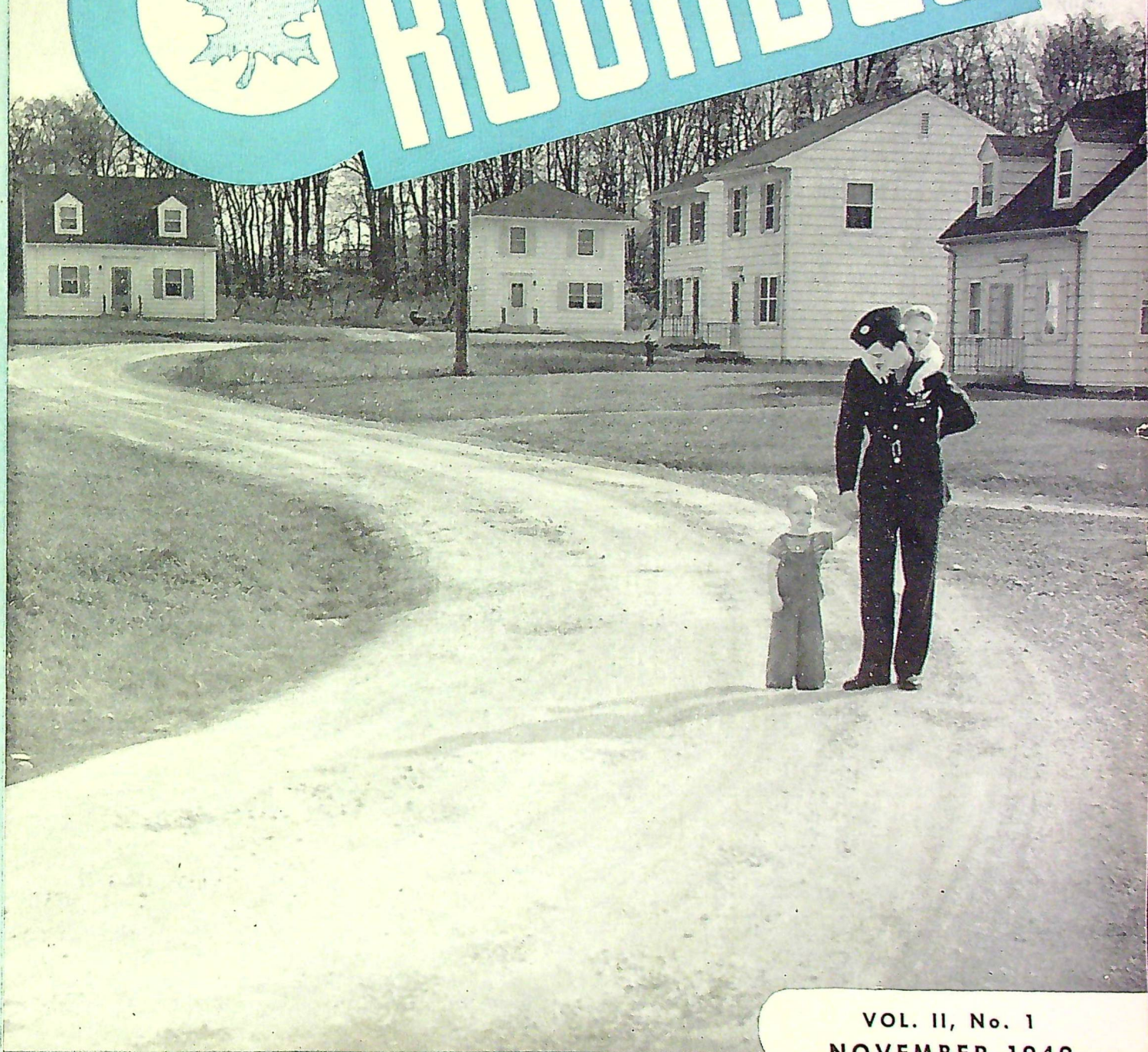


# *The* ROUNDDEL



VOL. II, No. 1  
NOVEMBER 1949

ROYAL CANADIAN AIR FORCE

# The ROUNDDEL

*Issued on the authority of*  
THE CHIEF OF THE AIR STAFF  
Royal Canadian Air Force

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*This Month's Cover*



This month's Cover Photo of Airmen's Married Quarters at R.C.A.F. Station Rockcliffe was taken by LAC R. Boast of No. 1 Photo Establishment. In the foreground are LAC H. Rogers of Rockcliffe, his son Ricky who is looking over his shoulder, and a young neighbour.

# Sgt. Shatterproof Walks the Wards

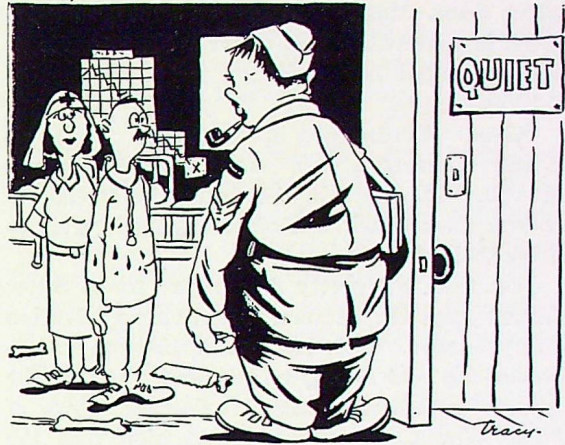
THE LAST LUNCH-TRAY had been taken away. One by one, the hospital radios clicked into silence. Nursing Sister Forceps, who had been flitting from room to room bedding down her patients for the post-prandial snooze, quietly closed the last door behind her and departed to other duties. L.A.C. Capsule, the Medical Assistant, finished tidying up his trays and seated himself for his vigil at the desk in the corridor. The afternoon hush descended upon the officers' ward.

But not upon the Editorial spirit. The Editorial spirit, I regret to say, was in a state of pronounced disharmony with the Cosmos. For the past two hours I had been undergoing the painless but static experience of receiving a blood transfusion, and it was likely to be at least as long again before the hoses would be uncoupled. Even the fact that my right arm was free to fork up the odd poached egg or hold the "Duchess Hotspur" (as it was then doing) failed to console me for my general immobilization. We Editors are a restless lot.

Therefore, when L.A.C. Capsule suddenly gave utterance to an anguished yelp, I laid the Duchess, cover upwards, on my knee and glanced hopefully through the narrow opening in the doorway.

My first thought was that Wing Cdr. Pentode was having another of his spells. Wing Cdr. Pentode, who is one of our smartest electronics men, had recently been admitted with a nasty dose of 'flu. Usually a model patient, he was apt to give trouble whenever his temperature rose above 102°. On such occasions he would leap from his bed with repeated cries of "Up guards and atom!", divest himself of his pyjamas, and creep in elliptical orbits around anyone he happened to meet. It was particularly embarrassing for Nursing Sister Forceps. Not being very well up in physics, she could not appreciate the fact that the Wing Commander was merely labouring under the impression that he was a stray electron in search of a likely-looking nucleus.

The next moment, however, I knew I was wrong; for the sound of familiar footsteps came echoing towards me—footsteps not unlike those of a dinosaur ambling purposefully through the carboniferous age.



Having saluted with his customary dignity, Sgt. Shatterproof tucked his K.R. (Air) securely beneath his arm and proceeded to fill his pipe. This done, he stood for several minutes in silence, looking down at me with an expression of mingled suspicion and disapproval. Finally he said:

"So, sir, it has come to this! The last time I dropped in to see you, you were on leave. This time I find you relaxing in hospital. Meanwhile 'The Roundel' once more wallows at the mercy of the Brass's whims."

"On the contrary," I assured him, "The 'Roundel' is in very capable hands. Grab yourself a chair."

He shook his head and began to pace the floor, stopping to eye me speculatively at the end of each lap, and emitting clouds of dense smoke at regular intervals. Then he halted and pointed his pipe-stem at me.

"What exactly is your trouble?"

I told him. He nodded gravely and advanced to the bedside. He excavated his watch from the depths of a trousers-pocket, brushed the crumbs off it, and felt my pulse. Apparently satisfied, he leaned forward and struck me a heavy blow on the shins with the edge of his K.R. (Air). My cry of pain elicited from him a pleased grunt.

"Have no fear, sir. You are in no immediate danger. Pulse normal. Reflexes excellent." He

frowned at the apparatus of tubes and bottles to which I was attached. "But beware of taking too much of that stuff. You might get a taste for it. Have you read 'Dracula'?"

"Yes."

"Good. Forewarned is forearmed. To be an Editor is bad enough—let us not become a vampire as well. The boys in the field have enough to endure already without officers lying in wait to drink their blood."

Just then the pretty face of my friend Sister Cornet peeped in, demurely framed in its Salvation Army bonnet. Entering, she handed me an ice-cream cup and a bright little smile; and as she left, she somehow managed to deal me a copy of "The War Cry" with such precision that the Duchess' undeniable torso was modestly concealed by the portrait of a Thanksgiving goose.

Sgt. Shatterproof, who had been standing aloof throughout the foregoing exchange, remarked coldly:

"I regret to see you trafficking with guerillas;

sir. Surely the Air Force can stand upon its own wings!"

While I was trying to visualize this unusual feat, the inflexible old warrior resumed his position in the middle of the room.

"Yes," he went on, "I feel that you are reasonably safe in the M.O.'s hands. In fact," he admitted, "I could prescribe no better treatment myself—unless, of course, you would like me to wire for one of my maternal grandmother's secret remedies. The ingredients, which are found mostly in swamps, are more or less unknown to modern medical science. Her Remedy No. 3 might be of some help to you. It is reputed to be infallible in all cases of warts, gout, and cerebral haemorrhage."

He was interrupted by a curious noise from the adjacent room.

"Ug ug glugalug uglimum . . ."

Sgt. Shatterproof listened for a few moments. Then:

"Far be it from me, sir," he said, "to criticize the way in which the S.M.O. sees fit to run his hospital, but I would suggest that someone clear out that drain-plug."

I explained to him that what he heard was not a stopped-up drain-plug. It was Sqdn. Ldr. Overlap, of one of the Photographic Squadrons, brushing up on his Eskimo while recuperating from a tonsilectomy.

Shatterproof looked interested.

"Indeed?" he said. "I wonder what the Squadron Leader's remark meant. I have been thinking of learning the language myself." He lifted an apostolic finger. "The day is not far distant when the Service will need an Eskimo K.R.(Air). Have you thought of that?"

I hadn't, but I knocked on the wall anyway. "WHAT WERE YOU SAYING, OVERLAP?"

He shouted back:

"I WAS JUST INVOKING THE GREAT SKY SPIRIT TO INDUCE A SEAL TO POKE ITS HEAD UP THROUGH THE ICE."

We heard him resume his studies:

"Ug ug glugalug uglimum . . ."

But the scholar in Shatterproof had been aroused.

"What's he saying now?" he whispered.



I knocked again. Sqdn. Ldr. Overlap, it appeared, was now issuing a solemn warning to a walrus-hunter to go easy on the de-icing fluid. "QUITE AN EASY LANGUAGE," he called out, "ONCE YOU'VE LEARNT THE BASIC VOCABULARY."

By this time one or two radios had started up again. I caught sight of Nursing Sister Forceps' trim legs twinkling by outside. The hour of the siesta was evidently over.

Sgt. Shatterproof drew himself up and sighed.

"Well, sir, I must be going. It would be unwise to overstay my leave—much as W.O.I. Gallstone would like me to. I have been having a little trouble lately. My suggested inscription for the Pearly Gates at Trenton met with a rather poor reception from the C.O. As you have doubtless long since realized, my thinking is a bit advanced for the average senior officer."

"What was your inscription?"

"'Despair all ye who enter here.' Possibly you recognize the quotation. It is taken from the works of the famous Irish poet, Dante Moore."

"But surely, Sergeant, it wouldn't be the best thing in the world for recruiting?"

He tapped the ashes from his pipe and refilled it before replying.

"Perhaps we might lose one or two weaklings, sir. But what men we did get would be of outstanding calibre. Desperate men, for whom life holds nothing. Men to whom even the lot of an airman would seem almost a change for the better. Think of the effect on morale."

While I was thinking of it, he started as though smitten by sudden inspiration.

"That good-looking young officer at your desk," he said, abruptly changing the subject, "—are his the capable hands to which you referred a while back?"

"They are. Why?"

"Ah!" His exclamation was pregnant with significance. "Do you happen to be aware of his views on cheesecake, sir?"

"Well, no. But I imagine he has a nice eye for it."

"Would he fight for his cheesecake?" he persisted.

"Good Lord, Shatterproof! How on earth would I know that? And anyway, whom would he fight?"

"The Brass!" said Shatterproof implacably, and fixed me with a compelling eye.

"The Brass?" I was baffled. "Are you suggesting that the new Editor of 'The Roundel' engage in fisticuffs with the Air Members over the female help? Have a care, Shatterproof! This borders on treason. The Brass deserves the best."

Sgt. Shatterproof's features arranged themselves in that forbidding pattern which his intimates recognize as a smile.

"I perceive we are talking at cross purposes, sir. I was referring to the judicious use of cheesecake in 'The Roundel'. It is a matter over which the Brass and I have crossed swords before. And much as I esteem you, I cannot but feel that you have not lent my crusade the support it merits." His gaze rested for an instant on the Editorial bald spot. "Time, I suppose, thins the blood. But now that youth is in the saddle—"

I held up my hand. "Just a moment, Shatterproof." I pressed the buzzer.

"L.A.C. Capsule," I said, when he had made his appearance, "do you consider that 'The Roundel' would be improved by a sprinkling of cheesecake?"

That discerning airman did not hesitate.

"I consider, sir, that a sprinkling of cheesecake would improve almost anything. But what, if I may ask, is 'The Roundel'?"

Neither Shatterproof nor I said anything for quite a long while. Slowly the old wardog reassembled his faculties. At length he stepped over and grasped my hand.

"Courage, sir!" he said. "Rome was not built in a day."

\* \* \*

When I was again alone, I closed my eyes.

"Ug ug glugalug uglimug," I murmured.

I was imploring the Great Sky Spirit to send me a nice quiet posting to Baffin Land . . .

# Stalag Luft III: Part 2

by FLT. LT. JOHN E. MAHONEY

## CHAPTER TWO

### Topographic Details

TIRED AND THIRSTY, we stared at the masses of barbed wire, the sentry boxes, the rows of wooden huts, the armed guards patrolling the wire. So this was to be our new home.

Inside the wire a large group of prisoners stood eagerly looking for familiar faces among us. (Subsequent experience was to teach me that a fresh consignment of "kriegies"\* was always a great event in the camp.) "Hide your lighters," one of them called out.

We discovered why a few moments later, when we were led into a nearby building and once more searched. Cigarette-lighters, fountain pens, civilian clothing—anything that might help us to escape was taken from us and an official receipt given against its return at the end of the war. The search over, we were fingerprinted and photographed, and then finally marched into the camp.

The inmates crowded round us.

"Hi, Bill!"

"So they got you too, Jack!"

"If it isn't old Smithy!"

Amid the general bedlam, I heard a familiar voice close behind me.

"Remember me?"

I turned. It was George, a friend of training-school days.

Grinning like a couple of Cheshire cats, we shook hands. Then:

"Save the chat till after," he said. "Right now I'm coming with you to arrange with the Adjutant for you to come into our room. We've got space for one more."

Presently he took me along and introduced me to my room-mates. I began to feel much better about everything. Running into someone you know helps the morale considerably in situations like that.

When we talked over our experiences for a while, George started in on my indoctrination.

"We have an easy enough time of it here," he told me. "You can do pretty much as you please—within the bounds of the camp, of course. There are plenty of activities—the library, the theatre, sports, and so on. Or if you want, you can just loaf around all day."

"What about food and cooking?"

"We have a light breakfast and lunch. Our big meal is in the evening. Each room is allotted forty-five minutes for cooking on the kitchen stove. Ivan's the gourmet of our room, so he prepares the evening meal. The rest of us are stooges. We take turns at preparing the other meals and washing up."

Each of the rooms in the hut contained six people at the time of my arrival, though eventually the number was increased to eight. The rooms were about sixteen feet square, with a large double window. The furniture (all of plain wood) consisted of three double bunks, two average-sized tables, four stools, two chairs, a metal stove, and three lockers. The hut itself was like almost all the other huts: a long, low, wooden building, containing twenty-two rooms. The doorways of the rooms opened on to a central corridor, at one end of which was a lavatory. Two rooms at the half-way point along the corridor were used as kitchen and washroom, respectively. In the washroom, the boys had rigged up a "Heath Robinson" shower out of a piece of hose leading from a wash-basin tap to a suspended tin can with holes punched in it. The only drawback about it was the complete lack of hot water.

On our second day in camp, all the new kriegies attended a lecture given by the Senior British Officer. This turned out to be more of a friendly welcome than a lecture. He congratulated us on ending up safely, and gave us a few tips on how to behave in the camp. We were warned particularly to be careful in our conversation about anything of a secret nature. Even among ourselves we must never refer to the building of escape tunnels

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\*From the German word "briegsgefangener," meaning "prisoner of war."



*A group of POW's beside their dining shelter.*

except by a code name. He advised us to read the Geneva Convention Regulations for the treatment of prisoners of war, which were posted on the wall in every hut, so that we would be familiar with our obligations and also our rights and privileges; and he informed us that we must salute German officers of equivalent or senior rank, and be courteous at all times.

"I wish also to point out to you," he said in conclusion, "that, even though you are prisoners of war, you are still subject to Service discipline, regulations, and procedure."

Under George's guidance, I rapidly became acquainted with the lay-out of the camp.

Stalag Luft III was composed of four compounds, North, South, East, and Centre. Later

the West compound and another section, known as Belaria, were added. The latter was a separate compound located about five miles away from the rest. Each compound held about fifteen-hundred men. The South and West were wholly American, the Centre about half American and half British, while the East, North and Belaria were British. In addition to representatives from every part of the empire, the British compounds also housed officers from all the European countries that were fighting with the RAF—i.e. France, Poland, Norway, etc. The Russians were the only allies not represented. I believe that the Germans had special places for them, where they were treated on an entirely different level from ourselves.

The North compound, in which I lived, was

fairly typical of them all. Around the perimeter was a double barbed-wire fence, approximately sixteen feet in height and six feet wide. Between the two fences numerous coils of tangled barbed-wire were placed. Sentry boxes were located approximately 150 yards apart. Each box had a powerful searchlight, which the "Goons" (our name for the Germans) used to flash along the wire and between the huts at half-minute intervals throughout the night. Some ten yards inside the fence was a small wire fence, about two feet off the ground. This was termed the "warning wire," and anyone going beyond it was liable to be shot. If a ball went beyond the warning wire while we were playing some sport, we were allowed to get it only after donning a special red jacket and obtaining permission from the sentry in the nearest box.

The camp contained fifteen huts which were used for living quarters, four outdoor lavatories, the canteen, the theatre, and the sports store.

In the canteen was a large kitchen where we heated the water for our "brews" at breakfast, lunch, and tea-time. Here also were the food stores (German rations); the barber shop (generally manned by skilled other ranks who had volunteered to work in the camp); the canteen proper whence supplies of tooth-powder, brushes, stationery, shoe-polish, pots and pans, and various odds and ends were distributed; and finally "Foodacco," our food exchange.

In the sports store was housed all our sports equipment, which was provided mainly by the YMCA, and the Red Cross. This building also contained a dozen hot-water showers and a dressing-room. Except after organized games, the luxury of hot-water showers was regulated by a roster that allowed two per person per week. The sports store was one of the last innovations in the camp. Built by the prisoners from materials supplied by the Germans, it was not completed until the spring of 1944.

The main building in the camp was the theatre. Like the sports store, this was constructed by the prisoners. It was reputed to be the best in any prison camp, and the Germans were so proud of it that they gave it much publicity. The interior

was of an attractive modernistic design. The stage was spacious, and intricate lighting arrangements enabled many artistic effects to be created. At the back of the stage were the costume, dressing, and make-up rooms. The seats, made entirely from wooden Canadian Red Cross boxes, were built on a floor that sloped upwards towards the rear. At the far end of the theatre were two lecture rooms, a chapel, and the reference library. The reference library contained over a thousand books on all subjects. It was a haven of peace and quiet where kriegies could come and spend a pleasant hour or two whenever they wished. We also had a fiction library in one of the blocks, with a stock of about 5,000 books. Many of the fellows who received books addressed to them used to pass them on to the library when they had read them.

The Medical and Dental Clinics were two other important features in our lives. They were staffed by captured Army Medical Officers. Emergency treatment was available in the camp "surgery," while regular treatment could be had in the "sick quarters" just outside the camp. Since, however, there was only one dental officer for the whole camp, only those whose teeth were actually aching were eligible for attention.

The lack of privacy was perhaps one of the more unpleasant aspects of camp life. Many people who would have studied hard if only they could have been alone, had to abandon their attempts at work. The inimitable Ivan was an exception. He could sit in the same room with a group of chattering people, the gramophone blaring at his side, humming a tune, and still be able to concentrate on the book of accountancy opened on his knees. He passed all his exams with honours.

## CHAPTER THREE

### The Inner Man

Before proceeding to sketch in the details of my picture of life in Stalag Luft III, it might be as well just to complete the background by giving the reader some idea of our usual diet and how it was prepared, for a kriegie's reactions to the life

around him are largely conditioned, like anyone else's, by the state of his inner man.

Our food came from two sources: German rations and Red Cross parcels. We were supposed to be able to subsist on German rations alone, which, according to the Geneva Convention, should have been equal to those of the German soldiers. The Germans, however, taking into account our receipt of Red Cross parcels, cut down their rations considerably. But there was still sufficient, at least during my period as a prisoner, to keep us in good health and enable us to take moderate exercise. (It was not so during the first two or three years of the war. The older kriegies told us sad tales of days when there were no Red Cross parcels coming through, and when German rations were extremely scant. Sickness was rampant, and at times the boys had hardly enough energy to lift an arm.)

The German rations arrived in bulk at odd times. They consisted of, roughly, six ounces of sugar, one half-pound of margarine, one loaf of bread, six ounces of jam, and a bit of "blood sausage" weekly. The latter was inedible for about 90% of us. The smell alone was enough to stop us cold. Occasionally we had a ration of cheese—sometimes good, sometimes bad. Vegetables were supplied daily in considerable quantity, and occasionally cereals in the form of millet, oats, or barley.

Each prisoner received one Red Cross food parcel per week. Its contents varied considerably, according to whether the parcel had originated in Canada, England, or the United States; but the following may be taken as a fairly representative break-down of its ten pounds:

2 tins meat	1 tin milk
1 tin sardines	8 oz. sugar
1 tin jam	1 pkg. tea, coffee, or
1 tin butter or margarine	cocoa
1 tin cheese	1 box biscuits
4 oz. chocolate	1 bar soap

The English parcels frequently contained odd tid-bits such as egg powder, pancake mixture, apple pudding, etc.

Thus, we didn't do too badly. There was no

time when we were without parcels, and only for about three months were we even on half rations. This fortunate state of affairs was not universal. Reports reached us of some camps that were not receiving their Red Cross parcels at all, or else very irregularly. This was a particularly common occurrence during the last stages of the war.

At one time cigarettes were very scarce, but during the last two years of the war we had more than we could use. In fact, they were so plentiful that, when we were getting one chocolate bar per week, it could be exchanged in "Foodacco" for four hundred cigarettes.

On two occasions we actually managed to save a considerable quantity of food. Our object was to build up an emergency supply in case we should ever run short. At the peak of our hoarding campaign we had saved up, on a per-man basis, one pound of raisins, one pound of margarine, one box of biscuits, one half-pound of cheese, and one pound of chocolate—as well as a surplus of jam, milk, sugar, and other items. This was before the big escape in March 1944. After that disastrous event, however, the Germans, noting the escapees' food supplies, forbade all further food-saving and ruled that we must consume all our surplus food within one week. What a bash we had that week!

(Later, as the Russians approached, the Senior British Officer foresaw the possibility of our food supplies being cut off, and advised us to start saving again—secretly. Once more we accumulated a supply; but this time we put what we had saved to good use by taking it with us on the march.)

Cooking was carried out by the individual messes. Each mess, as I have already stated, had one forty-five-minute period during the day to cook its main meal. Generally speaking, cooking was considered to be a full-time job, and whoever undertook the task was excused from all other "stooge" duties.

Just how unpopular the job was is best illustrated by the story with which I propose to end this brief Chapter.

Prompted either by culinary ambition or by the mistaken hope of a "soft touch," one of the chaps made his room-mates an offer.

"I'll take over the cooking permanently," he said, "but only on one condition: I don't want any complaints. At the first complaint, I resign." The others agreed to his proposal with alacrity.

For quite some time, everything ran smoothly. Eventually, however, the trials and tribulations of the kitchen began to wear the chef down. He became fed up with the eternal rushing back and forth with pots and pans, the "stove scroungers" (people attempting to squeeze "just one small pan" on the stove outside their own allotted period), the endless struggling with the food supply, and with the strain of trying to think up something new for the menu.

So, occasionally he became careless and served burnt cakes, watery porridge, cold meals, or anything he could think of to make someone complain, thus giving him a chance to resign.

They maintained a stoic attitude, however, suffering the occasional spoiled dish rather than

lose the services of a person who had undertaken to perform such an arduous duty.

Finally he decided to dish them up a real terror; a bowl of salty porridge burnt a dirty brown.

One by one they stared at it in dismay. Still not a word was spoken. The first man tasted it, grimaced horribly and looked at the cook. The cook glared back, silently daring him to utter a word against it. He gulped once or twice and swallowed it.

"I don't feel hungry tonight," he said. "I think I'll skip the porridge."

The second took a spoonful and swallowed it down without thinking. Suddenly he clutched his stomach and uttered a frightful howl.

"Where the hell did you get this muck?" he cried, then suddenly remembered, adding hastily, "but it's damn well cooked."

*(To be continued)*

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## Modest Demand

THE FOLLOWING ITEM is culled from the "Strictly Personal" column of "Aviation Week." It concerns a recent letter from Mr. Wright A. Parkins, engineering manager of Pratt & Whitney, to his friend Admiral T. S. Combs. As "Aviation Week" briskly puts it:

"Parkins was still reeling from his first reading of the new general specification for aircraft turbo-jet engines the Pentagon boys had just cooked up, figuring this spec is one to end all specs, nearly as complete as the Encyclopedia Britannica. Nothing has been overlooked; not even the environment of the engine:

"Environmental Condition—The engine shall not suffer any detrimental effects when exposed to the temperature range of minus 65 degrees Fahrenheit (minus 53.8 degrees C.) to plus 160

degrees F (plus 71.1 degrees C.). Consideration shall be given in the design of the engine for satisfactory operation during and after exposure to any combination of the following conditions in world-wide operation: humidity, fungus, sunshine, rain, snow, sleet, hail, ice-fog, fog, mildew, salt-spray, ice, ozone, smoke, wind, sand and dust.'

"Brother Parkins says wine, women and song were not included probably because those who wrote the spec wanted to make some concessions to the weaknesses of the engine designers. Finally, Parkins told the Admiral: 'I hope you too will take time out to read it and I hope that when some poor contractor finds that he cannot do a better job than the Creator, the services will be generous in granting deviations.'"

R. H. W.

# What We Learned From the Berlin Airlift

by M. A. Chaffee and R. B. Corby, Airborne Instruments Laboratory, Mineola, N.Y.

(Reprinted by courtesy of "Electronics")

DURING THE CLOSING MONTHS of Operation Vittles a record tonnage of food, medicine and coal were moved into Berlin, by air, despite foul flying weather.

From December, 1948, when surveillance radar was installed at Tempelhof Airfield, until the blockade was lifted, more than double the earlier daily tonnage was flown into the city. Except for a few days when the ceiling stayed continuously below the 400-foot safe operating limit of GCA, Air Force C-54 cargo planes operated through the Frankfurt corridor and, along with a variety of British aircraft, down the Hamburg corridor to Tempelhof, Gatow and Tegel airfields in Berlin with almost monotonous regularity. On maximum-effort days when all available planes were in use, air-traffic movements reached the rate of one plane a minute into the blockaded city.

This record of all-weather flying was made possible by efficient utilization of currently available electronic aids to air navigation. The practical experience gained from the use of these aids in Operation Vittles should help solve many of the instrument-weather traffic-control and landing problems now confronting commercial airlines. From a military standpoint too, the experience that was gained may have a direct bearing on planning for transportation methods and equipment in future emergencies.

## The Airline Problem

Airlift traffic in and out of Berlin, over the Russian zone, was confined to three corridors, as shown in Fig. 1. These corridors were conventional 20-mile wide airways. From half a dozen loading airfields in the American and British zones, at round-trip distances between 300 and 600 airline miles from Berlin, planes funnelled into Berlin through two corridors and were directed

into Tempelhof, Gatow or Tegel. After unloading, all planes returned along a third common corridor to their respective bases.

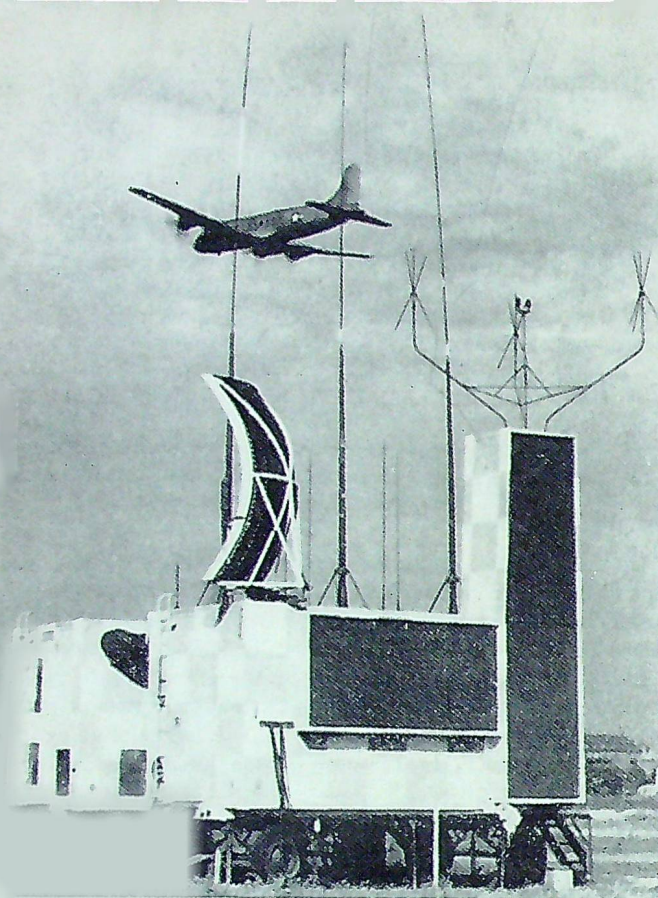
The joint American-British air-transport enterprise required the safe and efficient flow of high-density air traffic from a number of loading points through two narrow corridors to a comparatively small number of cargo-discharge points. The overall problem entailed the guidance of all aircraft from the loading points to the corridor entrances, safe control through the congested corridors, orientation and direction in the approach patterns over Berlin and precision landing control at each of the terminal fields.

The solution was achieved with a combination of conventional radio ranges and homing beacons with appropriate airborne range receivers, long-range surveillance radar, precision landing-approach-radar and vhf voice-communication equipment. With surveillance radar as the heart of the traffic-control system, the combination proved entirely adequate for the all-American operations in the Frankfurt corridor, where all planes were C-54's with the same speed range and where take-off sequence information was sufficient for the initial radar identification. Along the Hamburg corridor, where American planes combined operations with various-speed British aircraft, the initial radar identification was implemented to some degree by British airborne-transponder equipment.

## Flight Plan

Typical of the Airlift Task Force procedure was the following Frankfurt flight:

After takeoff from Weisbaden or Rhein-Main, the loaded C-54 homed first on the Darmstadt beacon, next on the Aschaffenburg beacon, and



*GCA trailer at Tempelhof, with power-generating trailer behind and C-54 coming in overhead. The three tall whip antennas provided two vhf channels and one standby for communication with planes. Elevation-beam antenna is behind dark vertical panel and azimuth-beam antenna is behind horizontal dark panel. Emergency radio antennas, not ordinarily used, are atop elevation-antenna box. Parabolic rotating search radar was not needed for airlift operations.*

then swung northeast at an assigned altitude toward the Fulda Range Station. Monitoring the vhf airways communication channel, the pilot noted the time of the preceding aircraft's reporting its position over the Fulda Range Station. On crossing over Fulda, the pilot reported in and adjusted his speed to position himself approximately three minutes behind his predecessor. Swinging northeast on a predetermined heading to track the Berlin leg of the Fulda range, the plane proceeded for forty minutes at constant airspeed. Forty minutes out of Fulda the pilot reported on the airways channel to the radar-equipped Airways Control at Berlin.

By this time, a new radar pip had just appeared within the 100-mile range marker of the CPS-5

surveillance-radar ppi scope at Airways Control. Correlating this latest reporting with the sequence reporting relayed forty minutes earlier from Fulda, the aircraft was identified and informed that it was in radar sight. In cases of uncertain identification, the reporting aircraft was requested to turn off course. A corresponding pip deviation would certify identification. Once identified on the ppi, the aircraft echo was tagged on a 24-inch Skiatron tube used at the control center as a master plotting board to permit tracking all aircraft movements.

Airways Control tracked the flight from the identification point, giving heading and speed corrections for maintenance of proper track in the corridor and safe spacing behind a preceding plane. Upon arrival in the Approach Zone over the Tempelhof Range Station, the plane was directed by Airways Control to turn left and to report immediately to Berlin Approach Control on the vhf approach-control channel.

The approach controller, provided with a radar ppi adjacent to the airway controller, assumed direction of the aircraft for guidance through an intricate and precise approach pattern. To aid this guidance, the controller used an expanded (eight-mile radius) radar presentation covering the approach to Tempelhof. Further, a map of ground check points (beacons, runway alignment marks and Russian airfields to be avoided) had been superimposed on the radar scopes by electronic video-mapping techniques. Provided with this ground reference data, the approach controller directed the plane for precise navigation around the approach pattern and into the final approach leg to Tempelhof. Upon turning for final descent, the aircraft was directed to contact Landing Control at Tempelhof on whichever of two available vhf channels was momentarily not in use.

From approximately six miles out on the final approach, the pilot contacted the GCA landing controller. Within three minutes the GCA controller talked the plane down, using his precision-radar information to keep the plane safely on the steep four-degree glide path, down between rows of tall buildings and onto the runway. With only

three minute intervals between planes, two GCA operating positions and two vhf channels were used alternately for successive approaches.

### Flexibility of Traffic Control System

Each of the three Berlin airfields was assigned an approach controller in the radar air-traffic-control center and each field was equipped with GCA. The flexibility of the approach and landing system was such that if, for example, Rhein-Main and Weisbaden were closed in by weather and the Frankfurt corridor traffic to Tempelhof decreased, the centralized Approach Control could distribute any increased American or British traffic in the Hamburg corridor to another airfield.

After unloading, planes from each field were cleared for takeoff and, entering the return corridor over the Wannsee beacon, homed westward on the Braunschweig beacon in the British zone. No accurate traffic control was effected in the return corridor but all takeoff clearances were monitored in Airways Control. Planes were identified on the Skiatron plot and movements monitored along the return corridor as anti-collision prevention.

### Surveillance-Radar Presentations

Examples of the types of ppi presentation obtained with the CPS-5 surveillance radar

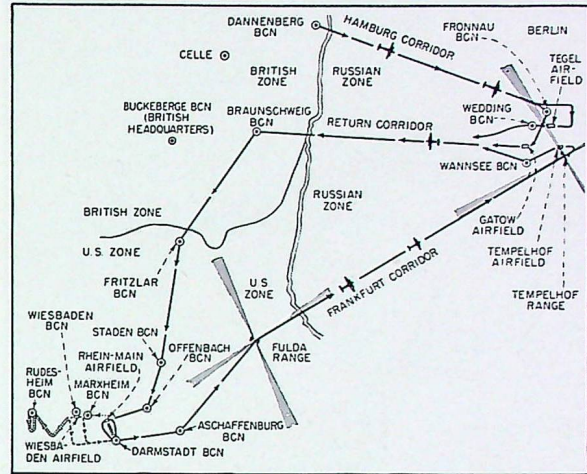
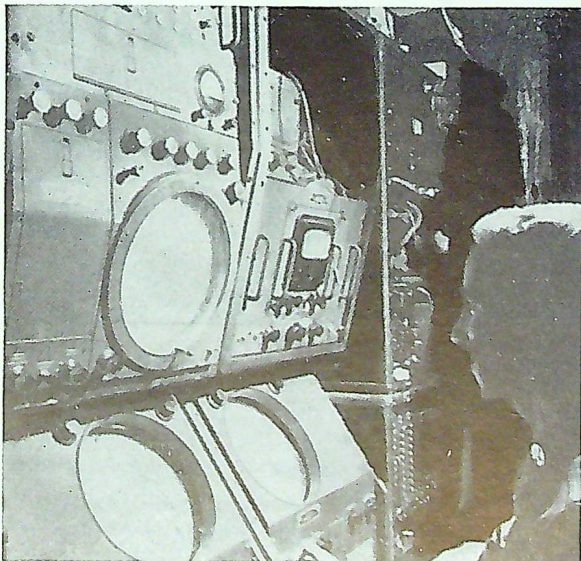


FIG. 1—Map of airlift operations, with Berlin area enlarged greatly out of proportion to show details of approach routes and return route used.

installed at Tempelhof for air traffic control are shown in Fig. 2 and 3. The accompanying interpretive diagrams emphasize the thoroughness with which this particular radar can replace or extend human sight in instrument weather, with accuracy, from 100 miles away to within less than a mile of the radar antenna. This feat was made possible by incorporation of moving target indication and video mapping in the radar receiver circuits, for removing ground clutter and superimposing accurately the essential map data needed for approach control.

The 20-mile presentation of Fig. 3 was available at a flip of a switch for magnification of pips when approach regions became very crowded, but was not normally used by the approach controller. Instead, his scope was adjusted to show an 8-mile radius shifted off-center to get maximum enlargement of the area for control.

*Operating positions in GCA trailer. Two men normally sat here to bring down alternate planes. Both angle-mounted scopes show same combined azimuth and elevation pattern. Search-radar scope mounted vertically to serve both positions was not used. Talkdown took about 3 minutes per plane. Note use of lip microphone.*

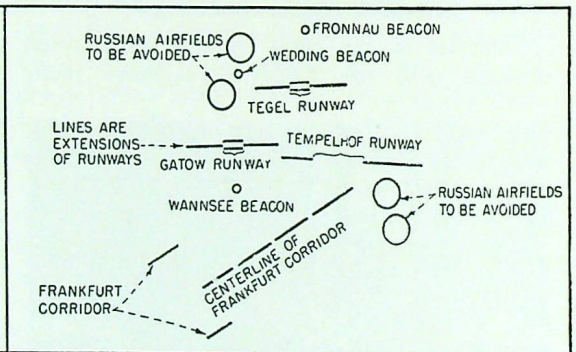
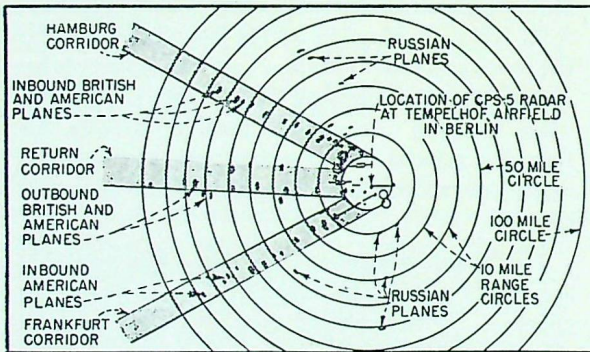
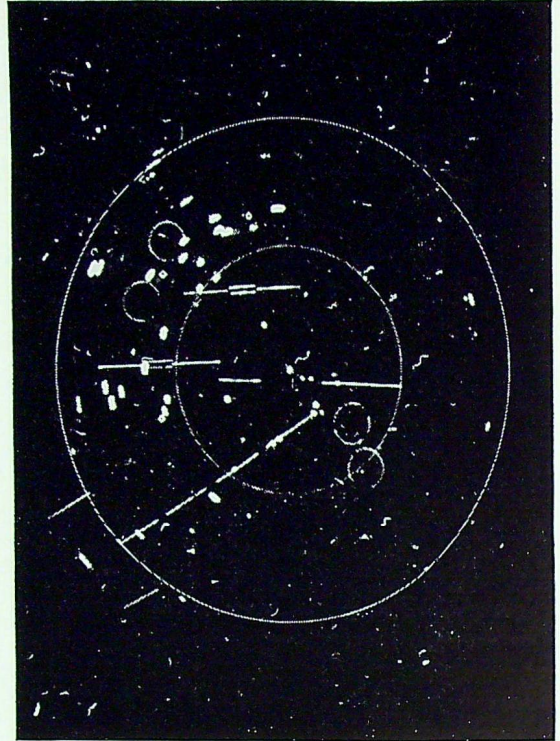
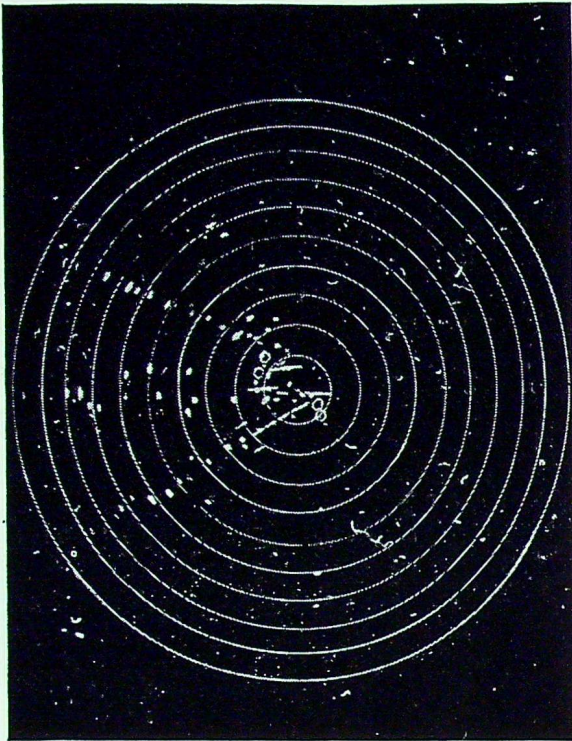


FIG. 2—Pattern seen on 100-mile screen of CPS-5 search radar on typical maximum-effort day near close of airlift operations. Diagram below identifies target pips and range circles.

FIG. 3—Enlargement of pattern of Fig. 2, taken at approximately same time and obtained by switching scope to 20-mile range. Diagram identifies superimposed video mapping.

## Airlift Radio Aids

The radio aids to air navigation which served the American effort in Operation Vittles consisted primarily of vhf communication equipment and l-f navigation equipment. Each C-54 was equipped

with an eight-channel push-button vhf communication set which sufficed for all normal communications. A small h-f communication set was installed as an emergency standby.

Conventional low-frequency A-N radio ranges

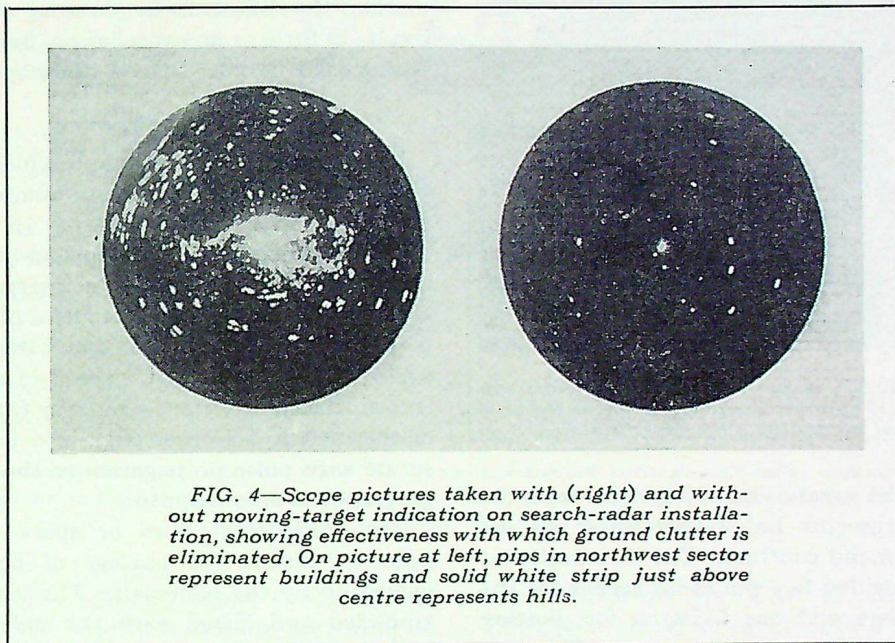
and low-frequency homing beacons were installed at convenient locations in the American and British zones. The aircraft were equipped with standard radio-range and beacon receivers. No other equipment was used.

For British operations along the Hamburg corridor where various-speed aircraft presented a problem in sequencing and traffic control, use was made of an available airborne transponder

All-Weather Flying Division, a combined navigation and traffic-control device having the capability of handling the density of airlift-traffic desired was seen in long-range surveillance radar.

The CPS-5 radar system was chosen in preference to other radars because:

- (1) Its range, in excess of 100 miles, was necessary.
- (2) It was capable of high accuracy.



*FIG. 4—Scope pictures taken with (right) and without moving-target indication on search-radar installation, showing effectiveness with which ground clutter is eliminated. On picture at left, pips in northwest sector represent buildings and solid white strip just above centre represents hills.*

which enabled the pilots to give more accurate position and identification information to Airways Control and the radar plotters.

### Choice of Radar

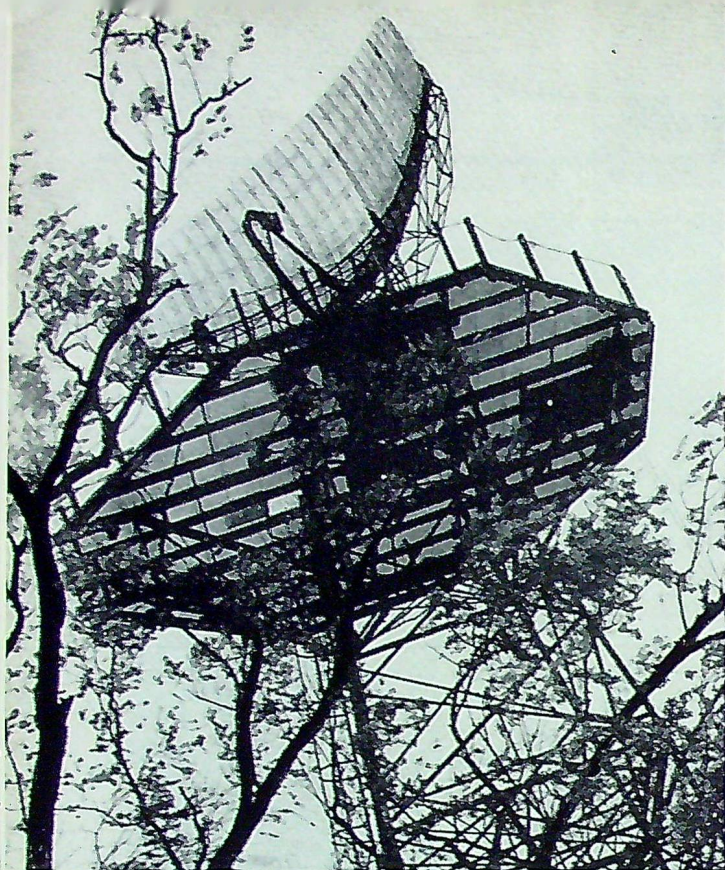
Full consideration was given to all available electronic aids to air navigation and traffic control during the planning stages of the airlift. Existing systems and components such as ground d-f systems, conventional l-f radio ranges and beacons were not considered sufficiently accurate for the special requirements of approach control to Berlin. On the basis of previous investigations by the

(3) It had minimum susceptibility to adverse effects of weather due to its operating frequency and narrow beam. Lower-frequency radars gave poorer resolution and, with antennas of reasonable proportions, wider beams. Higher-frequency radars were more prone to radar echo dispersion from moisture, snow, sleet and storm clouds.

(4) A moving target indicator had been designed for the CPS-5.

(5) Height finding was not available, but was not required for airlift planes operating at assigned altitudes.

The selected radar was installed and operated at



*Antenna of CPS-5 search radar, weighing one ton and rotating at 10 rpm. At Berlin it was mounted on a 25-foot steel tower atop a five-story building.*

Berlin under the supervision of engineers from the Airborne Instruments Laboratory under an Air Material Command contract. The installation at Tempelhof provided five ppi radar scopes for the traffic controllers and one Skiatron for plotting and tracking. All scopes were provided with video mapping of the Approach Zone and the radar system was modified to incorporate moving-target indication (MTI).

#### **Moving-Target Indication**

The incorporation of MTI in the CPS-5 at Berlin was the first application to air traffic control of principles developed jointly at MIT and TRE (Telecommunications Research Establishment) for eliminating the ground clutter that gave short-range blindness to most ground radars.

Elimination of all indications from buildings, trees, mountains and other stationary objects, as shown in Fig. 4, is based on comparison of phase relations between succeeding echo pulses and a reference

signal generated in the radar receiver. Each echo pulse is fed simultaneously into two receiving channels; one passes the pulse without delay to a comparator stage and the other has a delay line that retards each echo pulse for a time interval equal to that between outgoing radar pulses. Two successive echoes from the same target thus arrive simultaneously at the comparison point. If the target is stationary, the pulses in effect cancel and produce no trace; with radial target motion, the difference in phase of the echo pulse results in little or no cancellation, hence the pulses produce the desired pips on the scope.

#### **Video Mapping**

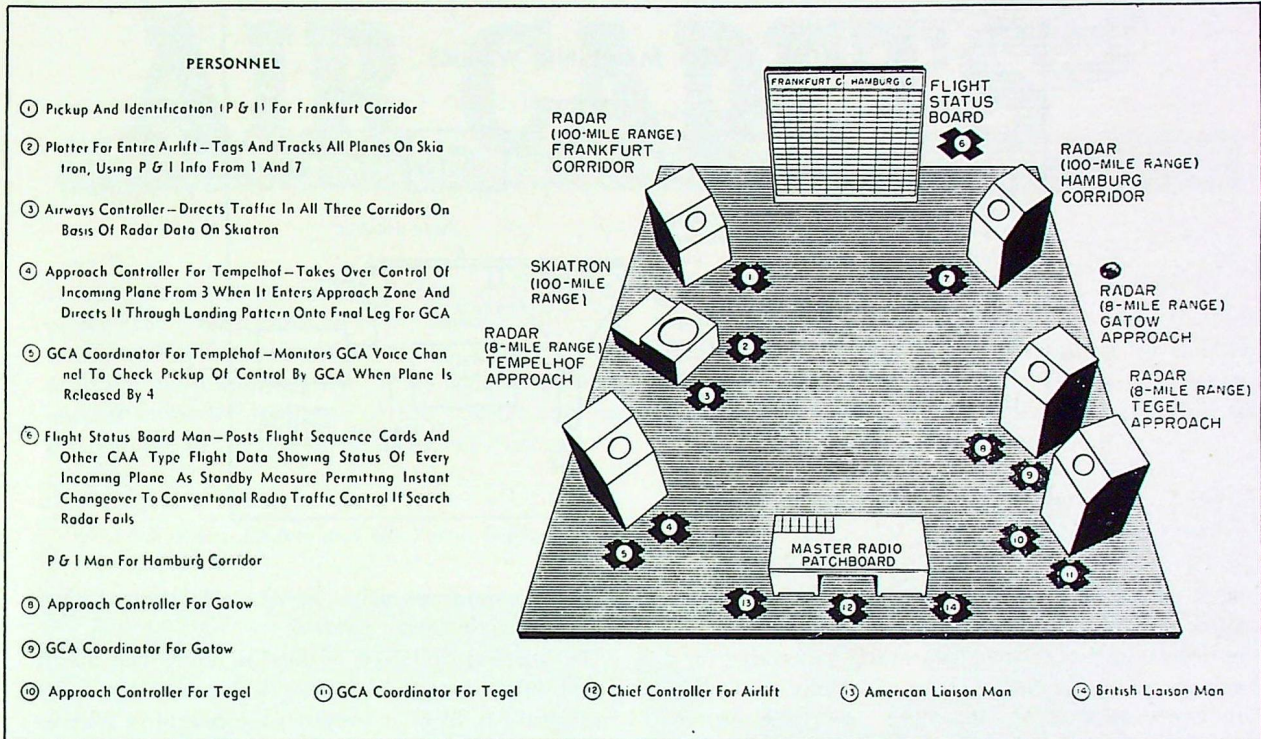
Video mapping is a technique which permits the presentation on a ppi scope of combined ground-reference and radar-echo data. In operation, a negative transparency of a map containing desired information for presentation is interposed between a linearly scanning light spot and a photocell. The map is rotated in synchronism with the antenna while the light source, triggered in scan by each transmitted pulse, travels radially from the center of the map to its outer edge in a time commensurate with pulse propagation to the limits of the geographical area mapped.

The transparent lines or spots on the map negative permit the passage of light which is picked up by the photocell. The video output is amplified and mixed with the video data from radar echoes for presentation on the ppi. Thus, the reference map presented with the radar echoes is always correctly proportioned and oriented regardless of range switching or off-centering of the ppi.

#### **Conclusions**

The Berlin airlift showed that long-range radar having the inherent accuracy of the CPS-5 could in itself provide sufficient air-navigation and traffic-control information to permit the efficient flow of high-density air traffic along the corridors and in the approach areas of Berlin.

The high precision of GCA allowed safe descent of aircraft on the final approach leg, under instrument conditions when ceilings were down to 400



*Traffic control room for entire airlift, located at Tempelhof airfield in Berlin. All radar screens here are fed by CPS-5 search radar on top of building, but are set for various ranges. Eight-mile range settings are also shifted off centre to give enlarged effect of a sector scan.*

feet at Tempelhof and even lower at Gatow and Tegel where the approach terrain and rate of descent were less hazardous.

For commercial air transport activities, the airlift indicated that GCA, teamed with surveillance radar to provide direct control of aircraft movements by the radar controller, will have considerable merit as aids in reducing bad-weather cancellations, disruption of schedules under instrument conditions, and stacking delays at a terminal airport. Under the conditions which surrounded Operation Vittles, surveillance and landing radar proved effective for safe and efficient traffic flow. Although the strict airlift regulations for sequencing, speed control and altitude assignment are nowhere duplicated in domestic air transport operations today, the success of Operation Vittles suggests the need (a suggestion already being

implemented by the CAA at Washington and Chicago airports) for investigating the application of such radar control to existing domestic traffic control procedures.

Although the airlift functioned well with the tools available, it did reveal the need for improvements in equipment and in methods of gathering and communicating control intelligence. While it was proved along the corridors that radar alone could direct operations on the Enroute Zone, the existence of more accurate navigational devices would relieve the controller of all but purely traffic-control responsibilities in that area.

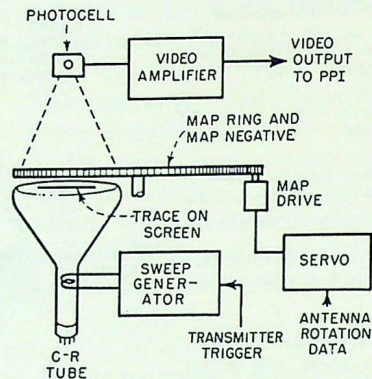
In the Approach Zone, the radar control could completely replace more complex navigational aids but again airlift experience indicated the need for more efficient utilization of the radio-frequency spectrum with better communication techniques,

## HOW VIDEO MAPPING WORKS

Antenna rotation drives map ring through servo system, making map negative of 100-mile-radius region rotate over face of cathode-ray tube serving as scanning light source.

Transparent lines and dots on negative pass light to photocell that feeds information of map through video amplifier to mixer for combining with radar signal. Synchronization insures that map appears on screen in proper position with reference to radar ppi presentation.

Changing range of radar presentation automatically changes scale of map since range-changing circuits are located after mixer stage.



such as instantaneous transfer of detailed instructions and point-to-point or private-line communications wherein control information intended for a specific plane would be directed at only that plane to the exclusion of all others. Further, as emphasized by the problem in the Hamburg corridor, more positive identification equipment and tech-

niques would greatly assist effective radar-monitored air traffic control.

In keeping the city of Berlin alive, the airlift accomplished a great feat. However, even more important is what it taught us concerning specific needs for future air-transport equipment and procedures.

## TRADE ADVANCEMENT

THE AUGUST ISSUE of A.M.C.'s "Monthly News Letter" quotes the following interesting figures from the Trade Advancement Boards' report for the previous 6 months.

Of 1444 tradesmen tested, 948 passed, 390 failed for the first time, 72 for the second time, and 34 for the third time.

There were 108 remustered from one trade to another after examination by an R.T.A.B.

There are 626 "P" tradesmen who may still qualify for "O" groupings in the current period, since 215 waived examination, 233 were first failures, and 178 were given 6 months' deferment.

Downgrading was authorized by A.F.H.Q.

for only 55 tradesmen, and, out of a total airman strength of 11,851, there have been 7072 who progressed in their trade status.

In the efficiency checks conducted at random in all groups of 16 basic trades by the R.T.A.B.'s, the percentages of passes in the various ranks were:

AC's	—	41.66%
Cpls	—	51.35%
Sgts	—	46.51%
F/Sgts	—	66.6%
WO's	—	100.0%

or, out of 111 tradesmen tested, 57 passed and 54 failed. That represents an overall average success of 51.35%.

# The ROYAL CANADIAN AIR CADETS

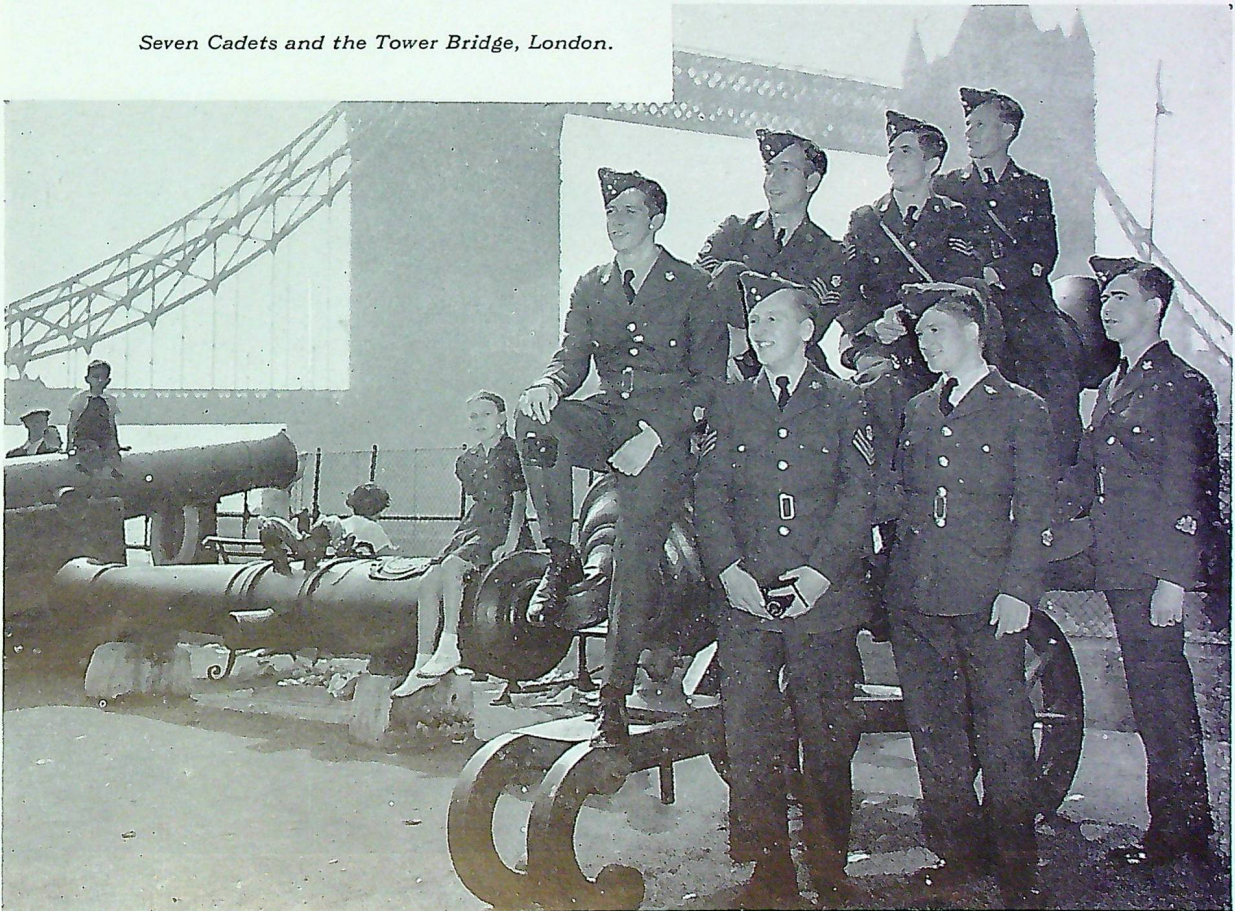


IN OUR LAST ISSUE we published several photographs of No. 180 (Mosquito) Squadron's successful visit to New York, where it took top honours in a military band competition. This month we show further camera highlights of the busiest summer programme in the Air Cadet League's history.

## Exchange Visits

Twenty-four Royal Canadian Air Cadets travelled to Britain to be entertained by the Air Training Corps and the R.A.F. In return, twenty-five A.T.C. Cadets visited Ontario and Quebec as guests of the League and the R.C.A.F.

*Seven Cadets and the Tower Bridge, London.*



# The Roundel

Twenty-six Canadian Cadets spent two weeks in the U.S.A. enjoying the hospitality of the Civil Air Patrol and the U.S.A.F., while a similar number of young American Cadets came up to see us here in Canada.



*The touring Air Cadets get televised in Texas.*



*Some of the American Cadets and friends in Halifax.*

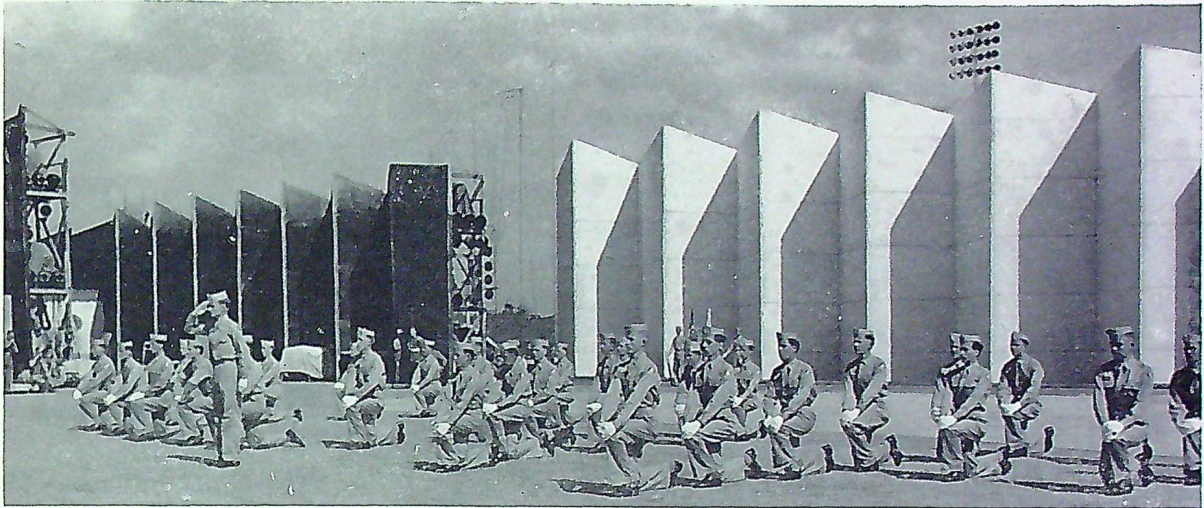


*Canadian Cadets give their host, Col. Harold D. Byrd, three rousing cheers at a party given by him for them at his country home near Dallas, Texas. The two-gallon hats are gifts from Col. Byrd.*

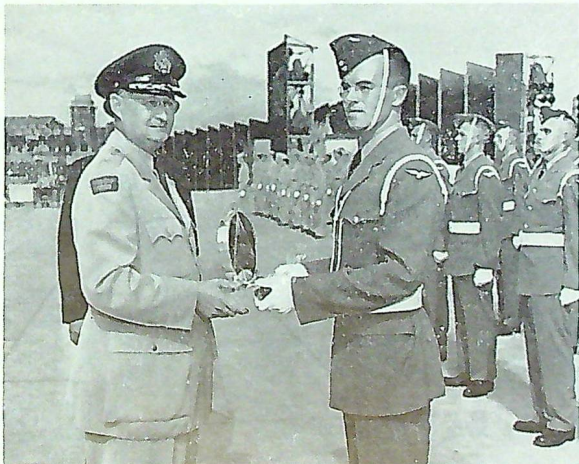
## International Drill Competition

Here are three more photographs of the International Drill Competition held at the Canadian

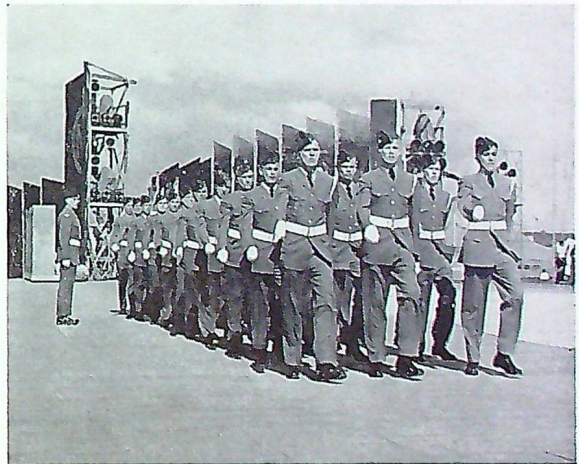
National Exhibition, Toronto. The event was described by Group Capt. Luke in the October issue of "The Roundel."



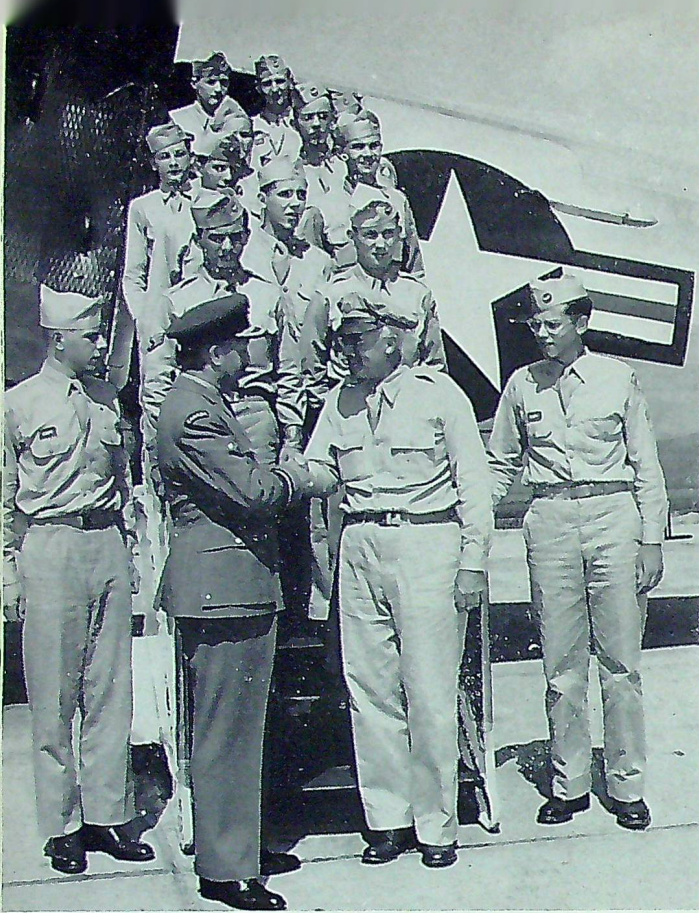
*The Civil Air Patrol team forms the letters "CAP" while its leader salutes the Crown.*



*Major-General Lucas V. Beau presents the Beau Trophy to W.O. 1 William Stewart, captain of the Canadian team. It was a close contest: the Canadians scored 358 points and the Americans 347.*



*The R.C.A.C. team in action.*



*Air Marshal W. A. Curtis greets Lt. Col. William G. Johnson, U.S. Civil Air Patrol officer in charge of thirteen visiting American Cadets, on his arrival at R.C.A.F. Station, Rockcliffe.*

### Flying Training

One hundred and fifty-five Air Cadets took the 4-week R.C.A.F. scholarship flying training course at various flying clubs. Many of them are continuing with their flying in order to reach the private pilot's standard.

### Summer Camps

Upwards of 4,000 Cadets attended the annual summer camps held this year at Summerside, Aylmer, Gimli, and Abbotsford. The 2-week camping period featured numerous outdoor activities as well as familiarization flights and classroom studies

## TRACERS

Donald H. Lee, Lee's Holiday Bungalows, Wasagaming, Man., wishes to learn the whereabouts of A. Bonnikowski, who graduated as a Sgt. Pilot from No. 4 S.F.T.S. in Nov. 1942 and who is believed to have later been a prisoner of war.

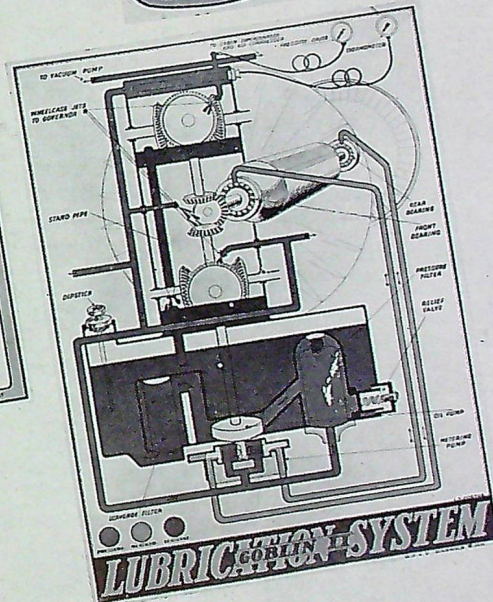
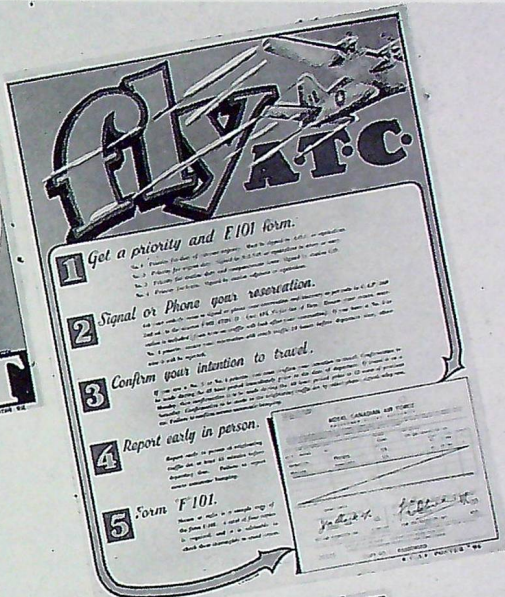
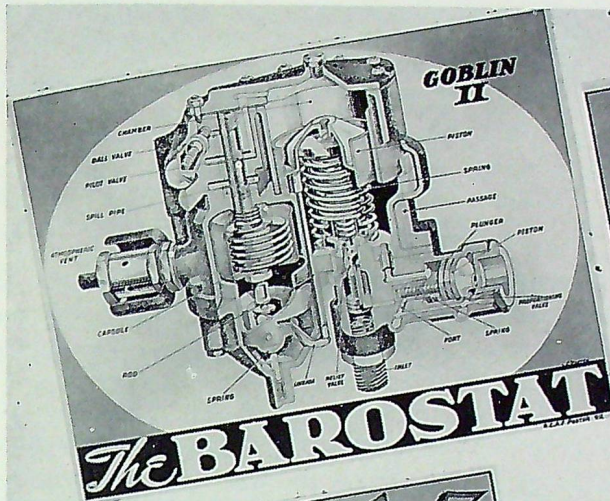
Will Jim Plenderleith, Arch Simpson, and Peter Baker please get in touch with Jack Shoemaker at 90 Northumberland St., Guelph, Ont.

Former W.O.G.'s Beatrice McGinnis, Viola Olson, and Dilys Danis are asked to contact Jayne Williston Camplejohn at Nassau, Bahama Islands.



Ex-Cpl. A. Campbell (R101066) is asked to drop a line to W. A. Campbell, c/o Dept. of Mines and Resources, Jasper, Alberta.

# Have You Seen these Posters?



- RCAF Poster No. 92: Barostat: Goblin II
- RCAF Poster No. 93: Lubrication System: Goblin II
- RCAF Poster No. 94: Fly A.T.C.
- RCAF Poster No. 95: Freight A.T.C.

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# A Few Thoughts on- The German Army

by LT. COL. G. M. C. SPRUNG, M.C.

*(Lt. Col. Sprung's articles on military history, strategy and discipline, are becoming increasingly well-known in England and the United States as well as in the author's own country, Canada. The following brief study is a condensation of a much longer one which appeared in "The Army Quarterly," last year. The original article was entitled "The Mentality and Ethos of the German Army." Its theme—tradition and discipline—is of universal interest.*

—Editor

THE GERMAN ARMY, though it loses wars, does not lose its prestige. The reputation of Germany's army has not suffered, though the German Army lies to-day twice beaten. Germany loses wars not so much because her Army is of poor quality as because her statesmen are.

The significance of the German Army within the life of German communities is, and for over two hundred years has been, far other than that of the Canadian or British Armies within their nations. Germans accept war as part of their lives. Their wars are fought close to their own homes. The soldier, therefore, occupies a large part of their thoughts and stands as an embodiment of the more heroic and tragic factors in their life.

The traditions of the British Army are born in war and live up to the next war to a great extent in the memories of reserve soldiers. Soldiering as an adventure occupies a high place in our esteem. As a way of life it has little influenced the nation as a whole. In Germany soldiering is a way of living which by its very nature justifies itself even in peacetime.

A study of German military history, tempered with experience of the German soldier and officer in wartime, raises certain specific qualities and traditions into clear prominence.

Frederick the Great spoke often of the honour of his officers. Perhaps the clearest expression of what the word "honour" has meant to Germans can be taken from a Prussian General Order of the time following the war of 1870-71, when the German Army was enjoying its proudest moment.

"I expect from the entire officer corps of my army that, as in the past, so also in the future, honour will be its most precious possession. It must remain the most sacred duty of the corps and every individual officer to maintain their honour pure and unsullied. In the fulfilment of this duty is comprised the conscientious and complete fulfilment of all other duties. There can be no true honour without faith kept unto death, without unshakable courage, firm resolve, self-denying obedience, pure honesty, strict taciturnity, nor without self-sacrificing fulfilment of even the most insignificant duties."

It is eloquent testimony to the German Army's sense of its own tradition that after the disaster of 1918, the German Army Chief, von Seeckt, summoned the new 100,000-man armed force to face its past with these words: "I am confident that our new Army as a whole and every individual in it, will preserve and cherish the ancient sense of honour as the most sacred legacy of our great past." Von Seeckt had sought to bind together the fighting community by applying to soldier and general alike the same moral standards.

It can hardly escape the British reader how intense is the moral note struck throughout. One notes how close to the heart of national life the German soldier stands. Honour, in the German meaning of it, is not itself so much a specific quality as it is an articulate idea.

At this point it is right that someone interrupt to point out how far from the ideal many German officers seem to have fallen. This would appear to

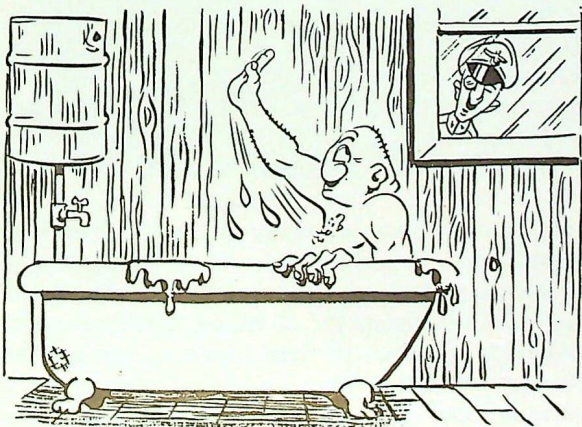
be frequently quite true. All ideals degenerate in practice and the high moral note of the written testament becomes only too readily a snobbish preservation of the appearance of a "pure and unsullied" reputation. Over against that must in fairness be held many instances from the recent war where extremely young German officers impressed their captors by a proud bearing and an effective taciturnity. In refusing any form of co-operation the phrase "not consonant with the honour of a German officer" was often used. Something of the tradition was alive.

It has often enough been observed that Germans have little natural cohesion as a nation. They are not innately law-abiding. Lacking the visible authority of the State, they quickly break apart into innumerable factions. Curiously, once their minds are seized of a dominant idea, they can be held rigidly in an artificial discipline far surpassing the national discipline of other peoples. German Army discipline is deliberate, binding, minute, relentless. On the bonds of authority being broken, it degenerates into deeper chaos more quickly than in most other armies. The cohesion of discipline is attained more by conscious effort than by unconscious habit. In a German regiment of high morale, the heel-clicking, bowing, saluting and "sir-ing" are meticulous and overwhelming. The garrison of Dunkirk in 1944, surrounded and without hope of succour, was still so punctilious that second lieutenants, it is reported, were

saluted through open windows as they passed by in the streets below. The Germans themselves explain their successes of 1939 to 1941 by the perfection of discipline. Their Commander-in-Chief and, more important, every platoon commander, trusted the men under him absolutely and utterly to execute orders without question or failure. At its best, obedience in the German Army could have served as a model.

It will come as a surprise after the preceding paragraphs that the Germans for several generations have placed great emphasis on readiness to assume individual responsibility. Frederick the Great knew that precision in close-order drill was a tactical necessity in battle. This tradition of minute obedience persisted until Moltke's insight into the changed conditions of modern warfare modified the doctrine of obedience as far as formation commanders were concerned. It became accepted doctrine that an officer was culpable if he *did* obey the letter of impractical orders. Initiative was thus encouraged in senior officers, but the same thinking was not applied to the rank and file until the rebirth of the German Army in 1935. By that time it had become clear that the same need for initiative existed in the company and platoon and that readiness to assume individual responsibility should be taught every man as a principle of soldiering side by side with the principles of duty and obedience. Time was too short for this new approach to take effect before the war began.

Of the many other qualities which receive much attention in German military writing and training, suffice it to deal with one more—the "offensive spirit." German soldiers pride themselves on their offensive spirit. Good German troops have, in fact, a spirit and an enterprise of formidable power. Foreign witnesses of the campaigns in Poland and the West in 1939-40 remarked the self confidence, daring, and the aggressive thinking which dominated the German soldier and officer alike. The performance of German troops in Italy was good, and the conditions were not inspiring. By report they suffered the Russian winters as well as troops could. It appears that German soldiers do better than some and as well as most in



disheartening conditions of fatigue and hardship—as long as their officers keep a firm grip.

German military teaching underlines patriotism as a soldierly virtue more heavily than we have ever done. Patriotism is not only a patent necessity for the German soldier, it is also accorded great weight in the theory of military ethics. "The supreme service consists of laying down one's life that the State may continue to exist." And again, "The Armed Forces have their roots in the moral idea of the State . . . The highest conception of soldierly duty gives birth to a fervent and fanatical love of the Fatherland."

It may be useful to mention one further quality, much spoken of by Germans—comradeship. The word "comradeship" does not mean in German what we think it should mean. We are inclined to think it should mean the breaking-down of barriers of rank during sport or in hardship, the mingling as human equals of men who are not equal. To the Germans it means almost the opposite. Comradeship can exist only among equals. The German private, captured in Italy, replied, when asked if the feeling was comradeship in his platoon, "Among the men, yes; but you can't call the corporals comrades." It has already been noted that between the German N.C.O. and man there is a greater distance than with us. This is doubly true of the officer. He is very rarely capable of playing games with his men without forfeiting his dignity. The German officer is trained to stand apart from his men in dress, manners, and way of life, and this training, while it strengthens disci-



pline, makes it difficult for him at the proper times to treat his men as comrades.

This last statement brings to light a condition in the German Army that is as fundamental as it is characteristic: the officer not only belongs to a special group within the Army, he is a member of a special class of society. The modern German tradition can be traced to the father of Frederick the Great, Frederick William I. Frederick the Great insisted on noble birth in an officer, for only such a one, he was convinced, knew "honour," i.e. could sacrifice himself in the cause of duty. The trading classes were materialists and incapable of producing officers. They could not relinquish their comfort and their personal advantage for the ideal satisfaction of being loyal in the performance of their duty. By 1860 nearly two-thirds of all officers were of titled origin. In 1913, seventy percent of the officers were of bourgeois blood. The war watered this percentage still further, and yet during the peace years of the Hundred Thousand Army (until 1935) the traditional mentality was still virile enough to stamp the German officer with an aloof taciturnity, a precise formality of manner and an extreme of fanatic devotion sufficient to mark him out from his fellows in most other countries.

In the nation at large the German officers have traditionally formed a class apart. No less is this the case within the Army itself. The German officer stands apart from his men. He imposes his will upon them by the authority derived from his aloofness. Even in the Second World War his dress marked him out at several hundred paces. More than in most countries, the German Army was built around its officers. "The German axiom seems to be that the greatness of an army lies with its directors. The British axiom is that the greatness of an army lies with its men."

A little book which appeared after Hitler's accession to power is worthy of quotation in this regard:

"Every group of leaders must develop and cultivate a social order of its own, whose moral standards are higher than those obtaining for the common man. That . . . is not possible without forming a certain caste or order. A moral decline

among the leaders, even if it appears to be confined to private matters, will put an end to leadership ability and to leadability. One can both give morally good leadership either by virtue of an unusual inner power . . . or by the certainty of an unquestionable authority, which latter can rest only on the clarity of the purest moral will . . . Whoever is not prepared to subordinate himself to it should not attempt to become a leader and in any case should not attempt to become an officer."

All this strikes the British ear as presumptuous and dull. Much of its weight can be discounted to the ponderous tread of the German mind, and yet there remain some simple truths embedded in it.

German officers in theory, at least, were not

regarded as so many individual citizens holding responsible posts in the Army, but as members of an order which had a mission. Because this attitude leads only too easily to regarding soldiers as the raw material upon which to practise the bearing and ethics of the order, rather than as fellow pilgrims, the German officer has not been on the whole as close to his men as the British officer. At his best, he commands respect, and exacts meticulous obedience. At his worst, when joining the insolence of his tailored breeches to the arrogance of his monocle, he stimulates among his men discontent and mutinous grumbling. The British officer probably seldom achieves the same utter obedience from his men, but on the average and in the long run probably elicits a greater effort.

### KHAKI AND BLUE



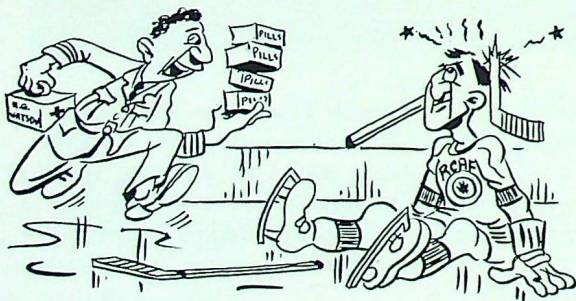
Stepping out as one man, these 60 young soldiers, sailors and airmen form a crack tri-service precision squad, representative of Canada's armed forces. The members of the squad, all young recruits, recently thrilled spectators at the opening of Canada's 21st Parliament, and at the ceremonies at the National War Memorial for delegates of the

British Empire Service League in conference at Ottawa from 28 countries within the Commonwealth. This young squad of superbly trained service men also performed before a quarter of a million people at the grandstand during the Canadian National Exhibition in Toronto this summer.

# WHAT'S THE SCORE

This month our questionnaire comes from the RCAF's medicos. Its author assures us that anyone who occasionally reads "Time" or any reputable daily paper, or who whiles away the odd half-hour with a copy of "Life," should have no trouble getting a score of 20. However, we still say that anything over 15 is above average. The correct answers are given on page 48.

- The Official RCAF First Aid Training publication is:
  - St. John's Ambulance Handbook
  - CAP 410
  - Red Cross Manual of First Aid
  - Dr. Chase's Almanac
- A trade sign which originated in the early days of surgery is used by:
  - Pharmacists
  - Abattoir operators
  - Barbers
  - Undertakers
- The nursing profession had its origin in the:
  - Crimean War
  - Boer War
  - Wars of the Roses
  - American Civil War
- The famous saying, "I dressed him and God healed him," was uttered by:
  - F. A. J. Loeffler
  - Ambrose Paré
  - Florence Nightingale
  - A. Gardner-Watson



- Anaesthetics were first used in the medical profession by:

- Lord Lister
- Dr. Wasserman
- John Barleycorn
- Dr. Simpson



- Diphtheria is caused by:

- A virus
- Rickettsia
- Protozoa
- Bacteria

- For prolonged flight, oxygen should be used at all altitudes above:

- 10,000 feet
- 20,000 feet
- 25,000 feet
- 15,000 feet

- Mosquitoes are known to spread:

- Scarlet fever
- Diphtheria
- Malaria
- Lycanthropy

- Acetyl-salicylic acid is:

- A vitamin only found in ripe Camembert cheese
- A hormone
- A by-product of brewing
- Aspirin

- The tarsal bones are in the:

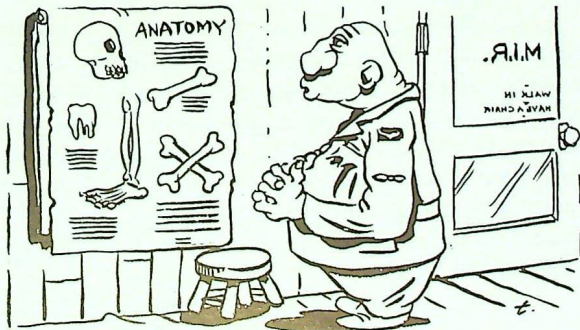
- Wrist
- Ankle
- Head
- Hand

# The Roundel

11. If bleeding is red and "spurting," it is:
- Venous
  - Arterial
  - Capillary
  - Nothing to worry about



12. When a broken bone protrudes through the skin, the fracture is known as:
- Compound
  - Simple
  - Comminuted
  - Green-stick
13. The number of ribs in a 6-foot man is:
- 18
  - 20
  - 24
  - 26
14. The patella is at the:
- Ankle joint
  - Elbow joint
  - Wrist joint
  - Knee joint
15. The medulla oblongata is part of the:
- Circulatory system
  - Central nervous system
  - Respiratory system
  - Gastro-intestinal system



16. Vaccination against smallpox was first demonstrated by:
- Banting
  - Courvoisier
  - Aesculapius
  - Jenner
17. The number of chambers in the human heart is:
- 2
  - 3
  - 4
  - 8
18. The average volume of blood in a human is:
- 4 quarts
  - 6 quarts
  - 2 gallons
  - 2 gallons and 1 pint



19. Poliomyelitis is a disease that primarily affects:
- The muscular system
  - The skeletal system
  - The respiratory system
  - The nervous system
20. The first Director of Medical Services in the R.C.A.F. was:
- Group Capt. Ryan
  - Group Capt. Kildare
  - Group Captain Hunter
  - Group Captain Corbet

# Rolling Safely to a Stop

(Reprinted by courtesy of "Flying Safety")

STOPPING AN AIRPLANE'S ROLL after landing without excessive wear and tear on tires and brakes is a demonstration of normal, good pilot procedure.

But sometimes conditions aren't normal, and it is obvious from the number of accidents caused when planes are not stopped before the end of the runway is reached that not all pilots know what to do to stop in the shortest possible distance when it becomes necessary. This is particularly true during periods of limited visibility or when runways are short, wet or icy.

When these unfavorable conditions exist, pilots sometimes undershoot in their efforts to land on the very first edge of the runway so that they will have room left to bring the plane to a stop. At other times planes are landed long through faulty judgment, and the pilot may damage the airplane attempting to stop. Likewise, it is sometimes necessary to abort a takeoff with little runway remaining.

Before discussing the best techniques to assist in bringing an airplane to a stop safely in an emergency, let us consider the various conditions other than pilot technique which affect landing-roll distances.

Ground-roll distance is almost tripled under some conditions. (Note chart prepared by an airline using a four-engine transport under varying load, wind and runway conditions.)

Friction available must be considered. Braking action is different on wet, icy or snow-covered runways, and the type of runway (concrete, macadam, sod, gravel) is important.

Weight is a factor. A lighter airplane will have less weight on the wheels, thus, skidding might occur with lightly loaded planes at lower speeds than would occur when brakes are applied on airplanes more heavily loaded. But at the same time, a heavily loaded airplane has increased landing speed and kinetic energy and, therefore, will require more braking action with possibilities for more wear on tires and damage to brakes.

Air density is a vital point to consider. The higher the airport the higher the landing ground

speed even though the stalling indicated airspeed is the same. Faster landings mean more kinetic energy must be dissipated. High temperatures mean lower air densities and consequently faster landing speeds.

From the standpoint of pilot technique, the touchdown speed is important and the lowest speeds consistent with a safe approach are desirable. The touchdown point similarly is a key to safe landings which will not require excessive braking; the nearer the approach end of the runway, the better.

Landing direction should be into the wind, and uphill too, if possible. Both these favorable factors tend to lessen the amount of runway flown over, and both slow ground speed quickly.

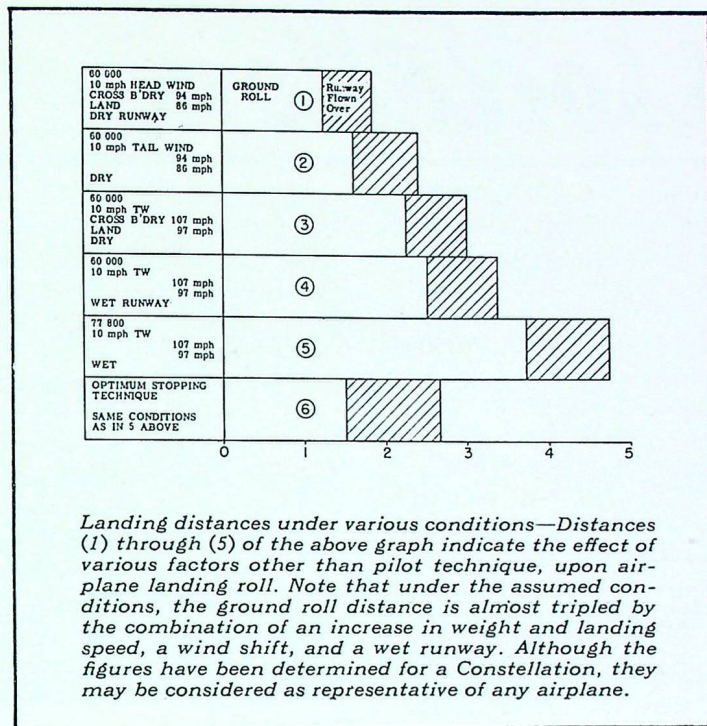
There are two basic ways to assist in stopping an airplane after landing: (1) use of aerodynamic drag, and (2) use of mechanical braking.

It must be kept in mind that reducing the angle of attack quickly on landing, and retracting the flaps reduces the aerodynamic drag as well as the lift. Therefore, in ordinary landing rolls where emergency stopping is not a factor, it is better to use the aerodynamic drag available (full flaps and high angle of attack). This saves wear on brakes and tires, and eliminates costly repairs and maintenance.

When an emergency demands that the pilot obtain the most effective use of brakes, the following points are of extreme importance to put more weight on the wheels and thereby make the brakes more effective:

1. (a) Reduce the lift of the wings by raising flaps on contacting the ground; (b) decrease the angle of attack by keeping tail high on tailwheel airplanes and by putting the nosewheel on the ground quickly on nosewheel airplanes. (Research has indicated that increasing the weight on the main gear is more important *for quick stopping* than the aerodynamic braking of flaps and high angle of attack.)

2. Approach the point of incipient skid when braking an airplane, but *don't* skid the wheels.



Maximum effective use of the brakes is accomplished in this way, but the pilot must be so well experienced in the feel of his airplane that there is no danger of nosing it up with the misuse of brakes.

Several instances of tire skidding and tire blow-out have been attributed to improper application of the brakes. Tire blowout is apt to occur if the pilot applies the brakes before the airplane is firmly on the ground. Light brake application before the airplane is on the ground will start a skid when the wheels contact the runway. When the skid starts, the tire rubber begins to melt and lubricate the contact area. Once the skid is started it will continue with very little brake pressure. Gravel on the runway will aggravate this condition.

There is a recent development called the "brake equalizer" which allows braking action up to the point of incipient skid but does not allow skidding no matter how hard the brakes are applied. A

fraction of a second before the point is reached where a skid would normally set in on either wheel, the deceleration of the wheels on the runway causes a supplemental valve in the hydraulic system to open and reduce the braking power just enough to retain maximum braking action without skid. Should either wheel decrease in speed again to a point where a skid becomes imminent, the valve regulating it reopens and repeats the action as often as necessary until the airplane stops, always giving maximum braking power without skidding. This may be as great an advance as reversible pitch propellers in helping to solve the problem of stopping the airplane safely.

However, until these devices are made available on all USAF aircraft, it is up to the pilot to use with utmost care and safety the present equipment and apply basic knowledge and techniques in the safest possible manner.

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# ROYAL CANADIAN AIR FORCE

## Association

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### No. 402 (Sudbury and District) Wing

Unfavourable weather marred the second annual Labour Day celebrations which had been arranged by No. 402 Wing in Sudbury.

The rains did not interfere, however, with the Wing dance held on Saturday night in the new Legion Memorial Hall with the dance orchestra of the R.C.A.F. Central Band providing the music. It was a huge success, very well attended, and everyone had a grand time.

On Sunday evening the entire band of forty played a concert at the Capitol Theatre to a capacity house.

In view of the preparations which had been made for Monday, the Wing had hoped to repeat last year's successful venture in clearing two or three thousand dollars at a double-header baseball game. The Nickel Belt All Stars were lined up against the imported Chicago American Giants, a highly-touted negro ball club. The Wing had marvellous newspaper and radio publicity, but the heavy downpour Monday morning and a steady drizzle all afternoon prevented the daylight contest which had been scheduled to start the double-header programme. Wing Members used sawdust and burning gasoline to put the field in shape for the night game, which went off very well, and the local all stars won a convincing 5-1 verdict over the visitors. Unfortunately, the rain and very cold temperature limited the crowd to about 2100, with the result that this year's programme left the Wing about three hundred dollars in the red. The R.C.A.F. Central Band entertained the somewhat chilly crowd prior to the game, and played again during the "seventh-inning stretch."

Another highlight of the day was to have been an aerobatic display by three Vampire aircraft

from Toronto. This was called off at 1 o'clock Monday afternoon when the R.C.A.F. telephoned to say it was impossible for the planes to get through owing to an exceptionally low ceiling between Toronto and Sudbury.

The intermittent rain also "washed out" the ceremony of No. 402 Wing taking over No. 200 Sudbury Air Cadet Squadron from the Rotary Club. This brief observance was to have been held at Queen's Athletic Field at 2 o'clock. The squadron waited for several hours at the Grey St. armories in the hope the skies would clear, but the ceremony was finally called off. The squadron, led by the R.C.A.F. Central Band, did stage a short parade along Durham St. later in the afternoon.

Official handing over of the Air Cadet Squadron to the Wing took place on Rotary Club Day, October 10th.

### No. 404 (Kitchener-Waterloo) Wing

At the time of writing, we have been advised that Kitchener-Waterloo is holding its Charter night on 16th September. The Chief of the Air Staff himself will present the Charter. We hope to be able to give full details later.

### No. 405 (Porcupine) Wing—Timmins

A letter from Mr. Ernie Cain, President of No. 405 Wing, indicates that the Timmins Wing is now a going concern. At its meeting on August 30th, the guest speaker was the Rev. David Mitchell of South Porcupine, who was introduced by Mr. William Adamson, Chairman of the Airport Committee of the Chamber of Commerce. His subject was aviation in Northern Ontario and the need for an airport in the Timmins area.



Front row left to right: Col. C. E. Reynolds, DSO, MC, Chairman of the Ontario Northland Transportation Commission; Sqdn. Ldr. R. J. Lehman, President of 406 (North Bay and District) Wing of the Royal Canadian Air Force Association; Flt. Lt. A. A. McKenzie, Sudbury; Air Commodore W. W. Brown, Training Command Headquarters, Trenton; Lieutenant Governor Ray Lawson, OBE; W/O L. Mitchell, North Bay; Flt. Lt. Clifford T. Alger, North Bay. Back row, left to right: F/O J. A. Welch, Thornloe; Flt. Lt. F. E. G. Carmichael, Sudbury; Flt. Lt. A. G. Angus, Kitchener, formerly of North Bay; Flt. Lt. J. A. King, North Bay; Flt. Lt. G. G. Barton, Sudbury; F/O W. W. Alderdice, New Liskeard District; F/O A. M. Holmes, New Liskeard; Lt. Col. B. Johnston, Aide de Camp to the Lieutenant Governor and former Officer Commanding the Queens Own Rifles; F/O W. N. Joy, Dean Lake, Ont; Wing Commander Ralph Christie, DSO, North Bay; WO1 B. B. Collins, Chapleau; F/O R. H. M. Roney, Sault Ste. Marie; F/O D. J. M. McConnell, Sault Ste. Marie; Flt. Lt. T. C. Callaghan, Sudbury; F/O O. L. F. Orendorff, Coniston; Flt. Lt. R. K. Patterson, Sudbury. Absent when the picture was taken were Flt. Lt. W. S. Martin, North Bay; F/O H. J. Humphrey, Sudbury; F/O J. F. Morton, Haileybury; F/O T. C. Murphy, North Bay; F/O J. F. Tees, Bruce Mines and F/O C. F. D. Williams, Sudbury.

On September 23rd they held a Cabaret Dance, complete with floor show, which was an unqualified success.

On October 13th they are holding their Charter night in the McIntyre Mines Community Building. This will take the form of a dinner and dance. Bishop R. J. Renison has agreed to officiate at the dinner. Some of you old-timers will probably remember him. He was the first R.C.A.F. Chaplain.

#### No. 406 (North Bay and District) Wing

Mr. Reg Lehman, President of No. 406 North Bay and District Wing, has submitted the follow-

ing report on the summer activities of the Wing:

"Two major events have highlighted the summer's activities.

"On August 12th the Wing played host to the U.K. Air Cadets who were visiting in Northern Ontario. The cadets were accommodated in cabins on the lake shore and enjoyed a moonlight cruise on Lake Nipissing.

"On August 20th our own 'Air Force Day' was celebrated in North Bay. The feature of the day was an investiture by the Honorable Ray Lawson, O.B.E., Lieutenant-Governor of the Province of



*No. 406 (North Bay) Wing arranges a midnight cruise on Lake Nipissing for the visiting British Air Cadets.*

Ontario. Twenty-three former members of the R.C.A.F. were invested with the Distinguished Flying Cross. No. 406 Wing was in charge of all arrangements.

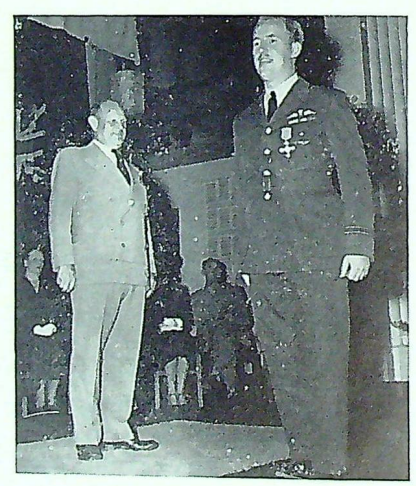
"The Lieutenant-Governor, accompanied by Mrs. Lawson and Air Commodore and Mrs. W. W. Brown, were welcomed at the airport by Wing and Civic officials at 11 a.m. The investiture took place at 3 p.m. and was followed by a reception and tea. Some three hundred were present, including the recipients of the awards and their guests, representative citizens, and Wing members.

"During the afternoon two Vampire aircraft gave an aerobatic display over the city.

"A concert by the R.C.A.F. Training Command Band ended the day's proceedings."

**No. 500 (City of Winnipeg) Wing**

It is with considerable pride that No. 500 Wing reports the booking of Mr. John R. Baldwin,



*Flt. Lt. Cliff Alger, Vice President of No. 405 (North Bay) Wing, smiles as he leaves the auditorium platform after receiving his Distinguished Flying Cross medal from Lieutenant Governor Lawson at the Saturday afternoon investiture in the Vocational School Auditorium.*

Chairman of the Air Transport Board of Canada, as their first Speaker of the 1949-50 season.

The Air Transport Board, a relatively new body in the machinery of government, covers a wide field of activity and is of tremendous importance to aviation. No airline can operate without the sanction of the Board. It can award routes to operators and, if necessary, recommend subsidies for their operation. All passenger fares and tolls for carriage of goods by air must receive its sanction. It conducts, among other things, economic studies of existing air services and projected air lines with a view to ensuring that they have a reasonable chance of success and will not become a burden on the public purse. Any foreign operators wishing to use Canadian airways and their associated facilities must apply to the Board for permission; and it is through the Board's influence that our large airlines have derived many of the concessions which enable them to operate into Europe, the West Indies, Asia, and across the border into the United States.

No. 500 Wing is now considering the question of whether it should sponsor an Air Cadet Squadron.

## No. 603 (City of Yorkton) Wing

Mr. C. L. Vokes, Secretary-Treasurer of No. 603 Wing, advises that the first item of their activity for the fall and winter season will be the sponsoring of a recruiting drive for the local squadron of the Air Cadets.

## Remembrance Day—November 11th

There are now Air Force veterans from two wars who are determined to carry on the traditions and principles for which they fought and for which many of their friends died.

All members of the R.C.A.F.A. are urged to turn out, either by Wings or, where Wings do not exist, individually, to commemorate the occasion by attending Remembrance Day ceremonies.

But for the sacrifices of others, we who remain would not have such an opportunity.

## Christmas Cards

Our Christmas Cards have now been received from the printer. These cards carry an embossed Association Crest and are printed in two colours, complete with envelopes. They are priced at \$1.25 per dozen or 65c. the half dozen. Get your orders in immediately to: The General Secretary, R.C.A.F. Association, 424 Metcalfe St., Ottawa, Ont.

# R.C.A.F. Aircraft Procurement Policy

By R. V. Dodds, Director of Public Relations, R.C.A.F.

THE F-86 SABRE, one of the world's fastest combat fighters, is destined soon to become standard equipment for the R.C.A.F.'s day interceptor squadrons. The procurement of this aircraft, which is to be manufactured by Canadair Limited of Montreal, bears out Government assurance that Canada's Armed Forces are to have equipment second-to-none in quality.

Holder of the official speed record of 670 miles per hour, the F-86 has been clocked unofficially at even faster speeds. Its world record mark of 670 was set with full combat load, and its general operational performance is outstanding.

## Aircraft Procurement Policy

Acquisition of the F-86 is significant, for it marks an important phase in the post-war aircraft procurement policy of the R.C.A.F. This policy is designed to avoid the supply difficulties which were encountered during the last war, and to meet current defence problems. It may be summed up briefly as follows:

- (a) A sound aircraft industry must be maintained in Canada.
- (b) The R.C.A.F. cannot afford to depend upon overseas supply sources for major items of equipment if comparable equipment is available on this continent.

The F-86 was selected because it met all the requirements of this policy. It will be manufactured here in Canada, and, in addition, air-frame and engine spares will be available in Canada and the United States, respectively.

Before the F-86 was selected, all suitable jet fighters in both the United Kingdom and the United States were carefully investigated. These investigations showed that the British aircraft industry could supply a jet interceptor comparable to the F-86.

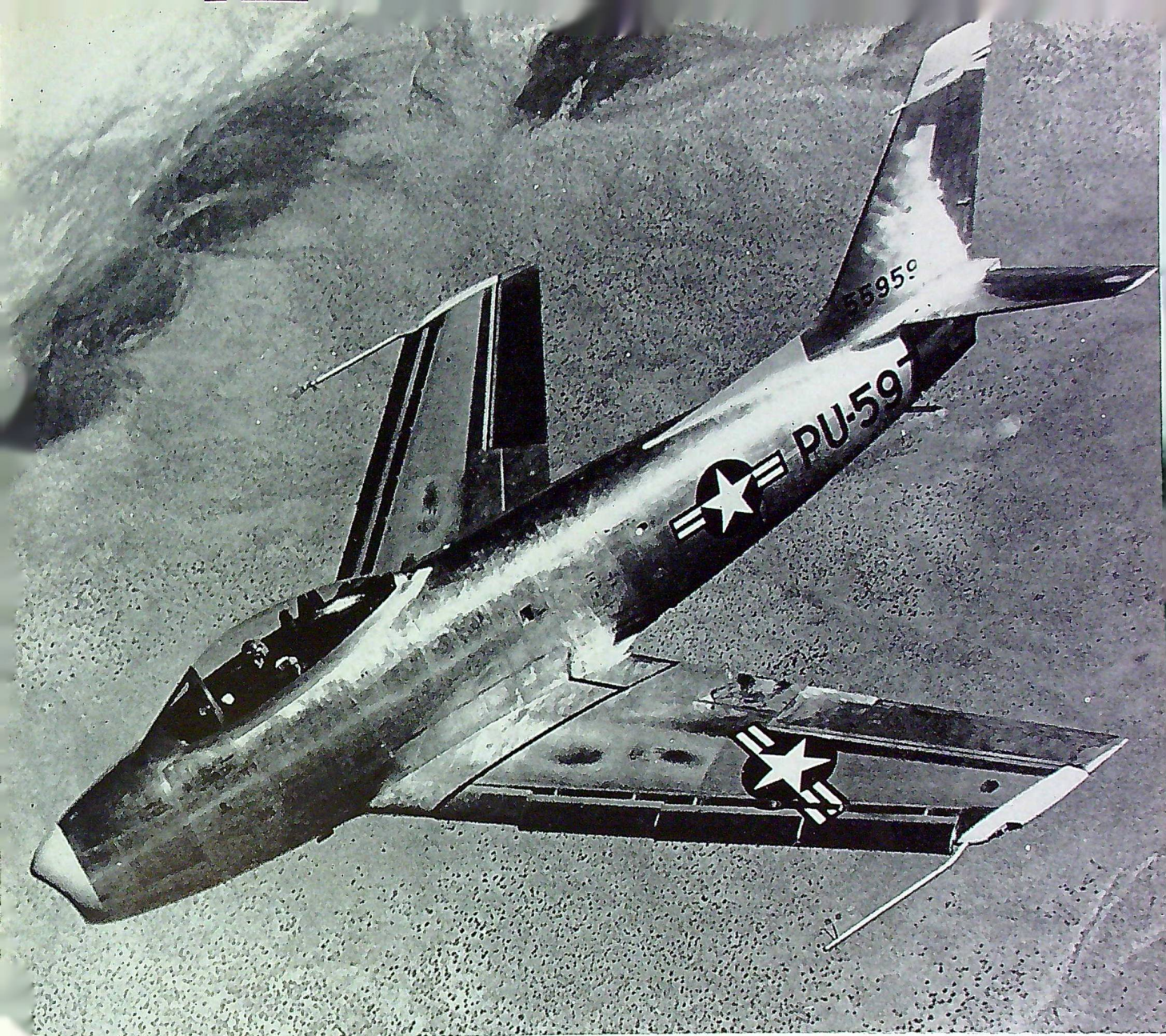
The picture changed, however, when British-built aircraft were examined in the light of R.C.A.F. post-war defence policy. Manufacture of a British designed airframe in Canada was

possible, but the production of a suitable power unit was impractical. Canada's jet engine production facilities have been busy with the development of our own Orenda jet engine, which, insofar as R.C.A.F. requirements are concerned, has greater potentialities than any British jet engine that we might make. Furthermore, it appeared unlikely that our own Orenda engine, still in its developmental stage, could be adapted to the airframe of an acceptable British fighter without extensive engineering changes to the aircraft, and there seemed to be no possibility of obtaining a jet engine from the United States suitable for installation in a British fighter of the type we desired.

Manufacture of a British airframe here would necessarily be done to conform to North American engineering standards, and this would have meant considerable re-engineering. The result would have been an "orphan"—an aircraft standard with neither the U.K. nor the U.S. In any case, we would have been dependent upon an overseas supply source for engines. The R.C.A.F. was determined to avoid this situation if possible, not because British-made engines are unsatisfactory in any way, but merely because their delivery in Canada might be a tremendous problem in the event of another war.

The policy governing present aircraft procurement by the R.C.A.F. is, to a great extent, the result of problems which arose during the last war, as well as of present overall defence plans. During the last war, Canada's aircraft industry grew to a force of 75,000 workers, and produced about 16,000 aircraft. This was done by an industry which before the war had employed about 1000 workers and had produced about 50 aircraft a year. It is one thing for an industry already in healthy existence to expand, but it is quite another to create an industry from next to nothing. From the standpoint of defence needs alone, Canada's aircraft industry must never again be allowed to fall to its pre-war status. We cannot have an aircraft industry if we do not build aircraft.

The problem of overseas supply is another vital



*The F-86 Sabre*

factor. If suitable aircraft are not available on this continent we will have to look elsewhere, as was done when the R.C.A.F. obtained the Vampire III's. The R.C.A.F. needed jets, and the only suitable ones available were in the United Kingdom. The Vampire III was therefore obtained to provide an introductory type. It is serving admirably in this capacity.

Additional aircraft are now needed, however, and it would be unwise to select a type available

only from overseas when a comparable alternative is obtainable on this continent. During the last war, the R.C.A.F. depended greatly upon supplies of spares from the United Kingdom for the many British-made aircraft and the large amount of British-made equipment with which it was equipped. When France fell, the flow of aircraft, engines and spares was badly disrupted. Delivery schedules could not be maintained, and only by superhuman efforts were the problems overcome.

It was in no way the fault of the United Kingdom that the R.C.A.F. faced this critical shortage. The situation was beyond anyone's control. Because there is no assurance that this situation will not recur, it is undesirable to place ourselves in a position of dependence upon overseas supplies.

It is obvious, too, that in any foreseeable future war we shall likely be working closely with the U.S. in defence of this continent. To attempt close co-operation of this sort with a variety of aircraft would necessitate duplication of supply lines.

### The XC-100

An additional result of the R.C.A.F.'s post-war aircraft procurement policy is the XC-100, the all-weather, long-range, two-seater jet fighter. This fighter, together with the Orenda jet engine which is expected to serve as its power unit, is presently under development in Toronto by A. V. Roe. Both aircraft and engine are Canadian in design and development.

Canadian geographical conditions make it imperative that the R.C.A.F. have an all-weather fighter such as the XC-100, in addition to new day interceptors. Accordingly, general specifications of such an aircraft, to meet present and future Canadian operating conditions, were laid down several years ago by the R.C.A.F.

A survey of developments in other allied countries failed to indicate the immediate availability of any aircraft suitable for our own special needs, and it was decided that the design and development of an all-weather fighter must be undertaken in Canada.

It was also decided to proceed with the development of a suitable jet engine, the Orenda. There are two main reasons for development of the Orenda:

- (a) To ensure that we will have a suitable power unit for the XC-100, and for possible use in other aircraft.

- (b) To create a jet engine industry in Canada.

At the moment, the R.C.A.F. feels that it is ahead of the field as regards this new fighter, the XC-100. Good progress is being made on both the aircraft and the Orenda engine, and it is expected that the aircraft will make its first test flights this year.

### Runway Extension Programme

Linked with procurement of new aircraft is the R.C.A.F.'s runway extension programme. During the war, the majority of R.C.A.F. flying stations existed solely for training purposes, and comparatively light aircraft were operated from them. By to-day's standards, consequently, many do not have long runways. Failure to carry out this runway extension programme now would handicap the R.C.A.F. in its operation of future aircraft types, particularly under conditions of adverse weather.

### Conclusion

It is essential that the R.C.A.F.'s overall policy be reviewed closely in any consideration of the why's and wherefore's of choosing the F-86 rather than a British-made fighter. To interpret the choice of the F-86 as an indication of dissatisfaction with British aircraft or equipment, or as a severance of the close ties that bind the R.C.A.F. and the R.A.F. is erroneous. Liaison between the R.C.A.F. and the R.A.F. has, if anything, increased during recent years.

The R.C.A.F. would not be serving the people of Canada, nor would it be fulfilling its obligations to the other democratic nations of the world if it equipped itself with aircraft and equipment whose usefulness might not be properly maintained in time of emergency. Our present policy is designed to permit the R.C.A.F. to play its full role by taking advantage of Canada's particular geographical position and industrial potential. The F-86 is the fruit of that policy.

# The Art of Elimination

By J. W. Campbell, APSA

(Reprinted by courtesy of the "PSA Journal")

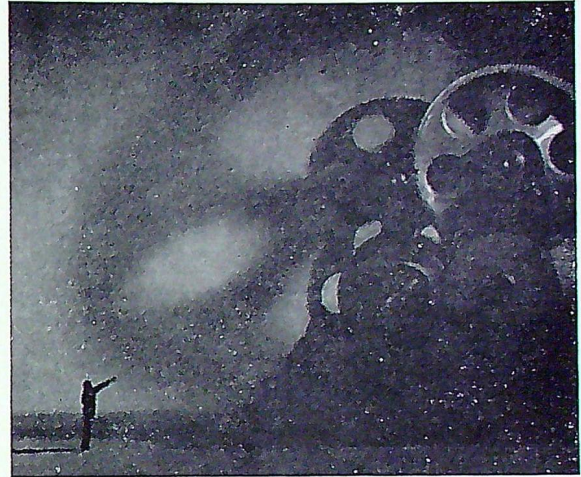
MANY BEGINNERS in pictorial photography attempt to build their pictures by asking themselves "What shall I include?" Careful study of the work of successful salon exhibitors indicates that "What can I eliminate?" is a much better frame of mind in which to approach the making of a pictorial photograph. The outstanding feature of the work of master pictorialists is the way they convey the theme or the mood with a minimum of essential subject matter. And probably the most common fault of beginners in pictorialism is the "busy" picture which contains too many centres of interest all competing for attention.

The tyro is continually advised to avoid this glaring fault (so obvious when the print is on the club easel), but is seldom given much information as to methods of control. Usually, the only remedy suggested is cropping the print. While this has its place, the purpose here is to offer some suggestions as to other and more important methods of avoiding the inclusion of distracting elements.

Let us assume that pictorial photography is a process of elimination, and then attempt to arrive at a series of methods of eliminating the unnecessary and conflicting elements which spoil so many pictorial efforts. There are several means which we can use, and in some cases it may be necessary to call upon more than one during the making of a picture. Some of these methods may be so elementary that it may be said that they are automatically employed, but, in considering this approach to pictorialism, it is felt that it is the employment of them all in their place which will lead to improvement.

## Elimination by Composition

The elimination of subject matter is practised by all photographers at the moment they select a viewpoint, as everything not included in the view finder or ground glass is automatically eliminated from the composition. Unfortunately, the beginner



*In making "Master or Slave?", Mr. Campbell found that artificial lighting of the table top subject allowed control of shadows to eliminate detail. Frontal light for limited partial exposure and curtailed development to subdue details to fit the mood were used. Printed through back of paper to avoid too literal rendition of cut-out figure and props. Leica, 50 mm Summar, one 25W and one 60W lamp.*

seldom carries the process far enough, and the selection of viewpoint is often decided without giving full consideration to all of the factors involved. This is the time to compose the picture, as all variations of view-point can be brought into play to aid in producing the pictorial effect desired. Compared with cropping the finished print, the opportunities at this stage are practically unlimited.

The following thoughts are offered, not as a formula, but rather as a guide in approaching the somewhat bewildering mass of material which seems to appear in the finder when photographing, for example, a landscape.

First, we should try to analyze the feeling which prompted us to consider the subject as pictorial material. Maybe the early morning sun has lighted trees, houses, etc., and given them a new beauty. Maybe the mystery of an evening scene—



*Mr. Campbell made the exposure for "—of loch and glen" without filter to eliminate detail in distant hills for atmospheric effect. A factory-type chimney silhouetted against the lake was removed by local reduction on the print, followed by spotting. Made from a high viewpoint with long focus lens. A closer approach with the use of shorter focus lens would not be successful as the lake would be lost from a lower viewpoint. Leica, 90mm Elmar.*

the play of light on water or any one of a thousand visual effects—has created an emotion which seems worthy of preservation.

Having decided what is the dominant factor which impressed us—the lighting or the shape of masses, or the general mood—the next step is to use the view finder and examine the subject from all possible angles, each time trying to emphasize the dominant feature by eliminating first one and then another of the secondary elements.

All the compositional rules and tricks will become evident as we practise this. We will see the value of foreground objects giving the impression of depth, and creating a feeling of distance.

We will see the use of diagonals—of low horizons—of high horizons—of vertical compositions—of the balance of masses, of the beauty of "S" curves. All kinds of lessons and theories of composition will become evident as we attempt to enhance the pictorial value of the main feature of the subject by trying to eliminate unnecessary material.

We will note that a tree in the middle distance can be used to hide a telegraph pole by varying the view-point. Often times a closer view-point will work wonders. If we can substitute a telephoto lens for the normal lens, we can note the difference in perspective and what part it can play in the building of a picture. By making exposures

of the more successful view-points, we can make comparisons for later study, which will prove the value of composition in re-creating the mood, which is the heart and soul of the picture.

The most successful rendition will be the one in which there are just enough secondary features to perform the functions of foils to the dominant feature and not detract from its prominence. Should this result conform to any of the recognized formulae of composition—divisions of thirds, "S" curves, etc. (as it probably will), well and good! Should the composition not fall into any recognizable category, do not be alarmed as it can still be good! The deciding factor is whether or not it is your carefully considered opinion that the theme, mood and pictorial value is enhanced by the composition.

The tonal value of dominant features can be heightened or lowered by the choice of suitable lighting, by variation of exposure and by the use of filters with panchromatic film. These points are well worthy of consideration, and any or all of them may be called into use to eliminate or subdue tone values which compete with the centre of interest.

For instance, a strong side light on the main object might be necessary to make it stand out from its surroundings. Actually, this would amount to the same thing as lowering the light value on the surroundings. The outdoor worker must do his lighting by choice of time of day and of view-points, but he can also obtain additional tone control by other methods. One of these is variation of exposure. Unwanted detail in shadow portions of a picture can be suppressed by shortening the exposure and by giving judiciously increased development to the negative. Highlight and half-tone areas can be compressed by giving full exposure and by curtailing development. Some experimentation along these lines will prove of great value as a method of tonal control.

### Use of Filters

Another method of tonal control is through the use of filters. A suitable filter can heighten the tone value of the main feature as opposed to the

tone of the supporting background—again eliminating unwanted material by the lowered value of the background.

A careful study of any good book on the use of filters will give an illuminating insight into their use as aids to pictorialism. They can have just as much effect upon the landscape as upon the sky, and a study of their possibilities can be of great value in the control of tonal gradation.

For example, suppose that we have arrived at a pleasing composition of a landscape but find there are some obtrusive telegraph poles on the horizon. Now, if the light is such that the poles normally would be rendered as a medium grey tone against the sky, it is possible, by means of a suitable filter, to subdue the tone of the sky to a point where the grey of the poles will almost merge with the sky tone.

Here is another problem in pictorialism which might be solved by filters. We might have a red barn in a green field, and the lighting conditions might be such that the barn (the centre of interest) is merged with the surroundings. On examining the scene through a red filter it will be found that the barn assumes importance by being heightened in tone. By using a green filter, the tonal value of the grass will be heightened and the barn appear darker. Other filters, yellow, orange, etc., will produce intermediate effects, and by observing the tonal control which can be obtained through filters, it will be seen that they can be valuable aids in elimination.

A blue filter can do a fine job of suppressing detail in the receding planes of a landscape by using the atmospheric haze as a veil. "Recession of tones" and "atmosphere" in a pictorial photograph are two elusive qualities which can be captured by this method of elimination of detail. Of course, to make use of the range of filters, it is necessary that they be employed in conjunction with panchromatic emulsions.

There are other means of elimination used to strengthen the main theme of a picture. Most of these are employed by the average photographer at one time or another. It should be borne in mind that it is unnecessary to use all of the methods mentioned on any one picture. Rather, it is



*Some of the methods used by Mr. Campbell in making "Midwinter Mood" were: choice of viewpoint, to eliminate large areas of snow and sky; choice of side lighting, to suppress secondary elements; light red filter to subdue telephone poles; final work on print. Local reduction used to break up shadow of power line running across print. Leica, 50 mm Summar—23A filter.*

suggested that the pictorial worker become familiar with them all and employ the most suitable methods as required. Careful consideration should be given to all factors involved before deciding which is the best combination of methods for the job in hand.

Retouching the negative is one method of elimination. Diffusion of the image (either when making the negative or enlargement) can be used to subdue contrasts and detail. Local reduction of the image will eliminate unwanted material. Again, this can be employed on either negative or print. Various degrees of contrast in enlarging paper can be employed to eliminate tonal values, either at the shadow or highlight end of the scale. Dodging, burning-in, and flashing during the making of the enlargement are valuable methods of getting rid of distractions.

Cropping the print is often the means of eliminating a great deal of unnecessary material and accentuating the main theme of a picture. Printing through the back of the paper will get rid of unwanted detail. Finally, hand work on the print can be employed—the spotting brush, the etching knife and pigment (either powder, water colour or oil colour) may be brought into play to eliminate the final objectionable details. The paper negative

process is capable of eliminating the most obstinate material.

Summarizing, let us set down the process of elimination as follows:

#### Negative

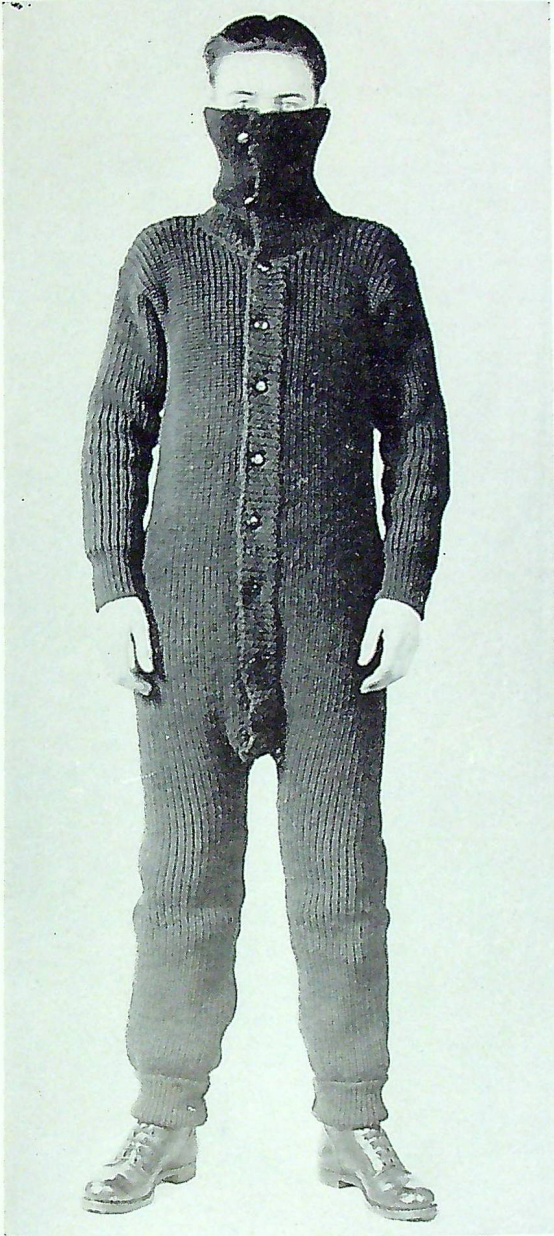
1. Choice of view-point
2. Choice of lighting
3. Use of filters
4. Use of diffusion on camera
5. Variation of exposure
6. Variation of development
7. Local reduction by chemical means
8. Retouching

#### Print

1. Cropping the print
2. Dodging, burning-in or flashing during enlargement
3. Choice of paper contrast and surface
4. Diffusion during enlargement
5. Printing through back of paper
6. Paper negative process
7. Local reduction by chemical means
8. Hand work on print

The artist starts out with a blank canvas and proceeds to add whatever he pleases until he builds his picture to his satisfaction. The pictorial photographer starts with a mass of pictorially unrelated material and works to eliminate the unnecessary elements with the object of producing a pictorially satisfactory rendition of the subject. When this fact is fully realized, it becomes obvious that the pictorialist should consider his subject from start to finish as an opportunity to use any or all of the means at his command in practising this fascinating process of elimination. He will gain photographic experience by so doing, and will become more familiar with the use of his photographic tools as a means of attaining that most worthwhile result—a pictorial photograph.

## GHOSTS OF THE PAST



Nothing is known about the manifestation shown above except that it appeared in Rockcliffe in 1926. We are assured by the Directorate of Psychical Research that this type of apparition is usually harmless unless the investigator attempts to deprive it of its underwear.



The Headless WAG of No. 3 Wireless School, seen by several reliable witnesses in 1942. Investigator A. M. Eager, who photographed it, eventually succeeded in bringing peace to this troubled spirit by leading it to the Clothing Stores.

# War under a Microscope

By Douglas J. Ingells

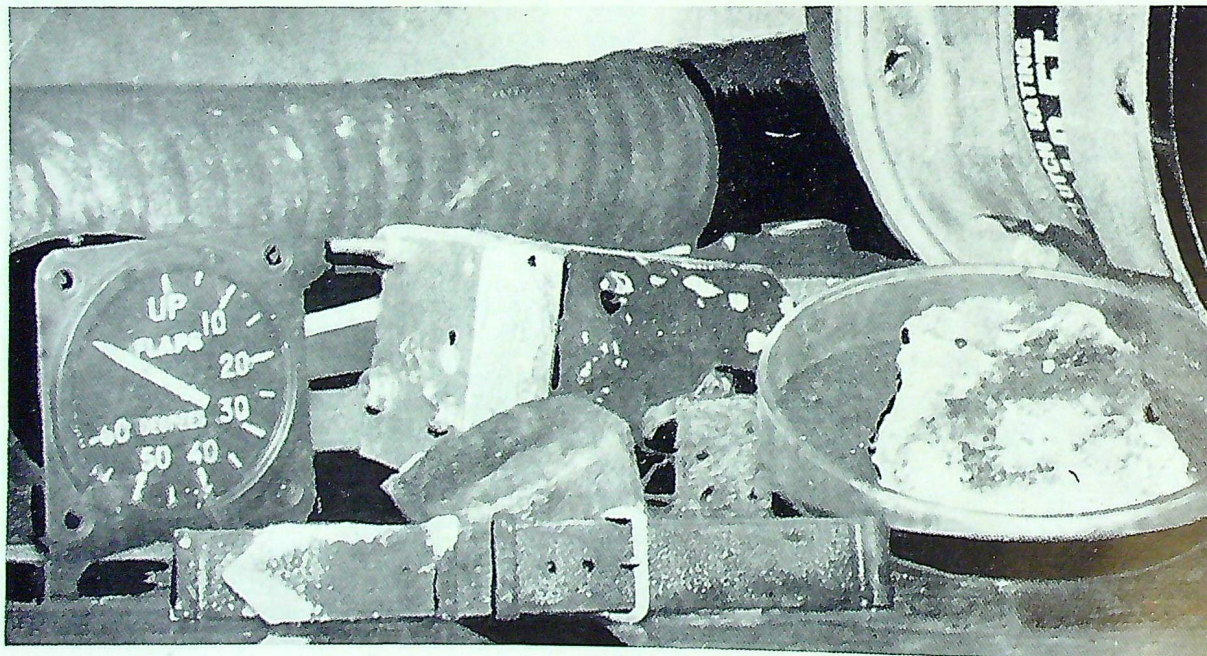
*(Reprinted by courtesy of "Air Force")*

ONE DAY an Air Force transport plane loaded with important cargo and very important passengers was scheduled to take off from Johnston Island in the Pacific bound for Honolulu and the States. During engine warm up, the flight engineer, scanning the instrument panel, saw the needles on two indicators swing wildly. Synchronously, the pilot spotted the trouble, cut the switches and ordered the plane grounded until mechanics could find out what was wrong.

Ground crewmen soon found the trouble—sluggishness in the gears of a propeller hub. They yanked out the whole works, put in a new "box" as simply as a garage man might remove and replace the battery in your car. As far as the mechanics were concerned that was the end of it. They watched with satisfaction as the plane took off and headed east.

But an alert engineering officer wasn't quite so easily satisfied. He picked up the discarded propeller hub from the junk heap and shipped it 11,000 miles to a little-known, seldom talked about laboratory at Wright Field. Here, technicians and experts disassembled the hub and put the different parts under microscopes. They found a fungus growth had formed inside the gear box and clogged the movements so that they could no longer function with precision. It succeeded in growing because tropical mites of the South Pacific had spilled their stool on the metal parts thereby providing an ideal medium for the growth of fungus. To beat the problem, engineers redesigned the hub using a new sealing technique and improved anti-fungi protectives. That particular difficulty never cropped up again.

That laboratory at Wright Field specializes in



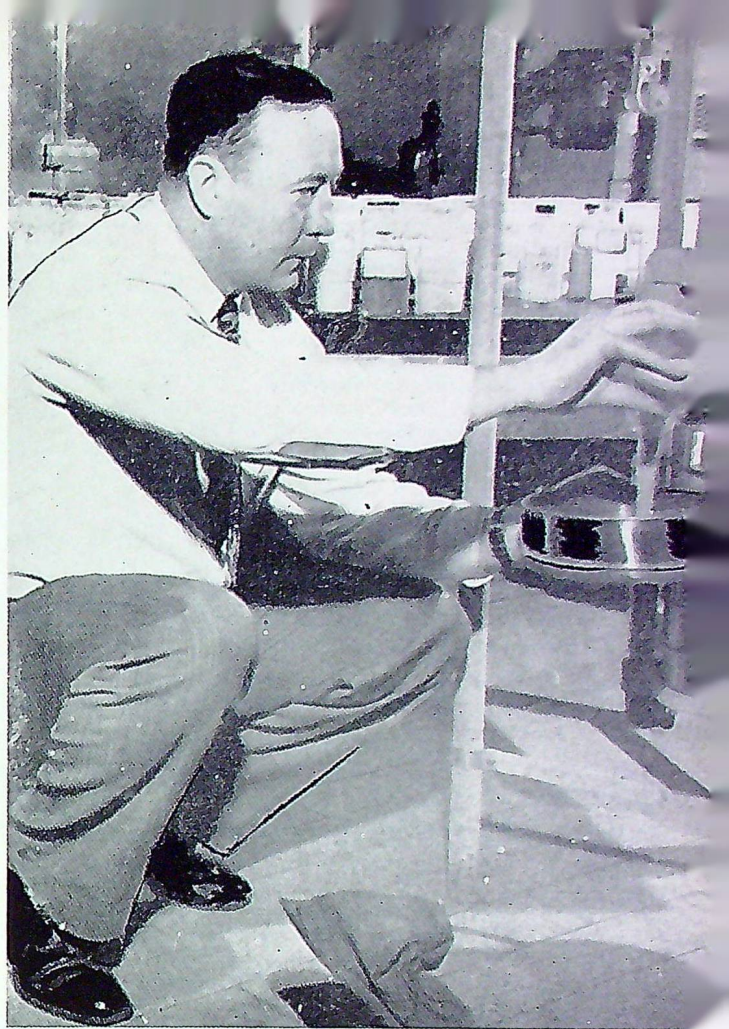
*This is what Air Force equipment looks like after various species of South Pacific fungi set up light housekeeping.*

“Environmental Engineering.” Here, all types of aviation equipment are subjected to climatic conditions found everywhere in the world with complete aircraft weather-proofing the final goal. The importance of this cannot be overestimated since our experience in World War II proved that heat and cold, dampness and dust, fungi and other tropical growths succeeded in keeping our planes on the ground more successfully than Zeros or Messerschmidts.

This indeed is a laboratory with the world inside. In one compartment with thick glass windows fine desert sands roar through a miniature wind tunnel, sandpapering the tiny buckets of a turbine wheel, heart of the modern jet engine. In another, jungle fungus growth eats through a hair-thin crack in an instrument casing. A steamed window reveals the corroding action of sea-air fog salting away an electric generator like a piece of pork in a barrel. Ice crystals form fascinating patterns on a propeller hub. A water spout does its best to rip open the bottom of a rubber life raft. Hail shreds the fabric of a rudder assembly and a sun lamp, its heat intensely magnified, beats down on a plexiglass cockpit smoking it up like cellophane.

In one place or another, similar conditions have seriously interfered with normal Air Force operations. Funny things have happened. High octane gas vaporized into nothing, and instruments went haywire. The carbon brushes in generators wore out in two hours instead of 200. Desert sand chewed up engines. Even at home planes operating from airfields near the ocean had to do something about the corroding effects of salt fog.

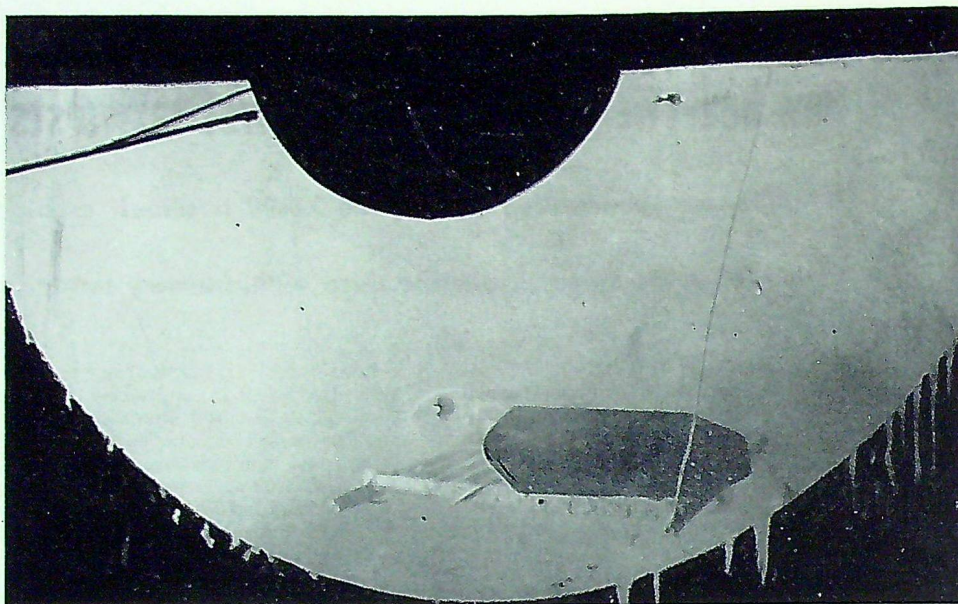
By war's end, the whole problem had been pretty well licked. But with the advent of jet planes flying at sonic and supersonic speeds and with rocket engine and guided missile experimentation reaching an advanced stage, a whole new set of problems were introduced. And the Air Materiel Command's Equipment Laboratory is throwing all its resources into finding the answers to questions like these: Will the effect of cosmic rays, which can detour spark gaps, force us to throw our intricate aircraft electrical systems out the window and come up with something new?



*Engineer puts sample of sand from Saipan in strainer for careful analysis. Stack of pans at right centre contain samples of soil from India, China, Cairo, and other far-off countries. Atmospheric study is being expanded at Wright.*

Can the effects of oven-like temperatures (500 degrees Fahrenheit and up), which are believed to exist above 100,000 feet be counteracted sufficiently to permit the possibility of man-carrying rocket ships? Will ambient heat, the result of skin friction on plane surfaces at supersonic speeds, warp or melt metallic covered wings or make cabins too hot to live in, and, if so, what type of cooling system can counteract such heat? How long can a spinning turbine shaft last under the abrasive conditions of a dust storm? Will the humidity and jungle rot of tropical climates necessitate new maintenance techniques for jet and rocket planes? These are only some of the questions which must be answered.

Extremes in temperature continue to be the



*This is a cockpit view of a man-made dust storm whipped up in Wright Field laboratories to study sand-papering effect on various types of plane finishes. This may be a Sahara "storm." One from Mojave may come five minutes later.*

most widespread cause of mechanical trouble which continue to plague Air Force planes based in arctic or tropical climes.

For this reason, a huge icebox, capable of housing an entire plane, has been set up at the laboratory. As one of the engineers put it: "We can study more accurately, with precision instrumentation, the effects of cold climates on engines and other equipment inside this huge frigidorium than we could by actually running the engines and using other equipment in Alaska, Greenland or other frigid locales."

The temperature inside the chamber is about 60 degrees below zero, colder than any temperature you might expect to find at any airport in the world. A two-engined trainer with wings clipped to fit the limited space sits there with its engines turning over. Two test pilots are running things from the cockpit while a galaxy of instruments, which you couldn't put up in the sky, record every

throb of the engines like an electro-cardiograph measuring a heartbeat. Other gadgets measure the BTUs (British Thermal Units) of cabin heaters and a unique counter registers the energy and stroke pressure of a windshield wiper fighting newly formed ice.

Behind the thick glass windows, the man who controls conditions inside the chamber turns "thumbs down" indicating that he will drop the temperature still lower. At 85 degrees below zero, the engines roar on, never missing a beat, but the pilot signals distress. His cabin heater had failed which meant that tomorrow further tests would have to be undertaken on it and certain new modifications tried out.

And so the never-ending struggle against the elements goes on. This is a frontier which will never be completely pushed back, because new speeds and new altitudes means a new set of problems for the scientists to solve.



# "Asymmetric" Symmetry

*Which introduces an article the purpose of which is to put the matter of asymmetric flying in its right proportions. For over five years E.F.S. has been advocating a policy whereby a pilot at the training stage is made not only conversant with the principles involved in asymmetric flying but also is given opportunities to put them to the practical test. Both from a review of recent accidents and from the outlook prevailing at certain units visited by the Examining Wing, it is evident, however, that the general attitude in the Service towards this question is still not wholly satisfactory.*

*(Reprinted by courtesy of "Air Clues")*

BASICALLY THE RESPONSIBILITY for a positive attitude towards asymmetric flying lies with instructors or training officers, supported by air staffs; a responsibility that is not always conscientiously assumed as the recent loss of a large aircraft testifies. This loss can be attributed directly to a negative attitude at training units through which the pilot concerned had passed, coupled with his failure to appreciate the problems of asymmetric flight; a failure which in turn might well be traced to an individual instructor. As far as instructors are concerned, thorough briefing—before and after flight—is indispensable to a convincing air demonstration, and can be really adequate only if they are fully acquainted with their subject. Here again the Examining Wing's experience proves that, all too often, not enough emphasis is laid on the importance of briefing and that, in fact, a percentage of instructors, training officers, and staff pilots are ignorant of such fundamentals as critical and safety speeds.

## **Psychological considerations**

However, as mentioned earlier, the responsibility for a positive attitude towards asymmetric flying is not one the instructor must shoulder alone; even if he is on top of his job, he needs to be backed up by an air staff policy. High standards in training can never be attained by negative methods. Thus, if demonstration of feathered landings is prohibited, no amount of "sales talk" will convince the average pupil that there is not some danger in practising them. Quite apart from the fact that only one power-setting on the dead engine gives a true representation of feathered conditions, what is the psychological effect on the pupil who sees the dead engine windmilling?

Difficult to assess, perhaps, but it must to some extent promote the wrong mental approach in the pupil, and ultimately lead to moments of desperation if and when he has to tackle a feathered landing in reality. Then, too, if instructors are allowed to give no more than one demonstration of a feathered landing there is the danger of the pupil regarding the whole business as a "bit of a trick." Nor will he be persuaded otherwise until he is given an opportunity to try it for himself.

## **The goal**

Ultimately the R.A.F. will become an all-weather air force and we must anticipate the day when asymmetric landings in bad weather will be accepted as part of flying routine. It is suggested that the number of pilots today who can contemplate such a development with equanimity is not very large, if only for the reason that so many pilots have still a vague or meagre knowledge of the problems involved.

Various articles and publications have set out the basic principles of asymmetric flying, and it is intended here to refer to some of the more important aspects of the subject, in the hope of guiding those pilots whose ideas are still confused.

## **Critical speed a variable figure**

By far the best approach to the problem of flying on asymmetric power is to follow the same procedures as if the aircraft was under full power. This is a proper and safe step so long as the rules are understood and followed. The first aspect—in fact, the "be all and end all"—of the matter is the need for a complete understanding of the meaning and scope of critical speed, which can be simply defined as: "That speed below which the aircraft

cannot be kept directionally straight with rudder.” But there are a great number of critical speeds, each governed by such factors as power, height, load, weather, condition of the failed engine(s), which engine has failed, and finally, but by no means least, the pilot. Critical speed is, therefore, an individual affair; it is likely to vary largely between two pilots in identical conditions. However, there is always a highest critical speed and it is this speed which every pilot must know. It is a condition which exists when an aircraft has maximum power (full boost and max. revs.) on one side, with the failed engine(s) windmilling at maximum revs. on the other, e.g., engine failure on take-off. All pilots, consequently, should test their own particular ability to master their aircraft under all conditions of asymmetric flight.

### One safety speed only

At this point it might be as well to refer to safety speed. The main difference between safety speed and critical speed is that, as we have shown above, the latter being an individual affair is therefore a variable figure; whereas, on the other hand, there is one safety speed only for a given aircraft and it is always quoted in *Pilot's Notes*. It can be defined as: “That speed at which the average service pilot can continue to maintain directional control with rudder under the worst possible conditions.” The safety speed given in *Pilot's Notes* provides for a safety margin and is quoted for the worst engine; hence the importance of attaining safety speed as soon as possible after take-off.

### Top needle in the centre

It was earlier pointed out that an aircraft on asymmetric power should be treated in the same way as if it were under full power. In fact, most manoeuvres which can be executed with full power can also be made on asymmetric power, provided that the top needle of the turn and slip indicator can be kept central. It must be realized that when the point is reached that the top needle can no longer be held central, speed has dropped below critical speed and, in instrument flight, this will

be the first indication that critical speed has been reached.

### Wrong to vary circuit procedure

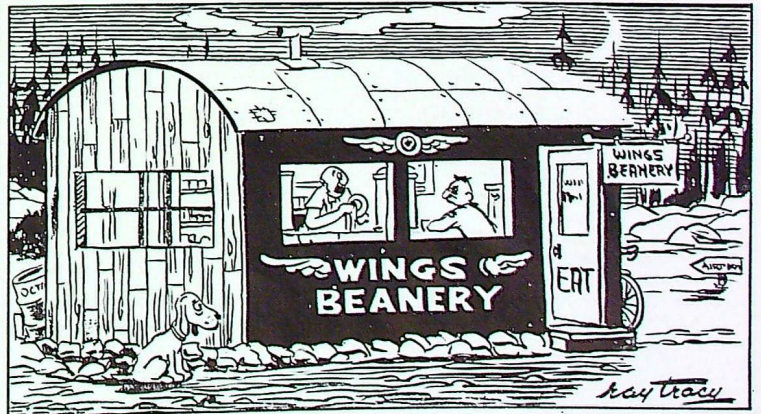
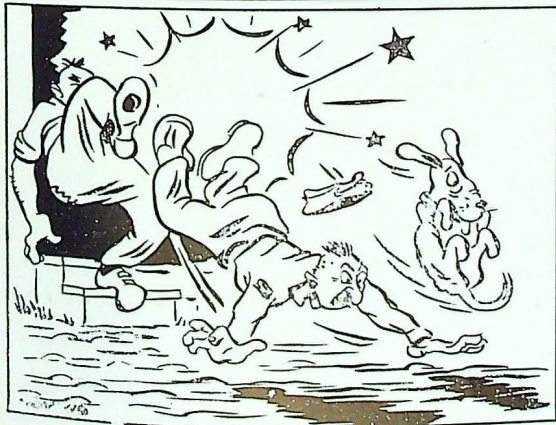
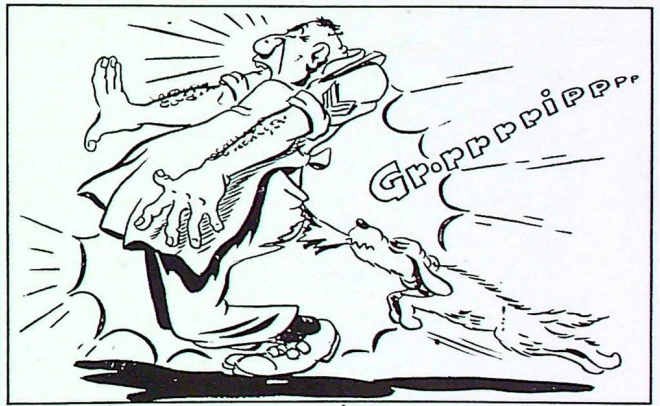
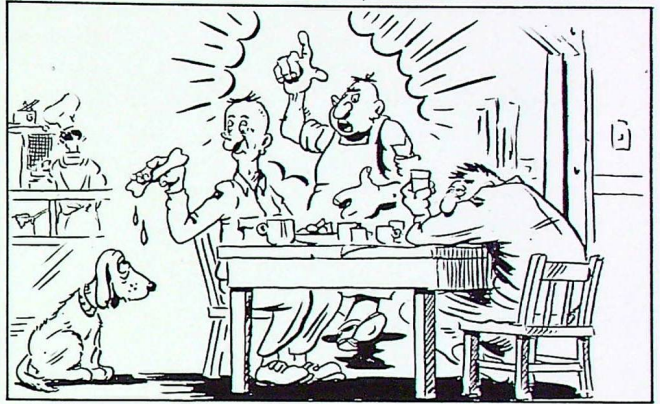
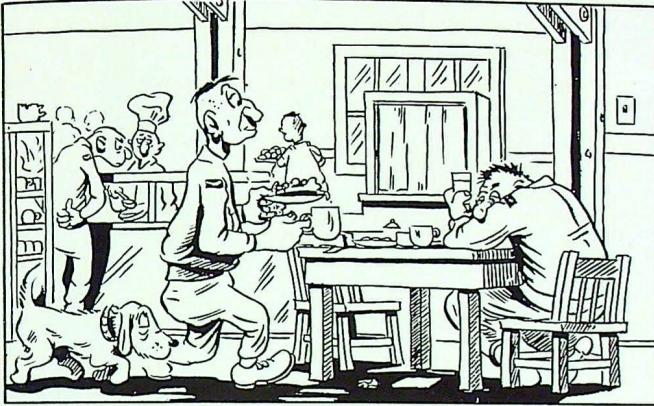
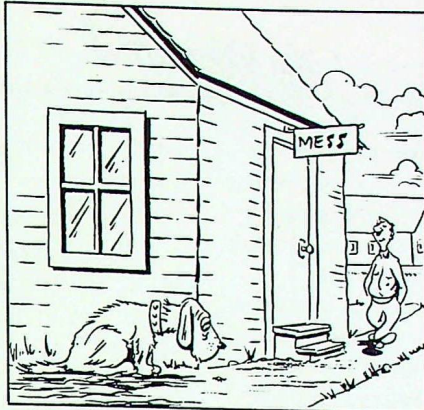
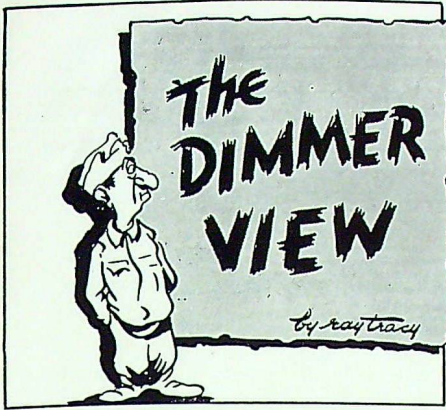
Another point of interest to most pilots. What of the asymmetric circuit, landing, and overshoot? Again the rule is—follow the normal procedure. Varying the circuit procedure can lead only to unnecessary anxieties; a pilot is far better placed to judge an approach and landing if it is attempted normally rather than abnormally. Furthermore, it will be generally agreed that the easiest approach to judge is the normal powered one in which, by judicious use of the throttles, a pilot should be able to position his aircraft at the correct height and airspeed over the end of the runway. This latter condition is more difficult to fulfil after a glide approach. Is it not better, then, to use the easier engine-assisted method?

### Overshoot—and a moral

There are aircraft on which an overshoot can be made from ground-level on asymmetric power, with undercarriage and flaps fully down. But, as a general rule, the decision to overshoot should be taken early on the final approach—if full flap has been lowered no attempt should be made to go round again—when the aircraft is at 600/800 feet, at which stage only partial flap should have been selected. And, if it is decided to overshoot, it is better to dive slightly so that speed will build up and enable directional control to be maintained at full power. The moral here is that it is obviously far better to be at 50 feet in a position to climb away safely under full control, than at 500 feet in an uncontrolled yaw, descending earthwards with ever-increasing rapidity.

### Encouragement and practice

Our aim is that every pilot should be capable of asymmetric flying in all weathers: our training must therefore lay emphasis on asymmetric flight to the limits of our aircraft's performance. This entails giving the individual pilot every encouragement and opportunity to practise such flying under varying conditions, and constantly checking him to ensure that his knowledge of the subject is both comprehensive and sound.





## FRIEND OF THE FAMILY

Sgt. R. W. Barton and friends at Coral Harbour, N.W.T. Sgt. Barton, who joined the R.C.A.F. on the 14th Sept. 1939, served with Nos. 58 and 405 Squadrons overseas, where he completed a tour of operations. After the war, he became a Mobile Equipment Technician. He is now about half-way through a two-year posting in the Far North.

★

## LETTERS TO THE EDITOR

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The Forgotten C.M.U.'s

Sir:

I have just finished reading Part X of "Northern Skytrails" and also your article on "R.C.A.F. Station, Whitehorse" in the August issue of "The Roundel." I enjoyed them very much—but now what about a story on how Stations such as Whitehorse, Snag, Watson Lake, Fort Nelson, etc., were built?

A very great deal of the work on these Stations, and on numerous other Stations off the West Coast, was done by the Construction and Maintenance Units of the R.C.A.F.

I served as an electrician at No. 9 C.M.U., with headquarters in Vancouver. While with this Unit, I worked at Dawson Creek, Fort St. John, Beatton River, Fort Nelson, Watson Lake, Whitehorse, and Snag. These Stations were heaven compared with the ones off the West Coast, such as Marble Island, Spider Island, Langara Island, Cape Scott, Bella Bella, Alliford Bay, and Sandspit.

We erected buildings, built bridges and runways, set up power lines, and on one occasion even blasted a fifteen-mile road through rocky terrain. We worked sometimes for ten hours a day, seven days a week, and we were in isolated spots for more than a year without any contact with the outer world.

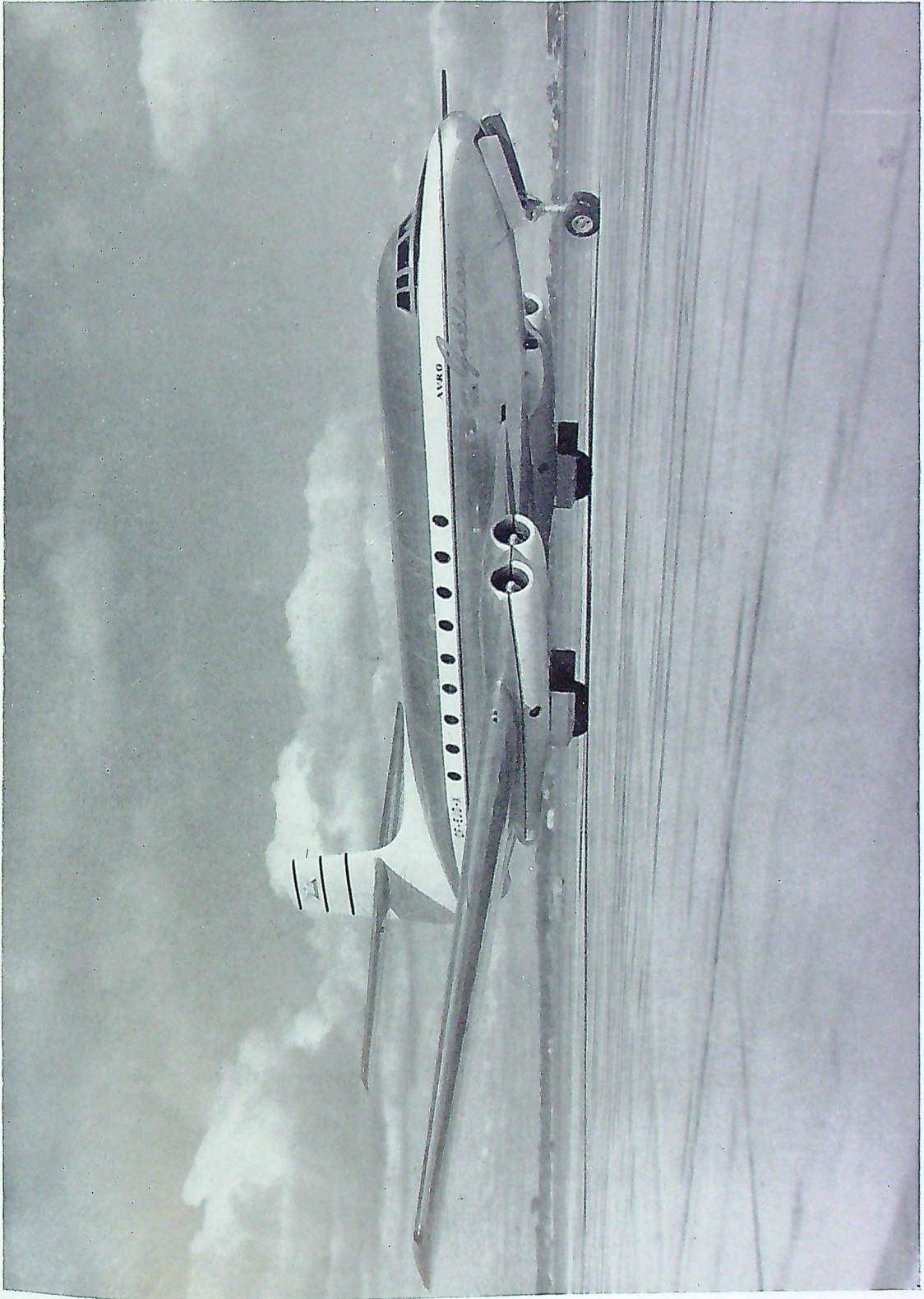
Since perhaps ninety percent of the R.C.A.F. has never heard of the C.M.U.'s, a story on them might be of considerable general interest.

R. G. Lipsey (R.C.A.F.A.),  
Shalalth, B.C.

(A good thought, Mr. Lipsey. We'll see what can be done about it.—Editor)

### Answers to "What's the Score?"

- |         |         |         |         |
|---------|---------|---------|---------|
| 1: (b)  | 2: (c)  | 3: (a)  | 4: (b)  |
| 5: (d)  | 6: (d)  | 7: (a)  | 8: (c)  |
| 9: (d)  | 10: (b) | 11: (b) | 12: (a) |
| 13: (c) | 14: (d) | 15: (b) | 16: (d) |
| 17: (c) | 18: (b) | 19: (d) | 20: (a) |



THE AVRO "JETLINER"

Courtesy A. V. Roe Canada Ltd.

*The*  
CROWDEL