

Diamonds in the Rough

A Short History of the International Grooving & Grinding Association and the Industry it Serves

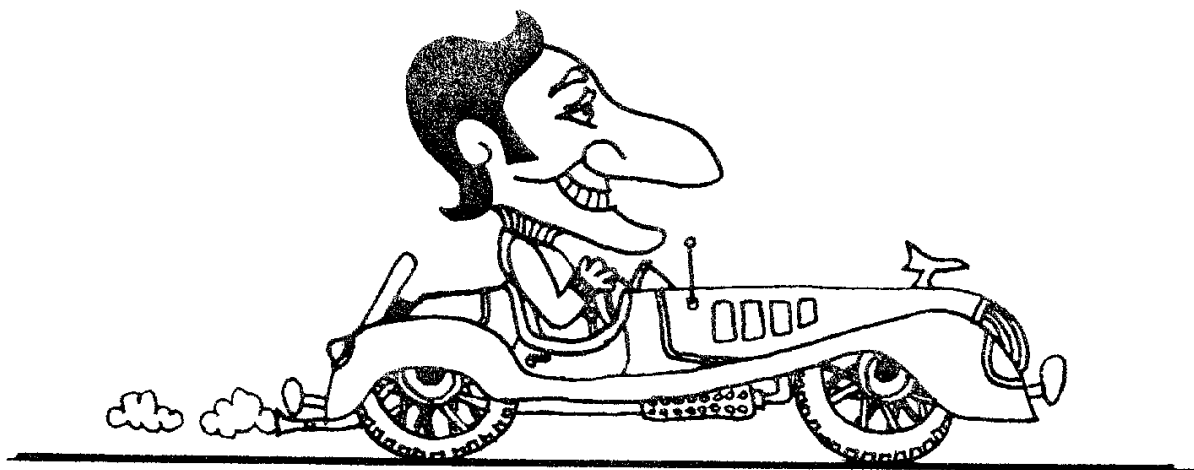
**By
Joseph Kurtz, Robert Priest and John Roberts
November 2012**



Forward and graphic by Richard Rasmussen (deceased) as presented in his paper entitled *Pavement Surface Texturing and Restoration for Highway Safety* – 1974

One of the things I remember from the first Highway Research Board meeting I attended was a slide depicting the philosophy that to a highway man, "Happiness is a Smooth Highway". In this sense, of course, smooth refers to riding quality, not surface texture. I would like to approach the subject of *Pavement Surface Texturing and Restoration for Highway Safety* from this same, though slightly expanded philosophy. I believe that to a highway man, "Happiness is a SMOOTH, SAFE Highway".

Happiness is a Smooth SAFE Highway



Introduction

It all began with a vision. Realizing the need for a collaborative effort in the grooving and grinding industry and the necessity to promote the general interest of contractor members, a handful of industry leaders created the International Grooving & Grinding Association (IGGA). This great association began with that vision and has continued to thrive ever since.

The IGGA is a non-profit trade association founded in 1972 by a group of dedicated industry professionals committed to the development of the diamond grinding and grooving process for surfaces constructed with Portland cement concrete and asphalt. In 1995, the IGGA joined in affiliation with the American Concrete Pavement Association (ACPA) to represent its newly formed Concrete Pavement Restoration Division. The IGGA/ACPA CPR Division now serves as the technical resource and industry representative in the development and marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world

Now after nearly 40 years in existence, the Association continues to lead the way in the development of optimized pavement surfaces and innovative concrete pavement preservation treatments worldwide. The following story chronicles some of the early history of the association and highlights the growth of an industry built by a handful of visionaries that could see well beyond the transportation horizon of their era.

Prologue

The ancient Greek and Roman societies have been credited with many innovations considered well before their time including concrete, aqueducts and paved roads. Interestingly, the concept of pavement grooving – the process of cutting precise channels into runways and highways to help prevent hydroplaning and wet weather accidents – can be added to that list. Pavement grooving, which has long been thought of as the brain child of British and American Scientists in the 1950s, has actually been around since the days of chariots. The ancient Greeks and Romans were very much aware that shod horses, when pulling carts or carrying riders, had a tendency to slip on wet pavement. In the ancient city of Ephesus, which was settled in the 10th century BC by the Greeks, there are still vestiges of transverse grooves carved in their marble streets.

While the credit for this inspiration may be lost to antiquity, the ability to innovate and improve the process belongs to modern day visionaries such as those represented by the IGGA. While there is not much documented by way of improvement to the grooving process spanning these many centuries, the last 60 years have been pivotal to the industry. Through experimental applications using diamond saw blades and specialized equipment, the grooving process, its younger sibling diamond grinding and the Concrete Pavement Restoration (CPR) process have evolved into what is today a multi-million dollar industry that is practiced around the world.

Grooving and Grinding – It's not all Fun and Games

The first modern use of the grooving process can be traced back to the late 1940s when a single diamond blade was first used on a concrete saw to groove pavement. Shortly thereafter, British engineers employed pavement grooving on several of their runways, including the world renowned Farnborough airport, to improve aircraft performance during landing and takeoff. Interest in aircraft safety polarized in the United States in the early 1950s when the advent of the jet engine aircraft quickly established that these higher performance aircraft with accompanying higher takeoff and landing speeds were much more difficult to control on wet runways than the piston type aircraft that they replaced.

Pavement grooving was first studied in earnest in the USA by NASA in 1962 and again in 1964. This was later followed by a combined effort between NASA and the FAA where 18 different test groove patterns were studied at 5 different airports to assess the effects of climate and traffic on these unique configurations. According to published reports, *"The contractor used Clipper grooving machines. These are small gasoline engine-driven vehicles capable of sawing 13 grooves at a time. Since the specifications called for completion of the work in 35 days, seven machines were used. Each was assigned a daily task of 35 feet of runway length, 150 feet wide. Approximately 200 feet of runway length were completed per day. The work was done between 11 p.m. and 7 a.m. to minimize interference with traffic."* This is a far cry from the production that can be achieved with the behemoth machines used today. In 1965, the first commercial runway in the USA was grooved at Washington National Airport. The configuration used on this project formed the basis of the FAA grooving specification used today. There were two researchers who worked for NASA that deserve a tremendous amount of credit for perfecting the grooving patterns used today; Walter Horne and Thomas Yeager. Their efforts have saved a countless number of lives by making aircraft takeoffs and landing safer.



Another infamous event played a strong role in the development of the industry in 1965. It was during this time that a Continental Jet attempted a

landing at the Kansas City Municipal Airport during a heavy rain storm. Due to the lack of surface drainage, the plane lost contact with the runway and skidded into the embankment protecting the airport from the Missouri River, where it then broke into two pieces.

The Kansas City Municipal Airport was the first civil airport in the United States to call for bids and award a contract for runway grooving. The runway was both asphalt and concrete pavement constructed with gravel aggregate. The specification called for grooves 1/8 inch wide x 1/4 inch deep, 1 inch on center.



The contract was awarded to Pavement Specialists, Inc. (PSI) in late 1966 and was completed in May of 1967. The airport had only one main runway and it was imperative that the runway be kept open for use by commercial traffic. The specifications called for night work requiring that the contractor work for 30 minutes and then clear the runway for 15 minutes to allow for commercial air traffic throughout the construction schedule. Based on the specifications, there were only 5 hours available for work each night. This was further complicated by having to move equipment on and off the runway a total of 10 times each night. According to those familiar with the project, it was the most difficult project ever completed by PSI.

While the grooving process was gaining momentum and legitimacy on both sides of the pond, another game changing development was taking place in southern California. Several enterprising individuals were working on a



device similar to a grooving machine that could be used to plane and texture hardened pavement surfaces. These devices were used on a number of different concrete applications beginning in the late 1950s, including runways, roadways and dam spillways. In 1962, the first dam spillway was ground at the Indian Valley dam north of Sacramento, CA.

Again in 1962, machines with 38" wide heads, 250 HP engines and weighing 10,000 pounds or more were introduced. During this time, the California Department of Transportation advertised a 1 million sq. ft. diamond grinding test section on the San Bernardino Freeway in California, now hailed as the

first production diamond grinding on a highway in the USA. That project was followed up in 1964 with a much larger scale grinding project on that very same roadway.

For those early pioneers involved in these events throughout the decade, it was clear that an industry was born.

Men On A Mission

The founding fathers and innovators of this fledgling industry could see the promise and potential that lay ahead. They saw the need to organize and standardize their efforts if they had any hopes of lasting success in the future. With that in mind, a group of committed industry leaders met at the Sierra Restaurant in Lakewood, California on June 26th, 1972 with the sole purpose of growing an industry. The attendees at this first meeting included:

- Cecil Hatcher - C.W. Hatcher, Inc.
- A.D. Ray and Jack Robishaw - Concrete Grinding & Grooving, Inc.
- Lester Kuzmick - Cushion Cut, Inc.
- Joseph Kurtz - Pavement Specialists, Inc.
- William Harris - Transportation Safety Systems
- Ted Reinhart - Concut, Inc.
- Harold Walters - Christensen Diamond Products

Review of the minutes taken by Secretary Les Kuzmick clearly shows that this was a group of energetic, driven individuals with a goal of growing this industry far and wide. In the course of 1 hour and 40 minutes, the group set forth on an ambitious agenda. Ted Reinhart requested permission to represent the association in Washington, D.C. with the Federal Aviation Administration and United States Air Force. Bill Harris had identified issues and opportunities in West Virginia and was looking to tackle them head on with support of the group. Cecil Hatcher was tasked with developing a budget for the group. Reinhart and Harold Walters were charged with preparing a letterhead and an insignia. Last, but not least, a set of bylaws were reviewed and amended. It was clear that this group was not going to simply wait for good things to happen.



By virtue of this meeting, the International Grooving & Grinding Association, Inc. was born. A motion was passed to make 1400 W. 240th Street, Harbor City, California, the address of the association.

The second meeting was held on August 15th and interestingly, the topic of diamond grooving slurry disposal was aired. The minutes indicate that *"There was agreement that this problem would become serious for all members in all parts of the country and therefore a water disposal committee was appointed to pursue solutions to this problem with dispatch."* A young man named Peter Silveri was discussed as a candidate to fill the role of publicity agent for the association.

Peter Silveri is a name that is recorded on numerous occasions in the historical IGGA meeting minutes. Silveri was writing articles and promoting the use of diamond blades around 1965. He was motivated by the fact that the hydroplaning accident that occurred at the Kansas City Airport was quite preventable and from that point on, wrote and published numerous articles extolling the benefits of both grinding and grooving. According to IGGA members from that period, Silveri was a strong supporter and good friend of the industry. Several years later, Silveri would become the Association's first paid Executive Director and served in that capacity until his untimely death in 1988.



By the time of the 4th meeting, held on November 29th, 1972, 6 members had paid the necessary \$500.00 annual fee. It is not clear which of the companies in attendance at that meeting had paid the necessary dues, but in attendance were:

Cushion Cut, Inc.
Asahi Industrial Diamond
Industrial Diamond Service, Inc.
C.W. Hatcher, Inc.
Pavement Specialists, Inc.
Cardinal Industries of California
Concrete Grinding and Grooving
Concut, Inc.
San Diego Concrete Cutting

Not surprisingly, the diamond grinding slurry topic played a role in each of the organization's first 4 meetings. It is also interesting to note that by 1973, the California DOT had grown a grooving budget in excess of \$3.65

million dollars, an impressive sum for that day and age. It was during this time that the California Department of Transportation began a several year's long research study, which documented how longitudinal diamond grooving could reduce wet weather accidents by an average of an incredible 69%.

The year 1973 was a pivotal time for the association which brought about many developments. On February 21, 1973, the association came into legal existence as a non-profit Corporation in the State of California. The corporate seal was also approved. The seal consisted of two concentric circles with the words International Grooving & Grinding Association, Inc.". The year also marked the addition of Joseph Kurtz to the IGGA Board of Directors: a role he would repeat many times over during his time in the association. Ever tied to the industry and the association, Kurtz would eventually serve as the IGGA's Executive Director. The group's first meeting, in conjunction with the ACPA, occurred during this period as well. IGGA Secretary Les Kuzmick made the call to Harold Halm of the ACPA to set this pivotal event for March 22nd 1973 in Atlanta. While the IGGA endeavored to meet and partner with many varied industry groups throughout the years, its relationship with ACPA has lasted through present day.



The remainder of the 70s was a busy time for the IGGA with robust growth in both the association and the industry that it served. During this time, the IGGA gained increased support from the world's premiere diamond producers, DeBeers and General Electric. The increase in marketing and financial support from these organizers anchored the association and fueled its growth. It was about this time that the group began to see the potential that lay beyond servicing only the grooving and grinding marketplace. The interstate highway industry was beginning to mature and many miles of highways constructed during the interstate highway initiative were born in the 1940s. Some of these pavements were approaching middle age and were in need of some well deserved repair and maintenance. Departments of Transportation were in need of a concrete pavement maintenance system that could improve the performance and longevity of their concrete pavement to help realize their full life potential.

It the year 1975, Tom Moreland, the Georgia Director of Transportation, wrote a letter to the ACPA requesting industry support in addressing his state's pavement maintenance needs. This request came attached with a threat that this influential state may cease using concrete pavement as a



part of their transportation program if they did not develop a means of maintaining the system. The IGGA held meetings in 1975 to discuss how and where a demonstration project and seminar could be held in Georgia. At one of the meetings, Joe Kurtz presented a plan and obtained the cooperation of many individuals and companies to participate. Most members had dual membership in the ACPA & IGGA at the time. This

cooperation between the IGGA and the ACPA made it possible to conduct this pivotal CPR Summit in Georgia, in February of 1976, which is credited by many as the saving of the concrete paving industry. Oddly, this serious issue acted as a spark that helped produced the acronym CPR, Concrete Pavement Restoration. The term CPR was offered up by the long time IGGA member, Bob Priest, who successfully fused a marketing phrase from General Electric and the medical term cardio pulmonary resuscitation. The term CPR has been tied to this industry ever since. Equally important was the genesis of an even broader industry focused on providing the complete concrete pavement preservation package that is still state of the art.



In the early 1980s, the industry was fortunate to recruit Ralph Allen, who was retiring from the GDOT as the Concrete Pavement Engineer. Allen was hired by the Target Company under the direction of then General Manager Bob Priest, to develop a marketing presentation outlining the 7 steps of Concrete Pavement Rehabilitation, now known as CPR. He was tasked with traveling across the US, visiting state departments of transportation and affiliated ACPA Chapter/State Concrete Paving Associations spreading the CPR gospel. Allen was assisted by Larry Mosher, the owner of a grinding company called Mu, Inc. and a man who would be forever linked to the industry and the association. Not surprisingly, Mosher would one day become the Executive Director of the IGGA. These men took to the road and spent many hours promoting the CPR concept and training those willing to learn more about the process.

By this time, many large restorative projects were now being scoped on interstate and secondary highways across the nation. Commercial grooving

and grinding were also developing into lucrative markets in their own rights. Another experimental process called dowel bar retrofit (DBR) debuted in 1981 as the GDOT began experimenting with retrofit load transfer research in an attempt to prevent joint faulting on their undoweled jointed plain concrete pavement. The GDOT was a leader in the industry in developing and improving CPR treatments to service their concrete pavement network. GDOT engineers, including Wouter Gulden and Alan Childers among others, are responsible for lasting contributions to this industry related to patching, joint sealing, DBR and more.



The 1980s was a time that saw technical advancements in both blade and machine development. The Target Company had developed their second generation of grinders and 1983 was the year that Cushion Cut, Inc. unveiled their new PC 5000 production grinding machine. By this time, approximately 5,000,000 sq. yds. of pavement had been diamond ground in the US.

Another important relationship developed in the 1980's was that between the IGGA and Stan LaHue, a high ranking official with the Federal Highway Administration. After a number of meetings with the IGGA and some exposure to the industry, LaHue developed a strong appreciation for the CPR process, to the point where he helped coordinate the pivotal Mt Vernon Parkway CPR demonstration project. Years later LaHue would join the ACPA as their Director of Highways and act as a strong advocate for CPR as well as the IGGA.



The remainder of the 1980's witnessed the growth and development of the bridge deck grooving market. Increased customer demand for smoother roads drove ever tightening smoothness specifications which fueled the burgeoning corrective grinding markets. Diamond grinding also began to be used in municipal and city street applications. Equally important during this time is the maturation of the CPR process as a whole. The use of full depth repair, under sealing, joint repair, diamond grinding and joint resealing used in a coordinated fashion became the norm in the roadway restoration market.

NASA Takes Notice

One of the lesser known, yet monumental accolades bestowed upon the industry occurred in 1990. At this time, NASA selected safety grooving as a NASA spinoff technology and inducted the process into the US Space Technology Hall of Fame. IGGA members Cecil Hatcher and Joseph Kurtz were selected for special recognition as pioneers in the evolution of the industry.



While some would see this as a signal that could cause an industry to rest on its laurels, the next generation of IGGA leadership saw this as a starting point for better things in the future. By this time, over 6,000,000 sq. yds. of roadway grinding and 5,000,000 sq. yds. of airport grooving had been constructed. Bridge deck grooving had developed into a major market accepted across the nation. Yet, even more innovation was in the wind.

In 1992, the Washington State DOT (WSDOT) began looking into load transfer restoration as a means of minimizing the joint faulting they were experiencing on their large concrete pavement network. Borrowing from the research conducted by the GDOT a decade earlier, WSDOT installed a DBR test section to gauge its benefits. In 1993, the first high production slot saw made its debut in Washington State and facilitated the construction of the first high production dowel retrofit project in the world. This process saved numerous pavements across the nation with nearly 6.5 million retrofit bars installed to date.

In 1993, Georgia was recognized by the National Transportation Research Group, TRIP and the Federal Highway Administration (FHWA) as having the best highway system in the United States. This was due in no small measure to the fact that GDOT had trained their own state forces to repair concrete pavement and even purchased their own fleet of diamond grinding

machines. In years there miles of pavement in remarkable was achieved their with the same competitive



approximately six were nearly 580 lane renewed concrete Georgia. What was the fact that GDOT highway superiority initial costs and bidding rules as all

other states. The key, of course, was that GDOT was a leader in monitoring pavement condition and took early steps to control the rate of deterioration, which is crucial to proper pavement preservation. They realized that a smooth road lasts longer than a rough one, which is the foundation for pavement preservation. A few years later, GDOT again confirmed their commitment to and confidence in the CPR process. When Georgia was readying for the Summer Olympics, GDOT put over 500 lane miles of CPR under contract, which resulted in an average ride quality 10% better than that which is required by specification for new construction.



The year 1995 marked the official linking of the IGGA and ACPA when both officially affiliated to strengthen CPR promotional efforts within the industry. IGGA agreed to represent the ACPA's newly formed Concrete Pavement Restoration Division. This partnership has endured until present day and has led to growth in this industry that was previously unimagined. Not

long after the affiliation between the two groups, the state of California embarked upon an ambitious pavement improvement initiative resulting in over 7 million sq. yds. of diamond grinding in a single year. This was a milestone for the industry without equal, at that time.

During this period, state participation provided the added benefit of rigorous data collection and reporting due to the fact that states that were actively engaged in pavement preservation were also actively engaged in collecting performance data. This was a huge benefit to the IGGA and the industry as a whole. As noted earlier, California hosted the first highway application of diamond grinding and since that time had collected a considerable amount of data on the process. The California Department of Transportation (CALTRANS) had calculated that the diamond grinding product would last between 16 and 17 years and could be applied as many as three times to a single pavement. When combined with other CPR techniques, this could add decades of additional life to an already long life concrete pavement. While evaluating their DBR program, WASHDOT determined that during their 17 years of using DBR and the placement of over 600,000 bars, the process was a cost effective preservation treatment for PCCP with an expected life of at least 15 years and would be used extensively in the future.

Diamonds are Forever

The present day era of the transportation industry is one that is focused on customer driven issues. Ride quality, noise and safety are paramount issues when any surface transportation project is being considered. Additionally, environmental issues are playing an ever increasing role when projects are being scoped and designed. These issues, oddly enough, play to the strengths of the CPR industry.

Today, in a world where funding is evaporating, natural resources are limited, customer comfort and safety are paramount, and the need to be sustainable is undeniable, CPR shines its brightest. The concrete industry was green long before the word “sustainable” was added to its professional lexicon. With CPR, a 40 or 50 year old concrete pavement can be given another 20 year lease on life through the application of patching, DBR, diamond grinding, joint resealing or a combination of these techniques. Natural resource consumption is kept to a minimum. CPR offers many other environmental benefits. Concrete pavement surfaces provide increased light reflectance which reduces the need for roadside lighting, less rolling resistance than flexible surfaces, thereby increasing vehicle fuel economy, and require significantly less petroleum during construction than alternative treatments.

The concrete industry continues to work hard to improve its products and services and make life better for the driving public. In the area of noise, the IGGA, in league with the American Concrete Pavement Association (ACPA), Purdue University and the Minnesota Department of Transportation (MnDOT) has developed the “Next Generation Concrete Surface” (NGCS) that has proven to be one of the quietest concrete surfaces ever developed. In addition to being very quiet, thus far it has also proven to be acoustically durable with very little change over time.



Keeping the environment in mind, a new process called “Buried Treasure” was been developed, where an aging asphalt overlay is removed from an otherwise structurally sound concrete pavement. The reclaimed asphalt is sold or stockpiled for future use with its value used to offset the price of repairs and the diamond grinding of the underlying pavement as a final surface. A truly sustainable process when viewed from an environmental perspective.

The Road Ahead

A wise man once wrote “to a highway man, happiness is a SMOOTH, SAFE highway’. In today’s transportation climate it would be easy to expand the phrase to include the words QUIET, ECONOMICAL and SUSTAINABLE. Who knew that a small, obscure

industry birthed over 50 years ago would be so well suited for the demanding and competitive conditions that permeate the surface transportation industry today. In looking forward, the IGGA will continue to use the strengths of this proud industry as a foundation for further innovations and

improvements that will carry tomorrow’s travelers in a safe, comfortable and economical manner. In looking back, the industry bears little resemblance to the early days chronicled within this historical account, but there has always been one underlying constant; the ingenuity, drive and passion of the people that are this industry.



Appendices

Current Board/Directors

- President: **Alex Ugalde** - Hilti North America
- Vice President: **Tom Bonness, Jr.** - C.P.R., Inc.
- Secretary: **Jake Steinberg** - Construction Materials
- Treasurer: **Scott L. Eilken** - Quality Saw & Seal
- Past President: **Jenne Imholte-Decker** - Simplex Construction Supplies
- International Director: **Charley Grady** - Crafcro
- Director: **Jerry Voigt** - ACPA

IGGA’s Executive Directors

Peter Silveri
Peter Silveri Associates, Inc.
1270 Avenue of the Americas

New York, NY
1975 - 1988

Fred Gray
G & T Enterprises, Inc.
Skyland, NC
1988 - 1992

Joseph Kurtz
Kurtz Enterprises, Inc.
Westlake, TX
1992 - 1995

Larry Mosher
Mu., Inc.
Lebanon, TN
1996 – 1998
John Roberts
West Coxsackie, NY
1999 - Present

Awards/Recognition

The IGGA conducts an annual awards competition with the purpose of honoring individuals and organizations for contributions made to the grooving, grinding and concrete pavement restoration industry. The awards are:

- The Lester F. Kuzmick Award is the IGGA's highest honor as it recognizes individuals, companies and organizations for excellence in the industry. The award is named in honor of Lester Kuzmick, a leader credited with shaping the IGGA and the industry.
- The Operator of the Year (Iron Man) Award recognizes those who work in the field for their leadership with special emphasis on dedication to quality.
- The Government Official of the Year Award recognizes a government or public official for leadership in the surface transportation industry with emphasis on grooving, grinding and concrete pavement restoration industry.
- The Honorary Life Member Award is for those who have rendered outstanding service to the industry and the IGGA. Candidates must be retired or retiring and should have provided significant contributions to the advancement of the industry.
- The CPR Promoter of the Year Award recognizes those whose efforts and accomplishments have risen above their peers while promoting the industry.

IGGA Past Presidents

- 2012 Alex Ugalde
- 2011 Pete Lewis
- 2010 Jenne Imholte
- 2009 Terry Kraemer
- 2008 Scott Eilken
- 2007 Duff Parker
- 2006 Casey Holloway
- 2005 Dave Lemesany
- 2004 Terry Kraemer
- 2003 Gary Aamold
- 2002 John Depman
- 2001 Richard Jones
- 2000 Terry Kraemer
- 1999 Gary Aamold
- 1998 John Depman
- 1997 Larry Swanda
- 1996 John Roudebush
- 1995 Dale Brent
- 1994 Dale Brent
- 1993 Dale Brent
- 1992 Tom Webster
- 1991 Tom Webster
- 1990 Robert Priest
- 1989 Robert Priest
- 1988 Thomas Trussell
- 1987 Thomas Trussell
- 1986 Thomas Trussell
- 1985 Lester Kuzmick
- 1984 Lester Kuzmick
- 1983 Joseph Kurtz
- 1982 Joseph Kurtz
- 1981 Joseph Kurtz
- 1980 Joseph Kurtz
- 1979 John Roudebush
- 1978 John Roudebush
- 1977 Joseph Kurtz

- 1976 Joseph Kurtz
- 1975 Joseph Kurtz
- 1974 Cecil Hatcher
- 1973 Cecil Hatcher
- 1972 William Harris