INDUSTRIAL DESIGN

1 January 1959 $1.50 per copy

OUTBOARD MOTOR DESIGN: an extensive case history

Photographic Equipment: a roundup of recent developments

Design Details: a new department

the Industrial Designers' Institute announces

The IDI Design Award is a token of recognition bestowed on a designer or a team of designers for outstanding design of any product mass produced prior to May 4, 1959. The award is open to all designers, regardless of affiliation.

submissions Entries may be made either by the designer himself, or by anyone else on behalf of the designer. Copies of the submission form are obtainable from the address below. Forms must be returned postmarked not later than May 4, 1959.

presentation Announcement of the designers to be honored and presentation of the award medals will be made at a luncheon on June 18, 1959, at the Hotel Ambassador, Chicago.

Request Forms From Carl G. Bjorncrantz, Chairman, 2212 Pioneer Road, Evanston, Illinois.

JANUARY, 1959 VOLUME 6 NUMBER 1

INDUSTRIAL DESIGN

A monthly review of form and technique in designing for industry. Published for active industrial designers and the executives throughout industry who are concerned with product planning, design, development and marketing.

CONTENTS

Coming

IN FEBRUARY—A report on significant developments in cigarette packages.

IN MARCH—Special Metals—another installment in the fabrication series; and a review of major appliances for 1959.

COVER: Our feature story on Johnson Motors (pages 24 to 37) provides a prop for the January cover.

FRONTISPIECE: A group of surplus army optical lenses becomes a refracting sculpture in Jim Ward's photograph—reflecting this month's story on photographic equipment (pages 44 to 55).

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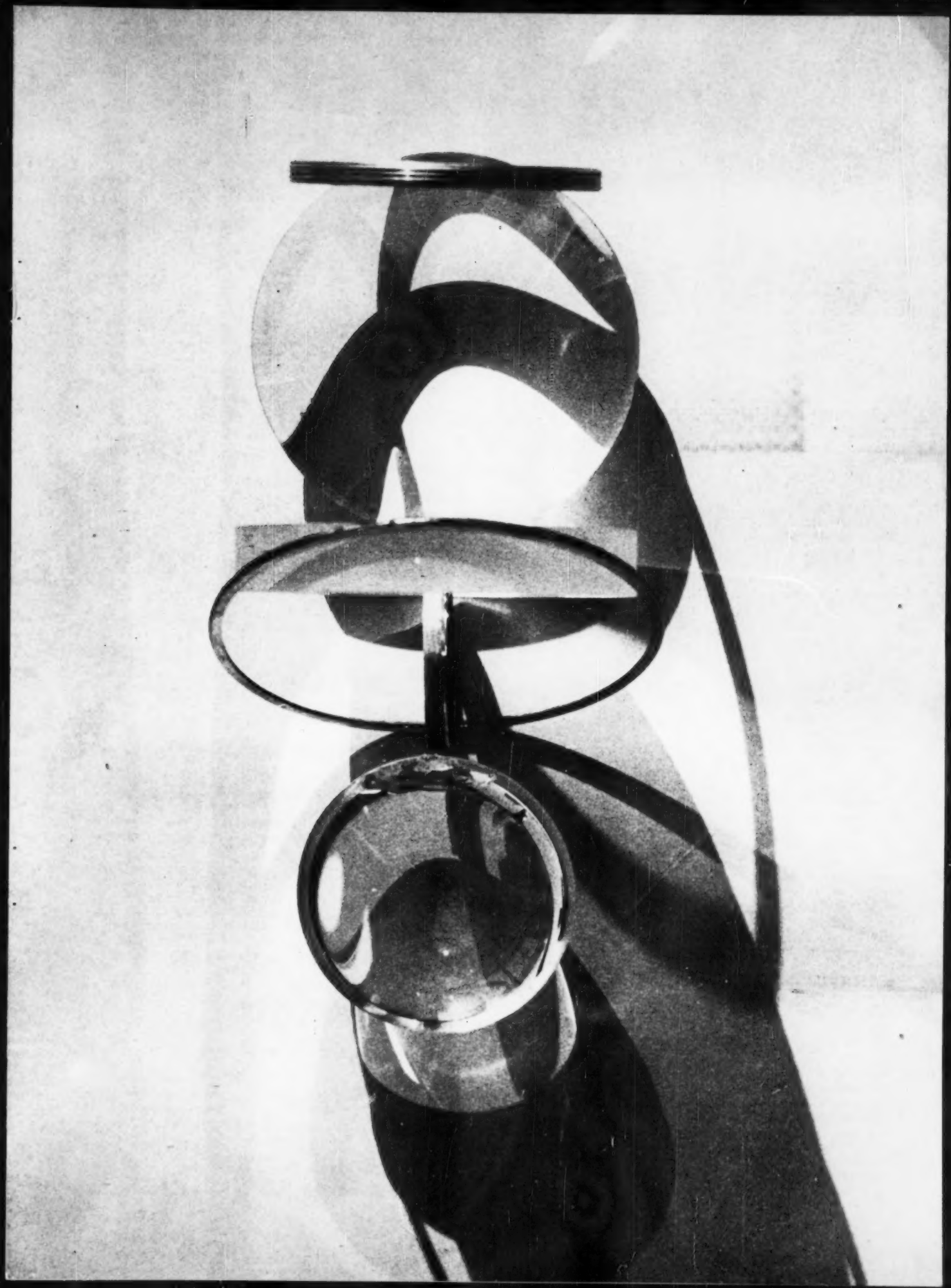


LETTERS

LeTourneau and his machines

Sirs:
We were very much impressed with INDUSTRIAL DESIGN's fine presentation of the LeTourneau story (November).

We have long admired Mr. LeTourneau's genius in engineering and styling. There can be few arguments that his equipment will continue to have a substantial influence on his competition.

It is difficult for us to agree with his attitude regarding an industrial designer, since even the best industrial designers hire industrial designers to assist in probing the many avenues of design and to improve the quality of the final design direction.

Regardless of our personal feelings, however, his results are always interesting and successful in avoiding making a mess of the mass.
Jon W. Hauser
St. Charles, Illinois

Sirs:
The report on R. G. LeTourneau in November was very interesting. The overall layout was particularly effective in that, like its subject matter, the presentation was straightforward and direct without any graphic "tricks". Robert LeTourneau's stature as a man, as well as a truly creative engineer, is very evident in both his life and work. But a few of his expressions concerning industrial design do warrant comment.

"He wouldn't know what to do with an industrial designer on his staff." The very nature of the statement implies that an extra non-functional factor is involved. This conclusion is further strengthened by, "We'll put the looks—if any—on it afterwards." Good design is an integral part of the basic creative process . . . not something added at a later date. The final appearance of a product is simply a visual verdict of the soundness of the planning, engineering, production, etc. that went into it. Too often, particularly in other fields, design is over-accented at the expense of other factors, but in Mr. LeTourneau's area such an approach could be disastrous.

Generally, even in the most involved product there is actually some range of possibilities as to the specific physical character. These huge machines are, by their sheer scale and power, monumentally impressive.

Add to this a direct, imaginative engineering approach, and you have an extremely interesting combination. The point is that when direct, imaginative design thinking is also incorporated as part of the basic concept the results can be even more effective. However, few assignments tax the skill and competency of the designer as does this type of equipment because of operational, structural, production and servicing requirements.

"A machine that works good will look good" cannot be taken as a basic premise, since the exception is too often true. Good engineering and appearance should be so interrelated that they defy separation. Examples concerning this are numerous. One of the most common is aircraft. Several can be competitively built to perform the same function and possess relatively the same degree of efficiency; yet some appear clumsy while others are more graceful and efficient looking. Probably a classic example in another field would be the work of the Swiss engineer, Robert Maillart. There are thousands of bridges which all "work", but those of Maillart stand apart because they express great engineering in visual terms which require no explanation to appreciate.

Perhaps sometime Mr. LeTourneau will experiment, and approach industrial design with the same open mind so evident in his own work. In the meantime, however, it is hoped he will continue in his straightforward manner and not attempt to "add style".
Jim Teague
Painter, Teague & Petertil
Chicago

Editor's note: Painter, Teague & Petertil are the consultants for LeTourneau-Westinghouse, the company which bought R. G. LeTourneau's original company five years ago. See ID, September, 1957.

Sirs:
It was in your excellent article about R. G. LeTourneau that I first noticed that one of the recent LeTourneau machines is named Goliath. I am writing to Mr. LeTourneau explaining that I emphatically did not have him in mind when I used the name Goliath for a very inferior, fictitious tractor in my stories. If I did not know of Mr. LeTourneau's religious activities, I might be tempted to suggest he read the Bible and find out what Goliath was really noted for—one of the world's monumental failures.
William Hazlett Upson
Middlebury, Vermont

Editor's note: Mr. Upson is the author of the popular stories about Alexander Botts, indefatigable Earthworm Tractor Company salesman, which have appeared in the Saturday Evening Post *for years.*

A vinyl laminates partisan

Sirs:
After completing the reading of the November issue of INDUSTRIAL DESIGN last night, I couldn't help but want to congratulate you on a very interesting and informative issue.

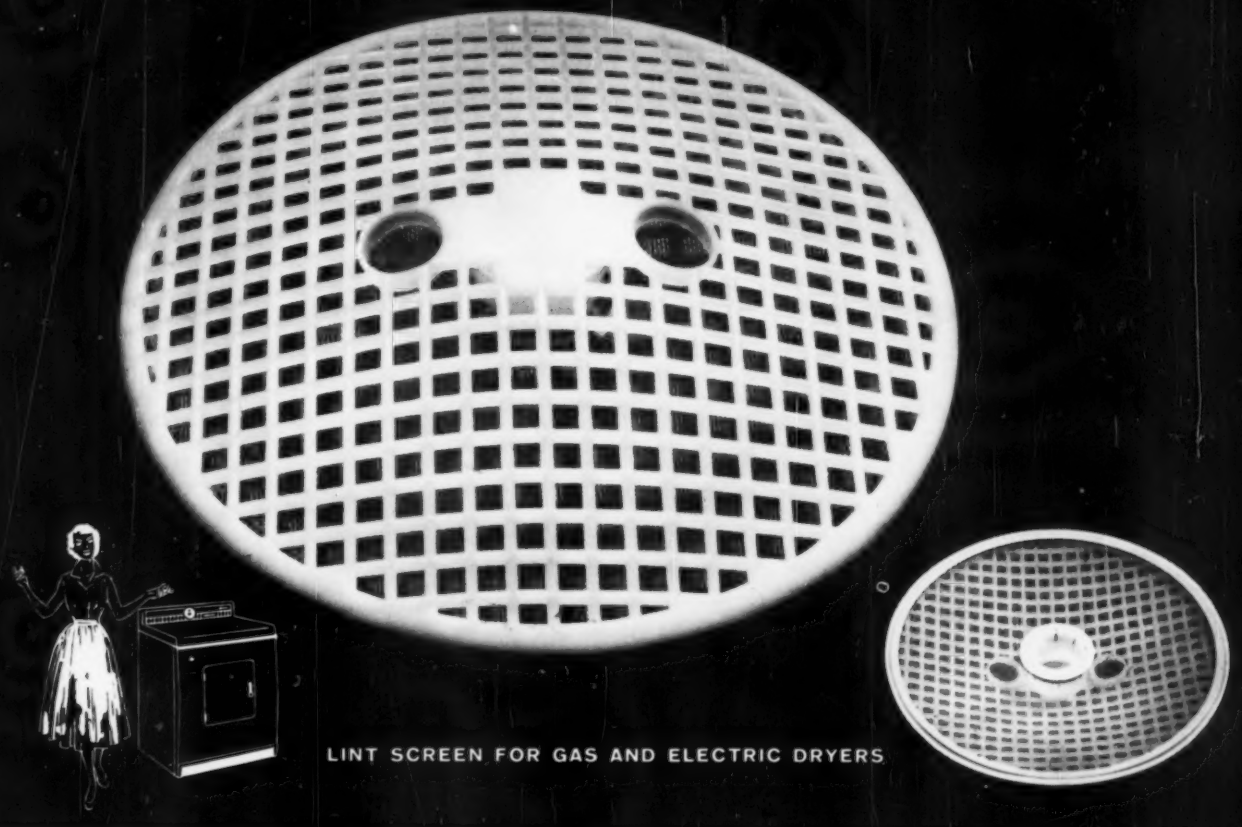
The "Paper" story was most enlightening to me, and the thought of "making" paper is most intriguing.

Of course, I like the article on "Vinyl Laminates" the best, but I think I would be prejudiced. It is very well done, and it brings everyone up to date on the process very fairly.
R. G. Nau
Arvin Industries, Inc.
Columbus, Indiana

From a London observer

Sirs:
I am a regular reader of your Journal, and would like to congratulate you both on its editorial contents and its format, and to wish you every success for the future.
Milner Gray
London

DESIGNED IN CELANESE FORTIFLEX...



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Properties of Fortiflex "A" Related to Melt Index

PHYSICAL PROPERTIES	ASTM METHOD	UNITS	FORTIFLEX RESINS A-20	A-70	A-250	A-500
Melt Index	D-1238-52T	—	0.2	0.7	2.5	5.0
Heat Distortion Temp. (66 psi)	D-648-45T	°F.	185	185	180	180
Brittleness Temp.	D-764-52T	°F.	—200	—180	—160	—100
Impact Strength, izod (⅛" x ½" injection-molded bars)	D-256-54T	ft. lb./in. notch	23	18	13	3
Tensile Strength, Max., 0.2 in./min.	D-638-52T	psi.	3700	3600	3500	3300
Elongation, First Tensile Yield Point	D-638-52T	%	25	25	25	25

Properties of Fortiflex "A" Not Affected by Melt Index

PHYSICAL PROPERTIES	ASTM METHOD	UNITS	VALUE
Density		g/cc.	0.96
Refractive Index	D-542-50	$N^{25}D$	1.54
Hardness, Shore D	D-676-49T		65
Stiffness	D-747-50	psi.	150,000
Water Absorption (⅛" specimen, 24 hrs. immersion @ room temp.)	D-570-54T	%, wgt. gain	<0.01
Flammability	D-635-44	in./min.	1.0
*Mold Shrinkage, length		in./in.	0.03 to 0.05
width		in./in.	0.02 to 0.04

*Measured on injection molded tensile bar. Mold shrinkage depends on part design and molding conditions.

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Response to the October article on reinforced plastics

Pro

Sirs:
The October article on reinforced plastics was a most welcome addition to my already considerable file on this industry in which Reichhold has a sizable stake. Furthermore, I have found the article very rewarding in its thorough coverage. I might only take issue with some of its emphasis and conclusions.

From a very parochial point of view, I did not feel that Reichhold's position as one of the two or three biggest polyester producers was put in perspective at all. Also, the name of the Reichhold "family of polyesters" on page 18 is spelled incorrectly. It's "Polylite," not "Polyite."

Despite these special complaints, I must reiterate that the article is, over-all, an excellent and informative survey of a facinating field.
David T. Nutt, Account Executive
MacManus, John & Adams, Inc.
New York

Sirs:
Congratulations on the really outstanding coverage of reinforced plastics in your October issue. Support from a publication of INDUSTRIAL DESIGN's high caliber should provide a tremendous boost for FRP.
James S. Lunn, President
Lunn Laminates, Inc.
Huntington Station, New York

Sirs:
I have read twice the October issue of INDUSTRIAL DESIGN on the subject of reinforced plastics. I believe you have done very well in presenting a composite picture of the industry from the viewpoint of an industrial designer. It is a very difficult subject to cover because of the wide variety of the products made, the wide difference between companies in it, and the conflicting claims and statements you encounter.

I was particularly interested in what you said about me on page 57. Some of what you said made me squirm a little bit, but of course you got your impressions from other people besides the impressions you got here in Ashtabula. The reason why we are so concerned about a profitable present is that we have no other income from any other source to fall back on if we do not make a profit in fiber glass reinforced plastic. In many cases the lack of necessity for making a profit probably is one of the reasons why progress has not been as rapid as it could have been.

I will be interested to see the comments of Owens-Corning's representatives on your article. No doubt, they felt that the confusion you speak of and lack of direction was not as prevalent as you noted it to be. I believe that it was very worth while to have someone take a disinterested critical viewpoint on the reinforced plastics industry to wake most of us up to the fact that we still have a terrifically long way to go to be a stabilized dependable industry. It also will knock some of the dreams out of some people and get them down to work on a more substantial basis.

I thank you for the excellent job you did and I believe it will be, in the long run, of very great benefit to our industry.
R. S. Morrison, President
Molded Fiber Glass Body Co.
Ashtabula, Ohio

Con

Sirs:
I have just finished reading the October issue of your magazine on the subject of Reinforced Plastics. Frankly, the pictures are nice and some of the product and process description is excellent. But—the editorial comment throughout the article is excessively verbose, unmitigated hogwash.

If the intention of the writers was to prod the members of the industry into improving the state of it you wasted many pages of printed matter. Without any disrespect intended, there are hardly ten people besides myself in the industry who could force themselves to read more than one or two paragraphs.

In addition to printing what I consider the worst kind of uninformative, polysyllabic writing there are gross untruths in lots of it. On one point — your writers strongly criticize the development and dissemination of technical information. The Reinforced Plastics Division of The Society of the Plastics Industry, Inc.—whose members are, for all practical purposes "the" reinforced plastics industry, is holding its 14th annual Technical Conference in February 1959. About 1000 industry representatives are expected to attend. For the past several years that many or more have been in attendance. The main function of this meeting is the dissemination of technical information. About 80 papers will be presented. I sincerely doubt that you can find an industry doing ten times the dollar volume of the Reinforced Plastics Industry that could muster that many technical papers and so large an interested audience. The Society of the Plastics Engineers' Annual Technical Conference serving the entire plastics industry will be no more extensive.

Another point—I challenge this "absurd lack of communication between molder and supplier." Maybe the steel or aluminum user doesn't need as much help but I can assure you a buyer of a ton of steel would wait until hell freezes over before a technical man would be sent by a steel company on any problem he might encounter. I can have a technical man in my place from American Cyanamid, Owens-Corning, Rohm & Haas or a dozen other suppiers to the reinforced plastics industry on a day's notice if I only bought a hundred pounds of glass or a drum of resin. In addition, at our Annual Technical Conference we regularly schedule sessions designed to permit the molders and the material suppliers to get together with the maximum convenience. This is a feature frequently commented on most favorably by those who also participate in conferences held by other industries.

All in all I think your magazine has one function when discussing materials — to show the industrial designer what has been or can be done with the material. Any other discussion is out of your domain and in this day of specialization it is altogether likely that you are unqualified. Leave industry analysis to *Fortune* or others who make it their full time business.
P. Robert Young
Manager, Plastics Department
Wallace and Tiernan, Inc.
Belleville, N.J.

Editor's note: Although Mr. Young has mentioned the presence of "gross untruths" in the article, he has failed to pinpoint a single one, beyond several general asser-

tions criticizing our calling attention to the industry's lack of communication. In preparing the article, we queried those closest to the reinforced plastics industry—over 150 molders, suppliers, and designers. Any statements we made were based on information we received from those knowledgeable sources. We do not, however, expect those within the industry to concur with our every finding. Regarding Mr. Young's curious assertion that we have no right to examine an industry, the fact is that designers are extremely interested in the industrial climate of the material in which they work and not just in the material's chemical properties. Since any industrial art depends on the cooperation of designer, fabricator, and supplier, it is part of our editorial function to serve designers by presenting the background and feeling of industries that concern them.
"What has been or can be done with the material" is an industry question that even non-specialists may be permitted to report on after careful investigation.

Semi-Pro

Sirs:

INDUSTRIAL DESIGN's October Reinforced Plastics issue performed the very real service of presenting this structural plastics material to the industrial designer *from the point of view of the industrial designer.* The issue affords, to my knowledge, the most complete single compilation on current reinforced plastics materials, processes and products.

Its value would have been further enhanced if conclusions to be drawn from the Materials, Fabrication and Products sections on the industry's steady progress in research, quality improvement, standardization and basic materials development had been incorporated in the Introduction. For example, a review of the product pictures, alone, refutes your description of the industry as "over-exploited and underdeveloped." Contrasting the many, important, well-engineered products that are so because of reinforced plastics, with the stated deficient knowledge of these materials among product designers, the failure of the industry seems, rather, to have been "under-exploitation."

Some seeming contradictions on the very considerable basic and applied research that has gone into the materials and products of this industry may also be attributable to "under-exploitation." In fact, it has been suggested in connection with the Annual Reinforced Plastics Technical and Management Conferences that the industry may talk to itself too much. To help correct this introversion at the coming 14th Conference to be held February 3, 4 and 5 at the Edgewater Beach Hotel in Chicago, tickets are being made available without charge to the Conference Exhibit, as distinct from the concurrent Conference itself. These tickets are being widely distributed by members of the Division to interested designers, engineers and manufacturers. Also for the first time, exhibits will be evaluated and awards presented.

Every industry has its share of buck passers and exploiters, but they are not representative of an industry which, like the reinforced plastics industry, initiated but four years after its commercial debut in 1942, when sales were a bare 3 million pounds, a yearly industry conference which today is the largest of any division of the plastics industry.

The agenda of this coming Conference was cited as evidence of a realization by the industry of the necessity of setting up standardization yardsticks and (by implication) quality controls and intensified research programs. The word "realization" has too much the connotation of "newly discovered." As reports of all fourteen Conferences will prove, this "realization" has been of concern to the industry from the beginning. Research—call it trial and error if you wish—created reinforced plastics and is responsible for its present development into a major structural material.

There has been a disposition to criticize the industry for its slowness to realize its potential. In many area this might better be termed an amazing self discipline. Take the case of sandwich panels for curtain walls. A number of different constructions have been developed using reinforced plastics as a facing. Rather than trying to capitalize immediately upon this potential, manufacturers are carefully testing these structures "on the site" to evaluate their performance under varying conditions and in different constructions.

In 1958, four major markets accounted for 66 per cent of all sales. In order of size, the boating industry accounted for 20 per cent of the total volume, construction 17 per cent, transportation 16 per cent and consumer products (notably furniture, luggage and sports goods) 13 per cent. These same four markets also offer the greatest potentials for the materials in the opinion of one out of every two members of the Reinforced Plastics Division answering a recent survey. Containers and trays, ducts and pipes are the next two most promising markets according to this same survey.

Use of reinforced plastics in aircraft and guided missiles, which has been down in volume the past two years, is expected to increase as weapons now in the prototype or limited production stages move into volume production. This is a field, incidentally, which deserves careful watching for it has been responsible for some of the most important advances in the industry such as high heat resistant materials and filament-wound structures capable of withstanding pressures as high as 85,000 p.s.i.

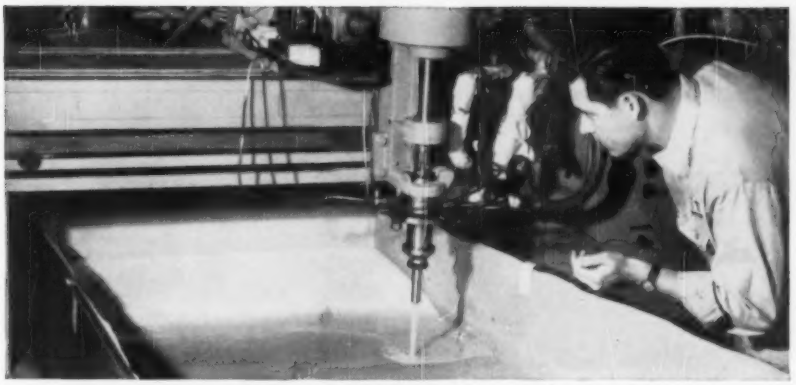
More and more use will be made of reinforced plastics molding materials or premixes. Automotive components and electrical formed parts are two markets where the use of reinforced plastics already has been expanded substantially with the development of refinement of molding materials.

The reinforced plastics industry also anticipates the development of more and more combination products in which reinforced plastics are used with plywood, or metal, foamed plastic or honeycomb materials. The thrust chamber housing for the two main engines of the Atlas ICBM is an example of reinforced plastics' use today in combination with metal. Possible combination products for the future are window sills with reinforced plastics coverings, plywood covered with reinforced plastics for heavy duty or sanitary service, reinforced plastics-covered steel for corrosion resistance, and economical decorative applications achieved by combining reinforced plastics with low cost pulp boards.

All this is, of course, the future. I can add nothing to your very complete review of present materials, fabricating techniques and products.

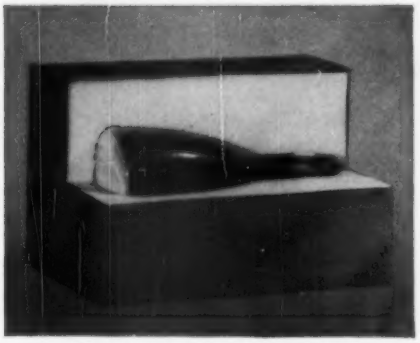
William T. Cruse
Executive Vice President
The Society of the Plastics Industry

and more FOAM is being used

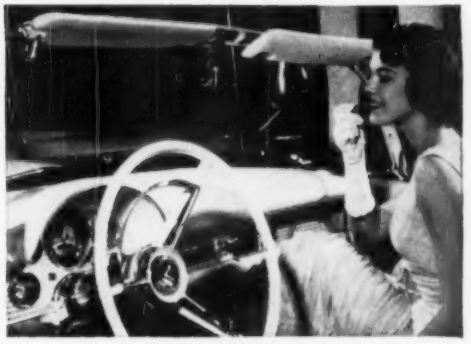


Mobay developed the first commercial "one-shot" foaming system, which greatly simplifies the production and curing cycle for polyether urethane foams — evidence of Mobay's technical leadership in the urethane industry.

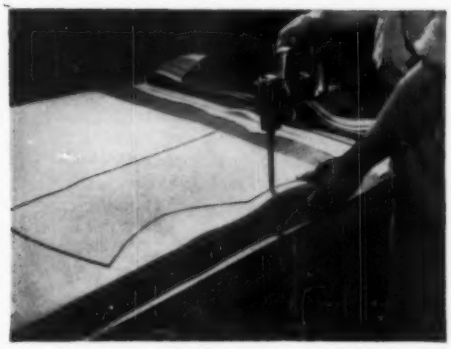
As supple, lightweight interlining.



As economical protection for shipment and storage of precision equipment.



For molded safety dash panels and sunvisors, cushioning and seating.



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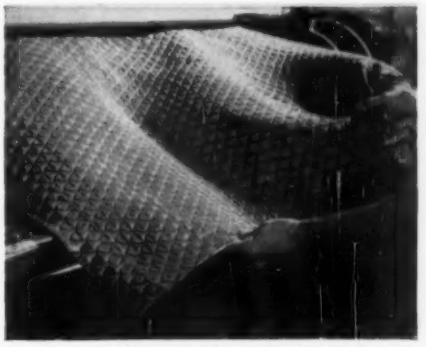

Slices so thin it has the drape and feel of velvet . . . quilts to fabrics with standard equipment.

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CLIPS AND QUOTES

Carl Sundberg, *president of Sundberg-Ferar, Inc., in a recent statement.*

"One important result of the now-receding recession is that the American people will get better products sooner than they would have otherwise. The pressure is on manufacturers and designers to accelerate their thinking. They are being forced to bring out in 1959 new products and new designs that otherwise consumers would not be seeing until 1960 or 1961. Not only are prices on older products being slashed, but the public is being offered new and better products at no increase in price. An advertising-agency executive has called the period that we're now emerging from 'the Era of the Goof-Off,' the age of the half-done job. That, in my opinion, is precisely what brought on the recession.

"We can't talk ourselves out of this recession — any more than we can advertise ourselves out of it. That's been tried before — and it never works. Instead, we've got to *design* ourselves out of this recession, just as we've designed ourselves out of the recessions in the past." ❞

Raymond Spilman *in* **Oculus,** *May,* 1958.

"The American community has tended to bring out the most atavistic impulses in many of our most aggressive citizens. We call this 'competition,' 'salesmanship,' 'getting ahead,' and a number of other synonyms covering a basic philosophy that to sell a product is the single most important reason for existence. In this American environment, still predominantly sales oriented, we find the average professionally trained American ill-equipped to sell (there is nothing wrong with the word) sheer reason, altruism, and humanitarian aspects of his art in his own land. While the skills that are inherent in the practice of architecture, engineering and design are all recognized as necessary parts of our culture, the crux of our professional and emotional problem is, who is to control the execution of creative effort, the business man or the professional?" ❞

Christopher Tunnard, *head of Yale University's city planning program, at a recent meeting of the* **American Studies Association of Texas.**

"Beat generation writers such as poet Lawrence Ferlinghetti and novelist Jack Kerouac have a sense of the modern city not to be found in older writers. They have discovered another dimension to American living, a secondary landscape, and are in tune with the extension of the city to the dimensions of the continent. Instead of rejecting it as older writers have done, they carry it comfortably with them wherever they go. The 1950's have seen a revival of interest in the city and a curious realization among a very few writers of what the city in our time is likely to be — a new revelation of its total form." ❞

Myron Helfgott, *President of the Package Research Institute, at the* **American Psychological Association** *convention, August,* 1958.

"The American culture has created motivation research; motivation research has not created the culture. The real debate concerns not motivation research, but the way the findings of motivation research are applied. When real, discernible differences exist between brands, consumers will make their selection on a rational basis. As differences between competing products become less apparent, motivation research becomes more useful as a tool for discovering the emotional differences which consumers associate with each brand and which lead them to purchase one rather than the other." ❞

The **Marquis of Queensberry,** *British industrial designer, at a recent lecture at the* **Council of Industrial Design.**

"Every article that is made by mankind must vary between having a shape that is exactly determined by its use and having no use at all except to be a thing of beauty. The vast majority of things manufactured in the world are somewhere between these two extremes, and all design problems must be solved between these two extremes.

"To criticize the way that a car or clock works demands some pretty specialized knowledge, but to criticize a teapot or a vegetable dish does not require this. Anybody can tell whether he can get his hand inside a coffee-pot, but not everybody can make up his mind about whether the spout and handle are harmoniously related to each other." ❞

Richard Neutra *in the Indian magazine,* **Design,** *July,* 1958.

"Design is by no means abstract art, but very concretely human and for humans. To 'know man' is an ancient philosophical precept. Especially, the client must not remain to us 'Man the Unknown.' It is far too little to be informed about his bank account or borrowing capacity. We live not only in an age of financial statistics, but also in the midst of a stupendous progress of the Life Sciences.

Architecture, practiced as a profession, is suffused with the confidence of someone seeking sensitive advice, and trusting to an architect a great deal of his future and the future of his dependents." ❞

PICK UP SAMPLE—PEEL OFF BACKING—ADHERE

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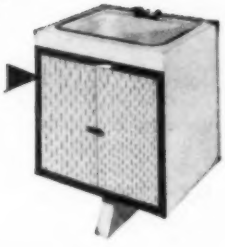

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NEWS

Uncle Sam moves to Moscow

Amid Congressional grumblings about unnecessary spending and about giving aid to the enemy, plans are moving swiftly ahead for a full-scale, American cultural exhibit in Moscow this summer. Los Angeles architect Weldon Becket will be in charge of constructing the three-building fair on a 3,000,000 foot site in Sokolniki Park, a few minutes outside Moscow.

The main building will be a Kaiser-fabricated, aluminum geodesic dome, 200 feet in diameter with 30,000 feet of exhibit space. The other structures will be a fan-like building for cultural exhibits, and a small, circular building for showing "circarama" films. Construction, with the aid of about 100 technicians brought from the United States, will begin in March for a Fourth of July opening. The government will spend between $2 and $3 million on the fair and it is encouraging private industry to set up displays also.

The theme of the fair and other exhibit information has not yet been made public, but, in accord with the general terms of the East-West cultural exchange agreement signed last January, the exhibits will range over American science, culture, and technology, and will omit any form of "political agitation." The George Nelson Company will be in charge of all exhibits. So far, the Chicago Symphony Orchestra, the Jerome Robbins ballet group, and a jazz band will perform.

In June the Russians will put on their own month-long, $1 million dollar show at New York's Coliseum. Sputnik models, an atomic powered ice breaker, atomic power plants, an exhibit on education, and many of the exhibits shown at the Brussels Fair last summer will be included.

Design leaders pick 100 top designs

The "100 best" products of modern times have been announced by Jay Doblin, director of the Institute of Design at Illinois Institute of Technology. The basis of selection was a poll the Institute faculty conducted among designers, architects, and educators, each of whom submitted ten nominations. The Institute plans to make a permanent exhibit of the products.

INDUSTRIAL DESIGN will report on the full list in a later issue; meanwhile here are the top ten:

1. Nizzoli's Olivetti Lettera 22 typewriter, 1948.
2. Eames's plywood and steel side chair, 1944.
3. Mies's Barcelona chair, 1929.
4. Loewy's Studebaker hardtop, 1953.
5. Baker and Parker's Parker "51" fountain pen, 1932 - 1940.
6. The Lincoln Continental, 1939 - 1941.
7. Otto's Edison Voicewriter, VP model, 1950.
8. Kiefer's "sheer look" appliances for Frigidaire, 1957.
9. Loewy's Hallicrafters radio, 1946.
10. Dreyfuss's 500 telephone for Bell, 1951.

The first Convair 880, General Dynamics' 88 passenger jet transport, rolled off the assembly line in San Diego last month to join the Boeing 707 and the Douglas DC-8 in the race for the commercial jet market. The world's fastest jet transport (615 miles per hour), it will make its maiden flight this month, after extensive testing.

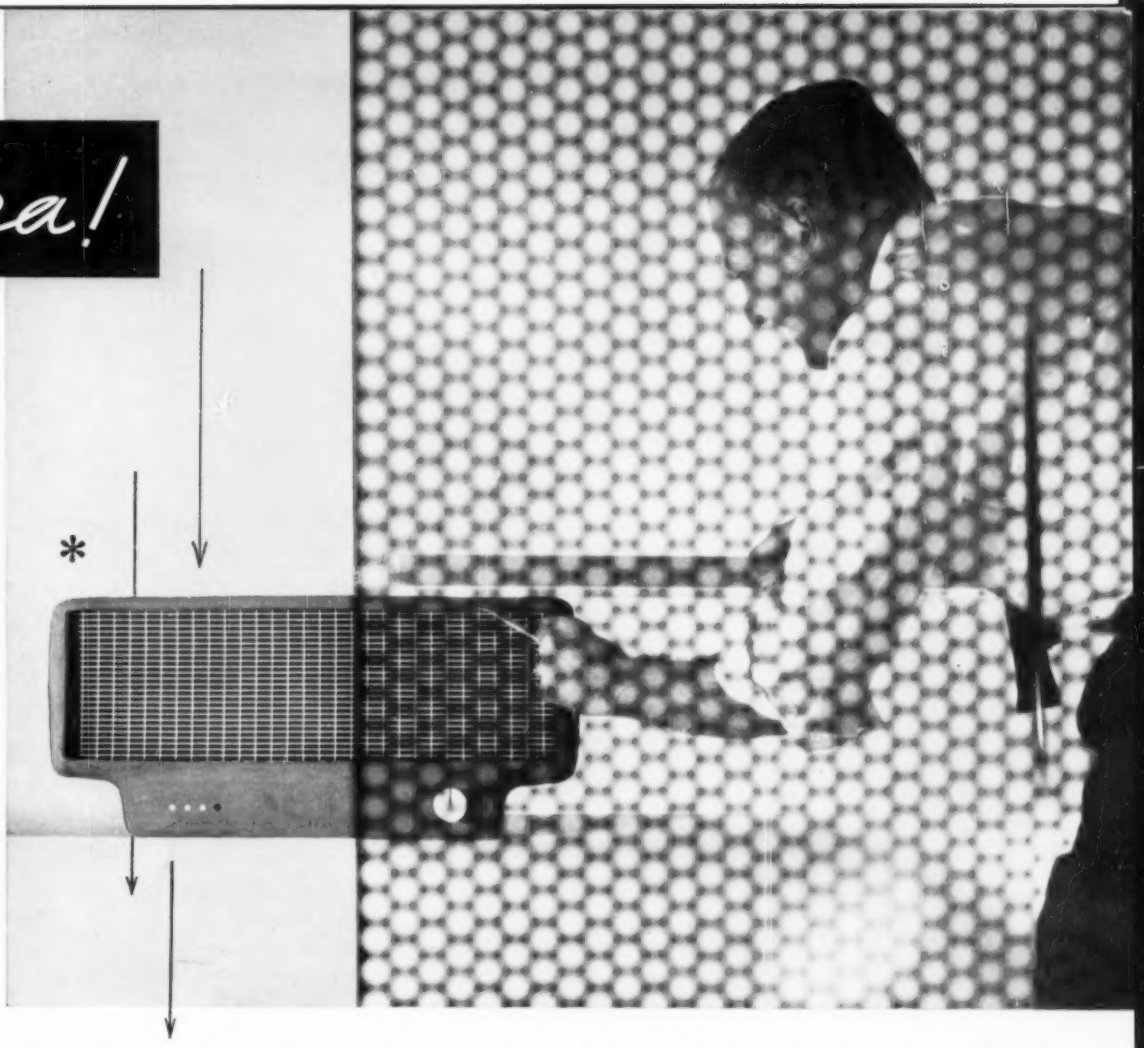
Top left; Golden; top right; Griffith; center, MacKenzie; bottom, Bass.

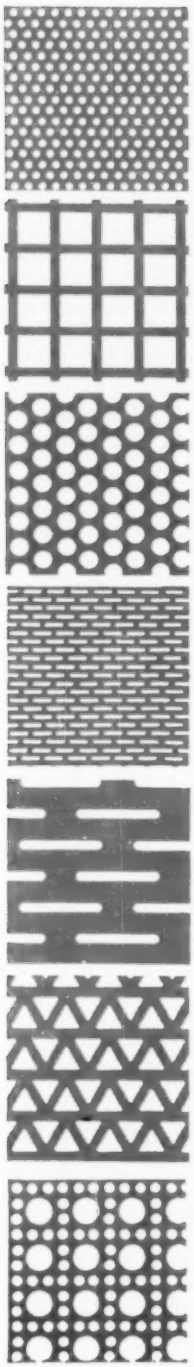
Panelists named for Aspen meeting

Bruce MacKenzie (above), editor of IBM's Journal of Research and Development will be keynote speaker at the ninth annual International Design Conference, which opens in Aspen on June 28. Mr. MacKenzie, who has been trained as a linguist and semanticist, will discuss the similarity of the creative process in design and in science. He hopes that emphasizing these similarities will help effect a rapprochement between the two groups.

Panelists, who will speak around the conference theme, "Communications: New Frontiers Between Man and Man," include: William Golden (above), creative director for CBS Television; Len Lye, pioneer in experimental films; Richard Griffith (above), curator of the film library at the Museum of Modern Art; Jim Real, designer and consultant; Gyorgy Kepes, professor of design at MIT; Ralph Eckerstrom, director of the design department at the Container Corporation of America; Saul Bass (above), designer.

Idea!





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mock-up projects design with H&K perforated metals

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Persson varies textures by combining glazed with natural surfaces.

Kjaerholm combines steel with hemp in these experimental chairs.

Lunning prize winners announced

Poul Kjaerholm, Danish furniture designer, and Signe Persson, Swedish ceramist, were awarded the eighth annual Frederik Lunning Prize of $5000 last month. The prize, intended for travel and study abroad, is sponsored by Georg Jensen, Inc., and is the largest of its kind open to Scandinavians. It is divided each year between two young designers whom the selection committee considers to be of great promise.

Miss Persson, whose ceramic work has been shown in a number of Scandinavian exhibitions, draws upon the folk art of earlier ages for inspiration. Thirty-year-old Poul Kjaerholm has already achieved recognition for his experimental use of materials in furniture design.

Reinforced plastics conference

New developments in raw materials for plastics, and its use in aircraft and missiles, commercial and military transportation, boating and tooling will be among the topics covered in nearly 80 papers when the Reinforced Plastics Division of the Society of the Plastics Industry holds its annual conference February 3 to 5 at the Edgewater Beach Hotel in Chicago. This year the program will include two special periods when manufacturers and molders will be available at designated spots for consultation.

PDC holds education conference

One of the first conferences devoted solely to package design education will be held on February 6 and 7 at the Museum of Modern Art guest house in New York. The conference, sponsored by the Package Designers Council, will afford an opportunity for design educators to discuss the future of package design education with practicing designers. Attendance at the daytime sessions will be limited to fifty so that the conference can operate on a workshop basis. On Friday evening, February 6, there will be an open meeting at the Donnell Library, where the question of careers in package designing will be explored by students, educators and professionals.

Further information on the conference may be obtained from the Package Designers Council, 331 Madison Avenue, New York 17, New York.

"Vinyl-leather" fabric introduced

A new leather-like pattern in elastic Colovin vinyl upholstery fabric, called British Calf, has been announced by the Furniture Division of Columbus Coated Fabrics Corporation, Columbus, Ohio.

The fabric, which comes in 54-inch widths, is being offered in 13 colors, including white, black, beige, orange, yellow, turquoise, red, tangerine, saddle, brown, gold, and antique white.

N.Y.U. to hold package seminar

Robert I. Goldberg will direct for the eighth year a New York University seminar on package design beginning February 4. The current series, to run for 14 consecutive Wednesday evenings, will be a comprehensive packaging and marketing seminar for industrial designers, marketing executives, and sales managers.

Among the speakers will be Frank Gianninoto, of Frank Gianninoto and Associates, and Jim Nash, of Jim Nash Associates. Myron Helfgott, of Lippincott and Margulies' Package Research Institute, and Raymond Berland, of Alfred Politz Research Inc., will discuss package research techniques. Pearl Hagens, senior editor of *Modern Packaging*, will describe significant changes in consumer packages, and Emil Klimak, editor of *Glass Packer*, will discuss trends in glass packages. Members of the Flexigraphic Technical Association, the Glass Container Manufacturers Institute, and the Permanent Display Producers Association will examine the relation between suppliers and designers. Walter Stern, of Raymond Loewy Associates; Norman Schoelles, of Lippincott and Margulies; Douglas B. Tuttle, of Inter-chemical Corporation; Gerald Frisch, of Jim Nash Associates; and Willard F. Deveneau, packaging consultant, will also speak.

Goldberg

IDEA announces new officers

James R. Shipley replaces Joseph Carreiro as president of IDEA, the Industrial Design Education Association, it was announced after elections held at the association's annual meeting at Georgia Tech on October 24 and 25. Other new officers are Aarre K. Lahti, associate professor of design at the University of Michigan, vice president; Arthur J. Pulos, chairman of the industrial design department at Syracuse University, secretary-treasurer.

The association also elected four regional chairmen: John E. Alcott, Rhode Island School of Design, East Coast; Harold L. Cohen, University of Southern Illinois, Midwest; Hin Bredendieck, Georgia Institute of Technology, Southeastern; and George A. Jergenson, Art Center School, West Coast.

Mr. Shipley, IDEA's new president, is professor of art in charge of industrial design at the University of Illinois.

Shipley

PACKAGING DESIGN IN PLASTICS

THE RONSON SHAVER CASE

A durable case with molded-in beauty: This handsome gray and gold shaver case was designed to (1) provide the Ronson C.F.L. Electric Shaver with day-in, day-out packaging protection, and (2) give Ronson a package with powerful masculine sales appeal. How was it accomplished? By using DYLENE polystyrene, a lightweight material that molds in a vast range of stimulating colors – colors that remain constant from package to package.

DYLENE also has remarkable dimensional stability. For instance, notice the shield that is molded directly into the top of the case. It's covered by a clear crystal piece that is easily removed so that the retailer can personalize the case with the customer's initials. And, here's an important part-saving feature. The bezel, usually a separate metal insert in this type of container, is now a gold-coated molded ridge around the inside of the base.

For more information on design-adaptable DYLENE polystyrene, DYLITE expandable polystyrene, SUPER DYLAN polyethylene and DYLAN polyethylene, wire or write Koppers Company, Inc., Plastics Division, Dept. ID-19, Pittsburgh 19, Pa.

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KOPPERS PLASTICS

Esherick and Leonni in retrospect

Wharton Esherick's furniture is that of a craftsman who brings to his work the approach to form of a sculptor, which he is. At New York's Museum of Contemporary Crafts both his sculpture and furniture will be on view through February 15 in a retrospective exhibition which covers 30 years.

Writing in the catalog to the exhibition, Robert A. Laurer, assistant director of the museum, says, "Esherick's aim has been to elevate furniture into the category of sculpture, to instill the purely utilitarian function of furniture with the same characteristics that govern sculpture: mass, line, movement and planes that appeal to the eye with an interesting play of light and shade."

A looming, 12-foot high figure called "Reverence" (designed for the grave of Esherick's friend, Sherwood Anderson) towers over the visitor at the entrance to the show. This and the somewhat smaller, angular figure called "Adolescence" are among the most arresting of the 15-odd sculptures on view. Toward the rear of the exhibit stands a two-story oaken stairway. Transplanted from Esherick's home, it appears more a rugged, free-form spiral sculpture than a very utilitarian flight of stairs. The nearly 50 pieces of furniture which the museum presents recapitulate Esherick's development from an early "cubist" phase to his highly individual present style.

Wharton Esherick

Walnut cocktail table

Figure for theatre

Factory director's chair

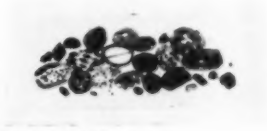
Hickory table and chair for World's Fair, 1940

Leo Leonni, the painter of introspective, isolated figures, as well as Leonni the *Fortune* art director, and Leonni the designer, was or were revealed in a retrospective exhibition of his work at Massachusetts' Worcester Art Museum, through January 11.

Describing the many facets of his work, Leonni says, "As a painter my values are absolute, to be found and satisfied only deep within myself where . . . I stand mostly alone. As a designer I perform for an audience, I exercise showmanship. Does this mean that I am proud of my mornings and ashamed of my afternoons? Not at all. I am happy to act within the coherence of my work, whatever it may be."

Besides paintings, the show includes Leonni's graphic designs—*Fortune* covers, advertisements for the American Cancer Society, for Olivetti, and for the Container Corporation of America. From his architectural work, the museum has selected a model of the politically controversial "Unfinished Business" exhibit at the Brussels Fair, and a model of Olivetti's San Francisco showroom. The show also includes samples of Leonni's street furniture, an installation for a museum exhibit, ceramic tiles, and fabric designs. The exhibit's Leonni-designed catalog gives visitors a take-home sample of his work.

Leo Leonni



Fabric design

Advertisement for Olivetti

"Woman against red"

Olivetti showroom

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But this corn popper *is a first*—to the best of our knowledge.

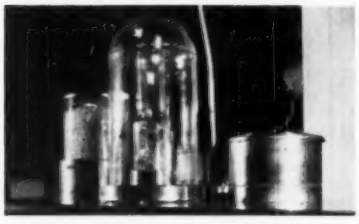
This machine pops corn with *hot* air—and all the action takes place *before your eyes.*

But that's putting the cart before the horse, because it was quite a number of moons ago when the designers at Electri-Cooker Division of General Foods were at the idea-developing stage.

They wanted a *new* way of popping corn. And they wanted to boost sales by having all the popping parts *visible.*

So, they developed a way of turning kernels into a fluffy delight with a *blast* of hot (about 200° F.) air. Then they turned to Corning.

And Corning in turn came up with a number of key components made from a PYREX brand glass. Included are a 17-inch display dome, 13-inch lamp chimney, and an 8-inch chamber for storing unpopped corn.



Why a PYREX brand glass? Because you can use it at elevated temperatures without worrying about thermal shock. (For example, PYREX brand glass No. 7740 has a linear coefficient of expansion of 32.5 x 10^{-7} in./in. between 0° and 300° C.)

Also, you can see through glass (an obvious but still extremely useful feature).

And glass is so easy to keep clean, there's no place for dirt to lodge in its *smooth* surface. Glass No. 7740 also is resistant to the attacks of most acids and alkalies and stands up well under distilled water.

You can find machines dispensing corn popped by hot air at Woolworth's, Grant's, Kresge's, McCrory's, Newberry's and Sears Roebuck & Company. You can find *glass* answers to one of your materials or component problems by coming to Corning.

You can get a head start by perusing "This Is Glass," a 64-page, well-illustrated primer. And/or ask for Bulletin B-83, a detailing of mechanical, thermal, electrical, and chemical properties for three of Corning's most popular types of glass. Use the coupon.

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What material would you pick if you had the problem of accurate spectrum *transmission*, growing *high-purity* crystals, or building a component that would *not* darken under radiation?

The answer: Corning's 100% Fused Silica, an extremely versatile material that will handle these, as well as many other, specialized tasks. And the key to this material's versatility is its *extreme* purity.

Capacity to stand up to high temperatures, coupled with optical properties that yield excellent schlieren or shadowgraph quality, makes fused silica a natural for installation in wind tunnels for designing supersonic aircraft and missiles.

Optical purity and a high softening point (1585° C.) make Corning's 100% Fused Silica useful in wind tunnel windows.

Fused Silica also is used in ultrasonic delay lines, being well suited for handling delays ranging from 10 to 16,000 microseconds. More: You'll find this material possessed of high electrical breakdown resistance, low dielectric loss, and low expansion. And it is permeable to helium.

Uses (other than ultrasonic delay lines and windows for wind tunnels) include the following: windows for high-temperature applications, windows for hot cells, and the optical components for ultraviolet instruments.

All the facts are now available in spec sheet form. Check the coupon.

NEW—CELLULAR CERAMICS

Now, for the first time, from Corning's Cercor process, you can get thin-walled cellular ceramics.

These cellular ceramics are lightweight, resist oxidation, and have an extremely high surface area. Here is a sampling of Cercor products.

The material used to make these objects has 1500 square feet of surface area per cubic foot. Individual wall thickness averages only 0.005 inch; weight is only 30 pounds per cubic foot.

This material can withstand temperatures up to 1800° F. with virtually no thermal expansion, and can be operated continuously at 1290° F. At either temperature you don't have to worry about thermal shock or oxidation.

To provide additional strength, a ceramic coating can be bonded to the exterior of most cellular forms.

The composition of the Cercor materials may be changed to provide desired physical and chemical properties, and further development is expected to result in a broadening of potential configurations and product shapes.

Suggested uses so far include structures for use in gaseous heat exchangers, catalyst supports, burner plates, column packing, and acoustical filtering, flow control, insulation, and structural materials in high-temperature applications.

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Pratt student exhibit

Exhibits

An international exhibition of **contemporary glass** will be held at the Corning Museum of Glass next summer.

Four new buildings — Notre Dame by Gillet, First Presbyterian Church by Harrison and Abramovitz, TWA terminal by Saarinen, and an opera house by Utzon— will be shown in models and photos at New York's Museum of Modern Art starting next month.

The Dave Chapman office held open house last month for Radcliffe College alumnae. The Chapman office was one stop on an "art tour" to raise money for scholarships.

Plastic materials and objects for the home and office were on view last month in an exhibit (above) collected and executed by Pratt Institute second year students under the direction of Jeanette Osborn and Arnold Friedman.

For the tenth anniversary of the Universal Declaration of Human Rights industrial design students at **Syracuse University** prepared an exhibit (below) which stood in the Secretariat of the United Nations last month.

More than 700 "Symbols for Brotherhood," designed by students at the **Philadelphia Museum School of Art** are on exhibition this month at the school.

An exhibition of **craft objects**, assembled by the American Craftsmen's Council will be shown at the Texas Technological College through next month.

"British Artist-Craftsmen," the most extensive selection of **British craft work** seen in this country since the war, has been on exhibition at the Smithsonian Institution this month. Starting in February it will travel to 12 other cities.

Company news

RETAINED: **Bruce Kamp Associates** by Wiedemann Machine Company and by the Electric Storage Battery Company . . . **Sundberg-Ferar** as consultants on the restyling of a complete line of power boats by Shepherd Boats Ltd., Ontario . . . **Charles Magers** to redesign labels for canned moth crystals produced by J. R. Watkins Company . . . **Schnur-Appel** to redesign packages for Johnson and Johnson's professional products division . . . **R. G. LeTourneau, Inc.**, to design and construct a 450-foot overland train for the Army . . . **Paul McCobb** to create a new line of serving ware and table pieces for Jackson Internationale . . . **Good Design Associates** by the Heath Corporation . . . **Eckstein-Stone Inc.** to design a trademark (right) for Triad Offset Process Inc., N. Y.

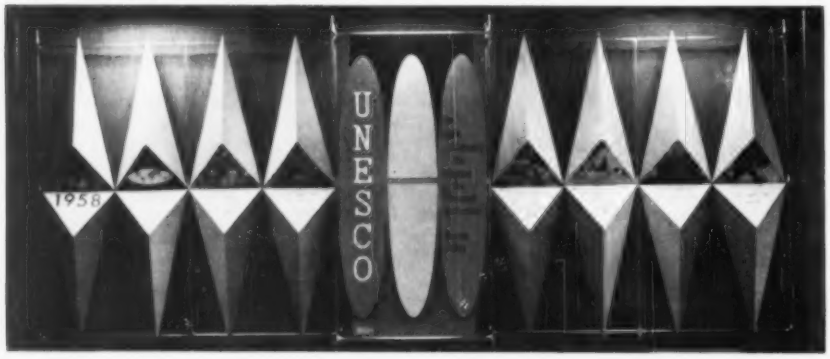
SHOWING: **Alcoa's** exciting 18-minute film, "Color and Textures in Aluminum Finishes." Winner of five film festival awards, the film is available for circulation from Motion Picture Section, Alcoa, 1501 Alcoa Building, Pittsburgh, Pennsylvania.

NEW OFFICES: John William Mason in Glenview, Illinois . . . Product Counselors, Inc., 145 East 57 Street, New York 22 . . . Branches for Ernest Dichter's Institute for Motivational Research in Sydney and Melbourne, and in Johannesburg.

Competitions

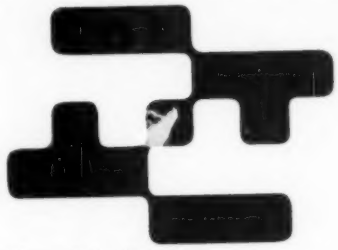
The Chase Brass and Copper Company announces a $1,500 contest for black and white or color photographs that show the bronze exterior of New York's Seagram building to best advantage. Entry blanks may be obtained from most photographic stores or by writing to Chase Brass and Copper Company, Box 2611, Grand Central Terminal, New York 17. The contest closes March 15.

Syracuse student exhibit



People

APPOINTED: **Frederick S. Brennan** as general partner, **Theodore Prisland** to head of the product department and **Donovan Worland** to head of the museum and exhibit design department in Latham, Tyler, Jensen . . . **Virginia Qamar** as vice president, **C. P. Donovan** as account executive, and **Judith Randal** as public relation director for Lippincott and Margulies . . . **Daniel S. Wynne** (below) as product design director for Charles Butler Associates



Trademark for Triad

. . . **Ludwig Mies van der Rohe** as visiting critic in the Yale University Department of Architecture . . . **Lewis Mumford** as visiting professor in city planning at the University of Pennsylvania . . . **Jerry Heaston** as assistant manager of the product planning department of Skil Corporation, portable power tool firm . . . **Dr. C. M. Vanderwaart** as manager of the process design department, engineering and construction division, American Cyanamid . . . **James W. Jacobs** (below) as manager of research and future products engineering of the Frigidaire Division of GM . . . **Edward C. Kluender** as manager of military systems engineering for GE's communication products department . . . **Archie G. Drummond, Danforth Cardozo,** and **Edward F. Kibble** as associates at

Jacobs *Wynne*

Walter Dorwin Teague Associates . . . **Joseph G. Krofta** to teach architecture at Illinois Institute of Technology . . . **Larry H. Zahn** to the advisory committee of the Michigan State University School of Packaging.

ELECTED: **Esmond Shaw**, chairman; **Joseph Judge**, vice chairman; **Jose Fernandez**, secretary; and **Daniel Schwartzman**, treasurer of the National Institute for Architectural Education.

DIED: **Dana Stuart Cole**, director of interior design for Raymond Loewy, December 16.

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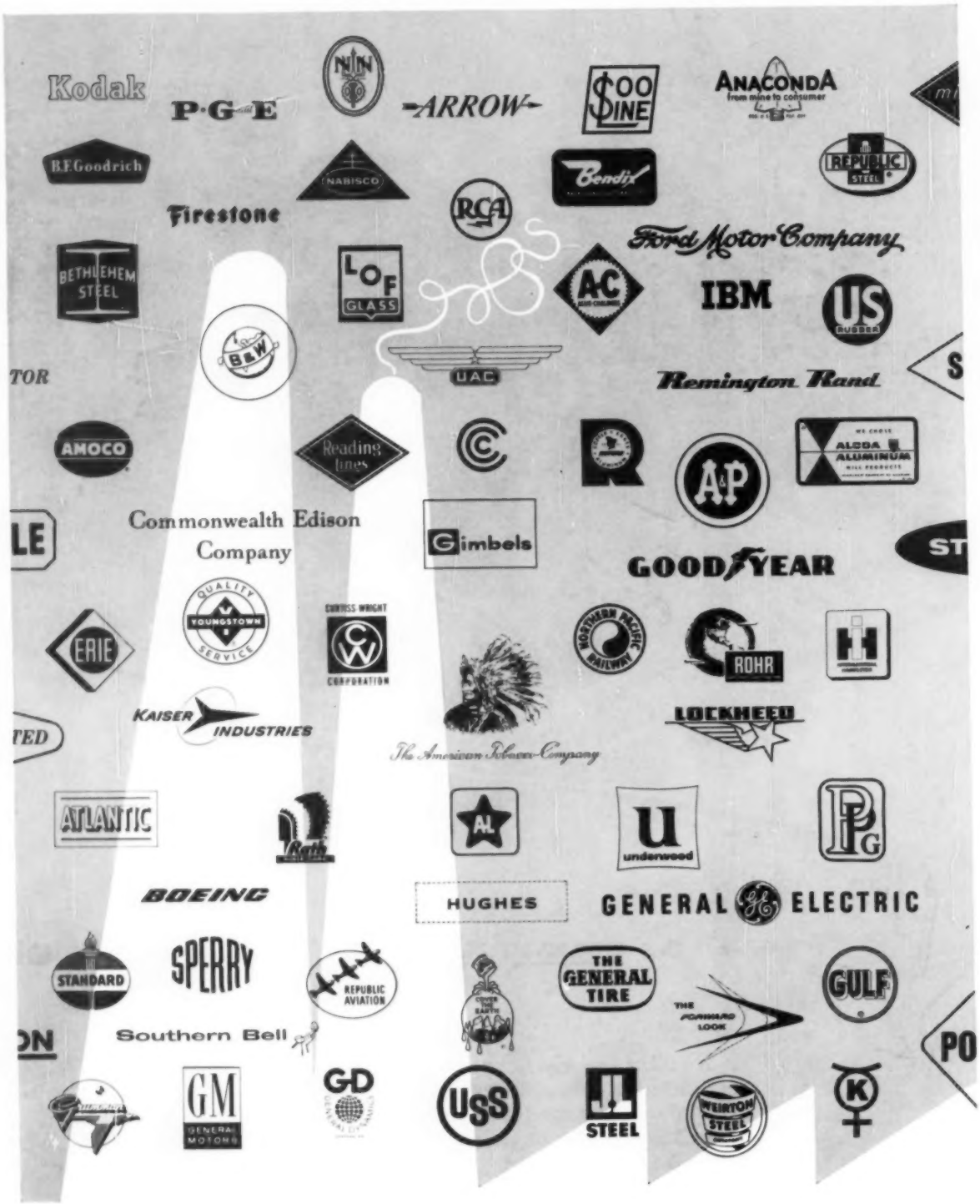
McLouth Stainless Steel



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The conventions of convening

Designers understandably spend a lot of time reflecting on the many interesting and occasionally troublesome ways in which they are different from other professionals. And it may indeed be true that no other profession has problems and opportunities so uniquely its own. But there is at least one activity—problem and opportunity—common to all groups with even a modicum of organizational status: *meeting*. Modern physics has established that, in curved space, parallel lines *do* meet. So does everyone else. Doctors meet and Daughters of the American Revolution meet and Zen Buddhists meet. Designers meet too, and often when they do we tag along.

In this issue we report on the annual meetings of two major professional societies—both highly stimulating affairs. Like most design meetings these were organized through the year-long efforts of devoted men who gave generously of their time, and therefore of their money, to advance the cause of a serious calling. Most design meetings are organized by amateurs, and this is as it should be. But the trouble with amateur convention organizers is that, since *they* don't have conventions, there is usually no machinery for transmitting what they have learned. That's why, in a month appropriately characterized by resolutions, we make bold to offer a few personal ground rules for the professional meeting.

1. Make sure that speakers have something to say *on the subject assigned*. Audiences frequently suffer through speakers who are serious, accomplished, famous, and sincere —but who simply happen to have no new thoughts on the particular subject at hand.

2. Make sure that speakers can speak. Often men who *have* something to say can't say it. This is their problem, and no audience ought to be asked to share it.

3. Check equipment beforehand. The projector should project, the amplifier should amplify, the lights—like the speakers—should illuminate.

4. Warn "outside" speakers of the prevailing "inside" cliches so that they are not embarrassed, and the audience bored, by presenting what is new to them but painfully old to the listeners.

5. Don't organize so tightly that there is no chance for members to exchange and assimilate ideas. A good convention is like any other fire: it can't burn without air space. Such space may be available in the bar, or in that florally draped center of American culture, the hotel room—where ideas are as much to be expected as the Gideon Bible.

6. Choose moderators partly for their ability to moderate. This is a skill, maybe even a small art. Like the interlocutor in the old minstrel shows, the moderator has to ask questions in a way that moves the discussion to some purpose, and he has to let the audience know where it has been and suggest where it may be going.

7. In the case of panels, allow time for audience participation; a discussion that is not open to the ideas of all present runs the risk of being undernourished. Of course there is always the alternate hazard of those audio-narcissists who speak to be heard by themselves. But they are the price we pay for free discussion. All things considered, it is not such a high price—and anyway, a practiced moderator can handle them courteously. (See rule 6.)

8. Don't take any meeting too seriously. Designers convene for professional reasons, but also for fun, and why not? Each convention should try to be important but it is unlikely that any of the Great Questions will be settled in a weekend.

9. Don't expect everything (anything) to work smoothly.

10. Rules always come in sets of ten, but we can't think of a tenth. Rather than make one up, we would like to use this remaining space to emphasize that the nine points above are based on the successes of the two meetings discussed in this issue, and on the successes and failures of a good many others we have attended during the past few years.—*R. S. C.*

JOHNSON

I had to sink my yacht to make the guests go home.

F. Scott Fitzgerald, *Notebooks*

MOTORS PROPELS ITS BOOM

an unusual collaboration of client, designer, and advertising agency has produced a recreational philosophy to sell outboard motors

by *GREGORY DUNNE*

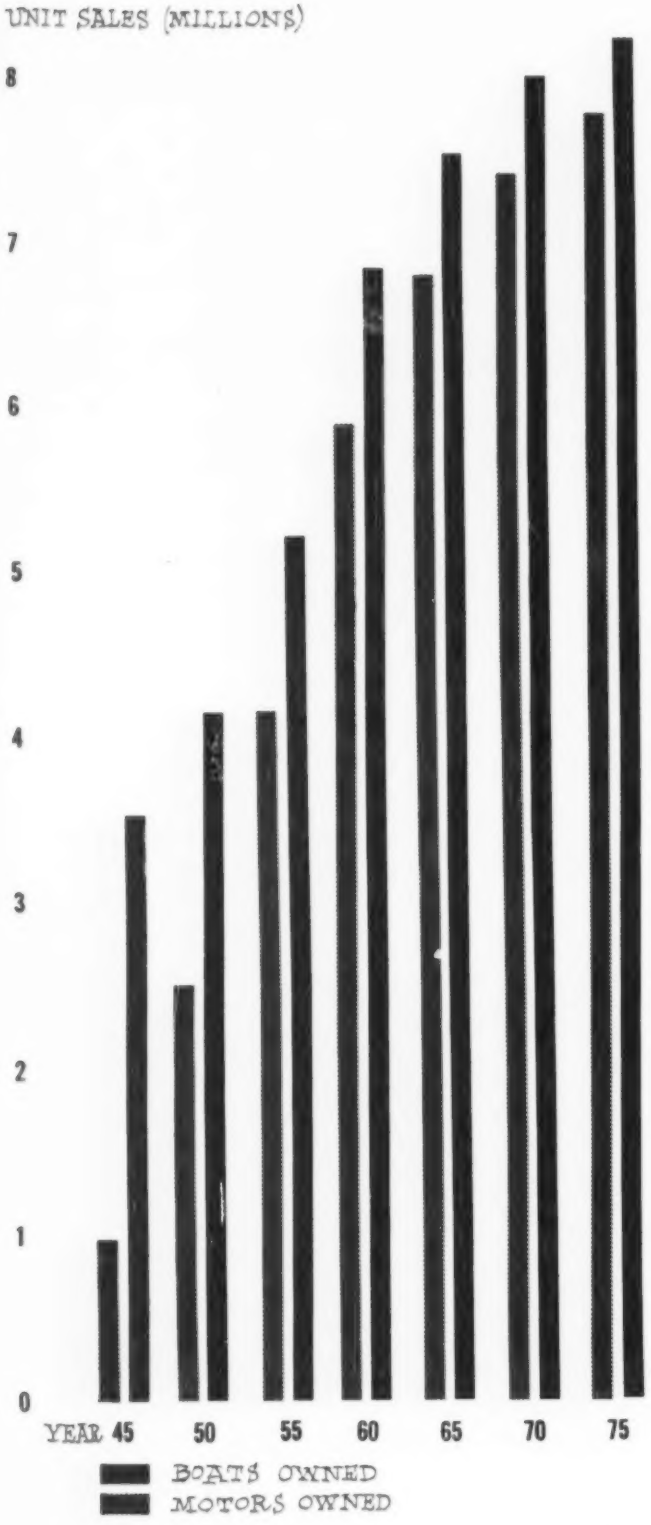
If Scott Fitzgerald were alive today to examine the post-war boating boom, he might observe that the sport of billionaires has become a billion dollar sport. From Waukegan, Illinois—a city several social light years removed from yachting's historical habitats—the Johnson Motors division of Outboard Marine Corporation has taken a long look at the boom and the boating industry. By meshing its internal resources with the creative talents of its external design and advertising agencies—Dave Chapman, Inc., Industrial Design and J. Walter Thompson Company, Johnson expects to harness and ride, and, if possible, prolong, the contemporary boating mania.

No longer is yachting the exclusive domain of the well-heeled, tracking the sun from Santa Barbara to Bar Harbor. Thirty years, one depression, and two wars after the frenetic odyssey of the Golden Decade, yachting has burgeoned into boating, the weekend pastime of 35 million people. Lake of the Ozarks and Old Lyme Shores have replaced Cannes and Acapulco; a handy six pack, the jeraboam of Mumms. Last year 7 million boats, of which over 5 million were outboards, cruised both inland and coastal waterways as boating enthusiasts spent 2 billion dollars for new and used boats, engines, accessories, fuel, insurance, docking, launching, maintenance, and boat club memberships. Outboard motor dealers moved 550,000 engines out of their showrooms while trailer manufacturers could scarcely satisfy the demand for boat trailers to haul outboard rigs to water. The curious boom has spiralled upward, unmarred by plateaus since 1946 and undeterred by the new consumer's limited understanding of his chosen entertainment. Boat and motor buying has become a mass operation for the first time; according to Dr. Ernest Dichter, president of the Institute for Motivational Research, it is an emotional investment in a new way of life which is a radical departure from that chronic form of leisure, *spectatoritis*. In any case, the Sunday boatsman has begun to replace the Sunday driver—to the annoyance of the waterfront native who prefers to use his Johnson or Evinrude outboard motor for a quiet weekday's fishing.

Chief beneficiary of the mushrooming boat market has been Outboard Marine, the parent corporation of both Johnson and Evinrude, which run one/two in sales in the outboard motor industry. Each of the two companies has an autonomous sales and merchandising organization, each an independent design office; hegemony over the two rivals is held by the corporation. Chapman was appointed as Johnson's outside designer in 1956 to take better advantage of the competitive possibilities of two non-allied design offices. Previously, both companies had employed Milwaukee's Brooks Stevens Associates to design their lines; Stevens now devotes full time to Evinrude.

In Chapman's three years of work with Johnson the boating paradox can be seen with the perspective of a designer who has had to grapple with the problems of a social trend in order to reach a bi-partisan solution with his client's advertising and public relations counsel. In attaining this solution perhaps the most obvious restriction under which Chapman has labored is the corporate structure surrounding both Johnson and Evinrude.

Beneath the shroud, both motors are identical in com-

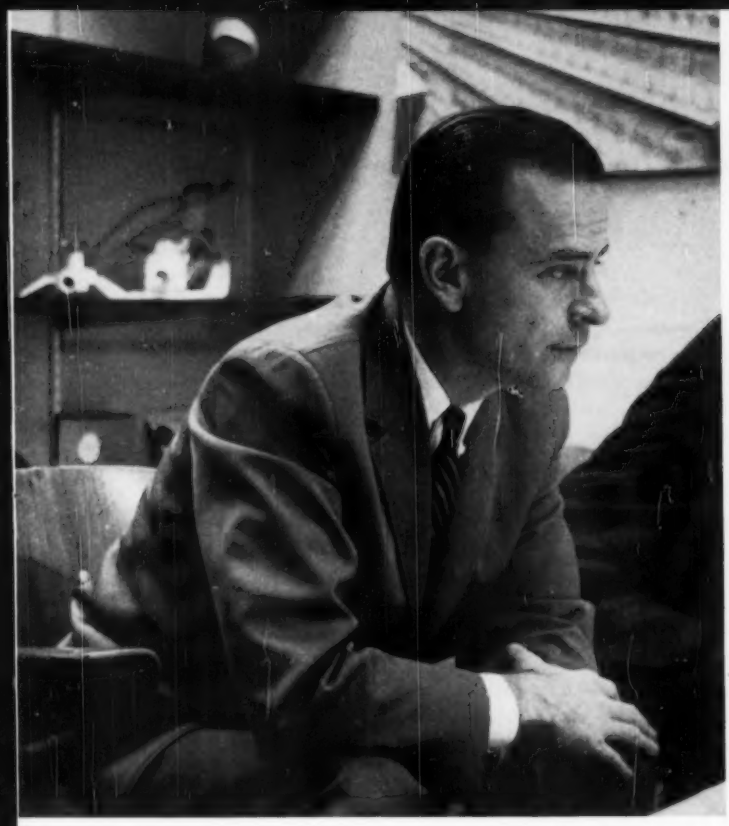


The proportions of the boom are here projected to 1975. Since the war there has been no lag in annual sales of boats or motors.

ponents and performance; moreover, the two companies blanket each other in the diversity of their lines. Manufacturing standardization is extended one step further by being a tri-lateral function. The Johnson division is responsible for all phases of aluminum production; Evinrude carries the burden of fabricating the bulk of the steel parts. A third affiliate, the Gale Division in Galesburg, Illinois (which produces a stripped-down outboard for distribution through jobber outlets), furnishes magnetos, carburetors, and fuel tanks. Design is limited to the styling of the shroud and other externals—shroud design in both cases conforming to internal engineering specifications. Corporate engineering limits design flexibility of course, but Outboard Marine's management feels that the major manufacturing economies it effects are a corporate necessity.

With such an effective system of checks and balances, it is reasonable to ask: why two companies? The question is neatly answered by Joseph L. Rayniak, General Manager, Johnson Motors, and a vice president and director of Outboard Marine Corporation: "Competition sells. It gives us 7,000 dealers instead of 3,500, and consequently, twice as much merchandising. That reaps profits." The division of design responsibility, another competitive tool, also has advantages with regard to production timetables. The consistent demands of dealers and manufacturing schedules make it impractical to force one design office to meet similar deadlines for the two leading competitors in the outboard field. Delays would not only prove an irritant to dealers, but would also precipitate unemployment of the production lines.

But it is in the atmosphere of the boom itself that the Chapman office faced its most interesting dilemma. Outboard motor design is fairly regimented and plausible; it does not permit a too generous allowance for ingenuity. Yet the boating craze has taken on a well-defined sociological outline. The Family has become infatuated with its sportive possibilities as a unit activity. Advertising woos not the fisherman, but the father; publicity has domesticated the river and lake and made them extensions of the back yard—nautical outposts of family living. The problem as it spelled itself out to the Chapman office was: how is a way of life that is a marketable fact designed into a basically prosaic product? Chapman's—or more properly, Johnson's—answer worked on the theory that design in this case was a counterweight to marketing and advertising/publicity, the three services forming an equilateral triangle spearheading a long range collaborative marketing program. How Johnson, J. Walter Thompson, and the Chapman office coordinated their separate functions is recorded on the following pages.



Joseph L. Rayniak
General Manager
Johnson Motors

Dave Chapman
President
Dave Chapman, Inc., Industrial Design

THE TEAM APPROACHES THE PROBLEM: DRAMATIS PERSONAE

Clarence Lund
Vice President & Account Supervisor
J. Walter Thompson Company

Paul Specht
Vice President
Dave Chapman, Inc., Industrial Design

The design team mocks up a product incorporating the findings of the research data

When Dave Chapman, Inc. was awarded the Johnson account in mid-1956, it came face to face with a client that desired a full exchange of both information and creative ideas between its external advertising and design agencies. Johnson and its advertising/marketing consultant, the Chicago office of J. Walter Thompson, had devised a long range marketing campaign based on an all-family theme—the idea being to sell not only Johnson motors, but the boating *idea* as an equal element. Within this framework, design became a catalyst for the stimulation and advancement of a specialized atmosphere, a "way of life" in which an outboard motor would be a major accessory. In essence, what was being sold was a recreational philosophy whose product—in this case an outboard engine—had to satisfy the requirements of safety and pleasure that were indigenous to the philosophy itself. The product had to ride the crest of an atmospheric wave subtly prodded by advertising and public relations. In the absence of a revolutionary clear-cut generic symbol, design's function was to reiterate the program—to sharpen the awareness of the boating feeling. Without the closest relation between client and external agencies, the "way of life" would be all but impotent as a means of taking advantage of the boom.

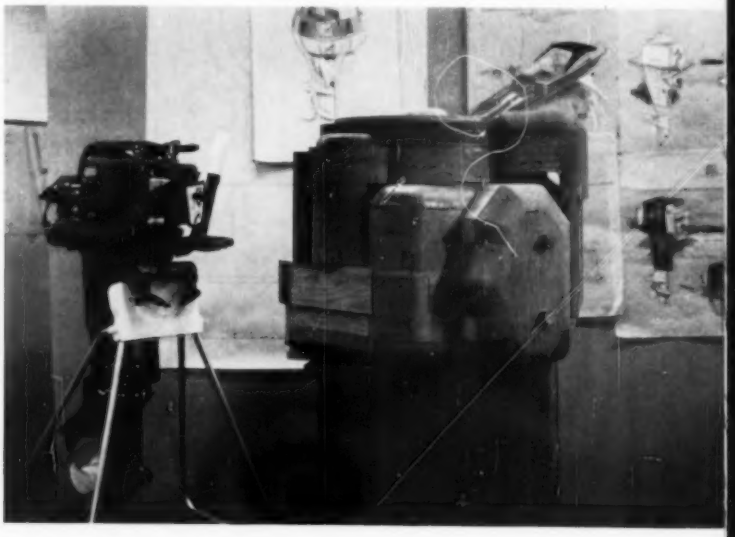
As the tools for the 1958 model year had already been essentially frozen, Chapman's assignment on the '58 line was primarily to suggest graphic and identity changes for the motors and their trim elements. The remainder of 1956 was used to familiarize the design team with the Johnson operation and to implement and interpret the available research information on competitive lines.

Thompson turned over to the Chapman office at the latter's request a mass of statistical data it had collected collating more than 2,000 responses to a questionnaire sent to owners of Johnson outboard engines. The questionnaire was planned so as to draw records of past and present uses of the motors and future desires for them. Responses offered records of ownership of engines, boats, and trailers, types of boats used, longevity of and reasons for interest in boating, family breakdown of the respondents, age and sex of operators within individual families, . . . ad infinitum.

In seeking an individual approach from the distillation of the unemotional, charted mass, two facts became readily apparent to the design team. Sociologically, the boom was rooted in a desired mutuality of family interests; economically, its hard core rested within the complex of the hourly wage earner. There were many indications of the trend: the gravitation towards the suburbs, up nearly 60 per cent since 1950 (while urban populations rose only 10 per cent in the same period), the deglamorization of the automobile from a luxury to a utility item, the availability of longer periods of leisure time in the form of a stabilized work week, paid vacations, and a pre-determined number of paid holidays, and finally, a general increase in family income. Furthermore, the national urge was do-it-yourself; active, rather than passive, participation in leisure activity followed the natural pattern. Boating was symptomatic of the drift; it was comparatively easy to finance, attracted the grandparent as well as the pre-pubescent, and seemed

Paul B. Specht, Chapman's senior project director on the Johnson account, reviews structural, functional, and visual approaches with design team in an attempt to evolve a finished design.

Dimensioned wooden mockups of the motors indicate maximum space details for stationary and moving parts of the motor's structure. Clay is applied to rough up final appearance model.



to satisfy the movement toward shared family entertainment away from the home.

Beneath the generalities of the trend, Chapman found more salient interpretive material. The bulk of the motors was being purchased by the "blue shirt" market, skilled, semi-skilled, and clerical workers who during the '57-'58 season, for example, purchased 62 per cent of the new motors sold. In unit sales, this is over twice the number of motors bought by the professional or managerial classes; moreover, the two groups reflected the general desire for motors of higher horsepower by buying engines of equivalent size. Almost fifty per cent of all motors sold are over twenty horsepower (Johnson's average: 22 hp; more than half their sales in 1958 came from the 35, and 50 hp lines); lower power categories have declined percentage-wise at a predictable annual rate, lending support to the family boating supposition because of the necessity of more horsepower for larger outboard cruisers.

Further digging revealed other facets of the boating mania. Discretionary income (the equivalent of mad money left over after payment of living expenses) was being channelled into outboarding rigs rather than the second car or television set. Disillusion with crowded highways and a reaction against passive entertainment were, in Dichterian terms, the motives used to rationalize this phenomenon. Thompson research also unearthed a "habit lag" in the blue-shirt worker to explain his ability to take on the financial burden of the expensive outboard gear—motor, boat, and trailer. The failure of the skilled worker to keep his cultural level apace with his improved financial position released more income for satisfying the urge toward group activity.

Chapman's evalution of the research data dictated the direction of the design plan. Paul Specht, since made a vice-president of the firm, was assigned to supervise the account and to coordinate a program that would dovetail with the marketing and advertising strategy devised by Johnson and Thompson. Because the connotation of the outboard had shifted from a utility power source for fishermen to an outlet for family recreational use, the design group took the family boating concept as the main theme of its design study in all areas—motors, existing and future boats, and water-front facilities. Stress in both visual and functional features of the product was placed on safety and stability rather than speed, or as Chapman explains the new emphasis "...on the human values of quiet and trouble free efficiency rather than the questionable values of hot rod performance." Altruism, however, was laced with a sound awareness of economics: the family boating enthusiast out of necessity purchased a larger power source to propel his cruiser; promotion of the bigger, costlier motor better insulated the corporate exchequer.

In a preliminary planning sheet (page 31) for his first three model years, Chapman proposed that there be a differentiation in the selling attitudes throughout the line. The utility group of motors—ranging up to 10 horsepower—would assume a visual character designed to emphasize their functional variation from the cruiser engines. The

The clay model begins to take shape. Clay models enable changes and refinements in major contour to be efficiently made in the design office under the immediate supervision of the design team.

Wood design model is returned to design office for graphic details. It is almost identical with production pieces, so accurate that tool makers can check their patterns against its dimensions.

CHAPMAN'S FIRST PRODUCT

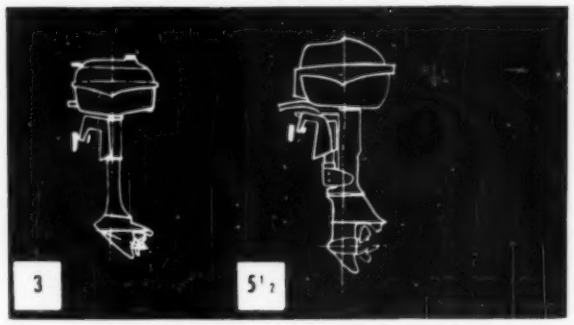
two classifications would be marketed as separate lines, not by economic category, but by end use; the former geared to the fisherman, the latter stressing the family power package. Company characteristics would be controlled by an established Johnson identification program.

As the design plan took shape, an extremely close chain of communication was welded between the engineering department in Waukegan and the design office in Chicago. Because the size of the 50 hp V-50 engine introduced in 1958 posed the threat of fissure in the dies used to cast the huge aluminum shrouds, corporate officials decided to mold the '59 shrouds down the line in fiber glass. Economic and design/engineering factors predicated the change. Moreover, the switch offered to Chapman a more flexible design approach than preliminary appearance studies with aluminum had indicated as possible. With fiber glass, one-piece shrouds could be molded that established softer contours than would be used in two-piece metal casings. The one-piece top-mounted shroud improved sound seal and restricted vibration when soft-mounted to the lower unit. Except for the underwater exhaust, all sound openings were closed off; the only unsealed outlets were the air intakes which were designed in a labyrinth to block out the annoying high frequency noises inherent in outboard motors. Sound deadening is important not only functionally, but also to Johnson's good will. As lakes become more crowded, nautical hot rods can fracture water front equilibrium. The lessening of disturbing sound elements, then, has solid promotional value, especially when sales policy is aimed at that segment of the buying public most interested in recreational relaxation. The shift to fiber glass is part of this campaign. Outboard Marine officials point out that this is the first major mass production use of the material; they anticipate that as better quality controls are established, the reinforced plastic will be functionally superior to aluminum on a long-term basis.

Chapman also investigated other corollary problem areas. With the tendency toward larger horsepower, Johnson has, of course, examined the possibility of more powerful engines. Indications from other manufacturers who have produced 75's have shown that there is an available market for the product. But before the demand is satisfied, the motor makers must stimulate the boat companies to design their craft to keep pace with engineering advances in the motors themselves.

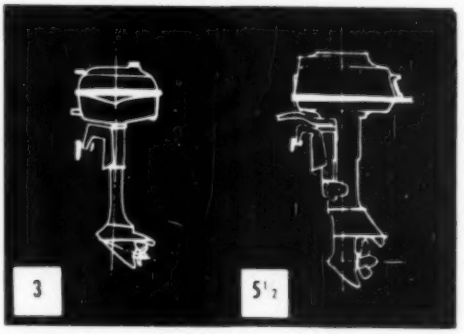
Last summer Johnson invited fourteen boat manufacturers to Waukegan to take a look at advance plans and to anticipate future problems and possibilities. Both Chapman and Johnson expect the early Sixties to bring radical changes in the shape of outboard design. Beyond this statement, they refuse to comment. But unless there is a closer union between the various segments of the boating industry, the impact of the changes will be sharply diluted. One alternative: captive boat plants—which would have to justify huge capital investments. It is with these tangent possibilities that Chapman will have the greatest opportunity to product plan on a major scale.

1958



No major tool change; newly established color scheme and also new production identification.

1959

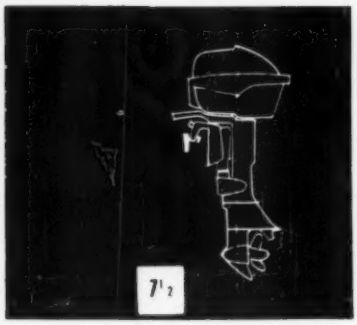


No tool change (3 hp); new tooling (5½ hp): fiber glass shrouds and die-cast lower cover.

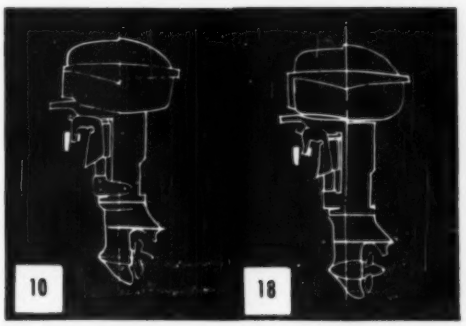
1960

Johnson's motors have heretofore been separated into three groups: a lightweight, light horsepower engine for the fisherman, a medium-weight horsepower for fishing, water skiing, and twin-engine installation on cruisers and runabouts, and larger hp motors that must be handled by more than one man or by mechanical means for cruising. In the future, the motors will be marketed in only two groups (bottom row)—the lighter motors as a sport, fisherman, and utility group, and the larger as a family power package. Proposed design and engineering changes are marked under the respective categories. Johnson subsequently (1959 line) decided to redesign all shrouds in fiber glass.

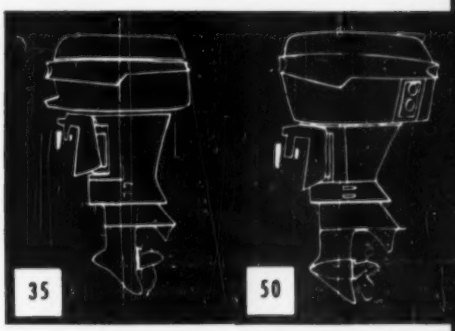
CHART INCORPORATES ENGINEERING AND DESIGN-MARKETING PROPOSALS



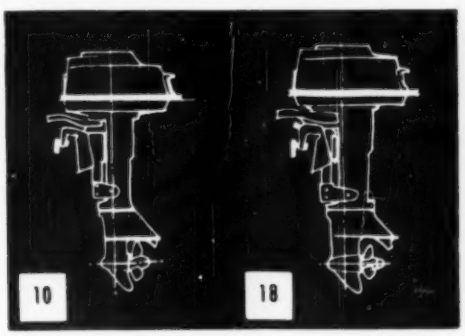
No major tool change; new color scheme.



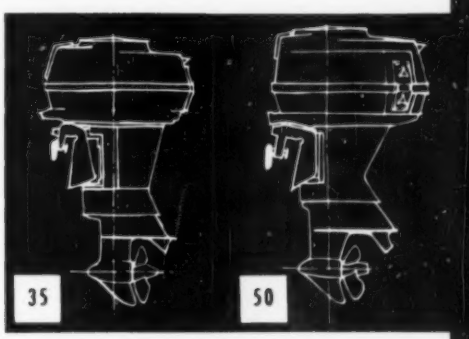
No major tool change; newly established color scheme and also new production identification.



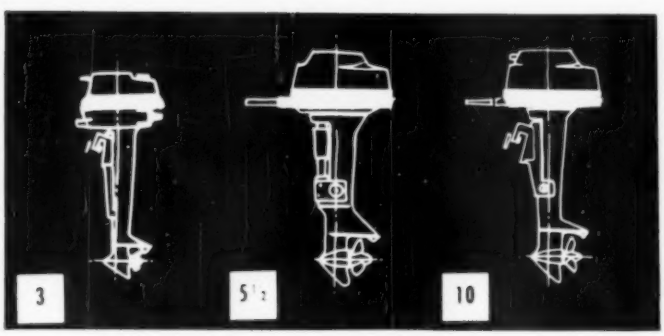
New engine, color scheme, and decals. These are largest selling motors.



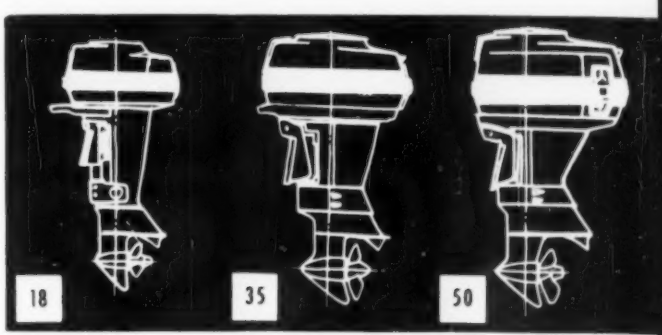
New tooling: fiber glass shrouds, die-cast lower motor cover. Fiber glass permits softer forms.



New engine, color scheme and decals. First time entire line redesigned.



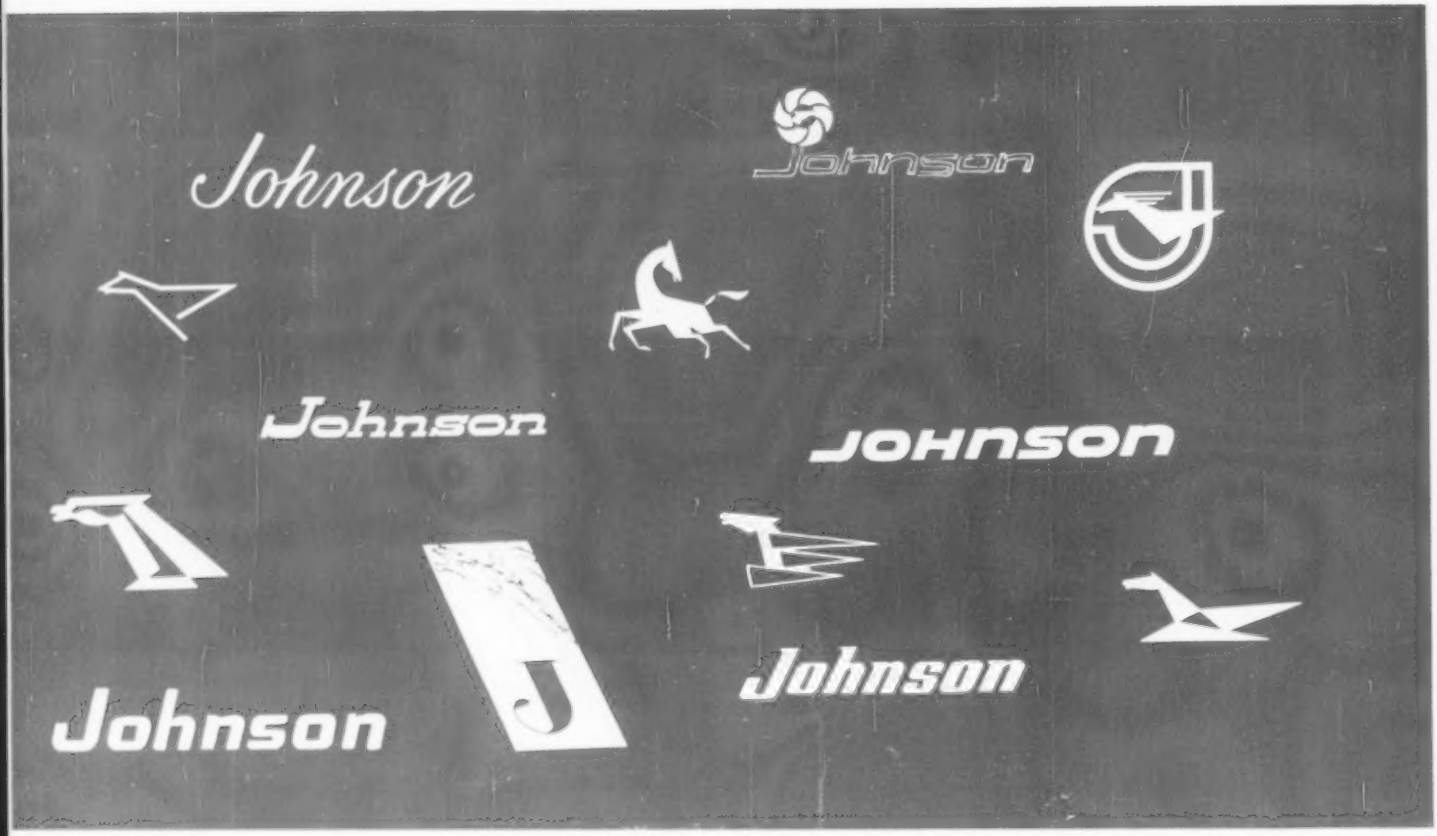
Redesign shroud, tank; reduce weight if possible. New color scheme and newly established Johnson identification.



New trim, new color scheme and newly established product identification. New shroud (18 hp), stern bracket (35 hp).

Johnson

Johnson Motors



Johnson

GRAPHIC REDESIGN EVOLVES THROUGH SCORES OF ATTEMPTED SOLUTIONS

Chapman found that Johnson's departments had no graphic harmony among them. The logotypes shown above suggest the number of solutions attempted before final identity was achieved.

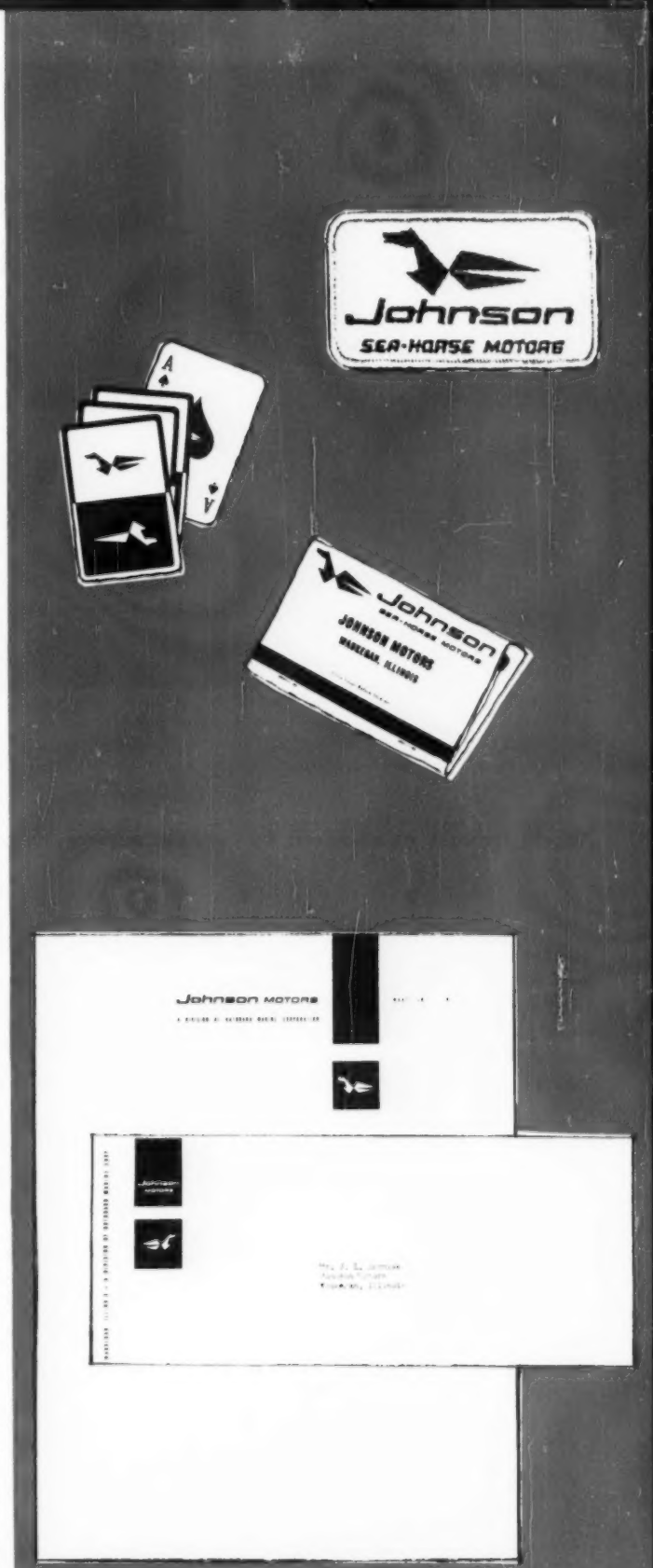
In the absence of radical product design innovations, Chapman recommended to Johnson early in their association a unified graphic identification program to bring order to the chaos of company symbols and logotypes that were currently in use. The underlying purpose of the plan was not only to identify Johnson with the principles of safety, service, and dependability it was promoting, but also to clearly associate the company with the boating feeling that it was helping to create.

After gathering records and samples of all forms and products seen by the many publics in daily contact with the firm, it became apparent to Chapman's account group that consistent identification was lacking within each department as well as in the overall company picture. Trademark and alphabet varied widely in office forms, catalogs, advertising layouts, and product visuals. Between January and July 1957, Chapman's staff collated and studied the mass of unrelated graphics in order to offer a reasonable and controllable visual program. Commercial artists from the Chicago area were hired to conceive a new sea horse symbol which would highlight the overall re-identity campaign. It is possible to suggest that the importance of these outside artists rests more in the bulk than the quality of their work, in that it impressed upon Johnson the enormous amount of time and effort that was needed before the visual plan could be routed towards its final direction.

Chapman proposed that all the forms of communication between Johnson and the public — whether motor, shipping carton, or invoice — be thoroughly consistent in trademark and type face. He ordered design control specification sheets prepared for the use of all departments and suppliers to implement this program consistently. These sheets detailed variation in symbol, color, and alphabet, allowing the user a controlled flexibility in the design of his graphic presentations. Johnson gave the plan action status in July 1957, and supervised minor changes in the following months until it was introduced last summer with the new outboard line.

The designer also emphasized the necessity of continuously exploiting the visual image of the manufacturer in every way possible. Clear-cut company identification more closely allied Johnson with the waterfront way of life it was so anxious to encourage. Capitalizing on admittedly necessary promotional costs, the design control sheets enabled salesmen and dealers to cooperate with the company's publicity policy through the use of singularly coherent business cards, letter heads, and sales and merchandising tools — e. g.: gift lighters, playing cards, match boxes, etc. Few of these forms need direct supervision by Chapman's office.

Several factors decided the final orientation of the logotype and trademark. The old sea horse (top left) had too close a kinship with Mobilgas's Flying Red Horse. Johnson did not want a mythical sea monster, but rather a suggestion of a sea horse that would be readily attributed to a specific product. A cleaner, less feathery trademark would give a more nearly three-dimensional effect that could be easily maintained when embossed, stamped or debossed. With such an angular symbol, script logo became unfeasible; only after months of trial and error was a type face designed that implied the motion of both the product and the trademark to the satisfaction of all concerned.



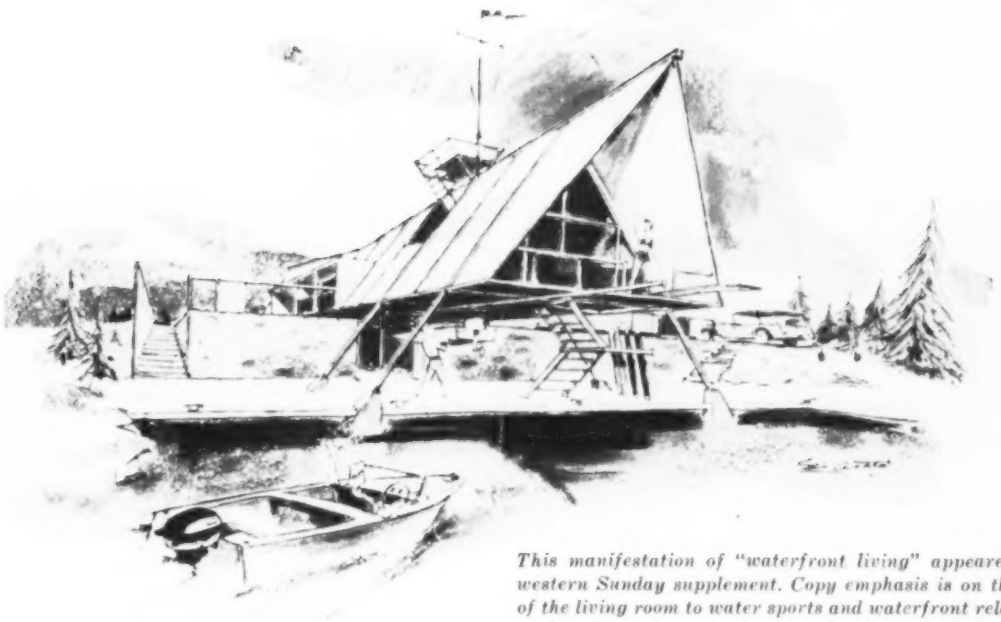
The merchandising tools shown above using the new trademark and type faces represent one way in which Johnson is presenting a single public face to promote its marketing program.

CONFERENCE PLANNING BETWEEN JOHNSON, J. WALTER THOMPSON, AND DAVE CHAPMAN

An apocryphal footnote to American social history declares that someone admiring the magnificence of J. P. Morgan's mammoth yacht as it rested at anchor in Newport Harbor, asked the financier how much such a vessel would cost. "A man who has to ask the price," Morgan reputedly replied, "has no business owning one." Yet such is the nature of social change that last June a major shelter magazine purchased each month by 550,000 people featured an article entitled "The Pleasure Barge," and strongly suggesting that readers must own one. All but lost amid a squadron of floating patios, diving rafts, and cocktail catamarans was the five point credit line: "Designs by Dave Chapman, Inc., for Johnson Motors." Nowhere else in the story was either Johnson or a Johnson product identified by word or picture. All through the summer, Sunday supplements and national magazines were dotted with stories on "Your 'Get away from it all' Place", "Your Waterside Living" "How to Live on and by the Water", and "Carefree Tent-house." The cohesive element among all the articles was the omnipresent design credit.

Each of these features was planted by J. Walter Thompson's publicity department as an outgrowth of a simple editorial request made to Chapman over a year before. A national pul[illegible]on in the sports field had asked the designer to prepare sketches of "future concepts in outboard motors", such spectacular blue sky innovations as jet-propelled or solar-powered engines. Because he regarded such invitations as an occupational hazard of the industrial designer, Chapman turned down the offer. He felt that any real values that could be flushed up by his design team should be placed in the hands of Johnson's research department rather than "frittered away in irresponsible prognoses with little more than opportunistic publicity value." He pointed out to Joe Rayniak and Johnson management that there were a number of valid avenues of design study that would support the findings of Thompson's statistical research of outboard ownership and which further could be used to illustrate family activity, waterfront comfort, safety and fun for promotional public relations purposes. In spite of the rash of housing studies by architects and builders, no one, he said, had given enough thought to the possibilities and character of waterfront living. With crusading overstatement, Chapman wrote in a statement to editors explaining his concept of waterside living that "...the subtle joys of amphibious living, the puttering pleasure of life at water's edge, may be considered as nothing but a genuine, therapeutic release from our complex, modern world." Chapman was not so far lost in his poetry, however, as to be unaware that design research of the type he was suggesting would provide valuable material for a publicity effort on an institutional level to support the product promotion campaigns already under way.

Johnson enthusiastically endorsed the proposal and Chapman's design team went to work developing conceptual architectural studies for Johnson's Family Boating Bureau. The staff made substantial sorties into the characteristics of waterways — rivers, creeks, tidal water, impounded water (man-made lakes) — as well as family economics in order to best delineate housing plans for a wide range of cost levels and natural conditions. At the same time, Thompson's public relations department, which had recently been appointed



This manifestation of "waterfront living" appeared in a mid-western Sunday supplement. Copy emphasis is on the proximity of the living room to water sports and waterfront relaxation. Any outboard rig shown in the story has been cloaked in anonymity.

HAS EVOLVED A WATERFRONT WAY OF LIFE AS A DESIGN-MARKETING THEME.

The two faces of product publicity are shown here. Left, the family indulges in some nautical horseplay. Below, a lower horsepower Johnson is used to show that the outboard motor manufacturer hasn't forsaken the fisherman, historically the largest purchaser of motors, in his quest for the family market.

Brook Stevens designed the "Housefloat" (left) for Evinrude. The fiber glass and aluminum boat, expandable because of its modular construction, is indicative of the quite different direction of Evinrude's promotion. Such futuristic styling is intended to stimulate outboard boat manufacturers to design their boats to keep pace with the latest developments in outboard motor design by incorporating many of the basic marine features of these boats of the future.

Johnson's publicity counsel, began work with the consumer press to get the program major coverage.

Chapman is realist enough not to expect the public to stampede to their real estate agents to place a down payment on an onshore-offshore house-pavilion. Yet, the waterfront living campaign is not a futuristic, hot rod gimmick, but a feasible, well-planned attempt to soft sell the consumer on the advantages of family waterside activity on a semi-realistic basis. By establishing a pre-determined climate, the designer/publicity consultant is trying to place the buyer in a frame of mind to consider one attribute of the climate, an outboard motor. As Frank Carioti, Chapman's vice president of public relations, sums up the waterfront living campaign: "We're not selling the pig but the squeal. But you have to have a pig to get a squeal."

Chapman's complete involvement in client public relations is indicative of the desire in the larger design offices to establish a broader working arrangement between client and designer. No longer does the latter regard his primary function as styling a product—or even a complete line. Rather he sees himself as useful in helping management decide what it should be making, how, for whom, and how best to sell and distribute what it eventually does produce. Such a working relationship implies the closest collaborative effort with all the external consultants employed by the client. Without harmonious cooperation between design, advertising, and public relations counsels, marketing tends to become fragmented instead of being a total collaborative service where there is no clear definition of where one agency's function ends and another's begins.

The association between the Chapman and Thompson offices exemplifies this mutual responsibility toward client interest. The two agencies have had maximum communication between their next-door offices, and a free exchange of recommendations on each other's presentations. Thompson, for example, saw Chapman's final presentation on the 1959 line before it was shown to Johnson, and suggested minor graphics revisions which the design team incorporated. On a longer range level, the design office and the advertising agency made a joint formal proposal to Johnson last summer outlining a "futures" plan of product design and related advertising (complete to suggested copy and lay-outs) for "196X", with recommendations for implementation on all levels as soon as possible. Corporate management greeted the plan enthusiastically, set up a timetable with a deadline estimated at 1962 or '63, and put the program into the works. Despite their cryptic refusal to comment publicly on the shape or scope of the proposed changes, all parties involved privately admit they expect that the face of the outboarding industry will be largely altered.

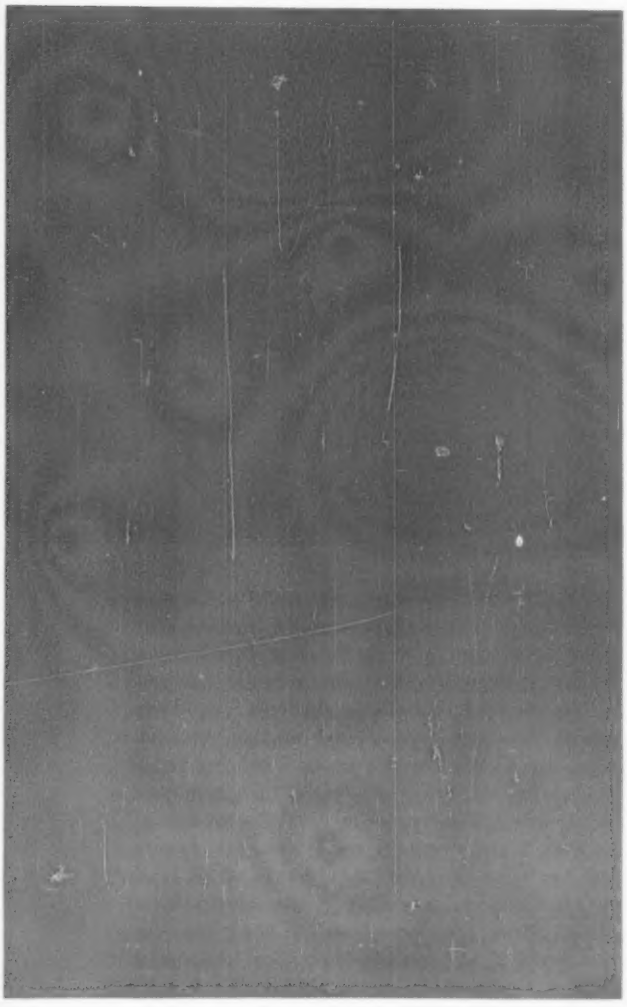
But alteration imposes restrictions on the designer. Now that the outboard motor is a mass commodity aimed at a relatively unsophisticated segment of the public, there is a danger that competitive demand and the Detroit-conditioned consumer reflex will force outboard manufacturers to warp what has historically been a clean piece of equipment with useless styling as a promotional technique for maintaining or boosting sales. Neither Chapman nor Paul Specht is arbitrarily willing to deny these forces. At the same time they both argue the necessity of engineering control over styling influences. As designers they consider that the primary importance of styling is to take maximum advantage of the tooling dollar, to externalize interior developments as ". . . a merchandising exclamation point." Within reasonable esthetic limits, they feel that it is possible to take minor engineering changes — which often have evolved through a process of trial and error over a period of years — and amalgamate them into an external symbol. One can only wonder if such genuine obsolescence will still remain the rule when the sales plateau is reached and manufacturers begin infighting for the consumer dollar.

Despite the blare of advertising trumpets for the 1959 Johnson motor's "Dynautical Design"—a phrase with approximately as much meaning as Chrysler's "Forward Look"—the long range success of Johnson's new line may be attributed to something more abstract: Johnson's attempt to coordinate its internal and external resources in order to create a total, coherent marketing program.

Johnson has tried to utilize the designer as a product planner (instead of a stylist) and the advertising agency as a marketing consultant (instead of a pitchman) in order to fuse their creative talents into a whole greater than the sum of its parts.

The program which has evolved from the easy collaboration of Johnson, J. Walter Thompson, and Dave Chapman, Inc is in a sense more important than the product itself, in that without the former, the commercial success of the latter is severely limited.

With their collaboration in the nebulous area of marketing, Thompson and Chapman have succeeded in designing an intangible—"nautical Togetherness"—into a plastic and steel and aluminum product. They have also marked out a future waterway in which boating becomes not an extension of Scott Fitzgerald's plaything of the rich, but a family sport which brings luxury to every man.

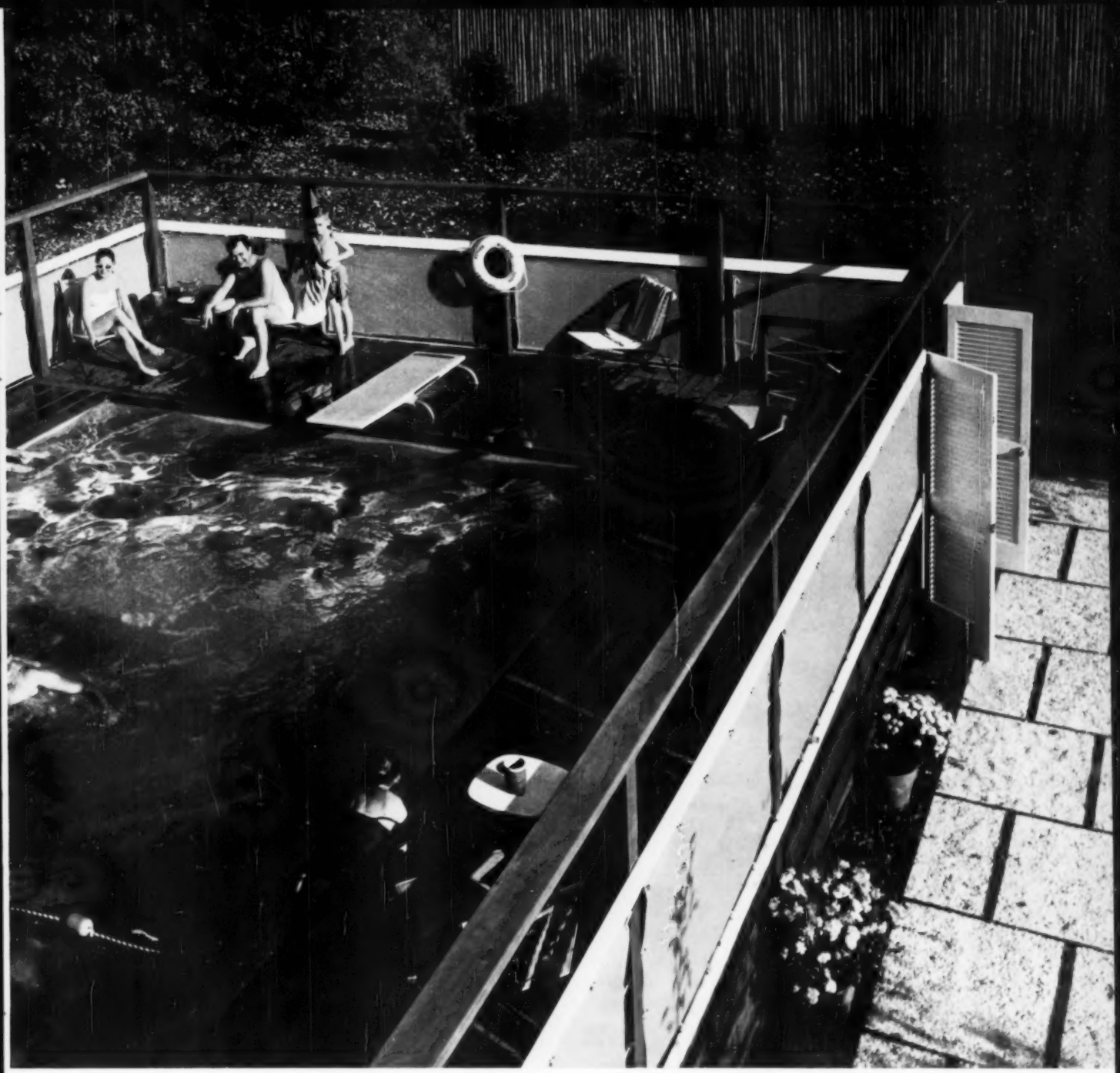


International Swimming Pools designs a pool that can be installed anywhere because it's built partly above the ground, enabling anyone with a backyard of his own to get a daily taste of life by the sea, by the beautiful split-level sea

ESTHER WILLIAMS' "LIVING POOL"

Esther Williams is a woman and a brand of swimming pools, and she has achieved fame in both capacities. The woman looks very much as she did in 1944 when she appeared in her first starring role, in a motion picture called "Bathing Beauty." But the swimming pools come in a variety of designs, and the latest of them is this glamorous California redwood structure called the "Esther Williams Living Pool." A spectacular structural reversal of the old hole-in-the-ground concept, it is a hole *above* the ground—at least partly above.

The International Swimming Pool Corporation of White Plains, New York—which manufactures Esther Williams pools—has for three years specialized in completely packaged pools; and one of the company's chief aims has been to design and distribute a package for which the total price could be accurately estimated. The biggest obstacle both to estimating the price and to keeping it down was the fact that soil conditions and drainage problems make installation difficult in ways that can't always be anticipated; sometimes—as in the case of rock formations that make excavation impossible—they preclude sub-surface pools altogether. It was only a little over a year ago that Chairman of the Board Don Pruess met with Senior Vice-President Elliott Keppler and designer Nembhard N. Culin to discuss a new product that might eliminate these problems. Pruess is a marketing specialist; Keppler is in charge of all company engineering; Culin, an associate in the architectural firm of Frederick Frost Jr. Associates, is consultant on product design, styling, and architecture. The three men decided that there was a place in the market for a full-



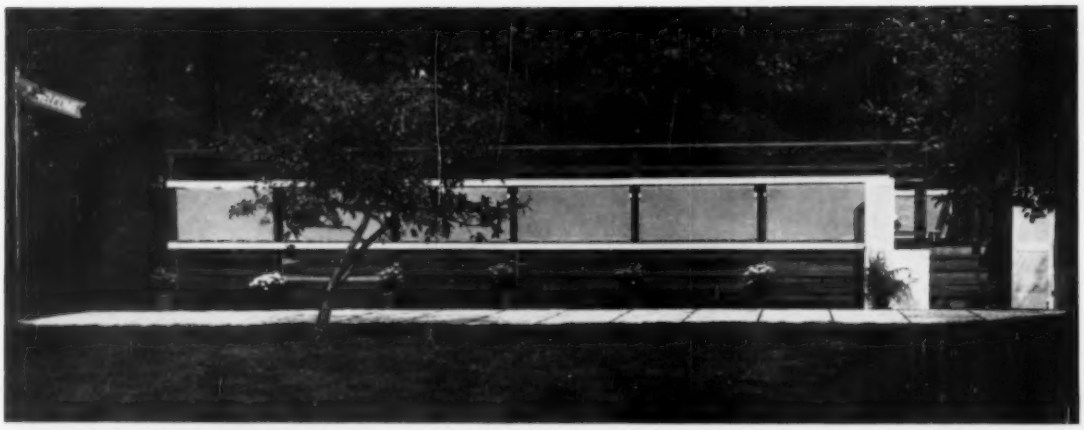
scale luxury swimming pool that could be installed on any terrain because it was built above ground.

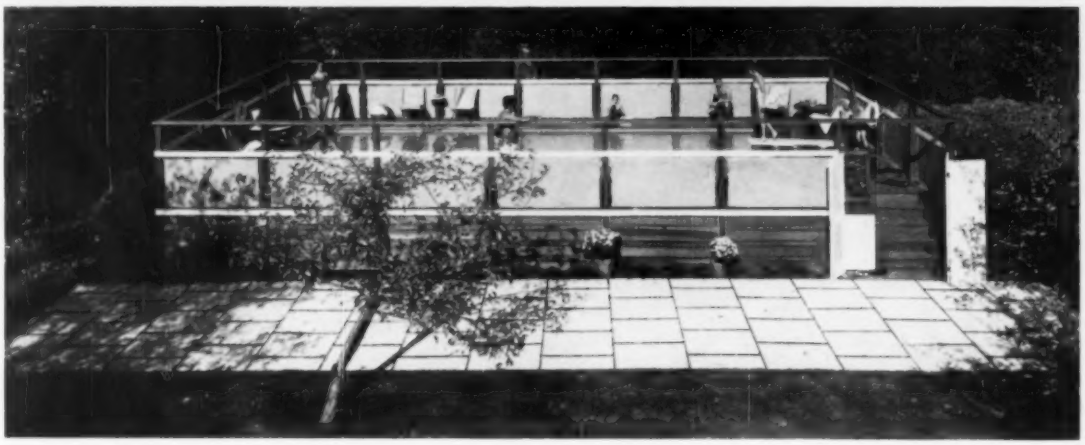
Such a pool would have a number of advantages. By making installation possible without deep excavation, it would mean less yardage moved, less disfigurement of landscape, less need for heavy equipment. It would mean a luxury pool that could sell to an average-income market and (unlikely as it seems and is) a swimming pool that might conceivably be sold to home-renters who could dismantle it when the head of the family got transferred to Peoria. An incidental advantage that no one had thought of is that this pool, unlike others, can be repossessed like an automobile—a fact that facilitates bank financing.

As much a family recreation center as just a pool, the "Living Pool" is surrounded by generous sundecks of two-inch-thick random-width redwood planking. All parts are unconditionally guaranteed. The "Penthouse II" model shown here can be converted to "Penthouse III" by the addition of a "Solaroof" that encloses the entire pool. It is equipped with a built-in fence and locking doors, for safety, and to give the owner privacy and the pool a sleek silhouette.

The Penthouse II is officially described as "split-level," not because it is an adjunct of suburbia but because it literally operates on two levels: above ground it has a constant water depth of 3½ feet, but a diving bowl is sunk into the ground at one end for necessary depth. The pool can be filled with a garden hose, and the original water is filtered and recirculated for an entire season.

Once Pruess, Keppler and Culin had the idea of the "Living Pool," the question was: Would the idea hold water?





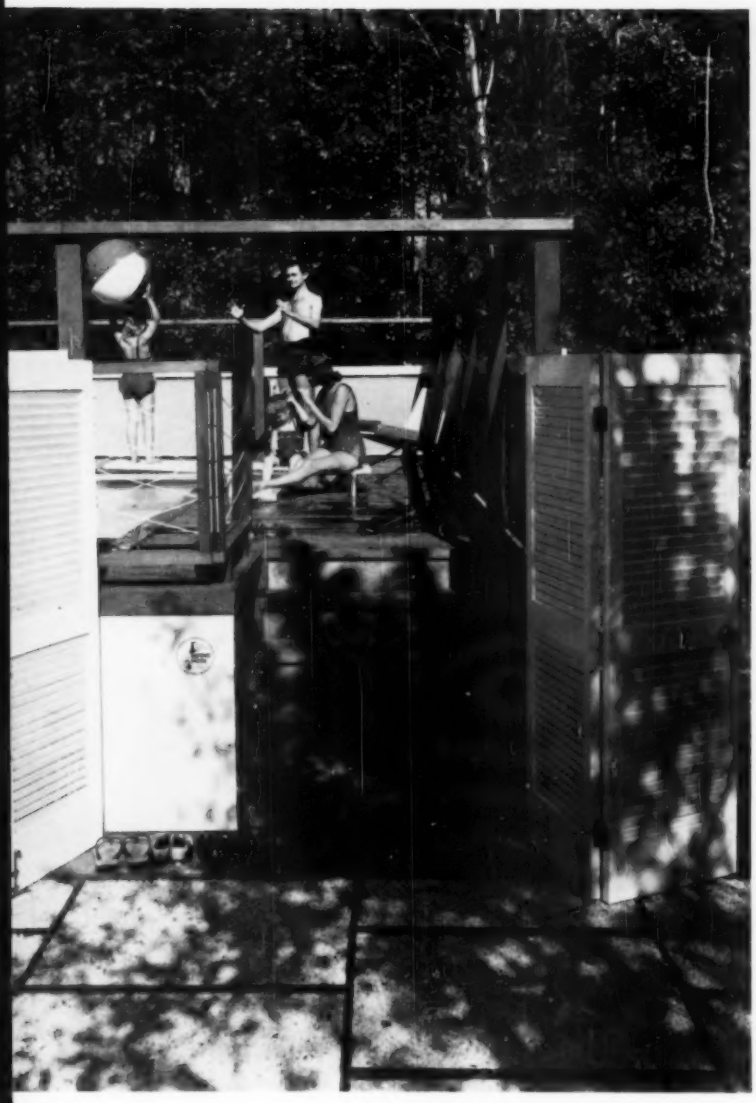
Pool's outside dimensions are 42' by 24' and its water area is 16' by 32'. Gross deck area is 1,030 square feet, and pool surface is 512 square feet. Deck lumber is clear "A" or better redwood, edgegrained to prevent splintering. A four-man crew can construct (or disassemble) pool in only two days.

There were existing above-ground pools, but these were simply round plastic tanks, without any of the luxury connotations of a "real" swimming pool that a standard-shaped rectangular pool would have. But the tanks, being circular, automatically maintained equal water pressure at all points. How could pressure be equalized in a rectangular pool above ground, with sides of different widths? The solution is a structural system of $\frac{5}{8}$" redwood plywood walls which transmit lateral pressures to two horizontal truss systems, one six inches above the bottom, the other just below deck level. These consist of 4" by 8" redwood horizontal members which take the bending load between panels and function as truss compression members; at intermediate panel points the compressive load is transmitted out to round steel rods of thicknesses varying from $\frac{5}{8}$" to 1", which act as surrounding tension members.

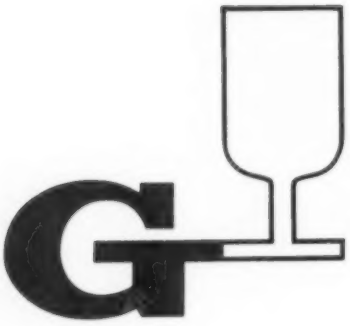
At bottom the pool is tamped sand covered with a pool skin of 20-gage virgin vinyl. The skin is laid over the pool and, when a little water is added, two men standing in the pool slide it into place, where it is nailed down and held fast by a redwood beam that goes all the way around the pool.

A CAREFULLY ENGINEERED STRUCTURAL SYSTEM MAKES IT POSSIBLE FOR A NEW IDEA TO HOLD WATER

Doors are ponderosa pine. Steps are inside pool area so that "Solaroof" can be suspended from upper member and enclose entire pool for use in cool weather.



Storage area of 518 square feet holds pool accessories and garden equipment. Blue weathercloths made of reinforced fiber glass vinyl are laced on with nylon rope.



TASTER-TESTED GLASSES

When the famous old London firm of W. & A. Gilbey Ltd. extended the range of its activities from selling wines and liquors to selling glassware to drink them from, ID announced the fact and described the ingenious carton devised by William and Veronica de Majo (March, 1957). Now the glasses (although, for the time being, not the carton) have been introduced to the American market, and are being distributed here by Gilbeyglasses Ltd., 56 Beaver Street, New York. Perhaps the most interesting design aspect of the glasses is their origin. The design, executed by R. S. Stennet-Willson, is based on the set of private sampling glasses developed and used by Gilbey's corps of tasters—an adaptation of a professional tool to the social uses of amateur palates. The glasses are "authoritatively correct" (consider the source), hand-made in Swedish lead crystal, elegantly anchored to unusually sturdy bottoms. In contrast to the increasing thinness and frailty of fine glass, this family of shapes is related by strength-giving features: thick disc bases, sturdy stems, angular shaping and straight bowl-sides.

1

2

3

1. Top row for brandy, champagne, wine; middle for sherry, cocktails; bottom for Old Fashioneds, tall ones.

2. Carafe for serving wine comes complete with how-to-do-it book on the fine art of decanting.

3. Old Fashioned tumbler is equipped with clip-on plastic-coated steel-spring handle.

Photographic Equipment

The photographer at left is too deeply involved in what he's doing to worry about lenses, film temperature or motion analysis: for him, the picture's the thing, and the fun of snapping it. This is an attitude he shares with the art photographer, who, however, has to worry about the technical details of a complex craft. Between the extremes of rank amateur and polished professional is the famous "bug," photography's counterpart of the radio "ham."

But whether the consumer has as his goal the family album or "The Family of Man," the designer has as his goal the resolution of an annually changing problem: taking a precision instrument manufactured for mass consumption, and organizing it into a responsive and manageable device.

Photo: J. S. Ward

From a guided "photo tour" of Grossinger's to stopping an inter-continental ballistic missile in mid-transonic-flight, the fun and the business of photography become more complicated and more commonplace. There are an estimated 50 million cameras and items of photographic equipment in the United States, ranging in level from amateur through advanced amateur (or "bug"), semi-professional, professional, and technical photography. Supplying this equipment is an industry whose sales ran well over 1.5 billion dollars this year, with the promise that next year will be better.

"Automation" by copywriters

This profusion of equipment has come about in a few decades. When George Eastman said "You Snap The Shutter, We Do The Rest", photography was still in its swaddling infancy, and Eastman's concern was to promote photography from an art and craft to a popular hobby in order to sell more film. The Eastman slogan today may be as apt as ever—but for an altogether different reason: it summarizes with admirable succinctness the designers' and manufacturers' attitude towards the consumer in their latest broad-scale attempt to increase the already great photography market through "automation". Automation is one of those words which come not so much into being as into vogue. Most inventions are "automated" chiefly by imaginative copywriters. Actually they are only automatic. And the latter term, although it does not carry a connotation of cybernetics and is therefore more accurate, expresses one of the dominant trends in the design of photographic equipment today.

Which does not come as a surprise to anyone. As a poet-engineer once said: "In America, laziness is the step-mother of invention", and as a consuming public we are lazy beyond compare. We like things to be *simplified;* we like them to be *convenient* to use; and we want products that can *do increasingly more.* Automatically operated instruments and machines satisfy these wishes.

Decades of technology

The love of the automatic, however, is only part of the picture: there is also a need for it, and that need is not due to laziness. Photographic equipment has applications that compel its design to be as fully automatic as we can devise. On missiles, for example, there must be a built-in exposure meter, an electronic device governing the iris of the aperture, an automatic range-finder, and a self-operating shutter-speed device. None of these inventions is new: their combined use is. The built-in exposure meter is at least twenty years old in this country; other devices are even older. Usually the most significant advancements in photographic equipment have occured (and will continue to occur) in areas of special, technical needs, such as in cameras designed for industrial and scientific use. In these areas, the improved developments have a specific and highly specialized purpose, and they represent the best latest solution to the most recently recognized problem. But just as the microscope eventually becomes a toy in the child's playroom laboratory, these technical developments at the top level filter down to the non-technical, and even amateur, levels, and finally these down-adaptations are combined in one package. The purchaser of a new camera today acquires decades of technology for just a few dollars.

More often than not, the technology underlying a well-designed camera is not even vaguely understood by the man who buys it. The amateur—who represents far and away the largest part of the camera-consuming public—may be impressed by the built-in controls and devices, but he is impressed somewhat as a savage is by a fetish. The controls represent power that transcends his own, which is one of the reasons that he tends—budget permitting—to buy the instrument with the most gadgetry, including a device or two that he will never quite learn to master although he will be happy to go on experimenting with it. To him the camera is always a kind of magic box. Its complex mechanisms are a source of mystery to him, and after he has wondered about them for a while and compared notes with others, he will do what he has always done with older and simpler cameras —snap the shutter and wait to see the drug store-developed results.

The designers of cameras seem to sense this. With each new design, there seems to be an effort to so construct the instrument that all possibility of human error will eventually be eliminated for the, so to speak, illiterate photographer. There is a tacit ideal in recent camera design: incorporate as many chemical discoveries and optical innovations as are available for this year's model, but make the camera as easy to operate as the old box Brownie—click!

Cameras and designers

The camera is nearly unique in that it is one of the few precision instruments designed for mass consumption, and as in most precision instruments, the esthetics of the whole are secondary to the sensitive functioning of its parts. It is because of this, in fact, that the camera should be pre-eminently in the domain of the industrial designer. Although there is a rapidity in optical and chemical developments affecting camera design, and although engineering staffs are usually called upon to deal with them as part of their daily employment, some of the best-made consumer cameras in America are those designed by industrial designers. And it is impressive and encouraging that in this area "cosmetics" has seldom been perpetrated, not even thirty years ago in the Dark Ages of industrial design. —*H. A.*

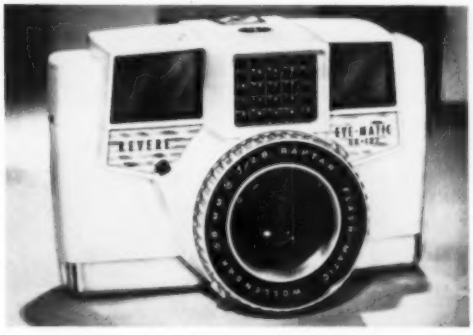
Simplification and combination keynote camera design at non-technical level.

The cameras on this page reflect in varying degrees the major premise underlying the design of cameras for the lay consumer: that people want cameras simplified to the point of being as nearly automatic as possible. To a lesser degree the Kodak Signet 80: it combines all the important features that various past Kodaks have had, including unified viewfinder, rangefinder, and exposure meter in its "control tower," and its simplified exposure dial reading in Light Value Scale (*f*-numbers are also present). The Bell & Howell and the Revere, however, go full tilt towards the automatic, with their self-regulating lens apertures. In the former, the iris, consisting of two thin edge-geared metal blades, is controlled directly by the voltmeter so that the lens opening always matches the light.

Bell & Howell Infallible Electric Eye eliminates exposure setting and focusing. Designed for 127 *film, it has a removable film holder for drop-in loading. Studs on side for attaching flashgun — accidental flashing of bulb cannot occur. Dimensions:* 3¾" *wide,* 2⅞" *deep,* 4⅝" *high.* 24 *oz.*

Kodak Signet 80 *with* 50*mm f*/2.8 *Kodak Ektanar rare-element lens. Has both Light Value Scale and f/ value. Built-in photo-electric exposure meter measures both incident and reflected light in LVS and shares "control tower" with viewfinder and rangefinder. Includes parallax correction. Styled in black and satin metal.*

*Revere Electric Eyematic EE-*127 *with* 58*mm Wollensak Raptar f*/2.8 *lens and Flash-Matic shutter. Has coupled rangefinder with two large windows at each side of built-in photo-electric cell. Uses* 127 *roll film format for low cost per load, convenience of short film-loads, superslides.*



Courtesy Popular Photography

THE FAMOUS SUPER GRAPHIC EMERGES SIMPLE, HANDSOME FROM A MAJOR REDESIGN

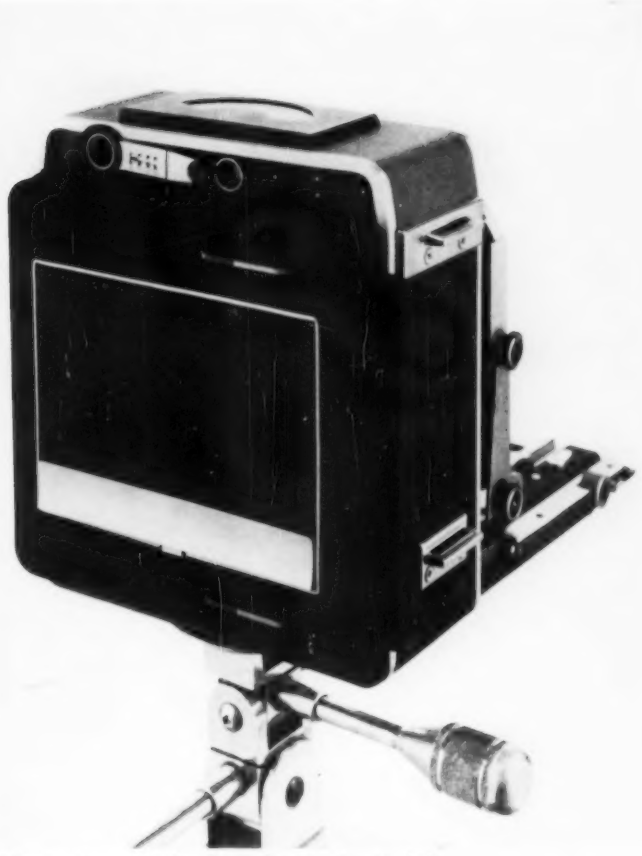
The design of the Super Graphic is an admirable demonstration of how a classic product can be improved and updated without becoming overdesigned in the process. The designers' concern was, while keeping the "Graphic look", to bring to the design of the instrument an awareness of new methods and materials and to incorporate them in a way that would best serve the needs of the professional photographer. The camera's impressiveness lies not in its appearance (although it is handsome) but in the simplification of its parts.

Based partly on Graflex, Inc.'s Speed and partly on the Crown Graphic, the new Super Graphic clears away the ungainly, studded protuberances which—with all their pivots, screws, trims, and projections—threatened in a short while to make the instrument resemble a mechanical porcupine. In its redesign by Peter Muller-Munk Associates, who contracted to do the basic body configuration and refinement of external detail, a major change occurred in the housing: the old mahogany was for the first time replaced by aluminum, thus eliminating moisture absorption and giving the camera greater shock resistance with minimal weight. The frame, which was extended to include the rangefinder and battery compartment to give it a cleaner look is made of aluminum bar stock extruded in a continuous strip, cut to proper length, and butt-welded. The extrusion provides edge beads for strength, and they act as anchoring bosses for attaching components and accessories. The front bed and the two-piece revolving back are magnesium die-castings, Dow-treated and primed with flat black. To avoid wearing and scoring in the revolving back, and because it is absolutely necessary to have complete intimacy of the two parts to assure a light-tight seal with the revolving member in any position, a black cycolac ring, square in cross-section, was fitted into a recess on the stationary element of the back. This ring, .09" high with .02" clearance between rotating parts, acts as a track upon which the revolving element is free to turn a full 360° and still give the film complete light protection. Cycolac was chosen because it would provide the resilience necessary to compensate for variations in thickness of the die-cast parts, and to preclude the necessity for lubrication.

Because of miniaturization of components and the use of printed electrical circuits, the top compartment, although measuring only $\frac{3}{4}$"x6$\frac{1}{4}$"x2$\frac{1}{2}$", contains two 22$\frac{1}{2}$-volt DC batteries, rangefinder mechanism, two 80-microfarrad capacitors, and the shutter release switch.

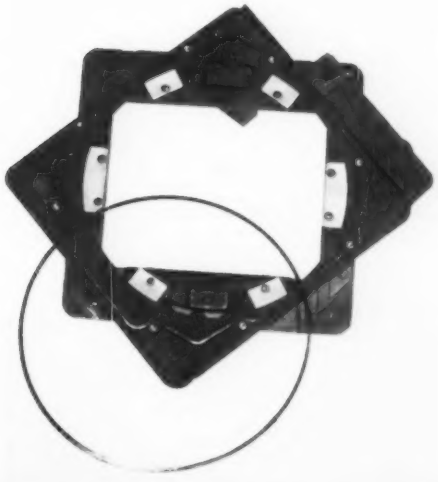
Low leakage (less than 10 microamps) capacitors are used because the electrical firing circuit is never turned off. The 3-plug cord is so designed that it will not pull out of its socket even when the flashgun is used off the camera. The wiring, now all internal, travels along the inside of the bellows.

The front lens standard swings and tilts, allowing compensation for architectural photography and other variable depth-of-field subjects. Springs and detents assure positive return of lens standard to primary position.



The new frame is aluminum bar stock extruded in a continuous strip, cut to length, formed to dimension, and butt-welded. Edge beads act as anchoring bosses for attaching components and accessories. Aluminum resists shock and weighs little.

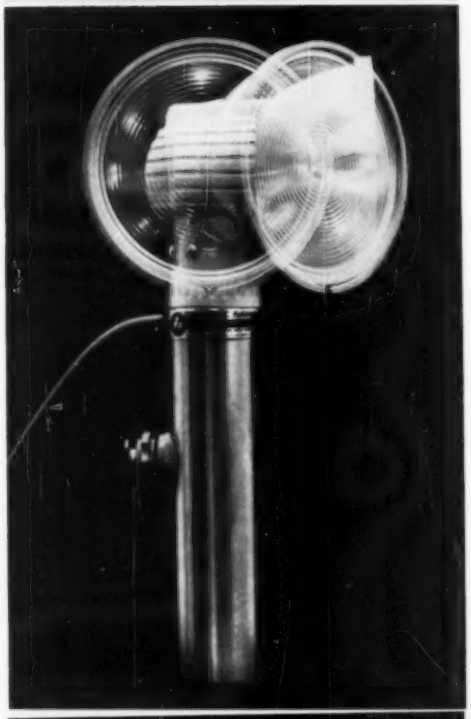
The two-piece, magnesium die-cast revolving back is Dow-treated and primed with flat black. To avoid scoring in the magnesium and to insure a light-tight seal, a cycolac ring acts as a track on which revolving element is free to turn 360°.

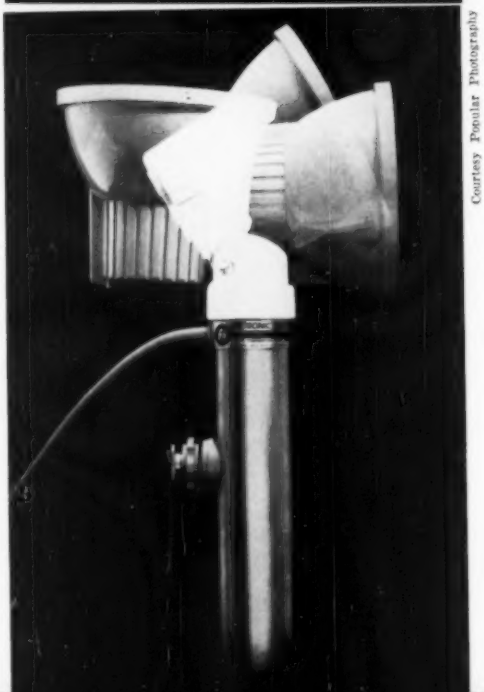


PHOTOGRAPHIC EQUIPMENT MAKES ADVANCES: FAMILIAR PRODUCTS CAN NOW DO MORE

The newness of the items on this spread lies not so much in what they are (they are chiefly advancements over preceding models or ideas) but rather in their special and different performances: each of them can do more than it could before. The familiar and classic Weston meter, a *de rigeur* piece of equipment for professionals and near-pros, has alertly incorporated the new Light Value Scale reading for cameras calibrated for LVS as more and more of them are. (LVS provides, with the reading of a single number, for an automatically adjusted coupling of shutter speed and lens opening.) The handsome FR Electronic Flash unit, at right, although it still requires a separate power pack (unlike the Heiland strobe unit—page 54), has a new swivel-head which swings around as well as up and down, thus making possible variations in the quality and direction of light which an immobile unit could not provide.

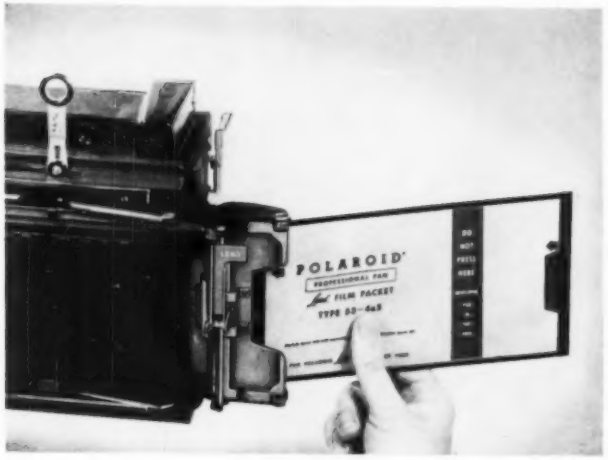
In another order of things, Polaroid continues to experiment, and its latest is a 4x5 film holder which adapts itself to the back of any press camera of those dimensions with the usual 60-second development, while Wittnauer, in its first attempt to enter the field of photographic equipment, has the home-movie viewer at heart with a two-in-one instrument: why bother with a camera and a projector when one machine can do the work of both?

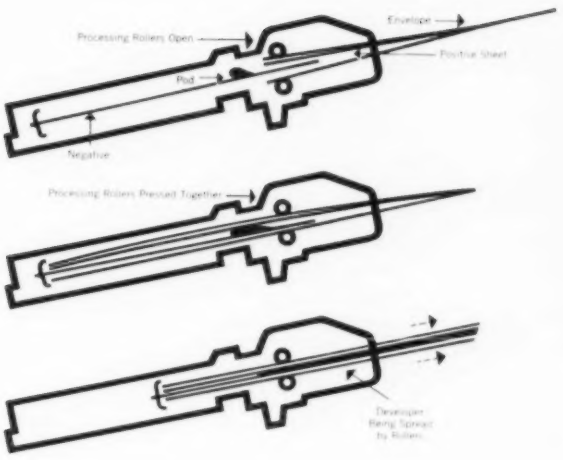




Courtesy Popular Photography

FR Corporation's 150 Electronic Flash. *This flash unit, molded of high-impact-resistant gray plastic, with a brushed stainless steel tube, has a swivel-head which provides for either bounce or spill light. Operated by four "D" size FR rechargeable batteries in its power pack, unit weighs a little under three pounds (most of it in the battery pack). Average recycling time is 15 seconds.*





Polaroid Land's 4x5 Film Holder *fits press and view cameras equipped with Graphic and Graflok backs. Holder is slipped into camera's back, Polaroid Land film packet is inserted into holder. Packet contains negative and positive sheet, and developing pod. Protective envelope is pulled back, exposure is made, and packet is removed from the holder. Picture is processed inside packet (usual 60 seconds).*

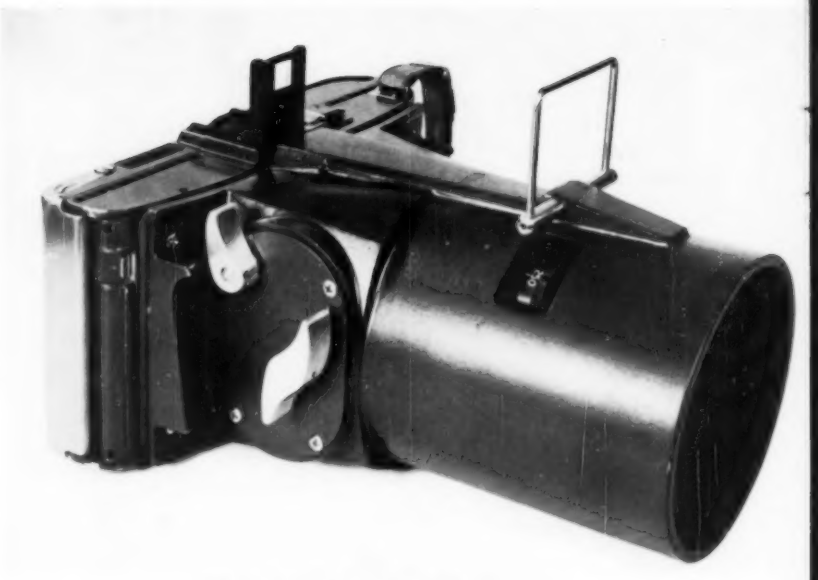
Wittnauer 8 mm Cine-Twin. *400-watt, camera-projector. 3 taking lenses (standard, wide-angle, telephoto), 1 projection lens and zoom finder. Reel-holding arms fold out from top, which is then placed on base containing motor, cooling system, controls. Front reel arm, when raised, opens passage for projection light.*

Weston Master III *(at right) and the DR (Direct Reading) light meters are classics in their field. The new Master III is calibrated for films with ratings up to 16,000 ASA; incorporates new Light Value Scale readings for the latest cameras on market calibrated for LVS.*

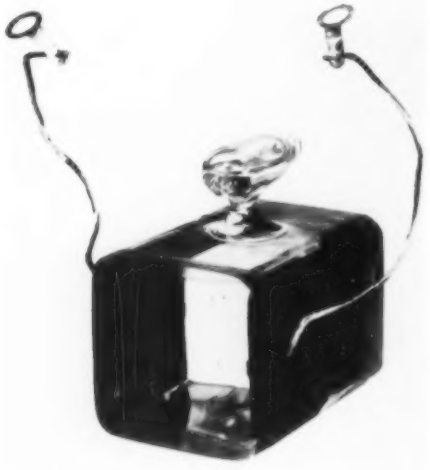
TECHNICAL NEEDS OF SCIENCE, INDUSTRY MAKE STRINGENT DEMANDS ON EQUIPMENT.

How can one photograph a missile traveling at transonic speed and still have the image knife-sharp? One answer is the new Kerr cell, designed for ultra-high-speed photography. An idea of its shutter speed: a car traveling at 60 mph covers a distance equal to a tenth the thickness of paint on its body in 1 microsecond; the Kerr cell shutter operates at 1/100 of a microsecond.

The Fairchild exposure meter, aside from being applicable to missiles where light can be measured only at the lens rather than at the source, is chiefly designed for motion analysis in industrial photography, where circumstances prevent the meter's getting close to the machine because of moving parts which get between the camera and the subject.



Mast Development Company's *10" spotting camera. Used for aerial reconnaissance and other telephoto applications, this hand-held camera has been designed to accept a Polaroid back for the new 4x5 film packet with 60-second development.*



Avco's Kerr Cell *is filled with nitrobenzene, has pair of flat electrodes with optically clear "windows" at both ends and Polaroid filters over both windows. This electro-optical shutter and pulse generator circuit (complete shutter package measures 12x12x5") achieves exposure time of a hundred-millionth of a second.*

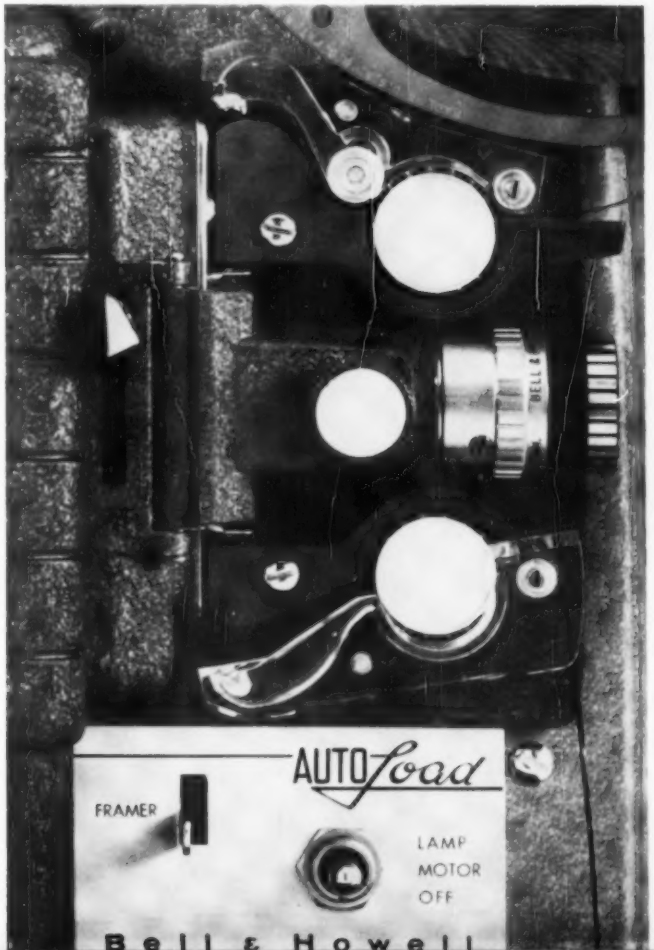
Fairchild exposure meter *is designed specifically for high speed motion analysis photography. The HS3201 measures not the source light but the light that enters the camera. Narrow acceptance angle of 2° gives accurate pinpoint readings and better average readings.*

CONVENIENCE IS THE STEP-MOTHER OF INVENTION IN CONSUMER CAMERA DESIGN

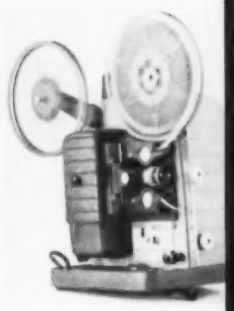
The great mass of still and movie camera users are as desirous of convenience as they are shy of complexity, and to them the end result (the photograph) is secondary to the ease of the means employed. The Kodak Starflash combines the camera with its own integral flash unit, making the snapping of a picture so easy that even a retarded child could compete with the avid amateur.

So too in film projection. The neat Bell & Howell package below makes it almost impossible to bore friends with the usual interminable preliminaries of threading and preparing a projector prior to showing the imperishable scenes ("Watch this now—Johnnie is going to fall") in the nursery.

Kodak Brownie Starflash, *the first American small combination flash and camera unit. Its simplicity and one-piece convenience lend themselves to even the most amateurish of amateurs. A neat package, and incredibily inexpensive.*



Bell & Howell's Auto Load projector *is the first self-threading 8 mm movie projector. Runs in reverse, stops on single image. Film cutter clips frayed ends. Easy-to-reach, quick-to-operate focus knob.*



**The Futuramic Strobonar—
Heiland's new one-piece
light-weight strobe unit**

Of the many advantages of "strobe" flash units, their semi-permanent power source is one of the greatest—it eliminates the nuisance of flash bulbs. In the past, however, this convenience has carried its own disadvantage — or rather the photographer has carried it: although freed from flash bulbs, he has had to carry with him a bulky hip-pack full of tube and batteries. To eliminate this encumbrance, engineers of the Heiland Division of Minneapolis Honeywell worked with Henry Dreyfuss to produce the strobe shown here—a highly portable single unit in which all the elements of the conventional strobe have been miniaturized.

The first and most spectacular reduction was effected by the transistor, whose boosting action makes it possible to use three small D cells (or AC house current) as the power source. This sharp diminution in the bulkiest element called for a corresponding miniaturization of the other components, which would have been a pointless refinement earlier. Heiland engineers turned their attention to the actual flash tube and reflector, and came up with a completely new shape which might best be described as one half of a doughnut mold (the reflector) with a thin doughnut (the tube) inside it; in effect compressing the same reflector area within a smaller volume. The strobe distributes light evenly within a 70° angle, sufficient for most wide-angle camera lenses.

In the case of the capacitor, the volume could not be reduced, since a capacitor of that size is needed to store enough electricity for the powerful charge the strobe requires. But the standard shape for such a capacitor is a tube—awkward in combination with the other new components. The designers worked with the manufacturer to produce a disc capacitor of the same volume as the old cylinder-shaped one, but much more closely related to the shape of the total unit.

Once the components were ready, the Dreyfuss office was faced with the problem of housing them as compactly as possible. While the shape of the parts naturally determined the shape of the whole, the components themselves had been designed with a vision, however tentative, of the final form. There seemed only one logical arrangement of the components: with the cells, as in a flashlight, forming the handle, and the other parts grouped in a row to form the head.

The housing for this arrangement had to fill a function in addition: it had to make the new strobe look as light as in fact it was. In part, this was accomplished by color; the plastic housing of the head section is pale gray, with the lens and reflector marked off in black. More signficant is the refinement of detail for the purposes of minimization: the stepped-down articulation of the front section, the slanted base, the scoring around the edge of the lens. The scorings, incidentally, serve another purpose: following the Fresnel principle of optics, they diffuse the light eliminating hot spots.

Heiland's Futuramic Strobonar *is a self-contained electronic flash unit, eliminating the separate power pack. Can be used attached to camera or held separately in the hand. Weighing 35 ounces and 11½ inches high, it operates on three size-D batteries or AC household current. Delivers a Kodachrome guide number of 35, or twice as much light as ordinary D-cell units. Produces even light distribution of 70°, which is sufficient for most wide-angle lenses. Has ready light, indicating when the unit is operating. Light output of the unit is approximately 750 E.C.P.S. nominal at 40 watts second stored energy, and its effective exposure time is 1/2000th of a second. Color temperature of the light is 5800° K. Re-cycle time is 8 to 12 seconds for photoflash batteries, 6 to 10 seconds for rechargeable batteries, and 5 to 8 seconds for AC current.*

2 *design societies use their annual meetings to discuss some of the larger aspects of a growing profession*

At meetings in New York and Silvermine IDI designers debate the international aspects of design and its political significance

A varied program, skipping in coverage from the design of the Brussels Fair to the design of military electronics equipment, was presented by the Industrial Designers Institute during its three-day national conference at the Park Sheraton Hotel in New York. "What's New" was the theme of the conference, and program planners tried to give delegates some of the answers on a wide range of problems that have affected, or will affect, designers' work. The program got underway on October 9 with a luncheon talk by inventor Eugene Ayres on "New Sources of Energy." That evening a panel of six reviewed the Brussels Fair.

On Friday morning George Beck led off a presentation of industrial design in military electronic equipment: Leonard W. Seagren described the problems of design in military electronic equipment and Robert Robb discussed "Product Development and Design Integration." In the afternoon Edgar Kaufmann, Jr. ably moderated a brisk discussion of "New Conflicts in U.S. Design." At the evening's banquet William Benton outlined his "Design for Survival." In charge of the entire conference program were John S. Griswold and Bronislav Zapolski.

IDI's officers this year will be the same as last year with the exception of Carl Bjorncrantz, who declined the position of vice president: Robert E. Redmann, chairman of the industrial design department at the University of Bridgeport, president; H. Creston Doner, design director at Libbey-Owens-Ford; secretary; Leon Gordon Miller, consultant designer, treasurer; George Beck, manager for industrial design in light military electronics equipment at General Electric, chairman of the board. IDI's new vice president will be John Griswold of Griswold, Heckel, and Keiser.

A design materials show, reflecting the latest advances in materials and techniques, was on display in the lobby of the Park Sheraton during the entire conference (see list of exhibitors, opposite page).

The national conference was followed on Saturday by the Southern New England Chapter's regional meeting at Silvermine, Connecticut (see page 58).

NATIONAL CONFERENCE

Speakers

Eugene Ayres, inventor and co-author of "Energy Sources —the Wealth of the World." William Benton, publisher of Encyclopaedia Britannica, *former Senator from Connecticut and former Assistant Secretary of State.*

Panelists

Brussels Worlds Fair: Jane Fiske McCullough, consulting editor of INDUSTRIAL DESIGN*; Ben Grauer, news commentator; Nathaniel Becker, of Becker and Becker Associates; André Willieme, Industrial Attache, Belgian Consulate General; James S. Plaut, U. S. Deputy Commissioner for the Fair (heard in a tape recorded message); Robert E. Redmann, president of IDI, moderator.*

Industrial Design In Military Electronic Equipment: George A. Beck, Manager-Industrial Design, Light Military Electronics Dept., General Electric; Leonard W. Seagren, Specialist - Industrial Design Planning and Development Liaison, L.M.E., General Electric; Robert C. Robb, Specialist-Industrial Design, L.M.E., General Electric.

New Conflicts in U. S. Design: Edgar Kaufmann, Jr., design critic; Melanie Kahane, interior designer; and George Beck, industrial designer, Light Military Electronics Department, G.E.

Exhibitors

Arvin Industries; Columbus Coated Fabrics; Croname; Eagle Ottawa Leather Co.; Hawley Products; Keeler Brass; Master Etching Corp.; Materials in Design Engineering; Park Nameplate; Poloron Products; The Polymer Corp.; Rigidized Metals Corp.; Textile Fibers Division, Union Carbide; U. S. Plywood; General Tire and Rubber Co.; Polyplastex United.

Design for Survival: Pointing out that American consumer goods are regarded overseas as standard-setters, William Benton said that this made industrial designers "not merely frontline soldiers, but generals in the design for survival. "Good design reaches whole foreign populations, and often becomes the image of their aspirations," he said.

"But while we of the West are preoccupied with the rumors of war, Mao and Khrushchev seem grimly determined to surpass us in the peaceful arts," continued Mr. Benton. "Last year the USSR had risen to sixth among the trading nations of the world. If Russia's fate were the only stake, the American people would applaud Russian gains, but the stake is not the USSR; it is the world." Estimating that it would take Russia only ten to twenty years to catch up with the U. S. in the production of consumer goods, Benton said that the role of the designer would become increasingly important.

"Industrial design as we know it in the United States has hardly been born in the Soviet Union. In the Soviet's European satellites the story is different — at least in Czechoslovakia. To many, the Czechoslovakian pavilion was a major triumph of the Brussels Worlds Fair. And Czech semi-handcrafts—textiles, pottery and glassware—might become part of a brilliant Communist goods offensive."

However, Mr. Benton went on to say that the U. S. has one great advantage over Russia. "The Communists can never create conditions which will equal ours in encouraging the good life of the arts and of creative designs. To the extent that a society encourages the daring, the creative resourcefulness and imagination of talented individuals, it is something other than communism".

New Conflicts in U.S. Design. Edgar Kaufmann led a free-wheeling discussion with Melanie Kahane and George Beck. Before the session was over, the group had delved into problems of planned obsolescence, lighted on the question of originality in U.S. design, and discussed design education.

Miss Kahane, in discussing her experiences with design groups in Denmark, remarked that planned obsolescence is an American idea. But Mr. Kaufmann went back into history to show that this idea could be traced to European fashion industries of the Baroque period. "However," he added, "we in our society have been able to turn this idea into something infinitely more effective than it ever had a chance of being in Europe." Analyzing the difficulties of an annual style change, George Beck remarked that it does not allow sufficient time for proper development of ideas so that "the result is far less than an ideal design." He added that he thought annual changes were intended more to stimulate the salesman—to give him a new talking point—than to please the consumer.

Going on to the question of design education, Mr. Beck criticized the kind of young designer who "carries a banner for certain ideals which are hard to bring into alliance with the practicalities of business." He then advocated what Mr. Kaufmann called a

Kahane, Kaufmann, and Beck

Redmann, McCullough, Grauer, Becker, and Willieme

Benton

"trade school" education, as opposed to broad scholastic background for the young designer. Mr. Kaufmann, who paralled the needs of the designer with those of the "universal man," favored a training which would not be limited to "technical proficiency."

The Brussels Fair: The problems of a world's fair as an exhibition of ideas, and the technical problems of organizing and presenting an exhibit on such a large scale got top priority in the roundtable discussion on the Brussels Fair. "In design this was a fair of refinement more than of exploration," said Jane McCullough.

Nathaniel Becker led the talk around to questions of organization. "The government should begin now to solve some of the problems it is going to have in telling the story of America to people in other lands," he said. "For instance, we found at Brussels that the designers wanted to build a monument within a monument [because of lack of communication between architects and designers]. You just can't do it," said Becker.

"The German pavilion," suggested Mrs. McCullough, "with its small, square glass boxes, offered an interesting design alternative to the difficulties of the round American building. Each box was just big enough for one designer to handle. This cellular concept is almost essential when you are dealing with anything as vast as the 300,000 square feet of the U.S. pavilion."

Ben Grauer reported that the world press gave top honors to the Czech pavilion, "which reflected a genuine sense of love and play and joy and warmth," he said. "It is clear," he added, "that the United States cannot any more enter the world arena with blandness, or a non-committal position."

THE SILVERMINE CONFERENCE

International aspects of design came up for thorough scrutiny when IDI's Southern New England Chapter launched its Silvermine Conference with a program based on the theme, "Design Universale." Some of the questions which conference speakers—with foreign designers predominating—raised and discussed were: 1) Does sameness of appearance increase or diminish potential for a product on the world market? 2) Is national origin of products becoming obscured? 3) Is there a problem of growing international conformity at certain levels of taste?

Alfred Auerbach, president of Alfred Auerbach Associates, advertising agency, was the kickoff speaker with "Public Taste and Its Impact on Design." Dean R. McKay, Director of Communications for IBM, described his company's approach to design—it must not only enhance IBM's products, but must pay off in dollars and cents. Architect Philip Johnson drew his audience into a free-for-all discussion by challenging them with the problems of designing within a standardized industrial system.

In the afternoon five speakers—introduced by John Vassos—described the state of design in their respective countries and the way in which American design is related to it. The five foreign speakers were Yosinori Sinoto, Japanese industrial designer; Hans Lindblom, Swedish architect; Jaap Penraat, Dutch designer; Krishna Doshi, Indiana architect; and John Bunyard, British interior designer.

Joseph M. Parriott, senior associate at Becker and Becker Associates, was chairman of the conference. Next year's conference, to be held the first week of October, will be under the direction of George Goshko.

Auerbach: "A knowledge of the level of public taste is of primary importance to the industrial designer. In actuality, though, there is no level of public taste; there are only peaks and valleys. Taste is good in some commodities — bathtubs, or disposal cans or shavers; and dubious in 'romantic' areas — wallpaper, furniture, and chinaware. Taste varies, too, by age group and by region. On the whole, although there have been improvements in the past 20 years, there is still much progress to be made. Lo, the poor designer, usually pinioned between a captious manufacturer and a public that demonstrates that a little bit of knowledge is often worse than none."

McKay: "Using design as mere wrapping paper to make the corporate image look better, probably doesn't work out . . . IBM means to use design as an integral part of our business.

"We think design is good business for us. So our design program is aimed at reinforcing our products and services. We believe the results we have achieved thus far can be measured in dollars.

"Ideally, we would like everything that people see of IBM — anywhere — to remind them that IBM is indeed an advanced and progressive company. And we think truly good appearance is a silent partner working 24 hours a day for us.

"In the last analysis it is not reasonable to expect a business man to judge design efforts except in financial returns, for that is his obligation to his company and his stockholders.

"Things are beginning to look better around IBM and we're enjoying it."

Mr. McKay demonstrated just how much better things are looking with a set of color slides of IBM's new Saarinen-designed center at Rochester, Minnesota.

Johnson: In an extemporaneous, no-holds-barred talk, architect Philip Johnson asked his audience, "How can you beat the system? How can you make basic innovations in architecture and industrial design when the components with which you work are all standardized, mass-produced items?" He cited the difficulties in obtaining a new glass for the walls of the Seagram building. The manufacturer explained that it would be too expensive for them to stop their production line for the one day it would take to fill this special order. Mr. Johnson reported more difficulties in having a clock face changed, and in obtaining a beveled light switch. Although thousands of each item were used in the Seagram building, the respective manufacturers still felt that the order was too small to make any change economical.

Thus, said Mr. Johnson, the designer or architect is faced with the problem of how to obtain distinctiveness, when all basic components are standardized. It is true, he said, that marketers demand frequent product changes to stimulate sales; but this is styling, not designing changes into the basic components used. "The only good auto designer in the country—the only one to beat the system"—according to Mr. Johnson, "is John Vassos. He took the fins off his Cadillac."

Foreign panelists

Sinoto, Japan: "Education in arts and crafts is an essential element in moulding the characters of growing people."

Penraat, Holland: "To be for or against industrial design is like being for or against eating. The concept of industrial design was born with industrialization and will exist as long as that will last."

Lindblom, Sweden: "If we can teach the people themselves to appreciate good design, we designers will be able to progress much faster than we do today."

Doshi, India: "With its 4 hundred million people living on a per capita income of $6 a month, India's design and architecture problems will require the greatest imagination, ingenuity and dedication on the part of all her creative workers."

Bunyard, England: "The evolution of design is an adjustment to environment and national tradition."

Sinoto

Doshi

Johnson

McKay

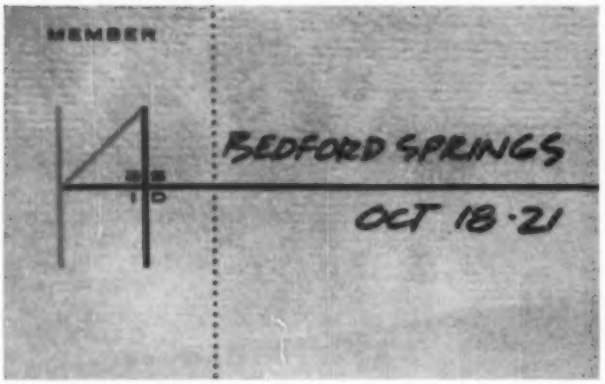
Auerbach

Penraat

Lindblom

Bunyard

2 *design societies use their annual meetings to discuss some of the larger aspects of a growing profession*



ASID members and guests explore the designer's professional responsibilities, his approach to creativity, his role in the marketplace

Last year the American Society of Industrial Designers devoted their annual meeting to the subject of "designing the next 100 years" (ID, January, '59). *This* year's meeting, as one speaker observed, betokened ASID's awareness that, since there were only 99 years left to go, there was no time to waste in getting started and, if no course was finally plotted, at least a number were seriously proposed last October at Bedford, Pennsylvania in a quaint, blue-law-abiding country hotel. The sober theme: "Design Responsibilities and Directions."

The program, tightly planned by Samuel Scherr, began with a stunning display of colored slides taken at the Brussels Fair by an Art Center School photographic team; commentary was provided by Art Center's Gordon Mackay. Other first-day events included outgoing President Bill Goldsmith's introduction of his successor, Don McFarland, and the other new officers: Richard Latham, executive vice-president; William C. Renwick, secretary; Kenneth Van Dyck, treasurer. The evening was given over to honoring Charles E. Whitney, publisher of Industrial Design, who discussed "The Designer as a Professional."

After a day of rest, members were judged ready to hear Chicago columnist Sidney J. Harris give the keynote address. Mr. Harris considered the designer as a member of civilization, and the message carried the strong implication that he didn't always act like one.

On the following day, several component aspects of the theme were examined. George Culler of the San Francisco Museum of Art suggested that the designer was responsible for encouraging a responsive and discriminating public, and that he could best do this by being true to his own artistic integrity. Saul Bass expanded the theme of creativity in the visual arts, and explained why it was incompatible with conformity. Architect Enrico Peressutti argued for a more "spiritual" approach to design, and showed color slides of Milan's Torre Vaslasca Tower, which he designed

From the philosophy of design to the business of design can be a staggering leap. But if any transition from blue sky to solid ground was needed, it was effected by Fred M. Hauserman, president of the E. F. Hauserman Co., who insisted that only by making the best product, and designing it to give as much service as possible, could a manufacturer survive. Following him, advertising executive Robert Allen told why he believes that the advertising agency and the design office house brothers under the skin, and marketing expert Victor Buell outlined a few things industrial designers should know about marketing.

That evening's victory went to Dr. M. F. Agha, who did a marvelous thing: plagued by equipment failure (a form of torture speakers had to contend with throughout the conference) that disrupted his slide-illustrated talk, he managed to keep a restless audience amused with impromptu commentary that was just as witty as the prepared talk itself.

On the final morning, psychologists Irving Taylor and Richard Wallen told what they knew about the creative processes, particularly as applied to visual arts. Dr. Taylor brought a wonderful machine called "Activision"—a projector that does everything MGM can do, including lose control of itself.

ASID's fourteenth annual design conference ended with a luncheon panel of designer's wives, each with her own idea of how and why to be one. This too was introduced by two psychologists: Dr. and Mrs. J. H. McPherson, who offered their findings on the care and feeding of creative people. The wives described their own techniques for handling the creative people *they* were responsible for, and suggested why they thought it was worth the trouble.

Speakers

Charles E. Whitney, publisher, Industrial Design
Sidney J. Harris, journalist and lecturer
George D. Culler, Associate Director, San Francisco Museum of Art
Saul Bass, designer
Enrico Peressutti, architect
Fred M. Hauserman, President, E. F. Hauserman Co.
Robert E. Allen, President, Fuller & Smith & Ross
Victor P. Buell, Marketing Division manager, The Hoover Co.
Dr. M. F. Agha, art director and designer
Dr. Richard W. Wallen, Director of Managerial Training, Personnel Research and Development Corp.
Dr. Irving A. Taylor, assistant Professor of Psychology, Pratt Institute
Dr. Joseph McPherson, psychologist, Dow Chemical Co.
Mrs. Joseph McPherson, psychologist

Speaking wives:

Mrs. Arthur BecVar, Mrs. Robert Hose, Mrs. Hugh Greenlee, Mrs. Jack Collins

Fred M. Hauserman

Kiyoshi Nagata
Tokyo Shibaura Electric Co.

Victor P. Buell

Enrico Peressutti

Charles E. Whitney

Robert E. Allen

Mr. Whitney

The industrial designer is responsible not only for expressing his talent, but for expressing it in a way that best serves both human and commercial needs. And he usually has to do this with a great many prosaic restrictions. He cannot wait for inspiration: he has to summon it. Charles Eames once described a particular design project as "a matter of doing the best we could between now and Tuesday." But the responsibility for getting something done does not relieve the designer of the responsibility for excellence. Eames followed his statement with a reminder that "the best you can do between now and Tuesday *is still a kind of best you can do.*" And that is an extremely perceptive statement of the professional attitude and the professional dilemma and the professional challenge.

Mr. Hauserman

Cynics advise us to forget about talking quality and to make our pitch on novelty—on superficial features which we can easily change in a short while, so that the old will be obsolete. They tell us that this is "selling the sizzle instead of the steak."

Don't misunderstand — I'm not knocking advertising or merchandising which bases its appeal on an understanding of human motives. That's good and it's necessary. I simply want to point out that if you are selling the sizzle you had better have a steak under it, or somebody will bite your hand.

The fact is you have to have the goods and be able to deliver them. There are plenty of examples of extravagant promises and appealing lures that have left potential customers high and dry—and of course have ruined the people who made the promises as well. For instance, is there anyone here who would like to get in on the ground floor of an automobile company that's going to build the most economical, the most attractive car on the market? Well, I suspect that there's probably still a little Tucker stock available!

Mr. Allen

It is axiomatic in our business that no amount of advertising, however skillful, will continue to sell a poor product. As the man responsible for the product itself, you designers grant or deny us the means to create resultful advertising. Agency executives are practically unanimous in their belief that the importance of the industrial designer will continue to increase. And it is very important that the agency participate fully in the early stages of your work with a client. The agency people can make valuable design suggestions based on their knowledge of the consumer. Working closely with the industrial designer is also a great help to the agency's planning. When a product design has been completed, it is of course quite common for the agency to interview the designer for information on product features, and most agency men are well aware that you are concerned with the function of the product, as well as with its surface appearance.

Mr. Buell

Industrial designers need to understand the nature of the U.S. marketing revolution and the business problems it has created. They should understand the problems that most companies are facing in the transition from a production-oriented business to a consumer-oriented business. The consumer is king. No longer may the production department dominate design if a company's products are to compete for the many other ways in which the American consumer can spend his money today.

Richard Wallen

Saul Bass

George Culler

M. F. Agha

Irving Taylor

Sidney J. Harris

London-born, Chicago-educated Sidney J. Harris is on the staff of the Chicago Daily News, *one of many papers that carry his column "Strictly Personal." Mr. Harris, according to a publicity release, "is noted for his use of the shock method of intellectual stimulation." Thus he was implicitly billed as the* enfant terrible *of the conference, and was in fact introduced by Dave Chapman with the words, "sometimes he's a precocious brat." Everyone sat back, as one member put it, "to catch hell." A generous sampling of what they caught appears below.*

Everyone knows what the profession of law is for, and the profession of medicine, and the profession of the ministry. But the profession of design is still wrapped in layers of argument and conflict, uncertainty and vexation.

After all, the word "profession" has a distinct meaning, quite different from that of trade, or occupation, or business. To profess means to take a vow. It means to swear solemnly, in the case of medicine, that the welfare of the patient shall come first.

It means, in the case of law, to swear that the legal forms of the community shall be followed and upheld. It means, in religion, that the clergyman owes his basic allegiance to God and his church, and not to some principle of self-service.

I am not making the naive assumption that all — or even most—doctors and lawyers and clergymen actually *keep* their professional vows. There are, alas, too many who are actually businessmen in disguise. Now there is nothing at all wrong or immoral about being a businessman (although I personally happen to think that it is a trivial and tedious way to waste one's life), but there is something wrong in pretending to be what you are not.

The doctor who deludes his patient, or the lawyer who subverts justice, knows perfectly well what he is doing; he is breaking his vows. He is not frustrated, whatever else he may be, for the line of behavior is clearly marked by the rules of his profession, and he knows perfectly well when he crosses to the wrong side of the line.

But the designer—at least as far as I can tell from my limited observation of him — *is* frustrated, even though he may have a finer professional organization and a higher code of ethics than other professionals.

And he is frustrated because the nature of his profession, unlike law and medicine and sometimes theology, forces him to *think* about himself. And thinking can be quite uncomfortable, especially when you do not have a firm philosophical framework in which to do your thinking.

The other professions don't have to think very much because they already have a stable, permanent and traditional *object* for their profession. The doctor has health, the lawyer has justice, the clergyman has piety. However they may interpret, or misinterpret, these ideals, they at least have some shining abstraction before them. This is what they *supposedly* are practising their profession *for*.

But what is the designer practising for? Here we immediately become lost in a sea of semantics, and of intensely personal reactions ranging all the way from the first book by John Ruskin to the last catalog by Sears Roebuck.

Should his chief goal be beauty? Should it be utility? Should it be a blending of the two? And, if necessary, which should be sacrificed for the other?

Should his chief goal be making the product, or selling the product? Can we call a product "good" that will not sell? Conversely, does the saleability of a product make it, *per se*, a good one?

To whom does he owe his allegiance? Is it to some abstract canon of "good taste"? Is it to the firm that hires him, no matter how senseless or squalid its aims may be? Is it to that vague anonymity known as "the public"? And, to cut it even finer, if it is to the public, is it to that cultivated portion of the public who will appreciate his better efforts, or is it to the uninstructed, the unlettered, and what used to be called the unwashed—although nowadays, thanks to the seductive powers of packaging design, they wash more often than their betters used to, and indeed more often than they need to.

As you all well know, the spectrum of answers to these thorny questions runs all the way through the colors of the rainbow. And I do not envy those who propound these questions to themselves, for they are truly in a cleft stick. The dilemma of their professional existence is not an easy one to solve, but it is certainly worth exploring.

It seems to me a very real danger that design may become a subordinate branch of ad-

John Balazs
(Kent State U.)

Donald McFarland

Bill Goldsmith

Sam Scherr and ASID's Executive Secretary Ramah Larisch take satisfaction in a well-run meeting.

vertising and public relations. I think this would be a disaster of the first magnitude—not because advertising and public relations are in themselves vicious occupations, but because, in any truly rational society, the intrinsic virtue of a thing must take precedence over its mere marketability.

You may remember that in his very first analect, Confucius told his readers that "the superior man knows what is good; the inferior man knows what will sell." This does not mean that selling is not important, but that it must remain a means and not an end. When we begin converting a means into an end, then we have begun to pervert the idea of a rational and decent society.

The creative man—which the designer essentially is — must be concerned with *ends;* and, as such, whatever his personal defects must be, he is superior to the man who is concerned only with means, just as the architect is superior to the builder or the contractor.

Again to draw an analogy with other professions, in the field of medicine there is a tremendous and constant pressure upon the doctors by the drug manufacturers. These manufacturers send millions of dollars of free samples to physicians, to try to induce them to pass these pills and tablets along to their patients.

We would think little of a doctor who acted as a mere transmission belt for the drug companies. Indeed, it is his task to resist the public demand for new drugs until they have been adequately tested and their claims have been certified as valid. A conscientious doctor does not work for the welfare of the drug companies, and would be horrified at the thought. Neither does he give the public what it wants.

Most of the public wants antibiotics at the slightest sign of a sniffle. But a good doctor knows that, in many cases, antibiotics are useless or actually contraindicated. He gives the patient what he, as a professional man, knows is good, not what the patient happens to be sold on because the publicity of the drug companies is so beguiling.

Of course, I recognize that decisions in the field of industrial design cannot be nearly so clear-cut. But I do suggest that unless the profession as a whole can understand and accept what its *primary* role ought to be, then it will lose its independent identity and become simply another cog in the industrial machine.

Bass on brain-storming

"It seems to me that it can be useful only in giving birth to gadgets, or their visual or verbal equivalents. Gimmicks, gadgets and twists are of course invaluable but they are also superficial. At a time when the superficial has manifest value, it is not surprising that a systematic approach should arrive for its perpetuation. By implication, brainstorming obscures and confuses the real problem, which is that creativity (like freedom) is indivisible."

Culler on interaction

"The designer's responsibility is to participate with his fellow man in an esthetic process which is active both for the maker of the designed object and for the person who selects, apprehends and uses it, and it is vital that designers approach their work creatively."

Taylor on creative training

"Research indicates that individuals can be trained to be creative. The three major training areas are *plastic* perception, the ability to see the same thing in many ways; *emphatic communication*, the ability to transform a symbol from one media to another and still retain its essential form; and *psychological understanding*, which is more than intellectual, and must be understood and experienced as an emotion, a point of view, a deep-seated attitude, a way of life. The great creative men have given ample evidence of their intimate psychological understanding of the very processes which allow them to be creative."

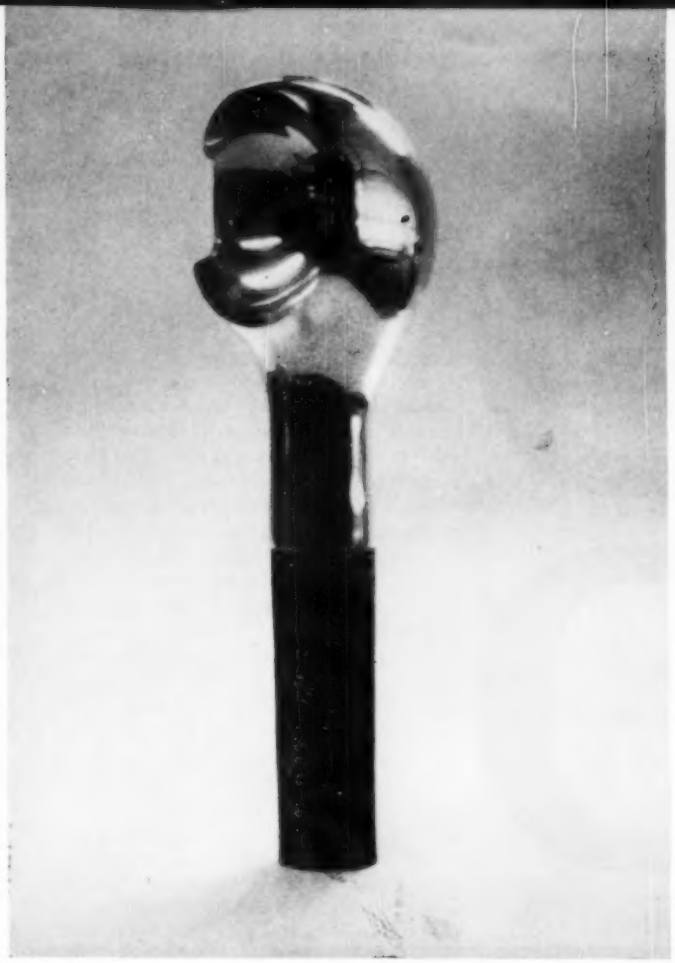
Wallen on creative people

"Creative people are not neurotic, but apparently it does help if they are somewhat asocial and maybe a little egocentric."

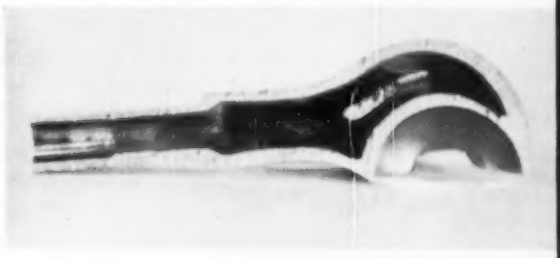
REdesign

Non-stick scoop resists cold

The answer to a soda jerk's dream, a "non-stick" ice cream scoop filled with cold-resisting fluid has been put on the market by the Modern Machine and Tool Company of Staatsburg, New York. Robert Fried, president of the young (eight-year-old) company—which specializes in research, development and manufacture of equipment for the food and dairy industry — bought the patent from physicist R. E. Clayton three years ago, and it has since become Modern's top seller. Clayton based his invention on a glycerine-like, non-toxic chemical which *retains* its normal temperature when in contact with a colder element. When the liquid is sealed within the head of the double-walled aluminum scoop, the scoop remains warmer than the surrounding ice cream. With this slight heat and a carefully tapered (but not sharp) cutting edge, the scoop skims right through the most hard-frozen ice cream. The notches on each side of the head help trim off the excess ice cream, and the scoop releases perfectly round, uniform portions whenever ice cream touches the side of a cone or dish (always cooler, hence more sticky, than the head of the scoop). Clayton thus eliminated the need for the usual mechanical release, and with it the need for any springs or other moving parts. At the same time, he created a scoop that is easier to keep clean and takes less time to operate. Restaurant owners and soda fountain proprieters obtain accurate portion control (within five per cent, as opposed to the usual 20 or 30 per cent) because of the scoop's perfectly trimmed non-stick portions. The result of physicist Clayton's brainstorn is an unusually handsome, as well as practical, product. The sculptured head is a highly polished, hardened aluminum alloy casting, while the dark contrasting handle is made of non-breakable Kralastic, a resin-rubber compound produced by the U. S. Rubber Company. The scoop comes in several sizes, each with a different colored handle. All sizes $6.95.



The raised aluminum bar within the head of Modern's ice cream scoop allows for a flow of the heat-retaining chemical with which the scoop is filled. The motion of the liquid helps in the absorption of cold at a rapid rate and keeps the head of the scoop warmer than the ice cream which surrounds it. Thus, the scoop can be used as many as fifteen times running, before a dip into warm water is necessary to send its temperature to normal.



Photos: J. S. Ward

D

Design Details

There are two ways of looking at a musical comedy. Some enjoy the *spectacle*—they take in the mass of sweeping lights, the pageantry of a precisely trained chorus, the waves of music coming from more trumpets than even Berlioz would have known what to do with. They delight in total effect. Others—the cognoscenti—take in the whole picture, but are likely, out of a stageful of talented girls, to single out the special, well-constructed, third-from-the-left. Their concern is with the contributing detail. Because designers *must* care about detail, we have instituted a new department devoted to it. After first looking at the total design, it will attempt to view at closer range how specific problems were solved. In examining the most concrete aspect of design we may often find that good detailing at its subtlest may be only a discreet change in materials that results in increased production efficiency, or greater satisfaction in use. Although details may be isolated for examination, however, they do not really exist in isolation: an inspired bit of detailing at one point may lead to another inspired detail (often created by another person) somewhere else. In other words, although details are parts of a whole, their effect is cumulative. Point for point, detailing is really what *allows* products to be shaped. This new department calls to your attention some current examples of that special third-from-the-left.

A PLASTIC "CURTAIN WALL" PROVIDES AN OPEN FACADE

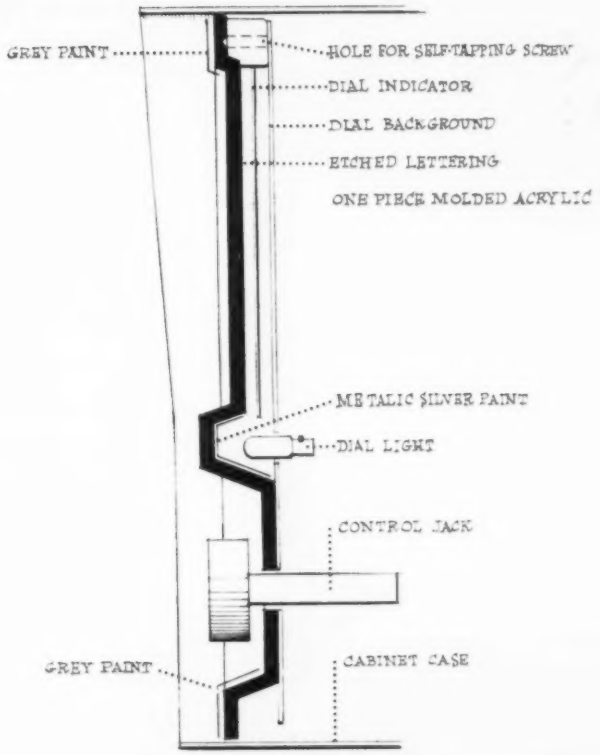
The practice of design might be described with some accuracy as solving problems through a series of limitations. This need not be bad. Restrictive production costs, can be the stimulus for more creative solutions than might otherwise be achieved.

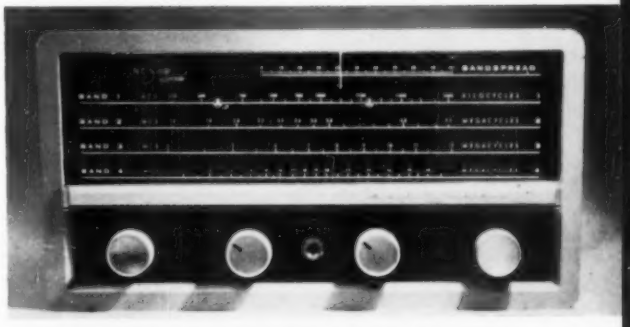
When the National Company, a manufacturer of professional and "ham" radio equipment decided to compete more vigorously in the consumer shortwave field, its engineering and sales departments shaped the fairly strict requirements of a low-cost competitive receiver. The design staff, headed by John Walsh, made suggestions preliminary to work done with consultant designer Peter Quay Yang.

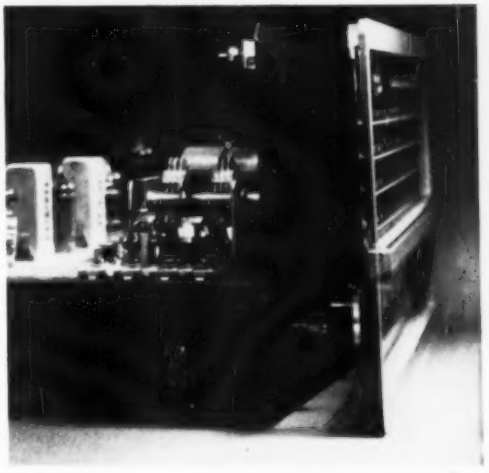
The cabinet design ideas finally chosen indicated a more open, easily controlled, lighted dial facade. However the accepted method of die-stamping metal and inserting plastic into it (with all the necessary assembly steps) was costly, and it didn't provide the desired openness. From this limiting circumstance came the idea of a single unit, almost a "curtain wall" construction of plastic. From Yang's preliminary sketches came the final detail section.

After conferring with plastics subcontractors, the designers decided on a clear acrylic, injection molded. This meant that all holes for control jacks and for mounting the panel could be molded in. At the same time the impression for dial numbers, calibrations, and company name and logo were molded. Upon leaving the mold, the panel was masked and sprayed a semi-gloss gray around the front border. The illuminating bulb was hidden behind the central dividing bar. This bar—the only highly polished section of the die—was rear-sprayed with a metallic silver paint, as a reflective contrast to the subtler front paint. Names and numbers became legible when paint was wiped into their molded impressions. Flat areas at both top and bottom were left clear to create a "see-through" impression.

Manufacturer: *National Company, Inc. Malden, Mass.*
Supplier: *Rohm and Haas Philadelphia*
Fabricator: *Vogel Manufacturing Co. Bridgeport, Conn.*







Front view, with control jacks inserted for photograph, shows legibility of lettering and calibrations. Trim paint applied to front side serves as contrast and hides rear connection for self-tapping screw as seen in side view, right. Control jacks secure panel at bottom.

NEW MOLDING PROCESS PERMITS THREE-DIMENSIONAL GRILLE

Necessity is the mother of everyone-knows-what; and invention is often, in its turn, the mother of respectable detailing. While inventions have come fast and frequently in the field of sound reproduction, it is probably fair to say that more creative energy has been directed to the technology behind the systems than to the face in front of them. Hi-fidelity equipment is a good case in point. While speaker systems have improved phenomenally, speaker grilles have not changed much. Still taking their form, logically enough, from the early days of radio, they are simply apertures covered with cloth.

This has never been a completely satisfactory solution. For however attractively fabric may be woven, if it is woven too tight it impedes the flow of sound waves through its pores. If, on the other hand, it is loosely constructed, it is likely to be ineffectual as a visual barrier, and the speakers are exposed in an unsightly way. Existing cloth closures reveal not only mechanical disadvantages but an aesthetic one: the invariability of flat cloth masks.

An intriguing invention in this specialized area has just appeared in a product made by a company new to the production of high-fidelity enclosures. Rek-O-Kut is a firm whose reputation is based on the manufacture of turntables and tone arms. Before deciding to enter the console field, they had their consultant designers, George Nelson and Company, make a survey of the field, and one of the Nelson recommendations was that the speaker area might be treated three-dimensionally. Since the Union Carbide & Carbon Corp. had successfully molded men's hats (which are three-dimensional everywhere but in New York's Greenwich Village) of Dynel, a modified acrylic fabric, this looked like a lead. Project designer Ronald Beckman worked with U. C.'s sales engineers Bob Simmons and Tom Mulligan to extend the application. Since the fabric had been compression-molded with two molds, it seemed likely that—if the fabric were somehow made non-porous—the simpler method of vacuum forming could be used. And the low cost of wood vacuum dies would allow easy pattern changes.

Preliminary work with molds led to the simple arrangement of placing an acetate sheet over the fabric to create an air seal, while both acetate and fabric are molded. From this it was an easy extension to roll the fabric and acetate together for simultaneous placement over the mold. The operator pulls the two flats into position, and heat of 260° to 275° is applied to soften the Dynel before the vacuum is applied. As the material cools, it is cut, removed from the mold, and separated from the acetate, which is then discarded. The whole operation takes less than a minute. The Dynel grilles, having their edges already formed, are snapped over the aperture and secured by continuous rubber tubing which forces their periphery into a dove-tail channel. Installation is inexpensive in time and labor.

And the conflict between the demands of appearance and those of sound transmission is resolved in the process. F. Schumacher and Co. has designed for this project a heavy fabric which is close-pored, before molding, and therefore unsuitable as speaker cloth. But as it is molded it is stretched in a way that creates larger openings in those areas which normally appear in partial shadow and at an angle to the eye. The result is a grille that permits the sound to come through fully, but does not allow an aesthetically frustrating peek at the speaker.

Manufacturer: *Rek-O-Kut Co., Long Island City, N.Y.*
Material Supplier: *Union Carbide & Carbon Corp.*
Textile Manufacturer: *F. Schumacher & Co., N.Y., N.Y.*
Fabricator: *Deitz Plastics, Hawthorne, N.J.*

ACCE$$ TO RECORD $TORAGE

BODY $HOCK ABSORBER

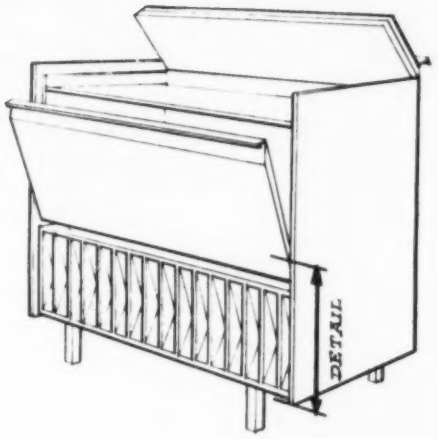
CONTINUOU$ RUBBER TUBING

DYNEL GRILL CLOTH

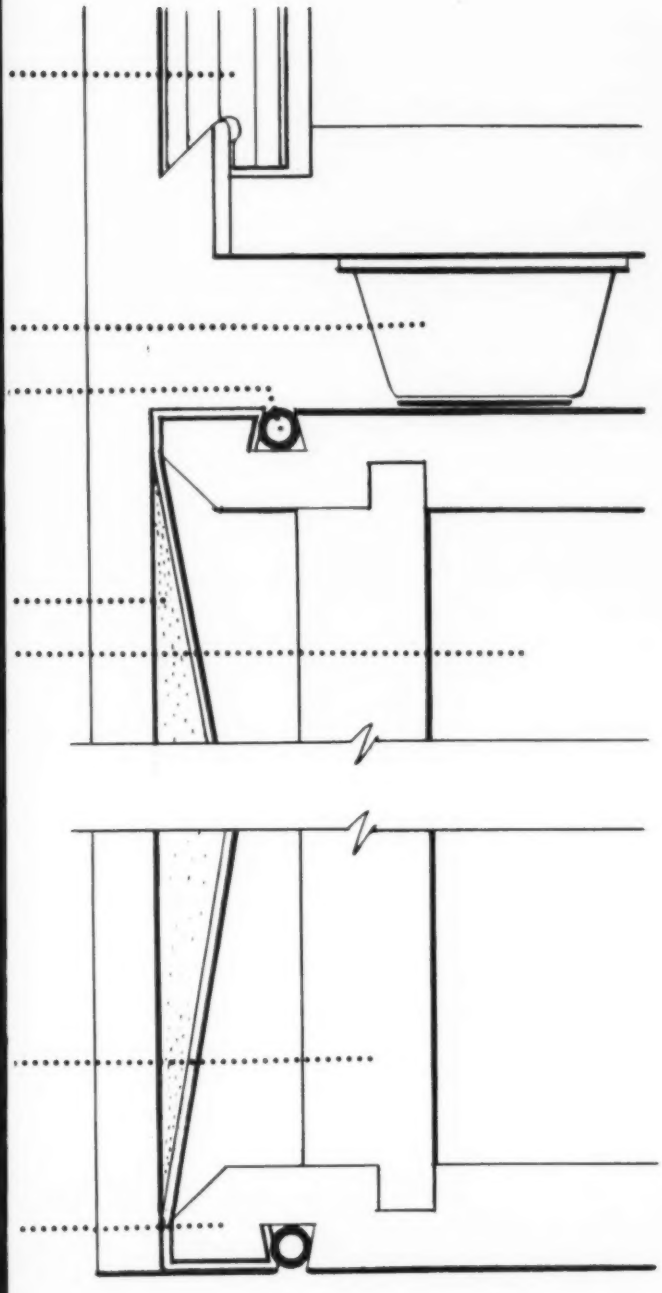
$PEAKER ENCLO$URE

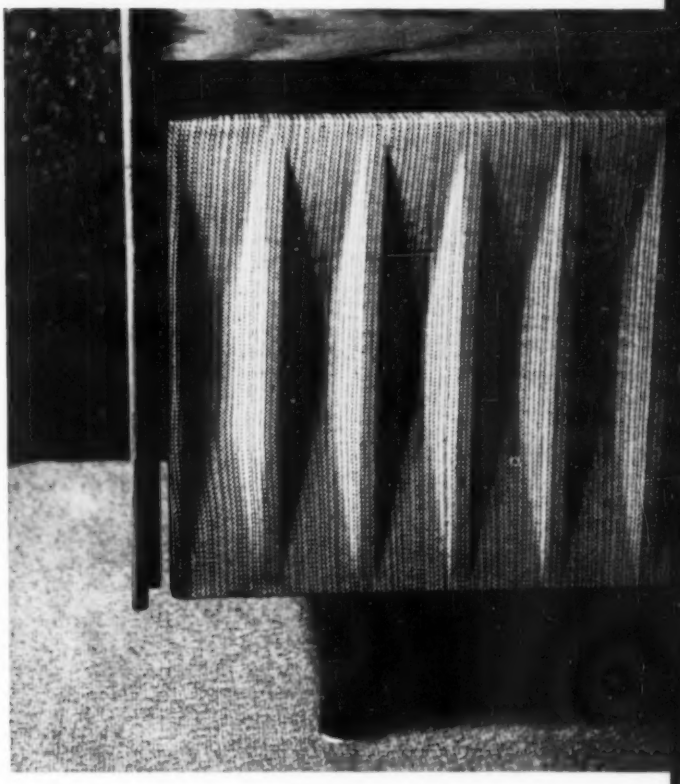
$PEAKER PANEL

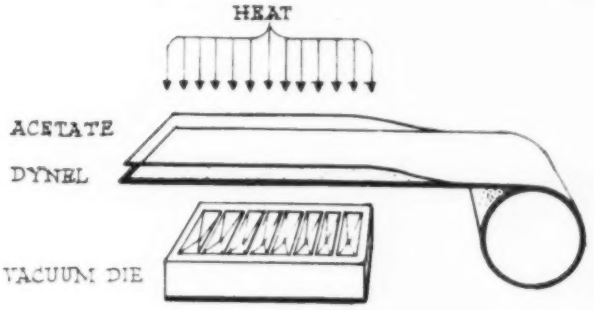
BOTTOM FRAME



Three-quarter view of console shows detail area of enlarged section below, left, and also displays fold-back top and record storage compartment.







The simplified diagram above illustrates the molding procedure. Dynel and acetate are rolled in layers for quick positioning over the vacuum mold. As heat is introduced and the vacuum is applied, both fabric and acetate are molded. Upon cooling, units are cut and separated, leaving the grille ready to be installed in the set.

Courtesy Liberty Music Shops

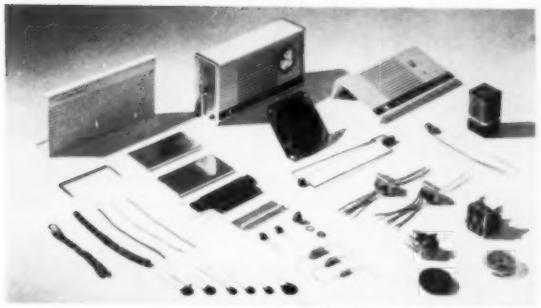
↑ **Sony** (Tokyo) TR610. Removable handle is used as leg or hanger. Weight: 9.2 oz. $39.95.

Radios

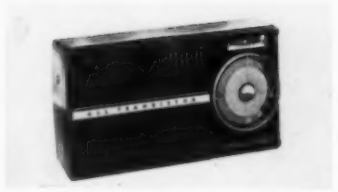
Once a large, dominant console that younger members of its audience believed capable of harboring the Lone Ranger and Tom Mix, radio is now a kind of shadowy background presence, performing a function to which no one gives full attention, except during an emergency like a newspaper strike. Its status as a minor entertainment has affected its design; at best, the result is a modest lack of ostentation; at worst, the result is the meretricious appeal of gadgets that have to fight a losing battle for serious treatment. A further consequence of the radio's loss of self-confidence is the lack of company identification: as with cars, it is no longer possible to trace family resemblances at a glance. All in all, radios are, perhaps, at that time of life when, past the freshness and invention of youth, they have not yet arrived at the stability and poise of objects that know why they are and what they are for. These ten pages offer a fairly broad sampling of the existing situation in radio design.—*U. McH.*

Miniature "personal" portables

Despite the widespread use of transistors (of the portables shown on these four pages, only the two lowest-price RCA Victor models operate on tubes), there is still a great range in the size of portable radios: from the 4⅛" Sony shown at left to the substantial dimensions (8" x 14⅛" x 5⅜") of the RCA Victor short-wave radio shown overleaf. The range is largely the result of variation in the speaker size. Although, as a general rule, clarity of reproduction diminishes with the size of the speaker, almost every manufacturer now produces a line of pocket-size ("personal") radios. Since, in their effort to be match-box sized, they are all basically match-box shaped, design differences are largely a question of surface organization — problems the more subtler for their small size.



↑ **Allied Knight** 83Y771. Edward Klein, designer. Do-it-yourself pocket radio kit. $25.95.

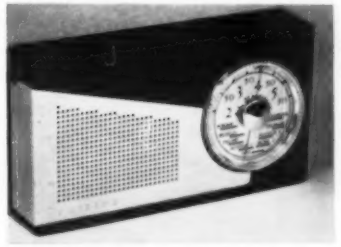


← **GE** P745. "Push-point" tuning for pre-setting stations. Dimensions: 6⅝" x 3-9/16" x 1-11/16". $39.95.

↓ **Maco** (Osaka) T-16. Calibrated volume dial; two earphone terminals; terminal for speaker $49.95.

↓ **GE** P785. Slide-rule tuning. Dimensions: 6" x 3⅜" x 1¾". $49.95.

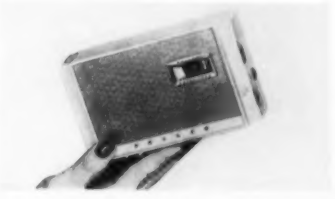
↑ **Roland** TW6. Monte Levin, designer. Two speakers, seven transistors. $49.95.



↑ **Philips** (Norelco) L1X75T. Seven transistors, black and white plastic. $59.95.

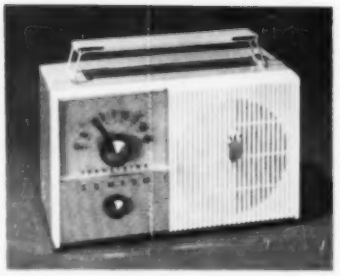
→ **Philco T-5.** Five transistors; ivory and black, pink and black, $39.95. 3½" x 6" x 1½".

↑ **Philco** T-3. Three transistors; ivory and black, gold trim. $19.95. 3¾" x 2⅝" x 1¼".



Larger portables

Even with their transistors, most of these portables are at least as large as the AM table radios on pages 74 and 75. But the larger speakers that seem the logical cause of the larger portables are probably not the whole story. (The Maco at the right, however, finds room for a short-wave band in less than 6½ inches.) To some extent, there is a portable convention: the map, a remnant from the old ham sets, or the luggage-like leather cases. But since, in ordinary use, the portable will move only from one table to another, a number of sets are designed to *look* like table models: the Zenith, the Philco T-4, the GE P770.



↑ **Zenith** 900. Reinecke and Associates, designers. Polystyrene cabinet, gold anodized dial. $69.95.

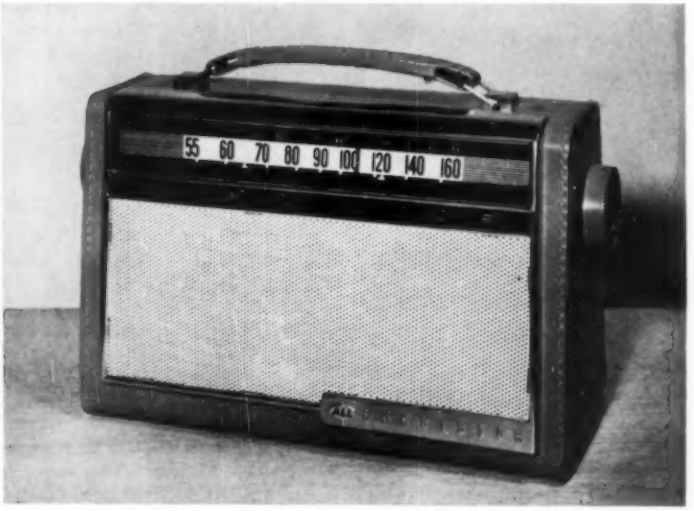
↑ **Maco** (Osaka) AB-175. Telescoping antenna for short-wave reception. Dimensions: 6-7/16"x3-13/16" x1-11/16". $79.95.

↑ **RCA Victor** 1MBT6. ("Strato-World III"). Short-wave band, earphone, phonograph jacks. Simulated black leather case. $195.

↑ **Philco** T-4. Four transistors, ivory and black or turquoise and black. Dimensions: 3¾" x 6" x 1½". $29.95.

↑ **RCA Victor** 1BX7. ("Cruiser"). Antenna in handle; battery powered. Beige with red or aqua. $39.95.

↓ **RCA Victor** 1BT5. ("Globe Trotter"). Simulated brown leather case with side opening for battery loading. Seven transistors. $69.95.



↓ **RCA Victor** 1BX5. ("Shipmate"). Calibrated volume dial; battery powered. Folding handle. White with brown or aqua. $29.95.

↓ **Philco** 681. Transistorized; antenna combined with handle. Speedometer tuning dial.

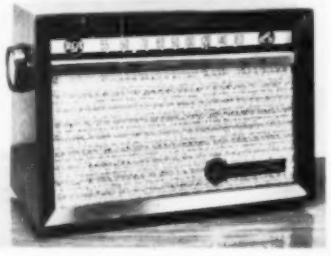
↓ **GE** P770. Retractable handle; plastic case in two-tone green or white and brown. $49.95.

AM table models

The AMs are the least versatile—and the least expensive—branch of the radio family. Even they, however, must these days be capable of mobility: almost all of them have finished backs, many have concealed handgrips. In some cases, the distinction between portable and table model seems purely arbitrary; the GE P671, for example, plays on batteries or house current, and the RCA Victor Starliner is transistorized. Incidentally, these are the only two AM models with horizontal pulley dials—a detail that, like the Starliner's cloth grille, adds to a radio's expense. (Not so incidentally, the Starliner is, in appearance, the most conservative radio on these two pages, although, with its transistors, it is, technically, the most advanced.)

The radios shown here, like nearly all AM radios, are almost wholly of plastic. The resulting design freedom has some pleasant consequences: the handsome louvered grilles, for example. Less attractive results are style mannerisms like some of the surface ornament or the indented waist.

↑ **Westinghouse** 681T5. Bronislaw Zapolski, designer. Molded-in carrying handle; 4" overall depth. White with coral, aqua, charcoal. Five tubes. $23.95.



↑ **RCA Victor** 9TX2; "Starliner." Transistorized; 4" x 6" speaker. Concealed hand-grip. Cabinet finished in mahogany, walnut, oak or birch. $69.95.

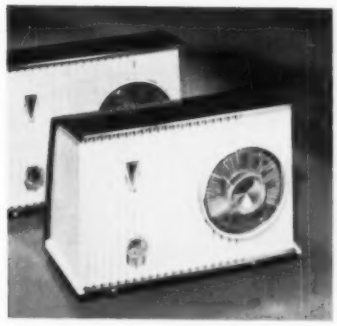
→ **Zenith** B615F; "Cotillion." Mel Boldt and Associates, designers. Molded plastic cabinet, finished back, 6" x 9" speaker. $39.95.

↑ **Zenith** B509C, "Ascot." Mel Boldt and Associates, designers. Full face lattice grille. $39.95.

↓ **GE** T125. Four tubes; 4" speaker. Pink, beige, or white. $19.99.

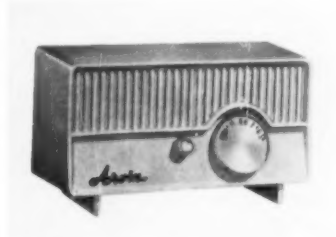
↓ **GE** T130. Venier tuning; white with gray, pink, or blue. $29.95.

↑ **Sylvania** 1206. Greenlee-Hess designers. White with blue or brown; phonograph jack. $27.95.



↑ **Philco** 824. Slanted back, color break to minimize depth. Vertically louvered grille. $24.95.

↑ **GE** P671. Retractable top handle; storage compartment for cord; batteries or house current. $29.95.

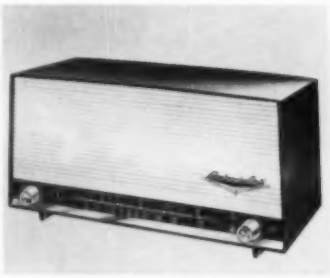


↑ **Arvin** 2572. Five tubes; automatic volume control. Green or ivory. $21.95.

FM table models

The FM radios shown on these two pages represent little design news: with their wooden cases, cloth grilles, and solid shapes they are vaguely reminiscent of all the radios we've ever listened to or looked at. Not that this need be disagreeable: many of their forms are pleasant and natural in their restraint, and the Philco and RCA Victor attempt a bold integration of a large circle dial into the pattern of the whole.

In many cases the FM radio is equipped with a phonograph jack, and often possesses two speakers as proof that it takes its sound seriously. (The twin speakers are not always articulated; they are here apparent only in the RCA Victor.)

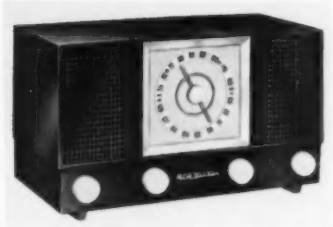


↑ **Packard-Bell** 7R-2. Louvered plastic grille; automatic frequency control. Ebony $49.95, Colored $51.95.

↑ **Magnavox** FM 17. Speaker 4" x 8"; plastic grille; mahogany-finished cabinet. $79.50.

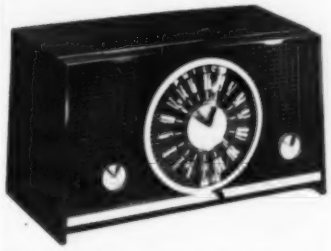
↓ **Westinghouse** 649T7. John Genn, staff designer; Bronislaw Zapolski, consultant. Speaker 10" x 2⅝". White with ivory or charcoal. $69.95.

↑ **Arvin** 3586. James F. Mariol, designer. Vinyl-laminated steel cabinet; cloth grille; 10 tubes, 2 speakers; phonograph jack. $100.



↑ **RCA Victor** 6XF9 ("Lindsay"). Dial separates two speakers; black cabinet, white knobs. $69.95.

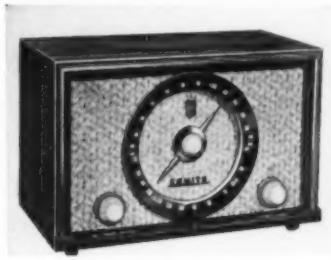
↑ **Telefunken** "Gavotte." Three speakers; short-wave band; jacks for phonograph, tape recorder, external speaker, antennas. Walnut cabinet. $159.95.



↑ **Philco** 974. Plastic cabinet and grille; circular tuning dial. $69.95.

↑ **GE** 210. Brown and beige plastic cabinet, cloth grille. Jacks for tape recorder, phonograph. Two speakers. $79.95.

↑ **GE** T135. White polystyrene cabinet, grille. Phonograph jack; 6½" speaker. $59.95.



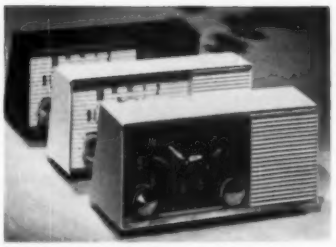
↑ **Philips** (Norelco) B2X78U-01. Charcoal and white plastic cabinet and grille; 4" x 6" speaker. $59.95.

← **Zenith** A835R. Three speakers; wood cabinet, cloth grille. $109.95.

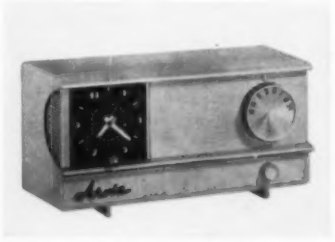
Clock radios

The problem here is the combination of two quite different functions: telling time and emitting sound. Because, from the visual standpoint, the clock function is the more important, the radio side of the unit's double life is often suppressed: the Westinghouse model (right, below) shows only residual traces of radio; the clock on GE Model C405 juts forward imposingly from the facade of the radio.

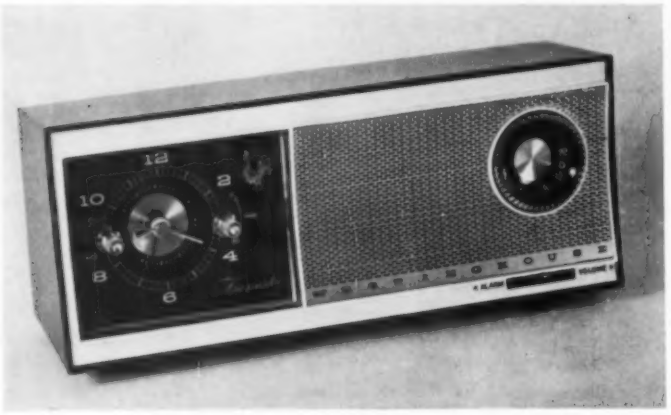
An important element of the design problem is the imposition of order upon a welter of controls, since many radios must not only tell time, play music, and ring alarms, but turn on the coffee and cook the bacon as well. Sometimes, like the Westinghouse model below or the Zenith 850 at the bottom of page they'll do all this and travel too.



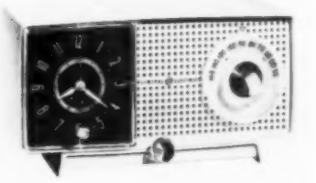
↑ **Philco** 753. Slanted back; ivory, pink or charcoal. $34.95.



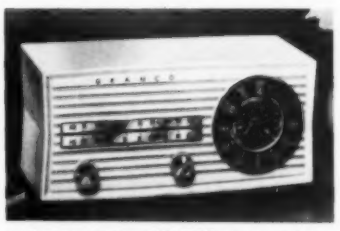
↑ **Arvin** 5571. Ivory or green; appliance outlet. $29.95.



↑ **Westinghouse** transistor portable. Vance Dimmick and Ralph French, staff designers. $75.00.

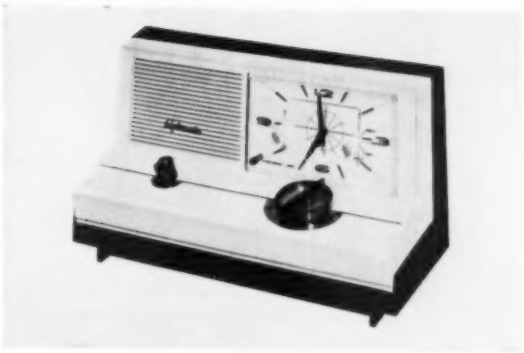


↑ **GE** C435. Bill Donnelly, staff designer. White polystyrene. $26.95.



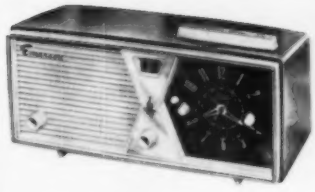
↑ **Granco** 770. AM/FM; 6" speaker; appliance outlet. $69.95.

↑ **Zenith** Royal 850. Mel Boldt and Associates, designers. Transistorized; earphone jack. $85.



← **Sylvania** 2207. Greenlee-Hess, designers. Dial face serves as night light. Appliance outlet. White with brown or blue. $39.95.

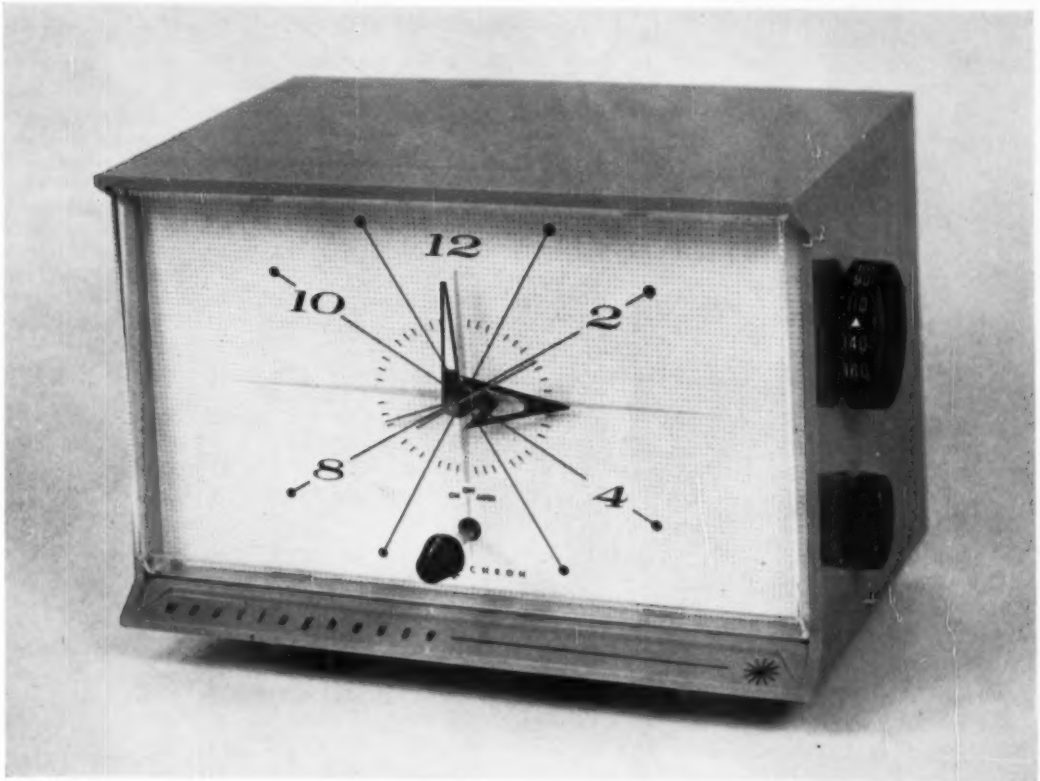
↓ **GE** C405. Polystyrene case in white with pink or gray. Lever-shaped clock controls. $29.95.



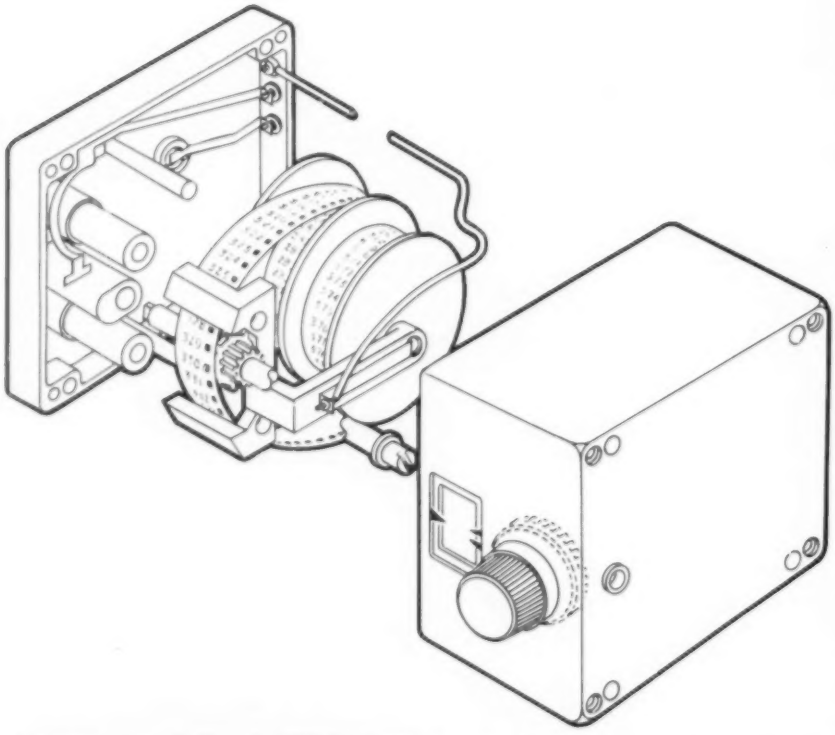
↑ **Emerson** 883. Directional antenna; window dial. $48.00.

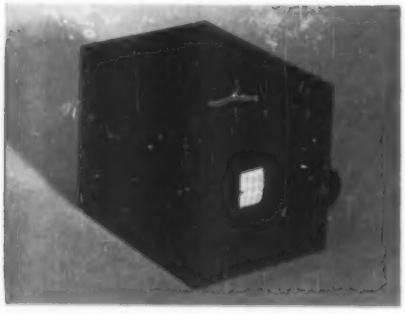
↑ **Packard-Bell** 6RC-1. AM/FM; automatic volume control. $49.95.

↓ **Westinghouse** 677T4. Gene Grossman, staff designer; Bronislaw Zapolski, consultant. Side speaker; beige, coral, aqua. $24.95.



TECHNICS *a catalog of new products, materials, processes and finishes*





Slidewire-tape potentiometer

A new multi-turn potentiometer is now being produced by the Howell Instrument Company and is said to solve many of the problems that have long plagued circuit and mechanical designers in many fields. The basic element of the TA'POT H5600, as the potentiometer has been designated, is a resistance wire bonded within the edge of a laminated Mylar tape. The resistance wire may be either straight or in helical form, depending on the total resistance required. Resistance ranges are from 100 ohms to 100 K. The case dimensions are 2″ x 2½″ x 2¾″ deep, while the resistance wire is available in lengths of 120 inches.

Readout is direct through a window on the front of the case. With the calibration stamped on the tape, any linear or non-linear calibration is obtainable including direct digital reading of temperature with any type of thermocouple, square root extraction when used with differential pressure transducers for flow measurement, and hyperbolic and logarithmic functions encountered in analysis and radiation systems.

Each TA'POT is calibrated on an automated system that compares the unit under test with a master tape 60 feet long. During calibration, digital values as specified are automatically printed along the face of the tape. 1000 calibration points are printed on the 120-inch tape length scale. As a result of this completely electronic operation, calibration is guaranteed for either linear or non-linear functions. Conformity between true resistance value and the specified function of the calibration is 0.05 per cent, resolution is better than 0.01 per cent, total resistance tolerance 0.25 per cent, and end resistance less than 0.005 ohm. Power rating is two watts at 25°C.

Straight-side case construction and interlocking drive shaft ends permit adjacent ganging of two or more units in minimum space for single knob setting of related functions without the use of gears or couplings. The standard manual-drive TA'POT has a ¼″ operating shaft and weighs four ounces. Ambient temperature range is −55°C to +70°C. Temperature coefficient of resistance wire is 20 parts per million per °C. Manufacturer: Howell Instrument Company, Fort Worth 7, Texas.

Disposable polystyrene cup

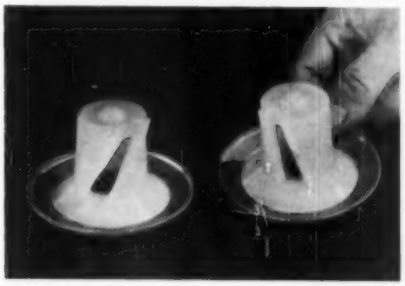
A new insulating Dylite expandable polystyrene has made possible a disposable hot-drink cup which can be held comfortably in the hand while containing boiling liquids. The cup, already used successfully on all flights of Braniff International Airlines, was developed by Crown Machine and Tool Company and is expected to find wide use in airline, plant and office canteens, and picnic service. Manufactured by Crown under the tradename of Thermokup, the new plastic cup is being produced at a price equal to or less than the conventional disposable paper cup with handles now used extensively throughout the world.

Because of the insulating properties of the material, which is manufactured by Koppers Company, Inc., the cups keep hot beverages hot much longer than paper cups. Furthermore, it does not get soggy if liquid remains in the cup for long periods of time, because of the high non-absorbant quality of the material.

The most striking quality of Dylite is that the insulating properties of the polystyrene material reduce the transmission of heat or cold from the inner to the outer surface so efficiently that a cup may be held in the hand without the slightest feeling of discomfort. Crown is already producing a million cups per month, and is adding more molding machines to meet expected demands in areas where paper cups now are used. Source: Koppers Company, Inc., Pittsburgh 19, Pa.

Nylon-metal pulley slide

A new nylon-metal pulley slide for Westinghouse Corporation's latest line of washing machines has been developed by Chicago Molded Products Corporation. The new slide replaces a costly all-metal one. Westinghouse and Chicago Molded engineers were faced with the problem of designing and developing both the piece itself and a ash-free mold. The slide had to be mass produced to meet close tolerances on both the internal diameter of the shaft and the two different type helical slots, and at the same time eliminate the expensive machining operations formerly necessary with the metal part. Nylon was chosen to be used with a stamped sheet-



steel insert (copper plated) because of its toughness and abrasion resistance, and because it can be injection molded in mass production units. Since the operation required little or no lubrication and since no costly machining was necessary because the slots are molded into the part, an appreciable saving was realized. Source: Custom Molding Division, Chicago Molded Products Corp., Chicago 6, Illinois.

Solar-powered transmitter

An amateur radio operator in Los Angeles recently held conversations with two other "ham" operators 2,000 miles away in Illinois using a transmitter and receiver powered entirely by solar energy. Major Gilbert, an engineer with Hoffman Laboratories Division, Hoffman Electronics Corporation, made the voice contact with hams in Chicago and Mt. Prospect, Illinois early in the fall.

Gilbert's station was operating solely on power supplied by a bank of silicon solar cells which convert light into electricity. This is believed to be the first time that a radio transmitter on the 10-meter band had made a long-distance voice contact using solar energy as its sole source of power. Gilbert's transmitter, which is completely transistorized, operates with an output between 60 and 75 milliwatts depending on the intensity of the sun. The power supply for the call was a bank of 72 of the half-dollar size silicon solar cells.

These cells, manufactured by the Hoffman Semiconductor Division, Evanston, Ill., are wafer-thin slices of highly purified and specially treated silicon. When light strikes them, approximately one per cent of the energy is converted into electricity. There is no change in the cells themselves and their life is estimated at up to 1,000 years. Gilbert, who transmits on a frequency of 28.82 mc, said both of the operators with whom he talked reported that his signal was loud and clear. Source: Hoffman Laboratories Division, Hoffman Electronics Corporation, Los Angeles 7, California.

Tape controlled spot welder

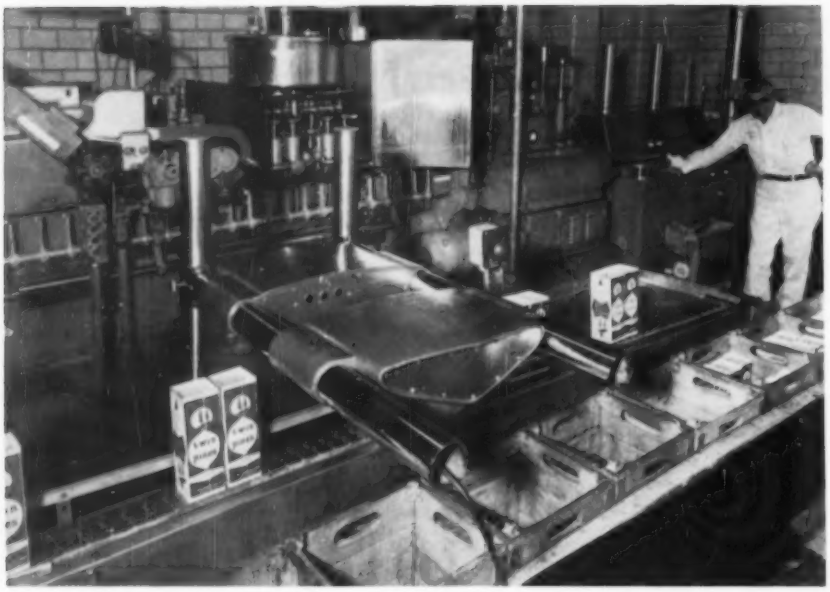
A new tape controlled, multiple-torch Heliarc spot welding machine is helping Convair Division of General Dynamics Corporation produce problem parts for Terrier surface-to-air guided missiles for the armed forces. Design technicalities precluded use of conventional resistance spot welding techniques on some Terrier parts, since resistance welds require that both sides of a joint be accessible. Heliarc spot welds are produced when a tungsten electric arc shielded by inert gas is applied to only one side of a joint. Since heat from the torch melts the metals through the joints, the second side of the joint need not be accessible.

The basic welding machine has four torches, arranged so four parts may be welded simultaneously. Hydraulic controls position the torches horizontally and they are raised and lowered pneumatically. When operated by a tape program control unit, pre-determined location and condition data for each weld may be punched onto a tape. The tape is then fed into the control system, which converts the data in command information for the machine. The machine then positions the torches, tilts the work to the proper angle, and selects the correct time and current for the weld. Source: Convair, a Division of General Dynamics Corporation, San Diego 12, California.

New "Leroy" scriber

Keuffel & Esser has added a new type of "Leroy" letterer to its list of products in the scriber category. The new addition differs from other scribers in its height-slant angle adaptability. The scriber can be adjusted to form template characters of varying heights and slant angles without changing character width. It can write characters either vertical or slanting at any angle up to 45 degrees forward, and any height from 60 to 150 per cent of the size of the figures represented on the drawing template. The height-slant adjustment itself is very simple. The center knob

is loosened and the arm is moved until the small red circle on the arm lies directly under the intersection of the "degree slope" and "per cent height" lines wanted. Once the setting has been set, the knob can be retightened and the scriber is ready for lettering. This new "Leroy" Height and Slant Control Scriber takes pens from 0000 to 8, and can be used with "Leroy" Lettering Templates up to size 500 C. Manufacturer: Keuffer & Esser Co., Adams & Third, Hoboken, N. J.



Nuclear measurement

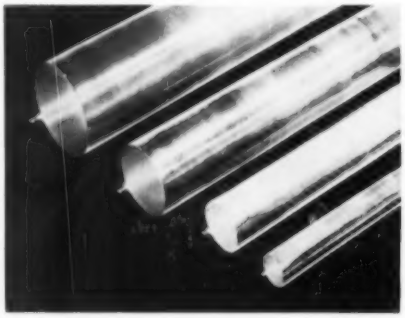
An automatic device that accurately measures the contents of sealed opaque containers through the use of nuclear beams has been perfected by the Nuclear Corporation of America. The compact equipment, supplied at the time of its installation with enough nuclear material for years of operation without recharging, is being manufactured for companies whose liquid, solid, or combined products are distributed in cans, bottles, cartons, boxes, drums, or carboys. Designated the Indicon 1-200, the $3,000 nuclear device can gage up to 1,000 containers per minute as they pass through it on a conveyor belt. With its nuclear beams set to judge whether they hold exactly specified quantities, or are under- or overfilled, the Indicon immediately detects all vessels whose contents are over or below the designated amount. The equipment does not contact any part of the containers it is gaging, and its beams have no effect on their contents.

The Indicon is a metal unit that fits over and on both sides of a conveyor belt that carries various sized containers toward points of shipment. When it is in operation two nuclear beams emanate from one side of the machine, penetrate the containers being inspected, and register opposite on a pair of high and low level signal points. If the lower beam has to pass through a container's contents to register on the opposite low level signal point, the Indicon knows the container is filled to minimum requirements. In a similar manner, the upper beam discovers overfilling. When the lower beam hits the container's contents, and upper does not, it is evident the container is filled within the minimum and maximum levels. These criteria may be as close as 1/32 of an inch.

The new device can do more than report delinquents among the vessels it is gaging; it can also remove them. The Indicon in operation creates a signal that activates a heavy industrial type relay when it discovers an improperly filled container, and if the container processing requires it, the relay in turn can activate a reject mechanism. Manufacturer: Nuclear Corporation of America, New York, N. Y.

From sheet to rod

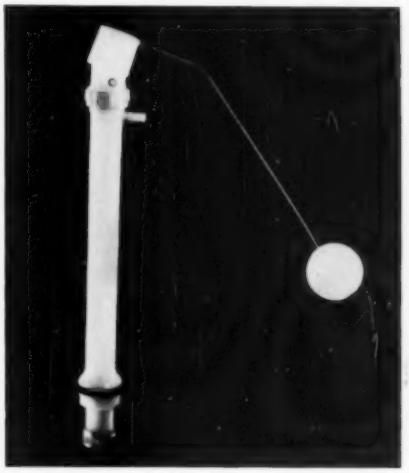
The manufacturers of Homalite 100 transparent plastic have expanded their line of thermosetting stock from sheet to rod. The clear plastic can now be obtained in rods of ¼", ½", ¾", 1", 1½" and 2" diameters in lengths up to 36". The rods can be sawed, drilled or machined and are applicable to a vast range of industrial, scientific, military and consumer uses. The rods are best applied where high abrasion and solvent resistance are important factors. Homalite 100 products can withstand temperatures up to 230°F. and can be subjected to higher temperatures for short periods. The plastic does not crack or discolor when exposed to sunlight, has a high impact strength and is not brittle at low temperatures. Manufacturer: The Homalite Corporation, 15 Brookside Drive, Wilmington 4, Del.



Nylon ballcock valves

New hydraulic ballcock toilet valves, made of Plaskon nylon, are said to perform more quickly and quietly while using less water than previous models. The lightweight valves cut water closet fill time in half, and in addition, are non-corrosive, according to the manufacturer, the Hydro Valve Corporation, Austin, Texas.

Injection molded of Plaskon nylon 8200, a compound noted for its resistance to heat, chemicals and abrasion, the valve is designed to transfer liquid pressure to either side of its piston. Because it goes into operation at full flow when water level is not adequate, seepage is eliminated and water usage reduced.



In closing, its smaller, lighter pilot ball equalizes itself and stabilizes the mechanism in the closed position when the proper water level is reached—thus stopping the bleed from the top of the piston. Since it is engineered to shut off with the water pressure, not against it, the compound leverages and metallic whine common to older systems are eliminated. Source: Plastics and Coal Chemicals Division, Allied Corporation, New York 6, N. Y.

Recording camera

Peerless Photo Products, Inc., have introduced a new recording camera which will facilitate the rapid handling and crediting of checks deposited by "lock box" customers of banks. The new camera, called the "Copy-Cart," combines in a single portable unit a continuous flow reduction camera and an automatic processor. No darkroom is needed, and no water supply is required. The compact unit, which is mounted on

casters and is readily moveable from place to place, has its working surface at desk top level and can be operated anywhere. Officials of the photo company state that the Copy-Cart will find application for any industrial, commercial or business organization where a small number of copies of a large number of uniform or assorted originals is quickly and cheaply required. Checks and other opaque originals up to 8½" wide and of any length can be fed into the recorder and are reduced in copying to seven per cent of their original linear size. Multiple page documents can be fed through without unstapling, each page being folded after copying, so that the entire document can be reproduced without taking it apart. By factory adjustment, the unit can be modified to furnish any desired single reduction from 50 per cent to 80 per cent of original linear size.

Copies are made on a continuous strip of sensitized silverhalide type photographic paper. The originals are returned in the

same order as they were copied. The copies, which are white on black negatives, are automatically developed and stabilized in the processor, dried, and delivered at the rate of approximately 1,500 check sized originals per hour. In the case of the 'lock box' application, checks, after being copied, are immediately put through the bank's regular clearing procedures and credited to the depositor's account. The copies are forwarded to the depositor to be passed through his own accounting department in the regular routine.

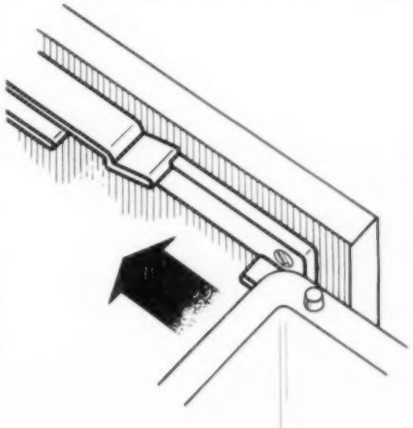
A 9-inch wide throat at the feed position assures easy and correct positioning of the checks or other originals for copying. After being copied, the originals are returned to the lower front of the unit, piled in the same order in which they were fed into the camera. Copies, if cut, are piled face up on the working deck, in easy view of the operator who can sit during the whole operation.

The camera is designed to come into operation automatically when an original is introduced for copying. Exposure is triggered by the passage of the original through the throat. The unit can be set for sequential copying of originals of varying lengths with a delay mechanism which leaves a standard, predetermined spacing between each copy. Alternately, it can be set to copy originals of approximately the same length with a photographically reproduced stub or legend before or after each copy, to be filled in later containing such information as the user may wish to note.

The camera section of the unit is designed to receive standard stat-camera type photosensitized material 6½" wide, in rolls up to 35 feet long. The camera is a compact unit, 16" x 38"; its electrical power requirements are modest—110 volt, 60 cycle alternating current, and a maximum load is 15 amperes. A visible counter records and indicates the number of copies that have been made. Manufacturer: Peerless Photo Products, Inc., Shoreham, N. Y.

Plastic drawer slide

Prolon Plastics are manufacturing a side-suspension type of plastic drawer slide made of Marlex high-density polyethylene. It is the use of this material which is responsible for the qualities of the drawer slide: self-lubrication makes for easy riding and noisefree operation; the plastic's chemically inert composition protects the slide from expansion or contraction due to temperature and humidity changes. Another material quality adding to the performance of the product is resistance to abrasion. Use of this type of slide eliminates the need for center guiding and parting rails. The picture below indicates the operation principle of the plastic slide. This view of the slide with the drawer in entrance position shows the openings at the front of the slide which make it easy to remove and replace the drawer. A stop-button on the drawer catches against the groove in the upper ledge of the slide to hold the drawer firmly in the open position. The slides are now being used primarily in case goods for the home, as well as with institutional furnishings. Manufacturer: Prolon Plastics Division of Pro-Phy-Lac-Tic Brush Co., Florence, Mass.



New translucent panel

Panel Structures, Inc. has put on the market a line of translucent building panels for numerous architectural and decorative uses. Called SANPAN, the panels are made of fiber glass-reinforced polyester skins bonded to heavy extruded aluminum frames and internal grids. They are supplied in a variety of sizes and colors, are light weight (1½ lb. per square foot) and transmit diffused illumination. SANPAN panels come in three types: type "A" is well suited for application as curtain walls, exterior wall panels, interior partitions, roof panels, skylights and canopies. Type "B" differs slightly in construction (has an aluminum lip protecting the plastic edge) and is suitable for the same applications as type "A". Type "C" also has an integral joint system for interlocking a series of units into assembled interior partitions or exterior panel systems. Manufacturer: Panel Structures, Inc., 45 Greenwood Ave., East Orange, New Jersey.

High-density polyethylene flashlight

A flashlight equipped with unbreakable plastic fittings and an oversized head that throws a safety glow when lighted is now being made with high density polyethylene supplied by Bakelite Company, Division of Union Carbide Corporation. Both head and bottom cap of the new Eveready "Beacon" Lite, as the flashlight is called, are molded of the new plastic.

The novel design of the head, plus the rigidity of the new plastic, protect the lens and the bulb recessed within the globe-shaped head itself. The same rigidity of the Bakelite high density polyethylene eliminates the problem of having the screw-on bottom cap slip off the metal case during warm weather. Particularly when flashlights are stored in automobiles, the pressure of the spring inside the light might be enough to force off the cap. The cap is rigid enough according to the manufacturer to overcome this pressure. Source: Bakelite Company, Division of Union Carbide Corporation, New York 21.

Automatic sign forming

The completely automatic forming of outdoor signs from butyrate sheet plastic has been announced by Auto-Vac Company, Bridgeport, Conn. The tough butyrate sheet is thermoformed with high definition and fidelity to the original design. Raised letters and intricate relief designs are no particular problem. The drape-vacuum forming process offers considerable economy in the cost of molds, plus tremendously increased reject-free production rates over the old style methods used with acrylic sheet.

The machine, called the Auto-Vac EQA 4872, has formed over 30 signs per hour using both clear and translucent 100 mil butyrate sheet plastic. Only 90 seconds was required for the forming cycle . . . 60 for heating the material, and 30 seconds for cooling. The actual vacuum forming by the Auto-Vac process takes only a second or two. Formerly, only ten to twelve signs could be produced in an hour with ⅛" acrylic.

It is claimed, in addition to rapid production, the Auto-Vac operation gives sign fabricators the benefits of utilizing materials with lower cost, reduced handling expenses, and lower mold costs. Weathering tests have proved the butyrate to have equal exposure ratings with acrylic. Added to lower material costs, this amounts to considerable savings.

While material savings are significant, the greater saving is in the use of automatic equipment to manufacture the signs. The use of the Auto-Vac machine eliminates the need for hanging plastic sheets in ovens for preheating, as well as the subsequent expensive hand transfer to the separate mold and forming setup. The automatic heating and timing controls of Auto-Vac machines virtually eliminate rejects, which can be a costly problem with acrylic.

Raised letters and sections can be formed directly into the sign using inexpensive male molds without forming and gluing them on separately. Colors may be preprinted directly on the sheet prior to forming a sign enabling the manufacturer to maintain color control. Manufacturer: Auto-Vac Company, Division of National Tool Company, Bridgeport, Connecticut.

Television for atomic submarine

Closed circuit television so sensitive that it can see in the dark was used on the submarine Nautilus for its recent trip under the polar ice pack, the General Electric Company has announced. The sub's captain and his crew had a seal's eye view of the ice pack on a 21-inch monitor that warned them when the ship was too close to the bottom of the ice. General Electric and naval engineers installed the television system just prior to the submarine's departure on its history-making voyage.

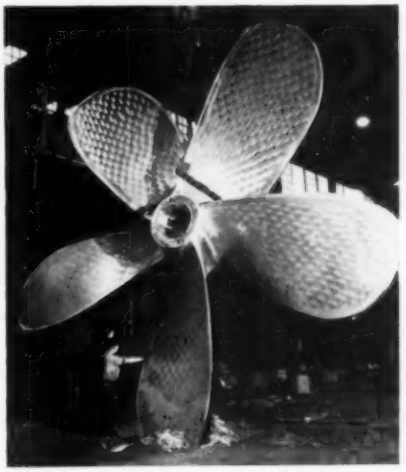
The camera was mounted vertically in a pressurized one-ton steel capsule in the conning tower of the sub. A glass porthole in the top of the capsule shielded the lens of the camera. A cable was strung through two water-tight seals into the periscope room where the monitor showed a clear picture of the ice overhead. According to the Nautilus' captain, the ice looked like "clouds passing overhead."

The camera needed no artificial light despite the fact that the sub was very deep beneath the ice pack. Source: General Electric Company, Schenectady 5, N. Y.

Sight glass

A refrigeration sight glass that says "Full" when it is full is now being sold by Ansul Chemical Company, Marinette, Wisconsin. The sight glass, called the Ansul Line-Flo, features an ingenious use of light refraction which takes the guess work out of determining the amount of refrigerant charge. The word "full" is printed on the bottom part of the glass and is visible only when the refrigerant is at full charge. When the level is low, the word is blurred beyond recognition.

The Line-Flo is sealed by brass-to-glass fusion which eliminates the threat of leaking, and is available with male-male or male-female connections in standard sizes from ¼ to ½-inches. There are no gaskets, joints, or solder anywhere in the sight glass. Source: Ansul Chemical Company, Marinette, Wisconsin.



Giant propeller

Larger and larger propellers to drive the newest and most modern ships in the world are being manufactured at the Eddystone (Pa.) Division, of Baldwin-Lima-Hamilton Corporation. Close on the heels of six record-setting 24-foot diameter propellers, Eddystone is now producing three new ones, such as the one above, of even greater diameter. Measuring 24 feet, 8 inches and weighing over 38 tons each when machine-finished, these wheels will be used on giant super tankers now under construction in Japan by Welding Shipyard Division of National Carriers, Incorporated. The new tankers — 940 feet long with a 135-foot beam and 104,500 dead weight tons — will be the largest cargo ships on the seven seas. Equipped with the B-L-H propellers, these vessels will develop 27,500 shaft horsepower at load speeds of over 15 knots. The first propeller will be installed on the S.S. Apollo, which will be launched in November. Manufacturer: Baldwin-Lima-Hamilton Corp., Philadelphia 7, Pa.

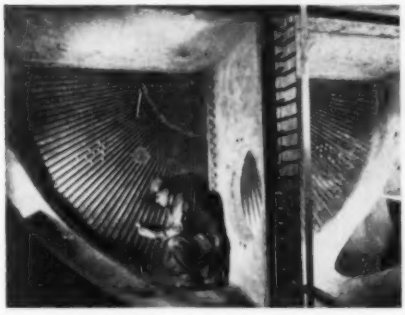
Plastic shoe pieces

Polyethylene is now being used by Endicott Johnson Corporation in the production of men's shoes. The plastic material is said to improve the end product in fit, durability, and moisture resistance. Heel pieces (center) are injection molded from polyethylene and are easy to round and skive. Similarly, mid-soles are die-cut from extruded polyethylene sheet because of the material's resistance to dampness and its extreme flexibility. Endicott Johnson has also found that polyethylene heel bases (bottom) not only have superior moisture resistance, but also can be designed with cut-outs to lighten their weight. This is an important consideration in modern shoe merchandising.

The plastic material — Tenite polyethylene, supplied by Eastman Chemical Products, Inc. — has another distinct advantage according to the manufacturer. It can be supplied in formulations that embody the precise qualities desired by the shoe manufacturer — including color. Color matching to various shades of uppers, heels, and interior finishes is achieved by using Tenite polyethylene concentrates. Source: Endicott Johnson Corporation, Endicott, N. Y., Eastman Chemical Products, Inc., New York, N. Y.

Electricity cost reduction

The Monongahela Power Company in West Virginia recently installed stainless steel tubes in one of their main steam condensers which are expected to increase the condenser's life span from ten to thirty years; this will eliminate the periodic overhauling of the condenser and will, in time, cut down the cost of the electricity (the condenser operation is part of the electricity-generation cycle). The condenser (see next column) is made up of 9,234 stainless steel tubes, 26 ft. long and ⅞ inch outside diameter. The condenser is equipped to receive 45,000 gallons of river water per minute. The water is pumped through the condenser to absorb heat from the steam in the chamber and to condense the steam to water then used to drive the powerful generator. In this process of water-to-steam-to water conversion many problems arise due to the corrosion effect exerted by the water on the condenser tubes. The corrosion film that settles on the tubes reduces the overall condenser efficiency. The stainless steel tubes however (the tubes are supplied by the Allegheny Ludlum Steel Corporation) are not subject to corrosion attack by the river water. Replacing the standard tubes with the stainless steel parts consequently



means a better condenser performance with less cleaning maintenance. It is this fact which prompted the Monongahela Power Company to try a complete installation of stainless steel condenser tubes (the Monongahela Power Company serves over 200,000 customers). The cost reduction in running the electric generating equipment will, in the long run, help reduce the cost of electricity. Over the last two decades, the cost of a kilowatt-hour in the home was cut from 4-¾ cents to about 3.1 cents. It is expected that the conversion to stainless steel condenser tubes will further reduce this cost to less than three cents per kilo-watt-hour. Manufacturer: Allegheny Ludlum Steel Corporation, Pittsburgh 22.

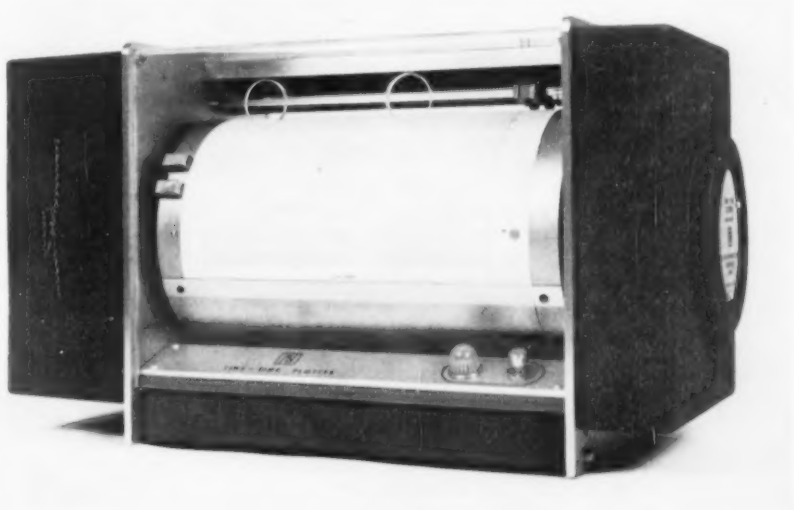
Time plotting instrument

The Mast Development Company has engineered a recording instrument designed to make a geographical presentation of a repeated series of time signals, and to record these with respect to the time of day or extended time base. Called the Time-Time Plotter, the fifty pound instrument is 18¾" x 7" x 9½" high, and requires an input supply of 110-115 volts at 60 cycles. It is also compact enough to be transported from place to place.

The Time-Time Plotter can be used whenever a recurring electrical signal is received and it is desired to record the duration of the signal with respect to the time of day. As a specific example, it can be used to make a graphic presentation of a repeated series of dosimeter measurements of chemical processes, as well as a variety of other measurable operations.

For any type of operation in which a short interval of time is a functional indication of concentration or percentage mix (such as titration or valve opening in batching), the Time-Time Plotter can be used. An electrical signal to the instrument for this interval of time causes the plotter's pen to traverse from right to left in a chronometric speed. The pen traces a horizontal line whose length is a measure of time and consequently of the parameter depending on time. At the end of the signal, the pen makes a rapid return to its zero position and there waits the next signal. The complete process then starts all over again.

If desired, the Time-Time Plotter can be adjusted to print only at the end of the timed interval which indicates concentration, percentage mix, or whatever the parameter is that is revealed by the time measurement. Manufacturer: Mast Development Company, Davenport, Iowa.



In-circuit transistor tester

Philco has developed a new tester that will facilitate testing problems of electronic circuitry employing transistors. This testing breakthrough resulted from work done by Philco design engineers in an attempt to cut down on the amount of trouble-shooting and servicing time often taken up by faulty electronic equipment. The engineers first came up with a unique combination of transistor circuits; this was further developed and refined until it could be reduced into a compact tester—an in-circuit transistor tester. Philco is now in the process of building some 900 of these testers for the Navy's Bureau of Ships; it is expected that commercial models will be made available soon. To employ the tester in a circuit it is not necessary to turn on power in the equipment under test. The new tester is equipped with low impedance circuits to nullify the effects of external circuitry, and tests the transistor being checked as though it were part of its circuit. Manufacturer: Philco Corporation, Philadelphia.

Large nylon cylinder

The largest nylon cylinder turned out to date is 21 feet long and offers the general advantages of the plastic when used as rollers in certain processing — embossing, coating — of paper, textiles, artificial leather, and other sheet materials. The 16-inches outside and 13-inches inside diameter cylinder is particularly well suited for these industrial processing applications because of its resilience and abrasion resistance. The cylinder can also be used as large journal bearings, as tires for industrial materials-handling equipment, and as housings for circuit breakers. The cylinders are fabricated on standard metal-working equipment, and the outside of the cylinder can be made as large as 48 inches without considerably altering the production method. The wall thickness of the giant tubes can be varied to almost any size greater than one inch. The tube is being manufactured by The Polymer Corporation, and this new product gives the company's line of POLYPENCO nylon tubing a range of .062 to 16-inch outside diameter. Manufacturer: The Polymer Corporation, Reading, Penn.

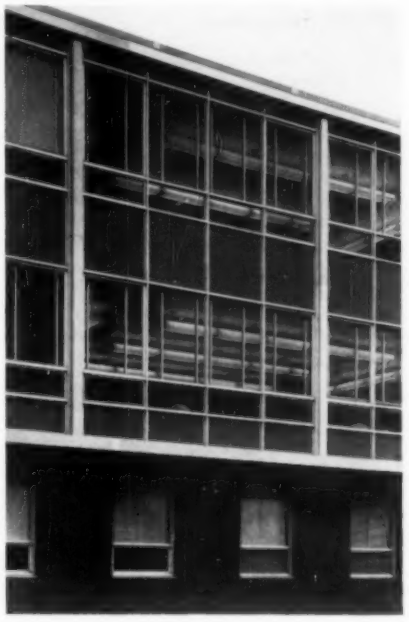
Wide application for new adhesive

A new bonding material, Eastman 910 Adhesive, is being used in industry with almost every kind of material. Introduced a year ago as a laboratory development by Eastman Chemical Products, Inc., a subsidiary of Eastman Kodak Company, the 910 Adhesive is fast becoming a popular bonding material because of its properties and ease of application. The material can produce a high strength bond between virtually any combination of materials without excessive pressure, heat, solvent-evaporation, or long curing time. It has been used as a bonding agent for such products as trophies, fountain pens, high-fidelity phonograph cartridges, industrial measuring instruments, tools, and storage batteries.

The adhesive is being marketed by the Armstrong Cork Company, which claims that the new product offers an entirely new approach to adhesive bonding. It can bond metallic or non-metallic materials; it can be used directly from the manufacturer's package; it develops high pressure bonds without any other agents; it is colorless.

The new adhesive differs in composition from most standard products used to bond materials. It is a chemical which under certain controllable conditions reacts within itself and causes the adherends to

bond together during this process of inner reaction. The reaction and the resulting bond are almost instantaneous. This quick action can, of course, mean savings of time and labor on a production line. Because of its strong bond and its ability to join dissimilar materials, it is expected that the 910 Adhesive will find uses where no bonding materials could be applied before, and will create new design possibilities for combinations of dissimilar materials which cannot now be joined by welds, solder, rivets, etc. Specifically, the new adhesive has been used or is being tested for the following bonding actions: to fasten seals and trim on hardware and flatware; to mount hearing-aid components inside the case, eliminating screws and other fastenings; to mount small camera parts to eliminate brazing and soldering which tend to distort parts; to seal bolts and nuts; to repair china, ceramics, etc. Using the new adhesive will also make possible quick fabrication and assembly of prototype models and laboratory apparatus, the splicing of various electronic tapes and films, the assembly of plastic angles to venetian blind heads. Manufacturer: Eastman Chemical Products, Inc., 260 Madison Avenue, New York 16, N. Y.



Portable exterior walls

In a new high school erected at Mt. Pleasant, Delaware, the pre-assembled exterior wall sections used in the structure permit expansion of the school without having to destroy the exterior walls. The assembled sections — made up of an aluminum frame and Calcore porcelainized curtain wall panels, assembled and erected by Fenestra, Inc. of Philadelphia — are easily detached and relocated, eliminating the cost of demolition and of new exterior walls. Attachment of the preassembled sections to the building frame is simple and quick. The panels themselves have a Foamglas core with a galvanized steel back, but a variety of insulating materials — Fiberglas, Cement Asbestos board, Paper Honeycomb, Aluminum Honeycomb — can be used in the laminated "sandwich" construction. Manufacturer: Caloric Appliance Corporation, Jenkintown, Pennsylvania.

Manufacturers' Literature Supplement

A bibliography of currently available technical brochures dealing with materials, methods, components, and machines

MATERIALS—METALS

1 Aluminum And Fiber Glass Panels. The Marco Company. 12 pp., ill. The 1959 issue of the company's annual catalog lists data on the complete line of MARCOLITE Aluminum and Fiberglass Skylight Products. All models and designs, as well as major installations, are described.

2 Hastelloy Alloy B. Haynes Stellite Company, division of Union Carbide Corporation. Latest information on a group of nickel based alloys that combine the advantages of excellent corrosion resistance with good strength at high temperatures.

3 High-Strength Steel Bars. La Salle Steel Company. 4 pp., ill. Bulletin lists recent improvements in the company's high strength, free machining STRESSPROOF steel bars; benefits resulting from improvements in strength, machinability, and tolerances are reviewed.

4 Laminated Structural Materials. Haskelite Manufacturing Corporation. 4 pp., ill. New folder describes laminated structural material called Plymetl, faced on one or both sides with a choice of several metals, Melamine or Royalite.

5 Patterned Metal. Rigidized Metals Corporation. 30 pp., ill. Book concentrates on the properties, application and design patterns of the company's Rigid-tex metal line. The products have been used in a variety of consumer-product, building and transportation applications, and examples of these are shown.

6 Tool Steel Stock. Uddeholm Company of America, Inc. 44 pp., ill. The company's tool steel stock is listed in addition to a tool steel selector and properties guide, to help users select the correct steel for a particular job.

7 Wire Cloth. Unique Wire Weaving Company, Inc. 12 pp., ill. Brochure discusses the properties and uses of wire cloth in different weaves: plain weave, twill weave, dutch weave, micronic weave, and special weaves.

MATERIALS — PLASTIC

8 Arc And Flame Resistant Plastic Laminate. Taylor Fibre Company. 4 pp. Technical data bulletin describes the company's Grade G-5 laminated plastic; product has high tensile and flexural strength plus high arc and flame resistance. Minimum and maximum property values for sheet rock, rolled tubes and molded rods made from this material are also listed.

9 Extruded Acrylic Sheets. Cadillac Plastic Chemical Company. 12 pp., charts. Contains complete information on handling, machining, forming cementing and annealing of Cadco extruded acrylic sheets. Includes table of properties and four pages of light-transmittance charts.

10 Foamglas. Pittsburgh Corning Corporation. 12 pp., ill. Booklet devoted exclusively to the use of Foamglas insulation in low temperature spaces.

11 Foamsil. Pittsburgh Corning Corporation. 4 pp., ill. Folder describes new insulating and refractory material, Foamsil. The folder contains background information on the foamed silica material which is 99 per cent pure fused silica and has a practical operating range of —450° to 2200°F. The material is unaffected by practically all commonly used acids and is unaffected by thermal shock.

12 Molded Fiber Glass. Molded Fiber Glass Companies. 32 pp., ill. Brochure describes molded fiber glass and the methods used to produce it. It is illustrated with photographs and charts and lists the mechanical, electrical and chemical properties of the material.

13 Paper-Base Epoxy Resin Laminate. Synthane Corporation. New engineering bulletin on Grade EP-22, a paper-base epoxy resin laminate, one of its latest products especially designed for printed circuit and other electronic application.

14 Phenolic Molding Compound. Durez Plastics Division, Hooker Chemical Corporation. 6 pp., ill. This pamphlet describes one of the new Durez(R) products, 16771 Natural, a high impact phenolic molding compound reinforced with Fiberglas.

15 Phenolic Products. General Electric. 8 pp., ill. This new folder describes the company's complete line of phenolic resins, varnishes and molding powders; it is an aid to designers, molders, fabricators, formulators and end-users, in the specification of phenolic materials.

16 Plastic Containers for Packaging. Lermer Plastics, Inc. 4 pp., ill. Brochure describes extensive line of printed, rigid plastic containers for packaging. Folder describes the virtually unlimited printing designs and colors possible with Lermer's wide variety of lightweight, shatterproof plastic containers.

17 Plastic Sandwich Panels. Monsanto Chemical Company. 116 pp., ill. Results of a three year study conducted at M.I.T. on the architectural potential of lightweight plastic sandwich panels. Advantages stressed are plastic's formability, durability, structural strength, and integral color and transparency or translucency.

18 Thermoplastics Volume. Society of Plastic Engineers. Titled "Processing of Thermoplastic Materials", the book will provide the most extensive information ever published on the engineering problems involved in extrusion, injection molding, calendering, and other thermoplastics processing operations.

METHODS

19 Automatic Assembly Machine. Dixon Automatic Tool, Inc. 4 pp., ill. Bulletin on the company's Dixon Auto-Positioner, used to place and assemble small piece parts; various models and arrangements are described and examples of parts being handled by new parts feeder are shown.

20 Compression-Molded and Extruded Products. Genuga Industries Company. 10 pp., ill. Catalog shows cross sections and sample parts representing compression-molded and extruded products which the company custom-manufactures.

21 Contact Microradiography. Philips Electronics. 16 pp., ill. This booklet gives technical background on contact microradiography for research in biological, paper, textile, metallurgical and foodstuff fields.

22 Dynamometer Design. W. C. Dillon & Company, Incorporated. Illustrated book shows how to make spring testers, measure deflection of aircraft wings, check railroad switches, motor torque, etc., with portable-traction Dynamometers. $5.

23 Epoxy Spray Coat System. Union Carbide Plastics Company, Division of Union Carbide Corporation. 3 pp., ill. Coatings Technical Release No. 45 describes a new method of spray-coating 10 per cent reactive systems based on Bakelite epoxy resin. It results in curing speeds suited to application requirements.

24 Functions of Univac Data-processing Equipment. Remington Rand. This brochure illustrates the full range of basic data-processing functions and shows the specific equipment to execute them. It also explains the techniques of processing unit facts in punched cards, perforated tape, magnetic tape.

25 Handling Equipment Selection. Lewis-Shepard Products, Incorporated. 2 pp., ill. Article describes methods of selecting the correct materials for handling equipment to achieve maximum space, time and manpower savings. Also includes a semi-technical article on the science of hydraulics as applied to fork-lift trucks.

26 New Concept In Modern Data-processing. Remington Rand. 8 pp., ill. Folder presents a summary of the components and values of the Univac File-Computer System, Model 1, and contains a description in non-technical terms of the random feature as it applies to typical business applications.

27 Powder Metallurgy Methods. Metal Powder Industries Federation. Powder Metallurgy Quarterly examines 16 case-histories of the advantages of fabricating cams and cam-like structures from metal powder.

28 Refrigeration And Air-Conditioning Insulation. Presstite-Keystone Engineering Products Company. 8 pp., ill. Subject of brochure is a new cellular-type tube and pipe insulation made of Neoprene for the refrigeration and air-conditioning industries.

29 Standard Steel Buildings Erection Details. Republic Steel Corporation. 8 pp., ill. Brochure gives detailed picture on how to erect quickly and efficiently a new standard steel building manufactured by the company's Truscon Division. It is also explained in this folder how the pre-fabricated sections provide for a choice of many sizes; the standard building is described as a "package" with all sliding, roofing, windows, doors and hardware included.

30 Tank-Insulation Method. Nelson Stud Welding Division, Gregory Industries, Inc. 4 pp., ill. Folder describes a new method for installing insulation and jacketing on large storage tanks for hot materials. Booklet also shows how end-welded studs are applied directly to the tanks or on lightweight strips that are then tack-welded to the tanks.

31 Trolley Conveyor Systems. Rapistan-Keystone Company. 4 pp., ill. Construction features of overhead trolley conveyor, Power-Push systems, and Monorail Conveyor are described and illustrated in this folder, which also includes a list of applications of these systems in manufacturing, wholesaling and service industries.

32 Tumbling Media for Barrel Finishing. The Carborundum Company. 20 pp., ill. Based on the latest laboratory and factory case studies, this is a handbook for supervisors and operators. Describes kinds of tumbling media, types of application, types of tumbling barrels, anaylses of typical tumbling jobs.

33 Vibration Testing Systems. MB Manufacturing Company. Bulletin No. 425 covers vibration testing for sinusoidal and complex motion testing with force ratings from 1200 to 2500 pounds; Bulletin No. 435, ratings from 1750 to 5000 pounds; Bulletin No. 470, 7,000 to 25,000 pounds. These bulletins give detailed specifications of each of the components of the system as well as system performance.

PRODUCTS AND COMPONENTS

34 AC Magnetic Starters. Cutler-Hammer Inc. 16 pp., ill. This new booklet describes the company's Three Star line of AC magnetic starters. Also included are detailed descriptions of the lines component units, and of elements such as magnetic coils, overload relays, contact assembly, etc.

35 Adjustable Speed Drives. Bulletin GEA-6234-B, 8 pp., ill., General Electric Company. Bulletin describes General Electrics Thymotrol® adjustable speed drives, one horsepower half-wave and one to four horse-power full-wave.

36 Aircraft Locknut. Standard Pressed Steel, 4 pp., ill. Form 2426 describes new cold-forged featherweight aircraft nuts offering 72 per cent weight saving.

37 Arc Welding in Machinery Design. The James F. Lincoln Arc Welding Foundation. 224 pp., ill., $2.00 A book intended to help designers of machinery of all types find answers to their questions in using welded steel construction to lower costs and improve performance. It provides a broad review of current practice in design and manufacture.

38 Automatic Fuel Burner. Peabody Engineering Corporation. 8 pp., ill. Brochure describes Peabody's completely redesigned PK-54 Burner.

39 Bobbin Winder. Boesch Manufacturing Company, Inc. 4 pp., ill. Bulletin gives information on the design, operation, standard and optional equipment and features of the completely automatic BW2 High Speed Bobbin Winder.

40 Boesch Catalog. Boesch Manufacturing Company. Catalog 58 describes the capabilities and features of the automatic, semi-automatic, and subminiature toroidal winders, the tape winding machine, and the new permeameter.

41 Button Cell Battery Brochure. Gulton Industries, Inc. 4 pp., ill. This publication on the company's line of small button cell batteries features the design potentials and specifications of the various types of small batteries.

42 Cadmium Storage Batteries. NICAD Division, Gould-National Batteries, Inc. 4 pp., ill. Provides detailed selection data on NICAD batteries designed for starting diesel

and gasoline engines, supervisory control, emergency lighting, and switch tripping.

43 Ceiling Systems. Smithcraft Lighting Company. 6 pp., ill. The company has put out three folders each giving full information on a different type of ceiling system. These include mounting details, lighting characteristics, shielding media, overall dimensions, and ordering information.

44 Central-Station Air Conditioning. Carrier Corporation. A complete 72 page catalog for accurate selection of central station air conditioning units from two new Weathermaker lines, for conventional and multi-zone applications.

45 Ceramic Transducers. Gulton Industries, Inc. 8 pp., ill. Technical brochure describes a new series of Glennite high temperature, piezoelectric ceramic transducers, which have high Curie points that have made it possible to reach higher output voltages per unit input pressure than can be reached with conventional ceramics.

46 Coaxial Cables. Chester Cable Corporation. 6 pp., ill. "Plasticote" wires and cables for military and commercial electronic service are featured. Coaxial cables, military hook-up wire, multi-conductor cables, appliance wire, miniature and audio wires and cables, antenna loop, television transmission lines, and other types of cable are listed.

47 Communications and Control Systems. Femco, Inc. 6 illustrated bulletins feature new Femco control and communications systems. Included are "Remote control for natural gas systems", "Femco controls for water systems", "Mine power controlled by fan operation", etc.

48 Component Parts For Jigs, Fixtures, And Special Machinery. Northwestern Tool & Engineering Company. 14 pp., ill. The companys catalog #28 covers over 400 components for jigs and fixtures, and over 200 clamping items. A large-size tracing-template of the jig and fixture components is included in the catalog.

49 Constant-Temperature Catalog. American Instrument Company. 60 pp., ill. Catalog describes a complete line of baths, conditioned-air devices, and temperature-humidity cabinets. The two-color brochure lists over 100 constant temperature laboratory instruments applicable to every field of research, materials testing, quality control, and production.

50 Continuous Reactor. Baker Perkins Inc. 4 pp., ill. Typical applicable heat-transfer calculations, laboratory and testing facilities available for researching new applications (in connection with a new continuous reactor which combines continuous mixing with accurate process temperature control) are described in bulletin FR-58.

51 Coordinate Comparator. Gaertner Scientific Corporation. Bulletin 181-58, ill. Gives complete description of the instrument and its accessories used for measuring x-ray plates, spectrograms, star photographs, charged particle tracks and similar records on photographic plates.

52 Custom-built Counters. Mast Development Company. Brochure gives examples of mechanical-digital and pulse type counters which have been designed and built to meet the customer's special application and quality requirements.

53 Custom-built Transformers. Microtan Company, Inc., 24 pp., ill. The new catalog gives a comprehensive idea of the mounting types and electrical ratings possible in custom transformers.

54 Cut-off Saws. Wallace Supplies Mfg. Company, 36 pp., ill. Bulletin describes complete line of Wallace saws, including hack and band saws, and rotating and plate abrasive saws.

55 DC High-Power Servo Motors. General Electric, 2 pp. This bulletin discusses design features of fully enclosed, ball-bearing and full-slot spiral motors designed for fast response to control signals, in applications requiring frequent starts, stops, reversals and fluctuating loads.

56 De-aerating Heater. Graver Water-conditioning Company. 6 pp., ill. Bulletin lists specifications and diagrams of the company's SSC De-aerating Heater; contains information on this two-stage spray-type packaged heater which comes complete with internal vent condenser of stainless steel and all controls and valves.

57 Digital Demand Recorder. Fischer & Porter Company, 16 pp., ill. Describes an impulse-counting and recording device recently developed by the company.

58 Digital Voltmeter with Built-in AC Converter. Kin Tel, Division of Cohu Electronics, Inc. Bulletin describes 402 AC/DC digital voltmeter which provides 100-microvolt resolution in DC, one millivolt in AC.

59 Electric Strip Heater. Edwin L. Wiegand Company, 4 pp., ill. Bulletin F-1613 illustrates Wiegand's line of Chromalox electric strip heaters and how this type of heater is used by industry to keep viscous compounds moving smoothly, for ovens and special purpose air heating, for tanks, kettles, and drums, and for new or converted platens or other production equipment.

60 Explosion Proof Electrical Equipment. Crouse-Hinds Co., 6 pp., ill. The bulletin describes design and construction principles involved in manufacturing Crouse-Hinds Condulet electrical equipment for hazardous locations.

61 15-inch Lathe. Sheldon Machine Company, ill. Circular describes an all new and different 15" lathe and points out that the lathe is designed to fill the gap between Geared-Head and Belt-Driven lathes. Base price: $2350.00

62 Finger-Flexible Hose. Titeflex, Inc., 6 pp., ill. Bulletin No. 400 describes the new Springfield 400 Finger-Flexible® Teflon® hose for industrial and aircraft applications. Bulletin lists specifications and ordering instructions along with a performance chart of the convoluted hose.

63 Flash Batteries. National Carbon Company, division of Union Carbide Corporation. Battery Engineering Bulletin #6 lists the Eveready Photographic Flash Batteries and offers technical information on their use in electronic flash circuits.

64 Flexible Metal Hose Connectors. Cobra Metal Hose Co., 16 pp., ill. Catalog 658 illustrates, describes, and individually prices over 2,000 standard model flexible metal hose connectors.

65 Floodlight Catalog. Crouse-Hinds Company, 184 pp., ill. Catalog 320 gives complete descriptions of each of the floodlight categories of Crouse-Hinds stock.

66 Heating Controls. General Electric Company. Bulletin GEA-6774, 4 pp., ill. Contains information on GE's complete line of domestic heating controls. Publication describes each device and gives application information.

67 Hydraulic Hot Presses. Berthelsen Engineering Works. 16 pp., ill. This brochure covers the design and engineering scope of Berthelsen's staff the, firm's facilities, and the major construction features of Berthelsen's hydraulic hot presses.

68 Hypervelocity Cameras. Avco Research and Advanced Development Division. 4 pp., ill. Bulletin describes two new hypervelocity recording devices — a Rotating Mirror Camera and a Rotating Drum Camera for use in hypersonic tunnels, rocket-powered supersonic tunnels, and similar specialized applications.

69 ID Unit. Fairchild Camera and Instrument Corporation. 4 pp. Folder describes the Fairchild-Polaroid ID camera, camera stand, identification unit, and lighting arrangement. Includes prices.

70 Low-Flow Servo Valves. Moog Valve Company, Inc. 6 pp., ill. Catalog 210 contains a series of curves and schematics which highlight the design and performance characteristics of Moog's low-flow servo valves for military, industrial and research application. Also presents a glossary of servo valve terms and a detailed cutaway photograph of a typical valve in this series.

71 Marine Group Control. General Electric Company. Bulletin GEA-6783, 8 pp., ill. Brochure describes GE's marine group control for shipboard application on AC motors up to 400 horsepower.

72 Margin Master Binders. Royal McBee Corporation. 6 pp., ill. Brochure lists group of binders designed to house punched forms and shows how these are handled, how portions can be removed etc.

73 Marine Tools. Ampco Metal, Inc. 4 pp., ill. This bulletin describes a new line of marine hand-tool kit combinations designed for pleasure craft owners. Eight varieties of kit and tool combination are offered by the company.

74 Mechanical Seals. Syntron Company. 4 pp., ill. Catalog lists different types of mechanical seal which stop the leakage of gas and liquids from around the rotating shafts of pumps, compressors, mixers, etc.

75 Obstructionless Magnetic Flowmeter. Fischer & Porter. Specification sheets give full technical data on F & P indicating and controlling instruments, designed especially for use with the new obstructionless flowmeter.

76 Open-type Motors. Allis-Chalmers. Bulletin 05-51B9040. Describes "Super-Seal" open-type motors suitable for many applications previously requiring enclosed designs.

77 Photographic Equipment. Film in Industry. Victor Animatograph Corporation, Davenport Bank Building. 24 pp., ill. Booklet tells how industry profits from the use of sound films.

78 Plastic Insulated and Jacketed Control Cable. Chester Cable Corporation, 6 pp., ill. Folder lists the specifications of small diameter-station-flexible and supervisory control cables with 2 to 19 conductors.

79 Plastic Markings. Duralith Corporation. This new products bulletin describes the characteristics and specifications of the company's new product, Duralar. This is a plastic laminate which the company uses to fabricate printed charts, diagrams and signs. These products are particularly useful where markings must withstand heat, cold and ultra-violet exposure.

80 Pneumatic-Electronic Control Device. Robertshaw-Fulton Controls Company. Technical Bulletin RF-587 details the high sensitivity level controller which is said to detect and control changes in media level with precision.

81 Power Transmission Bulletin. T. B. Wood's Sons Co., 6 pp., ill. Covers company's complete line of sheaves, variable pitch sheaves, V-Belts, and flat belt pulleys.

82 Projection Lamp Guide. Westinghouse Lamp Division, Westinghouse Electric Corporation. 20 pp., ill. Reference chart is a quick reference for replacing projection lamps in motion picture projectors, and in slide, microfilm, stereo, and special projectors.

83 Proximeter. Kling Photo Corporation. Catalog sheet treats Proximeter close-up attachment for Baldessa cameras.

84 Pulse Transformers. PCA Electronics, Inc. 24 pp., ill. Designed to assist engineers in the application of pulse transformers, this booklet provides tables, charts, schematics on the characteristics and uses of pulse transformers.

85 Pulsed Magnetic Components. Levinthal Electronic Products, Inc. 4 pp., ill. New folder describes the company's services available for the production of pulse transformers, chokes, coil-core assemblies, etc. Constructions of pulse transformers and charging chokes are illustrated, and data is tabulated on nine types of transformer and five types of charging choke.

86 Punched Steel Grid Resistors. General Electric Company. Bulletin GEA-6858, 4 pp., ill. Bulletin describes GE's new line of mill-duty punched steel grid resistors to meet all AC and DC power resistor requirements.

87 Reciprocating Pumps. Union Carbide Corporation. 4 pp. Folder describes four pumps for use with liquified atmospheric gases and contains detailed information on the performance and specifications for two turbine-type and two immersed reciprocating pumps.

88 Recorders, Recording Controllers and Indicators. General Electric Company, Bulletin GEA-6792, 12 pp., ill. Publication describes features, contains application data and specifications, shows outline and mounting dimensions, and includes photographs of the above equipment.

89 Reduction in Label Costs. Weber Marking Systems. 4 pp., ill. This booklet illustrates and explains a new low-cost method for custom-printing labels and tags complete with product information. Booklet also tells how custom-printing saves hours of office work and eliminates label inventories and delays caused by out-of-stock labels.

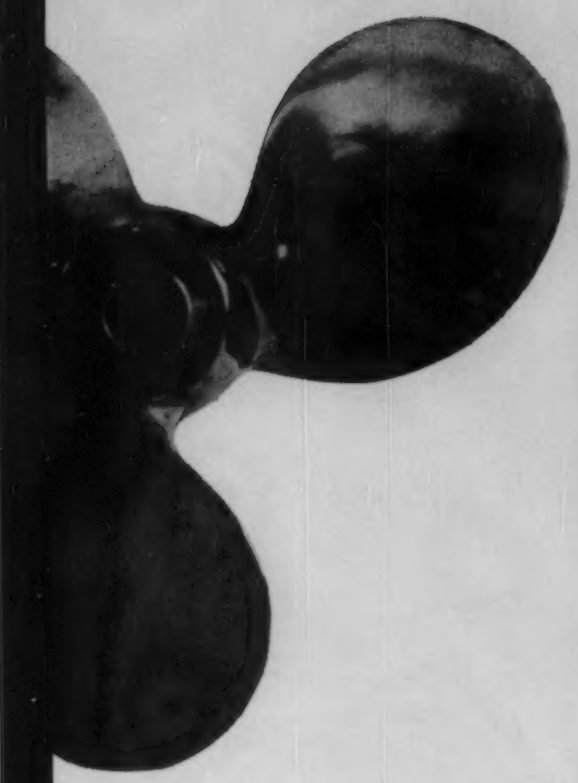
90 Re-usable Torque Locknut. National Machine Products Company. 4 pp., ill. Brochure describes one-piece re-usable prevailing torque locknut with complete engineering data and specifications.

91 Right-angle Gear Drives. Airborne Accessories Corp. 4 pp., ill. Catalog IA-58 shows solutions to a variety of industrial power transmission problems with standardized 90-degree power takeoffs.

92 Rotary Benders. Wallace Supplies Manufacturing Company. 32 pp., ill. Booklet gives an overall look at the line of Wallace Rotary bending machines and covers sixty years of development.

93 Rotary Vibrator Motor. General Electric Company. Bulletin GED-3756, 4 pp., ill. Describes new enclosed

(*Continued on Page* 93)



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Please send the items circled above.

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title or position.....

firm .....

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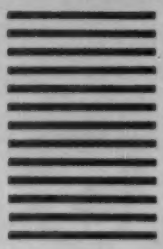

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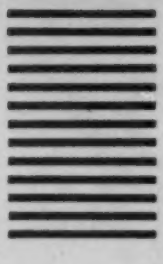

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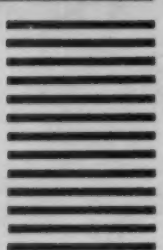

vibrator motors for light-and heavy-duty operation of vibrating chairs, beds, tables and pillow. Discusses motor features, illustrates various mounting arrangements, and contains performance data, outlined drawings and drawings.

94 Sealed Relays For Industrial Application. General Electric. 4 pp., ill. This bulletin offers manufacturers and users of industrial equipment up-to-date information on GE's line of miniaturized hermetically sealed relays. Specifications, optional features, performances data and ordering instructions are listed.

95 Self-Adhesive Wire Markers. W. H. Brady Company. 8 pp., ill. This folder describes 4,000 different self-adhesive wire markers including markers for wire identification conforming to NEMA specifications.

96 Solenoid Valves. Waterman Engineering Company. 12 pp., ill. Catalog 200 contains all models of the company's high-pressure solenoid valves for hydraulic power systems. Includes two- and three-way valves in AC and DC models.

97 Special Purpose Alloy Welded Tubing and Pipe. Alloy Tube Division, Carpenter Steel Company. Booklet covers the sizes, gages, finishes, chemical composition and mechanical and physical properties of high temperature, low expansion, and high permeability alloys used for tubing and pipe in the aircraft, missile, nuclear energy, and chemical fields. Data also includes fabrication characteristics and corrosion and oxidation resistance information.

98 Specific Gravity Tester. Fischer and Porter Company. 4 pp., diagrams. Specification Bulletin 14E1735 describes the company's in-line, hydrometer-type specific gravity tester.

99 Spray Decorating Equipment. Ill., data file. Includes electro-formed nickel and copper masks, mechanical and air operated clamps and pressure fixtures, automatic mask washers, and automatic spray decorating machine.

100 Submersible Motor. General Electric Company. Bulletin GEA-6853, 6 pp. Gives design and performance features of first oil-filled motor ever marketed as a complete unit for four-inch well applications. Contains motor ratings and dimension chart with cutaway view of the motor.

101 Teflon-Lined Pipe. Resistoflex. 4 pp., ill. Bulletin T-S-1A covers chemically inert, corrosion-proof Teflon-lined pipe and fittings. These pipes assure a dynamically balanced rate of thermal expansion-contraction between housing and linear, freeing them from the effects of thermal shock and fatigue stress.

102 Telephone Batteries. Exide Industrial Division, The Electric Storage Battery Company. 4 pp., ill. New bulletin includes quick-selector chart for picking out the right Exide telephone battery for any type of service equipment; batteries are tabulated according to ampere-hour ranges.

103 Terminals and Electronic Hardware. Lerco Electronics. 24 pp., ill. Catalog 30 features complete lines of molded and standard terminals, diode clips, taper pins, plugs and receptacles, handles, quintlock nuts, terminal boards, swaging tools, and miscellaneous hardware.

104 Textile Motors. General Electric Company. Bulletin GEA-6818, 8 pp., ill. A complete description of Tri-clad '55 motors in ratings from 1- 5 hp for use on looms, roving and spinning frames, and warping, twisting and carding machines.

Classified Advertisements

15¢ A WORD PER INSERTION, $5.00 MINIMUM PAYABLE IN ADVANCE. BOX ADDRESS COUNTS FIVE WORDS.

Positions Wanted

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GRADUATE INDUSTRIAL DESIGNER *with diversified product design experience in commercial, industrial and consumer products wishes position with future, challenge and responsibility. Power, with team work, to thrust product ideas into production. Age: 35, married with two children. Box ID-214,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22, New York.*

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HELEN HUTCHINS PERSONNEL AGENCY—*Specialist Professional, Sales, Administrative Personnel for Industrial, Architectural, Interior Designers; Home Furnishings Manufacturers, Distributors, Stores, Publications, etc. Helen Hutchins' long association with a leading industrial design organization insures intelligent screening. 767 Lexington Avenue, New York. TE 8-3070. By appointment.*

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Index to Advertisers

For Your Calendar

Through February 1. British Artist-Craftsmen at the National Collection of Fine Arts, Washington, D.C.

Through February 15. Wharton Esherick: a retrospective of his work in wood furniture and sculpture. Museum of Contemporary Crafts, New York.

Through February 22. 20th Century Design. An exhibition of the Museum of Modern Art's entire Design Collection, New York.

Through March 31. European Glass Design. Commercial Museum, Philadelphia.

January 21-23. Conference on plastic packaging materials, sponsored by the American Management Association, Hotel Biltmore, New York.

January 23-March 8. Ceramic International to celebrate the 20th anniversary of Ceramic National. Metropolitan Museum of Art, New York.

January 26-29. Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Bellevue-Stratford Hotel, Philadelphia.

January 26-29. The 10th annual Plant Maintenance and Engineering Show and Conference at the Public Auditorium, Cleveland.

January 27-30. Annual Technical Conference of the Society of Plastics Engineers, Hotel Commodore, New York.

February 1-6. Mid-winter general meeting of the American Institute of Electrical Engineers, Hotel Governor Clinton, New York.

February 3-5. Annual Technical and Management Conference of the Reinforced Plastics Division of the Society of the Plastics Industry. Edgewater Beach Hotel, Chicago.

February 6-7. Conference on package design education at the Museum of Modern Art guest house, New York, sponsored by the Package Designers Council.

February 9-11. American Management Association conference on the economics of packaging machinery, New York.

February 11-April 19. "Four New Buildings'" exhibit of models and photographs at the Museum of Modern Art, New York.

February 27-March 22. First exhibition of work by members of the York State Craftsmen. Albany Institute of History and Art, Albany, New York.

March 1-4. Second National Lighting Exposition, New York Coliseum.

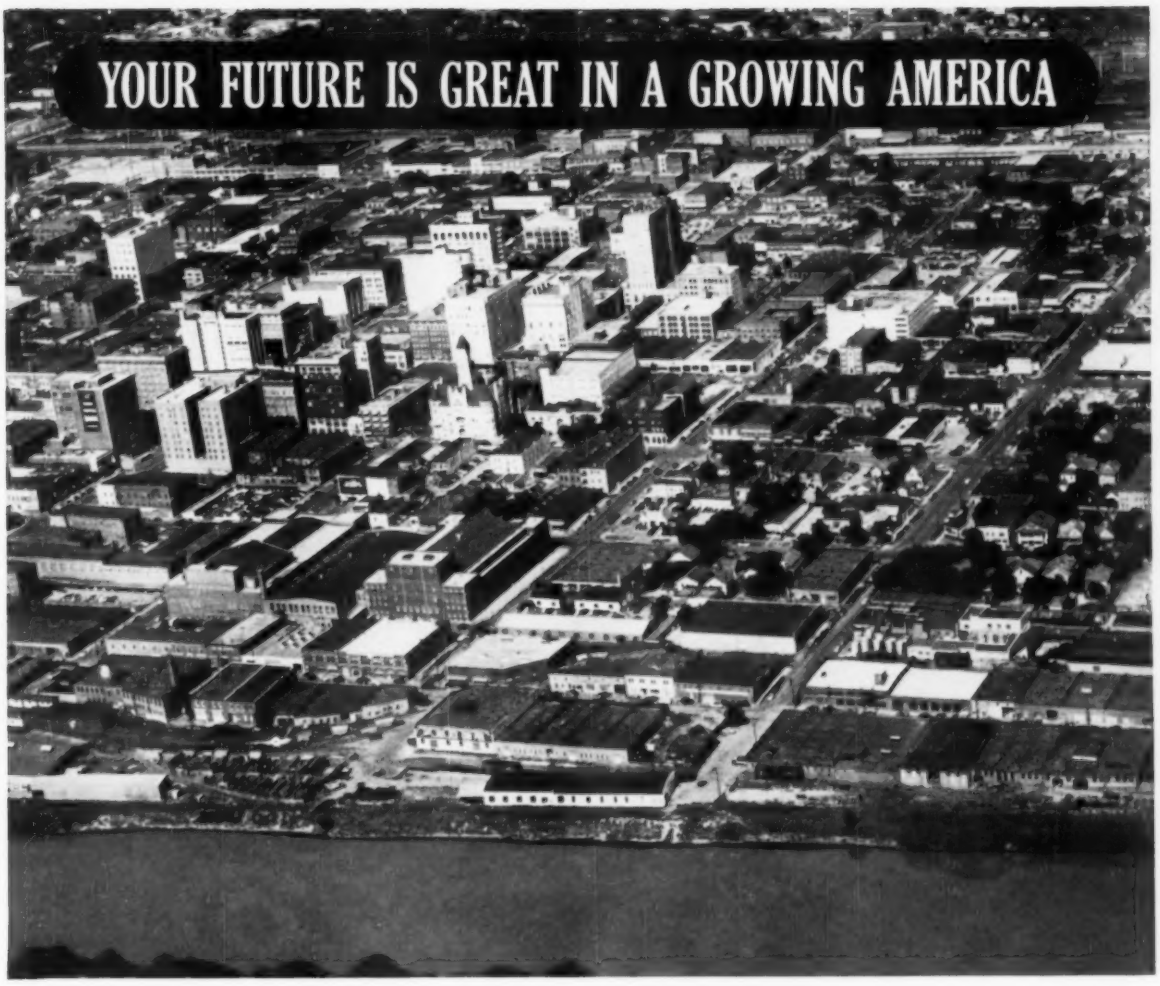
March 16-20. The 15th annual conference and show of the National Association of Corrosion Engineers. Hotel Sherman, Chicago.

March 23-26. Institute of Radio Engineers' annual exhibit at the New York Coliseum.

March 26. The 4th Packaging and Materials Handling Conference, sponsored by the Society of Packaging and Handling Engineers and The American Materials Handling Society, Stanford University, Palo Alto, California.

March 26. The 15th annual quality control clinic, sponsored by the Rochester Society for Quality Control. University of Rochester.

April 21-April 28. Europak 1959. European packaging fair to be held in the RAI buildings in Amsterdam.



THE CITY THAT DIDN'T EXIST A MONTH AGO

Every 30 days the U. S. adds as many new Americans as live in Norfolk, Va.—creating brand-new wants and needs which must be satisfied.

What does this mean to you? It means greater opportunities than ever before—in all fields. Home construction is expected to double by 1975. Power companies plan to increase output 250% in the next 20 years to provide the power for scores of new labor-saving devices. Clothing suppliers predict a one-third increase in 7 years.

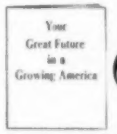
With 11,000 new citizen-consumers born every day, there's a new wave of opportunity coming.

7 BIG REASONS FOR CONFIDENCE IN AMERICA'S FUTURE

1. **More people** . . . Four million babies yearly. U. S. population has *doubled* in last 50 years! And our prosperity curve has always followed our population curve.
2. **More jobs** . . . Though employment in some areas has fallen off, there are *15 million* more jobs than in 1939—and there will be *22 million more* in 1975 than today.
3. **More income** . . . Family income after taxes is at an all-time high of $5300—is expected to pass $7000 by 1975.
4. **More production** . . . U. S. production *doubles* every 20 years. We will require millions more people to make, sell and distribute our products.
5. **More savings** . . . Individual savings are at highest level ever—*$340 billion*—a record amount available for spending.
6. **More research** . . . *$10 billion* spent each year will pay off in more jobs, better living, whole new industries.
7. **More needs** . . . In the next few years we will need *$500 billion* worth of schools, highways, homes, durable equipment. Meeting these needs will create new opportunities for everyone.

Add them up and you have the makings of another big upswing. Wise planners, builders and buyers will act *now* to get ready for it.

FREE! Send for this new 24-page illustrated booklet, "Your Great Future in a Growing America." Every American should know these facts. Drop a card today to: ADVERTISING COUNCIL, Box 10, Midtown Station, New York 18, N. Y.



(This space contributed as a public service by this magazine.)

FORECAST: There's a world of aluminum in the wonderful world of tomorrow... where devotion will find infinite expression in the ethereal beauty of aluminum... graceful aluminum that will inspire designs, textures, colors as numberless as the stars in the sky... as ageless as the Song of David. Aluminum Company of America, Pittsburgh.

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