FOR THE COIN-OP ENTERTAINMENT INDUSTRY ..... PUBLISHED TWICE MONTHLY

PLAY METER

NOVEMBER 1, 1984

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PLAY METER

Twice a Month Publication for the Coin Operated Entertainment Industry

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CONTENTS/ Volume 10, Number 20/November 1, 1984

FEATURES

The State of the Industry 31

1984 will be known as "The Year of the Crunch" in the coin-op amusement industry. **Play Meter's** 1984 State of the Industry findings reveal that the average video game is grossing a mere $53 per week. But there were some positive findings. Read about the positive and negative aspects of the industry in 1984 and **Play Meter's** predictions for 1985 in this special report. Charts and graphs illustrate the findings.

Operators Sound Off 48

Operators tell manufacturers and distributors how they feel about the industry and offer suggestions for its growth.

Buying Report 53

What are operators going to buy in '85? **Play Meter** contacted operators throughout the United States to find the answer to this question. Videos seem to be at the bottom of just about everybody's list.

DEPARTMENTS

6 Up Front
7 Letters to the Editor
8 News
18 Tournaments
20 National Play Meter
62 Frank's Cranks
65 Scoring Success
69 Technical Topics
74 New Products
76 Aids to the Trade
80 Classified Advertising
94 Commentary

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UP FRONT

The Rape of an Industry

For the first time in the history of the State of the Industry report, we are not pleased to present the results of the survey. This year's findings are disappointing to say the least. With a few small exceptions, it was a very bad year all the way around. For the operators it was a bad year, for the distributors it was even worse, but for the video game manufacturers it was devastating.

Operators will smile and think thoughts of poetic justice after hearing that it was a disastrous year for video game manufacturers. But the sad fact of the matter is that it is some video game manufacturers who are doing all the smiling. And why would some manufacturers be smiling at their own demise? The answer is simple but also scary.

Some of the video game manufacturers are licking their chops at the prospect of becoming the nation's largest provider of video lottery games. And a number of things had to be done in order to accomplish this goal in the shortest amount of time. Their main objective was to eliminate competition at all levels of the industry so they could create a path of least resistance to the legalization of video lotteries.

To remain financially sound during this transition, those video game manufacturers with gambling interests took the millions of dollars made during the video boom and invested them into non-industry related enterprises such as gambling casinos, health spas, and the like.

The next step was to eliminate all forms of competition and potential resistance and opposition to the video lottery movement.

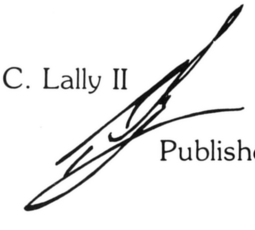
Although video lottery games will not be operated or sold by today's operators and distributors, these businessmen can and will strongly oppose and resist the video lottery movement. Hence, the number of video game operators and distributors had to be reduced in order to create less resistance to the rise of video lottery games. The best and easiest way of doing that, the manufacturers reasoned, was to depress the video game market entirely. Since these video game manufacturers were no longer dependent on video game revenues, they were in a position to sit back comfortably and watch the video game market go on the skids. They concluded that with a vast number of operators and distributors heavily dependent on video game revenues, a sour video game market would result in hordes of operators going out of business.

Hence, they made certain that they, and any of their competitors they could persuade, would manufacture nothing but inferior video games that would cost too much and earn too little for only but a few to survive. The tactic served two useful purposes. Not only did it drastically reduce the operator population, but it also reduced the number of video game manufacturers (future video lottery competition) due to poor sales and no outside sources of revenue to fall back on.

To further erode the video game market and clear the path for video lottery games, they encouraged the spread of "gray area" games. This also served a twofold purpose. Not only did it reduce the operator population as a result of seizures, confiscations, arrests, and convictions, but gray area games also set the stage and opened the doors for video lottery games.

After reading our State of the Industry report, you will see why the video game manufacturers with gambling interests are smiling. Their plan is working and the industry is suffering indeed. But, thank God, there is some hope. There are a number of amusement only video game manufacturers who are not blinded by visions of video lottery riches and who still have faith in the future of this industry. Those who read the pages of *Play Meter* know who they are. For their sake, and for the sake of the industry's future, let's hope that they now know how this industry is being raped and what can be done to stop it.

Ralph C. Lally II



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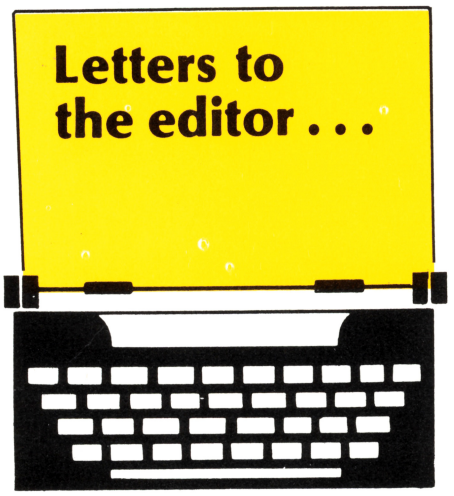

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In behalf of Greater Southern, please accept my sincere appreciation for your recent article concerning Greater Southern's Open House (*Play Meter*, September 1, p. 23).

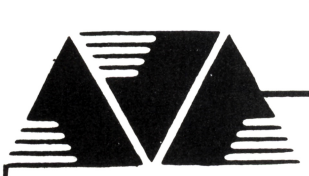
I was pleased and honored that you were able to attend, and I hope you were as enthused by the attendance as all of us at Greater Southern.

Thanks again.

Rubin M. Piha
Vice President, Administration
Greater Southern Distributing
Atlanta, Georgia

Something on your mind you want to vent? Got a gripe? Full of praise? Have a question? If you have comments on the coin operated entertainment industry, write to Play Meter. *Our "Letters to the Editor" columns are dedicated to you, the operator/reader.*

All letters must be signed; if requested, only initials will be used or the name withheld from print. Please include return address. (Although, for the sake of your privacy, addresses will not be printed.)



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NEWS

GRAY AREAS LEAD TO ARRESTS IN NY

An investigation of "gray area" card games by the district attorney's office of Westchester County, New York, culminated in the arrest of one distributor, four operators, and numerous bar owners and bartenders in Westchester County. Search warrants also were served on two companies out of the county.

The New York Police Department and the FBI began the investigation in October 1983 after hearing complaints from individuals about spouses and children playing the poker machines. "We started receiving quite a few complaints about the poker machines, and parents were even complaining that their kids were winning too much money," said Arthur Semetis, assistant district attorney with the rackets bureau of Westchester County.

The arrests included distributorship Albert Simon Inc. and manager Albert D'Inzillo, operators Yonkers Amusement Co. and owner Frank Galle and employees Vincent Galle and Edward Murray, Westchester Novelty & Music Co., Archie's Amusement Company Inc. with father and son Edward and David Goldbergh, and County Amusement Co. and owner Howard Herman who is also part owner of one of the bars where games were confiscated. Herman is also the president of the Music & Amusement Association, Inc. of New York.

Albert D'Inzillo of Albert Simon could not be reached for comment. Howard Herman was also unavailable for comment.

Frank Galle of Yonkers Amusement, not wanting to disclose much due to the circumstances, did say that he met with the state liquor authority which assured him the games are legal. "I had always stayed away from the gray area games, but opportunists were infiltrating my locations with the machines. When I had the assurance from the liquor authority that they were legal about a year ago, that's when I started operating them. The games were even licensed by the Department of Consumer Affairs!"

Galle also stressed that the district attorney's office only went after the legitimate operators and the situation will get worse as opportunists continue to operate the games. "I can't understand how these games can be licensed by municipalities and then be illegal," he said.

In the course of the investigation, undercover agents either received or observed payouts on the machines. A payout must be involved for an arrrest to be made, said Semetis.

The district attorney's office also executed search warrants at Entertainment Enterprises and Peters Distributors in neighboring Nassau County. According to Semetis, investigators are able to use search warrants in other counties if there is suspicion that happenings there are affecting their county. In this case, Semetis said they have reason to believe these companies were sending the illegal machines into Westchester County. The evidence was given to officials in Nassau County for a follow-up investigation.

Jed Forman of Entertainment Enterprises confirmed that law enforcement officials came to his offices with a search warrant in connection with the investigation but denied any wrongdoing.

"I'm not doing anything illegal and they didn't find anything illegal. I'm sure if there had been anything illegal here they would have taken it but they didn't find any illegal gambling machines," Forman said.

All gambling is not illegal in New York. If the state sponsors gambling, it is not illegal nor any gambling where two or more players have equal stakes, such as a game of poker. However, if one person profits from that card game, no matter what the outcome, then it becomes illegal.

"In New York, there are certain prerequisites for illegal gambling—when someone profits by players risking something of value on a contest of chance with the expectations of receiving something of value upon certain outcome," Semetis said. "However, if there is skill involved (such as on pinball) it is not illegal gambling."

The situation in New York is dubious. The operators who were arrested feel that the state cracked down only on legitimate operators who have been in business for many years. Even Semetis of the district attorney's office admitted that it will be extremely difficult to police the problem. •

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NEWS

FIRST PRIVATELY OWNED PHONE INSTALLED

American Pay Telephone, Inc. made the first legal installation of a privately owned coin-operated telephone in Minnesota and in the nation on August 14. The phone replaced a phone owned by Northwestern Bell Telephone Co.

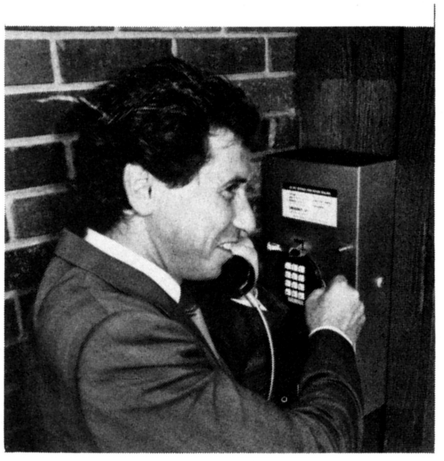
American Pay Telephone, Inc. was the first company granted authority to provide coin-operated telephone service by the Minnesota Public Utilities Commission (PUC).

The Minneapolis-based provider of privately owned coin-operated phone service installed the phone at Good Food & Company, a restaurant owned by Gary Quam, located at 4920 Excelsior Blvd., St. Louis Park, Minnesota. The phone installed was manufactured by Tonk-A-Phone, Inc. in Spring Park, Minnesota.

The Federal Communications Commission (FCC) ruled in June of this year that any piece of telephone equipment registered by the FCC as meeting certain technical standards may be attached to the phone network. However, public service commissions decided whether and how the phone services will be offered.

Minnesota is the first state, through a ruling by the Minnesota PUC, to allow competition for the pay telephone system. Similar rulings in other states are expected in the near future.

American Pay Telephone, Inc. is a subsidiary of Weisman Enterprises, Inc., a national vending management and leasing company operating since 1979. Weisman Enterprises will market the service through its subsidiary, Best Vendors Co., which represents 350 local independent operators providing vending services and consulting to national retail, hospitality, and restaurant chains in 49 states. Phone equipment is purchased from a variety of manufacturers and selected on the basis of features, legal specifications, and reliability.



William Weisman, president of American Pay Telephone, Inc., makes the first call from the first privately owned coin-operated telephone in the nation. Weisman, also president of a national vending management and leasing company, made the first call to his mother.

William Weisman, president of Weisman Enterprises and American Pay Telephone, noted that the changes in the marketplace will mean more phones available, more locations, better service, a greater potential for technological improvement, and greater profit for the owner.

Bell presently pays 4 to 7 percent commission on phones in high traffic locations. Quam wouldn't specify on the amount of money he receives from American Pay Telephone, but he said he switched to the firm "because they offered me more money."

The coin-operated phone, capped at a quarter a call by a state rate setting, looks like any other pay telephone. Local and long distance calling is available, charge-free access to the emergency 911 number is featured, and the phone is compatible with MCI, SPRINT, Allnet, and other long distance services. •

AUSTRALIAN FIRMS MERGE

Two of the oldest coin machine companies in Australia—Amarda (Holdings) Limited and Automatic Music Co. Pty. Limited—merged and created one of the country's strongest distributor/operator organizations.

The merged business, to be known as Amarda Automatic Group, is the major operator in the state of New South Wales (Australia's most populous state) and national distributor for Rowe International and Bally Midway. The group also supplies spare parts and billiards and pool accessories nationally.

"It was a very logical marriage of two companies who have known and dealt with each other for 25 years," said John Blamey, managing director of Amarda (Holdings) and joint chief executive of the new group. "Amarda has been the biggest buyer of Rowe jukeboxes from Automatic Music for many years, while our pinball operations have been rationalized to basically Bally machines. As far as we were concerned, Automatic Music had always provided the best equipment and outstanding customer backup."

"Automatic Music provided a successful sales and distribution organization, going back 40 years, supported by a sound operating business. Amarda, formed in 1959, has developed an efficient and widespread operating business recognized generally as one of Australia's most successful," he said.

John Blamey and Greg Davidson, managing director of Automatic Music Co., will jointly head the Amarda Automatic Group.

It is not unusual in the Australian industry for a business to combine distribution and operations. "There are no problems as long as the distribution side is handled ethically. Any distributor/operator who is not genuine in his dealings with his operator customers—and there have been one or two over the years—soon finds he is buying elsewhere," Greg Davidson said.

Davidson said the industry in Australia is slowly emerging from the gloom of the past two years and sales of new machines are improving. Experienced operators have resumed selective buying with the emphasis on quality.

The Group sees the Australian industry's major future problem as the continuing high cost of new machines, due to the strength of the U.S. dollar, and local import and sales taxes. Every time the U.S. dollar firms by one cent against the Australian dollar, the landed cost of a jukebox in Australia increases by $80 Australian. The government has turned a deaf ear to representations for fairer treatment.

On the bright side, Australia recently introduced a $1 coin, with the $1 bill being withdrawn from circulation at the same time. Some operators have already modified games for $1 bonus plays and are optimistic about the medium to long-term acceptance.

National marketing manager for Amarda Automatic Group, John Yakas, also believes the $1 coin will open possibilities for Rowe's World Bill Acceptor and World Bill Changer. The first Australian models should have gone on display in September.

The Amarda Automatic Group, with a staff of 55, is located in the previous Amarda headquarters at Alexandria, only 10 minutes from downtown Sydney. This complex comprises 37,000 sq. ft. of office, showroom, and factory area which facilitates the operations and distribution aspects of the merged companies. •

John Blamey, Greg Davidson, and Bob Davidson celebrate the merger.

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NEWS

VENDING PROFITS DROP

The average net profit before income taxes of American vending companies dropped to 1.5 percent of gross sales in 1983, reaching the lowest level since the Annual Operating Ratio Report was first compiled by the National Automatic Merchandising Association (NAMA) in the early 1950s.

The NAMA Operating Ratio Report study is based on reports submitted by NAMA member firms to Price Waterhouse & Co.

"Recent indications from member firms in different parts of the country and the response to NAMA's 'How's Business?' survey several months ago show that things have improved considerably for many of our members, and we hope that these 1983 experiences are now behind us," commented G. Richard Schreiber, NAMA president.

The 1983 net profit average of 1.5 percent of gross sales compares with 2.8 percent in 1982 and 3.7 percent in 1981.

Net profits for companies with sales of less than $750,000 averaged 5.1 percent last year, while those in the over $10,000,000 and from $750,000 to $2,000,000 brackets reported net profit averages of 1.3 percent. The average rate for companies with sales from $2,000,000 to $10,000,000 was 2.5 percent.

Figures for the 1983 report are based on operating data furnished by 150 member firms with a combined volume of $1,704,948,000, Schreiber said.

He said overall return on assets dropped from "a not-so-good 9.6 percent in 1982 to 8.9 percent in 1983."

Total payroll expenses averaged 26.1 percent of gross sales, up from 25.3 percent and 24.2 percent during the two previous years. Average commissions (payments of profit share to clients) came to 7.1 percent of sales, down from 8.3 percent in 1982 but even with the 1981 figure.

Sales other than through vending machines (mostly from concessions operations and conventional non-vending food service) amounted to 57.7 percent of total volume for the participating companies, up considerably from 44.6 percent in 1982 and 34.8 percent in 1981.

In contrast with the 1983 Operating Ratio Report results, 73.7 percent of the 383 members who participated in the NAMA "How's Business?" survey this spring said they expect higher net profits this year and 85.2 percent forecast increased sales volume. •

THE CALENDAR

October 11-14
1984 NAMA National Convention—Exhibit of vending and food service management, Georgia World Congress Center, Atlanta, GA. Contact Jack Rielley, NAMA, 7 South Dearborn St., Chicago, IL 60603. Telephone: 312/346-0370.

October 11-14
13th National Exhibition of Automatic Amusement Machines (ENADA), Congress Building at the EUR, Rome. For more information, contact SAPAR at Via di Villa Patrizi 10, Rome, Italy 00161. Telephone: 84-41-505; 84-14-81.

October 24-27
1984 AMOA International Exposition of Games and Music, Hyatt Regency, Chicago, IL. Contact AMOA at 312/654-AMOA.

November 15-17
1984 IAAPA Convention and Trade Show, Market Hall, Dallas, Texas. Contact IAAPA at 312/766-0881 for more information.

January 17-21
Second annual Induferias Show, Valencia, Spain. For information, contact Induferias at Apartado 476, Valencia, Spain. Telephone: 364-00-11. Telex: 62435 Feria E.

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BALLY'S EUROPEAN DISTRIBUTORS MEET

Bally Midway distributors from 10 European countries met in Madrid in May with executives from Bally Midway and Bally Manufacturing Corp. to discuss the present and future state of the coin-op industry in the United States and in Europe.

"The meeting was basically two-fold," said Tom Nieman of Bally. "First there was a product review for the European distributors, and the current state of the union in various countries also was discussed."

Bally presented its plans for Europe which include test manufacturing and a test project of offering kits to the distributors.

Bally's latest acquisition, Sente, and the Sente program also were discussed. According to Nieman, the Sente program may be structured differently in Europe to transform some of the burden from the operator to the distributor and manufacturer.

The European distributors emphasized that there is a market for quality games like *Spy Hunter*, which is also a hit in the United States. "The bright side is that they have turned the corner," Nieman said concerning the industry's status in Europe. "They are ahead of our schedule. They don't have the arcade structure except in a few cases but are basically street operations."

Nieman also pointed out that pinball is a bigger factor in Europe. "The abandonment of pinball was not as drastic as it was in the United States."

Bally plans to establish a European product committee to evaluate future products and furnish information from the market to research and development to serve as a communication link between the market and manufacturer. The committee will consist of representatives of Bally Midway, Bally Europe, independent distributors, and operators.

Roger Keesee, executive vice president of Bally Manufacturing Corp., announced the appointment of Einar Askvig as managing director of Bally Continental Ltd. N.V. Askvig will coordinate Bally Midway products handled by European distributors. •

Bally Midway distributors attending the meeting included (from left to right): 1st row—Fabio Cicchatti (Italy), Alfio Gentili (Italy), Bob Lundquist (U.S.A.), Mrs. Beatrice (Spain), Dave Adams (U.K.), Roger Keesee (U.S.A.), Bob Deith (U.K.). 2nd row—Mrs. Derckx (Holland), Mrs. Rosa Guilem (Spain), Mrs. Brody (Belgium). 3rd row—Georges De Ridder (Belgium), Feliz Hernan (Spain), Dave Marofske (U.S.A.), Per-Olav Nilsen (Norway), Frans Derckx (Holland), Einar Askvig (Belgium). Top row—Vic Leslie (U.K.), Tom Nieman (U.S.A.), Luc Wilms (Belgium), Steve Blattspieler (U.S.A.), Hans Rose (Germany), Mrs. Braeker (Switzerland), Georges Santa Maria (France), Hans Kloss (Germany), Larry Brody (Belgium), Roger Lambrechts (Belgium), Kaj Harders (Denmark).

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NEWS

VENDING MACHINE SHIPMENTS INCREASE

Shipments of merchandise vending machines increase to a total of 650,016 units in 1983 from 502,079 units in 1982, with their dollar value up to $328,254,000 from $318,943,000 in 1982, according to the annual survey conducted by the U.S. Bureau of the Census, said G. Richard Schreiber, president of the National Automatic Merchandising Association (NAMA).

NAMA underwrites the cost of the annual survey of vending machine manufacturers which was begun in 1955.

The number of beverage vending machines shipped by 19 reporting companies slightly exceeded 1982 (228,430 units vs. 225,037), but the value of these shipments decreased to $206,951,000 from $213,425,000 in 1982.

The shipment of fresh-brew hot beverage venders edged up slightly to 6,336 machines from 6,186, with the dollar value also up at $15,244,000 from $13,860,000 in 1982. The shipment of instant freeze-dried and liquid concentrate units decreased to 6,830 units ($5,693,000) from 7,152 units ($6,494,000) in 1982.

The production of bottle and can soft drink machines is reported jointly at 213,590 machines ($182,886,000) in 1983, vs. 210,312 units ($190,089,000) in 1982. Data for cup soft drink machines is omitted in order to avoid disclosure of individual manufacturers' production.

The shipment of confections and food vending machines was up slightly from 1982 at 85,868 units but their dollar value remained virtually the same at $69,377,000. In this category, bulk confection and charm vender shipments increased to 47,500 units from 38,328 in 1982.

Production of the popular glassfront "bagged snack and chip machines" was down from 27,374 machines in 1982 to 20,672, with the dollar value also off to $32,816,000 from $40,003,000 in 1982.

The survey combines refrigerated food vending machines with "other vending machines for confections and foods." Under this heading, shipment totaled 6,107 units up from 4,691 ($21,272,000 vs. $16,241,000).

The shipment of cigarette vending machines remained virtually steady with 10,155 units, compared with 10,506 in 1982.

Machines which dispense miscellaneous non-food items, ranging from cosmetics, pencils, paper, and aspirin to newspapers, recorded a substantial gain to 321,355 units ($40,374,000) from 178,967 ($23,221,000) in 1982.

The Bureau of the Census data represents shipments of new machines from U.S. manufacturers and does not include machines imported from other countries, Schreiber said. •

NEW ORLEANS NOVELTY HOLDS SERVICE SCHOOL

Coin Acceptors Inc. (Coinco) recently conducted a service school at New Orleans Novelty, and both companies are excited about the large turnout.

Eddie Boasberg of New Orleans Novelty said about 58 people (excluding staff) attended the service school/buffet coordinated by parts manager Lep Rosenbaum. Although it was a stormy day, attendees came from as far away as Alabama, Mississippi, and North Florida.

"Frankly, I was surprised at the turnout," said Coin Acceptors' Ken Hoffman. "Face it—the industry hasn't been so busy lately."

Coin Acceptors personnel informed attendees about coin mechanisms, electronic acceptors, token conversion kits, and other topics.

Hoffman and Boasberg gave the same reason for the successful turnout—operators are examining the details of their businesses to get a better return on investment. "Operators are getting down to the details," Boasberg said. "People are more concerned about the bottom line. They realize you make a buck by making sure the coin mechs take coins," Hoffman explained. "There's an awareness now of what it takes to make mechs work."

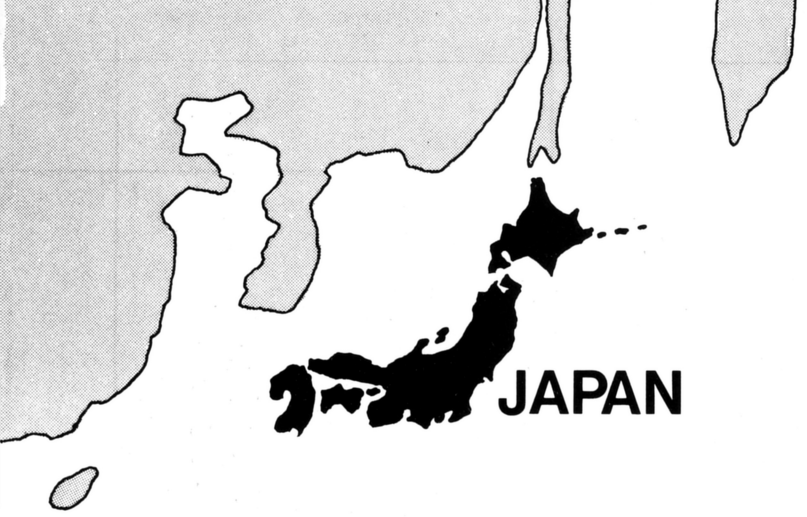
New Orleans Novelty is one of a growing number of distributors interested in training operators about the intricacies of the coin-op business. Hoffman said he has noticed distributors showing more interest in conducting service schools. •

GOULD AT RAND

Rand of Phoenix, Inc., manufacturer of tire-inflating and water-dispensing systems, commercial vacuums and coin-operated telephones, appointed Dan Gould as electronic design engineer.

Gould is responsible for electronic research and development of the Rand systems. He will monitor each product through the manufacturing process from conception to completion. Gould's present tasks include the refinement of the electronics and software for the Rand pay telephone.

Before coming to Rand, Gould worked for Goodyear Aerospace and the Boeing Company in system analysis and research and development. •



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DYNAMO SPONSORS $40,000 WORLD CHAMPIONSHIPS

Labor Day weekend saw nearly 500 table soccer enthusiasts compete for $40,000 in prize money in Dynamo's World Championships of Table Soccer. Cash prizes were awarded in 15 categories and some players also received Dynamo tables, trophies, and world championship jackets and rings. Held at the Holiday Inn DFW North, the weekend tournament attracted competitors from approximately 40 states and two players from Brussels, Belgium.

Tina Rhoton (l) and Cindy Head vie for the Women's Singles title.

All prize money distributed came from players' entry fees and from quarters deposited in tables during tournament play. A celebrity challenge, held for the Variety Club's Children's Charities, pitted Dallas Cowboys' Doug Donley, local radio station KZEW's Chris Taylor, and Dynamo's Mark Struhs against top pro players. Other players wishing to compete against the celebrities donated to the Children's Charities.

Finals were held Monday in the major categories of competition. Dallas' WFAA's "PM Magazine" crew interviewed players and filmed the entire two sets of open doubles competition. Dynamo plans to show the film at its AMOA booth in late October and to attempt to sell the film to a cable sports network. "We need more coverage like 'PM Magazine's' so people will realize what goes into

Dynamo's Mark Struhs and Bill Rickett presented trophies to (l to r) Tony Bacon, Tina Rhoton, Bob Maloney, and Kathy Brainard for outstanding individual performance in 1984.

being good at the game," said Kathy Brainard, Dynamo director of marketing promotions, who is also a professional table soccer player.

"We're very pleased with the tournament," Brainard added. "It's a good indication that the players are out there and that the game never died. It's more difficult to please players today because in the '70s, there were tournaments with pots of $250,000. Although the prize money is not as high, we wanted everything to be as exciting and as professional as past tournaments have been."

The Dynamo World Table Soccer Association (DWTSA) received more than 100 new members during the Dallas championships. Brainard said that Dynamo is finalizing league kits and setting up teams for fall and winter play. League play will continue through March of 1985 when Dynamo will kick off the 1985 table soccer tour probably with league playoffs, Brainard said.

"Our next goal is to get table soccer into the Olympics. Table tennis is sanctioned for the 1988 Olympics as a demonstration sport, and we would like to see the same thing happen with table soccer," she said.

First place for Open Doubles went to Tony Bacon of Seattle and Don Chalifoux of Chicago who were world champions in 1982. They received $5,000 and trophies, world championship jackets, and rings. Johnny Lott of Los Angeles and Bob Gibson of Denver won second place, $2,500, and trophies in that event. In Open Singles, Todd Loffredo of Denver ($2,000) defeated Johnny Valles of Tempe, Arizona ($1,000).

Frank Garbuglio from Columbus, Ohio, and Jodi Wittenberg from Florida teamed up to win the Mixed Doubles title ($1,000) against Bob Gibson and Tami Grabher of Denver ($600).

First place and $500 for Women's Doubles went to Tina Rhoton of Denver and Charlene Turner of Oklahoma who beat Maggie Laneri and Jodi Wittenberg ($250). And in Women's Singles, Cindy Head from Birmingham, Alabama, defeated Tina Rhoton. All first place winners received trophies, jackets, and rings in addition to the cash prizes, and all second place finalists also received a trophy.

Player awards for outstanding individual achievement for 1984 were given to Bob Maloney (Best Male Goalie and Men's Sportsmanship), Tina Rhoton (Best Female Goalie and Best Female Forward), Kathy Brainard (Women's Sportsmanship Award), and Tony Bacon (Best Male Forward and Player of the Year). •

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TOURNAMENTS

AIR-TABLE-HOCKEY HOLDS EXHIBITIONS

Air-Table-Hockey recently conducted Professional *Air-Table-Hockey* Exhibitions at Malibu Grand Prix in Mt. Laurel, New Jersey, and Rubus Game Room in Chicago.

In July, tournament players Mark Robbins of Boulder, Colorado, and Jesse Douty of Philadelphia displayed their skills by defeating all challengers in a two-hour exhibition. Robbins is currently ranked Number Three by the U.S. Air-Table-Hockey Association; Douty is Number One in the United States, having won his record 8th national championship earlier this year.

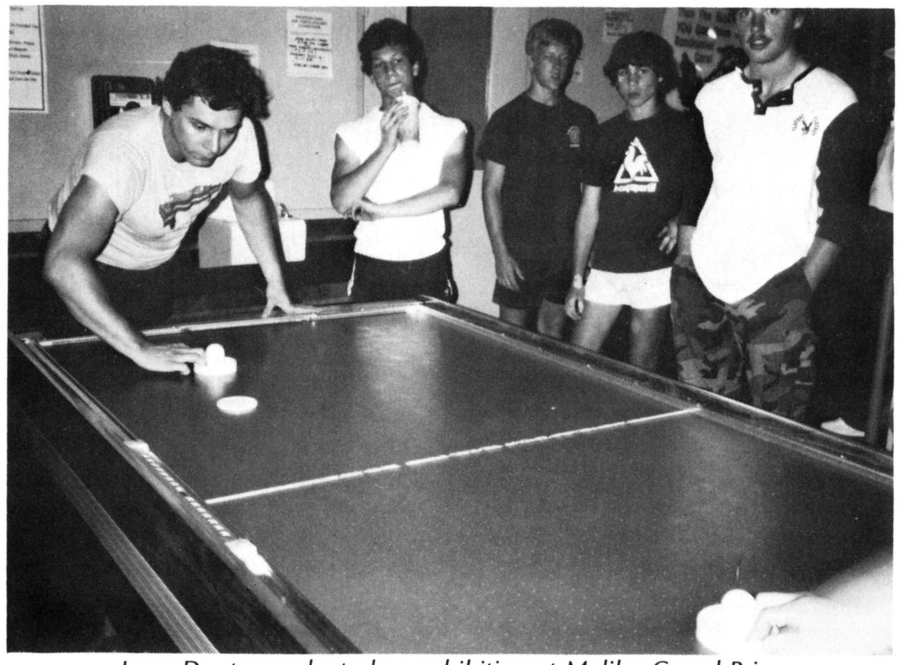
Challengers were awarded three tokens for each point they could score against the champions. A constant stream of players came to learn new shots and strategies, trying their skills against the nation's best.

Malibu Grand Prix has been averaging $400 per week (two-token play) on its new *Air-Table-Hockey* game, according to General Manager Robert Simony.

Rubus Game Room is on Chicago's near North Side. Steve Rubin, owner of Rubus, recalls that the game room did well with Brunswick air-hockey in the '70s, but the popularity faded as the tables wore out and videos captured customers' attention. Now, a new generation of players has taken a liking to the game, resulting in $250 per week earnings (25-cent play) on the new *Air-Table-Hockey*.

Seventeen players challenged Mark Robbins on August 2. Tokens were awarded for each point scored, and after two hours of play, Robbins was exhausted but undefeated. The mixed crowd of kids and adults peppered Robbins with questions about tournaments, strategies, grips, and practical advice for improving their games.

"Air-hockey seems to attract a wholesome crowd who respect the machines," Robbins commented. •



Jesse Douty conducted an exhibition at Malibu Grand Prix in Mt. Laurel, New Jersey.

Masters Tournament winners to appear in Guinness records

On the weekend of June 29-July 1, video game players from across the United States and Canada had the chance to have their playing prowess recorded in the Guinness Book of World Records.

The book, which has a distribution of 49 million copies to 23 separate countries, co-sponsored the 1984 Video Game Masters Tournament. The contest was held at nine locations across North America, giving players from any area of the continent a chance to compete.

The event's organizer was Walter Day Jr. and the Twin Galaxies International Scoreboard. After recording video game high scores for quite some time, Day was contacted by the Guinness Book editors who wished to collaborate with Twin Galaxies and make a section of the book devoted to video games.

"Guinness got interested in Twin Galaxies by seeing a lot of articles and such," said scoreboard founder Walter Day. "They got an incredible amount of response concerning video games. Guinness heard that our establishment was one they could rely on, so they decided to run a dozen scores in their 1983 edition."

The 1983 volume of the Guinness Book of World Records ran a half column feature on coin-operated video games, including 12 scores supplied by Day. Point totals had to be submitted judicially to the records book to be accepted, so Day sent high scores achieved during various competitions he staged while in Ottumwa, Iowa.

After the video game column's inception, Guinness was deluged with calls from players nationwide. "We got a tremendous amount of response after its publication," added Guinness Director David Boehm. "Although many video game magazines run scores, the different difficulty settings and playing atmospheres make it hard to accurately verify point totals," he continued. "We are the first source of widely published, verified scores."

Column expanded

The overwhelming feedback given to the premier appearance of video games in the Guinness Book was a major factor in persuading the publication's editors to expand the column this year. Guinness has committed more than a page to coin-ops for its 1985 edition.

So, with the space available, Walter Day devised a national contest to find the best players on 60 of the most popular machines.

Contest sites were then chosen in each area of the country: Victoria, B.C., at Johnny Zee's Family Fun; Seattle at Arnolds on the Ave.; San Jose, California, at Space Shuttle Video; Anchorage, Alaska, at Space Station Amusements; Oklahoma City at Star Buck's; Chicago at Video Wizard; New York at Broadway Amusements; Miami at Cloverleaf Golf and Games; and Wilmington, North Carolina, at World Class Amusements.

After the tournament locations were chosen, a detailed manual was sent to each participant, outlining the machine settings and special tricks players use to take advantage of programming flaws. Promotional posters and stickers were also made for the contest to aid operators in advertising the event.

Players from across the continent anxiously awaited the Masters Tournament to show off their skills and gain international notoriety. Out of the hundreds of competitors, however, only 60 spots were vacant. The 60 masters and their records will be recorded in the 1985 Guinness Book of World Records.

New faces

Besides the extensive television,

radio, and newspaper coverage each arcade received, many locations drew people that had never entered the game rooms prior to the contest.

"I've worked at this arcade for four years, and I saw new faces throughout the contest," said King Brown, manager of Miami's Cloverleaf Golf and Games. "Business is definitely up."

John Zanic, owner of Johnny Zee's Family Fun in British Columbia, showed higher earnings during the contest. "Throughout the competition we constantly had phone calls inquiring about our location. We are still seeing new people come through our doors every day and our profits are up," he said.

Pam Iverson, owner of Alaska's Space Station arcade, was yet another operator who saw business increase due to participation in the Masters Tournament. "My revenue has been up since a week prior to the contest, and it is still going up now, a week after," she commented.

The video game players, the people for whom the contest was geared, enjoyed the tournament even more than the operators who ran it.

"They were trying their best to set new records," said Wayne Coombs, editor of the national newsletter *Video Games Express*. "There were no problems. Everything went quite smoothly at the San Jose, California, location. Some players journeyed from as far away as Los Angeles and San Diego to compete."

"They thought the contest was an excellent way to showcase their talents," Zanic added. "Many players came from other parts of Canada to play. While here, they exchanged strategies and tricks. I can honestly say that many new friends were made because of the contest."

And what does video game promoter Walter Day have to say about his latest endeavor? "It was exactly what Twin Galaxies needed. The player response was excellent," he said. "This contest was professionally staged by everyone involved: Twin Galaxies, the operators who participated, and the individuals who contributed to the tournament manual. The success of this year's competition will build excitement toward next year, making the 1985 Masters Tournament the video game event of the year." •

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Bally Sente distributors view new product

Twenty-five Bally Sente distributors from across the nation gathered in San Francisco September 6-8 to discuss sales and marketing strategies, review Sente Arcade Computer (SAC) hardware modifications, and preview eight games slated for debut October 24-27 at the Amusement and Music Operators Association meeting in Chicago.

The September conclave included presentations by Bally Sente Chairman Nolan Bushnell, President Robert Lundquist, Sales Director Neal Smithweck, Marketing Director Ken Wagener, Customer Service Director Fred McCord, Vice President of Engineering Roger Hector, and marketing consultants C. Michael Leone and Bill Long.

The topics addressed in the meeting included introducing subtle changes in the Bally Sente Game Frame design and construction, backgrounding distributors on sales, advertising, and publicity efforts, and reviewing sample test marketing data accumulated from the Fresno, California, and Bakersfield, California, areas.

The marketing presentation, given by Wagener and Leone, premiered sample radio and newspaper consumer ads, as well as publicity and promotional opportunities available to distributors. According to the marketing team, these efforts played a vital role in premiering *Snakepit* to the Fresno area where a test measuring the effects of consumer advertising is being conducted. These marketing activities are ongoing as are tests for the new SAC 1 library of games.

This library of eight new games, as well as the original SAC 1 offering, *Snakepit*, were showcased to distributors on a wall of monitors. The games presented to the distributors included:

Hat Trick—A fast paced, video

These two motorized cable cars were decorated with the slogan "Back on Track—Bally Sente" referring to the cable cars of San Francisco and the company. The cable cars carried Bally Sente distributors through the streets of San Francisco for a meal that included stops at Fisherman's Wharf for seafood, North Beach for pasta, Chinatown for Chinese cuisine, and Union Square for dessert.

hockey game.

Trivial Compute—Where a character called "General Knowledge" tests the player's proficiency at recalling trivia.

Goalie Ghost—A soccer game that splits the screen to provide each player with a personal perspective of goal tending and shooting.

Chicken Shift—An especially fertile chicken produces eggs that travel down a convoluted passageway on their way to the cartons. The player can "shift" the direction the eggs travel, and a misguided move culminates in a scrambled mess.

Off The Wall—A combination of tennis, volleyball, and racquetball. The players have the opportunity to put the game ball in the face of their opponent.

Stocker—The player drives a vehicle on a fast-paced excursion across the United States watching his direction, fuel, and reckless drivers along the way.

Snacks and Jaxson—A ravenous clown attempts to devour a variety of foods as they float through his surrealistic kitchen.

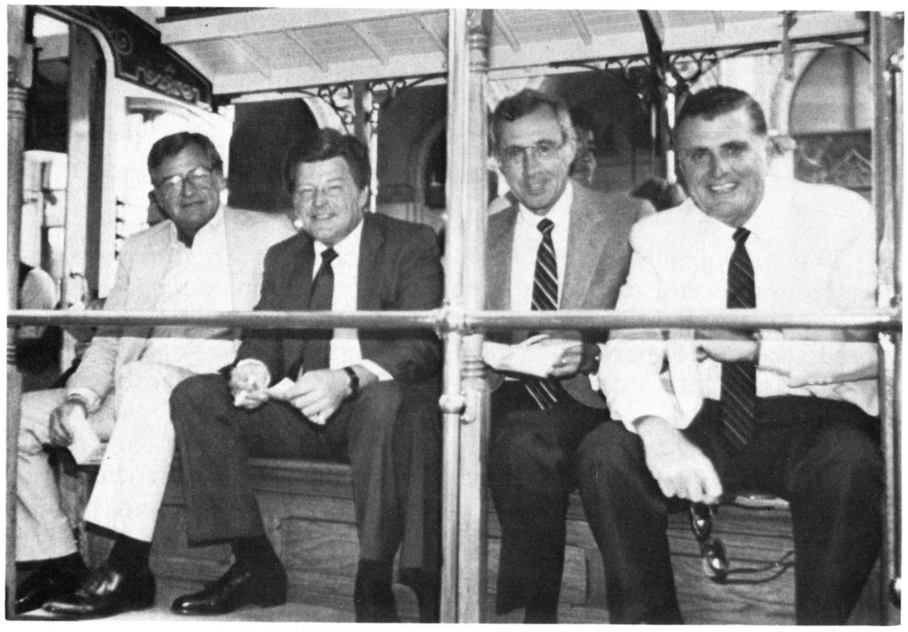
All of the above can be interchanged within SAC I Game Frames within minutes by inserting a new software board, control panel, and graphics.

The second generation SAC system, SAC II, which combines actual player movement with video game screen action, was also previewed at the September meeting.

Roger Hector, Bally Sente vice president of engineering, said the complexity of the SAC II system and its use of high speed processors in tandem with electric mechanical actuators make it unique in the video game industry.

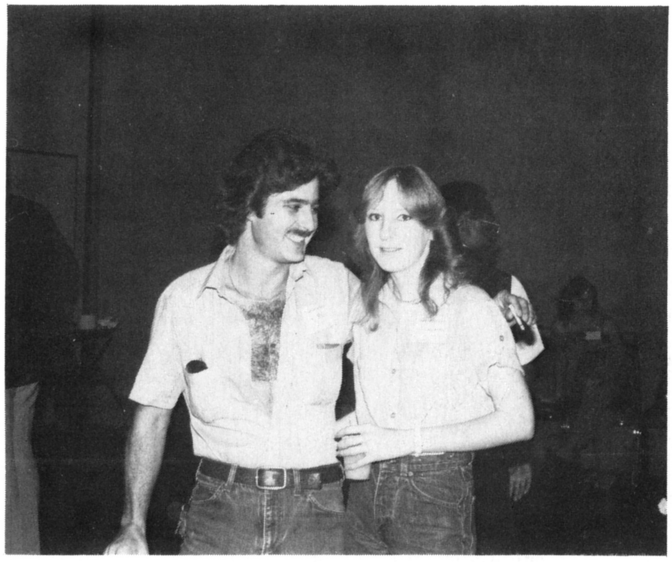
The first game created for this system, *Shrike Avenger*, is a "space opera" in which the player seeks to dodge deadly space mines on the way to an encounter with a deadly mother ship.

The SAC I and SAC II software are not compatible with each other. •



Pictured here aboard one of the specially decorated cable cars are: Bally Distributing's Chuck Farmer and Mike Rudowicz; Maury Ferchen, Bally Aladdin's Castle's president; and Bally Midwest's John Murnane.

Bally Sente President Bob Lundquist, Chairman Nolan Bushnell, and Bally Corporate's Tom Nieman take a break at the distributor meeting.



Operators enjoyed a Brady cocktail party.

From left: Brian Duke of Universal, Rene Lopez and Ken Ichiki of Konami, and Bill Cravens of Nintendo.

Brady Distributing draws a large turnout

The Brady Extravaganza lived up to its name as close to 200 operators and manufacturers' representatives met at Brady Distributing's offices in Charlotte, North Carolina, in August. Operators viewed new equipment and took advantage of bargains on games in stock.

"We wanted to do something to let our operators know we believe in the industry," said Brady's Jim Frye. "Distributors have more opportunities to go to various functions so we wanted to do something for operators."

Steve Walton of Data East showed the new *Karate Champ*. "This is a dedicated game that will turn out to be a real winner," Walton said, noting that the conversion market may be decreasing.

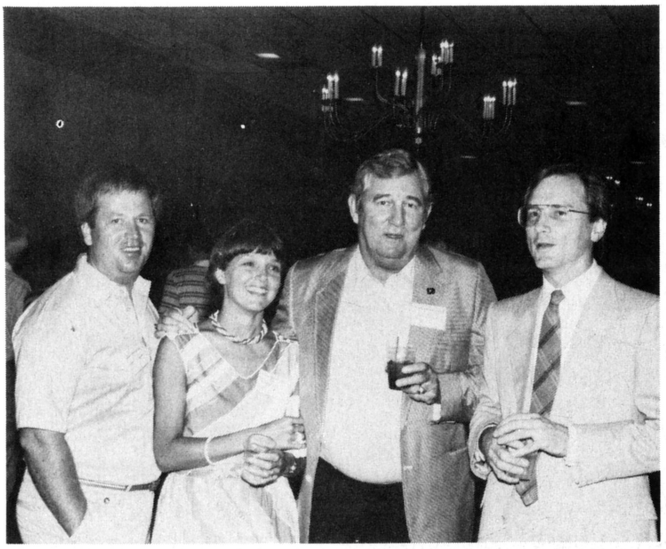
Thayer's Quest was explained by Dave McAndrews of RDI. The game features a keyboard on the control panel enabling the player to make many choices about game play.

Brian Duke talked about Universal's new piece *Do! Run Run*. "The sound and play on this game are fantastic," he said. *Do! Run Run* will be offered as an upright and kit.

Bally's Dick Konopa answered

Manufacturers pause for photo with Jon Brady. From left: Bill Cravens, Jon Brady, Joe Dillon of Williams, and Steve Walton of Data East.

Kent Jackson, Wayne McGuire, and Mark Belsoe collaborated on the Brady Pocket Raster generator device Wayne is holding. Brady is proud of its service department.



From left: Mr. & Mrs. Daryl Hayden of Putt-Putt, Don Clayton, founder of Putt-Putt Golf, and Tom Keil of Brady enjoy a drink at a cocktail party held for operators.

Jon Brady, center, with Chuck Milhem of Valley on Jon's right and Mark Struhs of Dynamo. (Brain Duke is behind Chuck but we never figured out what he was doing!)

questions about Bally's latest pieces *Gaplus, Big Bat*, and the pin *Black Pyramid*, while Joy Istorico of Mylstar showed *US vs. Them, Three Stooges*, and new pins *Alien Star* and *The Games*.

I Robot was demonstrated by Atari's Jim Newlander. Other factory representatives included Bill Cravens of Nintendo, Ken Ichiki and Rene Lopez of Konami, Chuck Milhem of Valley, Mark Struhs of Dynamo, John Barone of Exidy, Joe Dillon of Williams, and Ken Pacheco and Mike VonKennel of Digital Controls.

Brady Distributing also took the occasion to brag on its service department under the supervision of Wayne McGuire. "We are very proud of the service department," McGuire said. Kent Jackson, who is also employed in the service department, agrees. "Mr. Brady has drilled it in our heads that without good service, you can't have a successful distributorship." •

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STATE OF THE INDUSTRY SURVEY 1984

STATE OF THE INDUSTRY

VITAL STATISTICS

	1984	1983	1982
Gross Collections	$4.5 Billion	$6.4 Billion	$8.9 Billion
Weekly Gross Per Video Game	$53	$70	$109
Operator Population	9,000	11,000	12,000
Games on Location	1,652,324	1,876,389	1,793,000
Locations:			
Street	358,899	392,175	385,494
Arcade	19,565	25,092	23,687
New Purchases	260,324	363,752	640,000

Introduction

We want to extend our sincere thanks to the hundreds of operators who participated in *Play Meter's* 1984 Annual Subscribers' Survey. Without your dedicated cooperation, this report would not have been possible. We realize the amount of time it takes to properly complete our subscribers' survey, and we are always amazed at the number of valid returns we receive.

This year's survey consisted of 67 questions with many requiring multiple responses! The reward for your effort is the following State of the Industry Report, and it is dedicated to you, the operators who survived the "Crunch of '84."

About the Survey

The surveys were mailed to operators nationwide in mid-July. Operators were given until August 3 to complete and return their surveys. The survey covers the 12 months from July 1, 1983, to June 30, 1984. So, while we may refer to the survey as the 1984 report, it really represents the last six months of 1983 and the first six months of 1984.

To determine if all the surveys we received were representative of the entire United States, we audited the postmarks on all of the envelopes. (Because of the confidential nature of the survey, respondents were requested not to put their names and addresses anywhere on the survey itself.) We were then able to produce a geographic profile of our survey group. (See Geographic Breakdown of Responses chart.) Responses were received from all but six states. We then took the five states registering the highest number of responses to our survey and compared those totals to actual U.S. Census figures. The assumption here is that the number of operators in a given area is directly proportionate to the num-

ber of people in a given area. As it turned out, California, Florida, Texas, New York, and Illinois represented 40.2 percent of our sample. The U.S. Census Bureau confirmed the fact that these five states represent 34.5 percent of the total U.S. population. Therefore, we can reasonably conclude that this year's survey is geographically representative of the U.S. operator population.

Particular care was taken to make sure that the surveys were sent to legitimate operators. Since *Play Meter's* circulation figures are audited each year by an independent publication auditing agency, subscribers are required to report their occupations and job titles and sign their names to that fact. These classifications are coded and fed into our computer. For this survey, all domestic paid subscribers with an "operator" classification comprised the mailing.

This year we divided our responses into nine different groups again. The surveys were first arranged by size into three groups—small, medium, and large. The small group consisted of operators with 75 machines or fewer on location. The medium group was comprised of operators with 76-299 machines on location. And the large group consisted of operators having 300 or more machines on location.

Next, each size of operation was broken down into one of three categories—Street Only Operators (Street), Arcade Only Operators (Arcade), and Operators of Both Street and Arcade Locations (Mixed). (See Extended Grids of Operator Population charts.)

Using the numbers from our initial response grid, we were able to complete an extended total number of operators using percentages and an estimated operator population level of 9,000. (*Play Meter* circulation figures were used to determine the net increase or decrease in the operator population.) With these two extended grids, we were then able to compute more precise averages from the raw totals and multiply these averages by the extended totals giving us grand totals for the industry as a whole. These two charts were a key factor in determining all the statistical information included in this report.

1984 Subscriber Poll
Geographic Breakdown of Responses

State	%
California	10.7
Florida	9.8
Texas	7.0
New York	6.6
Illinois	6.1
Ohio	4.5
Pennsylvania	4.1
Michigan	3.3
North Carolina	2.9
All Others	45.0
Total	**100.0**

NOTE: No responses from Delaware, Maine, North Dakota, Oregon, South Dakota, and Wyoming.

A Word of Caution

This survey, like any other survey, by its very nature contains a certain margin of error. It would be impossible to question 9,000 operators nationwide. All we can do is mail the surveys to qualified operators and hope that as many as possible complete them and return them. So, in this sense, our sample group is not a scientific sample that is carefully selected to conform to a set of requirements. Our sample selected us by completing and mailing their surveys. Therefore, we have no way of knowing if our sample is a true representation of the entire operator population.

What we do know is that, for the most part, many of the same operators respond to our survey each year. And if we compare the results from this year's sample group to the results of last year's, using the same methods and computations, we can tell a lot about the economic health of the entire industry. *So, it's the comparisons, not the actual figures, that tell the real story.*

That being the case, it would be very foolhardy for any governmental body or tax authority to use these survey results for any legislative purpose whatsoever. Any attempt to use the results of this survey for any such purpose would be wrongful and misleading. •

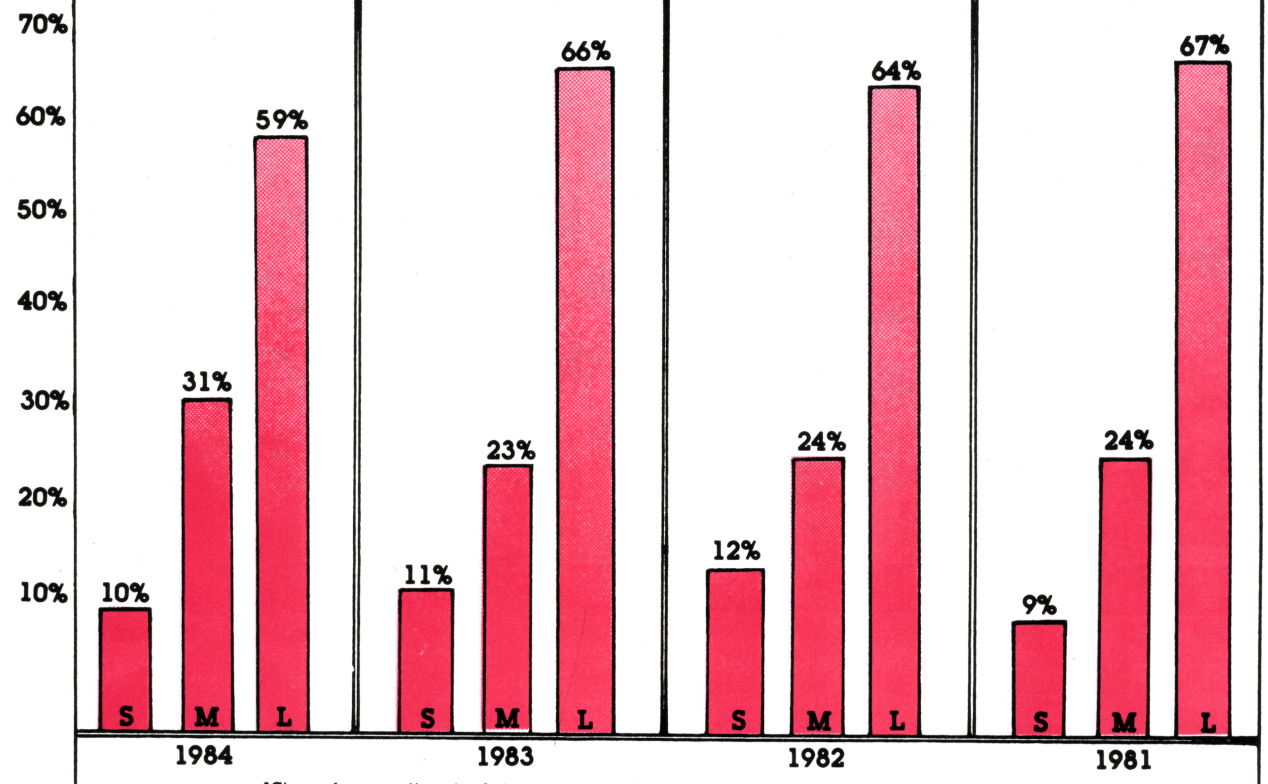
Extended Grid of Operator Population Chart

	Small	Medium	Large	Total
Street	1,620	1,080	180	2,880
Mixed	1,350	2,250	990	4,590
Arcade	1,260	180	90	1,530
Total	**4,230**	**3,510**	**1,260**	**9,000**

Extended Grid of Operator Population by Percent

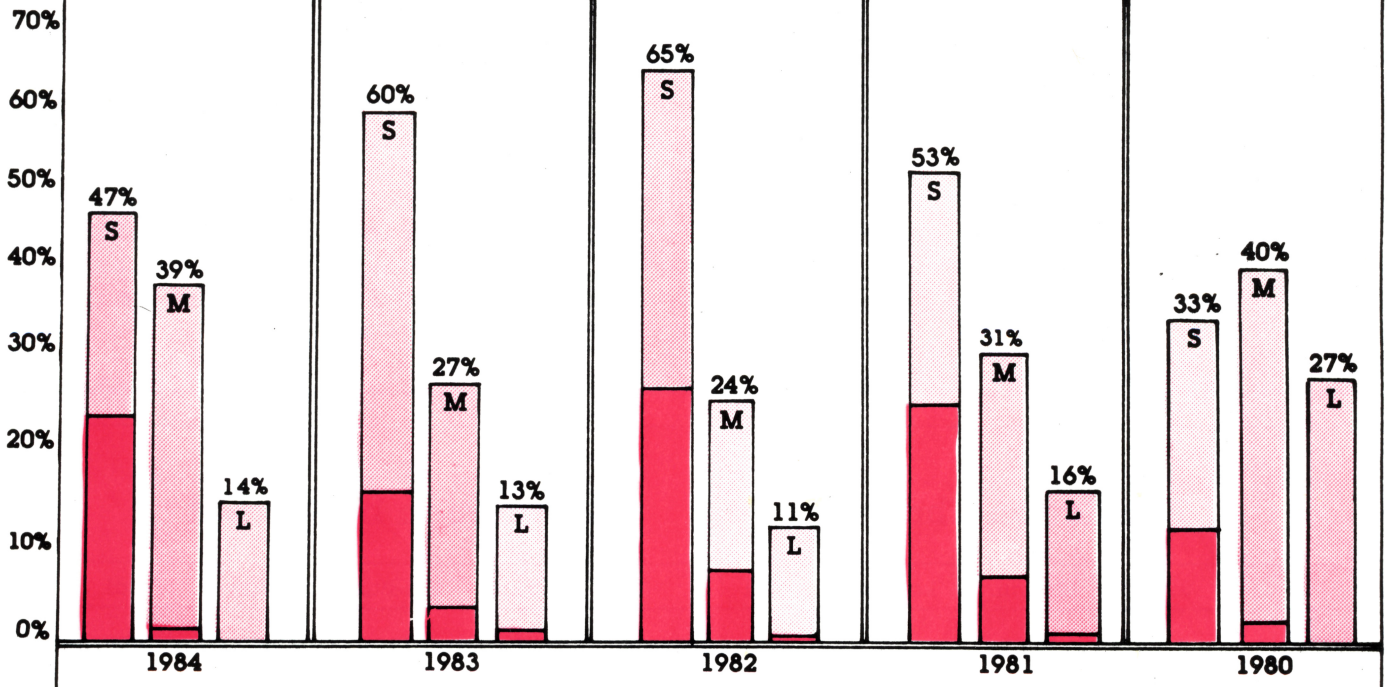
	Small	Medium	Large	Total
Street	18%	12%	2%	32%
Mixed	15%	25%	11%	51%
Arcade	14%	2%	1%	17%
	47%	**39%**	**14%**	**100%**

1984 Machines on Location Analysis by Size of Operation*



*Size of operation is determined by total number of machines on location.
S - Operator with 75 or less / M - Operator with 76-299
L - Operator with 300 or more

1984 Operator Population Analysis by Size of Operation*



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S - Small operator with 75 or less / M - Medium operator with 76-299
L - Large operator with 300 or more

Shaded areas represent new operators in business one year or less.

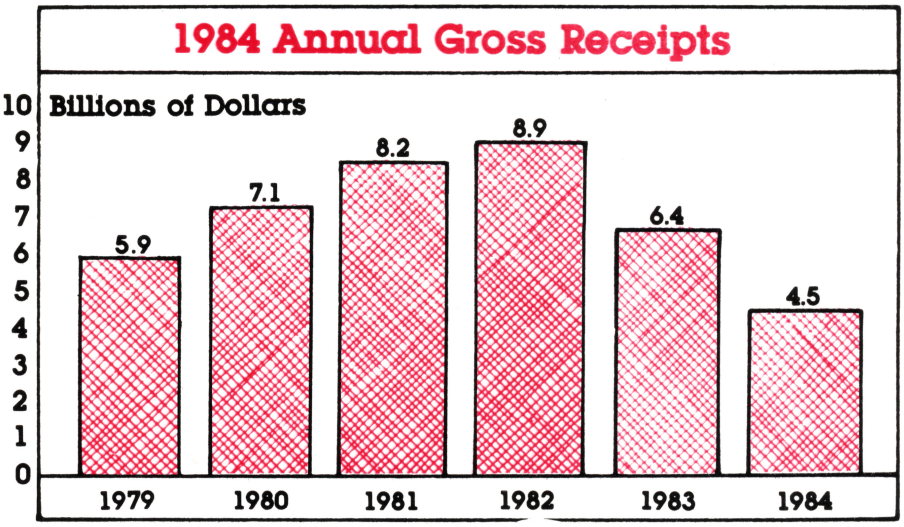
1984— The Year of the Crunch

The decrease of 7.6 billion quarters in the cash cans of amusement machines nationwide dealt a crushing blow to the coin-operated entertainment industry in 1984. That translates into almost $2 billion dollars that found its way into other forms of entertainment over the past 12 months.

Gross annual cash box receipts for the coin-op entertainment industry dropped to $4.5 billion in 1984. This marks the second consecutive year of declining revenues for the industry. This year's drop amounts to a 30 percent decrease from last year and a whopping 49 percent drop from 1982 when the industy hit its all-time high of $8.9 billion.

Video game earnings totaled $3.1 billion, down 43 percent or $2.3 billion from last year, and down 60 percent or $4.6 billion from 1982. In 1981, the average video game was earning an average of $140 per week in gross collections. Today, the average video game is grossing a mere $53 per week.

On the brighter side of the coin, all other amusement machines



1984
Average Weekly Gross Collections
By Type of Machine

	+/-% Change	1984	1983	1982	1981	1980	1979	1978	1977
Video Phonographs	-	$176	-	-	-	-	-	-	-
Laser Disc Video Games	-	$120	-	-	-	-	-	-	-
Ball Roll-Up Games	-	$ 98	-	-	-	-	-	-	-
Pool Tables	+ 3%	$ 60	$ 58	$ 63	$ 67	$ 66	$ 57	$ 53	$ 41
Non-Video Arcade Games	+28%	$ 59	-	$ 46	$ 36	$ 33	-	-	-
Electronic Dart Games	-	$ 55	-	-	-	-	-	-	-
Video Games	-24%	$ 53	$ 70	$109	$140	$102	$ 64	$ 50	$ 44
Counter Games	+ 6%	$ 52	-	$ 49	$ 37	-	-	-	-
Kiddie Rides	+35%	$ 50	-	$ 37	-	-	-	-	-
Pinball Games	+ 8%	$ 41	$ 38	$ 55	$ 66	$ 63	$ 65	$ 62	$ 44
Phonographs	-20%	$ 40	$ 50	$ 51	$ 55	$ 50	$ 54	$ 52	$ 46
Shuffle Alleys	-25%	$ 36	-	$ 48	$ 31	$ 28	$ 41	$ 32	$ 29
Shuffleboards	-	$ 30	-	-	-	-	-	-	-
Foosballs	-16%	$ 26	-	$ 31	$ 28	$ 20	$ 31	$ 41	$ 39

Total Operator Population
By Type and Size of Operation*

	Small	%	Medium	%	Large	%	Total	%
Street Operators**	2,970	33%	3,330	37%	1,170	13%	7,470	83%
Arcade Only Operators	1,260	14%	180	2%	90	1%	1,530	17%
Total	**4,230**	**47%**	**3,510**	**39%**	**1,260**	**14%**	**9,000**	**100%**

*Size of operation is determined by total number of machines on location.
Small Operator - with 75 or less / Medium Operator - with 76-299
Large Operator - with 300 or more
**Includes operators of both street and arcade locations.

performed surprisingly well despite declining video game revenues. The gross annual collections from all other coin-op amusement devices increased by $400 million in 1984. Renewed interest in these previously ignored industry staples, namely pool tables, pinballs, and phonographs, accounted for most of that increase. Ball roll-up games, non-video arcade games, counter games, kiddie rides, and electronic dart games are games that fared extremely well in 1984.

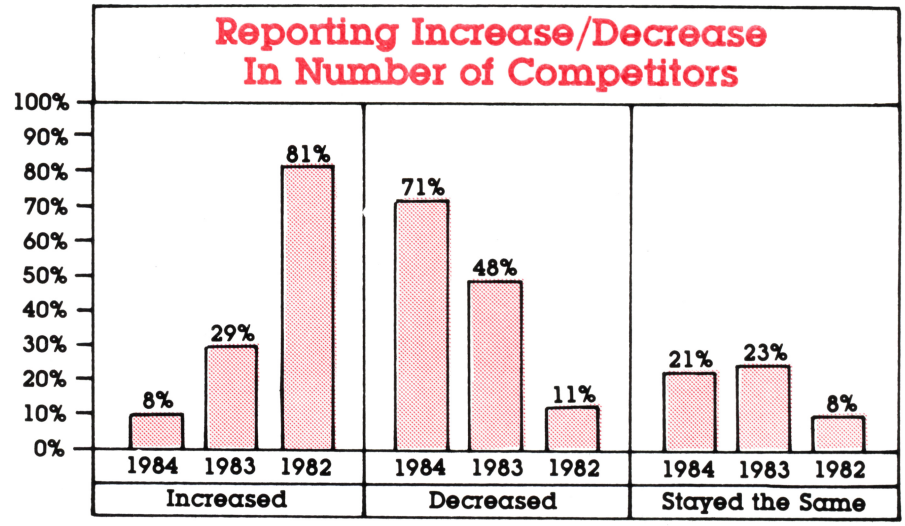
Clearly, operators are turning to these other forms of coin-op entertainment in an effort to offset ever declining video game revenues. In 1983, video games made up 80 percent of operator inventories; today that figure sits at 66 percent.

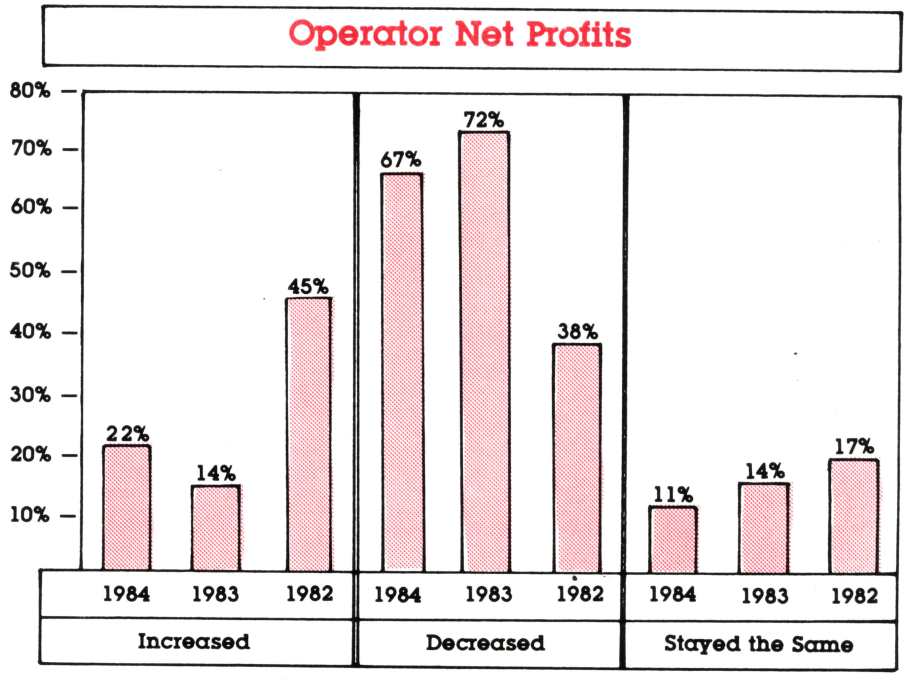
The Shakeout Continues

With $1.9 billion less to go around, many more operators fell by the wayside in 1984. An estimated 3,000 operators were forced to close up shop this past year while 1,000 brave souls entered the business. This resulted in a net decrease in the operator population of 2,000. The total operator population is now conservatively estimated to be 9,000 operating concerns—down 25 percent from an estimated 12,000 in 1982. Small operators, those operating 75 machines or fewer, accounted for a large majority of the casualties.

The survivors of the shakeout had very little to be happy about despite the fact that they had fewer competitors. For the second year in a row and for the second time in the history of this survey, operators reported a decrease in net profits for 1984. Sixty-seven percent of the operators responding to the survey indicated that their net profits decreased since 1983. Only 22 percent of the entire operator population said they had experienced an increase in net profits.

Profitable operating concerns reported an average pre-tax net profit of 22.3 percent with a range running from 14 percent up to 26





percent. This proves that there is still good money to be made in this business if one knows the ropes and is quick to react to abrupt changes in market conditions.

Due to the drastic decline in the number of small inexperienced operators, the remaining operator population has continued to take on a more mature appearance. The average operator now provides his customers with 10 years of experience compared to only 7.5 years in 1983.

Operators who have been in business three years or less now comprise 34 percent of the total operator population. In 1983, 61 percent of the operator population fell into this category. Small operators now average four years in the coin-op business, and the medium size operators average 12 years in operation. Large operators now average 23 years of service to their customers.

Employment

Interestingly, nationwide employment figures did not suffer any severe setbacks in 1984. In fact, this year's employment figures indicate a slight (5 percent) increase over last year's figures. Although 2,000 operating companies went out of business this past year, their demise did not adversely affect employment at the operating level of the industry. Most of the companies that went out of business employed one to three people.

The remaining operating concerns found themselves with fewer *new* video machines on location and considerably more non-video, electromechanical machines that require more service and attention. Additional office help and technical repair help more than offset the employment decrease caused by the demise of the small operators.

In 1984, the average operator had 5.4 full-time employees and 3.2 part-time employees. With the average operator operating 184 pieces of equipment, this means there was one full-time employee for every 34 pieces of equipment on location. Last year, with the average operator operating 171 pieces of equipment, he employed four full-time and 2.6 part-time employees. This means there was one full-time employee per 42 pieces of equipment.

The full-time employment figures for the operating segment of the industry was 48,683 compared to 44,000 last year and 70,000 in '82. Last year operators employed 29,000 part-time people; this year that total is down slightly to 28,400. As one might expect, more than half (52 percent) of all part-time employees are employed by *arcade-only* operators. In support of these rather startling employment figures, 73 percent of the operators polled said they are employing as many or more people this year as compared to last year. Fifty-seven percent reported employing more people this year than last year.

Due to the decreasing popularity of the relatively "service-free" video game and the increasing dependence on the more service-oriented staples such as pins, phonographs, and pool tables, the employment figure for service technicians is up 21 percent. Of the 77,083 employees at the operating level of the industry, 22,277 are service technicians. This represents nearly 4,000 more technicians than were employed one year ago.

Using the estimate of 1,652,324 pieces of equipment on location, this means that there is one service technician for every 74 pieces of equipment. Last year the industry reported one service technician for every 102 pieces of equipment on location.

According to this year's survey, 134,751 service calls were made each week. Multiplying this figure

1984 Location Analysis

Total Arcade Locations
(Locations with 10 or more Games)
By Type of Operation & Size of Operation*

	Small	Medium	Large	Total
Arcade Operators	1,575	480	1,305	3,360
Street Operators	1,913	6,570	7,722	16,205
Total	**3,488**	**7,050**	**9,027**	**19,565**

Total Street Locations
(Locations with Fewer than 10 Games)
By Size of Operation*

	Small	Medium	Large	Total
Street Operators	31,412	107,841	219,646	358,899

*Size of operation is determined by total number of machines on location.
Small Operator - with 75 or less / Medium Operator - with 76-299
Large Operator - with 300 or more

Distribution of Videos and Pins by Location

	Arcade	Street	Totals
Video Games**	897,201	198,160	1,095,361
Pinballs	70,731	68,372	139,103
Totals	**967,932**	**266,532**	**1,234,464**

**Includes laser disc video games.

by 52, 7,007,052 service calls were made in 1984. Dividing this number by the 1,652,324 machines on location, there was an average of 4.24 service calls per machine, per year.

Machines and Locations

Among other things, 1984 will also be known as the year of the demise of the arcade. For the first time in the history of this survey, the total number of locations for coin-op amusement machines declined. One year ago, 417,267 locations existed in the United States. This year that figure has fallen to 378,464, a decrease of 9.3 percent.

The arcades that once flourished throughout the United States took the biggest beating. There was an all-time industry high of 25,092 arcades in operation throughout the United States in 1983. According to this year's survey, only 19,565 arcades are still in business. This represents a 22 percent drop in the number of arcades within the past 12 months.

Street locations, on the other hand, suffered only a minor setback in 1984 dropping only 8.5 percent from last year's record level. But with a total of 358,899 street locations being reported this year, that still means 33,276 street locations no longer exist. Yet, despite this significant decrease in the number of locations, the average operator now services an average of 42 locations. Last year operators serviced an average of only 38 locations.

Likewise, for the first time in the history of this survey, the total number of units on location dropped dramatically in 1984. The total number of amusement machines on location in the U.S. fell a staggering 12 percent from last year's record level. A net total of 224,065 amusement machines vanished from the streets of America in 1984.

Had it not been for a resur-

1984 Total Units on Location
All Types of Machines
By Type and Size of Operation*

	Small	Medium	Large	Total
Street**	121,935	483,959	811,781	1,417,675
Arcade Only	51,799	26,880	155,970	234,649
Total Units	**173,734**	**510,839**	**967,751**	**1,652,324**

Total Units on Location
By Size of Operation and Type of Machine*

	Small	Medium	Large	Total
Videos Games	140,211	351,760	576,561	1,068,532
Phonographs***	5,878	45,559	117,403	168,840
Pinballs	13,010	43,913	82,180	139,103
Pool Tables	4,553	30,970	71,651	107,174
Non-Video Arcade	865	7,250	39,602	47,717
Laser Disc Videos	3,243	7,608	15,978	26,829
Ball Roll-Up	635	1,823	18,495	20,953
Shuffles	234	6,558	12,850	19,642
Foosballs	1,885	4,029	11,950	17,864
Kiddie Rides	183	1,442	11,493	13,118
Dart Games	397	2,815	4,990	8,202
Others	2,640	7,112	4,598	14,350
Total Units	**173,734**	**510,839**	**967,751**	**1,652,324**

*Size of operation is determined by total number of machines on location.
Small Operator - with 75 or less / Medium Operator - with 76-299
Large Operator - with 300 or more
**Includes operators of both street and arcade locations.
***Includes Video Phonographs

Average Number of Units on Location
Per Operator by Type of Machine

	All Operators							
	1984 (9,000)*	1983 (11,000)*	1982 (12,000)*	1981 (9,000)*	1980 (7,500)*	1979 (7,500)*	1978 (7,500)*	1977 (6,000)*
Video Games	122	136	114	96	72	60	62	30
Pinballs	15	13	13	31	98	91	99	66
Phonographs	19	9	12	19	43	44	59	50
Pool Tables	12	7	6	13	31	30	35	24
Others	16	6	4	12	24	36	37	30
Total	**184**	**171**	**149**	**171**	**268**	**261**	**292**	**200**

*Estimated Operator Population

gence of pinballs, phonographs, and pool tables, that number would have been nearly doubled. Video games were, undoubtedly, the hardest hit equipment type. There are slightly more than 400,000 fewer video games on location now than there were one year ago. A substantial increase in the number of phonographs, pool tables, and other non-video devices now on location made up almost half the difference. The total number of phonographs on location in 1984 was up 72 percent, total pool tables on location up 35 percent, and the number of pinballs on location remained relatively unchanged.

New Equipment Purchases

In 1981, when video games were averaging $140 per week in gross collections, 60 percent of all the video games on location were *new* games. Since that time, this percentage has dwindled rapidly. Today only a mere 15 percent of all video games on location are *new* games purchased within the past 12 months.

The video game glut of '82 and '83 has finally taken its toll on the industry's manufacturing community. Sales of new video games (including lasers) plummented 44 percent down to 168,508 units in 1984. Comparing that figure to the industry-s high water mark of 563,000 units set in 1982, results in a 70 percent decline in new video game purchases over the past two years.

Non-video amusement devices benefited from the public's growing disenchantment with video games. Sales of *new* non-video amusement equipment increased an impressive 47 percent over last year's figures. While 62,249 non-video devices were sold in 1983, a whopping 91,816 were sold in 1984. Non-video devices now represent 35 percent of all new equipment purchased. That figure was 12 percent only two years ago.

The phonograph headed the list of the non-video variety that made significant gains in sales last year. Sales of new phonographs in 1984 increased 58 percent over last year. Resourceful operators were obviously quick to realize that a jukebox cranking out $50 a week, month after month, year after year, was a lot better than a video game bringing in $50 a week and waiting for the bottom to

1984
Total New Equipment Purchases
By Type of Game and Size of Operation*

	All Operators			
	Small	**Medium**	**Large**	**Total**
Video Games	22,814	50,785	75,982	149,581
Pinballs	2,907	10,046	6,059	19,012
Laser Disc Videos	3,807	6,034	9,086	18,927
Phonographs	1,279	5,405	7,729	14,413
Pool Tables	2,073	5,702	5,245	13,020
Ball Roll-Up	748	592	9,171	10,511
Non-Video Arcade	1,082	2,012	6,671	9,765
Dart Games	142	1,892	5,652	7,686
Counter Games	93	3,370	2,603	6,066
Kiddie Rides	350	440	3,902	4,692
Shuffles	192	1,494	943	2,629
Foosballs	878	1,212	277	2,367
Others	95	1,164	396	1,655
Total	**36,460**	**90,148**	**133,716**	**260,324**

1984
Average Number of New Machines Purchased
Per Operator by Type of Machine & Size of Operation*

	1984				1983			
	Small	**Medium**	**Large**	**Average**	**Small**	**Medium**	**Large**	**Average**
Videos	6	16	68	19	10	25	111	29
Pinballs	1	3	5	2	1	2	7	2
Phonographs	-	2	6	2	-	1	4	1
Pool Tables	-	2	4	1	-	1	5	1
Others	1	3	23	5	1	3	5	2
Average	**8**	**26**	**106**	**29**	**12**	**32**	**132**	**35**

*Size of operation is determined by total number of machines on location.
Small Operator - with 75 or less / Medium Operator - with 76-299
Large Operator - with 300 or more

1984 Market Shares

By Manufacturer and Type of Machine

New Dedicated Video Games

(Estimated Total Units Sold: 168,508)

Manufacturer	1984	1983	1982
Bally Midway	21%	25%	33%
Atari	19%	19%	23%
Nintendo	10%	9%	10%
Mylstar	7%	6%	-
Centuri	7%	4%	2%
Konami/Centuri	7%	-	-
Cinematronics	6%	-	2%
Williams	5%	12%	11%
Taito America	4%	5%	6%
Merit	3%	-	-
Coin-It	2%	-	-
Stern	1%	3%	3%
Data East	1%	1%	-
Konami/Interlogic	1%	-	-
Universal	1%	2%	-
Exidy	1%	-	1%
Others	4%	7%	6%

Conversion Video Games

(Estimated Total Units Sold: 70,324)

Manufacturer	1984	1983	1982
Universal	18%	-	-
Taito	14%	-	-
Nintendo	13%	-	-
Bally Midway	10%	-	-
Konami/Centuri	7%	-	-
Konami/Interlogic	7%	-	-
Atari	5%	-	-
Crown Vending	4%	-	-
Data East	3%	-	-
Centuri	2%	-	-
Magic/Eagle	2%	-	-
SNK Enterprises	2%	-	-
Stern	2%	-	-
Cinematronics	1%	-	-
Williams	1%	-	-
Others	9%	-	-

New Pinball Games

(Estimated Total Units Sold: 19,012)

Manufacturer	1984	1983	1982
Bally Midway	45%	53%	47%
Williams	33%	20%	18%
Gottlieb	16%	20%	26%
Zaccaria	5%	-	-
Others	1%	7%	9%

New Pool Tables

(Estimated Total Units Sold: 13,020)

Manufacturer	1984	1983	1982
Valley	58%	67%	68%
Dynamo	31%	23%	14%
U.S. Billiards/ K. Enterprises	10%	9%	13%
Others	1%	1%	5%

New Phonographs

(Estimated Total Units Sold: 14,413)

Manufacturer	1984	1983	1982
Rowe	61%	66%	45%
Rock-Ola	19%	14%	28%
NSM	17%	11%	6%
Stern/Seeburg	2%	6%	15%
Others	1%	3%	6%

fall out. The introduction of video phonographs, featuring the latest music videos, undoubtedly had an additional impact on the sale of new phonographs as evidenced by their newly gained status of being the highest grossing amusement machine in the industry ($176/week).

Despite the decrease in the number of operators and the number of locations in 1984, purchases of new pinball machines and new pool tables remained relatively unchanged over last year. That in itself can be considered a respectable achievement in such a depressed market.

Other games making substantial inroads with the new equipment market were ball roll-up games, kiddie rides, electronic dart games, and other non-video type games. Diversification was obviously the key to success in 1984.

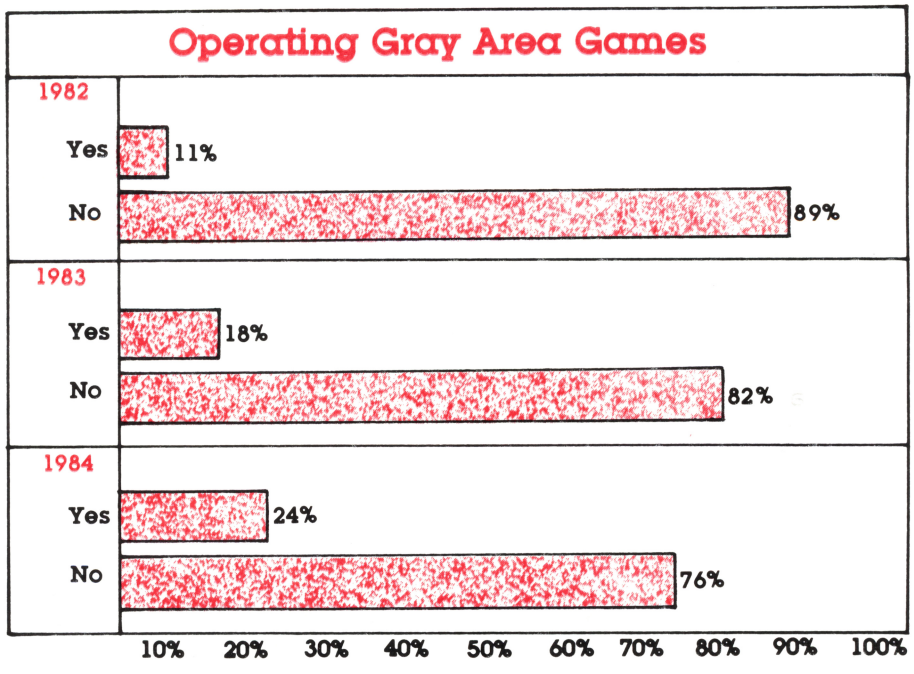
The long awaited emergence of factory authorized conversion kits for faltering video games made their formal debut in 1984. As expected, operators jumped at the chance to bring new life to games that were destined for the junkyard. Sales of conversion kits in their first full year of availability were estimated to be 70,324 units.

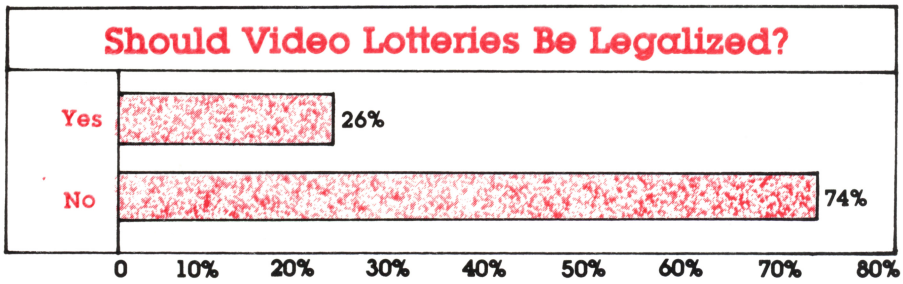
Issues and Answers

Gray Area Games

Subterfuge gaming devices, more commonly known as "gray area" machines, saw yet another increase in the number of operators resorting to operating the hotly debated devices in order to stay alive in 1984. A disappointing 24 percent of those operators responding to this year's survey admitted to operating gray area machines. That's more than double the number of operators operating gray area games two years ago. Compared to last year, gray area machine operators increased their fold 33 percent in 1984.

Even more depressing is the fact that 62 percent of the operators polled reported that gray area machines are being operated in their area. This is a sad commentary on an industry that once struggled so hard to rid itself of its rather unsavory image. Reports of raids, arrests, and convictions are becoming commonplace as more and more operators are finding themselves behind bars.





All the work, time, and effort spent on trying to clean up the industry's image all seem like a waste now as the proliferation of gray area machines continues to give the industry a black eye it may never lose.

Video Lotteries

The video lottery machine is, perhaps, the most threatening issue ever to face the industry. While still in its infancy, the spread of video lottery machines is being monitored very closely nationwide. The controversial video lottery devices are, for the time being, legal in Nebraska and are being tested in Illinois. In both instances, these legalized gambling machines have met considerable opposition. The Nebraska legislature recently passed a bill that will outlaw the machines beginning January 1, 1985. And a number of cities and townships in Illinois are actively opposing the placement of these devices in their communities.

The video lottery machines now in operation are being operated by the gaming machine manufacturers and state appointed agencies, thereby bypassing the local operators altogether. That being the case, the legalization of video lottery devices poses a very serious threat to the existence of the entire industry.

With that thought in mind, we asked the operators responding to our survey if they favor video lotteries being legalized in their states. A resounding 74 percent said they were not in favor of legalized video lotteries. When asked if they ever expected to operate video lottery machines should they become legal, we received a mixed response. A surprising 45 percent said yes, while 55 percent said they did not expect to be allowed to operate the devices.

Restrictions

On other industry fronts, the operators' battle against state and local authorities over unfavorable legislation continues. The number of operators being hampered by various restrictions rose to an all-time high in 1984 of 55 percent of the total operator population.

Again this year, the major complaints among the operators being hampered are excessive license fees and unfair taxes. Fifty-two percent of our survey sample said they were encountering legislative problems with high license fees (33 percent) and unfair taxes (19 percent). This represents a 12 percent increase over last year's figures with the largest increase being in the area of high license fees.

Other restrictions reported were: a restriction on the number of machines per location (12 percent), zoning restrictions (10 percent), curfew (9 percent), age restrictions (7 percent), a ban on some or all game types (7 percent), and a ban on arcades or game rooms (3 percent).

For whatever reasons, far fewer operators chose to take up the fight against oppressive legislation in 1984. Only 55 percent of operators reporting being hampered this past year said they fought back. In 1983, 74 percent took up the battle against city hall. Sadly, the success ratio of those who fought back declined from 57 percent in 1983 to 44 percent in 1984. That means 56 percent who did fight, lost the battle, and in some cases, their businesses as well.

Breaking Even

With the high cost of today's video games, operators are constantly concerned with their ability to earn money over the long haul. According to this year's survey, operators said they needed to gross $105 per week for 12.2 months to reach a break-even point.

In an effort to pin down the average location life of a new dedicated video game, this year's survey revealed the average life to be 8.5 months, up from 7.8 months last year. While the increase in the location life of a video game may sound encouraging, the operator still finds himself coming up far short—$52 per week and 3.7 months short to be exact.

Location Management

Commissions & Contracts

Since video games are averaging only $53 per week, operators need to be renegotiating commission arrangements. With lasers' high cost, many admitted making special arrangements for these pieces. However, there is good and bad news about commission arrangements this year. The good news is that only 8 percent of the operators said they received less than 50 percent of collections this year, compared to 17 percent last year. The smaller operators who dropped out of the industry in '84 probably accounted for the percentage drop in this category.

The bad news, however, is that only 24 percent said they received more than 50 percent of the collections compared to 49 percent in 1983. In all likelihood, the demise of the small arcade operator who garnered 100 percent of his collec-

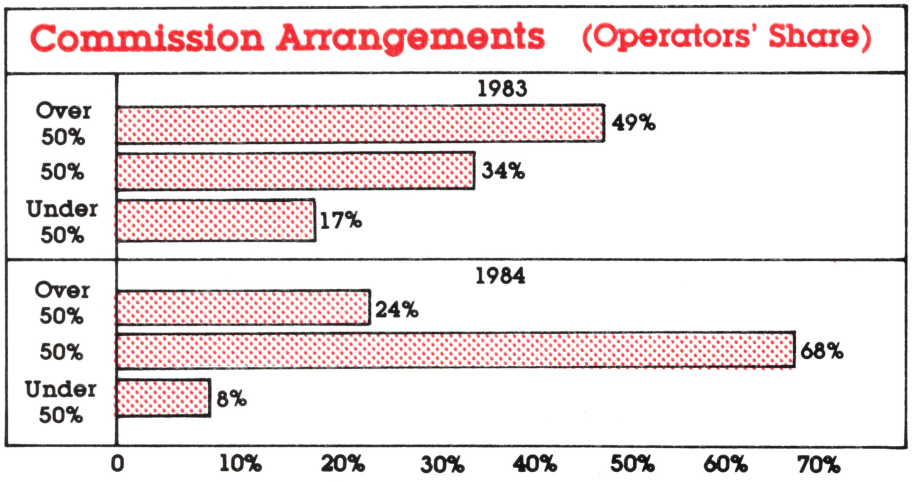
tions accounted for a substantial portion of this drastic drop. The percentage of operators who are on a 50/50 commission arrangement soared to 68 percent from only 34 percent last year.

Twenty-four percent of the operators polled said they charged a service fee. Of this percent, 58 percent said they charge a minimum guarantee, 26 percent instituted a service charge, and 16 percent required front money. This suggests that operators are finding ways to supplement lower collection commissions without actually renegotiating the collection split in their favor.

in league programs are in a pool program. Darts was named by 25 percent of those responding. Of the 11 percent participating in a league, 83 percent said their collections increased due to their participation.

Alternatives

With video collections at a record low (total sales of new equipment for '84 are less than the number of *Pac-Man* and *Ms. Pac-Man* units produced), operators are seeking alternatives. Vending machines are operated by 16 percent of the coin-op amusement operators and they average 39



Operators did not significantly alter policies in extending location loans or working with contracts. These percentages have stayed virtually the same since 1982. This year 14 percent said they make location loans (15 percent in 1983). Fifty-five percent said they were using no contracts. This figure remains unchanged from last year. Thirty-seven percent said they are using contracts in some locations (35 percent last year), and only 8 percent said they have all locations under contract (10 percent last year). But with the proliferation of gray area games and the advent of video lottery machines, more operators may seek to cement relations with locations by utilizing contracts next year.

In another attempt to secure locations' loyalty, 11 percent of the operators said they participated in league programs this year, with pool being the most popular program. More than half of those

pieces. An average of 99 cigarette machines per operator are run by 21 percent of responding operators. They sell an average of 89 packs per week/per machine. Last year only 19 percent said they operated cigarette vending machines.

Another alternative that should be employed by significantly more operators in the next 12 months is private coin-op pay phones. Although Minnesota is the only state to rule in favor of the phones for local calls, 3 percent report operating them. However, other states are not far behind. The FCC has given approval for submissions for the required FCC number, and companies are submitting phones.

Only 15 percent of the operators polled said they eliminated any type of equipment from their routes in the last 12 months, down 40 percent from the 27 percent who said they eliminated equipment last year. Though the percentage was higher last year, this is the first year video games were eliminated by operators (11 percent of those responding or 1½ percent of the operator population). Twenty-nine percent (or about 4 percent of the operator population) said they eliminated pinball. Other types of equipment mentioned (in order) are: jukeboxes, shuffleboards, foosball, air hockey, pool tables, cocktail videos, darts, and laser games.

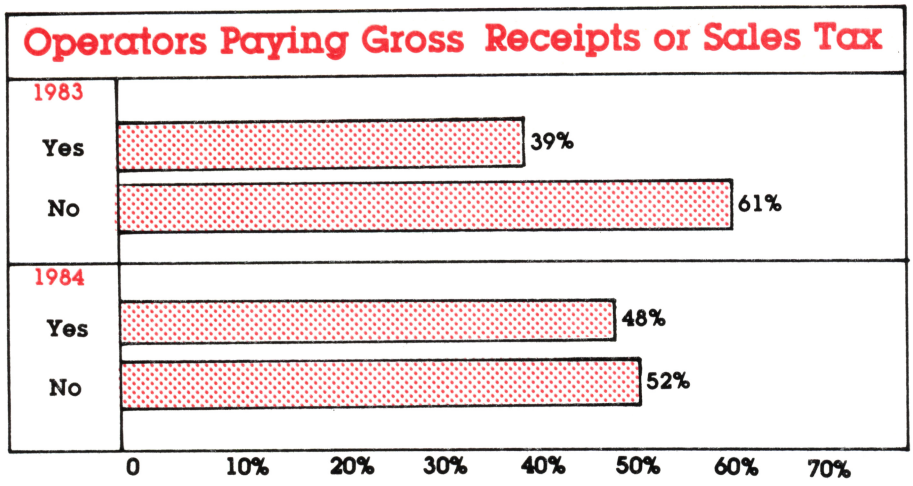
Associations and Fees

Operators have strived to secure and maintain a level of professionalism not formerly associated with this industry, and the percentage of operators who said they belong to a national or state association bears this out. This year 44 percent said they are members of the AMOA, up from 24 percent last year. Two percent said they are members of the relatively new NCMI, up from only one percent last year. State associations also saw an increase in membership. Forty-eight percent of the operators said they belong to state associations, up from 27 percent in 1983.

The percentages reflect that many newcomers, fly-by-night operators, who left the industry did not bother to participate in the associations. Their departure raises the percentage of the operator population which belongs to associations.

Similarly, in another effort to improve business quality, the percentage of operators who utilized computers in their operations rose to 31 percent from 25 percent last year. Last year it was predicted that this figure would more than likely increase, and it will probably rise again next year. The most popular computers mentioned in this year's survey, in order, were: Radio Shack TRS 80 Model II, IBM PCXT, Apple IIE, Apple II+, and the Commodore 64.

As collections on videos, the target of many legislative battles, plummeted, officials were hardly ready to stop trying to fatten state and local treasuries with taxes and



license fees from the coin-op industry.

Last year 39 percent of the operators polled said they paid a gross receipts/sales tax. That figure grew to 48 percent this year. Last year the majority (52 percent) of those paying the gross receipts/sales tax paid only 3-4 percent. However, this year 56 percent of those who pay the tax pay in the 5-6 percent range (31 percent paid in this range last year). In 1983 only 4 percent of those who paid the gross receipts/sales tax paid 7 percent or more. This year that percentage doubled to 8 percent. Where 13 percent said they paid 2 percent or less last year, this year that statistic dropped to only 4 percent.

The state, county, and city license fees on video games have nearly doubled since last year. License fees on other coin-op equipment have increased (except for the city license fee for pool tables) but not as drastically as video fees.

The average state license fee on video games is now $100, up from $41 in 1983. The average city license fee is $80, up from $34 in 1983, and the average county license fee is now $40, up from $26 in 1983. It is ironic that license fees escalated as collections dropped.

Other state license fees are $54 for pool tables, $56 for phonographs and pinballs, and $59 for arcade/novelty equipment.

The county license fees for these types of equipment are $25 for pinballs and pool tables, $26 on phonographs, and $38 for arcade/novelty pieces.

The city license fees are $25 on pool tables (the only fee registering a drop), $36 on phonographs, $45 on pinballs, and $40 on arcade/novelty equipment.

Equipment Purchases

It is obvious by the number of video games purchased this year that operators are scrutinizing each purchase, taking precautions against investing in equipment that will not offer them a fair return on investment. Since the introduction and less than hoped for reception of laser games in the last 12 months, other industry staples are making a comeback. Figures from this survey verify this. Operators purchased fewer videos this year—the only equipment type showing a decrease. Last year 22 percent said they purchased more new videos, compared to only 15 percent this year.

But other pieces experienced a purchasing upswing. Thirty-one percent said they bought more new pinballs, up from 12 percent last year (22 percent bought about the same number). Twenty-three percent said they bought more new phonographs, up from 15 percent last year (28 percent bought the same number). Twenty-six percent bought more new pool tables, up from 19 percent last year (31 percent bought about the same number). And 30 percent bought more new arcade/novelty pieces compared to 23 percent last year (32 percent bought about the same number).

Another encouraging statistic verifying the interest in pinball is that half of the operators purchased an average of four used

Average Yearly License Fees Analysis

	1984			1983		
	State	City	County	State	City	County
Videos	$100	$80	$40	$41	$34	$26
Pool Tables	$ 54	$25	$25	$36	$37	$17
Phonographs	$ 56	$36	$26	$31	$30	$26
Pinballs	$ 56	$45	$25	$40	$35	$16
Arcade/Novelty	$ 59	$40	$38	-	-	-

Sales Tax/Gross Receipts Tax Analysis

	1984					1983				
	2% or Less	3-4%	5-6%	7% or Over	Total	2% or Less	3-4%	5-6%	7% & Over	Total
State	4%	32%	56%	8%	100%	13%	52%	31%	4%	100%
City	56%	20%	12%	12%	100%	65%	21%	5%	9%	100%
County	58%	-	25%	17%	100%	67%	*	*	*	-

*Too few responses to compute accurately.

pinballs in the last 12 months.

The use of speed-up and enhancement kits showed a big jump from 1982 to 1983 when it was a major issue in the industry. However, 62 percent said they used the kits this year, and this figure was the same as 1983's statistic.

With the high cost of video games, slightly more operators (17 percent) admitted buying games thought to be unauthorized copies, up from 15 percent last year.

Operators have not significantly changed their sources for new and used equipment buying. Distributors were still the primary source for the majority of operators in both categories.

For new game purchases, 61 percent said they deal with their local distributor and 24 percent said their primary source was distributors outside the territory. Distributors are the primary source for new equipment for 85 percent of the respondents. Other sources include buying direct from a manufacturer (4 percent), other operators (6 percent), and other sources (5 percent).

For used game purchases, 31 percent said their primary source was the local distributor and 9 percent said they used a distributor out of the territory. Forty percent of the operators used a distributor as the primary source of used equipment. Other sources include 32 percent who named other operators, 13 percent whose primary source was auctions, 7 percent used jobbers, 6 percent named trade magazines, and 2 percent specified other sources.

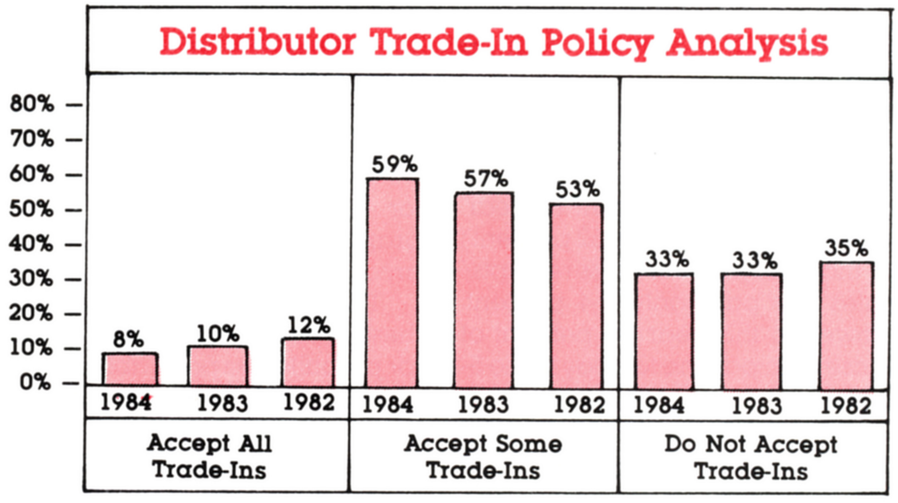
Distributors maintained about the same position on trade-ins this year. The only category to register a drop was those who accept all trades. Only 8 percent of the operators responding said their distributor accepts all trades, down from 10 percent last year and 12 percent in 1982. Fifty-nine percent said their distributors accept some trade-ins, slightly up from 57 percent last year. And 33 percent said their distributor accepts no trade-ins, the same as last year.

Twenty-six percent of the operators polled still rely on distributor recommendations when considering purchases of equipment. Thirty-one percent rely on earnings reports from other operators. This figure is significantly up from 22 percent last year. Twenty-eight percent rely on Play Meter, and 4 percent rely on other trade magazines. Eleven percent relied on other sources.

Even with the bleak statistics on videos, more operators are optimistic about the future of the industry this year. Twenty-two percent said they are more confident (only 12 percent said they were more confident last year); 53 percent said they were less confident (down from 66 percent last year); and 25 percent said they feel about the same (22 percent last year). •

1984
New Equipment Buying Trends
All Operators

	Bought More	Bought Same	Bought Fewer	Total
Video Games	15%	14%	71%	100%
Pinballs	31%	22%	47%	100%
Phonographs	23%	28%	49%	100%
Pool Tables	26%	31%	43%	100%
Arcade/Novelty	30%	32%	38%	100%



Turn to Play Meter for a preview of the AMOA Exposition. The December 1 issue will feature a sneak preview of the new equipment, highlights of Chicago, a special Frank's Cranks column, and more.

OUTLOOK FOR '85

With video games now only averaging $53 per week in gross collections and lasting just 8.5 months on location, something has got to give. At the rate of $26.50 per week (operator's share), there simply aren't enough weeks in a year to pay off a new video game that costs the operator $2,500-$3,000. Either the prices of new video games must be reduced drastically or the earnings of new video games must increase substantially.

The millions of dollars in profits made by the large video game manufacturers during the video boom were not reinvested back into the industry. Instead, these huge profits were used to purchase gambling casinos, health spas, yacht companies, amusement parks, and other non-industry related enterprises.

Consequently, there is very little money going into research and development these days. That being the case, we don't look for any big increase in the earning potential of video games, and we expect prices of new video games to begin falling considerably in 1985. The video game manufacturers just may learn something about the elasticity of demand. Reduced prices on new video games may very well result in a substantial increase in unit sales. For that reason, we are projecting an increase in new video game purchases in 1985.

Even more encouraging for the video game outlook is the widespread availability of conversion kits and the introduction of video game "systems." Making amends for their past sins, all major video game manufacturers are now offering conversion kits for their games. As expected, conversion kits were well received by the operator population in 1984, and we have every reason to expect this trend to continue in 1985.

The emergence of video systems by manufacturers such as Nintendo and Sente are sure to have a positive impact on the future of the video game. Nintendo's VS. System, for instance, offers the player a game that would be impossible to play at home because it employs the use of two monitors, and it provides the operator with a simple, more economical method of converting the game to something entirely different. Innovations such as this are sure to brighten the future of the video game in 1985.

We are somewhat skeptical about the future of laser disc video games. There can be no doubt about their income potential, but, as of yet, they provide very little interaction between player and machine, and until this technological bridge is gapped, laser games are not expected to make any significant comeback in 1985.

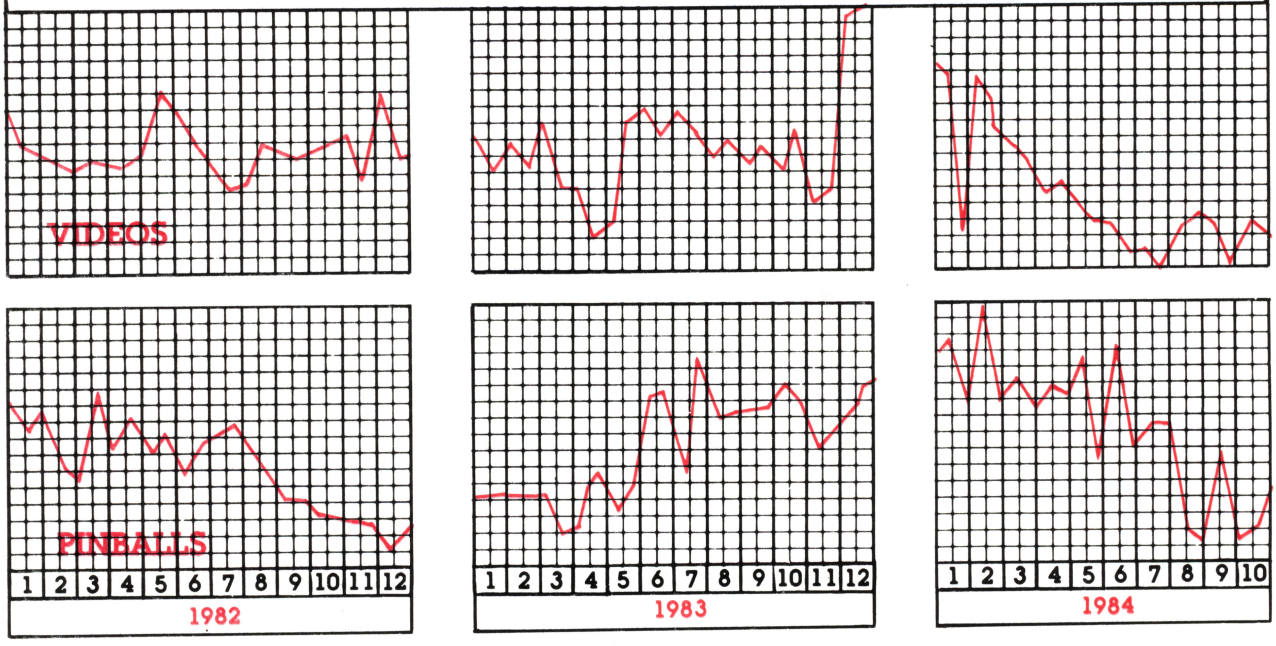
The largest single threat to the future of the video game is the emergence of video lottery games. The legalization of such devices would be devastating to the video game business as it exists today. With the tremendous amount of local opposition video lotteries are being met with, we don't expect that to happen in 1985. If they do catch on, they are not expected to do so until 1986. That should provide operators with enough time to prepare for the worst.

With that thought in mind, we can expect operators to be hedging their bets by digging in and entrenching themselves in their phonograph and pool table locations. Consequently, we are anticipating another good year for the phonograph and the pool table.

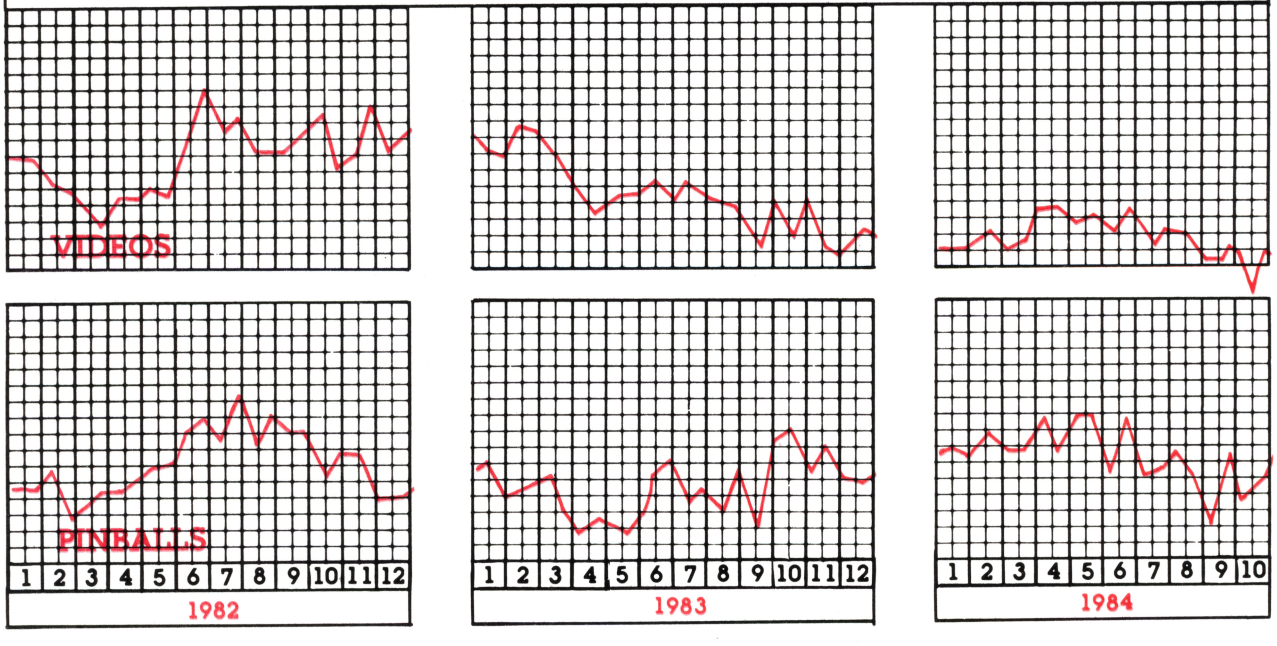
The time is also right for the reemergence of the pinball machine. Since pinball offers a form of entertainment that cannot be experienced in the home, we are looking for pinball to make a substantial comeback in 1985. The same can be said of other non-video amusement devices, and we are anticipating another good year for electronic dart games, shuffle alleys, and shuffleboards.

What all this boils down to is that those operators who firmly entrench themselves in their phonograph and pool table locations will be safe, no matter what happens. Those who don't are in for trouble in 1985. •

Average Weekly Collections
For Top Ranked New Videos & Pinballs
(Games Ranking First on Every Poll)
1982 — 1983 — 1984



Average Weekly Collections
For New Videos and Pinballs
(Games Six Months Old or Less)
1982 — 1983 — 1984



Top 20 Performing Video Games of 1984

A Composite of *Play Meter's* Twice Monthly Equipment Poll Compiled Over the Past Year (Jan. 1, 1984—Oct. 15, 1984 Issues)

All Locations

(Games Making the Poll 6 Times or More)

Rank - Game/Manufacturer	Rating	Times on Poll
1. *Punch Out!!*/Nintendo	13.7	14
2. *Spy Hunter*/Bally Midway	13.5	19
3. *Star Rider*/Williams	13.3	6
4. *Firefox*/Atari	13.1	7
5. *M.A.C.H. 3*/Mylstar	12.2	29
6. *VS. Tennis*/Nintendo	12.2	14
7. *Star Wars*/Atari	12.1	17
8. *Dragon's Lair*/Cinematronics	11.9	42
9. *Track & Field*/Konami/Centuri	10.9	34
10. *Crossbow*/Exidy	10.8	12
11. *Space Ace*/Cinematronics	10.7	18
12. *Astron Belt*/Bally Midway	10.6	13
13. *Time Pilot '84*/Konami	10.5	13
14. *Hyper Sports*/Konami/Centuri	10.4	7
15. *Gyruss*/Centuri	10.3	8
16. *Pole Position*/Atari	10.2	45
17. *Mario Bros.*/Nintendo	10.1	12
18. *Champion Baseball*/Sega	10.0	7
19. *Q*bert*/Mylstar	9.8	8
20. *Birdie King II*/Coin-It	8.8	12

Street Locations

(Games Making the Poll 4 Times or More)

Rank - Game/Manufacturer	Rating	Times on Poll
1. *Spy Hunter*/Bally Midway	13.6	7
2. *Punch Out!!*/Nintendo	13.5	6
3. *M.A.C.H. 3*/Mylstar	12.8	11
4. *Dragon's Lair*/Cinematronics	12.6	20
5. *Star Wars*/Atari	12.3	8
6. *Mario Bros.*/Nintendo	11.4	7
7. *Track & Field*/Konami/Centuri	11.1	16
8. *Astron Belt*/Bally Midway	11.0	6
9. *Crossbow*/Exidy	11.0	5
10. *Gyruss*/Centuri	11.0	4
11. *Pole Position*/Atari	10.9	23
12. *Time Pilot '84*/Konami	10.4	7
13. *Space Ace*/Cinematronics	10.3	6
14. *Q*bert*/Mylstar	9.8	4
15. *Birdie King II*/Coin-It	8.7	6
16. *10-Yard Fight*/Taito	7.8	5
17. *Major Havoc*/Atari	5.5	6
18. *Tapper*/Bally Midway	5.3	6
19. *Motorace USA*/Williams	5.2	4
20. *Discs of Tron*/Bally Midway	3.4	5

Arcade Locations

(Games Making the Poll 4 Times or More)

Rank - Game/Manufacturer	Rating	Times on Poll
1. *Punch Out!!*/Nintendo	13.9	8
2. *Firefox*/Atari	13.6	5
3. *Spy Hunter*/Bally Midway	13.4	12
4. *Star Rider*/Williams	13.0	4
5. *VS. Tennis*/Nintendo	12.6	8
6. *M.A.C.H. 3*/Mylstar	11.9	18
7. *Star Wars*/Atari	11.9	9
8. *Dragon's Lair*/Cinematronics	11.3	22
9. *Space Ace*/Cinematronics	10.9	12
10. *Track & Field*/Konami/Centuri	10.6	18
11. *Crossbow*/Exidy	10.6	7
12. *Champion Baseball*/Sega	10.3	6
13. *Astron Belt*/Bally Midway	10.3	7
14. *Hyper Sports*/Konami/Centuri	10.0	4
15. *Gyruss*/Centuri	9.5	4
16. *Pole Position*/Atari	9.4	22
17. *Birdie King II*/Coin-It	9.0	6
18. *Mario Bros.*/Nintendo	8.2	5
19. *10-Yard Fight*/Taito	6.7	6
20. *Tapper*/Bally Midway	5.5	8

[Editor's Note: These rankings were computed by awarding points according to a game's ranking on each poll. A first place rank rewarded 14 points, second place 13 points, third place 12 points, etc. Each game's point total was then divided by the number of appearances on the poll resulting in an average point rating for each game. These rankings are not to be confused with the 1984 *Play Meter* Awards for the Best Games of the Year. Official ballots for the annual *Play Meter* Awards will be mailed at the end of this year.]

OPERATORS SOUND OFF ABOUT THE MANUFACTURERS, DISTRIBUTORS

Manufacturers and distributors: the following comments are directed to you from the operators. For many operators, this is the only chance they will have to tell you what's on their mind—their concerns and suggestions for the coin-op industry.

These comments are from the operators who completed *Play Meter's* 1984 Subscribers' Poll. Question number 67 read: "What could manufacturers and distributors do to help the industry?"

Many operators wrote short one-sentence replies while others wrote a paragraph. Some replies were filled with anger, others asked for help, and a couple of operators' responses hinted of resignation or positive thinking.

Complaints about dedicated games and conversions' prices seemed to be on most operators' minds. Comments ranged from "freeze or lower new game prices" to "produce a game of public acceptance for less than $1,600" to "have more close-out sales on new equipment."

Operators also had many suggestions about the technical aspects of the industry. Some asked to keep 800 service numbers operating while other respondents requested the thorough testing of new games for better operation, plastic playfields in pins, and volume control buttons on machines.

It also seems that operators reponding this year had more tips for manufacturers on the research and development of new games. Comments indicated they want more conversions and novelty pieces, two-player conversion kits, and "fantastic lasers."

The operators' replies are grouped in categories by content. In addition to the topics already mentioned, there's a category on home videos, overproduction, competition within the industry, trade-ins, and promotions.

It also should be pointed out that the subscribers' poll featured 67 questions. It was a time consuming effort for operators to complete the poll and compose answers to questions like the one used for this article.

Some of the replies in this article were paraphrased for better understanding. But most of these comments are the exact words from the operators themselves.

Operators often complain that manufacturers and distributors don't help them with their problems. But here's one opportunity for the manufacturers and distributors to learn about the operators' concerns from the operators themselves.

Competition Within the Industry

"When I hear of distributors that are also operators (my competition), I get upset. When I'm honest with my distributor and tell him my trade secrets (successes and also mistakes), and I find out later that he also is an operator, he may be looking for the opportunity to take over my route."

* * * * *

"Stop competing with operators. Manufacturers won't let us compete with them. I refuse to deal with the local distributors—they won't take trade-ins anyway."

* * * * *

"Manufacturers should withdraw from direct competition. It's absolutely ridiculous that their distributors and sales people compete with operators."

* * * * *

"Deal with operators honestly. Stop competing with us (arcades, video lotteries)."

* * * * *

"Stay out of operating games, i.e., the video lottery."

* * * * *

"...stop trying to sell us junk while keeping the good games for their own game rooms. Stop competing with us." One manufacturer "found out that a fast payday for home videos can ruin us all."

Conversions

"Make more good conversions. Make more easy chip/IC conversions and minor (interesting) updates to good (old) games."

* * * * *

"...more, better, and cheaper conversions."

* * * * *

"Develop really good conversions for *Ms. Pac-Man, Centipede,* etc. (price not over $700)."

* * * * *

"All manufacturers could make follow-up kits for popular machines."

* * * * *

"Have manufacturers offer conversions for their own games like Nintendo."

* * * * *

"Mucho, mucho, more conversions and fast!"

* * * * *

"As far as conversions, I believe Nintendo is way ahead as far as simplicity and ease of converting. I believe Nintendo has the operator in mind."

* * * * *

"...more conversion games—new games are expensive and the industry is too slow to realize profit from games that die in two months after a large cash outlay for equipment."

Equipment Prices

"Price equipment fairly at the start—not charge $4,000 for first games then discount them to $1,895 later."

* * * * *

"Make the pinball sell for $1,100, the video for $1,100, jukebox for $1,000, and pool table for $1,000. Offer a nationwide buy back and trade back on any and all machines they make. Quit selling to anyone that is not an operator!"

* * * * *

"Price merchandise according to its actual cost to produce and market and get away from trying to share in the operators' profits."

* * * * *

"What bugs me is I bought a game from a distributor for $2,395, and four days later, the price was $1,395. I don't understand close-outs."

* * * * *

"Freeze or lower new game prices."

* * * * *

"Price good dedicated games lower."

* * * * *

"The prices have gone up a considerable degree on dedicated games and especially so on conversions while the used value of the games is way down."

* * * * *

"Have more close-out sales on new equipment."

* * * * *

"Lower kit and video game prices. Offer more incentives for operators."

* * * * *

"...lower its damn prices and quit selling us out. Without us, this manufacturer is nowhere. I don't feel sorry for it whatsoever, and I will not buy anything from it. Other operators feel the same."

* * * * *

"Lower the prices on kits to eliminate copies."

* * * * *

"Equipment prices have come down. But I think they should be lower to better reflect their actual earning power."

* * * * *

"Lower the cost on conversions—$1,000 is stupid."

* * * * *

"Get out equipment that can be amortized in less than one year. Forget the rest."

* * * * *

"Produce a game of public acceptance for less than $1,600."

* * * * *

"Lower prices on kits. If Crown Vending can sell me a kit for $295, and I guess make a profit, then the

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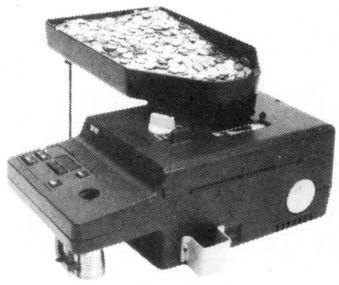

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Home Videos

"Manufacturers should stop introducing arcade video games as home videos. Manufacturers should wait at least two years before introducing them to home videos or even to cable TV."

* * * * *

"I think manufacturers should not be so anxious to release so-called 'arcade' hits to home entertainment games/units."

* * * * *

"Stop home videos. I no longer buy games from manufacturers who put out the home video games, especially if a unit I purchased of the same game has not yet been paid for."

* * * * *

"Do not release games to the home market before they have a fair chance on the street."

* * * * *

"Absolutely stay away from making or distributing games or software available to the home (i.e., home computers, cable TV games)."

* * * * *

"Get rid of copying the coin-op video game for the home. Let us venders have our own games. Don't let any company copy our coin-operated games. Home games almost broke me."

Future Technology (R&D)

"...invest their profits in research and development of new technology and new game ideas/themes, instead of investing them in health spas, resorts, etc."

* * * * *

"Slow the pace of the industry so that less risk has to be taken. Crack down on pirates so that money can be put back into research and development."

* * * * *

"Continue trying to make games that will make money."

* * * * *

"...more two-player conversion kits and non-videos like *Chexx*."

* * * * *

"...more upright mini-cabinets."

* * * * *

"...fewer and better dedicated games."

* * * * *

"Make more great hits and games like *Ice Cold Beer*, novelty games, and we could use another *Ms. Pac-Man*."

* * * * *

"...need something to appeal to the over 30 (age) crowd."

* * * * *

"Design the games in America and build them in Japan where the labor is cheaper."

* * * * *

"Instead of making high cost, high-tech games that only last six months and never pay themselves back, start giving arcade owners more of a variety of longer lasting games at more reasonable prices. For example: *Track & Field* and *Hyper Sports*."

* * * * *

"Make better built novelty pieces. Novelty games seem to be doing very well for operators."

* * * * *

"Make machines to get kids and adults to think and do something intelligent."

* * * * *

"We need fantastic laser games at conventional video prices. Kids will not get addicted to a 50-cent per play video. We need great conversion kits at low prices."

* * * * *

"Come up with a game that doesn't just attract males. Keep the females in mind."

* * * * *

"Design non-shoot-em-up games with a maximum price of $1,750."

* * * * *

"Quality—American video manufacturers are going to go the way the American auto industry went."

* * * * *

"Put more originality in games. Put back player appeal. Make it fun like it was in '81."

Overproduction

"Don't make three billion units of every good game!"

* * * * *

"Quit making games for awhile, including home videos. We're saturated!"

* * * * *

"Stop producing so many new games into the system. I believe the

market has remedied this, however."

* * * * *

"Slow down the introduction of new videos."

* * * * *

"Stop overproduction to regain the resale market."

* * * * *

"Tighten your control on irresponsible sales and production numbers."

* * * * *

"Stop acting as new car dealers (producing and selling too much junk). Test market games before releasing them to the operators."

* * * * *

"Treat the business as an ongoing business and don't try to oversell. We need a lot of help at the manufacturing level if we are to continue and survive."

Promotions

"Promote their products to the public—TV, magazines, etc."

* * * * *

"I believe they are doing a good job. But I think they should do TV advertising for their new games; then people would go out and play them more."

* * * * *

"Get involved on the operator's level, even so far as going directly to his locations with him. Also, they could set up and/or sponsor more tournaments—we would all benefit from this."

* * * * *

"Unite and advertise nationally on an equal basis."

Trade-Ins

"Give decent money for trade-ins."

* * * * *

"Distributors, take trade-ins."

* * * * *

"I believe more operators would invest in new equipment if the market were stabilized. How about manufacturers standing behind their product and offering guaranteed trade-in (not refunds) values for specified time periods? In other words, stand behind their manufacturing hype."

* * * * *

"Low capital has hurt my buying power. Trading up or even is the only way of moving games for me."

* * * * *

"Take more trade-ins, and give more for trade-ins. After all, they sold us the equipment. We paid an arm and a leg for it when it was going good; now, how about them helping us for awhile?"

Service

"Use plastic playfields in pin games. Make pinballs more reliable."

* * * * *

"Manufacturers should help the distributors with all their technical expertise because the new description of a distributor had better be Mr. Repairman."

* * * * *

"Test the equipment before you ship it to us. When we pay $2,200 to $5,000 for a game, it should work."

* * * * *

"Admit to defects or poor design so that those components could be upgraded or replaced instead of being nursed and constantly monitored for repair."

* * * * *

"...better prices and better operational guidelines in troubleshooting."

* * * * *

"All manufacturers should have easier tests for monitors and power supplies."

* * * * *

"The manufacturers should do more thorough testing of new games for trouble-free operation. It's taking too long to get them (distributors and manufacturers) to correct problems with games. This is causing a loss in revenue."

* * * * *

"Put qualified technicians on service telephones."

* * * * *

"...one year parts and labor on new machines, instead of 90 days, and better and more complete installation instructions for conversion kits."

* * * * *

"Make equipment smaller and lighter weight."

* * * * *

"...wheels and levelers on all games. Silk screen or paint instead of decals."

* * * * *

"Provide local service schools. Send more service info by mail."

* * * * *

"Put volume control buttons on all machines so any operator can turn the volume up or down."

* * * * *

"Explain new games better."

* * * * *

"Standardize parts. Improve availability of graphics—overlays and decals."

* * * * *

"Keep hotline (800) service numbers open. Provide SVC Bulletins (not the PR newsletter) for specific dedicated videos and jukes on request like auto dealers do."

* * * * *

"Jukes need not be so technical (readouts and electronics)."

* * * * *

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dedicated games that have realistic income reports. Build games for easy kit exchange—with controls in front for all adjustments."

* * * * *

"I believe they are all starting to test more locations prior to the full manufacturing of games, but test other locations than arcades."

* * * * *

"Build controls that last longer. Keep the serviceman in mind. Standardize parts."

* * * * *

"Make conversion information more detailed and specific. Many times 'pinouts' do not equal wiring diagram...timeliness in deliveries."

* * * * *

"Make games easier to convert. Use plug-in ICs. Make power supplies last longer."

General Comments

"The coin-op industry is dying. Some are making a little money, but it will never be like it was. Fellows, the big bucks are over."

* * * * *

"Pressure for lower license fees."

* * * * *

"Give more assistance in fighting legislative problems at both state and national levels."

* * * * *

"They seem to be doing it to a certain degree—they are not bringing out games that are duds. They seem to be taking more care in developing new games, meaning better, longer lasting games."

* * * * *

"I think they're getting the idea—more kits and more interactive and entertaining pieces."

* * * * *

"Come on guys, let's have some hits. I know you can do it. You did it before, i.e., *Pac-Man*, *Pole Position*, *Dragon's Lair*."

* * * * *

"Look to the future of the industry rather than short term profits."

* * * * *

"I'm getting out as soon as I pay off my loans."

* * * * *

"In one million words or less? They want all their profits up front whether we make any or not. They will say anything when they want to sell, and dust you off when it is a bomb. It's never their fault! I can't imagine buying an unproved new game ever again."

* * * * *

"...quality product that will sell on the street at a cost the operator can make an ROI and a buck extra. They need to get their heads out of the sand."

* * * * *

"Work closely with operators to turn over obsolete equipment. Be more accurate with equipment popularity polls."

* * * * *

"Some manufacturers would be best going out of business. The surviving ones should learn more about street operating in areas of cost and longevity of machine appeal. Distributors should try to re-establish their relationship with the older street operators—they have forgotten who supported them prior to four years ago."

* * * * *

"Be aware of operators' needs on a timely basis, rather than six months down the line."

* * * * *

"...doing good job."

* * * * *

"Legalize poker—like sex—people will always try to find it. Believe me, I know—got six kids."

* * * * *

"Think positive!"

* * * * *

"Get 'gray games' legalized nationally."

* * * * *

"...tell us their plans for the next 12 months."

* * * * *

"We know that business is down 50 percent or more compared to the heyday for manufacturers, distributors, and operators. But a good steady business is still out there. The manufacturers and distributors did lose a lot of the operators' respect and they must get it back. Example: *Major Havoc* "kit"—paid 4/24/84, $1,095; 7/17/84, $849; and 7/24/84, $645. Note the last two kits were for *Space Duel* that comes with a complete new playfield. The first was for *Tempest* with overlays only. We could fill a book on the inexcusable ways they have done business." •

OPERATORS PLAN TO BUY MORE STAPLES, NOT VIDEOS

An informal telephone survey of operators in various parts of the country indicates that operators will buy fewer video games this year than they did last year, and instead are concentrating their equipment purchases on industry staples such as jukeboxes, pool tables, and pinball machines.

In last year's telephone survey, the majority of operators polled said video games made up the bulk of their equipment purchases in 1982 but that they anticipated buying fewer videos in 1983. This year, operators said general buying is down, and their video game purchases in particular will drop in 1984 and 1985.

Jukeboxes head the list of equipment operators plan to purchase this year both for replacement and expansion purposes. In addition, operators said they foresee buying more pinballs and pool tables.

Only one of the 13 operators questioned said he'd buy heavily this year, but he went on to explain that independent financing enables him to "buy equipment now and worry about paying for it later."

The decline in overall industry revenues has, of course, a direct effect on operator buying—and has affected some operators more than others. John Montano of Montano Brothers Cigarettes and Amusements in New Haven, Connecticut, said, "We took an awful bath with the video craze in the last few years. To tell you the truth, I'll be buying very little, and we'll make sure that what we do buy has been field tested and proven to be a hot piece. We'll also be looking for some specials and some kits," he added.

"We're down about 40 to 50 percent in revenues this year," said Robert Smith of Quad Cities Amusements Inc. in Davenport, Iowa. "Instead of buying 10 of everything the way we used to, we're buying three and moving them around more."

"Our buying has changed drastically in the last year," Al Williams of Williams Music Company Inc. in Monticello, Arkansas, echoed. "Business has been down for quite a while now, and I'll only be buying very little."

Little interest

Most operators said they aren't interested in dedicated video games or in conversions for uprights and laser discs. "I haven't changed my buying strategies," noted George Saab of Saab Amusement Company in Jackson, Mississippi, "but I have to buy less of some things and more of others. The fad faded in videos, and you're back to a pins, pool, and jukebox situation. If something comes out that's a hot game in the video line, I'll be interested, but we've been paying $2,000 to $3,000 for games, and everybody's losing money on them."

Operators said they will reduce their purchases of video games and conversion kits because they don't provide an adequate return on investment. "Until about May of last year, about 75 percent of our route was video games," said Larry Powell of C & L Music and Games in Sacramento, "but you can't rely on videos to pay the bills. Expensive laser games didn't show us a bottom line which we achieved much sooner with kits. We're buying kits on a continual basis, and we'll be converting a lot of our games in the next six months. Then we'll have to take a look at whether to re-kit them. There are no hard and fast rules around here except one: Videos will no longer be a staple on our route," he commented.

Bob Milligan of Johnson Music Company in Boise, Idaho, said, "We had bought a few kits, but we've ceased buying them because the return isn't there."

Since some distributors won't take trade-ins, operators added that they are selling or trading their video games to other operators, and some are selling games to the home market.

Pinballs, on the other hand, are becoming more popular in some areas of the country. Some operators interviewed are buying used pins as well as new ones, but complain that factories aren't producing enough pins.

"Pinball is the fad here right now, and it's a stable item," Saab noted. "We need more of them made. Pins and pool tables are more in demand now, so I'll be in the market for more of them this year."

"The only things making any money now are jukeboxes, pool tables, and pinballs," Jack Freeborn of Freeborn's Music in Denver agreed.

"Pool tables are coming back," Montano said, "and so are bowlers, but bowlers are hard to get right

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Preview the AMOA Show in the December 1 issue.

now since Williams has closed down the factory for the summer. Pool is doing very well," he added, "and very little maintenance is required on a pool table. They can last up to 10 years—not two or three months like a video game."

Jukebox purchases

All of the operators polled agreed that they will purchase jukeboxes this year, although the majority said they are not considering the video jukebox. The price of video jukeboxes accompanied by ASCAP fees, maintenance costs, and tape rentals make them an expensive investment that operators feel will not offer a substantial return. "None of my locations will opt for them," said Otto Minter of Tip Top Amusement Co. in Carson City, Nevada, "because all my jukebox locations are on a contracted minimum basis."

While operators plan to buy equipment considered the staples of the industry, several said they will wait to see what's available at the AMOA show. "I'll have my eye out for something totally different at the show," said Michael Moore at Automatic Sales Company in Ft. Worth. Other operators agreed. One Massachusetts operator commented, "We need uprights, cocktail tables, pinballs, and jukeboxes, but there's not much available. Our business is down from last year, and *Birdie King II* is the only thing doing anything for us. I'd be interested in a conversion for that game because how many *Birdie Kings* can you have?"

And along with buying the bread and butter pieces of the industry, some operators are restructuring their routes to include only the types of locations they feel are stable this year.

"We're shifting out of the grocery store type locations into bars," Powell said. "It means more investment because we are buying more equipment, but it's a more stable market. One thing I think is important is that the locations that were good before the video game boom will always be good locations. Those new ones that came about in '81 and '82 just won't do it today." •

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ASCAP 'hit' gives geezers the blues

By Mike Royko

IF YOU HAPPEN to walk into Lois and Pete's Tavern on a weekend night, you'll probably hear some old geezer squeezing an accordian and singing "The Beer Barrel Polka." If he is in more of a hip mood, it might be "Poor Butterfly."

On a real lively night, there might be another geezer flailing at a piano, another geezer whacking a set of drums, and maybe even a tuba or a guitar going.

And when she's in the mood, Lois Szalacha, the owner and bartender, might belt out an old Tin Pan Alley song in her gravelly, whiskey voice.

When the song ends, the people at the bar and tables—mostly little white-haired ladies and bald, wrinkled gents—will give a wheezing cheer. If their pension checks just came, they might even buy the accordian player a drink.

It's not exactly Rick's Cafe or George's, but the regulars enjoy it. Most of them are of pension age and live within walking distance of the tavern, which is at 2916 W. Irving Park Rd.

SO ARE THE MUSICIANS. They play just for the fun of it and an occasional free beer.

"It started right after I opened the place," said Lois, who at 59 is one of the kids in the crowd. "A guy named Carmen came in and saw I had an old accordian. I used to play. He took it home, got it tuned and came in the next weekend and started playing.

"So I started buying old instruments. The piano, drums, a guitar—and some of the customers who knew how to play would get up and do some songs.

"It got to be so much fun that some people even went to the field house at Horner Park and took lessons. We got a trumpet player that way and even a guy who plays the tuba. They aren't real great, and sometimes you can't be sure what song they're playing, but it's something for them to do and it's fun."

Naturally, a city inspector showed up one day and told Lois she needed a city music license, which costs $214 a year. She grumbled but paid. In the tavern business you're used to buying licenses: city liquor, $1,338 a year; state licenses, $150; even a $25 potato chip license.

THEN ONE EVENING a couple of strangers came in . They sat at a table, listened to the music, took some notes and left.

A few weeks later, a letter came. It was from the American Society of Composers, Authors and Publishers (ASCAP) and it said that Lois had to send them $240 a year for a license to perform songs copyrighted by their members.

Lois showed the letter to her customers and said: "Can you beat that? They say we got to pay to sing songs."

The customers pondered the letter. Then they reached a legal opinion. As the accordian player put it: "They can't mean us. We're just amateurs and most of us don't even know all the words. Forget it."

So Lois forgot it.

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But ASCAP didn't. Notices kept coming in the mail. Lois would show them to the old-timers and they'd say: "Ya' can't make amateurs pay to play some music."

"SO I STARTED JUST throwing their stuff in the garbage can. It went on for years. I didn't even read most of it. I don't know anything about legal stuff."

So she didn't even know that ASCAP went into federal court last June and sued her for copyright infringement, asking for $10,000 in damages.

She was served with notice of the suit, but she tossed that away too. "I thought it was just more of their nonsense."

So she didn't even show up in court and a federal judge socked her for $3,000 in damages and gave ASCAP permission to grab the money from her bank account.

That's when she discovered what had happened—when she went to her bank and found that her $1,200 in savings was frozen. So she called a lawyer, who told her to pay up and forget it—his legal fees would be more than she could save by fighting it.

"SO NOW I CAN'T even pay my bills. It's so stupid. This is just a little neighborhood tavern with a few old people trying to have a little fun. And they make a federal case out of it."

The court record shows that the songs that the ASCAP snoops heard performed included "Poor Butterfly," "Tea for Two," "Pennies from Heaven," "With a Song in My Heart," "Where or When," and others.

And the plaintiffs were heirs to the estates of composers like Vincent Yoeman, Richard Rodgers and Lorenz Hart, and Warner Bros. Studio.

"Can you imagine" Lois says, "a Polish saloon keeper like me being sued by Rodgers and Hart?"

Will Lois pay? "Hell no," she says. "Now their fee is up to $324 a year. I'm already paying the city for a music license. Do they think I'm running some nightclub with Frank Sinatra singing? If I get 15 or 20 people in here on a Saturday, it's a big night. I'd rather close up and go to work somewhere as a barmaid. I'd earn more."

SHE MAY HAVE to do that because ASCAP says it won't give in.

"Payment is required wherever there is a public performance," a spokesman said. "They are paying for drinks, so she is making money."

To which Lois says: "Let that guy try to live on what I make."

Lois has one other tactic that she is considering. "Maybe we'll do nothing but Polish songs. Let those snoops write down *those* titles."

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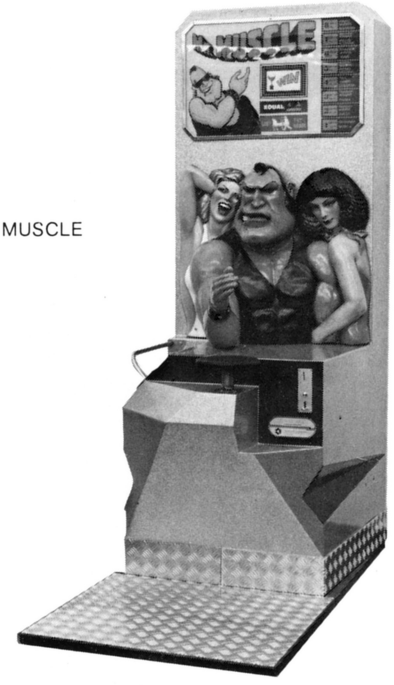

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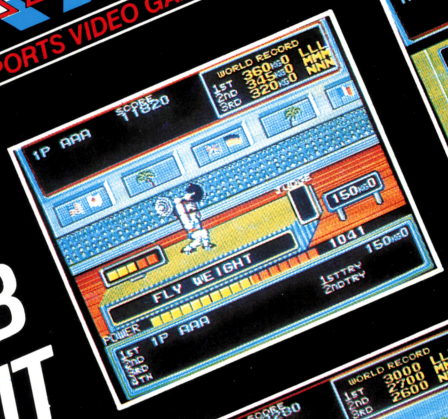

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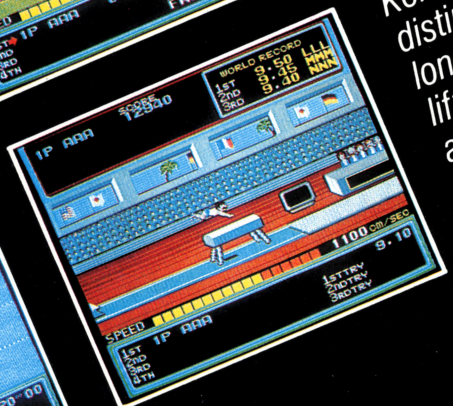

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PARADISE LOST

Why players left and how to get them back

By Roger C. Sharpe

"In many ways the coin-op industry was a victim of its own success. No one wanted to think about the future—it was only the present that counted and the opportunity to capitalize on a new market."

"The need exists to reinstill some excitement and interest in the public to get them back inside. It's no longer enough to produce a great game and hope that players will find it."

"The challenge is to coordinate and implement programs or activities to make a good game great and a great game even better."

Just when you think that things are about to turn around, you take a closer look at earnings, compare them to last year's, and you wonder what it's leading to. Even some of the staunchest supporters of coin-op are becoming hard-pressed to continue the faith.

Unfortunately, it's not enough to try to accept the slump and act accordingly—by buying less equipment if you're an operator, or lowering production if you're a manufacturer. The problem is that so many players have turned away from the games and left the arcades. Why did they leave and how do you get them back?

Many players simply became disenchanted with the games. There they were hungry for the entertainment, but all they got were repetitions of familiar themes and game designs. When the industry really needed innovation the most, we received more of the same, not for a month or two, but for almost two years. That's asking a lot of anyone.

In fact, this affliction besetting video games in many ways parallels the stagnation that occurred with pinball machines at the end of the 1970s. Here was an art form that had enjoyed its greatest prosperity and popularity. And what did the fans get? A seemingly endless stream of ordinary, run-of-the-mill equipment. The four major manufacturers at the time were all to blame for the sudden demise of the games.

The pinball manufacturers came to this realization too late, when they began to create exceptional models. But most of the audience had already left. Now it's video's turn to suffer the consequences.

But it's different with the video because its impact was so widespread. Not only were there players in record numbers, but an all out push by manufacturers to churn out equipment. Quite rapidly it was a numbers game of producing X thousands of pieces every day and every week. More people were hired to keep the assembly lines moving, and when companies outgrew space, they bought new factories, hired more people, and purchased more expensive machinery.

Forgetting the future

In many ways the coin-op industry was a victim of its own success, and greed demanded to make the most of the moment regardless of the outcome. No one wanted to think about the future—it was only the present that counted and the opportunity to capitalize on all the media hype and a new market of

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The pace was fast and no one took the time to remember what the industry had been, or question whether the boom could go on forever. Wisdom and practicality would have ensured that things not get out of hand, but they did. Coin-op began digging a deep hole for itself.

A major factor contributing to the rapid fall from such lofty heights was the foundation on which all the growth had come. Entirely different than pinball's rise to glory where the audience was already established, video really gained from the arrival of the curiosity seeker and faddist. Once the word was out that video was the in thing, it attracted a different breed.

They came and returned as long as the novelty remained, but once the uniqueness began to wear off, they lessened their visits and finally stopped going. In the meantime, the solid audience which had been there before the groundswell found itself wanting more from each succeeding game. While the field languished in knock-offs and spin-offs, players who had become sophisticated almost overnight lost interest when they were forced to go back to older games because newer editions couldn't measure up.

Compounding this situation was the fact that the industry finally had competition. Pinball machines and other novelty equipment remained rather special and non-replicable, but this wasn't the case with videos. The proliferation of home systems, many offering the same types of games as those found in the arcades, cut into coin-op's territory. Why go to the arcade and spend quarters when you can stay at home and play for free? Forget about the cost of the system or even the game cartridges, all that was considered was that it was there in the privacy of one's home.

So here we now find ourselves. Home video game systems are all but dead. Personal computers, which also arrived on the heels of the coin-op explosion, have recently fallen in favor, settling into a more realistic growth curve where entertainment is now only part of a package that includes word processing, education, personal finance, and other business applications.

Excitement needed

It would seem then that the field is wide open for coin-op to reclaim its superior position, but things are never that easy. Besides an overabundance of equipment in almost any type of business and location above and beyond conventional fun centers, game rooms, and arcades, the need exists to reinstill some excitement and interest in the public to get them back inside.

Knowledge about marketing and the value of promotional techniques should signal the alarm that it's going to take much more than what has been relied upon in the past to turn the industry's fortunes around. It's no longer enough to produce a great game and hope that players will find it.

Having become so entrenched in standard operating practices which have endured for decades, it's time for the coin-op industry to act like a major industry and borrow business principles. The primary factor remains, and always will be, the quality and originality of the products being built. But whether video, pinball, or novelty machine, unless the public is made aware of its existence, all the research, development, time, effort, and money become rather meaningless.

The challenge is to coordinate and implement programs or activities which can have a direct effect on making a good game great and a

You have to advertise, promote, and offer incentives to get customers into your place rather than someone else's.

great game even better. The most attractive tie-in is a tournament, although this doesn't have to be a massive undertaking.

The perfect case in point was Centuri's use of in-store displays and trophies when it introduced *Track & Field*. Mylstar is doing something very similar with its new pinball, *The Games*. And these two strategies provide a good start on which to expand and innovate.

There are other options available such as coordinating a game release with some type of promotional activity. Let's say that a particular machine has a sports theme. Why not go to a local stadium or arena and offer a machine to one of the people who attend the game or have some of the athletes compete with people in the crowd?

High score promotion

On an operator level, there is even more to consider. There doesn't have to be a great amount of planning and complexity involved. Recognizing scores of the week, or over a longer period of time, might not only increase business, but the reward could be an arcade machine to the top player.

The arcade business is just like any other type of retail operation. You have to advertise, promote, and offer incentives to get customers into your place rather than someone else's. You have to get them back to amusement games as part of their leisure time entertainment.

None of these observations and suggestions are extreme or even new. In fact, I've been writing about this kind of stuff even when business was at its height because it always made good sense.

If you're wondering what you can do to get some business back, the resources are there. *Play Meter* always provides features which spotlight successful operations. I'll even throw my own help into the ring for anyone wanting some assistance and guidance. Contact me through *Play Meter*, and I'll see how I can help.

We are at a point where it's crucial for everyone to pull together if the industry is to survive and thrive. And everyone is in this thing together. Just turning the other cheek and thinking that things will disappear or rebound on their own isn't enough. Maybe for one time in its history, the coin-op industry will recognize that it isn't immune from the problems and concerns which confront every other business.

Recovery will happen. But there will be many individuals and companies who won't be able to survive the difficult days that remain ahead. But the industry hopefully will be better and wiser for this experience.

Cultivating new audiences who will form the base of business is not an unbeatable challenge, just a test of hard work and perseverance.

Industry survives

The consolation should be in the knowledge that the industry has come so far over the years—and against greater odds than it presently faces. Back in the early '30s, the founding fathers of coin-operated amusements didn't think they'd last out that decade. But they did. Then the war, along with a national aversion to coin-op games and a legal environment that banned the operation of equipment from coast to coast, proved to be only temporary obstacles that were overcome.

The same success story can happen again. It won't occur overnight or arise on some silver platter. It's going to have to be fought for, and once the inroads are made, there is going to remain a need to cultivate and nurture the new audiences who will form the base of business. But it's not an unbeatable challenge, just a test of hard work and perseverance—not to mention a time for imaginative thinking and aggressive action. •

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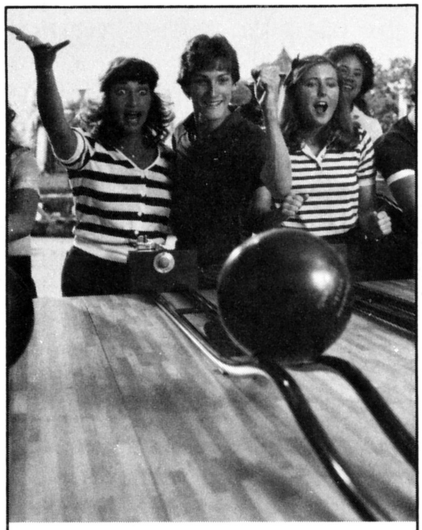

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FRANK'S CRANKS

By Frank "The Crank" Seninsky

'Seicross' catches The Crank's eye

Nichibutsu is one manufacturer we don't hear much about. The company employs 250 in Japan, but only six employees in the United States. Nichibutsu entered the video market in 1972, and as its President Ko Adachi said, "We have learned much about the American market since."

After *Seicross*, three kits are scheduled in the near future: a space game called *Cyclion*, a roller derby game, and an interesting game themed around identifying constellations.

Its latest kit, *Seicross* (vertical mount), caught my eye a few months ago. If you are in the same boat as me, you are constantly looking for new kits that will earn good numbers and generate enthusiasm. I've only had *Seicross* out for three weeks and the game is grossing nicely. A few hundred have been sold so far so it isn't surprising that *Seicross* hasn't hit the "National Play Meter" yet.

Radical Radial is the easiest game to use for this conversion because the PC boards and the wiring are identical. Whatever game you choose, make sure that you adjust the power supply so that +5 volts is measured *at* Pin 30 (+) and Pin 36 (–) *at* the 36 pin edge connector, not at the output of the power supply. *Seicross*, like many other games, will not operate properly if the voltage drops below 4.95 volts.

The factory setting on *Seicross* comes set on "easy-3-bikes." This setting is fine for the first two or three weeks. There are also four different "extend bike" settings so you can gradually make the game slightly more difficult as the players become experts. A nice feature about the game is that if a player advances through the higher levels, the color grid will turn back to green (levels are green, purple, blue) but the game will be much more difficult.

Hook up monitors easily

Be careful about hooking up your monitor. *Seicross* is designed to be used with "1 Sync" signal monitors (or as we know them, composite sync monitors). Figure 1 shows how you would hook up a "2 Sync" signal (where the horizontal sync and vertical sync are separated) monitor.

Pin 4 of the 6-pin connector located at the right corner of the lower PC board is connected to the (–)V SYNC of the PC board. Pin 6 of this same connector (6-pin) is for the (–)H SYNC of the PC board. In this case, you would hook up Pin 4 to the negative V SYNC of the monitor 3-pin connector and Pin 6 of the PC connector to the negative H SYNC of the monitor 3-pin connector. (Hey, this is not easy to explain!)

While the monitor hook up is simple in this case, you will no doubt come across others that will confuse you. The two kinds of monitors you will see are the Wells-Gardner and the Electrohome G07. Both have a 6-pin male connector labeled as follows:

	R	G	B	
GND		H Sync		V Sync

On this 6-pin connector, the H Sync and the V Sync are POSITIVE SYNC. There is a separate 3-pin male connector on each monitor. On the Wells-Gardner, the 3-pin connector is located right above and in line with (viewing from the back) the 6-pin connector. On the Electrohome G07, the 3-pin connector is located above and parallel to the 6-pin connector. Both are labeled as follows:

GND	H Sync	V Sync

On this 3-pin connector, the H Sync and the V Sync are NEGATIVE SYNC. The easiest way to hook up the monitor in this *Seicross* example (remember *Seicross* is a negative sync game) is to tie the two negative syncs together (the H Sync and the V Sync on the 3-pin connector) and run this wire to Pin 4 which is the negative sync of the PC board.

You will also come across a monitor that will accept only positive sync and you have a negative sync conversion kit. These monitors are the old style Wells-Gardner monitors that were used on Williams' *Defender* and *Stargate*. These monitors only have the 6-pin (positive sync) male connector. No problem!

Take a 7404 IC off of an old board. Hook Pin 7 of the IC to GND (ground) and Pin 14 to +5 volts. Pin 1 is the video input signal that is negative that must now be inverted to positive sync. Pin 2 is the inverted output that you can now hook up to the positive sync of the monitor. Tie

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the H Sync and V Sync together of the 6-pin male connector on the monitor and run this wire to Pin 2 of the 7404.

Service Tips

Track & Field—broken button wires. This week I only received one service tip! It was written by Charles Brenon Jr. of Brenon's Coin Machine in Brownville, New York. Brenon replaced the plastic spacers, that hold on the switch blades, with ¾" plywood. Just drill a hole for the button and screw the contact blades to the plywood. No more broken wires. This may be easier than rewiring the control panel, as others and myself have suggested.

Another alternative is to purchase the very inexpensive *Track & Field* Track Ball Control Panel (around $225). I think this is one of the best investments an operator can make for his *Track & Field.* I have installed a few, and revenues have increased by about 30 percent. Not only is it like getting a new game, but the track balls replace the buttons that the players had to pound on. No more broken control panel wires and no more banging. You now have higher collections and happy location owners.

Williams' pinball machines—Many times I had a flipper coil burn and couldn't understand why. Sometimes the end of the stroke switch wasn't breaking and the coil would remain energized until it "cooked." Some of the flipper coils should be replaced because they "sink too much heat" as the saying goes.

Williams suggests replacing its FL-23/600-30/2200 flipper coils with FL-23/600-30/*2600* which run much cooler. Note that these are 50 volt coils. On some Williams pins, even if you replace the coils with the cooler running ones and make sure that the E.O.S. blades are opening, some coils will still burn for no apparent reason.

Well, did you ever realize that those little capacitors (.1 MFD 200V) attached to the E.O.S. or on the flipper coils serve no purpose? These capacitors may short and result in the E.O.S. circuit not opening. Just cut them away, and I'll bet that you have fewer flipper coils burn.

Thank you readers

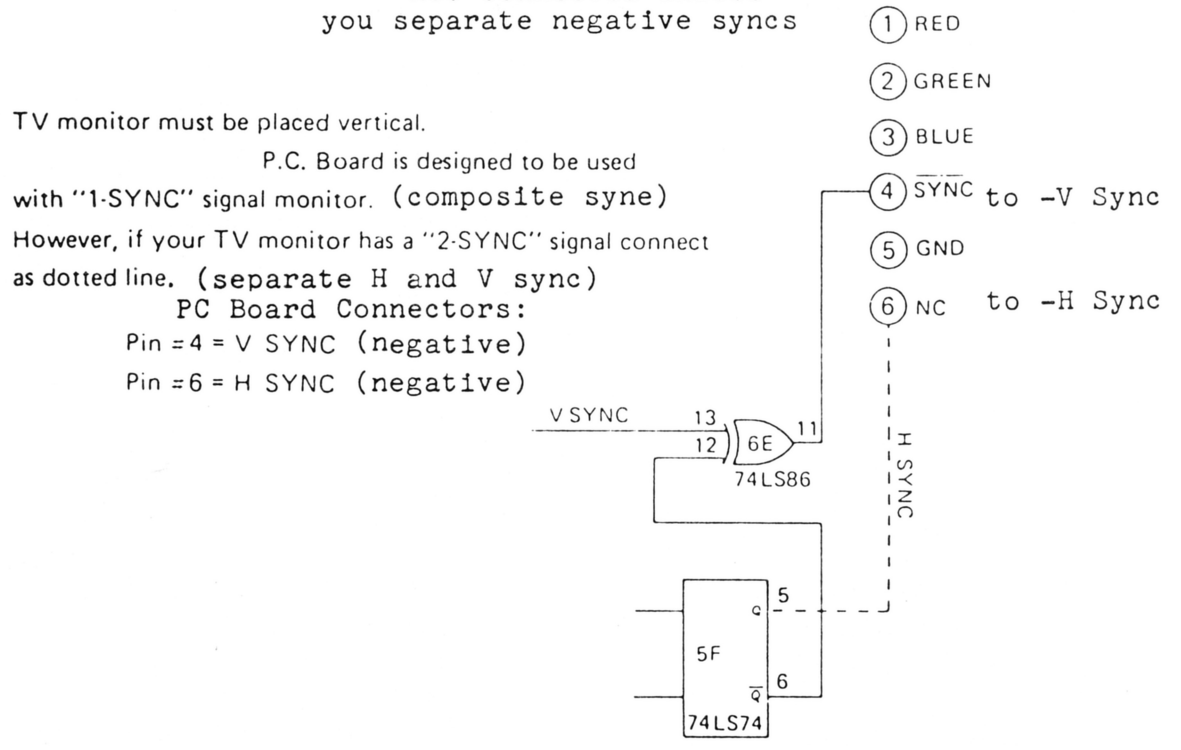
Hey, I want to thank you, the readers, for rating the "Frank's Cranks" column the number one column in *Play Meter* this year. It takes a tremendous amount of time to write the tips, but I'm happy that most of you find them helpful.

To survive in this industry, the operator MUST cut overhead to the bone. One of the most logical ways is for you to become a better repairer of games. The faster you can fix your own games, the better off you'll be. Thanks and as always...keep cranking! •

FIGURE 1

The *Seicross* PC board 6-pin connector that goes to the monitor 6- or 3-pin connector.

Pin No.	Signal
1.	RED
2.	BLUE
3.	GREEN
4.	SYNC
5.	GND
6.	N.C. Not connected unless you separate negative syncs



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MOS/FET & J/FET Circuit Design LCP

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Lesson 6: A.C. Couples Amplifiers II

Lesson Six – A.C. Couples Amplifiers II. In this lesson, high frequency RC coupled amplifiers are studied.

HIGH FREQUENCY RC COUPLING:

In the last lesson, the low frequency analysis of an A.C. coupled FET stage was performed which illustrated the effects of capacitive coupling. By ignoring the extreme low frequency effects of the input and output coupling capacitors, it was seen that the mid-band frequency response depended on the source de-coupling capacitor, C_3. Now, by considering the effects of the gate-to-source and gate-to-drain capacitances, an analysis of the response at higher frequencies can be performed.

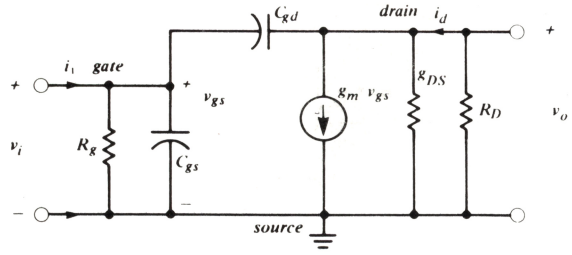


Fig. 6-1. FET Amplifier Equivalent Circuit at High Frequencies.

Consider again the cascaded stages in Fig. 5-1 and assume that the frequency range of interest is beyond g_m/C_3. The equivalent circuit in this range can be drawn as in Fig. 6-1.

The input admittance and voltage gain can be found by writing sets of node voltage equations. For the input admittance, where A_v is the voltage gain from input to output;

$$Y_{in} = \frac{i_1}{V_1} = \frac{1}{R_g} + j\omega\,[C_{gs} + (1 - A_v)\,C_{gd}] \qquad (6\text{-}1)$$

This expression for the input admittance illustrates the **Miller** effect on the feedback capacitance, C_{gd}. This means that the total capacitance seen at the input terminals is the sum of the gate-source capacitance and the gate-drain capacitance multiplied by the quantity $(1\text{-}A_v)$. If the voltage gain is quite large, the total input capacitance can also be quite large, and in some cases, dominate.

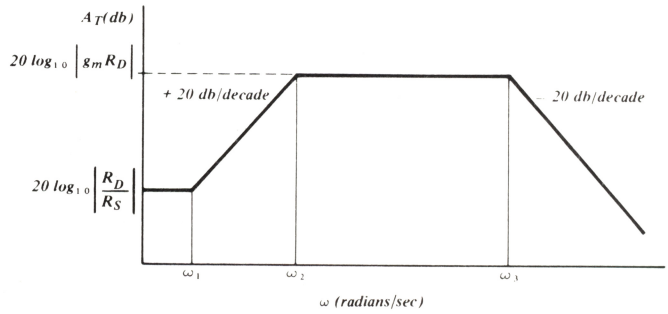


Fig. 6-2. FET Amplifier Frequency Response Plot.

The voltage gain can be written as:

$$A_v = \frac{V_o}{V_i} = \frac{-g_m R_d}{1 + g_{ds} R_d} \cdot \left[\frac{1 - j\omega\, C_{gd}/g_m}{1 + j\omega\, C_{gd}\,\frac{R_d}{1+g_{ds}R_d}}\right]$$

By assuming that $\frac{1}{g_{ds}} \gg R_d \gg \frac{1}{g_m}$,

$$A_v \cong -\frac{g_m R_d}{1 + j\omega C_{gd} R_d} \qquad (6\text{-}2)$$

which is a much simpler form. By combining this equation with Eq. 5-4, the complete wide-band transducer voltage gain is found to be

$$A_T = -\left[\frac{R_d}{R_S}\right] \frac{[1 + j\omega R_S C_3]}{[1 + j\omega C_3/g_m] \cdot [1 + j\omega R_d C_{gd}]} \qquad (6\text{-}3)$$

The frequency response plot for this expression is shown in Fig. 6-2 which illustrates the break frequencies. From the expression, it is noted that the gate-to-drain capacitance determines the high frequency break point.

Therefore, to have a large high frequency response, it is necessary to have an FET with small C_{gd}. Since the basic A.C. models for the JFET and MOSFET are identical, then the frequency response characteristics will also be identical. Therefore, the frequency response plot in Fig. 6-2 will be the same if a MOSFET were placed in the circuit.

EXAMPLE 1:

For the same circuit in Example 1 of Lesson Five, the gate junction capacitances are found to be:

$$C_{gs} = 5.0 \text{ pF @ } V_{gs} = 3.2\text{v, f} = 1.0 \text{ Mhz}$$

and

$$C_{gd} = 1.3 \text{ pF @ } V_{gs} = 3.2\text{v, f} = 1.0 \text{ Mhz}$$

Find the high frequency break point and write the voltage gain expression as a function of radian frequency, ω.

$$\omega_3 = \frac{1}{R_d C_{gd}}$$

$$\omega_3 = 77.0 \cdot 10^6 \text{ rad./sec.}$$

Since

$$\omega_1 = 125 \text{ rad/sec}$$

and

$$\omega_2 = 718 \text{ rad/sec}$$

then

$$A_T(j\omega) = \frac{-6.25\,(1 + j\omega/125}{(1 + j\omega/718)\,(1 + j\omega/77 \cdot 10^6)}$$

where ω is measured in radians/sec.

Due to the nonlinearity of FET transfer characteristics, the output will be slightly distorted under large signal operation. For this reason, FET amplifiers are generally used to amplify small input signals in the range of microvolts to millivolts. However, by coupling to bipolar transistors (as will be discussed), the output levels can be increased with very little distortion.

Lesson 7: Direct Coupled Amplifiers

Lesson Seven – Direct Coupled Amplifiers. In this lesson, the design of both single ended and differential input amplifiers is discussed.

SINGLE ENDED:

If FETs are direct coupled, it is possible to extend the low frequency response to zero frequency or D.C. The difficulty lies in maintaining the correct bias level on the gate as was explained in Lesson Five. For the enhancement mode MOSFET, the correct gate bias potential can be derived by using D.C. feedback from the output stage to the input. Fig. 7-1 shows a three stage direct coupled amplifier which uses one feedback resistor to set the operating point for all three stages. By adjusting the value of R_f

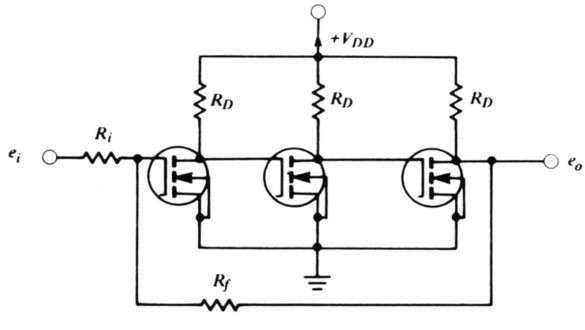


Fig. 7-1. Three Stage Direct Coupled MOSFET Amplifier.

the bias on all three stages can be controlled to allow proper linear operation. This type of FET is ideal for this circuit since the gate voltage is higher than the source. Obviously, JFETs cannot be used since the gate-source voltage must be in an opposite polarity.

EXAMPLE 1:

The D.C. bias conditions for the three stage direct coupled MOSFET amplifier can be calculated quite easily by assuming that all three devices have nearly the same characteristics. Fig. 7-2 shows the amplifier but with R_f replaced by the pot ($R_a + R_b$) and resistor R_1. The gate transfer characteristics for each MOSFET is shown in Fig. 7-3. The voltage equations are found to be:

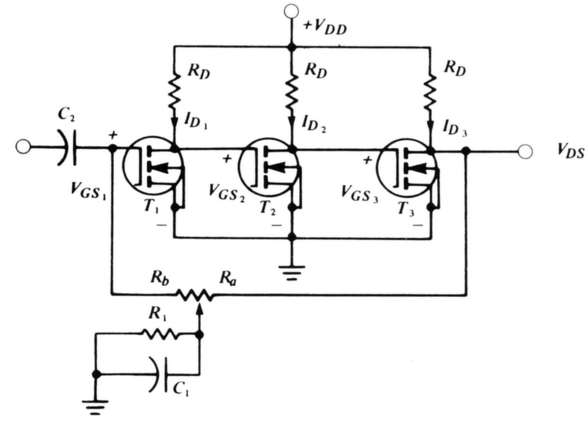


Fig. 7-2. Design Example of a 3-Stage Direct Coupled MOSFET Amplifier.

$$V_{GS_2} = V_{DD} - I_{D_1} \cdot R_D$$

$$V_{GS_3} = V_{DD} - I_{D_2} \cdot R_D$$

$$V_{DS_3} = V_{DD} - I_{D_3} \cdot R_D$$

All three of these equations will be equal since it was assumed that the three devices have equal characteristics. The gate-source voltage on the first device is given as

$$V_{GS_1} = \frac{R_1}{R_1 + R_a} \cdot V_{DD} - \frac{R_D R_1}{R_1 + R_a} \cdot I_{D_3} \qquad (7\text{-}1)$$

Now, by adjusting the pot to vary R_a, the bias on the gate of the first device will change. This change will cause the drain currents in the other two devices to vary and to set the proper value of output voltages. The capacitor C_1 bypasses the feedback signal to ground which allows a high value of closed-loop gain.

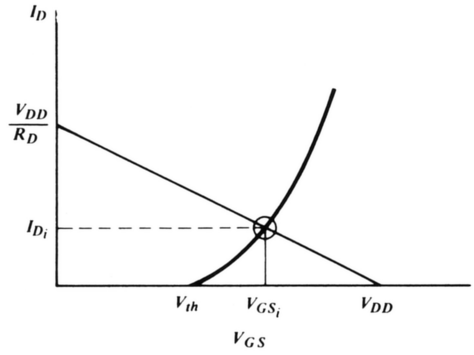


Fig. 7-3. Typical Gate Transfer Characteristics of a MOSFET.

DIFFERENTIAL INPUT:

Another method of direct coupling FETs is with the **differential input** method. Fig. 7-4 shows a typical differential input pair which has the two source leads tied to a constant current sink. This circuit finds many useful applications such as amplifying floating signals which are not referenced to ground and in discriminating small differential signals from large common mode signals. Also, this particular stage can be used as the **front end** to an operational amplifier to boost the input impedance and to reduce the input bias current. This application will be discussed further in another lesson.

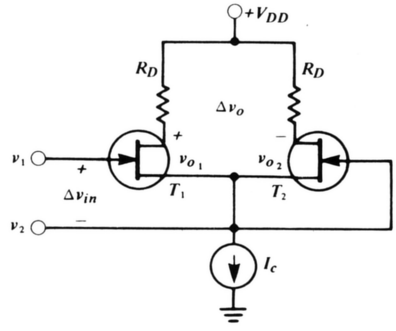


Fig. 7-4. JFET Differential Amplifier.

To analyze this circuit, it is required that there be no small signal variations in the constant current sink, I_c. In other words, the small signal drain currents are equal but of opposite polarity. Fig. 7-5 shows the model of the circuit from which can be found the differential and common mode voltage gains.

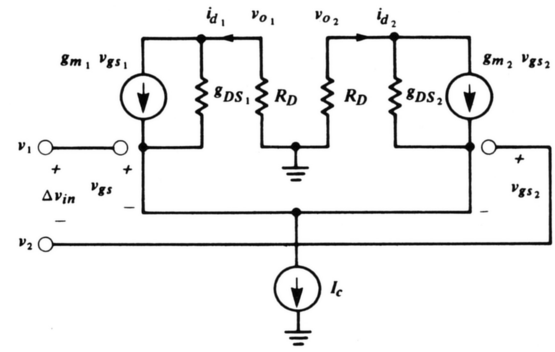


Fig. 7-5. Equivalent Circuit of the JFET Differential Amplifier.

Summing the small signal currents at the source node,

$$i_{d_1} = -i_{d_2}$$

$$\Delta v_{in} = v_1 - v_2 = v_{gs_1} - v_{gs_2}$$

$$v_{o_1} = g_{m_1} \cdot v_{gs_1} \left[\frac{R_D}{1 + g_{DS_1} \cdot R_D}\right] = -A_{v_1} v_{gs_1}$$

$$v_{o_2} = -g_{m_2} v_{gs_2} \left[\frac{R_D}{1 + g_{DS_2} \cdot R_D}\right] = -A_{v_2} v_{gs_2}$$

If the devices are perfectly matched, then

$$A_{v_1} = A_{v_2} = A_v$$

Therefore, the differential voltage gain is given by

$$\frac{\Delta v_o}{\Delta v_{in}} = A_v = \frac{-g_m R_D}{1 + g_{DS} R_D} \qquad (7\text{-}2)$$

which is the same expression for the single-ended amplifier stage with the difference being that neither the input signal nor output signal is ground referenced.

The common mode voltage gain A_c can be found by "splitting" the circuit down the center and examining one side of the circuit. In Fig. 7-6, half of the constant current sink has a current represented by $I_c/2$ which is equal to i_d. The impedance of this half-current sink is $2Z_c$.

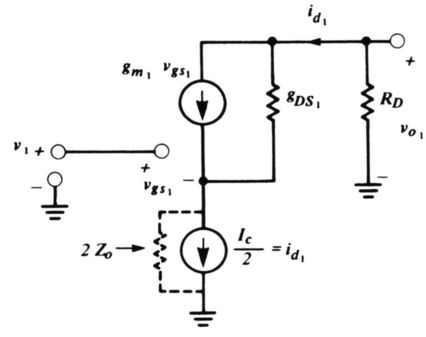


Fig. 7-6. Half Section of the JFET Differential Amplifier.

Therefore, the expression for A_c is found to be:

$$A_c = \frac{v_o}{v_1} \qquad (7\text{-}3)$$

$$= \frac{-g_m R_D}{1 + g_{DS} R_D + 2Z_c \cdot (g_{DS} + g_m)}$$

By allowing Z_c to be very large as is the case for most constant current sinks, then

$$A_c \cong \frac{-R_D}{2Z_c} \qquad (7\text{-}4)$$

To determine how effective the differential amplifier is in

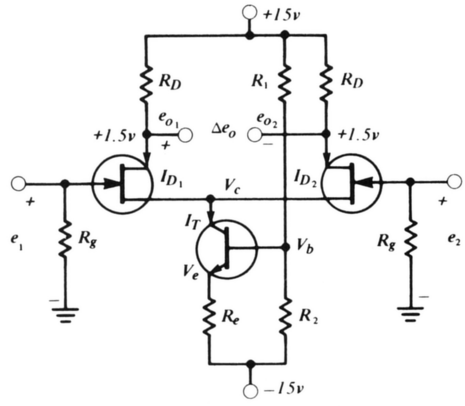


Fig. 7-7. JFET Differential Pair with Bipolar Constant Current Source.

rejecting the common mode signal, a term called the **common mode rejection ratio** (CMRR) is determined. CMRR is the ratio of the differential gain to the common mode gain, or

$$\text{CMRR} = \frac{A_v}{A_c}$$

For the JFET stage,

$$\text{CMRR} = \frac{2\, g_m\, Z_c}{1 + g_{DS} R_D} \qquad (7\text{-}5)$$

If rejection of the common mode signal is desired, then it is necessary to maximize this term. This can be done by requiring that the constant current sink have a high impedance and to require that $R_D \ll 1/g_{DS}$. Also, it is necessary that the parameters for each device be equal, especially the small signal drain currents. A constant current sink is therefore a distinct advantage when used with FET differential pairs.

EXAMPLE 2:

STEP 1: Fig. 7-7 shows a JFET differential pair biased by a bipolar constant current source. The drain current (zero T.C.) is about 500μA and the gate source voltage at this current ranges between 1.0v to 2.2v. Calculate the resistor values necessary to bias this stage at the zero T.C. point and with a D.C. output level of 1.5v. The supply voltages are ± 15v.

First, determine the value for R_D.

$$R_D = \frac{V_{DD} - e_o}{I_D}$$

$$R_D = \frac{15V - 1.5V}{500\,\mu A}$$

$$R_D = 27\ K\,\Omega$$

The total current in the constant current source is the sum of the two drain currents.

$$I_T = 0.5\ mA + 0.5\ mA = 1.0\ mA$$

This current is the same through the emitter resistor, R_e.

$$V_e - V_{DD} = R_e I_T$$

Set

$$V_e = 0v$$

so that

$$R_e = \frac{V_{DD}}{I_T} = \frac{15v}{1.0mA}$$

$$R_e = 15K\,\Omega$$

The base voltage, V_b, will be approximately 0.6v.

$$0.6v = \left[\frac{R_2 - R_1}{R_2 + R_1}\right] V_{DD}$$

$$0.6\,R_1 + 0.6\,R_2 = 15\,R_2 - 15\,R_1$$

$$15.6\,R_1 = 14.4\,R_2$$

$$R_1 = 0.924\,R_2$$

Choose

$$R_2 = 330K\,\Omega$$

so that

$$R_1 = 0.924 \cdot (330K\,\Omega)$$

$$R_1 \cong 300K\,\Omega$$

STEP 2: The JFET pair has the dynamic constants given below:

$$g_m\ @\ 500\,\mu A = 1000\,\mu\ \text{mhos}$$

$$g_{DS}\ @\ 500\,\mu A = \quad 50\,\mu\ \text{mhos}$$

and the constant current source has an impedance of about 1.5 megohms. Compute the CMRR.

$$\text{CMRR} = \frac{2\, g_m\, Z_c}{1 + g_{DS} R_D}$$

$$\text{CMRR} = \frac{2 \cdot 10^3 \cdot 10^{-6} \cdot (1.5) \cdot 10^6}{1 + (50) \cdot 10^{-6} \cdot 27 \cdot 10^3}$$

$$\text{CMRR} = 1280$$

The procedure used with designing circuits using FET differential stages requires a close matching of device parameters. An ideal FET pair would have its gate transfer characteristics matched within several millivolts. This insures that the D.C. drain currents are equal for equal values of V_{GS}. As a result of this matching, the small signal drain currents and the small signal

transconductances will be nearly equal thereby allowing a large value of CMRR.

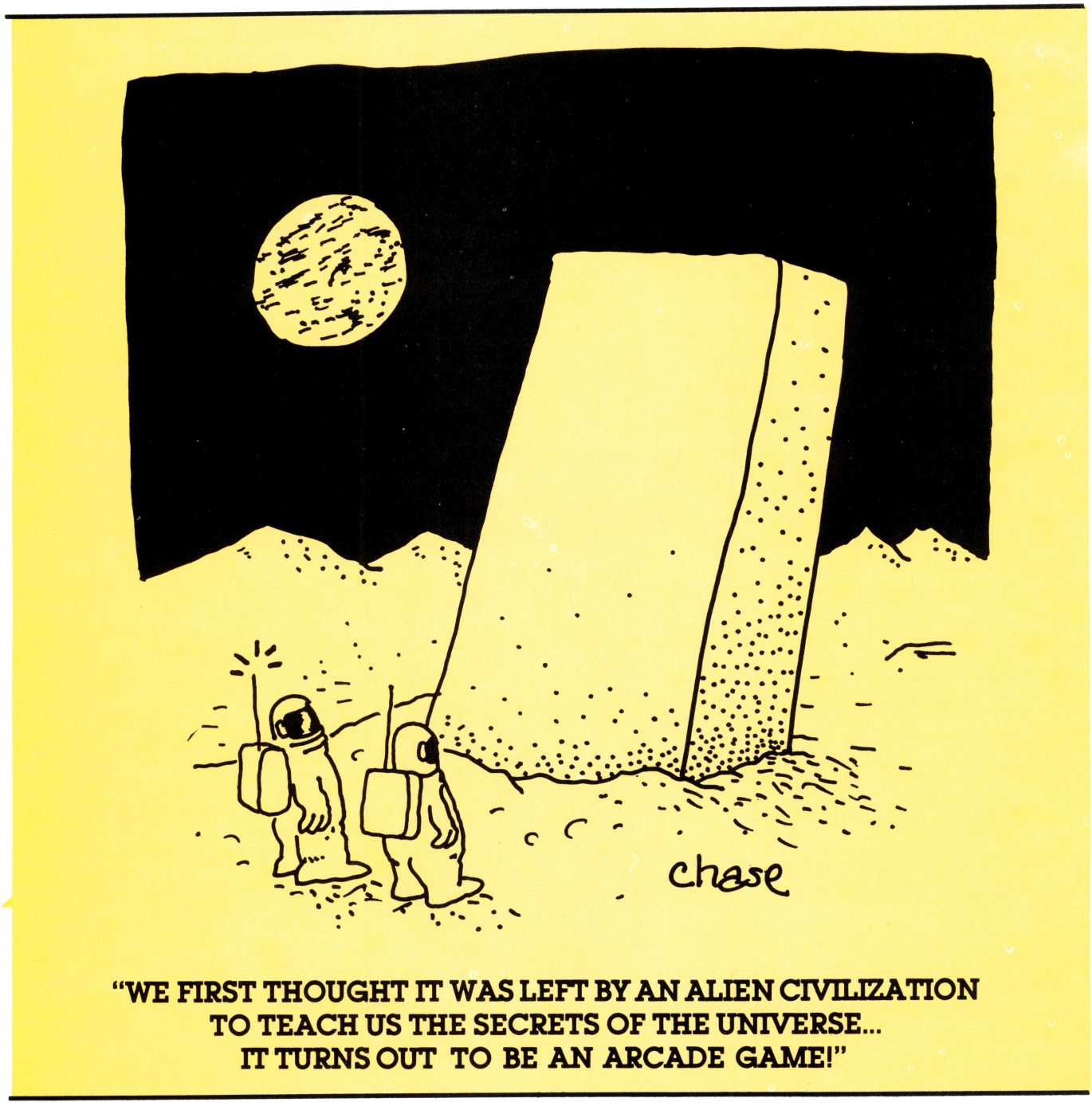
However, most manufacturers of matched FET pairs try to match the gate transfer characteristics at the drain current zero temperature coefficient or the zero T.C. By doing this, the circuit designer can design his differential stage for a minimum output offset voltage while at the same time achieving low thermal drift. On a typical device data sheet, there are three parameters which determine how well the device is matched.

1. $|V_{GS_1} - V_{GS_2}|$ – The **gate source differential voltage** which is measured at equal drain currents, usually the zero T.C. value. This value ranges from 1mV for extremely well matched devices to as much as 100mV for poorly matched devices.

2. $\Delta|V_{GS_1} - V_{GS_2}|/\Delta T$ – The **differential voltage temperature coefficient** or ΔV_{GS} **drift.** This parameter is also measured at the drain current zero T.C. and ranges in value from 5 μ V/°C to 100μV/°C.

3. g_{m_1}/g_{m_2} – The small signal **transconductance ratio** measured at the I_D zero T.C. This ratio determines how well the small signal drain currents are matched. Its value varies from 0.9 to 1.0.

The selection of a particular device type will depend on how much performance tolerance is allowed and how this performance depends on the matching characteristics. Obviously, the more closely matched devices will be more expensive but the performance is expected to be worth the extra cost in most cases.

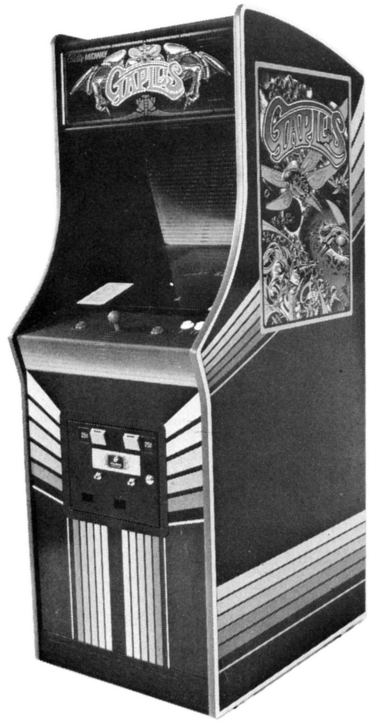


War of the worlds

Can you defend the earth from a marathon onslaught of killer insects from outer space? Meet the challenge to save mankind from *Gaplus*, the newest video from Bally Midway.

The earth-defending player must ward off the Gaplus as they appear in a variety of forms and flight patterns, which determine the number of points scored. As the attack of the Gaplus intensifies, the player's high-tech arsenal—the Phalanx Attack, the Hyper Attack, and the Cyclone Attack—boosts defensive techniques and point accumulations.

Bonus rounds can double or triple point values. Other features of *Gaplus* include Tofu Attacks, in which the ghost of a wounded stray Gaplus transforms into ultra-deadly bean curd; a bonus ship from the Queen of the Gaplus; and a scoring feature for high-score earth defenders.



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Black belt

Data East USA Inc. has released its interactive upright video, *Karate Champ*.

Karate Champ offers the player multi-joystick, high action sports games.

To begin the contest, the player enters a "training session" that allows the player to practice the moves while earning bonus points. In this sequence, the karate instructor demonstrates a variety of different moves. The player must then properly duplicate the moves of the instructor by correct joystick movements to earn bonus points.

Play then advances to the first intermediate match. The first player to score two points wins the match. The player advances to new and increasingly difficult matches with each victory. Various challenge stages are provided along the way to allow the player to earn bonus points.

The player can select from one of 24 offensive and defensive moves to combat his opponent. The game is available as a dedicated upright machine.

It's in the stars

With a resurgence of back-to-basics games and a greater interest in flippers, Williams presents *Star Light*.

For the first time, Williams' exclusive lane change feature is activated by a separate button on the player's right side for more control. Make rollover lanes and buttons light stars, and when all 10 are lit, a constellation lights for a 10,000 bonus. Lighting "Pisces" lights the right lane for an extra ball and lighting "Gemini" lights the outlane special. Making the roving light advances the bonus multiplier.

Other features include two-ball multi-ball play—all scores are doubled and a bonus holdover which, when lit on the last ball, awards a bonus time of one second for each star lit and 10 seconds for each constellation lit. The backglass art presents the theme in brilliant colors and imaginative illustration.

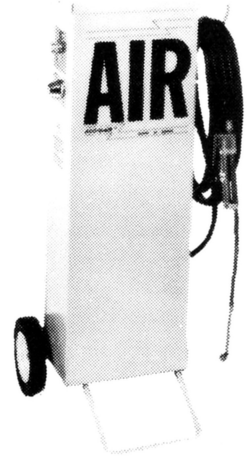
Blast off

SNK Electronics introduces a conversion kit especially designed for action-oriented video game players.

Blast off into the world of *Vulgus* and destroy the enemy insect mutants that infest the planet.

The object of the game is to maneuver the spaceship through three contrasting arenas of play action. The player uses rapid-fire missiles to blast through a maze of attacking insect mutants on the rough terrain en route to the aquatic battle where he encounters the mysteries of space where the Vulgus enemy planet awaits his next move.

One or two players have the advantage of five "Ultimate Missiles" for the giant insects that routinely prowl the planet.



Tire inflators

Acc-U-Air *Tire Inflators* from Alliance Industries in Madison Heights, Michigan, have a special compressor design that will not clog, corrode, or freeze (even at -60° below zero), company officials said. These compressors are backed by a 5 year warranty.

The Acc-U-Air PA100 Series has a built-in cart, allowing the machine to be wheeled in at closing time yet locked up when the station is open.

The A-100 Series comes with a wall mount bracket or it can be mounted to an optional in-ground pedestal.

All coin-op units feature a built-in specially designed vault for added security. All units come standard with a cut-proof wire braid air hose and inflator with a built-in read-out gauge.

Test your knowledge

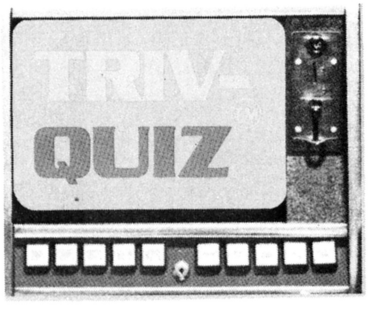
Status Game Corporation has joined the trivia craze that's sweeping the nation with the introduction of *Triv-Quiz*, available in upright or countertop models and conversion kits. The game features thousands of questions in four categories—sports, entertainment, world facts, and expert challenge.

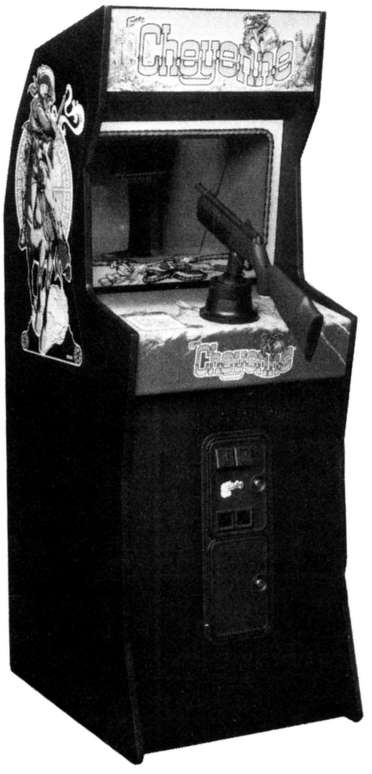
A built-in advertising feature allows operators to program advertising without a keyboard attachment.

Each player begins with 10,000 points. When the player sees the question, he decides how many points he wants to play. After he has wagered his points, three answers appear, and the player tries to select the correct answer.

Each player receives a minimum of four questions. Bonus questions are earned based on high scores. The player who achieves the highest score can enter his initials for display.

Company officials said future updated question kits will be available.





Fire away

Sample shipments of Exidy's new gun game, *Cheyenne*, were sent to distributors in late August. *Cheyenne* is a western gun game utilizing an unbreakable cast aluminum gun stock, company officials said.

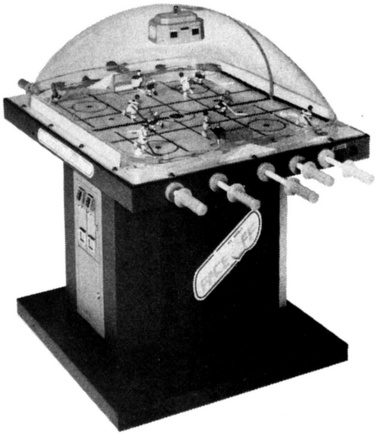
The player, armed with a rifle, is to protect "Buster Badshot" through a series of dangerous episodes as he challenges outlaws in his quest for a bounty of gold.

"Graphically superior to *Crossbow*, a challenge in itself, the test reports on *Cheyenne* have been absolutely phenomenal," said John Barone, director of domestic marketing.

Face-lift for 'Face Off'

A re-engineered version of Entertainment Enterprises' *Face-Off* coin-op ice hockey game is available at a price that's lower than comparative ice hockey games, according to President Jed Forman.

"If you can make the quality of a machine higher while making the price lower, you're talking true mass appeal," said Forman. "And that's exactly what's happened with *Face Off*. Our new version's going to really score—with distributors, operators, location owners, and players alike!"



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Aids to the Trade

Test fixture

Industrial Design Electronic Associates, Inc. announces a new design for its diagnostic tool for servicing the company's *All-American Darts* game.

Self-contained and portable for testing the game on site, the test fixture tests the following assemblies: main mother PCB assembly board, power supply, solid-state relay board, speaker, overhead light driving circuitry from main board, and matrix switch. Special retrofitting accommodates testing of the American-sized target.

All functions of the game can be simulated and tested. It works by matching up a suspect assembly with a known working assembly. Once the trouble spot is identified, it can be swapped or debugged. Debugging is facilitated by access of all parts to a scope or probe meter.

IDEA also announces that J.R. London in Milwaukee, Wisconsin, is its distributor in Wisconsin.

For more information, contact IDEA Product Sales, Route One, Sycamore, IL 60178. Telephone: 815/895-8188. Telex: #433-0077-TSPN, Att'n IDEA.

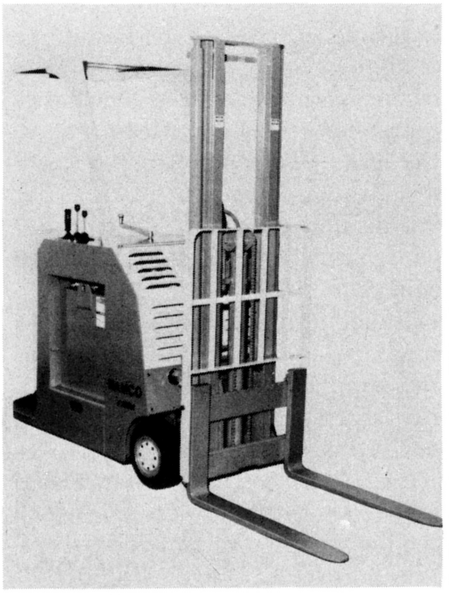
Transformers

Two new four-watt line-matching transformers have been introduced by Quam-Nichols Company.

The new transformers have a frequency response range of 50 Hz to 20 kHz, +/– 1 dB, and permit speakers such as Quam's 8C10CO coaxial and 8C10FEPAX and 8C10FEX air suspension speakers to deliver their full response range.

The new transformers are model TBH25 and model TBH70, designed for impedance-matching respectively to 25-volt and 70.7-volt lines. They are available individually or preassembled to speakers or speaker/baffle combinations.

Information is available from Quam-Nichols Company, 234 East Marquette Road, Chicago, IL 60637. Telephone: 312/488-5800.



Electric lift trucks

Two new stand-up, counterbalanced end controlled 36 volt electric lift trucks are now available from Schaeff Namco, Inc. in 2,000- and 2,500-pound capacity at 24″ L.C.—Model E2000 and E2500.

The trucks are 30″ wide and 83″ high with a right angle stack dimension of 71″. Front wheel drive enables the truck to negotiate dock plates and steep inclines with ease, with or without a load on the forks, company officials said.

Smooth plugging is accomplished through the General Electric EV1 SCR control which is located just under a hinged panel. The 7⅛″ diameter Prestolite traction motor is mounted vertically to permit the installation of new brushes without removing the battery or motor from the chassis.

An oversized battery compartment will accept up to 700 A.H., 24.3 K.W.H. 36 volt battery for multi-shift operations or small 375 A.H. 13.1 K.W.H. battery for light duty users. Rollers are included in the battery compartment for easier handling. Overhead hoists are not required to remove the battery. A battery service tray with rollers is standard equipment with each E2000 and E2500 truck.

To complete the product line, Schaeff Namco has designed a new family of Clear View Duplex Uprights up to 130″ M.F.H. and Triplex Uprights up to 156″ M.F.H.

For additional information, contact Tim Balakas, General Sales Manager, Schaeff Namco, Inc., P.O. Box 5869, St. Louis, MO 63134. Telephone: 314/429-5511.

Free catalog

A full-line technical catalog describing Line Tamer power conditioners has been released by Shape Magnetronics, Inc.

The 12-page catalog provides specifications and ordering information on three Shape Line Tamer series—Z-Phase, Computer, and Industrial. Line Tamer power con-

ditioners provide power line regulation, isolation, and noise rejection to assure the delivery of clean power to computers and sensitive computerized equipment, company officials said.

The new catalog is prepared for those who specify or recommend power conditioning equipment, such as systems integrators, electronic engineers, and electrical contractors. The catalog provides electrical and performance specifications, as well as model listings, case dimensions, and weights for Shape's Line Tamer power conditions: the new Z-Phase Line Tamer for three-phase applications, the Computer Line Tamer for single-phase applications, and the Industrial Line Tamer for single-phase applications demanding extremely high line voltage regulation.

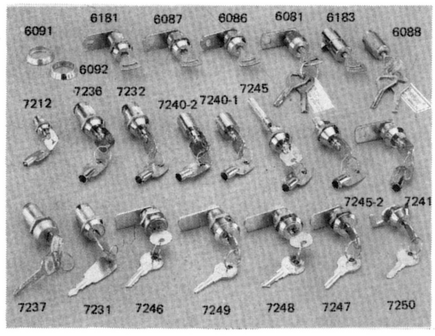
In addition, the catalog includes an explanation of the various forms of power irregularities and the solutions available to aid the specifier in selecting the option for the application. A key feature is a page of answers to the questions most commonly asked about power conditioning and about specifying and using Line Tamer power conditions.

Z-Phase Line Tamers are available in standard capacity ratings ranging from 7.5 kVA to 75 kVA, while Computer and Industrial Line Tamers are available in standard ratings beginning at 30 VA through 75 kVA. Other VA ratings are available on a custom basis, as are special plug or receptacle configurations and mixed input and output voltages.

For your free copy of the new Line Tamer full-line technical catalog, contact Shape Magnetronics, Inc., 901 DuPage Avenue, Lombard, IL 60148. Telephone: 312/620-8394. TWX: 910-991-2352.

Lock company expands

Coin Security Systems of Van Nuys, California, has expanded its base to service the vending and



amusement industry on a national scale.

Coin Security Systems Inc. is the exclusive supplier of the Baton line of high security locks as well as a factory authorized sales and service center for Abloy and Medeco Security locks. "To ensure strict key control, we assemble the locks at our facility and issue key codes on our own exclusive keyways," said President Sam Gold.

In addition to being a major lock supplier, Coin Security Systems Inc. also supplies a complete line of security accessory items such as hasp sets, cams, security collars, etc. "We are a full service supplier specializing in security and services which are not readily available elsewhere. We service all major lock brands with rekeying and key cutting available for Tubular, Abloy, Medeco, and Baton," Gold said.

For further information, contact Coin Security Systems Inc., 7702-4 Balboa Blvd., Van Nuys, CA 91406. Telephone: 818/782-5454.

PVC tubing lighting

An alternative to neon light for commercial signs has been introduced in the form of a low-cost plastic tubing which is activated not by electricity but by ultra-violet light. The tubing is available in 11 different colors, is fire-retardant, and can be shaped into a variety of designs.

Known as Line Lite, the tubing is made of transparent polyvinyl chloride (PVC) and is fluorescent. To attract attention, it glows in any one of the 11 colors—white, transparent, red, pink, magenta, orange, yellow, yellow-green, green, blue, and purple.

The new lighting system is developed by Line Lite International B.V. in the Netherlands. A company subsidiary, Line Lite Inc. of Boulder, Colorado, is directing marketing efforts in the United States and Canada.

Line Lite can be cut to any length and either attached to a flat plane for decorative and sign purposes or formed into three-dimensional shapes.

The tubing is available in four diameters: 2, 4, 8, and 12 mm. Black light blue fluorescent tubes are the most efficient source of ultra-violet light in the required 250 to 360 nanometer wavelength band. The black light blue tubes are also available in 8, 15, 20, and 40 watts.

For large areas and large outdoor signs, filtered spots and flood lights in 400 watts are advisable. The efficiency of illumination is dependent upon the proximity of the light source and is greatly enhanced by the addition of an aluminum reflector to direct the light toward the Line Lite tubing.

With the use of cyanoacrylate glue, it is easy to fix Line Lite to most surfaces. However, on wooden surfaces, veneer pins have been utilized successfully.

All of the Line Lite products—tubing, black light blue fluorescent tubes, reflectors, and coils of plastic materials—are warranted to be free of defects for one year, company officials said. Finishes are warranted not to peel, crack, or blister from normal atmospheric exposure for a similar period.

For further information, contact the Netherlands Consulate General, Economic Section 7a7 83, One Rockefeller Plaza, New York, NY 10020.

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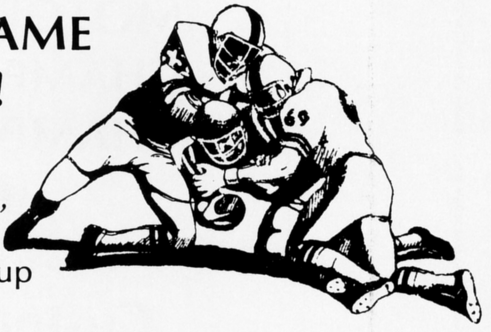

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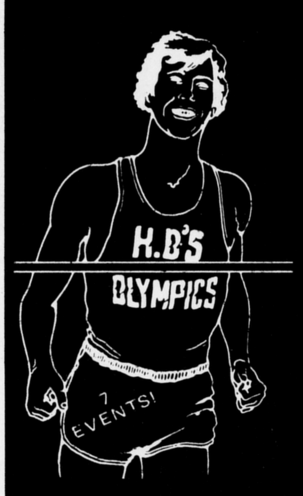

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AN OPEN LETTER FROM VIDEO WARE, INC. TO COIN-IT CO., INC.

September 14, 1984

Mr. Joel Hochberg
President
Coin-It Co., Inc.
7223 N.W. 43rd Street
Miami, FL 33166

Dear Joel:

I would like this letter to confirm our conversation today where you have outlined to me that the only legal Birdie King II P.C.B. that may be offered for sale in the United States and Canada are those that come out of machines manufactured by your exclusive manufacturer, Monroe Distributing, Cleveland, Ohio.

Any other Birdie King II P.C.B. should be considered illegal.

In anticipation of receiving reputadly "legal" Birdie King II P.C.B.'s, Video Ware advertised nationally Birdie King boards; in fact, these boards were never delivered and we very sincerely regret any con fusion in the market about the availability of legal Birdie King II con version kits.

We can assure you that Video Ware sells only legal P.C. boards and kits and in this connection we will of course respect all rights and priv ileges accorded to you in your patents/copyright application PA 158207PAU of November 19, 1982 and your Trademark Regis tration 1,279,071 of May 22, 1984.

We apologize for whatever confusion this may have caused you and/or your distributors.

Kind regards,

John W. Hibbs
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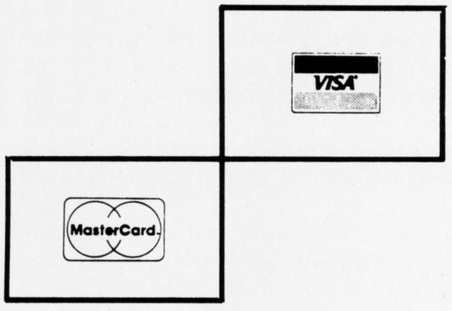

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COMMENTARY

Age Restrictions Upheld by Appellate Court

[Editor's Note: Herb Beitel, NCMI managing director, recently wrote these comments on an opinion issued by the Michigan Court of Appeals dealing with age restrictions.]

Just when the wave of adverse court problems seemed to be subsiding, the Michigan Court of Appeals issued a devastating opinion upholding age restrictions on June 18 that ranks alongside the Marshfield, Massachusetts, case (upholding complete bans on coin-op video games).

This is the first appellate level case that has come to our attention that has cited the Marshfield case. This decision is dangerous because it is a reported decision that is available to other jurisdictions (in contrast to municipal and county court rulings).

The Michigan case, titled *People of the City of Warren vs. Jaqueline Walker*, began with arrests on *January 18, 1979*, for violations of a city ordinance that made it a crime to "permit a minor before (their) 17th birthday to enter, loiter, remain, congregate, or play any mechanical amusement in an amusement center unless accompanied by a parent or guardian."

Through a series of actions and appeals, this case has been bouncing around in the Michigan court for five years. Note that all this began in 1979 before video games became a national event. The ordinance was enacted still much earlier. The ordinance was repealed before this decision, but that did not stop the court from hearing the appeal.

Court arguments against the ordinance were based on (1) First Amendment protection of expression and association, (2) equal protection rights under the federal and state constitutions, and (3) age discrimination in violation of the Michigan Civil Rights Act.

This court ruled against industry arguments on every point.

The court claimed that it could find no precedent for protecting an "individual's" right to association. The Mesquite case (*Texas-U.S. Circuit Court of Appeals*) did decide the age restriction question in the industry's favor on that very point—this court referred to the Mesquite case in a footnote as a case to "compare" with the finding here.

This court ruled that First Amendment protection is extended to "a group which assembles for purposes constitutionally protected under the freedom of expression." Further, this court cited and adopted the Marshfield case as precedent for denying First Amendment protection to coin-op games as not being "...designed to communicate or express some idea or some information. ...expressions that occur during the playing of a...game is purely inconsequential."

In holding that the Warren ordinance did not violate "equal protection" rights, under the federal and state constitutions, this court held that the classifications based on age and mechanical amusements in the ordinance were not arbitrary and were justified under the circumstances.

The "circumstances" alleged by the city of Warren, and apparently not put in issue in the court proceedings, include: children spending lunch money on the pinball machines instead of buying lunch. Some children were "borrowing" lunch money from other children to play the pinball machines. The term "borrowing" includes strong-arm robbery. These instances occurred when pinball machine arcades were located close to schools.

When the amusement center was located close to other stores, the neighboring store owners complained that at noon time and after school there were so many children gathering around that customers could not get into their stores.

The city also alleged that psychological effects such as gambling compulsions and addiction result from playing video and pinball games.

The age discrimination argument was quickly dismissed by this court on the basis that the Michigan Civil Rights Act prohibited age discrimination except "where permitted by law" and that the Warren ordinance was a law and did permit discrimination.

Some points should be kept in mind about this case:

1. The arcade owner's suit also claimed damages to pay for attorney's fees. Many in Michigan feel that the appellate court sought to rule for the ordinance to prevent saddling the city of Warren with a bill for five years accumulation of attorney's fees.

2. This court said in a footnote: "We are not convinced, indeed, we feel strongly that other less restrictive alternatives were available to the city of Warren to help control the truancy of its youths. Unfortunately, this observation does not reach the constitutional question."

3. The typical laundry list of scurrilous "trouble in River City" charges against the arcades, whether true or not, were not fully made an issue in the trial court proceedings, so that the appellate court had no choice but accept the city's allegations.

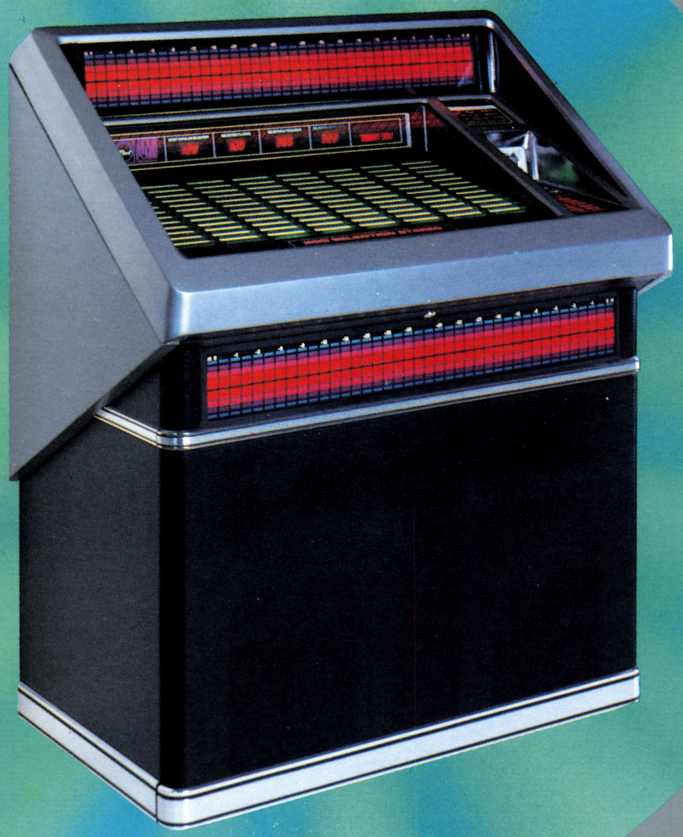
4. The ordinance in question had been repealed before this appeal was tried. But since the appeal was based on criminal charges and penalties, the court had to determine if the criminal acts occurred and occurred under laws that were in effect and constitutional at the time.

This is a clear example of the problems in resorting to test suits to overcome legislation (and public relations) problems:

1. Court actions take a long time and are expensive. By the time a decision results, the root of the problem may have altered or disappeared—but the precedent goes on forever.

2. The issues in suits become very narrow and very legalistic. Usually only part of the basic problem is resolved.

3. Court opinions and judgments almost always look back at history and not ahead to tomorrow or directly at today. Courts must address problems that have happened and rule on them. They may conjecture about future developments and actions (as they did here and in the Marshfield case), but they cannot pass judgment in advance. •



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