# BUGGY '72

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We would like to thank Janet Rosen, editor of the TARTAN, for her help.

# Introduction

Spring Carnival at Carnegie-Mellon University is like spring weekend at many campuses. There is, however, one aspect of Carnival that makes CMU unique. This is the Sweepstakes, or, as it is more commonly called, the buggy races.

A buggy usually resembles a superstreamlined soap-box racer. It may well represent an investment of a thousand dollars or more to the organization that built it but, as any buggy builder, pusher, or enthusiast knows, the investment in a buggy is actually far greater than that. Work on a buggy usually starts about two weeks after the previous race. It continues throughout the academic year right up to the race. In those last few hectic weeks before the race, buggy building can become a full time job.

An organization may have the fastest buggy on campus and still not win the race unless the other half of the buggy team, the pushers, do their work also. A good push team will practice at least five nights week beginning some time in February. By race day a pusher is ready both mentally and physically. He knows his hill and is determined that no one is going to beat him on it.

The buggy course is made up of five push zones, called hills, and one free roll zone. At the sound of a starting gun, the first pusher propels the buggy up hill one. As a rule, the buggy that gets up hill one first will go into free roll first. If the buggy doesn't go into free roll first, it may have to pass another buggy, a maneuver that is both dangerous and time consuming. For this reason the hill one pusher is often the best man on the push team.

At the top of hill one, the hill two pusher takes over. This man must push the buggy over the top of the hill and give the buggy the final critical shove into free roll. The pusher supplies the initial velocity for the buggy as it goes into free roll, so a lot depends on how strong he is.

The buggy is now in free roll where the race is solely dependant on the skill of the driver. Despite the constant bouncing of the buggy, the driver must guide his buggy down the free roll course and around the hairpin turn at the bottom. If he must pass another buggy, the driver must carefully judge his speed to avoid cutting back in too soon and thus causing an accident.

At the end of free roll is the bottom of hill three. The pusher on this hill must correctly estimate the speed of the buggy so he can time his pick-up. If he picks up the buggy too soon, he will slow the buggy down, but, if he picks up the buggy too late, he will have lost precious pushing time and the buggy will slow him down.

Hill four and hill five pushers have one thing in common; they must have fantastic endurance. The hill four pusher has a long, steep climb to look forward to. This hill requires a fast man but there is another requirement. To push the two hundred-plus pounds of driver and buggy up the hill, this pusher must be strong. Hill five is the longest hill but it is also the flatest. This hill presents a good chance to pick up vital seconds. If the fastest man wasn't used on hill one, he'll be on hill five.

The race depends on every man on the team and the time from starting gun to finish line is only two and one half minutes. Two and one half minutes that are the culmination of many months work.

# Grand Prix of Tech

Al Soltesz

Ernie Wilson

On May 19, 1920, a dozen "pushmobiles" lined up in front of Margaret Morrison. A gun sounded and the first Sweepstakes at CIT had begun and with it a tradition that has lasted over fifty years. As these original machines passed the top of the hill, the pusher jumped on the back and the two man team braved the perilous curves of Schenley Park. At some point during the race, each competitor was required to switch the two rear wheels to demonstrate the mechanical ability of the team. Finally, the driver and pusher could switch positions near Porter Hall for the final uphill stretch. Strangely, the results of the race were never reported by the TARTAN.

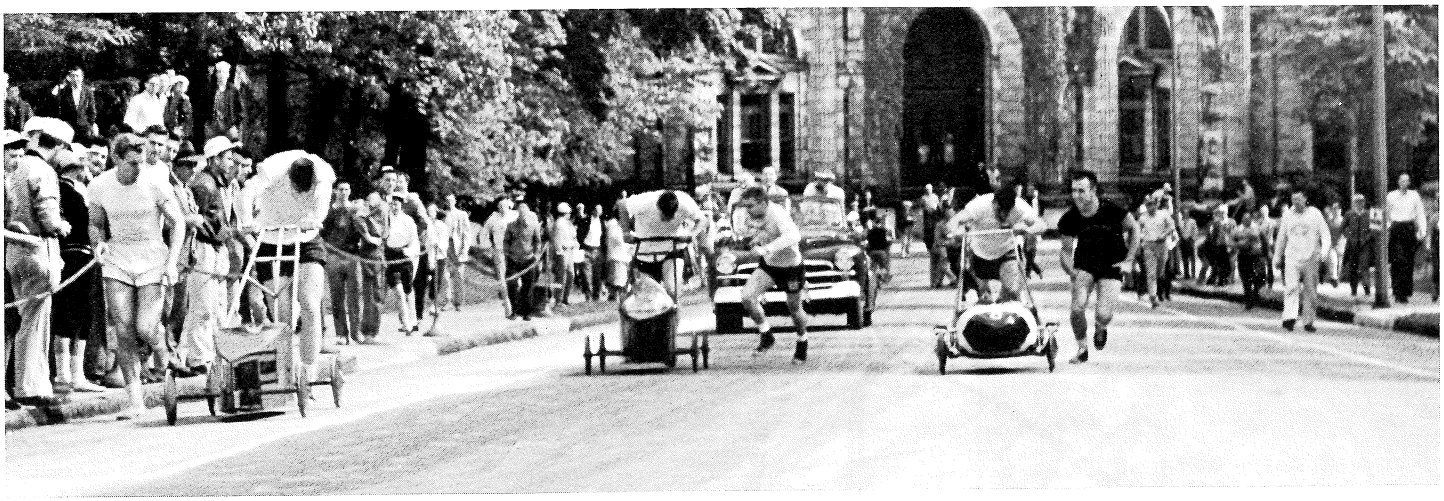
By the second annual race the evolution of the Sweepstakes to its present form had begun. The first design cups were awarded (to Delta Upsilon's "Fishmobile" and Sigma Nu's "Toonerville Trolley") and the pitstop was dropped to speed up the race. The race was still run in one heat, however, and of the eighteen buggies that started, only fifteen finished the race. Iota Sigma Delta, a local fraternity, won the race that year with a time of 4:38. The next year, two of our present day fraternities, PIKA and SAE, finished in a two-way tie for first place. The reason for the tie was that the crowd at the finish line could not restrain their enthusiasm and prevented the judges from seeing the actual finish.

1923 saw more changes in the race. Freak designs were eliminated and the design emphasis was placed on ingenuity and mechanical perfection. The push ream was increased from one man to a relay of four. During this time, track men and later, all varsity athletes were prohibited from taking part in the races for fear of injury. Each following year brought successive changes that finally resulted in the race as we know it today. In 1924, the TARTAN reported, "...and it has been rumored that some have been cavorting around the course during the dead of night." 1925 saw the race run in heats for the first time, with the finals run the same day.

Kappa Sigma became Carnegies's first "buggy house," winning every race between 1923 and 1928, except for a Pi Kappa Alpha victory in 1926. In 1928, the fifth pusher was finally added and the course became roughly the present one. That year the dorms were also permitted to enter what had previously been an all fraternity race. In 1929, Spring Carnival week-end was cancelled but the buggy races could not be stopped so easily. Ten buggies competed that year, and the race was held on two separate week-ends.

During the late 1920's and early 1930's, the buggies usually resembled a race car, such as an Indy racer of that era. In 1937, three wheeled buggies were introduced and Beta Theta Pi entered a buggy with a driver in the prone position. Design emphasis switched from racing cars to airplanes. That year, BTP was almost dropped from the finals when their mechanic forgot to bring the wheels.

Beginning in 1934, Kappa Sig had regained its place as the top buggy builders. They won every race up through 1941, with the exception of 1935 when Beta Theta Pi took first place. In 1942, the race results were not reported in the TARTAN. This year also marked the end of what many people consider the first phase of Sweepstakes.



During the war, the Sweepstakes were not held due to the draft and the high priority of aluminum. In those three years, much buggy building knowledge was lost and in 1946, when things returned to normal, it was new men building new buggies. Buggy design in the first post-war race was radically changed from the pre-war years. The buggies of this period commonly had four wheels and wedge or torpedo-like bodies. Most drivers still rode in a crouched, sitting position, but the horizontal driving position was beginning to take hold.

In the first race after the war, a new champion emerged, who was to have a stong grip on the race for the next seven years. Delta Tau Delta finished first with Kappa Sig, the pre-war champions, taking second. The Delt loss in those years was only to Delta Upsilon in 1947. From 1948 to 1952, the Delts set a new record every year culminating with the 1952 record, nearly six seconds faster than the previous year's record of 2:41.6.

Alph Tau Omega, evidently following the old adage, "If you can't beat 'em, join 'em," came out with an exact duplicate of the DTD buggy. In the closest race in Sweepstakes history (except for the 1922 "tie"), the ATO's "Andy I" narrowly edged the second place Delt buggy by 0.5 seconds. This marked the end for the Delts, who took third place the next year and then faded from the scene. ATO now began their buggy dynasty. For the next ten years, the race virtually belonged to Alpha Tau Omega, with the only near competition provided by Pi Kappa Alpha. In 1955, ATO achieved the near impossible by being the only organization to ever finish first and second in the same year.

1956 saw the establishment of a record 2:25.0 time by the ATO's "Andy I" which was tied the next year by ATO's "Golden Goose." This record was to stand for eleven years and provoked such comments as this one from the 1966 buggy book, "...perhaps the race has reached it's limit."

The advent of the "Golden Goose" brought about a radical change in design. It utilized the prone driver and the low-to-the-ground design that has become the design of every winning buggy since. Phi Kappa Theta had introduced the first fiberglass uni-body a few years earlier and this also influenced buggy design. Like every other winning streak, ATO's was blemished by one loss, to PIKA in 1959. 1963 marked the end of ATO's reign when the "Goose" spun out of control near Scaife Hall and crashed into the curve.

The next year, a new buggy house emerged, Beta Theta Pi. Beta had been a strong contender in the pre-war years, but since then had only taken two third place trophies. In 1964, Beta suddenly jumped to the front. That year, and the year after, BTP buggies took first and third place. The second place team in 1964 was Sigma Alpha Epsilon with their controversial bike design. The SAE bike was first introduced in the 1961 Sweepstakes and since then has compiled a record of three second and three third place finishes in eleven. Tau Delta Phi and the Dorms have also adopted the bike design, but neither has met with the success of the SAE bike.

BTP was still out in front in 1966, but the third place buggy that year was the PIKA "Shark." This was the beginning of the long standing competition between PIKA and BTP which is still a major factor in the present Sweepstakes. PIKA won the next Sweepstakes but, unlike the victory over ATO in 1959, this was clearly no accident. The "Shark" set a new course record of 2:24.8, breaking the eleven year-old ATO record by 0.2 seconds. This record was not to stand long, however. The next year, a new PIKA buggy, the "Tiger Shark II," shattered the course record by almost four seconds, setting the present course record of 2:20.9

PIKA dropped out of sight for a year with Beta Theta Pi returning to the front in the interim. The stage was now set for 1970. This was probably the only period in the history of the races when there were essentially two buggy houses on campus. PIKA and BTP squared off and when the smoke cleared, PIKA had regained the championship with Beta taking second and third places. For anyone who thought this might be a fluke, the two houses repeated their performances in the 1971 race.

This brings us to the present race. The course is in very poor condition, so it is doubtful that any new records will be set this year. Course times have also been increasing in the past few years, but if and when the streets are repaved, there should be a drastic reduction in course times and the course record will be in jeopardy. If the roads are repaved in the next few years, PIKA and BTP both stand excellent chances of breaking the record, with PIKA having the edge at this point. But who knows where a winning buggy will come from?

In short, the race has by no means reached its limit.

# Sweepstakes Results

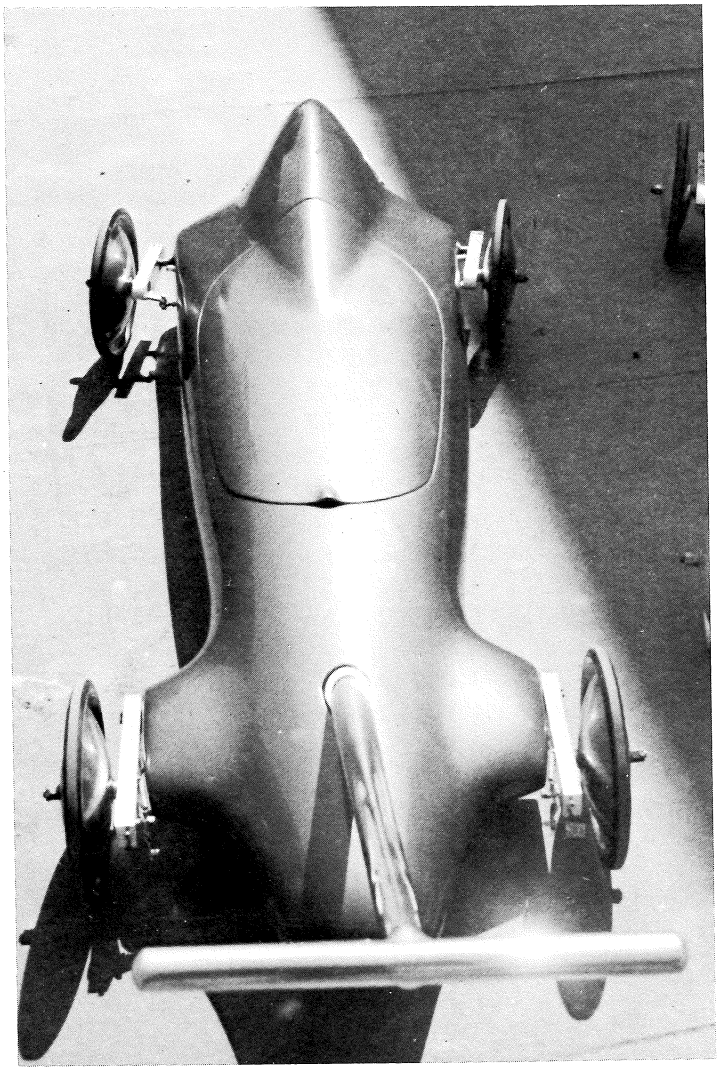
1920: first "Spring Week", first Interfraternity Sweepstakes
10 entries

| | *Sweepstakes Winners* | *Design Winners* |
|---|---|---|
| 1921: | 1. Iota Sigma Delta 4:38 | 1. DU |
| | 2. G.M.E. 4:42 | 2. SN |
| | 3. Chi Sigma Upsilon 5:04 | |
| 1922: | 1. SAE 4:30 | 1. SN |
| | 1. PiKA 4:30 | 2. ? |
| | 3. Delta Mu | |
| 1923: | 1. KS | 1. Delta Xi |
| | 2. TX | 2. KS and SAE |
| | 3. SAE | |
| 1924: | 1. KS | 1. DTD |
| | 2. SAE | 2. BTP |
| | 3. DTD | |
| 1925: | 1. KS | 1. DTD |
| | 2. SAE | 2. Delta Mu |
| | 3. DTD | |
| 1926: | 1. PiKA 3:18.3 | 1. ATO |
| | 2. (Phi K, DTD, SAE, KS | 2. ? |
| | 3. and Woodlawn Club in Finals) | |
| 1927: | 1. KS 3:15.8 | 1. BTP |
| | 2. DTD | 2. Phi Sigma Kappa |
| | 3. TX | |
| 1928: | 1. KS 3:04.4 | 1. SAE |
| | 2. SN | 2. Phi Sigma Kappa |
| | 3. Phi Kap | |
| | (Roughly the present course) | |
| 1929:* | 1. Phi Kap 3:05.6 | 1. (no cup awarded) |
| | 2. KS 3:08.5 | |
| | 3. BTP 3:08.6 | |
| | (Spring Carnival banned this year) | |

| | | |
|---|---|---|
| 1930: | 1. BTP 2:57.5 | 1. TX |
| | 2. Phi Sigma Kappa | 2. ? |
| | 3. ? | |
| 1931: | 1. DTD 2:59 | 1. TX |
| | 2. BTP | 2. ? |
| | 3. KS | |
| 1932: | 1: BTP 2:54.8 | 1. TX |
| | 2. DTD | 2. BTP |
| | 3. ATO | |
| 1933: | 1. BTP 2:48.5 | 1. TX |
| | 2. KS | 2. DTD |
| | 3. SN | |
| 1934: | 1. KS 2:49.7 | 1. BTP |
| | 2. PiKA | 2. PiKA |
| | 3. TX | |
| 1935: | 1. BTP 2:47.2 | 1. PiKA |
| | 2. KS close | 2. TX |
| | 3. ? | |
| 1936: | 1. KS 2:46.8 | 1. BTP |
| | 2. ? | 2. ATO |
| | 3. ? | |
| 1937:* | 1. KS 3:00 | 1. BTP |
| | 2. BTP | 2. ATO |
| | 3. ATO | |
| 1938: | 1. KS 2:43 | 1. PiKA |
| | 2. DTD 2:44.4 | 2. ? |
| | 3. BTP | |
| 1939: | 1. KS 2:44 | 1. PiKA |
| | 2. DTD | |
| | 3. ATO ? | |
| 1940: | 1. KS 2:53 | 1. BTP |
| | 2. BTP | 2. ? |
| | 3. DU | |
| 1941: | 1. KS 2:55 | 1. PiKA |
| | 2. BTP | 2. ? |
| | 3. DTD | |
| 1942: | no results in Tartan | |
| 1943-1945 | no races—War years | |
| 1946: | 1. DTD 2:49 | 1. BTP |
| | 2. KS | 2. PiKA |
| | 3. PiKA | |
| 1947: | 1. DU | 1. PiKA |
| | 2. PiKA | 2. ? |
| | 3. DTD | |
| 1948: | 1. DTD 2:48 | 1. KS |
| | 2. KS | 2. ? |
| | 3. PiKA | |
| 1949: | 1. DTD 2:42.5 | 1. SAE |
| | 2. PiKA 2:43.5 | 2. PiKA |
| | 3. KS | |
| 1950: | 1. DTD 2:41.8 | 1. KS |
| | 2. PiKA | 2. SAE |
| | 3 .DU | |
| 1951: | 1. DTD 2:41.6 | 1. KS |
| | 2. KS 2:54 | 2. SAE |
| | 3. DU | |
| 1952: | 1. DTD 2:36 | 1. KS |
| | 2. KS | 2. SN |
| | 3. PiKA | |
| 1953: | 1. ATO 2:30.55 | 1. Phi Kap |
| | 2. DTD 2:30.6 | 2. ? |
| | 3. PiKA | |
| 1954: | 1. ATO 2:28.1 | 1. PiKA |
| | 2. PiKA 2:36 | 2. ATO |
| | 3. DTD | |
| 1955: | 1. ATO 2:26.0 | 1. Phi Kap |
| | 2. ATO 2:30.5 | 2. ATO |
| | 3. PiKA 2:32.6 | |
| 1956: | 1. ATO 2:25.0 | 1. ? |
| | 2. PiKA 2:30.2 | |
| | 3. PiKA 2:32.6 | |
| 1957: | 1. ATO 2:25.0 | 1 Phi Kap |
| | 2. PiKA 2:27.5 | 2. Dorm |
| | 3. BTP 2:30 | |
| 1958: | 1. ATO 2:28.4 | 1. Phi Kap |
| | 2. PiKA 2:43 | 2. ATO |
| | 3. ATO 2:45 | |
| 1959: | 1. PiKA 2:29.7 | 1. ATO |
| | 2. SN 2:30.0 | 2. PKT |
| | 3. PKT 2:32.5 | |
| 1960: | 1. ATO 2:34.5 | 1. PKT |
| | 2. Dorm 2:36 | 2. PiKA |
| | 3. PiKA 2:41.8 | |
| 1961: | 1. ATO | 1. ? |
| | 2. PiKA | |
| | 3. SAE | |
| 1962: | 1. ATO 2:27.5 | 1. BTP |
| | 2. PiKA 2:29.8 | 2. ATO |
| | 3. SAE 2:31.8 | |
| 1963: | 1. PiKA 2:34 | 1. SN |
| | 2. SAE ? | 2. ? |
| | 3. BTP 2:37 | |
| 1964: | 1. BTP 2:31.5 (default) | 1. SN |
| | 2. SAE 2:33 | 2. PKT |
| | 3. PKT 2:37.7 | |
| | 3. BTP 2:37.7 | |
| 1965: | 1. BTP 2:28.7 | 1. BTP |
| | 2. ATO 2:31.9 | 2. ATO |
| | 3. BTP 2:32.05 | |
| 1966: | 1. BTP 2:27.8 | 1. BTP |
| | 2. ATO 2:29.5 | 2. SN |
| | 3. PiKA 2:30.5 | |
| 1967: | 1. PiKA 2:24.8 | 1. BTP |
| | 2. BTP | 2. ? |
| | 3. PKT | |
| 1968: | 1. PiKA 2:20.9 | 1. BTP |
| | 2. SAE 2:25.5 | 2. ? |
| | 3. PKT | |
| 1969: | 1. BTP 2:22.5 | 1. BTP |
| | 2. PKT 2:26.2 | 2. PKT |
| | 3. SAE 2:33.4 | 3. TX |
| 1970: | 1. PiKA 2:28.5 | 1. BTP |
| | 2. BTP 2:29.6 | 2. DTD |
| | 3. BTP 2:33.0 | 3. ATO |
| 1971: | 1. PiKA 2:26.4 | 1. PKT |
| | 2. BTP 2:30.0 | 2. DTD |
| | 3. BTP 2:30.9 | 3. PKT |

# Judging Buggy Design

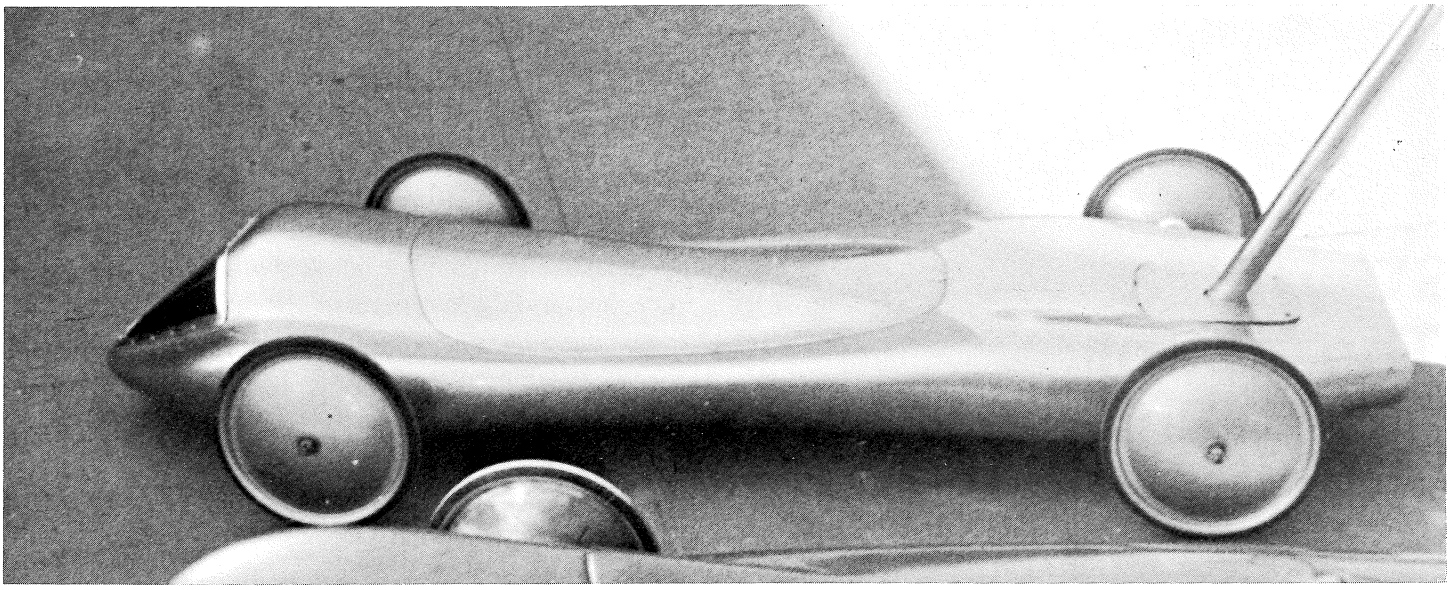
J.C. Purcupile



Since I was a buggy design judge last year, I have been asked to discuss the guidelines that the Design Judges use in evaluating the design of buggies. The most important item is safety – this means brakes, steering, suspension system, and the protection of the driver. The brakes must be reliable and brake both wheels. They should be self-releasing and be able to be reapplied similar to automobile brakes. We are not impressed with clever design such as air brakes or disc brakes, etc. – what's really impressive is a simple reliable system. How the driver puts on the brake is important. For example in the past two years, there have been at least two buggies that have failedthe brake test because the driver's foot slipped off the brake pedal or he couldn't find the strap at the right time. Hand brakes mounted to the steering mechanism, similar to racing bicycle brakes, are superior to the foot brakes. Mechanical brakes are just as effective for stopping the buggy as the most sophisticated air brakes.

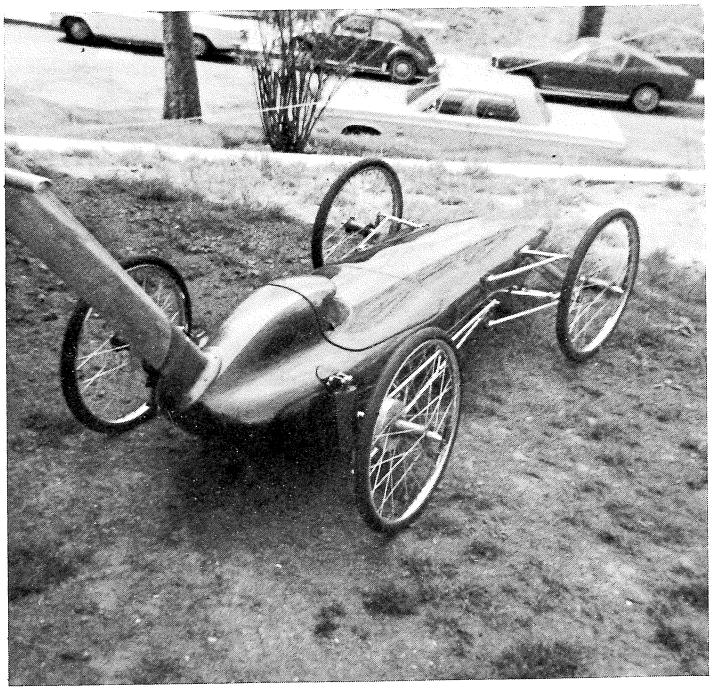
The next important safety item is protection of the driver. Having the driver lay down head first is clearly a hazardous position. No one in their right mind would drive through Pittsburgh laying down head first. If you think that your driver has to lay down head first, you are going to have to pay for this with extra safety precautions and protection for driver. The most important thing is that the front end is designed in such a way that on collision or impact the compartment stays in tact or splinter around the driver. One particularly dangerous design last year was built on a wooden board. The next point is that the compartment must be padded and the driver strapped in, in order to absorb and distribute the high forces on impact without causing a back or head injury. Since it is not possible for you to demonstrate that your design is sound in this area ahead of time, the judges have to make a subjective evaluation – it's your job to convince them through calculations, appearance, or past histroy that you have a safe driver compartment design.

In the past, with the exception of a few experimental buggies, the steering systems have usually been quite good. The steering mechanism should be a rigid linkage or, if cables are used, methods of pretensioning and keeping the cables tight have to be



incorporated. Again, the steering judging is subjective and it is your job to show the judges that you have designed a system with integrity.

I don't think a suspension system is actually necessary to win the race. Sometimes the winning buggy has a suspension system while some years the winner does not have any suspension system. If you do include a suspension system, it should be well designed so that the wheels track accurately and that you can explain the unique features of your suspension system and describe other factors that have gone into your design to the judges.

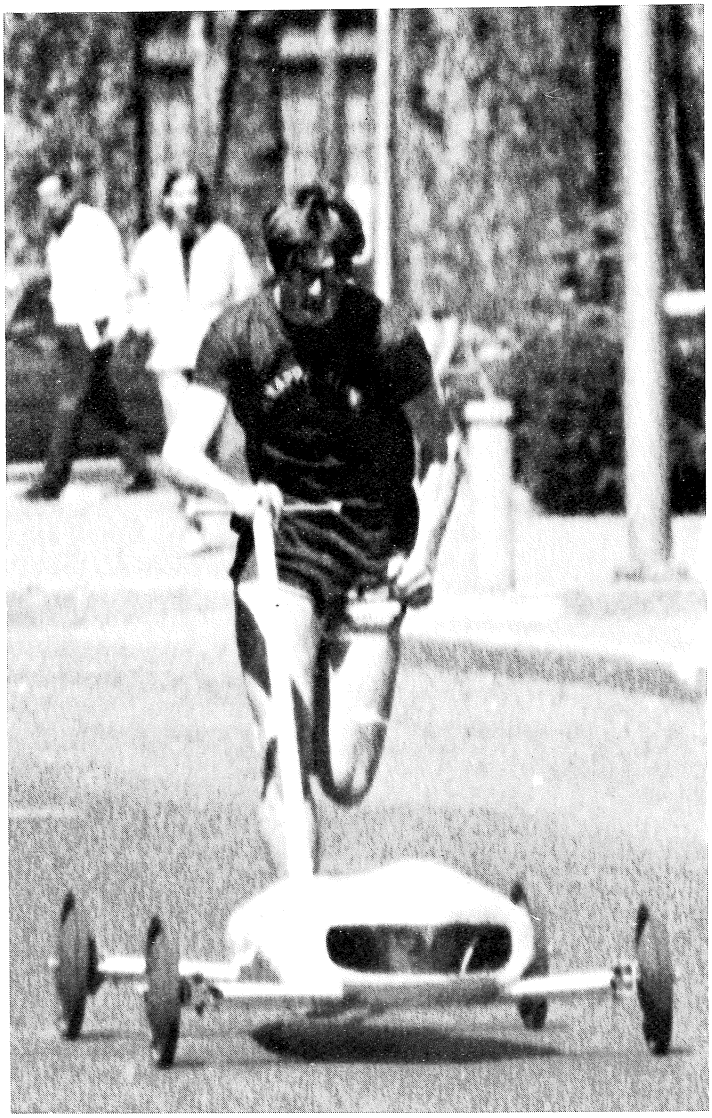


If you expect to win in the design judging, the overall general appearance of the buggy is probably the most important factor. Remember that from all entries there will probably be at least five or six buggies who will rank high in brake systems, steering, suspension, etc. Therefore, the judges have to make some type of decision on how to separate the best from the very good and certainly the general overall appearance is important in this area. Included under appearance is human engineering factors that went into the design so that the driver is comfortable and can control his buggy easily. For example, when passing, the lead driver is responsible while he is passing so some provision should be made for him to see in the rear. A cleverly designed rear view mirror that would not vibrate up and down would score a lot of points.

The buggies that I remember best from last year were the LSH buggy and the Pika buggy. The LSH buggy wasn't streamlined, and certainly didn't have a sophisticated braking system but I think that the buggy crew was probably having the most fun of any of the buggy crews. I remember the Pika buggy because their chairman said that they didn't care what we thought of their design; they were going to win anyway — and they did. So you can always forget about design and simply have fun and win — but don't forget about safety.

# The Art of Buggy Building

Lauren Hutton



There are a number of technical considerations that go into the design of a Sweepstakes buggy. There are very few widely accepted or agreed upon answers to these considerations and the degree to which one answer is superior to another is probably measurable only by race results. Without attempting to give a quantitative analysis, some of these technical considerations are discussed in the following paragraphs.

The single most important consideration is probably weight. Heavy buggies are thingsof the past because they don't roll down the hill significantly faster and they are definitely harder to push up the hills. Neither of the above statements is easy to prove using physics but can be shown with considerable rigor. Total weight of buggy and driver should be about 160 pounds. The only way to have less than 160 1bs. is to use a bike. There are two things however that hurt the free roll of a bike; first, they have a higher wind drag and second, the big bicycle wheels have a higher moment of inertia. Even though they are easier to push, the time saved going uphill is less than the time lost going downhill. The instability of the bikes also causes them to fall over occasionally.

Keeping the weight constraints in mind we will discuss the other considerations that go into the design of the buggy. The areas that must be considered are wheels and tires, suspension, aerodynamics, push bar, bearings, and lubricants. To cover each of these in detail would be too lengthy for this article but the general points of interest are outlined below.

Tires and wheels are probably second in importance after the weight. They should be light weight for a low moment of inertia. The wheel must be rigid and the rubber as resilient as possible without being brittle. Higher resiliency reduces rolling resistance and the tires also absorb less energy. The contact surface should be small but not so narrow as to let the buggy spin out at the sharp turn at the bottom of the free-roll course. A larger diameter wheel reduces bearing friction by decreasing revolutions per minute for a given tangential velocity. It is also less affected by road irregularities which in turn reduces the rolling friction. The only drawback of the larger wheel is the larger moment of

inertia.

In selecting bearings the primary consideration is the amount of contact area. Ball bearings should therefore be used rather than roller bearings. The lubricant should have a low viscosity but many tests must still be made to find the optimum lubricant or combination of lubricants for the bearings selected.

The shape of the buggy shell is also important. It must have as small a frontal area as possible with a general teardrop shape. The pushbar and axles should also be streamlined. The pushbar itself should be attached to the buggy slightly in front of the rear axle. This cuts the tendency for the buggy to swerve while being pushed. The angle at which the pushbaris attached is immaterial if you consider the buggy and pushbar as a rigid body. All efforts should be made to accomplish this.

The remaining major design problem is suspension. This is probably the most controversial point. A completely rigid suspension would be ideal if the road were smooth. This is because the springs and shock absorbers absorb energy. Even though springs do absorb energy on bumpy roads they let the wheel assemblies move up and down without lifting the buggy. It takes energy to lift a buggy, and of course this should be avoided. If the springs were efficient (giving back almost as much energy as it absorbs) a spring suspension would help on the rough parts. Most of the free roll is fairly smooth but the push hills are very rough, therefore the spring would help the pusher and hurt the free roll. In practice it has been found that the spring suspension doesn't hurt the free roll significantly. If you don't believe this, ask last year's winners. Of the five fastest free rolling buggies from last year's sweepstakes, four of them had rigid suspension, since rigid suspension makes for faster free rolls and also makes the handling more accurate. This is assuming the height of the center of gravity and the center of the wheels are approximately the same. The author's bias is toward rigid suspension. Hopes are that the roads will be paved soon and the author's position will be justified by race results.

All of the considerations mentioned above have one underlying theme, to use the available energy most efficiently. This energy is derived from the pusher's force moving along a distance and the potential energy of the hill during free roll, and should not be wasted by friction, drag, or lifting of the buggy.

# Safety '72

Don Dietrich
1972 Safety Officer

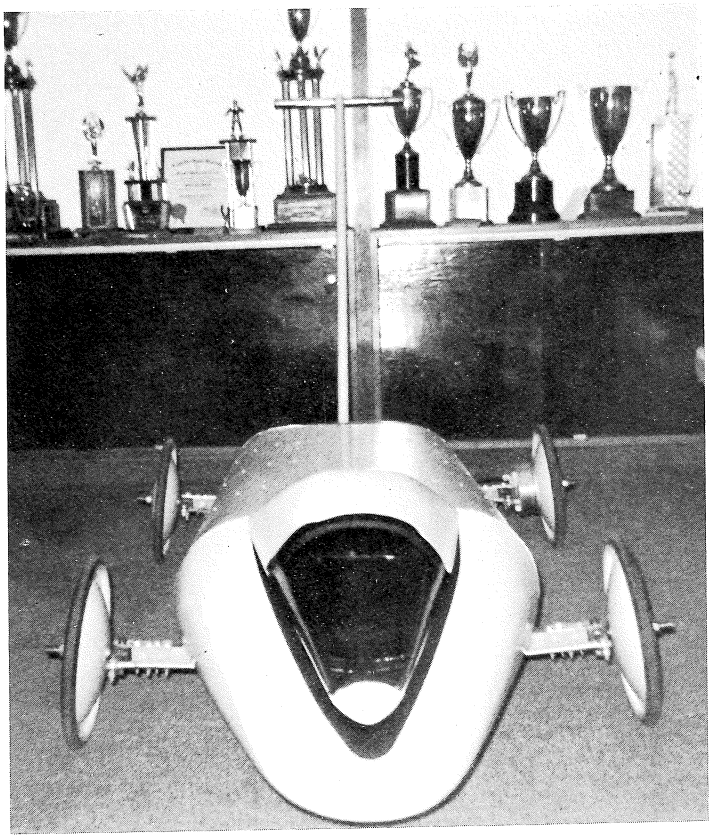
In 1972, more than ever before, safety will be of primary concern to buggy chairmen, pushers, and drivers. A serious and cooperative effort is being made to insure that the buggy competition will be free of any possible accidents. A new set of safety rules has been adopted by all buggy chairmen. These rules affect the construction of buggies as well as the way in which they are raced. Construction rules include safety harnesses, crash protection, vision, roll protection, and headgear for the driver. All buggies will be inspected to insure that these minimum safety requirements are met.

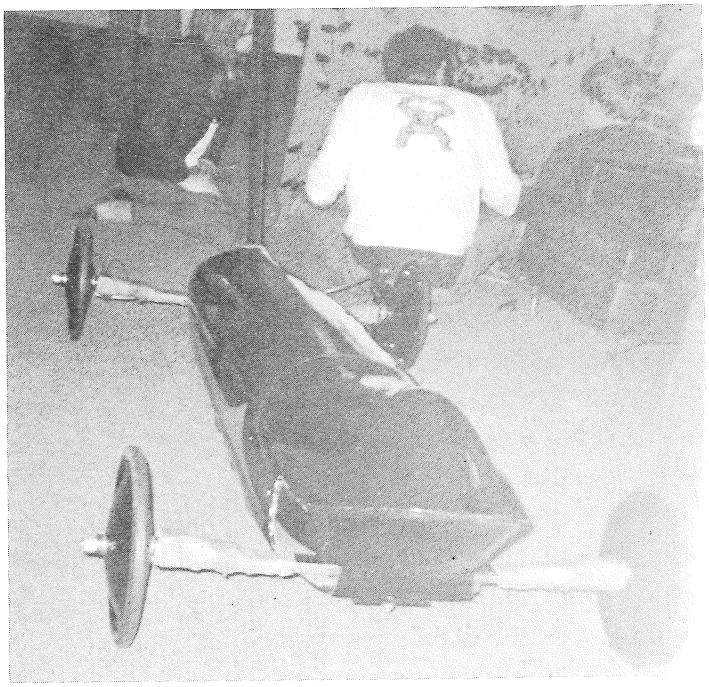
A new braking test is being used this year that will insure that buggies can stop in 40 feet from a speed of 15 mph. The buggies will be checked before every free roll, practice or race to see that the brakes are in good working order.

There is a driver's training course being given this year for all drivers who will be active in buggy competition. This idea is being tried to see that every driver out on the course this year can be counted on to know the "ropes" of buggy racing.

A new set of procedures has been adopted for buggy practice this year. Buggy practices are now supervised events, with the approval of the University administration.

The buggy race is a spirited competition that tests the engineering and athletic ability of any organization that wants to enter. Safety is an important part of these races, as it should be in all competitive events.





# Alpha Tau Omega

For the 1972 buggy races Alpha Tau Omega will use a combination of the new and the old. The new is the year old Stinger and the old is the 15 year old Golden Goose.

The Stinger made its debut last year with a fine time and a fourth place finish. The work that went into this buggy and the technology used is truly of the new style. This buggy was built after a void was found in the area of contemporary buggies. A new type of light axle was developed to make up the weight problem with a new type body. The product was a light, fast, strong buggy which was able to take the pounding of the streets. It is clear that this buggy has great potential and can be a real contender.

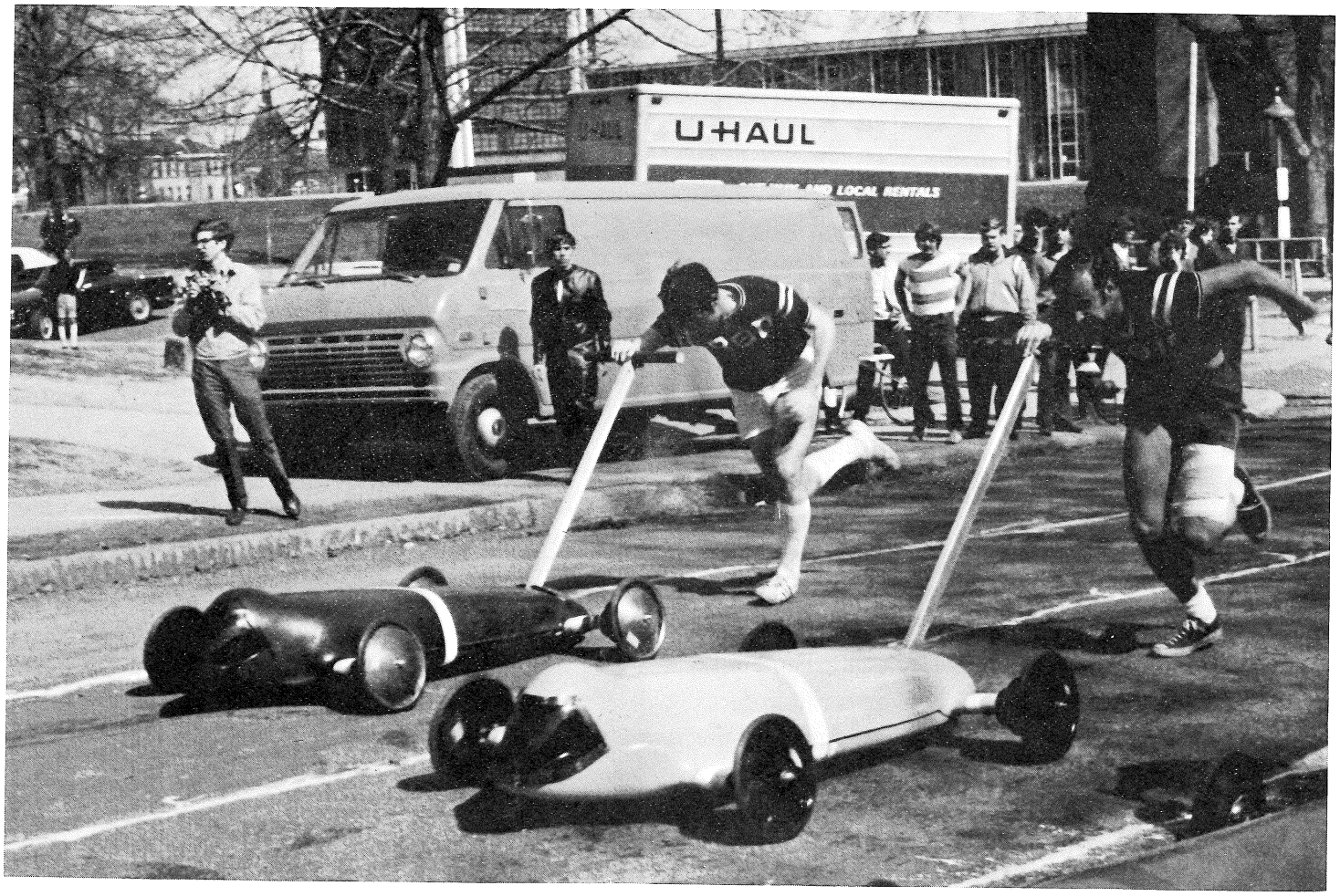
The old, the Golden Goose, has been synonymous with buggy at ATO ever since 1954. Two years in the making, it was the product of two full-time workers and went through possibly the most rigorous test procedures of any buggy before or since. (It was the iniator of an era. The use of fiberglass and aluminum, aerodynamics and stress, was brought about by the Golden Goose.) It held the record for over a decade and has remained a constant in the ever changing technology of the sweepstakes. It was, is, and always will be a contender in the buggy races.

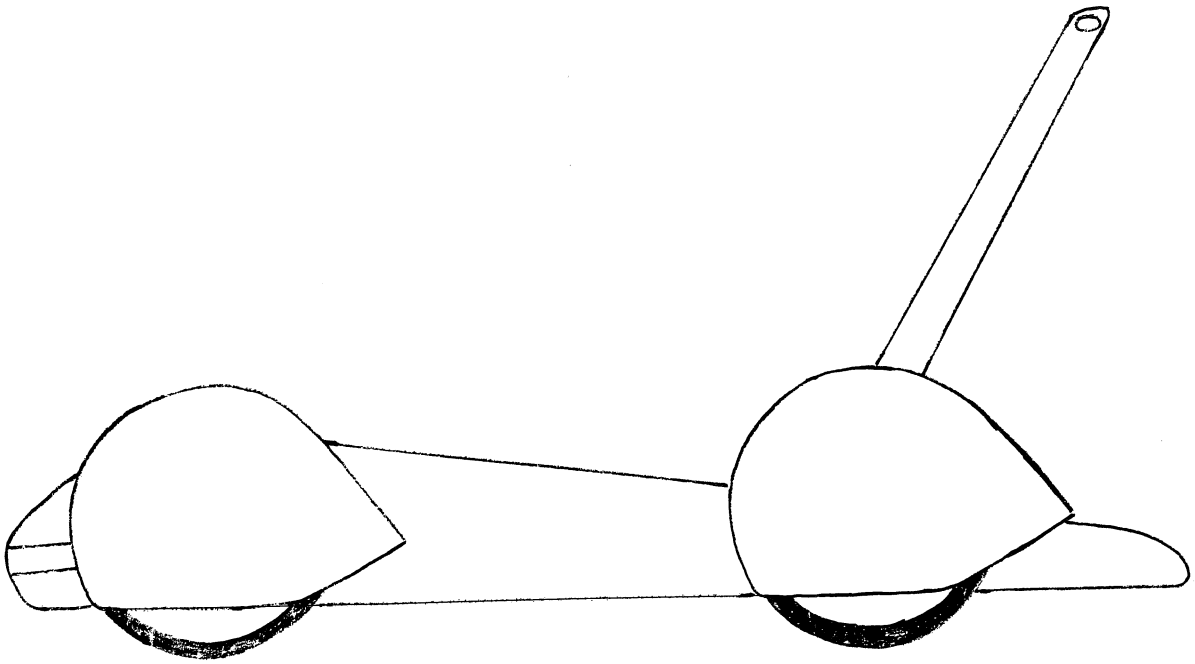
These buggies, one a tradition maker and the other steeped in tradition, plus ten strong pushers and two gutty little drivers will be ATO's contribution to and safe and (hopefully) record breaking sweepstakes.

# Beta Theta Pi

Beta Theta Pi will race its "A" buggy, 825, and "B" buggy, POS, again this year in an effort to maintain the fine traditions these buggies have established in the three years of their existence. Both buggies are nearly the same, being of the classic four wheel, prone drive, fiberglass body design.

The buggy chairmen, Bob LeMay and Dave Yavorsky, anticipate relatively few changes in Beta's buggy effort this year relying on the return of eight of ten pushers: Dexter Murphy, Wendell Miller, Mike Niles, Jim Donnelly, Harry Fennell, Norm Crapster, Rich Sandusky, and George Clay, and both drivers Charlie Yarnell and George Wago. Drawing on the experience of thesemen, the Betas hope to bring home a first place sweepstakes trophy this year.



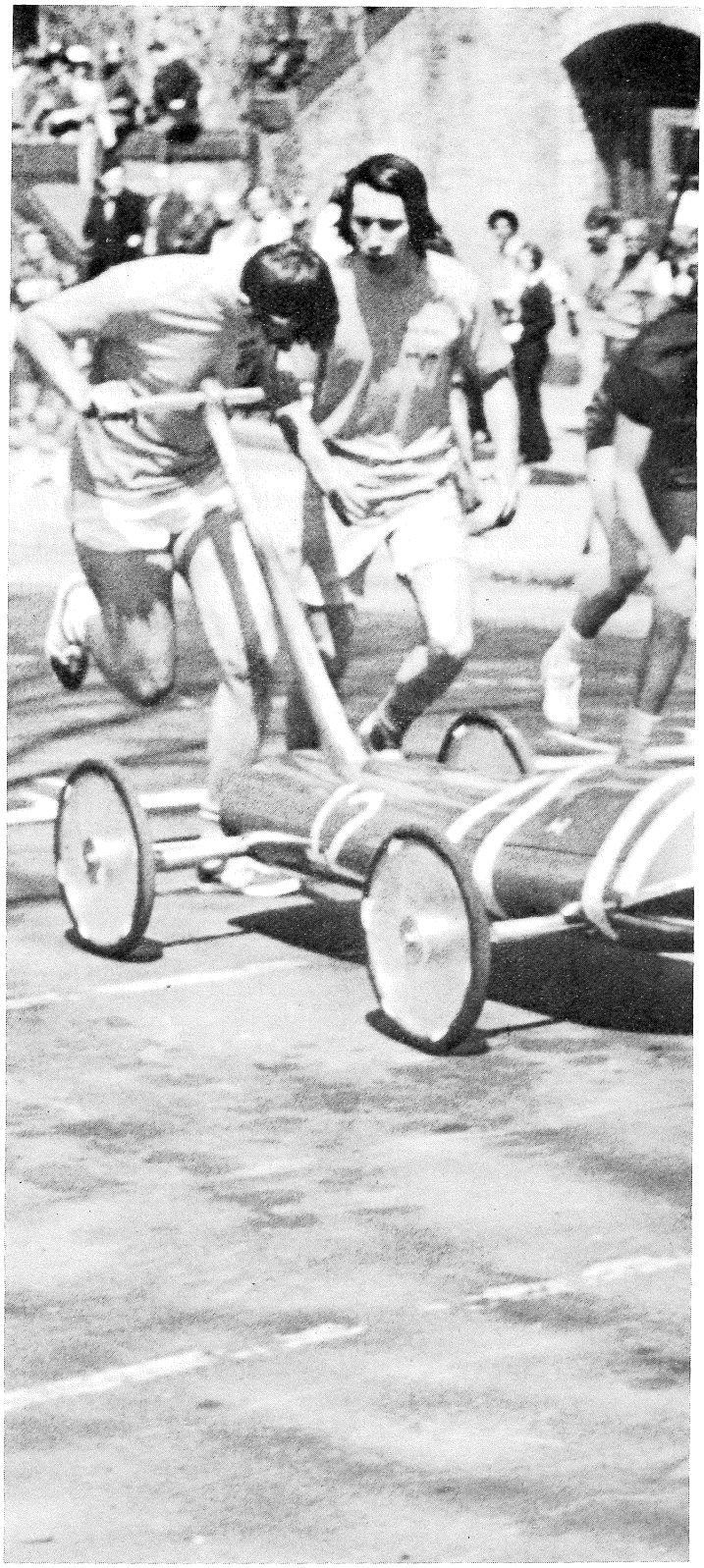


# CIA

The Carnegie-Mellon Involvement Association (CIA) was founded in 1970 by an industrious group of sophomores. The primary reason for this organization's existence is the eligibility of entering a buggy in Sweepstakes of Spring Carnival.

In the 1971 Sweepstakes, the CIA entered their first buggy in the competition and finished with the ninth fastest time, which was only 1.5 seconds away from the sixth place time. This was the best of any independent buggy group last year. This buggy, designed primarily by Frank Robb, and built mostly by him and Carl Saurman, had a very good push team consisting of Tom Lombardo, Ed Dumont, Chris O'Leary, Juan Neffa, and Larry Ross. Since Ed was the only senior, a strong and experienced push team is expected for this year's race. Carl Saurman will drive again this year.

Not satisfied with last year's performance, the CIA is entering a completely new buggy, designed and built primarily by Larry Ross. There are many differences between it and most fraternity buggies. Some of these are obvious, like the 16 inch bicycle wheels, and many that are subtle, but the emphasis is on safety, incorporating four wheel brakes, a shock absorbing bumper, and rear view mirrors.



This year the Delts will return with both of their prizewinning buggies. The "Bitch II" is again ready to win a design trophy while the "Green Grunge", with its fast free rolls, is ready to race.

The "Bitch II" has a honeycomb and fiberglass unibody construction. It features internal expanding brakes with four wire wheels and pneumatic tires. Its suspension consists of straight axles with torsion bars. The "Bitch II" features the driver lying in the prone position in the buggy.

As with the "Bitch II", the "Green Grunge" has a unibody construction.It is made of fiberglass laminated over a very strong and extremely light internal core. The "Green Grunge's" suspension is straight axles, and it also has wire wheels with pneumatic tires and internal expanding brakes.

The Delts have been so pleased with the performance of these two buggies that in September, they began building a new buggy. As yet it is unnamed, but it is of the same type construction as the "Green Grunge" and will feature many of the advances now incorporated into the trophy-winning "Bitch II".

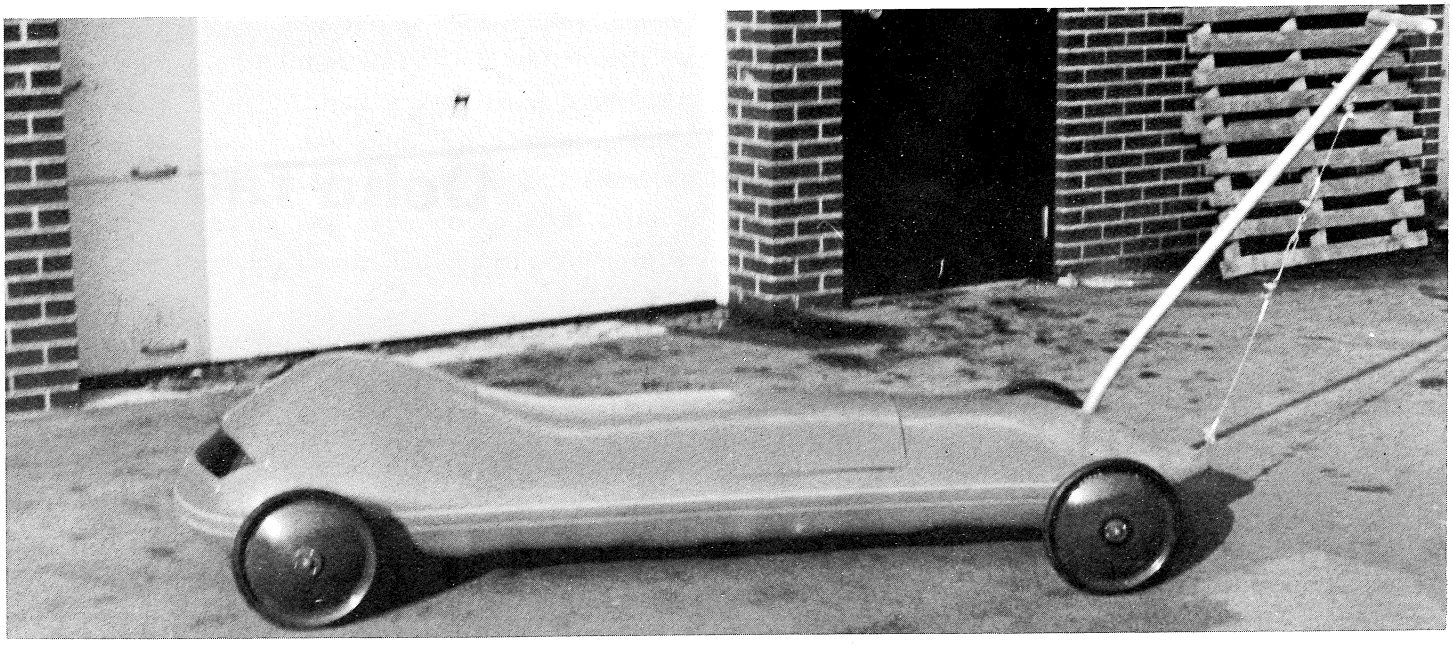
# Delta Tau Delta

# Delta Upsilon

This year's buggy, the dark blue Pipedream III, a reconstruction of last year's Pipedream II, should be the fastest rolling buggy in DU's Sweepstake history. Among the revisions buggy chairmen Clark Craig and John Bell have made on the basic tubular aluminum frame construction are a newly designed fiberglass uni-body with improved aerodynamics, improved front and back axle alignment, a redesigned braking mechanism, and a more fully developed suspension system.

DU should have a fine push team with returning veterans Coach Bob Kotjan, Max Unger, Bob Rees, Jim Stankus, Jay Work, and Jay Brenner, and rookies Jim Stoddart, Carl Schwabenbauer, Steve Shillo, and Brian Wood all battling hard for positions.

The driver will be either Jeff Carrick or Tim Parker, both guaranteed to be experienced by race day.

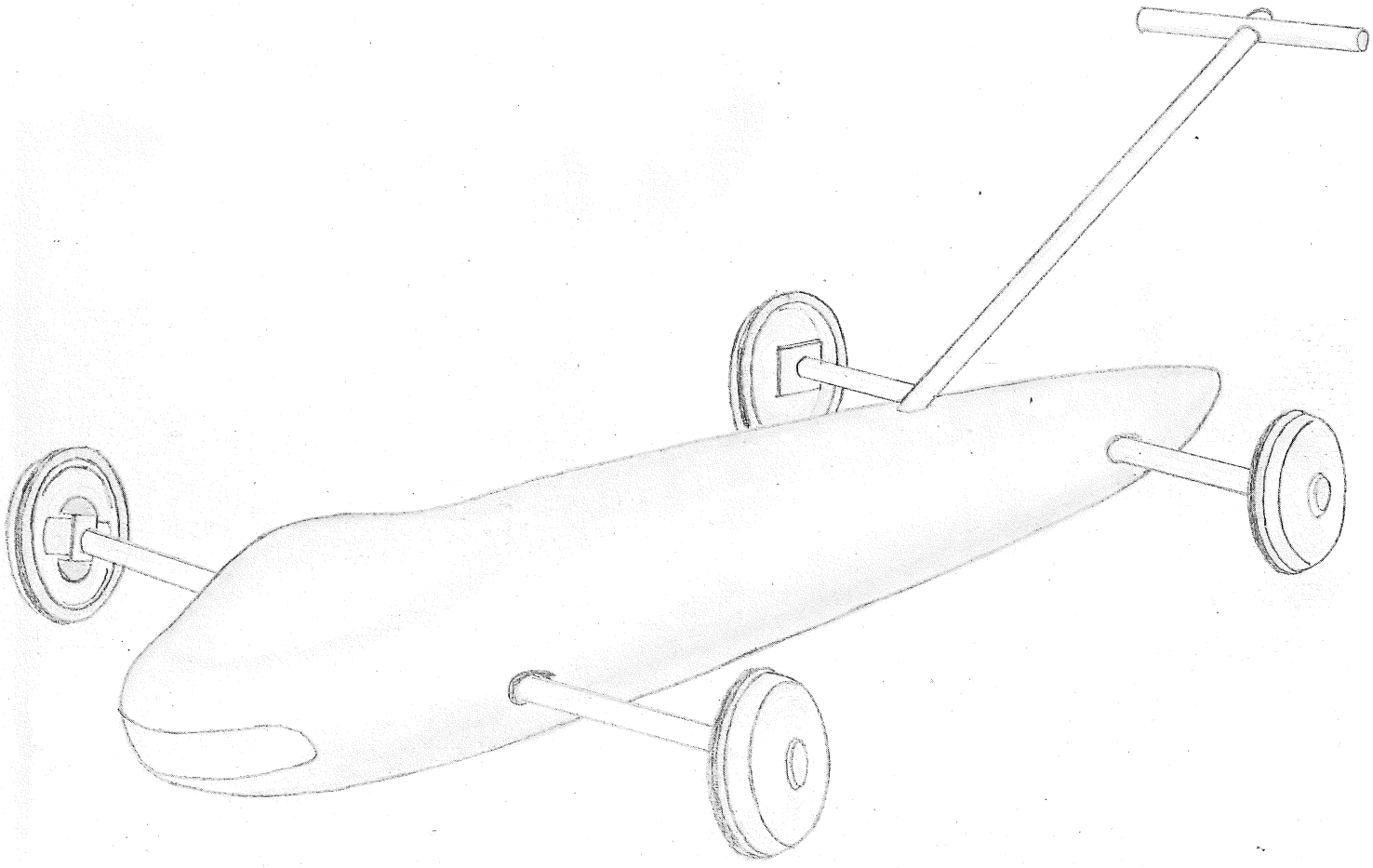


# MDC

This year, Men's Dormitory Council will be entering for the first time a new buggy which members of MDC have been engaged in designing and building for the past 2½ years. Its design incorporates many unusual features, including a unique suspension system, four wheel brakes, and extensive use of structual aluminum for all frame members. Every effort has been made to minimize energy losses of any form in its design, and thus reduce free roll time to a minimum. Of course, the ultimate test will come on race day, in competition with the established winners of past races. That's when we'll really know its capabilities.

MDC may also be racing an older buggy in B position, depending on the level of participation in the dorms. This buggy is a bicycle type, of rather conventional design.

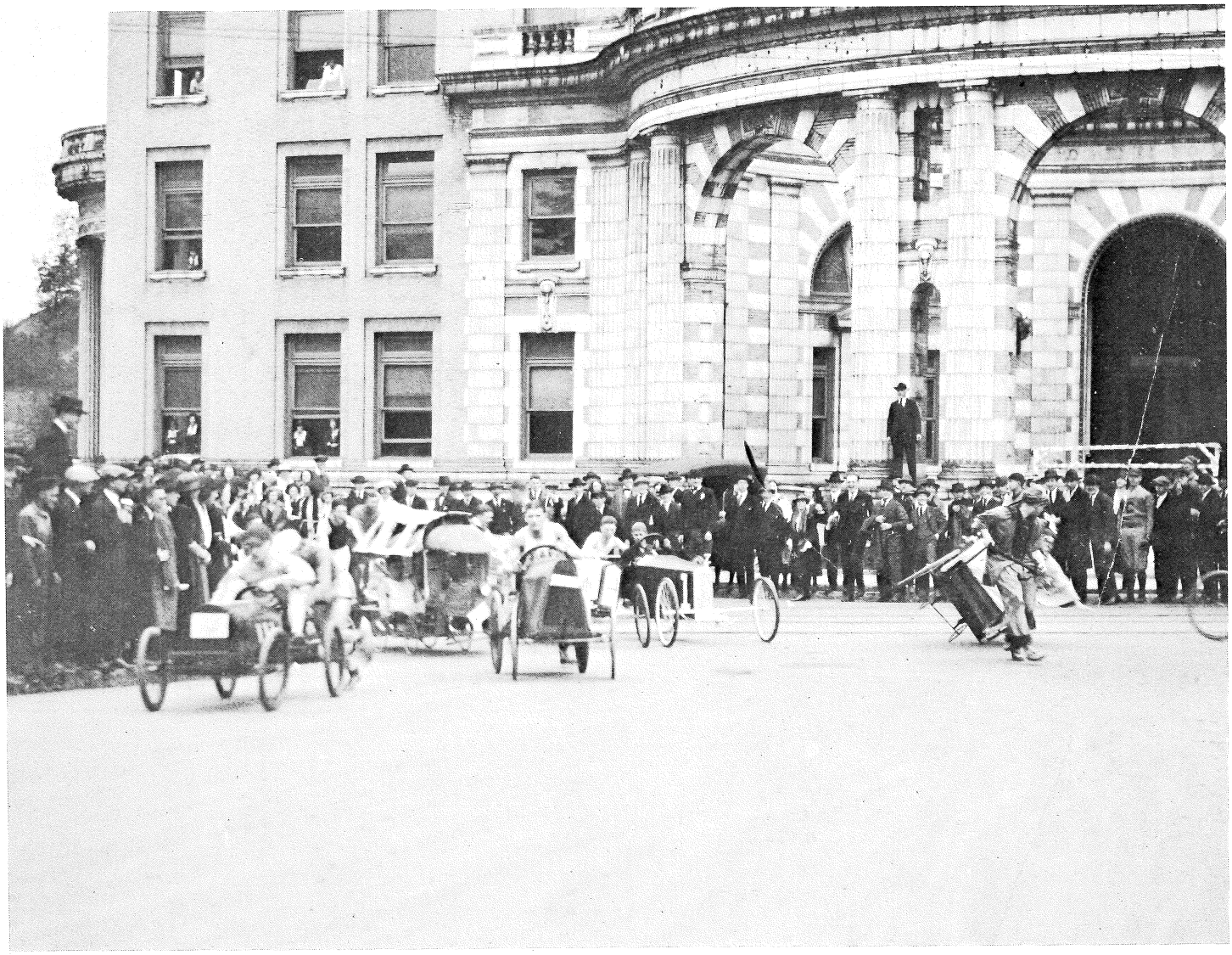
Over the past decade, Men's Dormitory Council has not enjoyed a top position in the Spring Carnival races. Our efforts this year mark the culmination of an effort to reverse this trend.



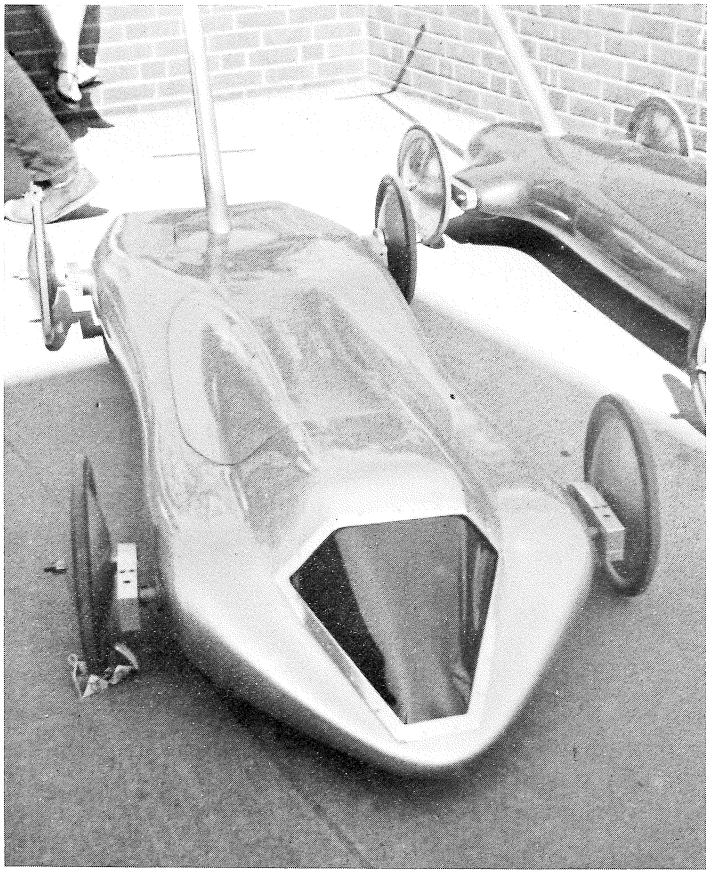
# Kappa Sigma

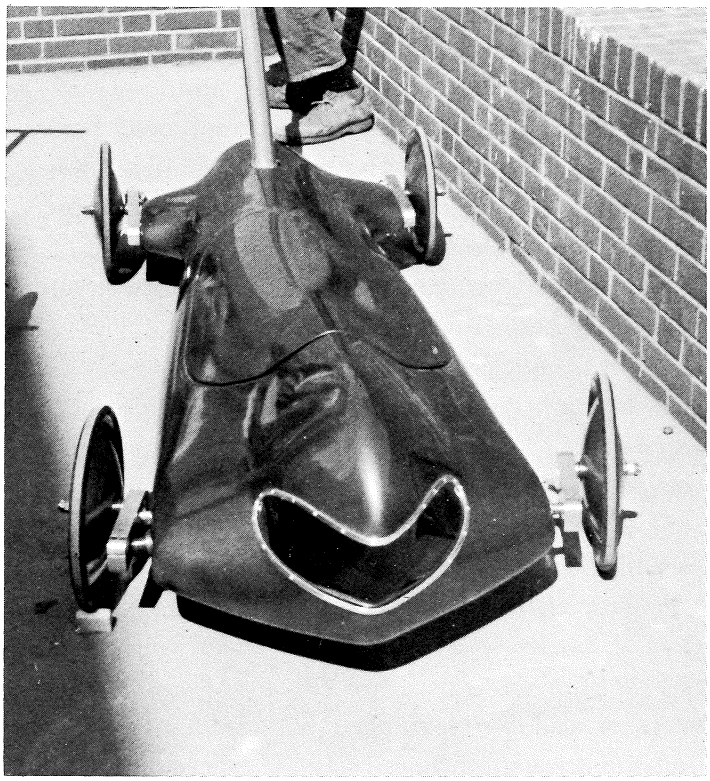
With the recent emphasis that has been put on safety features. the Kappa Sig buggy this year will probably be one of the safest buggie on campus. As Kappa Sig led the way in the 20's by being the first buggy house on campus, we now hope to healp create a safety technology that will be compatible with the speed technology already in existence.

The framework of our new buggy is all welded steel, forming a protective cage around the driver. This feature, together with the new braking system should be the heart of a good buggy. This buggy that will not only be built with speed in mind will be the first of an era of new buggies that will be designed with safety considerations taken into account.



# Phi Kappa Theta





Phi Kappa Theta's two veteran design and race buggies, "Streak" and "Snorpus", will again appear in the Sweepstakes. "Streak", Phi Kap's most successful buggy, was designed in the fall of 1969 by John Kilgore and Gary Shushnar and showed great speed and design potential in the Spring of 1970. With several design changes and detail refinement, "Streak" became top design buggy and took the first place design trophy in the spring of 1971.

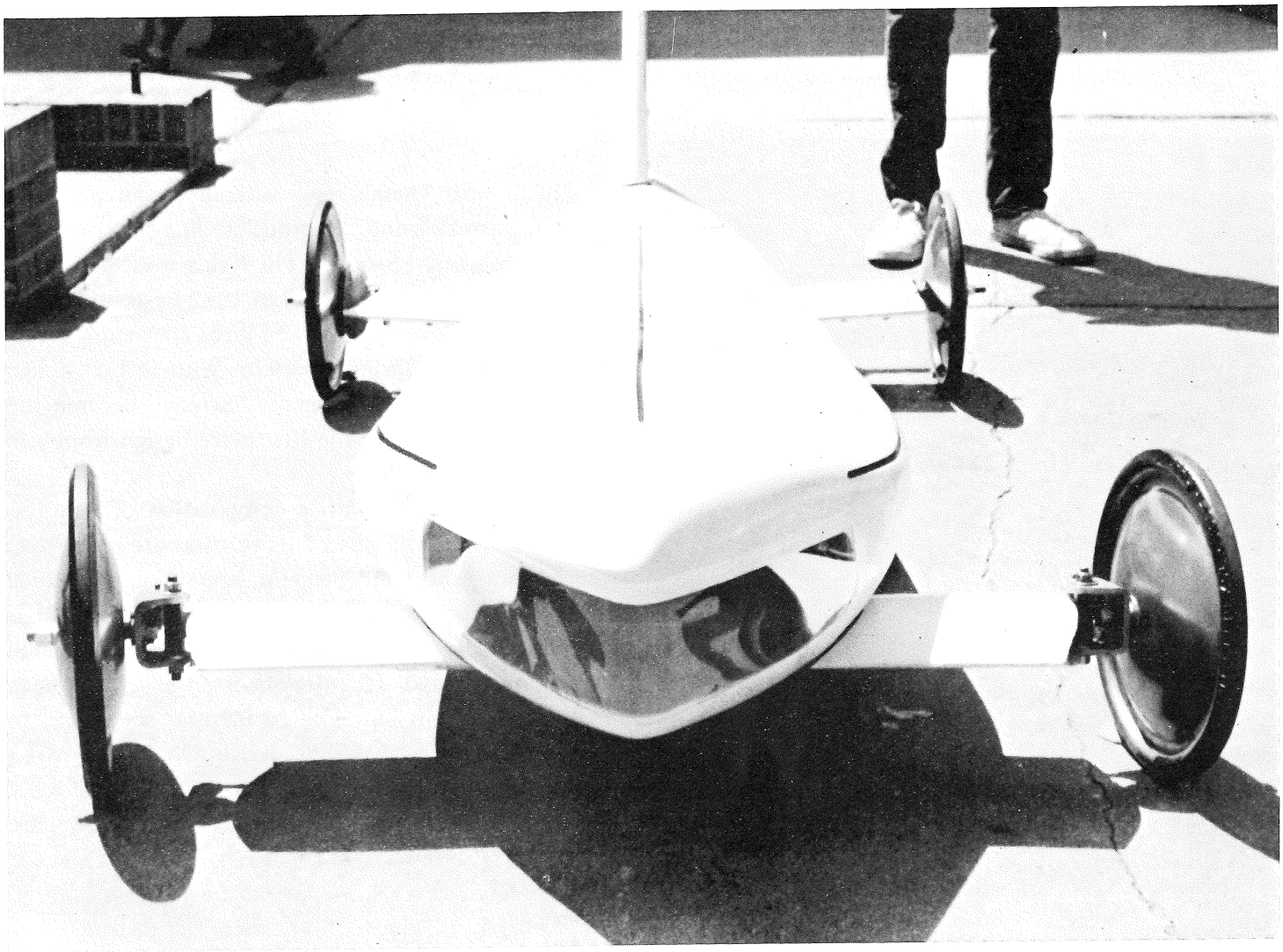
"Streak" is built with a combination of lightness and sophistication. Some of its features are high driver safety, four wheel independent suspension, hydraulic disc brakes for fast stops and a monocoque fiberglass shell with a wind-cheating Kamm-tail. Several detail improvements and technical innovations have been made this year in "Streak" to increase speed and to solidify its position as the top design buggy.

"Snorpus" was third place design winner last year, climaxing almost a decade of design trophies. "Snorpus" also has had many changes to increase speed and improve its chances for another design trophy. Featuring four wheel independent suspension, disc brakes, and a monocoque fiberglass body, "Snorpus" will return for its tenth Sweepstakes race and design and design competition this spring.

All but two of Phi Kap's superfast "A" push team returns this year led by Chuck Ednie on Hill 1. Other returning "A" team members are Ernie Legg and Mike Smith.

Returning "B" team members are Lee Dubuc, Steve Williams and Steve Baker, all trying for a berth on the "A" team. Skinny Evan Hutchison and Ken Forbrich are the returning buggy drivers.

Design innovations and new technical features have always been a part of the Phi Kap buggy tradition. John Kilgore and Gary Shushnar, returning buggy co-chairmen, plan to improve buggy performance and speed this year to offset "Streak's" disappointing sixth place finish last year. A new buggy has also been designed and researched and might possibly be ready tochallenge Phi Kap's "Streak" and "Snorpus" this spring for top race buggy. This year Phi Kap's buggies will roll as well as they look.

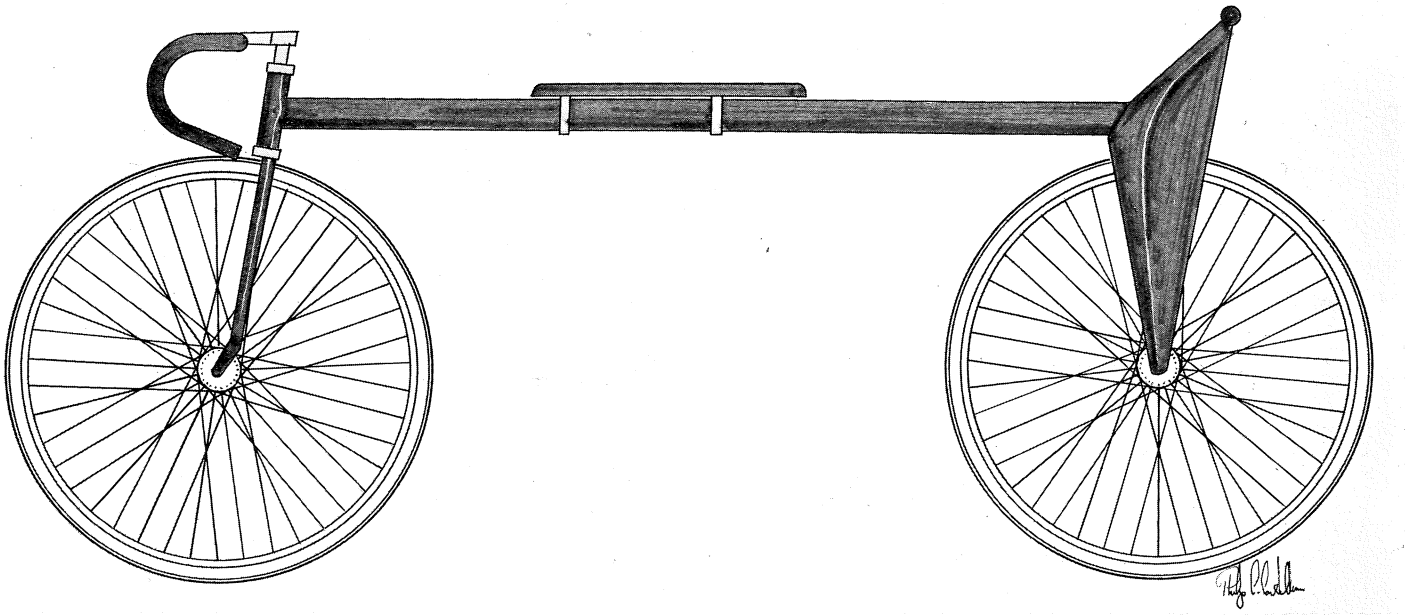


# Pi Kappa Alpha

Pi Kappa Alpha has been a major contender in Sweepstakes since its founding. This year Pika will again use the current champion "Pi-thon" as "A" buggy and "Tiger Shark II", current course record holder, as "B" buggy. The buggy committee, directed by Buggy Chairman Jay Simmons and assisted by Vic Rogers and Ollie Miller will incorporate more of the famous Pika "speed secrets" into the two veteran buggies to maintain their winning form.

Both buggies are of fiberglass monocoque construction and utilize the prone position of the driver for best performance. With the advent of newsafety rules, both buggies have been improved in many aspects for greater driver safety through strength, visibility, and handling.

With eight of last year's pushers returning and a strong pledge class it appears there will be tough competition for a berth on either "A" or "B" teams. Pika is also well equipped with both of last year's veteran drivers returning.

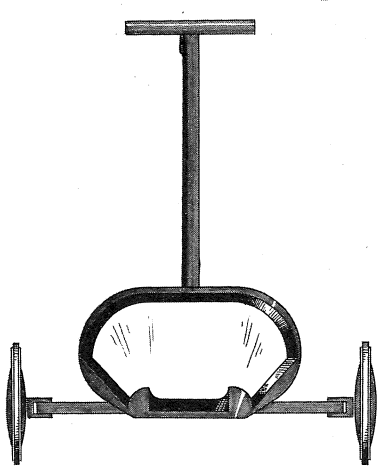


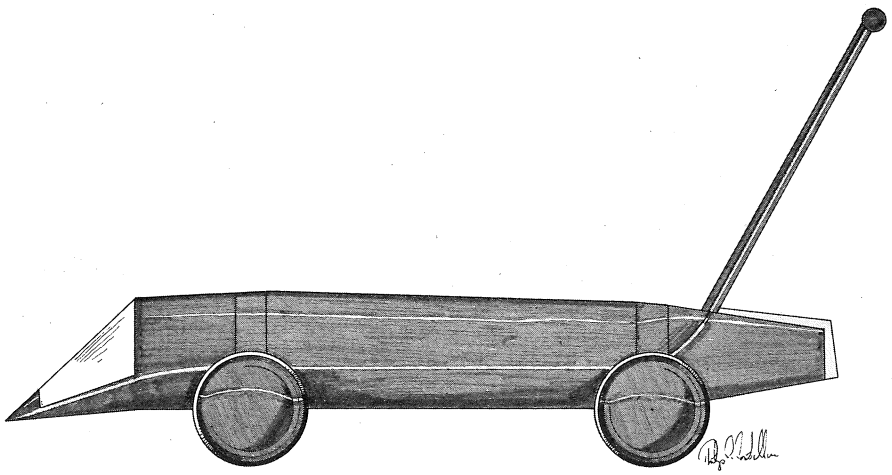
# Sigma Alpha Epsilon

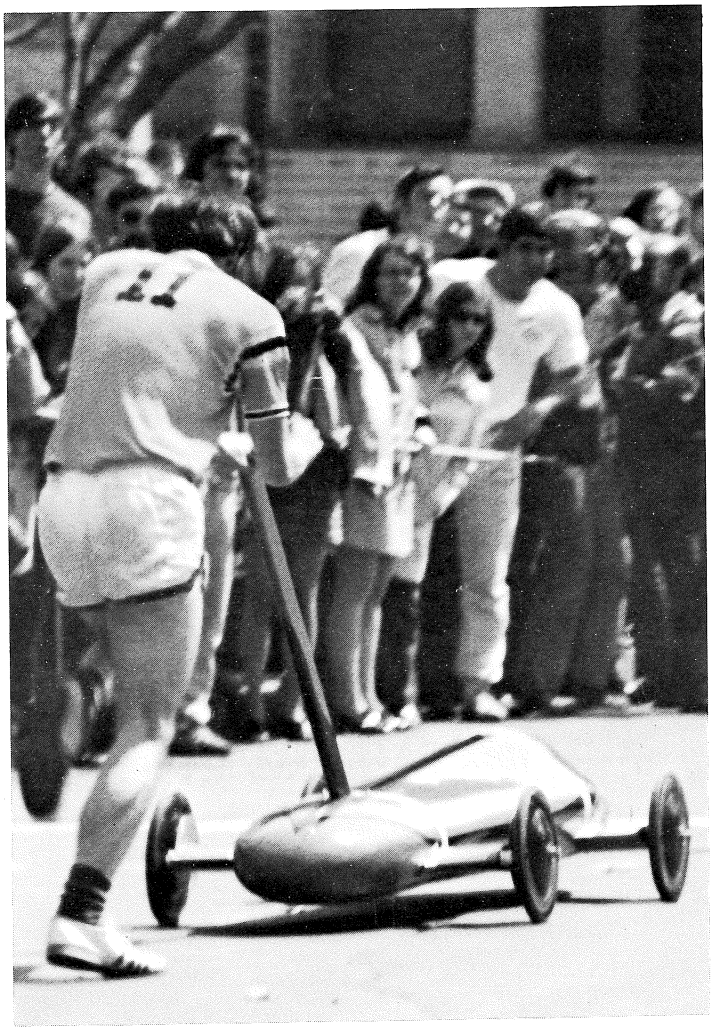
Yes fans, this year SAE may have a new addition to its racing family. Along with our prize winning two wheelers, we now have in the final stages of development our first Four Wheeled Bike. Because of its distinguishing characteristics, it has gained the title "2024." The "2024" is fabricated from high strength, low weight materials. It features honeycomb-composite construction and radical new suspension and steering systems. The "2024" is, to this date, our only undefeated Four Wheel Bike.

SAE's improved two wheelers are also to be run this year. The two wheelers hold an impressive record of finishing in the top six for ten out of the last twelve Sweepstakes.

The SAE push team comes back this year more psyched than ever. We have eight veterans returning plus recruits enough to power our vehicles to a 1972 victory.







Sigma Nu has always prided itself in the fact that its buggy has always had a good showing. Fast race times and remarkable design have been characteristic of the entries, but as luck has had it, disqualifications have thwarted all previous attempts to obtain the coveted trophy.

Most buggy enthusiasts will recall the "Lizard", an exemplary design-winning buggy. The "Lizard" was then followed by the "Aires", alias "Tom Slick". This buggy catapulted hopes with its third place finish,and the following year a new generation of buggies made their appearance.

The two nearly identical buggies, "Brother Rat" and "Hornet" have championed the cause ever since. The "Hornet", undeniably the faster of the two, has performed commendably in the past four years. It has placed repeatedly in the top three, but fate decreed that its performance should not be acknowledged because of persistent mechanical failures.

This year is the year to look for Sigma Nu. They take heart in the merits of their past performances. A fine push team returns with a rejuvenated "Hornet". Perhaps this year will erase the past disappointments and frustrations by placing the trophy in Sigma Nu.

# Sigma Nu

# Tau Delta Phi

Tau Delta Phi is again entering two buggies of the bicycle design because of the weight advantage and cornering ability. The "A" bike, No. 13 Le "D", is probably the lightest vehicle in the race, its tubular aluminum frame weighing only 13 pounds. The "B" bike, the Denbeigh Super Chauvinist Mark VII. is made of steel and weighs in at 30 pounds.

Both bikes feature racing bike parts, including caliper hand brakes, and specially designed wheels and wheel covers. The drivers are perched in a jockey position on padded supports to increase maneuverability, cut wind resistance, and provide greater visibility. The riders are protected by full racing helmets, wind masks, and leather clothing.

This year, with virtually the same teams returning, as well as some new engineering innovations, Tau Delt plans to win sweepstakes honors.

# Sweepstakes Heats

## PRELIMINARIES

Heat 1
1) Sigma Alpha Epsilon _____
2) Delta Upsilon _____
3) Dorms _____

Heat 2
1) Delta Tau Delta _____
2) Sigma Nu _____
3) Pi Kappa Alpha _____

Heat 3
1) Alpha Tau Omega _____
2) Phi Kappa Theta _____
3) Fringe _____

Heat 4
1) CIA _____
2) Tau Delta Phi _____
3) Beta Sigma Rho _____

Heat 5
1) Kappa Sigma _____
2) Sigma Alpha Epsilon _____
3) Beta Theta Pi _____

Heat 6
1) Dorms _____
2) Pi Kappa Alpha _____
3) Delta Tau Delta _____

Heat 7
1) Tau Delta Phi _____
2) Sigma Nu _____
3) Phi Kappa Theta _____

Heat 8
1) Alpha Tau Omega _____
2) Fringe _____
3) Beta Theta Pi _____

## FINALS

_____ _____
_____ _____
_____ _____

_____ _____
_____ _____
_____ _____