

The Twice Monthly Publication
for the Coin Operated Entertainment Industry

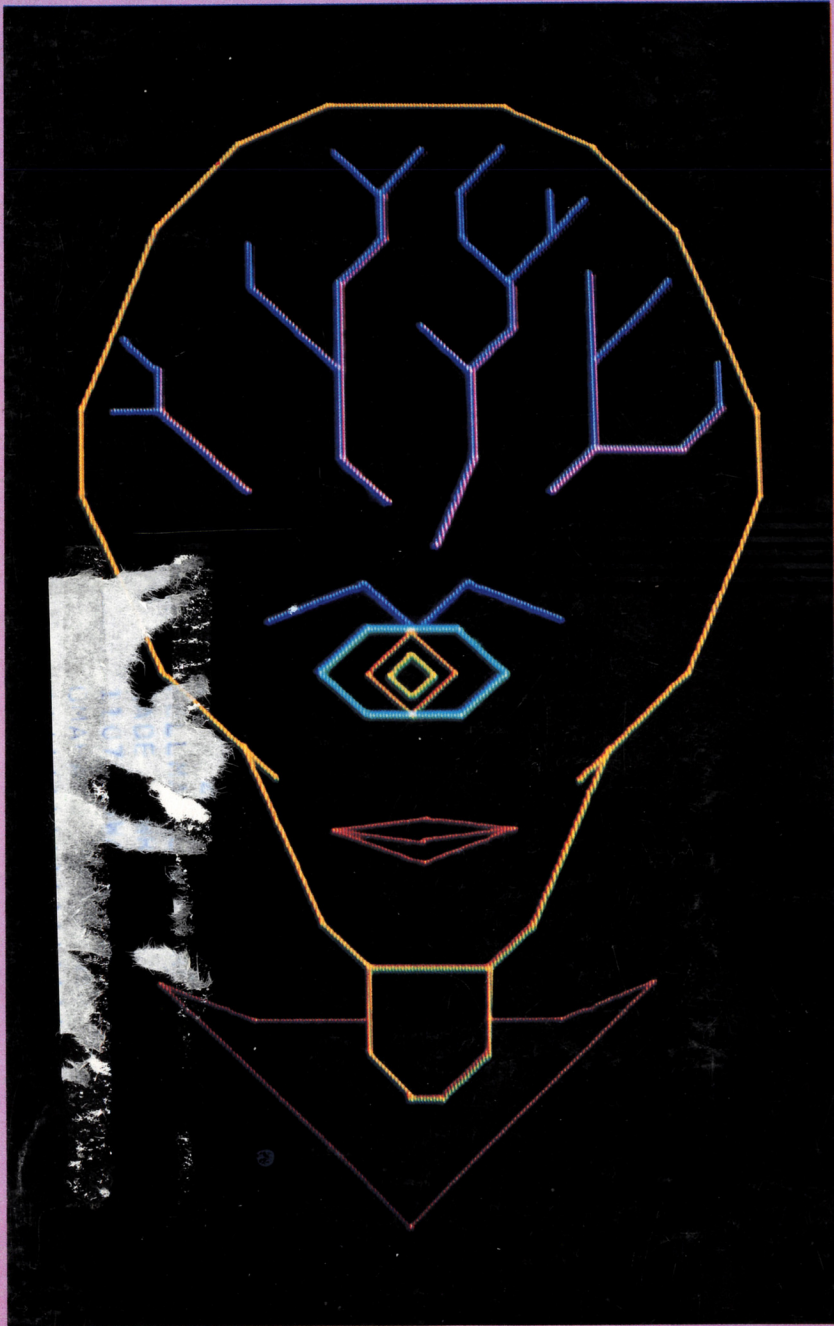
PLAY METER

Volume 7, Number 17

September 15, 1981

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CONVERT-A-GAME

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FEATURES

10

Convertible Games

Gremlin/Sega executive David Rosen outlines the new game system that's going to be the talk of the industry for the foreseeable future. Convertible games are sure to be controversial, and here in the manufacturer's words is the rationale for their introduction at this time.

27

Games Become 'Art' in Los Angeles

Randy Fromm reports on an unusual exhibit at the Institute for Contemporary Art: coin-op games. The industry's image got a boost from the Institute, and the young people in attendance received a bit of cultural exposure.

31

Talking Pictures Lend Pingames New Themes

Roger Sharpe explores how some much-needed change away from 'space' is being lent by some of the later crop of Hollywood efforts. And he *doesn't* mean *Star Wars*.

39

Coin-Op Business Myths

Our freind Charles Ross begins a new *Play Meter* feature, 'The Business Myth of the Month' with this look at what may be an apparent 'truth' but doesn't stand the light of reason in operating in the real world of coin machines.

DEPARTMENTS

4 Editorial

7 Mailbox

14 News

32 Equipment Survey

43 Music Programming

46 The Arcade School

49 Technical Topics

53 Frank's Cranks

56 Critic's Corner

58 New Products

61 Classified Advertising

68 News Briefs

UP FRONT

For quite some time, we've been receiving an alarming number of reports about numerous communities which want to make coin-op games illegal for young people. The tough age seems to be the 18 and under crowd who we all know represent a huge percentage of this industry's consumer base. Recent reports have come from California, Texas, New Jersey, and Florida; and there's no mention as to where it will end.

It's the same old story. Paranoid parents, hypocritical citizens, bored bureaucrats, and ignorant politicians are up in arms against all the imagined evils of coin-op games. They claim that arcades have become "hang outs" for "undesirables," places where teenagers squander their lunch money to buy dope and play games. As a result, some communities have enforced age restrictions on the games while others have gone so far as to outlaw pinball, pool, and video games completely.

It is comforting to note that some operators are not taking this issue lightly. The city of Mesquite, Texas, a Dallas suburb, passed a law prohibiting children under seventeen from playing coin-op games. But the Aladdin's Castle chain, which had invested heavily in preliminary work before the town passed its ordinance, went to U.S. district court to overturn the ordinance. When the district court denied the city's right to make such an ordinance, the city brought the case before the Fifth Circuit Court of Appeals in New Orleans. The circuit court upheld the local court's decision, claiming the ordinance violated the 14th Amendment and the rights of minors to associate. With the ball back in Mesquite's hands, the town has taken the issue to the U.S. Supreme Court.

While the courts are still trying to decide if grown-ups have the right to deprive the country's youth of innocent pastimes, it is interesting to note that, in many areas, the local press has come out against such bans. In the *Dispatch* of Hudson/Bergen Counties, New Jersey, a police officer who is an aide to the chief

of police was quoted as saying, "There's more drugs in the schools than there are on the outside." Does that mean schools are bad for our youth and should be shut down?

In a related incident, the *Miami Herald* editorialized that kids are going to hang out in groups, whether it's in malt shops, drug stores, and drive-ins of an earlier era, or in bowling alleys, convenience stores, and movie theaters today.

Removing a harmless and enjoyable form of entertainment from the community isn't going to take drugs away from kids or even make them less accessible.

If anything, these bans are only going to make young people more cynical about government. They learn at school and from television about computers. They find a type of computer—an exciting video game—that's fun, and then what happens? Your local government intervenes and pulls the plug.

The government's game of Shutdown should end. Local officials have more important matters to deal with than computerized space ships and exploding asteroids.

Nickie McWhirter, a staff writer for the *Miami Herald*, probably summed up the issue best when he wrote, "That adults should be so suspicious of electronic games and the kids they draw, would be laughable, except for the ordinance, which is a little sad. I don't think we like to see kids having fun doing anything we didn't get to do."

And so the struggle goes on. With their help and the continued efforts of strict supervision in arcades, we can lick this problem once and for all.



Ralph C. Lally II
Editor and Publisher

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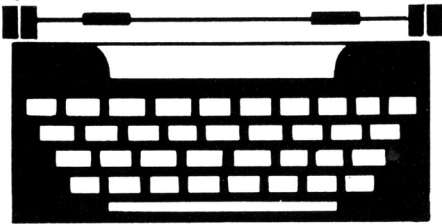
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Letters to the editor . . .



Coin-op sorcerer?

For literally months I have been in search of two bowling games such as *Champagne* or *Holiday*, originally manufactured by Chicago Coin. I've tried every possible source that's come to mind and have come up with zilch! I prefer new machines, but used games in excellent condition will suffice. Any leads you might conjure up will be greatly appreciated.

Joseph Stutterman
Christopher's Fun World, Inc.
 3351 Route 112
 Medford, New York 11763

[Perhaps our readers can aid us in 'conjuring'...ed.]

'Junkie' writes

I really enjoy reading your magazine: the reviews, the advertisements, and the electronic pieces. As a pinball junkie, I enjoy looking at the new ads for the multi-ball, multi-level machines that are being released.

There is not one single machine like this in the county where I live, and if there were, they would charge 50¢ for only 3 balls with tight play and a ridiculous high score for a credit. When will owners learn that they CAN make more with standard "five balls for a quarter?"

Stephen R. Craig
 Fort Myers, Florida

[Ed. note: Contributor Craig's article, "Polling the Pin Players," appeared in Play Meter April, 1981 issue.]

Faithful in Nebraska

We are a group of music and game operators—consisting of 28 members representing portions of five states. Each of the last 13 years we have been promoting tournament play in our respective locations ending an eight week competition with the finale at Peoney Park

Ballroom, Omaha, Nebraska.

Our membership reads your magazine faithfully in an effort to gain insight in our industry.

Jim Garden
Midwest Amusement Ass'n., Inc.
 Norfolk, Nebraska

Open letter: copies

Last Fall at the AMOA Show in Chicago, Williams Electronics, Inc. introduced its first video game designed in-house—*Defender*. The design and development of Williams' *Defender* game actually started in February of 1980 when the Williams Engineering and Development Center was given the task of designing a video game with the same player appeal, innovation, and reliability that Williams is known for on its pinball product line.

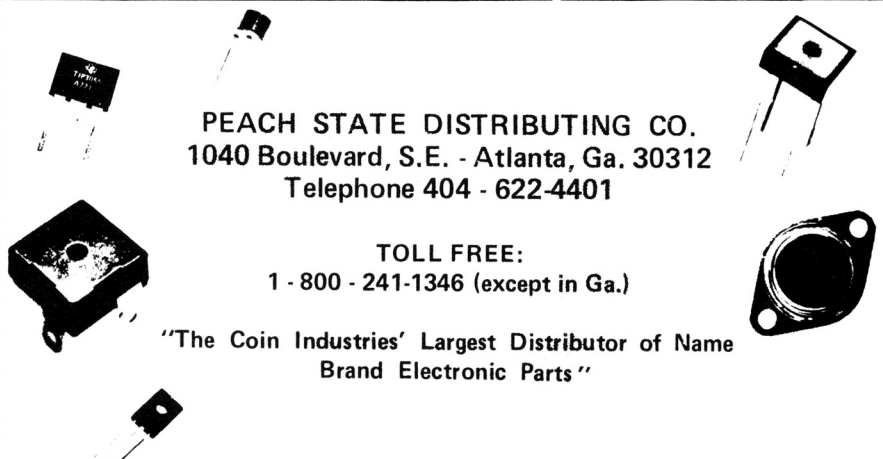
The result of that 10 months of effort was a video game that had the highest resolution of any color raster

video game—a game with audio-visual special effects never seen before—a game with the most complete diagnostic system in the industry. In addition to all these technological innovations, Williams' *Defender* game also proved to be one of the highest-earning video games ever put on location.

Because of the popularity of the game, it was not unexpected that the pirates that exist on the fringe of our industry—the copiers and knock-off artists—would make copying Williams' *Defender* game one of their main priorities. Copies of Williams' *Defender* game started showing up as early as January, 1981, in Europe.

The copies are virtually identical to Williams' *Defender* game with only the name of the game changed and, occasionally, with minor cosmetic changes to the appearance of the game.

To protect the considerable investment Williams has made to



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design and develop the *Defender* game, several copyrights have been registered, as well as a trademark on the name *Defender*. Williams has secured copyright protection for the artwork on the cabinet, the audio visual effects (play) of the game and the computer program of the *Defender* game.

Williams' policy is to take whatever legal steps are necessary to protect these rights. In lawsuits filed in United States District Courts in New Jersey, Alabama, California, and Oregon, Williams' rights have been upheld by the courts.

Williams will continue to seek relief through the courts against any person or persons who engage in the manufacture, assembly, distribution, sale, or operation of any product that is judged to be infringing these rights are subject to confiscation of the infringing products, as well as substantial monetary damages.

The only way Williams or any other legitimate video game manufacturer can stay in business and continue to provide games of the caliber of *Defender* is to be able to fill the market demands at a reasonable profit level to reinvest in additional research and development.

Copiers spend no research

monies. Copiers provide an inferior product. Copiers provide no service or support. Copiers that are here today may be gone tomorrow.

The problem of copiers is truly a blight on our industry. It hurts the manufacturers. It hurts the distributors and, ultimately, will hurt operators, as well. With your support, however, the problem is one that can be and will be solved.

I would appreciate to hear any thoughts or comments you have about the copying problem.

Ron Crouse
Marketing Director
Williams Electronics, Inc.
Chicago, Illinois

Second thoughts

Roger Sharpe and I probably feel the same about the game of pinball. We would play a pinball instead of a video game anytime.

And, as he stated in the June 15 issue of *Play Meter*, many long-time game players, and most new players, have turned to video games as a staple. But I think Roger's explanation of this phenomenon needs yet further analysis.

If you assemble game players into two very general categories—kids

and adults—it must be evident that today's kids are playing videos more than adults, and adults are playing pinball more than video. But the latter situation has been changing lately, and that's the real crux of the video takeover.

The reason for this isn't necessarily that recent solid state pins were not innovating fast enough, or that the current products are too loaded with features. (Roger seemed to advance both theories in the same issue). I think videos have caught on simply because most video games require and develop purer skill in the player.

From its inception, pinball has involved the element of chance: a ball moving amongst obstacles before reaching certain goals. The uniqueness of modern video games is that the player has to eliminate obstacles to reach the goal. In most video games with attacking obstacles, the player is given adequate reaction time to avoid being blown up, and the more he plays the game, the better his reactions and anticipation become.

In some games, the repeat player identifies a pattern in the video's logic (e.g., *Asteroids*, *Space Invaders*) and can become an



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expert, able to play the game until too exhausted to press another button. This is pure skill—something that pinball as we know it cannot possibly achieve.

As long as you have a ball (or two or three) banging around posts, bumpers, slingshots, etc., you will not have a pure skill game. Although expert pin players can stay on a game for hours, expert video players can get much more playing time overall for a quarter because there is little element of chance that they will lose.

As a pinball enthusiast and operator, I find this to be video's biggest fault. The money made on a video while the players are learning the game is electrifying, but the money lost on experts tying up the machine potentially all day is distressing.

However, that is of no concern to the player, which is one reason video is on the rampage.

Another reason: Would you rather watch a movie or a slide show? That's almost what the appeal of video as against pinball has become. Most videos present a constantly moving game environment requiring full attention, while the pinball player focuses on the ball and, no matter how innovative, an often-motionless playfield.

The intimidation factor Roger mentions is not really germane to the issue at all. What could be a more intimidating experience than one's first game of *Asteroids*? Yet, is it not the most popular game in the industry's history?

There may be people out there who are intimidated by new pinball

machines and features therein, but these are not true pinball players—and more than likely not video players, either. Few true game players back away from a challenge.

Whither goeth pinball? Naturally, to incorporate TV machines and features into pinball itself. I'm sure this idea is not revolutionary in the Chicago factories. And I wouldn't shy away from a bet that the pinball industry is biding its time (what else is new?) with the current "multi-craze" before introducing TV-pinballs (rudimentary at first, no doubt) to an eager amusement community.

In fact, my psychic tendencies have afforded me a vision of the first such game, so I will spoil the surprise unveiling planned by the industry and tell you that the name of this game will be...

"Evel Pong."

Paul M. Thiele
Los Angeles

Home games' effect

For all the operators contemplating the effects the home game cartridge market will have on their *Missile Commands* and *Asteroids*, I pose a question of more serious consequence.

The limited power of the Atari and Mattel home games prevents them from coming close to the action and sounds of the coin-op versions. But how many of us realize that the \$1000 home microcomputer (Apple, TRS 80, etc.) has thousands of inexpensive game programs available to it, some of which accurately copy the sounds,

graphics and action of the most popular coin-op games.

As the decade progresses, the home computer will become so affordable, half the households in America will have one in the living room. Why should dad and kids spend their money at the arcade when they can play "Defendant" and "Asteroid Field" at home for free?

Let's face the possibility that people will become saturated with video games and may tire of them altogether. Maybe we shouldn't write off pinball so quickly—after all, you can't copy a *Jungle Lord* and sell it at Sears.

Evan R. Wessel
Mercury Amusement Company
Ardmore, Pennsylvania

[Ed. note: Continuing discussion of the home games' impact on coin-op has included 'The Satellite in Your Living Room,' *Play Meter* September 1 issue, and 'Don't Panic Pinball Operators' July 1 issue.]

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.) All letters subject to standard editing. Be concise.

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convertible games

by david rosen

OF SEGA ENTERPRISES

We must not be lulled into believing, even for a moment, that our industry's past success will be as easy to come by in the future. The rapid growth we have all enjoyed has brought with it some very real problems—problems which must be studied and analyzed and dealt with if the industry is to continue to grow and prosper.

Market Maturity. The first issue confronting our industry is market maturity—that is to say, market saturation. Much of the prime real estate for new arcades and street locations has already been pre-empted. Most regional shopping malls have arcades, and the 7-11s of the world already have the latest in video games, or are testing the concept for their particular operations.

This means the pipeline for new equipment sales will be slowing down. How long before we see this happening? My best guess is before year-end.

What will a matured market for new equipment sales look like in six months from now? We should plan our business strategies around what will be a three-tier market segmentation for new equipment sales.

A word about each market segment...

New "Hot" Games. Regardless of market maturity, we will continue to see a large and growing market for new "hot" games. But operators will be more and more selective in their choice of models as there are just so many "winners" an operator can absorb. Moreover, we will see a continuing trend in arcades to "banking" two, three, or four of the same model. The demand for new "hot" games, coupled with "banking" of games will add to distributor sales of the current winners, but will also take away from sales of the "average" \$250-a-week game.

Bottom line, we can expect to see the latest "hot" model sell very well, but the new equipment market for all other models may well be sluggish compared with sales levels enjoyed today.

Replacement Market. The second and largest segment in a mature marketplace is the replacement market, which is enormous—estimated to be about 700,000 computer video games. This is where the bulk of future new equipment sales will come from. The problem is how to tap the replacement market realizing the economics of equipment trade-ins are *not* attractive to operators—except to purchase the latest "hot" new game. More about the replacement market and trade-ins later.

The third segment of a mature market for new

equipment sales is the steady, albeit slower, *stream of pipelines sales* to new arcades and street locations. We can expect to see an increase in the trend towards "space theme" type arcades and rapid expansion of pizza parlor type formats. Major chain street locations, such as Dunkin' Donuts and Winchell's Donuts, also offer significant opportunity for new equipment sales.

The words "market maturity" or "market saturation" may at first sound ominous and foreboding—however, *change* always presents new opportunities. And foresight and proper planning will allow us all to prosper from such new opportunities.

The pace of new game debuts

The second industry issue before us today is the problem of rapid introduction of new games. Distributors and operators alike are being flooded with new games—some "hot" and others not so hot, but nonetheless good money earners.

Broad player appeal and enthusiastic response to new video games has turned out to be a double-edged sword. On the one hand, both distributors and operators enjoy record sales and earnings. On the other hand, distributors and arcade and street location operators alike, are virtually forced to carry all the latest games. *The problem is common to every operator:* how to have all the latest games, when prices are up and trade-in values are down?

For example, every operator must keep on location the "good earning games" which today have relatively high trade-in values. At the same time, the operator must continue to buy the new "hot" games. Taking it one step further, when this same operator decides to trade in a particular model, his decision is made about the same time as everyone else. The market is then flooded with that particular model, and the floor drops out of the resale market.

Therefore, the operator has little or no trade-in to offset the initial purchase price of a new "hot" game—and the problem then becomes "How do I obtain the capital to sustain operations?"

We can all remember back a few years ago when the timing of trade-ins was critical to an operator's financial success. Today the element of timing is virtually non-existent; it's simply a matter of survival that an operator must have all the best new games.

Suffice it to say for now that trade-ins are the key to

video conversions from a major U.S. manufacturer:

what do they hold in store for the coin industry?

tapping the huge replacement market discussed earlier.

Distributors' issues

The following two issues refer specifically to distributors.

The flood of new games has put a strain on the financial resources of distributors just as it has the operators. As we all know, the prime rate is hovering around 20% which means that borrowing for most is in the 21% and higher range.

As a manufacturer who is also a major distributor and operator, Sega/Gremlin is sensitive to the financial pressures of distributors. Distributors are being squeezed from both sides: the manufacturer with ever increasing R&D and normal inflationary factors increases its prices, and expects the distributor to take large inventory positions. On the other hand, the operator wants price relief from the distributor. More about this subject later.

Distributor complacency. Lastly, with the industry issues just discussed, it is obvious this is no time for distributor complacency—not a time for believing that record sales levels will continue indefinitely without returning to the basics which have, made distributors an integral part of the industry.

The handwriting is on the wall for anyone to read: If, in the long run, distributors do not provide a method to satisfy the critical "trade-in" problem, the operator will find and develop alternatives that may be less than desirable to us all.

It bears repeating that the real fuel of our industry's growth is player revenues. Without the revenues, the operator cannot buy new equipment from the distributor—and on up the ladder.

If player revenues are to continue at the record levels we all enjoy today, the player must be offered a continuing series of new and interesting games. We cannot return to the past where simple cosmetic changes or rotation sufficed.

Operator's dilemma

When faced with a decision to purchase a new game, an operator, therefore, has three options: (a) buy the new "hot" game, (b) refuse to buy the game, or (c) bootleg the game.

If the operator chooses to bootleg a game—that is to say, bring in an illegal copy—or if he refuses to buy the new game at all, both the distributor and the manufacturer lose out.

On the other hand, an operator's decision to buy a new hot game today is a real economic problem to him because eight months from now the game may have little trade-in value.

This is the type of problem that faced operators in Japan two years ago.

Sega/Gremlin system

For the past two to three years Sega/Gremlin has been working on a concept which is founded in the real economic needs of distributors and operators. During the past two years, in coordination with Sega Japan, we have taken this concept and put it through the tedious process of implementation and field testing.

Sega/Gremlin has studied, reviewed and analyzed every market characteristic and trend from both the viewpoint of the distributor and the viewpoint of the operator. Sega Japan being both a distributor and

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"And here is one of our really high-class machines..."

operator made this easier. I strongly believe it is a fundamental of good business that what is best for the industry is best for Sega/Gremlin—and this kind of thinking transcends every element of Sega/Gremlin's planning.

What has Sega/Gremlin come up with that will support the distributor's and operator's position, and stem the industry issues just discussed? Sega/Gremlin has introduced its new video games, called *Convert-A-Game* with built-in conversion capability.

The Sega/Gremlin *Convert-A-Game* system represents the most recent state-of-the-art technology. The G-80 hardware system will accommodate as yet unrealized levels of sophisticated, complex game play. And conversion with *Convertapak* is incredibly simple!

Sega/Gremlin's introduction of video game conversion will impact the industry at every level. For this reason, it is important to clearly understand the market ramifications of conversion; and how Sega/Gremlin's *Convert-A-Game* system will impact customers.

First and foremost, Sega/Gremlin presents this marketing strategy only after we have proved to ourselves the benefits of *Convert-A-Game*. Conversions are a way of life in Japan—and have been for over two years now. It was during this time we developed the *Convert-A-Game* concept.

I would like to highlight Sega/Gremlin's conversion capability and shed some light on where we go from here.

Sega/Gremlin's unique G-80 hardware system provided the technological sophistication and tremendous flexibility needed in today's marketplace. In comparison to the rather "limited" capability of cartridge/cassette systems, the *Convert-A-Game G-80* hardware has built-in future capability to design games

which are more sophisticated than anything seen to date.

As with *Astro Blaster*, Sega/Gremlin's G-80 hardware is modular in design. Housed within a card cage are six PC boards: (a) CPU, (b) memory, which holds the game program, (c) video board, (d) video background board, (e) sound, and (f) speech. The card cage is situated in a newly designed cabinet which allows front entry. Quite simply, the PC boards to be replaced are slipped out, the new boards are inserted, and off you go with a brand new game.

What does Sega/Gremlin *Convert-A-Game* and *Convertapak* mean to this industry? The best way to answer is to refer back to the earlier listing of the key issues confronting our industry.

(1) *Market maturity*. The market can be viewed in three distinct segments: the market for new "hot" games, the replacement market, and pipeline to new locations. The Sega/Gremlin new game introductions that are now being presented, as well as future models that will be introduced as *Convert-A-Game* and *Convertapak*, meet the needs of all three market segments:

(a) *Market for new "hot" games*. As regards the market for new "hot" games, all indications lead us to believe the Sega/Gremlin new game introductions are timely to the marketplace—and are dynamite at the player level. And with the purchase of such games operators will be provided with an additional major benefit—built-in resale value at a later date. How so? Through *Convertapak* conversion capability in the replacement market.

(b) *Replacement market*. There are two levels within the replacement market. On one level are sales of Sega/Gremlin *Convert-A-games* to operators who need to add or replace equipment for whatever the reason. On

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the second level, in the future, are sales of Sega/Gremlin new game *Convertapaks*, and sales of one complement sales of the other.

• • •

Looking back again to industry issues, I would like to explain how *Convert-A-Game* and *Convertapak* make a very positive impact on the pace of new game introductions.

(2)*Pace of new game introductions/trade-ins.* There is a trend which suggests the player is not only more sophisticated in terms of what he expects from a game, but is also less and less inclined to stay with a new game for any period of time. This should mean manufacturers will be forced to introduce new games at an even faster pace than today. The added pressure on operators to have all the latest "hot" games will increase significantly!

The problems of too many product introductions, high new game purchase prices and low trade-in values are all mitigated with Sega/Gremlin's *Convert-A-Game* system.

It is important to remember that today's great "winner" is next year's problem unless you can convert the game to something new that's also a "top" money earner.

Convert-A-Game is a concept whose time has come, and I believe Sega/Gremlin is the first to develop and implement a truly sophisticated and flexible system to meet current and future market demands.

(3)*Distributor capitalization.* The benefit of conversion in terms of distributor capitalization is fairly obvious. With less capital tied up in *Convertapaks* a distributor can finance additional new business. The

ability to finance additional sales should properly be viewed as incremental business attributable to Sega/Gremlin's *Convert-A-Game* system.

In addition to this is the fact of credit lines. For the approximate price for one new machine of \$3,000, three *Convertapaks* can be sold.

Where do we go from here? We look at the industry as having about 700,000 computer video games on location. Over the next three years all these machines will have to be replaced. I leave it to your imagination as to the excitement and demand *Convert-A-Game* and *Convertapak* will create at the operator level!

Sega/Gremlin will continue to design and manufacture unique games other than the *Convert-A-Game*. Arcades, for example, will always require special effect games, a unique cabinet may be required for particular-type game play, and on and on.

Newer game systems to come

Also, Gremlin/Sega will introduce several different models of its *Convert-A-Game* system, and each model will be available in standard upright, mini, and table configurations. It's hardly a secret that Sega/Gremlin is about to unveil the world's first color X-Y game. That gives customers two *Convert-A-Game* models— color X-Y games and standard raster monitor games—with which to enjoy the economic advantages of *Convertapak* conversions.

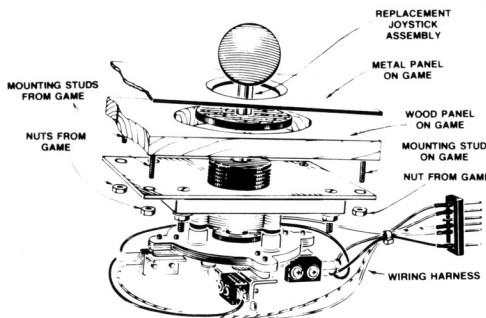
Lastly, Sega/Gremlin has beefed up its customer service function—and will continue to do so, even to the point of over-kill, to make absolutely certain we give the customer service support he needs. Field seminars including actual demonstrations of *Convert-A-Game* conversions will be scheduled throughout the country.

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Midway games cases:

Alleged video copies impounded from locations

Midway Mfg. Co. has obtained temporary restraining orders and the impoundment of numerous video games from various locations in the Boston area in a suit against operators and location owners for infringement of copyrights in *Galaxian* and *Pac-Man* games.

The suit by Midway was brought in U.S. District Court in Boston against defendants Melo-Tone Vending, Inc.; Dugas Vending, Inc.; Ryan Vending and Amusement Co., Inc.; 1001 Plays, Inc.; David Keene d/b/a Cape Bowl, Falmouth; World of Games Arcade; Mason Investment Corp. d/b/a Mason Recreation Center; J.B.W. Corporation d/b/a Joiey's Pub; and Parkside Development Corporation d/b/a Jason's.

The impoundments were conducted simultaneously by a number of county sheriffs at the various locations.

Games called "*Packman*" and "*Lunar Invasion*," not manufactured by Midway and alleged to infringe Midway's copyrights, were seized and impounded from the following Massachusetts locations: 1001 Plays in Cambridge, World of Games in Lowell, Joiey's pub in Shrewsbury, Mason Recreation Center in Fitchburg-Leminstor, Cape Bowl in Falmouth, and Jason's in Dennisport. The infringing "*Packman*" video games were identified as being manufactured by Omni Video Games, Inc. of Providence, Rhode Island.

After the impoundments, a contested hearing was held on the case, and the court issued a preliminary injunction against the defendants.

Midway is also seeking its lost profits and the defendants' profit from operating the infringing games, as well as its costs and attorneys' fees incurred as a result of the suit.

Midway announced it intends to continue vigorously prosecuting its rights in *Galaxian*, *Pac-Man*, *Rally-X*, *Gorf* and *Wizard of Wor*, as well as its rights in its other new video games when released, against all infringers and those who sell or operate infringing games.

On June 25, 1981, the U.S. International Trade Commission issued an exclusion order and opinion that certain coin-operated audio-visual games, kits, and components thereof infringe the copyright and/or trademark rights of Midway Manufacturing Co. in the *Galaxian* video game and are excluded from entry into the United States.

On June 9, at a public meeting the ITC unanimously determined that there is a violation of Section 337 of the Tariff Act of 1930 in the unauthorized importation and sale of the games, kits, and components based on such infringement of Midway's rights.

The exclusion order was issued

against the following coin-operated audio-visual games, kits and components: *Moon Alien*, *Kyugo Galaxy*, *Hoei Galaxy*, *Taito Galaxian*, *Karateco Galaxian*, *Fuso Galaxian*, and *Artic Galaxian*.

The order was also issued against any other unauthorized games, kits or components which use the name *Galaxian*, *Galaxy*, or *Galaxip*, or otherwise bear a false designation that originate from Midway.

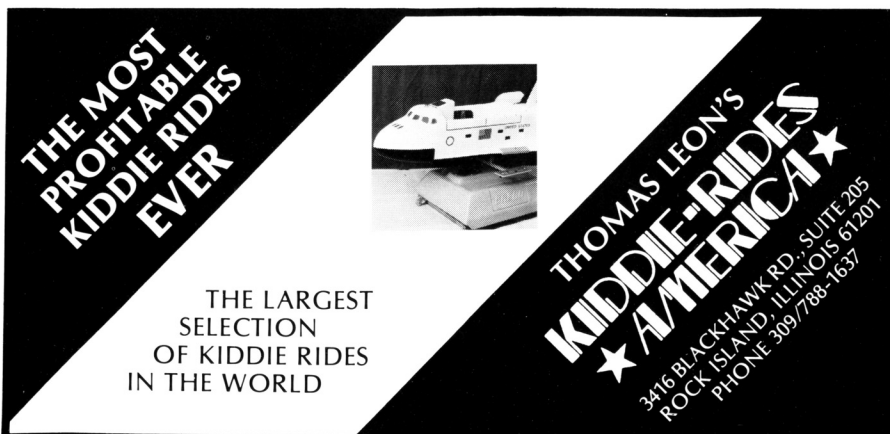
The following companies were found to have infringed Midway's rights in *Galaxian*: Artic Electronics Co., Ltd.; Chens International, Inc.; Fuso Corp.; Arjay Export Co.; Taito of Japan, Ltd.; Taito of Hawaii Corp.; Hoei Sangyo; Stan Rousso, Inc.; Miyabi, Inc. d/b/a Compu-Game; M. Enterprise, Inc.; T.T. Sales and Service; Kyugo Co., Ltd.; and Circle International, Inc.

All of these companies, as well as their customers, who have sold the infringing games, kits or components, or who have operated the infringing games, may be subject to civil suit for infringement of the rights owned by Midway Manufacturing and liable for damages, profits, costs and attorneys' fees.

Such games, kits and components are also subject to seizure and impoundment under the U.S. Copyright Act from any warehouse, showroom, game room or location by order of court and without prior notice.

Stan Jarocki, vice president/marketing of Midway, said: "Piratical copying of video games and the infringement of proprietary rights in those games undermines the creativity which is the life and blood of this industry. Midway intends to continue actively enforcing its rights in its popular video games through all legal means available."

Midway announced it will continue to seek seizures of infringing games through civil suits and U.S. Custom procedures, as well as exclusion orders through the U.S. International Trade Commission proceedings. Criminal sanctions will also be sought in appropriate cases.



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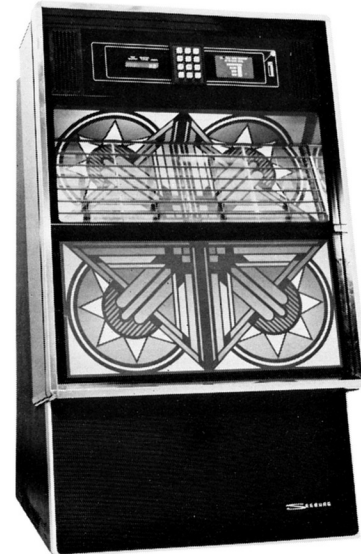
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Pace quickens for exhibitors signing for AOE '82/Chicago

Exhibitor support for the Amusement Operators Expo of 1982 was expanding after less than six months since the successful second annual Expo of this year, according to organizers of the coin-op show.

More than 130 booths were committed to exhibitors by August 1 for the 1982 AOE to be held in the Hyatt Regency, Chicago, March 26-28. Tony Scalisi, spokesman for Conference Management Corp., which organizes the event, said: "It's totally accepted by all of the (exhibiting) companies. This year it's totally recognized in the industry, across the board. It could be well over a 200-booth show," said Scalisi.

Exhibitors signed-on for 1982 and who had not made the second year's AOE, included Bally, Midway, Williams, and Centuri, as well as Konami Industry of Japan. Gremlin was currently the largest exhibitor in terms of space reserved, with 12 booths. "All major companies will probably be in this year," said Scalisi, noting the addition of suppliers as

well as manufacturers; for example, Standard Change Makers of Indianapolis, to exhibit at the AOE.

He went on to say that the AOE has proved to be profitable for the exhibitor, a fact made evident at the 1981 show when attendance exceeded projections at the same time that the reduced numbers of exhibitors (over the first ever show in 1980) reported a land office business. "It's because really there aren't that many places for them to exhibit that are effective," Scalisi commented. "The last two years have established the AOE as a major show."

Ralph C. Lally, *Play Meter* publisher and sponsor of the AOE, said of the exhibitor numbers, "The increase in product display indicated for the third annual Amusement Operators Expo is encouraging. It reflects support for an operator-oriented show by exhibitors who failed to be in New Orleans for the 1981 Expo, as well as the repeating exhibitors.

"Clearly, the popularity of the

AOE seminar program is the attraction for growing numbers of operators seeking the AOE as a major industry event," he added. In the New Orleans show of March 12-14, attendance nearly tripled from the initial 1980 AOE Show.

Conference Management broke down the profile of 1981 attendees this way: 38 percent were route owner/operators; 25 percent, arcade operators; 15 percent in distributor sales; 11 percent arcade management; and 7 percent were technicians (a heavy technical component as well as the business-oriented sessions contributed to the AOE seminars of spring 1981). Attendees signed up for a minimum of two days at the show; they attended an average of nearly four seminar sessions each.

Exhibitors for 1981 expressed enthusiasm about AOE '81 because of the buying nature of the show, where a number of new products were unveiled (*Play Meter*, June 1, pages 24-34).

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Toria Costa, muscular dystrophy Poster Child, gets acquainted with Chuck E. Cheese, host of the first annual Asteroids Tournament to be held at 50 Pizza Time Theatres throughout the country, August 24 through September 3. Proceeds from the tournament will be donated to the Muscular Dystrophy Association.

Videos for MD

Chuck E. Cheese hosted his first annual Asteroids Tournament August 24 through September 3 at 50 Pizza Time Theatres in 12 states. The goal of Pizza Time Theatre, Inc. was to raise \$50,000 for the Muscular Dystrophy Association. Proceeds from the event will be donated directly to the Association on the Jerry-Muscular Dystrophy Telethon, Labor Day weekend.

For a \$1 entry fee, participants will be given five tokens to play the Asteroids games. Entrants may register to play as often as they wish during the two-week tournament scheduled to run Mondays through Thursdays from 2 to 8 p.m.

Age categories will be seven and under, eight through eleven, twelve through fifteen, and sixteen and over. Both the standard Asteroids and the new Asteroids Deluxe will be used for the event.

An Asteroids Deluxe game will be given as the First National Prize for the highest score. Prizes given at local Pizza Time Theatres will include Atari home video games with the Asteroids cartridge, as well as game tokens and Chuck E. Cheese T-shirts.

Pizza Time Theatre, Inc. operates and franchises "Chuck E. Cheese's Pizza Time Theatre" family-oriented restaurant and entertainment centers.

Speculation at C.A. Robinson's show:

Casual player market grows

A sudden rush of new amusement games product led C.A. Robinson & Co. distributorship in Los Angeles to hold a "spontaneous" showing of the machine introductions recently.

Ira Bettelman of C.A. Robinson counted 800 people present for the one-day showroom opening in July. It was, he said, "clearly a testimony to the advantages and necessity of keeping abreast of developments in this industry."

On show at C.A. Robinson July 1 were first-time appearances of games including Atari's Centipede and its Battlezone "open-faced" model and Red Baron uprights; Midway's Wizard of Wor and Omega Race; Pleiades by Centuri; Space Odyssey and Super Moon Cresta from Gremlin; Super Cobra by Stern; Taito's Colony 7; Bally's Fireball II and Game Plan's upright model Shark Attack.

In meeting operators at his Los Angeles showroom, Bettelman said he found "a unique new phenomenon was occurring—that is, as opposed to the past when some blockbuster winners maintained their earning position for a significantly long time.

"The phenomenon now is a lack of congruity in the success of one game or another," Bettelman stated. He had observed, in other words, that a given game, doing well in revenue pull for one operator's sector, has been found to be a "dog" by another operator.

Ira Bettelman's explanation for this observed trend was that in the recent past, 18 months or two years ago, the majority of paying players were "aces—repeat customers who determined what they liked and

played what they liked."

By contrast at present, Bettelman told *Play Meter*, an enlarged "player base...is not made up of sophisticated experts but of new, casual players, not drawn to any specific machine." Compared to two years ago, when more quarters probably came from the "expert" than the "casual" player, in Bettelman's analysis "today the expert is in the minority."

All having to do, likely, with the broadening player interest in coin-op games, the consumer situation at mid-1981 was seen as a situation more like a child in a candy store with a pocketful of quarters buying candy wildly, rather than as a wine expert buying in a wine shop.


And what this may effect, said Bettelman, is the design of new games. The new creations would have to be suited to the casual, not the constant player.

Further, he said, with regard to the predominance of game product originating in Japan—if the Japanese playing public doesn't fit the observed American "casual player" character, then the games manufactured and tested on a Japanese market may end up in the United States as "bombs."

Potential end effect: more games developed domestically and tested and marketed here.

Meanwhile, back at C.A. Robinson's, no commitment was made on having a mid-summer show of games again next year. The July flurry of new product introductions may have been a "one time thing," said Bettelman, and the showing was a special service to the distributor's customers.

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ADMA installs in Chicago

By Ray E. Tilley

Now set up "in shop" as a third major trade association for the coin-op industry, the Amusement Devices Manufacturers Association (ADMA) promises to be a service to the distributing and operating arms as well, says its executive director, Paul Huebsch.

Huebsch talked with *Play Meter* in his new Des Plaines, Illinois offices approximately one week after the ADMA board of directors held its first formal meeting in those offices to discuss matters from house-keeping in the new shop to "industry events," said Huebsch.

Huebsch was enthusiastic about the prospects of the new association. "We hope to do everything we possibly can for all the people in the industry—operators, distributors, and fellow manufacturers," he said. The Illinois native (his father was once a state legislator) comes to ADMA with a wide background in the coin-op field, most recently as general manager of Atlas Music Company in Chicago.

"Years ago, everything was more or less based in Chicago. Half of the jukebox people were here and all the games makers at the time," he pointed out. "But now, this is a nationwide business, stretching from coast to coast, and I think this organization was a move that was long overdue."

He noted that there are now three

associations, with the AMOA and the recently-formed distributors group, "the prime purpose of all three being to coordinate our movements and do the best we can for the ultimate guy, the operator. It's not the purpose of ADMA to usurp the others' functions. It's a mutual area we have to work with. We're going to help them as well as look to them for assistance where we might have germane problems."

As an example, he pointed to a meeting set up May 29 by ADMA to host manufacturers' attorneys for discussing their mutual problems of copyright infringement by apparent games copiers. Also, an attorney is retained by the association, David W. Maher of the Chicago law firm Reuben & Proctor. As one of Maher's first roles for ADMA, he met with Rufus King of New York, an attorney and industry authority, particularly on legal definitions of legitimate amusement games.

With legal expertise available to it, ADMA will be able to aid operators when local legislation problems surface involving coin-op, said Huebsch. "An organization like this is going to be good, not only for the members, but for the industry as a whole. The services we render will be at no charge to the operators."

The legal battle to protect game copyrights is an example, he said, where operators will benefit, as in preventing the situation of

operators being required by court order to return copy games. And in the area of technical information for game servicing, ADMA may in the future provide a clearinghouse for the material, Huebsch indicated.

Advertising to the general consuming public is also a possibility for the ADMA agenda. Regarding the need for good image for the industry, Huebsch said: "It's probably a matter of educating the general public. There is a certain connotation about coin-operated amusement games, but the way they've grown and come about has produced one of the greatest sources of amusing people ever. And they're perfectly legal."

But of the ADMA organization, Huebsch added, "It's not solely a PR movement."

At its February 10 organizing meeting, the ADMA board of directors elected officers: Joseph Robbins of Atari, president; Michael Stroll, Williams Electronics, vice president; and Robert Bloom, D. Gottlieb Co., treasurer. Others on the executive board are Gary Stern, Stern Electronics; Donald Rockola, Rock-Ola Manufacturing; Duane Blough, Gremlin Industries; and H.R. Kauffman, Exidy.

Offices are located at 2300 E. Devon Avenue, Suite 221, Des Plaines, in a suburban area near O'Hare Terminal.

All companies which manufacture coin-operated amusement devices in the United States have been invited to join the association by contacting the ADMA offices or one of the above members. With one of its aims being the dissociation of amusement machines from gambling and pseudo-gambling devices, membership would be restricted to amusement machine manufacturers only. Within the industry, however, "it's an open association," said Huebsch, and a membership drive will be part of his new responsibilities.

A veteran of 30 years in coin-op, Huebsch began with the J.H. Keeney Company, a Chicago manufacturer. Later joining Rowe International he rose to general manager, a post he held when he resigned in 1979 to move from his New Jersey base to Chicago and Atlas Music.

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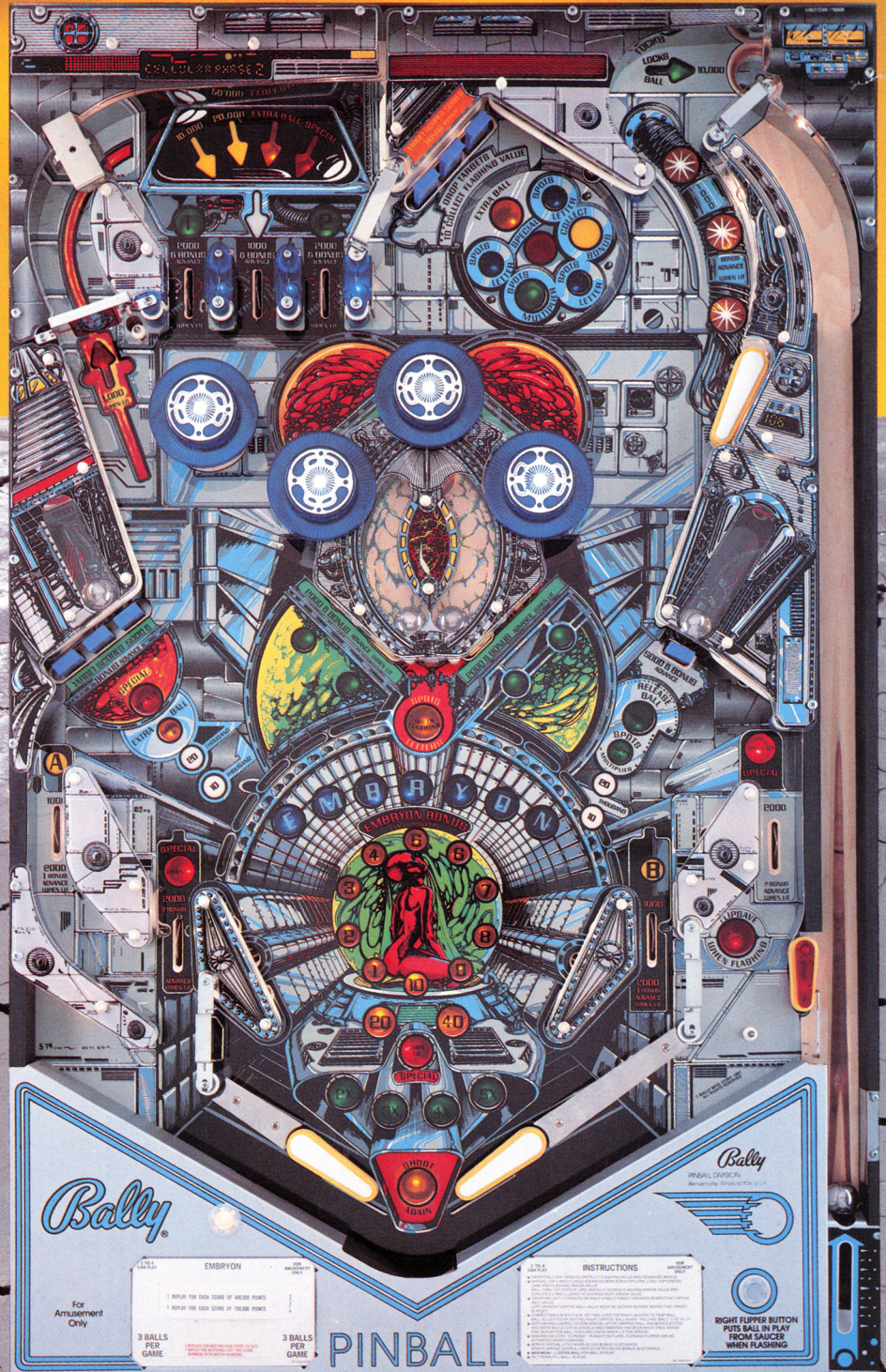
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From ADMA's president:

A plan for cooperative industry lobbying efforts

Memorandum on a Plan for Reacting to Proposed Adverse Legislation:

A very recent situation that developed in Redondo Beach, California, points out the need for a clearly outlined plan of action to be followed in future cases.

Generally, legislative or regulatory problems will develop at a very low level. An ordinance, zoning change, or similar regulative device will be introduced in the village, town, township, county, or city, and usually by one or more councilmen, or by the community attorney.

In almost every case, but not in every one, one or more hearings are required before a vote can be taken. Sometimes a good deal of advance notice is received, but sometimes very little time, a few days, and, infrequently, no warning at all.

Generally speaking, as the area of government rises, the notice is longer and more formal. This is especially true of bills introduced in state legislatures. They generally are referred to a particular committee, and the committee will serve notice of hearings, etc. I think it best, at this time, to refrain from discussing the implications of federal legislation.

In the case of trouble at a local level, the presence of an operators association, either of the state or local variety, is of enormous help. This is especially true if they have counsel on retainer, or available with previous similar experience. Assuming this is present, the attorney and the association can assume control of all defensive strategy and action.

If there isn't any such force in place, the distributors and the operators in the area must meet and assume immediate control. An attorney must be engaged at once. He should, preferably, have knowledge and experience in dealing with community and local legislative matters.

Once this is done, then the next step is to meet with the local

authorities as early as possible, before any hearing. If possible, define the issues, and identify the parties initiating the proposed legislation. Short of immediately defeating any proposal, some form of delay, tabling, or further deferral, is a primary objective. During these early stages, it is always preferable to keep the action at a very low key—local operators, distributors, storekeepers, and attorney only; no attorney or representatives from national organizations, outside factories, etc.

In almost all cases, a very concerned, unified, and intelligent approach and defense by the local businessmen will suffice. Certainly, it is advisable that they confer with officials and attorneys of the Amusement Devices Manufacturers Association, the national distributors association and the AMOA. Now, should it appear that the local effort needs supplementing, then it would be appropriate to arrange for a conference and involve personal representation by counsel and officials of the major organizations and factories.

Now, in the cases of state legislative matters, the approach is more complex. Here is the perfect example of where the state (and sometimes local) operators associations can play an essential and decisive role in combatting the introduction of adverse legislation.

In every case, the distributors and operators are required to create a groundswell of support from every possible source including businessmen in every phase of the industry and legislators in every part of the state. This is a prodigious job for the future distributors and operators and, of course, an "on hand" association with ready counsel is a tremendous asset.

In state affairs, the question of when to use directly the help of the national organizations, factories, counsel, etc., is usually one of timing.

From the onset, they should be involved if only from the periphery and in consultation.

I cannot emphasize too strongly how important the presence of a strong local operator association can be when trouble occurs. In the absence of any group, the distributors and principal operators must combine to take hold of the reins. In a local situation, the reaction must be led by local people, including counsel.

In every case, at every level, there is required continual communication by and between the local elements involved and the ADMA, the AVDMA, and the AMOA.

For coordinating purposes, I am suggesting, at this time, that all communication and questions be channeled through ADMA by contacting Paul Huebsch, executive director of ADMA, at 312/296-6333, or David Maher, chief counsel for ADMA, at 312/558-5229.

*Joe Robbins, President
Amusement Devices Manufacturers
Association*

The Parable of the Isms...

Socialism: if you have two cows, you give one to your neighbor...

Communism: If you have two cows, you give them to the government,

then the government gives you some milk...*Fascism:* If you have two cows, you keep the cows and give the milk to the government;

then the government sells you some milk...*New Dealism:* If you have two cows, you shoot one and milk the other;

then you pour the milk down the drain...*Nazism:* If you have two cows, the government shoots you and keeps the cows...

Capitalism: If you have two cows, you sell one and buy a bull.

—Source unknown

AVA logs \$1 million in *Star Castle* sales

Audio Visual Amusements of St. Louis has reached a landmark in selling over \$1 million in Cinematronics games within ten months, August 1980 to June 1981, reported Pete Entringer, president of A.V.A.

Entringer told *Play Meter* that Tom Stroud, Cinematronics vice president, had telephoned him to personally congratulate him for A.V.A.'s success with that game line, "I have to thank for my success the factories like Cinematronics," said Entringer.

The St. Louis distributor also handles lines including those of Nintendo, Nichibutsu, U.S. Billiards, Dynamo, and Electro-Sport.

URL Promote Tech Talent

Universal Research Laboratories (URL), Inc., Elk Grove Village, a subsidiary of Stern Electronics, Inc., announced the following staff promotions in its engineering department:

Anthony J. Miller, recently named director of engineering, was chief design engineer since joining the firm in 1979.

Terrance Coleman, formerly a design engineer, has been appointed chief electronics engineer. Coleman has been with URL since 1979.

Alan McNeil has been appointed chief engineer of software development.

STERN INTRODUCES NEW "COPY PROOF" SYSTEM

Stern Electronics, Inc., of Chicago, announced that it has introduced a new "copy proof" information storage system on its newest video game, *Super Cobra*, developed by Konami Industry of Japan.

The new memory unit, housed in a box at the base of the game cabinet, plugs into the video/MPU boards and prevents the copy or "knock off" of the game's logic system by competitive manufacturers.

"Copy proof" systems will be placed on many new Stern video games, according to company officials.



Putt-Putt hosts video tourney

A \$10,000 tournament on *Pac-Man* video games will have its national finals in Fayetteville, North Carolina on August 29 and 30, according to an announcement from Don Clayton, chairman of the board, Putt-Putt Golf Courses of America, Inc. Clayton explained that *Pac-Man* currently is Putt-Putt's most popular video game.

Video champions will be determined in local tournaments being held at affiliated Putt-Putt Golf and Games locations in approximately 50 cities. The final champions from three regional eliminations will then appear in Fayetteville for the national finals. Clayton stressed in his announcement that Putt-Putt Golf Course employees are ineligible for competition in this event.

The prize money breakdown is \$5,000 for first place, \$2,500 for second place, and \$1,000 for third

place. In addition, the three regional finalists will receive \$500 each at the regional play-off sites. The stakes were believed to be the largest prize money offered in a video competition in America to date.

Local tournaments to decide the preliminary winners in the \$10,000 championship began July 19. Four weekly events were staged at each participating Putt-Putt Golf and Games gameroom.

Regional play-offs in the Southern, Northern, and Western regional were to be conducted August 15 and 16 in Winston-Salem, North Carolina; Ft. Worth, Texas; and Columbus, Ohio.

Clayton announced that Putt-Putt Golf and Games has plans at the present time for over \$50,000 in tournaments during the summer of 1982.

AMOA Expo plans are set

The 1981 AMOA Exposition will be held Thursday, October 29 through Saturday, October 31, at the Conrad Hilton Hotel; Chicago. Exhibits will open from 12 noon to 6 p.m. on Thursday; on Friday from 10 a.m. to 6 p.m. and from 10 a.m. to 4 p.m. on Saturday.

Ara Parseghian, Notre Dame's popular, former head coach, will keynote the event; and industry seminars will be conducted throughout the three-day program. Other special events include a Ladies' Luncheon and Program (Thursday, 12:30 p.m.), the AMOA

membership meeting (Friday, 11:30 a.m.), and a banquet and stage show (Saturday, 7 p.m. to midnight).

The registration fee, which covers all three days, is \$35 per person (U.S. funds). Pre-registration is being handled by the AMOA office until Friday, October 2. Registrants should include such information as names, company, address, and business category, along with their registration fee. All badges will be distributed at the Expo registration desk in the Hilton.

For further information, contact the AMOA office: 312/726-2810.

Bally service schools coming

Bally and Midway have scheduled their annual 5-day service school to begin September 21 in Schiller Park, Illinois.

Bernie M. Powers, director of marketing services for Bally Pinball Division and Andy Ducay, field service manager, Midway Mfg. Co., announced the Bally/Midway Annual 5-Day Service School will be held September 21 through September 25, 1981. The Howard Johnson Hotel in Schiller Park, Illinois is the site of this popular

school.

This year's format will focus two days on Bally pinball and three days on Midway arcade games. The school is open to anyone; however, enrollment will be limited to the first 100 applicants.

For further information on the School or to confirm reservations, call Diane Guzzi at Bally's Pinball Division 312/860-6400. Out of State applicants can call toll free 800/323-3555.

Pinball talks robber away

Among the other civic contributions of pinball machines, the thwarting of an armed robber can now be counted.

It was a "talking" pingame that foiled a holdup at a convenience store, 4100 Canal Street in New Orleans on, June 28. Police said the would-be robber in his 20s entered the store about 10 p.m., drew a gun from his waistband, pointed it at the young woman at the cash register, and demanded that she "Give it up!"

At that point, the talking attract mode of a pinball game nearby engaged itself. (Name of the game unspecified by police.) "I want you to play me!" said the machine in guttural tones.

The bandit, not seeing a man present, was fluttered. Reports said he voiced a four-letter obscenity, turned, and fled empty-handed.

Police described the bandit as 5-foot-8, wearing a dirty orange shirt, a white male with the letters "B J" tattooed on his right hand.

He probably won't forget his first encounter with a talking pinball.

PLAY METER CALENDAR

September 19

Music Operators of Michigan, annual convention, Lansing

September 25-26

West Virginia Music & Vending Association, annual meeting, Ramada Inn, South Charleston

October 6-8

JAA Convention, International Trade Center-Harumi Bldg., Tokyo

October 7

Ohio Music and Amusement Association dinner and drawing, The Tangier, Akron

October 7-12

Japan Electronics Show, Osaka International Trade Fairgrounds, Osaka

October 12-18

Taiwan Electronics Show, World Trade Center, Taipei

October 14-20

Korea Electronics Show, Exhibition Center, Seoul

October 15-18

Enada Show, Rome, Italy

October 16-17

Amusement & Music Operators of Virginia, annual convention, Holiday Inn, Richmond

October 29-November 1

NAMA annual convention-exhibit, McCormick Place, Chicago

October 29-31

AMOA Exposition, trade show and convention, Conrad Hilton, Chicago

November 25-27

Incomat Exhibition, Salzburg, Austria

December 9-12

Forainexpo, Paris, France

January 18-21, 1982

ATE, Birmingham, England, National Exhibition Centre

January 19

Music Operators of Minnesota, annual convention, Holiday Inn, Minneapolis

January 21-24

IMA, Frankfurt, Germany



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Locations lose Midway 'copies' under federal court order

The United States Marshal's Service recently seized numerous video games and electronic circuit boards in connection with a second civil action for copyright infringement brought by Midway Mfg. Co. of Franklin Park, Illinois, in Phoenix, Arizona.

This civil action names as defendants KK Industrial Service Company, The Razwood Corporation, d/b/a Starship Fantasy Arcade, and Mercer Manufacturing.

The impounded goods seized under court order at the Starship Fantasy Arcade included 36 cocktail and upright games alleged to infringe Midway's copyrights in *Galaxian*,

Pac-Man, or *Rally-X*, plus assorted labels inscribed with Midway's trademarks for games.

Additionally, various circuit boards for games alleged to infringe Midway's copyrights in *Pac-Man* and *Rally-X* were seized at the facility maintained by Mercer in Tempe, Arizona, and impounded under court order.

In earlier action brought by Midway in Phoenix against Sutra Import Corp., Sutra West, Bernard Shapiro, d/b/a Bernie's Specialty, and Noma Enterprises, for infringement of Midway's copyrights in *Pac-Man* by the importation and

sale of "Gobbler" video games, judgement was entered against Sutra for damages, costs and attorneys' fees in the amount of \$130,800 and an injunction against further infringement. The action is still pending against the other defendants although a preliminary injunction order was entered enjoining any further infringement by them of Midway's copyrights in the *Pac-Man* game.

These actions are part of Midway's continuing efforts to enforce its proprietary rights against infringers in its popular video games, *Galaxian*, *Pac-Man*, *Rally-X*, *Gorf*, and *Wizard of Wor*.

Williams wins infringement action vs. Artic

Williams Electronics, Inc. has prevailed in its copyright infringement action recently filed in federal court in Newark, New Jersey, against Artic International, Inc.

United States District Judge Herbert J. Stern on Wednesday, June 24, 1981, upon the application of Williams, entered a final injunction order against Artic. The court order permanently enjoined Artic, its agents, employees, and others

acting in active concert or participation with them from infringing Williams' copyrights for its video game *Defender*.

The order also permanently enjoined Artic from using, vending, distributing or advertising any electronic video games or component parts thereof embodying any part of Williams' copyrighted audiovisual materials or copyrighted computer program.

Judge Stern retained jurisdiction to determine other claims by Williams and to assess damages against Artic.

Michael R. Stroll, president of Williams, stated that the company was "gratified with the decision of the court."

"Williams views any violations of its copyrights with seriousness and intends to continue vigorously prosecuting any violators," Stroll indicated.

Better visuals for videos offered

New retrofittable kits designed to enhance game play visibility for operators' *Asteroids Deluxe* and *Warlords* upright games are now available free through Atari's Customer Service Department.

The easy-to-install glare reduction


kit consists of a new monitor shield and speaker grille assembly that is angled toward the player, said the

manufacturer.

When installed, the kit substantially reduces glare and

reflection problems that may be associated with ambivalent light conditions and spectator visibility. It also improves the bass audio response since the area below the mirror now becomes a resonating chamber, according to Atari, Inc.

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Coin expo slated for Amsterdam

The 1982 Horecava exhibition dates in Amsterdam will be January 4-7. Site will be the Rai, international exhibition center.

The exhibition is a trade fair principally for the hotel/catering industries, but a section is usually provided for coin-op amusements at which most to the Dutch coin machine companies are represented.

Changeable game system from U.K.

An interchangeable game system has been introduced by the British firm Century Electronics. Called the Century Video System, it had been developed over a 15-month period by the Oldham firm, tested recently, and marketed to arcade operators.

Century's Managing Director Peter Robinson told the trade press that the CVS was being offered as an alternative to the mounting expenses of video operating in Britain. Robinson compared an "investment" in the new system to jukebox operating.

"Each phonograph installed has had to be looked on as an investment with a long-term standing for a stable return. With the interchangeable system we're introducing, the video games an operator can undertake the same foresight, with an obviously greater and more immediate return,"

said Robinson. "Just as the collector changes records on a jukebox, the video can be changed at the first indication of a drop in takings."

[See related story in this issue: "Visions '81" on the new Gremlin/Sega interchangeable games system.]

Robinson of Century went on to explain, "The idea of developing reprogrammable electronics, done either in the factory or by the use of tape cassettes was dismissed as being too cumbersome, too expensive, insufficiently versatile and not reliable enough."

Century had developed, he said, "a simple, rugged, and inexpensive module which allows instant game changes and yet which works with a system so flexible that virtually any game or novel effect of the foreseeable future can be incor-

porated."

The British firm had wholly produced its first games in the CVS series—*Dark Warrior* and *Cosmos*—which Robinson called "the first British games in their entirety."

The Century games feature a speech and music synthesizer which informs the player that the game is, first, functioning and then that his credit has been accepted.

Dark Warrior is an "extra dimensional" game featuring two "dogs" that seem to grow as they "walk" toward the player. When the creatures get within range they launch themselves toward the player as extra aliens, attempting to distract him from issuing fire from his laser base during the battle he is engaged in.

Century reported development being under way on a third game in the CVS series.

Arcade school diplomas from Dallas

The Dallas Arcade School held its first classes the week of June 22-27. The six-day school was taught by Randy Fromm, who also teaches at the San Diego Arcade School and is part of the technical staff at *Play Meter*.

The course was sponsored by Kurt Taro and Associates of Dallas, Texas. Future classes are scheduled on a one class per month basis. These classes will be instructed by both Randy Fromm and Kurt Taro's Nathan Bush.

Bush was *Play Meter's* Coinman

of the Month of July, 1977.

"Response to this first class was very positive, said Fromm. "We actually held two identical sessions per day; one in the morning from 8:00 a.m. to 1:00 p.m. and one in the afternoon from 2:00 p.m. to 7:00 p.m. That way, the students could attend the class and still keep up with their work. They could work in the morning and attend class in the afternoon, or work in the afternoon and attend class in the morning."

Twenty-three students attended the training session entitled

"Practical Solid-State Amusement Repair." The class is designed to teach the "pinball mechanic" how to repair games in the easiest way possible without having to buy expensive test equipment.

Fromm said an arcade school is planned for the Northeast and will be announced soon for a location in New Jersey.

The next session of the Dallas Arcade School will be August 24-29 at Kurt Taro & Associates, 11857 Judd Court, Suite 214, Dallas 75243; telephone: 214/231-3307.



Graduates of the Dallas Arcade School in June, 1981: left photo, front row—C. Perez, Casa Bonita; J. Gray, B&B Vending; D. Miller, D.E. Miller; R. Russell, Tex-La Amusement; B. Stanley, Crosstown Vending; standing—J. Ohde, Perry's Video Games; C. Brewer, Brewer Amusement Vending; B. Pearson, Dane's Music & Vending; G. Grogan, Galaxie Games; C. Magill, Doc's Video; S. Robertson, Zip Trip Enterprises; and Liza Pitzer, Z-Tek Systems. Right photo, left to right, front row—M. Chiselbrook, Forum Fair; R. Gibson, N. Texas Vending; K. Brewer, Vendco Vending; D. Palmer, Z-Tek Systems; J. Fulton, Brownwood Vending; standing—Nathan Bush, host, of Kurt Taro & Associates; G. Churchwell, Six Flags Over Texas; Brenda Pillsbury, Carousel Raceway; G. Glover, Automatic Sales; J. Blanks, DC Vending; C. Grady, B&B Vending; and instructor R. Fromm. Coming soon: a New Jersey area school, according to Fromm.

Exidy in production on the Emerald Isle

Exidy, Inc. has announced plans to open a production facility in Ireland. Final arrangements will be completed shortly with the IDA for a plant in Nenagh, County Tipperary, Ireland.

John Hogan has been appointed director of manufacturing for the facility. Hogan has most recently been production manager for another video games manufacturer located in Tipperary. Hogan will

report directly to Noah Anglin, president of Exidy, Inc.

Exidy Ireland Ltd. was expected to start operations August 17 with the newly developed game *Venture*. "This will enable Exidy to provide high quality, realistically priced, locally produced video games to the European market," said an announcement from the manufacturer.

Jeffries tops new firm

Status Game Corporation has been organized in Newington, Connecticut as a new management team and company for the manufacture, distribution, and licensing of new video games for the coin-op amusement gaming industries.

Irv Jeffries, president of Status Game, said: "New innovations in technology have been developed by us, that can be used in all types of video games including gaming video types, which we intend to produce.

Vice president of Status Game is Lawrence Dunn, who along with Jeffries and Steven Smith, Status Games' comptroller, was formerly associated with Game-A-Tron Corp.

"We're alive and well and making games," Jeffries commented. We'll soon be coming out with concepts and ideas that the gaming and amusement industries will be seeing for the first time," said the new company's president.

Status Game Corp. is located at 45 Spring Street, Newington, Connecticut 06111; telephone: 203/233-5581.



Jeffries

Huff

Huff joins Taito UK

Pat Huff, daughter of American trade personality Paul Huebsch, figures in two recent major departures from Associated Leisure Sales Ltd., the largest distributors of coin-operated equipment in the United Kingdom.

Managing Director Nigel Booth has resigned but made no announcement as to his future, while Huff, formerly administration director at Associated Leisure, has joined Taito UK and will head its purchasing department in London.

Huff, who was with Associated Leisure for four years, will work closely with Taito's Technical Director Norman Leftly under the leadership of the company's recently appointed Managing Director David Coren.

Huff started with Associated Leisure as a secretary, rising to an executive position with the major UK distributor.

PLAY METER, September 15, 1981

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Institute benefitted from arcade exhibit.

Games displayed as modern 'art' in Los Angeles

By Randy Fromm

Games People Play, an exhibition of the history, technology, and use of video games was held at the Los Angeles Institute of Contemporary Art June 6—20, 1981.

The exhibit was divided into three parts: in each of three rooms were displays on the history of video games, the technology of video games, and a working arcade (all proceeds from the cashbox going to support the Institute).

The exhibit was set up by Michael Mendelsohn, president of Games Unlimited. In addition to providing the games for the display and the arcade, Mendelsohn also donated a *Space Wars* video game which was awarded as a prize in a "high score" contest. The *Space Wars* was won by Paul Chen of Los Angeles.

The Los Angeles Institute of Contemporary Art(LAICA) was organized in 1973 to increase public awareness of art produced in Southern California. Institute Director Robert Smith contacted Mendelsohn about curating the exhibit as a fundraiser for the non-profit Institute.

"It was kind of a rush job," commented Mendelsohn. "We didn't have quite enough time to do as good a job as I would have liked."

Director Smith was more than satisfied, however, saying, "We made over \$1000. And quite a few of the people that came to see the arcade exhibit have returned to take a look at our latest display."

As a guide for visitors to the exhibits, Mendelsohn prepared a brief written history of the video game entitled "At The Drop Of A Quarter."



Set up by coin operator Michael Mendelsohn, the exhibit included arcade pieces and electronic boards.



The games drew youngsters, many of whom returned to LAICA to view the museum's art exhibits.



S. H. "Red" Shaver (center, above) is the first vending industry mechanic to earn certification as a journeyman/Level II under the comprehensive vending machine mechanics training and certification program launched last year by the National Automatic Merchandising Association. The certificate was presented in July by G. H. Tansey (left), NAMA director of conventions and education, at Sands & Co. headquarters in Marietta, Georgia where Shaver is employed. John Delves, in charge of training at Sands, is shown at right. Since the award to Shaver, 16 other mechanics, nine of them employed at Sands, have been certified by NAMA as journeymen mechanics and 147 have been certified as apprentices under the training program which began in early 1980. "We are extremely pleased at the reception of this training effort and are working actively with the materials in the field," Tansey said.

Stambouli sets up for expansion in France

The international Stambouli Group has announced the French government's authorization for the company to establish a Karateco video game factory for France on the outskirts of Paris.

The new Karateco factory is projected by Stambouli Group to be "the most modern and probably the largest in Europe, with a potential production capacity of 10,000 games a month."

With a new corporation formed for this unit—Karateco-France S.A.—production is scheduled for September 1981, following the August holidays in France.

Karateco at early summer was negotiating license arrangements with a number of companies around the world to bolster the quality of game product to come directly from Karateco's research and development divisions.

As a member of the Stambouli Group, Karateco-France S.A. will

have a distribution network worldwide for Karateco products.

The new company will be headed by Ms. Micheline Gehamy. Pierre Kateb has been promoted to the position of production manager, and Ramon Finster will provide coordination between Karateco and the Stambouli companies. An estimated 200 persons will be employed this year by Karateco-France, which will wholly produce its complete games.

This new venture of the Stambouli Group—which claims near-exclusive markets in the Middle East and a large portion of northern Africa—will permit its expansion to the premier position in Europe within a few years, a spokesman for Stambouli projected.

Meanwhile, Karateco Manufacturing Corporation has been chartered in the United States, and the group has stated plans to enter the U.S. coin-op games market in 1982 or 1983.

Heads Bally Gaming

Robert R. Harpling has been appointed to director of sales of the Gaming Equipment Division of Bally Manufacturing Corp.

In this position, Harpling will be responsible for all sales of gaming equipment. He has served as sales manager of slot machines since 1978. Prior to that, he was assistant sales manager, a position he held since 1964.

In announcing the appointment, Mahlon Barber, president of Bally's Gaming Equipment Division, stated, "I have the most utmost confidence in Bob's ability to further the growth of our division. His experience in the sales of slot machines will prove valuable to our division and the corporation's growth."

ENADA is sited for Rome, Oct. 15

The 10th ENADA—Esposizione Nazionale di Apparecchi da Divertimento Automatici (National Exhibition of Automatic Amusement Machines) will be held at the Congress Building at the EUR in Rome October 15-18, 1981.

All the national firms, producing automatic amusement machines and their spare parts, will participate. Also several of the more important distributors of vending machines, as well as those working in the field of amusement park equipment and material, have been invited.

The gala evening will take place Saturday October 17 at the Hotel Hilton, Rome.

Cover art credit

Credit for the provision of artwork used on the cover of *Play Meter's* August 1 Service Issue was unintentionally omitted from that issue. The color photograph was of a microprocessor unit assembled by Menasha Controls, a division of Xcor Corporation. Such Menasha units are used in pingames and videos manufactured by Williams Electronics. The photography originally appeared in Xcor's 1979 annual report to stockholders.

Play Meter is grateful for the courtesy of Xcor's sharing the illustration for our Service Issue.

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Valuing Your Business

By **Irving Blackman**

Sooner or later every closely held business must be valued, either for sale or for tax purposes. A tax purpose valuation must be faced during life if you give away any of your stock or recapitalize your company. When you are called to the big machine route in the sky, your executor must value your closely held stock for estate tax purposes.

If there is an area in the field of taxation where lack of certainty is the hallmark, it is the area of valuation of an interest in a closely held business. This causes frustration to accountants, who are used to adding and subtracting precise numbers that produce sheets which are in balance. This also frustrates lawyers, who are used to finding cases in point that, when taken in series, produce a brief that neatly proves their clients' case. Probably the most frustrated of all is the poor taxpayer client: uncertainty reigns supreme.

Placing a value on the stock of a closely held corporation often leads to serious conflict with the Internal Revenue Service. The IRS is our adversary. Valuation is a sort of game—a game without clearly defined rules. The score is kept in dollars—your dollars. Unlike publicly traded stock, whose value is published in the daily paper, the value of closely held stock must be individually determined. All too often such determinations run as follows:

a. By the IRS.....
Much higher than the value reported by the taxpayer.

b. By the taxpayer.....
Much lower than the value claimed by the IRS.

c. By the courts.....
Somewhere in between.

Huge tax payments often hinge on the outcome of such disputes. Professional fees to fight are high. Business liquidations (at sacrifice prices) sometimes become necessary to pay estate taxes.

Every company to be valued has its own sets of facts and circumstances and each valuation is unique and different from every other valuation. Two companies in the same business with almost identical numbers can have significantly different values because of just one fact different. No set of general rules or volumes of books can bring out the importance of unique facts.

The valuation process is an art, not a science, but just as art has its discipline, so too does valuation. The discipline lies mainly in approaches and techniques. The IRS, in *Revenue Ruling 59-60*, details its approach to valuing a closely held business.

This ruling is a must reading when you want to value your business for purposes. But it is only the starting point. Other rulings, regulations and a host of case law must be added to the pile of material needed to properly value a closely held business.

Let's try to simulate a real life scenario: Suppose you have a stack of stock certificates sitting in front of you—oils such, as Exxon, Shell and

Standard of Indiana. The morning paper gives yesterday's stock market value at \$1,000,000. A call to your broker will bring \$1,000,000 less commissions, to you in cold cash in four business days.

Same scene—but now suppose you have \$1,000,000 worth of your Company stock just valued by the appropriate techniques as required by *Revenue Ruling 59-60*. Worth \$1,000,000? Well, maybe. Somebody out there...when you find him... will pay you the million—over maybe five to seven years—at 10% (with prime at 17%). Oh well, you get the idea. No way is your company stock going to bring a real million dollars in cash or equivalent on the valuation date. Logic tells you a discount is in order. How much? The courts consistently allow a discount for "general lack of marketability." How much? The discount varies with the circumstances, but a safe range is 10% to 30%.

How to value a closely held business is a big subject. You should learn more about the valuation techniques that can be used to value your business. However, in the end, you and your family's best interests will be served by working with an experienced business appraiser.

Do you need more information? Send for the special report, *How to value Your Business for Tax Purposes*, which includes a sample valuation: \$15 to Blackman, Kallick & Company, Ltd.; Val. Rp.; 180 N. LaSalle St.; Chicago, IL 60601.

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From the 'talkies' to the talking pinball—

New themes for coin machines

By Roger C. Sharpe

A recent conversation with this magazine's Editorial Director David Pierson opened up a lot of ground as we discussed where the industry might head in terms of graphics and subject matter. For too long, it seems, both video and pinball have been lost in space, trapped almost by their own success and what was felt to be the magic component to attract players.

However, at this point David and I tended to agree that things would have to change and we speculated about the directions that all of us could look forward to.

Throughout the years, the industry, and pinball in particular, always looked to the popular contemporary themes for much of their inspirations. Recurring motifs which regularly appeared no matter what the prevailing moods included sports, Westerns, clowns, cards, and bits of "G-rated" sexuality for

what was always considered the predominantly male audience, as well as sporadic flights of fantasy that covered the past and imagined future.

What was consistent, was that the games generally reflected the current trends in not only content, but also artistic style. You can really get a feel for this if you go back through some of the long-gone trade publications, old brochures and flyers, or some of the books that were published in recent years chronicling the evolution of the industry.

In fact, what you will find is that the artwork never seemed to stand still and was always changing to stay in step with a changing world.

This stopped, however, when the movie "Star Wars" hit and captured the fancy of the world. Suddenly, all the themes one found on coin-op games were space-oriented. The

greatest influx was seen in video where almost everybody abandoned the sports and non-entity motifs such as *Breakout* in order to change over to something that was alien. Even car racing games took on a different appearance with spaceships taking to the byways.

For pinball the experience was no different, although the changeover was less obvious. Everyone was turning their sights to the stars, or at least to visions of the future either on this planet or created worlds that struck the same theme.

But then everyone fell victim to the onslaught. We had movies taking place in other worlds, TV shows that tried to capitalize on the wave, and all trying to out-create each other.

The tide has remained relatively the same for the past few years, although some have tried to break free from the mold. More recently

continued on page 34



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Play Meter

Equipment Poll

The following are rankings of the top videos and top pinballs making above average weekly gross collections nationwide. The dollar amounts appearing are the average weekly grosses as reported to Play Meter magazine through its regular national operator survey, including both arcade and street locations. Games with less than adequate responses (less than fifty percent) but with above average collections are so noted. Games not appearing on the poll either (1) did not generate over a ten percent response rate to provide an adequate representative sampling or (2) did not register weekly gross collections above the national average. **Special note should be made that these earnings figures are gross revenues. When computing operator revenues, these amounts should be reduced by fifty percent to reflect the most widespread industry practice, that of granting fifty percent commissions to the location owners.**

TOP PINBALLS

Seven of 20 pinballs (35%) with a response rate over ten percent have above average earnings.

	July 3	Aug. 6
National average for pinballs	\$98	\$115
★ 1. MARS/Gottlieb	\$181	\$159
★ 2. EIGHT-BALL DELUXE/Bally	\$163	\$153
★ 3. BLACK KNIGHT/Williams	\$152	\$136
★ 4. FLIGHT 2000/Stern	\$150	\$124
★ 5. JUNGLE LORD/Williams	\$113	\$121

TOP VIDEOS

Ten of 26 videos (38.4%) with a response rate over ten percent have above average earnings.

	July 3	Aug. 6
National average for videos	\$162	\$153
1. DEFENDER/Williams	\$210	\$213
2. PAC-MAN/Midway	\$213	\$206
3. GORF/Midway	\$225	\$198
4. SCRAMBLE/Stern	\$207	\$192
★ 5. CENTIPEDE/Atari	—	\$189
6. ASTEROIDS/Atari	\$192	\$185
★ 7. ARMOR ATTACK/ Cinematronics	\$197	\$183
8. PHOENIX/Centuri	\$187	\$170
9. BERZERK/Stern	\$189	\$153

★ Conditionally Rated— Weekly average based on less than 50% response rate

Provisionally Rated Pinballs and Videos (Above average earning games, with a response rate between 10—25%)

PINBALLS

VIDEOS

Provisional Ratings	July 3	Aug. 6
EMBRYON/Bally	—	\$180
PHARAOH/Williams	—	\$155

Provisional Ratings	July 3	Aug. 6
WIZARD OF WOR/Midway	—	\$239

If you would like to join the ever-growing number of readers participating currently in the survey, write: Play Meter Equipment Poll, P.O. Box 24170, New Orleans, LA 70184

STILL
#1

#1 VIDEO

Defender
RePlay Magazine
THE PLAYERS' CHOICE
April, 1981
May, 1981



#1 VIDEO

Defender
PLAY METER
Equipment Poll
August 15, 1981

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there's been a decided shift, and so the discussion with Dave Pierson.

Where are we going? What can we expect to find for upcoming games that might herald in some new ideas and approaches that can be as successful as outer space and yet allow the options to continually try new things...?

From silver screen to silver ball?

As in the past, the main inspiration will undoubtedly come from the movies, although, hopefully, other areas will also be tapped since imagination isn't limited

to this single medium. This writer's feeling is that, given the nature of the times we are living in, there will be no single theme that will predominate and have the same power as outer space. We, in fact, should see a variety of themes that will touch on many subjects.

The world of music, so much a part of everyone's life, holds out some promise, although, in the past, the only company to really take advantage of this area has been Bally. But we may see a slight rebirth in this category, especially with the overwhelming popularity of Country

and Western, which *Eight Ball Deluxe* only touched upon.

Another valid direction may prove to be punk or new wave music, which no one has really paid much attention to, probably because of the ages of most of us and the fact that we've lost touch with this very viable development.

On another front, and one that might rival space, is the concept of legend and myth since so many movies have been hits dealing with this subject, including "Dragonslayer," "Excalibur," and others. It is a form that offers the magic of the past we have all grown up with and the fantasy of knights fighting dragons and saving damsels in distress.

But something else that's developing is a return to war—both real and imagined, from the comedy of "Sergeant Benjamin" to "Stripes," and others more honest in their depiction. This is going to be fertile ground and we should all prepare ourselves.

Admittedly, whether any of these trends prove to find themselves on coin-op games will, in part, be determined by the adaption of sounds and integration of the cosmetics so important to today's games. Some lend themselves better than others, but as the technology expands so too will the ability to accomplish almost anything.

What will be important is that the industry doesn't find itself, once again, caught in something it can't, or doesn't want to, escape from. The similarity of motifs isn't, and never has been, a positive over the long haul. Those efforts which have managed to be different always tend to stand out from the crowd and capture the attention of players.

The big decision is to see who is willing to take that first step, and for the industry to rely less on imitation and more on innovation. It is a fact of life that has always plagued the industry and probably won't change much as long as there are people around who can profit by it.

But it carries over into the problems we are suddenly having with pirated games, similar game design whether it be video or pinball—and, of course, the nature of the artwork. For the industry to continue to grow, it will need the risk takers, those who are willing to take the initiative and dare to be different because they believe in what they're doing.

Let's hope that these will be the rule, rather than the exceptions. Only time will tell.

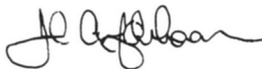
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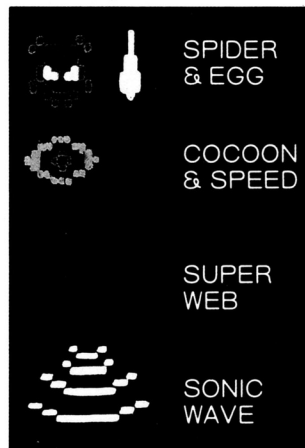
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- Every time one super web is hit, one Spider's belt is vanished.



Giant Spider appearing upon game start



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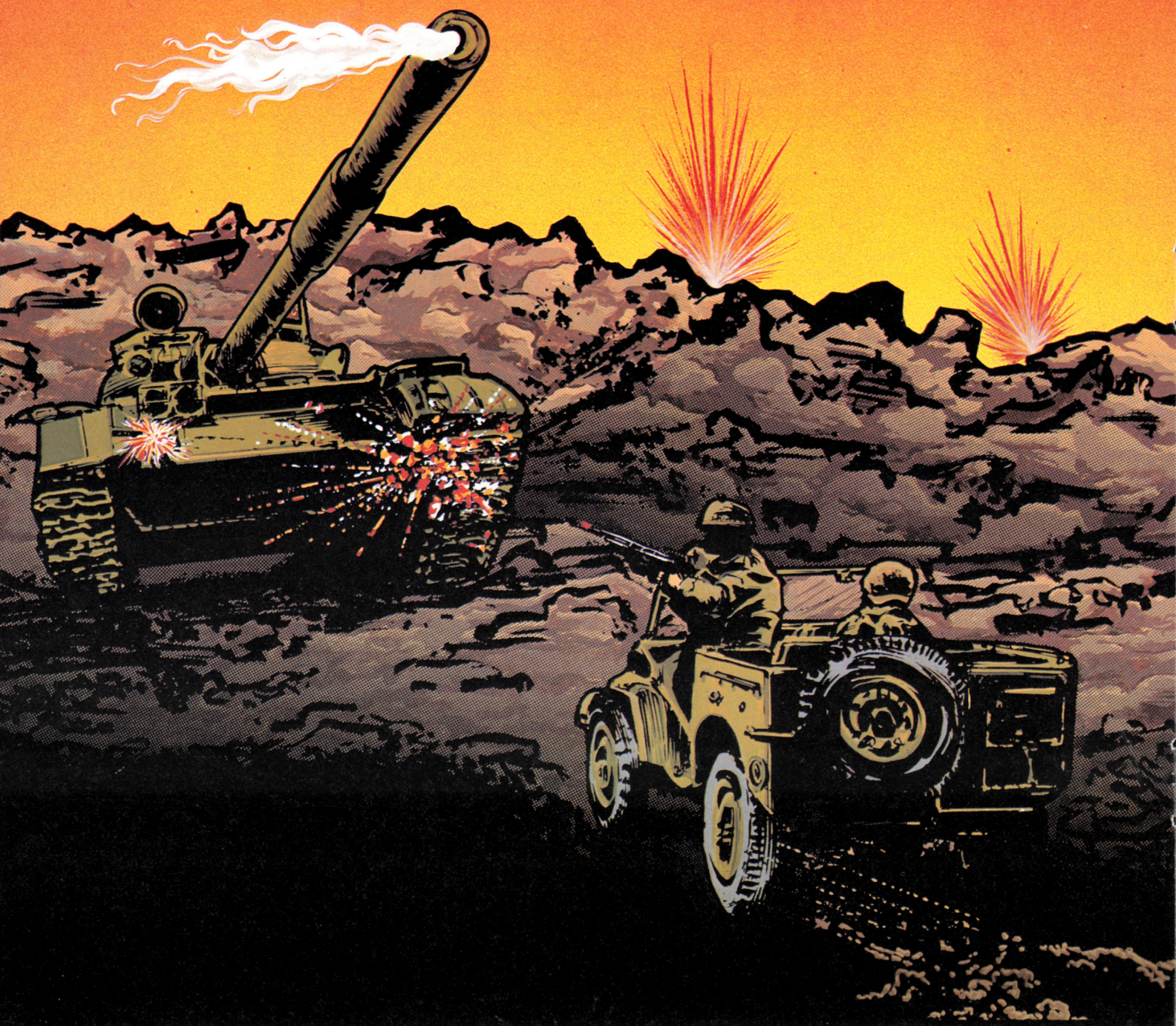
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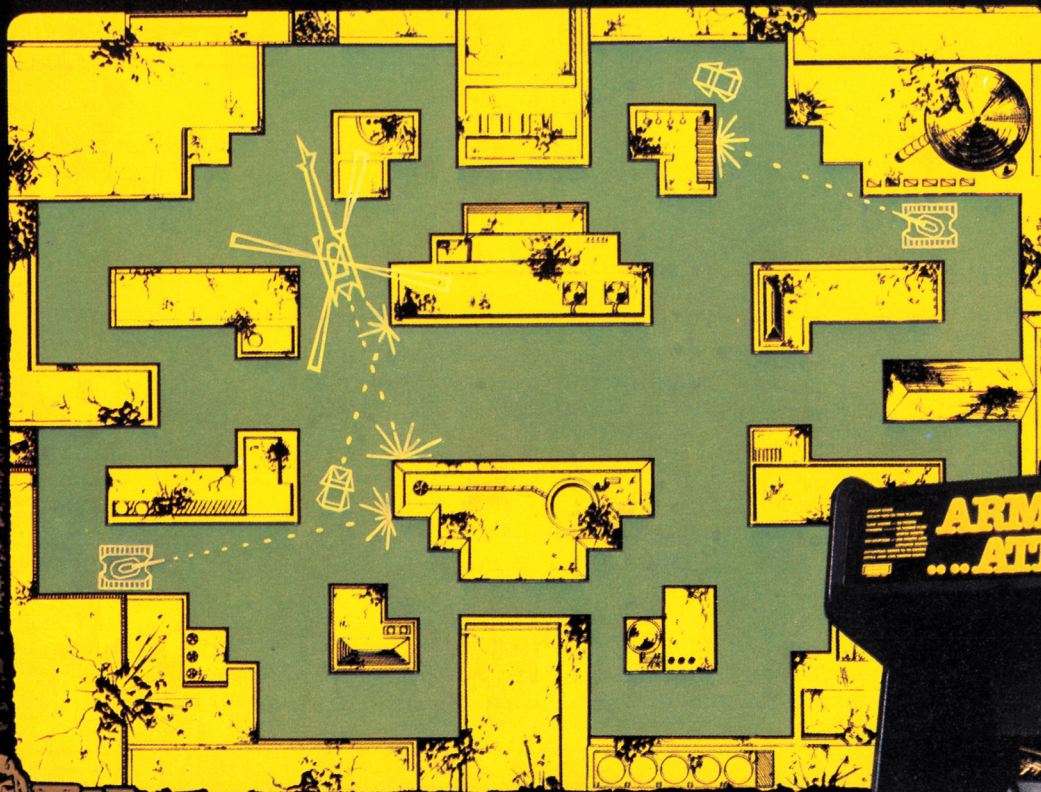
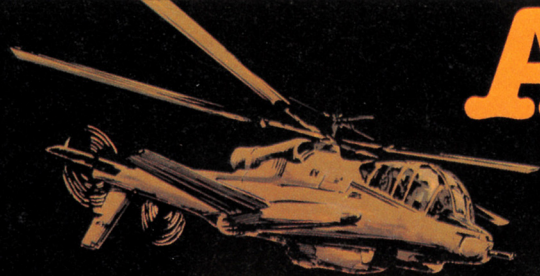
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Business Myth of the Month

A large part of the reason the amusement industry, and video games in particular, have come into public spotlight is revenues. Everyone in the industry, as well as many outside the industry, is awed by the revenues that these new video games are bringing in and consequently everyone wants in on a good thing.

While the business is good and the industry is a good thing, it is not as easy as everyone thinks it is. If it were really as all believe, then everybody in the industry would be wealthy and sipping martinis on yachts.

What everybody is overlooking is the expenses of running an amusement business. The fact that some large companies gross sales of \$4 billion dollars does not impress

people, until they see what the net income is, out of the \$4 billion dollars of sales.

However the same line of reasoning does not seem to follow in the amusement industry. Even the *Wall Street Journal* and "20/20 News Magazine" on ABC television quote weekly revenue figures on amusement machines, and the awe and the fallacy continue.

In case you were wondering why revenues have been everyone's prime consideration it is simply because it is a difficult task to get a net income for each location and each machine. However, just because it is difficult does not mean it should not be done. (Today there are computers to help with such difficult

tasks.) Some repairs are difficult to perform but they are still done in the interest of keeping the company profitable. Likewise, in the interest of keeping the company profitable, more detailed information regarding cost of operating your equipment should be performed.

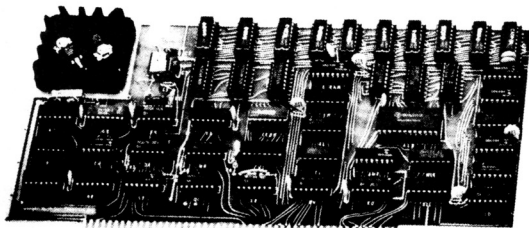
Many factors need to be considered when analyzing locations. First of all, revenues do need consideration, but also do your employee's time to service the location, the travel time, and truck expense to service the location, and the very important depreciation on the equipment at the location. I have actually seen machines at some locations which were not collecting enough revenues to offset the depreciation on the equipment. I

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The myth: "Revenues are our primary consideration for location evaluation"

By Charles C. Ross

don't mean the depreciation as calculated by the accountants, but the real depreciation on the equipment!

The operator in those instances thought the location was just an OK location and had no idea he was losing money—because of his short-sighted study of revenues. You also need to figure all the costs of running your office and the other expenses you incur in the process of running your amusement business, such as phone bills, accounting and legal fees, plus property taxes, local and state permits, and insurance.

The long and the short of it is that revenues are important—because if it were not for revenues there would be nothing to fall out of the bottom in

the form of net income.

But revenues should not be your only consideration for location evaluation. If that is the way you are evaluating locations you probably have several locations which are actually costing you money to operate.

Remember: locations which cost you money to operate are dragging down the profits of the company and are part of the reason that there is not quite as much to take home you would like.

So, just because everyone looks at revenues and gets all excited at "how much these games are making," remember and "making" and true net income are different terms. And net income is what counts since it is

what you really put in the bank.

Don't be misled by revenues. Pursuing revenues can make you work harder and take home less as you chase the sales dollar and not the income dollar.

How, you ask? By pursuing revenues in the past, you have probably overexpanded your company, causing you and your employees additional work caring for locations which are doing nothing for the overall profitability of the company.

Charles C. Ross is a partner in the firm of Innovative Management Consultants which specializes in consulting for the amusement industry.



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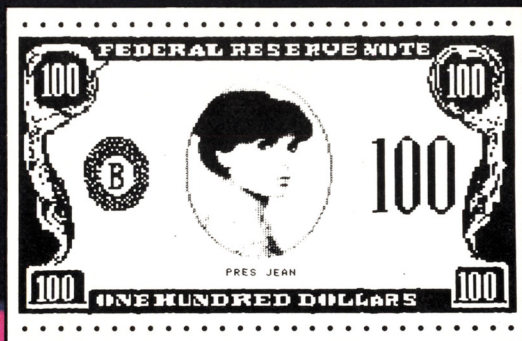
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Location opener:

Countertop coin-op gets positive reaction

A countertop amusement device with a high earning potential, the *Split/Second 2* holds out the possibility of opening locations that had not considered coin-op before.

That's the assessment of Linsey T. Hurd, New Orleans operator, who maintained that the return on investment from the reaction-timing machine is "comparable to any video machine."

With a new two-player feature, the *Split Second* Company's countertop is built for one minute playing time. For each coin inserted, each player is timed in thousandths of a second reaction time it takes him to depress a plunger as soon as possible after the moment when the LED digital display begins counting the thousandths. After five plays, the game adds up the five scores and flashes the total elapsed time.

The addition of the second-player feature spurs the competitive element of the timer, said Hurd, who

has operated the earlier one-player *Split/Second* machines. And he feels that on the "macho locations" where customers are most competitive—such as pool locations, or those with "the Monday night football type of crowd." Truck stops are also "great locations," he said *Split/Second 2* does particularly well. "But on the other side of the coin, at one location with an over-25 crowd, everybody in suits, it was doing over \$300 a week," said Hurd.

Noting that a conservative \$100 in the coin box can likely be assured with the game weekly, Hurd reported that location managers' interest is easily piqued. "Just taking up a square foot, it's going to open up a lot of locations," he said, adding that foot pedestal and wall mountings will be made available for *Split Second 2* and that these will make for ease of operation where the location doesn't desire countertop playing.

Going a step further, Hurd said, many locations which saw space considerations as ruling out videos or flipper machines will be won over for those games' placement once the earning power of *Split/Second* is demonstrated.

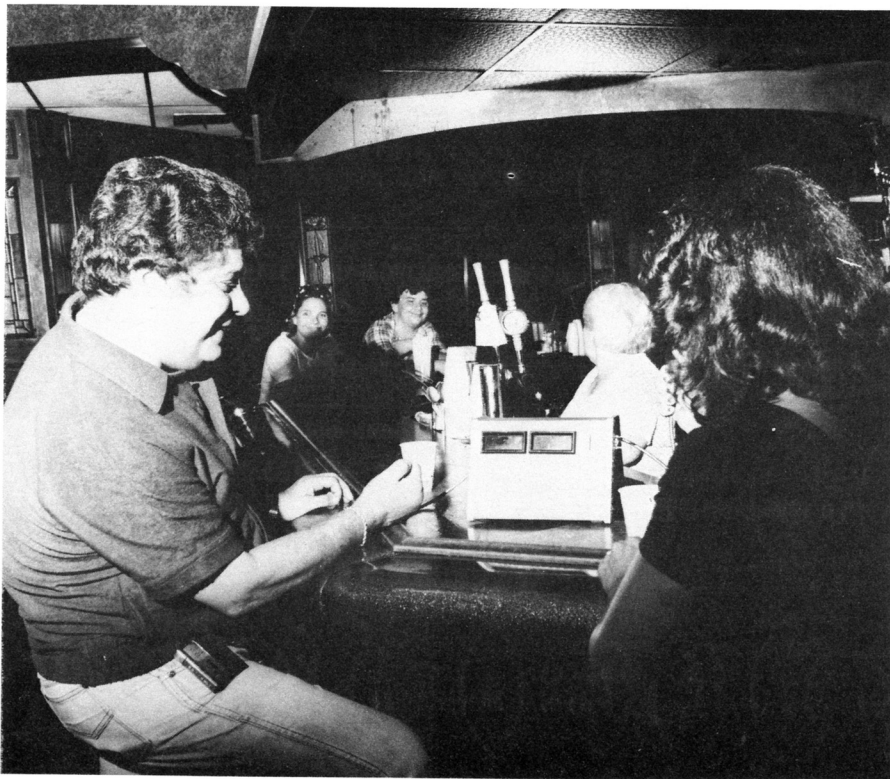
The Minneapolis, Minnesota manufacturer of the game suggests the promotional idea of stimulating competition at a location by logging fastest time on a plastic wall poster (which is provided with the timer) and awarding a prize, such as free pizza or beer for fastest score of the week. Hurd points out that this is the location's option but noted that it makes the location management even more cognizant of the interest shown in the game by his patrons.

An electronic coin counter in the machine may also reenforce the location's thinking about the revenues from the timer. It works by inserting two quarters with the reaction plunger held down; the digital readout shows the amount of quarters held in the \$350-capacity coin box. Nickel-cadmium batteries power this function and the reaction play, if electricity is temporarily cut off.

Hurd saluted the reliability of the all-metal machine, saying that in over a year, "I've had no electronic malfunctions whatsoever. Both for installation and moving off-location, it features both ease and security in being held to a brace with "one-way" screws, said Hurd. A flexible cable attaches the brace to the countertop.

Other features of the *Split/Second 2* are its continuous flashing mode when not in play; the "drunk meter" on its case, measuring the player's reaction speed with a bell-shaped curve; its low voltage of 9 DC; and the "jump the gun" penalty of 1/2 second added to the player's score if he pushes the stop button before the LED display comes on.

Further appeal to the operator comes in the wide variety of locations in which the game—which stands about 7 inches high—can be placed.

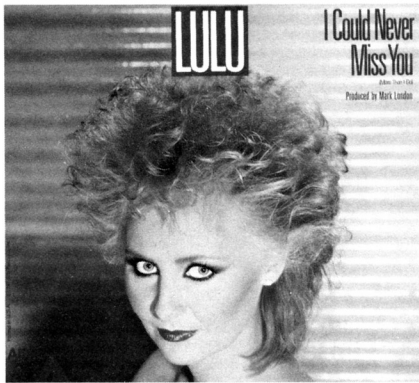


Countertop timer at some locations outpulls a video, says operator.

MUSIC PROGRAMMING

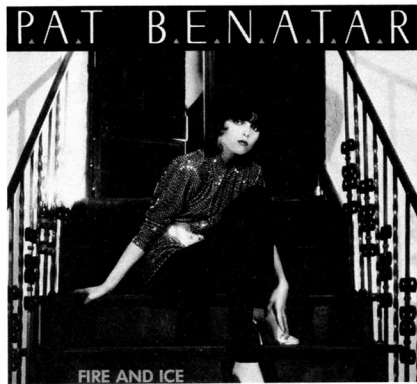
By Pat Matthews

The tidal wave advances



As expected, the major record labels are bracing for an avalanche of major artist album releases in the coming three months. All your biggie favorites will be riding the crest of the increased royalty rate wave and cashing in on some big bucks. Included in this number will be The Kinks, The Bee Gees, Hall & Oates, Meat Loaf (who will be rising from the depths of oblivion), Linda Ronstadt, et al. Those who've already released their new product (and not a minute before the new rate went into effect) include: Foreigner, ZZ Top, Journey, ELO, Devo, & Pat Benatar.

There's also to be a predictable flood of solo lps by individual members of slews of well known bands including Daryl Hall of Hall & Oates; Glenn Frey and Don Henley of the Eagles (Joe Walsh of same has already released his); Lindsey Buckingham of Fleetwood Mac



(Mick Fleetwood and Stevie Nicks have separately released theirs within the past month); Blondie's Deborah Harry; Paul McCartney; and Justin Hayward of the Moody Blues.

I, for one feel it is no coincidence that these new albums are being released at this time.

***I Could Never Miss You (More Than I Do)*—Lulu—Alfa/ALFA-7006**

There's no need to rub your eyes and look again. It is Lulu, the Lulu you thought you'd forgotten. She's back! And in a big way! Her comeback material is a soulful sound which is the type of musical vehicle she left us with. It's heavy on the string accompaniment and rhythm section with catchy lyrics. Add to that a voice that's as strong as ever and you've got a possible number one record! *10 out of 10.*



***Fire And Ice*—Pat Benatar—Chrysalis/CHS 2529**

For an artist who couldn't get her records played about three years ago, this lady's new releases are awaited anxiously like the Beatles were in the Sixties. This first single release from the new lp, *Precious Time*, her third is already very much in demand and is contributing to this singer's legacy. It has all the ingredients: written by Benatar with all her biting lyrics, her gutsy vocals, and some heavy guitar work. Nothing hot and cold about this one...it's a real barnburner: *10 out of 10.*

***Stop Draggin' My Heart Around*—Stevie Nicks—Modern Records/Atco/MR 7336**

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consider the big Mac of the Fleetwood clan, has teamed up with one Tom Petty and the Heartbreakers in a successful attempt to capitalize on each other's reputations and popularities. The combination is a natural on a song which is more of a duet than a solo effort for Nicks. Penned by Petty and Heartbreaker Michael Campbell, this single moves with all the flowing "roughness" of its writer's own stuff. Nice effort and I hope the rest of her album is as good. It's called *Bella Donna*; 10 out of 10, naturally.

A Woman In Love (It's Not Me)—Tom Petty & The Heartbreakers—Backstreet/MCA/BSR-51136

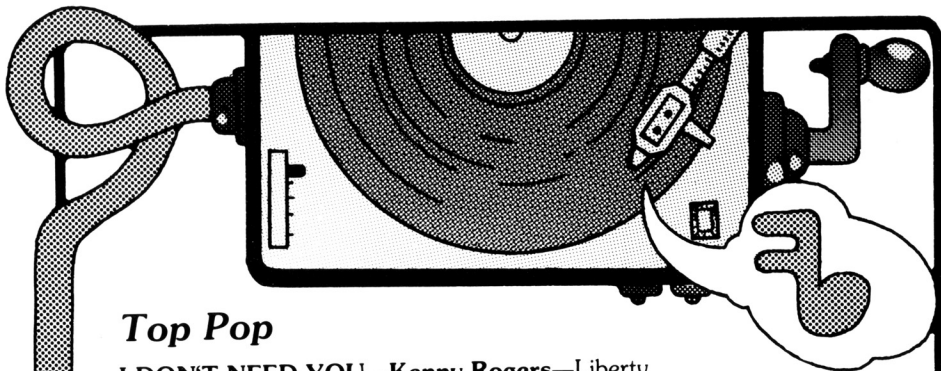
It's a great song but it may suffer in sales due to the just reviewed record. Cases like this always prove this way. You're giving the public a combination of superstars on one record and at the same time released another song by just one of those stars. It just doesn't work. Poor timing will hurt the single sales of this important Petty release. It's still a must for your jukebox; 8 out of 10, outside chance.

Hold On Tight—ELO—Jet Records/ZS5 02408

Xanadu wasn't really an ELO album, I don't care what anybody says! So, it's been over two years of being without real ELO. And there's no disappointment to be found on the new lp or the initial single. As usual, they've added just another touch to their music when we last left ELO and their *Discovery* album, there was just a tad of Disco in their sound (it was fashionable then). Now with "Rockabilly" coming back into vogue, Jeff Lyne is testing those grounds. With ELO on its side, "Rockabilly" should have less trouble gaining acceptance. By the way, the song moves from the first note to the last Beatle-ish 6-chord ending. Great song! 10 out of 10.

That Old Song—Ray Parker, Jr. & Raydio—Arista./AS0616

Ray penned this song which has the most commercial appeal of any song he's released as a single in his relatively short career. It's heavy on the strings and synthesizer. And the background vocals reflect the smooth manner in which the lead vocals of Parker are delivered. It's about a song that used to be played on the radio. This one maybe that song in about a year or so. Excellent choice for any format: 10 out of 10 on highest chart.



Top Pop

- I DON'T NEED YOU—Kenny Rogers—Liberty
- SWEET BABY—Stanley Clarke & George Duke—Epic
- QUEEN OF HEARTS—Juice Newton—Capitol
- BETTE DAVIS EYES—Kim Carnes—EMI America***
- ALL THOSE YEARS AGO—Dark Horse—Warner Brothers***
- THE BOY FROM NEW YORK CITY—Manhattan Transfer—Atlantic***
- THE ONE THAT YOU LOVE—Air Supply—Arista ***
- THEME FROM "GREATEST AMERICAN HERO"—Joey Scarbury—Elektra
- GEMINI DREAMS—Moody Blues-Threshold—Polygram***
- SLOW HAND—Pointer Sisters—Planet
- TIME—The Alan Parsons Project—Arista***
- ELVIRA—The Oak Ridge Boys—MCA
- HEARTS—Marty Balin—EMI America***
- IN THE AIR TONIGHT—Phil Collins—Atlantic
- URGENT—Foreigner—Atlantic***
- LADY (YOU BRING ME UP)—Commodores—Motown***
- ROCK AND ROLL DREAMS COME THROUGH—Jim Steinman—Epic/Cleveland International***
- (THERE'S) NO GETTING OVER ME—Ronnie Milsap—RCA
- TOUCH ME WHEN WE'RE DANCING—Carpenters—A & M***
- DON'T GIVE IT UP—Robbie Patton—Liberty***
- BREAKUP SONG(THEY DON'T WRITE 'EM LIKE THAT ANYMORE)—Greg Kihn Band—Beserkely
- COOL LOVE—Pablo Cruise—A & M***
- YOU'RE MY GIRL—Franke & The Knockouts—Millenium***
- ENDLESS LOVE—Diana Ross & Lionel Ritchie—Motown***

Country & Western

- WHISKEY CHASIN'—Joe Stampley—Epic***
- I DON'T NEED YOU—Kenny Rogers—Liberty
- THEY COULD PUT ME IN JAIL—Bellamy Brothers—Elektra
- FEELS SO RIGHT—Alabama—RCA
- PRISONER OF HOPE—Johnny Lee—Full Moon/Asylum
- RAINBOW STEW—Merle Haggard—MCA
- DON'T WAIT ON ME—Statler Brothers—Mercury/Polygram
- (THERE'S) NO GETTIN' OVER ME—Ronnie Milsap—RCA
- QUEEN OF HEARTS—Juice Newton—Capitol
- THE WILD SIDE OF LIFE—Waylon & Jessi—RCA
- TOO MANY LOVERS—Crystal Gayle—Columbia
- DIXIE ON MY MIND—Hank Williams, Jr.—Elektra/Curb

Rhythm & Blues

- FREAKY DANACIN'—Cameo—Chocolate City
- RUNNING AWAY—Maze—Capitol
- LOVE ON A TWO WAY STREET—Stacy Lattisaw—Cotillion
- SLOW HAND—Pointer Sisters—Planet
- ENDLESS LOVE—Diana Ross & Lionel Ritchie—Motown***
- LADY (YOU BRING ME UP)—Commodores—Motown***
- ENDLESS LOVE—Diana Ross & Lionel Ritchie—Motown***
- I'M IN LOVE—Evelyn King—RCA
- SHAKE IT UP—Cheryl Lynn—Columbia
- JUST BE MY LADY—Larry Graham—Warner Brothers
- SEND FOR ME—Atlantic Starr—A & M
- THE REAL THING—Brothers Johnson—A & M

***denotes records reviewed previously by PLAY METER

'The Arcade School'

by Randy Fromm

Part Two

Switching Regulator Power Supplies

A switching regulator power supply is more efficient than a conventional series-pass regulator power supply. This extra efficiency is reflected in the fact that the switching regulator runs quite cool during normal operation while just the opposite is true for the series-pass regulator (See Figure 1.)

To make it easier to understand, the power supply here has been broken down into sections (See Figure 2).

Section "A" should be familiar to just about everyone. This is a straightforward full-wave, bridge rectified power supply. The 110 volts AC enters the bridge rectifier through an AC line filter. The bridge rectifier converts the AC to "pulsating DC" which is passed through a 3.3-ohm resistor to a filter capacitor.

The filter capacitor does just what its name implies. It filters the pulsating DC so that it becomes a constant flow of current instead of pulses (See Figure 3). This DC power supply, which is around 140-150 volts, is used to provide the power for sections "B" and "F."

Section "B" of Figure 2 is the "switch" in the "switching regulator power supply." This section is similar to the horizontal output section of a raster scan monitor, or the high-voltage section of the "Quadrascan" monitor. The switching transistor switches the current from the DC power supply on and off across the primary winding of the transformer. This is done at a very high frequency. The frequency of operation will vary between power supply types but it will normally fall somewhere in the

range of 22 to 25 kilohertz (22 to 25 thousand cycles per second).

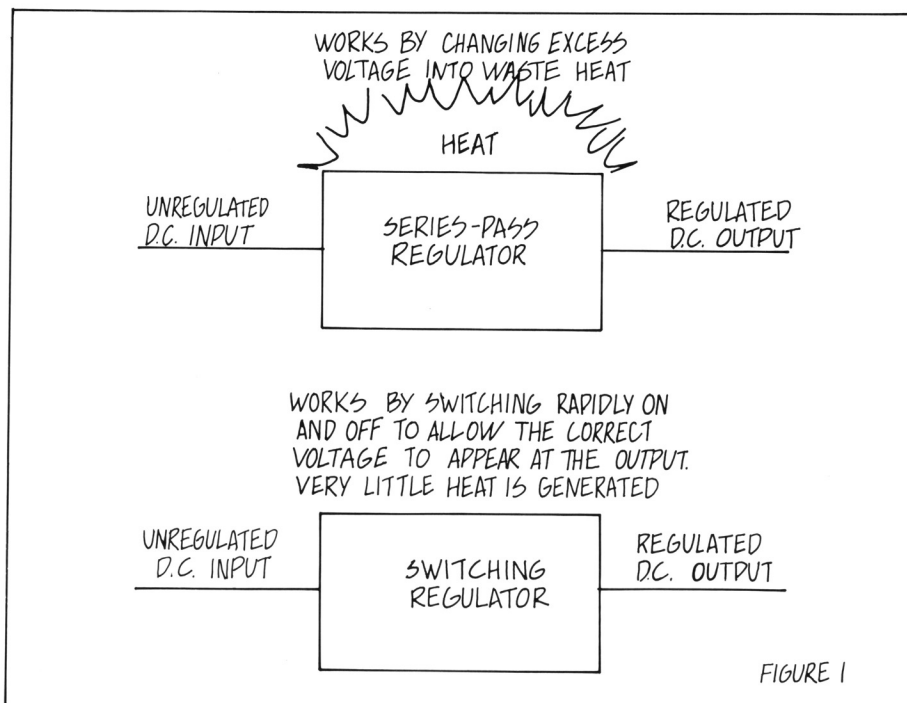
Because the switching speed is so fast, it no longer becomes necessary to use a heavy iron core to make the transformer work. Like the "flyback" transformer in a monitor, the power transformer in a switching regulator power supply uses a lightweight core made of a type of compressed carbon compound called ferrite. This gives the switching regulator power supply an enormous weight advantage over conventional power supplies which must rely on bulky and heavy iron core transformers.

Naturally, this transformer is a step-down transformer with fewer turns of wire on the secondary winding than there are on the primary. This lowers the output voltage at the secondary—just the opposite of the flyback transformer in a monitor which steps up the voltage to 16,000 volts or more!

Oddly enough, the high frequency operation of the transformer has nothing to do with the power supply's efficiency. Regardless of frequency, the transformer is about 80 percent efficient.

It is the switching action that gives this power supply its extra efficiency. The switching regulator power supply controls its output voltage by controlling the amount of time that the transistor switch is turned on. The longer the switch is kept on, the more energy that is stored in the magnetic "flux" that surrounds the transformer. The greater the "flux," the higher the voltage at the secondary winding of the transformer. This is known as "pulse-width modulation."

Longer pulse widths result in a higher output voltage; narrower pulses provide a lower output voltage. Since the transformer is



always either totally off or totally on, it has to dissipate very little power as heat.

Section "C" should also be fairly easy to recognize. This is the output rectifier and filter section which takes the high frequency, low voltage output from the secondary winding of the power transformer and changes it to pure DC which will be sent to the logic board and other five-volt DC circuits in the game.

This is actually a half-wave power supply, but because the frequency of the AC from the transformer is not 60 hertz but somewhere around 25 kilohertz, the output from a switching regulator is usually incredibly pure.

IC controls the on/off

The "switch" in the switching regulator power supply must have something telling it when to turn on and off. This is accomplished by the integrated circuit that is in Section "D" on the schematic. This IC accomplishes the work of dozens of transistors and other components, and that is one of the reasons we are now beginning to see more of these types of power supplies in games.

The integrated circuit senses the

output voltage of the power supply through the feedback or "sense inputs." If the output voltage of the power supply is too high, the IC senses this condition and makes its output pulses narrower.

The narrower pulses cause the output voltage to drop back down to the exact voltage it's supposed to be. If the output voltage of the supply is too low, the integrated circuit senses this too—and makes its output pulses wider, raising the output voltage (See Figure 4).

The pulses from the IC in Section "D" come from Pin 11 of the device and are coupled directly to the base of the transistor in Section "E." The transistor is used to drive a transformer which in turn provides the drive voltage for the transistor switch in Section "B."

Section "E" is a kind of pre-amplifier for the pulses coming down from the integrated circuit. The IC does not have enough power to drive the "switch" in Section "B" directly, so it must first be "amplified" and then used to drive the "switch."

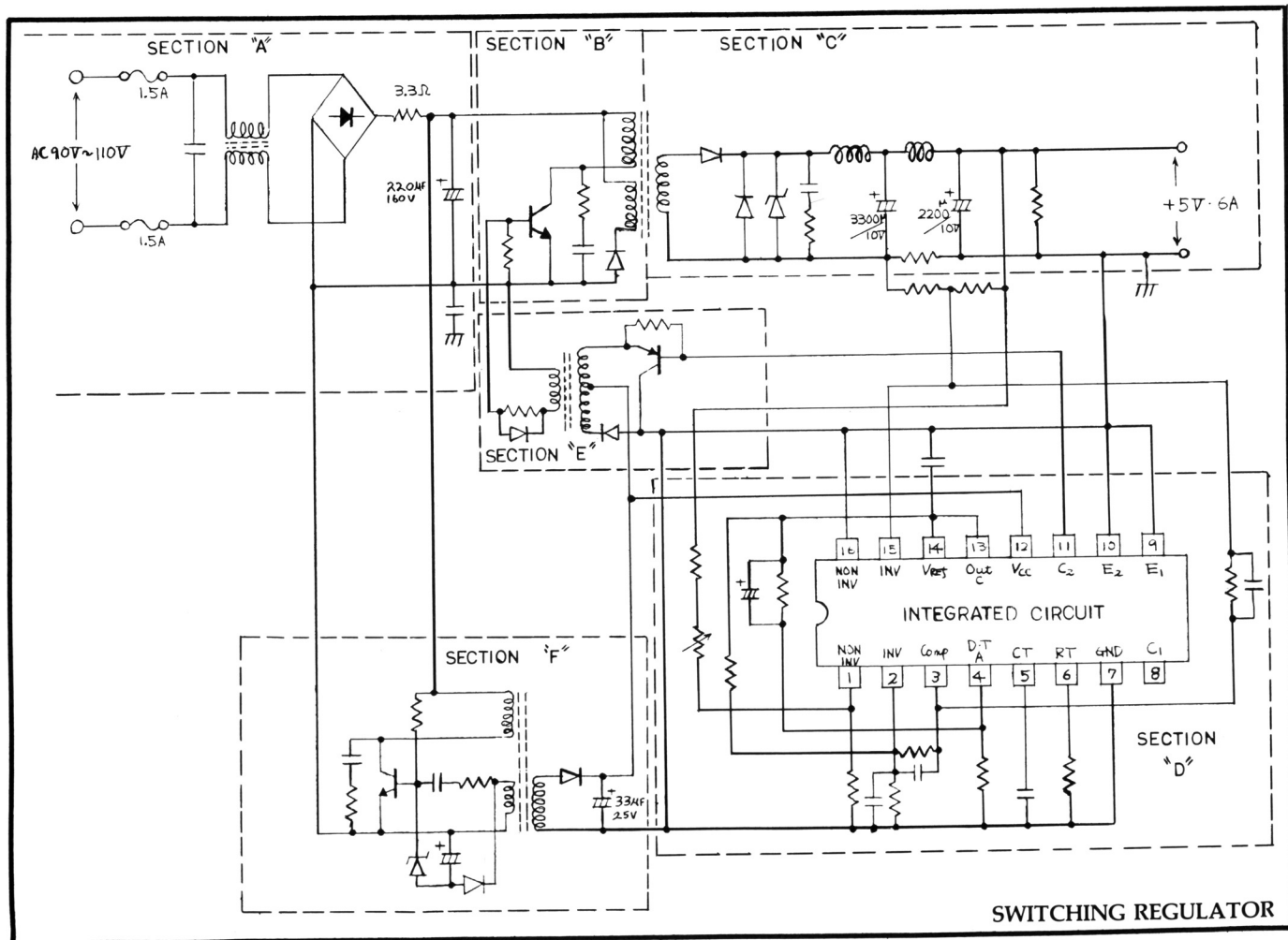
Finally, let's take a look at Section "F." This section is used to create a low-voltage power supply which is used to power sections "D" and "E."

These are actually two circuits.

One is an oscillator that changes the direct current from the power supply in Section "A" into high frequency alternating current (AC). This is accomplished by using a transformer with a special winding on it called a feedback or "tickler" winding. The "tickler" feeds some of the output of the transformer back into the input of the circuit. The result is an oscillation, and in electronics anything that is oscillating is creating AC. You get the same result if you hold a microphone up to the speaker of an amplifier to which it is connected: the feedback squall you hear is an oscillation.

The AC output of the transformer is rectified and filtered by a single diode and capacitor, and sent out to Sections "D" and "E." We know this is a half-wave power supply because it uses only one diode. But because of the very high frequency of the AC output of the transformer, this supply will also be very pure at its DC output.

That's about all there is to it. Of course, there are many different manufacturers of switching regulator power supplies, and they'll all be a



little different. The particular power supply covered above is from the Gremlin/Sega *Space Tactics* game and has just one output: five volts at up to six amps.

Other supplies may have multiple DC outputs of +12, +15, -12, -15, or -5 volts.

Special thanks to Bob Pecarrado of Gremlin for his help in researching this article.

Ed. Note: Part One of Fromm's "Switching Regulator Power Supplies" appeared in *Play Meter*, August 1 issue, page 42.

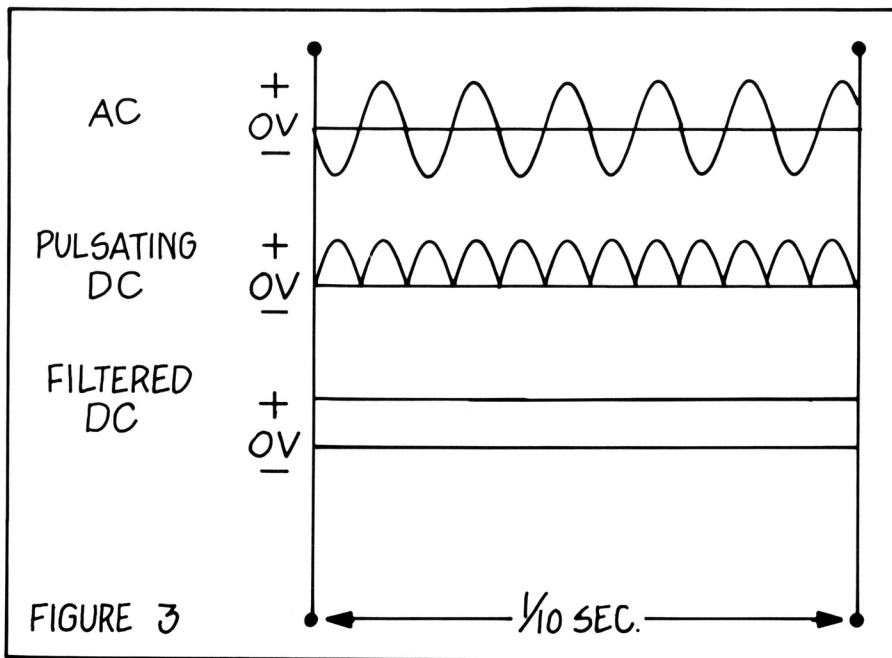
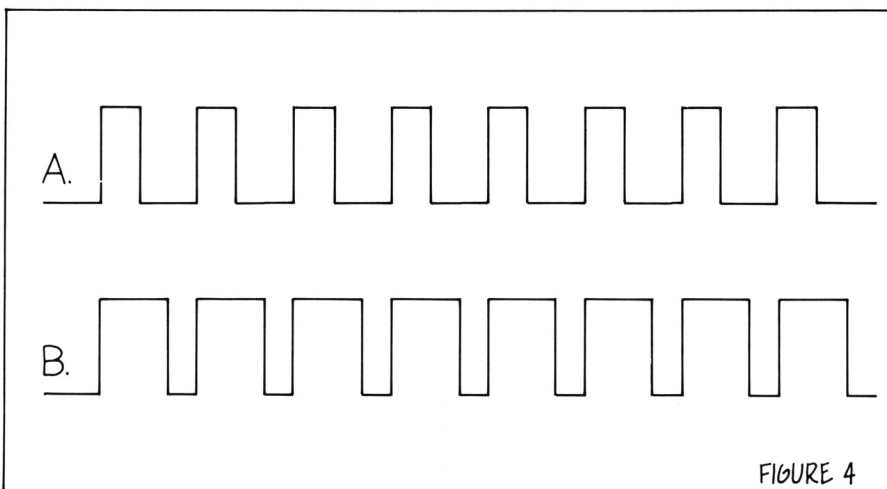


Figure 3 illustrates what happens to the alternating current (AC) as it passes through the bridge rectifier converting the AC to pulsating DC (direct current), and then to the filter capacitor where it is filtered. These graphs are the same picture that an oscillator draws for you: a simple graph showing time in the horizontal direction and voltage in the vertical direction. Positive voltages are shown as a line drawn above the 0 volt line. Negative voltages are shown as a line drawn below the 0 volt line. Notice that this is different between AC and DC. Alternating current is sometimes positive and sometimes negative. Direct current is always positive.



- A. Narrow pulses cause a lower output voltage.
- B. Wide pulses cause a higher output voltage.

By varying the width of the pulses, the integrated circuit controls the output voltage of the switching regulator power supply. This is known as "pulse-width modulation."

Court rules for Atari over General Computer

Atari, Inc. received a temporary restraining order from U.S. District Court in Boston, Massachusetts on August 3, to forestall General Computer Corp. of Boston from distributing its *Super Missile Command* games.

Atari charged that General Computer's plug-in "enhancement," called *Super Missile Attack*, infringes and dilutes Atari's copyright and trademarks. In addition, Atari claims that General Computer is engaging in unfair competition.

The suit, filed in United States District Court, District of Massachusetts, asked that the Boston firm and its principals, Kevin Curran and Douglas Macrae, be enjoined from manufacturing and selling the enhancement in the future. The suit also asked that all profits from the sale of the products be awarded to Atari, along with legal fees, court costs, and \$5 million in punitive and exemplary damages from each defendant.

According to an Atari spokesman, "This enhancement, or speed-up kit, takes advantage of Atari's copyrighted and trademarked name, game, and game cabinets. General Computer's advertisements trade on Atari's name. They appear, to our customers and to the public, as Atari products, creating confusion, and siphoning off legitimate returns from our investment in research and development," said Frank A. Ballouz, vice president of marketing for Atari's Coin-Operated Video Game Division.

The enhancement is in the form of a printed circuit board and a game program contained in two plug-in read-only memories (ROMs) that supplement original components in Atari *Missile Command* game cabinets. The game program builds upon the Atari game, adding more play objects and changing the degree of difficulty of the existing game. They have been sold since the beginning of June this year directly to the operators of establishments that feature coin-operated games.

"Piracy of games, misleading use of trademarks, the infringement of copyrights, and other forms of unfair competition have all been increasing as video games have become more and more popular," Ballouz said.

I.C. LOGIC DESIGN COURSE

Lesson Three: Complex Logic Elements

Editor's Note: The material below is a serialization of the Kurz Kasch correspondence course for electronics, designed specifically for the coin-operated amusement industry. This course is copyrighted and owned by Kurz Kasch of Dayton, Ohio and its reprinting is being sponsored jointly by Kurz Kasch and Play Meter magazine. This material is authorized for publication exclusively in Play Meter magazine.

Positive Logic			Negative Logic		
A	B	X	A	B	X
0	0	0	1	1	1
1	0	0	0	1	1
0	1	0	1	0	1
1	1	1	0	0	0

Table 3-1. A comparison of Positive Logic and Negative Logic truth tables for an AND gate.

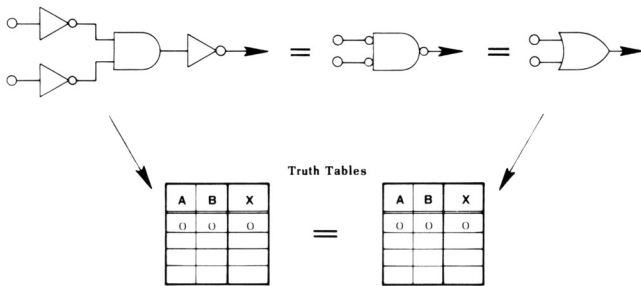


Fig. 3-1. An inverted input AND gate with inverted output performs the same function as an OR gate. The student is to complete the truth tables.

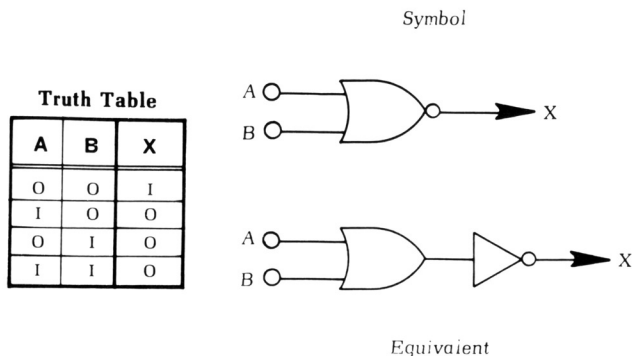


Fig. 3-2. The symbol for a NOR and the associated truth table. The triangular symbol is equivalent to only a circle when used in conjunction with another logic symbol.

Lesson Three: Complex Logic Elements. This third lesson is concerned with the more advanced logic elements. The NAND and NOR functions available from some of the previously discussed I.C. logic families are covered, along with the concept of negative logic. The student should become completely familiar with the difference, similarities, and conversions of the various logic elements.

NEGATIVE LOGIC:

In the previous discussion of logic gates, the 1 and zero logic levels have been taken as the absence or presence of some voltage. For instance, we might say that any voltage above +3V is a logic 1 and any voltage below +1V is a logic zero. The actual choice of voltages depends on the particular I.C. family being used, but the more positive voltage is logic 1 and the more negative is logic zero.

This assignment of logic levels results in what we call *positive logic*. Whether or not we use positive logic is quite an arbitrary decision. Let us momentarily reverse our definition. That is, let the more negative voltage represent logic level 1 and the positive voltage zero. This arrangement, called *negative logic*, offers some surprising possibilities.

First, consider the operation of an AND gate when negative logic is used. When both inputs are at 0V (logic 1), the output will also be 0V (logic 1). If one input is at 0V (logic 1) and another is at +3V (logic zero), then the output will be at logic 1 (0V). Only when both inputs are at logic zero (+3V) will there be a logic zero output.

The truth table for an AND gate using negative logic is shown in table 3-1. The positive logic AND truth table is also shown for reference. Notice that a positive logic AND gate becomes an OR gate when we use negative logic (fig. 1-5). Similarly, the student should verify that a positive logic OR gate performs the AND function when negative logic is used. The inverter (NOT gate) is a handy means of changing from one logic to another.

As a practical example, assume we had positive AND gates and inverters but that we needed to perform the OR function. First, we could change to negative logic by inverting each of the input signals.

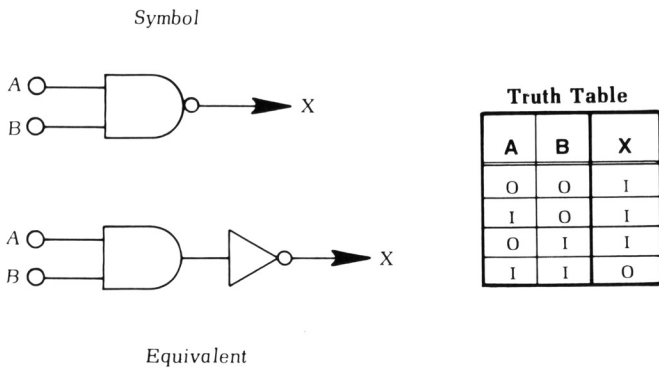


Fig. 3-3. The symbol for an NAND gate. Either symbol is correct but the top symbol is preferred. In the truth table for the NAND gate, the output, X, is inverted from the output of an AND gate.

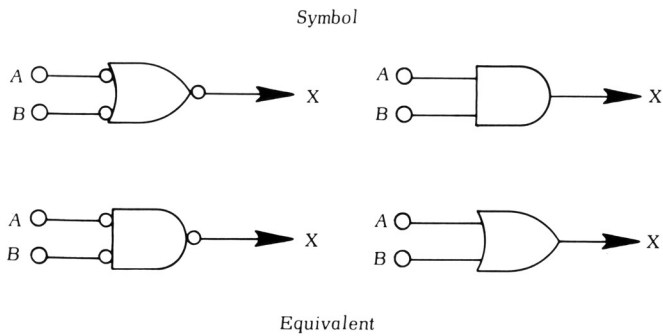


Fig. 3-4. The inverted input NOR gate will function the same as an AND gate. The inverted input NAND gate will function the same as an OR gate.

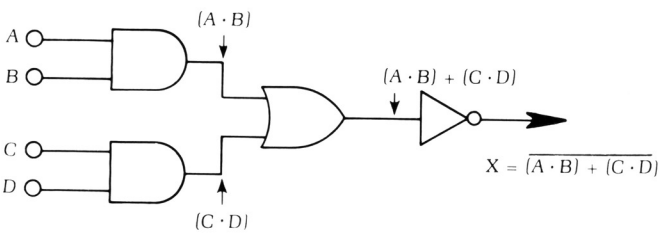


Fig. 3-5. The symbolic circuit diagram of an AND-OR-Invert gate and associated truth table top of next column.

Then we would use the positive AND gate (negative OR), and finally we could return to positive logic by inverting the output. The student can verify that the gates in fig. 3-1 are functionally similar by completing the truth tables. The concept of negative logic will acquire more significance once we have discussed DeMorgan's theorem.

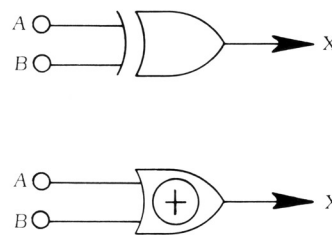
NOR/NAND GATES:

In the previous discussion of RTL logic gates, it was pointed out that the gate output would be at logic zero if one or more of the inputs were at logic 1. This gate does not correspond to either the AND or OR functions. In fact, the output is the complement of an OR gate output, and we can think of it as an OR with an inverter at its output. This negated output OR gate is called a NOR gate (see truth table in fig. 3-2). The symbol for the NOR gate consists of the OR gate symbol with a small circle at the output (fig. 3-2).

Truth Table

A	B	C	D	X
0	0	0	0	1
1	0	0	0	1
0	1	0	0	1
1	1	0	0	0
0	0	1	0	1
1	0	1	0	1
0	1	1	0	1
1	1	1	0	0
0	0	0	1	1
1	0	0	1	1
0	1	0	1	1
1	1	0	1	0
0	0	1	1	0
1	0	1	1	0
0	1	1	1	0
1	1	1	1	0

Symbols



Truth Table

A	B	X
0	0	0
1	0	1
0	1	1
1	1	0

Fig. 3-6. Two acceptable symbols for an Exclusive-OR gate and the associated truth table. Notice that the output is zero when both inputs are 1.

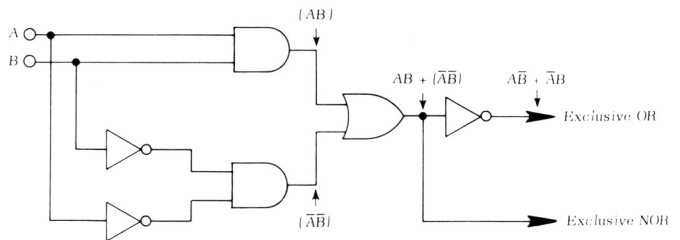


Fig. 3-7. The symbolic circuit for producing an Exclusive-OR gate. Both Exclusive-OR and Exclusive-NOR functions are available from this circuit.

The importance of the NOR gate is a matter of its availability. RTL, ECL, and MOS gates are all of the NOR variety.

Both TTL and DTL gates, however, are of still a different type. These two families make use of the NAND or negated output AND gate. The output of the NAND gate will be at zero logic only if all the inputs are at 1 logic. Thus, the output is the complement of an AND gate output (see truth table in fig. 3-3). The symbol for the NAND gate consists of the AND gate symbol with a small circle at the output (fig. 3-3).

Implementing a logic circuit with NOR or NAND gates is no more difficult than using OR and AND gates. In fact, an OR gate may be obtained by inverting the output of a NOR gate, and an AND gate results from inverting the output of a NAND gate.

If we invert the inputs to a NOR gate, we have an AND gate. This is in accordance with our discussion of negative logic. In the same manner, a negated

input NAND gate will function as an OR gate. Fig. 3-45 shows these relationships.

AND-OR-INVERT GATES:

The AND-OR-Invert (AOI) gate is a compound logic element shown symbolically in fig. 3-5.

When this device is fabricated on a single I.C. chip, only the inputs and outputs are made available to the user.

If the output of either AND gate is logic 1, the OR output will be logic 1, and the inverted output will be logic zero. The AOI output will be logic zero whenever either or both AND gates have logic 1 at

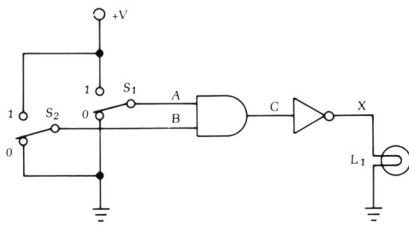
both inputs. The AOI gate's truth table is given in fig. 3-5.

EXCLUSIVE OR:

The previously discussed OR gate is enabled if either or both of the inputs are made logic 1. The Exclusive OR gate is enabled if either input is at logic 1, but not both. The symbol and truth table for the Exclusive OR function are shown in fig. 3-6.

Notice that the output is logic 1 only when the two inputs are at different logic levels. A typical configuration of the Exclusive OR is composed of two inverters and one AOI gate (fig. 3-7).

BREADBOARD PROJECT 3a: NAND Gate



Truth Table

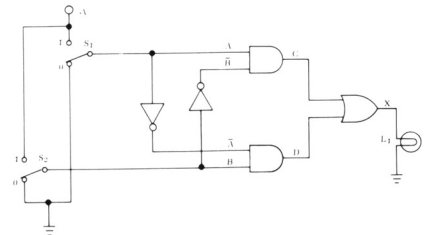
S ₁	S ₂		L ₁
A	B	C	X
0	0	0	

1. Wire up the circuit on the breadboard using one inverter and one AND gate. Before applying power, set S₁ and S₂ to the logic zero position.
2. Apply power, observing correct polarity.
3. The lamp *should* light. Although the AND gate output is zero, the inverter gives a NAND output of logic 1.
4. Use the logic probe (Breadboard Project-Negated Input AND Gate) to test C and enter its logic condition on the truth table.
5. Complete the first row of the truth table.
6. Switch S₂ to the logic 1 position and complete the input statement on row two of the truth table.
7. What is the output logic condition for row two?
8. Using the probe, test C and enter its logic condition in row two.
9. Return S₂ to the logic zero position and switch S₁ to the logic 1 position. Enter the input statement on

- row three of the truth table.
10. What is the logic condition of the output?
11. Use the probe to test C and enter its logic condition on row three.
12. Switch S₂ to the logic 1 position and enter the input statement on row four.
13. What is the logic condition of the output?
14. Use the probe to test C and enter its logic condition on row four.
15. Columns A, B and X of the truth table represent the NAND gate. Compare this with fig. 3-3 in the textbook, they should be identical. Notice that the NAND gate truth table is also identical to the negated input AND gate truth table. These two gates may be used interchangeably.

BREADBOARD PROJECT 3b Exclusive OR

1. Wire up the circuit on the breadboard using two inverters, two AND gates and one OR gate. Before applying power, set S₁ and S₂ to the logic zero position.
2. Apply power, observing correct polarity.
3. The lamp *should not* light. Since A = 0 and B = 0, we expect not-A = 1 and not-B = 1. If this is correct, then C = 0 and D = 0 also. When both inputs (C and D) to the OR gate are 0, then X = 0.
4. Using the logic probe, verify each of the logic conditions stated above and complete the first row of the truth table.
5. Before applying the next set of input conditions (A = 0, B = 1), predict the states of each unknown variable (not-A, not-B, C, D, X) for row two.
6. Check your results by switching S₂ to the logic 1 position. If you have made a mistake, use the logic probe to find the error.



Truth Table

S ₁	S ₂					L ₁
A	B	\bar{A}	\bar{B}	C	D	X
0	0					

7. Repeat this same process for the remaining input conditions. You should be able to correctly predict the logic states of not-A, not-B, C, D, and X in each case. Fill in the truth table as you progress.
8. Columns A, B, and X represent the truth table for the exclusive OR gate. Compare this with the truth table shown in fig. 3-6 in the textbook; they should be identical.
9. Notice that the output is at logic 1 if either A or B is at logic 1, but not when both are logic 1.

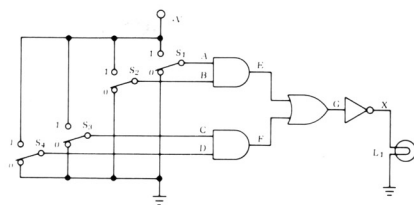
BREADBOARD PROJECT 3c AND/OR Invert

1. Wire up the circuit on the breadboard using two AND gates, one OR gate and one inverter. Before applying power set S₁, S₂, S₃ and S₄ to the logic zero position.
2. Apply power, observing correct polarity.
3. The lamp *should* light. Use the logic probe (Breadboard

Project—Negated Input AND Gate) to test E, F, and G; then, enter the results on the truth table.

4. At this point, the student should fill in all the possible input conditions in standard form. In standard form, the variable D will change state from row to row. Variable C changes every two rows. Variable B changes every four rows, and variable A, every eight rows. There should be a total of 16 different input combinations or rows. Check yourself against the truth table in fig. 3-5.

5. Starting with row two, determine what output condition (X) will result (A = 0, B = 0, C = 0, D = 1). This is done by determining E, F and then G. (In this case, E = 0, F = 0, D = 1). This is done by determining E, F and then G.



Truth Table

S ₁	S ₂	S ₃	S ₄					L ₁
A	B	C	D	E	F	G	X	
0	0	0	0					

6. Check your result by switching S₄ to the logic 1.

7. Enter E, F, G and X on the truth table.

8. Repeat this same process for all 16 input combinations. You should be able to correctly predict the logic states of E, F, G and X in each case. Fill in the truth table as your progress.

9. Columns A, B, C, D, and X, of the truth table represent the AND-OR-INVERT gate. Compare this with the truth table in fig.3-5 in the textbook; they should be identical.

10. Notice that the output is at logic zero if both A and B are at logic 1, or if both C and D are at logic 1.

TECHNICAL TOPICS

Technician seeks printed matter

After three years as a service technician I have received my first copy of *Play Meter*. I find it holds my attention all the way through. I have a copy of *Gunfight* by Midway Computer Service Manual Video Game Data Library Vol. IV distributed by Kush 'n' Stuff.

I know that Kush 'n' Stuff is no longer around and I just have to know if there are other similar manuals available. Please help.

Agustin Acosta, Jr.
Senior Technician
State Amusement
N. Miami, Florida

those who support them through their patronage.)

Atari led the way in producing comprehensive service manuals, along with Gremlin Industries. Both began producing detailed circuit descriptions and troubleshooting guides along with a complete set of schematics, and enclosed a copy of the manual in every game shipped from the factory. The practice marked the demise of Kush 'n' Stuff.

The Kush 'n' Stuff manuals were distributed by Wico, and there may be a few copies in stock at one of the Wico distributorships across the country, although they no longer advertise them in their catalog.

Currently available are several manuals that deal with game repair. The much touted "Electronic Pinball Electronics for Pinball Mechanics" volumes 1 and 2 is a bit outdated at this point, but still good reading for the novice mechanic. They're available from Wico.

An excellent service manual is available from Atari, Inc. Its called "The Book", and it contains a great compendium of useful knowledge and information. "The Book", is available from your Atari distributor. The price is \$39.

Technical Editor

Tech ed. responds

The service manuals produced by Kush 'n' Stuff were a noble attempt to fill the void created by the lack of documentation available to operators at the time. Remember, video games were as new to the manufacturers as they were to you! They didn't know at the time exactly what information the operator needed to repair the games, nor did they care to divulge the schematic drawings for fear of unauthorized duplication of the games (its been a problem since Pong, and continues today. The "knock-off artists" are the scourge of our industry, as are

New digital circuit tester

Kurz-Kasch Inc. has introduced its ROM Test II, new digital circuit tester to allow check or verification of ROMs, PROMs, EPROMs, and EAROMs with a minimum of training in its operating instructions.

ROM Test II requires no circuit probing, according to the manufacturer. Only one signature is read for a "good" or "no good" test. Kurz-Kasch claims the ROM Test II "cuts testing time to approximately 2 seconds to reduce service-call costs, or to give you easy one-step testing of incoming chips or program verification."

To use the ROM Test II, a "personality board" compatible with the device to be tested, is installed.

Now memory chips are inserted one after another in the personality board and check is made of each device in 2 seconds' time or less by reading one signature. A self test is built-in.

Testing of 64K devices would normally require probing 80 data lines and reading 80 signatures, said Kurz-Kasch product literature. Now any read-only memory up to 128K can be tested with no probing, and 10 signatures verify operation.

Further details are available, and a demonstration can be arranged, by contacting Kurz-Kasch, Inc., 2271 Arbor Boulevard, Dayton, Ohio 45439; telephone 513/299-0900.

FRANK'S CRANKS



By Frank Seninsky

Cinematronics' new game on test

What do you do when they kick the coin door?

The new game on review this month is *Armor Attack* by Cinematronics. *Armor Attack* has brought back the tank fight theme.

In just a few years the game programs have become quite sophisticated. *Armor Attack* has up to fifteen different tank speeds, all controlled by a "tank speed select" program. This circuit, called a "programmable divide by N circuit," takes four inputs generated by the CPU board and selects the speed of the tank. (For more on this new design, contact Cinematronics directly.)

The marquee (the plastic decoration section on the top, front of the game) is held in by two metal guides which are mounted to the cabinet by six screws. These screws have square indentations in the heads which are supposed to make them difficult to remove without the proper tool. However, the screws can be easily removed with a pair of pliers or a small screwdriver. The marquee can be removed by anyone who feels like taking it. Marquees have been known to "disappear" on *Star Castle* and they will also "disappear" on *Armor Attack*.

Since there is nothing behind the marquee to keep it from being bent inward, it only takes one frustrated fist to completely demolish the marquee. Since the replacement cost is only \$30, it seems the manufacturers see no reason why an operator would mind replacing them.

Armor Attack control panel

The control panel has a total of ten buttons. These are standard and should not cause any service problems. To get at the switches and the circuitry under the control panel takes a fair amount of time. There is a molding cover bracket which goes over the top of the control panel and



the monitor cover which must first be removed.

This molding cover is held in place by six screws of the type mentioned above with the square cutouts in the screwhead. These screws were all loose on my *Armor Attack* and I actually removed them by hand. If I can do this it will certainly be done out on location. Better stock up on

molding covers also.

Once this molding is removed, there are two bolts with wing nuts, washers, and star washers to remove. One bolt is located on each side of the cabinet going through the cabinet and a panel leg (wooden side brace attached at right angle to the ends of the panel) of the control panel. After all this, the panel is finally off.

One would think that the panel must be affixed securely, but the legs are only attached to the control panel by two $\frac{3}{4}$ -inch-by- $\frac{3}{4}$ -inch-by-4-inch, stapled-in sections of wood. The legs can easily be pulled off and you may find that you now have an *Armor Attack* without a control panel either.

I don't want to just pick on Cinematronics, because most of the other manufacturers' control panels can also be pulled off from the outside without too much effort. Even when latches are used, as with Midway games, I found the latches completely ripped away from the panel. All that could be done on location was to secure the latches to the panel with carriage bolts instead of screws.

If you now lift the control panel up about an inch from the cabinet, the three-wire plug from the coin door to the control panel will probably pull off. Be careful not to break the wires or the connections, especially the "fragile" ribbon cable connecting the panel to the CPU logic board.

More wire could have been pro-

"The troubleshooting guide is written very simply and will help to determine if a board or monitor is bad."

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vided to make it easier to work on the panel without disconnecting the harness.

I find it saves a lot of time if you can work on a control panel by just turning it over and placing it on the area it just came from with all the wires still connected.

The coin door is the standard Coin Acceptor type that has been used on past Cinematronics games. There is no slam switch, I'm sorry to say. The slam switch is the only protection a video game has against abuse.

If the players can just kick the coin door as hard as they want, eventually they will find a way to get free credits. Worse than that (is there anything worse than that?) the door will bend inward and will have to be replaced. It's very difficult to reshape a door and still have the coin returns and coin chutes work properly.

The coin door has no coin entrance lights and no key hook for the back door keys. I can't really crank about not having coin entrance lights but a key hook is important. On games where none is provided the back door keys must usually be clipped onto one of the wires on the coin door.

Many problems can arise from placing the back door keys this way. The keys can get caught in the coin chutes and cause a jam-up. They can be the cause of a short circuit or even a blown board. The keys can fall to the bottom of the cabinet where they can't be reached. Then you have to break open the back door. This could really slow you down especially if you don't have a spare lock that happens to fit on the back door.

At least a volume control and a meter have been provided on the *Armor Attack* coin door.

These are positive features that I'm sure we all are glad have been retained.

All of the option switches on the CPU board can be reached from the coin door which some operators like and some don't like. I would rather have the coin and a cash box section completely barricaded from the rest of the cabinet to protect the cash box.

On *Armor Attack* the cash box can be easily lifted from the back of the cabinet. There are no barriers or partitions separating the cash box area from the rest of the game.

The inter-lock safety switch is located about three inches from the top of the back door. This is much better than having the switch located in the middle because most of the back doors will warp and bow

outward due to extreme heat inside the cabinet.

If the lock is holding the back door on tightly, you will most likely not have any problems with the inter-lock switch cutting off the power. A pinball plunger tip can be placed over the switch button to provide a tighter, and more secure fit. Most operators just rotate the switch and pull it out so it is always on—even with the back door completely off. This defeats the purpose of the switch but we all must try to cut down on service calls.

Power supply

Looking into the back of *Armor Attack*, we see the power supply is mounted to the left side wall of the cabinet. This supply is the same as that used on *Star Castle*. The only adjustment on this supply is the +5 volt adjustment. Two circuit breakers and a slow-blow fuse are also located on the power supply.

It is good practice to unplug the game when resetting the circuit breakers. This way they cannot be held in too long by accident which could cause a disaster like a "cooked" board.

On the right side wall the CPU and Audio boards are mounted. No components are located on the cabinet floor, which is good. Any loose objects usually end up on the cabinet bottom and can easily fall on top of transformers, fuse holders, or terminal blocks which some manufacturers insist on placing on the bottom of the cabinet.

An LED is located on the CPU board which flashes once when powered up and then remains off if all is well. There is a two-page section in the manual called "Operators Guide to Troubleshooting." It is written very simply and will help you determine if a board or the monitor is bad. It describes how to use the LED, how to check the +5 volt supply, and what to do if the circuit breakers trip out.

This is a terrific section that everyone should read. It would be nice if other manufacturers would (and some do) expand on a section like this. It might help some of us prevent sending out a good board or monitor for repair. Distributors claim that this is what usually happens.

A Vectorbeam monitor has been used on *Armor Attack*. It is the same monitor that has been used on all past Cinematronics games except *Sundance*. All the components are spread-out and clearly labeled.

To remove the monitor, two bolts

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must first be removed and the monitor can then be lowered to a horizontal position. In this position the monitor screen can be reached for cleaning purposes.

If you want your game to earn more money, the picture tube and inside covering should be cleaned regularly.

On Cinematronics games, be extra careful when rubbing the decal on the picture tube. This decal will become very brittle from the heat and will peel and flake off if rubbed heavily.

Once the monitor is in the horizontal position, four more bolts must be removed and then the monitor will slide out easily. Brightness is the only control adjustment on the monitor that has a pot that can be turned by hand.

Other adjustments which must be made with a screwdriver are width, height, and line length (2).

There are many ribbon connectors going from board to board on *Armor Attack*. These connectors go from the CPU to the control panel, audio board, and monitor. They can be plugged in two different ways, so be very careful.

The red marked edge is on the left when looking at the CPU from the

back of the cabinet. For the CPU and the monitor, the ribbons are connected correctly if the ribbon connections are at the bottom of the board and come out the bottom of the connector. This is also explained in the manual.

Also, molex plugs run from the power supply to the monitor, CPU, and audio boards. Cinematronics warns, "Never connect or disconnect the molex power plugs unless the game is unplugged." This is good advice to follow when working on any type of game.

The last component to mention is the audio board. This board now has a protection output feature. Cinematronics has redesigned the circuit to reduce the frequency of having the audio amplifiers blow out.

The output stage of the amplifier circuit is now current-limited. The two wires going to the speakers can even short together and the audio amplifier should not fail.

Small, but important, features concerning the cabinet include a line cord that can be fully placed in the cabinet during moving; cutouts on the back top of the cabinet to help tilt the game back onto a hand truck; and a black front section of the cabinet which helps hide scuff marks

and keeps the game front looking attractive.

The sides of the cabinet are white and have a large decal on each side. These decals have already started to peel and will not look attractive in a few weeks. It's a shame to spend so much money on a game and have it look like it's been through a war after a few months.

On location there have been very few problems with *Armor Attack*. For this reason I'll give it a 7 out of 10. The game is quite good but there are still many improvements to be made on the cabinet design.

Thanks to John Colcough, design engineer at Cinematronics for taking the time to update me on *Armor Attack*.

So far I've received a number of letters from you "cranks" out there. Please write me about the difficulties you're having. Send responses to 955 Amboy Avenue, Edison, New Jersey 08830, or write c/o *Play Meter*.

[Ed. Note: Contributor Seninsky is president of Alpha-Omega Amusements, Inc., which operates a route including over 50 college game-rooms and Wizard's World Arcade on the New Jersey shore.]



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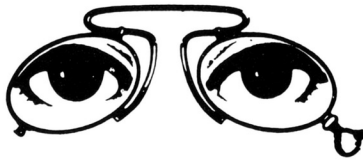
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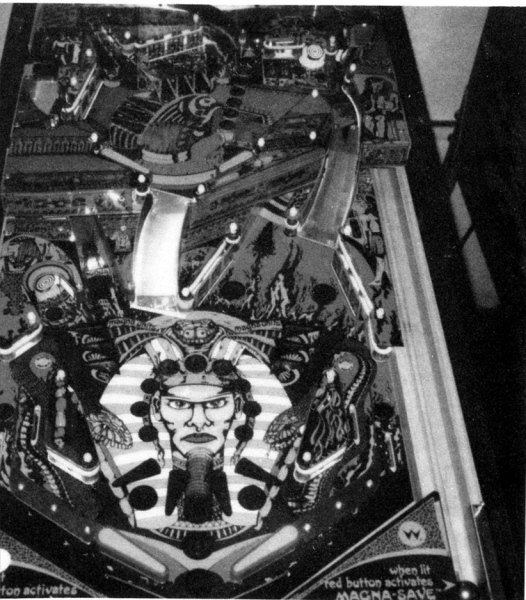


Critic's Corner

By Roger C. Sharpe

PHARAOH gets the eye

At the turning point



Williams PHARAOH

Pinball activity continues although some would just as soon write off this year so far and hope for better times. But the thing that still comes back at me is that no one is really losing during this transition period. Admittedly, the earnings of pins aren't really comparable to video at this point, but they have managed to stabilize keeping pinball as a viable, and necessary, product for the marketplace.

If anything, what I find personally staggering, is just how far the machines have come and some of the innovations and design twists that have been added. We've had multi-level games, multi-ball efforts, the integration of time on some features, and some great variations on a theme.

There has been the addition of more capabilities tied into the flippers, such as lane change and even a last chance for the players on such machines as *Mars* and *Black Knight*. Even *Jungle Lord* brought us a "drain shield" and the list goes on.

In fact, looking at this year's crop of machines, there have been some remarkable and lasting developments that have helped the games take better advantage of the available technology and furthered the importance of the programmer's place in the design of any effort.

In the long run, we may well look back at 1981 as a turning point in pinball's evolution rather than question what many thought would be its demise.

Fortunately, we have experienced the diversity of just what pinball can offer when the effort is taken to broaden its scope, and that for me has been a plus in evaluating things as we get closer to the AMOA show, which has always tended to be a

turning point for most manufacturers over the years.

This time around Williams continues its double-level assault with *Pharaoh* that's loaded to the gills with a variety of features that rival *Jungle Lord* in its difficulty to master for the novice player.

Williams PHARAOH

The follow-up to *Jungle Lord* offers some novel touches that are not only humorous but also effective as double-level play continues to be refined and modified in an effort to overcome the design constraints as well as maximize the available space. **PLAYFIELD:** The action begins on the top level with a bull's-eye target at the right near the ball's point of entry. Just next to this is a little loop captive ball that spells out P-H-A-R-A-O-H. Move over toward the left and there's a three-bank of drop targets just in front of a slightly hidden kick-out hole, which can lock up a ball when lit. Further over is another three-bank (both are tied together with colors: red, blue and orange) as well as a top little loop called the "slave's tomb." Just below all this is a top set of flippers and a long kicking rubber along the right.

The entry to the lower level is from a ramp on the right side as well as one slanted just to the left of center. This portion of the board offers a three-bank of drop targets on the right as well as another set closer to the middle of the field, although it's angled, with the ramp and a recessed kick-out hole (also possible for locking up a ball) separating the two.

Over at the left is a bull's-eye target (which ties into the top one for multiplier when lit) as well as a long shot into the "hidden tomb" that gets the ball back up to the top level in an

ingenious design touch. The bottom is conventional with the addition of the company's Magna-Save feature. ANALYSIS: Tony and John of Williams have incorporated a lot into *Pharaoh* both from a design and programming standpoint. There are timed features for increased scoring possibilities as well as some good, long shots that keep the action quick.

Basically, going through the drop target banks at the top will activate the possibility of two-ball multi-ball play as well as 2X scoring. The "slave's tomb" can activate increased scoring on the timer which is collected by going in either kick-out hole and there's also a mystery score tied into this for the outlanes, which is all part of what is being called a "stop and score" feature.

Go down the interior lanes to the bottom flippers and the bull's-eyes are lit for multiplier up to 5X so that the scoring can be high with the game. Add in the captive ball which can control everything from multi-ball possibilities to increased point totals.

All in all, there's a lot going on with *Pharaoh* which demands some investment and time on the part of the player in order to get comfortable with the field and what to shoot for, as well as when to shoot for it.

GRAPHICS: There's a great deal of fun on this theme that is once again a strong departure from the past glut of space motifs. It's necessary to take a close look at the playfield plastics and the detail work which are a refreshing change of pace from the norm.

In addition, the sound effects and speech, provide some balance in their own right, carrying through an effort that has some tongue-in-check value.

PLAY: There is the capability of some high scoring on *Pharaoh* and those who would "dare enter the tomb of the mighty one." Gratefully, it's seven-digit scoring and you should be able to get away with two limits: For extra ball play try 600,000 points to start followed by 1,500,000 points; on free play you might want to increase this by about 200,000 points depending upon your percentaging.

PRO & CONS: *Pharaoh* is an interesting game that does offer some satisfying shots and a great deal of strategy that can be a positive as well as negative. The problem is that there is so much that many players may just be overwhelmed

when they step up to the machine. Whether this will be a factor in your location is something you'll have to decide, given the nature of your players.

Everything is nicely tied in from top to bottom and features are utilized to their full extent, but maybe the allure of a double-level playfield is just wearing a bit thin given the fact that it's been used so often. But this effort is solid, does have some saving graces and provides its own moments, although one wonders how it will stand up over the long haul for those repeat play coins.

RATINGS: ###

On other fronts, the other manufacturers haven't let up, witnessed by the models on tap for upcoming issues, including Gottlieb's newest, the next from Stern, and a conventional machine from Bally. And other games wait in the wings as the year draws to a close and we approach the Chicago extravaganza.

One thing's for certain, all stops are off regarding pinball as the newest machines show. Until next time, be well and prosper. ●

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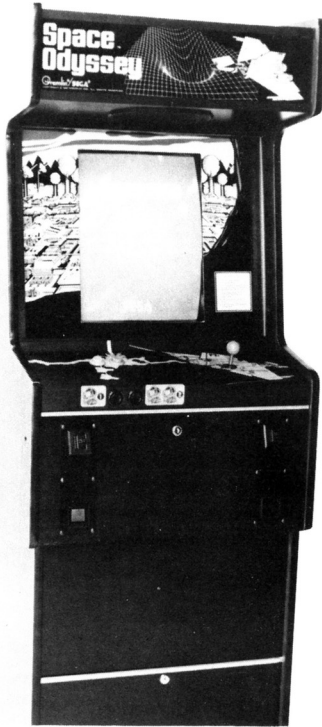
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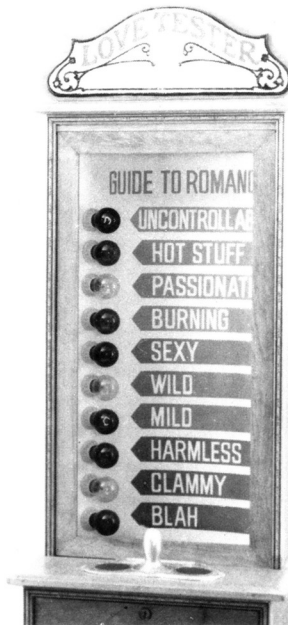
Space Odyssey/Gremlin



Super Cobra/Stern



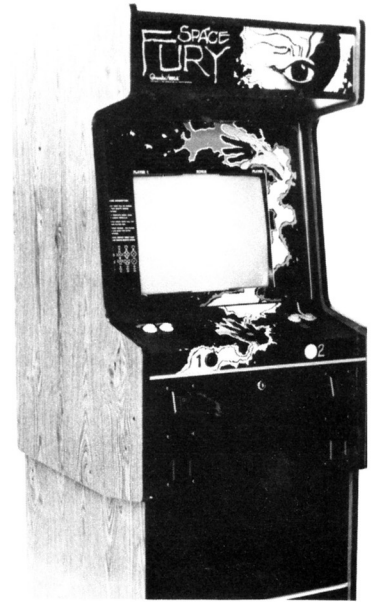
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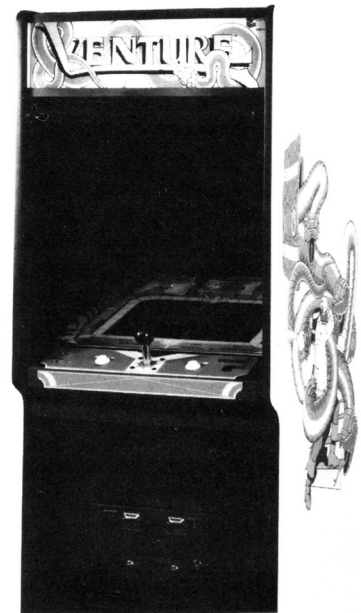
Love Tester/Mike Munves



Cocktail chair/Starnet Sales



Space Fury/Gremlin



Venture/Exidy

Enter: Space Odyssey

Players enter a galactic voyage marked by many changes of fortune in Sega/Gremlin's new *Space Odyssey* video game.

Space Odyssey, a one- or two-player Multi-Phase game, features 256 different colors, a moving foreground and background, horizontal and vertical play sequences, and Sega/Gremlin's Convert-a-Game capability.

Space Odyssey players man a joystick which controls altitude, direction, and speed of the player

ship. Players also control laser fire and bomb release buttons in a hair-raising battle against seven deadly aggressors.

The first set of floating UFO bases moves right or left. Low flying tankers and fighters appear at the bottom of the screen simultaneously. Occasionally, a UFO or fighter will fly out of formation and attack the player ship.

The second army of horizontal UFOs start at the bottom right and move up until they reach the player ship, ready to attack.

The "Mother Ship" releases the third set of UFOs while the low flying tankers and fighters appear again. The Mother Ship, armed to fire at a player's ship, resists multiple laser shots before being destroyed.

Multi-colored diamond-shaped UFOs with vulnerable midsections appear as the fourth challenging army. Players add bonus points by shooting out the center of the UFOs and maneuvering their ships through the mid-section without scraping the sides of the remaining target.

When these rounds are complete, the player ship moves on to three vertical sequences. In the first, the player battles while looking down on the city from a very high altitude.

The next two vertical sequences put the player ship in deep space. In the first sequence, during battle the player must avoid large scary "black holes" in space. If the player ship flies too close to the center of a black hole, the ship loses control temporarily and the player is unable to fire at passing UFOs.

In the final vertical sequence, the player ship is assaulted by hurling asteroids. The player ship is helpless, without fire-power, and must dodge these flaming targets. If a player succeeds through this phase, the game continues to a higher level of difficulty.

At the end of each round, total distance the player ship has flown is converted to bonus points. The faster a player can complete each round, the more points he earns. A high score earns the player a bonus ship. Operator may select from several levels of game difficulty and number of ships available to the player.

Space Odyssey is a raster monitor Sega/Gremlin Convert-a-Game. The company states that Convert-a-Game offers the opportunity for continued top earnings because the video game is convertible into a new game with Convert-a-Pak which Sega/Gremlin will make available with future new game introductions.

Super Cobra strikes

Stern Electronics, Inc. has announced plans to begin production of *Super Cobra*, a new video game licensed from Konami Industry of Japan.

The solid-state, one- or two-player game features explosive sound effects synchronized with the non-stop play action.

Object of the game is for the player—bombed on all sides by enemy tanks and rockets, UFOs, and surface-to-air missiles—to navigate his helicopter through enemy territory and penetrate 10 defense systems. To win, a player must capture and escape with enemy "booty."

Super Cobra offers players the option of starting a new game at the defensive level attained in the previous game.

Other innovative game and scoring features include:

—The player moves helicopter up and down, accelerates and decelerates by moving "joy stick" control. He destroys attackers by pressing Laser and bomb buttons.

—The player earns extra fuel for aircraft with destruction of enemy fuel tanks.

—At 10,000 points, the player is awarded Bonus Chopper.

Levels of difficulty increase after penetration of each defense system.

Is that Mt. St. Helens?

D. Gottlieb and Co. recently announced the release of *Volcano*, a multiple ball pingame that takes players back in time to a prehistoric fantasy world.

Players are treated to a variety of new features on *Volcano*. A moving shooter guide lets each player take aim, freeze the shooter guide, and try to hit the lit target at the top of the playfield. Hitting the lit target earns the player a Ball-Save on the left outlanes.

Once the action starts, players must shoot for the new Crater Playfield in the game's upper right-hand corner. This "ski-ball" type playfield offers four crater holes to enter. Entering a lit crater captures the ball and advances the player towards multiple ball play while entering an unlit crater activates the

Volcano shaft and the player will find the ball shot back at the flipper area with Volcanic force from a subterranean shaft.

"Fast action, great new features and graphics, our versatile speech sound system, and an erupting *Volcano* light show have all been blended and the result is a truly exceptional pingame," commented Marshall Caras, vice president of marketing. "The results of our new test programs have exceeded our expectations and we've found *Volcano's* earnings are surpassing those as some of the best video games on the market. We have also had a good response from operators on the promotional aids included in each game," he said.

Coin makes the world go 'round

The new *Love Tester* coin machine from Mike Munves Corp. is a reproduction of an antique popular arcade piece.

The *Love Tester* features solid state PC boards, a handfinished cabinet, heavy brass handles, and metal casing.

The player inserts a coin (10¢ or 25¢ at operator's option), pulls the handle, and sees and hears his "score" in ringing bells and flashing lights.

High-volume capacity is supported by the Mike Munves machine, with 10 seconds playing time per coin.

Comfort offered sit-down players

A chair designed for maximum comfort for the video cocktail table player features design to discourage non-player seating.

Owners and operators of video games welcome this innovation design because while the chairs are comfortable for the players, they are not so for general purpose seating, said the manufacturer.

The chairs are attractive, durable and highly functional, measuring 18 $\frac{1}{8}$ inches in seating height by 13 $\frac{1}{2}$ inches in seating depth. They feature hard rubber, hooded ball casters for easy maneuverability and heavy duty steel ball bearings in the pedestal base for reinforced swivel action.

The easy-care upholstered seat and back are finished with the same

attention given to luxury home furnishings. The nickel-chrome plated base and bolted T-nut construction ensure long-lasting and trouble-free dependability.

The chairs are available in a variety of colors, geared to complement a wide range of interiors.

Chairs can be ordered through local distributors. To obtain the name of the distributor in the local area, contact Starnet Sales Corp., P.O. Box 103, Skokie, Illinois 60076; or call 312/965-8870

First video color vector game

Sega/Gremlin has introduced its *Space Fury*, the first video game utilizing a color vector system which the company calls ColorBeam.

ColorBeam displays vivid, brilliant color, enhancing *Space Fury* game play.

"*Space Fury* combines ColorBeam with realistic speech synthesis, fast-paced Multi-Phase action and the popular space theme for a game that attracts crowds at any location. Location test reports show that *Space Fury* is an outstanding performer, a real 'hit' that urges many repeat plays from all age groups," boasts Gremlin President Duane Blough. "*Space Fury* also affords the tremendous advantage of Sega/Gremlin's revolutionary Convert-a-Game capability."

A one- or two-player game, *Space Fury* demands attention during the advertising mode when it asks: "Is there any warrior mightier than I?"

Players accepting the dare are further challenged when an eerie, one-eyed alien creature appears and says: "So...a creature for my amusement. Prepare for battle!"

Right and left rotation, thrust, and fire buttons are provided for the defense of the player ship. The player has an unlimited supply of ammunition and the thrust button allows the player ship to dodge threatening craft.

In each round, enemy ships are formed when four crafts join forces and attack as one. Only complete ships launch lethal scarlet fireballs. If a single craft is destroyed before it links with other craft, the partial ship will attempt to track down the player ship and destroy it.

When the player has successfully eliminated enemy fleets before

reinforcements arrive, the player may choose a docking sequence for increased firepower. The player who fights through two rounds hears the alien creature address enemy ships: "Warships: destroy this annoyance at once."

As the player continues to antagonize the alien creature by destroying more and more enemy ships, the creature orders further attacks and subsequent rounds get progressively more difficult.

Once the alien creature has defeated the player, it rates that player's performance: "Our battle is complete, warrior. You were an amusing opponent," or: "You were an adequate (easy, stimulating or outstanding) opponent," challenging players to better their rating with another play.

Operators may select from several levels of game difficulty and number of ships available to the player.

Treasures in the dungeon

Exidy, Inc. recently released *Venture*, its newest video game. *Venture* game play begins in a hallway of a multi-leveled dungeon. The player (appearing on the screen as Winky) chooses one of four chambers to enter, to avoid confrontation with the Hallmonster.

Each room contains a treasure (such as a pot of gold, a diamond, a damsel in distress, Winkette herself) guarded by three or more threatening creatures (such as goblins, serpents, or spiders). The player must out-manuever or shoot the creatures to obtain the treasure.

Points are awarded for hitting creatures, and obtaining treasures. The less time it takes the player to collect a level's treasures, the more bonus points are awarded. The player must collect all the treasures from a level before descending to the next.

Venture features a new Micro-synthesizer Audio System with original soundtrack and special sound effects, a left- or right-handed fire button, new 8-position joystick, international graphics, multi-lingual instructions (English, Spanish, French, or German).

Selectable options on *Venture* include Top Today's High Score, coins per play, international coin types, language selection, number of turns per player, and the amount of

bonus.

Exidy Director of Marketing Lila Zinter, commented, "We are experiencing exhilarating and overwhelming response to *Venture*, both by the players of our field test locations and by the many distributors who've come to see *Venture*. The special appeal of *Venture* is the continuous mystery that calls out to the players from behind every door. The player is intrigued to find what creatures waits for him in the next room, what the next level looks like, how long he has in a chamber before the lethal Hallmonster crashes through, and how many treasures he can collect. *Venture* has all the variety, innovation and excitement, without becoming complex, to make it the next video craze."

Coin Controls' Mini door

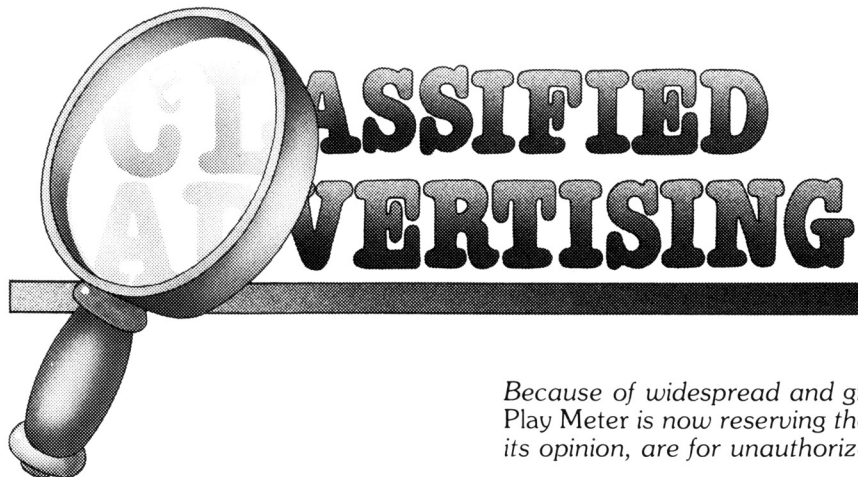
Coin Controls of Oldham, England, is shipping its new line of *S 10 Mini* coin doors, introduced last January at the ATE in London. Based on Coin Controls' *S 10 Standard* door, this reduced size entry unit incorporates the technical and aesthetic advantages of the "big brother," said the manufacturer.

The *S 10 Mini* continues the protective features of *S 10s* against vandalism and cheating, said product literature.

Either single or double entries for all the major coinages of the world can be mounted, or the door can be supplied "blank" for access to cashbox or service areas of machines. A Double Mini Door assembly provides both facilities within one framework and all items can be offered with either stainless steel or black painted fronts.

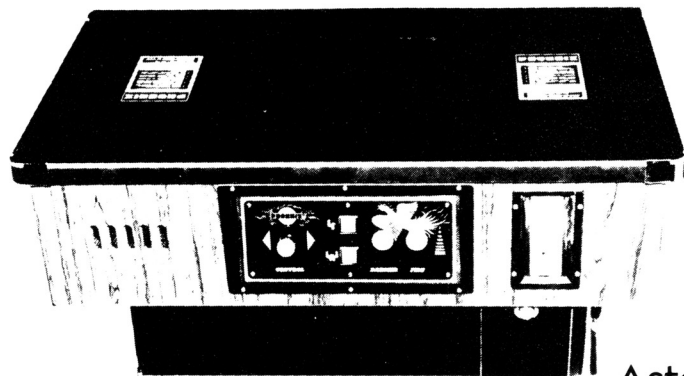


S 10 Mini/Coin Controls



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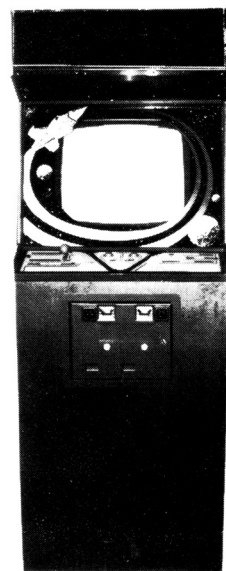
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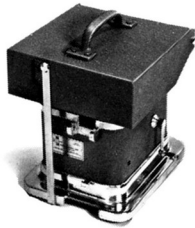
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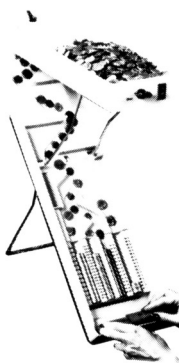
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....News briefs....news briefs....news briefs....news briefs....news briefs....ne

.....Rock-Ola was preparing to enter its first video game in the U.S. domestic market as well as for export, in mid August. It was reported to be a licensed game, as were the first two Rock-Ola videos (marketed abroad through agreement with Cinematronics, Inc.)--but Rock-Ola's own "think tanks" were working toward the first in-house developed game, to be introduced at a later date, a source at the Chicago factory said. In the interim big hopes at North Kedzie were placed on the third video, about to roll off the Rock-Ola assembly lines there.....

.....Several hundred San Francisco Bay area operators attended a festive new product showing at Advance Automatic Sales Co. recently. Among the new products on display were: Centipede from Atari; Midway's Wizard of Wor; Amor Attack from Cinematronics; Williams' Pharaoh; Centuri's Pleiades; Bally's new Fireball II; and Gremlin's Space Odyssey and game conversion system. "The turnout was excellent," noted Chat McMurdie, Advance's president. "We felt this would be a good way for our customers to see all the products recently introduced and enjoy a relaxing time with us, too." To top off the show, a special drawing for prizes was made by McMurdie and Will Laurie.....

.....In Middletown, Ohio, where controversy has raged over pinball games' legality, city officials were upheld by the state Supreme Court in their right to ban the games, but they appeared in July to be ready to consider easing the ban. Pinballs may be allowed "under certain conditions," under a recommendation from the city manager. Meanwhile, in the township of Bound Brook, New Jersey, officials backed down from enacting an ordinance that would have prohibited children under 16 from playing pinball and other electronic games. The ordinance would have also stopped anyone from playing the games after 9 p.m. or jukeboxes after midnight. Mayor George Plesa was quoted as saying public reaction against these measures was "flabbergasting." Most vocal in opposition were tavern owners, who said customers would have been inconvenienced by the strictures against coin-ops.....

.....Venture, the new video game from Exidy, was previewed to several individual distributors from around the world at Exidy's facilities in Sunnyvale, July 6-13. Enthusiasm was reported high from the distributors after Pete Kauffman, Exidy president, and other key personnel demonstrated the game play, operator options, and special features of Venture. (For details of the game's play features, see New Products, this issue.).....

.....Due to continuing demand for Cinematronics' hit video game Star Castle, a limited number of uprights were still being made available in late July, the factory announced. "With the amount of calls we have received requesting Star Castle, the decision was made to resume production on a limited basis," said Cinematronics Vice President/Marketing David Stroud.....

.....In Michigan, voters' defeat of tax proposal "A" gave operators cause to cheer that a tax on services was shelved that would have included a levy on amusement machines. MOM association's Executive Secretary Walt Maner and Michael Spaniolo, legal counsel, were in on the legislative discussions on the tax from the inception. MOM advocates any increase in taxes to be spread across as wide a base as possible, not impacting one industry such as the coin-operated disproportionately.....

.....Williams Electronics, Inc. announced that the company anticipates earnings per share for the third quarter on a pro forma basis to be approximately the same as those for the six months ending March 31, 1981, which were \$6.766 million, or \$1.35 per share.....

.....Bally Manufacturing Corp. announced in July the sale of 893 new electronic slot machines to the MGM Grand Hotel/Casino in Las Vegas. It was the second largest sale of slot machines in Bally's history, Board Chairman Robert Mullane announced, including an order of 270 new electronic slots to the Reno MGM Grand.....

BULLETIN: Centipede has been designated for use in the finals for the Atari \$50,000.00 World Championships in Chicago. Don't miss out on the action. Call toll free 1-800-426-8897 for details.

Chomp. Chomp. Chomp. Chomp. Chomp.

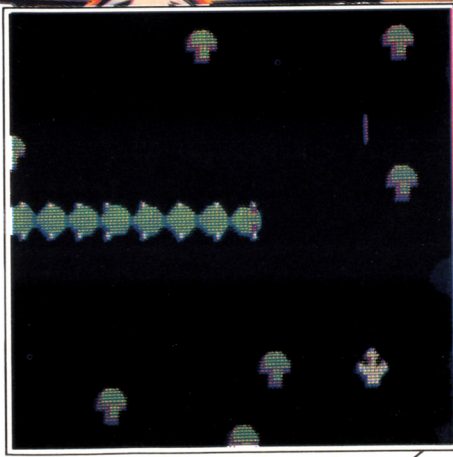


Look out! The Centipedes are loose and they're eating every coin in sight! In game centers, street locations, everywhere, these insidious invaders are gobbling up Centipede feed faster than players can get change for a dollar.

Atari's new **Centipede™** video is eating its way to Number One because it's different. It's a fresh new experience for players that means fresh new profits for you.

Join the Centipede hunger crusade. Get all the details from your Atari distributor or ask us for referral at Atari Inc., 1265 Borregas Avenue, Sunnyvale, CA 94086.

We also have a free "Centipede Feed" kit available. A package of information and attention-getting advertising materials designed to help your locations get maximum profits from Centipede. Send in the coupon.



Mr. Frank Bailouz, Vice President of Marketing
 Coin-Operated Games Division
 Atari Inc., 1215 Borregas Avenue,
 Sunnyvale, CA 94086

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A woman with blonde hair, wearing a red bikini top and black bottoms, stands behind a Gottlieb 'Volcano' pinball machine. The machine's playfield is illuminated with red and orange lights, depicting a volcanic scene. The background is a dramatic, fiery landscape with several volcanoes, one of which is erupting with a large plume of yellow and orange smoke. The sky is a deep red, and the overall atmosphere is intense and fiery.

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