FLYING ACES

APRIL 15¢

FLYING THE TRANS-ATLANTIC SHUTTLE

"THE SKELETON BARRAGE," AMAZING PHILIP STRANGE AIR MYSTERY
BUZZ BENSON, PHINEAS--THRILLING ARTICLE ON WAR ZEP RAID$
ATTENTION MODEL BUILDERS!
HERE'S A SURPRISE—
In this issue of FLYING ACES we've got an extra-special, chock-
full model section for you—with plans for EIGHT model planes.
Yes, our cover does say "six plans"—but at the last minute we
found a couple of more pages for you builders and put in the
extra ones. Hope you like them!

FLYING ACES

A. A. WYN, Editor
HERB POWELL, Managing Editor
VOLUME XXIII
APRIL, 1936
NUMBER 1

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The Skeleton Barrage

A drink befuddled Boche sprawled in a chair... an overturned bottle... a few upturned playing cards. Such was the scene sketched upon that curious paper Philip Strange held in his hand. True, the Chief of the Intelligence Service had dismissed it as meaningless. But something in that rough penciling caught Captain Strange’s eye, brought him hurriedly to phone the 73rd—and brought him in reply the blood-curdling screech of a tortured soul!

* * *

CHAPTER 1

THE SKETCH OF THE DRUNKEN BOCHE

In the brief silence, the examining-room clock ticked loudly. Captain Philip Strange gazed out through the balcony window, his mind on the problem Colonel Jordan had just presented. Beyond the G.H.Q. barracks, the little French town of Chaumont sweltered in the hot summer night. For a moment, the Intelligence ace absently watched the heat lightning which flashed over the distant foot-hills. Then he swung back to look at the curious sketch on the table.

“I still think, Colonel, that this is the key to the whole thing.”

“It’s only a fool picture of some drunken Boche,” snapped the G-2 chief. “Here’s our real problem: Why did this German pilot fly a captured Nieuport sixty miles into France, risking death as a spy, just to toss a camera into the Suize River?”

“The answer is, he didn’t,” said Strange.

“The hell he didn’t!” exploded Jordan. “I checked the report myself. At 7:15, just about an hour ago, the Nieuport appeared from the East, gliding toward Chaumont. The pilot switched off his motor to make a silent approach and landed in a small clearing close to the Suize. It was near dusk, but a road patrol saw him run to the bank, take a camera from under his flying-coat and throw it out into the river. They grabbed him, found he was wearing a German uniform, and brought him in. He won’t talk, and all we found on him were cigarettes, a Mauser pistol—and this blasted thing.”

Strange lit a cigarette, his eyes fixed thoughtfully on the sketch. It was drawn on cheap white paper. Someone had crumpled it up, but the penciling was not smeared. The scene was obviously a recreation room at a German post. On the left, a fat Boche sergeant was sprawled in a chair, an overturned bottle at his feet. His head lolled back and his eyes were closed in a drunken stupor. An unlighted cigar dangled from one corner of his mouth, and flies swarmed around his pudgy face.

In front of him was a card table, with three empty chairs. The players had thrown down their hands. Two cards at the third place were exposed, and all five of the drunken man’s cards were turned up on the table. Near a door at the right were two guffawing Germans. A third figure was partly obscured in shadow, but he seemed to be looking down at something in his left hand. His right was lifted, and on his index finger was perched a small bird the size of a sparrow.

“This sketch was in the prisoner’s flying-coat pocket. wasn’t it?” Strange asked abruptly.

The irritation on Jordan’s bulldog countenance changed to a puzzled look. “Yes, but how did you know?”

“The logical place,” Strange muttered. He was holding the sketch to the light. “How did he act when it was found?”

“Like any man if somebody found a worthless scrap in his pocket,” growled Jordan. “Forget that thing. I’m having the prisoner brought over here. Make him talk. Try hypnotism, or maybe that telepathy business of yours.”

Strange grinned. The hard-boiled G-2 chief had never liked or quite understood these two mental processes which at times he was able to call into play. Jordan always spoke as though telepathy were something to be turned on and off like a faucet.

“It’s hard to hypnotize a man who resists,” he said.

“And with telepathy, the minds have to be attuned. That’s seldom the case with enemies.”

“Well, see what you can do,” grunted Jordan. “They’ll
bring him over in about ten minutes. Drop in my office when you're through." He went out.

Strange entered the adjoining room, came back and placed a .32 revolver on the table. He turned the sketch around, adjusted the green-shaded lamp before him. He was ready.

Heat lightning still flashed over the foot-hills. Strange crossed to the long balcony windows, stepped outside. He stood there a moment, his tall figure poised with the unconscious ease of a trained fencer, his thoughts suddenly somber. It seemed an age since he had been free—hunting no man, and himself unhunted. He had been freer even in those dismal days when he had been exploited as a boy prodigy, as Broadway's "Mental Marvel." He had broken from that, roamed the world.

Freedom... then the war... Kelly Field, Isoudun, a few weeks at the Front. Then G-2 had discovered his ability to speak a dozen languages, and, through telepathy, he had found a German spy in G.H.Q. Overnight, he was an agent. The swift steps which led to his heading the air intelligence unit seemed incredible when he looked back. To all but a few in France, he was Captain John Neville, just another "Brass Hat." But to Germany, he was the hated "Brain-Devil" of G-2, with a price upon his head and a public hanging awaiting him in Berlin.

A faintly bitter smile twisted Strange's lips. He was turning to go inside when a rickety taxi wheezed to a stop below, in the space sacrosanct to the cars of high-ranking officers. A guard emerged belligerently from the lighted entry of G.H.Q., just as a lithe figure in khaki stepped from the rear. A gleam of amused expectancy came into Strange's eyes as he recognized Tom Jay, one of his twin aides. Both Tom and Noisy Jay had been in a magic and ventriloquism act before the war, and a trail of trouble and practical jokes usually marked their passage.

"Hey, ya can't park that ash-can here," snapped the guard as Tom closed the door.

"Sh-h!" said Tom, putting his finger to his lips. "You'll wake the general."

A loud snore seemed to emanate from the rear of the car. Tom turned to the driver, who was huddled over in the shadow of the front seat.

"Wait here, my good man. And remember, not a sound."

"Oui, oui, m'sieu," came the quavering reply.

The guard looked uncertainly at the car, followed Tom Jay to the entry. "Who'd ya say was in there?" he demanded sourly.

"Corporal," said Tom with dignity, "I perceive that you are new to G.H.Q. I shall overlook it this time—but remember, such things are not mentioned in polite society."

"But I ain't said anything like that," protested the non-com. "Ya must've misunderstood me."

"Ah, that's nice of you, child," said Tom sadly. "But I never drink." He bowed, vanished inside the building.

"Crazy as a cuckoo," muttered the guard, staring after him. A snore reverberated from within the ancient cab. It was followed by an unmistakable giggle. The corporal spun around, started for the curb. He halted, jaw sagging. The door had opened and there, apparently, was the man who had just gone into G.H.Q. At the non-com's exclamation, the man put his finger to his lips.

"Sh-h!" he said. "You'll wake the general."

A loud snore sounded as though from inside the car. As the befuddled guard watched,
Noisy Jay turned toward the driver’s seat.

“Wait here, my good man. And remember, not a sound.”

“Oui, oui, messie,” came the quavery answer, seemingly from the front of the car.

The dazed guard followed Noisy toward the building.

“Wait a minute, lieutenant,” he pleaded. “I gotta get this straight. Am I nuts, or didn’t you just come out of—?”

“Corporal,” said Noisy with dignity, “I perceive that you are new to G.H.Q. I shall overlook it this time—”

“Oh, Lord,” moaned the non-com, “that’s the same as you said before. But I seen you inside—”

“Ah, that’s nice of you, child,” said Noisy sadly. “But I never drink.” He bowed, disappeared. He had hardly vanished when once more a raucous snore sounded from the direction of the cab, followed by a loud giggle.

“Migawd,” said the guard hoarsely, “it’s gonna happen again.”

He stared fearfully toward the ancient machine. No one emerged. He took a halting step in that direction. There was another deep snore, broken with a grumbling sound, as though the sleeper had awakened.

“Stop, you fat old gee!” an indignant voice suddenly shrilled. “Non, non, non! I weel not kees you! Adolph, wake up—save me!”

“Sacre bleu!” a Gallic voice roared. “Nom de Dieu, so thees ees why you get me drunk! Henri, Alphonse—come, weel kees thee fat old diable!”

“Help! Help!” bawled another voice, against a volley of French oaths.

The corporal dashed to the car, yanking his gun from its holster. He jerked open the door, tottered back.

“Oh, Lord,” he groaned, “I’m crazy as a loon. There ain’t even any driver!”

He turned and staggered into the old barracks. Strange chuckled, looked toward the second-floor window above the entry. The Jay twins, convulsed with mirth, were just drawing in their heads. He called across to them, and in a few moments they came into the examining room, still snickering.

“If you boys stole that car,” he said, “don’t expect me to fix it with the gendarmes again.”

“We just borrowed it,” grinned Noisy. “I didn’t like that smart corporal’s looks, and I thought we’d better slap him down before he knew there were two of us.”

“Well, in case you’ve forgotten,” Strange said dryly, “there’s a war going on. And I can use you two right now.”

He had barely finished explaining when marching feet sounded outside. The Jays went out as the squad entered. The prisoner proved to be an Uber-Leutnant, a thickset man about thirty, with a close-shaved head and a sullen face. Strange could feel a sudden tension in the atmosphere the instant the man entered. He told the guards to wait in the hall, motioned the prisoner to a chair. The German shook his head, also refused a proffered cigarette.

Strange sat down, lit a cigarette, left the metal case open on the table. Not a word had been spoken, and he could see that the man was getting nervous. He moved his foot under the table, pressed a hidden button. The phone buzzer rasped, and the prisoner started. Strange reached for the phone.

“Standing by on signal,” came the low voice of a G-2 operator. Strange saw the German’s eyes dart toward the clock, a quick, fearful glance.

“Good,” he said into the phone, “that proves we’re on the right trail. Let’s hear the rest.”

He kept the phone at his ear, though no one spoke. In the mirrored surface of his cigarette case he could see the prisoner gazing at the sketch.

A puzzled look came into the man’s face. Suddenly he stiffened, took a convulsive step forward. As Strange turned, he saw that all the color had gone out of the German’s cheeks. The man’s look of consternation changed to furious purpose. With a tigerish spring, he snatched up the .32, jammed it against the G-2 ace’s heart.

“Put down the telephone!” he said in a harsh whisper. “One word, and I’ll kill you.”

Strange obeyed. Under the table, his foot touched the button, twice.

“Stand up!” rasped the German. “Back over there by—”

Simultaneously, the doors of the two adjoining rooms flew open. In each doorway was a Jay twin, with a pistol in his hand. The German gave a cry of rage, lifted the gun.

“Drop it!” snapped Tom Jay.

The man wildly pulled the trigger. Flame jetted from the muzzle, and the report boomed in the room—but Tom Jay did not fall.

“Schwein!” the German screeched. “Why don’t you die?”

The revolverblastedagain. In the same moment the door to the hall burst open. Two of the guard squad leaped in, .45’s drawn. The prisoner whimpered, gun smoking.

“Hold it!” cried Strange, but he was too late. One of the guards fired almost on the instant. The heavy slug spun the German around, sent him crashing back against the balcony window. He slid down with a gasping cry, was still. Strange looked accusingly at the Jays.

“I thought Tom warned the squad,” mumbled Noisy.

“He must’ve thought—”

“Well, it’s too late now,” Strange said grimly. He gestured to the staring doughboys. “Carry the body downstairs. Tell the guard officer Captain Neville will explain.”

Colonel Jordan pushed through the crowd at the entrance, closed the door as the dead man was taken out. Strange glumly explained the unintended result of his blank cartridge trick on the Boche.

“Too bad,” grunted Jordan, “but he’d have been shot, anyway. Did he talk?”

“Only by action.” Strange sat down, hastily ran his eyes over the sketch. “But he proved this is a message from an Allied agent in Germany.”

“And the pilot was just playing mail-man,” said the G-2 chief sarcastically. “He was going to land here, anyhow—”

“He was forced down,” snapped Strange. “He landed near the river to get rid of something hidden in that camera—probably a message to a Boche agent near here.”

“You’re guessing,” retorted Jordan.

“It all fits,” Strange replied shortly. “I’ll bet you a hundred francs you’ll find an empty tank and a ‘fixed’ fuel gauge in that Nieuport.”

“Even so, it doesn’t prove anything about this goofy picture,” growled Jordan.

“The prisoner didn’t even recognize it,” Strange argued. “That means somebody put it into his pocket, after making sure he’d be forced down in France. The Germans must be up to something desperate, for the prisoner turned pale when he realized the meaning of the sketch.”

“Why didn’t this agent write his message in secret
ink?” demanded Jordan. “It would look like a bit of waste paper—and naturally we’d test anything found on a captured splicer.”

“He probably couldn’t write unobserved,” Strange said quickly. His green eyes were on the cards shown in the picture. “He could draw this silly looking sketch in front of a dozen Heinies, and they would suspect nothing.”

“Maybe you’re right,” grunted Jordan, impressed by Strange’s logic. “But what the devil does it mean?” Strange was silent a moment, while the Jay twins and Jordan peered over his shoulder.

“The clock hands show exactly nine,” he said half to himself. “That and the cards are the key ... the sergeant’s hand—ace of spades—must mean disaster . . . the seven and three of clubs, the ace and nine of hearts. . . . That pendulum tip is a tiny arrow pointing in between the three of clubs and the ace of hearts. Must be to indicate a separation.” Strange started, cast a look at the examining-room clock.

“What is it?” rasped the G-2 chief.

“Something’s going to happen in just three minutes!” Strange exclaimed tensely. “That’s why the German was so nervous.”

“How do you know this?” Jordan barked.

“Count the ace as the figure ‘1’ and you have the one and nine of hearts—the figure ‘19.’ This is the nineteenth. The pendulum was slanted to lead us from the hour to the date. Something ominous to happen at nine o’clock on the nineteenth—something at a place indicated by the seven and three of clubs”—

Strange snapped his fingers, whirled to the phone. “Get the C.O., 73rd Pursuit—emergency!” He flung around to the others. “The 73rd’s insignia is a shamrock—and a club represents the same kind of a three-leaf clover.”

“You’ve hit it!” exclaimed Tom Jay. “But what about the other things in the picture?”

“They may be only background.” Strange frowned at the sketch for a few moments. The receiver clicked.

“Major Kelly,” said a voice with an Irish accent. “Captain Neville, G.H.Q.” Strange said hastily. “Has anything gone wrong there?”

“Wrong?” retorted the Irishman. “Now don’t tell me you can hear a bit of a binge clear down.”

The last word was sharply cut off by an exclamation from some one near the major. The next instant Strange heard a faint, eerie cry. It rose swiftly, drowning a chorus of excited voices at the 73rd. A chill went up Strange’s back as that weird, hellish scream echoed over the wire. He jerked the receiver from his ear. In the hushed room, the sound swelled to an awful, blood-curdling cry, like the screech of a tortured soul. Then sudden, dead silence.

Strange caught up the phone. “Kelly!” he said balefully. “Kelly—what happened?”

Not a sound came back. As he slowly put down the phone he saw the taut faces of Colonel Jordan and the Jays. As though drawn by a magnet, his eyes went to the clock on the wall. The hands stood exactly at nine.

CHAPTER II

THE SKELETON STRIKES

“WHAT in Heaven’s name could that have been?” Jordan whispered.

“I don’t know,” Strange said grimly. “It was the most fiendish sound I’ve ever heard.” He rattled the phone cradle. ”Operator! Get Message Center—tell them G-2 wants the nearest station to the 73rd—priority call.”

In a minute the man called back.

“That whole area’s dead, sir!” he said excitedly.

“Message Center’s gone crazy—they can’t even get through by wireless.”

Strange jumped to his feet. “I can fly there in twenty-five minutes,” he said to Jordan after a swift explanation. He started for the door.

“Take Tom Jay with you,” ordered Jordan. “You may need him to rush back some word. Contact me through Third Corps as soon as possible when you find what’s happened.”

Seven minutes later a G.H.Q. car roared through the gate at Hanlon Field and stopped with tires squealing. Strange had called ahead, and two Spads were idling on the line. He gave Tom Jay brief instructions as they ran to the ships.

“If you lose me in the dark, head for the 73rd. Find out what you can, then make for Third Corps.”

“Okay, Phil,” Tom said hastily.

Strange clamped in, snapped his belt. He sent the Spad roaring up into the night, exhaust stacks spitting red and blue flames in the darkness. The ceiling at dusk, he recalled, had been about five thousand feet. He leveled off at three thousand. The ship’s lights were out that night.

The ship that had gone from Doulaincourt, while he flew mechanically, his mind on the riddle of the 73rd.

What lay back of that abrupt sinister silence? Not just a squadron, but the surrounding area silent, too—That was ominous. And that fearful scream—what could have made that hellish sound? It was more than a scream of terror. There had been something ghoulish, diabolically furious, in that cry.

The lights of Poissons swept beneath. Strange checked them subconsciously, his thoughts now racing over the details of the mysterious sketch. There had been two more cards face up—the Jack and the Queen of Diamonds. His eyes narrowed, but though he feverishly recalled every squadron insignia he could find no connection. It might have been merely background.

The dash-clock hands stood at 9:28 as he crossed the Marne. He looked around for the first time, but failed to see the exhaust flare from Tom Jay’s engine. Probably Tom was within a mile of him. He turned back, peered ahead into the gloom. He was almost over the drome of the 45th Pursuit, just seventeen miles from the 73rd. He should soon be able to see through the ground haze . . .

Twinkling lights below made him glance down again. Flares winked up, red dots from the blackness of the field. A ship was taking off. Perhaps the 45th was also investigating that mysterious silence in the North.

For the second time that evening, he felt a premonition of evil. The queer sequence of events flashed through his mind. Once more he seemed to hear that weird scream—

HE whirled around, stared upward. The sound was real! A blurred something was shrieking down from the clouds!

His hand clenched the trips tight against the stick, and tracer streaks shot from the panting Vickers. He kicked the ship’s nose around and up in a hasty chandelle. A fiery shape plummeted out of the darkness above, leaving behind it a trail of thick smoke. For an instant more, it was only a blur, with a hint of something gruesome in its vague outlines. Then in horrified amazement he saw what it was.

(Continued on page 58)
Snapshots of the War

The British Royal Naval Air Service liked the French Nieuports, and they made grand use of them against the Jerry Zeppelins along the East Coast. Here's one of their Nieuport 12's, which was much like the 24's except for the depth of the engine cowel. This 12 job used the 95 Le Rhone motor.

Here's Frank Baylies, the New Bedford, Mass., boy who became one of America's greatest aces. He scored 12 confirmed victories before he "went West" in June 1918—but they say he should have been credited with more than 20. This picture, showing Frank in a Nieuport, was sent to us by Joseph Walsh, one of our New Bedford P.A.C.'s, who received it from Mrs. Baylies, Frank's mother.

A new use for wreckage! After the souvenir hunters got through with this Heinkel two-seater brought down by a British airman, a Canadian infantryman decided to dry his laundry on it. Wise, if the engine was still warm? (Canadian Official War Photograph.)

Our idea of two swell fellows—Col. Billy Barker, Canadian Ace, and his royal passenger, the Prince of Wales, now King Edward VIII. Colonel Barker won the V.C. for taking on 59 Germans single handed and downing 1 of them. Note that he's got one arm in a sling. (Canadian Official War Photograph.)

This British D.H.-2 Scout has just suffered a forced landing near a communication trench in the back area near Pozieres. Its undercarriage has been neatly wiped off, but we presume they got it mounted again later in the day and "carried on." (Canadian Official War Photograph.)

The grim side of war is amply portrayed in this wreckage of a Handley-Page bomber downed in Germany. It was a machine from Squadron 214, an outfit that had a fine night-bombing record. If you look carefully, you may see the hand of the dead pilot showing through the wreckage near the center of the picture.
The most difficult stunt in the book is—to fly in a straight line from one place to another.

For instance, here is Denver.

Our ship has a cruising speed of one hundred miles per hour, so we swing a hundred mile circle around Denver. We can fly anywhere within that hundred mile radius in one hour—providing there is no wind.

So—At 10 o'clock A.M., we take off at Denver. At 11 o'clock we fly over Greeley which we know is 100 miles north of Denver. We have been flying one hour and have come one hundred miles or half the distance to Cheyenne. Up to now—with no wind—we have "made good" our course in another hour or at 12 o'clock we should be in Cheyenne. At 11:30 we should pass Ryan's Ranch, that is dead reckoning.

Now it is one o'clock. We are up in Cheyenne and want to fly back to Denver. A wind has risen out of due north—the velocity of this wind is twenty miles per hour. This tail wind increases our ground speed 20 miles per hour—or the cruising speed of the ship, plus the velocity of the wind.

If flying dead into the wind—we subtract the wind velocity from the cruising speed of the ship—in this case it would be 100 m.p.h. minus 20 m.p.h. (wind) which is 80 m.p.h. ground speed.

It is easy to add tailwinds or subtract headwinds but a side wind tends to sweep us off the course—so we must "navigate" in order to fly in a straight line. See next month's lesson.

Cheyenne
Ryan's Ranch
Greeley
Denver
Palmer Lake
Colorado Springs
Pueblo

Cheyenne
Ryan's Ranch
Greeley
Denver
Palmer Lake
Colorado Springs
Pueblo
Gripping Exploits of
The Zeppelin Raiders

By Robert H. Rankin
Formerly with the Fokker Aircraft Corporation

"Z e p p e l i n"! The mere mention of that name flashes dramatic pictures in our mind’s eye. We see huge, cigar-shaped forms slipping almost noiselessly through the clouds over the sleeping country-side of war-time England. Suddenly London itself stretches below and alert observers in the darkened control car of the titan ship “spot” a key target within the great city. Signal lights flash on instrument boards, the night-rader noses lower, breaks through the clouds as navigation and bombing officers make quick calculations. Then the men at the bombing stations trip their toggles—and tons of explosives go screaming earthward to wreak death and destruction.

But now the probing fingers of searchlights have found the aerial monster, and hell breaks loose in the heavens as the anti-aircraft guns begin to fling their defensive steel into the air. Into the air rush planes of the Home Defense—and the dirigible quickly seeks altitude, turns homeward, seeking the aid of a friendly tail-wind to speed its flight across the Channel to safety in Germany.

Certainly, the exploits of the wartime Zeppelins formed one of the most gripping chapters in the history of aerial operations during the Great War. These huge craft flew millions of miles on bombing raids in conjunction with the battle fleet, on patrol duty, and in reconnaissance and mine-sweeping operations. Patrols were flown over the stormy North Sea almost every hour of the war, indicating the great confidence placed by the Imperial German Navy in the ability of the airships. Decidedly, it was no small achievement when Zeppelin observations saved the German High Seas Fleet at the Battle of Jutland, in addition to having aided their cruiser squadron in the Yarmouth raid and having been instrumental in the sinking of the Nottingham and the Palmouth.

Yes, the story of the raiders is one of thrills, and most certainly of danger, too—for all of the Zeppelins were not up to date, and the press of conflict required that the German High Command use whatever craft they had at hand. Thus, crews were often ordered out on missions that were much too difficult for their craft. In addition to this, it was next to impossible for the Germans to get accurate indications of the prevailing weather conditions over the enemy territory, consequently they had to resort to guess work in planning their raids and patrols. The Zeppelin commanders prayed constantly for favorable winds and weather, but just as often as not, everything would be adverse and they would be almost helpless as far as getting back to Germany was concerned.

Enough of that, however. Let us turn back the pages of the book of time and see at first hand some of these raids as they developed.

It is an October midnight in the year 1917. A fleet of eleven raiders has just successfully completed their bombing mission and have turned to hurry homeward.

L 70. The Mightiest Air Raider of the War—Three Tons of Bombs Could Be Carried. A Distance of 8,000 Miles—Seven Maybach Engines Were Carried, Two in the Forward Gondola, Giving a Total of 2,100 H.P.—Brought Down Aug. 1918 by British Naval Forces, Over North Sea.

This diagram shows the layout of the L-70, most formidable of all the Fatherland’s monster raiders. It carried a crew of 30 and was capable of a flight duration of 55 hrs, at full speed or 177 hrs. cruising. Built in 1918, it was brought down in August of the same year by British naval forces operating in the North Sea.
Here's a rare photograph of the "Schwaben," one of the forerunners of the wartime Zeppelins. It was built 'way back in the summer of 1911—which will probably surprise you, for that cabin-in-the-hull construction gives it a rather modern look. With its three 145-h.p. engines, this 490-ft. ship had a maximum speed of only 43 m.p.h. The "Schwaben" came to an unfortunate end in 1912 when it burned after an explosion which killed 37 of its passengers and crew. But in its comparatively short life, the craft was successfully flown on a scheduled run and carried 4,354 passengers in a total of 218 flights.

lest the dawn find them over enemy territory. Five of the craft have been somewhat late in performing their mission, however, and they become separated from the rest of the fleet. High up in the heavens they streak across the Channel toward Germany.

Suddenly, the waves below them begin to lash higher and higher. The clouds scurry rapidly across the sky. Thunder booms. The sheet lightning plays about the hurrying craft. It seems that the gods who rule the upper air are angry with these humans for their work of the night. Then a terrible storm breaks in all its fury and there is worried concern aboard the Zeppelins, for four of them are under the command of rather inexperienced men. They try vainly to get above the storm, then seeing that they can not, they turn eastward with the hope that with the aid of the wind they will be able to keep a compass course that will take them over the North Sea to the Fatherland. But the wind is angry with them, too, and they are being blown southward—ever southward. At their high altitude it is bitter cold and their raiding craft have no comforts. But they must bear their suffering as best they may.

Finally the night passes and a cold dreary dawn finds them far back of the French lines. Of the group of five, the L-49 and L-46 are cruising helplessly. The gauges mocking show the flight officers that the fuel is all but exhausted. And a Zeppelin without fuel is as helpless as a fish out of water, for without its engines it can not be steered or controlled. Still the winds hold from the north, although officers and crew alike pray that it will shift to the east. Soon the fuel will be gone and unless they land they will be at the mercy of the wind even more than they are now. For these two ships there is but one thing to do—valve the gas and descend. Yes, it will mean capture, but that is much better than aimlessly drifting with every gun in the sector taking pot shots at them.

Eventually, the L-45 noses down and comes to rest in a sparsely settled district. As soon as the ship has touched the ground, the crew have fired it, and as they and the officers hurry to shelter from the intense heat, the proud L-45 goes up in a burst of roaring flame.

The L-49 is not so fortunate. It is forced down in a thickly settled section at Bourbonne les Bains and every man is captured before they can destroy the ship—and worst of all, to the great dismay of the commander, code books, log book, charts and plans are captured before he can get rid of them. (So it was that copies of them were made and distributed to each of the Allied nations.)

(Continued on page 87)

After the L-49 was forced down at Bourbonne les Bains, France, portions of it were put on display. As can be seen, this "power egg" gondola taken from the great craft has been considerably damaged, partly from shell fire, and partly, no doubt, by the crew's attempt to destroy it after the ship landed.
Flying the Trans-Atlantic Shuttle

THRILLING STORY BEHIND THIS MONTH'S COVER

By C. B. Mayshark

ALTHOUGH the art of aviation is today making great strides forward, flying, like air conditioning and television, will not enjoy its real "arrival" until tomorrow. True, the present generation is placing more and more emphasis on aeronautic progress, but the man in the street is still somewhat hampered by a kind of Nineteenth Century transportation hangover. His traditions tend to make him feel a lot happier on the ground. But even so, the speed of aero development is phenomenal.

It is only a few short years since Lindbergh made his immortal flight across the grey wastes of the Atlantic. For completing that initial scheduled air trip to Europe—we say "scheduled" because he arrived non-stop at his chosen destination—he was hailed as a Twentieth Century Christopher Columbus. He was lauded as being years ahead of the rest of us.

But now we suddenly find that he was not so many years ahead—only about ten, it now appears. For already plans are being laid for regular passenger and mail service between North America and Europe via the air lanes. The launching of this service will constitute the dawn of that tomorrow we spoke of above.

Giant flying boats will soon ply East and West, transporting passengers over three thousand miles of water at speeds undreamed of thirty-five years ago. Steamers on the water below will look as if they are going backwards. Those who make the trip will have just about enough time to enjoy a detective novel and indulge in a rubber or so of bridge before they disembark at their destination, whether it be New York, London, or Paris. Businessmen will save valuable hours—indeed, valuable days. Much money will be saved by the commercial world. Best of all, a more neighborly spirit will come to exist between the two continents.

And so it can be seen that in spite of that oft-repeated warning that "speed will kill us all," we are going ahead. Many of the old stick-in-the-muds, in fact, are now coming over to our side; but still others will not give way. "You're fools," they tell us, pointing a trembling finger in our direction. "God gave us feet as a means of locomotion," they say, "and He gave us good, solid brown earth on which to walk—so why in the name of all that's sensible don't we use them and stop all this monkey business of tearing around the heavens in fearful flying machines?"

But the individuals with such beliefs will soon pass on, taking all their mediaeval hoopla with them into the "good, solid brown earth" of which they have so much to say.

You who read these words won't have quite so much trouble in carrying out your ideas when you get the reins. And then, ludicrous enough, another generation will spring up after you which will think your ideas are old fashioned.

BE that as it may, trans-Atlantic travel by air is soon to be a reality. FLYING ACEs, to be sure, cannot at this early date predict the precise means by which this route will be established. But the newspapers these days are telling us that the foundation stones are already being laid for the U.S.-to-Europe airline.

The names of Pan-American and Sikorsky have figured prominently in the plans, but these companies will probably not have the corner on the lucrative business which will ensue from this enterprise. There are several European organizations, notably Imperial Airways and Air France, which undoubtedly intend to share in the project.

Presumably, by the time the line is ready to carry passengers, a ship suitable for the route will have been developed. In light of experiments to date, it would seem that a flying boat capable of high speeds at great altitudes would be the most logical solution to the problem. Such a plane would carry from forty to fifty passengers and travel at 250-300 m.p.h. at about 35,000 feet. The planes would fly from Northern Europe to Newfoundland, Bermuda, or both.

Bringing such a big ship into the busy and often fogbound harbors of Eastern North America might be a risky and hazardous undertaking for a large flying boat. Not that it couldn't be accomplished. It could. But a more feasible and reasonable method has come to our minds—the use of shuttle service amphibians which could land on our larger Eastern airports as well as on the sea.

The idea of a shuttle service for air travel is not new. As a matter of fact, the Department of Commerce now has before it specifications for three ships, one of which will be built in quantity to supplement the long distance runs of the new high-altitude airliners which will replace the transports now being used on the transcontinental routes. Before long the word "shuttle" may be just as common to air travel as it is at the present time to our New York subway transportation.

The Sikorsky Manufacturing Company is building nine of the recently developed S-43's for Pan-American Airways. The ship is brand new, and it incorporates all the latest aids to aerial navigation. It is of the amphibious type, and is powered with two radial engines. Its seating capacity is for less than twenty passengers. Such a ship would be ideal for a shuttle service between New York and the two terminals of the big ocean-going transports at Newfoundland and Bermuda. Passengers could embark at Floyd Bennett Field or Newark and be whisked in a few hours to either of the two bases. They would there make connections with a trans-Atlantic airliner for European ports.

On our cover this month we show a Sikorsky S-43 flying out over New York at night bound for Bermuda or Newfoundland. The passengers aboard are confident, and they know that in an amazingly short period of time they will be in Europe—three thousand miles from New York.

Of course, it is impossible for us to say definitely that the trans-Atlantic route will be carried on exactly as we have pictured it. The whole thing is a matter of conjecture at the present time. But it will be well if we prepare ourselves mentally for what is bound to come. Within the next two or three years, trans-Atlantic air travel will be a reality.
The Batty Patrol

PHINEAS PHEARLESSLY PHIGHTS PHOR NAPOLEON

By Joe Archibald

Author of "Doin's in the Dunes," "T. N. T. Party," etc.

Once he got a taste of von Kruller, Phineas would be finished—according to the way the Krauts figured. But the Boontown Prankster's interest was in nuts, not doughnuts. And you can't beat a combination like Charlemagne, Julius Caesar, Disraeli, and Columbus when you've got Marshal "Carbuncle" Ney on the board of directors.

On the drome of Jagdstaffel 7, Heinnie Air Force, about one hundred and twenty kangaroo hops from the town of Deidenhofen, an octet of Kraut brass hats and worse were embroiled in a hectic powwow. The subject of the masterminding was one Lieutenant Phineas Pinkham, of the Ninth Pursuit Squadron, U. S. Air Corps, located south of Bar-Ledu.

A Jerry about the size of three Notre Dame tackles let his monocle pop loose at a remark from one of his fellow skullduggers.

"Das ist gut!" he enthused gutturally, punctuating his words with a swig of Edelweiss wine. "Der plan, idt fails noot. Idt moost noot fail, chentlemen! For eeney year ve haft tried idt to gelt das Pingham. Was ist he does budt make der Arabs alzo madt against us by Africa, fl! Und mit der shmelly cigars vet! Ach, for das trick he moost die. Kaput for das Pingham! Zo! Idt gift der lookg now like das oopstارد from der Yanks he gets doomed—ja. Hoch der Kaiser, chentlemen!"

After the hoching another Herr Oberst, with a voice like a cold pump being primed, tossed out violently, "Der Leutnant Kruller—you haff heardt by der ears he goes by der Doktor, mein Friends?"

"Ja, Excellenz," the Jagdstafel leader chuckled. "Der Leutnant's heart idt makes der loops mid der Immelmanns und he gets scared. Der Doktor tells him idt gift der badt heart und ein, zwei, drei mont's he will live unce only. Das ist der shmarted idea, mein!"

"Ja—ho ho! Was ist einen Leutnant against das Pingham, hein? Besser ist you tell idt der Leutnant tonight, Excellenz."

"Sehr gut! Und mit der bullet what explodites like der bomb—ach, how can der Kaiser help but sweep der vorldt? Ho, ho, und I will forget noot to gift idt by der Leutnant vun good stow mit Hassenpeiffer tonightt. Ach Himmel—ve Chermans!"
Zoon ve make idt der explosive what don’t cost so explosive yest. Der Professor makes der experiments day odder night. Chentlemen—by Metzerweise. Und where he ist—neh, who would tink of lookin’ for him there, hein? Mit Frederick der Greuf, Charlemagne, Disraeli, und—ja—und efen Lucretia Borgia.”

The assembled Heinies roared with great gusto until the plaster fell off the walls. Evidently they had hit upon a scheme at last to exterminate Lieutenant Phineas Pinkham, late of Boonetown, Iowa. Let us make believe that three or four hours have passed and take a look into the Operations shack of the Kraut flying unit. We see there a small tow-headed pilot standing before his superior and looking as healthy as a bunch of last year’s lilies of the valley.

“Her Leutnant Kruller,” the obese Jerry with the monocle rumbled, “For Cerryman you will do this, ja! You haff nodd long that you liff, hein? Your heart skips vunce und turns ofer all der time. Zo, you will die der gross hero mit der Frauleins bringink der flowers by your—ja—your restink place. Einen hero mit Bismark und Riche—en und—you will go oudt und fly at das Pingham und bring him down—smash idt der opnostrotid by der liddle pieces yest. You will go oudt und fly until you hit him. Nein bullets—yoost crash der Albatsos against der Shpad. Ve make sure so dat der Leutnant vunce gets kaput!”

The Kraut guinea pig turned three shades paler and nodded his head slowly as if it had become no lighter than an anvil. “Ja wohl!” he quavered, spun on his heels, and went out. A little later an Herr Oberst brought him a present.

“Mit der golpmimtens uf der High Kommand. Sweet meads from der Kaiser’s palace,” the Jerry brass hat said as he proffered it. “You will haff der best to eatd undt!—ha—auf Weidersohn, Herr Leutnant.”

The little towhead muttered something under his breath and unwrapped the package. He took out what looked like a big bar of chocolate filled with raisins and other fruit and bit a hunk out of it. He chewed slowly and felt of his pump with both hands. His heart was pelting against his ribs with the persistence of a landlord knocking upon the door around the first of the month.

“Ach, Himmel,” he breathed. “Yoost vunce more I could see mein Wilhelmina, yoost vunce. Gott!”

MILES to the south in a cafe in Bur-Le-Duc the potential victim of the homicidal Teuton brass hats sat sipping at a little glass of absinthe. Across the table from Phineas was his big moment, Babette, eyeing him narrowly.

“Zat ces ze stuff wheelack mak!” for you to see ze pink vache et purple peeg, oui!” the French girl spoke up in a warning voice. Two glasses you haff dreenck of these. Sacre bleu! Phineyas, you are beauccoup craize—beauccoup cuckoo.”

“Aww, this is what makes the heart grow fonder—absinthe,” Phineas argued. “Haw-w-w-w, ze more I dreenk ze more I lak’ be jolee Babette, next paw?”

“Ah, Phinyas, look! Ze beeg officials zey come in,” Babette exclaimed. “Maybe some day you weel be ze great general, non?”

“Non is right,” Phineas chortled, “as I like to look at a war close up when it’s going on, Haw-w-w-w!” He eyed the newcomers with jaundiced orbs nevertheless. The tallest one, he thought, was familiar. Yes, Phineas was sure of it. He would never forget that man. Colonel J. Luther Upshaw. Once he had been instrumental in incarcerating Phineas Pinkham in a Frogs bastile for three days. Colonel Upshaw had failed to see anything funny in a prank like breaking up sticks of macaroni and dropping them into the steaming radiator of a Frogs taxi.

Colonel Upshaw drew a kerchief from his pocket and dabbed at his blue nose. Something fell to the floor and rolled toward the Pinkham table. Simultaneously a Frogs waiter dropped a tray of glasses so that the Colonel did not hear the relatively weak clatter of the fallen item. It hit against Phineas’ boot and the Boonetown joke-smith looked down curiously. He saw a small round metal box which he immediately picked up.

“Saw-w-w-w,” Phineas laughed when he removed the cover. “Snuff! I bet he carries dried fennel to keep hives away. Well—huh—” The Yank glanced around quickly, dug a hand deep into the pocket of his trench coat which was hanging over the back of his chair. He produced a paper sack of something. Babette leaned over the table and sniffed at the small bag.

“But you do theez, Pheneyas! Oh, you airze beau-coup cracked pot!” Babette mixed protest and epithets as usual when speaking to her swain. “Always eez eze trouble when you air viz me.” She grabbed for her handbag and jumped up from her chair. “Boon soir!” she said fast. “Vous etes lak ze smallpox. Only mabbe worse. Bah!”

“Go ahead an’ alez,” Phineas sniffed. “I never saw such a skittish dame. There’s plent of Frogs femmes in this town who are dyin’ to git me. Huh!” Lieutenant Pinkham got up disgustedly and walked toward the bar. He saluted Colonel Upshaw smartly and the brass hat whirled to face him.

“Ah—er—I guess you dropped this,” Phineas stuttered. “It was on the floor and—picked it up huh—well, I picked it up—”

“Well, give it to me,” the brass hat sniffed. “You got paralysis? Salute me when I have a glass in my hand, will you? Hmph!” He pushed his face close to the Pinkham physiognomy. “Say, haven’t I seen you some place before?”

“I don’t think so, sir,” Phineas said wearily. “Maybe it was behind somethin’.”

“Lieutenant Pinkham, eh? Well, get out of my sight, you buck-toothed baboon!”

“Yessir,” Phineas said with alacrity and his big ears reddened at the mirth that flowed out of the assembled throats. “Sniff that box, you old turpik, the Boonetown pilot inwardly yipped. “Haw-w-w-w-w!” He hurried out fast, eyed two M. P.’s warily, circled them and headed for the place where he had parked the squadron motorcycle.

Colonel J. Luther Upshaw evacuated the estaminet several minutes after Phineas’ exit. The Colonel was of the Intelligence Corps. In the seclusion of his room at his hotel he drew an envelope from his pocket. When he turned it upside down on the table a
rain of bits of paper resulted. The brass hat had collected them in a house from which a suspected spy had decamped with great haste that day. He believed that the letter might be of some value to the department so he set to work piecing them together.

The Colonel labored far into the night and finally managed to get two-thirds of the letter assembled. He believed the need of a pinch of snuff. He took out his small silver box, removed the cover and lifted quite a gob of the powdered tobacco between thumb and forefinger. He raised the snuff to his ample proboscis, inhaled deeply. But he exhaled very much faster. A small edition of a tornado came out of each nostril. Bits of paper flew to all parts of the room—and out of the window. Even the table top shook. The Colonel sneezed violently several times until there was nothing in the room that looked like a fragment of a letter. Colonel Upshaw’s eyes were twin waterfalls. A tomato held close to his face would have looked like a snowball in color comparison. When he had gathered himself together, the brass hat began to swear. He examined the snuff box, swore some more, and threw it out the window.

“Found it, did he?” he blazed. “That fresh big-eared aviator. This time I’ll put him in the jug for life. By gad, I’ll—or—?” From outside came the sounds of violent sneezing. It seemed that everybody in Bar-Le-Duc had acquired hay fever.

“No pepper—in my snuff box! I’ll fix that cluck!” the Colonel was beside himself and ran out of the house. “My letter—I’ll never find it—I’ll teach that baboon to upset the Intelligence Corps!”

BACK on the drome Phineas strolled into the farmhouse, a large and expansive smile crinkling his face.

“Well, what good deed did you do today?” Captain Howell greeted him. “Who did you poison?”

“H’lo bums! There is one very bad habit that I cured a guy of, haw-w-w-w-w! That’s all. Any mail, see swar?”

“Pinkham!”

Phineas stiffened. “Give me two guesses! he yipped before anything more could be said. “Don’t tell me who it is. I am hard to catch on to—why, hello, sir! Haw-w-w-w, ya fooled me. I’d never know that was your voice.”

“A Colonel Upshaw phoned me, Pinkham,” Major Garrity ripped out of his tonsils. “He said to arrest you until he could get the time to come out here. Pepper in his snuff! You flap-eared, spotted—hand over that—”

“Why—this is—what do you mean?” countered the innocent-faced humorist. “Why the very idea! I am at a loss for words, sir. Pepper? Why—huh!”

“Yeah—pepper! You flathead!” Garrity thundered, hopping across the room. “Lift up your hands!”

“So it’s robbery, huh?” protested Phineas. “A stickup. You should know that crime does not pay. Why—er—”

He looked down at the bag the old man held in his hand. The Major was ripping the string off the top. He stared at the contents.

“Black pepper, huh?” he growled. “Maybe going to put it in our coffee or something, were you? Well I’ll ditch this—” He ran to the fireplace.

“No—ya can’t do that!” wailed Phineas in protest. “Oh—h—f—”

“F—f-000-0-000oh! A great puff of smoke and flame belched from the hearth. Major Garrity, his face the twin of a minstrel show end man, staggered backward and sat down very hard. Frantically he pawed at the singed cloth of his tunic. Bump Gillis vanished through the door, a column of smoke streaming out from his empannage.

“I said that wasn’t pepper. It was black powder!” Phineas yipped. “Oh-h why can’t you believe me for once? Well—er—haw-w-w-w! You got the wrong paper sack. Mistakes’ll happen, I guess, Adoo!” The culprit made a hasty exit just as Colonel Upshaw drew abreast of the farmhouse door.

“Stop right there, you nincompoop!” the brass hat shouted, brandishing his stick. “Don’t you try and desert!”

“I just forgot somethin’,” Phineas sniffed. “I left my biscuits in the oven. They’ll be ruined. Oh, good evening, sir. Did you have a good time in Barley Duck?”

Quite a session followed in the Old Man’s business office. Colonel Upshaw made charges against Lieutenant Phineas Pinkham, and Phineas told the Colonel he would have to prove the charges as anybody might have put pepper in his snuff.

“You see I have no pepper on me now,” the incurable practical joker grinned after submitting to search. “Haw-w-w-w! I know—we’re all hasty at times. You have got to have the proof, sir. Like the corpse delicious in a murder.”

“That’s what he did!” Upshaw bayed at the Old Man, while Garrity probed at his ear with a forefinger and informed the brass hat that he was not deaf. “He messed up important Intelligence clues,” the Colonel roared. “Might even have been a code letter about that new bullet the Krauts are usin’. He ought to be arrested.”

“Do you still believe one bullet could break the whole corner off a Yankee pill box?” Garrity yelped. “I don’t. Somethin’ hit that the same time the Boche were shooting at it.”

“I tell you they’ve got a bullet that’ll do as much damage as a bomb, Garrity,” Upshaw insisted, pounding his fist against the table. “Think what that means!”

“You do it,” the Old Man groaned. “Well, I’ll listen, Upshaw, but I’m sick of hearing that cock and bull story.”

(Continued on page 80)
Talons of the American Eagle

By David Martin

Author of "Russia—The Air Power Enigma," "Wings of the British Lion," etc.

Yes, the arm-chair aero critics are giving our sky fighting forces the rap again, and they’re using newspapers, radio, and the news reels to do it. In one breath they tell us that New York has no air defense, and in the next they blandly explain that the next war must come from Asia—Japan, to be specific. We need more aircraft carriers, more big bombers, and faster fighters, they say; but they smugly hasten to point out that the men of the U.S. Air Services are the “finest, the greatest, the best,” and all that. Their big argument always centers on equipment.

But they all seem to be knockers without any constructive ideas, and many of them, we fear, have axes to grind. Perhaps they have planes to sell—part of the lobby system, you know. The trouble is that they aren’t specific in their criticisms. Sometimes they do make comparisons with ships of similar types used by other powers, but they completely forget the geographical and political differences between our country and the power named.

We of Flying Aces do not say that the United States has the best or largest air service in the world—but we do say that it’s far from being the worst. In fact, considering the number of first-line machines available, the supporting equipment, and the men who fly the ships, America is about second or maybe third in world air power. France, of course, is first. But perhaps La Belle France should be, considering the way she’s fenced in on all sides by the other air powers.

Don’t forget that the real strength of any military arm cannot be computed until it has seen actual service experience. In the meantime, we’re in favor of a betterment of our air services based on unbiased and expert opinion—not on the rantings of the club chair pilots.

Unfortunately, it is almost impossible to set down any exact figure on the strength of the U.S. Air Services, owing to the often-ridiculous secrecy maintained as to number of craft, performances, and specifications. Probably no country in the world today, except perhaps Germany, guards the secrets of its air service so closely. But this has worked out just the opposite to what was expected, for machines that were on our secret list two years ago turned out to be “duds” when the figures were finally revealed. Take the first Hell-Diver, for...
thing of an idea of the general layout: The Chief of the Air Corps has offices at Akron, Ohio, and at Chanute Field, Rantoul, Ill. At Akron he has the Balloon production and Inspection Division as well as his District Office. At Chanute he is in close touch with the Technical School Troops H. Q. and the 48th and 98th Training School Squadrons. Brooks Field, in Texas, houses the 12th Observation Group, the 22nd and 88th. Observation Squadrons, the 1st Photographic Section, the 62nd Service Squadron, a Border Patrol station, and an intermediate landing field.

The Chief of the Air Corps also has an office at Rockwell Field, where there is also a Supply and Repair Depot. At Randolph Field we find the Primary Flying School where the fortunate cadets actually first test their wings. This field also accommodates Headquarters A. C. Training Center, four training squadrons, a service section, and photographic section. The School of Aviation Medicine is also at Randolph Field.

The details of obtaining posts as Flying Cadets in the Army Air Corps have been given so many times in this magazine, that to run over them again is only unnecessary repetition, but we advise our readers who may contemplate applying, to first write to the Chief of the Personnel Division, Washington, and get full particulars. This also goes for those who contemplate enlistments in the Navy Air Service.

From the defensive standpoint the Air Corps is divided into three Wings. The First Wing Headquarters is to be found at March Field, Riverside, Calif.; the second is located at Langley Field, Hampton, Va.; and the Third Wing, which is something of a mystery Attack Wing covering the south and west area, is located at Crockett Field, Galveston, Tex. This field is the base for the Third Attack Group and comprises at present the 8th, 13th, and 90th Attack Squadrons.

The actual strength in Army machines is not known, but the new appropriations indicate that the actual first-line strength will soon be well over 2,000 military

A is generally known, the American Air Service is actually split up into three parts—Army, Navy, and Marines. There are a few odd additions in the national air defense, such as the Coast Guard, Border patrols, and National Guard outfits, but they come under the general jurisdiction of either the Army or Navy. Naval flying is far removed from the Army service, and while many may claim that this duplicate system is wrong, there are many who feel that it suits the American temperament better than attempting to build up a separate arm. Maybe this is based on the inter-service feeling aroused every year at the Army and Navy gridiron battle. But there may even be something more to it, at that.

The Army Air Service—which we will take up first—is composed of eleven separate divisions commanded by the Chief of the Air Corps, whose headquarters are the War Department, Washington, D. C. Most of the administrative divisions are distributed through about seventy-seven fields, forts, bases, and government building offices throughout the country.

A short list of the most interesting fields and bases will give some-
service machines. Recently thirty-five new Boeing bombers (the four-engined jobs) were ordered, as well as a great number of Douglas bombers and Northrop fighters. In the meantime the Boeing fighters are undergoing considerable improvement and Curtiss is working hard on several single and two-seat fighters that no doubt will get the nod once they pass their base tests.

The Army Air Service specializes in four distinct types of military aviation. Pursuit, Attack, Bombardment, and Observation compose these four branches. Pursuit, of course, is the modernized form of scout squadrons evolved from the French chasse, or chaser type of squadron. It is distinctly American in all phases. The machines used are fast climbing, maneuverable single-seaters and their work is presumed to be that of actual fighting to maintain control of the air and thus allow the other machines to carry out their duties.

The types in general squadron use today are the Boeing P-26A single-seat fighter, the Curtiss P-6 (in several models), and the Boeing P-12E. The Boeing monoplane fighter is the fastest of this group, with an unofficial top speed of 234 m.p.h. It may be faster. But tests. This list includes the Northrop fighters, the new Curtiss “Swift,” and possibly one of the Seversky amphibians.

Attack aviation is an out-and-out American institution. There has always been attack aviation, of course, from the day airplanes first swooped down on enemy troops—and that started as far back as 1916. But it appears that our Air Corps is the first organization to develop to the point where complete squadrons and even groups are drilled in this form of offense.

To this end, then, American designers have gone off the deep end to develop special attack machines, and we find the original Curtiss A-8 attack ship and the (Continued on page 9).

### AMERICAN AIR SERVICE CRAFT

#### ARMY EQUIPMENT

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<td>204</td>
<td>6 Brownings</td>
<td>Several types of guns used.</td>
</tr>
<tr>
<td>Curtiss Falcon</td>
<td>Monoplane</td>
<td>Curtiss D-12</td>
<td>172</td>
<td>6 Brownings</td>
<td>Also used as light bomber.</td>
</tr>
<tr>
<td>Consolidated P-30</td>
<td>Monoplane</td>
<td>Conqueror</td>
<td>230</td>
<td>Not known</td>
<td>On secret list.</td>
</tr>
<tr>
<td><strong>Bombardment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keystone B-5A</td>
<td>Biplane</td>
<td>2 P &amp; W Hornets</td>
<td>130</td>
<td>5 Brownings</td>
<td>Several types are used.</td>
</tr>
<tr>
<td>Martin 139</td>
<td>Monoplane</td>
<td>2 Wright Cyclone</td>
<td>280</td>
<td>3 guns</td>
<td>On secret list.</td>
</tr>
<tr>
<td>Curtiss Condor</td>
<td>Biplane</td>
<td>2 Wright Cyclone</td>
<td>180</td>
<td>5 Brownings</td>
<td>Also used as troop-carrier.</td>
</tr>
<tr>
<td>Boeing Y11B-9A</td>
<td>Monoplane</td>
<td>2 600 h.p. Wasp</td>
<td>156</td>
<td>3 guns</td>
<td>First “flying fortress.”</td>
</tr>
<tr>
<td><strong>Observation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curtiss O-1 Falcon</td>
<td>Biplane</td>
<td>D-12 Curtiss</td>
<td>175</td>
<td>2 Brownings</td>
<td>Standard type.</td>
</tr>
<tr>
<td>Douglas O-25</td>
<td>Biplane</td>
<td>Conqueror</td>
<td>175</td>
<td>3 Brownings</td>
<td>Soon to be replaced.</td>
</tr>
<tr>
<td>Douglas O-33</td>
<td>Biplane</td>
<td>P &amp; W Hornet</td>
<td>175</td>
<td>3 Brownings</td>
<td>Steady worker.</td>
</tr>
<tr>
<td>Curtiss Raven</td>
<td>Sesquiplane</td>
<td>650 Wright Cyclone</td>
<td>181</td>
<td>2 Brownings</td>
<td>Also built in mono. type.</td>
</tr>
</tbody>
</table>

#### NAVY EQUIPMENT

**Single-Seat Fighters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Engine</th>
<th>Speed</th>
<th>Armament</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curtiss Goshawk</td>
<td>Biplane</td>
<td>760 h.p. Wright Cyclone</td>
<td>193</td>
<td>2 Brownings</td>
<td>Also used as light bomber.</td>
</tr>
</tbody>
</table>

**Two-Seat Fighters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Engine</th>
<th>Speed</th>
<th>Armament</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grumman SF-1</td>
<td>Biplane</td>
<td>600 h.p. Cyclone</td>
<td>700</td>
<td>4 guns</td>
<td>Latest Navy fighter.</td>
</tr>
<tr>
<td>Curtiss SOC-1</td>
<td>Biplane</td>
<td>600 h.p. Cyclone</td>
<td>700</td>
<td>4 guns</td>
<td>Full Navy equipment.</td>
</tr>
<tr>
<td>Vought Corsair</td>
<td>Biplane</td>
<td>600 h.p. Cyclone</td>
<td>700</td>
<td>4 guns</td>
<td>Standard service fighter.</td>
</tr>
<tr>
<td>B/8 OJ-2</td>
<td>Biplane</td>
<td>P &amp; W Hornet</td>
<td>154</td>
<td>3 guns</td>
<td>Also made in sesquiplane.</td>
</tr>
</tbody>
</table>

**Torpedo Carriers**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Engine</th>
<th>Speed</th>
<th>Armament</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin 125</td>
<td>Biplane</td>
<td>575 h.p. Cyclone</td>
<td>142</td>
<td>3 guns</td>
<td>Smart “dive-bomber.”</td>
</tr>
</tbody>
</table>

**Fleet Patrol Boats**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Engine</th>
<th>Speed</th>
<th>Armament</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated PTY-1 F.B.</td>
<td>Sesquiplane</td>
<td>2 575 h.p. Hornets</td>
<td>7</td>
<td>4 guns</td>
<td>Performance figures on secret list.</td>
</tr>
<tr>
<td>Grumman JF-1</td>
<td>Biplane</td>
<td>Twin-Wasp</td>
<td>666</td>
<td>4 guns</td>
<td>Navy amphibian.</td>
</tr>
<tr>
<td>Hall FH-1</td>
<td>Biplane</td>
<td>2 575 h.p. Cyclone</td>
<td>154</td>
<td>4 guns</td>
<td>Carries crew of 5 on long-range control.</td>
</tr>
<tr>
<td>Keystone PK-1</td>
<td>Biplane</td>
<td>2 575 h.p. Cyclone</td>
<td>90</td>
<td>4 guns</td>
<td>Long-range patrol boat.</td>
</tr>
</tbody>
</table>
THE LATEST AERIAL BOMB—AND THE FIRST

ONE ton is the weight of the huge modern air bombs which tower twice as high as a man, and one of them can destroy a small town! Before this messenger of ruin is released from the bottom of the bomber which carries it, special bomb sights that figure altitude, speed, drift, and direction are brought into play. Various kinds of explosive are used, depending on the kind of destruction required. By using different cases and timing devices, the bomb, moreover, can be made to penetrate farther within the target before exploding.

In contrast, let us consider the U. S. Army’s first aerial bomb produced in 1916. Consisting of a load of explosive in a pear-shaped metal container, this bomb weighed only 15 lbs. It was carried in the Army’s first plane, one of the early Wright pushers. The bomber simply let loose with it when he figured he was over his target.

THE LATEST NON-STOP TRANS-CONTINENTAL FLIGHT—AND THE FIRST

WHEN Howard Hughes’ Northrop Gamma landed at Newark on January 14 of this year, a new non-stop trans-continental record of 9 hr., 27 min., and 10 sec. was chalked up. Hughes covered the 2,490 miles from Burbank Airport, Calif., at an average speed of 263 m.p.h., doing most of his flying in the neighborhood of 18,000 feet. Though designed for a 700-h.p. engine, Hughes’ ship used a 925-h.p. Wright “Cyclone” power plant for this trip.

By comparison, let’s hark back to May 2, 1923 when the first non-stop coast-to-coast flight was completed. In this memorable hop, the ship was a re-built T-2 Fokker Army Air Service transport powered with a 400-h.p. Liberty, and the pilots were Lieuts. John A. Macready and Oakley G. Kelly. It took them 20 hr., 50 min. to reach Rockwell Field, San Diego, after leaving Roosevelt Field, L. I. They figured their average speed a bit better than 100 m.p.h.
Swamp Angel's Spectre

A phantom plane had joined the 76th! Mysteriously, out of nowhere it came to fly formations, hurtle in maneuvers with the other ships of the famed Squadron whose insignia it bore. But with that spectral craft came death—a ghastly blue death. And the pilot who mercilessly inflicted it was a man who had already lain dead in France for eighteen years!

BLUE death had struck No. 76 Squadron. And the ghost of Captain Martin Cassidy was haunting the formations, the mess gatherings, and the routine of the famous pursuit outfit stationed at Bergaw, N. C.

It was queer, too—for Marty Cassidy "went West" on October 17, 1918. The leather-bound squadron history that lay in the glass-covered table case in the squadron library said so. Something about being shot down on a late afternoon patrol, a few kilometers south-east of Gravelotte. Besides, Major Joyce Killrain, present C.O. of No. 76, was a shavetail Spad pilot in those days and he actually saw Cassidy go down.

But Marty Cassidy had nevertheless come back to haunt the 76th. In fact, the Swamp Angel—that's what they had called him in the old days—had come back flying a Boeing P-26, just as the rest of them were doing eighteen years later.

He had appeared one day in a formation "show" south of Raleigh. There was no place for him in the six-ship Vee—so he eased Chubby Jasson out of it and took his place.

They found Chubby later in a splintered skeleton fuselage. The engine was in about seven feet, and Chubby—was blue. Completely blue! That was funny, because Chubby had always been very red. A beefy bird who laughed all the time and blushed for no reason at all. Major Killrain tried to work up some sort of a theory about blood pressure and going blue after death—but that didn't explain the fact that the little Boeing pursuit had been shot up—with something.

The ghost of Martain Cassidy got away with that one because no one actually noticed the change. They saw Chubby go down and a few minutes later a Boeing dived into his place. It all happened rather fast while they were doing a tight attack stunt—something about three men taking the imaginary gunners of a two-seater formation from above while the other three came up from underneath and blasted hell out of them. Just routine tactics. But when they got back, someone was taking a telephone call about Chubby's machine.

Spencer Daunt got it next. He went up one morning to do a camera-gun fight with Hal Sloan. Sloan was delayed in getting off. His camera gun had not been loaded. While one of the greaseballs went to get a new roll of film, Sloan sat back and stared up at Daunt who was practising barrel-rolls. Then out of nowhere came another Boeing and took Daunt on, just as though Sloan had been up there. They charged about, curled around and went through the motions of camera gunning. But the next thing Sloan knew, Daunt was hurrying for the field without any wings on. They waited to see Daunt clamber out and take to the silk.

'The ship hit with an awful smack—and Daunt was with it!'

Same thing—blue all over, his skin the same color as tattoo ink. The other Boeing just headed off, didn't land to find out what had happened. Daunt never spoke. They just carried away his body. Sloan swore that the other craft was a machine of No. 76, for it carried the Squadron insignia—a shield divided into three parts. The upper panel was dotted with the small black Maltese crosses—the number of Huns No. 76 had registered in France. The lower right panel bore the outif's silver scimitar. And in the lower left-hand panel were the gold numerals "76."

But every machine of the Squadron was on the ground and accounted for!

That night, at mess, there was another empty chair at the far end of the long table. The remaining pilots had left it there and had huddled down closer to the C.O.'s end as if they were, well, a little leery of it.

The C.O., Major Killrain, was trying to explain it all to them. Some sort of an explanation was necessary. The whole outfit was slumping into a blue funk.

"I must admit, men," he was saying, "that I really don't know what it's all about. But there is an explana-
As Buzz kicked rudder to avoid the ship ahead, there came a sudden rending crash that made his Boeing jerk like a laced stallion—a crash that ripped his motor almost clear of its mounting! And then came a strange feeling about his face... a feeling of tightness...

...tion for it, of course, and we'll get to the bottom of it damned soon. In the meantime we will carry on with the routine work as though nothing had happened. We'll treat it just like an ordinary crash.

"But Major," young Charlie Light remonstrated. "It's not just an ordinary crash. Both Chubby Jasson and Daunt got it and went blue. That's not ordinary. Something's got to be done!"

"I agree, Lieutenant," Major Killrain went on, drawing a design on the table cloth with the prong of his fork. "I am working on the assumption that it is a strange form of exhaust poisoning. I'm going to have it all checked."

"But those bullets—slugs of some sort, Major," young Light went on. "Slugs don't turn fellows blue. They were slugs. They were shot down... first."

THE Major squirmed in his chair. He knew he was failing in his job of creating confidence. That damned Light kid! Grand pilot and all that—but too many questions played hob with the outfit's morale.

"You leave it to me, Lieutenant," Killrain snapped. "We'll trace that plane somehow. As a matter of fact," he glanced about uneasily, "I have already done something about it."

He leaned forward on his elbows and half whispered down the long table.

"This is all sub-rosa of course, but a new man will join the outfit tomorrow. His name, as far as we are concerned, is Lieutenant John Wilson. I'm not telling you who he actually is, but I believe one or two of you will probably recognize him. I'm telling you this just to show my confidence in you all. Anyway, his name will be Wilson. Get it?"

"But what happens in the meantime?" groused one of the older pilots.

"Nothing—as far as flying is concerned. All ships will be grounded until Lieutenant... or... Wilson arrives tomorrow."

No sooner had Major Killrain spoken, than the room...
seemed to constrict under an eerie cackle—a cruel, throaty laugh.

"Ha-aa-aaa-rrrrrrr!" the voice surged from the darkness at the far end of the room. "He'll... never... get... here..."

The spoken words came out like mechanical speech from a small amplifier. Twenty heads jerked around and twenty pairs of eyes squinted and tried to pierce the filmy gloom thrown up by the cigarette smoke.

"Who the hell...?"

"Ha-aa-aaa-rrrrrrr!" the voice cracked again. "He'll never get here—alive. He might—blue."

"Cassidy!" Major Killrain said, trying to swallow at the same time.

"Get that guy!" young Charlie Light shouted.

"Sit where you are!" the voice snapped.

They could see a broad-shouldered man in uniform rising from the empty chair at the end of the table. He had a black automatic in his hand. How long he had been sitting there, they could not tell. But one and all, they were trying to figure out that strange voice. It seemed to be coming from the end of the table and yet—

"I just wanted to find out when he was coming," the voice said. "That will be all for tonight. I'll take care of him tomorrow. Good night, Major Killrain!"

And before they could move the dim figure had disappeared.

B U Z Z B E N S O N pondered on the strange story. Major Norton had told him before he left for the dread drome of No. 76. He tried to take it to bits and piece it together again as he flew southward from Bolling Field mounted in a trim Boeing fighter. His ship, too, flaunted the gay insignia of the 76th.

Buzz had never been called on to act in this role before. On the surface it was invigorating and promised much, but Buzz frankly was not any too certain of himself. This menace of the blue death that was striking from ghostly hands was no schoolboy game. After all, men were dying and ships were crushing.

He tried to figure it out from a sane point of view, but he found trouble in putting his finger on anything which was sane. Finally, he gave it up and decided to settle down and enjoy handling the little 235 m.p.h. fighter. He quickly got used to her quirks and fancies.

Buzz was presently putting the ship through her paces over the Neuse River at a point between Kinston and Goldboro. First an easy roll, then a few smart tight turns, and finally a series of spins. She answered sweetly and came out with amazing precision. He threw her about the sky, raced through a series of fighting maneuvers against an imaginary enemy, then picked up his position again.

He was now over a point between Clinton and Warsaw—dead over the grim swamp land of North Carolina. Ahead about forty miles lay the drome of the 76th.

Buzz settled back again and flew on for about ten minutes mulling over the details of the strange quest once more. Parts of it seemed to haunt him, particularly the business about the blue death. True, Norton had given him only the barest hints, but—

"Hello!" he suddenly beamed. "Someone's coming out to greet me. That's one of the Boeings from the 76th. Has the same insignia. Probably figured I'd get lost in this wilderness. It certainly does look pretty gloomy down there, at that. I'd hate a forced landing here."

The other machine came up smartly, curled over, took up a position just ahead of Buzz, and headed south again. He waved once and Benson responded in a cheery reply. He watched the ship carefully for a minute, then noted that it was fitted with a camera gun, mounted on top of the cowling in a handy position just right of the wind-shield. That item caught his eye at once.

What the devil would a service machine be doing with a camera gun mounted that way on an ordinary patrol flight? They usually keep those guns in the Armament stores and only mount them when they are to be used.

"I'd better watch that baby," he said to himself. Then suddenly the ship ahead swung over into an almost broadside position. Buzz started to kick rudder to prevent fouling the man's tail.

CRASH!

The Boeing Benson was flying jerked and acted like a locoed stallion. There was a rending of metal and the crash of steel. Buzz sensed a strange tightness about his face as though it had suddenly been frozen. But he had to act fast. Risking everything, he pressed the trigger-release mechanism of his guns and let fly with a long swinging burst of lead that seemed to enshroud the Boeing ahead.

"What the devil?—"

Buzz's ship dropped in a sickening spin. He could see that his motor had been ripped almost clear of its mounting and was hanging precariously in the remains of the cowling. Only the stubs of the prop blades were to be seen.

"How did that happen?" he asked himself as he eased the fighter out of the stall and let her nose into an easy glide. "He didn't shoot at me—but something happened. He couldn't have shot at me. His nose was pointed the other way."

Buzz looked up, saw that the other Boeing was circling for height and climbing like mad. There was something fishy about it all.

The next ten minutes were taken up in attempting to stretch his glide to make the Bergaw field. Buzz was thankful he had plenty of height, and soon saw that he would have little trouble in making it. He had snapped his switch to prevent fire and now he checked the ship again to make sure she would not fall apart before he got too low to take to the silk.

He saw the field ahead and below and spotted the wind marker. He also noted with surprise that none of the hangars seemed to be open.

"Funny. That Boeing was certainly a machine from No. 76. I saw the insignia plainly."

He wheeled his bus around, brought her in gently. He could see several men coming out of the living quarters and three heading from a wooden building that looked like the administration office.

From then on he gave his attention to getting down. Though his ship was badly battered and ripped about, he hung on and planted her down a few yards from the apron. There he sat and waited for assistance.

Three officers, headed by a Major, came toward him, staring anxiously at the damaged machine.

Buzz put his head over the side and reported: Second Lieutenant John Wilson, reporting to No. 76 for 'duty, sir."

B U T the major did not answer. He was staring wide-eyed at Benson. Behind him, at a respectful distance, two young Captains looked at him with the same bovine expressions.

"Second Lieutenant John Wilson, sir," Buzz went on (Continued on page 70)
Taxi in on this runway and pick up a plane load of laughs! In this department, we present a collection of jokes, cartoons, and humorous verse. For all original contributions which we can use here, FLYING ACES will pay $1. Contributions will not be returned—except art work with stamped return envelope.

**WISERCRAK-UPPS**

"Hope the batters won't mind, Cap."

—

**BAD EGGS**

A report has it that the chief of a hostile Indian tribe at Puerto Carreno, Columbia, sent his braves prowling around under an army bomber to steal the "big bird's eggs" he saw hanging there. He wanted to hatch some planes of his own with which to fight the white men.

—

**GOOD REASON**

_Stooge:_ Why are you changing that sign from "Joe's Aircraft Factory" to "Joe's Aircraft Supplies"?

_Painter:_ The boss's son just took off for a joy ride in the company's last airplane.

—

**EXIT SMITH!**

_C.O._: Where's Lieutenant Smith?

_Ackemma:_ Well, sir, he went up to attack Richthofen's Circus single-handed.

_C.O._: The fool—that's the last thing he should have done!

_Ackemma:_ It was, sir.

—

**A RECORD BREAKER**

**Willy:** Say, are these Flying Fleas fast?

**Windy:** Well, when I was out on the Coast I saw one pass Howard Hughes' Racer.

**Willy:** Is that so?

**Windy:** Yeah, it was going the other way.

—

**TRY THE STRATOSPHERE,**

**Phineas**

**Major Garry:** Did all your sins pass before your eyes when you fell in that spin and crashed?

**Phineas:** Heck, no, Major. I only fell 5,000 feet.

—

**COUNT 'EM!**

_Instructor:_ What fifty things can a Jenny do?

**Stude:** Pop, sputter, wheeze, cough, jingle, bang, whistle, ring, jerk, crack, jangle, bong, buzz, tingle, snap, snort, rattle, swish, clang, slap, knock, thump, squeak, groan, bark, hiss, whang, hop, squeal, growl, chirp, grunt, click, clash, slam, chug, plop, squash, whirl, wham, crunch, clatter, burst, clink, screech, puff, flap, scratch, plink, and clack.

—

**UP SHE GOES**

**First pilot:** Why weren't you all killed when your plane crashed?

**Second pilot:** Well, I had new balloon tires on the plane, and when we hit the ground it bounced so high that I had time to fix the engine.

—

**THE A.M. PROF AGAIN**

And then there was the absent-minded professor who, while riding in an airplane, lit his pipe, threw the pilot out, and tapped the match on the shoulder.

—

**CERTAINLY HAD 'EM GOING!**

**Phineas:** When I was over the lines, I made a whole staffel of Fokkers run.

**Galis:** A whole staffel? How did you do that?

**Phineas:** Easy. I ran—and they ran after me.

_Dumb Dora_ thinks the China Clipper is a Shanghai barber.

—

**CALL OUT THE TOW CAR!**

**Mechanic:** Say, what's all the trouble out on the flying field?

**Pilot:** Some fellow flying an Aerocene landed on a wad of chewing gum and got stuck.

_Dumb Danny, Dumb Dora's brother_, insists that the best way to make a wheel pant is to exercise it violently.

[21]
Through the Years

A BRIEF HISTORY
By Leslie J. Tyk

With the development of the new Martin, Boeing, and Douglas bombers—every one virtually a flying fortress—it is evident that our country's designers are fast revolutionizing world theory and practice in this important category. High speed, long range, and multiplied armament—that combination does the trick!

The late model Douglas and the Boeing 299 took the spotlight at the recent tests at Wright Field, Dayton, Ohio; and following those trials the Army ordered a number of them. True, the Boeing crashed in the course of the tests. But now 35 of those amazing ships have been called for, indicating that the unfortunate crack-up cast no aspersion on the plane. Perhaps many more will be ordered after the first craft of the new 35 is put through its paces. Probably capable of 300 m.p.h., the Boeing, and other ships of its kind, are relentlessly pushing the single-seat fighters off the stage, for a mosquito isn't much of a match for an eagle.

The first real long-range bomber was the early British Handley-Page, which was closely followed by the German Gotha, a distinct copy of the former. America then made her initial bid with the first Martin bomber brought out too late for the War but retained as standard equipment until 1925.

Our next machine was the Curtiss NBS-1, which like the early Martin used Liberty motors. Patterned somewhat after the Martin, it had a wider range of action. After these came the Elias NBS-3, which like the Curtiss carried the motors on the lower wing. (The Martin's engines were fitted in spiders between the wings.)

About this time the need for special day bombers and long range night bombers was realized, and by 1922 the L.W.F. and the Barling triplane were designed. The Barling weighed twenty tons and used six 400 h.p. Liberties, but structural weaknesses sent it into discard. The L.W.F. failed to pass its tests, too.

The Huff-Deland, developed in 1924, eventually became the Keystone LB-1, an 800-h.p. Packard powered
With Our Bombers

craft which started the series of light bombers. Ten of these machines were purchased—and then it was discovered that the single motor did not provide enough forward vision for bombing work, so the Keystone firm turned to two-engine jobs, the first being the B-1B which was powered with two 600 h.p. Curtiss engines mounted on the lower wing. The LB-3A came out next with two 410 h.p. P. & W. radials mounted in nacelles between the wings. The LB-5 saw the first taper-wing Keystone powered with 420 h.p. Liberties. After that came the LB-6 and the LB-7 which went back to the original type wing and used the 520 P. & W. motors.

From 1928 to 1930 we saw the flood of Curtiss “B” types which included the famous B-2 that had gunner turrets in the rear of the engine nacelles. Fokker then turned the Army’s interest to monoplanes with his B-8, which was actually a revamped observation bus. No true monoplane bomber was developed in this country until Boeing came out with the old B-9. This ship, especially designed for bomber-fighting, eventually became the basic type for many Boeing transports and eventually the 299. A new era in high-speed bombers was on us when it was announced that the B-9 did 188 top at 6,000 feet with a two-ton load of high explosive. It had a ceiling of 20,150 feet.

After the Boeing came the Douglas B-7 which was also a redesigned observation ship. It was a gull-wing monoplane mounting two Conqueror engines in metal frames hung below the wing. Top speed was 170 with a light load of 1,000 lbs. The Martin B-10, formerly known as the XB-907, followed. These were the machines that made the memorable flight to Alaska in 1934.

And now for the Navy. One of the earliest bombers in that branch of the service was the Gallaudet D-4, a light, bombing seaplane. At the time of its production it was the fastest seaplane, having a top speed of 126 m.p.h. It carried one large pontoon below the fuselage and two small ones at the ends of the bottom wings. An interesting feature was the placing of the 400 h.p. Liberty motor behind the pilot. The shaft of this motor spun a ring in the fuselage to which were mounted four propeller blades. A gunner was carried in the nose. One drawback of this ship was that it car-

(Continued on page 92)

Ever since the first U.S. bomber took the air in ’18, our designers have been busy turning out improved models in this important classification. So hop into our flag-planes and we’ll review this dramatic cavalcade of ships from the war-time Martin down to the flying fortress of 1936.

This is the little-known Great Lakes XBG-1 dive bomber being tried out by the Navy. It’s reported to do 215 with a 1,000 lb. torpedo. We know it mounts a double-row Pratt & Whitney engine, but few other details on the craft have been given out.

Another Army pride is this Martin Y1B-15, sometimes known as the 199. It’s still on the secret list, although it has been delivered to the Army, some with “Cyclones” and others with “Hornets.” She carries a crew of five and plenty of guns. A real fighter-bomber!

And now we turn the pages back to 1929 for a look at this early type American Army bomber—the famous Keystone LB-1. Like the Curtiss “Condor” shown on the preceding page, it carried twin rudders. These mud-guards on the wheels certainly look ancient in contrast to our present day streamlined parts.

And was the renowned four-engined Boeing Bomber 299, generally considered the finest long-range bomber ever developed! Its blisters faired into the fuselage are believed to hide something new and deadly in the way of aerial armament. The first 299 crashed at Dayton—but don’t let that fool you, for the Army has ordered thirty-five of these flying fortresses.
An Eye for an Ace

No Airmen’s fist fight ever ended more decisively than when Bart Cranston pounded Captain Thelon to the hanging floor. And the boys of the 72nd were right in saying as much. But if they thought that concluded the story, they were wrong. For one of those desperate blows thrown by the beaten Thelon punched Bart Cranston right out of the 72nd and into the strangest adventure of his life.

CAPTAIN BART CRANSTON blinked miserably out of one eye. His mood was bitter as he flew a lone dawn patrol. His right eye pained him. Its rheumy condition gave him a squint, and he cursed the luck and fate which had damaged that eye.

The scrap had been, to all appearances, fair enough—but only Bart Cranston knew that in that mad mill of flying fists, Captain Thelon, now acting C.O. of Bart’s squadron, had worn a heavy signet ring.

From the very moment Thelon had come up to take over “A” Flight of 72 Squadron, a feud had brewed. That fight which cost Bart the sight of his eye had to do with the honor of one of Cranston’s “C” Flight pilots—a youngster who had wrongfully been charged by Thelon, with cutting out, fumking, during a dog-fight. Bart Cranston visualized that youngster now who, after the charge, went down to his death, rather than face a court martial. On the face of it, it seemed as if Thelon’s evidence could be well supported—but Cranston knew that engine trouble had taken the kid out of that dog-fight.

The youngster had been driven down to his death, a death Cranston changed directly to Thelon. And so the two skippers met in a cleared hangar one day, in a bruisling battle which only ended when Thelon lay stretched on the floor. But as a result of that fight the sight went out of Bart’s right eye.

Since that time two months ago, Cranston had tried to mask the fact that he had practically no sight at all in that one eye. Thelon had been chosen to take over the squadron, replacing Major Hanbury, severely wounded.

Thelon had got wise to the condition of Bart’s sight. He quickly put Bart on the spot, with the result that the skipper was being marked out. He had orders to report to London where he could take a few days leave, and then—

By rights, Cranston had no business in the sky this morning. He had left his “C” Flight buddies back at the drome. He had told them to shut up, and had left them hating Thelon and mourning the loss of their skipper who had made war flyers out of all of them.

Then abruptly the sky was plastered with Archie bursts. But Cranston seemed not to worry about the anti-aircraft shrapnel. He was ranging, with his one eye, the familiar landmarks below. He wondered if those lads hugging the firesteps below would miss him. Would they know that this was the last flight of the “Wild-Cat,” as they called him?

Chin sunk onto his chest, he kicked about to the east. But suddenly the stutter of striking lead on the fuselage of his Spad pulled him out of his day dream. Out of the haze above and behind, three fast Fokkers were riding herd on him. And those ships carried the flaming Panther insignia of von Kolzert’s crack staffel.

Fate couldn’t have been kinder to Bart than to have shoved him onto this spot. Death in a piece of rimfire action was preferable to being written out of the service! Hell! He was fit enough for lots of action, but Thelon was rubbing him out!

A snarl tightened his thin lips as he Immelmaned to clear a furious burst of Spandau fire. In a flash he was in his element—a lone wild-cat in the midst of three merciless, skilled Boche pilots.

Thus it was “C” Flight members eventually found Bart as they came sky hunting for him. They could stand the suspense back at the drome no longer, so at a word from the deputy leader they barged out—and they found their skipper pouring out the last rounds of his ammunition rip into the vitals of a German ship. They saw that Fokker pilot crumple in his pit, saw that war eagle of the Fatherland plunge to sickening destruction.

They beat off the other two Boche ships, giving their one-eyed pal a chance to get out. He had barely enough gas to get him home. But he was, comparatively speaking, happy. In his last, farewell battle he had sent down one of the best aces in the German force! He had sung his swan song through the muzzles of jammering Vickers!

TWILIGHT that day found the pilots of 72nd Squadron grouped about the car which was to whisk Bart away from active service. Captain Thelon stepped up and handed Bart a sheaf of papers.

“Your instructions, Cranston,” he jerked. “Suppose I should make a speech and tell you how sorry I am that you’re leaving us. But—well, report to the London office when your leave is up.”

“Don’t kid yourself, Thelon,” Bart retorted. “Maybe you haven’t heard the last of me. I have a notion we’ll meet again some place. Then—I’ll see that your hands are as bare as mine.”

Bart slumped in his seat, leaned over to the driver. “Step on it, son,” he snapped. “Take her out as fast as you can to tramp her down!”

He reflected as he rode along. His eye hadn’t received the attention it might have, since he had wanted to keep the damage a secret. But in London there were some of the best eye specialists in the world. Hell! Here it was only the spring of 1918, with no sign of a cessation of hostilities. In Bart Cranston’s mind was born a strong, new hope.

At the depot, Bart turned to his driver. “Okay, Jenson,” he breathed. “Take this letter back to Lieutenant Ferguson, my—deputy. So long, son, and don’t forget to duck!”

Half of all the money Bart possessed had gone into that letter with a short note to Ferry which read: “Have one real binge on of ‘One-Eye,’ then go in and be real soldiers, gang.”

Bart Cranston had ten days leave ahead of him. For ten whole days and nights he intended to forget a war
SMASHING WAR SPY STORY
By Harold F. Cruickshank
Author of "Feud of Fury," "Ace for a Day," etc.

THREE days of Bart's leave had slipped by. But he was beginning to feel that nothing could clear the ache from his mind—the ache for action in those war skies. During a Zeppelin raid he had stood out in the open, partly drunk, his one good eye staring wildly up into the inferno of gun and shell flashes and the glare of searchlights. He revelled in the blast of shells and the scream of shrapnel.

In bitter mood, he now downed a Scotch and soda. Suddenly a hand touched his arm. He started, snapped out an oath, then his single eye gleamed strangely. He was blinking it at one of the best friends he had ever known—Captain Halsey, of the British Intelligence Corps.

"Halsey! Why, there is a Santa Claus after all!"

"Cran! . . . Wild-Cat!" Their hands met and held. They had flown together in a British unit before Bart joined Uncle Sam's forces.

"Have a drink, Hal," Bart urged.

"Just a spot, then. But, say! aren't you looking tough! Hitting the fizz a bit too much, eh?"

After a drink, the Intelligence man scraped forward his chair. "Time to pull yourself together, son," he said.

"Pull myself together? Hell! Haven't they marked me for home duty—or London duty? What the hell d' you mean, Hal?"

"Just what I say. You've never had a real surgeon look at that eye—but you're going to. You're going up before Fitzhugh in the morning; like it or not. Greatest eye man in Europe. He'll—"

"But—what's it all about, Hal?" Bart asked.

"It means I happen to know you've had a rotten deal, Cran. You're too valuable a man to let slip. I need you badly. Listen: In a short time, there'll be a big convoy of American troops coming over; and in order to get them through safely, we've got to route them around the north of Ireland. The Huns are wise to the movement of the convoy, however, but I'm not sure that they've tumbled on the north-of-Ireland route. I need you, Cran, for the safety of this convoy is my job. It'll be quite a job. Think you'd like it, if Fitz can fix up that wink?"

"Like it? Say, brother, if Fitz or even a monkey's uncle could help this eye out even a bit, I'd go right plumb down to hell an' back, an' figure I'd been on a vacation. Count me in!"

"* * * *"

"There—that's two-thirds of your normal sight back. Best I can do, Cranston." So said Fitzhugh after the operation bandages were removed ten days later. Bart blinked gratefully at the eye specialist.

Bart's last rounds of ammo ripped into that Fokker, crumpled the pilot in his pit—plunged one of the Fatherland's greatest war eagles to destruction! Bart had sung his swan song through the muzzles of yammering Vickers!

"You see, there was a fluid which was allowed to collect, Cranston," continued the surgeon. "This formed a sort of false cataract over the iris—Not a cataract in the common sense of the term. But that doesn't matter. I operated successfully, and in a couple of days you ought to be top-hole.

"God! did you hear that, Cran?" Halsey was present, as he had been since Cranston had been under Fitzhugh's care. "That Irish trip is in the bally old sack, son. Still game?"

But Bart was staring into space. He was seeing again! Thelon . . . . action . . . . that ring! Two or three more days—then action again. Action and intrigue with this heller, Captain Halsey. After all, the gods had been kind.

Thus in less than a week, Bart Cranston was stunting over the sand-dunes of the south coast of England. He now wore no patch over his eye, as he shoved a new Bristol through every trick he knew. He was in a wild state of exultancy. He could see through that right eye!

The Wild-Cat was again truly the wild cat, as he dived in on knolls, kissing sand with his undercarriage, only to zoom hard and arc into terrible loops.

Tomorrow he would fly across the Irish sea. Halsey had all plans arranged. Halsey, too, had been sworn to secrecy in the matter of the return of Bart's right eye's sight. Bart wanted it kept dark, for some day he had a score to settle with Thelon . . . .

THE little village of Ballymora on the Irish north coast was wrapped in a sweeping fog, as Bart's Bristol cut down to a landing. Bart had been chased far out to sea, and had almost given up hope of finding a landing spot—until a winking eye of light suddenly guided him in. Fog played fickle tricks along this forbidding coastline.

Now, as he dropped to within two hundred feet of that light, he turned to Halsey in the rear pit, and

(Continued on page 76)
Modern Planes Album

GLOSTER "GLADIATOR"

The Gloster Gladiator

The Gloster Gladiator is the Royal Air Force of Great Britain is fast filling in their new squadrons with speed equipment. The new Gloster Gladiator, already service equipment for two new squadrons, is about 15 m.p.h. faster than the Hawker Fury. With the new Bristol Mercury engine it has a top speed of 265 at 15,500 feet. It climbs to 10,000 feet in 4½ min. and to 20,000 feet in 9 min. 20 sec. These figures are guaranteed with full military load, wireless, night-flying equipment, and oxygen tanks. Its total weight is 4,400 lbs.
The Gladiator won the Royal Air Force military trials against a wide field and will no doubt become regulation equipment for day-and-night fighter squadrons of the important home-defense posts.
Actually, of course, the Gladiator is a development of the firm's Gauntlet, but this new machine has single-bay wings which have been stressed to give unusual strength in dives. Another interesting feature is the use of a single-strut cantilever undercarriage which is fitted with the new Dowty internally-sprung wheels. This undercarriage, once frowned upon abroad, was given a particularly rigid test in the military trials and came through to everyone's satisfaction.
The Gladiator carries four guns. Two are Vickers fitted into the nose and synchronized to fire through the prop. The other two are Lewis guns nested in streamlined cradles fitted under the wings.
The Mercury engine employed is rated at 655-715 h.p., which probably accounts for the great improvement in the Gladiator's performance over that of the Gauntlet even while carrying several hundred more pounds in fuel and equipment. The Gladiator has a service ceiling of 35,000 feet, which should be plenty high enough to null any prowling raiders, be they Zeppelins or heavier-than-air machines.

THE FOKKER C.X. BOMBER

Tony Fokker's plant in Holland is still turning out some grand fighting craft and the Royal Dutch Air Force is using plenty of them. One of the most interesting models in service is the Fokker C.X. two-seater bomber, which is fitted with a British Rolls Royce Kestrel motor and does 205 m.p.h. at 14,000 feet.

No matter what Fokker builds, one always finds a trace of his old wartime products. The splayed-out center-section struts and the N-struts between the wings all carry a certain significance; and in spite of the shatter-proof glass cowling over the cockpits, we still notice the old Fokker line in the fuselage.

This fuselage is made up of steel tubing. The front end is covered with removable aluminum panels and the rear half employs fabric. The engine bed is welded directly into the fuselage.
The cockpits are fitted with dual control and the observer's controls are quickly detachable, but both pits are provided with full sets of instruments. The pilot has two fixed Vickers guns and the observer has a special mounting that will take one or two Lewis guns. Bomb racks taking four 50 kilo bombs are fitted to the underside of the lower wings.
The wings are of unequal span and they are tapered to a semicircular. The upper wing has a span of 39 ft. 4 inches. It is built in one piece and is bolted to the cabane with four bolts. The lower wings are built in two parts and are bolted to the lower longeron of the fuselage. Box spars and plywood ribs are used in the upper wing and solid spars and plywood ribs in the lower.
Fuel is carried in an aluminum tank holding about 100 gallons. The water and oil-cooling radiators are carried low in the fuselage and may be raised or lowered according to the desire of the pilot. The undercarriage does not retract.

[26]
THE LATEST IN FIGHTERS AND BOMBERS

The air powers are still busy turning out new ones—and here are a few that are outstanding: Britain’s new 265-m.p.h. Gladiator fighter; Fokker’s speedy biplane bomber; France’s unique new long-range flying fortress; and our own fast Boeing XF7B-1.

LIORE ET OLIVIER .208

It will be noted that while the top wing is of equal span to the lower, it is much narrower in chord; and as the gunners have two turrets with guns pointing upward, as well as a special underslung car below, this narrow top wing allows a wider angle of fire on craft attacking from above.

The .208, as it is listed, carries 2,645 lbs. of bombs at a speed of 202 m.p.h. at 13,000 feet. The engines are Gnome-Rhones which give 815 h.p. at 7,5000 feet and 1,065 at the take-off. They are fitted with N.A. C.A. cowlings and controllable-pitch propellers. This unusual military load may be carried over a range of 1,243 miles.

In the nose of the .208 is one of these new swinging gun turrets, so popular now in large bombers all over the world. The turret swings with the movement of the gun so that the gunner is protected against slipstream and thus is offered a steadier platform. The pilots sit in a compartment just forward of the leading edge of the upper wing. The underslung car carries a bomber and the bomb racks, while the rear gunner, who has an open turret high in the fuselage, may also drop down and handle a lower gun that fires out below the tail. Dural tube and sheeting is used in the wings and fuselage. The interplane struts are broad “I” type affairs, and during flight the landing gear legs, which carry two wheels apiece, are carried up inside the engine nacelles.

While the back-stagger arrangement of the wings and struts give this machine an unorthodox appearance, there is every reason to believe that it is an unusually efficient piece of fighting equipment.

BOEING XF7B-1

The United States Navy is still experimenting with fast single-seat fighters, as may be judged from the new Boeing XF7B-1—and we hope you can make out all those initials.

This craft, a single-seat fighter built somewhat along the lines of the P-26 job is still very much hush-hush and gum-shoe. All we know about it has appeared, as it usually does, in foreign publications. One or two readers who have seen the machine in flight have also sent us rough drawings of it and their own personal ideas as to its performance. It travels at anything from 250 to 400 m.p.h., if we are to believe all we hear.

Actually, it is an all-metal fighter of low-wing design, carrying considerable equipment suitable for Navy flying work, and that includes flotation gear and certain equipment for deck landings and catapult work. In one or two instances it has appeared with the 550 “Wasp” engine, and we also have reports of its using the 700 R-1510 Wright “Cyclone.”

The ship has all the outside dimensions of the Boeing P-26—or at least it started out that way. Since its first appearance, it has been sent back to the shops for several modifications and refinements. With the 550 Wasp it displayed a cruising speed of well over 200 m.p.h. It is fast in maneuvers and does tight vertical banks from 300 m.p.h. dives—and stays together. The wings are fitted with flaps and slots, which the P-26 did not have. The body is deeper behind the pilot, too, and the pilot has a completely enclosed cockpit. The fin is built directly into the body and the wing is neatly filleted into the fuselage, giving the ship neat lines.

A sane guess at its actual speed with the 700 h.p. motor and all the equipment necessary for Fleet work would be 240 to 260 m.p.h.
The Abyssinian Air Mystery

Ethiopia's air strength lies in her terrain—and that is so formidable that Italy's flyers face a trying task in their attempt to defeat Haile Selassie's brave tribesmen with air weapons, modern though they are. So states Mr. Whitehouse, who in this department is given free rein to express his personal views on various phases of aviation.

At this writing, the war in Ethiopia has been on for several months, and already many of our readers are asking: "Where is all this air strength Italy is supposed to have? So far they have carried out a few abortive raids on points none too far from their bases in Eritrea; a small town or two has been bombed and one or two strong points made targets for aerial explosives—but where is there any evidence that the next war would be won in the air?"

Such a question is natural. We have been warned for years that the next war would be an aerial massacre carried out by fleets of fighting planes, long-range bombers, and death-dealing attack ships that would make war so terrible and deadly that it could not last but a few days. A month at the most.

But nothing about the present situation in North Africa carries out these mournful predictions. In the few raids carried out by the “Desperado” squadron, three or four ships have been shot down, several have had forced landings, an observer has been killed. (It is always the observer who is killed, it seems to me), and one or two have returned with bullet holes in their wings. During the World War when allied planes were delivering an average of thirty tons of bombs a day, the loss of two machines was considered a poor return on the investment. If the Italians are averaging one ton of bombs a day—which they aren’t—they have not satisfied us that the modern war air arm is as deadly as we were led to believe. Their only opposition appears to be antique rifles, a few puny machine guns, and one or two 40-cal. Madsen anti-aircraft guns.

What then is holding up Mussolini’s airmen? The real story lies in the land itself. The geographical and meteorological conditions faced in Abyssinia are more on the mark for the finest engines, planes, guns, bombs, or airmen.

In the first place, as I have pointed out before, the Italian Air Service was mainly devised for coastal defense, or high-altitude work in the Alpine districts along her northern frontier. Of course, they had plenty of time to prepare land bases for these craft in Eritrea or Italian Somaliland, but once their machines crossed the borders of Ethiopia they were licked. They could not take these landing grounds with them; and any fighting plane, like a dreadnought, is limited to its range of action from its nearest base.

Thus, Italian flying men taking off from sheltered fields in Eritrea to attack Adowa had to fly about seventy-five miles from Massaua, which is on the Red Sea—seventy-five miles of rugged country bristling with jebels (sharp-pointed peaks) from 6,000 to 7,000 feet in height, a natural fortress slashed with deep ravines, some gouged into the earth for a depth of 4,000 feet.

From these unnatural surfaces came treacherous air currents. In the old days they called them “air pockets” and a few misinformed writers still do. Winds sweeping off through these ravines mushroomed from the crags and steep walls. Warm air in the valleys heated by a blazing tropical sun, danced out through the nullahs (gullies) and the cold air from the hills swept down to take its place. Put it all together and it spells bad flying!

Through all this country, native soldiers huddled in ambush. If the Italian airmen spotted them, they had to go down into the deadly cross-currents, brave the treacherous jebels, and soft-pedal their way through the gorges to get their guns—or bombs—on them. A trip through the Grand Canyon in Roscoe Turner’s Bendix Racer would begin to give an idea of what Italian airmen are facing today. If two or three of their machines were actually shot down, perhaps many more than is admitted “failed to return.”

They are brave men, those Italian flyers! The War Gods must have laughed when Captain Galeazzo Ciano led his Desperado squadron on to Adowa. They had seen the same thing happen seventeen years before when Italian airmen under the great Major Baracca had tried to attack the Austrians through the death passes of the Alps.

Yes, the Italians reached and took Adowa. But Addis Ababa is 450 miles from Massaua, or about 400 miles from the nearest Italian border. The danger must increase with the ratio of the distance to be traversed because of the lack of suitable fields in Ethiopia.

Four hundred miles is the average radius of action of the present fighting equipment used by the Italians against the tribesmen of Abyssinia. It is most unfortunate that the great Italian Air Service has been built up around flying boats because of her unusual length of coastline to be protected around its Mediterranean jutting Boot.

(Continued on next page)
AND planes suitable for action inland are comparatively few in the long list of fighting machines developed in Italy. The highly efficient flying boats and seaplanes that go to make up the greater part of Mussolini’s aerial arm are absolutely worthless where the campaign in Ethiopia is concerned, for no airman in his right mind is attempting a long-distance bombing raid across the snap-toothed terrain of Abyssinia in a flying boat. If later on they can move on north-east from Italian Somaliland to the inland lakes of Abaya, Shalla, and Zwai (which lie about 250 miles from the nearest Italian jumping-off point) they might be able to establish seaplane bases there and carry out short patrols in their flying boats and perhaps bomb the Ethiopian capital.

Actually there are only three flying fields worthy of the name in the whole of Abyssinia. Two are just outside Addis Ababa and the third is at Dia Dawa. A fourth, if it can be considered at all, is still in the course of construction at Jiga Jiga. This field and that at Dia Dawa are conveniently close to the French and British Somaliland borders—near Harar, to be exact. Thus they are at least 200 miles from Italian territory and can hardly be considered when the Italian airmen seek a suitable landing from which to carry out operations against Addis Ababa.

The two landing fields at Addis Ababa are about 1½ miles beyond the railroad station. One was actually on a racecourse, but it is believed that this has already been abandoned for tactical reasons. The other lies south-west of the railway station and has a fairly level field 1,500 yards by 730 yards. In a pinch this might be used as a base of operations.

(Continued on page 93)

There are many excellent light jobs on the market today—so the fellows who want to form a light plane club, chip in for a low-powered craft, and fly, can get going immediately. The safety of these small planes has been demonstrated, and herewith FLYING ACES offers further proof of the argument.

On the Light Plane Tarmac

Contrary to general opinion, the light plane is not a dangerous vehicle. The experiences of flying clubs abroad have proved the innocence of this thrilling sport. And here in America there are many so-called light planes on the market today suitable for the average man, even though the Department of Commerce is still working hard to discover a truly fool-proof airplane for the masses. Provided he gets a good grounding in his flight training, there’s no reason why Mr. Average Man can’t get right into the light plane game immediately and have a lot of fun at it.

Over here there’s still some scoffing at the European light planes with their mosquito motors—but nevertheless the fellows over on the Other Side who cruise around in those diminutive craft are “going great.” Take the British Drone, for instance. This ship was actually a powered glider in its original form, but now it’s a real powered plane employing a 28 h.p. Douglas engine—a power plant, by the way, which was devised from a motorcycle engine.

One club in Ghent, Belgium, has used this type of ship for club work for over two years. They’ve run up over 400 hours of flight and to date have had no serious accidents. In addition, members who passed on to solo flying actually built three of these ships themselves and are still flying them.

And this brings up another point—that concerning the building of power craft by amateurs. There is no question that amateurs can build motor boats, sailboats, and the like. A few have built gliders and flown them successfully. But few men outside the industry are capable of building a good light plane. The best way out of this matter is to copy another European idea. Over there a bright young man with a shop has advertised that he will assist enthusiasts in building the much advertised Pau (Flying Flea) and will provide the raw materials, jigs, patterns, and machinery to work with. The amateur actually builds the machine to correct specifications under professional advice from blueprints and instructions sold by the original designer.

All this goes to prove that the so-called light plane—and we mean the ship under 40 h.p.—is safe. Hundreds have been built and flown abroad. Their lightness and low power make them safe under...
PILOTOPICS

By ROY HUMPHRIES

1. A plane lands faster during the day than at night...

2. Captains Anderson and Stevens wore football helmets borrowed from a Rapid City, South Dakota, high school team on their stratosphere flight...

3. Zulu warriors in the Boer war thought the English used balloons to go up and talk with God, who told them how to win the war...

4. Rubber gliders that can be folded to fit into a suitcase.

Stories Back of the Above Pictures

1. Because of differing air conditions, a plane lands faster in the daytime than at night. During the day, the sun's rays tend to heat the air, causing it to become lighter (more rarefied).

2. The football helmets were used by Captains Anderson and Stevens as a protection for their heads in the swaying gondola.

3. During the Boer War, the British used observation balloons to good advantage, according to Jack Finlay, who tells of attending a Kaffir gathering in which a Zulu chanted a song describing how the English went up in a balloon and talked with God, who told them how to win the war.

4. A collapsible, all-rubber glider weighing only 45 lbs. that can be folded to fit compactly in an ordinary suitcase is claimed by the Russians. The framework is of soft, rubberized tubes and the entire craft is covered with the same air-tight material. Simply blow it up and it's ready for use.

World's Youngest Pilot

Making his first flight "solo" at the age of 11 years and 10 months, William L. (Billy) Lee of Savannah, Ga., is believed to be the youngest pilot ever to fly solo.

After a number of hours cross country flying with his father, Mr. J. B. Lee, President of Southern Airways, and seven hours landing instruction with Bill McCraig of Savannah, Billy was allowed to make his solo flight. His flight was not announced until Billy had a number of solo hours in his log-book to prove that the first flight was not "luck."

Citizens of Savannah are now boasting that "Billy" is the world's youngest aviator. They have watched with pride as Billy flies his dad's Taylor "Cub" over the city and makes perfect three point landings at the Savannah airport.

Superchargers

What is a supercharger, anyway? We hear about this new crate and that new crate being equipped with superchargers which will do this, that, and the other thing. But exactly what is a supercharger?

According to the correspondent of the Army Air Corps News Letter at Wright Field, Dayton, Ohio, a supercharger is nothing more than an air compressor constructed in a form suitable for use in connection with airplane power plants. The general idea is that it fully or partially restores sea level pressure to the air before the air enters the engine cylinders, thus affording a constant delivery of power regardless of the altitude of the airplane. Engines are made to work best under normal air pressure. When the pressure changes, so does the efficiency of the engine, which of course limits the ship's ceiling since air pressure decreases with increase of altitude.

Results to be expected from the use of superchargers are: Increase in power for a given engine weight, constant power delivery regardless of altitude, increase in ceiling by approximately 75 percent, increase in speed proportional to constant power output and increase in density due to altitude, and increase in maneuverability at high altitudes.

Flyers Take to Bikes

It seems kind of a come-down for a doughty airman to take to a bicycle, but that's what lots of them are doing in the Army's big engineering shops at the San Antonio Air Depot, Duncan Field, Texas. So large is the engineering building, covering about seven acres under a single roof, that soldiers, mechanics, and others on duty or having
business in the building, are wearing out a fleet of twenty bicycles to save time and energy in getting about the big structure.

**WHAT A RUNWAY!**

A **N** airplane “runway” 110 miles long is located in Texas! Utilized in turn by Indians, Spaniards, pirates and free-booters, Padre Island, on the Gulf of Mexico, adapts itself equally well to the modern age.

Its wide, smooth, hardpacked beach has long served as a roadway for automobiles, for it connects with a causeway at Corpus Christi. Pilots were quick to discover the island’s natural runway and many aerial flying parties have made use of it in recent years. It gives them almost unlimited room for landings and takeoffs. The flying fishermen find themselves right on the spot for deep sea fishing.

Padre Island protects the gulf line of Texas. It extends from Corpus Christi to Point Isabel, near Brownsville—a stretch of 110 miles, nearly as long as Long Island, N. Y., however, it is only four miles wide at its widest point!

**HAD ‘EM GUESSING**

THE new wing-less Autogiro had the “powers that be” of the Army Air Force stumped for a while. The problem was: Where in the dickens is a guy gonna paint the regular Air Corps “star-in-circle” insignia on a dog-gone flying palmtree. Of course, regulations prescribe that the insignia shall be painted on the wings, but the blamed thing hasn’t any wings. There’s no rotor blades, but with them spinning around the insignia wouldn’t be anything but a blurry spot when the ship was in motion.

To make a short story shorter, they finally solved the puzzle by painting the “star-in-circle” on the top and bottom of the fuselage just to the rear of the cockpits. No one has complained so far.

**FASTER FLYING—LESS EATING**

**Louis Wait,** assistant chief test pilot for Boeing, reveals an interesting side-light on the speed of the huge new Boeing Bomber, which flew from Seattle to Dayton, Ohio, and subsequently was destroyed in a crash.

In the 2,100 mile flight from Seattle to Dayton, says Wait, those on board managed to eat only one meal—for the average speed of 232 miles per hour set up by the ship hurried them across that great distance in nine hours. Since they left Seattle early in the morning, this fast speed brought them to Dayton in ample time for dinner, so only a breakfast snack was needed on route.

**THEN:**

**The New Airmail Pals**

**WELL,** pen pushers, how’s the paper and ink holding out? The way it looks over here at GHQ, there’s no fear of a shortage yet! Every month the postman brings us more pen pal letters than he brought the month before—when!—another pile arrived just as we were typing that last line.

Speaking of pen pals, Russell Woodward, of Iowa, writes in to say that we shouldn’t forget the pencil pals. Russ addressed us in plain, garden variety lead pencil, saying that he couldn’t write very legibly in pen, so he’d skip the ink.

Okay, pencil pals. And now, let’s take a look at some of these letters:

First off, here’s one from Kenneth Ross, who lives up in Montreal, and this is the story: Ken is coming down to New York City for a week this summer, and he wants to start writing to a pal who’ll take him around the local aviation fields when he arrives. How about it, fellows? We’ll hold that letter out until we hear from someone living in New York or vicinity who’s interested in Ken’s proposition. Are there any takers?

And say—how’s this for an interesting hobby? Fillmore-Shields, who lives out in Ohio, tells us that he collects shells—not sea shells, but rifle and pistol shells. He’s got more than sixty specimens. We hooked him up with Bob Groves, of Maryland; for Bob belongs to the National Rifle Association and totes a Western Field repeater. Those two ought to get along swell!

Another letter we’re going to hold until the right pal comes along is the one sent in by Nicholas Cruger, of New York City. Nick is looking for an American pal who’ll trade or sell 16 millimeter motion picture film. He’s got 750 ft. of movie celluloid. Any of you Buzzards interested?

Of course, most of the letters that come our way talk about one subject, and one subject only. You guessed it—model building! Do you remember our telling you that Charley Schultz, of Columbus, Ohio, had built 256 models? Well, now another Charley—Charley Ivey, of Texarkana, U.S.A., comes along and says that he’s built “just about a million models.” Tie that one if you can! Incidentally, Charley Ivey’s town of Texarkana is a mighty interesting place. Half of it is in Arkansas and half in Texas. They have two of everything—two mayors, two school systems, two fire departments—and probably two different kinds of weather.

The other favorite of you scribblers seems to be zero photo collecting. But we also get a number of letters from pals who have other pictures to send their new friends. For example, a message came in this month all the way from Hilo, Hawaii, to tell us that John Costa, its writer, had some photos of the eruption of Mokuaweoweo, on Mauna Loa, that he’d send his new pal. Mokuaweoweo is a volcano, if that one has you stumped.

Before closing, we want to explain to you seekers of foreign pals that, unfortunately, we can’t get you correspondecells in countries where they don’t speak English. You see, those other-lingo fellows don’t get Flying Aces. And so we can’t take care of the pals who wrote in this month wanting Egyptian, Arab, and French scriveners. We did get a letter, though, from Lelio Otto Stierlin, of Rock Island, Ill., who tells us he’s one-fourth Indian, one-fourth German, and half French. Can any of you beat that one?

The last letter we got was addressed to the “Keeper of the Airmail Pals.” Well, maybe a lot of you letter writing nuts need a keeper at that! Heh! Heh!

**HOW TO GET AN AIRMAIL PAL**

**FIRST,** write a letter just as if you were writing to your new Pal—the kind of a letter which tells your age, your hobbies, a general idea of what kind of a correspondent you seek, et cetera. Then, send this letter to Airmail Pal, care FLYING ACES, 67 W. 46th St., New York City. And be sure to enclose a stamped, self-addressed envelope.

Now, when your letter arrives, we select a Pal for you from our batch of letters—the sort of Airmail Pal your letter indicates you want—and we mail his letter to you in the stamped envelope you send us, and we mail your letter to him. Then you’re all set! Of course, if you want additional Pals, just write us again.

**REGARDING FOREIGN PEN PALS**

In case you do not reside in the United States, write a pen pal letter—but do not enclose a stamped, self-addressed envelope or send any money for stamps. Your pal letter will be forwarded to an American correspondent, following which you need only wait for his reply.

If you are an American who wants a foreign pal do not write a pen pal letter. Instead, send us a stamped, self-addressed envelope with a note to this department stating that you wish a foreign correspondent. A foreign writer’s letter will be returned to you in the envelope you send us—whereupon you may begin writing to him direct from this address. Foreign airmail pals are cared for in this fashion because foreign stamps sent in from other countries cannot be used in the United States to forward letters to Canada or across the seas.
JOIN THE FLYING ACES CLUB

To advance a chapter, over 50,000 men and women, boys and girls, have banded together to form the Flying Aces Club. To become a member, fill in and mail the application coupon below, along with a stamped, self-addressed envelope for return of your official membership card.

It costs nothing. There are no dues. After becoming a member, you will be all set to win your Cadet Wings, Pilot Wings, Ace's Star, and perhaps the D.S.M. Take the first step now—in fill and mail the membership coupon!

To become a member, each applicant must fill out and mail the application below. Be sure, when writing, to enclose a stamped, self-addressed envelope for reply. This is important.

Honorary Members
President and Mrs. Franklin D. Roosevelt
Vice Pres. John Nance Garner
Casey Jones
Wallace Berry
Capt. Edward Rickenbacker
Al V. Alexander
Col. Scarrow
Gifford Pinchot
Major von Schliech
Lieut.-Col. Pinard
Amelia Earhart Putnam
Capt. Boris Sherley
Col. Roosevelt Turner
Charles W. A. Scott
Capt. E. C. Sisley
Jackie Cooper
Gov. James V. Alfred
Capt. A. W. Stevens
Capt. C. A. Anderson
Mrs. Charles S. Baylies
Lieut.-Col. Theodore Roosevelt
AWARDS AND HONORS

The D.S.M.
The Flying Aces Club Distinguished Service Medal is the highest award of the Club and is given to those whose work on behalf of the F.A.C. is outstanding. This award has been awarded for obtaining prominent men and women as Honorary Members, for exceptionally successful activity in the promotion of the Club, for outstanding work in covering the secret assignments of G-2. Winners of the D.S.M. who merit further awards will be given beautiful bronze prop. Won on the ribbon of the D.S.M., they may be conferred upon any member of the F.A.C. who is a member of the Croix de Guerre. The highest award of the F.A.C. is the D.S.M. with three prows.

The Ace’s Star
The Ace's Star is awarded to regular members of the F.A.C. who have qualified for their Cadet and Pilot Wings and have succeeded in enrolling five new members in the Flying Aces Club. Each new member must fill out the Application Coupon below. Get five of your friends to do this, send in, their applications all together and win the F.A.C. Ace's Star.

Official Charters
F.A.C. Flights and Squadrons are recognized on the basis of achievements in aviation and the wording is in keeping with the high ideals and purposes of the Club. They are printed on a very fine grade of paper and the names of the Squadrons are hand-lettered. Charter applications are accompanied by a complete list of members with their addresses. For the Flying Aces Charter send 25¢, for the Squadron Charter 50¢, to cover.

Volunteers for G-2
G-2, the Inner Circle of the F.A.C., is open to a restricted number of members who are qualified for Secret Service activities. Those who are chosen will have unique opportunities to win the Club’s Distinguished Service Medal. Those who are chosen will be given identification card as well as the secret code. Assignments will be made by letter and code.

Citations and Awards

The Distinguished Service Medal of the Flying Aces Club has been awarded to the following members of G-2 for exceptional services to the club:

- Thomas Mone
- Herman Kyle
- Frank Wocheram
- Joseph Alterbas
- Jack Sorman
- Vernon N. Drew
- Teddy Marsh
- Harold Von Hasseln
- Leo Grabarzcy
- George Foote
- Howard R. Lilly
- Arthur Magson
- James Kunis
- Jay Cappoge
- Stephen Fortunato
- Kenneth Priest
- Roy Polon
- Dennis Nastu
- Robert Van Scoy
- George Hassen
- Johnny B. Bryson

The following winners of the Distinguished Service Medal of the Flying Aces Club have been given the first award of the bronze props for additional services to the club:

- Dante De Angelis
- Craig Smith
- John Hammell
- Bill Balogh
- Donald Marshall

The following winners of the first award of the bronze props have been given the second award of the bronze props for additional services to the club:

- Charles Penrose, Jr.
- Ted Jack
- Carl Jacobs
- Ralph Breuning
- Earl Austin
- Edward Munzing
- Warren Huffman
- Edward Neas
- Harold Lloyd
- Willis Gallop
- Forest Holbrook

The following winners of the second award of the bronze props have been given the third award of the bronze props for additional services to the club:

- Salley Ford
- Charles Russell
- M. H. East
- Robert D. Simonson
- J. A. McDermott
- Michael Schafani
- Bernard Danowitz

The following members of G-2 of the Flying Aces Club have been awarded the silver F.A.C. ring for exceptional service to the Club:

- Ted Jacobs
- Blakley Hargis
- Edward Naun
- Charles Heinrich
- Louis Penilen
- Joseph Von Waldron
- Alfred Constante
- Raymond Dowsett

The following members of G-2, of the Flying Aces Club, have been awarded pocket knives for exceptional services to the Club:

- Albert Kirscher
- Fred L. Smith
- Leonard D. Robinson
- Harry Leach
- Russell Feereiel
- John Buchinsky

The following members of G-2 have been cited by the Flying Aces Club for exceptional services to the club and are also considered for the Distinguished Service Medal:

- Bernard Bernaski
- Neubar
- Vola W. Mankell
- Elaine Slepian
- Edward Farrell
- Charles Guisgar
- Lemuel Cummings
- Aquala Solomon
- Kenneth Carlson
- Ed Gutierrez

FLYING ACES CLUB—67 W. 44th St., New York City
Flying Aces Club News

Where-e-e-e! Here we go...up...up...up...up! But we're not in the FLYING ACES Transport this trip, F.A.C.'s. Instead, we're in the elevator of the Rafel Building zooming up to the 20th floor for a visit with Doug Allen at his GHQ desk.

This month we're going to take advantage of that long-standing invitation to visit GHQ of the F.A.C. headquarters. Yes, friends, Doug Allen, our FLYING ACES transport is tied up for a long-needed overhaul so we'll ride downtown on the subway. Piling off at Times Square station, we hike over a couple blocks, enter the Rafel Building at 67 W. 44th, go shooting up twenty floors above the Isle of Manhattan, and barge into Doug's GHQ office.

Here we are met by Miss Edith Lenny, charming "Hostess" of the FLYING ACES transport, and Secretary to Mr. A. A. Wynn, our F.A.C.'s of Command. "There's Doug," says Miss Lenny, "the gentleman over there behind that desk full of mail." And as we approach, we are quickly convinced that GHQ receives one sweet pile of letters! Not only is Doug's desk piled high, but a high pile alongside is full-as-well.

"Come on fellows," says our National Adjutant, "draw up a chair and go over some of this interesting correspondence." "Friends," continues Doug, when all are seated, "I've just dictated letters of thanks to General Cull, San Francisco, and Emmett Marshall, Dayton, Ohio. You'll note from these letters I hold in my hand that General has indeed approved of this flight and the fellow who blazed the trail across the Pacific in the China Clipper—join the F.A.C. And Emmet has sent us some copies of his book on aviation, gently reminding the world with a new stratosphere record. This is fine work, and we deeply appreciate the fact that many of the F.A.C.'s are interested in the important role being played by FLYING ACES and are lending their support by accepting honorary memberships.

Picking up a letter bearing foreign stamps, Doug now remarks: "Here's some mail from dear old Australia. It seems that this fellow is working on Rosy Hill. And listen to what he has to say!"

For 12 months now I have been reading your very interesting magazine. I thoroughly enjoy the stories and I have made some friends from them. Presumably it is like the FLYING ACES Sport Racer, and I'm telling you—I was very much surprised at the speed with which she flew.

At this point Herb Powell (champion coffee drinker, and the old man who steps into the office. After meeting the crowd, he says: "I've just received a copy of the December issue, and I must say it's pretty good. Here—look it over." Examining the copy handed us we find that it's a bulletin issued regularly by one of our units in Chicago, headed by Jaroslav Cimelcek. The bulletin is nicely turned out on a reproducing machine and comprises interesting stories, articles, news, etc. To our way of thinking, much interesting content is in this bulletin. The men are amased and many new members secured were of the larger F.A.C. units to follow suit.

Opening a letter in a blue envelope, Doug hurriedly reads, then remarks: "We've had a lot of letters recently dealing with the F.A.C. Radio Communications Corps, but here's a note of a little different nature. It's from Captain Lionel E. Berg, of the Dawn Patrol unit, 50 Essen St., Boston, Mass. We have various radio receiving and transmitting equipment for swapping purposes," says Captain Berg.

"There's your chance to live dangerously. And while we're on the subject of trading things, I have a letter right here from our good friend, H. Haden, 44 McDonald St., Napier, N.Z., stating that he will swap a square inch of German war-time plane fabric for a good set of plans of the Bowius Dupont Model Sailplane.

Some more letter digging, and Doug looks up again, this time looking pretty serious. "Our F.A.C. brothers across the sea are putting us to shame over here," says he. "Flight after Flight and Squadron after Squadron are being formed, and in instances where suitable 'timber' is not available, S.O. calls are sent out. One such call, for instance, J. Cooper, 27 Hall Rd., Hall, England, and Ian Grant, 106 Lothian Rd., Edinburgh 3, Scotland, wanted those interested in aviation and residing in their respective country, to get in touch with them. I'd like to see more of that spirit ever here. Remember, GHQ will cooperate fully."

Taking a letter from a basket marked, "Special," Doug continues: "Fellows, this basket contains letters conveying ideas or suggestions for passing on to you Buzzards. This one on the top of the pile is highly interesting since it contains an idea whereby F.A.C. units might not only be of assistance in furthering the cause of aviation but can aid their respective communities into the bargain. The writer is Andy Anderson, of Poplar Bluff, Mo, Andy, first of all, is an airplane pilot of twelve years standing and for several years past has painted air markers for towns throughout the country. He has an air-marker proposition to place before the leaders of the F.A.C. units, and those interested may address him as follows: Mr. Anderson, c/o General Delivery, Poplar Bluff, Mo.

Tired of doing most of the talking, Doug passes amongst his visitors a batch of letters from young air enthusiasts desiring membership in the club. Among them we note communications from Judge John McDuffie, U. S. District Court, Richmond, Va., and Francis A. Delgado, Resident Commissioner from the Philippines—both sent by Col. Paul R. Guerrero, Tacon, Washington. Then there's one from Rex Mays, Pacific Coast Race Driving Champion for 1934-35, correled by Harold (Crash) Shanappe, 1115 Stanley Ave., Glendale, Calif. In addition, Frank Schnitzel, Ventor City, N. J., secured the honorary membership of Mayor Earl E. Jeffers of neighboring Margate City, while James Eickensberg, Oakland, California, secured the honorary membership of Col. Rod Hendrickson, well-known radio personality to West Coast audiences.

Suddenly, as remembering a forgotten appointment, Doug opens the top drawer of his desk and pulls out a letter. "Here's something of especial interest to all of us," he says, "since it is representative of what is happening all over the country. The letter is from Edwin W. Lockwood, 1st Lst. Inf. Company "B", 1st Separaed Battalion, State Militia, Atlantic City, N. J. It's a short letter and I'd like to read it to you:

We're often mentioned the fine work done by Bill Balsch, of Detroit, Mich., but we're never let you see what he looks like. Well, Buzzards, here's the Detroit Wing Commander—and he isn't posing, either. Just after this "shoo" was clicked, Bill climbed in and went aloft.

Congratulations on your wonderful magazine, and here's wishing you great success during 1936! Together with several of my "Non-Coms," we're getting a group of youngsters together for a club shortly after the New Year. So we will be yelaling for a Charter real soon.

I just sort of stumbled on an issue of your magazine about a year ago and have missed but one copy since. Saved 'em all too.

Well, here's the long delayed application and request for Cadet and Pilot's Wings. Together with my Top Kick and Platoon Sgt., who are Assistant Secretaries at the Y.M.C.A., we will develop a real outfit soon.

Doug had no sooner finished reading the letter than his 'phone bell rang. Excusing himself, he engaged in a rather spirited conversation. Having finished, he remarked: "That was dalliet R. Fleck, a reporter on the MAIN LAND DAILY TIMES, Armore, Penna."

"What did he want—an interview?" asks one of our visitors.

"No, he didn't," replied our National Adjutant, "Dalliet Fleck is a member of the F.A.C. Fully entitled to honorary membership, he turned down in favor of active membership. He has a ship of his own and has just got his Editer to let him write an aviation column in the paper."

Glancing at his desk clock, Doug slowly begins to drag out an immense paper weight. Placing it

(Continued on page 93)
With the Model Builders

This workshop of Loen Bonney, of Welham, Mass., is so neat we thought you'd all like to see it. Bonney has a D.H. Mail Plane on the production line there, and we think he's doing a swell job of it. Any more of you birds have layouts like this?

T. W. Bates, of Burnley, Lancs, England, sends us this shot of the framework of his Hawker Fury. If you like real workmanship, give this the once over, boys. Hours of labor have gone into it, but the result is well worth the effort. We'd like to see the finished article.

Bob Moore, of Joliet, Ill., has only just found out about FLYING ACES. He says some nice things about us and sends along his photo showing his Curtiss Robin. It's a mighty nice job—but say, Bob, what's that star insignia doing on the fuselage?

Take a look at this top-notch job Pelham E. Bennett of New York City, has turned out! It's a Curtiss Swift XP-984-A. Doggone, but he must have been close to one in order to get such details! Great work, Pelham!

Adolph Augustino, of Vineland, N. J., built this high-wing craft to take a gas engine. He hasn't raised the dough for the tiny motor yet, but we'll bet he gets rare performance when he does. The span is 8 ft 6 in.

Above: That Navy Boeing FAPA is still plenty popular with the boys! This neat model—one of the best we've seen—was built by Leo Lasheore, of Manchester, N. H. That's a real job of photography, too. Note the joystick in the cockpit.

Right: He's back again! Norman Sinclair, the demon model builder of Southampton, England, shows us a German war-time Albatros D.5 this trip, and it's complete with hangar and pilot. There's startling detail in his motor.
Construct the Stinson Pursuit Trainer

STINSON PURSUIT TRAINER
POWER PLANT
LYCOMING 260HP
WING AREA
223 SQ FT
GROSS WEIGHT
2790 LBS.
USEFUL LOAD
780 LBS.
HIGH SPEED
160 M.P.H.
LANDING SPEED
49 M.P.H.

W.WINTON '36
Over in France they’re still talking about it—and fifty million Frenchmen can’t be wrong! We mean the “whizzing blur” that won the Deutsch de la Meurthe circuit race and chalked up a speed mark of 314 m.p.h. into the bargain. That “w.b.” was the Caudron 460 Racer. And now here’s a great treat for you—full instructions for building an exact scale flying model of this record-smashing job.

**Build the Caudron Racer**

By Marion Clarke and Robert Smith

2, thus completing the wing structure. Cut the ribs from 1/32” material, except the center one which is 1/16” thick. The leading edge must be rounded on one edge, while the opposite edge fits in the notches of the ribs. The trailing edge is, of course, tapered to a knife edge at the rear, and the wing tips are bent from 1/32” sq. bamboo.

When the wing halves are complete they should be glued securely at the center and the middle rib inserted. The amount of dihedral necessary for best flying results is 5° under each tip. The framework is now covered with a light grade of paper, using banana oil as the adhesive. This is now sprayed with colored, or clear dope (as the builder prefers). The authors finished their model in green. An opening similar in shape to the middle rib is cut out of the body covering on either side of the fuselage to allow the wing to be slipped through. Once fitted it is glued in the framework firmly.

**Fuselage**

MAKE the body in the usual manner. Join Plates 1 and 3 together for the outline. The noseblock is carved from soft balsa and shaped and hollowed out as shown. Drill a hole in front to accommodate the nose plug. The long headset after the cockpit should be carefully hollowed. To add realism to the model the fuselage should be covered with sheet balsa. (You may find it too heavy in comparison with others, but it is worth the extra weight in looks.) The original had 1/64” stock on it, except the bottom of the fuselage which may be covered with regular tissue.

The sketch of the tail plug is self explanatory. Bend a rear hook of .029 music wire and cement it securely in the plug. The pilot’s enclosure is made from bamboo and covered with thin celluloid, and the upper forepart is shaped out of ¼” balsa. This forms a roof for the enclosure.

**Wing**

THE wing is built in two separate panels. The right half can be traced by reversing the left one shown on Plate 6. Carefully cut and sand the tips out of 1/32” sheet. The root ribs are 1/16” thick, and the other ribs are 1/32” thick. Cover these frameworks on both sides and dope them in the same manner as the wing. Glue them on the fuselage in the position shown in the plans.

**Landing Gear**

CUT two struts from 1/32” sheet to the shape shown on Plate 4. Cut two more from 1/8” stock, but this time cut the bottom so the wheel will fit and turn without hitting the thicker strut. A piece of thin aluminum is cut and bent as shown. One end is glued between the thin and the thick struts. Repeat for the other leg of the gear. Pins serve as axles, on which turn 1¼” balsa wheels. Small beads between the wheel and aluminum and thin balsa strut will keep it in place.

A streamline block is glued on each leg of the landing gear (refer to Plate 4 and photos). Cut away paper on the bottom of the wing so that the struts will fit up in it, and then glue the legs on the spar and auxiliary spar. Be sure the landing gear struts are parallel to each other and that they are securely cemented. Mount the tailskid on the tailblock, and glue it in to stay!

**Propeller and Flying**

CUT the prop block out of a ¾ x 1¼ x 7½” balsa block and shape as in Plate 4. Carve the prop carefully and paint it silver a couple of times to represent the Ratiere controllable pitch propeller which the real ship uses. Mount a hardwood noseplug and two thrust (Continued on page 94)

Left: This view of the partly-covered framework will aid you in checking your work. Note how the undercarriage is fitted to the wing spar. Right: A front three-quarter photo of the structure.

[36]
CAUDRON 460 MONOPLANE
EQUIPPED WITH SIX CYLINDER RENAULT ENGINE DEVELOPING 330 HORSE POWER

3/2 SQ. LEADING EDGE

LANDING GEAR STRUT

1/8 TRAILING EDGE

MAKE TWO

BAMBOO TIP

TAPERED SPAR FROM 1/2 STOCK

MAKE ONE (CENTER)

ALL RIBS OF 1/32 BALSAM EXCEPT CENTER WHICH IS 1/16
Here's the French Potez 37R2

You solid model fans who go in for jobs with unusual fuselages will find the Potez is right up your runway.
So get out the balsa and try your hand at this famous all-metal French Air Force observation ship.

TOTAL AREA OF WING  378.89 SQ. FT.
AREA OF AILERONS  38.75 SQ. FT.
AREA OF VERTICAL TAIL SURFACES  19.91 SQ. FT.
AREA OF HORIZONTAL TAIL SURFACES  53.28 SQ. FT.

WEIGHT EMPTY  3597.50 LBS.
FUEL AND OIL  749.57 LBS.
USEFUL LOAD  1211.66 LBS.
TOTAL WEIGHT  5558.73 LBS.
SPEED  164.04 M.P.H.
CLimb TO 16400 FT.  17MIN. 10 SEC.

SPAN  46.59 FT.
LENGTH  33.74 FT.
HEIGHT  11.48 FT.
TRACK  9.84 FT.
CEILING  24606 FT.
TAKE-OFF RUN  623.4 FT.
LANDING RUN  672.6 FT.

HEIGHT OF PROPELLER
AXIS ABOVE GROUND
AIRPLANE AT REST  8.04 FT.
AIRPLANE IN LINE OF FLIGHT  6.56 FT.

POTEZ
37R2

NICK LIMBER
Bob Morrison set his completed Hawker Fighter before him, got busy with pen and ink, and turned out this neat impression of the speedster flashing through the air.

Hawker’s 1936 Fighter

Model fans, here’s a big surprise for you—the first published plans of Great Britain’s fastest and finest fighter, the new 1936 Hawker! Reports say it’s been officially clocked at better than 300 m.p.h. And here are full instructions for building a solid scale model of this outstanding job.

By Robert C. Morrison

The intended large expansion of the Royal Air Force has encouraged British airplane makers to develop super air weapons to guard Great Britain and its territories from enemy attack. In the past few months, Britain has produced some very fast planes, but none has equaled the outstanding performance of the Hawker low-wing fighter just completed. Reports have flashed across the ocean that the new plane has been accepted by the Royal Air Force after exhaustive tests at the Hendon Airport. Its speed, they say, has been officially clocked at 300 m.p.h. top!

The power plant is a twelve cylinder inline Rolls-Royce engine known as the Merlin. In design, the swift fighter has many of the popular American features, such as split trailing edge wing flaps, wing fillets, retractable landing gear and tail wheel, and control tabs. Its engine radiator is underslung well aft of the fuselage and thus offers very little wind resistance.

On the accompanying page are the plans of England’s fastest air weapon published for the first time! Follow the instructions and build a model of the ship.

First, get dimensions for purchasing material from accompanying full size plans. It is preferable to purchase the wheels already made. The model should be made from balsa wood.

Start with the fuselage. Draw the outline of the top view of the fuselage on stock and cut to shape with a jigsaw. Go over rough surfaces with coarse sandpaper. Then draw the outline again and cut once more. Be accurate. Sandpaper the top and the bottom of the fuselage sufficiently to smooth out the bumps. Using a sharp razor blade, shape off the edges and sides until the correct contour of the fuselage is obtained as shown by the three cross-sections on plans. The enclosed cockpit may be hollowed out, if desired, with a sharp chisel. The enclosure may be made of thin strips of balsa wood with cellophane for windows. Use model cement for connecting window panels and cellophane. Go over the entire fuselage thoroughly with fine sandpaper until a smooth finish is obtained.

Make the wing next in two parts, one for each side of the fuselage. Draw the outline of the top view on stock with the grain in the wood running lengthwise. The fillets (streamlining where wing joins fuselage) may be made after the assembly of the model with plastic wood or putty. Cut around the outline of the wing with jigsaw and then taper down the wing as shown in front elevation on plans with a sharp, flat chisel. Shape out the airfoil as shown by the airfoil section D-D (See Plan). Go over the surfaces of the two wing halves with coarse, and then fine, sandpaper. Pressing heavily on a pencil so as to make a groove in wood, draw on the ailerons and the trailing edge wing flaps underneath the wing. Wing flaps are denoted by the dash lines on the plans.

The tail units, rudder, elevators, fin, and stabilizer, are easily made with a razor blade, as sufficiently shown by the plans. Make the prop spinner from a scrap piece of balsa with a razor blade or on a lathe if you have one. Shape out two prop blades and cement them to the spinner.

Construct the engine “belly” radiator and then the landing gear fairings and struts. These are to be made from 1/16“ sheet balsa and sanded down to a slightly lesser thickness. If you desire, you may make the land-

(Continued on page 94)
HAWKER'S 1936 FIGHTER

ENGLAND'S LATEST AIR FIGHTER

POWERED BY ROLLS-ROYCE MERLIN ENGINE

THE 1936 HAWKER FIGHTER
Hervat's 39-Minute Glider

Put on your wheel brakes right here, if you're looking for a real winner—for this record-breaking solid glider is all of that and more! When Joe Hervat tossed this one into the air out on the West Coast it zipped off a flight of 39-minutes-plus before it disappeared from view. Joe hasn't seen it since, so you'd better not let go of yours until you're sure it knows the way back.

GATHER 'round, all you model builders who like to do your flying in the great open spaces. We have a solid glider for you this month. Not just another glider, but one that has stayed aloft and in sight for 39 min. and 30 sec.

Joe Hervat, the builder and designer, launched his original model just before a contest held last summer out on the West Coast. He hasn't seen it since! Of course, we aren't going to say that the ship is still up, but we won't say that it isn't, either, because the timer lost sight of it while it was playing tag with the clouds at about 1600 feet.

That ship was certainly choosey. After having been up for 22 min. it came down to within 100 ft. of the ground, but seeing a plowed field below, started up again. It disappeared over a mountain, probably looking for greener pastures on which to settle.

Now that we have aroused your interest (or haven't we?) we'll give you a building outline so that you can get to work.

WING

THE wing is made from 3/16" x 33/16" light balsa. If you can’t get 33/16" wide stock simply build up the required width with two narrower pieces. Cut this sheet balsa to a length of 20" and, using the drawing (see next page) as a pattern, shape the tips with a razor blade. Draw a center line chordwise on this blank and taper each half of the wing, as shown, with rough sandpaper wrapped around a sanding block. The airfoil section may be sanded into the wing or may be planed in. As the section approaches its final form, use finer grades of sandpaper on the wing until you get down to about the "ten nought" grade. Now give the wood a coat of the following mixture: 2:3 dope and 1:3 thinner to which has been added a drop of sweet oil for every oz. of the polish made. Sand the wing smooth after the polish has dried, and then finish it off by rubbing briskly with heavy wax paper. Finally cut a "V" out of the wing at the center, as indicated, so that the setback and dihedral angles may be formed.

FUSELAGE AND TAIL

OUR fuselage is cut from pine stock 3/16" x 27" to the shape shown. Note that the cross section of the fuselage is of an inverted streamline shape. You can rough this cross section out with a knife and finish the shaping with medium rough sandpaper. When you have smoothed the fuselage down with various grades of sandpaper, put the final polish on (after doping) (Continued on page 85)

From the Model Builder's Workbench

A Batch of Model Hints

HOLLOW cockpits on small solid models are easily made. First, carve the fuselage as usual and sand it, but not to the final stage. Second, cut out the portion of the fuselage that constitutes the cockpit. From 1/16" sheet balsa carve as many sheets so that when they are put together they will give a block exactly similar to the one cut out. Then, before gluing, take each sheet that constitutes the block (except the bottom one) and cut a piece out of the inside, leaving a thin wall. Then glue the sheets in place in the fuselage and finish sanding. Hollow motor cows may be made in a similar manner.

Imitation ribs on the wings of solid scale models may be made in the following way: Carve the wing and sand and finish it according to the outline of the plan. Then mark light lines at the places where the ribs should be. Take a small block of wood as wide as the distance between the ribs, and carve or sand the width down to a shallow convex curve. Tack on a piece of sandpaper. Then sand the spaces between the drawn lines on the wing until the desired effect is obtained.

Small round windows may easily be painted on solid models by dipping a dowel, with a diameter equal to that of the required window, in black paint. Then lightly touch the spot where the window is to be made and you will have a perfectly round window.

Scale cylinders, whether small or big, can be made by screwing a balsa or pine dowel of the correct diameter through the threads of a large nut. A nut with U.S.S. threads gives the best scale appearance.

To make corrugated covering or surfaces, take a comb with teeth as wide as the space between them and file them round. Then, using a straight edge, press the comb over a sheet of balsa, or on the solid balsa fuselage, and the desired effect is obtained. Another idea is to glue sheets of leaves from corn stalks in the required place.

While we're on the subject of food, it might be well to note that macaroni of the right diameter may be used for cockpit padding. After cooking, wipe the excess moisture off of a piece of macaroni and put in place around the cockpit. After it dries, put some glue around it and later paint it.

To make hubless wheels, cut off the conical part of the wheel and carve a slight hollow in the wheel. Carve a piece of wood into the shape of the conical part of the wheel which was cut off. Hollow this, especially in the center. Put the main part of the wheel on the axle and glue a washer on the axle to keep the wheel from coming off. Then glue the conical piece of wood to the wheel, being careful not to have any part of the wheel glued to the axle or the washer.

—Benjamin Talsky

Attention, Model Builders!

FLYING ACES wants plans and directions for building flying scale models of the latest modern planes. In order to be printed in this magazine, drawings must be done in India ink, and must fit a 7 x 10-inch page. Plans should not exceed six pages. Photographs of completed models must accompany plans. Send in your work, model builders, and get it printed! Payment is made for accepted plans.
Be it real plane or model plane, there’s nothing more important than the power plant. So if you want your ships to appear truly realistic, you should fit them with miniature motors that look like the real McCoy. In this article, Joe Battaglia shows you how to build a tiny “Cyclone” that’ll pack 525 d.h.p. (display horse power) into your next solid model.

Make A Model “Cyclone” Engine

By Joe F. Battaglia

Well, you scale model fiends, here’s a real treat for you—full instructions for making an accurate model of the 525 h.p. Wright “Cyclone” power plant. This motor is what the Wright people call their Model R-1750E.

So many scale modelers have been looking for some good, practical drawings and information on the better-known aircraft engines, that we’ve taken it upon ourselves to get it for you. You see, the average model builder turns out a fairly decent craft, but when he attempts to build a realistic engine he’s stuck, more often than not.

The Wright “Cyclone” we are going to build is drawn full size in the accompanying plan (see next page) so you can tell immediately whether it will fit one of your present solid models. Of course, if you want a different size motor, simply increase or decrease the sizes of materials used in proportion. True-scale engines can be built of almost any material, for the weight factor is negligible in solid scale work. However, the most inexpensive, yet realistic, motor can be constructed from the following “makings”:

1. Birch dowel, $\frac{1}{4}$" diam.—for cylinder barrels.
2. Bristol board, either 2 or 3 ply—for cooling fins.
3. Balsa, plywood, or cardboard—for cylinder skirts.
4. White wood or balsa—for cylinder heads.
5. Birch dowel, 1/16” diam.—for push rods.
6. Heavy thread or thin wire—for ignition wires.
7. Metal eyelets or Birch dowel—for spark plugs.
8. White wood, pattern pine, or balsa—for crankcase.
9. Aluminum tubing or Birch dowel—for crankshaft.
10. Bristol board, 2 ply—for baffles.

If the builder should decide to make his engine of metal, aluminum should not be used, because such expensive equipment is required for soldering with aluminum. The best metal would be brass, copper, or any other metal easily joined by ordinary solder. For the benefit of the average model builder having none too much money to spend, let us assume that the material just listed is to be used.

Take the $\frac{3}{4}$” dowel to form the cylinder barrels, cut off nine pieces to the proper lengths, and put them aside. Next, make the cooling fins from Bristol board, as shown, by drawing circles the proper diameters on the stiff paper, making enough of these rings for each cylinder. Then cut them out and color with India ink or black paint. This done, place them aside also.

Now make the cylinder “skirts.” These are made similar to the cooling fins, except that they are thicker than the fins and are made from wood or cardboard. Make nine of these and likewise paint them black. The cylinder heads are next. Should they be made from hard wood (which is best for this purpose) cut short lengths from a $\frac{3}{4}$” diameter Birch dowel and make irregular “V” shaped cuts at what is to be the top of each head, as shown in the drawings. Then make each piece the proper shape. When these are completed, cement each onto the end of the respective cylinder barrels. When these are dried out thoroughly, slip each cooling fin in place and last of all each cylinder skirt. When you have straightened them all out, place cement at the inner part of each circle and allow them to dry.

Make the crankcase next. (Note: If you have a lathe, or one is accessible at your high school manual training department, this operation is decidedly easy; but if you are unable to use a lathe, the crankcase may be formed by using your regular tools.) The crankcase should be made in two halves. Join two pieces of 2” diameter Birch dowel end-to-end and turn the combined pieces to a maximum diameter of 1 13/16”. Then turn the pieces to the shape of the side view of the two combined halves of the crankcase (minus the shaft).

This done, drill a hole through the center from front to rear.

Now make a template the shape of the front view of the crankcase (see plan). Next, take the two halves of the crankcase apart at the “case center” and cut and sand the nine faces (according to the template) which are to accommodate the cylinders. Next, drill the holes for the cylinder extensions to fit in, and when through, slip each cylinder in place and cement to the crankcase.

(Continued on page 94)
CROSS-SECTION FRONT VIEW OF CYLINDER.

CYLINDER COOLING FINS MADE FROM BRISTOL BOARD (2 OR 3 PLY)

SIDE VIEW OF CRANK CASE, SHOWING CENTER-LINE JOINING FRONT & REAR HALVES OF CASE.

FRONT VIEW OF ENGINE

FRONT VIEW OF CRANK CASE

DRAWN BY
JOE F. BATTAGLIA  DEC. 2, 1935
TYPE OF ENGINE - CYCLONE - MODEL R-1750 E H.P.525
SCALE -
MFTD. BY WRIGHT AERONAUTICAL CORP.
You'll certainly want to add this neat craft to your model tarmac, for it's something special—a convertible flying model! One of the photos on this page shows the ship as an endurance job, while the other pictures the speed model. Before reading the photo captions, see if you can tell which is which. And can you point out the two features in which the one differs from the other?

By Felix Gutmann

Here is a little ship that gives top-notch performance, especially outdoors where it was designed to fly. You may build it either as a speedy go-getter, or as an endurance ship capable of flying up to 100 feet altitude under favorable conditions.

The plans given herein show the plane as the speedy job, so if you want an endurance ship, do the following:

(1)—Make the landing gear 1/2" longer. Also leave off the triangular-shaped balsa landing gear struts altogether and substitute heavy music wire for the long bamboo struts, bending the wire at the end for use as wheel axles.

(2)—Use a 10" propeller. The layout of the blank will be in proportion to the 8 1/4" blank given on Plan 2. The end dimensions are: 1 7/16" x 1 1/4".

Now to start building. Be sure that you have first thoroughly acquainted yourself with the plans—which is always a good thing to do.

The most important part of a plane is always the wing, so we will start with that as it requires the most care:

Wing and Fuselage

The wing construction is comparatively simple. Leading and trailing edges are of 3/16" x 3/16" medium balsa cut to shape, carefully streamlined, and sanded smooth. The spar is also of 3/16" x 3/16" sanded smooth. The tip is of 1/2 sheet. Note the direction of the grain. The ribs are all of 1/32" sheet. Two templates may be made from Plan 3. Note that the center ribs are inclined. This is to allow for the 2" dihedral to be put in each wing when the halves are dry.

The fuselage is made of two 1/32" sheet balsa halves made by tracing or copying the heavy outline in the side view, Plans 1 and 2. When these are made and sanded smooth, the bottom edges may be beveled, then cemented well, and joined at an angle. When dry, 3/32" sq. strips are used to make triangular reinforcement stations, as shown in the perspective view, but first 2 rectangular strips of celluloid are cemented on the inside where the circular windows are. Now the top of the fuselage is covered also with 1/32" sheet balsa, the patterns of which are shown in heavy outline on the top view. Two 1/16" sq. strips are cut to form the front "Y" cabin window, this to be covered with celluloid or cellophane. A nose block is now made with a plug at the back end to tightly fit the triangular opening at the nose of the fuselage. Two "rails" are now made to be cemented on the outside top of the fuselage, as shown in the side view. Slits are now made at the tail end to accommodate the tail group. Two formers with grain running in opposite directions are laminated (glued together) to form the supporting bulkhead for the tail hook.

Tail Surfaces

These are made of 1/32" sheet balsa, streamlined, and sanded smooth. Note the coloring. This is made by drawing in pencil the diagonals lines, then applying banana oil on that side of the line nearest the leading edge and quickly laying a sheet of red tissue over this area, making sure that the edge of the tissue is on the line. Now trim with sandpaper.

Props and Landing Gear

See dimensions on plans for small propeller. For endurance prop, see beginning of this article.

(Continued on page 96)
PLATE 3
FULL SCALE

1/32" SHEET

LEADING EDGE

CENTER SPAR

TRAILING EDGE

ALL RIBS OF 1/32" SHEET

B - 2

B - 14

1/3 SCALE FRONT VIEW
The Tail-less R.O.G. Special

A unique ship and a swell flyer—that's the Tail-less Special! You'll all want to make one, too; for though we offer it primarily for the stick model fans, it has several features that you expert builders will want to try out. Boasting lots of sweepback and with elevator surfaces built into the wing tips, it follows the lines of the Westland Pterodactyl that we showed you in these pages last month.

In all tail-less planes, the wing's the thing! And this "shot" shows the wing of our R.O.G. Special to great advantage. It certainly doesn't take more than a glance to tell you that this job packs real power!

By Jesse Davidson

SIMPLICITY is this R.O.G.'s middle name. Though lacking the usual elevator, its capabilities are not hindered in the least; for the absence of the elevator is compensated by the specially designed wing whose upturned trailing edge tips are actually small elevators built integral with the wing. The tail-less is powered with two strands of 1/6" sq. rubber, and when fully wound up it takes off in zero run, climbs almost like an autogiro, and when through cutting capers glides to a neat landing like a secondary sailplane.

First of all, have the necessary working materials on hand besides the usual cutting and round nose pliers to shape the metal fittings.

**MOTOR STICK AND RUDDER**

THE motor stick is chosen from a length of hard balsa measuring 3/32" x 8/16" x 9 1/2". Taper the front and rear ends as shown in the plan, then shape all the metal fittings and cement them in place. The thrust bearing is held securely by wrapping white silk thread several times about the stick.

One piece of bamboo 1/32" sq. forms the outline of the rudder. Note how it is made in combination with the tail skid. Cover one side only with Jap tissue using banana oil for the adhesive. Attach to the extreme end of the stick with an application of cement.

**WING**

MAKE a full scale working drawing of the wing. Then shape the leading and trailing edge parts as shown in the plan, designated by A-A and B-B. Pin these down on the plan. Next, cut all the ribs to shape and cement each one in its proper position. Now shape a piece of bamboo 1/32" sq. (about 7" long) over steam to resemble the trailing tips. Keep curving the bamboo by placing it directly over the pencil outline, and when it is near enough to the shape as on the plan put small pins around the curved edges to hold the bamboo in place until it dries thoroughly. Snip off any excess length and cement well to the joining ends. Of course, this must be done to the remaining side of the wing also.

The next step is to give the wing dihedral angle measuring 1 1/2°. With this done, bend the bamboo trailing tips upward as shown in the front view. (See dimensions on drawing.) Now cover the wing, one half at a time and, on one side only, the top. Complete the wing structure by cementing the wing clips in their respective positions. If desired, water-spray the wings one half at a time and allow the moisture to dry naturally. Do not place near any heat.

**PROPeller AND LANDING GEAR**

CARVE the prop to the shape shown. Use a hard block which can "take it." Insert the prop shaft the usual way and place a couple of brass washers on the shaft. Balance the prop carefully. The landing gear is shaped from No. 8 wire to the design shown. Note the slight curve as shown in the side view. Use 3/4" diameter balsa (or celluloid) wheels and complete the landing gear by bending the outer tips up as shown in the front view. The landing gear may be attached to the stick permanently with an application of cement or clipped on directly underneath the prop shaft as shown. (See front view.)

From the photograph you can assume the approximate position of the wing. Glide the model without winding the rubber. If the glide results in a stall, move the wing slightly back; if the model dives, move the wing forward a little. Test the glides until you obtain the longest glide possible while releasing the model from your eye level.

Rub a little machine oil on the rubber to lubricate it. A drop of oil between the shaft and thrust bearing won't hurt, either. To get the model to spiral in tight circles, raise or lower any one of the trailing tips slightly. Always launch into the wind.

All workbenches clear? Okay, then, let's go!

**Coming Next Month:**

"How to Mount Gasoline Engines in Model Aircraft," by Leo Weiss, National Gas Model Champion
THE TAIL-LESS R.O.G. SPECIAL

No. 1-1 REQUIRED - 2/6" SHEET Balsa
No. 2-2 REQUIRED - 3/6" SHEET Balsa
No. 3-3 REQUIRED - 4/6" SHEET Balsa
Ribs - Full Size

Front Wing Clip
Propeller Shaft
Rear Wing Clip
Rear Motor Hook

Wire Parts - Full Size
No. 8 Wire Required

Propeller Shaft
Can

Motor Stick - Balsa - 3 3/16" x 3 3/16" x 9 1/2"

Wrap With Thread and Cement

1/8" Sq. Bamboo

Bend Bamboo Up at These Points as Shown in Front View

Section View - Full Size

1/16" x 1/16" Balsa
1/16" x 1/16" Balsa
1/16" x 1/16" Balsa

Wing

Sweepback - 3/16"

1/8" Sq. Bamboo

1/2" x 1/4" Balsa

Leading Edge

Front View - Wing

Large Wing Clip on Trailing Edge

Dihedral 1/2"

Landing Gear

1/8" Wire

Propeller - 3 1/2" Balsa

Scale - 1/2" = 1"

JD-HA

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Try a Solid Model of the Amiot Fighter

**Amiot 143 M5**

French Fighter

Gnome et Rhône 14 Kts., 800 h.p.

**Construction:** Skin stressed cantilever monoplane.

**Power:** 2,800 h.p. Gnome-Rhône 14 Kts., s.c.

**Crew:** 5.

**Guns:** 8

**Span:** 80

**Length:** 59

**Gross Weight:** 16,200 lbs.

**Top Speed:** 190 m.p.h.

**Landing:** 55 m.p.h.

**Climb:** 13,120' in 11 min.

**Range:** 1,250 miles.

**Bombs:** 2 or 4,000 lbs. carried in wings and in cabin. Photographic equipment also carried.

FRENCH DESIGNATION: "MULTI-PLACE DE COMBAT" (or MULTI-SEAT FIGHTER)

**Scale:**

1:2345678910

\[\frac{1}{8}'' = 1'0''\]

**French Colors:**

- Red
- Blue
- White

*Drawn by* [Signature]
CONSTRUCTION OF WIND TUNNEL TEST MODELS

This month we consider the requirements of test-model airfoils for wind tunnel experimentation. And don't be frightened by the complicated-looking charts which accompany this article, for you'll find them mighty interesting when you read Mr. Zier's discussion of them. Okay, let's go—

THE first of the series of wind tunnel tests to determine the adaptability of large aircraft airfoils to model planes is now in preparation. This month, therefore, we will discuss the construction of test-model airfoils to be used in the Casey Jones School of Aeronautics tunnel.

The results of any wind tunnel tests depend largely upon the accuracy with which the test model has been made. Inasmuch as the airfoil characteristics, as was pointed out in our previous article, depend upon the contour of the section, it can be readily understood why the construction of a test model of an airfoil must be made with the highest degree of accuracy on the part of the builder. The contour or shape of the section must be made within limits of 3/1000" of precision. Of course such accuracy demands the skill of an experienced workman and no model builder, or at least no average model builder, can be expected to work within such close limits.

Directly after the War the Sikorsky Company designed an airplane using a Jenny wing as the upper surface. It was suggested by the engineers that the airspeed indicator tube be run along the leading edge of the wing. But it was found that because of the presence of the tube in the air stream the characteristics of the wing were altered to such an extent that the airplane refused to take off—even after running the complete length of the field. You can see from this how important it is to have the contour of an airfoil section accurate.

Test models of airfoil sections must be made of material that is capable of retaining its shape under all conditions. The section used in our experiments was constructed of hard balsa wood doped and redoped until the hardest surface was obtained, then the complete section was given a coating of special finish to give the surface a lustrous effect.

In examining the many airfoil sections tested by the National Advisory Committee of Aeronautics, we chose for our own tests the N.A.C.A. 2412 airfoil section. This is perhaps the best all-around section developed in the N.A.C.A. series. Its maximum lift-drag ratio is 22.5. That is the lift is 22½ times as great as the drag developed by the section. You will find the lift-drag ratio (denoted in Figure 1 by the “L/D”) quite easy to read. First, note the outer column of figures to the left. Now it will be seen that the highest point of the L/D line is slightly higher than 22—22.5, to be exact—when the airfoil has an angle of attack just short of 4 deg. (see bottom row of figures on chart). The other major characteristics (center of pressure and lift and drag coefficients) can also be traced on Figure 1.

Airfoil sections, whether they be six feet or six inches in chord length, must be proportionately shaped if they are to have the same characteristics. Because of this it became necessary to establish a means of obtaining the contour of the airfoil section regardless of its chord length. Every so often one of my readers asks me to explain just how he can obtain the correct curvature of a particular airfoil on his model airplane. Now if you will get a piece of paper, a pencil, and ruler we will follow the procedure used in laying out the 2412 section for our test. This procedure is adaptable to the laying out of any airfoil which you may choose for your model.

LET us assume, for convenience, that we wish to plot our 2412 airfoil section on a five-inch chord. With your ruler and pencil lay off a line five inches in length. This line represents the chord of our airfoil section. (See figure 2A on next page). You will note three rows of figures in the upper left hand corner of Figure 1. The first row is labeled “Station.” These stations are in percent of the chord. Thus station No. 2 is located at 1.55% of the chord length, or in our case 1/16" away from the leading edge. Our third station is located at 2.5% of the chord, or 1/8" away from the leading edge. Following these percents down the row, we establish all our stations along the chord. (Figure 2A). The second column is labeled “Upper.” This applies to the upper camber of the airfoil section, and is likewise plotted in percent of the chord. Thus our corresponding point of the upper camber on our 30% station is 7.88% of the chord, or .394 inches. All points of the second column are plotted above the chord line.

Our third column is labeled “Lower.” This applies to the location of points along the lower camber. Thus
at our 30% station our point would be 4.12% of five inches, or .206 inches below the chord line. The minus signs, as indicated in front of all the percents of the lower points, imply that the distance is measured below the chord line. In many cases the lower camber will cross the chord line. Thus the sign in front of the percent on the third column will be plus. We have such a case in the N.A.C.A. section No. 4409. After all the points of the upper and lower camber have been located with the aid of a French curve, connect the points, paying particular attention to the curvature of the leading edge. (Figure 2B).

In this manner all airfoil sections may be plotted upon any chord length you may choose. N.A.C.A. Report No. 460, which is obtainable by writing to the Government Printing Office, contains 78 related airfoil sections from which you may choose a particular airfoil section for your model planes.

If the results of our experiments with the N.A.C.A. 2412 gives us the same identical characteristics as plotted above we can definitely adopt any section developed by the N.A.C.A. for our models. Not only this—it would also prove to us that the action of air at low speed is the same as that of medium speeds. Unless these tests prove otherwise it will be necessary to develop sections in the low speed ranges adaptable to our model planes. So until next month, Snappy Landings!

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Right: Figures 2A, 2B, and 2C.

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All Questions Answered

This section of FLYING ACES is at your service, F.A.C.'s. Send in your questions and requests for air information, and we will be glad to answer them here in the order received.

Edward Pintz, Brooklyn:—The seven original members of the Lafayette Escadrille were: Victor Chapman, Kiffin Rockwell, Bill Thaw, Bert Hall, James Bach, Norman Prince, and James McConnell.

Bill Jackson, Galveston, Texas:—The straight-sided cross you mention is the one used by the Germans to mark their aircraft after January 1, 1918. The Maltese cross was employed prior to that date.

John McConnell, Mooresville, N. C.:—I cannot give out the official speeds of service ships because I do not know them—a question I have answered many times before. The McConnell of the Lafayette was named James. He is credited with no enemy planes as far as I can find out.

James Snoddy, Brownwood, Texas:—I do not know Larry Callahan who once served in the 88th, R.A.F. and later with the 148th. Let’s hope this catches his eye and he gets in touch with you. (James lives at 507 East Depot Street, Brownwood, Texas). I have no record of John McGavrock Grider, either.

William Tuma, Lonsdale, Minn.:—See the article in November FLYING ACES for all the details you desire on enlistments, etcetera.

J. Oakden, Manchester, Eng.:—Since when has the Overstrand been considered a light bomber? I think you took the wrong attitude on the article and jumped too quickly to conclusions. Thanks for the clippings.

Robert Mitchell, Salinas, Calif.:—Thanks for your letter. You surely have a sense of humor. What kind of coffee were the Germans drinking at the end of the war and who supplied it? I give up! You’ll have to write to Joe Archibald and find out what “schnapps” are.

[56]
As for that picture, it's no crasser than most of the futuristic stuff we have had to put up with during the last ten years. (Editor's Note: Joe just came in with the info that "schnapps" are derived from the lowly potato—so there you have it!)

Orrin Johnson, Nevis, Minn.—The only Muller of the German Air Force I know of who was alive after the war was the Hans Muller who was credited with twelve victories. The famous Max Muller was killed on Jan. 9, 1918.

Parks Miller, Port Tampa, Fla.—So you wish to get in touch with Captain Blaine Hulewitz, former ExF pilot. I have no record of him, but we hope you can get in touch with him through this department. Miller can be reached at P. O. Box 125, Port Tampa City, Fla.

Paul Paulson, Randolph, Mass.—Any one closely connected with aviation is eligible for an honorary membership. I am sure the man you mention would be welcomed. The trade school diploma would be helpful in getting a ground job. The goggles you refer to would have to be made special, just the same as spectacles. The cost would vary according to the lenses required. Roy Brown's initials are A.R.

William Pederson, Bronx—Okay, the S-42 is an amphibian—an amphibian flying boat, though. I can't tell you about oil colors on doped tissue. Why not try lacquers? The belt of a machine gun used on airplanes goes the same place as the empty cartridges go—out into nowhere. That's because the belt is really a series of metal links in which the bullets themselves act as the pins. When the bullet is extracted from the belt, that section of link falls away—and there you are.

Bruce Robinson, Spokane, Wash.—As we have explained so many times before, Captain Ball was on leave in England when Immelmann was shot down. Immelmann was one of the Cubbin shot the noted ace down. Collinshaw never had 77 official victories during the Western Front action. But he added plenty to his score up in Russia later on. I don't know how they continue to make that mistake about McCubbin.

J. Perlman, Brooklyn.—Most of the artists working on FLYING ACES use photographs and scale models in their effort to get correct proportions. Many, of course, also spend much time at nearby airports and either make actual sketches or photograph the planes in the position they most desire. To work from an actual scale model is best, though.

Barry Kenyon, Westerly, R. I.—The fastest plane used during the war was the Sopwith Snipe. (How many times do I have to answer that one?) The Douglas transport DC-2 is the fastest ship put out by that firm, as far as I know officially. I believe Alan Winslow is credited with scoring the first victory for the U. S. Air Corps. I cannot answer your question on Bert Hall.

Wallace Bishop, Glendale, L. I.—Most Jennys of the period you describe were painted olive drab and had natural color struts. They used squadron letters or markings of various types, such as large letters on the fuselage. Few carried any national insignia in 1917.

Paul Keenan, Rochester.—Manufacturers selling military craft to the U. S. government usually agree to retain that type for American squadrons, but they usually make some minor change in the machine and sell it abroad as an expert job. You can buy any unarmed type, I believe, if you have the money and can afford to run it. The Super-Fury has a smaller tapered wing and spatted wheels.

Walter Oden, Colusa, Calif.—Fokker never offered his machines to this country. He offered them to Great Britain. America was not in the war then. As a matter of fact, there is not a great deal of evidence that he ever offered them to Great Britain. They were not particularly good, outside of the D-7. It was the fixed synchronized machine gun they used that made them so effective at first.

Jack N. Dwyer, Bath, N. Y.—Squadrons cannot be given any special strength. They change according to the type of ship flown by that squadron.

For instance, there would be more officers in a two-seater outfit of eighteen machines than that using single-seaters. The Spandau fired about 450 rounds a minute. We have shown many war-time pictures of Italian planes in this magazine, such as the S.A.1, the Macchi Scout, and the Caproni jobs.

Warren Hiltonsmith.—Cruising speed is the speed a ship does at its most economical throttle-setting. Cruising range is the distance a ship can fly and get back to its starting point. Air-speed is your actual speed through the air, registered through a pitot tube, but your ground speed depends on whether you are being hindered or assisted by winds. With a twenty-mile tail wind, a ship that does eighty in air speed, actually does a ground speed of 100 miles per hour.

Frank Tommovic, Kankakee.—The Macchi-Castoldi motor is really a double engined job bolted together. The main crankshafts are geared to drive two hollow pro-shafts that run in opposite directions and which are set between the two banks of cylinders of the forward motor. Thus you can get two props running in opposite directions.

A. Wood, Jr., Concord, N. H.—The Irish Swoop did not pass test conditions for the Australia race and the refusal to allow it to enter was justified later when Fitzmaurice tried to fly it in a solo hop. It practically fell apart in the
Diving headlong out of the night was a flaming skeleton! Tongues of fire licked at its bones, streamed out behind and merged in that sinister smoke. In the flames, the skeleton seemed to writhe as though some last vestige of life remained to suffer in agony. By that lurid blaze, its skull and bones were a sickly yellow. Down it plunged, flaming hands extended as though to seize the plane in their grisly grasp. Its lower jaw had fallen in a hideous leer. Its frightful screech drowned the roar of the engine and the Vickers' desperate clatter.

For in that first dazed moment, Strange still kept the trips hard together. He saw his tracers probe upward, into the skeleton's path. The ghastly thing shrieked closer. A last burst ripped from the guns, then Strange kicked clear, as his machine-gun like brain drove away his panic.

The skeleton could not be alive. That terrible scream must come from the shriek of the wind through its gaping jaws. A sick horror took hold of him as the thing flashed past. A minute ago, this must have been a living man—some luckless airmen who had died in a terrible fire.

He had time for only that single thought. The skeleton had barely dived past when the Spad was engulfed in a billow of dense black smoke, darker even than the night. A nauseating odor sent its reek up his nostrils. He balled, held his breath, shoved the stick forward. He was half-way out of that sickening black cloud when from somewhere there came the roar of a terrific explosion.

The Spad pitched over, whipped onto its back, tossed like a leaf in a gale. Deafened by the tremendous concussion, Strange clung to the stick. A vast pillar of flame shot up from the ground, and for one fearful second Hell itself seemed to have opened beneath him. Blinded by the flames, he knew not the way away from the inferno. Parched, air scoured his lungs as he rolled out to safety. One moment, the ship hung, wobbling, above the holocaust.

Then the controls tightened, and the plane pitched on to steadier flight. Strange thankfully gulped in breaths of cool air, and his half-stupefied mind began to clear. After a few seconds, he turned back. The blinding glare had already died away. The only flames now came from blazing trees along the western side of the 48th's drome.

The hangars-and-barracks section was covered by a great, dark pall. Here and there beyond that ominous blanket were tiny patches of fire. Above the field, another and smaller cloud of smoke was slowly dissolving. Still half dazed by the explosion, Strange circled the field, his eyes fixed on the scene beneath. The smoke was slowly eddying, thinning in patches. He glided low, peered under the lifting pall. Then a choked exclamation rose to his lips.

The Spad had strayed left but a huge, smoking crater!

Hangars, shops, and barracks—all were gone. The squadron had been utterly destroyed. So colossal was the disaster that it stunned his already dazed mind. He stared down as though the scene beneath would change, and he would again see the cluster of buildings and canvas hangars which had stood there a minute ago.

Khaki-colored wings dipped into view at one side. The sight of Tom Jay also brought horror and disbelief. Brought him back into action. With a forced cozen, he banked close to the other ship, and signaled as Tom's ashen face turned toward him. Tom dazedly nodded back. He landed at the edge of the field, Tom close behind him.

They taxied slowly toward the crater, deviating between scattered fires where blazing wreckage had fallen. At one side, Strange glimpsed part of an Hispano engine. Nearby was what looked like a heap of old clothes. He saw a mangled arm protruding. The tail of a plane perched grotesquely in a small tree at one side. The blazing woods lit up the desolate scene, but except at close range it was impossible to tell the remnants of the dead from the fallen debris.

Strange closed his mind to the horror of the picture, kept the Spad rolling until he could go no farther. Tom taxied up a hundred feet from the crater. His face was deathly white, and he stumbled as he climbed down.

"Good God, Phil," he said hoarsely. "They're all gone—there's all dead!"

"I know," Strange answered. His eyes swept over the field, went back to that great, smoking hole in the ground. Tom's lips twitched in a violent spasm of emotion.

"How can you stand there like that?"

He cried wildly. "Three hundred men killed—wiped out—their bodies blown to pieces!"

"Pull yourself together!" snapped Strange. "This is not time for hysterics."

Tom passed a shaking hand over his forehead.

"I'm sorry," he whispered. "I didn't mean to let go. But it's awful—I knew half of the pilots—"

"We've got to figure out what happened," Strange cut in tersely. "It's obvious now that it was this same horror that hit the 73rd. It may strike again."

"How do you know it's the same?" Tom asked huskily.

Strange gave him a keen look.

"Did you hear anything queer just before this happened?"

A frightened light came into Tom's eyes.

"Yes—I thought I heard that same terrible shriek again."

"You did," Strange confirmed grimly. Then he described how the skeleton had dived out of the sky. Tom stared at him, took a step backward.

"I'm perfectly sane," Strange rapped out. "If you'd been cooler you'd have seen it, too."

But—but what could it have been?" Tom enquired.

"It could have been some poor wretch who had been burned alive," Strange muttered. "That was my first thought. It would mean some terrific fire—perhaps something caused by a chemical mixture. That would explain the flame burning the field clear off."

Tom shivered.

"Even so," he said, "what connection could a skeleton have with this? He motioned toward the yawning crater.

"I don't know," Strange admitted shortly. "It might have no connection. Yet, it happened twice—at least, we heard the sound at the 73rd, and the same thing undoubtedly destroyed that squadron, too."

"We didn't hear any explosion over the wire," Tom said hopefully.

"The blast would destroy the phone before it could ever register a sound," Strange returned. "It also explains why all the communications around the 73rd went dead. This blast here was enough to upset phone transmitters and wireless tubes for several miles around."

Tom looked down shudderingly into the gaping hole before them.

"It's almost as bad as that mine crater north of Givry. He jerked around. "A mine! Do you suppose the Boche could have—"

"It's eighteen miles to the Front," said Strange. "It would have taken months to tunnel this far—and the 45th wasn't here until three weeks ago."

Tom dully nodded. His eyes strayed along the side of the rim, to where something horribly shapeless had fallen back after the explosion.
“God!” he said hoarsely, “A whole squadron—blown to bits—not a man left!”

The harsh note was coming back into his voice. Strange motioned him curtly toward his ship.

“Come on, we’ve work to do. We’ll head for the field at Third Corps. Be careful when you take off.”

His brusque manner had its effect. Tom’s eyes lost their wild look. He climbed into his cockpit, taxied back for a clear space. Strange followed, and the two Spade lifted up and away from that field of the dead. A motor car, von Stetten’s car, kept close on their tail. They turned West and Strange could see men crossing a meadow, near the stricken drome. Word of the disaster would soon be spreading up and down the Front. He gazed into the sky above the smoking crater. The small cloud left by the skeleton in its meteoric plunge had disappeared. Nothing was to be seen.

Some of the flinty look vanished from his face as he flew on into the darkness. The horror of the catastrophe had affected him more than he had let Tom see. He, too, had known men on the 45th —and his feeling for their fate was more of his various roles. There had been little Tubby Walters, whom he had met in Paris. Tubby had thought him a rookie, had kindly offered to “show him the ropes” and lend him money.

Hanging set his teeth. Mustn’t think of Tubby—must think of the dead. There were other Tubby’s along the Front who might die as he had died. If he were to get at the truth, he must forget emotion, call on his brain for cold, machine-like thinking.

He gazed ahead, eyes slitted. More than ever, the sketch took on importance. Was there something he had overlooked? Was the drunken Boche a clue? And that figure back in the shadow, with the bird perched on his lifted hand—

“The camera!” Strange muttered. They had been fools not to see it before.

“The aeroplane!” “Look out—birdie’s” a phrase invariably connected with the old-time photographer.

The man who had drawn the sketch could have meant only that one thing. But the camera was lost in the Suize. Jordan had men dragging for it, but any message inside it would probably be illegible even if they recovered it by a miracle.

The dash-clock showed 9:46. Strange glanced down, knowing he must be close to his destination. A few stray lights marked the village of Louvin-croix, to the southwest of which lay the two squadron field used also by Third Corps. The Ferrad pursuit and Staff Observation were based on the two arms of the L-shaped drome, and there was also a hangar for Staff ships and courier planes attached to Corps.

Strange pointed his ship toward another set of twinkling lights in the approximate direction of the field. Then he remembered. The lights had been installed on a “decoy drome” a mile or so beyond the real field, to trick Gotta bombers. Two or three Bessonneau hangars and some old sheds had been erected to carry out the deception, and there were even some dummy figures about the field and several old ships on the line. The trick had been successful once, he knew, when several tons of bombs had been dumped on the decoy field.

He was about to swing around toward the real base when he was startled to see tracers lance through the gloom, a hundred yards ahead. He shoved the throttle open again. Those were Tom Jay’s guns. He had seen Tom’s exhaust stacks flashing ahead of him only a moment before. The tracers shot up at a steep angle as he closed the gap. He followed Tom’s hasty zoom, though he could see no sign of a foe. The spitting Vickers went dark, then with a violent reversion, Tom came hurtling around almost into Strange’s path. Strange kicked aside in the nick of time, and the other Spad roared past.

Strange shot a glance upward as the plane was swallowed up in the darkness. His heart gave a leap. There not two hundred feet above him was another flight and the same kind of ship.

With a swift roll, he threw the ship out of the way. But no furious plunge followed, no fearful, ear-splitting shriek. He steadied back. The skeleton appeared to be floating down... there was something beside it... Strange got his head down and marshaled his thoughts. The thing had appeared from nowhere.

Side by side, the two skeletons writhed down the sky, as in some weird, macabre dance. As abruptly as it had appeared, the second one vanished. The other one gave a peculiar twist. Its ribs seemed to telescope, and for a moment its bony arms appeared to grow from the flaming hip-joints. Fascinated, Strange ruddered in for a closer look.

In that second, his plane jolted in a furious rush of air. Strange had a taunt feeling that something had whirled by him, though nothing had. He kicked away a tried way. He cast a hurried glance upward.—That was a darker shadow.

Thump! The Spad’s nose flipped up sharply. He threw a dismayed look backward.

Clinging to the tail of his ship was one of the skeletons!

CHAPTER III

DECOY DROME

O NLY part of the gruesome figure was visible. One flimsy arm lay along the left flipper surface, bony fingers beating a tattoo on the tight oval of the surface. The head protruded a blackened skull, its solid darkness emphasized by the faint, licking flame which fringed it. The blackness was somehow more horrible than empty sockets would have been. It was as though a shrouded face stared over the tail.

In that first moment of shock, Strange gazed back, rigid. The Spad went up steeply, lost flying speed. He kicked fiercely to the left. The plane fell off, began to spin. He centered the controls, felt a grim pull at the stick. The skeleton was still there!

Desperately, he rammed the stick forward. Engine roaring, the Spad lurched out of the spin, pitched earthward. Strange looked over his shoulder. He had a glimpse of the skeleton whirring helplessly from side to side as it hung on. With a muttered oath, he swept the stick to his chest, blotted the rudder. The Spad reversed with a mighty howl of its wings. He felt the stick jump, freed of its burden. When he looked back, there was a vague blur against the white ground below.

Gingerly, he tried the controls, banked above the falling figure. It was dropping into the decoy drome. He turned toward the Third Corps base, then with a sudden grim determination banked again and glided over the other field. The thing wasn’t supernatural, no matter what it seemed. The best way to solve the puzzle was to go after it, without losing any time.

He spiraled down, searching for a trace of the skeleton. The flames had about burned themselves out, he knew, or they would have set his ship afire. He could follow the faint glow of one where the thing had fallen. He circled at a hundred feet, gazing down. The skeleton had dropped close to a clump of trees. He thought he saw the other one, too, but the spreading limbs kept him from being certain.

He made a turn, forcing his way through the hangars of the decoy field when he thought he heard a faint moaning above the sound of his ship. He remembered the rush of air which had jolted the Spad. Remembered, too, that hint of a darker shadow. But he could see nothing now. A single figure, a shriveling shadow, added itself to the glow of decoy lanterns below. He saw a man silhouetted in the door of a shack as he sideslipped for a landing. He dropped the Spad closer, trying to take advantage of the light. A hummock of ground loomed up suddenly as he went, the edge of old cartry, tried to stall down with a burst of the Hisso. The ship touched ground, rolled a hundred feet, and snappog viciously as the right wheel collapsed.

Strange was hurled forward, his goggled face narrowly missing the breech of a Vickers gun. His tight safety-belt drove half the breath from his lungs. The plane grated to a stop, wingtip crumpled against the side of the hummock. As the wheel gave way, Strange had hastily cut off the switch. He unfastened his belt, climbed out as soon as he caught his breath.

T HE man from the shack came dashing up, a lantern in his hand. Strange drew an automatic from the holster under his arm, lowered it as he saw the khaki uniform and the man’s duty belt.

“Are you on guard here?” he demanded.

“Huh? Oh, sure,” the doughboy answered breathlessly. “You hurt any?”

“No,” said Strange. He took a quick step toward the wrecked ship. “Let’s have your lantern a second.”

The enlisted man bent down with him
as he inspected the crippled landing-gear. There were five bullet-holes through the broken strut. Strange stood up, frowning. Some one had fired on the Spad—but he had seen neither ship nor traces.

"You must've got th' Heinein," vouch-safed the sentry, "I heard him land up to the Nieuport.

Strange grimly shook his head.

"He wasn't the one who fired these shots. That was a Spad you heard," he took a quick glance across the defile field. "Are you the only one here?"

"Yes, sir," the man replied. "I'm supposed to keep lights if any Huns come over—an' then dive into a bomb-proof at th' last second."

"Then there's a phone to Third Corps?"

"You can get 'em, yeah—but th' line runs to 664th," said the sentry.

"Strange? I want you to call there, while I investigate something. Get Lieutenant Jay—he's the one who just landed there in a Spad. Tell him Captain Neville is down over here, and to bring an armed squad as quickly as possible."

"Yes, sir—I'll tell him," the man said hastily.

"I'll need that lantern," clipped Strange. He looked at the doughboy's freckled face as the yellow rays fell upon it. "You didn't see anything fall near here a few minutes ago?"

The sentry looked puzzled.

"No, captain, I didn't. Anything."

He hurried back toward the shack. Strange took the lantern, quickly started in the direction of the spot where the skeleton had fallen. He passed a gloomy hangar, before which was an old Nieuport, devoid of an engine. Two more dilapidated machines stood nearby. The lantern's glow fell on a figure in khaki. His eyes narrowed, then he saw that it was one of the dummy soldiers used to make the drone seem occupied. There were several more, stiffly propped up like martial scarecrows.

Strange went by them, and swiftly—hesitating only a moment—threw those along the edge of the clearing. The ground was uneven, and the underbrush caught at his boots. In spite of himself, his nerves were tense as he reached his goal. He held up the lantern, looked hastily around in the dark. Then—a feeling of astonishment went over him. There was not a sign of the skeletons!

After a second, irritation replaced his amazement. The things had to be there—one of them, at least. He searched up and down for a hundred yards, then finally gave up and turned back. He was almost at the little group of buildings when he saw a dark mass moving toward him. He was passing and no car had come from the 6th. He strode toward the shack which the doughboy had entered. The insistent ringing of the telephone became audible as he neared the building. He opened the door, stepped inside.

The room was sparsely furnished with an Army cot, a table and two chairs. A big packing-box served as a desk for the telephone and as support for the acetone lamp which lit up the sentry's quarters. Some food and a can of tea stood on the table.

Strange looked around for the enlisted man, turned impatiently to the phone. Then he halted, a stifled exclamation on his lips.

Lying there in the shadow of the packing-box was the sentry, his glassy eyes bulging in death!

Strange hurriedly knelt beside the man, drew his body out into the light. With a second shock, he glimpsed the ugly purple marks on the dead man's throat. Plain in the light were the prints of long, thin fingers. They were almost like a skeleton hand.

Strange rose to his feet, answered the phone. Instantly, an angry voice spoke.

"What's the matter with you, Wilson? Where have you been?"

"Wilson has been killed—murdered," Strange said curtly. "Get me the C.O. at once."

There was a gasp at the other end.

"Wilson murdered! Say—who is this?"

"Captain Neville—from G.H.Q.," snapped Strange. "Hurry up with the C.O."

There was a brief delay, then Strange's brain heard the gruff voice of General "Wild Bill" Thorne, Chief of Air Service.

"Step outside, operator, while I take this call." There was another pause.

"Hello—Strange?"

"Yes," Strange answered swiftly.

"I want you to get here as fast as you can," Thorne said in a tense voice.

"Tom Jay is starting right now in a car."

"Wait, general," Strange interrupted, "there's been a murder here—and it's connected with that other business."

"You mean the destruction of the 73rd and the 45th? Thorne said harshly.

"Right," Strange replied. "And if we can find the killer—"

Crack! The report of a pistol outside the window, and the crash of the glass came as one. A bullet dug a furrow in the box, two inches from Strange's hand. As he sprang back, another slug thudded into the door-frame behind him. With a lightning motion, he knocked the lamp to the floor. The room was instantly dark. He flung open the door, dashed out and ran toward the side of the shack.

As he neared the rear of the building, he could hear some one running in the opposite direction. He followed, automatic raised for a quick shot. But when he reached the other end there was no trace of the other man. He halted, peering into the shadows. The killer might have ducked into one of the gloomy hangars, or back of one of the other shack. He tiptoed around in front, paused near one of the motorless Nieuports, listening for footsteps. Only the muffled roar of a speeding car came to his ears.

He started on, then looked about him sharply. Something was about to happen. He could feel the old familiar instinct of danger. He gazed around but saw no one. Yet there was something wrong with the scene. His subconscious brain was trying to tell him, to warn him—

The decoy lights in the two adjacent shackes were the same as before. A lantern near the second hangar had not been moved. The dark hangars, the abandoned ships were the same. He wheeled for another glance. Then suddenly he knew.

One of the dummies was gone.

A tall, scarecrow soldier had stood in front of the Nieuport. Now it was missing. He took a step and bent over. There was the hole where the prop had been stuck in the ground. He turned and looked along the line. The thing might have been picked up by the killer as he ran. If not—

From the corner of his eye he thought he saw something move. He whirled, gave a start. There stood the missing dummy!

FOR a second, Strange was motionless, then he sprang with lifted gun. In the same instant the dummy came to life. One hand whirped upward, and Strange caught the gleam of metal. He struck fiercely at the weapon. There was a roar and a gun blazed above his head. Strange saw a gloved hand fire a talon-like hand furiously wringing a handgrip. The pistol fell from his numbed fingers. He drove a vicious blow into the other man's face. With a snarl, his attacker fell back. Strange followed up with a swift jib, but in the dark the third blow knocked him dead. His icy hands shot out, gripped his throat.

He clawed desperately, managed to tear one of the hands away. The other talon was like a cold iron band sunk into his flesh. He fell to his knees; dragging the other man down with him. As they tumbled to the ground, he put all his failing strength into one last blow. He heard a gash of pain as his fist thudded into the man's stomach.

The torturing hand relaxed its icy hold. Strange fought against the whirling blackness which was about to overtake him. Then he heard the true report of the car—a roaring which suddenly merged with the rapid exhaust of the approaching car. As he forced his eyes open he saw the headlights swing toward the hangars and shackes. From somewhere he heard a snarled exclamation, but what he twisted his head around the other man had disappeared.

He got to his feet, staggered into the headlight rays. The car's brakes howled. Men jumped out, and in a second Tom Jay was at his side.

"Phew!" he said anxiously. "Are you hurt?"

"Be careful of names," Strange muttered. He felt his throat, looked at the others. A brawny sergeant and three privates were eying him, open-mouthed.

"We heard a shot over the phone—General Thorne said there'd been a murder," Tom said excitedly.

"There came near being two murders," Strange said thickly. He turned to the sergeant. "The sentry has been killed—strangled. And the man who did it is hiding somewhere on the field."

The sergeant snatched out his pistol.
“By God, we’ll find the rat! Come on, you birds—spread out around that first hangar.”

His three men hastily followed his orders. Strange bent over, picked up his automatic. After a moment’s search he found the gun the other man had dropped. It was a Lugner pistol. The butt was oddly cold, and even the rear of the barrel was cool although the gun had been fired.

“Phil,” Tom Jay said in a low voice, “I saw two more skeletons just before I landed. It was awful—they seemed to be doing some horrible dance.”

“I know, too,” Strange told him grimly. He described what had occurred. “I can’t understand it. There wasn’t a thing under the trees, but I know one of them dropped there.”

“I was afraid it meant another explosion,” Tom said. He turned. “Listen, I hear a phone ringing.”

“Probably ‘Wild Bill’ again.” Strange quickly led the way to the shack. “How did he happen to be at the 64th?”

“He’d been at Third Corps, working out some plans,” explained Tom. “He rushed over to get the details when he heard about the 78-th.”

“Then the reports are already come through?”

“It’s all over the front,” said Tom. “A pilot from a French escadrille brought in word just before I landed. Then I told the general what happened to the 73rd. Everybody’s running in circles. The place is a mad-house.”

“You told him about the skeleton at the 45th?”

“Yes, but he already knew—the Frenchman saw another one just before the 73rd was destroyed. From what little I heard, exactly the same thing happened.”

Strange motioned toward the lantern he had put down outside the shack.

“Bring that in, will you? I knocked over the other light—” he stopped short, eyes riveted on a spot visible through the open door.

Glowing there in the darkness was a fiery hand.

CHAPTER IV

Another Camera

“Good Lord!” whispered Tom, staring over his shoulder. “It looks like—”

“Bring the lantern,” Strange said in a swift undertone. He raised his pistol, covered the spot where the hand showed. Tom hastily lifted the lantern so that the light shone into the room.

The flaming outlines immediately faded, and there before them was revealed the body of the sentry. The marks of the killer’s hand showed plainly on his throat, a yellowish tinge now coloring the ugly purple they had first seen. He knew, Tom saw them.

“Cover the lantern,” Strange said briefly.

Tom moved it behind him, and the fiery glow came back in the marks the stranger had made. The telephone was still ringing. Strange picked it up. As he had expected, Thorne’s voice came out an anxious query. He explained quickly about the mysterious killer.

“Sounds like some lunatic,” grunted Thorne. “Let that drop—get up here to the 64th.”

“Finding that man is vitally important,” Strange told him. “I’d better send a platoon down here, and some spotlights to help in the search.”

“All right,” snapped the general. “But hurry up here.”

Strange put down the phone. Tom Jay was stooping over the dead man. There was nothing in his left hand,” he said as Strange joined him.

They pried open the unfortunate sentry’s fingers. A shiny brass button fell to the floor. A tuft of dark blue cloth showed that it had been jerked from a uniform in the dying man’s struggle. Strange took the button, held it close to the lantern.

“What is it?” asked Tom, as he saw Strange’s puzzled expression.

“It’s a button from a German naval officer’s uniform,” Strange replied.

Tom looked at him blankly.

“What kind of a Boche naval officer be doing here?”

Strange gazed out onto the darkened field.

“It would explain the dummy,” he said to himself. “But he had to move fast ... it means he probably wasn’t here himself.”

“What are you driving at?” demanded Tom.

“Come on,” rapped Strange. “He’ll be trying to make a getaway, if he hasn’t—”

As though his words had been a signal the engine of the car outside suddenly throbbed. Strange leaped through the doorway. There was a crash of gears. The car lurched forward, careened in a tight circle and raced away. Strange emptied his gun at it, but the machine roared on. Two of the dogfights ran up, followed by the sergeant.

“Who the devil—” sputtered the non-com.

“Where’s your third man?” Strange broke in.

“Dulanev!” bawled the sergeant. There was no answer.

“He’s probably been knocked out,” Strange said hurriedly. As the men spread to look for their missing comrade, he ran back to the shack. He phoned a warning, looked glumly at Tom as he hung up.

“Of course, it will do any good. He’ll ditch the car or turn off some road that isn’t patrolled.”

“Do you have any idea who he was?” asked Tom.

“No—except that he’s a German naval officer, tall, and thin, with a grip like iron.” Strange felt his throat, it was bruised. There was a bruise on his face—I almost broke my fist on his jaw.”

“You think he changed clothes with the dummy?”

“He must have. There was no sign of another man.”

Proof of Strange’s words was soon forthcoming. A man moment after the unconscious Dulanev was found, the sergeant appeared with a blue uniform bundled in his arms.

“This was right inside the hangar, sir. And the stuffing from that dummy was alongside it.”

Strange puckered his lips in a low whistle. “It had the gold braid and crown on the sleeves.”

“A four-striper! Anything in the pockets, sergeant?”

“No, sir—and the label’s been ripped out, too.”

The tailor probably had the officer’s name, “Fritz,” Strange frowned at the gold stripes. “He was obviously afraid his identity would expose the truth. Our friend is a fast thinker.”

A car followed by a lorry filled with men sped up to where they stood. Strange explained to the platoon officer that the fugitive had escaped. The unconscious soldier was placed in the rear of the car. Strange and Tom crowded in with the lieutenant, while the others waited for the lorry. They passed several cycle patrols on the short run to the 64th, but there was no trace of the missing car.

When they reached the field, they found it swarming with excited officers and mechanics. Strange and Tom jumped out and the lieutenant drove on to the dispensary with the wounded man. The base was in absolute darkness, and the result was complete confusion. Cursing greaseballs were shoving planes out to the line, hooking wings in their haste. A Staff car moving without lights honked its way through the scurrying mob. Men bumped into each other, swore and hurried.

“The general must’ve ordered the field abandoned,” Tom said tensely. “He was telling them to stand by when I landed.”

Above the clamor sounded the drone of a plane. It dropped down and the pilot boomed out a signal for lights.

“That’s Carpenter’s number,” yelled some one along the line. “If we don’t give him lights, the damn fool will land in the dark and kill somebody.”

“Make it snappy, then,” bawled another voice. “Cut ’em off as soon as he’s rolling.”

Strange and Tom raced within a hundred feet of the administration building which served both squadrons. It stood at the junction of the two arms of the L-shaped field, with barracks, huts and hangars extending away at right angles on both sides. The sudden fan of light which spread over one wide runway also lit up the two rows of buildings.

A hasty movement on top of a flat-roofed supply shed caught Strange’s eye as he glanced up toward the descending plane. He was just in time to see a man throw himself down on the roof, in an obvious attempt to keep from being seen. With a quick word to Tom, Strange ran toward the building. The front door was locked, but he found that a rear one had been forced open. With Tom at his heels, he hurried inside. The glow of the floodlight enabled
they to find the stairs at once. They reached the second floor, started up a ladder to an open trap.

The rumble of the landing ship had drowned the sound of their approach. Strange looked around quickly as he emerged from the trap. The man was still lying flat, close to the edge of the roof. Strange stole forward. He was within ten feet when the man jerked around and saw him.

With incredible speed, the man leaped up, clawing under his khaki blouse. Strange dived in, hurled him down with a thud. The man wriggled free with a vise-like grip. He slashed murderously at Strange with the barrel of his gun. Strange ducked, caught the blow on his shoulder. The gun clattered along the roof.

The man plunged after it, came up to his knees with the weapon leveled. As he saw Tom Whitney up him, he whirled frantically. Strange pitched headlong against him just as he pulled the trigger. The shot blazed into the air. The man, knocked off balance, toppled back to the edge of the roof. A wild yell burst from his lips as he felt himself sliding over. He dropped and tried to seize the metal spouting. It was too late. Screaming, he dropped from view. The cry abruptly ended.

The fight had been witnessed by a hundred men on the field. Strange turned hastily as the crowd ran toward them.

"Well have to find what he was up to before that mob gets here. If we search him—"

"Look!" exclaimed Tom. "He had a camera with him."

He picked it up. Strange took it, made a quick examination. It looked no different from the hundreds of other cameras, with one difference: there were two rolls of film. Strange produced the camera, rectangular in shape except for its rounded ends. Before he could scrutinize it further the floodlight went out. They made their way down in the darkness, were stopped at the exit by and American soldier, with two of the guard detail. Strange produced his G.H.Q. credentials. The lieutenant's manner changed as he read the card by flashlight.

"Captain Neville? I've been looking for you. General Thorne said to bring you—"

"Just a second," interrupted Strange. "Get the crowd back. I want to search this man."

He knelt by the silent form, his trained hands making quick work of the search. He handed a wallet, pipe and tobacco pouch, and a clasp-knife to Tom.

"Look through those, and examine his shoes and clothes for hidden messages when they've moved the body inside. Bring me a report as soon as you can."

The lieutenant trotted alongside as he hurried to the administration building.

"It seems incredible that Thompson was a spy, sir. He acted harmless enough—"

"How long has he been here?"What were his duties?" rapped Strange.

"He's been here about two weeks—"

he was just a helper in the photographic section of the 371st."

"Ever see him using this camera?"

"Yes, he was always taking pictures— but they didn't have any military value. Just pictures of ships and general scenes around the field. I happen to know I'm in the photo section."

THEY had reached the main door of headquarters. A dozen officers were grouped about a big, gray-haired man midway of the wide hall. The stars of a major-general gleamed from his shoulder. Strange recognized Thorne's deep-lined face.

"That's all, now," rasped the gruff old warrior as he saw the G-2 ace. "Captain Neville, I want to see you alone."

But Strange beckoned the lieutenant into the room. Thorne had entered. "Just a second, General. I think we'll need help on this."

He snapped off the light, opened the rear of the camera and felt inside. Closing it again, he turned on the light. Thorne glowered at the leather-covered box. "Develop them and rush back here. Never mind stopping for prints."

The lieutenant hastened out. Thorne impatiently closed the door. His eyes were haggard under his bushy brows as he fixed them on Strange's face.

"Tom said you saw the 45th wiped out. You must have some idea of how it was done."

Strange wearied seated himself on the edge of a desk. "I had a vague idea of something—but I'm all at sea after the last hour or so."

He recalled his encounter with the vanishing skeletons. Thorne listened with a grim astonishment.

"The whole thing's mad—impossible!" he burst out fiercely. "First it's a screaming skeleton. Now they float and dance—and then they disappear."

"That's not all," Strange added sourly. "There was a German naval officer—a four-stripper at that—on that field within a few minutes of the time when those skeletons fell there. I'm pretty sure he wasn't there before."

"You're not hinting that a skeleton turned in a Kraut naval officer?" roared Thorne.

"I'm only saying what happened." Strange concluded with a hasty resume of Wilson's murder and the events following.

"It's too tangled for me," Thorne groaned. There was something pathetic in the old general's helplessness. But it lasted only a moment. His jaw hardened, and he struck the desk a resounding blow. "By God, Strange, we've got to find the answer to it! Two of our best squadrons have been blotted out—everyone on the Front knows. They'll be deserting dromes right and left if it happens again."

"Then you haven't ordered any squadrons to move back?"

"Not yet. I've sent word for them all to be ready. It'll only mean more deaths—unless they abandon the ships, too. Half the pilots have never flown at night."

Strange turned suddenly and reached for the telephone. "I forgot to call Jordan. He undoubtedly knows by now, but there's a chance he's figured something else from the sketch."

"What sketch?" demanded General Thorne.

Strange told him, after placing a rush call to the G-2 chief. Thorne stared when he mentioned the camera the German pilot had thrown into the river.

"Another camera! Now what in Hades are you after?"

"Here's the colonel now," said Strange. He identified himself in code words, started to give Jordan a terse report.

"Never mind, I heard what happened to those squadrons," barked the G-2 chief. "There's only one thing to do, the first pilot who answered the alarm. He landed here. I've already seen many and two others across. They're in Boche uniform and flying captured Fokkers. They'll land on three of the nearest German fields to refuel, and there's a chance they'll learn something."

"And a better chance they'll be shot," responded Strange. "The Boche will be on the watch for that very trick."

"I can't help it," Jordan answered, and Strange heard the desperate note in his voice. "If we keep on losing a squadron every thirty minutes—"

"Well, don't you mean there's been a third one blown up?" grated Strange. He saw Thorne pale at his words.

"The 38th is destroyed just like the others, at ten o'clock," Jordan came back grimly. There was a tense pause.

"Strange, I hate to say this. . . . But it looks as if we're getting into the German 8th Army Intelligence . . . I know it's a death-trap—"

For a moment Strange did not answer. Jordan was right. That German base was a death-trap. Then a picture came before his eyes a vast, smoking crater mangled bodies upon the ground . . . the face of little Tubby Walters. Slowly, he nodded.

"I'll try it, colonel. I'll be at my dressing-room in Hanlon Field in twenty minutes." He put down the phone, looked up at Thorne's haggard face.

"The 38th—it's gone, too."

"Alarm light came into Thorne's deep-set eyes."

"That settles it," he said dully. "I'm going to call G.H.Q.—have them flash word to all fields—tell them to abandon everything!" he went out, his gray head bent, his feet dragging with the slow, bitter step of a beaten man.

Strange followed him into the hall, saw him go toward the communications room. He turned to the entrance, was almost at the door when Tom Jay came in.

"There wasn't anything on that spy," Tom reported.
“It doesn’t matter,” said Strange. He nodded for Tom to go out with him. “Have a Spad warmed up for me—I’ll be at the line in a minute or two.”

Tom looked curious, but Strange did not enlighten him. As Tom went toward the hangars, Strange stopped an officer, asked the location of the photographic section, and then gave directions. He made his way along the crowded tarmac, oblivious to the excited men about him. He found the photo lab, a small building set a little apart from the machine-shops. As he opened the door the sputter of an engine came from somewhere. He lost no time in transmitting his order.

He stepped inside and closed the door. The office of the lab, a small partitioned space, was unlighted, but there was a faint glow from the other side. As he closed the door, the sputter of the engine was muffled and he could hear a voice from the other side of the partition.

“Tell Captain Neville the film was blank.”

“I’m right here,” said Strange. He stepped through the doorway. There was a sudden flash. He had a split-second glimpse of the lieutenant bound tightly to a chair, his lips forced apart by a hastily inserted gag. Then a tall figure leaped from the shadow at his left. Something flashed down, struck aside Strange’s hastily upflying arm. A fierce pain shot through his head, and his mouth was filled with something they had been putty. He heard a mirthless laugh, then darkness swept over him.

CHAPTER V

A MUFFLED clicking sound was the first thing which penetrated the fog in Strange’s brain. He listened stupidly as his senses began to clear. After a few moments he realized that a message was being clicked out in code, but the letter-groups were unintelligible.

A gag had been forced into his mouth and loosely bound in place with a cord or strap. He lay on his back, his hands secured tightly beneath him.

The clicking stopped. He heard some one walk quickly across the floor. Cautionly, he opened his eyes a fraction of an inch. A man in soiled and faded khaki had parted a heavy curtain which covered one window. There was a bloody scratch on the long, bony hand which held the curtain. His spiral puttees hung loosely, as though they had been hurriedly wound.

Even before the man turned, Strange knew it was the one who had stolen the dummy’s uniform. He kept his tightly slitted as the man wheeled from the window. A hard, thin face met his veiled glance, a face oddly rigid and devoid of expression except for the cruelty of its thin and bloodless lips. It was hard to be sure, but the man looked about forty-five. Pale blue eyes, the eyes of a killer, darted a quick look toward a table littered with racks of films and plates. Strange saw that the man was looking at an alarm clock. The hands stood at 10:24.

“Six minutes!” Strange heard him mutter in German. He turned hastily toward the middle of the room. The clicking sounded again. Strange turned his head carefully, so that the motion would not be noticed. Lying on the floor at the opposite side of the room was the young officer. He was still bound to the chair, but there was a gash on the side of his head which had not been there before. It was evident that a terrific blow had toppled the helpless man to the floor. His face had the color of death.

In the exact center of the room was a small stand which had been drawn away from the wall. The skylights which formed the roof of the room had been swung wide open. The main lights had been switched off, the only illumination coming from a single drop-bulb in the dark. From under it there was a quick tapping of the man’s finger on the focusing knob.

With a final rat-a-tat on the knob, the man whirled toward the front entrance of the building. He halted abruptly, his pale eyes flicking down at Strange. He found that one of his fingers was back one foot. The brutal force of that kick almost brought a cry to Strange’s lips. It took all his strength to force it back. The German laughed, with the same mirthless note.

“Auf Wiedersehen, Schwein. If you only knew it, you will awake in Hell.”

When Strange opened his eyes, a second and fourth man was gone. He heard the snap of the spring-lock on the front door. Out on the dark field, his Spad’s engine rumbled.

Desperately, he tried to free his hands, but his own weight had partly paralyzed them. He rolled over after the third time, and feebly, as though he felt his wrists begin to slip. He had learned from the Jay twins methods used by escape artists, but it was almost a minute before his hands were free. He jerked the gag from his mouth, swiftly unfastened the belt from his feet.

He was half-way to the door when the sharp crack of a pistol cut through the darkness. He had just reached the threshold, he felt his wrists begin to slip. He had learned from the Jay twins methods used by escape artists, but it was almost a minute before his hands were free. He jerked the gag from his mouth, swiftly unfastened the belt from his feet.

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As he snatched at the phone his left hand touched the camera. He jerked it back with an exclamation. Where he had touched it, close to the lens, the metal was almost searing hot. He stared at it an instant, locked up at the open sky-light.

“Good God!” he whispered. Frantically, he sought for the switch he knew must be cleverly hidden in the camera. He pressed the focusing knob, but the heat still poured from the lens. His eyes leaped to the clock. It was now 40:26.

He tore the burlap curtain from the window, folded it and gripped the heated box. As he dashed out toward the line he heard angry voices. Men were milling around in the gloom.

“Let me alone—I’m going after that damned butcher!” snarled one man. A shadowy figure sprang to the nose of a plane.

“Away! Away!” came a shout. A flashlight shone, and men with a stretcher ran through the crowd.

“No use—the poor devil’s dead,” a pilot said grimly.

Strange saw a mechanic lying on the ground, a bullet-hole squarely between his eyes. By the glow of the flashlight, he saw Tom Jay staring down at the dead man. He reached Tom, spun him around just as the infuriated 64th pilot started his engine.

“Tom! Tell the general to flash word—all squads, G-2, everywhere—watch for spies with cameras—the skeler-gon! They’re skeler-gon!”

He whirled toward the ship just started.

“Where are you going?” cried Tom.

“Can’t explain! Keep them from following me—they’ll be killed—”

The 64th pilot was at the step of his plane. Strange started back, but one hand, gave him a violent shove. He was in the cockpit before the man could get to his feet. A dozen ground men sprang toward the ship. Strange pushed the throttle, booted the rudder. The propeller blast blew a cloud of dust into the crowd. The Spad lurched onto the smooth runway, its cold engine trying to take the sudden load.

Strange gunned the Hisso with short, hasty bursts. Back of him, a searchlight cut through the cloud of dust he had stirred. A line of men on a derrick belt, stopped before it had fired a score of shots. He hurled the ship around into the wind as the motor revved up and ceased to spit. With a prayer that it would not cut out, he opened it to full speed. The Spad roared through the searchlight beam, lifted in three hundred feet.

As the ship soared above the tree-bordered road on the West, he pushed the stick forward. A mile to the decay field . . . a precious half-minute . . . with Death riding the cockpit.

The fixed beam of a spotlight showed another of his group still on the field. Still the man had said . . . If it meant what he feared . . .
FLYING ACES

April, 1936

tere the burlap from the camera, laid the box on the ground, the lens pointing skyward. He was back at the Spad in five seconds. His hands were almost shaking as he rammed the throttle open.

The plane thundered between the hangars and the little row of sheds. The fleeing men had left the spotlight almost in his path. Leaping from the car into the wild zoom, fought the swaying ship into the air. Before him, the luminous clock hands were almost on the half-hour. He climbed away from the decoy field, holding the Spad at a steep angle. The altimeter hand stood at a thousand feet. Now his vivid eye was calibrating the one and two thousand divisions. The clock showed 10:30. . . . Had he made a mistake? Was the camera only an infra-red signaling device?

Then abruptly he hit it—the same weird scream which had echoed through the phone in the G-2 room. The wild, hellish screech which had meant three squadrons’ doom.

Out of the blackness above appeared a fiery streak. He kicked frantically to the side. Again that flaming horror seemed to be diving straight for his heart.

But with a diabolical shriek, the skeleton plunged on by. And again, a nauseating black smoke enveloped Strange in its reeking folds. But this time he did not dive away. Holding his breath, he pulled up into the pitchy darkness. Eyes closed, he counted each second of his dying sting, he clung to the stick, waiting.

It was only two seconds, but it seemed as though time had stood still. Then it came—a frightful, blasting roar from directly below the Spad. The plane was hurled upward as though by a giant hand. For an instant, Strange thought the wings would be sheered off by the Titanic force. The impact drove him down into his seat. The blood rushed from his brain, and the darkness swam above him.

Only a vague red glow shone through the dense cloud. The black smoke eddied furiously. His breath almost gone, he was about to dive to one side when the cloud began to thin out. He held on through another torturous moment, then his starved lungs greedily drew in the fresh, clean air above.

The glare from the explosion still shone in his eyes. A black smoke died dully, angry red, like a flame in the midst of the cloud. He thought of the men on the lorry. Had they managed to escape before the skeleton struck?

He banked toward the field from which he had taken off. Mechanically, his eyes shifted to the altimeter. He started to pull up out of cloud. The explosion had lifted the plane fully a third of that distance. He reached toward the throttle, then his hands stiffened on the knob. A vague black shadow had flitted past him. He twisted around, trying to see it again. It had been no more than an impression . . .

Half a mile away, the light had leaped to his level, a white pin-point of light blinked. He wiped the smoke-smeared goggles he had pulled down over his eyes. The light was winking a code message to some one, that was clear.


The last letter had hardly been completed when machine-guns erupted from somewhere near the sender. Tracers left red trails in the night, two in one group, a third behind, with a second set of cherry-red lines from another pair of guns. The rattle of guns was over before it had fairly begun. Strange ruffled in warily as he saw the flare of a plane's exhaust.

Suddenly, another light blinked—a bright spot in the darkness. It repeated the signal, "G-X-3," and at once the white light answered with "L-e-h-r."

The two blinking lights neared each other, began to rise. Strange followed, straining his eyes to make out their source. The white light went out just as a large gasoline flare burst. The red light remained, glowing steadily now. He nodded grimly to himself. The frozen-faced killer had arranged a meeting, was following that guiding red light to some rendezvous.

It was the thought that gave him those steely, so that it was all Strange could do to keep at the same level. After a minute the white light blinked from the Spad the killer had seized. The red light slightly lessened its rapid ascent. Strange stared into the gloom. Parts of the puzzle were beginning to come together. But there was something missing. Why had that hard-faced German been forced to signal for guidance? It should be comparatively simple to fly to the Front and reach the safety of the Boche lines.

Then he realized that he was climbing in a wide sweeping arc. He was according code this when the red light was abruptly obscured. He jammed the throttle against the stop in the effort to catch up with the stolen Spad. Clammy mists closed around his plane, and the explanation of the red light's disappearance was made clear. They were climbing through the cloud layer, at five thousand feet. He veered off slightly to avoid crashing the tail of the killer's ship.

At six thousand, he came through into clear air. He looked around, hurriedly lowered the ship into the cloud-top. The German's Spad was less than a hundred yards away, faintly visible under the wan light of a tiny crescent moon. He gazed eagerly in front of it, and his eyes lit as he glimpsed the dark shape he had expected to see.

It was a coal-black plane, so dully black that not even the faint rays of the moon reflected from its surface. In its stubby, stubby body lurked an unusual speed and power. No flames showed from its engine. The pilot was not visible, and Strange guessed that he was sitting well down in a covered cockpit.

The bright dot of red light was glowing from the upper left wingtip. It went out as the black ship circled on up under the wan moonlight. Strange lifted the Spad from the enshrouding clouds when he was sure he would not be seen. Keeping as far as he could without losing sight of the other Spad, he followed up into the chilly night.

The air grew colder, and still the blind ship led up on that mystery trail. Strange pulled his flying-cot collar about his face, hunched down out of the biting wind stream. He had left his gloves beside Wilson's body, and his finger tips were almost numb.

He steadied up ahead at the dim bulk of the other Spad. He knew now why the hands of that grim-faced Boche had been so icy cold on his throat. A dive down through a bitter-cold sky would have done it . . . The German must have been trying to make him freeze to death. That had been the dark shadow he had seen. The moaning must have been its landing. But why hadn't he used it to escape?

"Cracked up—that's why," Strange muttered through cold teeth. "He cracked up when he landed near that woods."

The ill-fated Wilson had probably heard the ship descending, instead of Tom Jay's Spad. His own landing had undoubtedly covered the sound of the crack-up, and in the darkness the ship had been aimed at the German instead. He must have gone to the line, thinking to steal one of the Nieuports, not realizing they were derelicts. He had encountered Wilson—had heard him calling the 64th and had killed him to prevent a searching party from being summoned.

Had the German landed? Strange crouched down in the cockpit, trying to think of the answer. The skeleton—two skeletons—had floated down and vanished. But they had been different from the deadly, shrieking things which had plunged on the Yankee drones. If his guess were right, there had been terrific weight back of the bony figures which had dived past him. Those skeletons had hidden.

He sat up with a start, the cold air abruptly forgotten. The face which had stared over the Spad's tail had been the frozen face of a German. Something about it had had an eerie quality—something not quite right, the German had been the blackness of the night. And those writhing figures, the odd telescoping of one skeleton's ribs . . . their floating down, their crazy twists and turns—

"That's it!" he exclaimed. "He went after it—it would have given everybody away—the thing must have fallen by accident!"

Fallen—from what? The unspoken query was like a key, unlocking something which had tugged vaguely at the back of his mind. An image of the mysterious sketch came before his eyes. He saw the drunken Boche, the cigar dangling from his lips, the flies swarming about him.

His seething thoughts were snatched back to the present as far as a thousand feet above him. He looked a bluish-white glow appeared. He went tense. The fan-shaped beam was not pointed downward, but it might shift at any instant. He threw the Spad into a hasty turn. The ship lost fifty feet in the thin air. He caught it, raced ahead for a mile before climbing again. As he swept into a chandelier he saw the faint moonlight reflect from something off to one side. It looked like
on wings of a khaki-colored Spad.

Strange groaned as he saw the plane. The ships of the 64th were a silver hue. That was Tom Jay's Spad! The youngster had followed him when he took off — had seen the stolen ship and trailed it exactly as he himself had done.

The black plane and the other plane had been rafted into the lake. As the light beam fell on Tom's ship, the black plane pulled up swiftly. In the same moment, gun crews raced to the Maxims on both sides of the deck. Tom was zooming furiously, trying to escape from the light. He kicked out to escape sideslipping, but the gun crew had nosed over as the black plane climbed. His cold fingers clutched the trip wires briefly. The Vickers growled a muffled response. He ripped out three bursts, felt the guns throb to a swift tempo. The black ship was almost on Tom's tail. Strange slashed around, ringed the dark plane in his sights. Tracers cut through the black fuselage, stabbed forward at the newly uncovered pit. A dark-hooded figure whirled, and two glaring eyes looked up through glass slits. At the back of the black plane, the gun crew reversed.

Strange swore as his bullets trailed off through the left wing.

Tom stared across in amazement as Strange was revealed in the flickering searchlight. Strange flung him a hasty signal to dive. Silver wings swam into the air. Two black ships charged in fiercely, guns blazing. He rolled through the light beam, hoping to blind the German. His eyes were closed against the glare as he whirled through the rays. When he opened them, hardly a second later, the black plane was streaking in from the left.

Masked guns smoked from under the streamlined cowl. Bullets crashed through the Spad's tail. There were no tracers, but Strange could tell the German's aim was shifting toward his pit. He zoomed, whirled into an Immelmann roll. Silver Spad plunged beneath him, Vickers blasting at Tom's plane. In anguish, Strange saw Tom start into a spin. He dropped on the German like a thunderbolt, guns pumping madly.

The silver Spad veered out, wings moaning. The rigid face of the pilot glared back at Strange pitched by. But he was not afraid. The other Boche came down in a headlong dive. Strange hurled the Spad aside, but his eyes were on Tom Jay. The khaki plane had come out of the spin, but it was wobbling perilously. For a moment it swayed while a Maxim crew had the gun at the rippled ship. Tom turned back toward the floating drome. His guns stuttered, and the men at the Maxim crumpled to the deck.

A murderous hail through his wings drove Strange to hurried defense. Both the Germans were charging in, guns crossed on his ship. He snapped around in a grinding turn, raked the black plane as it overshot in a split. The pilot threw himself low as the Vickers chopped into his cowl.

With a shove at the stick, Strange threw the tracer lines down the dark plane's side. The pilot jumped up into view, like a grotesque jack-in-the-box. But that jump was a start of sudden agony. His quivering body sagged out of view, and like some venomous creature freed from its master's hand, the black ship went into a wild gyrating, was quickly lost in the night.

Strange's abrupt turn had forced the other Spad to bank away. He took time for a lightning glance below. A look of anguish came into his face. Tom had crashed on the floating drome!

The ship had evidently stalled in a turn over the platform. It was flying low near the stern of the platform, close to a Maxim mount. A dozen Germans were running toward the wreck. Suddenly there was a movement in the pit of the khaki plane. Strange gave a stifled exclamation as Tom crawled into sight.

One of the running Germans snatched at his hip. Strange clamped the trips, dived the Spad headlong at the deck. Five of the crew went down in that first fierce blast. He shifted the rudder, and three more wilted to the platform in the second before he zoomed. He banked back to a height close to the Maxim as the gunners whipped their snout up toward the plunging Spad. One of the Boche was in a heap beside the gun, and the other was struggling desperately to hurl Tom back.

Machine-guns on both sides of the flying Spad were firing with a pitting back. He flung himself down as a dozen holes appeared upon his cowl. Splintered glass flew back in his face. The instrument board lay in ruin before him. He threw the Spad out of a vicious crossfire, kicked around to rake the nearest gun-crew. But the Germans slumped before he could even twitch his gun-trips. Another fiery barrage from his left ceased abruptly. He slashed around in a vertical bank, then saw the reason.

Tom had downed both Germans. He was circling the platform in his Maxim, pouring a deadly fire from one side of the deck to the other. A choked sensation came into Strange's throat. The youngster might have let himself be taken prisoner . . . he would have had a chance at life . . .

but he had signed his death warrant now.

Then a different light scorched into Strange's eyes. It was madness, not even a chance in a thousand . . .

But his hand was firm as he sent the Spad gliding down toward the corpse-strewn platform. At least, Tom would not die alone!

He shot a look backward, but the silver plane was keeping clear. He guessed the reason. The Boche was waiting to make sure before he struck again. Well . . . here was his chance.

The Spad was within a hundred feet of the deck when he realized what he was doing. If he died, what he had learned died with him! Thoughts of his future lives against the life of Tom Jay . . .

He groaned, and started to bank away. Like a pouncing hawk, the silver Spad now dived on his tail. Instinctively, he whirled away from the smoking
traced. There was a crash and a rising squawk as a flower burst hit the prop. Jagged splinters tore through the riddled wings. He closed the switch as the engine revved up wildly. In a last vain attempt, he turned away from the platform. The Spad lurched as its flying speed fell. The deck seemed to leap up. The creaking of the platform and the sagging wings merged with a grinding roar. He threw his arms before his face, felt a stunning jolt as the top wing collapsed over the pit.

Though his limbs refused to move, he did not lose consciousness. He heard the skittering of feet, the thrum of the black-clad ship, begin to pull at the wreckage. He was dragged from the cockpit, kicked and struck half a dozen times before a blue-clad officer reached the spot.

"Don't kill him!" the officer snapped.

"We must find out how much they've learned below!"

"Clear away those bodies," bellowed another officer. "Fire-squad, drag this wreck to one side. Kapitan von Lehr is signaling for a landing."

Two sullen Germans in heavy reefer coats hustled Strange to the foot of the pilot ladder. Though he was reeling from the blows and the impact of the crash he forced himself to observe what he could, if he should be any chance at escape.

The entire crew seemed to be composed of the German Navy. The enlisted men were dressed in heavy coveralls, with short reefer coats over them and heavy, knitted caps on their heads. A number had black leather hoods flung around their necks, dangling from cords. Tubers from the hoods ran down the long, slender, skinny men, shrouded around their waists. It was this kind of hood, evidently, which the pilot of the black ship had worn. It was obvious that the floating drome was normally operated at a much higher altitude.

Strange stole a look around, trying to find something of the first officer's words, he had supposed that Tom was a captive too. But there was no sign of him. He watched dully, the two Germans tightly gripping his arms and a third man nearby with drawn Luxer, while the deck was cleared. The German worked swiftly. The dead men were piled in a row, and the wrecked Spad was dragged to the stern and pushed into space. One of the guards made a grim joke about the possibilities of its dropping in a French town.

"Gott Sie Damb, Kapitan," he exclaimed in a rumbling voice, "we were afraid you had been captured."

"You mean you hoped so," grated von Lehr. The floodlight showed him clearly, and Strange saw that not a muscle changed in his face as he spoke. Even his thin lips did not appear to move. He was speaking with a forced note. "I'm afraid you have a wrong impression of me—"

"Words! Words!" snarled von Lehr. "What are you waiting for? Get these lights off—order the ship up to cruising altitude! We're in danger down here!"

The men's hurriedly ordered and rattled orders at the officers behind him.

"What of the Allied plane, Herr Kommandeur?" asked one of them.

"Have it stowed below," rasped von Lehr, before the other man could answer. "It may be useful later."

One of the Germans shouted an order. Mechanics pushed the Spad onto an elevator platform which formed a section of the floor. Then the platform slowly descended, leaving a large, square hole in the center of the flying deck.

Some of the floodlights had gone out. The other was dimmed and left focussed on the elevator shaft for a minute. Just as the elevator went down, von Lehr motioned curtly to the commander.

"Where are the prisoners, Brehana?"

"One is over there," said the commander, pointing to where the guards held Strange. "The other—that accused pig who seized the Maxim—was knocked overboard just as this other one crashed."

Cold horror surged over Strange. He closed his eyes and sick and the thought of that long, terribed drop into space. Von Lehr's mightless laugh was like a knife turning in his heart.

"Just as well. He saved us the trouble. But I should have liked to see the свиньё's face as he went over."

He stalked across toward Strange. The guards came to attention like automatons, then were shifted to Strange's face. His rigid face did not change, but a murderous fury leaped into his pale eyes.

"Lieber Gott!" he snarled. "How did this Teufel get here?"

Commander Brehana started. "Then you know him, Herr Kapitan?"

"Know him! I left him unconscious, bound and gagged, on the field we just destroyed!"

Strange saw the alarm in Brehana's face. He knew an effort to avert the Germans' learning that the wrong field had been destroyed. "You should have kicked harder, mein Herr," Strange said sarcastically to von Lehr. "I was out of that room thirty seconds after you left."

For a moment he thought the German would shoot him down in the air. The man's paralized face twitched convulsively under the stress of his emotion. Then a look more deadly than fury froze his pallid eyes.

"Before you die," he said almost in a whisper, "you will wish a thousand times you had stayed on that field—and been blown to pieces."

There was a brief silence. One of the guards shivered.

"Himmeln!" Brehana exclaimed. "What if this man learned about the cameras?"

"He probably learned they could be used for signaling," von Lehr admitted gruffly. "He was in the room when I ordered you down within easy climbing distance."

"Then he may have told the others—they might have discovered the rest and sent out word—"

"Use your brain," snapped von Lehr. "If he had learned nothing, they would have switched off the current. The torpedo would not have gone to the mark."

The air had begun to get bitterly cold, and Strange could feel the effect of the thinning atmosphere. Von Lehr motioned to the guards.

"Bring him down to my cabin. I have frozen enough for one night."

He nodded for the commander to follow. They went toward the streamlined enclosure on the starboard side, but half-way there von Lehr halted with an angry oath.

The flying platform had just come up. Strange followed the captain's gaze, and his flitting attention sharpened.

At first glance, there seemed to be five glowing skeletons lying there on the platform. One of them was devoid of a face. The second floodlight had gone out, but the rest was flared. Strange now saw that the skeleton figures were painted on huge projectiles the size of naval torpedoes.

The five torpedoes were cradled on small hand-trucks, attended by several Germans. One of the men had just returned, bearing a skinned and wrapped figure from the fifth projectile, and another Boche was fitting a stencil of eye-sockets and gaps into jaws in the black space where the skull had been outlined. There were two skeletons painted in phosphorous on both sides of the starboard face, so arranged that no part of both could be seen at the same time. One represented the gristy figure as seen from the back, the main difference being in the skull.

The sight of the man with the large stencil appeared to infuriate von Lehr. He strode to the platform, jerked the Boche around.

"Dumkopf!" he rasped. "Do you want to take the long walk?"

Even in the pallid light, Strange saw the man turn white with terror. "Ach, Gott—nein, mein! I have done nothing, Herr Kapitan—"

Von Lehr struck fiercely across the face with the back of his hand.

"I risk my life when that first damned stench blows overhead—and here you are ready to let it happen again! I even got that accursed phosphorus on my hands!"

The man cowered away like a whipped cur.

"You thing below," the Kapitan ordered him harshly. He glared at the others. "The next man who brings it up here will make his own grave."

The Boche with the stencil scurried across to the port shelter. Strange's guards had halted uncertainly.

"THE silver Spad was now circling close to the flying drome. As soon as the deck was clear, an officer took two flags and held them up toward the pilot. The Spad glided in, leveled off at the officer's signal. It stopped about mid-way, then piled off the engine and climbed down. A hush fell, and all eyes followed the thin-lipped German as he stepped away from the plane. A little group of officers had hurried toward the ship. The one in the lead was a grizzled Boche with a thick imperial mustache turned up and waxed at the ends. The three gold stripes of a commander shone on his overcoat sleeve as he gave the other man a brisk salute.
Lehr turned and saw him.

“A little hint, mein Freund,” he said savagely, “as to what awaits you.”

IN spite of himself, Strange shivered, and not from the biting cold. He was thinking of Tom Jay . . . and the sudden weakness which threatened to overcome him was not alone from the rigor of the weather.

The guards shoved him into the stair-board enclosure, and he saw mechanics and one or two pilots grouped around heaters. They all stood, became silent, as von Lehr went down the long duralframe stairs to the lower level. Strange noted that most of them were putting on their oxygen hoods.

There was an air-lock at the bottom of the steps. They passed through it into a super-charged chamber. He had a glimpse of a torpedo room, with more of the deadly projectiles in racks. Next to it was a hold for the planes. There were two more of the black planes in addition to the four he had seen above. The Spad had been pushed to one side, and mechanics were examining it curiously.

Von Lehr and Brehna were fifty feet ahead, moving along a narrow but well-lighted passage. Strange felt a faint stirring of hope as one of his guards was forced to walk ahead. But it was gone at once, for the man in the rear pressed a pistol into his back at his further side.

They were about past the wide door to the plane hold when Strange’s roving gaze fell upon the elevator mechanism at the end of the big room. He had supposed that the platform could be lowered or raised through the middle Zeppelin structure, to permit easy bringing of planes aboard when the monster craft was grounded. But evidently the Germans had not been willing to sacrifice the additional hydrogen cells. The elevator shaft ended with the hold.

He remained motionless, and his eyes had a thoughtful look as he stumbled ahead. Von Lehr was opening a door at the end of the passage. Strange heard Brehna speak uneasily.

“Are you sure, Herr Kapitan, that the American can’t find the stencil where you hid it?”

Von Lehr swore. “Mein Gott! After all my trouble, jumping into that plane without a hood or even a coat, trailing the verdammst thing down for eighteen thousand feet, do you think I would be fool enough to leave it carelessly hidden?”

“I meant no offense,” the commander said hastily. “But we are fortunate that no one saw it.”

“That green-eyed Hund behind us, did see it,” grated von Lehr. “It must have seen from all around with its stolen stencil caught on the tail of his plane when he closed in to see it better. He shook it off as though a hundred devils had hold of him.”

They had reached a well-furnished cabin, on the left side of which Strange saw a room fitted up like the stateroom of a battleship. It was apparent that von Lehr had carried as much of his background as possible into his Zeppelin service.

The Kapitan opened another door, revealing a cabin directly forward. It was fitted as a chart-room, but there was a wireless cubby in one corner. Strange saw that the transmitter switch was tied open. The Germans were taking no chances of signals being picked up by Allied planes and being used as a guide to their fuel. von Lehr was sitting in a chair, bent over a receiving set, scribbling on a pad. Heavy green curtains covered a doorway above which was a sign, “Control Room—No Admittance.”

“Take the prisoner into the chart-room and keep him guarded carefully,” von Lehr snapped at the two enlisted men. “Brehna, see if they have picked up the eleven o’clock signal while I get out of these filthy rags.”

The wireless operator looked up, started, as the guards herded Strange into the room. Brehna gave him a curt explanation, pulled aside the green curtains. Strange glimpsed a curved glass box standing on a table, and for the first time saw the pale moonlight. Luminous instruments were glowing from a panel directly in the center. Men stood at the rudder and elevator control wheels, as though awaiting commands for action.

Strange’s guard had pushed him back against the stair-board bulkhead of the chart-room. They held him so that each one gripping an arm, pistols dangling in their other hands. He gazed hopelessly ahead for a while. Then, with a shock, what had been a blur before his eyes materialized into a map—von Lehr’s map of operations. At the top was precisely labeled, “June 19th, attack plan, 9 P.M. to 3 A.M., June 20.”

Thirteen red stars marked as many locations upon the Allied side of the Front. Each was numbered neatly. The first was the 73rd, the second the 45th, the third the 38th. He knew without looking that the number “4” would be for the dual-drome at Louvin- croix. Nerves tightening, he searched for the numeral “5.” It seemed abruptly to jump out at him.

Number Five was Chaumont—G.H.Q.!

And then, when it was too late, he knew the final step in the puzzling sketch of the drunken Boche. The Jack and Queen of diamonds meant to be the letters “J” and “Q.” In his desper ate attempt to warn them, the unknown Allied agent who had smuggled that sketch over the lines from Germany had used those cards, hoping some one repeating the letters aloud would catch the rest of it. Von Lehr’s illuminated cigar dancing from the Ger man’s mouth had been a guide-post to a Zeppelin, the swarming flies were the black diving bombers which hurled the death-laden torpedoes to their goals. It had been there within his grasp . . . . he and had failed to see it.

CHAPTER VII

DEATH OVER LOUVINCROIX

THE opening of the door to von Lehr’s cabin brought him back from his bitter thoughts. The Kapitan stepped through, glowing at Strange. He was attired in a duplicate of the uniform he had discarded on the deck field, and his paralyzed face was even more forbidding under the black visor of his cap.

“Now, Herr Schweinhund,” he said grimly, “I will show you what it means to—”

“Kapitan von Lehr!” Brehna broke in from the doorway of the control room.

“Something has gone wrong. The infra-red indicator shows no signal from Chaumont.”

Von Lehr scowled at the chart-room door.

“Only one minute left, Jo, something has happened. Are we in position?”

“As nearly as possible without the signal. The wireless cross bearings place us within a mile.”

“Procede to Number 6,” snapped the Kapitan. “If this signal shows later, we can swing back.”

Brehna relayed the word, and in a few seconds the throbbing of heavily muffled engines sent a vibration through the giant craft. The flying drone had hardly begun to pick up speed when the wireless operator jumped up from his seat.

“Herr Kapitan, a message from Headquarters. I just decoded it—”

Von Lehr snatched it out of his hand. His pale eyes raced over the words, and his rigid face twitched in a furious spasm.

“Relay that order!” he roared. He sprang to the control room door.

“Change course to Louvincoix! Full speed, all engines!”

Brehna rushed into the chart-room.

But, Kapitan, we, destroyed Point Four—”

“We were tricked!” raged von Lehr. “The camera was taken to the decoy drome—” He spun around, to Strange. “Bei Gott, you did this!” He snatched a pistol from one of the guards. Strange made a desperate effort to pull himself free. Von Lehr jammed the gun against his head, then, backed it away, with a muttered curse. “No—that way would be too easy.”

Brehna was tugging at his mustache in a frenzy of dismay.

“If the camera was switched, then they will know everything! They may have planes in the air—waiting to attack us—”

“You fool! How can they get this high?” rasped von Lehr. “And besides, they know nothing. The camera this message tells that much. Our Intelligence has a report from a spy who was waiting near Louvincoix to see the explosion. He went to the base after the decoy field was blown up. A pilot—either this one or the devil who fell from the cloud—left some wild report before he took off. It was about the cameras, but the stupid Yankees could make neither head nor tail of it.

“Now, they think they are safe there because they knew we would think it destroyed. So they have moved more squadrons onto the two fields. The place is packed with planes, according to the spy’s report. Not only that, but half the American General-Command Staff are there at the Third Corps Headquarters. It is a God-sent chance.”
“But how can we destroy them?” cried Brehna. “Without any infra-red sets, the indicators in the planes will not register the direction—”

“One plane will dive without a torpedo,” grunted von Lehr. “It will drop four flares, at the same time. The others will follow in ten-second intervals. They will be able to see their targets by the flares. The smoke pots in the torpedoes will be cut off. The last pilots would not be able to see through the smoke. It means the shriek sirens will not work, either, but this time we will do without them. And even if the fools do see the last flares for a second, it will make no difference. They will all be dead in a few moments.”

Relief came into Brehna’s fearful eyes. “Gut Ja, Kapitän—the scheme is perfect.”

“Then get above—have the pilots ready—torpedoes on the ships!”

The commander dashed aft through von Lehr’s cabin. The wireless operator had been feverishly taking down another message. He turned with a puzzled look.

“Herr Kapitän, this is from our base. A Hanover is somewhere near us, calling for a guide-light. A Staff officer is to be put aboard.”

“We’ve no time for any meddling Stab-Offizier now,” grunted von Lehr. He wheeled, gestured curtly to the guards. “Take the prisoner to the brig. I’ll have words with him later.”

The stolid Germans marched Strange into von Lehr’s cabin and toward the passage. As he heard the chart-room door close, he felt a new hope come to life. There were two against him, and armed, but he had overcome worse odds. In half a minute he could believe his heart sank. A pilot was standing just outside the door of von Lehr’s cabin. The man’s back was turned, so that he would be watching as they went aft. He stumbled along between his guards. But suddenly there was a sharp exclamation, and Strange turned his hold. The first man turned hastily.

“Get ‘em up, Fritzie!” snapped a low voice, from behind Strange.

The man’s hands shot into the air, his stolid cheeks a leaden hue. Strange whirled as that low voice spoke. For a moment he could not believe his senses.

There stood Tom Jay.

“Tom!” he said hoarsely. “Thank God—I thought you were dead!”

A tense, crooked grin twisted Tom’s lips. “We’re pretty close to it, right now. Grab that Kraut’s gun while I make sure our bird’s out.”

Strange jerked the Luger from the guard’s unresisting hand. Tom straightened from a hasty examination of the man he had struck down.

“Won’t bother us. But we’ll have to hide him somewhere.”

“Von Lehr’s stateroom,” Strange whispered. “He’ll be too busy to look in there.”

TOM and the frightened guard carried the unconscious man through the cabin and into the stateroom, while Strange tensely watched the entry to the chart-room. When the German had been deposited on the floor, Strange entered the stateroom and closed the door.

The disarmed guard was cringing at one side, Tom Jay’s pistol thrust against his ribs. Tom made a significant motion behind the man’s back as Strange came in—a motion of tapping the Boche on the head with his gun. The guard caught the movement in the stateroom mirror. He gave a frenzied jump for the door. Strange cut him off.

The German’s mouth opened for a yell. Strange swung with swift precision. The blow smacked loudly in the room, and the unarmed man died into a moan. He swayed for an instant, knocked out on his feet, then fell with a crash before either man could catch him.

Strange was walking, stepping lightly on his feet, as he came.

In the cabin outside, some one gave an exclamation. Strange threw himself back as the door burst open. Von Lehr plunged in, tried to leap back when he saw Tom Joy, and the guards on the floor. Strange sprang from beside the entry. His hand was over the Kapitän’s mouth in a flash. The gun in his other hand pressed hard in von Lehr’s side.

“Close the door,” he said to Tom. “Find the thing to tie and gag this German rat!”

In a minute, von Lehr was trussed in his box with twisted strips of a sheet. Strange smiled grimly down at him as he began to fasten the gag.

“A little of your own medicine, mein Herr. Even the most jaded is almost tempted to include a good kick.”

Von Lehr’s pale eyes blazed with a manicidal light.

“Teufel!” he said in a shaking voice. “Even if you escape, I’ll hunt you to the end of—” the gag blocked the rest.

“Juries go for a day or two.”

“We’d better get out of here,” Tom said nervously.

“For a few minutes, this is the safest place we could be,” returned Strange.

He was rummaging in the Kapitän’s closet as he spoke. He took out a hanger with some very ...

Strange grabbed for a hanger and tossed it aside. He took the trousers from his belt and passed them to Tom. He then handed over his overcoat.

“Here, how do you escape?” he asked Tom hurriedly. “The Germans think you fell overboard.”

“I was one of their men,” said Tom. “When the rear gunner, I knew my only chance to help you was to hide out, or we’d both be prisoners. I made a break to the aft starboard hatch—beyond those black ships. It was pretty dark, and I thought I’d made a getaway, but there was a Kraut pilot by one ship. He grabbed me, and then I grabbed his gun and this oxygen mask.”

He touched the hood suspended from a cord around his neck. “Four or five mechs came dashing after me—I had this thing over my head by then. I pointed at the Kraut. We both had on flying-helmets and goggles, so he didn’t see his face very well. The poor devil put up a fight—somebody knocked him down—he rolled under the rail—”

Tom shuddered at the recollection.

“You’re sure you got away without being suspected?” asked Strange.

“Yes, I had a hard-boiled Hun act and told them to get the hell back to their posts. It’s taken me all this time to sneak down here without being caught.”

Strange had hastily pulled out the drawers of a built-in dresser. He pawed through von Lehr’s effects, whirled and picked up his flying-coat.

“I’ll have to use make-up. I was hoping to find another oxygen hood—”

“There’s one out in the cabin, by his overcoat,” interrupted Tom.

Strange had taken a flat make-up kit from a hiding-place in the lining of the coat. He shodded it under his olive-drab blouses.

“Then I won’t use this unless we get in a tight spot.” He took the Luger he had laid down, swung to the door. He peered out cautiously, was in the cabin and the hood over his head in a second. He plunged his arms into the four- stripee’s overcoat, closed the stateroom door while Tom anxiously watched toward the chart-room. As they ran aft, Strange lifted the adjustable mouthpiece and spoke in a taut whisper.

“We’re going into the plane hold. Hide my name somewhere.”

“They’ll think it’s queer, down here in a super-charged compartment,” Tom said hoarsely.

“Look at one of those stripes, and they won’t question anything,” Strange responded. “The whole crew is in deadly fear.”

The air-lock to the plane hold was in use when they reached the compartment. The elevator platform was down. The reason was soon evident. Hooded mechanics were about to haul one of the two black ships onto it. Strange opened the door of the second, as he felt the cold, rare air. He looked up. A lieutenant with one of the hoods stood at the edge of the big square hole, watching the operation below. The deck floodlights had not been switched on, but there were sounds of feverish activity.

“Go on!” Strange grated through the hound mouthpiece, matching von Lehr’s rasping voice.

“But Commander Brehna ordered—” one of the men began. He stopped and hastily saluted as he saw Strange’s insignia. “I beg your pardon, Herr Kapitän—I didn’t see as we felt the cold, rare air. He looked up. A lieutenant with one of the hoods stood at the edge of the big square hole, watching the operation below. The deck floodlights had not been switched on, but there were sounds of feverish activity.

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He disappeared. Strange waited until the elevator reached the deck. As the safety-bolts shot into their sockets, he whirled and closed the door of the hold. Tom ran with him to the elevator cable drum. Strange lifted the heavy weight at the end the magnetic brake, and Tom swiftly shoved an overturned fiber chair under it. Together, they pulled at the spokes of the drum until it finally moved. The metal cables slackened, the safety-bolts above keeping the platform from descending. The drum spun faster as it gained momentum.

"Let it go," Strange rapped out. "'There's a hundred feet of slack already.'"

PANTING from their efforts, they hurried to the passage door. The drum was still unwinding its cable as they closed the door behind them. They ran up the stairs to the flying-deck. One of the black ships was idling when they came out from the starboard shelter, and another one was being started. Strange's eyes narrowed as he saw a torpedo under the second dark fuselage. In the gloom, the black torpedo itself was almost invisible. A flaming, bony figure seemed to be suspended there beneath the plane.

"We'll have to make every move count," he whispered to Tom. "I'll order the 'dive' and split that ship—swallow the flares. When I give you a signal, take off and pull up a thousand feet above the 'drome.' Drop your flares —then dive clear!"

"What about you?" Tom asked hastily.

Before Strange could answer, Commander Brehna appeared from the darkness.

"Kapitän!" he exclaimed. "I've been looking all over—I just sent a messenger down to find you."

Strange hid a start. "'Have the flying-boat lined up,'" he snapped. "'Hoff Leutnant'—to Tom—'stand by that first plane.'"

"But we're not quite in position," objected Brehna.

"Do what I tell you!" roared Strange. Brehna dashed toward the light control station. He had just reached it when Strange heard, above the low purr of the black ships' engines, the static drone of a Mercedes. The floodlights went on. The roar of the unseen ship increased, and in a moment a checkerboard Hannover twelve meter showed down for a landing. Brehna tossed the signaling flags and waved the pilot away, but the two-seater did not turn.

The Hannover landed heavily, bounced, and almost went out of control. Deckmen caught it, ran along at the wingtips, and the pilot stopped. Strange swung under his breath. The two-seater was blocking the take-off space. With a muttered word to Tom, he hurried toward the ship. The engine was still idling. He saw the pilot stagger down, turn and help his passenger to the deck. Neither man had an oxygen mask, and both were suffering from the thin and icy air.

Strange was about to snarl an order to have the Hannover pushed aside when the pilot's goggled face became visible. He froze in his tracks. It was the other Jay twin!

In the same moment, one of the drone crew gave a start of amazement as he saw Noisy Jay's face.

"Mein Lieber Gott!" he bawled through his horn. "This is the man who flew aboard?"

There was an uproar, and a score of Germans ran to the spot. Strange charged through, shoving men right and left.

"Numbnuts!" Brehna was flinging at the envelope men. "I suppose he fell right into one of our ships!"

Another mechanic glanced through his eye-slits at Noisy, who was clutching the edge of the Hanover's wing for support.

"If it is not the same man, it must be his twin," he said fiercely. "They are alike as peas."

A choked cry rose to Noisy's lips, as he caught the implication of the German's words. Strange broke in before the youngster could betray himself further:

"You blundering fools, have you never heard of two men looking alike? I know this Offizier."

There was a silence, and he saw the two enlisted men look at each other. He swung on them savagely.

"Get to your posts! Commander Brehna will have the second diving-bomber in position for taking off. I'll join you as soon as I have a word with these officers."

The crowd scattered. Strange fixed his eyes on Noisy, who had stood there in a daze. His companion, a small frailling man, appeared on the verge of collapse. His dark eyes were like holes in his pesty face.

"Don't make any sign," Strange said in a low, sharp voice. He leaned closer. "Noisy, it's Phil."

Noisy's eyes bulged, and he took a shaky step backward. Strange gripped his arm.

"Watch out—everything's all right. Tom isn't dead—he's here on the drome."

The color rushed into Noisy's half-from-wet face.

"Thank God!" he said huskily. "Thank God!"

The dark-eyed man swayed and Noisy caught him.

"Who is he?" Strange asked hastily.

"Abbott—a British agent," Noisy explained, before the one who read the sketch. He isn't a pilot—he knew what was up—helped me steal a ship—"

"Got to blow it up," Abbott whispered. He was almost fainting, but his dark eyes held a desperate purpose. "They'll blot out air forces—headquarters—"

The steady throb of the monster craft's engines suddenly lessened. Commander Brehna came forward.

"Ready, sir! We'll have to move this ship—"

"These officers are returning to Head-quarters," cut in Strange. He gestured to Noisy. "Get your passenger aboard. Take off as soon—"

Strange stopped, his blood almost turned into ice. Charging out from the starboard shelter was von Lehr!

"Spies!" the Kapitän cried in a furious voice. He was unh总公司, and his paralyzed face was unmistakable in the glare of the floodlights. "Seize those four men!" he snarled. "I want them taken alive!"

Strange whipped out his Lugger, dropped the first two Germans who leaped at him.

"Noisy—the Hanover!" he shouted. "Tom—follow my plan—"

A BURLY German sprang at him from the side. Strange tried to fire, but the gun was knocked from his hand. As he went down he saw von Lehr's men close in on Tom. In a few seconds it was over. Noisy and Abbott had been taken with little resistance. Tom was dragged to his feet, and his hood jerked away. His forehead was bleeding where one of the glass lenses had been smashed against it. Von Lehr pulled off Strange's hoo with vicious force. The cold, thin air made Strange dizzy, but he gritted his teeth and held onto his senses.

"March them aft," the Kapitän ordered, his voice trebled. His rage seemed to make him oblivious to the rarefied air.

"We are in position, Herr Kapitän," Brehna said anxiously. "Would it not be better to wait—a minute?"

"Take a minute," rasped von Lehr. "Have those other two bombers brought up. Move that Hanover, and have the pilots ready for my orders."

Strange hardly realized what von Lehr had directed. They were nearing him, the flying-monster, and with a shuddering horror he knew what was going to happen. "Take this one first," the Kapitän said harshly. He pointed a bony finger at the Englishman.

Two men with Madisi rifles appeared hastily along bayonets to trust muzzles. The men holding Abbott jumped aside. The Englishman stared around, a dazed look in his eyes. Then he knew his terrible fate. He tried to jump back, but the cruel bayonets forced him on to the edge. He whirled, caught wildly at the one that thrust rifle. The German struck him with the flat side of his bayonet. Abbott tottered for an instant on the brink. Then with a horrible cry he plunged into space.

"For one frightful moment, the scream of the doomed man tore through the blackness. Then it swiftly died away. Absolute horror gripped Strange. This thing could not have happened... it was some awful dream...

"This one!" said von Lehr savagely.

The fierce hands holding Strange's arms released him. Sharp steel probed at his back. His horror broke, became a murderous fury. He was doomed... but if he died that way von Lehr would go with him! In the sudden hush he heard Brehna's voice.

"Unlock it, the weight will start it." The prodding blades had sent Strange to within six feet of the edge. Before him lay the black abyss of empty space. The steel dug into his back. He took
another step, then whirled like a madman. With a furious sweep of his arm, he struck at the blade on his right. The bayonet tip raked to the side, ripping through the cloth to his flesh. Thrown off balance, the German bumped against the other Boche.

With an oath, von Lehr leaped forward. Strange clawed at the nearest Mauser. The man who held it jumped back and Strange fell to the deck. He had a glimpse of von Lehr about to snatch the second German’s rifle. A sudden, loud whistling rose above the gurgling waves of the Germans. Strange went rigid. The elevator had been unlocked!

Von Lehr whirled. There was a grinding roar as the huge platform crashed through the framework beneath. The drome shook violently, then all the lights went out.

Instant pandemonium swept the crew. Half of the men on the deck had been thrown down by the jolt. Strange wrenched a Mauser from one of the guards as the man stumbled. The other man lunged frenziedly as he caught the light of the giant moonlight. Strange was almost on his feet. He threw himself to the side and the German’s blade flashed by. Before the man could turn, the butt of Strange’s rifle went smashing down onto his head.

The flying-deck shook under another rending crash. Dural girders were buckling in the framework of the middle Zeppelin, and Strange could feel the monster settle drunkenly. He leaped through the semi-gloom to where two men were fiercely struggling. But before he could get to the third figure, Strange sprang into action. Tom Jay had broken loose in the confusion. A Boche pilot lay groaning on the deck behind him, and his gun was in Tom’s hand.

Flame spurted from the muzzle, and a chunky German sagged to the deck. Tom lifted his half-exhausted twin, then spun around, gun raised, as Strange raced up.

“Hold it!” Strange shouted. He dropped the rifle, hoisted Noisy to his shoulder, and dashed toward the Hanover. The flying-deck was rolling and pitching like the deck of an ocean vessel. He heard Tom’s gun bark twice. Somewhere in the gloom, von Lehr’s voice grated a hasty command. “Pull the main line-fuses! If those leaking cells catch fire, we’re finished!”

The Hanover had twisted around, one wing down over the shelter, but the engine was still running. Strange dumped Noisy into the rear pit. As he fastened the youngster’s belt, Tom appeared at his side.

“You take it, Phil! Get him down—that’s all I—”

“Get in!” rapped Strange. “I’ve another job to do!”

He held the wing while Tom gunned the ship around. A cursing Boche dashed out of the shadows as the ship began to roll. Strange landed an uppercut, and the man thudded against the wall of the shelter. The beam of a flashlight stabbed through the half-darkness. A Luger roared, and the bullet ricocheted from the deck.

A frightened pilot was scrambling into the cockpit of his ship. Strange tried to cut him off, but the man gunned the engine and went streaking along the deck. The floating drome gave a lurch just as he was gaining speed. The plane slithered around, struck the port shelter with a deafening roar.

Strange was halfway into the pit of the second black plane when the first one crashed. He held his breath, then remembered it carried no torpedo. One of the magnesium flares had been released by the impact. It blazed up, searing a black hole. The whole deck was instantly lit as by the moon-day sun. Strange caught frantically at the throttle. There were twenty Germans within fifty feet of him—and not two yards from the ship was von Lehr!

The Kapitan saw him just as the plane dipped forward. His right hand flashed up. Back of the blasting pistol, his paralyzed face seemed to work with the frenzy of his rage. A bullet gouged through the movable cockpit shield. Strange crouched, kicked the ship to the right as the huge flying-drome rolled back. A graying hole leaped toward him . . . . the elevator shaft!

The Hanover had been beyond it, and in the tension he had almost forgotten it was open. He jerked the stick at the last second, and the black ship hurled across the deck to the other side.

With a crazy sweep, it veered off at the end, pitched into the air.

With both hands, he fought the stick back and held his altitude. As he turned, he saw the monster settle another thousand feet and then begin to surge ahead. Fortunate figure very dimly seen in the rill eye. With a crazy sweep, it veered off at the end, pitched into the air.

“Very good! Now let’s get the Hanover!”

Strange turned as the smell of the drome filled his nostrils. Strange was aware of the Hanover’s great wings. Sometimes it was not even necessary to dash at the Hanover with the drome. Sometimes it was best to let the Hanover come to you. Strange pushed the drome into the air.

But while the Major was able to get out a few words, the expression on his face changed not a bit. He still looked like a man confronted by a ghost.

“You’d better check up, Major. I just saw one in the air—same insignia,” continued Buzz.

A dozen men charged for the gun-mounts as he came into the light. He saw a blue-clad figure dash for the nearest Maxim. He could almost feel the fury of von Lehr as the gun blazed into action.

Closer . . . . closer . . . The black ship shook under a fierce pounding of German slugs. Eyes slitted, Strange went over the stick. His hand pushed it forward, and with a mounting screech the plane went down the sky.

Through the two rings before him he saw the flying-deck. A gray deck . . . . a white drome . . . . a circle that swiftly grew larger. Flaming guns . . . . tiny figures like ants, scurrying madly. . . . Bullets crashing into his wings, eating closer to his pit. His hand clenched on the brass ring at the side of his seat.

The black ship leaped as his torpedo went screaming down. He swept up in a tight zoom. Below, a fiery skeleton was diving headlong at the floating drome. For a tense instant, he thought that the torpedo would miss. Then it struck at the base of the port shelter, and a terrific explosion blew a circle that went on increasing.

In that tremendous blast, the great drome all but disintegrated. Strange fought his way out of the scorching smoke which arose. Shading his eyes, he gazed downward. The flying-deck had been blown to pieces, and two of the huge Zeppelins which had supported it were roaring down in a mass of flame. The third Zeppelin had broken in three parts. One was blazing, and suddenly the section near it caught. Two pygmy figures clinging to ruptured shells vanished in the flames.

By the hellish light, the last section was clearly visible. As its leaking cells sent it twisting downward, Strange saw a lone German hanging to a gider. A grim presentation made him glide closer. As the black plane circled, a lone German hung there to a gider. A grim presentation made him glide closer. As the black plane circled, a lone German hung there.

A second more, von Lehr hung there, clawing futilely. Then his bony hands lost their hold, and he fell into empty space.

Strange tore his eyes away and looked around the sky. The Hanover was circling, and he saw the Jay’s white faces gazing down at the ruin. He moved his wings in a signal, and the two ships started down. Of the giant craft and its crew there was left only blazing wreckage slithering to earth.

The blackness had swallowed up von Lehr, but in Strange’s taunt mind it seemed he could hear a horrible cry still ringing through the night.

Swamp Angel’s Spectre

(Continued from page 20)

But while the Major was able to get out a few words, the expression on his face changed not a bit. He still looked like a man confronted by a ghost.

“You’d better check up, Major. I just saw one in the air—same insignia,” continued Buzz.

“Take a look at your face . . . . er
.... Wilson," the Major gasped staring. "It's all..., well, nearly all blue!"

"Buzz leaned back so that he could catch his reflection in the big dial of the tachometer. He could see that it was blotched and spotted darkly. He jerked off a glove and blotted it on the Major’s cuff. "Judas Priest!" he gasped."

"But your motor? ... It's almost out of the bearing-plate."

"I know that—but how it happened I don't know. This bird came up friendly enough and started to fly back with me. That's the way it was. I had to show me the way to the field. Then he suddenly swung over in front of me so that I almost rammed his tail—and then, well, everything seemed to explode in the motor."

"Sure you didn't hit his tail? That would have snapped your blades."

"Quite sure! He flew off and climbed upstairs like a bat out of hell. Don't know where he went. Too busy stretching my glide to get in."

Buzz climbed out, stared at the damaged propeller, listened to it and then to his own, and then he stood up and shouted, "I want to see the Major!"

The Major, who had been watching the buzzing of the blades, suddenly turned to face the blade that had been shattered by chunks of metal hurtled at it, some of the chunks almost as big as a clenched fist. On the other hand, it was hard to state just what they were, for the blades of the prop had hurled pieces of dural through the engine and where the blades had snapped off powdery marks could be seen indicating that there might have been a fusing of metal.

"You'd better come into my office, Wilson. I have a lot to talk to you about."

"And we'll have the M.O. in to look you over and see just what it's all about—that blue stuff, I mean."

"It might help," agreed Buzz staring at the plane as he crossed it.

"What the devil sort of outfit is that you have on?" Major Killrain abruptly asked.

"Oh," said Buzz staring down at his new coverall. "This is one of the new Byrd cloth outfits. It is wind and water-tight. Has two thin linings inside one of rubberized silk and one of thin asbestos. Something new they are trying out. Major Norton got one for me."

"That's Buzz," snickerd Killrain. "Rubberized silk ... asbestos ... I wonder. Look, there's none of that blue under the coverall."

"We'll get some of those outfits at once," snickered Killrain.

They dragged Killrain into his office, staring at the unblemished skin of his arms. He swung out of his para-cutch harness and sat down.

"Well," opened Killrain. "He got you—almost the way he said he would."

"He? ... Who?"

"Cassidy. He turned up last night at mess."

"Cassidy? ... Who’s that?"

"He was Captain Martin Cassidy—an old flight commander in the old outfit in France. He went West on October 17, 1918, and I saw him go down."

"And we haven't heard from him since last night?" asked Buzz puzzled.

"Well, someone did who looked like him," said Killrain wearily. "I know it sounds goofy, but he did."

He went into more detail and explained all that had happened. Buzz listened intently and then went off to the old war history of No. 76 and learned the tragic story of Marty Cassidy.

Later he slipped out of his coverall and let a doctor look him over. The M.O. could find nothing wrong, except the bluish discolorations. For these he could offer no explanation. But he took a blood sample and went off, promising to tell them later of his findings.

When the M.O. had gone, Buzz asked about Cassidy again.

"Funny thing," Killrain said quietly. "I was at the ready this morning when I recognized him the day Chubbly Jansen went down. But I kept quiet about it then. I figured they'd say I was nuts. I was certain last night, even though his voice was different."

You actually saw him go down in the war? asked Buzz.

"Positively. In flames, too. I was with him—was supposed to tail him while he got Hun's. But when I charged into a couple of Heinies myself, the next thing I knew Cassidy was going down—just like it says there in the book."

"And never found his grave?"

"No—but they never found Frank Luke's either, did they?"

"Um ... Then, suppose this Cassidy guy didn't die ... just crashed and, we'll say, lost his mind?"

"Good Lord, Benson."

"It doesn't mean you know, Buzz warned. "Let us suppose he bore you a grudge, feeling you didn't protect him on that last flight in France. And now he comes back to get even."

"All right, why doesn't he get even with me—not just anyone in the 76th. That don't mean Wilson."

"None of it does, but you are losing men just the same. Was there anything else between you two, Major?"

"Anything else? ... Er ... no. Nothing else, Benson."

"My name's Wilson here, remember." "Yes, Wilson. Only I thought, Benson, that I would sort of let the boys in on it. I don't mean they that know you who really are—all just that you are someone from Washington who is working on the case."

"You told them—that I'm not Lieutenant Wilson." barked Buzz. "What's the idea?"

"Well, you see, I wanted them to feel better, and I don't believe anyone here has anything to do with it. They're all scared stiff and I figured that if they knew that someone outside with a big reputation was working on it, they'd feel better."

"That doesn't make sense, either, Major," Buzz growled. "However, we'll have to make the best of it."

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For the rest of the day, Buzz settled to his strange task of siftting the available evidence on the weird happenings of No. 76. He checked every man in the squadron from the Major down with little reward. He did discover, however, that Captain Frank Cassidy, squadron adjutant and chief meteorological officer, was also an old member of No. 76 from the war days. His record showed that he had left the Air Corps early in 1919 but had returned again in 1927—for no apparent reason.

"Notify was a sort of petty type, stiff as a ramrod and a strict disciplinarian—a proper spit-and-polish soldier."

He was a good man at his job and he went about his duties with thoroughness, mixing little with the flying men but always firm and fair in all his dealings with them.

"Yes, I remember this Cassidy," he replied to Benson's questions. "A wild heller of the war days. He was due to get his, the way he worked—neck or nothing sort of thing, you know."

"Did you see this—this ghost of Cassidy the night?"

"No. I seldom eat at the mess. I have quarters in town. I'm doing some historical writing, you know, and you can't work here."

"Do you think Major Killrain really saw this Cassidy?" Benson asked.

"I do. ... You asked. ... Wilson, I'm a firm believer in the supernatural. I've studied the subject with interest. I can see no reason why Cassidy could not come back and visit his old squadron."

For a minute Buzz was completely taken back. There was no arguing with this man.

"All right, Captain," Buzz allowed.

"But even if such a thing could and has happened, why would this Cassidy come back to murder men he had never heard of and whom he had seen just toddling around when Cassidy went west."

"That I can't answer, Wilson," Capt. Bauer replied. "There must be a reason for it, of course, but I wouldn't know it."

Buzz knew he was getting nowhere fast, and he decided to give Bauer up. After all, the man actually believed in spirits and ghosts.

He returned to Major Killrain's office to plan a trap for the ghost of Cassidy.

"Every ship accounted for, eh?" he asked when he found the C.O.

"Every one. You are sure that Boeing and the guy in the iguana suit?"

"Positive! That's what fooled me. We're going to remedy that."

"What do you mean?"

"Well, we're going to fix those insignias up so that if this bird appears again, we'll be able to nail him before he gets into position."

"I see."

"We're going to put a narrow strip of white adhesive tape across that upper panel in the shield. We'll run it diagonally upwards across the part that has the Maltese crosses on it. You can have one fixed up for me right away, because I'm going to scour these swamp lands
FALCE

and see if I can turn this guy up."

Major Killrain gave a decided jerk. His mouth twitched.

"You'll . . . you'll kill him sure, won't you, Wilson?" he said hollowly.

"Not if I can help it. I want to find out what this is all about first."

"But he's a dangerous man. He's already killed men. He shouldn't be given a chance."

"I agree. But the main job is to clear up this mystery. After all, we don't know what it is all about, do we? I can't go barging around the country shooting men down on your say-so. He apparently has killed men and he apparently took a crack at me with something, but I want to know what that something was and why he's doing all this. After all, there must be a reason, Major."

"Blue Death?" Killrain almost shouted. "And you got some of it, too! Look at your hands and face—and look what it did to your ship," cracked Killrain in jerky sentences.

Buzz studied the man for several moments, trying to fathom what he was hinting at.

At that moment the M.O., Captain Bartley, came in with a paper in his hand. "Ha, Wilson," he said, "here you are. I'm afraid I do not have much to offer you."

"We've tested that blood sample?"

"Yes, and the result is not very clear. The blue appears to be the result of contact with a vapor—some sort of gas containing a ferrous substance. An iron content, you know. I don't know how it was discharged, or why. At any rate, it appears that that new flying coverall you were wearing acts as a shield against it. I will make a report on it to Washington and see if they can learn anything further about it."

"Rather interesting, eh, Major?"

Killrain simply stared at the paper the M.O. had handed him.

"You feel all right?" the M.O. then asked Buzz.

"Sure! Still notice that tightness about the face and hands though."

"Um. It's a poison of some sort, no doubt. The other poor devils were completely covered with that blue stuff. But they were only wearing white airplane cloth coveralls. Damnable stuff, though."

Killrain walked to the door, gave an order to the Sergeant concerning the strips of adhesive tape that were to be placed over the squadron insignia. Buzz studied the Sergeant's face, noted the bluish discolorations on his hands. He noticed that they were getting fainter. He also noticed Captain Bauer leave the Orderly Room and go across to the Meteorological office.

"I'll take some lunch in a few minutes, Major, and then I'll have a ship, if you want a mind."

"Lunch? . . . Certainly . . . and er . . . a ship? Sure."

AT 3 o'clock Benson, decked out in his new Byrd cloth flying outfit, climbed through the loops of his parachute harness and went out to the hangars. They had a new Boeing fighter ready for him and he inspected it carefully and saw that they had set strips of wrapping paper around the upper portion of the shield in a diagonal position. While they warmed the engine he went into the hangars and made certain that the other machines were marked in the same way. Then he went out and climbed in, fitting a large-scale map to his hood so that he could fly over and inspect every point of the swamp area.

Killrain did not come out, but Bauer was on hand, watching Benson's preparations with interest. He offered no advice nor did he ask any questions.

Benson studied the area that lay between the two branches of Cape Fear River. Directly east of the field lay the Angola Bay Swamp and south of that Shelter Swamp. The two grim, dank areas covered a square almost thirty miles on each side. Only the small town of Maple Hill seemed to have dared to intrude there.

He took off with a wave to Bauer who was watching him like an eagle.

"There's a lot of phonies in this dump," Buzz reflected as he climbed higher. "Killrain named this business 'Blue Death'? It was pretty apt and all that—but too apt for my money."

The Boeing raced away toward the east and was soon lost to sight by those on the ground. For about ten minutes Buzz flew on, then spotted the green and brown stubble of the big swamp ahead. There was something about that grim area that was sinister, yet compelling and fascinating. He raced on, checking his instruments and guns. He knew they were loaded. He was on his own. He was not going to allow any Boeing fighter to get near him this time.

The swamp came up fast now and he realized more than ever the vastness of the God-forsaken land that lay below. He flew over the small town of Maple Hill, decided to land and got his map out and turned south and headed for big bend in Cape Fear River.

Gloomiest dump I ever saw," he scowled over the side. Then his eye caught an open tract that ran down to the river-edge. He eased away, climbed, and studying the map, he glided for several minutes. From the open tract ran a smooth grayly plot that trailed through a heavy thicket of scrub pine. Then, in an oblong open space further in, he caught the outline of a shed that held a heavy brown thicket of foliage. His practiced eye noted wheel tracks and evidence of recent activity.

"There's only one way to find out," he muttered to himself. "Go down and see."

He shut down on the motor, let her glide around for a landing. He searched every inch of the ground below as he eased in smooth S-turns for position. There was nothing particularly promising about the lead, but if he had selected it, he could not tell at that minute.

He did know that the man he was looking for had once been a crack airman in France. He had been known to his fellow men as the Swamp Angel. Benson rightly figured that there must have been a reason for that strange nickname. Then he argued with himself, "But he went down—the Swamp Angel, who was supposed to be dead, once lived in this area. His history disclosed that. And the two big swamps of North Carolina were strangely near the field of the 76th."

Buzz side-slipped fast, knifed his wing-tip toward the narrow runway that had been slashed through the thicket. He cut the gun, kicked her nose around, went slithering through the opening, and dropped his wheels down on the edge of the open oblong of turf. He jammed the spade of the prop and jacked the throttle until he had run up within a few yards of the big shed. Then he eased his P-28 around with his prop blast and foot brake so that he was in a position to take off again.

For a minute or so he sat there and stared about him. The shed was a crude, clap-board affair but it boasted a sturdy roof. The doors were unusually wide and ran back and forth on roller tracks so that when fully open they left a very wide opening.

He stared over the side, studied the ground, and as he turned around he saw there were wheel tracks there and Buzz now caught the imprint of a third mark running between each set of tracks.

Like a flash, it came to him. The marks of a tail-wheel or a flat-shoed ski! There was another airplane in this group—somewhere!

"Now the trick is," Buzz pondered with himself, "whether to clear out and come back with a posse or to take a chance now and see just what this is all about."

But, he had no chance to make up his mind on either point. A cold voice cracked out from behind him.

"Get out of that cockpit—Benson!"

Buzz turned quickly, saw a man in corduroy hunting tugs standing in the doorway of the shack attached to the shed that he had already seen. Looking Remington rifle in his hands and he handled it with cold assurance.

"Come on—get out!" the man ordered, jerking the muzzle of the rifle in a small, authoritative circle.

"I somehow expected this," Buzz said half aloud as he clambered out.

"Toss that gat down on the grass, Benson. The one inside your chute harness."

There was now no question in Benson's mind but that this was the man he had sought — the Swamp Angel. He certainly looked like a somewhat older edition of the Marty Cassidy whose photo he had seen in the Squadron history volume. There was also the strange metallic tone to the voice.

Buzz tossed down the gun. The man came forward and picked it up while he swung a curious look at Benson.

"Okay, Get inside," he said, jerking his head toward the door.

Buzz nodded. He was followed in with a mumble of the rifle prodding the small of his back.

THE room was neat and tidy. It had a field stone fireplace across one end. Pictures, tanned skins, and generous
shelves of books made up most of the wall decorations. It was an ideal spot for a lone wolf.

"Sit down there—that chair by the fireplace," the man snapped, hanging the rifle up and taking a .45 from a holster hanging nearby. "And don't get gay, either, or I'll slap a slug through your face."

He peered across the table at Buzz, apparently trying to figure out his strange bluish complexion.

"How the hell did you live through it?" he asked suddenly.

"It didn't take on me," Buzz smiled. "You're blue ... your hands and face."

"Sure . . . but that's all. You're Blue Death is a washout, and you're licked, Cassidy, if you're Cassidy," Buzz taunted.

"Whew . . . Blue Death? . . . Blue Death?" snarled the man. "Who told you it was Blue Death? Where did you get that name?"

"Well, that's what Major Killrain calls it. I suppose he just coined the word. Not bad, either. You certainly snuffed 'em out of them with it."

"Major Killrain! . . . Major Killrain!" spat the man with disgust. "He ought to call it Blue Death—the dog!"

"You've been taking a pretty lousy way to get even with him, Cassidy," Benson said coldly. "Why kill those other fellows, and what happened to you years before most of these kids entered school?"

"How do you know about that, Benson?"

"Killrain told me about it."

"The louse! Well, he had his chance to come clean and he wouldn't. Now I'm going about getting it in my own way. I'll haunt him to the edge of the grave!"

There was something queer about this angle, and Buzz was not quite sure of himself. He decided to fence for an opening.

"Killrain knew about the Blue Death all the time, didn't he?" he said.

"Sure. He knows . . . well, he knows one thing about it, and he won't give it up. It doesn't belong to him, either," the man answered in a colorless tone.

Plainly the man Buzz faced was demented. His mouth twitched at the corners as he spoke and his eyes had a strange yellowish tint where they should have been white. His hands trembled as he rested them on the table, and Buzz wondered whether he would pull the trigger of the big black automatic without realizing what he was doing.

"Will you turn that gun away a trifle?" Buzz asked with a smile. "Your hands are not steady and I'm afraid you'll fire without intending to."

The man stared at his hands, saw that he was actually jerking now. He nodded mutely, turned the gun away a trifle. "Thanks," Buzz said. "Been taking something?"

"Sure— dope. Got to in my state. This is Killrain's fault—the hound!"

"Why don't you come clean, Cassidy," Buzz soothed. "You're getting nowhere this way."

"No! Well, I'm two up in the game so far."

"Sure," agreed Buzz, "but you can't win."

"So what?"

Buzz sensed that this was a challenge—or was the man fencing now? He decided to try a new tack.

"How did you get out of that crash in France?"

For a moment the man did not answer. Then he turned quickly and his face jerked spasmodically. He ran a finger over a long scar that marked his neck.

"Oh, yes . . . France . . . the crash. I got out all right. I'm Cassidy all right; I've done anything you like, doesn't he? I'll bet I gave him the fright of his life last night when I dropped in on his mess."

"In a way," Buzz went on. "He says he was positive he had seen you that first day—when that fellow Jasson went down."

"Tasson . . . Jasson? Oh, yes, Jasson. I got him swell. Never knew what hit him, eh? They tried to cover it all up about fumes in the cockpit, didn't they?"

But Jasson wanted to get up and strangle the fool. There was no question in his mind now. He was insane—a maniac. Still, something would have to be done.

"Why are you doing all this?" Buzz asked outright.

"To make Killrain talk—to tell me—"

He stopped and with a nervous gesture clamped his lips together with his long yellow fingers, as if to prevent further words from slipping out.

"Don't! . . . Don't you ask me again or I'll kill you!" the man suddenly screamed, "I'll plug you where you sit, Benson!"

Benson's mind raced trying to piece it all together. Killrain was in on it somehow. He knew something that Cassidy didn't—but Cassidy had the hellish device and was using it to kill men. He knew it.

What was it that Killrain knew that meant so much to Cassidy? Cassidy slouched across the back of his hand, tried to regain control of himself.

"That suit you were wearing when I—when you escaped me this morning?"

he suddenly asked Buzz.

"Yes, it apparently saved me somehow. Only my face and hands were burned. Mean anything to you?"

"No. I know how to guard against it. Rubber and lead-weighted silk cloth stops it. You were lucky you were wearing it. What did Killrain say about that?"

"Nothing much. He was interested in a normal way," Buzz replied. "Does Killrain know how to guard against it?"

"Killrain? You look at his flying suit when you get back. But no," Cassidy laughed aloud, "you won't get back—alive."

Buzz ignored the last sentence. "You mean, Killrain knows how to guard against it? Then, he knows what it is you are using, eh, Cassidy?"

"Sure he knows . . . or . . . damn you, Benson, you're pumping me again! Sure he knows! He knew years ago—in France. He tried to sell the idea abroad once, but he didn't know the arrangement of the nozzle."

"All right. Let me go back and charge him with conspiracy—or withholding information. We can make him talk on the charge."

"Stop! Swell for you, Benson. You get the glory. And the government gets the Swamp Angel's secret. Killrain goes to jail a few years and I—I get the chair. Swell for you, Benson."

"What else do you think you can get out of it? You're killed men and destroy government property."

"Bah! Cut it out. You're not trapping me in that way," the man scowled. "I'll get what Killrain knows, jump the country, and sell abroad where they want this thing. Two big groups in Europe—you know who they are—will pay me a cool ten million for it outright and give me sanctuary. Europe's not such a bad spot to live in when you've got that much dough."

Buzz saw the logic of the argument and tried again to figure out what Killrain would have by canvasing tales.

"I've got it! I've got it!" Cassidy suddenly snapped. "I'll trade you to Killrain for—for what he's got that I want."

"What do you mean?"

"We're going up to Bergaw and rout him out."

"How?"

"Fly."

Benson's eyes gleamed at that. Here was a chance.

"Oh, don't jump to conclusions. You ain't gonna get away. You'll fly your horse—but there won't be any ammo in the cans. And you won't have a parachute or that coverall. You're done for this time, Benson."

Cassidy took a pair of steel handcuffs from a table drawer and went round the back of Benson's chair. He dragged Buzz to his feet and pinned him securely, then bound his ankles. With a last look around he went out into the shed adjoining. Buzz sat still, heard him getting his plane ready. He warned the motor up inside the shed, then opened the doors. He rolled it out to a position a short way behind Benson's Boeing.

"All right," he snapped when he came back. "No funny business now, Benson."

He released Buzz's arms, ordered him to get out of his chute harness and the Byrd cloth flying suit. Still covering his captive, he slipped into the new coverall and donned the chute. He took Benson's brown helmet and goggles and handed over his own black set.

Benson was beginning to get the idea. It was damned unpleasant.

"Now then," Cassidy growled, "you climb in your bus. You're to be shackled there, too. I'll put the bracelets on your left wrist and fit the open end to the steel framework near the throttle. You've got no ammo—I took it all out—and you cannot bail out, either. Now you take off when I give you the signal and lead the way back to Bergaw. Get it?"

Buzz nodded and climbed in, and Cas-
sidly fastened him as he had planned. Buzz could fly okay with his free right hand and there was enough play to the manacles to allow him to handle the throttle. But otherwise it was fairly unpleasant.

The tip-off was to come a minute later, Cassidy tore off the white adhesive used to attach the insignia and held it up. He grinned, walked around to the other side and removed the other.

"Now wait a moment while I place them on my bus, Benson. Then we'll be all set. Get the idea?"

"Yes, sir." Someone was going to be shot down for Cassidy—and it wouldn't be Cassidy!

"All right. You can start your motor now. No funny business, either. I've got you covered plenty, Benson. So be nice and we'll see how this works out."

Buzz snapped the switch and pressed down the starter. The motor caught with ease as it was still fairly warm. He nodded to Cassidy and indicated that he was ready. Cassidy ran back to his ship, plastered the two strips across the insignia painted on the blackleg bugeyed fuselage. He nodded to Buzz and together they raced down the opening and climbed into the sky. The rear Boeing was dead on the tail of Benson's machine. There was no chance to make a get-away. Too many guns packed with sudden death rested in the blackening of that black slime behind him. And not only bullets—but Blue Death!

**MAJOR KILLRAIN** sat in his office, a living corpse. He stared at the unread papers before him. He was white and drawn. An unhealthy pallor marked his cheeks, and little twitching lines were pencilled under his eyes.

He was pondering on Benson—and Cassidy. He put one hand in his breeches pocket and fingered a small leather case. Inside the case was an oblong of aluminum—a strip cut from a war-time ammo box. On the surface of the metal he had traced a series of chemical formulas. He had fingered that leather case for months—for years.

Killrain was tormented by nightmarish memories of the past. Memories of a squadron hut in France. Confidences and exchange of views. A man, known as the Swamp Angel who had an amazing imagination. He wanted to end the war quickly and bring victory to the Allies. He had an idea and they worked it out one day on leave in a small chateau they rented. There were strange chemicals, mixed a certain way at a certain temperature. It did strange things when released from a wicked-looking instrument that might have been a cross between a machine gun and a high-pressure fire hose nozzle.

One cannon of the lethal concoction had been made and put away. They had returned to their Squadron to plan its first trial. Then came the usual arguments as to who would try it first and under what conditions. To play safe, Killrain had jotted the chemical formula on a strip of aluminum. The next day Marty Cassidy went West!

A knock came at the door and broke off Major Killrain's meditations. He winced, was glad of the interruption. It was as though someone had awakened him from a bad dream. It was Captain Bauer with a message in his hand.

"Hello, Bauer! Any news?"

"A radio from this fellow Wilson, sir. He's over Ashton and wants you to come upstairs and meet him. He stated distinctly that you should come alone. He has his man—in the other Boeing—and he wants you to join him so that there can be no slip-up when he makes him come in to land."

Major Killrain handed back the paper, read it over. Then his face lighted.

"He's got him, Bauer! He's got Cassidy! You remember Cassidy. He died in France—I saw him. I saw him, Bauer, but we've got him—a ghost. That can't be, can it, Bauer? But we've got him!"

The Major was in a strange frenzy. His eyes were wide and staring. Bauer watched him sharply, tried to answer him. But the Major went on: "Get a ship out, plenty of ammo. The guy isn't going to land here. I'll get him. I'll get him now. Get him this time. Bringing him in. Bah! Got to kill that sort of vermin, eh, Bauer?"

"Risky business, sir," said Bauer.

"But I'll order your ship out."

"That's it, Bauer. Plenty of gas and ammo, too."

Bauer left, a cold smile distorting the lower part of his face.

The Major forced himself up from his chair, glanced around the room. He walked over to his locker, took out his greasly Sidcot-type suit, and spread the flaps back. He had a feeling he was going to do it—go at the Boeings. "Silk and rubber lining. A mad grin spread across his features.

"Bringing a ghost in," he rumbled on in a strange monotone. "I'll see they never bring that—that man in. Shoot him down on sight... Not come back to haunt me again. Nearly twenty years they would have nightmares!"

Killrain dressed and went out, buckling up his helmet. The bellow of a motor crashed out. A Boeing fighter, gleaming with new dope and dural, stuck its impudent nose at the sky. A squad of mechanics stood by while Bauer climbed up and inspected the guns and ammo boxes.

"She's all prime, sir," he reported.

"Good! Stand by for our return, Bauer. Nothing out on this till I give the word, remember."

"Yes sir. Best of luck, sir."

And Major Killrain climbed in and settled himself in the cockpit. In three minutes he was climbing fast over the field. Then he headed east and raced toward the swamps.

**BUZZ** watched the maniac behind him through the rear-view mirror. He realized that the man was an accomplished pilot. Cassidy never wavered an inch off line and any move Buzz might have tried to make to get away would only have brought certain death. He had seen the man's trembling hands on the automatic. There was little to be gained in taunting his reflexes now that he had four guns and plenty of ammunition resting in the death tubes of the Boeing.

Of course, Buzz did not know that Cassidy had made contact with Captain Bauer through his two-way radio set, completing his plans for getting Major Killrain. Had Killrain been in his right mind—or at least mentally alert—he would have remembered that the plane Benson took off in, was not so fitted. It was one of the new ones and the technical staff had not as yet completed the radio installation on all the machines.

It was not until they had reached a point about eight miles east of Bergaw that Buzz and Buzz realized whathad happened. He gazed with amazement at the oncoming Boeing. He knew that it was a machine of No. 76 Squadron for already he could catch the gleam of the insignia painted on the sides. And he also caught the diagonal strip of white tape stuck across the upper panel of the design.

"The devil!" he gasped. "Now what?"

In a flash the whole situation came to him. Whoever it was, they would figure Benson to be in the rear machine with the marked insignia. Was Cassidy going to shoot him down first, then move in on the man who was marked Blue Death? What was Cassidy up to, anyway?

The shock came almost at once. The oncoming Boeing turned and stood off a moment. Buzz watched what Cassidy was doing. Then, before he could make out what was happening, a second Boeing came charging at him with all guns screaming.

The Boeing staggered under the spray of lead and Buzz jerked her up fast and stood her on her tail. The newcomer raced under him and Buzz looked down—into the distorted countenance of Major Killrain.

"Killrain! But where the hell is Cassidy anyway? He could shoot him off!"

The Major's Boeing was coming around fast again and Buzz realized that he was in a tough spot. Somehow, the Major had to be stopped coming to Bergaw. He was trying to kill Cassidy! That was it! Getting Cassidy before Cassidy spelled nothing.

Buzz knew that if he evaded the Major, Cassidy would pull something. There was no time to lose. He darted away from the Major's fire again and now he saw the area clear. Buzz acted fast. He played a game of watching the Major, then suddenly whipped over and slammed at Cassidy. Cassidy saw him coming, let drive with all four guns. But he hung in his sights too long. Buzz thinking nothing of the risk, pulled into a wail of hell and shot his ship dead at Cassidy's wing-tip.

He saw Cassidy try to swing away. He saw him throw up one arm, as if to protect his face as Buck came in hard. His heavy spattered undercarriage legs caught the curved tip of Cassidy's lower wing and sent the whole thing into a giant, two-bladed halberd. There was a cruel shock and a rending crash and somehow Benson's ship went through.

He saw a wheel and a fairied leg go twisting and tossing away. He stared back, caught a glimpse of the falling
Boeing. The wing had crumpled up and had folded back over the main section of the fuselage. A man was struggling to get clear, but in his anxiety he pulled his ring too soon and the silken plume billowed out and fouled the fluttering tail surfaces. The Boeing nosed down and the Leaving legs of the undercarriage had fouled it and again he was going down minus his blades.

From behind came another smashing blast of lead and he had to spin three turns to clear. Then he ripped his helmet off and tried to stand up and show himself. It worked. The amazed Major cut himself short as he peered through his telescope sight and caught the drawn face of Buzz Benson.

Buzz went down and eased into an open clearing not twenty yards from where he was. He landed tangling of dural lay that had hung over Major’s ship. He tried to peer forward to see what the damage was to his own ship, but he could not see either of the streamlined bulges that ordinarily were over the wheels.

So, I’ll have to hope. I may have one wheel and I may have none at all. There’s only one way to go down under conditions like this. Take it on a wing.

He slithered into the opening and fasthauled madly. He snapped the switch and let her zip in until she reached the starting point. Then he snapped one wing down fast and scraped the ground. He eased it up and dabbled the other down. This time she caught and spun him around fast. There was a dull thud somewhere underneath and the craft collapsed in a jangle of metal. But Buzz stood under nothing worse than a hard smack on the side of the head that knocked him dizzy for a second or so. When he came completely, he was staring over at Major Killrain who was sitting in his Boeing not ten yards away.

“Get me out,” yelled Buzz. “I’m tied in here.”

The Major came over panting: “Is—is he dead?” he husked.

“Never mind that. Get out your kit and hack-saw this tube strut away. I’m handcuffed to the seat.”

“I don’t think I’d jump—”

“Don’t you think?” gasped Killrain again.

“Sure. But get that saw out of your kit, Major.”

The Major came back with a small hack-saw and in a few minutes Buzz was clear, though he had to go about with handcuffs dangling from his left wrist.

They found Cassidy, his broken body still tangled in his harness.

“Cassidy!” screamed Killrain. “Cassidy!”

“Killrain, you dog!” the blood-flecked lips of the dying man muttered. “You got away with it. But you’ll never get away with it with that guy Benson. He’s too smart for either of us.”

“Quick, Cassidy,” Buzz said, kneeling down. “Let’s have it straight. You’re going out man—let’s have it quick!”

“I . . . . I designed the nozzle . . . . he got up the formula . . . . then he shot me down and tried to get away with it . . . . I didn’t die. I crawled back through the lines, hid in our chateau . . . . and found this weapon we had mixed. He had the formula and I tried to get it before the stuff ran out.”

“He’s crazy!” screamed Killrain.

“Crazy hell,” snapped Benson. “Dying men seldom lie. You’re going to tell the rest of this, Major.”

“ Didn’t he sell it now. He tried to, but he was always afraid I would turn up, he knew I wasn’t dead. His conscience told him so, but he wouldn’t give up the formula, and I wouldn’t let him see the noise mechanism. He tried to double cross me. I wanted to give it to the Allies at once . . . . in 1918. He wanted to hold it and make a fortune . . . . on the blood of his pals. Get him, Benson!”

Then Cassidy “jerked,” and he rolled over—dead.

**KILLRAIN stood off, a stunned figure. He tried to look down once or twice, but somehow, he could not make himself look at the body beside Benson.**

Buzz pulled the tangled folds of the parachute down and covered the face. Then he got up and turned to the Major.

“We must straighten out here and now, Killrain!”

“Yes—before some comes. We’ll have a few minutes.”

“I talked with him before he made me take off and start back,” Benson said. “I don’t know how you knew.”

“Bauer—it was Bauer. He was in on it with Cassidy. He brought a message in and said that you had radiated in that you had Cassidy.”

“Bauer? But there was no set in my machine.”

“But I didn’t realize that till a few minutes ago. But that proves that Cassidy and Bauer were working together, you see. Bauer probably worked it to get him a Boeing—somehow.”

“I see. But you really knew that this was Cassidy all the time, didn’t you, Killrain?”

“I never knew for certain—until I saw him. I saw him go down in 1918, and I believed he was dead until 1919—after I got back and I was trying to sell the Blue Death idea to . . . . well, a foreign power.”

“And every time you made a move, Cassidy appeared—or gave some sign that he was watching you?”

“Yes. He planned it beautifully.”

“What was the idea, anyway?”

“I’m in a bad spot, I guess.”

“Pretty bad—if they can prove you did shoot down back in ’18.”

“But . . . . you see, he didn’t die . . . . then. I could . . . . well, there’s the Blue Death thing. I could turn it over—and make amends that way, couldn’t I?”

“That all depends. Two men died, you know.”

“But this man was mad—insane!”

“Yes, there’s no doubt about that. But the authorities will have to decide your case for you,” Benson replied.

“He wanted the formula, didn’t he?” Killrain asked.

“I don’t know what it was he wanted. I couldn’t quite see it clearly. He had the Blue Death, but something was wrong. He still wanted something you had.”

“Here. You see, we only made up one canister of the stuff at first, and I got the idea that he was going to pull a gag on me and turn the whole idea over to the government—and get a decoration. I wanted money, not medals.”

“Go on,” said Buzz.

“First I hung about trying to square myself about it, and then I decided to go down to the chateau and get the canister. When I got there, both the canister of stuff and the discharge nozzle equipment were gone.”

“You rather feared about Cassidy then, didn’t you?”

“I knew it was Cassidy, and yet I couldn’t do anything about it. They would say I was crazy and begin to suspect something. So I had to hang on in hope that one day evidence would turn up that Cass was actually dead. Then we’d be able to sell the idea without fear of his turning up at the last moment.”

“What was the Blue Death?”

“It wasn’t in the first place.”

“What do you mean?”

“Originally, it was a ferrous chemical we—or rather I—drew up, that was to be discharged from a nozzle. Once this semi-liquid gas was released into the atmosphere, it became a metallic solid and anything it hit, particularly anything moving at high speed like a prop or a place they were smashed. It formed balls of ferrous metal and the props slamming into this spray of flying metal simply broke up and ripped the motors out of the pearera.”

“My Lord! It’s a terrible weapon!”

“But that blue business?”

“That was that myself—except that we must remember that the only canister Cassidy had was made almost twenty years ago, and it is quite possible that some chemical change took place in that time, forming a mixture that causes all parts of the skin that come in contact with the dregs of the vapor to take on this strange discoloration.”

“Then you were not sure what was going on the first time?”

“No—that blue gag put me off.”

“And actually, Cassidy was really trying to get the formula from you so that he could sell the idea abroad, is that it?”

“Absolutely.”

“Then everything is explained. You still have the formula. We can take the nozzle mechanism from Cassidy’s machine and then tell the lads in Washington a straight story.”

“I’ll tell it as straight as I possibly can, Benson.”

“You’ll have to, Major.”

A truck came thundering across the fields toward them.

An hour later Captain Bauer was caught, trying to get away from the drome of No. 76.”
pointed down, a grin lighting his features. But that grin was quickly wiped off by a frantic gesture from Halsey—for already the master minds of German espionage were at work! Bart had been diving right down on the open sea, on a decoy light cleverly planted by the Boche.

With a snarl he hoisted the Bristol up, kicked about to roar westward. His heart was thumping fiercely now, for the fog had seemed to suddenly thicken. But soon another eye of light winked through. There was no mistaking where this light came from. It blinked from inshore, and it blinked a message in Morse.

In less than five minutes, the Wild-Cat was jockeying down to a landing on a patch of flat sand. They were met by one of Halsey’s operatives who broke news almost at once. Two of Germany’s last submarines had been flung to the south of one of the Irish loughs. A valuable coastal guard station had been blown up!

“This spot’s the very home of German agents, sir,” snapped the man Halsey had introduced as Lieutenant Barclay. “We’ve got a job on our hands that’s going to take swift action and clever brain work!”

“Have you investigated the old castle and its tenants, Barclay?” Halsey asked.

“I have, sir. Martin’s got a job there. But we can’t find a blessed thing. Still, I’ve seen him. He’s got that old professor there isn’t so damned innocent now. I’ll have a couple of men run your plane into hiding. I really think no one is wise to your arrival.”

Halsey was on the point of telling his lieutenant of that deadly decoy light on the lough but that old professor there isn’t so damned innocent now. I’ll have a couple of men run your plane into hiding. I really think no one is wise to your arrival.”

Bart was still hoping the ground in the castle; in the fog, he had been searching for a small lough in a quaint old boat. Wet fog stopped his face. It was a dismal morning, but it seemed to suit his mood. Garbed as an Irish fisherman, he fitted his goat well. He was to have himself over a gunwale and set out a trolling line. There was good sport in these waters.

But the sudden puffet . . . puffet . . . puffet . . . a powerful puffet by a small object in his overcrowded. He jerked himself round, snatched at his oars. The mist was lifting, and now a port in the bank he glimpsed the hull of a small-sized launch. He struck water with his oars, jammed the boat to starboard. His lips were white, and he turned to port. This scudding boat was bearing down on him. It was the seasoned intention to ram him.

He quickly realized that he hadn’t a ghost of a show of out-manoeuvring that fast, oncoming craft. A half straight tip. He was nearly a half mile out to sea—a hell of a long swim that.

For a brief moment, as he shipped his right oar, his hand closed over his automatic. He was in a fighting mood, for the crew of that speeder had paid no heed to his frantic signals. But he let the gun slide back into his pocket.

He stood up in the boat, cupped his hands. “Ahoy, there! Slough her off to eastward . . . Sta’bud yer hel-m. Ye’ll have meFindered, so ye will . . .

He glimpsed a couple of men in the bow—_adc —and we soldiers built the other a tall man, older. In a flash of thought, Bart coupled this man with the old professor, the man who claimed to be a sea fossil hunter—Professor Stern, who resided at the old castle.

The speeding power boat increased its speed. There was no question at all now about the intent of that crew. With the racing craft a bare two hundred feet from him, Bart took a header overside, dived deep. A violent crash folowed. His boat was split to splinters.

Now he struck out, hammering away by his uncouth clothing. Suddenly he felt the water on every hand cut by bullets. He could now distinguish the yammer of a gun above the engine sound.

Filling his lungs with air, Bart drew deep, and stretched himself for a long swim under water—until those lungs threatened to burst . . .

Spent—chilled almost to the marrow—Bart finally dragged himself on to the shingle. He began to stamp up and down, flailing his arms, trying everything he knew to excite circulation. He was suddenly conscious of voices. A yell! Bart’s blood commenced to race.

That yell had meant plenty—for it came from the vicinity of the Bristol’s hide-out.

Cranston turned, raced along the road. He was the guard. One of Halsey’s, men, struggling with one of the figures Bart had seen in that power boat. There was no sign of Halsey’s other guard. They usually worked in pairs—two hours on, and four off.

Bellowing, the Yank skipper hurled himself across the beach over his eye to get better vision. Now he saw the stranger hook a leg behind the guard’s knee. As the guard tottered, the other swung down on him with a gun barrel.

Something snarled from the launch—more—blows—beaten to Perch—"I tried to—" snarled into limp unconsciousness. Here was a hell of a situation! There was no aid nearer than a couple of miles.

Bart gently lowered the man’s head, then raced to the plane. Time bomb! ... But Bart had little thought for the danger which was he expected. At any second he might be hurled skywards in a terrible shambles.

Cautiously he approached the Bristol. His heart picked up its beat as he reached the front cockpit. He recoiled momentarily as he glimpsed there a small, box-like shape. Gingerly he reached in, lifted the object clear of the ship. He could hear the ticking of its fiendish mechanism. He knew that there would be no object in setting the timing of this machine ahead much. It was easier to crack open one gun line.

Cranston’s breathing was almost cut off. He must save the Bristol at all costs, for he was sure that the launch which had rammed his boat had contact with the German submarine outift.
Now he hurried toward a small lagoon. Posing himself on a rock, he hurled the deadly box from him, then leaped clear.

The thing broke before it contacted, and Bart was hurled about twenty feet. A million lights stabbed a black void into which he had slammed; then—the silence of unconsciousness.

It was evident to Bart Cranston, as he came to that the enemy had a very firm position in these waters. He told himself that Britain and the U.S. would be well-advised to cancel orders on that convoy through those waters. It would be wholesale suicide!

But this was all up to Captain Halsey. Bart now moved back to the prone form of the guard. The man was dead! In his own rough way, Bart, the Wild Cat, commended the soul of this young Britisher to God he had gone to meet.

Now a smile crossed Bart’s face. He knew that those Hun agents would be sure, when they heard the monstrous explosion, that the British had been blown. Bart was visualizing a trip across rough seas, across those dark waters. That launch must be located.

He moved back to the plane, climbed aboard.

The motor was roaring hard when Bart happened to glance up. A group of men were coming towards him—Halsey and three others.

“What the hell have you been into, Cran?” Halsey was staring into Cranston’s bruised face. “Good Lord! And where’s—Daly?”

“If you mean the other guard, Hal,” Bart grumbled, “I was too late to prevent two lousy Hun’s from smacking him down an’ running him off.”

“Cran! Couldn’t you—have shot off—man? What—”

Then Cranston told him of his adventure out at sea, of his long swim, of his wetsuit, and pilotsuit.

“Sorry, ol’ boy,” breathed the other. “But give me the whole story, quickly. I’ve found something on that old fossil hunter. Martin’s got a lead at last. Von Sternberg’s his real name.”

Halsey’s eyes were shooting bright dark as Bart clipped off the whole story. He knew Cranston well. They had flown Intelligence assignments together in deep across the badlands of the Ardennes. Suddenly Halsey jerked up his head.

“Feel fit enough for a little trip, Cran?” he asked. “My man, Martin, got very suspicious over that old legged fossil hunter in his collection. Two clam shells. Martin nicked in and pinched them.”

“So what?” jeered Bart.

“So I detected—a after a close examination at my lab in the old farmhouse—writing. . . . Invisible ink, and all that sort of thing in the shells. Clever, what. I cut the spoof one, and now have a lead on the sub base. Cran, that old sea-bug hunter is a clever German spy, with lots of his rats along this coast. He—”

“But look here, Hal,” Cranston cut in. “Why not order that convoy routed...
through different roads now? Hell, we can't expect our navies to come up here on to this coast. That would leave the gates to the German Baltic Fleet wide open. Couldn't you advise the authorities to change the—"

"Come in and eat some breakfast, Cran, you old wild-cat," chuckled the other. "I want to pour about five fingers of Scotch down your gullet. But I'll think over your advice as you get into dry clothing. You're shivering, man!"

Bart grinned. "Okay, let's eat, then get into action." And Bart swung over, and was soon rolling down the road. Lieutenant Callum again, a swashbuckling veteran in floppy homespun clothing.

Later, Bart Cranston was again aloft diving down on what appeared to be a totally barren island.

Halsey had yelled something through the speaking tube, but Bart seemed not to hear. He was hurtling the Bris hard down on a small lough beyond the north-easterly shore of that island. His both eyes glinted. By heaven, he was right! He had seen them—five of them! Five German super-sub! There was no hope for escape. They were certain to have Bart. Cranston snarled. That was the launch all right!

"Okay, Hal," he snapped. "Want me to sink her?"

"No—hoik up into the clouds. We'll lose ourselves. At the same time I want to have a look at her. Don't lose her!"

Halsey's face was a grim, expressionless mask, as Bart hit the clouds and turned. That launch could be seen to head into a mooring spot close to where the Bristol had first landed.

Then Cranston jerked up his head with a horror. A rowboat had picked up the crew of another sky ship's motor. His eyes almost popped out as he glimpsed—a huge seaplane roaring in toward the launch. It carried the coca-codes of the Allies, but both Cranston and Halsey knew that it was a Hun in disguise.

Bart's fingers itchcd on the trigger trips.

"Action?" he bellowed.

"No, certainly not. Watch them! That bogus professor is getting ready to sneak out. I'd give a lot to get that bounder."

Something in Bart's mind clicked. Professor von Sternborg was ready to make his get-away, carrying information that would ruin both the Allied navies, and to all Allied shipping. But Halsey was giving orders now, orders to land on a flat stretch of sand. Halsey leaped into the Bristol and the Bristol stopped and turned again to Cranston.

"Quick, ol' champ," he jerked. "Chuck her up at it again, and follow that plane. Hurry.

"But, why in hell didn't you let me get that plane when we were—"

Halsey cut Bart off.

"For the simple reason that some-thing important is being transferred from that seaplane to the launch. I must investigate. The professor is your meat. Cran. Luck, son! Cheerio!"

"But can't you give me the low down, a bit on what your plans are for the routing of that—"

"Sorry, Cran. There isn't time now. Get to go. I'm inclined to think there'll be new faces at the castle tonight. Get that ship, ol' chap."

Bart reached out his hand, then gave the Bris the gun. As she hit altitude, Bart settled into his old familiar crouch. Here was a real job. But that ship would go down. He wondered if he had gas enough for a long trip! But he cast the thought from him and pressed in the throttle.

He suddenly gulped as he looked down.

"Destroyers! Why, they're bringing the whole cockeyed German navy north," Bart calculated. That seaplane was now exchanging signals with those sleek water rats below.

Bart joshed up his motor, and the Bristol leaped ahead.

A COUPLE of hours later, breathing hard, Bart Cranston headed the Bristol across the North Sea. He was afraid to look at his gas gauge. That seaplane, he knew, was heading for the Mole.

Hell! He'd have overtaken that phony ship had he not experienced some carburetor trouble. But now, with a snarl he slashed his hand along the throttle quadrant and gave her the works.

He was picking up speed, a hell-bent demon—the old Wild-Cat who had carried such a name for himself. He was gaining now. His motor backfired once, then stretched into a sweet purr. He was closing the gap. And then, suddenly twin lanes of flame spurted from the after guns of that ship ahead.

Bart tramped down on his trips. He was in his deadly fighting crouch above the stick, eager for the kill.... So Thelon had thought him washed up! He started, as part of his instrument panel shattered to bits.

He kicked off right. A murderous burst of Hun lead seethed by. Then Bart zoomed his Bris hard. He was in on his quarry. He looped his ship into that terrible dive of death for which he was well-noted. His Vickers gun was pouring out its very vitals. He had that seaplane, had it right smack where he wanted it, when all at once a bullet clipped the lobe of his right ear. He could feel the hot blood hard. Three fast Fokkers were burning the sky at his back.

The Wild-Cat snarled, and Immelman. He cleared a murderous burst of Hun fire. He was breaking out into a volley of explosive language at being cheated of his kill when he suddenly glanced below him. By George! He had got that ship after all. Her tanks had exploded. She was going in—down to the dark, gray sea which met her in a seething, hissing embrace.

Bart shot a glance at his gas gauge. He stared. It was one of the instruments shattered. Hell! He had no idea just how much fuel he had left; couldn't be near enough to stick around milling with these German escort Fokkers. There was a patch of sombre drift cloud ahead. He kicked about, but pulled in whispering past his head. He half turned. Those Fokkers were in mad pursuit.

A slug clipped Bart's right arm just as he hit the cloud bank. He knew he wasn't badly injured, but it stung and was oozing blood, as was that nick in his head. He flashed a warm, liquid trickling down his neck.

He eased back the throttle as the Bris pushed through the clouds. Surely he was close in on the shoreline now.

Yes! There it was. There was a chance he would make it after all.... But with a sudden cough of protest, the Rolls coughed out. Bart tightened his hand and foot touch on the controls. He would be forced to dead stick down. With dusk almost full now, a landing would be a great uncertainty on that unknown terrain inshore.

Bart, with all extraneous thoughts from his mind, he had won his game. He was going to make this Bris behave.

Down... down, through the gloom. He was dimly conscious of some forms scurrying ahead and below. Now his senses trolled for the one true target.

A heavy bouncing jar socked the skipper hard into the belt webbing. The Bristol heeled over, smashed out her starboard wing. But Bart didn't know this, or anything. He was out cold.

STAND a lot of rum now, sir?"

Bart started. He was lying on a cot, aching all over, but able to see things now. He was blinking hard into the face of a young medical officer.

"Thanks... yes. Say, but I'm lucky. Just where am I?"

"In the medical hut of 'A' Brigade, British Royal Field Artillery, sir. You landed in France."

Downing the grog, Bart started up.

"France? Say, is there any chance of a car, M.O.?" he asked.

"Well—I think so. We have a runabout. Where did you want to go?"

"The American Pursuit Squadron— at Callons." There was a meaning in Bart's tone that the other didn't catch.

"Right, sir. I'll arrange that. Glad to have been of help. But first, sir, we are not quite satisfied in the matter of identification. It's the clothes, sir. Bit unusual, don't you know?"

Bart grinned, as he surveyed his torn homespuns. "Yeh—they are odd. But say, M.O. I've got to get to 72 Squad. Send a man along if you like. I can be identified there—"

Thelon! The name was ringing in Bart's mind. He swiftly dipped a hand into his pocket and fished out a dark cigarette. The M.O. had left the room. But he returned in a moment. "Right. We'll have to send a man, Captain Cranston. See that you eat something at the squad-ron, then get to bed right away. Your (Continued on page 80)"
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arm will be a bit stiff, but nothing serious is wrong."
Bart gripped the young man's hand, then rolled to his feet.
When he arrived, 72nd Squadron's tarmac seemed strangely deserted. As Bart drove up, an orderly raced to meet the car.

"Where's everybody?" Bart jerked. At first the man didn't recognize him, then his lower jaw fell.

"What? The Wil—Excuse me, Cap'n Cranston. I—Well, we've had hell, sir. C.O.'s got it. Not expected to live."

"Holy—smoke!" This from Bart. "And Lieutenant Ferguson, what about him?"

"Captain Ferguson now, sir. Slightly wounded. He's sitting in with the C.O. at the medical hut."
Bart turned and cradled something to the men from the naval battery. Then he strode on toward the medical hut.
Bart opened the hut door softly, and entered, a strange figure in his home-spun, torn and tattered, and bloodstained.

But Ferguson soon recognized him. "B—Bart—did you—say—Bart, Ferg?" came in a weak voice from a cot.

"Yeh—Bart. Cranston breathed.

"It's. . . all right, Bart Cranston. I heard you'd be hit. Thought I'd drop in an—say—damn sorry to—hear it."

"But your eye—Cranston . . ."
That was a hell of a thing I—did. Lost my head completely. Your eye, Cranston . . . I blinded you.

"My eye? . . . Hell! Lookit! Can you see?" Bart jerked off the black patch. "Got it fixed up swell by a London specialist. I've just come in from an Intelligence job—a success. I can see as plain with either eye, Thelon. I—" Bart reached in and took the limp hand reaching out for his.

"Heaven—Cranston. I feel better—now."

"Out!" jerked the M.O. "You come just in time, Cran. He's been worrying to beat the devil. Fergy'll tell you all about it while I go get an ambulance."

SOMEDAY later, Major Bart Cranston stepped into his office. He had just returned from heading a full squadron shoot. And 72 squad had come through with flying colors. He started as he glimpsed a telegram on his desk.
Now his eyes were glinting. Here was a message from Halsey. It read:

Dear old Wild-Cat: "Congratulate on your promotion. Thanks for great job on that seaplane. We cleaned up in the north. Here's what: All the time, it was our ruse to drive out all the Hun subs and destroyers we could to those north Irish waters. Never had any intention of coming back. Contemplating a transport through there. Got 'em safely in through the south roads. See me on your next leave. Cheerio!

"Well, I'll be!" Bart exclaimed. By George, he had to hand it to Halsey. Clever? Well, Bart Cranston would be ready to affirm this to the whole cock-eyed world at any time. He slammed down the desk to dash off a reply to the wire.

The Batty Patrol

(Continued from page 13)

PHINEAS sneaked out during the argument and hied to his hut. He flopped onto his cot and relaxed, thoroughly satisfied with himself. "That bum I'm even with, haw-w-w-w-w!"

Then, with his hands under his head and gazing at the ceiling reflectively, Phineas thought of the wild story that had come from Chaumont, the one Upshot another ran to convince Major Garrity was true.

It seemed that the amazing Heine chemical wizards had found a formula for an explosive bullet that would wreck a railroad station. Doughs on the front claimed that half a concrete machine gun shelter had been blown up by a bullet shot from a Spandau. Allied officers had accused the doughs of being scalded with giggle juice while on duty. But a test had proved that they had been as dry as Philadelphia on a Sunday afternoon.

"I'd have to see it to believe it," Captain Howell declared before his patrol hopped off the next morning. "No bullet could be that potent."

Somebody's nuts," Phineas agreed and climbed into his Spad.

Ten minutes later the patrol dived down through a hole in the ceiling to jump on the backs of a pair of Heine Rumplers that were bent on washing up a pontoon bridge. The Yank doughboys on the carpet scattered for shelter when the two-sanders dipped low. But the Rumplers were dropping no bombs. Phineas Pinkham focused his lamps on the observer of the lower Rumper. The Kraut was swinging his guns toward the bridge. He let them roar. Boom!

"I don't believe it," Phineas gulped even as he stared at the shattered bits of wreckage on the surface of the Meuse. "That had to be a bomb!" He looked up to see Captain Howell's ship shaking like an eagle with the ague. The Yankee flight did not get over the shock for less than an hour after that, six Kraut Albatros jobs had dropped off a shelf high above the Spads and were beginning to apply the shells.

Old Man Garrity's warbirds were in no mood to fight. Their morale had sunk lower than a duck's arses in soft mud. They had taken a gander at what one bullet would do to a pontoon bridge. If the Heinies had one left with which to experiment, Howell's flight did not want to get in its way. So the Captain signaled for a sprint back to the dome and even Lieutenant Phineas Pinkham was glad to follow him.

The Major came out of his headquarters when Howell landed. The flight leader almost washed out four ack-ack marks in a hurry to land. When he was
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**FLYING ACES**

**April, 1936**

**Dile bits, ja?** Krueller said to the gloating Junkers. **“Ach—if der heart will hold out yest.”**

All indications pointed to a very interesting forenoon in any man’s war.

**“IT’LL only take one slug now,”** How he said when walking across the field. **“We’ll fly the next one they make for you, Phineas. If it hits you—”**

“Couldn’t you think of somethin’ nice to talk about like a juicy murder in a Tardee sewar?” Phineas retorted testily. **“Haw-w-w-wl! I didn’t see you tryin’ to save Pinkham, heh—heh!”** Five minutes later, over Fresnes, he felt as though the cock-pit in which he sat was a cold bath on a wintry morning back home.

“Somehow I’ve got to find that Heinie hell-juice factory,” the exponent of small-bulldoggin’ hit off. “Just one dinkin’ me—an’n’fice Phineas. Oh, well, maybe we won’t meet any Huns today.” He swung his head toward Howell’s bus which was rocking like an Indian canoe in mid ocean. The flight leader pointed a finger into the blue and started the climb. Phineas followed more reluctantly in his eventful life. In ten seconds he was wishing he had joined the Navy, An Albatross scout had ploughed down through the ozone and was headed straight for the Pinkham prop box.

“He’ll duck out of the way when he sees I won’t give an inch!” the Yankee flyer yelled. **“Haw-w-w-wl! They can’t bluff me.”** He tripped his Vickers at the Kraut and nothing happened. Suppose some wise ackmona brought the drome had his head with blanks! One hundreds yards and the Heinie still was coming for the Spad’s nose. Fifty! Phineas yowled and yanked the stick back. His ship shot up. Something grazed its tail and the Spad emulated an acrobatic dancer in the midst of the melee.

**Whew-w-w-w-l!** breathed Pilot Pinkham, shaking beads of sweat as big as golf balls away from his face.

A Jerry took a pot shot at him, then screamed by overhead. Another one came at him from the left flank. Phineas gave the Spad plenty of throttle and wondered why it made a noise like a coffee grinder. It picked up no more speed than a turtle with arthritis—and that Boche crate was driving straight for his midsection. The ship’s Spandau was silent. Phineas threw the Spad into a dizzy slip, did not pull out of it until he had given up a thousand feet of altitude. He flipped it to even keel, tried to grab a full breath. No use—the Albatross was dropping down on him again.

**“Tryin’ to crash me—that humongous thing is downin’ on the Iowa Yank.”** “Well, if he does, it will be on some intersection downstairs. I’ll show him—I hope!”

Five hundred feet up Phineas saw the Jerry sliding at him again—cutting across his line of flight. Steam pouring out of the Spad’s tubes. He started to drive his Boche from view. **“I bet he thinks I’ll try an’ pull up again,”** Phineas croaked. **“Haw, I’ll dive instead,”** and he did. Not ten feet from the ground he yanked the stick back again. There were weeds sticking to his empannage. Down plummed the Hun. **Leutnant** Krueller tried an Immelmann with about fifty feet of space between himself and Allied carpet. He grazed the branches of a tree and knocked a wasps’ nest loose. It rolled into his superstructure, broke up and led to his death. **Herr Krueller** forgot all about his weak heart and his mission in death. Half a dozen wasps found a foothold on his face and sat down hard.

**“Himmell!”** yowled the *Leutnant*. **“Dundum! I’m mad at myself. I can’t take care of Phineas, flying on its own, ploughed through a Frog haystak, executed a pretty somersault, and smashed against the wall of a barn.”**

Phineas, madder than the wasps, found a place to set his crate down and ran toward the wreck. Yankee doughees poured around in his wake. **Leutnant** Krueller was sitting in the middle of the farmhouse yard, making crazy gestures with his hands. Phineas drove away a pig that was sniffing at the Kraut and cut the head of the dead Yankee to his five senses. When Krueller’s eyes were uncrossed he focussed them on Phineas dizzyly.

**“Ach—you ist, hein?”** the Kraut guipled. **“I would haff kilt you but I got der wasps, ja. Himmell!”**

“And you would’ve went West, too, you fathead!” Phineas told him. **“Now I ask you—is that smart?”**

“**Ach,** I die anyway,” Krueller groaned.

“So idt makes me no never mind!”

**“Huh?”**

“**Der heart gifts yoomp and dives,**” explained the German mournfully.

“Listen vunque. It pods mit shakins. So der High Kommand they say mash izt das Pingham, ja, und die vun hero. **Ach!”**

The Kraut shook his head, took something from his pocket and bit off a hunk.

“**Chewin’ tobacco, huh?**” shot out Phineas. “You just got a nicotine heart, that’s all—uh—” An idea in the Pinkham cranium rolled over in bed and yawned. “**Gimmie that!**” He snatched the plug from Herr Krueller’s hand and sniffed at it suspiciously. “**Oh, boys,**” the Boonetown trickster howled.

“**What a sucker! Leutnant,** this is loaded with cordite, this Heinie candy bar. Why—haw-w-w-w-l!”

**“Was ist?”** gasped the Kraut in bewilderment.

**“Cordite,**” explained Phineas in his questionable German-English jargon. “**If you chew enough of that stuff your pump can do more tricks than Hundini. Oh, boys! Are you dumb. I bet they been feedin’ to you for a long time. Haw-w-w-w-l!”

**“Bummers!”** erupted Herr Krueller when the idea penetrated. **“Ach, now I see. Der Doktor he says—der poomp idt gifts out soon und—ach Himmell! Zo, I get idt efen. Ram der Spahd, hein? Diniv hero? Ja, I show der Schmatzig buch.”**

“**That’s the kind of pals the Germans are,**” Phineas went on. **“Stealin’ my trick stuff, huh? **Now, Herman, there is a way to get even. Look—after the war—comprenny—I look you oop! I get you der job in Boonetown by der butcher**
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54] FLYING ACES   APRIL, 1936

battle wagon. He used dried branches, leaves, old boards from a rotten fence
and a big piece of canvas which he had
lifted from Garrity's layout. The Boontown
Houdini then hopped on the un-
leashed bicycle and pedalled toward
Metzerwey which was about twelve
miles away. Halfway there he rested
in the shade, just to be sure he was
in the right road. He even risked lighting a cigarette
and was puffing away when a figure loomed
out of the mink behind him and hailed
him.

"Greetings, weary traveler," intoned
the voice.

Phineas turned. In front of him stood
a man in a cocked hat and a long cloak.
A sword dangled at his heels. In
the cocked hat was a big plume. The Yank
A.W.O.L. wondered if he had fallen
asleep, and pinned himself to be sure.
"Uh—how swar," he grumbled.
"How are you?"
"I needs must have your fiery steed," the
stranger replied. "I am Marshal Ney
and must get to Napoleon right
away. To warn the Emperor."

"That's a madcap horse—" stuttered
Phineas. "Not a horse.

"Don't bandy words with me, knave!" reaching for his rusty sword.
"I needs must have a mount. Mine I had
to leave. I have ridden far—from the
court of Marie Therese.

Something clicked then in the Pink-
ham gray matter. One of the inmates
was also A.W.O.L. "Crazee house—bug-
house!" The man seemed unable to
get his sword loose. Phineas jumped
up quick and swung hard. Marshal Ney
pancaked and Lieutenant Phineas
skidded to a stop with a screech. He
dragged the human cuckoo deeper into the
ticktack, pulled out his flashlight and
played it on his face. Marshal Ney stirred so
Phineas administered the anesthetic
again. From his little bag he produced
a makeup kit and a pair of glasses. The light he
play on it, he began an experiment in
histrionics. In ten minutes he had
a large, bulbous nose based by a mustard
and crowned by bushy eyebrows. His
freckles had vanished behind an applica-
tion of color paste. With his facial
appearances changed to his satisfaction,
Phineas turned to the removal of
Marshall Ney's garb which he then
downed.

Leaving the nocturnal traveler securely
leyed, Herr Pinkham got on his bicycle
and pedalled toward Metzerwey. In
half an hour he had located the
gloomy, vine-covered edifice hemmed in
by a fence. At the gate a man stopped
him with hidden ammunition.

"So—you came back, Marshal? How
is Napoleon?"

"Yes, he's indeed," Phineas nasaled in
imitation of his late victim. "Josephine
would not let him in. I craved
admission—knave!"

"Ja wohl," the keeper grinned and
Marshall Ney alias Phineas Pinkham
strode through and across a big yard.
Two uniformed men in the same.
Phineas cloaked the lower part of his
face as light struck him full.

"Ho! ho! Marshal Ney comes back
vance more. Mein Herr, your room is
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buzzed. Boche pilots hopped out of warm beds and grabbed flying gear. Das Pingham! And on the prowl again. On the drome of the Ninth, Major Garritty wiggled into his pants and almost fell downstairs. Two pilots half dressed were running toward the shed.

Bump Gillis yelled at Captain Howell, "Something's blown up somewhere. Do you think it could be—Phineas? He went out to—say, that could only be the hell-juice! Nothin' else could make that noise. Why I was lifted right out of bed and out through the door. You think?"

"I don't dare to," Garritty choked and sat down in the middle of the floor with a splinter in his bare foot.

Meanwhile Phineas had reached his Spad. He did not bother to remove all of his camouflage. After what seemed like ten years he got the Hisso turning over. When he was finally up in the scraposphere, the skies were already humming with Benz and Mercedes power plants. There wasn't a chance for a brave as small as humming bird to get through to the lines. Lieutenant Pinkham went into a huddle with himself. All around him flashed tongues of fire—Heinie exhausts.

"Well, I'll enjoy skiing maybe for a couple of months," the irrepressible Iowan chirped cheerfully and pointed the Spad's prop boss in the general direction of the Alps.

Three hours later when Major Garritty's phone buzzed, he grabbed it and bellowed into the transmitter, "Well, what is it now?"

"Why hello, Napoleon," came a familiar voice. "This is Marshal Ney—or—haw—Pinkham talkin'. It ain't safe to go to Moscow until the thaw. Huh? Oh —I forgot—I'm not quite recovered. I wish you'd send me a coach—or—auto—to Belfort. I had quite a trip as only four circuses got in my way. Haw-w-w! Tell the brass hats that it was a bug-house all right. Tell Josephine—or, Bump Gillis—to see that my hat is made ready for my arrival. Adoo, Emperor, ain't I got to take wooden sous. Haw-w-w-w!"

Major Rufus Garritty cut off the familiar bray by slamming down the receiver. He gaped at the cordon of pilots who were waiting with bated breath.

"I'm nuts," sighed the Old Man, wiping his brow.

"Who? Phineas?" from Bump Gillis.

"Who else?" contributed by Howell.

"It's just me again. I'm all right now, sir. Haw-w-w-w, bet you thought I was nuts, huh? Well the super-nitroplus bullets are no more. Tell Pershin'. Wire me railroad fare at once—please. Say, Major, how's your liver?"

Garritty crashed the instrument down, ripped his pipe from between his teeth and threw it across the room.

"I didn't get the hell-juice factory—where they made those bullets, then?" moaned Howell. Oh-h-h-h!"

The Old Man roared, "Sure he did! But what's so good about that? The crackpot didn't get himself killed, did he?" He stamped away muttering, "I never have any luck—h—!"
Gripping Exploits of the Zeppelin
Raiders
(Continued from page 9)

While this is all taking place, the L-40 has been shot down in flames over the lines, while the only craft of the group to be commanded by a really trained officer has finally reached Germany after nerve-wracking experiences. It had been necessary to send this ship up to over 25,000 feet to keep it above the range of the snarling guns seeking to destroy it. The crew, one of the best in the expedition, had tossed aside (as far as they were) forced to throw everything possible overboard — tooth brushes, razors, personal belongings, equipment, uniform coats, and last of all the fur lined flying jackets that were keeping them from freezing. At last they reach home, but they have painfully frozen toes, fingers, and ears to show for their work of the night.

It is now noon of the day following the raid and all the craft of the bomb- ing fleet have been accounted for with the possible exception of the L-39. We all ask, ultimately became of it? Well, during all this time it is being blown by the unfriendly winds past Paris and on into the Alps. Commander Schwonder and the crew of the L-50 have been in the air for more than twenty-four hours now. They have survived the nerve-scrabbering experience of the bombing raid and the resulting hell of anti-aircraft fire, but they realize that their only hope of final survival is to attempt to dodge into Switzerland. Of course, it will be a difficult undertaking — but that is much better than capture and prison. Above all, they will be able to keep their ship out of the hands of the Allies.

However, such is not to be. In spite of everything they can do, the Zeppelin now begins to gain altitude at an alarming rate of speed. Higher and higher goes the ship until at last the men are breathing oxygen from the emergency tanks. Still higher sweeps the craft into the freezing reaches of the upper air. Feet and hands become frozen and it is becoming harder to manage the speed- ing dirigible. Finally the oxygen supply is exhausted and one by one the men tear at their throats, then after agonizing minutes slip senseless to the floor of the gondolas. First, all of the mechanics lose consciousness and the motors roar on unattended, for the officers are too weak to climb up from the control car to the cat-walk to find their way through the belly of the hull of the ladders leading down into the motor gondolas. The two or three officers who are still conscious are lying on the floor of the car, trying to save their strength so that they can steer the huge craft. Then these men finally give way, too, and slump into unconsciousness.

The L-50 flies on and on until at last the mountains rear their forbidding peaks. As the crewless dirigible rushes the helpless raider — and dead ahead looms a huge mass of rock and snow. The ship does not hesitate. There is a crash — followed by the ripping and tearing of fabric, the groan of twisted metal. The L-50 staggerers. The huge hull, now freed of the weight of the control car and a motor which have been torn from its impact, leaps high into the air and with long streamers of torn fabric flapping behind, it "free balloons" away to the south. When the half dead men who have been thrown to the mountainside finally come to their senses they find that four of the number have been borne away with the hull.

WHAT about the fear of fire while flying the raiders, you query, Now strange as it sounds, and in spite of what has been written by the fiction writers concerning the subject, there was not a great fear concerning fires aboard the craft. You see, in the first place the crews of the Zeppelins were chosen for their courage and their ability to think in times of crises, and being good soldiers they took orders without question. They knew that hydrogen is only explosive when mixed with air and when touched off by a spark, hence their only worry was the incendiary shells. As a safety measure, however, the crews wore no buttons on their clothes and their boots were nailed with felt, so there was no danger of sparks being created by touching metal or friction. Authentic records show that Zeppelins sometimes came home with as many as 300 shell holes in them. No, the fear of fire was not nearly as hard on the nerves as was the fact that one served as a target for practically every gun that could be pointed skyward.

Take, for instance, the case of the L-10. One night late in the year 1915, this Zeppelin, in company with a sister raider, set out from her base in Ger- many to bomb Paris. It was thought by the High Command that if the war could be carried right into the French capital it would soon be over. In other words, lick the enemy in his own back yard and he won't bother you for longer.

On and on through the night fly the two craft. Then, just before they reach their objective, they are forced to pass through a ten-mile barrage which the French throw up in vain attempt to save their beloved city. Nevertheless, the ships attain Paris and the commanders nod with satisfaction as each bomb drops from the craft. Back and forth fly the raiders. Finally the last bomb is released. And then, more than a mile and a half high, safe from all gun fire, the ships cruise slowly while the officers survey the damage they have done.

Finally, they turn back toward their base in Germany. By now, the whole country-side is aroused, and by the number of gun flashes which they spot in the gloom beneath them, the crew has reason to believe that every Allied gun is aimed at them alone. Everything goes well for a while — then, over Nogen, things begin to happen. The gun crews there are determined that the raiders shall pay heavily for their night's work.

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One gun gets the exact range of the L-10 and two whole salvos strike her squarely in the mid-section. Luckily the shells are not of the incendiary kind and they pass completely through the Zeppelin. The riggers quickly inspect each one of the lorries and find that they can. They report that the ship is full of holes and that some of the cells are leaking badly—but there is no fire.

The stricken ship begins to lose altitude, and tools, loose equipment, clothes and machine guns are thrown over the side. The sky is now gray, and the air is very weakly winded in many places and there is danger of the craft twisting in two. But luck is with the L-10 tonight. Just over the line, she is met by a large escort of German planes which hover about her to protect her. The French attempt to join the French pursuits to finish her. The weakened frame girders now begin to give way and there is an immediate danger that they will buckle. Carefully the commander brings her closer to the ground and preparations are made for an emergency landing. The pilot officer notes their position. There is a hurried conference with the commander—yes, they are far enough within their own lines to be safe from the enemy. Then just as the great envelope begins to sag a landing is effected. The men are a bit shaken up, but not a man is injured.

As the men climb down from the gondolas and car they congratulate each other and, as for the commander—well, there will be the personal thanks of the Emperor himself. For his craft is wrecked by enemy gunfire, but he has set her down in his own territory and she can be easily and safely salvaged.

Now, you ask, What was the range of these craft? Well, that is easily answered. During the early days of the great conflict, the range was somewhat limited and every commander took a great risk when he set forth upon a raid. During the later days of the war, the range increased and finally, as a result it was decided by the High Command to send a Zeppelin to the relief of the German troops stationed in German East Africa. For long, weary months those brave troops had been battling against the jangle, in addition to the British forces, in order that the flag of the Imperial Empire should continue to fly over that distant colony. There is an end to human endurance, though, and unless some relief came very soon they would have to give up. For this very reason, orders were forwarded to Jamboli, Bulgaria, where her commander was instructed to prepare her for the round trip flight to German East Africa.

Now, the L-59 had been constructed in the short space of two weeks, and although she was untried as far as actual aerial operations and tests were concerned, her commander and crew had every confidence in her ability to carry them successfully through their mission. So when Jamboli had loaded with, among other things, 31,600 pounds of ammunition, rifles, jungle weapons, radio parts, assorted military equipment, three tons of medicine, 25 tons of gasoline and oil, and over 15 tons of food and spare parts for the ship's motors. Finally all preparations were made, and on the 16th of November, 1917, with the prayers and best wishes of the people and with the Emperor's "Godspeed" they cast off and slowly gained altitude as a course was laid south west by west. Blowing across a continuous wind, they continued the relief craft as she sped high over the Mediterranean Sea, and as the white rollers broke on the beach of the coast of Egypt far below, the course was changed and the L-59 followed the valley of the Nile.

But now the river became rough and the craft would alternately lose altitude and regain it with a rush. Then the ship ran into a series of severe electrical storms just before she left the course of the Nile. But she had been built to withstand the harshest of the weather and she could be anything like a soldier. Now, the ship was over the Sudan and before long she would sight her objective.

Then came the blow! A wireless contact is made with the German forces—and it is found that the troops, unable to hold out any longer, are surrendering. The territory is in the hands of the enemy and in all Africa there is no friendly haven where the L-59 can land!

There is but one thing to do—return. So the craft puts about and noses her way back toward Bulgaria. Thus it was that the L-59 returned home, having covered about 1,660 miles in some 95 hours, and when the craft nosed back to earth at Jamboli there was enough fuel left in her tanks for another 64 hours of actual flying. That trip was an epic among the various exploits of the World War.
FLYING ACES

rocket's and incendiary shells, while shrieking shrapnel informs the raiders that the guns are quickly finding the range. Now and then the huge craft rocks as a shell bursts close by. Yes, it is hard on the nerves, but this is an experienced crew, and having a job to do they set about doing it to the very best of their ability. So disregard of the opposition the craft is headed for the factory district leaving a trail of explosions and spreading fires in its wake. Over the factories, the ship allows for an instant and as the flames appear, buildings below, indicating several well placed hits, Commander Boeker presents his bombing officer with his congratulations, then orders the ship put about and set on a course for home.

Suddenly, the L-33 leaps and rocks from nose to tail—the British gunners are really angry now. Evidently they mean to show the raiders that they can not twist the British lion's tail and get away scot-free, for they throw a curtain of fire at the fleeing Zeppelin. As the L-33 comes back to an even keel, Commander Boeker laying a direct hit, the riggers inspect the interior of the huge hull. Back they come with their reports—no, it was not a direct hit, instead several shrapnel shells have burst almost along side of the craft and there are more than fifty holes in the rear gas cells. The commander orders the engines pushed to the greatest possible speed. There is not a minute to lose—he must make neutral Holland before the loss of gas forces him to land. Now they are over the Channel, and after the events of tomorrow are beginning to sink lower and lower. Lower still sinks the wounded L-33. Everything possible is cast over the side, but to no avail—the ship is sinking more rapidly now, to the men it seems that the angry waves are rushing up to engulf them.

Commander Boeker sees that escape is impossible. He has tried like a soldier to save his country's ship and now that it is impossible he thinks of his men and orders the ship turned about and headed for the English coast. At times it seems that the waves are close enough to break into the very windows of the control car, but finally, like the wounded, gallant lady she is, the L-33 reaches the coast. There is still a little altitude left and the stricken craft is navigating inland and a safe landing is effected in a large field. Quickly the men spread about, attempting to set it on fire. But for some reason the ship won't burn and before anything of value can be destroyed the craft is surrounded and every man made prisoner.

Later, when the British decided to build large rigid airships they copied the construction of the L-33, and their post-war rigid dirigibles, the R-35, R-34, R-37, and R-38 were built almost wholly after the plans of the L-33.

WHAT of the value of the Zeppelin raids? Well, in actual damage to military centers and supplies and in the loss of lives the Zeppelins did not run up a very large score; but they did handicap and delay the manufacture and shipment of war materials and supplies, due to the fact that lights were turned off and traffic stopped over a very large area during the entire period of a raid. In addition, they forced England to keep thousands of soldiers and guns at home for defense—men and guns that might otherwise have helped turned the tide of the battle in France. If for no other reasons, the Zeppelins were worth their cost and operation to Germany.

However, as has already been indicated, raiding was not the sole scope of activity for the airships, for the patrol and mine-sweeping activities of the craft were of great value to the German Navy. For long periods of time, patrol was the only activity of the craft and raids were made more or less as a means of shattering the enemy morale. The real worth of the Zeppelin as a patrol craft is best gleaned from the diaries and logs of British submarine commanders. They had a constant dread of being bombed from the clouds without any chance to fight back. The real truth of this is borne out by the case of the British submarine E-18 which was sighted and bombed by a cruising Zeppelin while lying more than 70 feet under water. Here is the story of the Zeppelin L-31 which, having sighted four enemy submarines below, cruised above the protective screening of the clouds until she was directly over them, then descended and in spite of the furious fire from their deck guns, bombs, and machine guns, she blasted and sank them.

Yes, the Zeppelins were an important factor in the war. Consider that no less than 88 were made during the War and that in one year 16 of the huge craft made over 400 patrol flights and at least 50 raids on England—and only 4 of the ships were lost. Quite a splendid record, isn't it? And it is very possible that the men who flew those ships, or any of the war-time Zeppelins, did not at any time find life too dull for them.

Talons of the American Eagle

(Continued from page 16)

later model, the A-12, making up the bulk of this type of equipment. Recently, they believe, the Consolidated P-25 has been selected as the principal equipment. These machines generally are fast two-seaters carrying plenty of machine guns and bombs. Their work is to fly low over enemy territory and attack ground positions, moving troops, redouts, dumps, and rail-heads. They represent the first of a regiment, while the work is dangerous in that time, many airmen today seem to prefer this work. There seems to be no trouble in getting candidates for these cockpits.

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436 McDonald Ave., Dept. B, Brooklyn, N.Y.
The ships are probably armored in places for the protection of the crew, but actually very little is known about them outside of the squadrons that use them. The Consolidated P-30 is said to do 250 m.p.h. top, and the Curtiss ships are known to do well over 200 m.p.h.

Bombering work, its in many ways— and there are many things going on the type target involved—is carried out under the heading of Bombardment. A somewhat cruddy word, also a carry-over from the old war associations.

Here, America appears to be going in for the Flying Fortress idea in a big way. Years ago, writers in this journal indicated that the day of the single seater fighter was fast reaching its close, and since we have seen what the new Boeing Bomber can do in the way of speed and armament, there seems to be little hope of any single seater getting anywhere near them—safely. The new Boeing, which has been ordered in large numbers in spite of the crash the first model suffered (and which, by the way, was in no way caused by the structure of the ship itself) is probably the most efficient fighting craft ever built here.

But even so, the Martin 139 and the Boeing YIB-9A are about tops in the bomber line. They are fast, clean, well, and carry good loads for amazing distances. The Curtiss Condor, also a bomber of high reputation, can be turned into an aeroplane of low-speed or troop-ship with very little trouble. There are also still a number of Keystone in service, which no doubt will be replaced within a short time, although the B-4A is still a fine craft. (Also see feature, "Through the Years With Our Bombers" which will be found elsewhere in this issue.)

American Observation is still something of an enigma, for the designers are concerned, and nothing particularly startling has come off the drafting boards, mainly because no one seems to know just what American observation objectives are. The new Curtiss Raven, which does nearly 200 top, to be the best of the lot, but the Douglas O-25 and O-38 seem to bear the brunt of the work, so far. Speed is not a great factor in this work, of course, since the requirements demand steady platforms for camera work and spotting and good military equipment to carry out the highly technical work of military observations. If the pursuits and two-seat attack ships do their job, the slower observation ships can work with better efficiency.

In addition to all these groups we have also seen how transport outfits, ambulance flights, special photographic squadrons, and troop-carrying organizations. Then there are also the Army kite-balconoon sections and other special observation and mapping sections.

THe United States Naval Aviation is a part of the U.S. Navy organization and is under the direction of the Secretary of the Navy. Many experts abroad have stated that the U.S. Naval Aviation body is the mightiest of the fleet Arm group in any world power. Certainly no Naval Aviation group anywhere is quite up to the skill and ability of the U.S. Navy pilots who work from the U.S. Navy aircraft carriers.

Unlike units of the Army, Naval aircraft squadrons are usually divided into two divisions of nine machines each. (In the Army, the Squadron is generally a three-flight affair with six machines in each flight.) In the Fleet itself Naval aircraft are allotted to battleships and scout cruisers. Three obsolete aircraft-craft of each battlesh-ship and two or four scouting craft are to be found on the scout cruisers.

The four main aircraft carriers (Lexington, Saratoga, Ranger, and Langley) carry approximately 365 fighting machines when up to full aircraft strength. The newly launched Yorktown and Wasp can then double this number. The typical aircraft-craft pilot is probably one of the most skilled in the profession and at the present time the U.S. Navy seems to have a corner on the market, for more actual work is carried out from American carrier decks than from the carriers of any other power.

Naval Air Stations are located at Pensacola, San Diego, Norfolk, Lakehurst, N. J., Sunnyvale, Calif., and Anacostia, D. C. The Fleet Air Bases are to be found at Pearl Harbor, Hawaii, and probably about 70 other ports. In addition, there are several Naval Reserve Air Bases, such as: Floyd Bennett Field, N. Y.; Great Lakes, Ill.; Squamound, Mass.; Long Beach, Calif.; St. Louis, Mo.; Oakland, Calif.; Minne...
apolis, Minn.; and Detroit, Mich.

Disposition of the various squadrons may be found by checking the Aircraft Battle Force and the Cruiser Scouting Force. For instance, the U.S.S. Saratoga is listed as accommodating Bombing Squadron Two, Fighting Squadron Six, Scouting Squadron Two, and Torpedo Squadron Two. The Texas has, or did have, Observation Squadron One; and the Arizona has, or did have, Observation Squadron Two. It is evident from this, of course, that neither of these battleships can carry eighteen planes of a full squadron, and what becomes of the surplus is a matter of question. They're probably on base duty at one of the land air stations.

The U.S.S. Wright, an aircraft tender, accommodates Patrol Squadron Seven, Patrol Squadron Nine, Utility Squadron One, and Torpedo Squadron Two. According to records, these must be skeleton squadrons, since the Wright must certainly cannot care for four squadrons of eighteen planes apiece.

It is facts and figures of this type that make the true accounting of air strength practically impossible. In one breath they tell us that a battleship carries three observation machines and in the next tell us that No. Such-and-Such squadron is aboard the U.S.S. Concord. If there are eighteen machines in a Naval squadron, what happens to the other six?

The patrol squadrons, generally using large flying boats, operate from the Naval bases, and there are two Naval aviation units of unknown strength with the Asiatic Fleet.

Naval planes often demand special accessories and equipment. Operations from the deck of an old warship are planned so that the carrier is out of the business. The catapults of the battleships require certain structural changes in landing gear and shock points. For instance, the Boeing F4B4 used by Navy fighters is practically the same as the Boeing FY. The Navy has planned the installation of special undercarriage, landing hook device, and certain Naval equipment such as flotation gear.

Machines operating off catapults, as we have just said, require strengthening in certain parts to take up the shock of the high-speed cradle from which they are launched. Certain parts, then, are heavier and the extra naval equipment load cuts down speed and other performance specifications, but safety and efficiency come first.

In looking over the four classifications of Naval Aviation work we find the shake of the high-speed cradle carrying off the single-seat fighters. The Boeing F4B4s and the Curtiss Goehawk appear to be the main props in these outfits, but we also understand that the new Grumman fighter is now service equipped. We have been getting along fairly well with our fighting units. Other reports have it that the Northrop single-seat fighter will soon be adopted.

We do not know the official speed of the last two, but the Boeing and the Curtiss do not reach 200 m.p.h. because of the radio, navigation, and night-flying equipment they carry. Nevertheless these machines all stack up well in comparison with any abroad, with the possible exception of the British Hawker Nimrod. While many of the new machines promised are monoplanes, we note with interest that one-wingers are everywhere, and are in the air in both the Army and Navy services. In the Navy, biplanes are preferred because they have narrower span and are more adaptable for folding-wing arrangements for storage below decks.

As for the Wright, the British, the value of the two-seat fighter and there is a faint possibility that eventually, two-seat fighters, carrying a specially trained crew (an oswj who can also fly the ship) will completely replace the single-seater. The two-seater is so small and compact and the cockpits so arranged that in the hands of two properly trained men it becomes a far more formidable weapon than the single-seater that probably boasts an added six miles an hour.

The two-seaters in use include the Grumman SF-1, the Curtiss SOC-1, the Vought Corsair, and the B/J OJ-2. There are several other models under consideration, of course, many of which have been shown in this magazine. How soon any of them will go into actual service is a question. We are only trying to show just what is available at present.

Torpedo-carrying, as done by the U.S. Navy, had taken on a particular trend, much like Attack aviation as practiced by the Army Air Corps. The idea of dive bomb is not new. Camel pilots did it in 1918, but it took the U.S. Navy to put it over and demand ships that would stand the strain of a 300 m.p.h. dive with a heavy projectile. Today, dive-bombing and dive-bombers have taken a place among the many European powers. Great Britain has actually had her Royal Air Force hat off to the U.S. Navy and has accepted the idea completely. Unusually well, too, judging from photographs recently received from the other side.

U.S. Navy diving generally means dive-bombing for the Martin 125's. Moreover, the new Martin BM2 ships are out-and-out dive bombers. The low angle method of attack prescribed for the real torpedo-carrier may be more effective in accuracy, but the dive-bomber, aiming for the flat of the deck, takes the line that such a speed attack is more likely to score a hit—someplace—and still get away. The Great Lakes TG-2 is a torpedo-carrier of high efficiency. And the men who man these birds are among the Navy's world's greatest. A torpedo-bomber pilot must be a real Navy man and know where to plant his load. He must be a great navigator to be able to get back to his floating base which may be hundreds of miles away from where he launched his ship. He must be resourceful, highly competent, and, above all, skilled under bitter fire.

The Fleet Patrol squadrons are men of all work. They do offensive patrols, long range reconnaissance, Navy cooperation work, coastal attack, and a
thousand other jobs requiring highly skilled pilotage and observation. American patrol boats have registered amazing scores on long-distance flights and are considered among the finest in navigation efficiency. The machines they fly are splendid in design and are loaded with the finest navigational equipment. The Consolidated P2Y's and the Keystone PK-1's are smart flying boats capable of going anywhere at any time and under practically any conditions. The New Grumman JP-1, the amphibian biplane used in the wide range of equipment used by the Patrol outfits and today they are equipped to carry out practically any duty asked. Every man aboard is specially trained in radio, gunnery, bombing, observation, spotting, and photography. Discipline aboard is as keen as that on any battleship and as tightly cooperative. Just what the shouters and belitters would add to improve this service is not known or ever presented. They can always find some item of a few miles an hour in speed or a few feet of service ceiling to grow about, but none of them could actually sit down and draw up plans for a ship that would carry the necessary military load, offer the required range of action, together with the undeniable ease in active service maintenance. And most certainly none of them has a recipe for an improvement in personnel.

There's very little else to be said.

Of course, there is still the Marine Flying Corps to consider. This glorious arm of the service has about eight squadrons today and their headquarters is U.S.M.C. Headquarters, Washington, D. C. Their air base is Fleet Marine Force at Quantico where four squadrons are headquartered. Out at San Diego the second Marine Aircraft base is found with four more squadrons. It is also understood that there are one or two fighter squadrons equipped with Boeing F4B-4's somewhere. But you know the Marines. They never sit still long.

And so, fans, that's the story of our U.S. Air Services. And here's an idea: Save this article—especially the boxed list of “American Air Service Craft” —and get the Curtiss photo book that gives you pictures, drawings, and new information on American fighting planes, just add the new “dope” to this matter and you'll always be up-to-date on our air forces.

Through the Years With Our Bombers

(Continued from page 23)

ried only 390 pounds of bombs. The wings were swept back. The first of the so-called three purpose planes was made by the newly formed Douglas Company. The ship was the Douglas DT-2, which used only one 400 h.p. Liberty single-engine biplane, it had a top speed of 115 m.p.h. and carried 1,700 pounds of torpedos or bombs. This ship was replaced by the Douglas DT-4. This job was similar to the DT-2 but was slightly slower, having a speed of 107 m.p.h. The new ship was a 625 h.p. Wright “F-2” motor. In 1924 the Douglas-made ships were replaced by the Curtiss CS-1. This plane was a convertible land or seaplane powered by a 500 h.p. Wright T-2 motor. Then in 1926 and 1927 the Martin Company brought out some new ships which reigned supreme for about two years. The earliest of these was the T3M-1 which, with slight modification, became the T3M-3. The T3M-1 used a 675 h.p. Wright. It carried 1,425 pounds of bombs at a speed of 104 m.p.h. and had a service ceiling of 6,270 feet and a range of 525 miles. This ship, with a Packard motor, was known as the T3M-2. One hundred T3M-1 and T3M-2 types were bought by the Navy. In 1928 the T4M-1 was produced especially for carrier use. It used a 875 h.p. Pratt & Whitney engine. The Navy bought 102 of these ships, but they were subsequently replaced by newly designed dive-bombers.

These dive-bombers were the result of experimentation carried on by the Navy test pilots. The earliest of these craft was made by the Curtiss Company—the ship known as F8C-1. With several modifications, this eventually was known as the F8C-8. These planes used Wright and Pratt & Whitney motors. The speeds attained ranged from 155 m.p.h. to 170 m.p.h. One 250 pound bomb was carried under the fuselage between the split-type landing gear.

The Curtiss dive-bomber, or “Hell-diver,” was followed by the last of the huge Navy bombers. This was the Douglas T2D-1, a convertible land or seaplane powered by two 525 h.p. Wright engines. Thirty of these ships were bought by the Navy. A load of 1,620 pounds was carried at a speed of 152 m.p.h. The service ceiling was 12,520 feet.

In 1930 this ship, in turn, gave way to the Martin X1TM-1, which after trials was known as the EM-1 and BM-2. The ship uses an air-cooled motor reported to be of Wright design. It is a pretty ship, very clean in design. With a crew of two and 1,000 pound bomb its speed is 150 m.p.h.

The latest dive-bomber is the Great Lakes XB-1. This ship is still in the experimental stages, but in all probability will be accepted. It uses a double-row, air-cooled Pratt & Whitney “Wasp.” The speed is reported to be about 210 m.p.h. with one 1,000 lb. bomb.

A new type of dive-bomber is now being put into service. The first of these, the Boeing XF6B-1, was originally designed as a fighter but was not accepted in that classification. Very clean in design, this new type ship is to act as a cooperative dive-bomber, i.e., a craft for carrying a small load of bombs and to act as a guard for the heavier regular dive-bombers. The Boeing carries between 100 and 150 pounds of bombs at about 210 m.p.h. The power is supplied
Happy Landings
(Continued from page 29)
operations, but the risk of handling squadrons of high-speed planes under such limited ground area might prove very dangerous. A ship crashed on landing or taking off is in no more fortunate category than one shot down in action. The pilot may be more fortunate, but he still lacks a mount.

Flying conditions in Ethiopia are somewhat mystifying to the average European—or American. The small rains last from February through to mid-July. September, the dry spell actually start in late July and last up until September 24th-28th. During these months landing grounds are practically useless, particularly in July, August and September. A few emergency fields useful only for landings may be found in the South, where these rains do not seem to affect the ground to this extent.

One flying into Ethiopia (say, from Eretria in the north) will discover to his woes that the first twenty miles in land will be covered with clouds. The ceiling averages 2,000 feet and the cloud bank usually has a thickness of 4,000 feet. Thus to clear the mountains of the Tigre or the Amhara country, one must climb to at least 6,000 feet to be certain of clear weather. If you climb out you face the prospect of hitting a 7,000 foot jebel or wiping your wings off in a ravine that may be anything up to 4,000 feet in depth.

Few in this country who read of the

On the Light Plane Tarmac
(Continued from page 29)
normal flying conditions.

No one, of course, would think of attempting to fly this type of plane in a high gale, but if light planes are handled under proper conditions there should be no trouble. One thing is certain — where real light planes suffer crack-ups the result is nothing like the smash experienced if you have a 500 lb. engine in your nose and racing type wings on either side of you.

What few crack-ups are experienced by light plane owners are usually those resulting from bad landings, or forced landings in rough territory. Usually it's a twin-row "Wasp" and has a speed of about 230 m.p.h. It also carries about 100 or 150 lbs. of bombs.

This resume of bomber development in the U.S. Army and Navy services indicates that our military aeronautical experts are on their toes. We got a belated start—but through their fine work we have made up for lost time and now rank with the foremost air powers in the bombing classification.

Personally, I do not believe any of these Drones or Fleas will "go over" the Allied aircraft, but still want something that people will not laugh at. We're trying to make it. Machines like the new Arup Flying Wing with the 70 h.p. Le Blond engine, the American gyro "Crusader" carrying the 125 h.p. Menasco, or the much discussed Hammond-Y, the pusher job that has been considered by Gene Vidal as the best prospect for the flyer-of-the-air—all seem to stand the best chance of becoming popular with the first wave of light plane enthusiasts. The Taylor Oil engine seems to be a very nice tip, but beyond that the damage is negligible. A close check-up of club accidents over a period of a year indicates that those members flying light planes in the low horsepower class suffered less accidents per mile flown than those who handled ships in the 100 h.p. class and over. People have been killed in light planes, but the percentage of chance in an accident with a light-powered ship is much more favorable due to the slower landing speeds enjoyed.

The British Drone, for instance, designed by Mr. Kronfeld lands at something like 26 m.p.h. Kronfeld demonstrates his machine to prospective purchasers with a series of stalls with the motor shut off. The airplane stalls perfectly and following dive in such a manner that he comes out of the last in such a position that the ship practically lands itself. This is done, of course, to show that the machine is practically foolproof—for if allowed to land itself under such conditions, the worst that could happen would be a dive from a height of about eight feet.
ITALIAN bombing raid on Adowa realize that these heavily loaded machines had to take off from Massaua with their altimeters set at sea-level. Fifty miles away lay Asmara on a plateau. But that fifty miles which could be covered in twenty-five or thirty minutes under ordinary conditions required an 8,000 foot climb before they dare start out from their own base. When they got through, they found the Asmara plateau ahead of them marked by black jelbes sticking up like monstrous bayonets. After that, all they had to do was to fly on to Adowa, risk a glide down through the clouds, and find their targets.

And Addis Ababa is 450 miles away! The route includes the Tigre region marked by high mountains, impassable ravines, and thirsty scrub. Beyond that to the south is the high mountainous country, several high plateaus, and intense tropical heat, Massive peaks, death canyons, and high crested rock walls stand guard over Addis Ababa for the rest of the way—and not a landing field within three hundred miles!

The Italian flyers are brave men, and they are among the most skilled pilots in the world—but this campaign asks them to solve the toughest air problem of them all before beginning to fight.

**Build the Cylindrical Engine**

(Continued from page 46)

When these are dry, cement the push rods in place. The Ignition wire and sparkplugs are next. The plugs can be made of Birch dow or brass eyelets. The wire may be heavy thread or wire. Cement them in and allow to dry.

Now make the propeller shaft (of either aluminum tubing or wood) and cut it to length. When through, cut out the Bristol board baffles and place at the rear of the cylinders.

The last piece to be made is the air scoop which is to be fitted at the bottom-center of the crankcase. Make it of Bristol board, creasing it at three points and cementing it on as shown in front view of engine.

If any more is not completed. For any added information, write the author c/o FLYING ACES, 67 W. 44th St., N.Y.C.

**Build the Caudron Racer**

(Continued from page 30)

washers on the .029 prop shaft, and bend the end of it in the propeller. The spinner is notched to receive the hub and cemented on the prop. For a simple scale prop for display purposes you can cut blades from thin wood and glue them on a spinner.

Paint the fuselage, tailblock, spinner, and landing gear with the color you selected for the wing. As these units are all wood you will find it necessary to give them two or more coats of dope. The discs of the wheels are painted silver and the tires black. A big numeral 6 should be placed on a climb and under the edge of the left wing, while the script, "Avions Caudron" should go on the empennage. Louvers can be either painted on, or cut in, the nose of the ship.

Put in six strands (three loops) of 3/32" brown rubber. An "8 hook" will come in handy when using the winder for longer flights. The machine is now set to be tested and this should be done over tall grass or something similarly soft so you won't smash the job right off the bat!

If it stalls, add a little weight inside the nose; if it dives, lighten the nose and bend up the elevators. After it glides perfectly, wind it quite a few turns and let it fly. The amount of incidence of the left wing may have to be increased due to the torque of the prop and the small wingspan. This can be done by steaming the wing structure and keeping it in the required position for a length of time. Don't be surprised if your model flies extremely fast. It's got to—for it not only weighs quite a bit for its size, but it's also trying to live up to the terrific speed of its prototype! Good luck, and don't break too many speed records!

**Hawker's 1936 Fighter**

(Continued from page 42)

ing gear retractable. In such case, the bottom of the fuselage and wing will have to be partially hollowed out to make room for the wheels and struts. Wire may be used for hinges or even a fine grade of paper would act as such successfully. A piece of copper wire joined to both ends of the tail wheel axle will hold the wheel to the bottom of the fuselage.

Go over all parts of the model with fine sandpaper once more, then brush off all dust, making them ready for painting. Dope or lacquer should be used in painting the model. Several coats will have to be applied before a smooth finish is obtained. The entire model is to be painted silver with trimmings in black. The insignias are to be doped red in the outer circle, blue in the inner circle, and white between the two. Wheels, exhaust pipes, etc., are to be black. Do not apply a second coat before the first has dried. It is helpful to sandpaper the parts once more after the first coat has dried.

**Assembly**

When the dope has dried, begin the assembly. Lay the fuselage on a flat surface in an upright position. Lay the
Flying Aces Club News
(Continued from page 33)
right in the middle of the correspondence, he says: "Well fellows, it’s time to close up shop. We have our club news all lined up. And so let’s quit for the day. But before leaving the office what do you say to a view of the city from the balcony here?" We climb out of Doug’s window to the balcony, and what a sight! In front of us is the Empire State Building, its lights seeming to nestle among the clouds. To our left is the spire of the Chrysler Building,

Hervat’s 39-Minute Glider
(Continued from page 44)
as was done before on the wing. Cut a shallow "V" slot along the top of the fuselage (at the position indicated by the wing setting), in which to cement the wing when it has been assembled. Also make a small concave cut at the rear of the stick in which to set the stabilizer. This fuselage, being heavy, allows you to toss the glider to great heights which, in model parlance, means for long flights.

Cut the rudder and elevator to the shape shown from 1/16" light balsa sheet. Sand each to a streamlined cross section, first using medium rough sandpaper and ending up with very fine paper. Wipe surfaces as before, sand with fine paper, and finish with wax paper.

Assembly

The assembly of the various parts of the glider is a simple operation but a most important one. The different parts must be aligned accurately and at the proper angles if your model is to be successful.

Glue the halves of the wing together and place blocks under each tip to obtain the proper dihedral angles. Before gluing, however, sand off the polish for about half an inch on each side of the edges to be joined. This is done so that the cement will get a firmer grip on the wood.

When the wing is drying, glue the tail section in place in the hollow of the fuselage. Be sure the stabilizer is perpendicular to the wings. If you have trouble trying to fly the model, when this has dried, cement the rudder in place at right angles to the stabilizer. Note that the rudder is turned slightly so that the ship will circle to the left when in flight.

If the wing has dried by this time, cement it into the groove previously cut in the fuselage. Use a thin coat of glue at first and hold the wing in position with pins. Be sure that each half of the wing makes equal angles with the fuselage. When the first coating of cement has dried, apply the filling paste as indicated. Besides streamlining the wing into the fuselage, this paste strengthens the root of the wing and also the wing joint. This finishes up the building of the ship and now you are ready to adjust the model for flight.

Adjusting and Flying

Before test-gliding the model, twist the left wing (looking from the front) and breathe on it at the same time so that it holds a few degrees of wash-in. Now, when the ship is launched, it should fly in a flat glide, slightly banked, to the left. If the model stalls, sand or shave the rear of the fuselage; if the model dives, sand or shave the front of the fuselage. Of course, if the tendency to dive or stall is slight it may be corrected by changing the amount of wash-in the wing or the amount of turn on the rudder. For fine adjustments, modeling clay may also be in

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POWER AND ASSEMBLY

The motor consists of 1/4” flat rubber. Use brown rubber if obtainable, and use a lubricant. Allow at least 3” slack. Use from 6 to 8 strands slack on either type model.

The top of the wing is covered with white tissue, but the bottom is done in red, as this provides better visibility when following the model. Tail surfaces are red and white for the same reason. The wing is sprayed with water. When dry it is given a coat of banana oil. The prop also takes several coats of banana oil with intermediate smoothings with fine sand paper.

Glue the two tail surfaces well, into the slots. Bend a bamboo tail skid of 1/16” square stock and streamline it. Cut it to a point at the end where it is to join the body. Now press the point through the wood and into the vertical piece of 3/16” square near the tail, as shown. Take it out again and this time apply cement and press it in. The wing is attached in the rubber band method. The thing is lined-up correctly.

FLYING Aces Cabin Sportster

(Continued from page 48)