



IBM MEANS "I BRING MASSACRE"

**Roaring at 10,000 mph,
this Intercontinental
Ballistics Missile can
destroy a city half a
world away in less
than one hour's time.**

By Martin Caidin

C-1.

Remember that designation. It's the code name of the world's most fantastic rocket weapon—a hypersonic glider capable of crossing an ocean at speeds up to 10,000 miles per hour!

More than ten years ago the Ordnance Department of the U. S. Army launched with the General Electric Company a new rocket research program dubbed Project Hermes, which has expanded into what is probably the world's



Piloted, the IBM is more than a weapon—it is the prototype of

greatest single concentrated attack on the myriad problems of rockets and guided missiles.

From Hermes' laboratory and field activities there have emerged new and powerful rocket motors of all sizes and shapes. Dangerous fuel combinations have been tamed and used on an operational scale. Hermes' scientists conducted the launching of a V-2 rocket from the deck of the U.S.S. *Midway*, then exploded in Operation Push-over another V-2 under the same conditions. Hermes' engineers handled all but one of the 68 V-2 rocket firings in this country. They shattered all rocket performance records when they sent a V-2 with a WAC Corporal thundering 252 miles above the earth at a speed of more than 5,000 miles per hour!

The G. E. scientific staffs amassed a tremendous backlog of data on missile development and firing. Now the most dazzling of all the Hermes' endeavors has come to light in the C-1.

C-1 is, simply, a design for a three-stage Intercontinental Ballistics Missile whose final step is a hypersonic glider with a range of thousands of miles.

Actually, the first physical stages of the C-1's development began more than five years ago in the test firing series known as Operation Bumper. This program, which involved the launching of two-stage rockets to unprecedented heights and speeds, created serious problems which at first baffled even Hermes' battery of engineers. To lick the problems they teamed up with scientists of the California Institute of Technology and the Douglas Aircraft Company.

The problems of launching successfully a two-stage liquid-fueled rocket had never before been encountered in practice. The first four launchings of a V-2, carrying in

its nose a slim WAC Corporal missile, were "successful failures." They indicated clearly to the General Electric engineers why the rockets misfired and disintegrated.

The Hermes staff then learned what had never before been known—how to start a rocket motor at heights exceeding 100,000 feet! At that altitude, where the WAC Corporal motor was to burst into flaming life, the fuel and the oxidizing agent in the Corporal was more prone to vaporize and explode with terrible force, than to burn normally.

What the G. E. engineers learned is secret. But Bumper No. Five soared 252 miles and reached 5,100 miles per hour. Bumper Nos. Six, Seven and Eight were experimental shots which tested in practice the horizontal flight separation of rockets at speeds of 3,000 miles per hour.

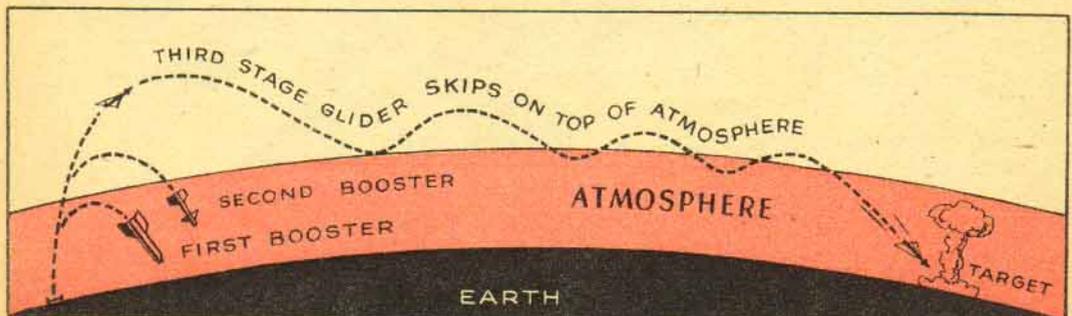
These latter experiments were the key to the successful testing of what will probably be the world's first Intercontinental Ballistics Missile—the C-1 hypersonic glider.

C-1 is a three-stage rocket; i.e., a missile of three separate parts, or stages. The first stage, also described as a first booster, will lift the ponderous weight of the intermediate stage (or second booster) and the hypersonic glider beyond the atmosphere and endow it with a speed of several thousand miles per hour.

High above the earth, already tilting from the vertical flight of the takeoff toward the curving horizon, the second stage motors will roar into life when the first booster's fuel tanks are empty. Then the empty first booster will be jettisoned. Already moving at many thousands of miles per hour, the second stage will send the glider higher into the atmosphere, adding to its constantly increasing velocity.

Finally, with both boosters falling back

Moving at thousands of miles per hour, the hypersonic glider "bounces upward," streaking across the top of the atmosphere until it hurtles into its objective at just above supersonic speed.



the world's first spaceship!

to earth, the motors of the third-stage glider begin to operate. More speed! And within soundless seconds the brilliant flames of the rocket motors give the glider a maximum speed of from 8,000 to 10,000 miles per hour!

The hypersonic glider, once its fuel is exhausted, continues to whip over the globe in a great, shallow curve. Finally, even the fantastic velocity of the glider succumbs to gravity and begins to diminish. The glider then starts its reluctant return to the atmosphere. But it is fitted with gracefully curving delta wings, and as the wings bite into the rarified gases of the lower stratosphere, the tremendous speed of the glider imparts great lifting force to these wings.

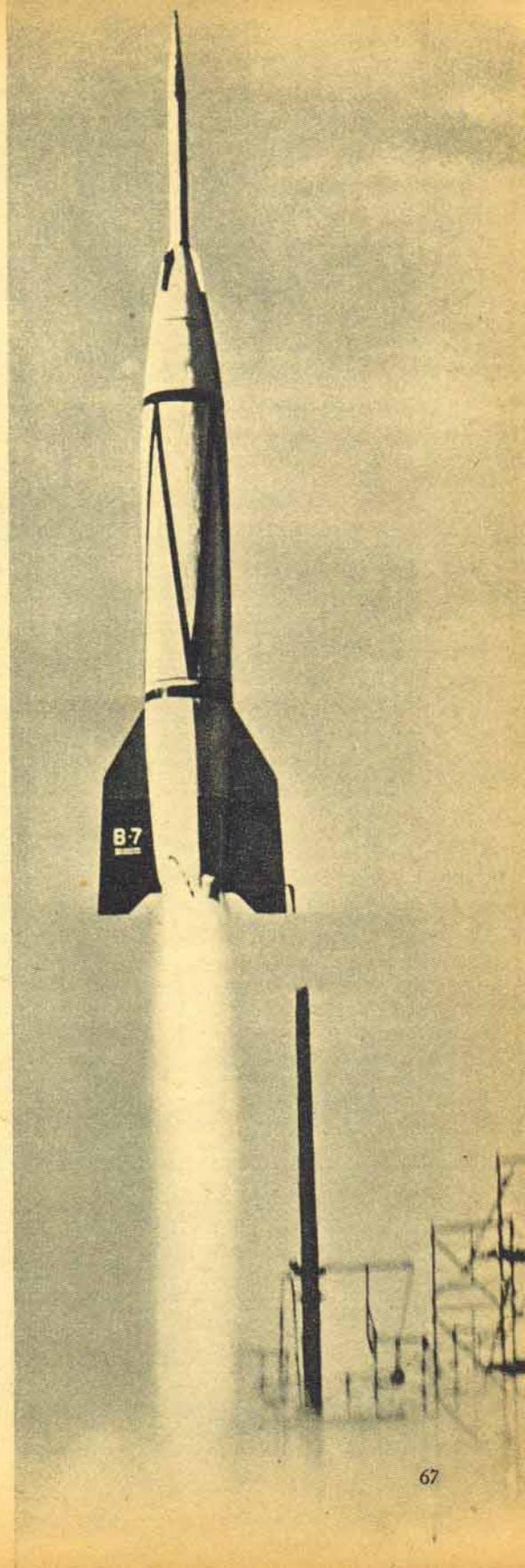
Miraculously, the glider, moving at thousands of miles per hour, "bounces" upward! Again the glider soars in its great shallow curve. Again the forward velocity drops, and the glider slides on its invisible curve to the waiting atmosphere. Silently, in the bitter cold of the upper atmosphere, the wings "grip" the air, heat up furiously and send the glider soaring upward.

The hypersonic glider, in effect, hurtles across the top of the atmosphere like some fantastic stone hurled by a giant across a pond. It skips across the earth on the tenuous matter of rarified gas! Each time the glider descends into the air, the friction of its passage through that air reduces the forward speed. Finally, nearing its destination, which is an enemy target halfway across the globe, the glider is down to just above supersonic speed when it hurtles into its objective.

This is no pipe-dream project. This is the C-1 of Project Hermes. This is the far future come true!

The C-1 project actually began many months before Hermes even existed. If any weapons project of World War II could truly be tagged with the word "fantastic," then it was the German rocket program at Peenemunde. Under the direction of Major-General Walter Dornberger, German scientists not only produced the well-known V-2 and other rockets but commenced the first of what they planned as a series of tests to produce an intercontinental missile—a [Continued on page 200]

Two-stage bumper rocket leaps skyward at one of the Army Ordnance's long-range proving grounds.



It's not only dangerous but it can ruin the dog's nose for hunting. As your car pushes through the air when traveling, it creates quite a vacuum in the rear. A dog in a propped-open trunk is subjected to the carbon monoxide fumes that are being sucked into the trunk from the exhaust pipe. It may not kill the dog but you can make book it will kill his nose for finding birds for some time. Why not throw one of your kids in the trunk and let the dog ride in the back seat? After all, the kid's no damn good on quail.

● *I read your article in the February '55 issue of MI about the use of magnum loads in a full choke gun. Is it safe to use these loads in an inexpensive American gun?*

Howard Swain
Flat Rock, Mich.

The manufacturers claim that these shells are safe to use in any good American gun in perfect condition. Naturally, with a gun that's years old and has old-fashioned Damascus or twist steel barrels, you'd stand an excellent chance of being elected Mr. Hamburger of 1955 if you use these shells. The manufacturers are referring to modern American guns in top shape.

● *You seem to be against detergent oil. Why?*

J. M.
Trenton, N. J.

Recently I was running some tests for a well-known oil company that specializes in detergent oil. During a lunch break the top vice-president of this company in charge of sales told me that his 1954 car was burning an excessive amount of oil, about a quart every 500 miles though the car only had 6,000 miles on it. Just for fun, and to give him the big needle, I told him the chances are it was because he was burning lousy oil in it. At this he got very pompous and told me he was using his company's high detergent premium oil exclusively. "That's what I mean," I told him, "you're using lousy oil." I told him to try using his cheapest oil without a detergent and his oil consumption would greatly improve. To my amazement, another v.p. of the company's Engineering Division backed me up and suggested that Mr. Sales and Promotion try it. I understand now, via the grapevine, that he did it and he's happy. He stopped burning oil.

This isn't the real reason I dislike detergent oil. I just think it's a lousy way to lubricate an engine. With a detergent, you keep the gook continuously circulating through the system until the filter is jammed, instead of letting it settle on the crankcase walls like the cake of a good old pipe where it will do

little if any harm, providing you change oil filters regularly. In addition, it also louses up natural carbon seals in the engine's hot spots—aw, hell, I just don't like it, as it was made for Featherbrain McGuinness and his stupid hydraulic valves and not for a real automobile engine.

● *How do you feel about tubeless tires?*

Ken Barnard
San Francisco, Cal.

I own two cars with tubeless tires now and to say they thrill me would be a lie. If the tire companies spent half as much time figuring out how to make their tires round and well-balanced as they do making these gutless doughnuts, the public would be getting a much better break. The off-round, out-of-balance tire situation is a disgrace. It is not only extremely dangerous at high cruising speeds but reflects, to me, the real insincerity of the tire companies. All this guff about being able to stop on a centipede is medicine show stuff to con the peasants. Just make 'em round, boys, and we'll all be a lot safer.

● *I have been reading your column for some time. Due to the fact that I have been unemployed for more than a year, I would appreciate it if you would tell me the least expensive way for me to get a reliable car.*

H. G.
Cleveland, Ohio

Steal one. But make sure it has a full tank of gas. •

I Bring Massacre

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missile which would cover 2,500 miles in 35 minutes!

The German V-2 is the father of Project Hermes' amazing C-1 three-stage hypersonic glider. The Bumper firings conducted by General Electric's engineers banished all doubts as to the operational practicability of multi-stage missiles and paved the way for the actual C-1 tests.

Will C-1 be a robot or will it be piloted? Security will not permit that question to be answered here. But we do know that either form is possible.

The unpiloted C-1 missile is, of course, a tremendous Intercontinental Ballistics Missile, designed to transport at hypersonic speed either atomic or hydrogen warheads to an enemy target.

The piloted C-1, however, is much more than a weapon.

It is actually the prototype of the world's first spaceship! •