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CAA WORK ON INSTRUMENT LANDING SYSTEM AND GCA RADAR

WASHINGTON, D.C. -- Instrument landing systems are now being installed by the Civil Aeronautics Administration at 81 airports throughout the country, 31 of them for the Army. In the next fiscal year an additional 31 systems will be installed for civil use.

These are the familiar three-element systems developed by the Civil Aeronautics Administration before the war and adopted as standard by the Army which gave them the military designation of GS-51.

While this system is being installed for early use, the CAA continues development work both on its own system and the radar "Ground Controlled Approach" system, also used by the Army and Navy during the war. Of the two systems, the CAA's system warrants national installation, and the GCA still requires further consideration and development.

The CAA system consists of a localizer, glide path and marker beacons. Thousands of completely blind landings have been made on this system by hundreds of different pilots. At historic College Park Airport near

FUGUA AND MARKS JOIN STAFF

The Office of Safety Regulation is very happy to welcome Mr. Frank H. Fugua and Mr. Clark L. Marks to its staff. Mr. Fugua is an Air Carrier Inspector (Radio) assigned to the Aircraft and Components Division, and has just transferred to the Eighth Region from the New York office.

Mr. Marks is our Service Representative assigned to the same division. He has recently returned to the service after having been on active duty in the Navy as a Radio Technician.

Washington, hundreds of landings have been made with the wheels of the plane touching each time within a space 100 feet square, with the pilot landing "under the hood" by instrument alone.

Further development of this system is planned at Indianapolis to produce completely automatic landings of airliners in bad weather. To do this, the automatic pilot, with which many transport airplanes are equipped, is connected to the instrument which receives the sig-

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NORWAY --
June 27, 1946

Well, nothing much to do these days but sit and wait. Things look pretty good at old FM with the CAA preparing to take over the Army air-ground circuit. The CAA has been operating and changing frequencies on it and the Canadians taking over the Schedule Able teletype. The CAA has been operating and changing the circuit number on it. So you see we stand on the shining threshold of procedure changes just as the shadows of learning the old ones are disappearing on the horizon. Seems like some foolosopher once said something about change being the only thing of permanence in this best of all possible worlds. So be it.

Looks like our new CAC, Gullej, ought to be right at home at FM when and if. New arrivals include Jerry and Norm Laurich, WB from Montana. With the exception of Accom Roy Nelson, the complete operational staff of the CAA and part of the WB are Baa-State fugitives.

Mike Werlein of the 3 and Mtic George Sargent have recently returned to the glitter of the big town for a short review of civilization on the annual leave route, but they're glad to be back, of course. Other less fortunate mortals have been content to make short, sweet trips up and down the highway, returning with many beautiful, toothsome grayling.

The new arrival list also includes Melk Gene Lundstrom, formerly of TW, who sports a nice shiny new Ford coach (woil, almost new). Gene is now fixing up an apartment in Dormitory Quarters (former Army dispensary) and liking it fine, in anticipation of the Mrs., who'll probably want to change it all around anyhow.

For diversion we had 70 visitors McMorrey, Hammarsley, and Knight, who had much efficiency in mind and couldn't be coaxed to sample of our club or stream life. However, think we made a pretty good impression in a strictly non-business way, and they'll probably come back some day, we hope.

It is with real regret that we announce the resignation of Mildred Moriarty, Secretary to the Superintendent of the Communications Branch. Mrs. Moriarty, affectionately known as "Milly", came into our employ April 4, 1942 as clerk-stenographer in the Mechanical Maintenance Unit at the time Mr. J. C. Lee was the Unit Chief. Since that time Milly has served in the combined maintenance units and was transferred to the office of the Chief of the Signals Branch, assuming the position of Branch Secretary on July 1, 1945. Milly's services have been "well done" during the war years of busy hours and responsibilities. We of the Communications Branch wish Milly well in her future undertakings and will long remember her "Irish" smile and congenial attitude.

Some swimming has been going on lately, but with the much-needed-for precipitation obliging our gardens, it isn't always necessary to go to the pool. Oh yes, the gardens are coming along fine. We anticipate christening the road to the range site the "Farmers' Loop" (not original). That should be some ceremony, with Cliff Aahl, biggest farmer (hi hi), wielding the axe to clear the peas and string bean plants from the entry to the lettuce, celery, tomato, cucumber, radish, beet, and carrot patches.

Planning a big picnic and brawxxx ball for July 14th, with guests of honor, appropriately enough, our British friends from NQ (Snag) over in Yukon Territory. Always international doings at FM, it seems. The picnic will be at the swimming hole; Jupiter Pluvius notwithstanding, and then the romantics will congregate in the club to finish off with dancing, etc.

We anticipate having more new arrivals to announce next issue. Gullej and Family should be around by then, and Gene. Note Lundstrom's carp Smokky is participating again. We had 40 cars. His car is still in the garage, waiting for more or less essential parts like crankshafts. That guy saves more gas than anyone else we know.

It ain't beautiful, but it's brief. See you all again, and keep the pot coming.

YAKATAGA
April 30, 1946

There seems to be a great bustle of activity around ZZ these days. Everyone is busy putting in gardens, and some nice ones, too. Rumor has it that Betty Banta is stealing a march on the rest by aiding the growth of her tomato plants with a sun ray lamp. More power to you, Betty.

Then others are busy fixing up an old cabin down the beach, far enough away from the station that you can't hear dit da dit da dit etc. The cabin will be used (if we get it finished) as a base for hunting and fishing operations, also as a general all-round rest camp on our days off (just turn those words over slowly -- days off -- ah me). Aren't these 40 hour weeks wonderful?

A surprise costume party was held a week ago Sunday night in the utility building, and some really cute characters turned up, believe it or not. A good time was had by everyone. Social life in general has been limited mostly to informal get-togethers, cards, and gossip sessions. Most of the communicators have been too busy studying, testing and practicing, if you know what I mean.

June 1, 1946

Headline in our news is the arrival of ASCOM Erwin Brown and wife Jo from Seattle. With them welcomed into our midst and initiated in the life at Yakataga, we can settle down to awaiting the arrival of summer.

Most exciting activity around these parts at present is trying to rush the hooligan run up the rivers. Some of the boys have had some mighty cold baptisms in the rivers, pursuing the few that have come up so far. To date the champion fisherman is Harve Dailey with a catch of 72.

Our bear population is still far up in the hinterland, but the coyotes are frequently in evidence. CAC Thomas took a nice shot at one the other day and mowed him down.

We now feel that we are right up there with those who have all the conveniences of civilization. Reason: The Post Office Department has authorized two mail trips

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CAA UNVEILS FIRST RADAR-EQUIPPED
TOWER FOR CIVIL USE

INDIANAPOLIS, May 24 -- The first radar-equipped control tower for civilian flying was unveiled at the Indianapolis Airport today by the Civil Aeronautics Administration.

Built by the CAA Technical Development Service on the roof of its Experimental Station, the tower was given its initial demonstration before members of the Aviation Writers Association, now holding their annual convention here.

The tower employs a console screen, constructed by the CAA after many experiments with military versions of radar equipment, to give the controller a "plan-picture" of all aircraft within 30 miles of the airport.

The picture appears on a cathode ray tube screen, 12 inches in diameter, and from it the regular control tower operator safely and speedily can schedule departure and approach of aircraft without being hampered by poor visibility.

The radar screen and other tower improvements will be service-tested for several months in the handling of traffic at the Indianapolis airport, and on the basis of this experience, the CAA will be in a position to determine what plans for installation at key airports throughout the country should be undertaken.

In its present stage, the screen gives distance and direction information on all planes in a 30 mile radius, and has no "blind spots." Development of equipment for determining altitude and identity of the aircraft will be carried out by CAA in the new tower.

The basic radar equipment which supplies signals to the tower screen is known as the Navy "SG". It was built by the Raytheon Company and modified at Indianapolis under direction of Raytheon engineers to include many late improvements developed for the Navy. Among these are the Moving Target Indication, which allows only moving aircraft to appear on the screen, eliminating disturbing "ground clutter" from reflection of waves by nearby objects. Another change is installation of an improved search antenna, which rotates on top of a 65 foot steel tower. This permits the

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Our Man of the Month is a real sourdough. Al Horning's background is filled with the adventure and color of the Alaska of dogteam days as well as the Alaska of the airplane. The son of a couple who had landed on the beach at Nome in 1900 and had spent several years freighting and mining in the vicinity of Council and Bluff City, Al Horning came to Alaska in 1910, when he was only four years old. He had lived in Iditarod and in Knik for several years when his family moved to the newly-founded town of Anchorage in 1917.

Al graduated from the local high school in 1923 and from the University of Washington in 1928, with a degree in Mechanical Engineering. He spent his summers working in the Willow Creek mines in order to put himself through school.

In September 1929 he graduated from the Hancock College of Aeronautics in Santa Maria, California, where he remained as an instructor until May 1932. He then returned to Alaska to aid his parents in setting up operations at the Gold Cord Mine, which is still owned by the family. Once the mine was in production, Al reverted to his main interest, and joined the McGee Airways in 1934. He stayed with that organization and its successor, the Star Airlines (the present Alaska Airlines), and earned a reputation as a pilot of outstanding ability, especially with float planes.

Horning became an Airways Flight Inspector for the CAA in 1940, and served throughout the early days of the CAA in Alaska, when the small group of technicians were working night and day to fund the airways that were so urgently needed. Many of the most entertaining anecdotes in the CAA's Alaska story concern Al and his experiences with W-26 (the "Buck"), Fairchild NC 99, the old Seabee NC 9, the Cessnas and the Beechcrafts.

Late in 1945, Horning took over the job of Chief of the ANF Planning and Control Staff. But he still likes to leave his work occasionally to add a few hours to the nearly 4000 already listed in his log book.

Horning married Louise Shannon in 1936. They and their five-year-old daughter Susan live at 718 Sixth Avenue.

The Air Navigation Facilities Inspection Staff has gained a new Airways Flight Inspector in Charles F. Wayer, formerly a major in the Army Air Forces. At one time an Airways Engineer in the Radio Establishment Unit of this region, Wayer has spent most of his time during the past four years flying between Elmendorf and Attu with the 54th Troop Carrier Squadron.

Jim Hurst observed the long Fourth of July weekend by flying NR 254, the famous Terror, to Walnut Ridge, Arkansas, to be scrapped. He is to return to Anchorage in a few days with a new C-47 to be used in connection with maintenance work down the Chain. Chris M. Lample, Director of the Air Navigation Facilities Service, is expected to arrive with Hurst in the new plane for an inspection of Alaskan facilities.

The Norseman, NC 99, has been put on floats for the summer months. Fuzz Rogers will be flying it extensively in survey work related to the VHF construction program.

RADAR-EQUIPPED CONTROL TOWER

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CAA operator to "see" airplanes at high elevation above the station as well as those at horizontal distances.

The console has been built by CAA so that the screen can be connected to any one of several kinds of search radar equipment. Normally, of course, only one would be provided, but in this experimental tower, actual operating data must be obtained on all types.

In addition to the expected increase of speed and safety for airport traffic, the tower radar has the advantage of requiring no new equipment on the airplane itself.

Anchorage. Al's main hobby is amateur radio. He doesn't mind trading a little practical joke now and then, either.

Horning's common sense and thorough knowledge of different phases of aviation and of the CAA have brought him to his present position of responsibility and leadership. His record makes a neat package indeed. Nice going, Al.

Dear Mukluk Telegraph:

You don't know me, but I have long been an admirer of yours. I am writing you now because I know you will help right a wrong -- well, not exactly a wrong, but perhaps an omission which for the sake of justice -- well, anyway, here is the story.

You are aware that we had a tidal wave here at Kodiak April first (April Fool's Day). At least, according to the papers we had a tidal wave scare, and thereby hangs the tale. I shall now quote part of my diary. To make matters clear, let me explain that we, that is the wife and I, work from four till midnight and live at the west end of Woody Island, which is about twenty minutes by car from the control station. It so happens that by the time we get home, cook some food, eat, wash the dishes, feed the dog, read, talk a little, etc., it is about 3:30 or 4:00 a.m. before we hit the hay, and we get up accordingly. And now the diary:

Heard someone banging on our door, went to open it, and there was Boyd. He said, "You better pack your things; there is a tidal wave coming this way and we got to move everybody from this end of the island to the other side."

"Well," I thought, "April Fool's Day, and why the heck did he have to wake me up so early!" But it was no use going back to sleep, so I took a bath and made coffee and we had a leisurely breakfast.

Then Ralph came around and said, "You better pack your things. Tidal wave is headed this way and we got to move everybody off this end of the island to the other side."

"Well!" I thought, only this time out loud, "Sure, sure, April Fool."

He said, "If you don't believe me, turn on your radio." And sure enough there was WVOQ broadcasting all about the tidal wave.

We packed everything, including our furniture, on the truck and took it up to the other side of the island. By then it was time to go on watch. Things were pretty exciting at the station. Reports were coming in about the tidal wave's hitting Honolulu and San Francisco

and about Scotch Cap lighthouse and Dutch Harbor, and all the stuff had to be sent over to three different addresses at the base. Finally came the report we had been waiting for. The tidal wave was due to reach Kodiak in ten minutes.

It is now a matter of record how this message was broadcast to the people in Kodiak and how they all took to the hills. But here is the point I want to make. Not one of the men and women who man this station left his post. They stuck to their jobs in the face of danger or even death; they continued to copy weather sequences, send out OP's, P's, even R's and D's. They showed a heroism which is the more remarkable because nobody seemed to be aware of being heroic.

Slowly the hands of the clocks move -- five minutes, four minutes, three minutes, one minute, thirty seconds, twenty seconds, ten seconds, five seconds. We all take a deep breath. The water starts coming in under the door. It starts to rise -- up to our ankles, up to our knees -- it covers the Boehme tapes, the Kleinschmidt punchers, the teletypes. Still the operators continue to copy weather, to send traffic, to man the air-ground channels. The water is up to our mouths now, up to our eyes, over our heads. Nobody moves, nobody cries out.

To make a long story short, the work of the station went on as usual; never a sequence missed, all entries made as scheduled, all BT's punched as per B Manual. Not a single irregularity report was received by any operator for April first. Life went on as usual. The water continued to rise and sireps that we were under 75 feet of water when it reached its peak. We all felt light, and instead of walking, just floated from position to position. Gradually we became adjusted to this underwater existence. We grew gills, fins and fishtails and looked just like a bunch of mermaids and mermen. The only casualty was the blonde who came out of it a brunette.

The water didn't subside for weeks and weeks. I have proof of this. A few days ago the CIMO called for a fire drill. There is an old shack here which is an eyesore and which has been sur-

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INSTRUMENT LANDING SYSTEM
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nals of the transmitters on the ground, and planes have been brought safely down to 10 or 25 feet above the runway time and time again.

The three elements give the pilot indications in the cockpit and he flies the airplane by observing a cross-pointer instrument. The localizer is a wedge-shaped signal sent out about 15 miles from the airport. The pilot flies down the center of this wedge and any variation to either side is indicated on the vertical needle of the cross-pointer.

One other bit of information is given him by marker beacons, placed at intervals along the approach path. These are fan-shaped radio signals sent up at right angles to his path, through which he flies. As he passes through a marker beacon signal, it lights a bulb on his instrument panel. Those bulbs are of different color and they inform him that he is five or three miles from the end of the runway, or right over the end of the runway.

The glide path is a sloping signal which the pilot encounters three miles from the airport and which leads him down to the surface at an angle of about three degrees. If he gets above or below this path, the horizontal needle on the instrument warns him. Thus, when he flies the plane so that the vertical and horizontal needles cross at right angles in the center of the instrument, he knows he is on the right course toward the centerline of the runway and on the right path coming down to the surface. The glide path was a parabolic curve which gave the airplane the proper flare as it neared the surface.

There were differences of opinion as to the merits of a curved glide path versus a straight path. The first straight path to be made practical was produced by Don Stuart, now Director, Technical Development Service, W. E. Jackson, now Chief, Radio Division of that Service, and Henry I. Metz, now Chief of the Experimental Station. With this path, plus the localizer, -- a relatively easy problem, and the marker beacons, also easy to produce, the engineers had something to offer the airline pilots which they could use and of which they approved. All these signals are transmitted on Very High Frequencies.

Thus all indications for landing are in the cockpit and the pilot is in complete charge of his plane. In actual practice, a pilot would have his co-pilot fly in by instruments, while he watched for the first good view of the ground, at which time, he would signal the co-pilot, take over the controls and make the actual contact with the ground visually. It is rare that the weather is so bad that the ground cannot be seen from 25 to 50 feet.

The radar system, GCA, consists of radar screens on the ground on which the plane is visible as a dot of light. One of the operators on the ground, through VHF radio, "talks" the pilot through his landing. Lines on the screen enable him to direct the pilot to the right or left or up or down, and thus keep him on a safe path of approach to his landing. No receiving equipment for the radar system is required in the plane, but good ground to air communication with the plane is essential.

At Indianapolis two radar developments are progressing side by side. The Army, using a C-54 four-engined plane and a multitude of different pilots, is making comparative tests of the CAA system and GCA. The CAA, using GCA equipment given it by the Army and Navy, is making tests, using airplanes of several kinds and sizes.

A practical difficulty with radar at present is the necessity for crews on the ground to operate it. During the war the Army frequently used a crew of 16 men with each installation. Commercial manufacturers of the equipment say that crews of five men would be adequate, and they hope to be able to reduce this to a crew of two. This would involve a large increase in CAA personnel at airports if this type of radar were adapted to actual use now.

For keeping crews familiar with instrument landing, any system used will have to be kept in operation in good as well as bad or potentially bad weather. This will enable a pilot to make practice instrument approaches and landings even in "contact" weather. Thus four crews of two men each, to take the smallest estimate, would be required at each radar installation, to maintain continuous operation on the basis of eight-hour shifts and a 40-hour week. At 100 sta-

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tions, this would involve 800 or more additional skilled airways workers for instrument landing alone. In addition, GCA in its present stage requires a great deal of maintenance.

In contrast, the CAA system is automatic in operation. The man who maintains radio equipment around an airport can service the CAA equipment, and it is left turned on all the time, in good weather or bad.

Even during the war there were those who called for abandonment of the CAA's VHF system and immediate adoption of the radar system for civil use. However, the flying industry and the flying public are the bosses, indirectly, of the CAA. Anything presented for use along the airways must be acceptable to the pilots who use it, and it must contribute to the safety of the flying public. Airline pilots, through their association, the airlines, through their organization, Air Transport Association, and the airlines' mutual radio organization, Aeronautical Radio, now called Airinc, are agreed that radar should not be adopted without further study of its practicability and usefulness to air transportation. Pilots of American Airlines have been emphatic in urging the CAA not to run off after some new and promising development and leave them without a more immediate instrument landing solution.

Commercial airlines are more interested in improving regularity of service than in any other subject except safety.

Despite this, the CAA has received no request from any airlines for placing any instrument landing system in full operation for passenger planes. One airline has asked permission to use the localizer element of the systems installed along their route, (and this is permissible because pilots have been doing it for some time). Another airline has asked that its all-cargo planes be allowed to operate on lower weather minimums than its passenger planes, which would involve instrument landings in some cases.

As soon as the CAA system is completed at Chicago, the CAA wants cargo planes to begin using it for landings. This will give much more experience on which to base eventual agreement between the

a month for Yakataga, beginning this month of June. We have been wondering if we can stand the excitement of two mail days; one mail day a month used to get us so excited it took us a couple of weeks to get over it.

Everyone has been busy these last few weeks trying to break sod in the virgin soil and plant a garden. Come to the fair along about August and see the harvest -- might be interesting. Strawberries hereabouts are in full bloom and it looks like there will be a good crop. Any visitors we can lure in here will be treated to some luscious shortcakes come July. Any bidders?

IN THE MAIL BAG
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voyed, so he decided to use it for a fire drill. But would it burn? It would not! How could it, under 75 feet of water? It is only since the day before yesterday that we know definitely that the water is gone. Our utility building burned up (or down, I don't know which is correct) very successfully. Now everybody is shaving off his gills, getting rid of his fins and tails, and looking altogether like new. Glub, glub.

Yours,
Woody Island Willie

P. S. What I mean, dear Muktel, is -- couldn't you get us the Congressional Medal or something? WTW

KCAA V KCDW NRC/O RZIG T KIZY KYWQ A
KCDW CCCCCZ KCAA8 GRNC

KCAA8 NUM 000. ALCAA8. IN THE NEAR FUTURE CENO IN THIS REGION WILL BE DISCONTINUED AND ITS PERSONNEL WILL BE ASSIGNED TO FIELD STNS IN ORDER TO ALLEVIATE THE SHORTAGE OF SKILLED OPTRS. IT IS ANTICIPATED THAT WITH CENO PERSONNEL ON WATCH CENTRAL MONITORING WILL BECOME SUPERFLUOUS DUE TO LACK OF IREGTYS. BIGEAD

pilots, the airline officials and the CAA to allow its use when passengers are aboard.

-- Office of Aviation Information
May 24, 1946



I don't know about the rest of you popes, but I'm tired. Oh-my achin' back!

MISS CHAMBERLIN

MR. WHITTAKER'S SECRETARY - - - -
AFTER 'BUDGETING; REORGANIZATION, AND EFFICIENCY RATINGS -
A TYPICAL CAF 4 - - - - AFTER!

ELG LOW