



The R/C Guff during one of the classic "One tip assisted takeoffs," this one being at its last contest, the 1947 Nats near Minneapolis, Minnesota. Walt is launching, Bill (behind Walt) at the controls. After breaking a tie with Jim Walker, the Goods were awarded the coveted Roberts Trophy for the third time, thus retiring it permanently to them.

R/C GUFF, *The Life Story*

By DR. WALTER A. GOOD. . . The life history of the most famous R/C aircraft of all time, from its beginning in 1935 to its retirement in the Smithsonian Air and Space Museum in 1960, where it continues to be on display. It's also the story of the beginning of the R/C hobby as we know it today. Part One of a series.

• With the exception of a very small percentage of today's active radio control modelers, the actual heart of the hobby, the radio control system itself, is pretty well taken for granted. . . you buy the complete package in one box, take it home, plug in and connect the charger (or stick in a dozen AA pencils) and everything works. . . right out of the box. . . or even still in it. . . Murphy's law being about the only problem.

Fifty years ago, in the middle 30s, radio control was a term understood by only a few, about as familiar to the average in-

dividual as television was at the time. People maybe read about television (it didn't even have the nickname "TV" back then) in Popular Science, and occasionally saw a fictional movie about the future in which live pictures were transmitted by radio into a mysterious box, mostly the figment of some movie producer's imagination. And radio control was something strictly out of Buck Rogers, and limited to full-scale aircraft or land and sea vessels.

After World War II, and even after license-free Citizen's Band was established in 1953,

radio control modeling was something only available to the electronically inclined experimenter. Modelers bought parts here and there, mostly in radio parts supply stores, traded circuit ideas through the mail or followed occasional articles in the model magazines, built their own transmitters, receivers, and actuators, used gas tubes (no transistors around), big heavy dry cell batteries (no rechargeable nickel-cadmium cells existed), wound their own tuning coils, etc., everything from scratch.

The continuing series that begins in this

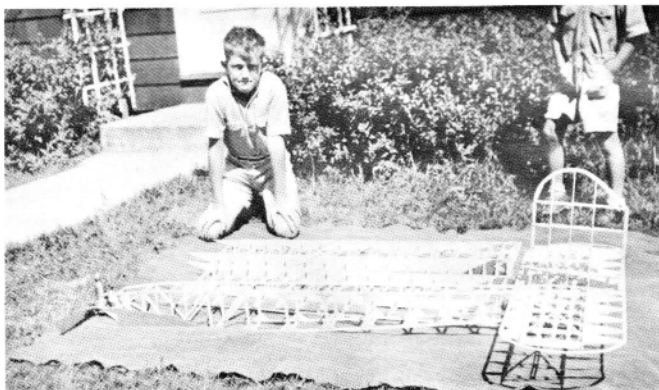


Photo 1.



Photo 2.

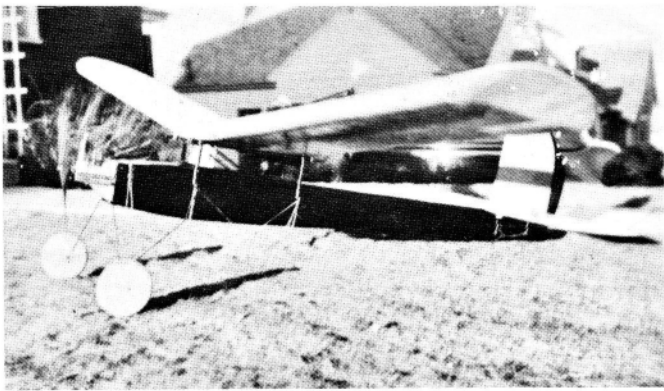


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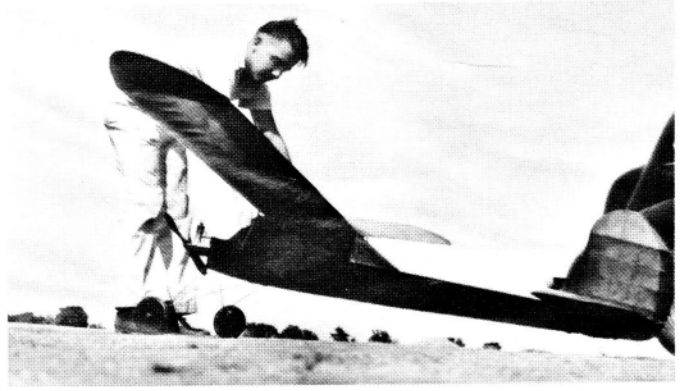


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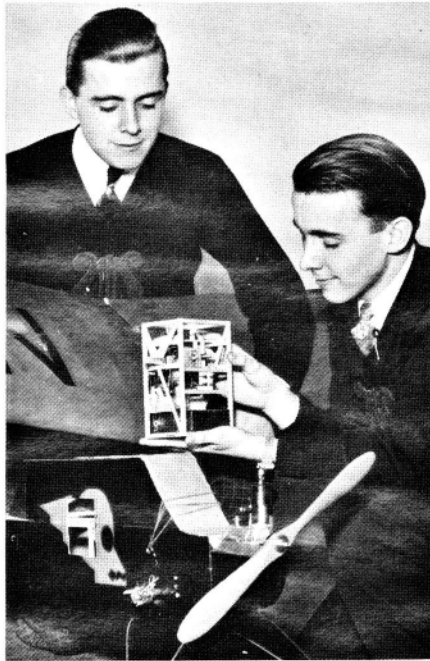


Photo 5.

issue is about the two Good brothers, exact twins Walt and Bill, who were a part of that small pioneering group that experimented, developed, and flew workable radio controlled model aircraft back in the mid-1930s. Ironically, even though it is a fact that they were not the first, the Good brothers could be in many ways compared to the Wright brothers (who also may not have been the first), because in their field, they were the ones who made the news, who captured the attention of the uninitiated public, and who lead the way so others, and eventually anyone, could share the satisfaction and the excitement of

remotely controlling a model aircraft, car, boat, robot, or anything else one could care to operate by radio.

This series came out of a conversation we had with Walt Good (with whom we first became acquainted in the mid-1950s), during the 1986 AMA Nationals in the nation's Number One Open Sauna, Lake Charles, Louisiana. We had been watching a modeler clean up and put away his version of Walt's and Bill's historic R/C Guff, somewhat modified and much heavier than the original. The conversation led to an agreement to publish the R/C Guff in *Model Builder*, pretty much following the original article in *Air Trails* magazine, and with accurate reproduction of the original plans, to be made available as full-size prints to the modeling public.

Part of the agreement was that Walt would provide some historic background on the model, along with a few original photos, to dress up the article. Well...! Give a modeler an inch and he'll take a mile, and in this case we will all benefit! When Walt started digging into his personal photo archives, he came up with an amazing number of fascinating and historic photos, nearly all of which have never been published, and each one helped him to recall bits of history that even he had long forgotten!

So... What started out as a single article featuring the construction of the original R/C Guff, will now be a series of articles taking several months, and featuring a photo/history of the R/C Guff, from its beginning as a modified KG free flight model (with R/C in mind) to its final resting place, as a part of aviation history, on display in the Smithsonian National Air and Space Museum, Washington, DC. The last installment (maybe two) in the series will indeed

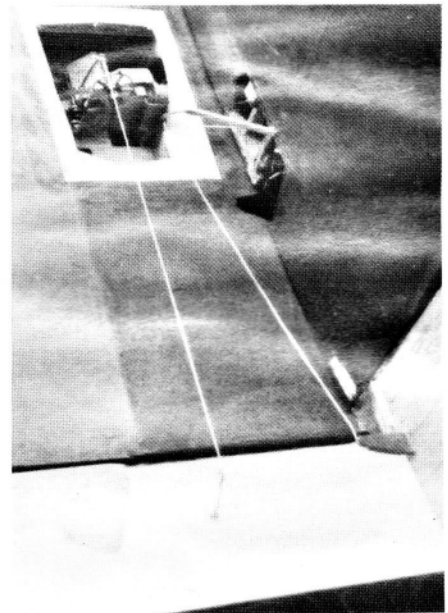


Photo 7.

be the construction article, with plans especially prepared by old timer model and ignition engine conversion expert, Phil Bernhardt. We know you're gonna enjoy it.—wcn

Presented here and in following issues is the story of the ups and downs of one of the first successful radio-controlled model airplanes in the USA.

The story begins in 1935 with a free flight gasoline engine powered model plane which is converted into an R/C model over several years of mixed successes and then proceeds to win four National Championships. Much of the early effort was during the pre-WWII Depression, so only a minimum of expenditure was available.



Photo 6.

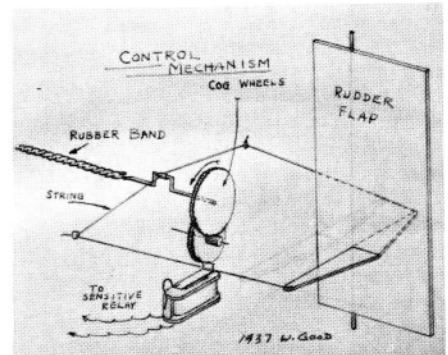


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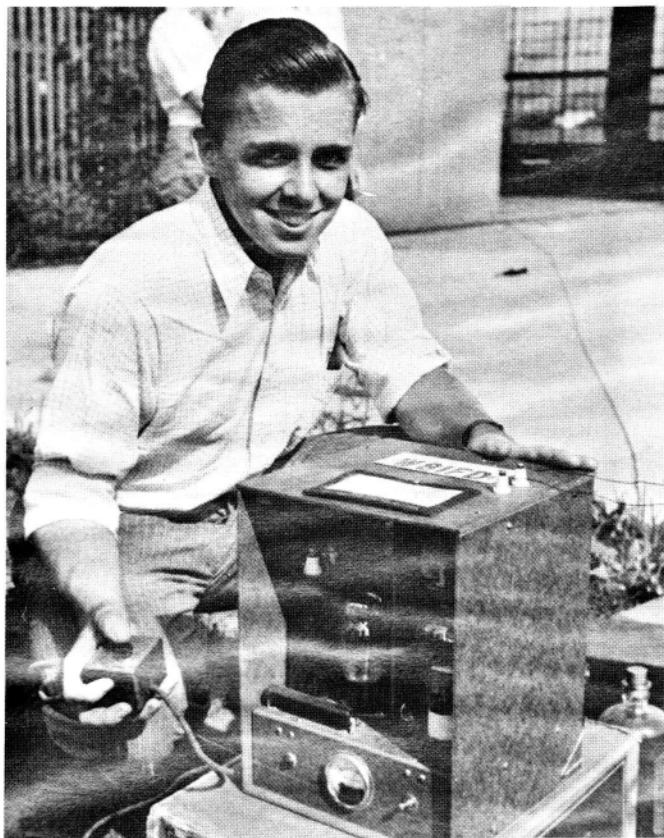


Photo 10.

Bill and I lived in Kalamazoo, Michigan, attended Kalamazoo College, and graduated in 1937 with degrees in Physics. We then went on to graduate schools for our PhDs. Bill's hobby was amateur radio and mine was model planes. So we combined our two hobbies to try to develop a working R/C model plane.

The photographs and the descriptions will lead the reader through our trials and tribulations.

PHOTO 1

My first gas model was started in June 1935 and followed the well-known Kovel/Grant KG-1 free flight design with only a few modifications. (*Plans for the original KG are available from John Pond Old Time Plan Service. wcn*)

Here, in the photo, the structures are ready for covering with sheet balsa and

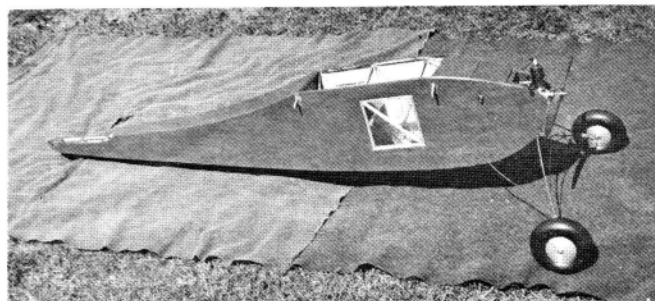


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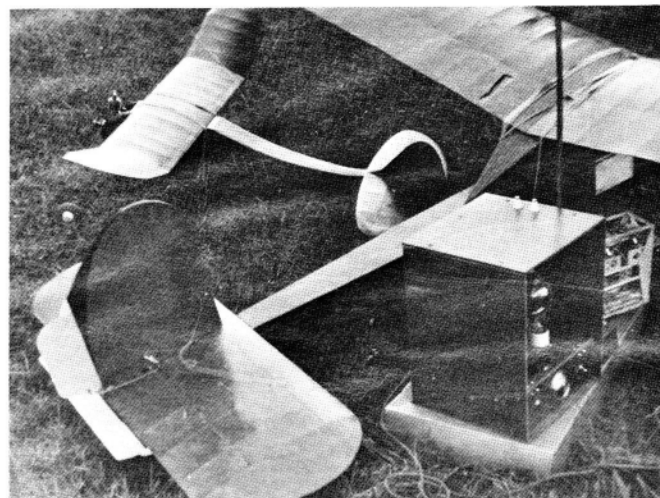


Photo 9.

bamboo paper. The antennas are already installed in the wing for future R/C! Neighborhood kids take a careful look.

PHOTO 2

Later in 1935. The first test glide without motor. . . just ballast in the nose.

PHOTO 3

The KG, doped and ready to fly as a free flight gas model with Brown Jr. engine and homemade propeller. Its weight was 5-1/2 pounds; and with 10 sq. ft. of wing area, it was a floater! The wing has an 8-foot span, 15-inch chord. The body was 6 feet long.

PHOTO 4

At the 1936 Detroit AMA Nats, flown in F/F Gas, it placed 36th out of 97 entries on a time of 4 minutes, 58 seconds! Note that a cabin has replaced the original wire "bird cage" wing mount to be ready to enclose future R/C gear.

The model was entered in several 1936 F/F meets. There were also many practice and trim flights. One flight went for 48 minutes, disappearing into a cumulus cloud. It finally came out over the edge of the cloud and landed in a field a mile from the takeoff! Big thrill!

PHOTO 5

It is now 1937, and we are seen with our first R/C receiver and the KG plane adapted for R/C rudder control. The one-tube receiver, relay, and batteries were mounted in the balsa cage. Radio gear was developed by Bill in the Kalamazoo College Physics

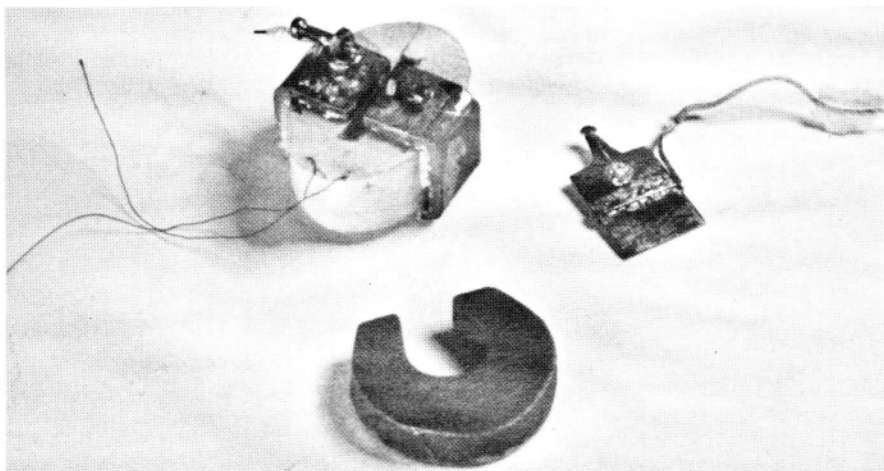


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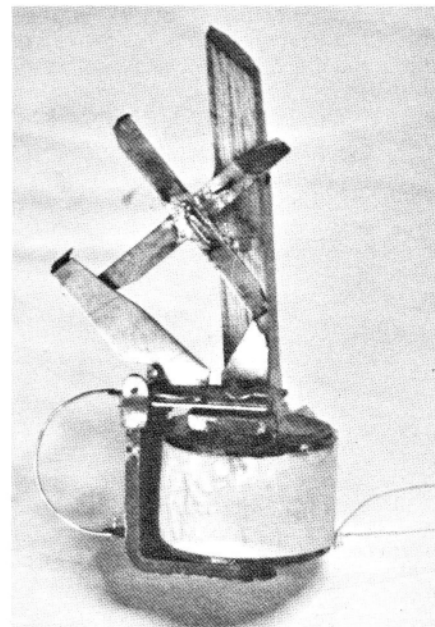


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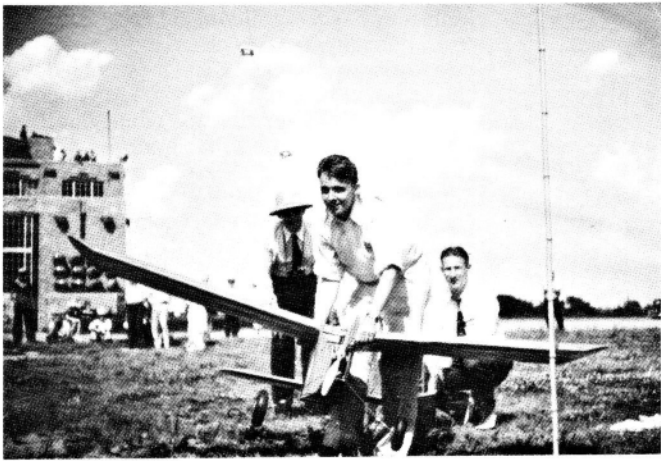


Photo 15.



Photo 14.



Photo 16.



Photo 17.

the next four years, sometimes with active light planes on the other runway!

SKETCH 6

This is the rudder control mechanism used in the May 1937 flights. A steady signal allowed the rubber band to turn gears, thus moving rudder until signal was turned off. Then the rudder remained in its last position. It worked, but then the plane turned very slowly, thank goodness!

PHOTO 7

In early June of 1937 I added an elevator mechanism while Bill made another receiver and modified the transmitter to work on two frequencies; one on 56 MHz for rudder, and the other on 60 MHz for elevator. These were in the five-meter Ham band. We reasoned that it would take both to win the first R/C Nats at Detroit. That assump-



Photo 18.

tion turned out to be wrong!

Six practice flights were made in June with both controls. They worked, but we found that the rudder was the important control; the elevator would be used only in an emergency.

PHOTO 8

On the road to the 1937 Detroit Nats; a

Continued on page 101

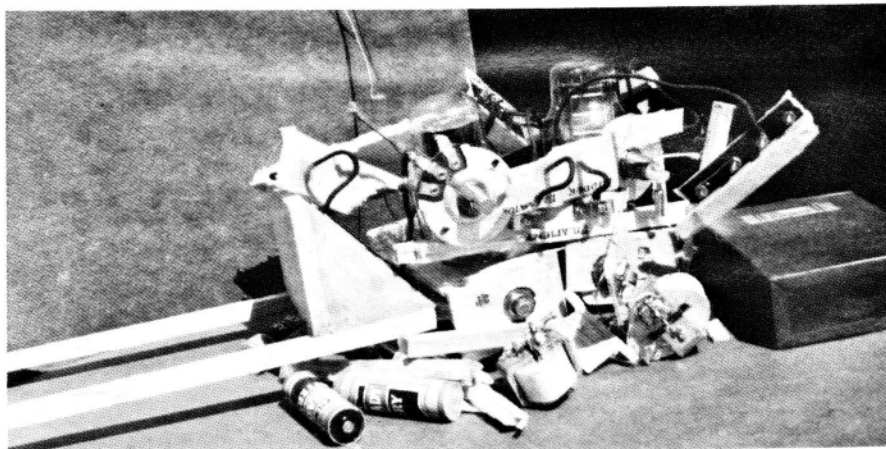


Photo 19.



Photo 20.

eliminated, and increased rpm are a direct result. See your hobby shop, or write: J'Tec, 164 School St., Daly City, California 94014.

* * *

Futaba's Attack 2NBR radio has servo-reverse switching and a battery eliminator circuit. The system comes with two S-28 servos and a BEC receiver. This two-channel stick transmitter system is available at your hobby dealer carrying Futaba products. •

Walt Good. . . Continued from page 25

very typical pre-war AMA Nationals conveyance, complete with a flat tire on the trailer! R/C plane was in the box on the roof of the car.

PHOTO 9

At the 1937 Nats, our plane is shown with the 100-watt transmitter and the two receivers (balsa cage on right). All gear was well demonstrated on the ground for the judges, but the rain arrived when it was our turn to fly, so we had no flight! We placed fourth on the basis of ground performance alone! Disappointed? Yes! Discouraged? No!

The small F/F gas model in the background is my version of a Thracy Petrides model which I later modified to become the Guff F/F model. It did well in 18 meets during 1938 and 1939, but that's another story.

PHOTO 10

Here is Bill with the 100-watt R/C transmitter used in both the 1937 and 1938 Nats. It required 110 volts AC from the power line which is seen snaking back through the hangar door. The control box in his hand shows one of the two push buttons; one for rudder, and one for elevator.

PHOTO 11

The R/C ship got a new (and final) fuselage design for 1938 to allow for easier access to the airborne radio gear, which at that stage needed constant care and adjustment. It was rare to make more than two flights without retuning the receivers or adjusting a relay. Note also the six-inch M & M Airwheels which replaced the original balsa ones.

PHOTO 12

A new type of balanced-armature sensitive relay was built to minimize engine vibration effects observed on earlier flights. This was a great improvement in control reliability under power.

PHOTO 13

A new rudder actuator based on the four-spoke escapement principle replaced the 1937 unit in order to gain specific rudder positions very quickly; full deflection in 1/10th of a second! The four-stop sequence was: (1) right rudder, (2) neutral, (3) left rudder, (4) neutral, (1) right rudder, (2) neutral, and so on. It weighed one ounce and was mounted in the base of the fin where it was linked directly to the tiller of the rudder as shown in Photo 14.

PHOTO 14

The rudder area was enlarged for 1938 and proved to be more effective than in 1937, but not dangerously so. The elevator actuator was omitted this time so we could concentrate on learning the rudder alone. The NC 7388 on the fin was not an AMA

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number, but was added in Bill's Ham language, where 73 meant "best regards" and 88 meant "love and kisses." We hoped it would bring good luck!

PHOTO 15

Now we are at the Detroit Wayne County Airport preparing for our first official R/C flight. From left to right: Dad Lester Good, me with plane, and Ham helper, Paul Kreilick. Bill was not able to attend either the 1937 or the 1938 Nats. We used the same 100-watt transmitter as before, and it was plugged into the 110 volts at the hangar in the background. We felt confident because we had made over 30 test flights with the new equipment, but the wind was quite strong at 20 mph and the other R/C entries were holding back. We decided to go!

PHOTO 16

I am signaling to Paul to press the transmitter button for the final radio check; all okay. I reminded Paul not to push the button again because the rudder sequence was at neutral and the next step would be full left. Besides, he had not been checked out as a pilot! (Note the old hangar building in the background. We believe it is the same one that can still be seen at the modern Detroit airport. If you fly there and rent a car, the courtesy shuttle bus takes you right by the old hangar on the way to the car rental parking lot. wcn)

PHOTO 17

Here is the actual launch with Ralph Lit-

ler on the left tip and me on the right. As soon as the plane was free, it climbed steeply into a stall and dropped the nose into a dive; all this time I was running full speed back to the transmitter. After picking up speed in the dive, the plane made another climb into a loop. It hit the ground at the bottom of the loop just as I reached the transmitter! Too late!

PHOTO 18

Sad Walt and friends looking at the damage which didn't appear too great at that moment, at least from this angle.

PHOTO 19

Then we explored the receiver department and found it in shambles, as shown in this photo. Two more lessons were learned the hard way; the pilot should end his launching task close to the stationary ground-based transmitter in order to grab the control box quickly, and in the future the receiver and its batteries should not be mounted in the same balsa cage! The cage was mounted in sponge rubber, but that was not good enough for that impact. Before it was flown again, the batteries were lashed to the fuselage floor.

PHOTO 20

All of the other R/C entries had opted not to fly because of the bad weather, so I was presented the first-place trophy, but it was not a very satisfying win. (See *Air Trails* January 1939.)

TO BE CONTINUED NEXT MONTH. •