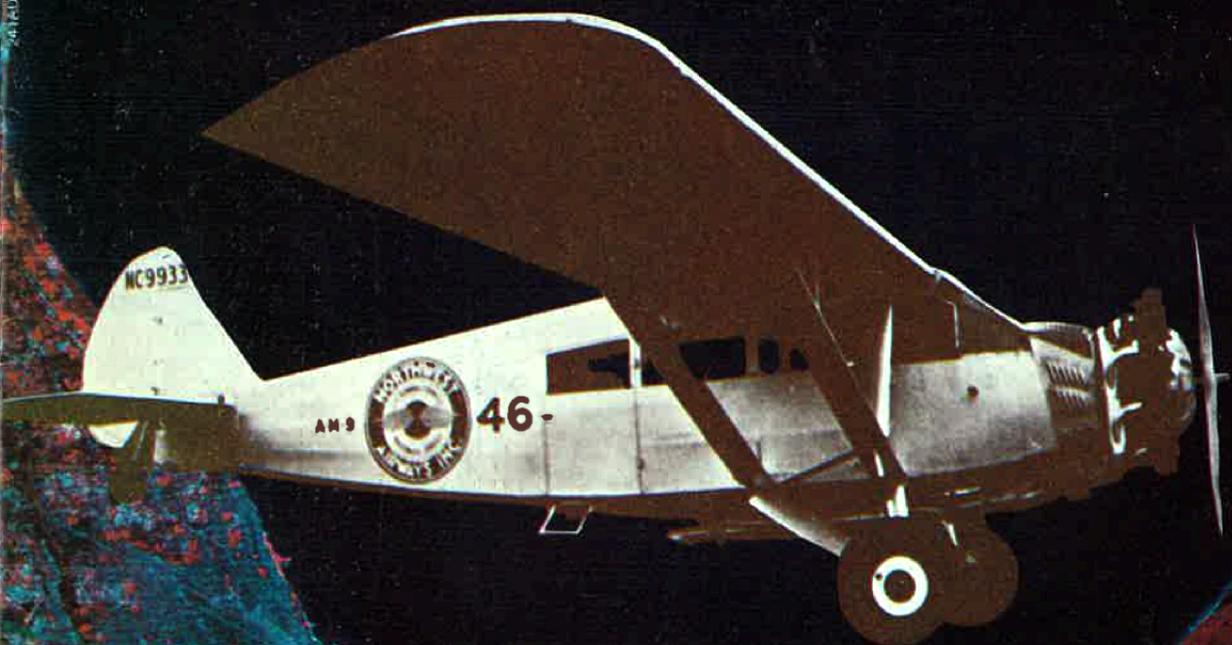


**9 / 76**  
VOLUME 7 NUMBER 9

**PASSAGES**  
THE MAGAZINE OF NORTHWEST ORIENT AIRLINES



## **NWA'S GOLDEN ANNIVERSARY ISSUE**

A look back  
and a look down  
to inspire  
a look ahead.



Oh I have slipped the surly bonds of earth  
And danced the skies on laughter-silvered wings;  
Sunward I've climbed, and joined the tumbling mirth  
Of sun-split clouds – and done a hundred things  
You have not dreamed of.... *John Gillespie Magee, Jr.*

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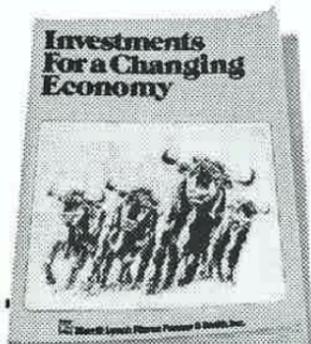
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THE MAGAZINE OF NORTHWEST ORIENT, SEPTEMBER 1976, VOLUME 7 NUMBER 9



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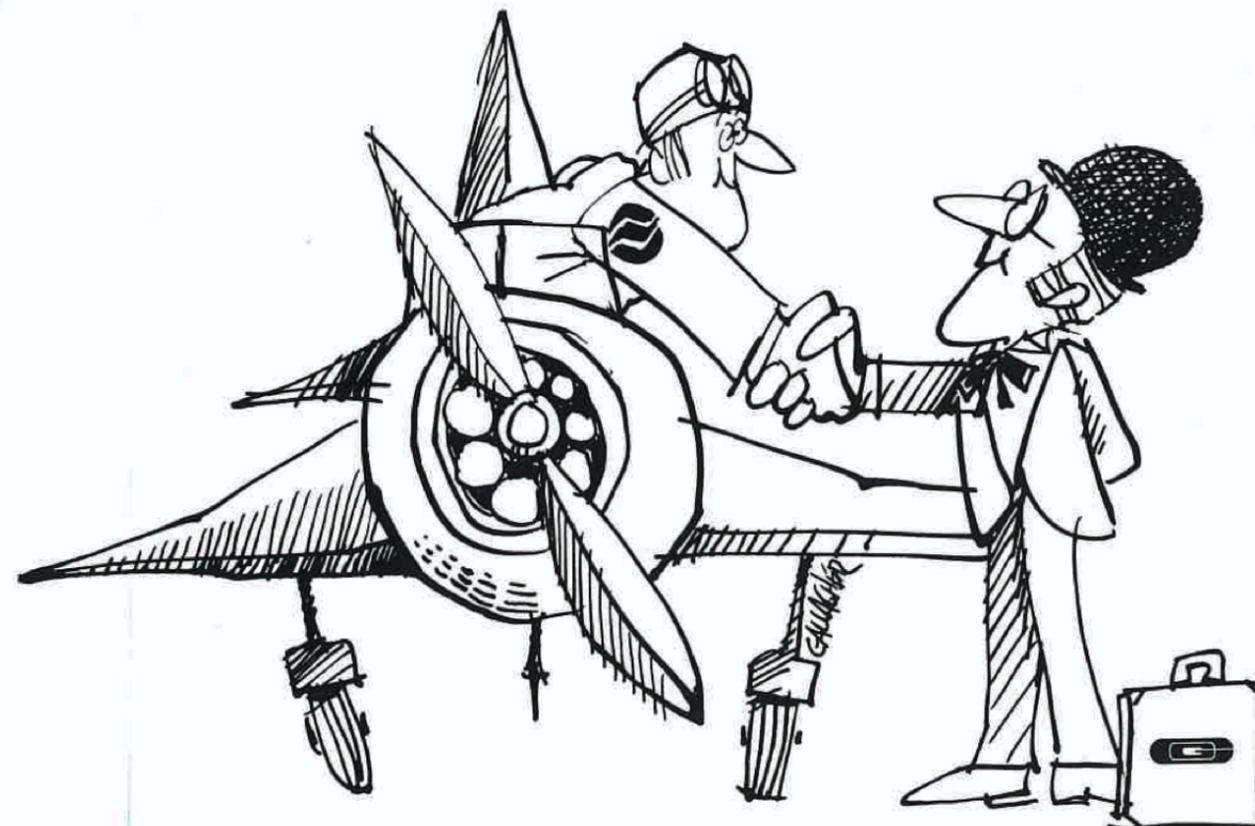
# HAPPY 50th to NORTHWEST ORIENT AIRLINES!

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## PASSAGE POINTS

by Suzanne DeVito



### The Winner Is...

In the June issue of *Passages*, we invited readers to enter our Early Aviation Photo Contest. We asked for photographs of planes in service between 1925 and 1935, preferably with people in the picture, and an anecdote about the photo. The winner's prize? Fifty dollars and your photo and story in this Northwest Orient Anniversary issue.

And the winner is . . . Harold J. Ryan, a consulting engineer living on Long Island.

Mr. Ryan sent us the actual pages from his photo album, the pictures being too rare and full of memories to risk removing them. We would have liked to print them all, but with space for only one, chose the one above taken in 1925. Mr. Ryan, in flying gear, is standing beside a Curtiss "Jenny." The "Jennys" (JN-4D planes) were World War I trainers. Thousands of them had been completed too late for the war and in the 20s could be had for as little as \$300. Millions of Americans had their first taste of flying in these sturdy little planes. Barnstormers, who held their aging planes together with ingenuity and baling wire, would swoop down over a town to attract the folks, land in any open meadow and then try to entice the leary customers up for a joy ride. "Step right up, folks. Nothing to be afraid of. Just \$5 for the thrill of your life. Something to tell your grandchildren."

In 1925, Mr. Ryan was a young engineering student at MIT with a yearning to fly. Here's his story.

"My first flight, February 14, 1925.

The plane is a 'Jenny,' really a flying box kite, a spruce frame covered with canvas, the canvas then painted to shrink it to fit the frame. The 'Jenny' was a favorite among the stuntmen of that era. Its normal flying speed was only 80 mph (top speed, 100 mph in a dive), so there wasn't much wind resistance. You could wave a big hello to a passing plane with no trouble.

"It was an open cockpit plane, hence the heavily fleece-lined winter flying suit, including lined helmet, gloves and boots.

"We took off from a cinder strip in a field in East Boston which is now part of Logan Airport. After climbing to approximately 3,000 feet, I was introduced to a 'loop' (a swooping dive), a 'volplane' (descending in large circles to deaccelerate for a slower landing speed), and a 'tailspin' (engine stalls and plane goes into a out-of-control spinning dive because of a too steep climb).

"We climbed again and then dove at the main stack of an ocean liner in the harbor. For a moment, I thought I'd end up in its engine room. Once again at a safe altitude, the instructor signaled me to take the 'stick.' I will never forget the thrill I had of controlling that plane, somewhat erratically, to be sure, for the next ten minutes before he again took control and brought us down on the bumpy cinder strip. That brought to an end my exciting introduction to the freedom of flight."

Thank you, Mr. Ryan, for sharing a bit of that era with us. continued on page 6

BANKERS TRUST COMPANY

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continued from page 4

### America's Founding Women

In a letter to her husband John in 1776, Abigail Adams gently encourages him to "remember the ladies" when he helps draw up the nation's new code of laws. Even though the founding fathers did not change the laws to give equal recognition to female citizens, the American woman was still able to play an active part in the revolutionary era.

"Remember the Ladies," in Pilgrim Hall in Plymouth, Mass., is the first major exhibition to explore the role of women in American history from 1750 to 1815. The documents, artifacts, objects and paintings on display give a well-rounded view of American women from all social levels and lifestyles: as mothers, as artists, as slaves, as politicians and as soldiers.

On view through Sept. 26, "Remember the Ladies" has such highlights as portraits by John Singleton Copley, Gilbert Stuart and John Durand, an extensive selection of fine needlework and period costumes, two ball gowns belonging to Dolly Madison and a collection of letters by Abigail Adams.

We can thank Philip Morris Inc. and Clairol for this outstanding exhibition which will be making stops through June, 1977 in Atlanta, Washington, D.C., Chicago, Austin and New York.

### Yahoo!

by Dorrine Anderson

Cowboys aren't a thing of the past. North Dakota is living proof that the excitement of rodeos with saddle bronc, bareback, bullriding, calf roping, steer wrestling, barrel racing, goat tying, team roping and wild horse racing still exists. Roughriders come from West Germany, Japan and all around the horse-loving world to watch or take part in the United Tribes Days. This year's sixth annual event will stir up the dust on September 10, 11, and 12 in Bismarck, North Dakota and will feature colorfully dressed Indians, cowboys and Indian cowboys.

A wild, rough, fun-packed program will also feature the traditional Indian dancing and singing contest with prizes totaling at least \$7,780. A Plains Indian Art Show will be set up at the Kirkwood Plaza Mall nearby. It's a great family outing, with low admission rates, campgrounds and good water available on the site. One free meal will be served between 4-6 P.M.

### Real Goodness From You Know Who

On July 11, Jimmy Carter threw a big bash for 5,000 delegates at Pier 88 in New York City. That's a lot of box lunches. The sound of crunching could be heard for miles. Why? All 5,000 were biting into that finger-lickin' good Kentucky Fried Chicken. We all know from TV Commercials that KFC is just the thing for tired Moms and for Dads whose spouses are busy writing theses for their Ph.D.'s. But a little known fact is that KFC is into catering in a big way - from intimate dinners for two to a banquet for 15,000, from children's bowling birthday parties to a wedding on a San Francisco beach. Call the Colonel's helpers at your local Kentucky Fried Chicken restaurant.

### The World's Great Masters Come To Canada

"If one were to make a list of the world's 100 best works of art, at least 30 of the works in this exhibition would be on that list," boasts the curator of the Winnipeg Art Gallery. The priceless exhibition, entitled "Master Paintings From The Hermitage and State Russian Museum, Leningrad," is stirring even the most conservative of art lovers.

The gallery is the only institution in Western Canada to display an exhibition of rare masterpieces which range from two 16th century pieces to a magnificent group of 17th and 18th century paintings of various European schools, and concludes with six 19th and 20th century French works. Among the most famous of these masterpieces are such artists as: Rembrandt, Rubens, Picasso and Matisse. On view at the Winnipeg Art Gallery through September 26, 1976.

### Reading and Riding

Have you been driving along on a sunny day, wearing nonprescription sunglasses to cut down the glare, and then had to grope frantically for your eyeglasses so that you could read the map spread out on your lap? Here's help for reading-glasses-only travelers.

Alfred Poll Opticians in New York City makes non-prescription sunglasses with a tiny reading bifocal on the bottom part so that a driver can peer at maps through the lower part of the sunglasses, but then look back up at the road through just the tinted glass. Write or call Mr. Poll at 40 W. 55th St., N.Y., N.Y., 10019, (212) CI 6-4452.

### Black Artists in Perspective

The amazing artistic output of the black people in America over a two hundred year period will be shown through the works of 63 artists in "Two Centuries of Black American Art" at the Los Angeles County Museum of Art.

The sum of the exhibit of 200 works - paintings, sculpture, drawings, graphics, crafts and decorative arts by renowned, anonymous and newly discovered black artists - will be an overall rendering of the black artist's view of 200 years of change and growth in America. The many facets of black artistic development will be shown through folk and classical art, imaginative and realistic, ethnic and universal, by such artists as: Jules Lion, Selma Burke, Joshua Johnston, Aaron Douglas and Lois M. Jones.

Professor David Driskell, organizer of the exhibition, says, "This presentation should serve to counteract the widely held belief that all black art is either 'primitive' or 'socially relevant' and will add up to a group contribution which is not narrowly ethnic or eccentric, but deeply and solidly American."

This major Bicentennial event was made possible through grants from the National Endowment for the Humanities and Philip Morris Incorporated. From Los Angeles, where the exhibit can be seen from Sept. 30 to Nov. 21, the collection will travel to Atlanta, Dallas and New York.

### The Best From India

After the huge success of the First India Trade Fair in 1975, 150 of India's biggest manufacturers are coming back for seconds. They'll exhibit their best products at the Second India Trade Fair at the New York Coliseum, October 10-14, and then move west to the Los Angeles Convention Center, October 24-28.

Visitors can pick and choose from a huge variety of fine Indian products - precision industrial machinery, electronic equipment, sporting goods, sewing machines and delicately wrought handicrafts.

The Fair is sponsored by the Trade Development Authority of India (TDA). Information about the Fair may be obtained by writing TDA of India, 666 Fifth Ave., N.Y., N.Y. 10019.

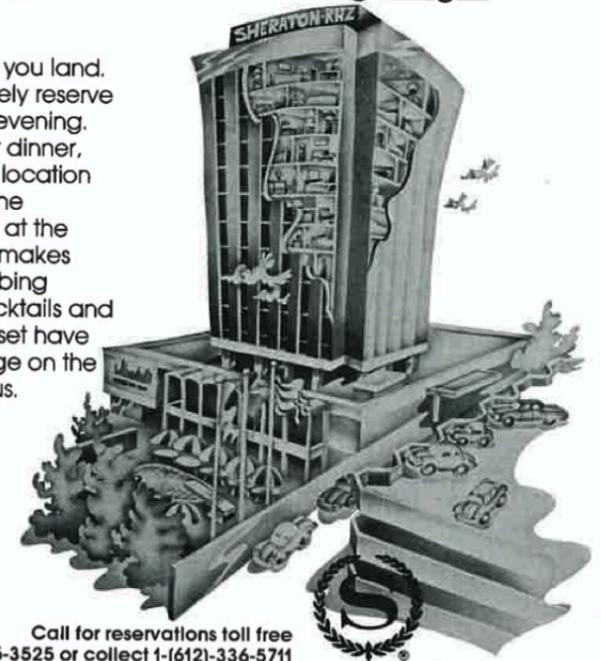
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24, followed by "The Trial of the  
Moke," by Daniel Stein, which chron-  
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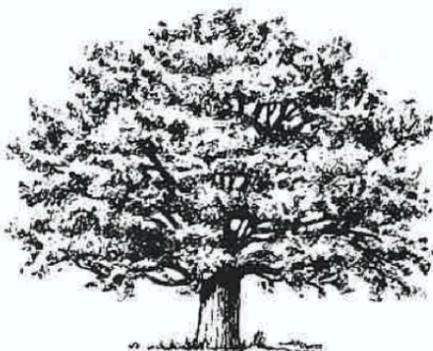
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discuss independence.*



*The pine tree shilling.  
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*America's first  
flags bore trees as  
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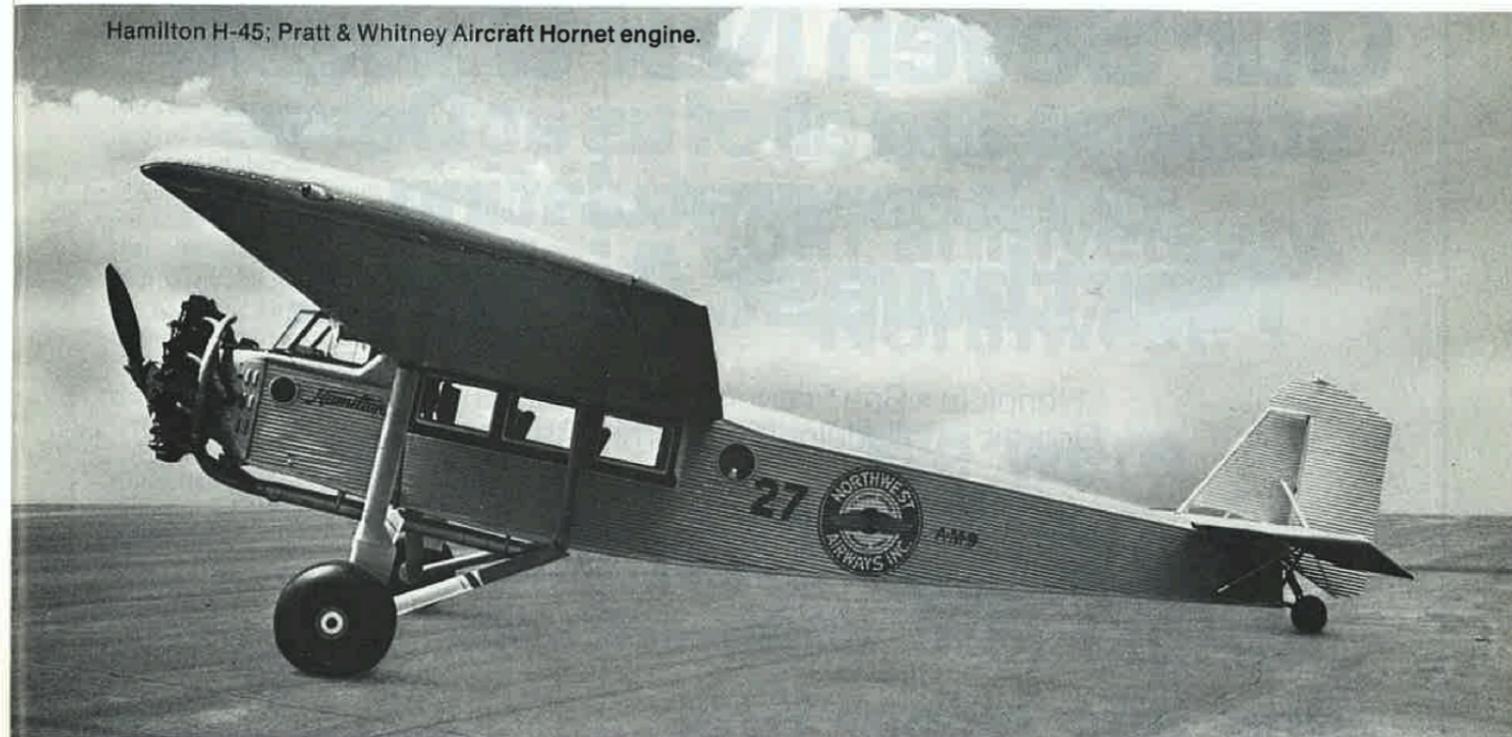
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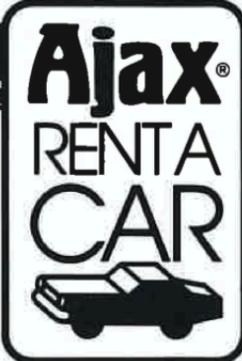
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continued from page 8

#### Northwest Notes

The 13th annual National Arts and Antiques Festival at the Seventh Regiment Armory, Park Ave., and 67th St. in New York, October 9-17, is THE antique event of the year.

Kyoto in the fall is a kaleidoscope of color. The flaming autumn colors on Mount Kiei are an eye-filling backdrop for the richly costumed participants in the Processions of the Eras, the highlight of the Jidai Matsuri Festival, this year on October 22.

Also in Japan, for those who didn't get their fill of Olympic feats, the 31st National Amateur Games, Japan's own Olympics, are held in Saga City on Kyushu, Japan's southernmost island. The dates are September 19-22 and October 24-29. Kyushu can be reached by plane and express train from Tokyo.

The Mid-autumn Festival in Hong Kong, Sept. 8 this year, will find thousands of revelers munching the traditional moon-cakes filled with delicious ground lotus and sesame seeds. Don't miss this colorful holiday in the Crown Colony.

Marin County in California celebrates the grape during the 77th Annual Grape Festival on October 2 in the Marin Center complex designed by Frank Lloyd Wright. Free entertainment, games for children, homemade goodies to eat on the spot or take home are part of the fun.

The screams heard from Busch Garden's The Dark Continent in Tampa, Florida are not from hapless visitors being eaten alive. They are coming from passengers on two new rides, "The Python," a roller-coaster-type thriller, and the "Monstrous Mamba." The admission charge (adults, \$6, children 4-11, \$5) gets you into and onto all the rides, shows and other attractions.

Art Nouveau was a movement in the late 19th and early 20th centuries that broke with the old traditions in architecture and interior decoration. "Art Nouveau in France and Belgium: 1880-1910," at the Art Institute of Chicago, through October 31, is an excellent overview of this important movement.

"Star-Spangled History," a collection of 65 drawings by the late 19th century illustrator will be at the California Mus. of Science and Industry in Los Angeles until Sept. 19. This traveling exhibit is funded by the American National Ins. Co. of Galveston, Texas. □

# Happy 50th anniversary, Northwest.

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# LEWIS BRITTIN AND HIS FLYING MACHINES

*It seems like light years away from inflight movies and tinkling ice cubes.*

by Ken Ruble

The mayor of St. Paul lost his nerve at the last minute, so the urgent question of the day on that hot, sultry July afternoon was: Who in the band of well-wishers would replace the mayor as the first ticketed passenger of Northwest Airways on its nine-month-old air mail run to Chicago?

The date was July 5, 1927—only 23½ years since the Wright Brothers first achieved man's age-old dream to fly and just a few weeks after Lindbergh had soloed the Atlantic. The place was Wold-Chamberlain Field, an old automobile raceway-turned-airport on the southern borders of Minneapolis and St. Paul.

Perspiration beaded the forehead of Colonel Lewis I. Brittin, "father" of the infant air service known today as Northwest Orient Airlines.

His tall, scholarly appearance — heightened by a pair of rimless "granny" glasses and a gray Homburg perched squarely on his head — concealed a restless, dynamic drive that had surmounted one obstacle after another to place Minnesota's Twin Cities on the slowly growing U.S. air map.

Col. Brittin spotted Byron G. Webster, a young St. Paul businessman, in the small crowd that had gathered to cheer the beginning of Northwest's passenger service.

"Come on, Byron," urged the Colonel, "let me write you the number one ticket on Northwest Airways."

Webster didn't need persuading. He had followed this man's spirited leadership just a few months earlier in a drive that had pushed through a \$295,000 bond issue to build an airport near downtown St. Paul.

Brittin wrote the ticket, and lanky Charlie Holman, at 28 already a legend known to an adoring public as "Speed" (a nickname he disliked), boosted Webster into a black-bodied, golden-winged biplane known as the Stinson "Detroit." This was the nation's first closed cockpit plane to be operated by a commercial airline. Then Holman hoisted his 6-foot 5½-inch frame in and settled into the pilot's seat of the three-passenger craft.

Andy Hufford, chief engine mechanic and "a

genius of the tool bench," slouched forward from the crowd and gave the propeller a preliminary spin. "Contact!" yelled Holman.

The roaring engine drowned out the cheers from the small audience as Holman taxied to the sod runway, "revved up" and vaulted into the steamy Minnesota atmosphere at 2 p.m., exactly on schedule.

Closed cabin or not, Holman wore the same helmet and goggles that were his trademark whether he was flying the mail, winning major races in an open cockpit plane against the nation's leading aviators, or thrilling audiences with his famous stunt flying exhibitions. He had originally won national prominence at 24 when he defeated the country's best in a stunt flying contest at the Pulitzer races in St. Louis.

Holman's aerial gymnastics thrilled Colonel Brittin. He appreciated the publicity Speed's exploits gave his fledgling airline, but worried about his number one pilot, who also doubled as operations manager (all for \$75 a week).

As they gained altitude, Holman tapped Webster on the shoulder and pointed down at the Mississippi river snaking its way through the Twin Cities. Webster nodded, since the "Detroit's" clattering pistons made conversation an impossibility.

"We followed the Mississippi downriver," Webster recalled later, "and at its junction with the St. Croix river near the Wisconsin state line, the engine suddenly went deader than a smelt."

The unflappable Holman calmly scanned the countryside and then expertly floated the silent plane into a small field for a perfect three-point landing.

"He gave me that sleepy grin of his," Webster remembers, "hauled out a tool kit and started working on the engine. Pretty soon he was satisfied he had repaired the problem, but the field was too small to take off from unless the load could be lightened."

Holman walked to the nearest farm house, telephoned Colonel Brittin, and the two men waited for a Northwest truck from St. Paul, about 35



1920's pilot's uniform



1927 Stinson "Detroit"



1928 Hamilton "metal plane"



Amelia Earhart deplaning



miles away. While Webster and the mail sacks were being trucked back to the Twin Cities, Holman bounced the plane into the air and flew back to Wold-Chamberlain field. He was waiting when Webster alighted from the truck, and grinned: "Shall we try 'er again?"

Once again mail sacks were put aboard, and he and Webster took off. This time their audience had dwindled to a few Northwest employees.

First stop: LaCrosse, Wis., about 120 miles downriver from the Twin Cities. A welcoming committee had been standing by for three hours, through a thunderstorm that drenched the crowd and turned the airfield into a mass of goopy mud.

Holman gentled the "Detroit" onto the field, and the soggy welcomers conducted a brief ceremony in honor of the occasion. Then the drenching rain returned and everyone scattered.

Next stop: Madison. It was dark now, and Wisconsin's capital city delegation, pelted by a heavy downpour from the same weather front that had soaked LaCrosse, had sensibly gone home. Holman added another mail sack to his cargo, phoned ahead from the airport office to check the weather in Milwaukee. It was bad, so they sent out for food and waited for a break.

Soon after the takeoff for Milwaukee, another thunderstorm tossed the little plane about. Holman's impromptu lunch tumbled to the floor in a mess as the "Detroit" bucked and pitched along, far below its 85 MPH cruising speed.

At midnight, in total darkness, Speed set the Detroit down smoothly on the Milwaukee landing strip. ("He must've had cat eyes," says Webster.) In those days, "lights out" time was seldom later than 9 p.m. Night flights were a rarity.

The mayor and his welcomers had given up and gone to bed long before, but an eager, rain-soaked reporter, Robert H. Wills of the *Milwaukee Journal*, was there to record the arrival of Northwest's first official passenger. By then, Holman and Webster had developed a comradeship that required few words. Holman asked Webster, "You game to try Chicago?"

"Why not?" laughed Webster. "I don't think we could get a date at this hour of the night, anyway."

In clearing skies, the two took off from Milwaukee, and the first commercial passenger flight between the Twin Cities and Chicago became history at 2:30 a.m., July 6, 1927. The 370 zig-zag miles had taken 12½ hours, plus a lot of faith, courage and skill.

Today the same flight is a comfortable hour in one of Northwest's ultra-modern wide-bodied jets, but that 12½-hour odyssey helped to set the stage for a 50-year battle against odds to create one of today's major international airlines — seventh largest in the U.S. and first in several categories that are more important than size.

Air mail was the name of the game in the early years of United States commercial aviation. Passenger service, by itself, simply did not pay.

World War I speeded up the development of both planes and pilots. Shortly before the 20s, the Post Office Department answered a growing

demand for faster mail service by launching an experimental air route between Washington and New York. By September 8, 1920, the project had inched along until Post Office planes were flying one coast-to-coast route that connected New York, Chicago and San Francisco.

But not without a price. Crashes and skin-of-the-teeth escapes were commonplace.

As a young Air Corps reservist, Charles A. Lindbergh parachuted to safety four times while flying the mail. Many others were not so lucky. (Lucky Lindy didn't even wear a chute on his history-making Atlantic crossing May 20 and 21, 1927. He packed five sandwiches and a quart of water, but eliminated both his parachute and radio so the "Spirit of St. Louis" could carry more gasoline.)

Among the Post Office feeder lines flown in 1920 with left-over World War I planes was one between Minneapolis-St. Paul and Chicago, with no beacons, no radio and plenty of weather. In nine months, four pilots were killed and eight planes destroyed. The line was discontinued.

Even the feeder from New York to the nation's capital was dropped. While the Post Office continued flying its lone transcontinental route, the speed-minded public of that era complained that progress was woefully slow.

In Congress, there was a growing sentiment to "take government out of business." The Contract Air Mail Act of 1925 was a major step, providing a plan of competitive bidding to establish air mail service through private enterprise instead of the Post Office. And the Air Commerce Act of 1926, signed by President Coolidge on May 20 (exactly one year before Lindbergh's famous flight), gave clout to the 1925 law by directing Secretary of Commerce Herbert Hoover to establish airways, organize air navigation, conduct research, license pilots and aircraft, and promote safety by investigating causes of accidents.

Only days after Coolidge signed the Air Commerce Act, a well-to-do Chicago seed dealer and aviation enthusiast named Charles "Pop" Dickinson filed a bid at \$2.75 a pound to resume the Twin Cities-Chicago air mail route that had been abandoned by the Post Office six years earlier. The news was hailed ecstatically by the press. Business and civic officials supported a move to collect several thousand letters for the initial flight.

But Pop Dickinson's luck changed. The enthusiastic press coverage of June had turned sour by July. Even the Minneapolis postmaster charged that the public was "paying 10¢ for 2¢ service."

Dickinson's contract with the government had a 45-day escape clause, so he reluctantly filed notice that he was going out of business October 1, 1926.

One of the first persons he told was his good friend, Colonel Brittin. He knew the colonel, who was director of industrial development for the St. Paul Association (predecessor of the Chamber of Commerce), was vitally interested in aviation as a key to future growth of the Twin Cities.

The colonel left for the East that same day and called on two different aviation firms, urging

them to bid for Dickinson's expiring contract. They laughed at him. One official sneered: "There's no future in serving Minneapolis-St. Paul."

Newspaper headlines that September reported: "Air Mail Service Ends October 1." But Lewis Brittin was a fighter.

By then, the colonel had lost nearly two weeks in the futile hunt for a going airline to assume Dickinson's route, so he had only 31 days left before the October 1st deadline.

He had no money, no planes, no pilots, no tools, no air mail contract and no personnel except Lewis I. Brittin. But friends he did have, and in one monumental session persuaded 29 of them from Detroit to form Northwest Airways, Inc., with \$300,000 in capital stock. Using two rented open cockpit biplanes while awaiting delivery on its first Stinson "Detroiters," the infant airline opened for business October 1, 1926.

Northwest's new air mail flights captured scant news space at first. That was the year that Gertrude Ederle swam the English Channel, Bobby Jones won the U.S. Open golf championship, Admiral Byrd flew over the North Pole and "Scarface Al" Capone shot up the streets of Chicago.

It was the "Roaring Twenties"; the great War was "over, over there," and America was ready for some fun. Millionaire sheiks in balloon trousers and bone-thin flappers danced the Charleston; college kids competed in goldfish-swallowing contests and sang ditties like "Baby Face" and "Crazy Over Horses."

In those opening months of 1926, the staff of Northwest Airways totaled 11 (versus more than 11,000 today), and one of them was "Rosie."

"Rosie" Stein was loved by everyone, including the newspaper reporters who had nicknamed her. (Her real name was Camille.) No matter how tough things were going, she always answered their query: "How are things?" by smiling: "Everything's rosy."

She had been Colonel Brittin's secretary at the St. Paul Association, and she moved with him to the little operations office in which the young airline set up business at Wold-Chamberlain Field, near a barny 80x100-foot hangar.

Rosie did anything that needed doing. She tended a coal fire in the pot-bellied stove that kept the operations shack warm on chilly days, answered the phone, sold tickets, took deposits (when there were any) to the bank, bought engine parts, chased an occasional stray cow off the landing field and if a passenger was weathered in, she'd fix him a lunch over the coal stove, clean off the colonel's desk and invite the passenger to sit down.

Later, Rosie was hailed as the first woman airline officer in the United States when she was elected assistant secretary and a director of the company.

Dave Behncke, the first pilot hired by the new operations manager, Speed Holman, reminisced years later: "During the winter months we flew part of the route to Chicago almost completely after dark. There were no emergency fields and no radio — no aids of any kind except one revol-

ving beacon on the Milwaukee airport hangar. When bad weather trapped me at night, I circled a farm house and the farmer would come out with the family car, light up the field with his headlights, and down I'd come."

Charlie Holman's personal fortunes improved in the fall of 1927 when he was granted time off to enter the National Air Derby, a grueling cross-country race from New York City to Spokane, Washington.

By the time the nation's top pilots (including such luminaries as Jimmy Doolittle) had reached the Twin Cities, Holman was running second, but he had cut his deficit to 16 minutes by the time he reached Butte, Montana. Always the competitor, Speed decided to shoot for the \$10,000 first prize by leaving the best known route through the Rockies to gamble on finding a shortcut that would pick up those precious 16 minutes. He careened into Spokane, winning by 19 seconds over his one-time teacher and good friend, Eddie Ballough.

Despite Holman and Byron Webster's storm-tossed first flight, which had opened Northwest's passenger service on July 5 that same year, 106 adventurers flew the Twin Cities-Chicago route before the young airline suspended its first year's passenger travel for the winter. Those 106 persons wouldn't fill one of Northwest's "small" jets of today, the 727-200, nor half a load for the wide-bodied DC10s, nor a third of a load for the big 747s.

Mal Freeburg, one of Northwest's early pilots, sometimes flew in his BVD's to keep cool on hot summer nights while flying the mail in an open cockpit Waco. He was following the Burlington tracks on his way to Chicago one night in 1930 when he saw a flaming railroad trestle over the Chippewa River in Wisconsin.

Mal knew the railroad schedules by heart. In a matter of minutes, the Burlington Blackhawk was due to cross that trestle.

He shoved the throttle forward and raced toward the oncoming train, banked off to one side when he saw its headlight, and dived repeatedly at the engine cab, landing lights blinking wildly. The engineer decided this was just another hot-shot pilot showing off, and made no move until Freeburg desperately dropped several emergency landing flares.

Squealing to a halt, the train stopped two blocks short of the burning trestle. One of the passengers saved by Freeburg's quick thinking was Bobby Jones, on his way to win the U.S. Open golf championship at Interlachen in Minneapolis, where he made the only "grand slam" in the history of golf.

And that, in the language of today's Bicentennial announcers, is "the way it was," a half century ago and what seems like light years away from in-flight movies, tinkling ice cubes and wall-to-wall comfort. □

*Ken Ruble, now a Florida-based freelance writer, is currently writing a book on the history of Northwest Orient Airlines.*



1928 Ford Tri-Motor



1930 Waco JTO



Charles "Speed" Holman



1931 Sikorsky



1937 Lockheed Sky Zephyr



1939 Douglas DC-3



1949 Boeing Stratocruiser



1955 Lockheed Constellation



1947 Martin 202



1973 Douglas DC-10



Northwest Orient symbol

# AUDIO PROGRAM #22

For your in-flight entertainment, Northwest's 747 international flights and some 747 and DC-10 domestic services include in-flight stereo entertainment featuring the following programs. On international and Hawaii flights, during which movies are shown, all airlines are required to make a small charge for headsets.

## 1 - 4 MOVIE

## 5 THE CLASSICS STEREO 1 HOUR

The following selections were programmed by London Records.

<b>Wagner</b>	RIENZI Overture	London CS 6858
	Zubin Mehta—The Los Angeles Philharmonic	
<b>Beethoven</b>	Piano Concerto No. 1	London CSA 2404
	Vladimir Ashkenazy—The Chicago Symphony—Sir Georg Solti	
<b>Tchaikovsky</b>	Selections from THE NUTCRACKER	London CS 6890
	Richard Bonyng—The National Philharmonic Orchestra	
	Pas de Deux	
	Trepak	
	Waltz of the Flowers	

## 6 ORIENT EXPRESSLY FOR YOU STEREO 1 HOUR

<b>The Dark Ducks</b>	Sado Okesa	Monitor MFS 458
	Kusatsu Yumomi—Uta Kuwana No Tonosama	
<b>Japanese Folk Melodies</b>	Oedo nihonbashi	Nonesuch H72020
	Kojo no tsuke	
<b>Toyohisa &amp; Shizuki</b>	Murasaki Kouta	Fiesta FLP 1457
	Meigetsu Akagiyama	
<b>Music of Japan Shinto Music</b>	Miko Kagura	Baren Reiter BM 30L2016
	Kiriake shinji	
	Yu-Kagura	
<b>Music from the Kabuki</b>	Interlude	Nonesuch H72012
<b>Japanese Temple Music</b>	Voice	Lyrichord LLST7117
	Zen Solo Chants by priests at Myoshinji Temple	
	a) Daishindarani	
	b) Prayer to Avalokitesvara	
<b>The Little Singers of Tokyo at Lincoln Center</b>	Echigo-Jishi	London Intn'l SW 99378
	Tōyānse	
	Kompira Fune-Fune	

## 7 PACIFIC ADVENTURE

<b>The Waikiki Beach Boys</b>	Tiger Shark	Fiesta FLPS1623
	Ray Charles Singers	Command RS845SD
	Werner Müller & His Orchestra	London SP44021
	Beyond the Reef	
	The Coconut Wireless	
	Blue Hawaii	
	Hawaiian War Chant	
	Moon of Manakoa	
<b>Charley Mauu &amp; Roche's Tahitians</b>	Himene No Te Tamai	Reio Tahiti RT 550
	Fare Niau	
	Tau Here	
	Sarawaki	
<b>The Waikiki Beach Boys</b>	Fiesta	FLPS 1623
<b>Alfred Apaka with The Hawaiian Village Serenaders</b>	Princess Poo-Poo-Ly Has Plenty Papaya	MCA 2 40007
	This Song of Love	
	The Magic Islands	
	Hei Parohiti	
	E Maru Rahi	
	Apai Pai	
<b>Alfred Newman &amp; Ken Darby</b>	Ports of Paradise	Capitol STA01447
	Farewell For Just A While	
	Isa Lei	
<b>Frank Chacksfield &amp; His Orchestra</b>	Hawaiian Wedding Song	London SP44087
<b>Ray Charles Singers</b>	Aloha Oe	Command RS845SD

## 7 JAZZ 2ND HOUR

<b>Miles Davis</b>	The Sorcerer	Columbia CS 9532
<b>Jimmy Smith</b>	The Creeper	MGM GAS 107
<b>Three Sounds</b>	Upper Four Hundred	Blue Note BST 84341
	Oscar Peterson & Clark Terry	Mercury SR60975
	Mack The Knife	
<b>Cannonball Adderly &amp; Sergio Mendes</b>	Clouds	Capitol ST2877
<b>Antonio Carlos Jobim</b>	The Red Blouse	A&M 3007
<b>Joe Pass</b>	Falling In Love With Love	Pacific Jazz 73
<b>Horace Silver</b>	The Preacher	Blue Note BST 84325
	Stanley Turrentine & Shirley Scott	Blue Note 84315
	Slowin' In The Wind	
	Perdido	Columbia CS 9629
	Everywhere	Pacific Jazz ST 20132
<b>Ray Charles</b>	Birth Of The Blues	Impulse A2

## 8 COMEDY 1ST HOUR

<b>Jimmy Walker</b>	The Apollo	Buddah BDS 5635
	The Great Black Myth	
	The Prince And The Public	

## 1ST HOUR

<b>Bob Newhart</b>	Abe Lincoln versus Madison Avenue	Warner Bros. W 1672
	Driving Instructor	
	King Kong	
<b>George Carlin</b>	Baseball—Football	Little David LD1008
	Good Sports	
	Flesh Colored Band-Aids	
	Radio Dial	
	Y'ever	
	Mental Hot Foots	
<b>Billy Cosby</b>	Bedroom Slippers	MCA 73139
	Sulphur Fumes	
	My Boy Scout Troop	MCA 169

## 8 CHILDREN'S ROOM 2ND HOUR

<b>The Electric Company with Mel Brooks, Rita Moreno, Lee Chamberlin, Victor Borge, Judy Graubart, Morgan Freeman, Skip Hinnant, Jimmy Boyd and Short Circus</b>	"D"	CTW 22052
	Punctuation	
	Jennifer Of The Jungle	
	The Clown Song	
	Be Kind To The Letter "S"	
<b>Tanya Tucker</b>	You've Got Me To Hold On To	MCA
<b>Barbara Mandrell</b>	That's What Friends Are For	ABC
<b>Tom T. Hall</b>	Faster Horses	Mercury
<b>Gene Watson</b>	You Could Know As Much About A Stranger	Capitol
<b>Olivia Newton-John</b>	Come On Over	MCA
<b>Mickey Gilley</b>	Don't The Girls All Get Prettier At Closing Time	Playboy
	Mr. Doodles	
<b>Donna Fargo</b>	You Are So Beautiful	Warner Bros.
<b>Ray Stevens</b>	Lone Star Beer And Bob Wills Music	Warner Bros.
<b>Red Steagall</b>	Another Woman	ABC
	Lonely Teardrops	
<b>T.G. Sheppard</b>	Red, White, and Blue	Melodyland ABC
<b>Narvel Felts</b>	Lust Affair	MCA
<b>Loretta Lynn</b>	Back In The Saddle Again	GRT
<b>Mel Street</b>	The Littlest Cowboy Rides Again	Columbia U.A.
<b>Sonny James</b>	Nothin' Takes The Place Of You	Capitol
<b>Ed Bruce</b>	If I Had It To Do All Over Again	ABC
<b>Asleep At The Wheel</b>	Sun Comin' Up	MCA
	Till I Can Make It On My Own	Columbia
<b>Roy Clark</b>	You Are The Song	Capitol
	I Couldn't Be Me Without You	Mercury
	All The Kings Horses	Columbia
<b>Nat Stuckey</b>	I Really Had A Ball Last Night	MCA
<b>Tammy Wynette</b>		Columbia
<b>Freddie Hart</b>		Capitol
<b>Johnny Rodriguez</b>		Mercury
<b>Lynn Anderson</b>		Columbia

## 9 COUNTRY IN THE AIR 2 HOURS

<b>Carmel Taylor</b>	I Really Had A Ball Last Night	Electra
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All items shown on these pages are available for sale in-flight on Northwest's international transpacific flights and on Northwest flights within the Orient. Please contact your cabin attendant for further details on these and other tax-free items.

# DUTY-FREE IN-FLIGHT SHOPPER

<b>Billie Jo Spears</b>	Your Picture In The Paper	U.A. Mercury
<b>Statler Brothers</b>	El Paso City	Columbia
<b>Larry Robbins</b>	Junk Food Junkie	Warner Bros.
<b>Elvis Presley</b>	Hurt	RCA
<b>Hank Williams, Jr.</b>	Stoned At The Jukebox	MGM
<b>Buck Owens</b>	The Battle Of New Orleans	Capitol
<b>Dr. Hook</b>	Broken Lady	Monument
<b>Terry Bradshaw</b>	T For Texas	Polydor
<b>Conway Twitty</b>	I'm So Lonesome I Could Cry	Mercury
<b>Dr. Hook</b>	After All The Good Is Gone	MCA
<b>Freddy Fender</b>	Only Sixteen	Capitol
<b>Troy Seals</b>	Wild Side Of Life	GRT
<b>Jean Sheperd</b>	Sweet Dreams	Columbia
<b>Willie Nelson</b>	Mercy	U.A.
<b>Emmylou Harris</b>	I'd Have To Be Crazy Together Again	Columbia
<b>Moe Bandy</b>	The Biggest Airport In The World	Reprise
	You've Got Me To Hold On To	MCA
<b>Tanya Tucker</b>	That's What Friends Are For	ABC
<b>Barbara Mandrell</b>	Faster Horses	Mercury
<b>Tom T. Hall</b>	You Could Know As Much About A Stranger	Capitol
<b>Gene Watson</b>	Come On Over	MCA
<b>Olivia Newton-John</b>	Don't The Girls All Get Prettier At Closing Time	Playboy
<b>Mickey Gilley</b>	Mr. Doodles	
<b>Donna Fargo</b>	You Are So Beautiful	Warner Bros.
<b>Ray Stevens</b>	Lone Star Beer And Bob Wills Music	Warner Bros.
<b>Red Steagall</b>	Another Woman	ABC
	Lonely Teardrops	
<b>T.G. Sheppard</b>	Red, White, and Blue	Melodyland ABC
<b>Narvel Felts</b>	Lust Affair	MCA
<b>Loretta Lynn</b>	Back In The Saddle Again	GRT
<b>Mel Street</b>	The Littlest Cowboy Rides Again	Columbia U.A.
<b>Sonny James</b>	Nothin' Takes The Place Of You	Capitol
<b>Ed Bruce</b>	If I Had It To Do All Over Again	ABC
<b>Asleep At The Wheel</b>	Sun Comin' Up	MCA
	Till I Can Make It On My Own	Columbia
<b>Roy Clark</b>	You Are The Song	Capitol
	I Couldn't Be Me Without You	Mercury
	All The Kings Horses	Columbia

<b>Nat Stuckey</b>	Honky Tonk Dreams	MCA
	America	
<b>10 YOUNG SOUND STEREO 1 HOUR</b>	Women Tonight	Warner Bros. BS2852
	Average White Band	Atlantic SD 7308
<b>Elton John</b>	Tell Me When The Whistle Blows	MCA 2142
<b>10cc</b>	Blackmail	Mercury SMR 1102
<b>James Taylor</b>	Fire And Rain	Warner Bros. 1843
<b>Orleans</b>	Tongue-Tied	ABC X 795
<b>The Eagles</b>	Too Many Hands	Asylum 7E 1039
<b>Phoebe Snow</b>	Poetry Man	Shelter SR 2109
<b>Bee Gees</b>	Fanny	RSD SO 4807
<b>Neil Young</b>	When You Dance I Can Really Love	Reprise 6383
	Living In The Past	Chrysalis 2TS210
<b>Jethro Tull</b>	Weep No More	SwanSong SS 8413
<b>Bad Company</b>	The Immigrant	MCA 463
<b>Neil Sedaka</b>	That's The Way I Like It	TK 603
<b>K.C. &amp; The Sunshine Band</b>	Chicago	Atlantic SD 7294
<b>Graham Nash</b>		
<b>10 "HAPPY BIRTHDAY AMERICA" A Bicentennial Salute To American Music</b>		
		2ND HOUR
		The following program was produced by Stan Martin of New York's WKTU Radio
<b>Joan Baez</b>	Jeannie With The Light Brown Hair	A&M SP 4527
<b>Mormon Tabernacle Choir</b>	Battle Hymn Of The Republic	Columbia 33015
<b>Knuckles O'Toole</b>	Stars & Stripes	ABCS 740
<b>Andre Kostelanetz</b>	Maple Leaf Rag	ABC KC-33954
<b>Joel Grey</b>	Medley: Yankee Doodle Dandy Over There Grand Old Flag	Columbia KOS 3200
	St. Louis Blues	Capitol SW 1929
<b>Nat King Cole</b>	Black & Tan Fantasy	Capitol SM 1602
<b>Duke Ellington</b>	This Land Is Your Land	HRB Music Co., Inc.
<b>Pete Seeger</b>	You Made Me Love You & Over The Rainbow	Capitol WBO 1569
<b>Judy Garland</b>	The House I Live In	Reprise 1016
	Men With Broken Hearts	MGM M3H649
<b>Frank Sinatra</b>	Heartbreak Hotel	RCA LSP 1707 (E)
<b>Hank Williams</b>	America	Columbia OS 2070
<b>Elvis Presley</b>	Blowin' In The Wind	Columbia PC 9463
<b>West Side Story</b>	Bridge Over Troubled Water	Columbia KCS 9914
<b>Bob Dylan</b>	Water	
<b>Simon &amp; Garfunkel</b>	America The Beautiful	Epic 8-50222

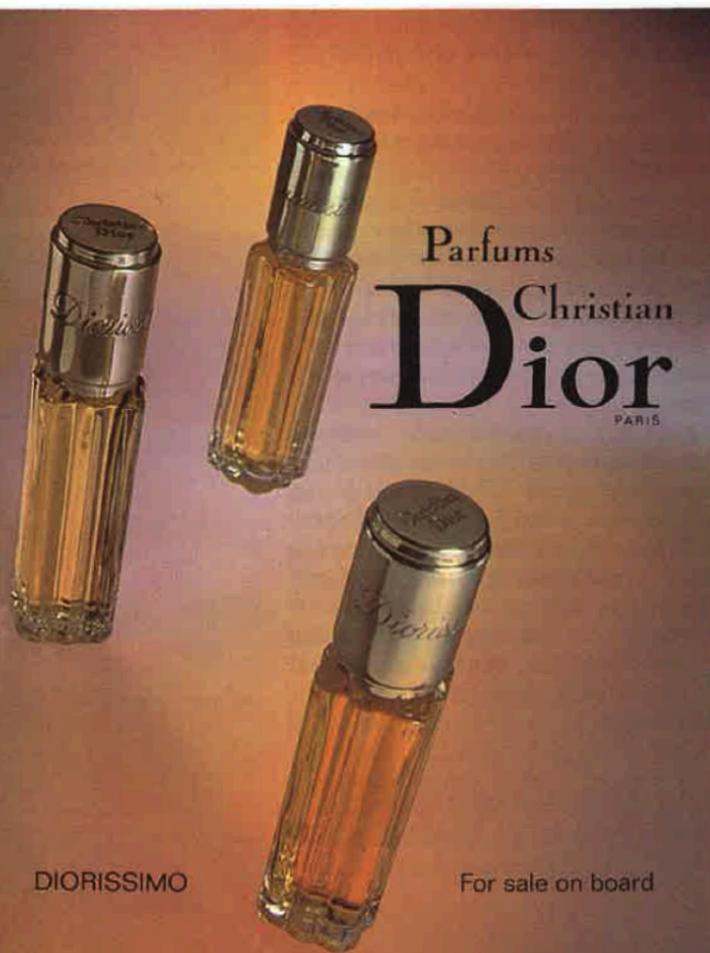
## 11 DREAMER'S MOOD STEREO 1 HOUR

<b>Tony Osborne</b>	Play A Simple Melody	Deram SML 13705
	Exodus	
<b>Richard Hayman</b>	Body and Soul	Time 52033
	Love Is A Many Splendid Thing	
<b>The Brass Ring with Phil Bodner</b>	Al-Di-La	ABC D50015
	True Love	
	Baby The Rain Must Fall	
<b>Dean Franconi &amp; His Orchestra</b>	Strangers In The Night	Design DLP 262
<b>Claude Denjean</b>	A Day In The Life Of A Fool	London SP 44155
	Na Na Hey Hey Kiss Him Goodbye	
<b>101 Strings</b>	House Of The Rising Sun	Ashire S 5175
	Everybody's Talking	
	Aquarius	
<b>Gordon Franks &amp; His Orchestra</b>	Never On Sunday	Deram SML 13706
<b>Tony Mottola</b>	I Can't Get No Satisfaction	Command RS 908SD
	Your Cheatin' Heart	
<b>Ted Heath Orchestra</b>	The Stripper	London SP 44164
<b>Barry White</b>	Under The Influence Of Love	Supremacy SUP 8002
	Fragile—Handle With Care	
<b>Botticelli &amp; His Orchestra</b>	Seasons In The Sun	London SP 44214
<b>Roger Williams</b>	A Taste Of Honey	Kapp KS 3638
	Softly As I Leave You	

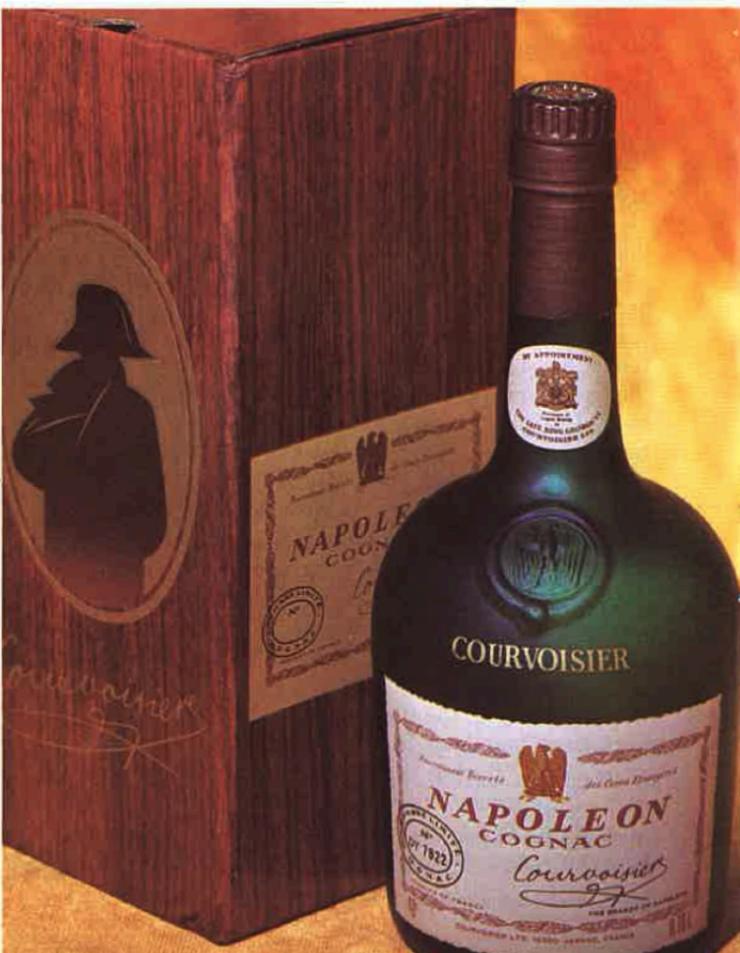
## 11 SHOW TUNES STEREO 2ND HOUR

<b>Original soundtrack "Butch Cassidy And The Sundance Kid" composed &amp; Conducted by Burt Bacharach</b>	The Sundance Kid	A&M SP 4227
	Raindrops Keep Fallin' On My Head	
	Not Goin' Home Anymore	
	South American Getaway	
	On A Bicycle Built For Joy	
	The Old Fun City	
<b>Original casting recording "Bubbling Brown Sugar"</b>	Stompin' At The Savoy/Take The "A" Train	H & L 69011
	Bubbling Brown Sugar	
	Nobody	
	His Eye On The Sparrow/Swing Low Sweet Chariot	
	Sophisticated Lady	
	Stormy Monday Blues	
	In Honeysuckle Time, When Emaline Said She'd Be Mine	
	Sweet Georgia Brown	
<b>Original soundtrack "Nashville"</b>	It Don't Worry Me	ABC ABCS 893
	Bluebird	
	For The Sake Of The Children	
	Keep A Goin'	
	Memphis	
	I'm Easy	

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# DONALD NYROP AND HIS FLYING DIVIDENDS

It seems like this is the way to run an airline.

by Ken Ruble



Now a Florida-based freelance writer, Ken Ruble was Campbell-Mithun's first account executive following NWA's switch to the Minneapolis advertising agency in 1955. In 1969, as an agency VP, Ruble spent a year in Tokyo supervising the airline's Orient advertising.

It would create quite a stir on Wall Street if American Motors made more profit than either General Motors or Ford in a given year. Yet last year, Northwest Orient Airlines — a distant seventh in size in terms of operating revenues — was first in net earnings among U.S. airlines. Why did Wall Street accept this achievement without any visible surprise? Perhaps because Northwest Orient had been first in airline industry earnings four out of the last eight years, and either second or third in the other years. In short, David had been beating the Goliaths on a regular basis, so the financial community had come to expect a superior earnings performance from Northwest.

The credit for this remarkable and consistent performance, according to analysts who are paid to follow the U.S. airline industry, is largely due to the management skill of Donald W. Nyrop, Northwest Orient's president since 1954.

Well known in airline circles, Nyrop is little known outside the industry because he has no interest in personal publicity. His background in commercial aviation is unique, however, as he is the only airline president who also has served as chairman of the Civil Aeronautics Board (1951-52) and as administrator of the Federal Aviation Administration (1950-51). His tenure as chief executive of a major U.S. airline (1952 to the present) is exceeded only by Continental Air Lines' Bob Six.

Nyrop feels there are four basic reasons behind Northwest Orient's consistent earnings leadership: standardization, centralization, capital management and aircraft fleet planning. And Nyrop gives specific examples in each area.

**Standardization:** The 22 McDonnell Douglas DC 10-40s in Northwest's fleet today differ from those flown by any other U.S. airline. The Northwest Orient planes are powered by Pratt & Whitney jet engines, while all other U.S. DC-10s use General Electric engines.

"The GE engines were excellent," says Nyrop, "but so were Pratt & Whitney's. There was no reason for duplication, so we standardized and used the same engine in both our DC-10s and our Boeing 747s."

Nyrop's decision to standardize engines contributes substantially at the "bottom line," since spare engines for the DC-10 cost \$1 million each, and fewer spare engines are needed because of the commonality feature.

**Centralization:** There are many examples of Nyrop's belief that centralization can reduce expense, increase efficiency and contribute to improved profitability. Instead of Northwest Orient continuing to hold major maintenance centers in Seattle, New York, and Minneapolis-St. Paul, all major maintenance work is now done at the Twin

Cities' headquarters. This centralization eliminates the need for duplication of facilities and major spare parts inventories in several locations.

Centralization has been accomplished in the reservations area, too. Through improved computer technology and communications equipment, Northwest was able to eliminate ten reservations offices while providing round-the-clock service for customers.

**Capital Management:** In this area, Nyrop is understandably proud of the fact that Northwest Orient passes what he terms "the toughest test of all" in measuring an airline's financial performance, displaying the best record in the industry. This test is debt as a percent of equity.

In 1975, Northwest shareholders' equity was \$623.7 million. Long term debt was \$246 million, just 39.4 percent of the equity figure. In comparison the next best carrier had a 78 percent debt-to-equity ratio' six of the 11 major U.S. airlines were in excess of 100 percent, and two exceeded 300 percent.

Nyrop has proven that money management, in an industry as capital-intensive as the airline business, is critical to financial success. "We went into the equity market in the 1960s to obtain the necessary financing for the new wide-bodied jets we had ordered," he explains. "By buying our new jets, rather than leasing them, as many other airlines were forced to do, we retained the benefits of depreciation and investment tax credits."

**Fleet Planning:** The combination of these management decisions by Nyrop has enabled Northwest to purchase the finest fleet in the U.S. airline industry. Today Northwest Orient owns 17 Boeing 747 passenger aircraft and three Boeing 747 freighters — more 747s for its size than any other carrier — plus 22 McDonnell Douglas DC 10-40s, 63 Boeing 727s and eight Boeing 707s.

Keeping Northwest's fleet the most modern in the industry occupies much of Nyrop's time and energy. In his 22 years as president of the airline, Nyrop has purchased 223 aircraft and sold 141. That's a total of 364 transactions — or an average of more than 16 per year!

These examples give some perspective on Donald W. Nyrop's success in transforming Northwest into a consistent leader in U.S. airline profitability. Nyrop modestly doesn't volunteer the fact that things were not quite that way when he arrived in 1954 as a 42-year-old chief executive. But the records show that in the previous year, the airline had total operating revenues of \$66 million, carried just over one million passengers and had net earnings of only \$1.9 million. (Common share dividends were nil.)

Within his first year as president, Nyrop resumed payment of quarterly dividends to common shareholders (which have continued every quarter since 1955) and "shot Santa Claus" when Northwest Orient became the nation's first airline to file with the Civil Aeronautics Board requesting an end to subsidy on its international routes. "A subsidy is like a cost-plus contract," Nyrop explains. "It undermines efficiency. We felt it im-

## A TEN-YEAR SUMMARY OF MAJOR U.S. AIRLINES GROSS REVENUE & NET PROFIT

	10-Year Total (1966-1975)		Net Profit % of Revenue	Average * Net Profit Per Year
	Gross Revenue	Net Profit		
<b>NORTHWEST ORIENT</b>	\$ 4,919,588,000	\$ 456,845,000	9.3%	\$ 45,684,000
Delta	8,198,325,000	468,263,000	5.7	46,826,000
National	2,907,265,000	150,679,000	5.2	15,067,000
*Braniff	3,748,209,000	127,253,000	3.4	12,725,000
Western	3,266,128,000	101,855,000	3.1	10,185,000
Continental	3,269,519,000	66,918,000	2.0	6,692,000
*United	16,892,953,000	330,666,000	2.0	33,067,000
*American	12,124,618,000	110,328,000	.9	11,032,000
*Trans World Eastern	15,777,200,000	36,400,000	.2	3,640,000
Eastern	10,616,800,000	( 38,500,000)	(.4)	( 3,850,000)
*Pan American	12,066,300,000	(116,500,000)	(1.0)	(11,650,000)

## HOW THE MAJOR U.S. AIRLINES PERFORMED IN 1975

Airline	Operating Revenues	Operating Expenses	Net Profit (Loss)
<b>NORTHWEST ORIENT</b>	\$ 800,563,000	\$ 750,863,000	\$ 43,396,000
Delta	1,415,025,000	1,344,165,000	37,385,000
*Braniff	598,856,000	551,467,000	16,021,000
Western	518,973,000	510,412,000	12,320,000
National	353,479,000	331,058,000	10,592,000
*United	2,409,870,000	2,388,749,000	( 5,311,000)
Continental	515,397,000	480,258,000	( 9,719,000)
*American	1,710,005,000	1,727,131,000	(20,470,000)
*Pan American	1,605,700,000	1,627,000,000	(46,100,000)
Eastern	1,624,394,000	1,617,989,000	(49,714,000)
*Trans World	2,640,125,000	2,685,129,000	(86,279,000)

## RETAINED EARNINGS & SHAREHOLDERS' EQUITY OF MAJOR U.S. AIRLINES AS OF DEC. 31, 1975

Airline	Retained Earnings	Shareholders' Equity
<b>NORTHWEST</b>	\$ 472,531,000	\$ 623,677,000
Delta	360,584,000	500,307,000
*UAL, Inc.	360,406,000	777,300,000
*American	196,164,000	541,830,000
National	165,844,000	191,915,000
*Braniff	110,875,000	167,096,000
*Trans World	98,733,000	335,229,000
Western	85,113,000	137,938,000
Continental	67,361,000	147,426,000
*Pan American	10,700,000	256,600,000
Eastern	(23,193,000)	290,284,000

\*Includes airline, hotel, etc. operations. Source: 1975 annual reports

portant to stand on our own two feet."

It is this kind of philosophy which has helped Northwest, under Nyrop's leadership, to establish these envied records as an industry leader:

*First in profit as a percent of revenue over the last ten years.*

*First in profit four of the last eight years.*

*First in retained earnings.*

*First in shareholders' equity relative to airline size.*

Add it all up, and you know why Donald W. Nyrop is the man who made Northwest Orient Airlines a winner. □

## REVELATIONS FROM A STEEL BUTTERFLY

When one sees the whole elephant and yet also can check out the crinkles in the skin, it inspires to high adventure for the next half century.

by Larry Holden and Suzanne DeVito

Where were you on the night of July 17, 1969, when Neil Armstrong set foot on that eerie lunar landscape? Do you remember your reaction? Without doubt, manned space flight is the headline grabber and public eyecatcher. Unmanned probes of the planets, such as the landing of Viking 1 and 2 on Mars run a close second in capturing the imagination. Will we finally have the answer to the haunting question: Is there life — green or purple, one-eyed or X-ray-visioned, bacteriological or amino acidic — anywhere else in our solar system?

Since the launch of Explorer I in 1958, so many satellites have been whizzing overhead that a jaded public tends to say, "So what else is new?" And, of course, there is a segment of the population that sets up a terrible howl about the billions of dollars spent in space exploration. "What's in it for the public?" they want to know. The scientific knowledge gained from sifting and analyzing the atmosphere and soil of distant planets will undoubtedly have long-range benefits for humanity, but what about NOW?

Yet, a read-back of the nation's space programs over the last few years offers convincing proof that American taxpayers are getting their money's worth, and right NOW.

Until recently, mankind regarded the earth and its resources as a self-renewable horn of plenty — a cornucopia without end. Finally, the dire predictions of scientists, once buried in the backpages, became headlines — Energy Crisis! And the bleak picture began to sink in: Earth's non-renewable resources are nearing depletion; the world-wide population explosion shows no conclusive signs of abating; we must pool our resources and knowledge if we are to survive.

The phrase "Spaceship Earth" is not just jargon coined by sci-fi and "Star Trek" buffs. It implies the increasing interdependence and cooperation of all nations in the future of the planet. If there is to be a future for Spaceship Earth, its global resources, including fuel, minerals, crops, timberlands, water and many other resources, must be properly managed. This requires a huge volume of accurate, world-wide information provided on a continuous basis.

To meet this need, NASA created ERTS, now renamed Landsat, the first Earth Resources Technology Satellite whose purpose was to survey and provide data on the natural resources of the world.

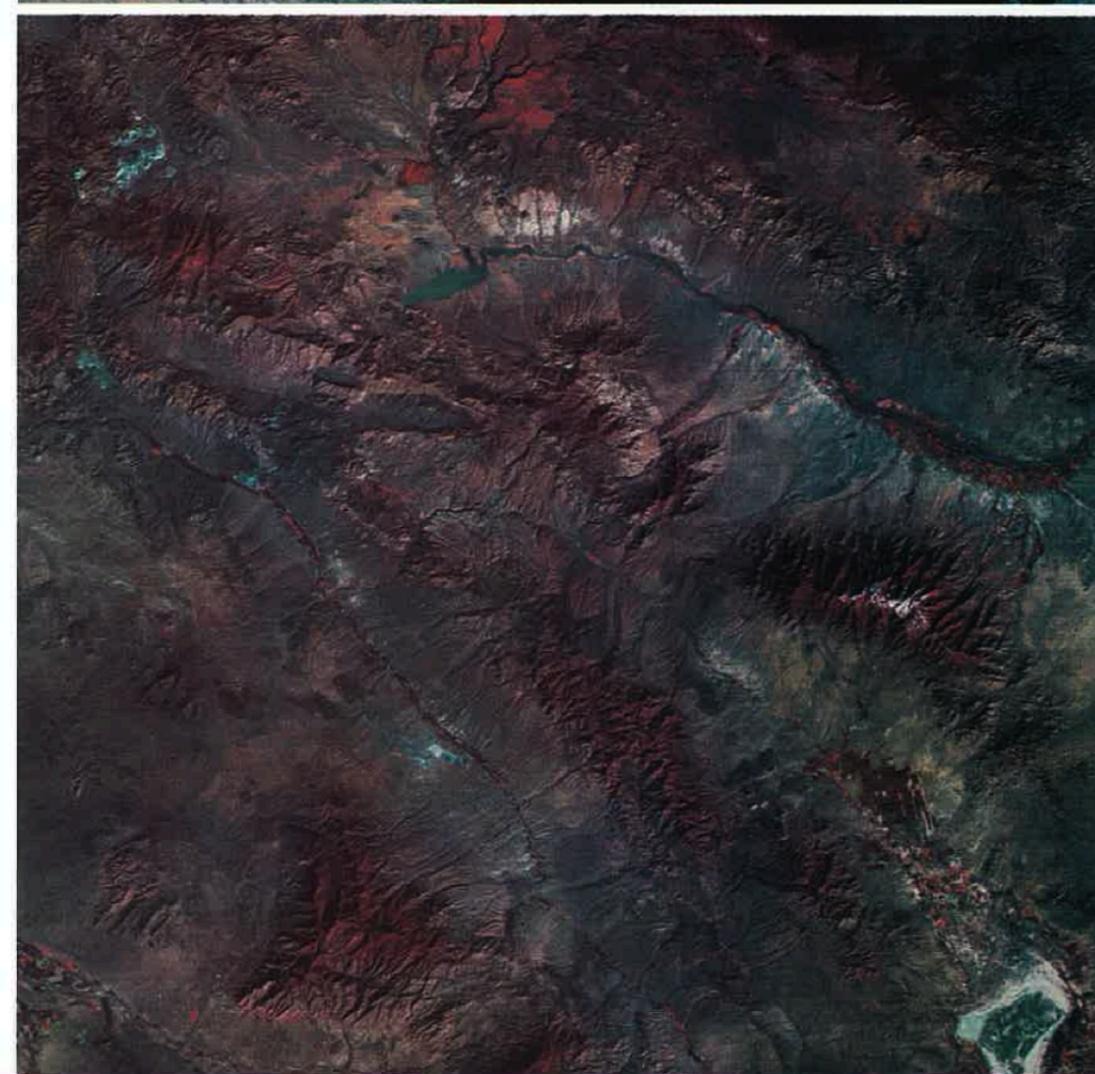
Without much ballyhoo, Landsat, a 10-foot high, 2,000-lb., butterfly-shaped spacecraft, was thrust into orbit on July 23, 1972, and began spinning

around the globe relaying back to earth information on a wide range of world-wide conditions — rather like taking the planet's pulse. Landsat's performance and the wide application for its data have far surpassed the expectations of its designers. Besides providing data on earth's resources, Landsat is opening up great new vistas in map making, geology and mineral exploration. And uses continue to grow — for forestry range management, water and marine resources, environment monitoring and land-use planning. Quoting from an article in *Fortune* (Feb. 1975), "Some scientists liken the satellite's contribution to the invention of the microscope. This time, the whole earth is under a microscope." One geologist who has worked extensively with the satellite's data says: "Before Landsat, we were crawling over an elephant's skin with a magnifying glass. Now we see the elephant."

Landsat flies in a circular orbit 570 miles (920 km) above the earth's surface and circles the earth every 103 minutes, or roughly 14 times per day. With each daytime orbital sweep from pole to pole, it views every section of the globe, with repeat coverage every 18 days. At the Equator each pass is some 1,800 miles west of the previous one. Landsat's electro-optical imaging system transmits billions of images to NASA receiving stations in Alaska, California and Maryland, either directly or from data stored on tape recorders. The data are converted from electronic signals to photographic images and computer compatible tapes at NASA's Goddard Space Flight Center in Greenbelt, Maryland. Master reproducible copies are flown to the U.S. Department of the Interior's EROS Center in Sioux Falls, South Dakota, where the images are placed in the public domain and where requests for reproduction are filled for the scientific community, industry and for the public at large.

More than \$2 million worth of satellite images were sold to the public last year. Buyers range from exploration, timber, mining and agricultural companies, to schoolteachers, geologists and one-man wildcatters. (Requests for photos should be sent to: User Services Unit, EROS Data Center, Sioux Falls, S.D. 57198. The cost of a black and white photo is \$3.00; color, \$7.00.)

Since the launch of Landsat 1 in 1972, followed by Landsat 2 in 1975, the satellites have imaged more than 100,000 "scenes" through a "multispectral scanner," or MSS. The device uses an oscillating mirror inside a telescope and is connected by glass fibers to light detectors. As the satellite passes over the earth, the mirror faces a continu-



Landsat imagery of the earth, recorded in four spectral bands, is transmitted in a digital format to NASA receiving stations. Technicians construct photo-like negatives from the data, assigning colors to highlight classes of objects shown: heavy vegetation appears in red; variations in the red tones indicate states of growth in different species; urban areas (concrete and asphalt) in blue or grayish blue, and clear water in black.

Depending on the area of interest of the researcher, the composites supply valuable information unavailable through conventional photography.

(Top) A color composite of Southern California, for example, might be analyzed by foresters trying to assess the extent of fire damage or clear-cutting, by geologists tracking changing linear features in an active geologic area, or by regional planners in need of an overview of land use.

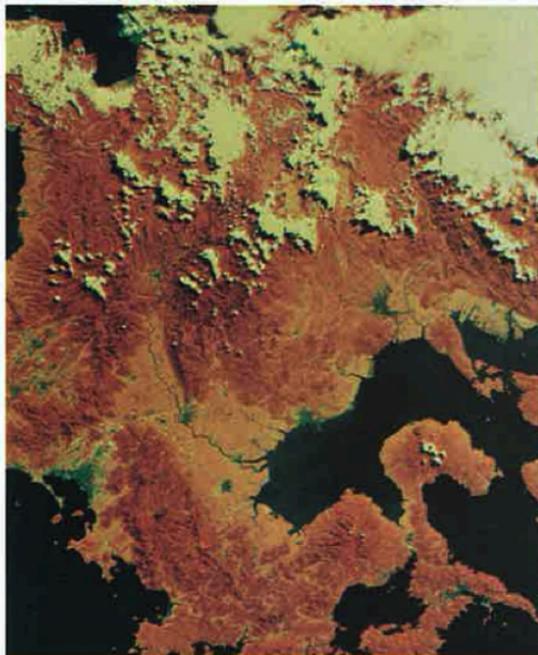
(Bottom) Man's use and misuse of the environment is also under Landsat's "eyes." When analyzed by trained technicians, imagery of open-pit mining activities reveals a wealth of information about the environmental impact of mining operations, such as inventories of mined land, assessment of the progress and success of reclamation programs and identification of refuse sites.

Circling the globe roughly 14 times per day, Landsat's multi-spectral scanner scrutinizes virtually every acre of the planet. Each pole-to-pole orbital sweep is some 1,800 miles west of the previous one, with repeat coverage every 18 days. Completely unclassified, the photographs which are constructed from the data can serve not only the United States, but also the social, cultural and economic development of any nation which elects to send representatives for instruction on how to analyze the imagery.

(Below) A color composite of Japan, a heavily industrialized country, could reveal to the trained eye the effects of air pollution on regional weather conditions. Technicians suspect that clouds generated by industrial plants drift with the winds and cause precipitation which might not have occurred otherwise.

(Bottom) Of special interest to agricultural companies is this photograph of the Yuma, Arizona area. The major feature visible is the Colorado River, the narrow black line which runs from north to south snaking along the red (heavily vegetated) area in the upper center. Route 80, the thin black line in the lower left of the image, crosses the white sand dunes of this largely desert area. The irrigated croplands in the bottom left stand out sharply against the blue and white of the natural desert background. The different colors of the agricultural fields indicate different crops in various stages of growth.

Landsat 3, scheduled for launching in 1977, will contain a thermal infrared sensor which will monitor heat islands such as industry, nuclear power plants and cities.



ous strip of land 115 miles wide. When light reflected by objects below hits the mirror, it is conducted by the glass fibers through four-color filters to the photoelectric detectors. Each filter lets through only a narrow band of the light spectrum. The detectors thus see the image simultaneously in different wavelengths. The images are recorded in two visible and two infrared bands just beyond what the human eye can see. These bands were selected in order to make various classes of objects more visible. Vegetation, for instance, stands out especially well in infrared, while rocks are more visible in other spectral regions. The various bands can distinguish cultural features, the boundaries between land and water, the movement of sediment-laden water, the presence of shallow water and other features. The system can even distinguish among different kinds of vegetation.

Each class of objects on earth has its own "spectral signature," determined by its atomic and molecular structure. The multispectral scanner picks up these signatures as electronic signals, which are then transformed into a digital format and telemetered to receiving stations where they are recorded on magnetic tape.

NASA technicians at Goddard Space Flight Center then construct a photo-like negative from the electronic signals in each spectral band. They may then assign colors to the negatives and produce "false color" prints highlighting the different types of objects shown.

The "eyes" of Landsat have been relaying such a wealth of information that much of it cannot be fully analyzed for months and its potential application not realized for years. But even at this early, experimental stage, Landsat is well on its way toward providing a continuing automated inventory of the world's resources — both natural and manmade.

Landsat's biggest potential payoff lies in uncrunching the energy crunch, by spying out and identifying new sources of energy, particularly oil and natural gas deposits. The prospectors of the 1800s used to search for years for telltale rock formations and other geological indicators that signaled the possibility of precious metals hidden below, and wildcatters would punch hole after hole in the earth's skin to find black gold. Landsat has changed that. Its images have revealed the presence of many previously unseen faults and linear fracture traces which, because of their size or subtle features, had gone unrecognized in conventional ground and aerial surveys. These faults, corridors of weakness in the earth's crust, mark the points where minerals in gaseous or liquid form were forced upward from the interior of the earth. The minerals were often deposited along the faults and particularly at their intersections. The satellite's view has sent geologists back to their drawing boards to revise their ideas about where ore and oil are likely to be found.

A large number of oil companies, among them Continental Oil, Phillips Petroleum and Superior Oil, have been quick to seize on Landsat imagery

to better understand the areas they are exploring. Private industry accounts for 30 percent of EROS's present sales.

The identification of potential mineral deposits by satellite has raised the specter of economic imperialism and exploitation of undeveloped countries. Representatives of some of these countries have voiced fears that the wide availability of Landsat data will allow multinational corporations to acquire mineral deposits even before their countries are aware of their existence.

NASA argues that Landsat images only indicate the more favorable sites for ground exploration, and access to these sites could easily be controlled by that nation's government.

The Geological Survey's International Remote Sensing Training Courses held at the EROS Data Center, provide technology to any nation which elects to send participants to the courses. The scientific staff of the Center has provided formal training to more than 100 foreign scientists whose participation is funded by their own governments or by AID missions.

Though the discovery of new oil fields would be the biggest bonanza to come out of prospecting from space, Landsat is sending out strong signals about the presence of precious ore. Mercury deposits in California appear to cluster around geological feature intersections, some located for the first time by the satellite. In Southwest Africa, images reveal possible nickel-copper deposits, and dry Amazon riverbeds pinpointed by Landsat imagery offer new gold mining possibilities. In the U.S. Southwest, they revealed a large number of circular structures believed to be remnants of old volcanoes, a geological feature favorable to copper. And in Nevada, on the basis of Landsat imagery, optimistic companies have staked claims to land they hope will reveal the mother lode. No one's hit paydirt yet, but geologists are confident that it will happen.

Beyond indicating the possibility of natural resources, Landsat's constantly acquired knowledge of the location of linear faults can save lives. Engineers will better know where it is unsafe to build bridges, tunnels, dams and other large structures which can be weakened by the movement of rocks.

Other experiments with Landsat indicate its potential for contributing to a worldwide survey of food production. To forecast with accuracy the size of harvest, information is needed about the acreage planted in various crops. In experiments with Landsat images, scientists have achieved 97 percent accuracy in identifying different crops.

The potential of Landsat for benefiting humanity seems endless. Since Landsat passes over the same spot on earth every 18 days, the spacecraft can track changing events — floods, the movement of icebergs and glaciers, shifts in rock formations, and manmade effects such as pollution, strip mining and clear-cutting forests. In short, we will have an improved ability to protect against disaster and control the environment.

Less dramatic than the discovery of new energy

resources, crop monitoring and disaster prediction is Landsat's obvious application in map making. Before the satellite was launched, cartographers were skeptical about the ability of the equipment to produce images with the precision necessary for map making. To their delight, the scanner reproduced scenes on earth without the distortions present in conventional aerial photographs. Images 115 miles on a side can be put together to form maps of whole countries and continents. For instance, a mosaic of an area the size of the United States would require 100,000 aerial photographs at a cost of \$3 million. Such a map can be constructed with fewer than 600 Landsat images, at a fraction of the cost.

The stakes in the Landsat venture are so high that attaching a dollar sign to the cost of keeping the big butterflies whirling around the earth seems ridiculous — almost like questioning whether one should continue to feed the goose that laid the golden egg. But despite its experimental success and future promise, the program almost expired in a bureaucratic and budget-slashing quagmire. Luckily, President Ford, with the not-so-gentle prodding of the Landsat community — geographers, foresters, pollution fighters and land-use planners — overruled his Office of Management and Budget and approved funds for Landsat-3. The third spacecraft, which NASA says will have even sharper vision than its predecessors, will be launched in November 1977 to replace Landsat-2 whose components are nearing the end of their useful life.

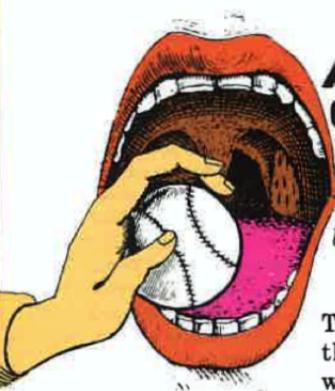
How, also, can you attach dollar signs to the goodwill and prestige for the United States that the program has been producing abroad? Indicative of the value placed on Landsat data by foreign nations are the ground stations installed or planned in other countries. Canada and Brazil were the first foreign nations to install receiving stations. Italy now has one, and Zaire and Iran have signed agreements with NASA for locations in their countries.

"The earth-resources program," says NASA administrator James C. Fletcher, "is going to pay for itself many, many times over, in terms of benefits to people not just in this country but throughout the world. Very possibly, it may pay for the entire space program."

Yes, there is high adventure in manned space, and from unmanned probes of our solar system man may soon learn if he is really alone in this universe. But the pioneering spirit of America isn't only landing on the moon or searching out extraterrestrial life. It's also embodied in a 10-foot-high, whirling butterfly that just might help keep "Spaceship Earth" a habitable planet. □

*Larry Holden is a freelance writer living in Dallas, Texas.*

Additional information about the EROS Program can be obtained by writing to EROS Program, U.S. Geological Survey, 1925 Newton Square East, Reston, Va. 22090. Descriptions of products available, order forms, and price lists can be obtained from the EROS Data Center, Sioux Falls, S.D. 57198, (605) 594-6511. The Data Center will also provide information about training on request.



## A FUNNY THING HAPPENED ON THE WAY TO THE BRAWL GAME

*Between peanuts and crackerjacks, baseball fans tear up the turf, pelt the players and hassle the hitter.*

by Richard Trubo

That meeting a couple of summers back between the Cleveland Indians and the Texas Rangers wasn't exactly your typical baseball game.

Shortly after the game began at Cleveland's Municipal Stadium, a streaker sprinted across the playing field as the crowd of 25,000 roared with laughter. Then a woman ran onto the field and embraced home plate umpire Larry McCoy. A half-dozen other fans dashed on and off the playing field. Later the entire Texas relief pitching staff was forced to vacate the bullpen when spectators pelted them with empty beer cups and a smoke bomb.

Finally in the ninth inning, with the score tied at 5-5, dozens of fans leaped out of the right field stands and began prancing wildly through the outfield. The umpires finally gave up and forfeited the game to Texas.

America's baseball fans don't always let their enthusiasm carry them right onto the playing field. But hardly a game goes by anymore when spectators don't make their presence felt — hand-clapping, foot-stomping, cheering and booing. Spectator excitement and fanaticism have become as much a part of the game as the stolen base and the home run.

Some of the most fanatical baseball fans can be found at Chicago's Wrigley Field, where their support of the Chicago Cubs is undying. The most exuberant of these spectators usually crowd into the left field bleachers. Their trademarks are yellow hard hats and antics that range from singing and dancing to practical jokes. They've been known to toss seat cushions at opposing outfielders in attempts to distract them from fly balls coming their way.

These so-called "bleacher bums" run the full gamut of ages and occupations, including lawyers, truck drivers, accountants, businessmen, college students and even a few grandmothers.

The rivalry between players and fans has rarely lost its good-natured flavor, but when it has, some of baseball's greatest players have been involved. Detroit's Ty Cobb, one of the game's finest hitters and base stealers, once hurtled into the grandstands while playing in New York and punched a fan who was mocking his play.

A few years later, Babe Ruth, angered by the shouts of a fan sitting behind the dugout, jumped over the rail and began chasing the fan through the grandstands. Luckily for the spectator, he was able to outrun the burly Babe.

One of the most hair-raising incidents involving fans occurred during the 1973 National League playoffs between the New York Mets and the Cincinnati Reds at New York's Shea Stadium.

After Cincinnati's Pete Rose was involved in a brawl with Bud Harrelson, the Mets' shortstop, New York fans showered Rose with beer and debris when he returned to his defensive position in left field. When the Mets made the final out to win the playoffs, fans surged onto the field, ripping up the bases and tearing up chunks of grass to take home for souvenirs.

Despite their peculiar behavior now and then, most fans seem quite satisfied with tamer rituals — like showering their favorite players with loose coins. Pittsburgh outfielder Willie Stargell can gauge how well he is playing on any specific day by the amount of change thrown at him at Pittsburgh's Three Rivers Stadium. When Willie returns to his outfield position after hitting a home run, Pittsburgh fans in the left field bleachers frequently reward him with dozens of nickels and dimes. If he only hits a single, he settles for a trickle of pennies. (At the end of the season, Stargell donates the accumulated coins to a foundation for the study of Sickle Cell Anemia.)

Umpires are not always treated so kindly. Former National League umpire, Cy Pfirman, was not pleasing the home fans one afternoon. Toward the end of the game, a spectator threw a baseball out to him. On it was written: "Is your name Pfirman or Vermin?"

Then there's the story of George Magerkurth, a National League umpire during the 1940s. One day on Brooklyn's Ebbets Field, a young spectator leaped onto the field and punched Magerkurth for "deliberately making calls against the Dodgers." Although unhurt, the stunned umpire was knocked to the ground, whereupon the fan sat on him.

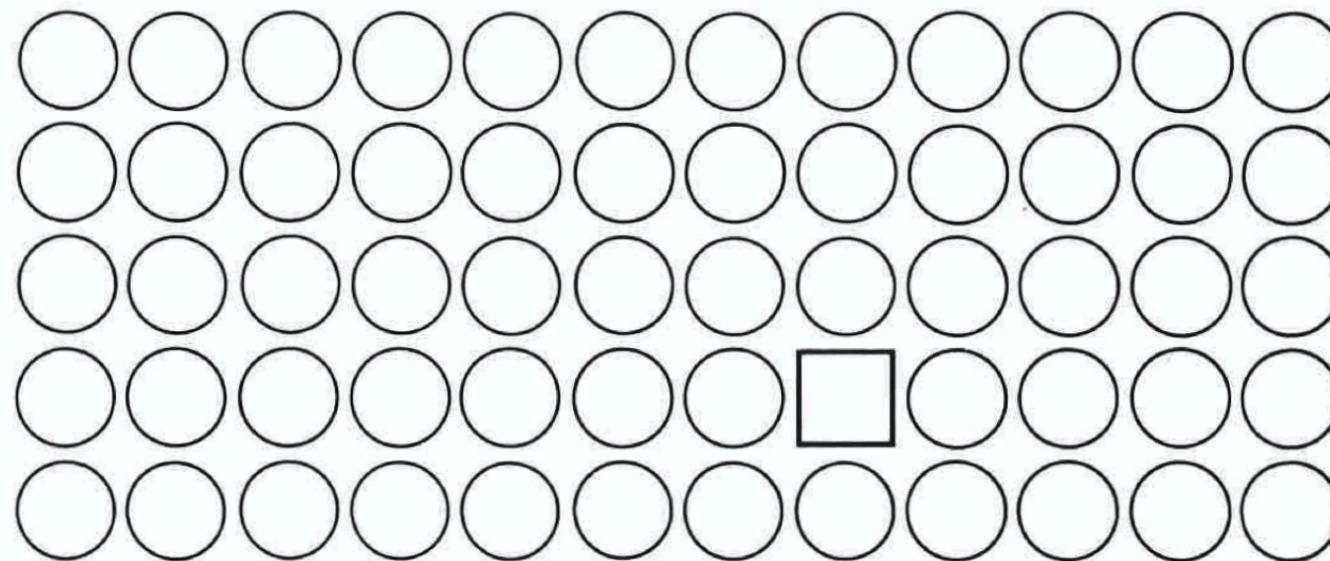
Despite his quirks, the baseball fan is a treasured commodity whose enthusiasm is part of what makes baseball our "national pastime." Even though lifelong followers of the game might think they've seen just about everything, "bleacher bums" think up some new antics.

One afternoon after grounding into a double play, infielder Frank Thomas heard someone in the grandstands yell "Thomas, you're a bum." Thomas, who played for many National League teams, glanced up in hopes of spotting whoever was shouting the angry words. He was more surprised than anyone to see that the voice belonged to his five-year-old daughter.

Later she told her father, "When you hit home runs, you're my daddy. When you hit into double plays, you're a bum." □

*California-based writer Richard Trubo has been known to lose his own cool when the Los Angeles Dodgers play ball.*

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# DUCK À LA BILLINGS OR WITH A TOUCH OF SAKI

When it comes to those crisp-skinned birds, gourmets share an international language.

by Kirk Alexander



Northwest Orient Airlines is 50 years old this year. Hard to believe because once upon a time I didn't dream that anything in the world could ever be fifty years old. The most wonderful recollection for this once-12-year-old was to be part of that mystic time when airplane pilots would set their biplanes down in some fallow field in the Midwest and for a couple of dollars take the "rubies" up for a swing around the county.

Fifty years ago all pilots were Fearless, Dauntless. They were Heroes. They belonged to us 12-year-olds, and we were fiercely protective of them: They could Do No Wrong.

Fifty years later, I can still recapture the thrill of that first ride — the smell of gasoline and bruised grass, the heart-in-the-mouth takeoff.

Today, Northwest Orient, on its route west, cuts right through the very "melting pot" heartland of the United States where I was born and raised on a farm just outside Bad Axe (no kidding!), Michigan. Continuing west, the route crosses

cowboy country, Montana and North Dakota, then over the Rockies and, leaving behind the jagged edge of the continent, on thousands of miles to Japan.

Imagine for a moment, that you are traveling halfway across the world. And though this is not the only purpose for your journey, you have envisioned yourself sampling the local cuisine along the way. It's autumn, and millions of ducks are on the migratory path — mallards, teal, canvas-back, pintails, scaup, widgeon, which rise like smoke when a low-flying plane passes over a lake where they are resting. Duck it will be, you say, as you prep your taste buds for the juicy, crisp-skinned birds. Here are the recipes for the mouth-watering dishes you might be served in Milwaukee, Billings and Tokyo.

*Kirk Alexander, when he can tear himself away from the kitchen, is a New York-based freelance writer and TV director.*



middle of oven for 20 minutes, until the skins are slightly brown. Draw off fat with a bulb baster and save. Reduce heat to 350; turn ducks on one side and roast 20 minutes. Turn on other side and roast another 20 minutes, removing fat. Place ducks breast up again and roast 20 minutes longer.

#### Sauerkraut Dressing

2 lbs. sauerkraut, rinsed and squeezed dry, chicken stock to cover, ½ cup reserved duck fat, ½ cup chopped onions, 3 Tbs. flour, 3 cups water, 1 tsp. sweet Hungarian paprika, 1 tsp. caraway seeds.

Cook sauerkraut in chicken stock for one hour. Remove and drain. Into a 10 inch skillet, pour duck fat and saute onions until limp and transparent. Mix in flour, cook and stir for 2 minutes. Add water and bring to boil. Add paprika and caraway seeds and boil uncovered for 15 minutes until mixture is

reduced to two cups. Stir in sauerkraut and cook additional 5 minutes. Serve separately. Serves four.

#### Montana Roast Wild Duck with apricot orange sauce

2 Wild ducks, Apricot puree, ½ cup chicken stock, ½ cup white wine, Julienned orange peel, Cooking oil, salt pork or bacon for barding, 1 cup coarsely chopped celery and onions.

Birds should hang for four to five days in a cool, dry place. Draw, dry-pluck, singe and dry the birds inside and out. Do not wash. Preheat oven to 500 degrees. Rub inside and out with salt and pepper and brush with cooking oil. Stuff cavities with celery and onions. Bard the breasts with ½ inch slices of pork or bacon, and truss.

Allow 20-25 cooking time for mallards, 12-20 minutes for teal and other small duck. In all cases, sear 5 minutes and then quickly reduce heat to 350 degrees for remainder of cooking time. Remove ducks.

Degrease drippings; add white wine and chicken stock to pan. Add orange peel and apricot puree. (Soak dried apricot halves overnight, boil and rub through sieve.) Reduce by boiling and serve with duck. Serves four.

#### Tokyo Duck simmered in saki-seasoned sauce

1 whole boned duck breast with skin left on, Salt, ¼ cup cornstarch, ¼ cup saki or dry sherry, ¾ cup chicken broth, 1 tsp. sugar, ½ tsp. salt, ½ tsp. soy sauce, 2 Tbs. slivered fresh ginger root.

Slice duck breast diagonally into 16 pieces. Salt each piece lightly. Dip into cornstarch and shake off excess. Bring 2 cups water to a boil and add duck. When water returns to a boil, remove duck and drain.

Combine the saki or sherry with chicken stock, bring to a boil and stir in sugar, salt, soy sauce. Add ginger and duck slices. Reduce heat and simmer for about 4 minutes. Serve at room temperature. Serves two.

#### Czechoslovakian Duck with sauerkraut dressing

Two 4½ pound ducks, fresh ground pepper, salt, 2 crushed garlic cloves.

Preheat oven to 450 degrees. Pat ducks dry inside and out, rub skins with garlic and sprinkle cavities liberally with salt and pepper. Prick skin around the thighs and lower part of breasts with tip of sharp knife. Truss, place breast side up on a rack in a large shallow pan. Roast in

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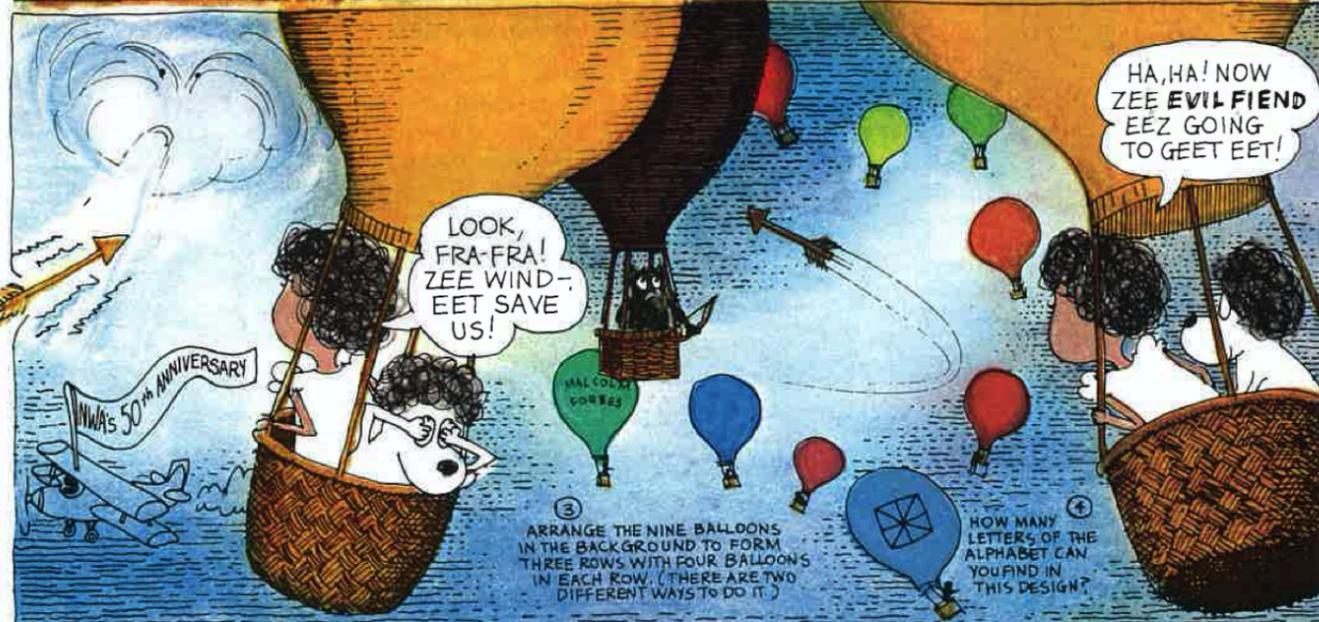
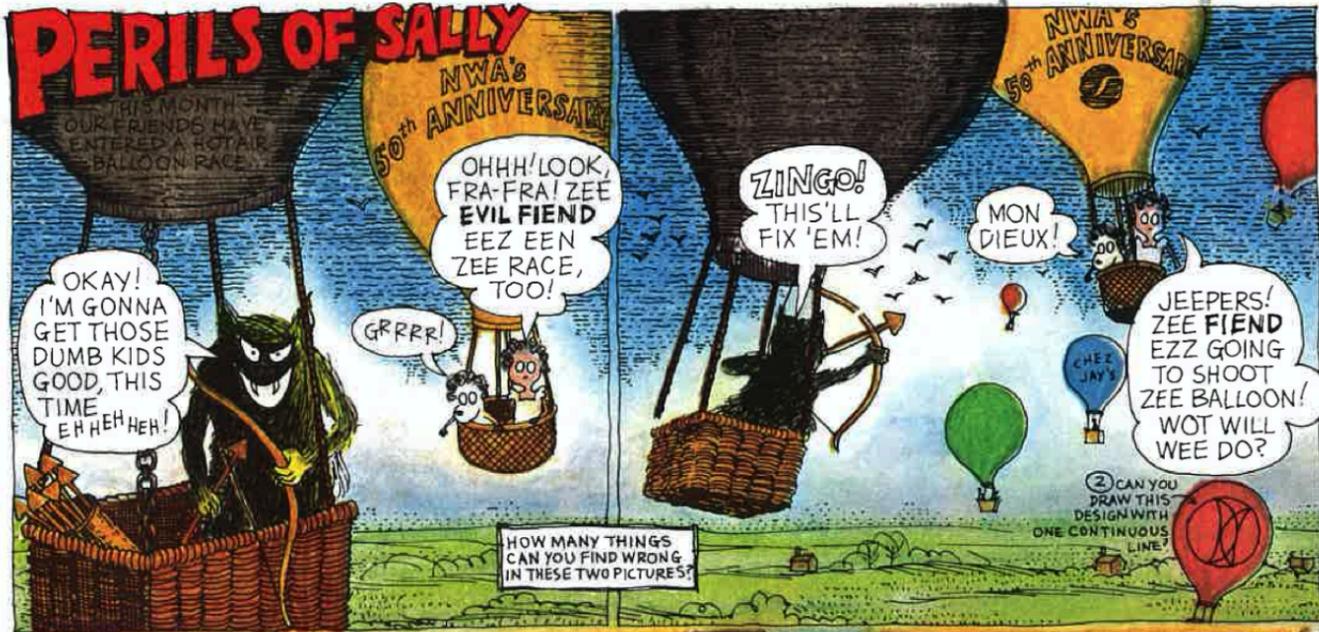


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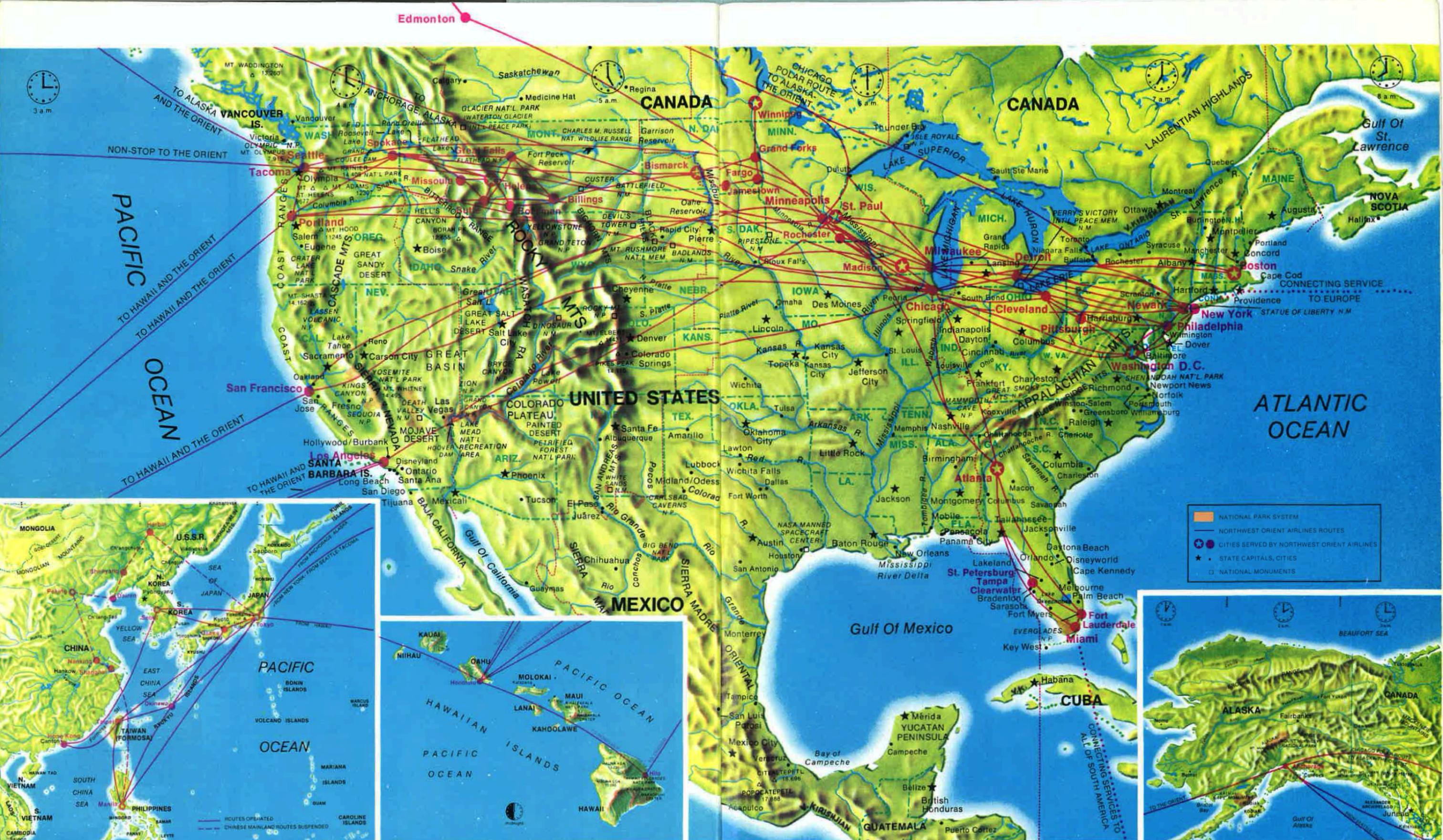
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**Enjoy a Cigarette?** Go ahead, except when the "No Smoking" sign is lighted by the captain. But please, no cigars or pipes. Do not use a "see-thru" cigarette lighter in flight as it sometimes flares up when lighted. All NWO aircraft have "No Smoking" sections. If you prefer to sit in a NS section, please contact your flight attendant.

**Enjoy a Drink?** A variety of highballs and cocktails is served by the attendant on most flights. Federal Aviation Administration regulations provide that no person may drink alcoholic beverages aboard an airline flight unless they have been served by the airline. **Car Rental Service:** Automobiles are available at practically all cities served by Northwest Orient. When making your reservation, you may request your Northwest Orient agent to arrange that a car be waiting for you on arrival.

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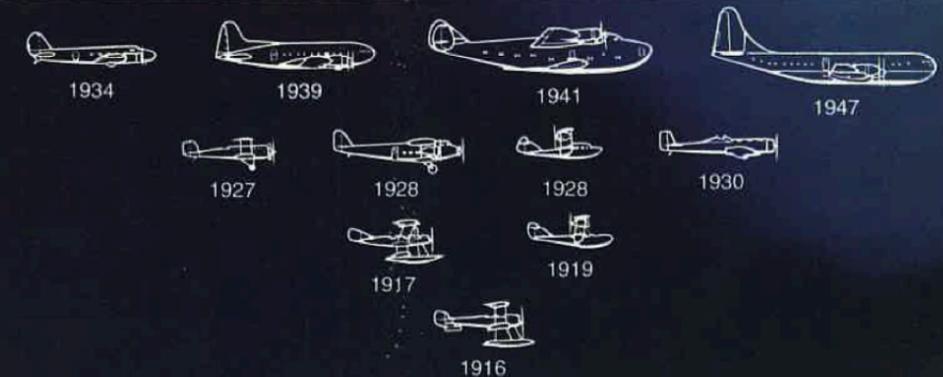
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