systems were successful and improved with the growing microchip technology: RAM, MARC VII, IGM 770, BASIC III, and now the newest IGM-SC and IGM-EC for live assist or automated control.

After Burkhart had a heart attack in 1980 and sold the company (he remains a consultant), IGM Communications faltered only briefly until the addition of Jim Wells as General Manager (now President) propelled the firm solidly forward again in 1981. Throughout the period IGM's product excellence prevailed.

Veterans today with IGM Communications include popular sales personality, Carl Peterson, the irrepressible redhead whose booming laugh and wide grin are as familiar as National Association of Broadcasters shows . . . Nick Solberg, a remarkably versatile designer/engineer/salesman who started with IGM in 1965 . . . Fred Harkness — if he hasn't sold it, it doesn't exist . . . and Rick Sawyer, formerly with radio station WHUE Boston.

IGM Communications will showcase its state-of-the-art cartridge playback units and the IGM-SC and EC controllers at the NAB Show, Dallas. Come by and say hello, whether you're in the market for anything or not. WE WANT TO MEET YOU.



INTRODUCING . . . TWO NEW CONTROLLERS

You Never Had A Better Controller

At last, automated control or flexible live assist that gets on with the job, that manages your station, large or small.

True sophistication is beautifully simple . . . like a sleek hydroplane, a rocket, a fashion designer suit. Everything needed is there, nothing added that is unnecessary.

That's the kind of controllers IGM is introducing this year.

For a station that has a sophisticated format, live assist needs, network affiliation, and wants to use Instacarts, there's the IGM-SC, the **SOPHISTICATED CONTROLLER**. If your operation has no need for live assist or Instacarts, the IGM-EC, **ECONOMICAL CONTROLLER**, gives you walkaway time with minimal investment.

Here's what you get:

- The software to handle the commands for controlling your programming. You select the computer, an IBM-PC or compatible for the IGM-SC; a Kaypro, Tandy 1000, or other lower-priced computer for the IGM-EC.

- An audio switcher to facilitate the switching and control of the audio sources.

Your system can be updated as the state of the art progresses. Your software can be modified to accommodate new ideas. Buy your computer "off the shelf" and get local service.

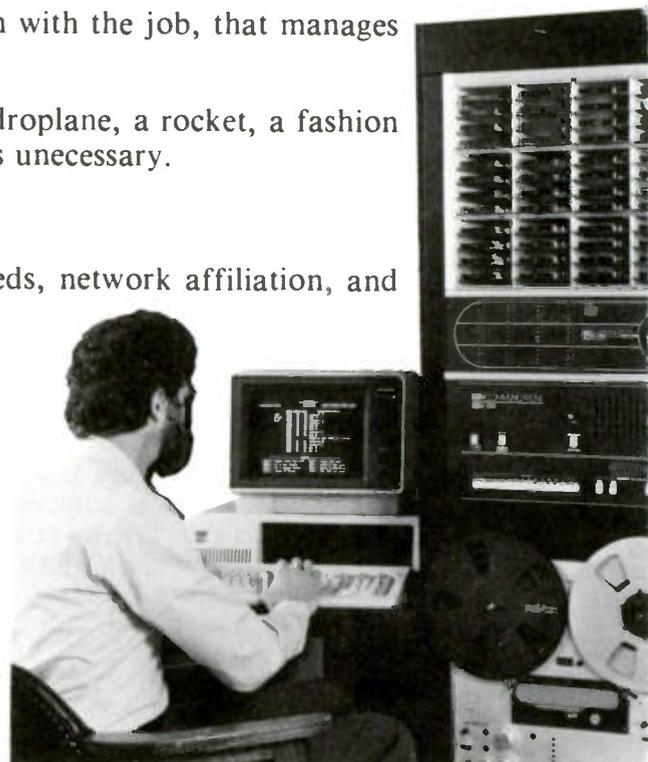
If your station uses another IBM (or Kaypro, Compaq, etc.), you have an automatic backup unit in house, one that can be used for programming the disk for later insertion. If your broadcast terminal fails, just transfer software to the other computer until repairs are effected.

You only buy what you need. It's like trucking . . .

*You wouldn't send a huge van to carry a few items,
you'd send a pickup . . . right?*

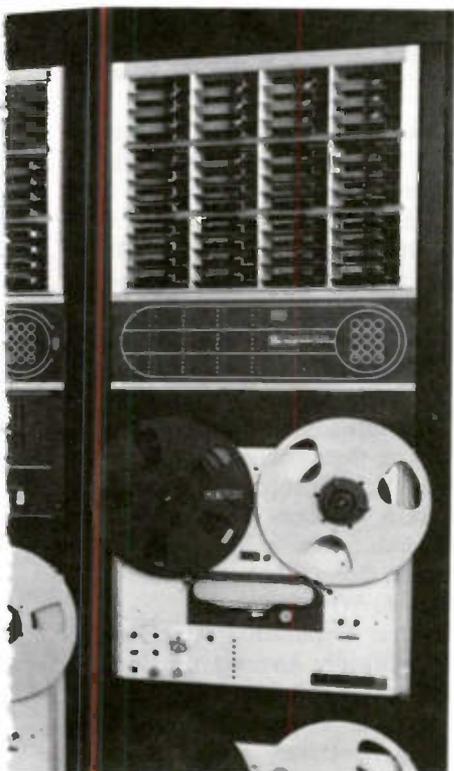
IGM-SC — IGM-EC! WHICH SIZE IS FOR YOU?

Call us about your requirements, or see us at the NAB, Booth #3378.



ROLLERS TAILORED TO YOUR STATION

choice . . . Or A Harder One



IGM-SC - THE SOPHISTICATED CONTROLLER

This system handles full automation or live assist. Using special software on an IBM-PC or compatible, the controller manages the simplest or most complex tasks. You can have remote monitors, remote controls, operate live, temporarily automated, totally automated, whatever your needs are. You control 16 audio sources which may be expanded to 32 audio sources.

Let's take a typical busy station agenda:

You open up the day with live assist for AM drive time. Using the system as a storage device for commercials, PSAs, etc., (on Instacarts or Go-Carts) — you keep the pace moving live and pertinent to the day's weather or traffic conditions, local interests and commentary.

Mid-AM is a more quiet time, live is not required, automation is the answer.

Your noon newscast is live. Again the system is used as a storage device for items to enhance the live commentary.

Back to automation in early afternoon, you now have time to do production, change the format, program the SC, etc.

PM drive time is again live assist, keeping motorists abreast of the latest traffic and local news, and commentary.

During evening hours, you switch to an automated satellite program, maybe the Larry King Show, then back to music 'Satellite or Syndicator', PSAs, commercials. *Fully* automated, a one-person night operation.

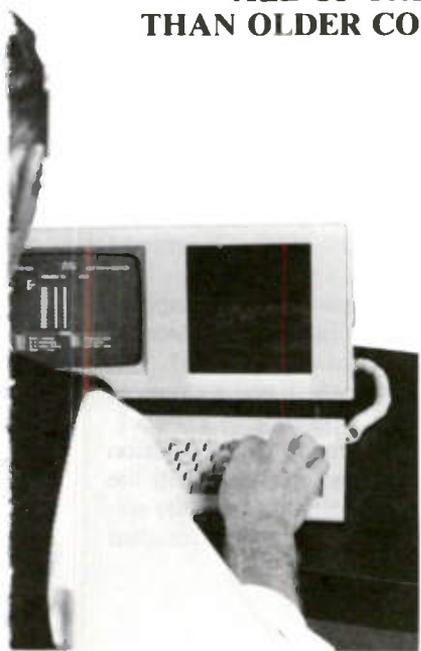
The SC provides for total English verification logging, 24 hours a day.

You have the ability to talk to other computers in your station.

You can advance-program one full day on individual disks. These are then inserted and await an automatic program load command from the computer. You also can prepare variable day-long formats on a different or back-up computer, place them on disks, then - shortly before air time - update them for timeliness. All this without interfering with on-air programming.

Through remote terminals, you can call up the programming from home, make program changes or check the status of the SC without physically going to the station.

****ALL OF THIS FLEXIBILITY WITH GREATER CAPABILITIES IS LESS EXPENSIVE THAN OLDER CONTROLLERS. TRULY A SOPHISTICATED CONTROLLER, THE IGM-SC.****



IGM-EC - THE ECONOMICAL CONTROLLER

IF YOU HAVE A RELATIVELY SIMPLE FORMAT, YET NEED WALKAWAY TIME WITH POSITIVE PROGRAM CONTROL, THIS IS IT!

For hardware, all you need is an economical computer like Kaypro, Tandy 1000, etc., one that uses Basic language. Make your own deal with your local computer store.

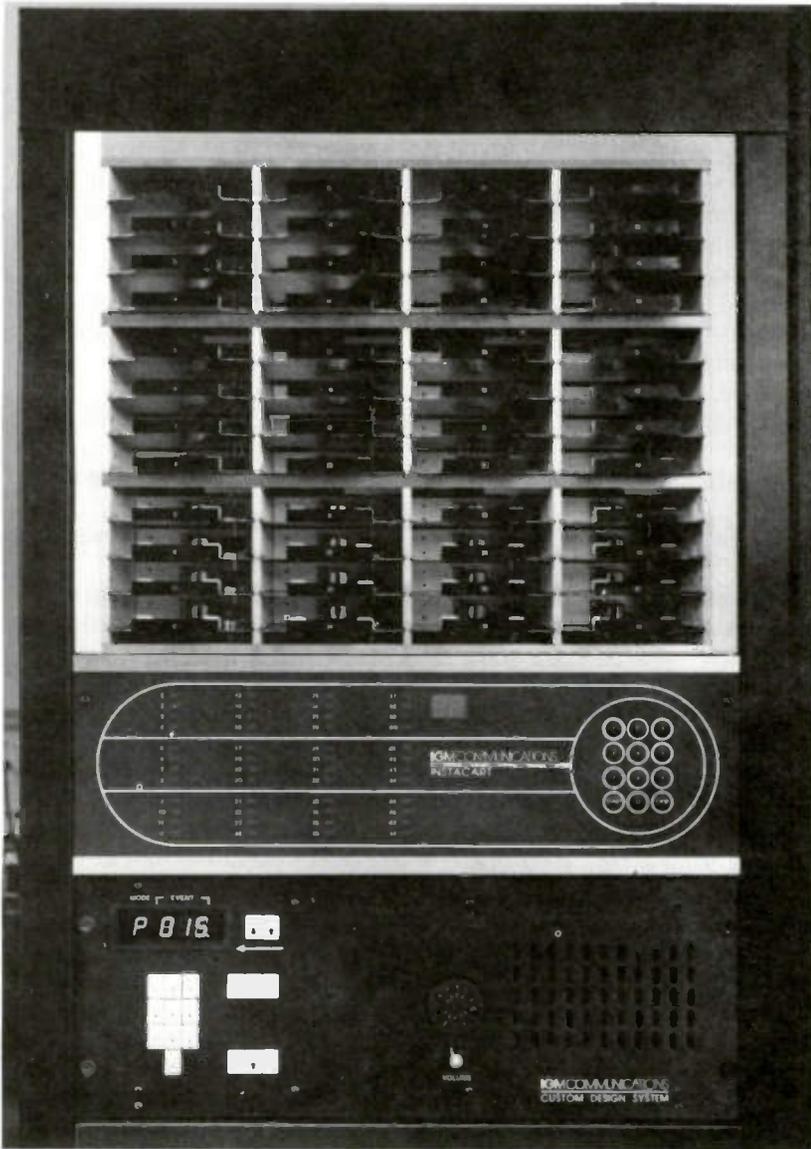
The switcher handles up to 12 audio sources and includes interfacing for Go-Carts. This means you could operate:

4 reel to reels	2 Go-Carts
A network feed	2 live studios
2 single cart machines	1 news feed

— Probably more than you currently need, so you have expansion room.

DO YOU REALIZE YOU COULD HAVE THE ABOVE HARDWARE AND THE SOFTWARE TO OPERATE IT, A TURNKEY AUTOMATION SYSTEM, FOR LESS THAN \$500 PER MONTH!

Voice of America Updated



The Voice of America Broadcasting Studios in Washington, D.C., represent a mosaic of the world's countries. Separate small studios broadcasting 41 foreign languages and English are contained in the beautiful art-deco structure only one block from the nation's capitol. Staff members, often born in the country to which they are broadcasting, make up a miniature United Nations.

When the VOA wanted to update its news handling methods, IGM Communications won a contract for streamlining the system. One key to an efficient operation was the In-stacart, giving random access to any of its 48 cartridges, which made it easy to file and distribute incoming news actualities.

The Voice of America began broadcasting in 1942, during World War II, as part of the Office of War Information (OWI), created to transmit American news and features to allies and enemies overseas. The broadcasts continued during the post-war Cold War.

In 1946, the OWI disbanded, leaving to the State Department its staffs at 76 overseas missions, a daily 7000-word wireless bulletin to 40 locations, a Russian-language magazine called *America* with a circulation of 50,000, 26 cultural centers with 45 branches, and the Voice of America, which operated via 36 transmitters in 25 languages.

It operated under the United States Information Agency (USIA) after 1953, in 1978 was renamed the International Communication Agency, and in early 1983 changed again to United States Information Agency (USIA). Reflecting the various administrations' policies, as well as the philosophical trends of the times, USIA and VOA directors have included such well-known communicators as Edward R. Murrow, Carl T. Rowan, John Chancellor, John Daly, and today Charles Z. Wick.

Naturally, the VOA has emphasized American viewpoints; and was specifically directed by Congress in Public Law #94-350 to tell the *truth*, to explain our motives, to give a clear picture of American life, supporting American foreign policy and selling America as a good country. Typical of the freedom in this nation, the broadcasts could include bad as well as good points of this country, and controversial views were sanctioned.

Although programming concentrates on news and features, there are also music broadcasts, selections from symphonies, church music, music festivals, rock and jazz. The jazz airings that originated in the 1960's are so popular worldwide that, according to Downbeat Magazine, Willis Conover's *Music U.S.A. Show* over VOA has an estimated 100 million listeners. When Conover goes abroad, he is greeted as a famous star. Way back in 1967, Communist Czechoslovakia alone had 31 jazz clubs.

However, hard news is the most vital broadcast. To improve the programs, at President Reagan's urging, the Voice of America received significant appropriations in 1983, for overhaul of obsolete equipment, among which was a captured *World War II* German transmitter still operating in Europe!

Design criteria were formulated for many modernization projects, and IGM Communications was selected from the bidders to do the work that led to an automated actuality service in the newsroom. Here's the way the news was handled "before" and "after":

In the central newsroom of VOA bits of data, audio actualities from ten seconds to three minutes long, come in from all over the world, a constant stream of information. Formerly the actualities were placed on big reels, including as many as 50 cuts on one reel, a continuous recording of about four hours.

As soon as a reel was completed and a new one started, the news center sent a "billboard" or listing of what was on the recorded reel to each of the 42 VOA foreign language news desks via computer or teletype. Forty-two duplicated reel-to-reel tapes also were made and delivered to them.

The foreign language editor then determined which cuts were of interest and processed them for playing on the air.

By the time the actuality was ready for broadcasting, considerable time already had elapsed and the news was growing old. Shelf life of such actualities was only a few hours or days, and the language editor might use all of his requested cuts or none. Thereafter the reels of tape just sat gathering dust in the 42 newsrooms until a messenger swept through to retrieve them for reuse. Still another problem was that it was inconvenient and slow to disseminate emergency bulletins for immediate use from the central newsroom to foreign language news desks.

The updated system design evolved over about two years as a concept called "Sound on Demand." Today the system installed by IGM Communications works like this:

THE TRANSMIT SYSTEM: The central news editor has two 48-tray mono Instacarts and an IGM-developed computer and video terminal for communication with the individual news desks.

News actualities are received by the central newsroom and each is carted, rather than placed on reels. The cartridges are then placed in Instacarts. The news editor enters in his computer terminal the order in which the cartridges will be fed to foreign language news desks — a random order, not necessarily in order of importance.

He transmits that menu or billboard to all of the 42 news desks over a video screen, as well as on a teletype. For example, #3 is a quote from President Reagan, #10 an item about the Premier of Russia, #82 concerns a hijacking, etc. With two Instacarts, there are 96 possible actualities, and the system may be expanded to 192 positions.

Now the news editor pushes the START button to initiate transmission. Cartridge #1 is played to all the news desks, then cartridge #2 and so on, until all the actualities have been played. Then the playback repeats until the time of the next update — usually every hour. At update time, the editor transmits a new billboard adding the latest actualities.

With this system the central news editor can interrupt the feed any time to send a bulletin of a major news break, like a

plane crash, volcanic eruption, etc. The emergency bulletin is heralded by an ALARM to all news desks.

Meanwhile at the individual 42 news desks, the foreign language editor monitors the RECEIVING PART of the installation. The system consists of a handsome wood rack (designed by IGM), containing a chassis attached to feed lines from the transmitter, in turn connected to a VOA-supplied reel-to-reel recorder.

The foreign language editor has received his billboard from the news editor. He determines that he wishes to receive certain cuts or audio actualities and puts a fresh tape on the reel-to-reel unit. He enters on a key pad the ones he wishes to receive, e.g. #10, #15, #38, #1, #86, or every one on the list.

As each actuality is transmitted from the central newsroom, a DTMF touch tone number precedes it, followed by a synthesized voice announcing the menu number assigned to that cart. At the receiving end, if the foreign language editor has entered that number via key pad, the reel-to-reel unit is actuated to record it, turn-

ing itself off after the recording. This continues until all actualities requested have been recorded. If the foreign language editor has requested all of the actualities, all are recorded (identified via synthesized voice). When the transmission is completed, an alarm alerts the editor.

At this time the editor removes the reel and, from that, makes the cartridges to be used in the broadcast. Usually the English language cart will be played, somewhat muted, while the editor gives the translation as a voice-over. The editor might elect to translate first and play the actuality by cartridge alone.

VOA's new system thus avoids the necessity of tying up so many reel-to-reel tapes, speeds the news dissemination, and saves money.

The Voice of America broadcasts via transmitters at sites all over the world, including Greenville, North Carolina and an assortment of relay stations in various world locations.

New opportunities are opening for the VOA. Now it feeds music via satellite to several cable companies in Europe as well as news and feature programming. A standard IGM Basic III controller plus Go-Carts and reel-to-reel units, located in Washington, D.C., is handling these needs.

According to the U. S. News & World Report of October 7, 1985, the struggle for the minds and opinions of world populations is being waged vigorously not only by the Soviets, who broadcast in 81 languages, but by China, Egypt, West Germany, and others.

Using the more efficient news dissemination system installed by IGM Communications, the Voice of America is better able to present the U.S.A.'s viewpoints to more listeners.

“VOA’s new system thus avoids the necessity of tying up so many reel-to-reel tapes, speeds the news dissemination, and saves money.”

Wells Heads IGM



Dynamic and personable Jim Wells leads IGM Communications today into increasing international business.

A graduate of the University of Washington with a B.A. in marketing, Wells has managed diverse companies. He was with Henry Broderick & Co., predecessor of Coldwell, Banker & Co.; and worked for six years with Dean Witter

Company and the securities industry. He became Director of Marketing for an international firm, Moduline International Corp., and has been involved with other marketing endeavors. In 1981, Wells was named President of IGM, a Trillium company.

He is currently on the Board of Directors of Washington Council for Technology Advancement, of Washington Technology Center at the University of Washington, and of Mount Baker Bank, Bellingham.

The Trillium Corporation is involved with major property developments including the Cordata Complex, a new shopping mall for Bellingham, and the Resort Semiahmoo, a huge recreational development at Blaine, Washington. Trillium's owner, David Syre, formerly an attorney, is a Bellingham area native.

Sawyer Named Ops Manager

Late in 1985, Rick Sawyer was appointed Operations Manager of IGM Communications. He is assisting the company in scheduling, product introduction and customer relations.

Sawyer started in radio as an announcer at WAUK Waukesha, Wisconsin, in 1970. During that time he got his first-class license and started engineering work. He served WAXY Fort Lauderdale, a RKO station, as Chief Engineer and was moved to Boston in 1974 to babysit the new IGM 750 control system at WRKO-WROR. Two years later he was carried off cross-town to WCOP Boston, a Plough Broadcasting station.

So familiar by then with IGM's equipment he transferred to IGM's Eastern Division, remaining in Boston from 1980 to 1985.

In June, 1985, IGM called him to Bellingham to give a fresh perspective to the design, layout and construction of IGM's product line. He also admits with a laugh, "I'm not so sure they didn't transfer me to cut down my huge phone bill!"

Rick and his wife Taous, with their two young children, are finding the outdoor life of Washington state delightful. They like to camp and bicycle in the scenic countryside.

IGM personnel are particularly shocked at the recent death of Danny Coulthurst of radio station KGMI. Danny worked many years for IGM and was extremely popular with everyone in the industry. We mourn his passing.

IGM COMMUNICATIONS

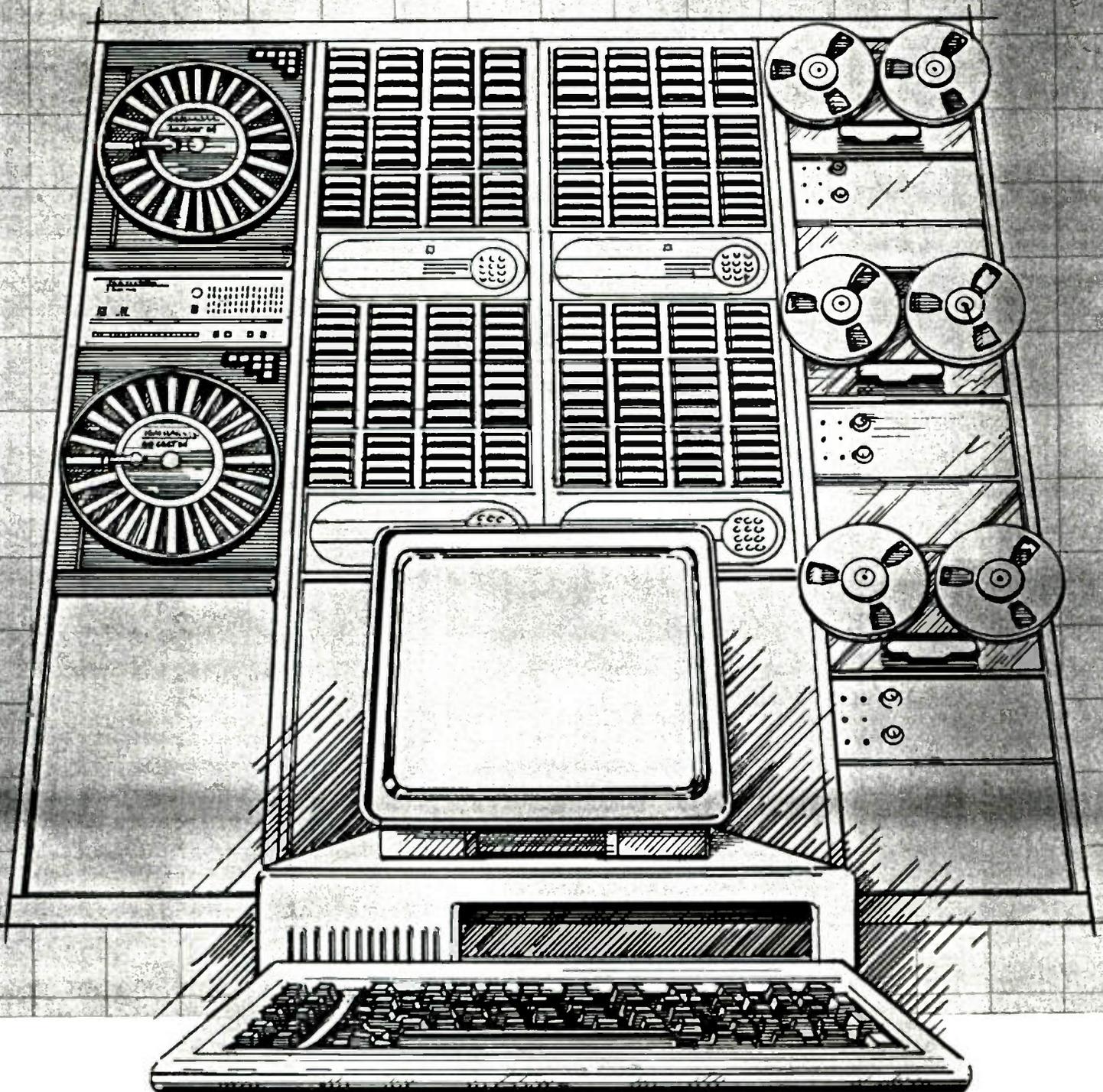
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Bellingham, Washington 98226

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4612 UNIVERSITY AVENUE
PO BOX 55188
MADISON, WI 53705

IGM-SC

The Sophisticated Controller



BOISE GOES DIGITAL

MEI's latest Digisound installation has been completed by Hall Electronics at KLCI Boise, Idaho.

USA Broadcasting purchased KFML Nampa, Idaho after the station went dark and moved it to Boise. Paul Springer, VP bought new state of the art equipment and leased space in Bosie's most prestigious new office building.

On September 15, 1987, KLCI went on the air with Transtar's oldies Format. The station is using a Digisound automation system with 2 disk drives providing 120 minutes of monaural audio storage. The on air studio has a remote keyboard and CRT. for live periods. A printer for English text logging is placed just outside the studio window. A second keyboard and CRT. are in the production studio. The controller is a Format Sentry unit with a PC.

The station operates live from 6 am - 9 am and from 4 pm - 7 pm. The spots are play from Digisound. From 7 pm to 12 midnight Jazz tapes are played and Digisound supplies the spots. During the remainder of the day and from 12 midnight till 6 am the programming is from satellite with Digisound airing all spots.

Dean Alexander, Operations Director, said "I've been in radio a long time and used a lot of state of the art equipment..I mean good cart machines, but nothing compares to this (Digisound). Automation always sounded automated. We have people at other stations in town who can't believe were automated. It's so live sounding."

"The walk-a-way times are fantastic! We leave it along from 7 pm to 6 am each day and on weekends from 6 am Saturday thru 7 am Sunday. The only reason we stop it on Sunday morning is to play some taped programs, otherwise we could let it run till monday morning."

For more information call:
Dave Collins 312-295-2606
Microprobe Electronics Inc.
910 Sherwood Drive, Unit 19
Lake Bluff, Il 60044

October 15, 1987

IGM COMMUNICATIONS

GO CART

IGM GO

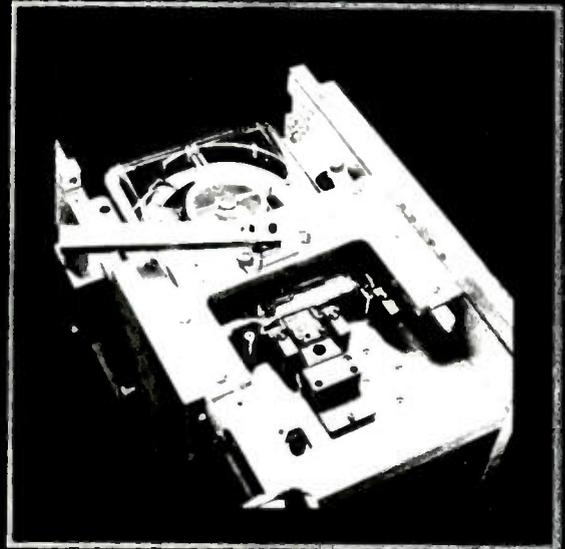
BI-DIRECTIONAL SEARCH TIME LESS THAN 8 SECONDS

Bi-directional drive logic, unique to the Go-Cart, has reduced the travel time between cartridge selections to no more than 8 seconds. These unusually fast times are a result of the Go-Cart's microprocessor control which automatically determines the shortest route to the next required cartridge, and rotates the cartridge carrier in that direction.



EXCEPTIONAL AUDIO QUALITY

A patented mechanism gently slides the cartridge onto a rigid play table constructed of 1/2" thick precision-milled aluminum plate. The cartridge is then released and left in contact with the reproduce head, totally supported from front to back thus matching single cart playback performance. This makes the Go-Cart ideal for both stereo and mono high demand applications.



RUGGED CONSTRUCTION FOR LONGER LIFE

The power supply normally operates at about 1/3 of its rated capacity. Switches throughout are solid state Hall effect, zero bounce. Circuit components are mounted on Mil Spec fiberglass boards with gold plated contacts. The mechanical chassis is constructed from heavy weight precision milled aluminum and steel.

EASY LOADING TRAYS

Carrier Trays are of one-piece, precision injection molded plastic known for its high impact resistance and long term stability.

SELF-DIAGNOSING ERROR DETECTORS

Go-Cart's operational ease is further complemented by self-diagnosing error detectors—yet another unique feature of the IGM unit. In the event of a malfunction, Go-Cart's microprocessor logic actuates an "error" light on the front panel—a great assist to the operator.

- Bi-Directional Search
- Microprocessor Based Design
- Exceptional Audio Quality
- Rugged Construction
- Easy Loading Trays
- Self-Diagnosing Error Detectors

- CART 24



GENEVA DRIVE ASSEMBLY

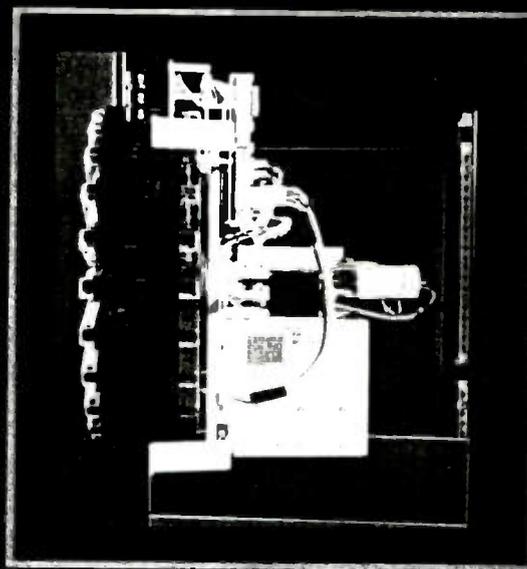
Cartridge trays are permanently attached to a revolving disk, which has gear-like teeth around its periphery. The drive design is totally different from others in the industry - a well proven method used in precision machines such as motion picture cameras.

This deceptively simple, rugged drive system using a two-pin mechanism known as a Geneva Drive, moves the carrier assembly clockwise or counter-clockwise by engaging the disk's teeth. The Go-Cart can't skip a tray; every cartridge is assured a positive position. Each time the Go-Cart moves, the mechanism latches and locks the tray in place.

RANDOM OR SEQUENTIAL MODE

When used in the "random select" mode, the Go-Cart allows full random access control to all 24 trays. Upon command, the Go-Cart immediately rotates via the shortest route to select the required cartridge. The loading mechanism moves the cartridge onto the play table, and plays upon receiving a start command. When finished, the cartridge is unloaded, returned to its tray and the carrier is rotated to the next programmed tray number and the new cartridge is loaded.

When operated in the "sequential" mode, the Go-Cart quietly and efficiently loads the first cartridge onto the play table, and plays it upon command. When re-cued, the cartridge is unloaded and placed back in its tray and the Go-Cart rotates to the next cartridge. The new cartridge is then loaded and the unit awaits the next start command. If any tray position is left empty, the Go-Cart immediately advances to the next filled position.



EASY MAINTENANCE

To service or perform routine maintenance on the Go-Cart, simply remove the mask and two screws. The entire unit swings out on hinges permitting easy access and observation. The Go-Cart operates normally while open for service.

- Random or Sequential Modes
- Quiet Operation
- Integrated Hardware and Software
- Geneva Drive
- State-of-the-Art Components
- Easy Maintenance

S P E C I F I C A T I O N S

Source Audio Inputs (12):

10k bridging, unbalanced
0dB nominal input level for reference.

Audio Gain:

Unity.

Output Channels:

Left, Right and Mono Program.
Left, Right Monitor.

Headroom:

Greater than 24dB above nominal input level of 0dB.

Host PC Package

- 1) PC, 128K (MS or PC — DOS) with keyboard
- 1) Monochrome CRT
- 1) Monochrome display and parallel printer adaptor
- 1) 360K, 5¼" floppy disk drive with drive adaptor
- 2) RS232C asynchronous communications adaptors

Frequency Response:

20Hz to 20kHz, 0dB to -1dB, 600 ohm balanced load.

Noise:

-75 below 0dB output, 600 ohm balanced load, 20kHz bandwidth with one source on, input level 0dB, input grounded.

Total Harmonic Distortion:

Less than 0.15% at 1kHz, 20dB input level, 600 ohm balanced load.

Cross Talk

-65dB below 0dB output into 600 ohm load, Left to Right, Right to left with 0dB input level at 1kHz.

```

>>SYSTEM ON LINE<<          --ON AIR--          >>NEXT ROTATION EVENT 2400<<
                                04:59:00P
LAST   EVNT  SOURCE TRAY  ACTION
ON-AIR 0198   06   10
NEXT   0200   08   00
        0201   01   00
        0202   02   00
        0203   03   00
        0204   --   --   DO NEXT EVENT AT 04:59:45P
        0205   08   00
        0206   06   11
        0207   05   19
        0208   01   00
        0209   02   00
        0210   03   00

COMMANDS
CTRLB - Manual return from music
CTRLM - Go to menu display
CTRLP - Go to program display
CTRLU - Update RS devices
    
```

```

--PROGRAM--
09:00:25A          >>NEXT EVENT 0002<<
EVENT SOURCE TRAY  ACTION
0001 07 12
0002 05 23
0003 06 09
0004 -- -- MUSIC
Edit 0005 -- -- BACK AT 09:15:00A
0006 07 10
0007 05 11
0008 06 01
0009 -- -- MUSIC
0010 -- -- BACK AT 09:30:00A

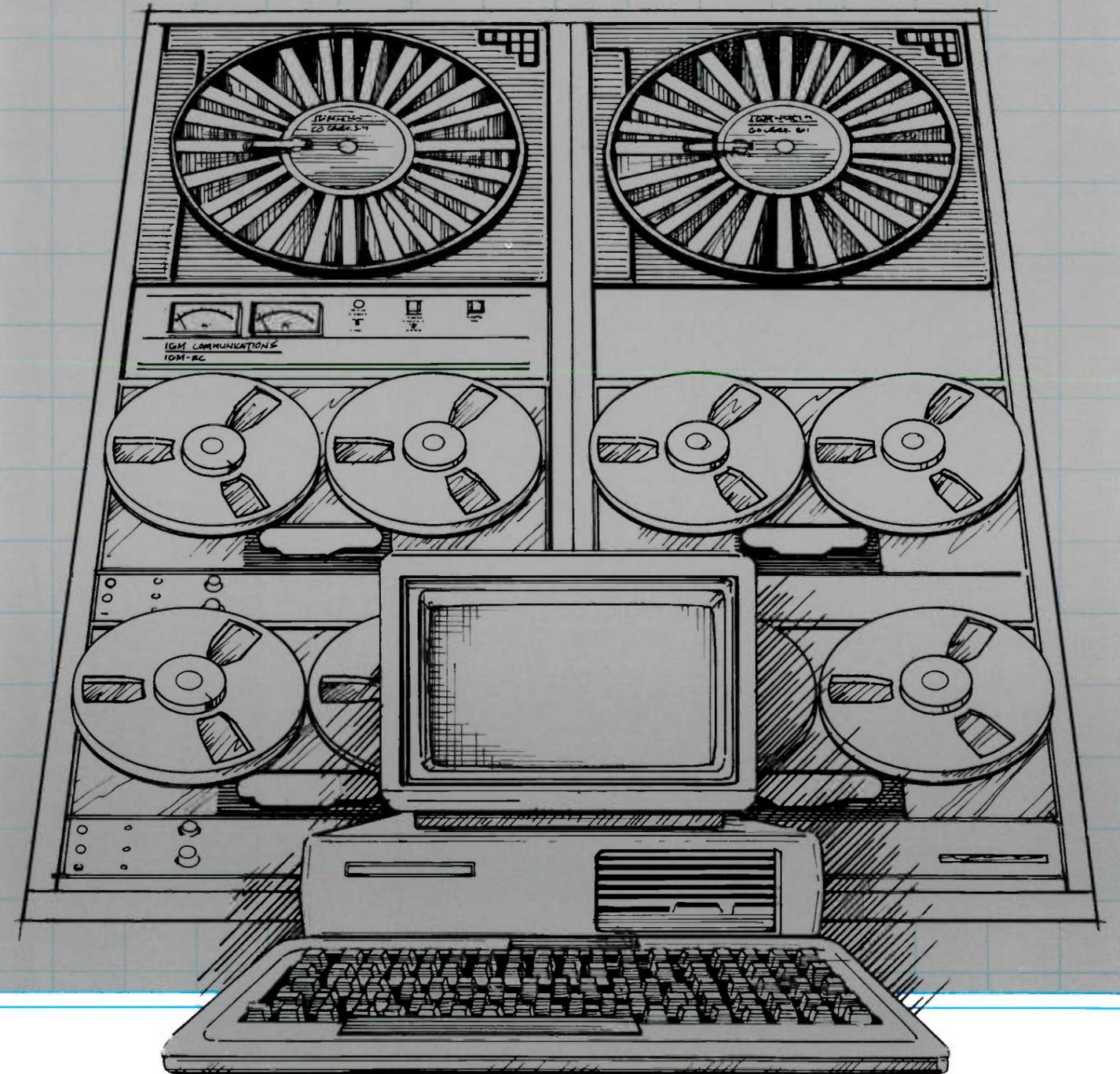
COMMANDS
CTRLX - Exit the edit mode
CTRLC - Change displayed event
CTRLA - DISK LEAD AT
CTRLB - BACK AT
CTRLD - DO NEXT EVENT AT
CTRLP - FORMAT
CTRLG - GO TO FORMAT AT
CTRLJ - JUMP TO EVENT
    CTRLX - Delete displayed data
    CTRLL - LINK TO NEXT EVENT
    CTRLD - SYSTEM ON AT
    CTRLP - PLAY THEN STOP
    CTRLR - MUSIC ROTATION
    CTRLS - STOP READY AT
    CTRLT - RETURN
    CTRLU - UPDATE TO NEXT EVENT AT
    
```

Simple broadcast language commands make the IGM - EC versatile enough for small and medium stations. The system software is an advanced, structured, high-level systems programming language operated by the host PC.

This display is typical of the IGM - EC while in full or partially unattended automatic control.

IGM-EC

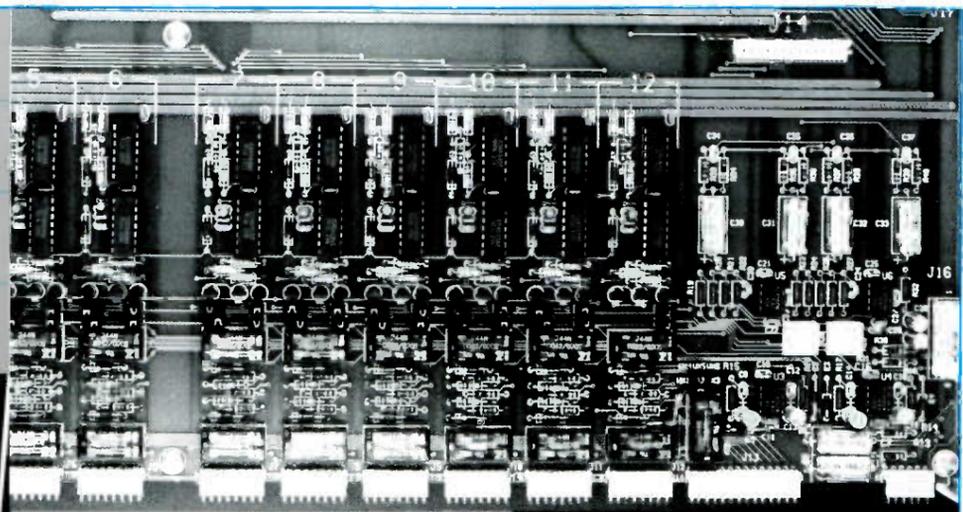
The Economical Controller



IGM COMMUNICATIONS

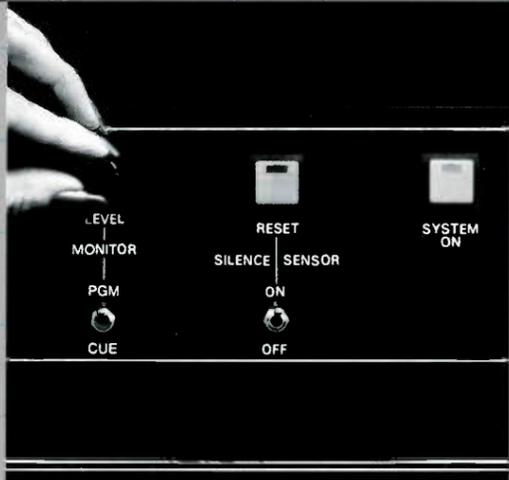
282 West Kellogg Road, Bellingham, WA 98226 - U.S.A. (206) 733-4567 — Telex 704983
Features and Specifications are subject to change without notice.

IGM Communications has always enjoyed a reputation for P.C. boards of the highest quality — and the EC Main Board is no exception. Computer-aided design ensures efficient layout and high reliability.



Operator interface with the host PC, for system control and programming is easily accomplished with simple commands.

IGM Go-Cart 24's are perfectly matched for control by the EC.



Simplicity of operation is typical of the EC with switching and monitoring elements placed in logical locations on the front panel. Reliability is built in to every system by IGM Communications.

S Y S T E M S

F E A T U R E S

The IGM-EC fits a 5¼" rack space and operates under the control of the selected host PC. Micro-processor control and command features are coupled with switching to provide trouble-free operation.

Left and right VU meters allow precise level setting and monitoring of the PGM (Program output) lines or source CUE bus. The silence sensor can be switched on or off, or reset under operator command. A system on indicator lights when the system is "On-Air".



VU METER
Left and right audio (PGM or CUE) will be displayed on the VU meters.

MONITOR SWITCH
A single switch controls whether PGM (Program output) or CUE audio will be supplied to the monitor amplifier and displayed on the VU meters.

MONITOR LEVEL
Used to adjust the monitor amplifier outputs.

SILENCE SENSOR
Silence sensor function is controlled by an ON/OFF switch, and a lighted alarm indicator is provided for operator reset.

- Economical
- Special music rotation file
- 12 audio sources
- 2500 events
- Use with Go-Cart 24's
- Random select
- Optional log printer
- Floppy disk memory backup during operation
- RS422 interface with selected host PC
- Produced by IGM Communications, a manufacturer with a longstanding record of performance.

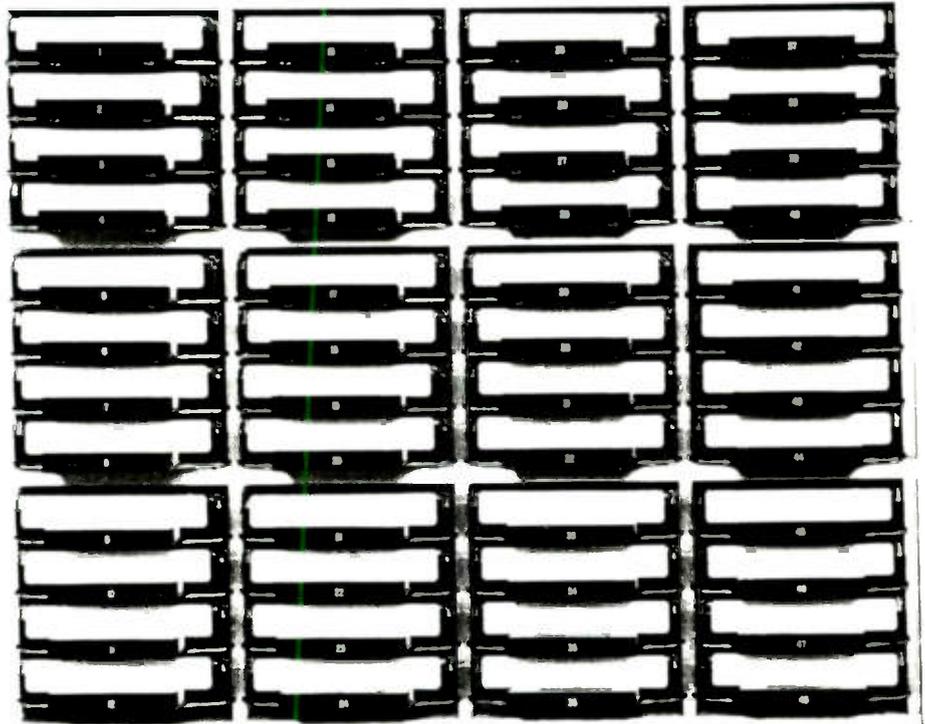
Specifications

Equalization	NAB 1975 standard.
Frequency Response:	Meets or exceeds 1975 NAB standard.
Amplifier Distortion:	0.5% THD or less measured in accordance with 1975 NAB standard.
Wow & Flutter:	0.15% or less DIN weighted
Output Impedence:	600 ohm balanced
Output Level:	+24dBm maximum before clipping.
Tape Speed:	7.5ips, direct drive hysteresis synchronous motor.
Timing Accuracy:	0.1% or better.
Cue Signals:	NAB primary 1 kHz, NAB secondary 150Hz.
Logging Data Signal:	Data (Cue) track output level adjustable from -10 to +10db, 10k ohm, unbalanced.
Mounting:	Standard 19" rack mount. Swings open for service.
Diagnostics:	Standard, complete system diagnostics included for detailed fault location and system checks.
Power:	120VAC, 60Hz, 100 watts. Special Oder: 120VAC, 50Hz or 240VAC, 50Hz.
Dimensions:	19" wide, 19" high, 24" deep.
Shipping Weight:	100 lbs.

Note: Specifications subject to change without notice.

IGM COMMUNICATIONS

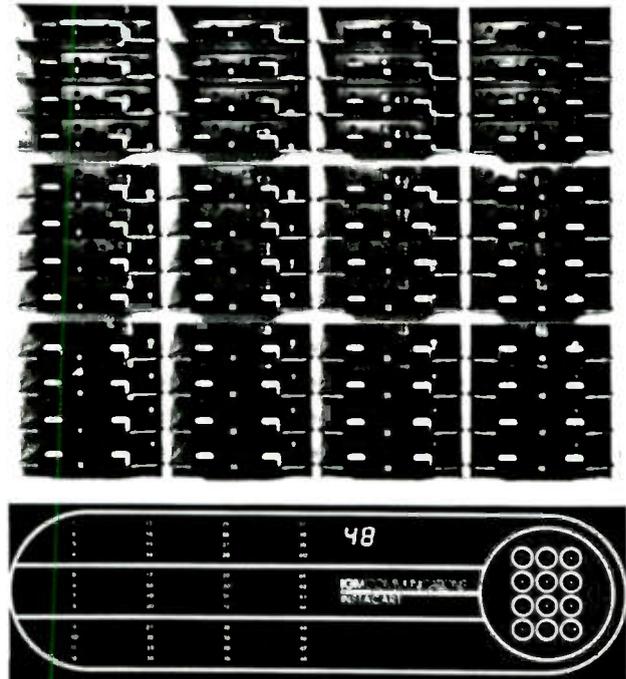
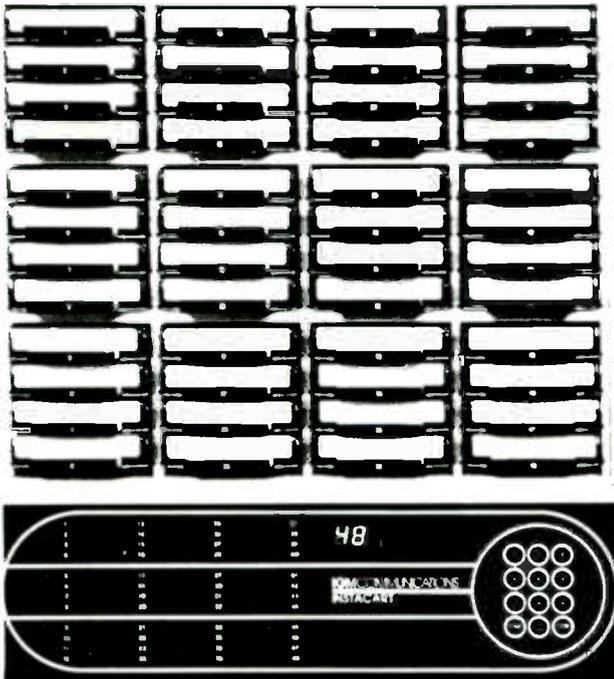
282 West Kellogg Road
Bellingham, Washington 98226
206 733-4567
Telex 704983



- 12, 24, 36 or 48 cartridge capacity • Mono or stereo • NAB or IBA (United Kingdom) specifications • Maxtrax™ (wide track) heads (option) • Microprocessor controlled • Front panel opens for service • Touch pad switches for manual operation • LED power supply status indicators • New modular power supplies • LED tray number readouts for manual control • 48 LED's indicate tray status • New pre-amps, data and program amplifiers using NE5534 IC's • Audio muting at end of 150 Hz tone for each cartridge • Individual level and equalization controls for each pre-amp • One shaft and capstan motor for each bank of 12 trays • Capstan shaft fully supported by three sealed precision bearings and two motor bearings. • RS422 serial computer interface or parallel interface to duplicate older Instacarts • XRL audio connectors.

- 12, 24, 36 or 48 cartridge capacity, mono or stereo
- New microprocessor controlled front panel
- Individual microprocessor control for each bank of 12 cartridges
- New audio pre-amps, data and program amplifiers, all with NE5534 IC's
- New improved 150 Hz and 1 KHz sensors
- Audio mute at the end of the 150 Hz tone - each tray
- Pre-amp equalization and level controls - each tray
- Meets NAB or IBA (United Kingdom) specifications

Instacart's instant access capability is made possible because each play position has its own playback head, solenoid for actuation, tray assembly, pre-amp, 150 Hz tone detector, and 1 KHz stop detector.



- Available with Maxtrax™ (wide track) heads
- New individual, modular power supplies
- 60 or 50 Hz, 120 or 240 VAC operation
- RS422 serial interface for computer control
- Parallel interface - duplicates older Instacart
- Optional multiple audio outputs from each bank of 12 cartridges
- New head connectors
- Improved access and modular construction for maintenance and service

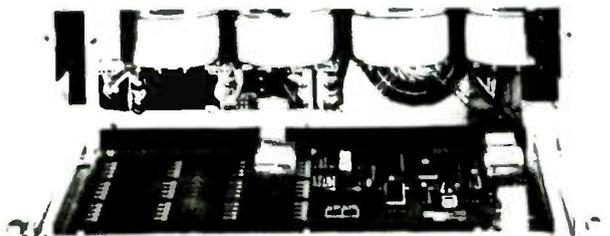
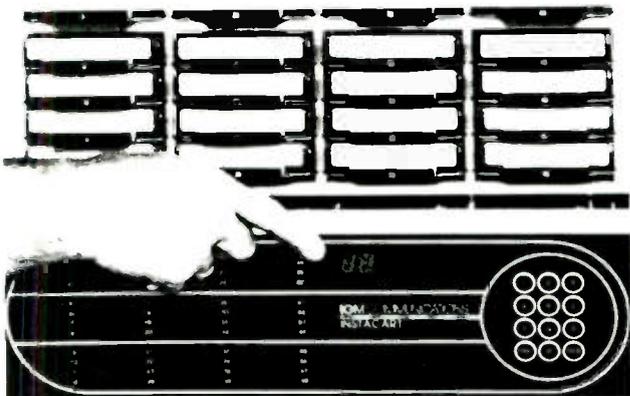
Each patented linkage assembly, head and solenoid, which are accessible for service or replacement, remain stationary in the mainframe. When a cartridge is started, the solenoid is engaged and pulls the cartridge in by 1/16 of an inch to contact the capstan drive shaft. This 1/16 inch movement is the only mechanical motion encountered in the Instacart, except that of the capstan and motor.

The front panel (mounted below the mainframe) contains the main control and interface microprocessor, a 12-key touch pad, with a 2-digit LED readout for manual operation. Forty-eight LED's indicate the status of each tray assembly, and are lighted as long as a tray assembly is engaged or a cartridge is running. Five LED's also indicate the status of the power supply. The front panel opens for service and access to the system microprocessor.

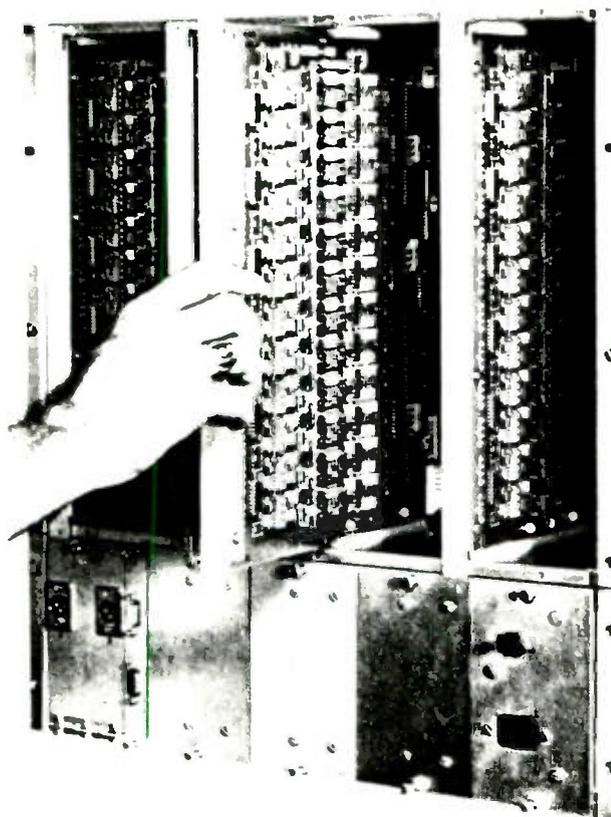
Full manual control of each tray is available to the operator -- individual trays may be started or stopped. In addition, special codes may be entered to stop all trays running, or all audio may be muted, allowing the cartridges to continue playing to recue.

The direct tape drive system consists of high quality, high torque motors designed for continuous duty operation.

Each stack of 12 cartridges has its own motor driving a precision capstan shaft. Each capstan drive shaft is fully supported by three fixed position sealed bearings and two motor bearings. The mainframe itself, which contains the head and tray assemblies, motors, capstan



The new electronics chassis, which contains and supports up to four main audio/control boards (one per 12 trays), rack mounts directly behind the mainframe. This chassis contains the control and power cable assemblies for each of the new boards. Each PC board is fully supported top and bottom, and is removable, using optional extending bars and extension cables to allow maintenance and service access.



Each main audio/control board contains twelve identical pre-amps, with individual audio level, and equalization controls, 1 KHz stop tone sensors, and 150 Hz aux tone detectors.

Solid state audio switches and microprocessor (8048) for each bank of 12 trays are also included on the main board.

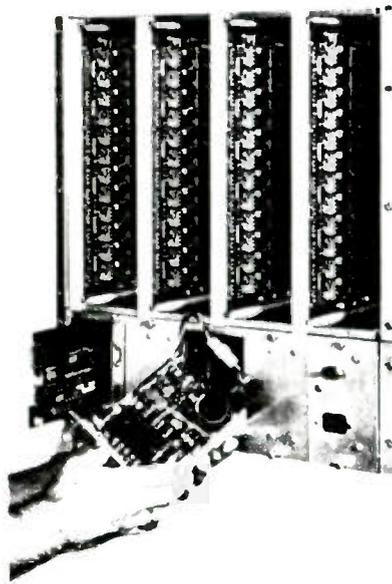
shaft and bearings, is made of 1/4" machined and precision aligned aluminum plate, and mounts in a standard 19" equipment rack.

The power directly and control program parallel audio output also contains ± 12 VD the system

The power modules maintenance supplies current

The power supply chassis rack mounts directly below the electronics chassis and contains the audio and data program amplifiers, the RS422 or parallel interface connectors and XRL audio output connectors. The chassis also contains the +5 VDC, ± 15 VDC, ± 12 VDC supplies and AC supply for the system.

The power supplies are individual modules removable for service or maintenance. The +5, +15, -15 VDC supplies are also over voltage and over current protected.



The updated Instacart audio circuits include for each tray individual pre-amps using the NE5534 IC. Each pre-amp has potentiometers for audio level, and equalization (left and right). All audio switching is handled by solid state FET switches.

Each tray has its own 1 KHz stop detector and 150 Hz aux tone detector, along with a data track pre-amp also using the NE5534 IC.

Audio muting for each tray takes place at the end of a 150 Hz aux tone or at the 1 KHz stop tone, whichever comes first.

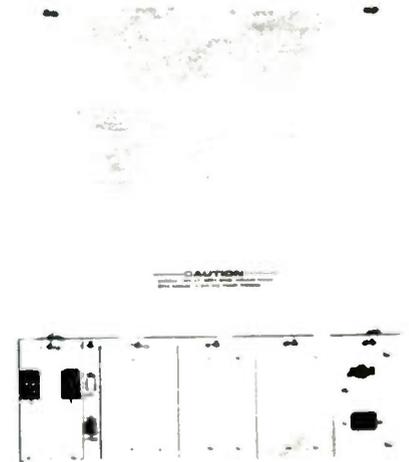
Each bank of 12 pre-amps is under direct control of its individual microprocessor (8048), which in turn is under control of the main processor (8049) located on the front panel.

Program amplifiers and output data amplifiers also use NE5534 IC's. Audio outputs are 600 ohm balanced, transformerless. Data output is 10K ohm unbalanced. The standard Instacart audio output is one left and right along with data for all carts. Special output configurations are available, such as separate audio outputs for each bank of 12 trays. Various custom configurations of multiple audio outputs are also



Instacart is available with an RS422 serial interface allowing full random access control and monitoring of all functions from any computer system via a simple 4-wire line. Software protocol and interface requirements are available on request.

Instacart is also available with an interface that will duplicate the older Instacart using the same remote control connectors for random access, and allows the Instacart to be used on existing systems with no change in cables or interface requirements. This interface also allows sequential operation of the Instacart. Details on this interface are also available on request.



available. XRL connectors are standard for audio and data output connections.

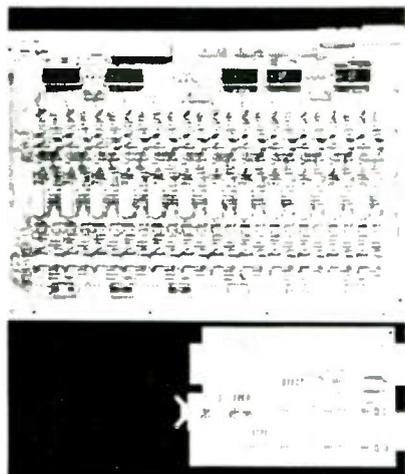
The Instacart is normally supplied meeting or exceeding the NAB (1975) audio specifications.

Other special specifications can also be supplied, such as 1) special playback heads with an improved frequency response of ± 1 dB, 2) Maxtrax™ wide track heads, 3) Maxtrax™ heads and matrix audio, 4) IBA (Independent Broadcast Authority) specifications (United Kingdom).

Newly redesigned main audio and control printed circuit boards (one for each stack of 12 trays) feature individual pre-amps, 150 Hz sensors and 1 KHz stop tone sensors for each tray. Audio level controls as well as equalization controls are also included.

A microprocessor on each board handles all control functions and audio switching for 12 cartridges, along with communications to the main microprocessor located on the front panel.

Audio muting for each tray is standard, audio switching is all solid state, each pre-amp is switched on the audio bus at tray start, and switched off the



audio bus at the end of its 150 Hz tone or at the 1 KHz tone, whichever arrives first.

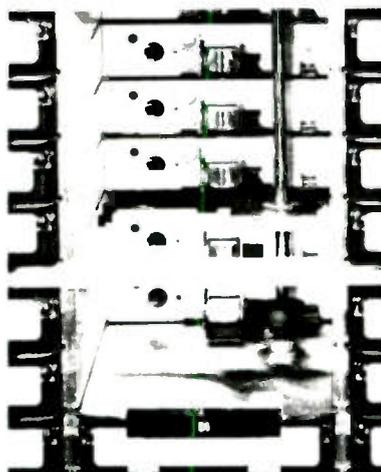
Solenoids are switched on at full voltage and then held on at a lower voltage to eliminate heat buildup.

The new program and data track amplifier board features 600 ohm balanced, transformerless audio outputs, 10K ohm unbalanced data output along with the main audio and data level controls. NE5534 IC's are used exclusively for all audio in the new Instacart.

In Instacart the playback heads and drive assemblies remain stationary. When a cartridge is called to play, the solenoid is energized and pulls the cartridge in by 1/16 of an inch to contact the capstan drive shaft. This 1/16 inch movement is the only mechanical motion encountered in the Instacart, exclusive of the capstan and motor.

The direct tape drive system consists of high quality, high torque motors especially designed for continuous duty (in some stations, the Instacart is turned on during system installation and not turned off again for literally years . . .).

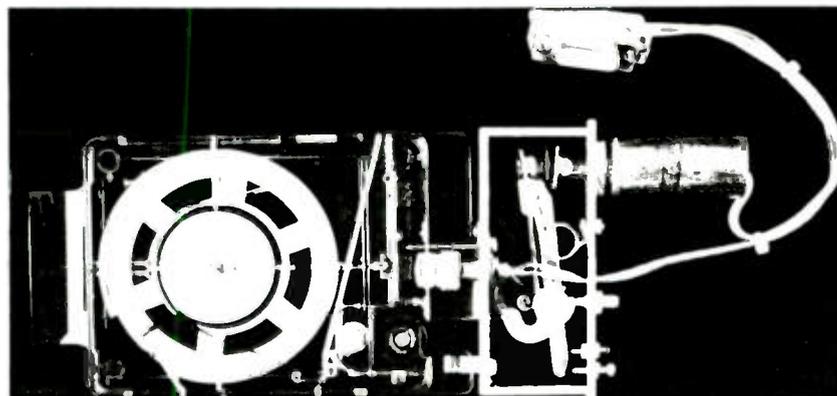
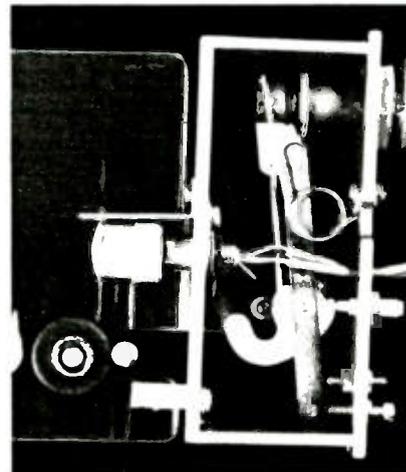
Each motor drives a precision capstan shaft for each stack of 12 cartridges. Each capstan drive shaft is fully supported by three precision fixed position sealed bearings and two motor bearings.



Each precision head assembly with its solenoid/linkage is removable for service and parts replacement or adjustment.

Instacart's audio characteristics are better because there is virtually no movement of the cartridge or carrier after insertion. The cartridge lies on a perfectly rigid carrier made of stainless steel that slides forward smoothly, allowing the pinch roller to contact the capstan drive shaft and causing the tape to play.

When the message or music selection is completed, the carrier returns to its "at rest" position 1/16 inch from the drive shaft. Because the mechanism moves only 1/16 inch, the cartridge tape, tray and head always maintain precise alignment relationships. It is this degree of tolerance that allows radio stations to use Instacart so effectively for stereo music, the most demanding of cartridge tasks.



Instacart was designed with the station engineer in mind. Accessibility to the unit is simple and direct for inspection, cleaning, routine adjustment and functional tests.

A plug-in connection mates each removable precision head to its associated electronics.

As in all IGM products, components throughout are the highest grade available. Circuitry is fully solid state. Components are mounted on Mil Spec fiberglass printed circuit cards.

Because of the unique cartridge/tray combination, individual playback heads can be contacted only by playback tape. It is physically impossible for any part of

the cartridge or tray assembly to touch the playback head in an Instacart. Therefore, alignment and adjustment of head assemblies, once set at the factory, are now a thing of the past.

Virtually the only maintenance required by Instacart is routine head, capstan shaft and pinch roller cleaning.

Easy to understand electronic circuitry, proven, simple, reliable mechanics combine to make Instacart the lowest maintenance multiple playback unit on the market today.

The IGM Instacart has found wide acceptance in both broadcast and industrial fields. This ingenious device has established an impeccable record of reliability and performance in highly demanding, continuous-duty applications.

Instacarts opened up a new dimension

in programming and sound production for all broadcast modes, whether live, manual assist or fully automated. The significance of the Instant access capability to radio or TV production and on air programming allows operators and sound production personnel to be completely freed from concern about the location of a particular "carted" feature, PSA, commercial, sound effect, music selection, or news insert. They simply command any cartridge to follow any other cartridge from the same machine --instantaneously.

It's easy to see why the Instacart has indeed become, and still is, the standard of the industry.

Instacart is available in many custom configurations for special applications in TV, motion picture and radio post production, sound sweetening and sound effects, in configurations for non-broadcast applications, including an FCC approved system for telephone inter-connect. We invite interested persons to request our separate brochure on the Instacart for post production and information systems. Requests for custom applications and special configurations are also invited.

Wow and Flutter: Less than .15% weighted peak
Timing Accuracy: .1% or better
Start Time: Less than 100 mSec
Stop Time: Less than 40 mSec
Tape Speed: 7.5 ips. One direct drive hysteresis motor for each bank of 12 cartridges.

Output Impedance:
Load: 600 ohm balanced or unbalanced.
Source: 150 ohm balanced, 75 ohm unbalanced.
Output Level: 0 dBm nominal
Maximum Output Level: +25 dBm balanced, +9 dBm unbalanced.
Amplified Distortion: Less than .5% THD
Signal to Noise, Stereo: -50 dB unweighted
Signal to Noise, Mono: -53 dB unweighted
Cross Talk Between Channels: 45 dB or better
Equalization: NAB standard (others available on special order)
Frequency Response: Amplifier \pm .5 dB NAB curve
Cue Signals: 1 KHz primary, 150 Hz secondary
Data Output: .5 Volt into 10K ohm load
External Connectors: XLR Type - audio and data
Power Requirements: 120 VAC, 60 Hz, 110 watts
(240 VAC, 50 Hz on special order)

Weight: 160 lbs.
Dimensions: Height 21"
Width 19"
Depth 19 3/4"
Mounting: Requires 25" deep rack with center mounting rails.
Models: 12, 24, 36, or 48 cartridge playback, mono or stereo

RS422 serial interface

Parallel interface (duplicates older Instacart)

Multiple audio outputs - left or left and right from each bank of 12 carts

IBA (United Kingdom) audio specifications

Standard NAB specifications with improved frequency response

50 Hz 120/240 VAC operation

Maxtrax™ wide track heads

Maxtrax™ heads and matrix audio switching

Light or heavy spare parts kits

Service and alignment kit

IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226

206 733 4567

IGM-SC™ Price List

26-0102-0250-00	IGM-SC System Includes: IGM-SW Audio Switcher, Complete Provisions for 16 Source Cards 2600 Event Memory RS422 Interface for Instacarts and Go-Carts Digital VU Meters, Silence Sensor Program, Monitor and Sum Amplifiers SC Operating Software Operations and Technical Manuals (Does not include computer system)	\$12,505.00
15-0201-0230-00	RSC - Relay Source Card optional with 12 N.O. Relays	\$350.00
15-0200-0230-XX	USC - Universal Source Card and Cable Note: One USC card is required for EACH audio source attached to the IGM-SW (audio Switcher).	\$350.00
26-0103-0250-00	IBM-PC 256K, 1 Disk Drive, Package	\$2,000.00
26-0104-0250-00	Printer with cable to IBM-PC optional	\$375.00
00-2000-1002-00	Remote Terminal, TeleVideo PT optional	\$499.00
00-2000-0200-00	Uninterruptible Power Supply optional	\$395.00
26-0049-0250-00	IGM-EN FSK Encoding Package optional	\$1,499.00

Specifications and Prices are subject to change without notice.
Price List is furnished as a convenience to the customer
A specific proposal may vary slightly in total due to addition
of required cables and other hardware not shown here.

IGM COMMUNICATIONS

282 West Kellogg Road
 Bellingham, Washington 98226

206 733 4567

IGM-EC™ Price List

26-0060-0250-00	IGM-EC System Includes: IGM-EC Audio Switcher, Complete 12 Audio Sources 12 Random Select Interface for Go-Cart 24's 2600 Event Memory VU Meters, Silence Sensor Program, Monitor and Sum Amplifiers EC Operating Software Operations and Technical Manuals (Does not include computer system)	\$4,975.00
00-2000-2324-22	RS232 to RS422 Converter	\$195.00
26-0062-0250-01	Tandy 1000 256K Package Includes: Tandy 1000 256K with keyboard, one disk drive Tandy RS232 I/O Board Tandy 26-3211 Monitor	\$1,450.00
00-2000-0080-00	EPSON RX-80 Printer optional	\$335.00
00-2000-1401-00	Printer Cable Tandy 26-1401 optional	\$45.00
00-2000-0200-00	Uninterruptible Power Supply optional Includes Battery	\$395.00

*Five year warranty on 1000
 cost to provide 350.-*

*note price has dropped to 455.-
 on the life of the installed*

*price of CRT
 2,000.00*

*1095.-
 1000.00*

Specifications and Prices are subject to change without notice.
 Price List is furnished as a convenience to the customer.
 A specific proposal may vary slightly in total due to addition
 of required cables and other hardware not shown here.

*price of CRT
 2,000.00*

*note price has dropped to 455.-
 on the life of the installed*

IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226

206 733 4567

Source Equipment Price List

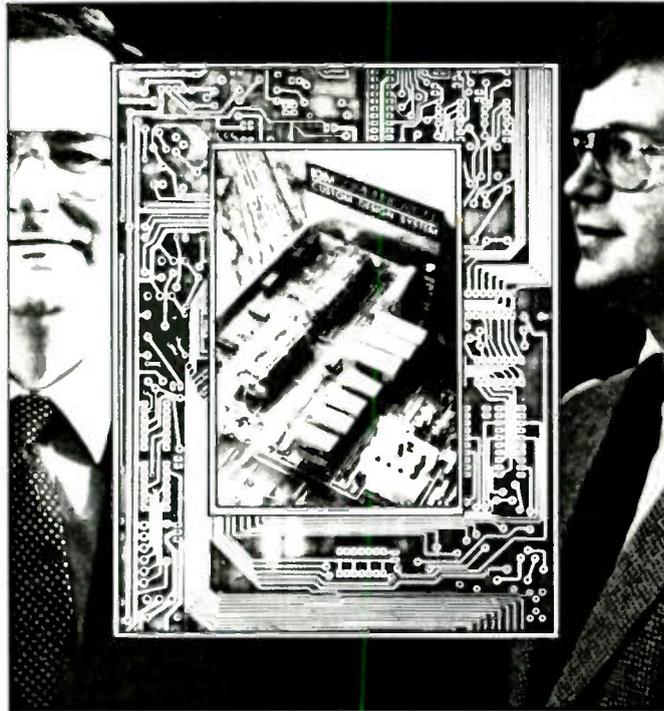
18-0014-0250-10 18-0014-0250-20	IGM Go-Cart 24 24 tray, bi-directional drive, single play station, random access or sequential operation, NAB Specifications.	Mono Stereo	\$4,045.00 \$4,245.00
00-9575-1242-10 00-9575-1242-20	IGM Go-Cart 42 42 tray, bi-directional drive, single play station, random access or sequential operation, digital tone sensing, high speed tape re-cue, NAB Specifications.	Mono Stereo	\$8,155.00 \$8,355.00
00-9575-1278-10 00-9575-1278-20	IGM Go-Cart 78 78 tray, bi-directional drive, single play station, random access or sequential operation, digital tone sensing, high speed tape re-cue, NAB Specifications.	Mono Stereo	\$8,915.00 \$9,115.00
27-4111-1100-00 27-4211-1100-00	IGM INSTACART 48 Tray 48 trays with individual play stations, random access, NAB Specifications.	Mono Stereo	\$17,100.00 \$19,500.00
00-1340-3202-00	Studer-Revov PR99 Reproducer Stereo, with 25hz sensor and filters		\$1,799.00

RACKS

00-1409-6125-99	R-90 Rack Black, Rear Door, AC strip, Cable Duct		\$575.00
00-1409-6125-94	Side Panels, Pair, for R-90 Racks Black		\$210.00

Specifications and Prices are subject to change without notice.
Price List is furnished as a convenience to the customer
A specific proposal may vary slightly in total due to addition
of required cables and other hardware not shown here.

See us in
Booth 403
NAB '85



IGM COMMUNICATIONS has *extensive experience* in the broadcasting industry building precision electromechanical equipment and the *finest* Control Systems available. We are *leaders* in the field. We offer this designing ability to you. We will develop *your* ideas into your

manufactured products. *IGM quality* is applied to *your* quality product. We are *experts* in software design, hardware and mechanical engineering. We have *pride* in our work and our products. We can provide your company with a team that knows how to develop *your ideas*.



Your personnel establish the *specifications* for the product.

We help develop your *product's potential*.

The *result* is a product of quality.



With *performance standards* set, the development of operational and electrical specifications begins.

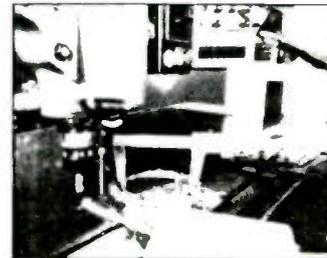
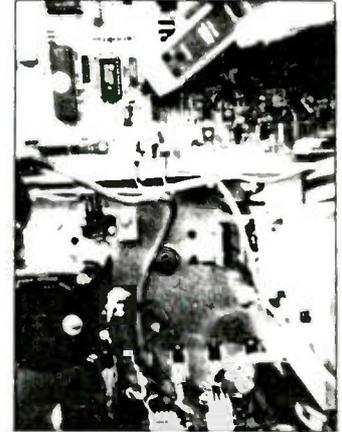
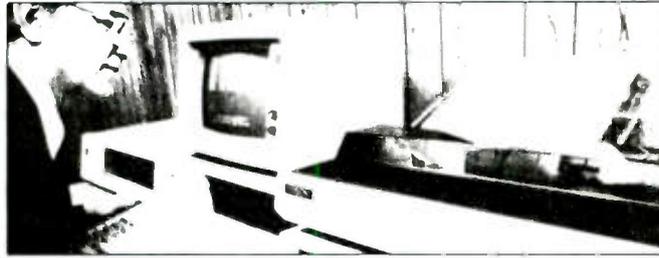
Components and sub-systems are identified and operational *procedures studied* and discussed.

Complete *specifications*, preliminary operations manuals and electromechanical drawings are *delivered* to your staff for approval.

With your approval, the placement of components begins.

Components are identified and software and hardware are developed.

Our CAD computer programs, schematics, and circuit board layouts are prepared.



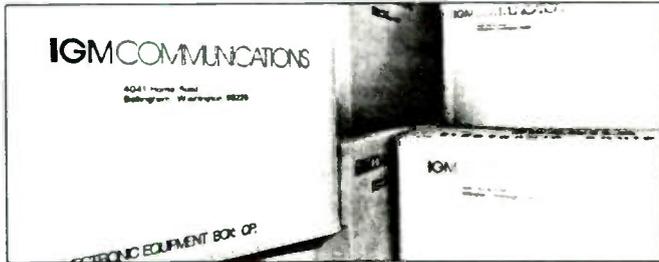
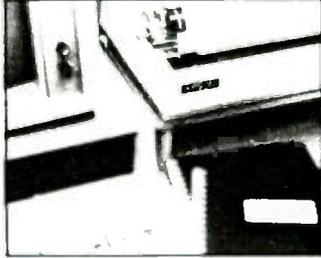
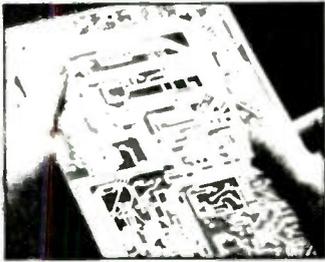
With your approval of the specifications and placement of order, *system design* begins.

Components are specified for purchasing. Software and hardware development *schedules* are developed.

Our *CAD* computer system *produces* electronic schematics, mechanical drawings and printed circuit board layouts for final manufacturing.

Engineering *prototypes* are designed, *test* procedures developed and *software* development begun.

Final hardware specifications are *released* for production.



With final engineering design released, the **manufacturing process begins.**

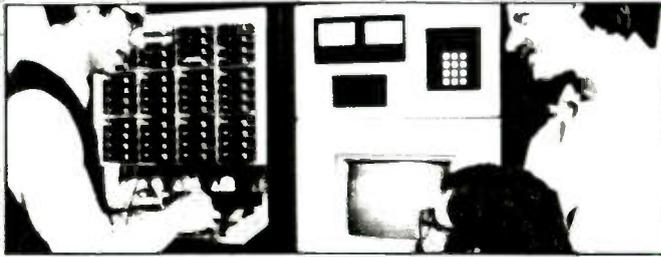
Components and vendor supplied items are **coordinated**, tooling for mechanical assemblies and printed circuit boards produced.

Final **assembly** of the system is begun. Sub-assemblies are tested and the final system **test** is

completed. Our **quality control** staff, and those of **your staff**, if requested, will be **involved** in this critical step.

Final operations and technical manuals are produced, and then, according to the delivery schedule, the system is **shipped.**

Proper **ins** equipment service, **fin** **training** to completed.



Proper *installation* and interface with existing equipment is coordinated by IGM Customer service, final adjustments are made and personnel *training* for both operational and technical staff is completed.

Every effort is made to ensure a *smooth transition* into use of the new system.

IGM customer service is available after installation and beyond to assure *continued service* of your system.

IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, Washington 98226

206 733 4567

October 2, 1987

Tom Smith, Chief Engineer
WLIV
PO Box 55188
Madison WI 53705

Dear Mr. Smith:

Thank you for your interest in IGM's program automation systems and playback machines. I have enclosed a packet of our product literature as well as an IGM-EC demonstration diskette and an operations manual.

The IGM-SC is a PC-interfaced switcher which has all the features that you depend on. It can handle 2600 events of memory and automatically load the next day's programming from the computer's floppy disk. We made the IGM-SC very easy to operate, and we made it easy to service. And best of all, the IGM-SC will work with most MS-DOS computers. When a printer is added, it can log from the cue-track of the cartridges and print the log.

Our other controller, the IGM-EC was designed to present the most cost-effective approach to program automation for the broadcaster. The controller alone costs less than \$5,000 and was designed specifically for the traditional program automation formats that use tapes or satellite. This system handles 12 audio sources. We included logging of event number, source and tray number as a standard feature. Like the IGM-SC, the IGM-EC will work with most MS-DOS computers.

The IGM INSTACART holds 48 individual cartridges that can be accessed just as if they were in 48 individual cart machines. It's more flexible than any other multiple-cart machine because only the INSTACART has a playhead for each play position. The INSTACART works with all major program automation controllers.

The IGM GO-CART is the industry-standard for multiple-cart machines. The GO-CART holds 24 cartridges that can be randomly selected by most automation controllers (including, of course, the IGM-EC and IGM-SC). The unit automatically brings the requested cartridge to the play position, eliminating manual handling of broadcast cartridges. Its hinged mounting simplifies maintenance by allowing service from the front of the rack. The GO-CART is faster and offers better audio quality than comparable products.

Please review the enclosed information. You will find a price list included in the literature packet. I will be calling to follow up in a few days. If in the meantime, you have any questions, please call me.

Sincerely,

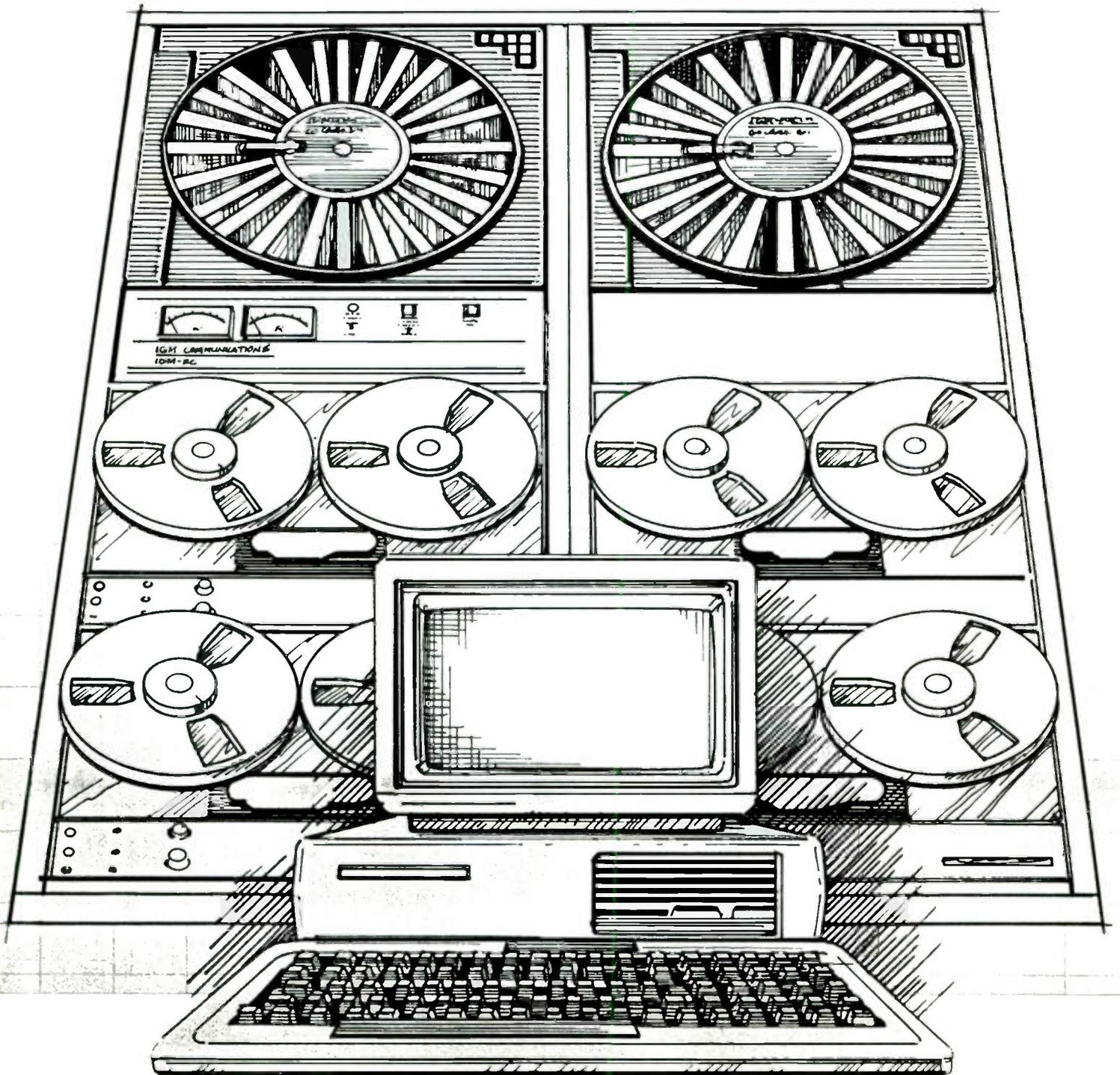


Thomas R. Ransom
Director, Sales & Marketing

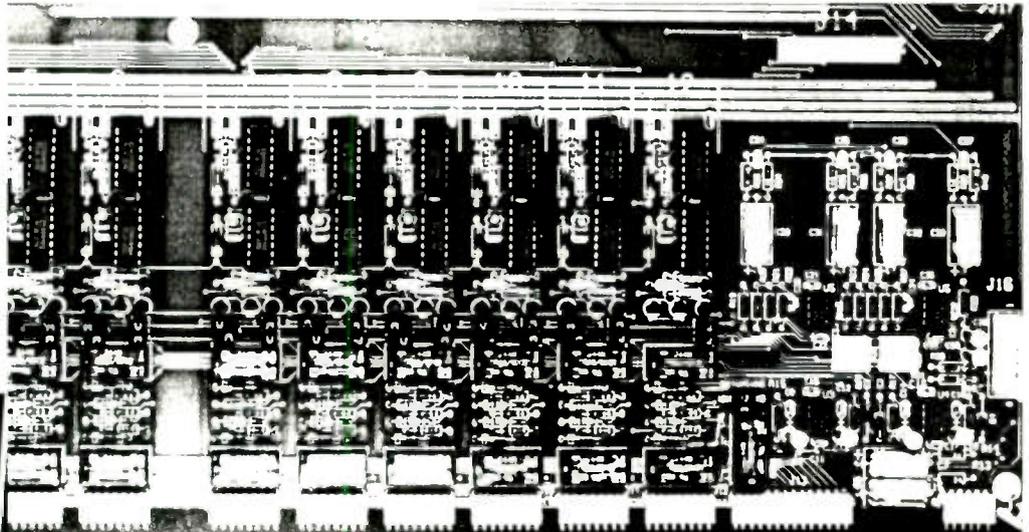
Enclosures: All IGM Brochures, IGM-EC Demo, Price list

IGM-EC

The Economical Controller

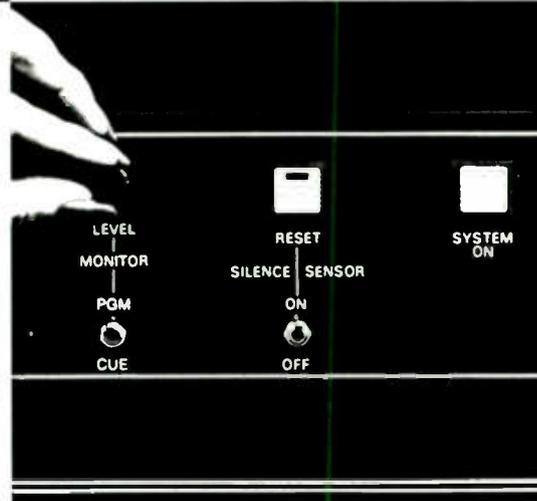


IGM Communications has always enjoyed a reputation for P.C. boards of the highest quality — and the EC Main Board is no exception. Computer-aided design ensures efficient layout and high reliability.



Operator interface with the host PC, for system control and programming is easily accomplished with simple commands.

IGM Go-Cart 24's are perfectly matched for control by the EC.



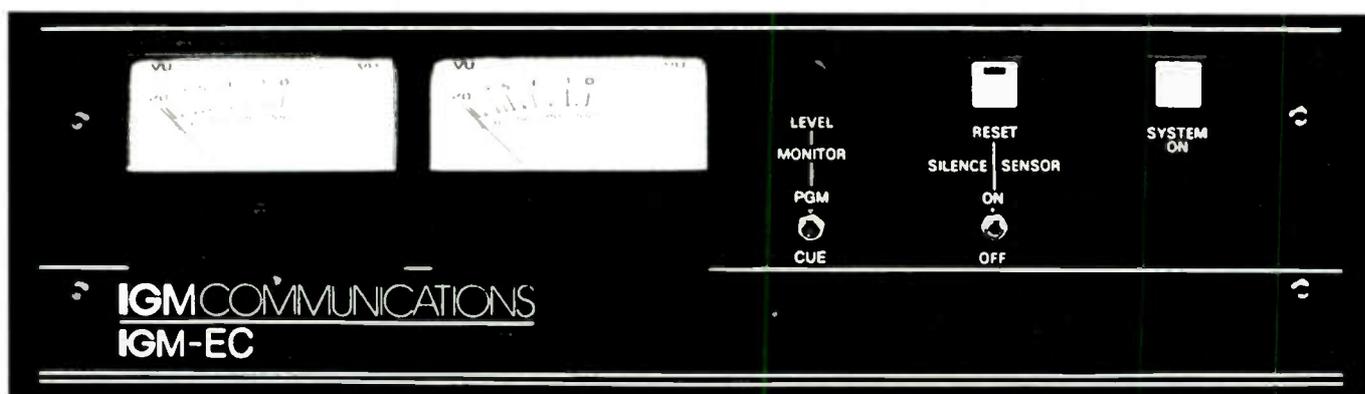
Simplicity of operation is typical of the EC with switching and monitoring elements placed in logical locations on the front panel. Reliability is built in to every system by IGM Communications.

S Y S T E M S

F E A T U R E S

The IGM-EC fits a 5¼" rack space and operates under the control of the selected host PC. Micro-processor control and command features are coupled with switching to provide trouble-free operation.

Left and right VU meters allow precise level setting and monitoring of the PGM (Program output) lines or source CUE bus. The silence sensor can be switched on or off, or reset under operator command. A *system on* indicator lights when the system is "On-Air".



VU METER

Left and right audio (PGM or CUE) will be displayed on the VU meters.

MONITOR SWITCH

A single switch controls whether PGM (Program output) or CUE audio will be supplied to the monitor amplifier and displayed on the VU meters.

MONITOR LEVEL

Used to adjust the monitor amplifier outputs.

SILENCE SENSOR

Silence sensor function is controlled by an ON/OFF switch, and a lighted alarm indicator is provided for operator reset.

- Economical
- Special music rotation file
- 12 audio sources
- 2500 events
- Use with Go-Cart 24's
- Random select
- Optional log printer
- Floppy disk memory backup during operation
- RS422 interface with selected host PC
- Produced by IGM Communications, a manufacturer with a longstanding record of performance.

S P E C I F I C A T I O N S

Source Audio Inputs (12):

10k bridging, unbalanced
0dB nominal input level for reference.

Audio Gain:

Unity.

Output Channels:

Left, Right and Mono Program.
Left, Right Monitor.

Headroom:

Greater than 24dB above nominal input level
of 0dB.

Host PC Package

- 1) PC, 128K (MS or PC — DOS) with keyboard
- 1) Monochrome CRT
- 1) Monochrome display and parallel printer adaptor
- 1) 360K, 5¼" floppy disk drive with drive adaptor
- 2) RS232C asynchronous communications adaptors

Frequency Response:

20Hz to 20kHz, 0dB to -1dB, 600 ohm
balanced load.

Noise:

- 75 below 0dB output, 600 ohm balanced
load, 20kHz bandwidth with one source on,
input level 0dB, input grounded.

Total Harmonic Distortion:

Less than 0.15% at 1kHz, 20dB input level,
600 ohm balanced load.

Cross Talk

- 65dB below 0dB output into 600 ohm
load, Left to Right, Right to left with 0dB
input level at 1kHz.

```

>>SYSTEM ON LINE<<          --ON AIR--          >>NEXT ROTATION EVENT 2400<<
                              04:59:00P
EVENT SOURCE TRAY ACTION
LAST 0198 06 10
ON-AIR 0199 03 00
NEXT 0200 08 00
      0201 01 00
      0202 02 00
      0203 03 00
      0204 - - DO NEXT EVENT AT 04:59:45P
      0205 08 00
      0206 06 11
      0207 05 19
      0208 01 00
      0209 02 00
      0210 03 00

COMMANDS
CTRL/B - Manual return from music
CTRL/M - Go to menu display
CTRL/P - Go to program display
CTRL/U - Update RS devices
CTRL/D - Delete next event
CTRL/O - Switch to next event
CTRL/S - System to Stop-Ready
    
```

```

--PROGRAM--
09:00:25A
>>SYSTEM ON LINE<<          >>NEXT EVENT 0002<<
EVENT SOURCE TRAY ACTION
0001 07 12
0002 05 23
0003 06 09
0004 - - MUSIC
Edit 0005 - - BACK AT 09:15:00A
      0006 07 10
      0007 05 11
      0008 06 01
      0009 - - MUSIC
      0010 - - BACK AT 09:30:00A

COMMANDS
CTRL/X - Exit the edit mode
CTRL/C - Change displayed events
CTRL/A - DISK LOAD AT
CTRL/B - BACK AT
CTRL/D - DO NEXT EVENT AT
CTRL/F - FORMAT
CTRL/G - GO TO FORMAT AT
CTRL/J - JUMP TO EVENT
CTRL/K - Delete displayed data
CTRL/L - LINK TO NEXT EVENT
CTRL/O - SYSTEM ON AT
CTRL/P - PLAY THEN STOP
CTRL/R - MUSIC ROTATION
CTRL/S - STOP READY AT
CTRL/T - RETURN
CTRL/U - UPDATE TO NEXT EVENT AT
    
```

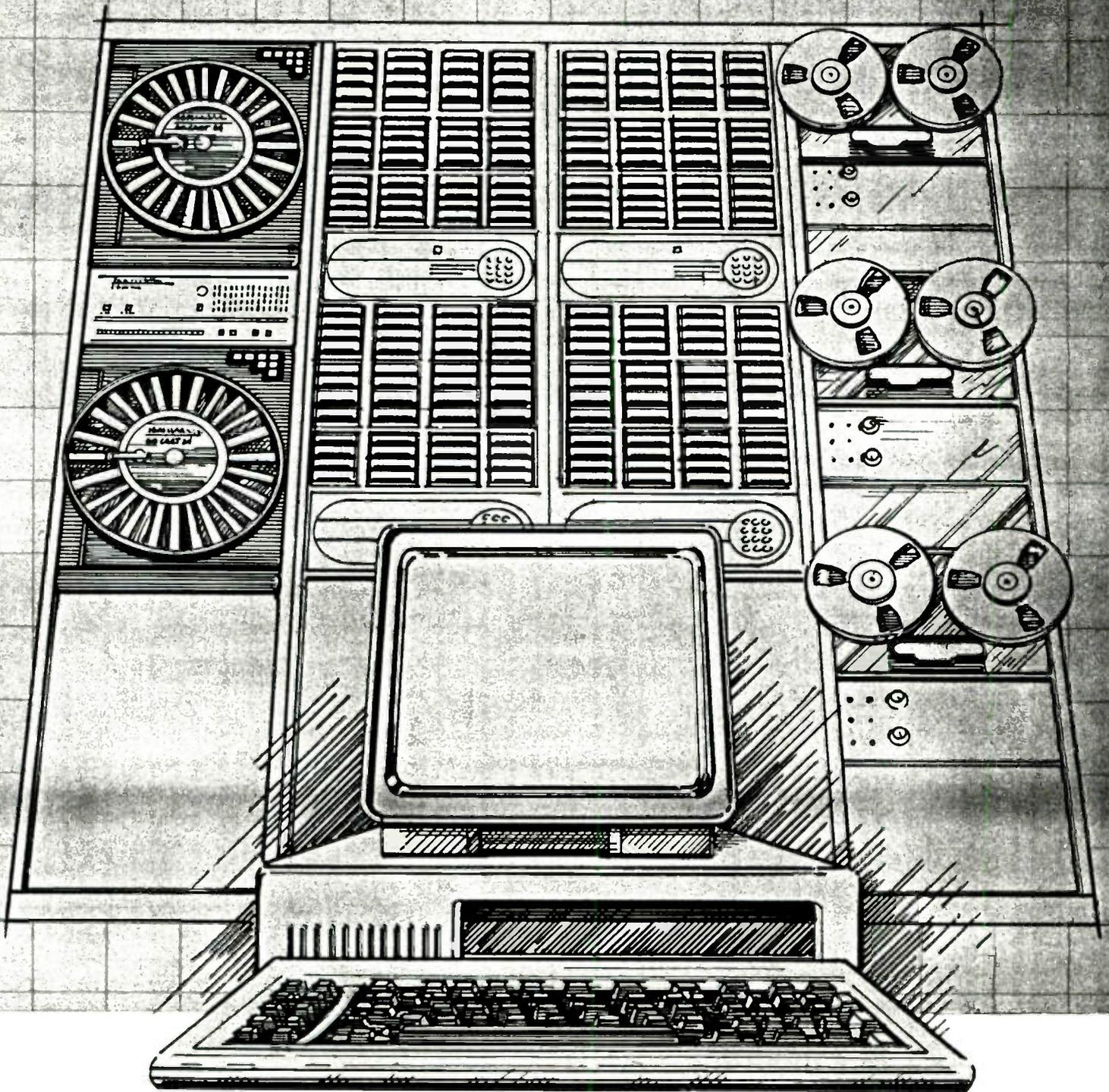
This display is typical of the IGM - EC while in full or
partially unattended automatic control.

Simple broadcast language commands make the IGM
- EC versatile enough for small and medium stations.
The system software is an advanced, structured,
high-level systems programming language operated
by the host PC.

IGM COMMUNICATIONS

IGM-SC

The Sophisticated Controller



YOU WILL APPRECIATE THE IGM-SC DIFFERENCE.

IGM-SC, the most versatile System Controller ever developed, is unmatched in its ability to provide system information to its operators. All control and programming of the system is accomplished in simple broadcast language commands with special command keys at each terminal, menu-driven displays and on-screen "help" routines.

Next Events to be placed "On-Air".

```

=====
>>SYSTEM ON LINE<<          ---ON AIR---          >>NEXT ROTATION EVENT 2400<<
                              07:59:00A
EVENT SOURCE TRAY  DESCRIPTION/ACTION
LAST          0198 06 10 Commercial
ON-AIR        0199 03 00 Hits #3
NEXT          0200 04 00 Hits #4
              0201 01 00 Hits #1
              0202 02 00 Hits #2
              0203 03 00 Hits #3
              0204 - - UPDATE TO NEXT EVENT AT 07:59:45A
              0205 08 00 Station ID
              0206 06 11 Commercial
              0207 05 19 Commercial
              0208 01 00 Hits #1
              0209 02 00 Hits #2
              0210 03 00 Hits #3

-----
COMMANDS
CTRL/B - Manual return from music
CTRL/M - Go to menu display
CTRL/P - Go to program display
CTRL/U - Update RS devices
CTRL/D - Delete next event
CTRL/O - Switch to next event
CTRL/S - System to Stop-Ready
CTRL/N - Make 2501 next event
=====
    
```

These displays are typical of the IGM-SC while in full or partially unattended control, and are available at both the Host PC and the optional remote TeleVideo PT terminal.

```

=====
>>SYSTEM IN STOP<<          ---SOURCE DESCRIPTION TABLE---          >>NEXT EVENT 0001<<
                              10:15:00A
Source   Max. Tray   Unit-Type   Description
01       00         Reel to Reel   Current Hits #1
02       00         Reel to Reel   Old Hits #2
03       00         Reel to Reel   Old Hits #3
04       00         Reel to Reel   Gold Hits #4
05       48         Instacart      Commercial
06       48         Instacart      Commercial
07       24         GoCart         PSA
08       00         Studio         Announce Booth #1
09       00         Network        ABC News
10       12         Relay          Relay Control
11       00
12       00
13       00
14       00
15       00
16       00

-----
UNIT TYPES
CTL/R-Reel      CTL/C-Cart      CTL/I-Instacart  CTL/X-C/D      CTL/T-Relay
CTL/V-Extra     CTL/N-Net       CTL/E-Cassette   CTL/S-Studio   CTL/G-Go Cart
=====
    
```

F E A T U R E S

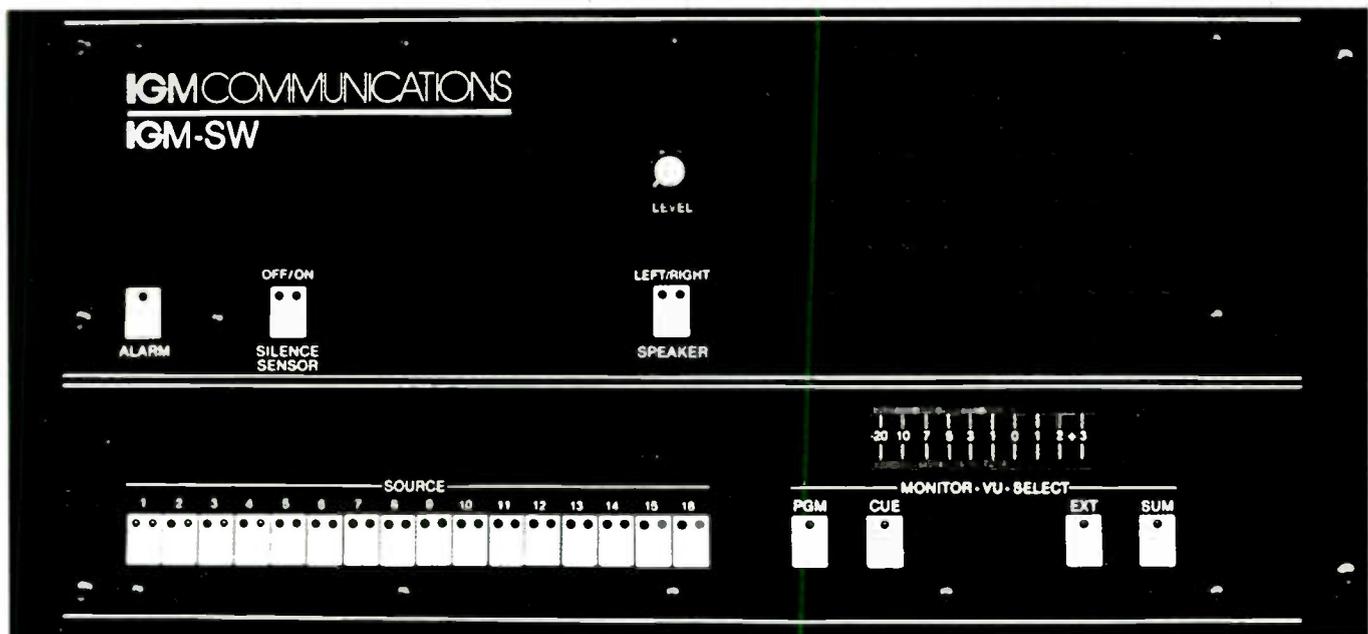
SILENCE SENSOR AND SYSTEM ALARMS

A silence sensor, monitoring both the Left and Right program amplifier outputs, is provided with provision for the system operator of the Host PC or at the optional TeleVideo PT terminal to set the audio dropout delay from 2 to 20 seconds.

SOURCE

Sixteen monitor/indicator switches are provided to select a source card audio input to be placed on the CUE audio bus. These switches have two LEDs to indicate the source is "ON" or "CUE".

THE IGM-Audio Switcher, complete in only 8 $\frac{3}{4}$ " of rack space, operates under control of the host PC with solid state audio switching, the latest in microprocessors control and command features, with extremely-high reliability. The audio switcher chassis contains the program and monitor amplifiers, digital VU meters, monitor speaker, RS422 interface for instacarts and Go-Carts, silence sensor, external audio inputs, provisions for up to 16 audio source cards, any of which can be random access. The audio switcher also contains its own microprocessor and memory along with assembly language software developed by IGM for its operation.



- Partial or fully unattended control and switching
- 2500 event memory
- Simple Broadcast language Programming
- Menu-driven Displays
- On-screen "help" routines
- Jump instructions
- Real-time Commands
- Insert function — "NEXT" — allows special event to be placed "On Air"

- Floppy disk — memory backup
- Universal Source Cards with LED indicators/diagnostics
- Random access — Instacarts and Go-Carts
- Left, Right and Sum program and monitor amplifiers
- Digital meters (VU or Peak)
- Monitor Speaker
- Programmable Silence Sensor
- Full system control-Start, Stop, Fade and Switch to next event

MONITOR VU SELECT

Four indicator and control switches, PROGRAM, CUE, EXTERNAL and SUM are located on the front of the audio switcher. Specific inputs may be selected to be displayed on the VU meters, switched to the monitor amplifier input and to the monitor speaker.

Digital VU meters with
Monitor-VU select

IGM-SW operator controls

IGM COMMUNICATIONS
IGM-SW

LEV

LEFT/RIGHT

SPEAKER



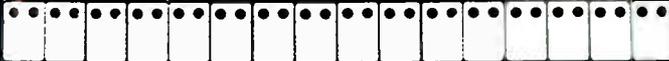
ALARM

OFF/ON



SILENCE
SENSOR

SOURCE

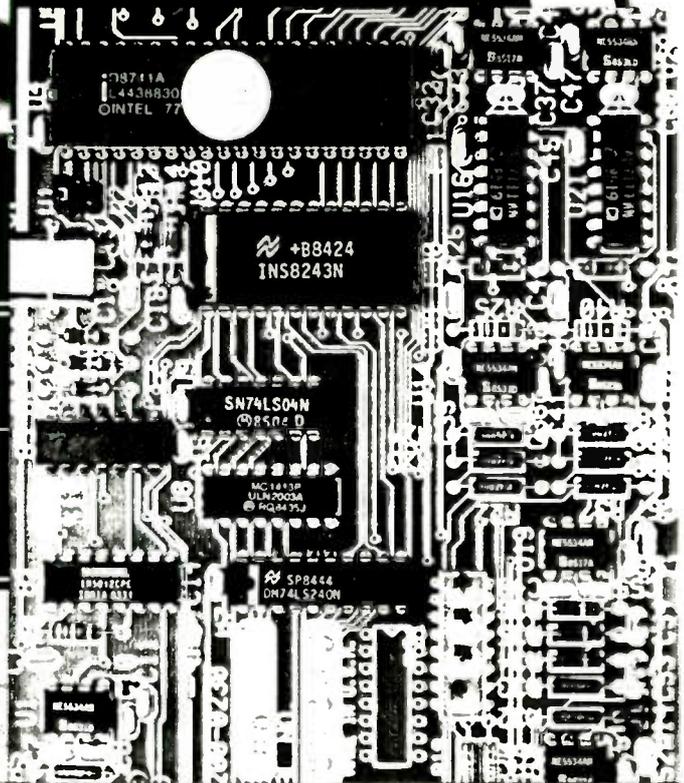


PGM



20 10 7 6 3 1 0 1 2 +3

MONITOR - VU - SELECT



IGM-SW main CPU board

Data and program entry



NO MORE GUESSING WHAT THE "SYSTEM" WANTS. YOUR IGM-SC RESPONDS INSTANTLY.

For today's broadcast operations, fully or partially unattended, live assist or a combination of live and unattended operation, the IGM - SC provides the broadcaster with the information necessary to make decisions.

Menu-driven displays, on-screen "help" routines and simple broadcast language commands combine to make the IGM - SC versatile enough for the small and medium stations, yet sophisticated enough for the major broadcaster. The system software is an advanced, structured, high-level systems programming language operating in the host PC.

Events
requested from
memory for review or
programming

```

=====
>>SYSTEM ON LINE<<          PROGRAM-----          >>NEXT EVENT 0002<<
                                09:00:25A

EVENT SOURCE TRAY  DESCRIPTION/ACTION
0001 07 12 Comercial
0002 05 23 Comercial
0003 06 09 Comercial
0004 - - MUSIC
Edit 0005 - - BACK AT 09: 5:00A
0006 07 10 Comercial
0007 05 11 Comercial
0008 06 01 Comercial
0009 - - MUSIC
0010 - - BACK AT 09:30:00A

----- COMMANDS -----
CTRL/X - Exit the edit mode
CTRL/C - Change displayed events
CTRL/A - DISK LOAD AT
CTRL/B - BACK AT
CTRL/E - JUMP TO EVENT
CTRL/F - FORMAT
CTRL/G - GO TO FORMAT AT EVENT
CTRL/N - DO NEXT EVENT AT
CTRL/W - HOLD FOR
CTRL/D - Delete displayed data
CTRL/O - SYSTEM ON AT
CTRL/P - PLAY THEN STOP
CTRL/R - MUSIC ROTATION
CTRL/S - STOP READY AT
CTRL/T - RETURN
CTRL/U - UPDATE TO NEXT EVENT AT
CTRL/V - LINK TO NEXT EVENT
CTRL/Y - DEAD ROLL AT
=====

```

Command Key Status
Line, Indicates active
function keys for the
routine displayed.

Typical of the many menu displays contained in the IGM-SC is the display of the File Write routine.

```

=====
>>SYSTEM IN STOP<<          FILE WRITE-----          >>NEXT EVENT 0002<<
                                10:00:00A

Ready disk drive then:
Press:
CTRL/D to WRITE event file to disk
ESC to return to MENU display
=====

```

SPECIFICATIONS

IGM-SC SYSTEM HARDWARE

IGM-SC Audio Switcher

Audio Switcher Output:

Program Amplifiers Left, Right and Sum

Load Impedance:	600 ohm, transformerless, balanced
Source Impedance:	95 ohms.
Nominal Output Level:	+8dB, Adjustable -1dB to +9dB.
Headroom:	Greater than 20dB above +8dB.
Frequency Response:	20Hz to 20KHz 0dB to -1.5dB 600 ohm, balanced load
Noise:	-70dB below +8dB output, 600 ohm load, 20kHz bandwidth with one source on, input level 0dB, input grounded.
Harmonic Distortion:	Less than .015% at 1kHz, 10dB input level, +12dB output into 600 ohm balanced load. Less than .3% at 200Hz to 20k Hz, with +20dB input level, output 600 ohm, balanced load.
Crosstalk	-65dB below +8dB output into 600 ohm load, Left to Right, Right to Left, Data to Left, Data to Right with 0dB input level at 1kHz.

Monitor Amplifiers Output Left and Right:

Output Impedance:	600 ohm
Load Impedance:	5K ohm.
Output Level:	Fixed at 0dB, +20dB maximum before clipping.
Audio Source Inputs Left, Right Audio and FSK Data:	
Source Impedance:	600 ohm.
Input Impedance:	10K ohm, Balanced and floating.
Input Level:	Adjustable, -5dB to +5dB, 0dB nominal input level for reference.

External Audio Input (for monitor only):

Source Impedance:	600 ohm
Input Impedance:	10K ohm, Balanced and floating.
Input Level:	Adjustable, -5dB to +dB, 0dB nominal input level for reference.

Host PC Package

- 1) PC, 256K (MS or PC — DOS) with keyboard
- 1) Monochrome CRT
- 1) Monochrome display and parallel printer adaptor
- 1) 360K, 5¼" floppy disk drive
- 2) RS232C asynchronous communications adaptors

TeleVideo PT Terminal

Screen: 9" diagonal, non-glare yellow-green phosphor
 Display Format: 24 lines by 80 columns.
 Keyboard: Low-profile, typewriter style with 2-key rollover and 3-key lockout

IGM COMMUNICATIONS

282 West Kellogg Road, Bellingham, WA 98226 · U.S.A. (206) 733-4567 — Telex 704983
 Features and Specifications are subject to change without notice.

TeleVideo PT is a trademark of TeleVideo Systems Corporation.

IGM COMMUNICATIONS

IGM-EN™

FSK-Cartridge Encoder System

The IGM-EN (FSK-Cartridge Encoder System) is used to place FSK (Frequency Shift Keying) encoded logging data on the "Cue" or "Data" track of a standard NAB cartridge.

When a cartridge containing encoded data is placed "On-Air" by a system controller, the encoded data will be decoded by the system, and placed on the printed "On-Air" log for verification.

The logging information to be placed on a cartridge is first entered in the encoder memory using a standard TeleVideo PT terminal. Full on screen editing of the data entered, up to 9 individual lines of 55 characters including spaces, is possible.

For verification of the recorded and encoded data, the IGM-EN will be receiving back from the recorder playback head the recorded FSK data; this data will be decoded by the IGM-EN and displayed on the TeleVideo terminal as received to check the encoding process.

A previously encoded cartridge may be placed in the cartridge recorder at any time and then by pressing the recorder "Start" or "Play" switch the encoded data from the cartridge will be decoded by the IGM-EN and displayed on the TeleVideo terminal.

System Hardware

The Encoder System consists of two major units, The Encoder Chassis and a TeleVideo PT Terminal/Keyboard.

Also required for operation will be a Mono or Stereo Cartridge Record/Playback unit built to the NAB Specifications.

The encoder chassis rack mounts in a standard 19" equipment rack and uses 3 1/2" of rack space. The encoder chassis includes the system power supply, CPU, memory, system software, one RS232 serial I/O port for the TeleVideo PT terminal and one I/O port for the attached cartridge recorder.

Encoder Specifications

The encoder output to recorder specifications:

- 10K ohm, Unbalanced.
- Level adjustable to 400Mv into 10K ohm.
- Mark Frequency 3650Hz + or - 1%.
- Space Frequency 3350Hz + or - 1%.
- Distortion less than 10%.
- Data Rate 110 baud.

The encoder recorder input specifications:

- Unbalanced.
- Minimum level in -10dB.
- Data Rate 110 baud.

The Encoder chassis should be mounted in close proximity to the Cartridge recorder. The TeleVideo PT Terminal may be up to 75 feet away from the Encoder chassis.

IGM COMMUNICATIONS

282 West Kellogg Road
Bellingham, WA 98226
(206) 733 4567
Telex 704983

IGM

...The best there is!

PRODUCT DESCRIPTION

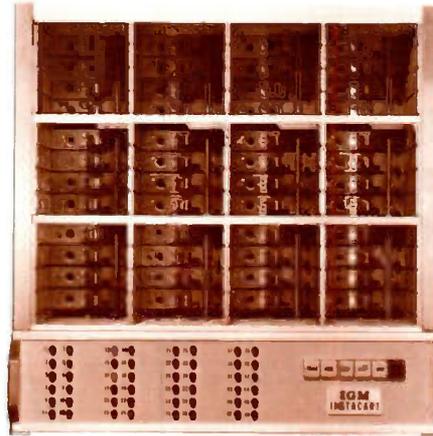
INSTACART

Instant Access Cartridge Reproducer

■ **Instantaneous, Multiple, Random, Back-to-Back Cartridge Access**

■ **Cartridges, Heads and Drive Remain Stationary At All Times—No Cartridge Movement**

■ **Visual Indication of Machine and Cartridge Status At All Times**



■ **Solid-state Electronics Throughout**

■ **Whisper-quiet in Operation**

■ **Field-proven in Hundreds of Studio and Automated Installations**

Since its original introduction in 1969, the IGM Instacart has found wide acceptance in both the broadcast and industrial fields, and has established an impeccable record of reliability and performance in highly demanding, continuous-duty applications.

Instantaneous random-access to any cartridge within the system is accomplished with a separate head and start line for each cartridge position, and cartridges may be called for back-to-back or overlapped, even from the same stack. Each cartridge is positioned for play on its own numbered tray, and each precision stainless-steel tray carries its own accurately aligned, up-right and parallel pressure roller. Instacart accepts all NAB standard Size "A" cartridges. Cartridges may be changed in the machine at any time.

Each play position has its own head, tray assembly, solenoid, pre-amp and 1 kHz stop detector. A plug-in connection mates each removable precision head and frame to its associated electronics. Line amplifier(s), cue/data track amplifier for encoded logging information and 150 Hz end-of-message sensing are located on their own plug-in circuit card. A regulated power supply card completes the unit. Optional 8 kHz tertiary sensing plugs in when required.

The direct tape drive system consists of a high-quality, high-torque continuous-duty rated hysteresis synchronous motor and precision capstan drive shaft for each stack of 12 cartridges. Each capstan shaft is fully supported by three high-precision fixed-position sealed bearings.

All cartridges and heads in the system remain stationary at all times. When a cartridge is called to play, the solenoid is energized and, through its linkage assembly, pulls the cartridge tray and pressure roller in by 1/16 of an inch to contact the capstan drive shaft. Thus, cartridge, tape, tray and head always maintain their precise alignment relationship to each other. The 1/16 inch movement is the ONLY mechanical motion encountered in the Instacart. THERE IS NO OTHER MOVEMENT OF CARTRIDGE, HEAD OR DRIVE ASSEMBLY AT ANY TIME. Instacart is whisper quiet in operation.

Front panel indicator lights provide visual run status on all cartridges within the system at all times. Conveniently located controls provide power on/off, home, start, stop, step and cue functions for manual operation. Full remote control outputs are provided as standard with each unit. Instacart will interface readily to most automation systems, memory systems, manual operations, computer controls and industrial controls.

Live studio operations can eliminate the necessity of manually handling large numbers of cartridges. Cartridges may be pre-loaded into Instacart and called for at will, either randomly or sequentially, thereby providing the utmost in programming control and flexibility for both operator and management. Cartridges within the system are always cued and ready for play at the push of a button.

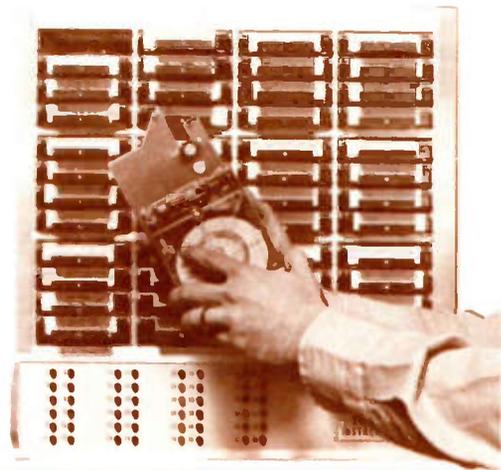
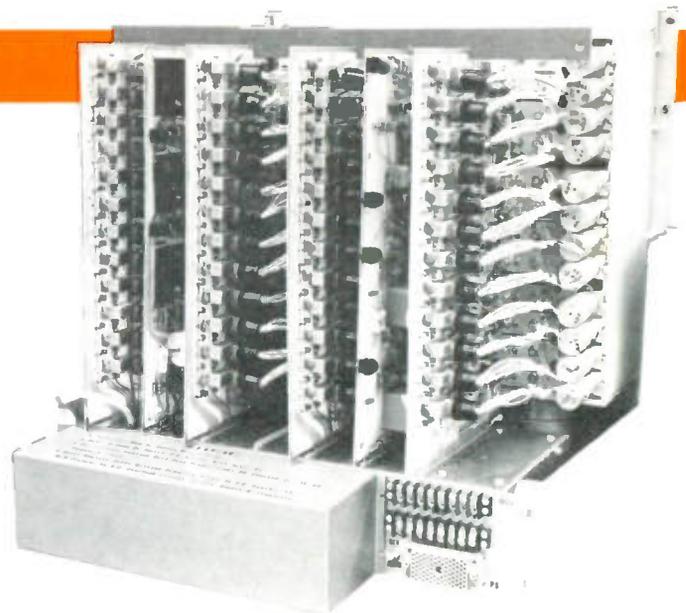
Sequential operation, when desired, is automatic within Instacart. In this mode, start signal routing is transferred to Tray #2 as soon as Tray #1 is started, etc. If so desired, Instacart will, by itself,

INSTACART (cont.)

automatically sequence through all cartridges in the machine continuously until stopped. Specialized switching requirements can be configured easily.

Maintenance accessibility for cleaning and service is simplicity in itself. Most major parts of Instacart are easily available without the necessity of disassembling the machine. As in all IGM products, components throughout are the highest grade available. Circuitry is fully solid-state and components are mounted on MIL-spec G-10 fiberglass epoxy resin printed circuit cards with gold-plated fingers.

Available in monaural or stereo with 12, 24 or 48 cartridge positions, Instacart is the automatic answer to instant-access cartridge handling.



SPECIFICATIONS:

Frequency Response: Meets and/or exceeds N.A.B. standards for cartridge tape reproducing as adopted by the N.A.B. Recording and Reproducing Standards Committee in 1975.

Signal-to-noise Ratio: Mono - 50 dB unweighted.
Stereo - 47 dB unweighted.

Distortion: Less than 2% at nominal operating level.

Wow and Flutter: Less than .2% RMS.

Output Level: +4 dBm nominal.

Headroom: 10 dB.

Output Impedance: 600 Ohms, transformer balanced.

Timing Accuracy: 99.9%.

Standard Speed: 7½ ips, 3¾ on special order.

Control Frequencies: 1 kHz cue. 150 Hz end-of-message. Optional 8 kHz tertiary.

Cue Track Output: Separate output for encoded data-track logging.

Power Requirements: 117 VAC, 60 Hz, 200 Watts.
50 Hz on special order.

Dimensions: Height — 19¼", Width — 19",
Depth — 21½", Rack Mount.

Shipping Weight: 156 lbs.

Models: 12 PBM, 12 cartridge playback, mono.
24 PBM, 24 cartridge playback, mono.
48 PBM, 48 cartridge playback, mono.
12 PBS, 12 cartridge playback, stereo.
24 PBS, 24 cartridge playback, stereo.
48 PBS, 48 cartridge playback, stereo.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

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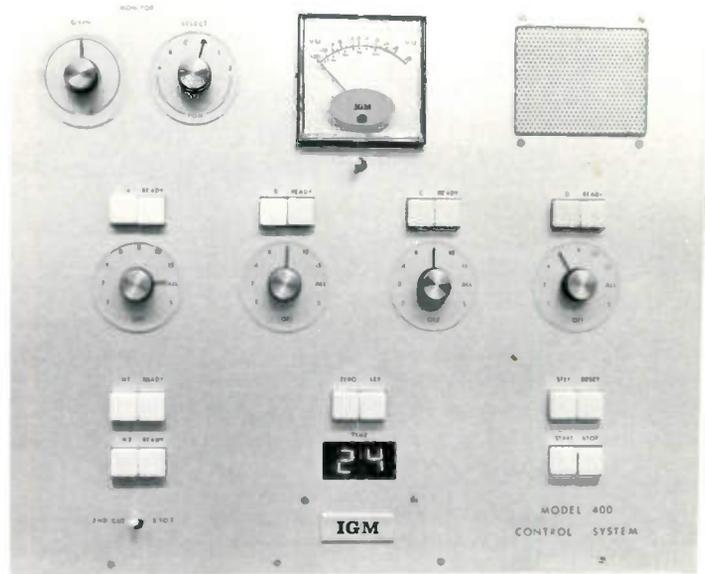
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Tomorrow's Engineering Today

MODEL 400 CONTROL SYSTEM

- Packaged as a 6-input system, using IGM's proven, easy-to-program "insertion" technique
- Latest all-solid-state and integrated circuit technology, backed up by IGM field service
- Controls any type of tape transport or cart playback capable of remote control
- Compact — requires only 15-3/4" of rack height
- Compatibility and trade-in value guaranteed
- Price: Monaural, \$3,000; stereo, \$3,250

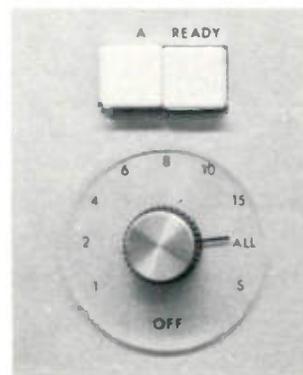


THE IGM MODEL 400 incorporates the same ease of programming proven popular and highly successful in the IGM Model 500 control systems. It can supply the complete automation control needs of many stations whose format is simple and repetitive. It provides the maximum flexibility and reliability in its price range. Quality has not been sacrificed—capability is simply matched to less sophisticated requirements.

THE MODEL 400 has six inputs, four of which are normally used for talk features and two for music. Talk or "voice" inputs, designated A, B, C and D, are individually scheduled by selector switches and push buttons. While easily changed, voice inputs are repetitive from hour to hour without operator attention. Music can be controlled on an end cue or on a one-to-one basis, but not sequentially. Logging is by slow speed recording.

SELECTOR SWITCHES, as shown at right, schedule the talk features—normally IDs, spots, time, news, weather, etc. The numbers around the switch indicate how many times, spaced around the hour, each type of feature will play, as follows:

- All After every music selection
- 15 15 times per hour, every 4 minutes
- 10 10 times per hour, every 6 minutes
- 8 8 times per hour, spaced unevenly
- 6 6 times per hour, every 10 minutes
- 4 4 times per hour, every 15 minutes
- 2 2 times per hour, every 30 minutes
- 1 1 time per hour, on the hour
- S As customized by you
- Off Not being used at present



IGM engineers and supplies your complete equipment package including the choice of two basic systems of automatic control. IGM backs up equipment with technical services in systems planning, installation, operation and maintenance — the broadest experience in the broadcast field.



IGM Model 400 control system

EACH INPUT can be scheduled independently of the others. Increasing the number of spots you run per hour is as simple as turning the switch on the spot input channel, say "B," from 6 spots per hour to 10 per hour. The system will automatically play more or less music, depending on how often you play spots or other talk features. If the system schedules two types of features at the same time, they will be switched on the air in alphabetical order—first "A," then "B," etc.

The system does not interrupt music to play talk, but rather gets the talk input channel ready to be switched on when the music selection is complete.

THE TWO MUSIC INPUTS can control any type of music transport, cartridge or reel-to-reel. Intermixing is either on an "end of tape" basis, called end cue, or on an "Every other time" intermix, called "one-to-one." Manual transfer is also possible at any time. One or the other of the music input channels will always be ready, and will automatically play until any of the talk features become ready. Music will then play again when all scheduled talk features have been aired.

ALL SWITCHING AND CONTROL is accomplished with silicon transistors, diodes, integrated circuits or reed relays. Low level mixing is provided for smooth audio switching. Complete overlap between any two sources in the system is provided on a fixed length or variable length basis, as desired by the customer.



Digital clock, built in, provides the time base. Minutes only are shown. This clock provides all readying pulses for the system.



A built-in monitor/cue selector is provided for output monitoring and cueing of individual sources.

COMPLETE MONITORING of both the program or system output and cue bus are provided, both on the VU meter and the speaker. In stereo systems, the meter and speaker are switched between the left channel, the right channel, or a composite, monaural signal.

Each input can be auditioned on the cue bus by selecting the input desired on the selector switch.

MODEL 400 AUDIO SPECIFICATIONS

INPUT

At least -4 dbm

OUTPUT

Up to $+8$ dbm, balanced 500/600 ohms (10 dbm head room)

DISTORTION

Less than 0.5% at all levels between 50 Hz and 15 KHz

SIGNAL TO NOISE RATIO

-70 dbm

FREQUENCY RESPONSE

± 1 db, 50 to 15 KHz

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Sales and technical service representatives in principal cities

MARC VII

THE THEORY: MARC VII

We have discussed the continuing and expanding application of the tape cartridge in the broadcasting industry. It is obvious that this proliferation is a mixed blessing. The radio station will continue using the cartridge profitably, and a way has now been found to eliminate the physical handling procedures that are currently contributing to costly and unprofessional errors. The device that has been developed to accomplish this must be able to match wits with the Disc Jockey, the Program Director and the Traffic Department. It is the model of simplicity and flexibility and still permits the spontaneity that is the essence of live radio.

THE EQUIPMENT: MARC VII

One MARC VII entry keyboard (a second keyboard may be placed elsewhere in the station for remote entry).
One CRT television monitor.
One or more multiple cartridge units: Instacarts, Go-Carts.
One MARC VII electronics chassis.

THE APPLICATION: MARC VII

Multiple Cartridge devices may be loaded for a shift, for a day, or for an entire week in advance. The D.J. simply enters the numbers for each event from the log by depressing the appropriate keys on the MARC VII keyboard. After determining that the information entered is valid, the D.J. pushes the START button and his show is on-the-air. Changes in the predetermined program may be made simply and quickly while the event on-the-air is still playing. With some pre-planning, the MARC VII may also be used to increase the professionalism of shifts not covered by top talent (nights, weekends, etc.).

THE RESULT: MARC VII

**Better air sound! Better use of existing talent! Better control!
BETTER PROFITS!**

SPECIFICATIONS

Audio switcher:

Passive switching of up to seven inputs. Multiple audio overlap standard.

Outputs:

May be ganged as a single output to console, or separated into up to seven outputs to faders on console. Data track output plus seven control lines for automatic logging standard.

Random Access:

Optional interfacing provides address locations for up to 99 sub-sources per source. "Look ahead" advance search for slow access devices standard.

End of Message:

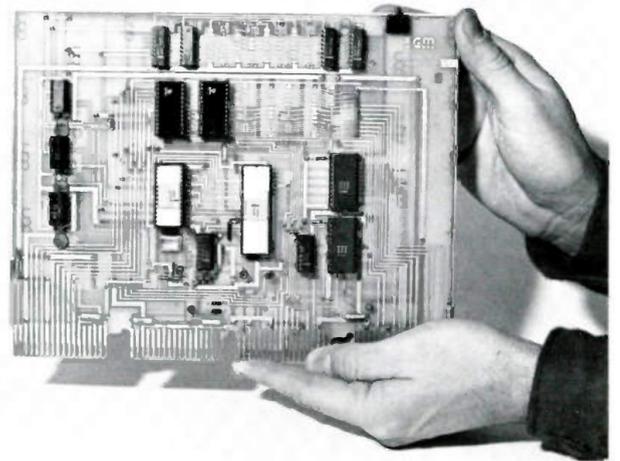
Relay closure from playback (150 Hz from cartridge, 25 Hz from reel-to-reel) activates next switching action.

Keyboard and Display:

Removable throughout station. Multiple displays may be used. Supplied with one keyboard and one TV display as standard.

Power requirements:

117 VAC, 60 Hz. (50 Hz on Special Order)

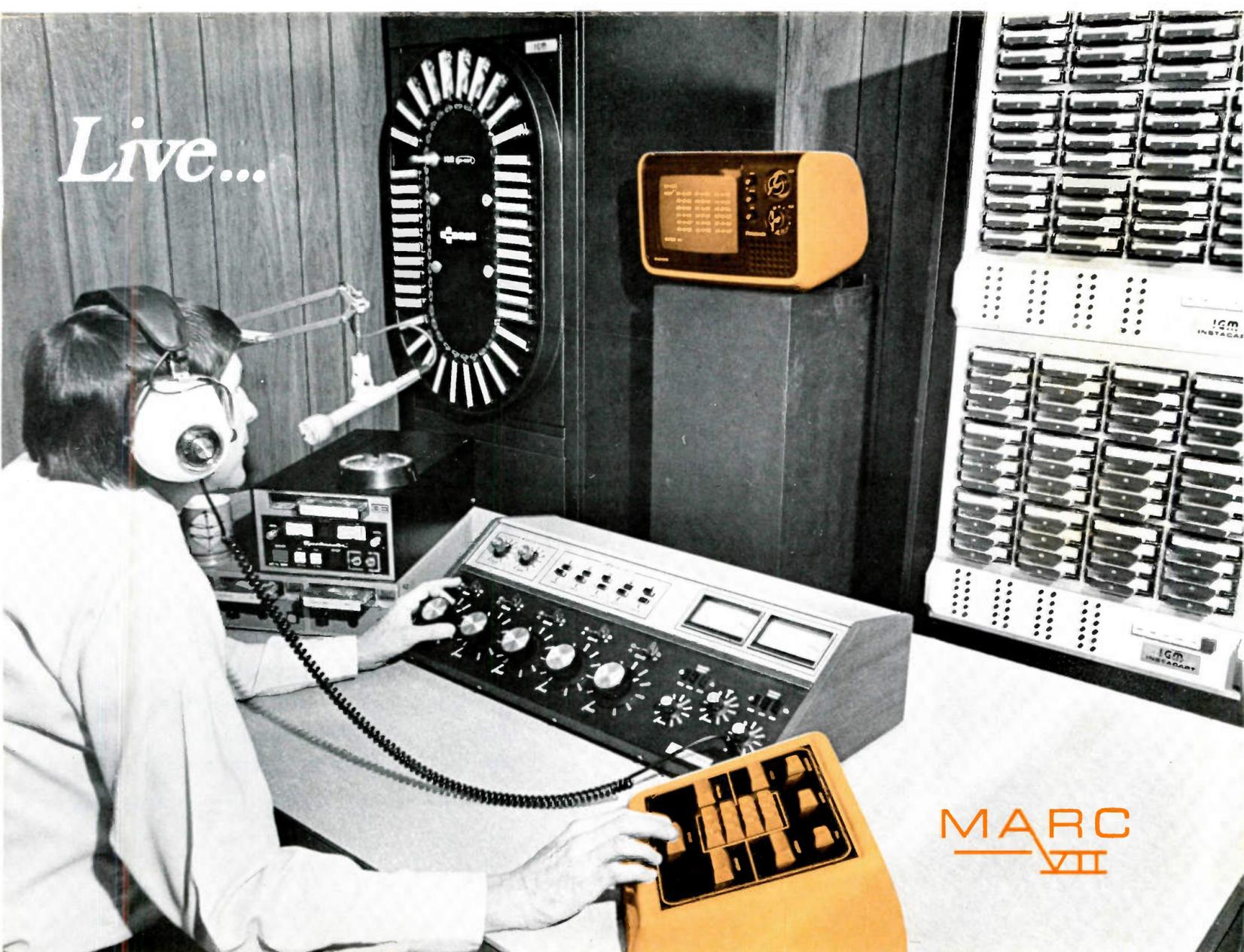


The miraculous micro-processor gives the MARC VII its personality and capabilities.

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MARC VII 2M 3-76 Printed in U.S.A.



**MARC
VII**

MARC VII

Manual Assist Remote Control

- Designed exclusively for "live" operation
- Eliminates cartridge handling during board shifts
- Rapid access for last moment scheduling
- Input keyboard at D.J.'s location
- Plug-in capability for automatic English printout logging
- Micro-Processor circuitry

The introduction of the tape cartridge brought about broadcasting as we now know it. Advancements in the technology of the cartridge and the various playback units have allowed the station Program Director to commit most of his program schedule to cart, including, most recently . . . music. With 50% to 90% of all material for broadcast already recorded on cartridge, the D.J. has found the situation to be something of a paradox. The convenience of the cartridge is undeniable, yet how do you retrieve-position-play and return all of this material and still retain the spontaneity demanded of a live operation.

The MARC VII

IGM seriously investigated the state of the art of today's live radio. It immediately became apparent that while thousands of man hours and millions of dollars have been invested in the improvement of automated radio, little attention has been paid to adapting this new technology to the requirements of live broadcast.

In designing a system to meet and exceed the specifications sought by the broadcaster, IGM also made a study of the problems existing in the typical live radio station. The biggest single problem in a live operation? CARTRIDGE HANDLING!

Dozens of station operators were interviewed to establish the parameters within which any manual assist device must operate. As

anticipated, any concept designed to assist in a live operation must be built to very exacting standards, while meeting the following requirements:

- Absolute simplicity of operation
- Total flexibility
- Rapid accessibility for last moment scheduling
- Input capability from D.J.'s location

From these basic requirements came a concept.

The MARC VII

With practically all commercial, PSA and jingle material committed to cart and the continuing trend to cartridge music, most stations commented . . . "The location, insertion and starting of cartridges in single plays or triple cartridge units" . . . is the area in which most D.J.'s tend to err. Likewise, the handling or mishandling of cartridges can quite often result in error, missed commercial minutes, damaged equipment, general control-room confusion and "noise." IGM concluded that any manual assist to the board operator would have to incorporate the following methods of eliminating the major control-room problems:

- An entering device with which the D.J. can plan his broadcast several "steps" in advance
- A CRT display capable of displaying these entries for the D.J.'s verification
- A storage system in which cartridges may be held ready for broadcast and accessed automatically

MARC VII



The entry keyboard was designed to offer the D.J. maximum flexibility and ease of operation. Note that this keyboard was also designed to provide the D.J. with instant ability to program, re-program and air his show with the least amount of physical involvement. A thoughtful study of this design reveals that the D.J. is allowed to enter, correct, advance, or delete information instantly at will.

The actual functions of the keys as shown in the picture are:

- ENTER** By pressing a series of three numbers on the keyboard and touching the ENTER button, the D.J. programs each of his next events.
- INSERT** If the D.J. wishes to place an event "in between" two previously programmed events, he merely pushes the INSERT button.
- KILL** All audio may be instantly switched off the air by depressing the KILL button.
- CLEAR** The entire screen, with the exception of the "on-the-air" event can be erased by touching the CLEAR button.
- ADVANCE** To delete the next event from going on-air, the D.J. touches the ADVANCE button.
- HOLD** To retain a cartridge on-the-air [as in the case of a recorded open and close], the HOLD button is depressed and the word "Hold" appears on the screen. Push again to cancel Hold condition.
- FOLLOW** Any number of events may be "tied together" for automatic back-to-back switching by pushing the FOLLOW Key. Arrows appear on the screen to indicate these "linked" events. Push again to cancel FOLLOW condition.
- START** Each time the D.J. is ready for the next event or sequence to go on-the-air, he merely depresses the START button.
- ←** The back arrow key is used to address any of the 18 next event locations, or to make desired corrections on the "enter" line.

Think of a situation in which you might find yourself while on-the-air and you will see clearly how simply the MARC VII can accommodate it.

Pictured below is the CRT screen which allows the D.J. to review the schedule he has created and prepare for his next on-the-air segment.

Note that the following information is displayed for the D.J.'s review:

- The event that is on-air [4-48]
- The next event to go on-air [2-00] and the 17 events that follow it.
- An ENTER line, set to accept the next event to be scheduled by the D.J.
- A 59:59 clock that will automatically reset to 00:00 and count up each time an event is started on-the-air.



The MARC VII accommodates seven audio inputs, each with the capability of addressing 99 sub-sources. Each input may be any type of playback device, such as IGM's Instacart, Go-Cart, turn-tables, reel-to-reel decks, single plays, etc. In the case of any random access cartridge playback device, there will be a source and sub-source number. Therefore, a cartridge placed in Instacart No. 1, tray 14 would be listed as 1-14. Any type of single source such as a turn-table or a single play cartridge machine, would be listed by its source number only, such as 1-00. Stopping points in the sequence are entered as 0-00. The MARC VII will then "wait" at these points until the D.J. pushes START again.

On the screen pictured, Instacart 4, tray 48 [4-48] is on-the-air. Single-play 2 [2-00] is scheduled next. Instacart 3, tray 33 [3-33] is the second scheduled event. The D.J. has determined that these three events should run back-to-back. Therefore the FOLLOW button has been depressed and arrows appear between these events. If the D.J. does not change his mind, these events will play automatically, one-after-the-other.

Following tray 33 from Instacart 3, the D.J. wishes to talk and has entered three zeros [0-00]. The MARC VII will then stop and wait after 3-33. The D.J. can still change his mind at any time, and by depressing the FOLLOW button again, he will erase the arrows and be able to speak between any two events.

When a series of events has been entered, such as those pictured, the D.J. is ready to begin his show. He touches the START button and is on-the-air with 4-48 [perhaps an oldie]. This will be followed automatically by 2-00 [a new release from a turntable.] After these two selections, 3-33 [a spot] will begin and then the D.J. will talk [I.D.—time check, etc.]. NOTE: Suddenly there is time to think. No frantic reaching for cartridges, back-cueing records while on-the-air, missing spots because the cartridge couldn't be found at the last minute. As the mechanical functions are set up several steps in advance, any missing ingredients are spotted before air time. Play lists can be entered, exactly as listed by the P.D., and the air personality can be held accountable for its execution. The P.D. may also wish to place a remote CRT screen in his office to monitor control-room activities.

IGM

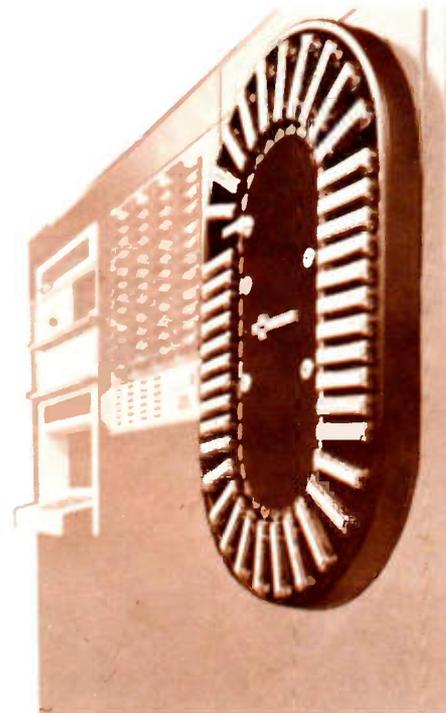
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PRODUCT DESCRIPTION

GO-CART

Multiple Cartridge Handling System

- Stationary Cartridge Deck for Accurate Tape-to-Head Alignment
- Cartridge Completely Removed from Carrier When in Play Position
- Bi-directional Drive and Micro-processor Logic for Fast Cartridge Access
- Entire Unit Hinged for Easy Swing-out Maintenance Accessibility
- Safe, Gentle, Precise Cartridge Handling
- Expandable Cartridge Handling Capacity



Taking their cue from the widely accepted standard of the IGM Instacart, IGM's electro-mechanical design team set about to satisfy the many inherent limitations found in the circular or elevator-type mechanical cartridge handling systems so prevalent in today's market.

Simplicity, ruggedness, precision, serviceability, high-speed access, expandability, superior cartridge performance, and innovative electronic control circuitry were just a few of the desired design criteria. Go-Cart is the vivid result of these efforts.

Go-Cart provides safe, swift, gentle and positive cartridge handling. Its cartridge carrier belt is driven by a high-torque, bi-directional, variable-speed DC motor directly coupled to a sprocketed wheel assembly. The teeth of these drive wheels mesh directly with the cartridge carrier trays. Each carrier tray is individually and specifically referenced through a binary shaft encoder on the rear of the machine, and photo-optical sensors are employed to read the exact cartridge location being searched.

The desired cartridge is rotated in its carrier to the stationary head and deck assembly, electronically de-accelerated and dynamically braked to a stop. The drive train is then precision indexed and locked securely in position. Next, the cartridge is automatically loaded onto the 1/2 inch thick precision-milled aluminum deck plate by a remarkably simple three piece sliding roller assembly. Once the cartridge has been placed in contact with the heads, the load mechanism is completely disengaged, leaving the cartridge totally free from any carrier tray or similar artificial guidance system. In this way, cartridge performance is on a par with the finest single decks available. The same load mechanism is re-engaged for the return cycle, and the cartridge is placed back into its own numbered carrier tray after each use.

Carrier trays are of one-piece precision injection molded Delrin, known for its high impact and long term stability characteristics. The trays are linked together in flexible chain fashion, forming an oval-shaped carrier belt. Since there are no trick tabs or cartridge retaining clips to fumble with, manual

loading or unloading of the carrier trays is a quick and easy one-handed operation.

The basic Go-Cart is supplied with a single playback deck and 42 cartridge positions. The unit may be expanded by adding more carrier trays to the belt and extending the lower sprocket idler wheel main frame, making the machine capable of handling a maximum of 78 cartridges in a standard 6-foot high rack.

Go-Cart's main frame mounts on rugged hinge brackets and allows the entire unit to swing out of the rack for routine cleaning and adjustment. Electronics and power supply are mounted on their own sub-chassis behind the main assembly, and the machine remains fully operational in the open position.

Control electronics, integral micro-processor, audio amplifier and cue tone sensor circuit cards plug into a miniature IGM-developed Audabus chassis which allows any circuit card to be inserted into any socket. The micro-processor has been programmed to incorporate self-diagnosing error detectors and, in the event of a machine malfunction, Go-Cart will cease operation, light an error light on the front panel, and illuminate one of 7 specific fault indicators. Thus, the technician is directed to the exact cause of error. As a further convenience, solid-state indicators have been incorporated into the cue-tone detector circuitry providing a visual reference of proper tone sensor actions.

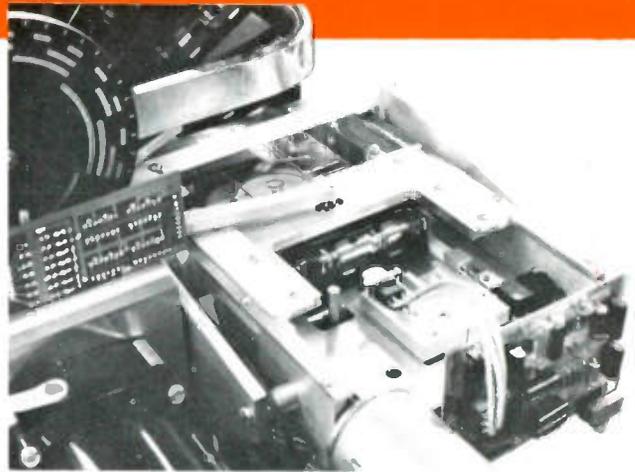
Micro-processor computer-based control logic gives Go-Cart many advanced abilities. For example, the machine automatically determines the shortest access distance to the next required cartridge, and will rotate the carrier belt in that direction. The micro-processor is also responsible for the electro-dynamic braking action as the desired cartridge approaches the deck assembly. Should the operator desire to audition a cartridge different from the one already loaded, he places the machine in the manual mode and selects the required cartridge. When through, the operator restores the machine to automatic cycling, and Go-Cart ejects this manually selected cartridge and loads the next cartridge called for on-air.

GO-CART (cont.)

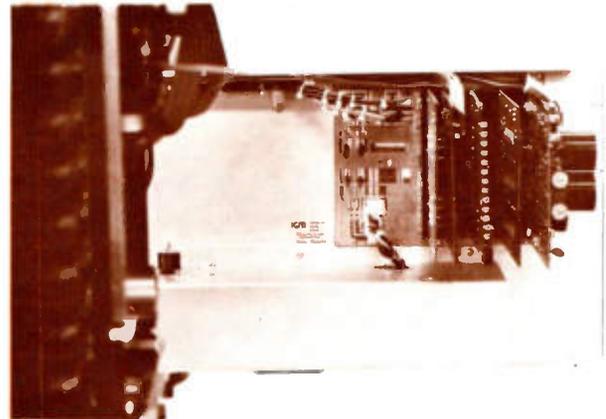
As in all IGM products, mechanical and electronic components are the highest grade available. Motors are massive, direct-drive and continuous-duty rated. Switches throughout are solid-state Hall-effect zero-bounce. Internal position sensors are solid-state Hall-effect or photo-optical. Circuit components are mounted on MIL-spec G-10 fiberglass epoxy resin boards with gold plated fingers. The mechanical chassis is constructed solidly from heavy-weight precision-milled aluminum and steel, incorporating castings or high-grade plastic components selected for their stability and long-term wear characteristics where appropriate.

Random access capability and manual remote control outputs are included as standard with Go-Cart. Optionally available will be a manual remote control unit, recording capability, 78 cartridge positions, and 8 kHz tertiary tone sensing.

Go-Cart is the ideal complement to automated, manual-assist or live studio operations, and brings a new and highly reliable approach to today's multiple cartridge handling processes.



Easily accessible cartridge playback deck.



Streamlined electronics chassis.

SPECIFICATIONS:

All Specifications meet and/or exceed NAB standards for cartridge tape reproduction as adopted by the NAB Recording and Reproducing Standards Committee in 1975.

Front Panel Controls: Error; Rotate UP; Rotate DOWN; Start; Stop; Load; Manual.

Power Requirements: 117 VAC, 60 Hz, 100 Watts, 50 Hz on special order.

Cartridge Search Time: Worst case access (42 cartridge model) is accomplished in under 6 seconds maximum, plus cartridge run-off.

Dimensions: 42 Cartridge Model—30 $\frac{5}{8}$ " high, 15" deep, 19" wide.

Shipping Weight: 100 lbs.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

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In all IGM equipment—"tomorrow's engineering today"

GUARANTEED TRADE-IN VALUE. As one of the most effective safeguards in the industry against sudden obsolescence, the purchaser of any IGM equipment is protected by an agreement establishing a definite trade-in value for any future date.

CIRCUIT BOARDS, etched on heavy duty epoxy glass, are employed virtually throughout. Each board plugs into a drawer which is mounted on slides for easy access to all circuits from the front of the unit.

ALL SOLID STATE, using silicon transistors and silicon diodes. Program and monitor amplifier are interchangeable providing a built-in spare. Audio switching circuits use photo resistive devices.

INDIVIDUAL PLAYBACK COMPONENTS can be moved from chan-

nel to channel by changing one plug per input. All control and audio connections are contained in a single cable and plug.

SEPARATE SENSE AMPLIFIERS. Individual playback components, including reel-to-reel units, have their own sense amplifying equipment. This permits automatic cueing of tapes, and means the entire system is not dependent on a single switching tone detector.

BUILT-IN CUE SYSTEM, including VU meters and monitor, permits all levels to be set to the same standards. The result is better production.

ALL COMPONENTS ARE rated considerably higher than their normal operating parameters, providing a comfortable safety margin.

AUDIO SPECIFICATIONS

IGM 600 control systems

Output

Up to + 18dbm, balanced 500/600 ohms

Distortion

Less than .5% at all levels between 50Hz and 15KHz

Signal to noise ratio

- 70 dbm

Frequency response

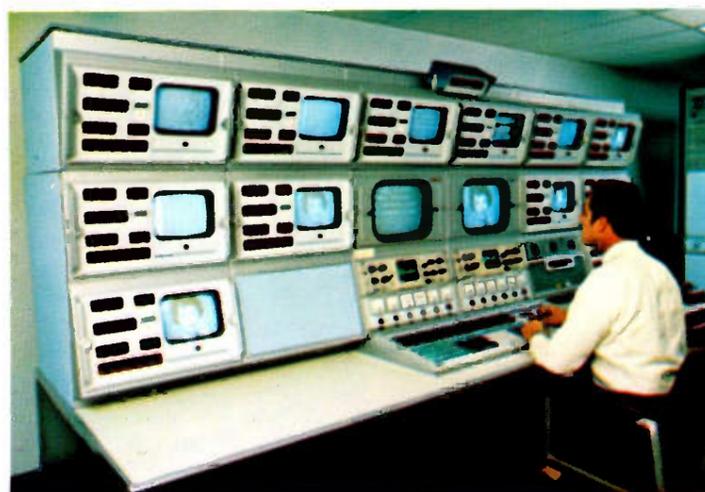
± 1 db, 50 to 15KHz



Compact, solid-state plug-in printed circuit modules, above, permit all interfacing required by the basic IGM 630 system to be contained in a single roll-out.



IGM Series 500 controls provide for automated programming by time or pre-set time intervals, using any number of non-music channels and automatically filling in between with music. Modular, expandable, all solid state.



Audio video controls by IGM are used to automate the switching of multi-channel ETV systems with as many as 36 inputs and 14 outputs, monitored and controlled from a single console. IGM also produces non-duplication switching systems for CATV.



Series 600 IGM audio control systems

- DELIVER UNSURPASSED FLEXIBILITY, with new real time capability
- PRODUCE A COMPLETE VERIFIED LOG as each event is aired
- PERMIT LIVE PARTICIPATION to any degree at will, with new ease of manual and remote override
- ARE COMPUTER COMPATIBLE

A punched card for each event
 ■ actuates control; ■ automatically types the log, verified as aired ■ ties in with automated billing.

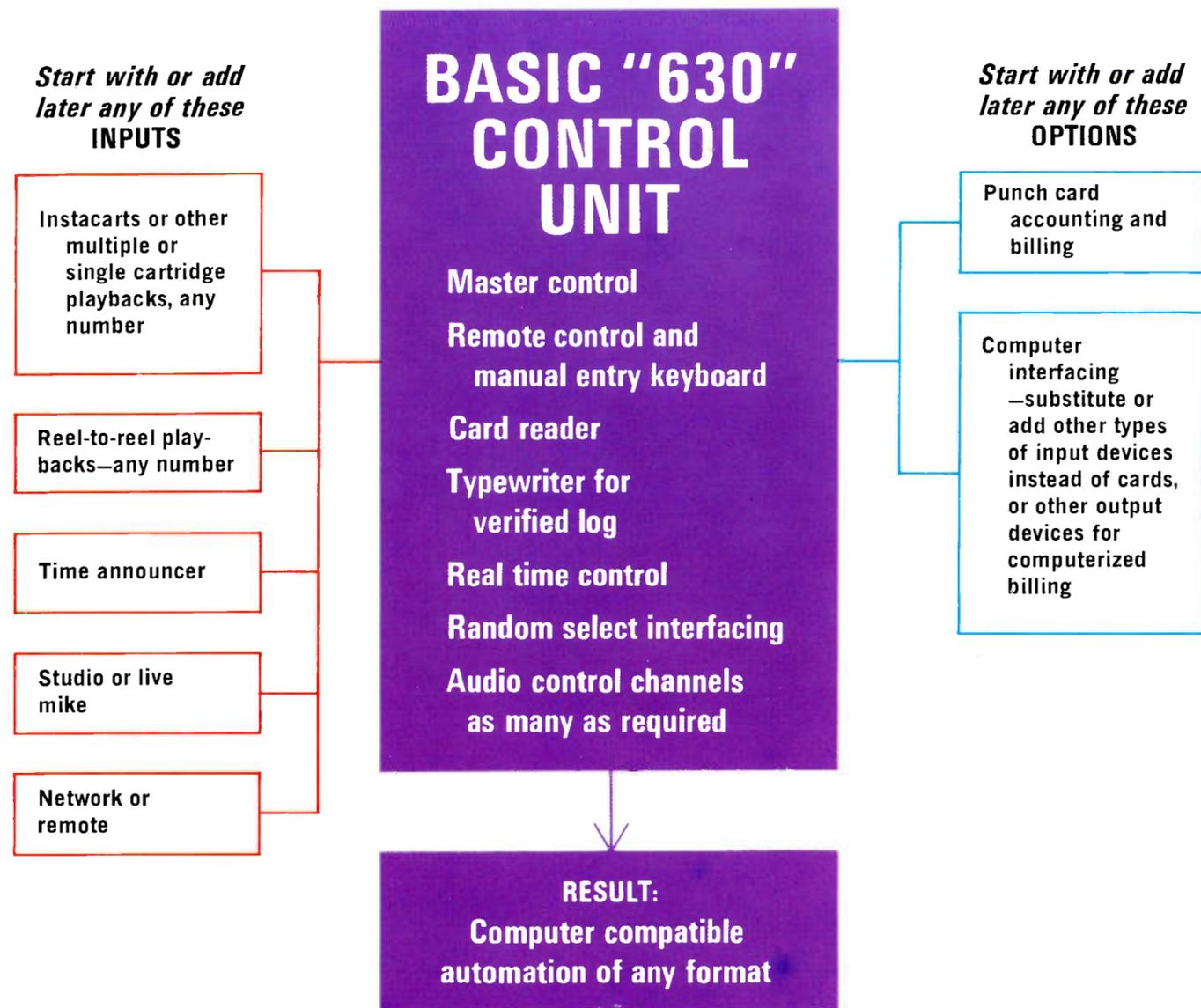


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The computerized IGM 600 system—what it is:



IGM Model 600 systems are actually specialized digital computers which rely on hardwired logic rather than "software" common to general purpose digital computers. Standard computer punched cards are used as an input device and provide data for a complete log description of each program. A Univac card reader is used to read the cards. The logging typewriter is a standard IBM computer peripheral, operating at 15 characters per second. Other types of input or output devices can be interfaced to the basic Model 600 logic if desired. All internal logic and interfacing is designed and built by IGM, using modern TTL integrated circuits. This state-of-the-art system, with its built-in digital clock, provides flexibility and features available in no other system, even those utilizing general purpose computers. Complete random access to all sources is standard.

There is no need to establish a fixed sequence or several fixed sequences of events, and repeat them hourly or daily. Each 15 minutes, or hour, or day, or week can be as different from the last as desired. One punched card contains all information relating to a single program feature, and the information is printed on the card itself for easy identification. There is no complicated procedure to establish or change a format. The fully verified station log, including a verification code from the source as it goes on the air, is typed as each feature is aired insuring that last minute changes are duly reflected on the log. The manual entry keyboard permits last minute changes to the format from a simple ten-key telephone type keyboard if desired, making it unnecessary to punch new cards and change the program deck.



Manual entry

The manual entry feature now standard in IGM 630 systems offers another simple means of making program changes. By simply pushing a button, a standard 10-key keyboard feeds information to the next event memory. This makes it unnecessary to substitute cards for last minute changes as the system can be programmed manually. The first three columns of the log will also be completed automatically, allowing the operator manually to type a complete description if desired.

Use with live DJ's

If you are looking for a system which will relieve your announcers and studio engineers of routine switching and logging duties, and allow them to concentrate on productive, revenue producing tasks, the IGM 600 Series equipment is it.

Only those features which you presently pre-record need be loaded into the system. The DJ can continue to operate from a console with turntables and microphone.

The output of the console is fed to the IGM 600 system as a regular input—"10" for example. The "next event" readout, showing the next source to be used, is remoted to the DJ's studio as is the remote control for the system. Daily schedules are prepared in the normal manner. When a recorded feature is scheduled, the DJ presses a single button which switches the audio, starts the input containing the feature, and completely logs the entry. At the completion of the recorded feature, switching to the next event, or back to channel "10", is automatic. Records and talk are programmed live until the next recorded event.

As an option, music may also be pre-recorded to any extent desired—on cartridges in the case of a format requiring a limited play list, or on reel-to-reel tapes. With this system, all elements of the format except DJ talk, time checks, weather and news summaries can be searched, switched, and logged automatically. Even non-recorded features can be logged automatically from the studio at the press of a "log" button.

Log form

The layout and number of duplicate copies of the log desired are custom designed for each station and printed in continuous fan-fold form. A cover sheet or extra margin can be used to provide space for a key to codes used, date, a place for the announcer on duty to sign on or other information. After the day's log is completed, the original is verified and stored. Duplicate log copies are useful as a schedule for next week, availability schedule and for other purposes. The day's "deck" of punched cards is also saved for future use.

Traffic and accounting tie-in

One copy of the log is typically used as a schedule for traffic purposes. Changes in the format can be noted in pencil on the schedule for next week. Commercials which expire are crossed off and new commercials added at their appropriate times.

Operation of Series 600 system is simplified by the use of an IBM printing card punch. This unit punches the cards, prints a description of the punched information on the top of the card, and has built-in duplicating and "program card" capabilities.

Units are available from IBM on a lease or purchase basis. Schools to train operators and complete IBM service on the equipment are generally available on a local basis.

New cards are manually or automatically sorted into the previous week's deck of cards for the same day, so that changes correspond to the revised schedule. This is a simple matter, even on a manual basis, as the cards remain in the same order as the entries on the schedule, and only those cards which change need be considered. The corrected, current schedule is used to load the tape equipment, the cards are placed in the card reader, and a new day's automatic programming is ready to start.

If punched card accounting equipment is used, the portion of the commercial cards not used for printing the log can be used for traffic and accounting data. Contract starting date, end date, scheduled time, salesman, agency, product codes, and rate can all be shown. Using automatic sorting equipment, availability schedules, invoices, sales report, and accounts receivable can be produced on the IBM printer with the same cards that operate the automation system. Commercial cards can be quickly sorted back into the cards representing other features by punching all cards with a scheduled time, then sorting into chronological order.

If program logs are presently being prepared from punched cards, all that converting to the IGM 600 automated control system requires is that the appropriate column or columns of the card and log form be reserved for channel source and verification codes.

Interfacing to computers

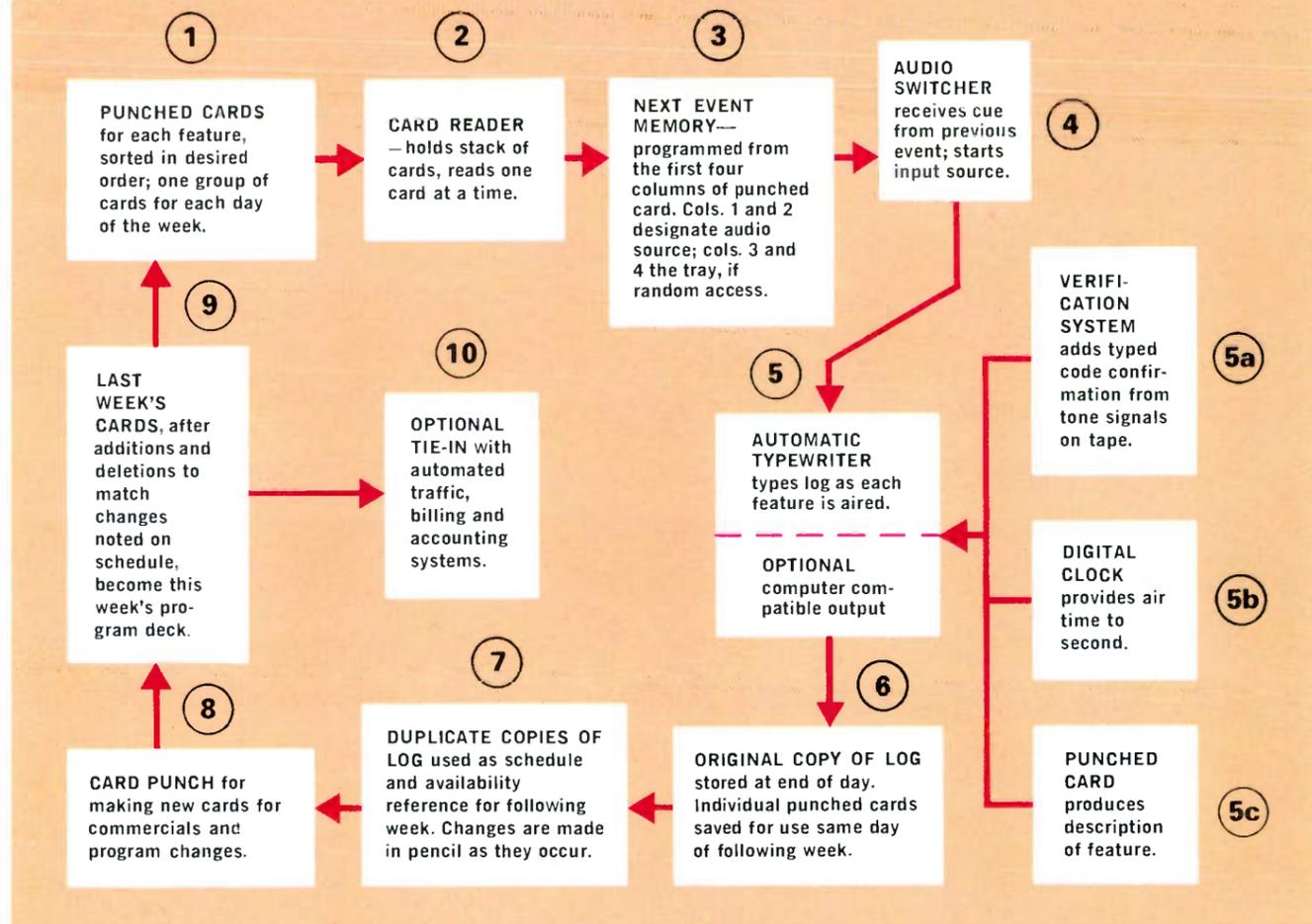
Punch cards are a standard and widely used computer input/output device. The program deck for the IGM 600 system can be automatically produced on a daily basis by a computer if the availability or scheduling function is computerized. Special types of input devices, such as magnetic tape or paper tape, can also be substituted for the card reader in the 600 system on special order. A special paper tape or magnetic tape output can likewise be added to the Model 600 system to produce a listing of all commercial account numbers and their air times automatically as they go on the air. This commercial verification can then be used as an input to a computer system, eliminating the need to enter this information manually. IGM has extensive experience in all types of logic design and interfacing which can be utilized for special requirements.

IGM TAPED MUSIC SERVICES



As the largest supplier of taped music to the broadcast industry, IGM offers individual stations access to over 20,000 hours of original selections covering the entire spectrum of musical sounds, chosen with discrimination and expertly classified. Over a dozen different taped services are offered to broadcasters, announced or unannounced, monaural or stereo. IGM music services are fully described in a separate brochure, available on request.

SIMPLIFIED DIAGRAM OF IGM 600 SYSTEM



Keeping the system on time:

The IGM 630 system eliminates the labor of timing the entire format in advance to insure that the station IDs and other programs scheduled at fixed or approximate times are properly aired. The system adjusts to studio time at intervals selected by the operator by skipping "fill" material which is not needed, and cueing up the desired program at the desired time. These intervals can be standard times, as selected on switches, or completely random time intervals selected by punching the desired time into a special card. The "real time" capability of the system permits several types of actions to be accomplished at times punched into the cards. These are to:

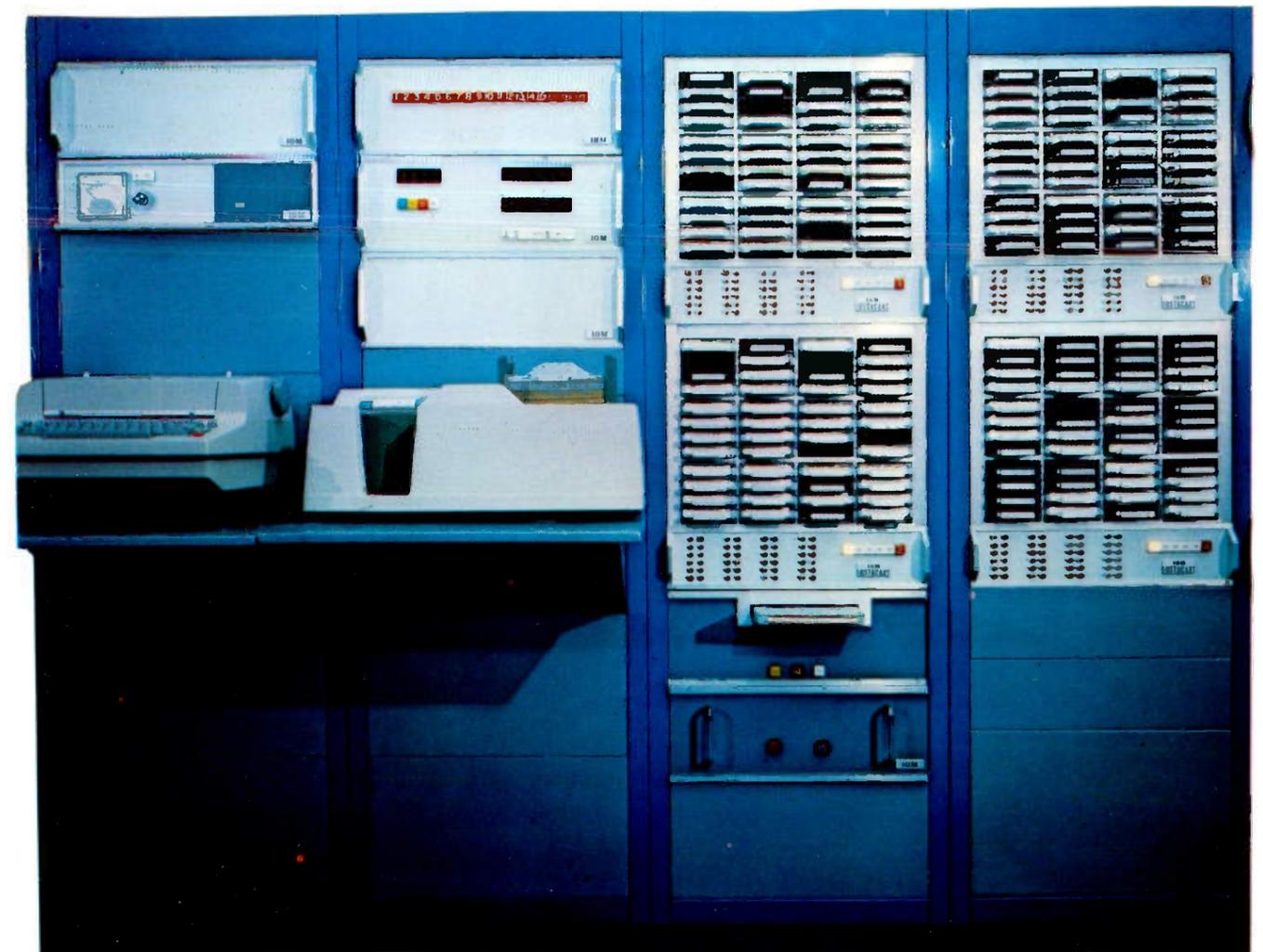
1. Skip fill material
2. Fade and switch

IGM TECHNICAL SERVICES

IGM engineers and supplies your complete equipment package, including controls, tape transports, cartridge playbacks and all needed optional or accessory equipment. Installation by IGM factory engineers, plus thorough initial training of station personnel assures undivided responsibility and smooth operation from the start. Continuing technical, maintenance, programming services and consulting for accounting systems are also available.

3. Skip scheduled material and prepare the system for real time switch by arming a special fill channel which, if needed, fills the time between the end of the event then on the air and the desired starting time of the next feature.
4. Mix the audio of the present air source with the next. This permits a talkover (such as a show close) by a DJ over music prior to switching to a real time feature.
5. Arm the system to switch on an external command, such as a network switching cue.
6. Provide a spare code for customized station use, such as automatic transmitter turn on/off, or turning tape recorders on/off.

A code is assigned to each type of function and is punched into column #1 of the card. The next six columns of the card contain the desired time. As these cards enter the read station of the card reader, they are automatically read and memorized. When studio time matches the scheduled time, the desired action takes place, smoothly and automatically. Note that an audio mix is scheduled at 9:29:50 in the illustration below.



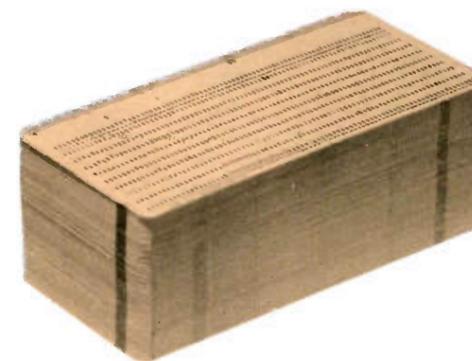
Cover illustration and view above, IGM 630-15 system in use by WFIR, Roanoke, Va.

The computerized IGM 600 system - how it works:

A card for each event - a "deck" of cards for each day of the week

Punched cards are used to program the IGM 600 series systems and to provide information for the automatically prepared station log. There is one card for each feature in the format, including spots, programs, time checks, music selections and DJ intros. The program format is set up by organizing the cards in the desired order, either manually or automatically. A separate group of cards is normally made for each day of the week. There is no need to set up an established format and repeat it every half hour or hour. The most complex format can be handled without compromise as the system is completely random access and capable of scheduling events on a real time basis. Yet, changes are made as simply as deleting, adding or moving a card to a different position.

The cards are loaded in the hopper of the Univac card reader. Cards are automatically fed, one at a time, to the "read" station and dropped in the hopper at left when used. The order of the cards may be changed at any time up to air time without affecting the program log.



The punched card, standard input device for IGM 600 systems. Individual cards may be removed, changed or added right up to air time.

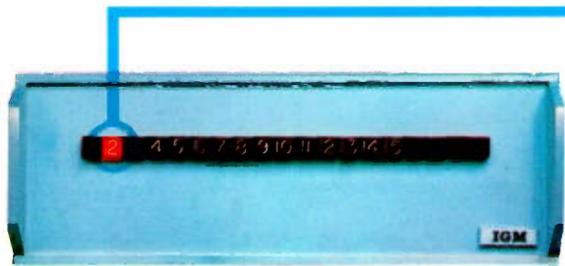
Visual readout of "next event" and time

As each card enters the "read" of the Univac reader, the information punched in the first four columns is memorized and displayed on the "next event" readout to indicate the source of the next feature. If the playback source is not random access (such as music tape, time announcement or studio) the last two digits are zeros. Thus, the number "0700" might refer to a studio as input #07 to the system. If the source is random access, such as Instacart, the digits in the 3rd and 4th columns indicate the tray number. Thus "216" indicates input #2, tray #16. A digital clock readout is also located on the panel and is fed to the typewriter to record actual switching time in hours, minutes and seconds.



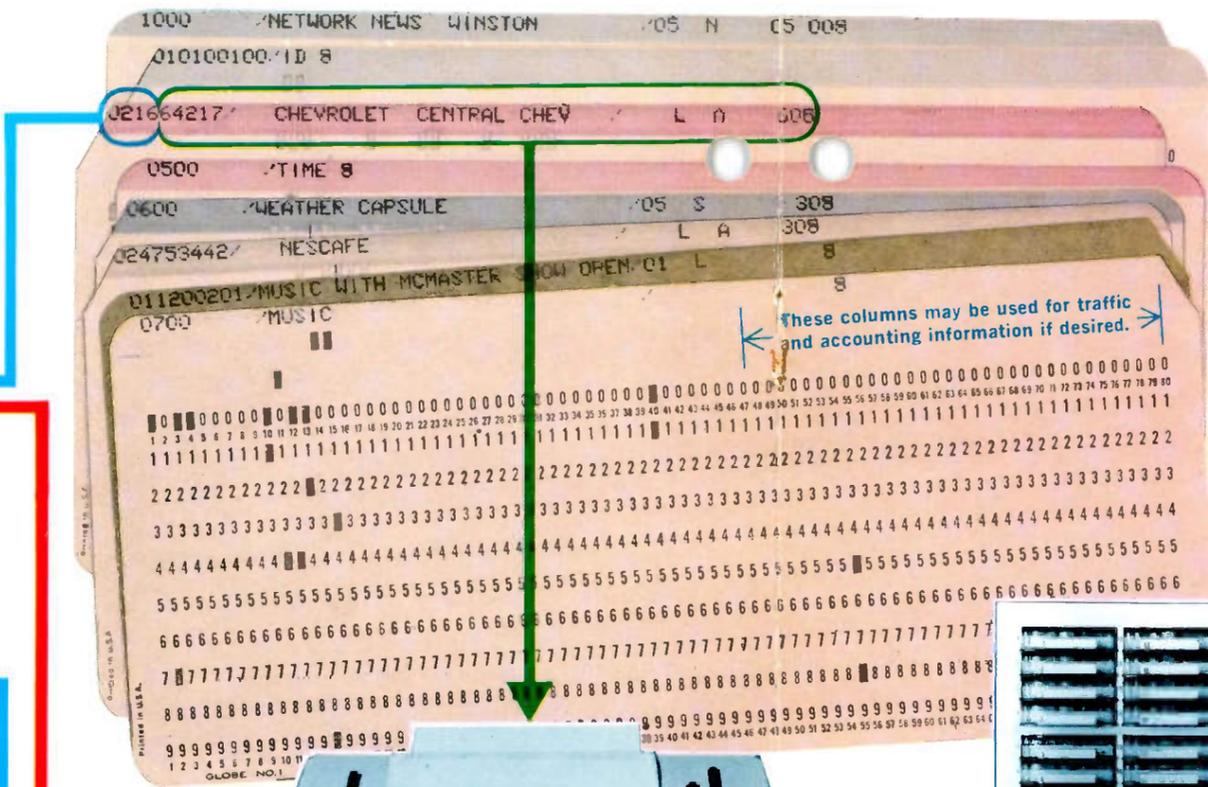
Audio switching

A separate chassis, shown below, contains individual printed circuit boards for each separate input source. Switching is by photo sensitive devices, eliminating all relays, clicks and pops. Each time a switch occurs, audio from the next source is faded on at a fast rate, while the audio from the source ending is slowly faded off. This provides smooth, console-type mixing, at low levels. A single cable between the audio card and the transport provides all start, stop, and audio control. Input sources can be quickly moved from input to input by simply moving the cable. The chassis is wired to handle a maximum of 20 input sources, each of which can be split into 48 sub-sources. A numbered push-button lights up as each source is put on the air, and also provides manual start and audio switching for emergency situations.

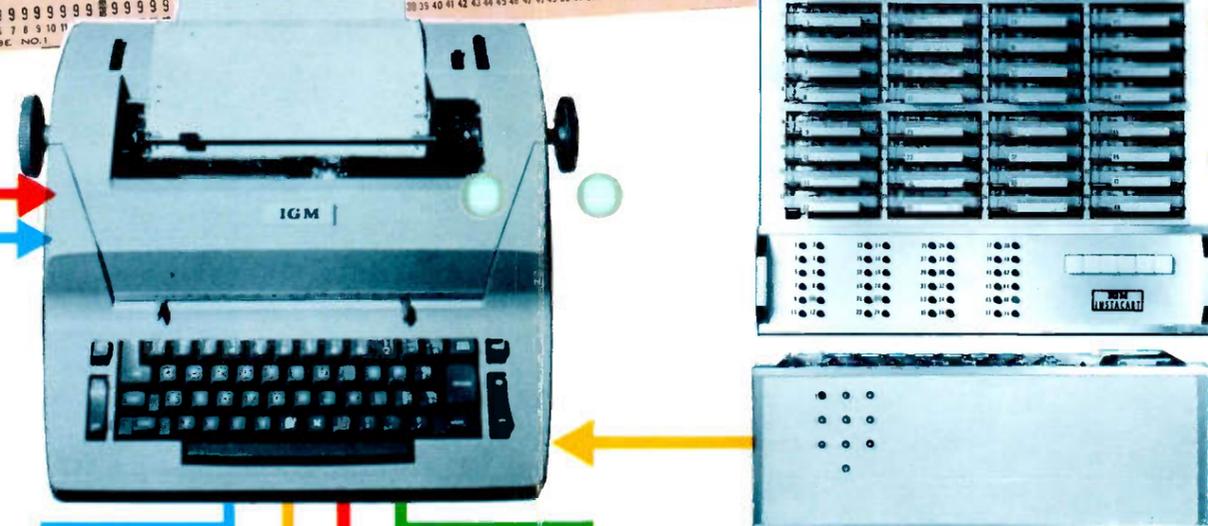


A separate chassis with VU meters provides audio mixing and reamplification to the desired output level. VU meters and speaker can be switched between the program (output) mode and the cue mode, permitting the operator to cue up or audition tapes while the system is on the air. A built-in fail-safe alarm warns the operator of a lack of audio and switches the system to the next event after a pre-set interval.

Overall control of the system is provided by the three buttons designated "Master Start," "Master Stop" and "Step." These, along with the next event readout are also remoted to the control studio on the same console with the manual entry keyboard, permitting complete remote control and programming of the system. Additional remote control stations, including time, can be added as desired.



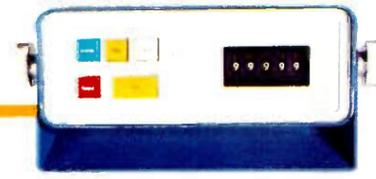
- Source
- Time
- Code and data from punched card
- Verification code from cartridge



CH	CODE CARD	TIME	CODE CARD	PROGRAM - SPONSOR	PRG TYPE	PRG SOURCE	CHAS TYPE	DURATION MIN SEC	INITIAL
1000		09:00:00		NETWORK NEWS WINSTON	05	N		5 00	
0101	00100	09:05:00	00100	ID					
	0216	09:05:06	64217	CHEVROLET CENTRAL CHEV		L A		60	
0500		09:06:06		TIME					
0600		09:06:11		WEATHER CAPSULE	05	S		30	
0247	53442	09:06:43	53442	NESCAFE		L A		30	
0112	00201	09:07:12	00201	MUSIC WITH MCMASTER SHOW OPEN	01	L			
0700		09:07:20		MUSIC					

Cartridge verification system

A special five-digit code is recorded on the cue track of the cartridge as the commercial or feature is recorded. A special IGM encoder, shown below, generates standard telephone company "touch tone" bursts which are recorded at the beginning of each message. As the cartridge is switched on the air, these tones are decoded and fed to the typewriter. This provides evidence, from the source itself, to confirm that the proper cartridge was loaded, selected, and switched on the air. This positive verification system has long been an exclusive feature of IGM systems. Those sources in the system which do not require verification are hooked up so that this feature is bypassed on the log.



Logging sequence

As each feature ends, the switching tone signalling the end of the feature is routed to the next event memory, which in turn starts the appropriate transport via the audio switcher. At the same time, the typewriter is fed the information in the "next event readout," indicating on the log which source has been switched on the air. This information is typed in column #1 of the log (see blue arrows in illustration at left).

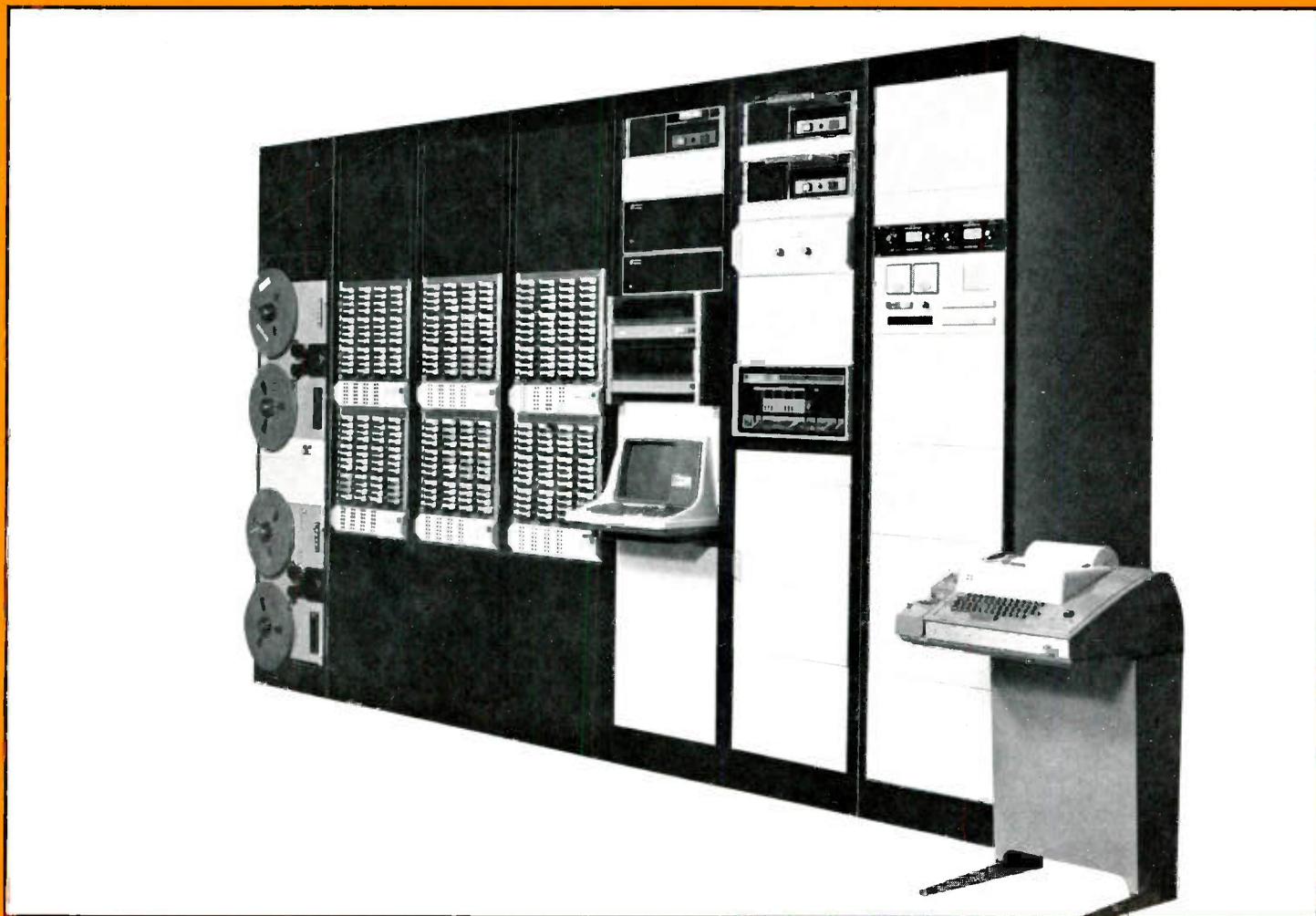
If the feature being switched on the air contains a verification code, the typewriter tabs to column #2 and types the five-digit code as it is decoded from the cartridge itself. This goes in the "code card" column of the log. If the input source does not contain a code, the typewriter automatically tabs past column #2 and types the time in column #3. The time is memorized at the beginning of the switching action so that it is correct when typed on the log.

The typewriter then tabs automatically to the "code card" column of the log (#4). This column, when used, is a cross reference to the code from the cartridge. By simply comparing the two columns, the log is verified and can be certified by an operator as being correct. When the code is not used, this column is skipped over by the typewriter. The information for column #4 and all subsequent columns of the log comes from the punched card, which is now read column by column. Individual log entries can be as brief or as complete as desired. A special code, punched into each card after the last information desired on the log, causes the typewriter to carriage return, the card to skip, and the next card to come in. This can be punched in column #5, resulting in no description in the columns to the right of the time.

The minimum time required to start, log the source and time, skip the card and get the next source ready is about 2 seconds. The maximum time to type a full log entry, such as the Chevrolet spot shown on the log, is about 7 seconds.

Cards of different colors can be used for different types of features so that they can be easily distinguished. Different edge cuts can also be used to make certain kinds of cards, such as commercial cards, stand out in the program deck.

series 700 computer control systems



IGM/NTI

THE IGM/NTI SERIES 700 CONTROL COMPUTERS ARE HERE. And tomorrow is suddenly now.

From the beginning, IGM/NTI engineers have researched and implemented a better way. We are proud to present our new generation of broadcast control computers: The IGM/NTI series 700.

The IGM/NTI series 700 is an entire family of field proven control systems designed exclusively by broadcasters for broadcasters, and controlled by a commercially successful, field-service-supported, standard computer unit.

The IGM/NTI series 700 . . .

With programming as fast as the touch of a keyboard.

With program logs printed instantly—automatically—continuously.

With unequalled control of audio transitions and voice-tracks.

With commercial, PSA, or music lists called up individually in a matter of seconds.

With virtually unlimited computer memory expandability.

With control or monitor capability in every department, if desired.

and most important . . .

With total ease of operation that anyone can master with just a few hours of training.

The IGM/NTI series 700 offers four completely different models. Each has far greater flexibility, capacity, and expandability than other less sophisticated broadcast automation systems. We invite you to catapult your station into the new generation. Learn more about the series 700 computer controlled automation systems, and discover why tomorrow is suddenly now.



The DEC PDP-8 is the heart of every system 700. It is backed by a worldwide local manufacturer's service organization. Outstanding technical training in owner-maintenance is also available. Over 30,000 PDP-8's have been sold since their introduction.

YOUR REQUIREMENTS AND AND THE CAPABILITY OF THE COMPUTER

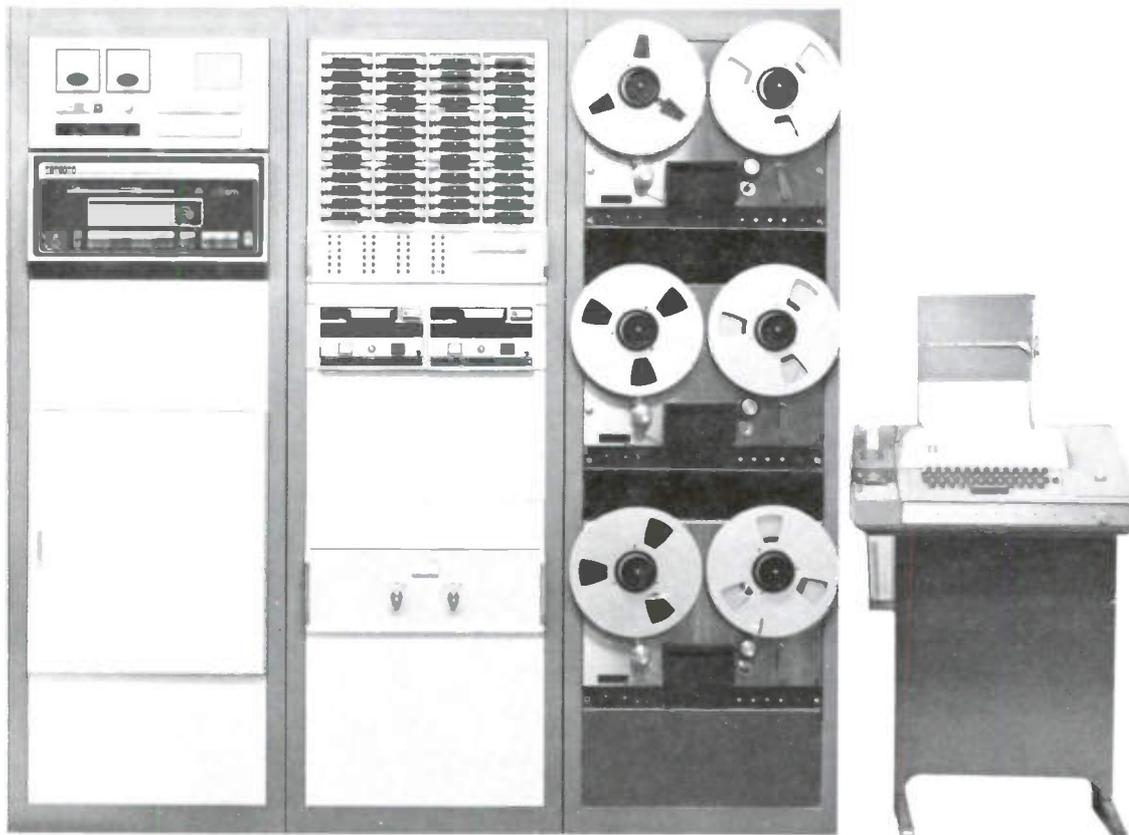
The capability of all computer control systems is affected by two factors: (1) The size of the computer memory and the capability of its instruction set, or operating system software. The software instructions are stored in the computer memory, so the more sophisticated the software, the more memory required; (2) The number and speed of input and output devices connected to the computer. Manual entry devices (keyboards, CRT or video display units, teletypes, etc.) are slow-speed devices compared to automatic high-speed units like random-access tape drive systems, and disc-packs.

IGM/NTI offers a complete range of series 700 computer models. In each, the same basic computer is used, but since the operating system software, the amount of computer memory, and the number and type of input and output devices differs, the capability of each model differs too.

CHOOSING THE RIGHT SYSTEM 700

Choosing the right IGM/NTI system 700 for your application means first determining what you expect your system to do, then selecting the model with matching capabilities. As model numbers progress from 730 to 770, so do capabilities. Whichever model you choose now may be expanded at any time in the future, as your needs expand, with virtually no hardware obsolescence.

The 730 & 740



In this typical system 740, the teletype machine is used for automatic program logging and can be used for making program entries in both the 730 and 740.

The IGM/NTI 730 AND 740

The IGM/NTI 730 and 740 broadcast computer systems meet typical requirements where the daily program schedule calls for 2400 events or less. Models 730 and 740 use computer memory for storing operating system software and all switching instructions. Model 740 includes automatic program logging with log descriptions stored in computer memory. Model 730 does not include program logging.

SYSTEM 730/740 COMPONENTS

THE COMPUTER—Standard is a Digital Equipment Corporation PDP-8 with 8000 computerword (8K) memory, power-fail and restart module, interfaces and cables to input terminals.

INPUT TERMINALS—For operator use, a 16-key keyboard/display with 15 feet of interconnecting cable is standard. A teletype machine with paper tape punch and reader is also standard. It may be used to make entries into the computer memory, for maintenance and diagnostic routines, and with motor control option, for logging.

AUDIO MONITOR PANEL—Contains the digital clock, control switches, stereo VU meters, cue speaker with volume control, as well as audio source channel selector push-buttons. In normal operation, the channel selector push-buttons light to indicate the audio source(s) on-the-air. In case of computer malfunction, the channel selector push-buttons may be used to control the system manually.

AUDABUS CHASSIS—A 39-card Audabus chassis (for audio and random access interfaces), silence sensor, line amplifiers, power supplies, and one rack are standard. Access to the Audabus is from the front of the rack.

SPARE PARTS KIT—Standard with all IGM/NTI system 700's is a spare parts kit, including logic probe.

CARTRIDGE ENCODER/DECODER—(Model 740 only) An IGM/NTI encoder/decoder and remote control, for placing logging tones on the cue track of each cartridge, is included for use with the station's cartridge recording equipment.

CAPACITY—Without options, the 730 can accommodate 2400 program and/or time events; the 740 can accommodate 1000 program and/or time events, plus computer storage for 100 log descriptions. Both the 730 and 740 include unlimited subroutine capability, allowing a series of repetitive events (such as a news sequence or music format to be called on as desired with a single command.



The standard 730/740 entry unit, with 16 keys and data display, allows the operator to schedule events, and to see at any time what events are on-the-air and scheduled next.

730/740 PROGRAMMING

The IGM/NTI 730 and 740 are programmed by event number starting with the number "0" and going as high as storage capability permits. Typically, event numbers are assigned in an arbitrary time frame. For example, numbers 0 to 49 could be Midnight to 1 AM; numbers 50 to 99 could be 1 AM to 2 AM, etc. This makes event numbers easy to identify with the scheduled time-of-day. For further ease-of-operation, the operator may skip from point-to-point using the X, Y, Z, search, or may manually call for different event numbers. (X, Y, Z, search is described on Page 7.)

SWITCHING INSTRUCTIONS

On the 730/740 keyboard/display unit, once the event number is shown, the operator can choose a Function Code to show what kind of event is being entered into the computer memory. The Function Code may tell the computer to do one of six different things:

- A NORMAL Command (0) is one which simply follows another in sequence.
- A FOLLOW command (1) is one which is linked to the event preceding it, such as a tag for a spot.
- A JUMP TO SUBROUTINE command (2) is an instruction to the computer to play a prescribed sequence of events, then return and continue where it left off. The system 700's are the only systems capable of performing both jump and subroutine commands, including real-time jumps.
- A JUMP command (3) is an instruction to refer to another part of today's schedule for the next set of events.
- An EXTERNAL command (6) is one which does not affect audio switching on-the-air, but may be used to tape a Net feed, turn lights on or off, change antenna patterns, etc.
- An IGNORE command (7) is one that you wish the computer to skip today.

When the Function Code has been chosen, the operator next chooses the audio source number to be played. If the source is a random access cartridge machine, the tray number follows the source number.

After the source and tray number have been chosen, the operator may choose the transition codes for the event. Transition codes are the way in which the computer will switch audio on and off. Each event may be programmed with a fast, medium, or slow fade-on, and/or fade-out, as desired. For stations wishing to use a separate voice-track tape, music selections may be established at a pre-set level until the voice tape goes off-the-air, at which time the music will be brought up to full level, automatically. Eight different transition codes are available for fading-on or fading-off each event.

On the 730/740 standard 16-key keyboard/display, the display would look like this:

ON AIR EVENT	STATUS	NEXT EVENT
0040 0 0142 00	0A	0041 0 0300 00

This example shows that Event 40 (0040) is ON THE AIR; it is a NORMAL event (0); it is Source 01, Tray 42; and the transitions on-and-off are FAST (0-0). The keyboard/display unit is in the "ON AIR" status. The next event is number 41, NORMAL, Source 03, with no tray number (00), and normal (fast) transitions (00).

REAL TIME CAPABILITY

Any event in memory may be programmed with a time command instead of a source and tray number. This is accomplished by using a code that indicates whether the time command is (a) a simple command to skip over fill programming that is not needed; (b) a NOW command that indicates that switching must occur at a specific hour, minute, and second; (c) and EXTERNAL command that indicates that the next switching action will come from an external source; or DEAD-ROLL for fill to a Net feed.

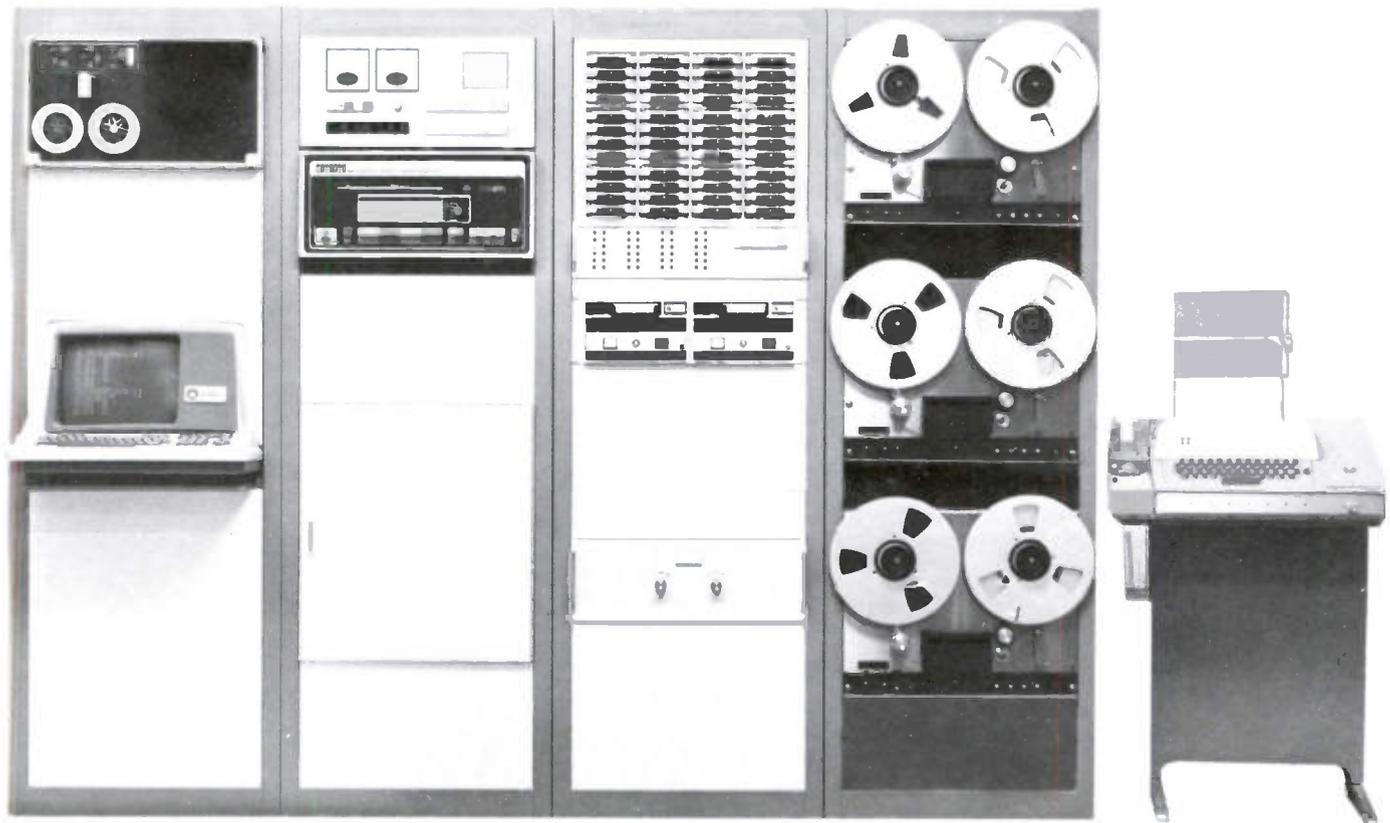
AUTOMATIC PROGRAM LOGGING

In the 740, log descriptions are stored in the computer memory. Some of these are fixed descriptions that may be identified with particular audio inputs to the system. For example, music decks may be logged as MUSIC, the time announce unit may be logged as TIME, and the incoming Network may be logged as NET. As each assigned source is switched on-the-air, the computer automatically selects the proper description and prints it on the log in English, along with the time and source number.

For commercial cartridges and other cartridges that must be logged with specific information for FCC purposes, a five-digit number is recorded on the cue-track of the cartridge, and is also entered into the computer with the English description. Each time a specific cartridge plays, the computer detects the five-digit number from the cartridge, verifies the number in the computer memory, and prints the English description on the log. If a matching number and description is not found in the computer, the number actually received from the cartridge will be printed on the log with an asterisk (*), indicating a discrepancy.

The logging printer is fully buffered, and the audio switcher can be up to five events ahead of the logging printer. Audio events as short as two seconds in length can be fully logged using this system.

The 750



This standard 750 system includes high-speed mass computer-tape drive storage, allowing seven full days of programming and English descriptions of each program event on the CRT screen. Logging showing discrepancy notations is included as standard.

THE IGM/NTI 750

The IGM/NTI 750 contains many of the same features found in the 730 and 740, but in addition to the computer memory, the 750 has an external high-speed computer tape memory system which allows the 750 to be programmed for seven days in advance.

Several other features, such as a 24-line video (CRT) display/keyboard, and the ability to store and automatically display English language log descriptions for each source on the CRT are standard on the 750. The logging system included with the 750 also provides discrepancy notations so that a check of the finished log will immediately indicate any "make-goods" or discrepancies.

SYSTEM 750 COMPONENTS

THE COMPUTER—Standard is a Digital Equipment Corporation PDP-8 with 8000 computerword (8K) memory, power-fail and restart module, interfaces and cables to input terminals.

INPUT TERMINALS—For operator use, a video (CRT) display with complete keyboard is included. A teletype machine with paper tape punch and reader is also standard. It may be used to make entries into the computer memory, for maintenance and diagnostic routines, and with motor control option, for program logging.

EXTERNAL STORAGE—A single high-speed random-access computer tape drive, controller, interface card and wiring, software, and one tape capable of storing 188,672 computerwords is included.

AUDIO MONITOR PANEL—Contains the digital clock, control switches, stereo VU meters, cue speaker with volume control, as well as audio source channel selector push-buttons. In normal operation, the channel selector push-buttons light to indicate the audio source(s) on-the-air. In case of computer malfunction, the channel selector push-buttons may be used to control the system manually.

AUDABUS CHASSIS—A 39-card Audabus chassis (for audio and random access interfaces), silence sensor, line amplifiers, power supplies, and two racks are standard. Access to the Audabus is from the front of the rack.

SPARE PARTS KIT—Standard with all IGM/NTI system 700's is a spare parts kit, including logic probe.

CARTRIDGE ENCODER/DECODER—An IGM/NTI encoder/decoder and remote control for placing logging tones on the cue-track of each cartridge is included for use with the station's cartridge recording equipment.

CAPACITY—Without options, the IGM/NTI 750 is capable of storing 28,000 program and/or time events, plus 100 log descriptions.

750 PROGRAMMING

The IGM/NTI 750 is programmed by event number starting each day with the number "0." Twenty-eight thousand events of storage are available, divided into seven days of 4000 events each. Typically each day's events are further broken down into 24 groups of 100 events each. This provides 100 events of programming each hour, 24 hours-a-day for seven days, leaving 1600 extra events each day to be used for special formats and instructions that may be called for at any time by using the JUMP command. In this way, special formats may be run without erasing your normal format or making substitutions.

SWITCHING INSTRUCTIONS

Since the events in the 750 are divided into days, the operator first chooses the day number (1 = Monday, 2 = Tuesday, etc.) then the event number. The operator then chooses a Function Code to determine what kind of event is being entered into the computer memory. In the 750, the Function Code may tell the computer to do one of five different things:

- A NORMAL command (0) is one which simply follows another in sequence.
- A FOLLOW command (1) is one which is linked to the event preceding it, such as a tag for a spot.
- A JUMP command (3) is an instruction to refer to another part of today's schedule for the next set of instructions.
- An EXTERNAL command (6) is one which does not affect audio switching on-the-air, but may be used to tape a Net feed, turn lights on or off, start automatic traffic scheduling, change antenna patterns, etc.
- An IGNORE command (7) is one that you wish the computer to skip today.

When the Function Code has been chosen, the operator next chooses the source number to be played. If the source is a random-access cartridge machine, the tray number follows the source number.

After the source and tray number have been chosen, the operator may choose transition codes for the event. As with the 740, eight different transition codes are available for fading-on or fading-off each event.

Next, the five-digit code number associated with each commercial cartridge is entered.

The entry of data on the CRT display/keyboard is straightforward. The CRT has two modes: an ON AIR mode, and a PROGRAM mode. In the ON AIR mode, the display vertically lists the ON AIR event on the top line, followed by the next 22 events to follow. In the PROGRAM mode, the CRT displays any requested 24-line section of the schedule for any of the seven days.

When the display is used for entering material into the computer, or onto the high-speed tape, the operator simply enters the events in the order in which they occur. The operator can skip from point-to-point using the X, Y, Z search (described later), or by manually calling for different event numbers. This makes the system easy to operate, since data can be entered very rapidly. Automatic data input from a computerized billing and traffic system is also possible.



The 24-line CRT keyboard/display unit is standard on the 750 and 770. It allows an operator to correct, add, or delete lines of information at will.

When the CRT display/keyboard is in the PROGRAM mode, the screen displays the day, sequence number, function code, source and tray number, transition codes, and the five-digit logging code for 24 events. All 24 events may be changed, edited, and corrected, then entered as a block into the computer, or onto tape storage. A sample one-line entry might look like this:

DAY #	FUNCTION	SOURCE/TRAY	TRANSITION	CODE
2-2341	0	0741	00	12345

In this example, the display tells us: On day 2 (Tuesday), event number 2341, run a NORMAL (0) event from source 07, tray 41. The transition codes (fade rate) at the beginning and end of this event are NORMAL (fast). This event should be described by logging description 12345.

NOTE: The day number and event number are generated by the system. Normally, the operator need only enter the function code, source and tray number, transition codes, and logging code number.

When the data is entered for each event, the computer immediately interrogates its memory and responds with the English description from the log file to match the five-digit logging code. In the example above, the display would then look like this:

DAY #	FUNC	SOURCE/TRAY	TRANS	CODE	
2-2341	0	0741	00	12345	Pepsi Cola :60 CM REC

The English description can follow any form desired by the station, with a maximum of 42 characters per description.

Since the logging descriptions are on display at all times, the operator knows exactly what has been programmed. Each description should match what is on the program schedule. This virtually eliminates operator errors, since the display shows exactly what is happening at all times in English, and not just in numbers.

REAL TIME CAPABILITY

Any event of memory can be programmed with a time command instead of a source and tray number. This is accomplished by using a code that indicates whether the time command is (a) a simple command to skip over fill programming that is not needed; (b) a NOW command that indicates that switching must occur at a specific hour, minute, and second; (c) an EXTERNAL command that indicates that the next switching will come from an external source; or DEAD-ROLL for fill to a Net feed.

AUTOMATIC PROGRAM LOGGING

The IGM/NTI 750 is equipped with logging capable of noting discrepancies on the program log. A completely verified printed log is produced as the code from the cartridge cue track is received and compared (1) against the code stored with the English description in the computer memory, and (2) against the code scheduled for that event. Discrepancies between what was scheduled and what was actually broadcast are noted on the log with an asterisk (*) automatically. As an option, a separate discrepancy report can be generated when desired to immediately inform traffic which spots must be made good.

The 770

The standard 770 will store, retrieve and sort up to 9,999 music and commercial descriptions, as well as provide FCC and management reports. More than seven full days of programming may be entered and stored in the 770.



THE IGM/NTI 770

The IGM/NTI 770 has a dual-disc system that allows storage of an infinite number of operating commands. In addition to seven days of programming, the 770 offers storage for 9,999 music, commercial, PSA, and program title descriptions. The 770 can sort these items in several different ways to provide time-saving music rotation schedules, and positive commercial placement with no threat of competitive products playing back-to-back.

The 770 also allows three different levels of code word command-entry. One level may apply only to the traffic department, one only to the program department, and one only to engineering. Each department has its own password that gives access only to the areas of the computer necessary for that particular department.

For voice-track applications, the 770 will accumulate time for any desired portion of the broadcast day, hour-by-hour, or segment-by-segment. Each hour may be timed, and programmed to end at a precise time, thus virtually eliminating "net fill" music, and also allowing time-checks to be given on the voice-track reel, rather than on a time announce unit.

For traffic use, the 770 will assign locations to music and commercial cartridges, rather than the traffic department's having to manually do so. It will also retain an entire week's program logs in its memory so that a complete copy of commercial and/or music activity may be accessed and printed at any time during the week, or once at the end of each week. The system 770 will not allow any changes to this stored data until the legal FCC log has been printed.

SYSTEM 770 COMPONENTS

THE COMPUTER—Standard is a Digital Equipment Corporation PDP-8 with 20,000 computerword (20K) memory, power-fail and restart module, interfaces and cables to input and output terminals.

INPUT/OUTPUT TERMINALS—For operator use, one video (CRT) display with complete keyboard is included. Additional CRT's may be optionally added, with or without keyboard. A teletype machine with paper punch and reader is standard, and may be used for maintenance and diagnostic routines, or as a backup to the CRT or high-speed printer. A high-speed 132-column line printer is standard for logging and reports.

EXTERNAL STORAGE—Two disc-drive units and disc controller are standard. Each disc is capable of storing 1,600,000 computerwords. One disc is used for on-line operation, the second for backup. Disc copying commands and routines are standard with automatic changeover in the event of disc malfunction.

AUDIO MONITOR PANEL—Contains the digital clock, control switches, stereo VU meters, cue speaker with volume control, as well as audio source channel selector push-buttons. In normal operation, the channel selector push-buttons light to indicate the audio source(s) on-the-air. In case of computer malfunction, the channel selector push-buttons may be used to control the system manually.

AUDABUS CHASSIS—A 39-card Audabus chassis (for audio and random access interfaces), silence sensor, line amplifiers, power supplies, and two racks are standard. Access to the Audabus is from the front of the rack.

SPARE PARTS KIT—Standard with all IGM/NTI system 700's is a spare parts kit, including logic probe.

CARTRIDGE ENCODER/DECODER—An IGM/NTI encoder/decoder and remote control for placing logging tones on the cue-track of each cartridge is included for use with the station's cartridge recording equipment.

CAPACITY—Without options, the IGM/NTI 770 is capable of storing: 19,200 program events (2400 events per day for eight days); 9,999 music, PSA and/or commercial descriptions; up to seven days of program logs and other reports before printing; 3-level password system; program makeup, title sort, assign cartridge tray, accumulate time, and on-air programming commands.

770 PROGRAMMING

The IGM/NTI 770 is programmed by event number starting each day with the number "0." Twenty-four hundred events per day for seven days are available for programming, with one full day of 2400 events left over for special formats that may be called on with the JUMP command. Typically, each day's events are broken down into 24 groups of 100 events each. Each of the 19,200 events in the 770 may be programmed with either a switching instruction, an approximate, or an exact-time instruction.

PROGRAM AND PRINTING ROUTINES

The extensive capability of the 770 in providing programming and traffic paperwork routines, as well as pre-log and management reports, precludes listing general descriptions of the many functions available in the 770. For detailed descriptions of the capabilities of the 770, please contact your IGM/NTI representative.

AUTOMATIC PROGRAM LOGGING

The IGM/NTI 770 is equipped with program logging that automatically notes discrepancies between the pre-log schedule and what was actually broadcast. If no five-digit code is detected from the cartridge playing, the scheduled number and description is printed on the log with the notation NT (no tones). If the wrong cartridge is played, the log will show the five-digit code for the cartridge actually aired and its description, with the notation MM (Mis-Match). In either case, a quick check of the pre-log will show whether make goods are necessary. Logging may take place either on the high-speed line printer, or on the teletype machine, as chosen by the operator. Logging may also be stored internally for printout at any time, if the printers are in use for other printing jobs such as preparing a pre-log, or doing makeup routines. Logging printouts may include music, or just FCC-related items, as requested by the operator.



The DEC high-speed printer, as illustrated, is included as standard with the system 770 and operates at 180 characters per second.

STANDARD SOFTWARE:

	730	740	750	770
Standard Operating Software	X	X	X	X
Station Monitor Software	X	X	X	X
Diagnostic Software	X	X	X	X
Exact- or Approximate-time switching	X	X	X	X
Switching Transition Codes	X	X	X	X
X, Y, Z Search	X	X	X	
Five-digit logging with English Description		X	X	X
Verified log showing discrepancies			X	X
Other after-performance reports				X
English description of Logging events displayed			X	
English description of all events displayed				X
Unlimited subroutines included	X	X		
Forward and backward jump routines included	X	X	X	X
Seven day programming capability			X	X
Programmed by event number or time	X	X		
Programmed by day, event number or time			X	X
Source/tray assignment capability				X
Storage for 9,999 program elements				X
Storage for seven days of reports and logs before printing				X
Ability to display accumulated time for any part of the broadcast day				X

BASIC CAPACITY:

Program and/or time events	2,400	1,000	28,000	19,200
42-character log descriptions	none	100	100	
84-character log descriptions				9,999
Program/time events stored in	core memory	core memory	computer tape	disc memory
Log descriptions stored in	none	core memory	core memory	disc memory
Log descriptions entered by	none	teletype	CRT	CRT

BASIC SOFTWARE—Standard operating system software is delivered with each system 700 to instruct the computer to perform its designed functions. In addition, the software is designed with a priority system to examine a variety of parameters 330,000 times each second. It constantly checks the exact time, the audio channels, the power line, and the input/output terminals.

SYSTEM MONITOR—In addition to the priority system, a system monitor keeps track of all working sources in the automation system. If a non-working or invalid source is called for by an operator, the machine rejects the illegal command. Likewise, one audio source may be substituted for another by entering a command such as 0200=0600. In this case, we are saying "play source 06 each time the schedule calls for 02." One similar entry can provide all-day substitution of client copy, or allow a tape deck to be pulled out of service for maintenance.

X, Y, Z and TIME SEARCH—Each IGM/NTI 700 computer control unit (except the 770) is delivered with X, Y, and Z search classification codes. This feature allows specific events to be coded through the input terminal for access without affecting other events. For example, all commercial availabilities may be coded "X" . . . all cartridge music may be coded "Y" . . . and PSA's coded "Z."

Commercials may then be accessed and changed by asking the computer to show all "X" coded events on the terminal. Likewise, cartridge music rotation can be changed by asking the computer to show only "Y" coded events, etc. With the X, Y, Z search, there is never a chance of the Programming department erasing traffic information, or the Traffic department erasing programming information. Changing commercial matter from day to day is a simple, fast procedure using the X, Y, Z search, because the display will automatically skip over all events not specifically coded as commercial matter. All exact- or approximate-time commands may be accessed in the same manner.

POWER FAILURE—In case of power line failure, the computer remembers what it was doing when the power failure came, and will resume where it left off when power is restored.

MAINTENANCE ROUTINES—The teletype machine that is standard with each system 700 is used both as an input/output terminal, and for diagnostic routines. These are special computer instructions that let the computer actually check itself for trouble. A set of diagnostics is provided with each system 700 without charge. Diagnostics may be entered into the computer through the paper tape reader on the teletype machine should trouble be suspected.

STANDARD HARDWARE:

	730	740	750	770
DEC PDP-8 computer with power-fail and restart module	X	X	X	X
8,000 computerword memory (8K)	X	X	X	
20,000 computerword memory (20K)				X
16-key keyboard/display unit	X	X		
24-line CRT keyboard/display unit			X	X
Teletype machine with paper punch and reader	X	X	X	X
One control rack included	X	X		
Two control racks included			X	X
AUDABUS chassis with 39 receptacles	X	X	X	X
Audio monitor panel with VU meters, cue speaker, volume control	X	X	X	X
12-hour crystal controlled digital clock	X	X	X	X
Manual control push-buttons	X	X	X	X
Power supplies	X	X	X	X
High-speed random access tape drive			X	
Dual disc pack with controller				X
132-column line printer				X
Encoder/decoder for cartridge logging		X	X	X
Spare parts kit with logic probe	X	X	X	X

OPTIONAL HARDWARE:

Additional 4K modules of computer memory allow:

2,000 more events (or)	X	X		
190 more log descriptions (or)		X	X	
3 more CRT displays				X

Maximum optional capacity:

Events	15,000	13,000		
Log descriptions		1,230	1,230	

SPECIFICATIONS

MONITOR PANEL—Master Start; Override; Master Stop; Reset; Cue; Channel run/manual selector (up to 39 push-buttons which indicate on-air source, or which can be used to manually switch system); Stereo VU meters; 12-hour digital clock (hours, minutes, seconds, A or P); Cue speaker with volume control.

AUDABUS CONTROLS—Clock "0," Advance minutes, Advance hours, AM select, PM select; Left and right gain controls for each channel; Program/Cue switch for each channel; Master left and right program gain; Silence Sensor disable switch; Cue speaker left/right switch; Log flag test switch.

Standard External Control inputs: Remote Start, Remote Stop, Remote Override, Carrier failure.

Standard External Control outputs: Start Light; Stop Light; two teletype motor controls (optional).



AUDIO CHARACTERISTICS—

- Frequency Response: 50-15,000 Hz, ± 2 db, including 25 Hz filter, line.
- Distortion: Less than .5% at + 14 dbm, 50-15,000 Hz
- Stereo separation: -45 dbm or greater
- Signal-to-Noise: 60 db or more below + 4 dbm (not including audio source noise)
- Line Output: + 4 dbm, 600 ohms, balanced
- Cue Speaker Output: 1.5 watts
- Silence Sense: 2 to 15 seconds, adjustable

POWER REQUIREMENTS—

- 30 amp minimum for control rack
- 117 V AC $\pm 10\%$, 60 Hz
- (Special voltages and frequencies on request)

INSTALLATION

Complete installation of each IGM/NTI system 700 is included in the purchase price. Installation time varies depending on the model purchased, but normally lasts from three to five days, and includes a review of basic programming procedures.

TRAINING

Without charge, IGM/NTI provides to each system 700 purchaser, a training certificate good for tuition in one of IGM/NTI's regular training sessions. Since both programming and technical materials are covered, stations are requested to send (1) the person who will be responsible for programming the system 700; and (2) the person who will be technically responsible for the system 700.

The certificate covers tuition and training, but does not include transportation, food or lodging. IGM/NTI training sessions normally last three days, and are highly recommended.

MAINTENANCE PROVIDED

IGM/NTI provides each system 700 purchaser with a standard-business-hours DEC service contract without charge for the first 90 days after computer installation. Subsequently, the user may choose to undertake computer maintenance on his own, or continue the contract with DEC.

DETAILED INFORMATION

Detailed information is available for all system 700 models from your IGM/NTI representative.



The material contained herein is for informational purposes and is subject to change without notice.

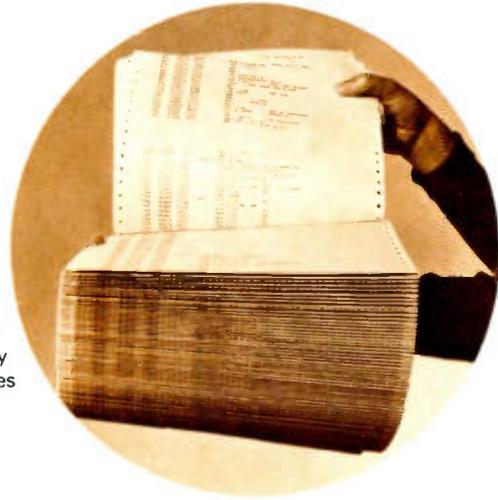
IGM/NTI

4041 Home Road
Bellingham, WA 98225
(206) 733-4567

This disc cartridge, used in the system 770 memory, provides massive data storage and lightning-speed data access. That's why the system 770 is an absolute powerhouse!

The IGM/NTI Series 700's ...tomorrow is here today

The essential operating software for all system 700's is produced by staff engineers with years of training in the design of specialized broadcast equipment and thoroughly qualified to appreciate the scheduling and operating needs of today's broadcasters. A hard-copy printout of a typical operating system, as illustrated, occupies 124 pages and provides over 8,000 instructions to the computer memory.



All series 700 systems are designed with the operator in mind. Streamlined and efficient, all series 700 systems are quick and responsive. The system 750 and 770 even respond to the operator in English.

IGM/NTI

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