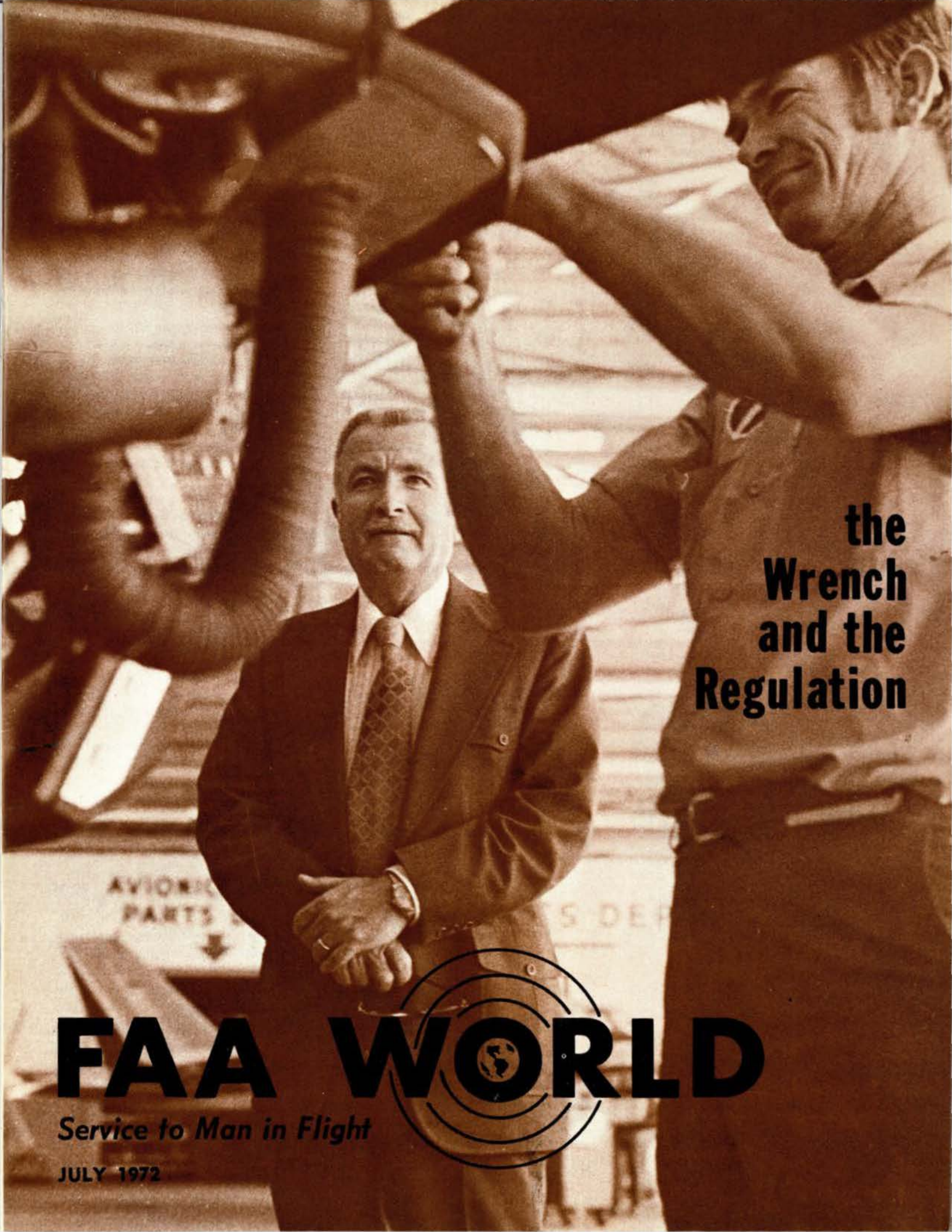

the Wrench and the Regulation

FAA WORLD

Service to Man in Flight

JULY 1972

FAA WORLD

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The cover: *Engine, mechanic and inspector . . . Walter Rigsbee, supervisory maintenance inspector from the Miami GADO, watches A&P mechanic Hugh Jacobs work on the engine of a light plane at an FAA-approved repair station in Fort Lauderdale, Fla.* **—Photo by Don Braun**

A Farewell

When I accepted President Nixon's appointment as Deputy Administrator, I knew that I would eventually return to private industry. Having completed two years of service in what I consider the finest agency in government, I have decided to accept the position of Executive Vice President of E-Systems, Inc. This company, headquartered in Dallas, is an independent corporation specializing in aerospace and electronic systems and related products.

I have been most fortunate in serving as the Deputy Administrator during an era of great progress. We have been together during the enactment and implementation of the most far-reaching aviation legislation in our history—the Airport and Airway Development Act of 1970. With this new mandate, we have charted a new course for the future of aviation.

Under the leadership of Administrator John Shaffer, we have made major advances in modernizing the National Aviation System. We also are continuing to provide better services to the aviation community while promoting the growth and development of aviation. I am deeply appreciative of the tremendous efforts you have put forth in all that we have undertaken. We have been successful for one very fundamental reason—you the people of the FAA made it happen.

I have thoroughly enjoyed serving as the Deputy Administrator. It has been a challenging yet gratifying experience. I am exceptionally proud of the personal and professional relationships which we have established. While I will miss being a member of the FAA team, I look on my departure not as an ending but as a part of the process of change. Progress comes through change.

I want to conclude my last communication with you by charging you to:

1. Remember that the people of FAA are its greatest asset.
2. Communicate at all levels through both the written and spoken word and, above all, listen to each other.
3. Learn how to supervise and manage through training—never economize by turning your back on training.
4. Be loyal to the organization you elected to join.
5. Be mobile, for your own personal gain and that of the agency.
6. Be prepared to change, because we serve a dynamic and rapidly changing industry.

I wish you and your families every success in the future. I know you will continue to strive for the highest levels of achievement in all you undertake.

KENNETH M. SMITH
Deputy Administrator

CHANGE OF ADDRESS: FAA employees should send their changes of mailing address for FAA WORLD to the control point in the region or center where they are employed: AC-44.3; AL-52.1; CE-20; EA-20; GL-13; NA-11; NE-14; NW-14.7; PC-42; RM-5; SO-67.1; SW-67.23; WE-13; and Headquarters employees, HQ-431. You should not send change-of-address information to Washington. If you move from one region or center to another, you should submit your change of address to the region or center to which you move.

In Eastern Airlines' huge hangar, principal maintenance inspector Philip Mindel (left) talks about the overhaul of the jacked-up 727 behind him with (left to right) Dave Foster, foreman, aircraft overhaul; maintenance inspector Carl Gebhardt; and George Hale, superintendent of Eastern's aircraft overhaul.

The Wrench and the Regulation

The story of FAA's maintenance inspectors

In a steamy delicatessen near Miami International Airport, William Clark said over a thick pastrami sandwich, "Nuts and bolts isn't what maintenance inspectors look at so much anymore." He took a pickle. "They used to look at them because they knew every bit of hardware in an airplane, but in the jumbo jet age, things are different."

Clark, chief of the Miami Air Carrier District Office, was talking about the evolution of aircraft maintenance and FAA's role in it.

"Now . . . take the air-conditioning system of a big jet . . . you'd be surprised how complicated it is. But instead of inspecting the details of every system in today's transport planes, we closely monitor the airlines' maintenance programs, which are established by the FAA. We look at their records of repair and fleet reliability, which must meet certain standards. And we look at selected airplanes to see the results of airline maintenance."

Inspection, formerly done mostly with a toolbox, is now performed by the airlines with advanced aids, such as X-ray, spectrographic analysis and other electronic devices, and data is managed by computers. The agency's air-carrier maintenance inspectors are a key link in monitoring this evolving approach to airline maintenance.

"If the airline wants the performance standard for an aircraft system or component set at a value we think isn't sensitive enough to trouble, we talk it over with them to reach a more realistic value," said Philip Mindel, principal maintenance inspector in Miami for surveillance of Eastern Airlines. "After all, a plane could have a serious problem if we didn't detect it in the early stages."

Mindel and his three assisting maintenance inspectors watch over Eastern's gigantic maintenance arcade at Miami International Airport. There, as at other airline bases, men tear down jet engines into pieces smaller than thimbles and jack 160,000-pound airplanes four feet off the floor to change the landing gear and do a hundred other types of inspection and maintenance.

"Often an airline will ask for an increase in the service life of a piece of hardware, based on reliabil-

ity reports or new technology," Mindel continued. "We look at the documentation for these requests very carefully before giving a yes or no. And we spend a good part of our time evaluating airline engineering orders—how they propose to modify their planes. Anything from a door handle to an electrical connector to a bearing in an engine—if it affects airworthiness or safety, we must approve the change before it can be made."

Incidents of mechanical trouble, such as a recent in-flight failure of the wing-flap system on a large jet transport, are reported to the FAA within 24 hours by the airline involved. Such reports are called Mechanical Reliability Reports.

MRRs, which average about two a day from each airline, and Malfunction and Defect Reports filed by pilots, owners and mechanics in general aviation, are forwarded to the agency's computerized Maintenance Analysis Center (MAC) at the Aeronautical Center. When FAA maintenance inspectors anywhere become concerned about a particular problem, they ask the computer to tell all it knows about similar problems on the same kind of plane. If a troublesome trend becomes apparent, the inspectors can alert their counterparts throughout the agency to prevent the problem before it happens again. Data from the MAC are used by FAA engineering people as well, and regularly issued MAC reports are used in aviation maintenance worldwide.

A serious mechanical problem may result in an FAA Airworthiness Directive calling for specific preventive action by the airlines or aircraft owners. ADs are worked out cooperatively by the agency's maintenance and engineering people in consultation with aircraft manufacturers.

The "bible" for an airline's maintenance program on a particular plane is the detailed schedule of required inspections and maintenance approved for that type of plane by an FAA Maintenance Review Board, which works with the aircraft manufacturer and the airlines during the development of the airplane.

Away from steel and aluminum, avionics inspector Vladimir Blazek (left) and maintenance inspector Thomas Reem, both of the Miami ACDO, brief Mindel on their research of Eastern's repair records to find if selected mechanical problems are being satisfactorily solved by the company.

With the skill of a watchmaker, mechanic Fletcher E. Dalgo repairs a fuel-regulating mechanism, while Mindel questions Eastern's Lou Lyles about quality assurance.

"A maintenance cycle on a jet aircraft will involve a considerable period of time," explained Mindel. "At the end of that time, the entire plane and powerplant will have been inspected and completely overhauled once. The cycle is repeated for the life of the plane. Special problems get immediate attention anytime."

Air-carrier maintenance inspectors ride on scheduled flights of their assigned airline to look at the results of maintenance from the operational point of view. Airline maintenance people check each plane after the day's flights. Before every takeoff, including those midway in a trip, every plane gets a walk-around inspection from the crew. And other eyes are trained on an aircraft when it pulls up to the gate. Several times a month, each air-carrier maintenance inspector cruises the terminal, making ramp inspections "to get a good look at the final product—planes in operation," said Mindel. "I've never seen anything serious enough to make me prohibit a takeoff," he added.

"Have you had any personnel changes, Art?" The question was to Art Breckenridge, service manager of Sunny South Aircraft Service, Inc., in Fort Lauderdale, Fla. The questioner was Walter Rigsbee, supervisory maintenance inspector from the Miami General Aviation District Office, who was on a quarterly inspection of the large general-aviation repair shop. His question reflects the difference between the surveillance of air-carrier and general-aviation maintenance: In general aviation it comes closer to the bone, closer to the individual mechanic or supervisor, to the men who do the work—rather than emphasizing program results, as in the air-carrier category. Nevertheless, any repair station that wears the sign "FAA-Approved," as does Sunny South, must meet strict agency standards regarding its overall operation, including technical data, equipment, personnel, records, housekeeping and the like.

In general aviation, there are 132,000 active aircraft and 3,400 air taxis which must be maintained according to the high standards that are ensured by the work of maintenance inspectors like Rigsbee.

Breckenridge gave Rigsbee the name of the company's new general manager, and they walked over to the shop's "library," a room of shelves filled with aircraft manufacturers' maintenance manuals. Arranged in reasonably good order, the manuals were somewhat chewed up with repeated use. "I like to see 'em that way," said Rigsbee, "because if they all look like they've never been opened, somebody's doing his own brand of maintenance."

Walking back across the main shop where a dozen or so light planes sat in various stages of repair, Rigsbee said, "You can tell how good a mechanic is in short order by watching him work. How does he handle his tools? Does he pick up a wrench, try it, and go back to his tool box for another size? Or does he get it right the first time? Is he neat? Does he seem to have confidence in what he's doing?"

"Airplanes are still airplanes," remarked maintenance inspector Larry Young back at the GADO, which is located on Opa-Locka Airport. "But now, even in small ones, there's more sophistication, more systems, more hardware that has to be thoroughly checked during inspections and repairs. The whole

At Miami-Dade Junior College's aircraft mechanic school, Miami GADO maintenance inspector Larry Young (right) and school technician Gene D. Vecchione look in on students working on engine parts in the lab. Young and a Southern Region office staff member were re-certificating the school on revised nationwide standards set by FAA for aircraft mechanic schools.

Eastern's superintendent of jet-engine overhaul Lou Lyles (second from left) with Gebhardt (left) and Mindel. James R. Hall, mechanic on engine assembly, re-wires a 727 engine.

aim of our job is to prevent maintenance failures," he said earnestly, "and since the actual work is done by airframe and powerplant mechanics, we've got to make sure they're qualified and proficient."

The inspectors judge the competence of all people performing aircraft maintenance by issuing A&P certificates to mechanics who gain sufficient experience or graduate from mechanic schools and who pass written, oral and practical exams. Designated examiners appointed by the inspectors give many of the tests. Inspectors may require the re-examination of mechanics when there are indications, including complaints, that their work is deficient. There are now about 170,000 certificated mechanics in the U.S.

Mechanics who have held an A&P certificate for at least three years and have been actively engaged in maintaining aircraft for two years can earn an Inspection Authorization by passing a three-part FAA exam. This special group of mechanics may perform annual inspections and approve aircraft for return to service after a major repair or alteration. Some 4,000 IAs and 3,000 FAA-approved repair stations constitute the backbone of general-aviation maintenance. One-hundred thirty-five aviation technician schools in the U.S., certificated by maintenance inspectors, are training the next generation of aircraft mechanics, who will find their way into both air-carrier and general-aviation jobs.

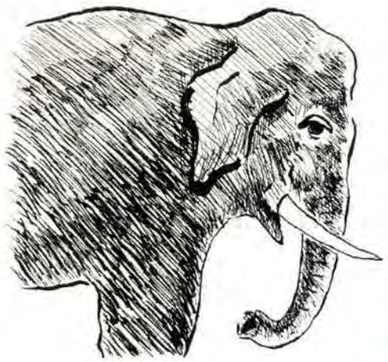
Owners and operators of general aviation planes must have them inspected at prescribed intervals, while pilots should make pre-flight inspections without fail. Many planes for hire must get an inspection after each 100 hours of flight time, and this leads to a good deal of cheating by some disreputable aircraft operators, who pretend their services are free by charging customers for something other than the actual flight or don't report some revenue at all. Theoretically, if money doesn't change hands, the regulations let these people do less maintenance than they should. Both air-carrier and general-aviation maintenance and operations inspectors must spend some of their time gathering evidence to bring legal action against such people. "Sometimes we watch these 'renegades' on weekends when they run illicit operations," said Rigsbee.

Besides certificating and observing mechanics, repair stations, mechanic schools and air taxis, general-aviation maintenance inspectors may be called at any hour of the day or night to investigate accidents, incidents or complaints. Air-carrier inspectors make similar investigations.

Together, these inspectors keep vigilant eyes on the people and places that repair and care for airplanes, so that air safety and mechanical reliability stay at the highest.

—By Don Braun

Walter Rigsbee (left) of the Miami GADO examines the spare-parts stock room of Sunny South Aircraft Service, Inc., with service manager Art Breckenridge.



ELECTION QUIZ

It's convention time—the harbinger of one of the most dramatic political phenomena of the American scene: the Presidential election. All of us rise to the occasion with renewed interest. Even if off-year elections sometimes seem humdrum, the making of the President seems to spark new enthusiasm. But how's your knowledge of this quadrennial affair? How much of past campaigns do you remember? Try your hand on the 10 questions below. The answers can be found on page 19.

1. This year, a former Vice President is very much in the race. In the past, many good men were nominated for that office and didn't make it. Several of them went on to distinction in later years. Can you name the unsuccessful nominees for the Vice Presidency in 1920 and 1948?

2. In 1968, both major candidates had occupied the position of Vice President. You have to go back a long way, but there was another election when the candidates of the two major parties had both served as Vice Presidents. Can you name the candidates and the year of the election?

3. The last Republican nominee for the Presidency was, of course, President Richard M. Nixon. Who was the first Republican Presidential nominee, and in which year was he nominated?

4. After having been defeated in 1960, President Nixon came back to win the election in 1968. Several Presidents were elected after having already lost in a Presidential election. Can you name them and the years in which they lost and later were victorious?

5. Only one American President has ever served two terms of office separated by the term of another President. Name him and his years in office.

6. The period between the Civil War and the election of Franklin Delano Roosevelt is generally thought of as a period of Republican dominance in Presidential politics. There were only two Democratic Presidents elected during this period. Name them and their years in office.

7. Has an American President or Vice President ever resigned before his term of office had expired? In which year?

8. If no candidate receives a majority in the Electoral College, the election is then decided in the House of Representatives. This has happened before in our history. Do you know when this occurred and who were the candidates involved?

9. Electoral votes still decide the winner in the Presidential sweepstakes, and the winner's total usually far exceeds the loser's regardless of the plurality of the popular vote. Which President received the highest percentage of all electoral votes cast?

10. There have been many political parties in American politics, but in two Presidential elections, none of the candidates represented political parties. Can you name the years and the candidates?

In case your enthusiasm runs away with you, here are a couple of questions reminding you that there are regulations limiting your political activity:

11. Career Federal employees are insulated from the effects of political considerations that might damage their job tenure. This protection is spelled out in two laws. Can you name them and the years that they were passed?

12. In the 1956 Presidential campaign, a career Federal employee was asked to display a bumper sticker on his car for one of the candidates. Then he was asked to drive the car in a torchlight campaign parade. He refused both requests, claiming that regulations prevented his participation in partisan politics. Was he correct in this interpretation?

If you have any questions as to what you—as a Federal employee—may or may not do in this year's campaign, see page 6 of the May issue of FAA WORLD or check with your local operating personnel office for specifics.

Richard Blenheim, lead mechanic for New York Airways, reinforces giant rotor blade for Sikorsky S-61L helicopter, as air-carrier-maintenance SWAP-team inspector Dick Dodd (right) observes. Showing Dodd the process are Bob Mitchell (left), company quality-control supervisor, and Martin Conway, director of technical services.

SWAP TO THE RESCUE

His commuter air-taxi company had just been 'swapped'—received its first Systemsworthiness Analysis inspection by FAA, covering his entire operations and maintenance systems. The successful, youngish president rolled his chair back from the desk and picked up a thick report made by consultants from industry.

"Gentlemen," he said, addressing the several SWAP team members seated in front of him along with the Flight Standards District Office chief, "we recently invested $4,500 in a study of our business by private consultants. You uncovered everything they did—plus a lot more."

The District Office chief and three SWAP inspectors—two from operations, one from maintenance—were prepared to discuss areas pointed out in the findings that required improvement. The FAA recommendations made would help the air-taxi line toward safer, more economical and efficient procedures. This would in the long run mean much greater dollar benefits and improved safety, through better administration of FAA regulations and related policy.

The SWAP team had recommended improvements in the company's systems of flight-crew qualification, scheduling and training, as well as operational control (dispatch and trip records, for example) and flight operations. SWAP maintenance recommendations were equally searching as to the company's systems for complying with FAA regulations in areas of employee training, inspection control and improving aircraft and avionics.

Such SWAP findings are based on experience gained through in-depth inspection of the entire aviation business spectrum—not only air taxis, but air carriers, travel clubs, flight schools, mechanic schools, etc. Each SWAP inspection looks into all facets of an operator's *modus operandi*—from a systems viewpoint, rather than into every "nut and bolt."

Starting at Washington Headquarters, I asked SWAP coordinator Harry Hicks about the overall program that Flight Standards inaugurated six years ago for the air carriers. Before coming to his present position, Hicks was the principal maintenance inspector at the Baltimore General Aviation District Office (GADO).

"The agency has some 1,800 operations, maintenance and avionics inspectors who work out of Flight Standards field offices, Hicks said. While every part of aviation has grown in volume and complexity, the number of inspectors who must see that FAA regulations are complied with has stayed fairly constant. The manpower problem surfaced in 1966, and the SWAP program was established. Studies showed that the regular inspector couldn't adequately cover its growing workload."

Hicks went on to say that the program was expanded about three years ago to cover general aviation as well. Some 180 inspectors out of the total Flight Standards force now provide extra arms, legs and expertise for some 113 district offices—ACDOs, FSDOs and GADOs.

In all cases, a SWAP inspection begins and ends with the district office, where the inspectors who regularly maintain surveillance can participate in and review the SWAP team findings before they are presented to the operator.

Those 180 SWAP inspectors are located in all FAA regions, except some of the newer ones—such as Northwest, Great Lakes and Rocky Mountain, which are serviced by other regions.

To get the flavor of a SWAP team in action, I took Harry Hicks' suggestion and visited the Systemsworthiness Analysis staff's offices in Valley Stream, N.Y. Acting chief of the facility Walt Bailey (who also heads operations) and Joe Barbieri, maintenance section chief, talked about the work of their staff.

"We have four units," Bailey explained. "Both Air Carrier and General Aviation have a Maintenance Unit and an Operations Unit."

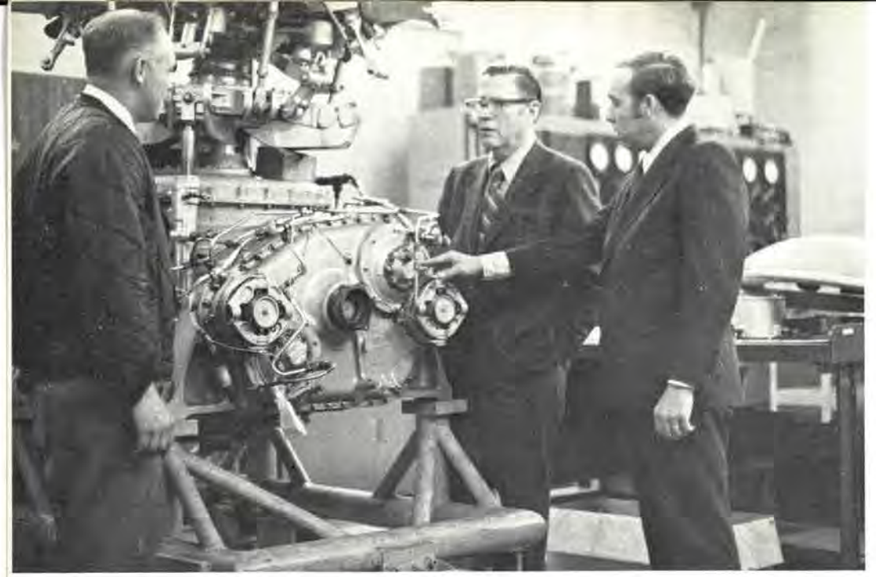
Each of the SWAP-unit men, as well as their leaders, has decades of experience in aviation within his specialty. Bailey used to fly non-scheduled airlines and was also a flight instructor; Barbieri was a flight engineer and had extensive maintenance responsibilities with National Airlines and Seaboard World Airways before coming to the FAA.

"Our main purpose," said Barbieri, "is to assist the district office in conducting inspection of the more complex operations over which they have surveillance responsibility. This may include air carriers, air taxis, repair stations, and mechanic and flight schools.

Bailey and Barbieri put me in the hands of a slim veteran of many years' supervisory maintenance responsibility with the airlines and industry. He is Don Wisner, the General Aviation Maintenance Unit leader. Wisner was about to join operations inspectors Delbert Burgess and Walter Sanders for a SWAP call on one of the 24 air taxis in the region that are inspected every two years.

Wisner told me that some 40 SWAP studies were completed in the region in calendar 1971, divided evenly between air carrier and general aviation. As we drove out to Baldwin Aviation at Republic Airport in Farmingdale to pick up a Beech Baron for the half-hour flight to Poughkeepsie and the offices

In a visit to an air-taxi operator at Dutchess County Airport, Poughkeepsie, N.Y., by SWAP-team inspectors, unit leader Don Wisner (in raincoat) and operations inspector Walt Sanders talk with the director of flight operations beside the company's Twin Otter, while SWAP operations inspector Del Burgess prepares to join them.



New York Airways' Conway (right) and Mitchell (left) show inspector Dodd the work being done on a Sikorsky helicopter's main gear box. Conway points out modification to lubrication lines based on a recent Sikorsky service bulletin.

SWAP inspector Dick Dodd (left) is briefed about recent changes in New York Airways' maintenance system by district office inspectors Ted Cymmer (center) and Jack Kiefner. Cymmer's specialty is avionics; Kiefner's is maintenance. Briefings are held before SWAP visits to operators.

of Command Airways, Wisner told me about the acceptance of their work.

"Nearly all the operators we've inspected have indicated that SWAP has been extremely helpful to them," Wisner said. "Quite often they'll contact us through the certificate-holding FAA district office and ask us to see the improvements they've made, based on things we pointed out in our findings."

While Del Burgess checked out Baron N9174Q, I learned that SWAP inspectors use both agency and rental aircraft in making their visits, thus maintaining flight proficiency.

Arriving at Dutchess County Airport, the SWAP trio was greeted by Capt. Sidney K. Richards, director of flight operations for Command Airways. This air-taxi company has 13 pilots besides Capt. Richards and carries some 9,000 passengers monthly between Pittsfield, Mass., Boston, Binghamton, N.Y., JFK and its home base.

Generally a SWAP team spends from 10 days to three weeks in making a study. On this call, the team was going to discuss improvements resulting from a previous study in areas of weight-and-balance-system records. The team also was interested in seeing the new manual prepared by the company for its pilots—a publication containing training criteria and other information vital to maintaining peak efficiency in flying the company's commuter-carrying Twin Otters and a Beech 99.

After the SWAP inspectors had discussed the improvements, we returned to Valley Stream. There, with air carrier maintenance inspector Richard E. Dodd, I paid a SWAP call on New York Airways, whose four giant Sikorsky S-61L helicopters each carry 30 passengers and a crew of three. Dodd's contact at JFK's Hangar 17 was Martin A. Conway, technical services director. Dodd keeps abreast of maintenance, training and aircraft records kept by New York Airways. For my benefit, he asked Conway to explain the operation.

General-aviation-maintenance-unit leader Don Wisner checks visual status board used by Command Airways to show avionics equipment in use or out for repair. Capt. Sidney Richards indicates that pertinent dates of overhaul can readily be seen on color-coded hanging tabs.

Loading-manifest records are shown to SWAP-team operations inspector Walt Sanders by Command Airways' Margaret Best, accounting clerk.

"On an average day, we carry about 920 passengers," Conway said, "serving JFK, Morristown, N.J., Wall Street and Newark, N.J. Every six minutes we have a takeoff—our helicopters are in the landing and takeoff mode most of the time, which is why maintenance is so important."

We observed one of the giant helicopter's twin 1,500 h.p. engines under repair, as well as a modification being made to external lubrication lines on the main gear box.

The visits with the SWAP office inspectors covered only a fraction of the SWAP work underway. The recent merger of Allegheny and Mohawk Airlines would call for a special inspection soon. In general aviation, numerous SWAP visits are scheduled six months ahead.

For the SWAP inspectors, the job means considerable travel. Like Don Wisner, Del Burgess, Walt Sanders and Dick Dodd, FAA's remaining 176 SWAP men enjoy their work, because it is putting their lifetime of experience to maximum use for greater air safety.

For Eastern Region's Flight Standards Division chief Harry Bernard, Air Carrier District Office chief Dick Kleinert, the SWAP teams free district-office inspectors for regular surveillance, certification and demand work.

Manhours expended by field offices on air-taxi operators alone have nearly tripled since fiscal 1969. SWAP teams are easing the burden.

To make the program work smoothly, a series of 63 workshops are being conducted in which SWAP and district-office inspectors work together to standardize a systems approach. To date, 1,030 inspectors have attended the workshops, which should end by January 1973. ***—Article and Photos by Thom Hook***

FACES AND PLACES

WORK RECOGNIZED—*A $300 check with a Special Achievement Award for sustained outstanding performance was presented to Earl D. Baird (left), Broomfield, Colo., GADO operations chief, by GADO chief Ansel McAllaster.*

PING PONG DIPLOMAT—*Angelita Rosal (left) 16-year-old daughter of electronic technician Monico Rosal of the Miramar AFFO, San Diego, crosses paddles with Yang Chun of the People's Republic of China. The youngest member of the U.S. team and ranked seventh in the nation, Angelita was chosen to tour the U.S. with the Chinese Table Tennis Team. She lost this game to Miss Chun at the UCLA Pauley Pavilion.* —Los Angeles Times photo

LAST FORECAST — *James C. Fidler, a pioneer in meteorology and on the weather service staff of the Aeronautical Center, has retired. He will direct the summer aerospace education program at Miami of Ohio University for the seventeenth time. Fidler made a number of innovations in weather broadcasting on radio and television.*

MAKER OF MEN—*Modelmaker Edwin J. Call chisels away at a wooden dummy to be used in airplane seat tests at NAFEC. The needed rigid dummies cannot be bought, so Call had to design, build and sculpture them.*

GOOD ADVICE—*Northwest Region's EEO specialist, Ancil Potter, counsels one of more than 6,000 Vietnam veterans who attended a two-day Veteran's Employment Fair in Seattle. At least one veteran contacted here has been selected for the agency's 150 Program.*

SIMPLICITY PAYS OFF—*A simplified design for a docking device that permits new mobile lounges to hook up to existing terminal devices at Dulles International Airport saved FAA $50,000 and netted a $1,025 award for Samuel A. Duncan, engineering technician at Dulles. Duncan is gladhanded by R. Dan Mahaney (left), Dulles manager, and C. R. Melugin, Jr., then acting manager of National Capital Airports, now Deputy Director of Flight Standards.*

DOUBLE HONORS — *Named a Fellow of the Aerospace Medical Association and given the Harry G. Moseley Award in recognition of his significant contributions to flight safety was A. Howard Hasbrook, chief of the Flight Performance Unit in the Physiology Branch of CAMI.*

PIRATE'S NEMESIS—*A group award of $800 was made by Rocky Mountain Region Director Mervyn M. Martin (left) to Akron, Colo., FSS personnel for helping apprehend a parachuting skyjacker. FSS chief William F. Cobb relayed info to police that ATCS-and-pilot Patricia Jones and electronic technician John Lingwall (right) radioed while circling the descending skyjacker in Miss Jones' plane.*

DIRECT LINE

Q. Order 1100.126A, Standard Organization of ATC Terminal Facilities, omits clerical positions from the organization charts. Does AT consider these positions too insignificant to mention, or was this just an oversight that will be corrected soon?

A. The omission of clerical positions from the terminal organization charts was not due to an oversight nor to AT considering clerical positions insignificant. Order 1100.126A is specifically addressed to the operational complement of terminals. The grade levels of the operational complement are contingent upon the level of the facility, but the grade levels of clerical positions are not significantly affected by the level of the facility. Hence, there is no need to include them in this terminal organization and grade-pattern charts.

Q. I think that the current Employee Appraisal Record, FAA 3430-1, is an unfair evaluation for the stenographic/clerical employees of the FAA. I think this appraisal is designed for technical personnel. For instance, the highest-rating question in Item One is: "Has thorough knowledge of the principles and practices pertinent to his work—is looked to by others for technical advice." How can a stenographer be looked to for technical advice? I think there should be a separate Employee Appraisal Record for stenographic/clerical personnel.

A. You've got a point and something has been done about it. Your complaint has to do with Part IV of the EAR on promotion evaluation, and the phraseology used to differentiate between the four columns for the various rating factors. We have had few complaints about the rating factors themselves, because they are, in fact, the skills, knowledge and abilities required in almost all FAA jobs. In retrospect, however, it appears that the descriptive phraseology for the four columns does have more of a technical than a universal flavor. You may be interested in knowing that a special study team in the Office of Personnel is studying the entire FAA appraisal system. Your critique has been referred to the study team for consideration along with the comments, complaints and observations received from other FAAers.

Q. My facility chief claims he was given a low Employee Appraisal Report because an Unsatisfactory Condition Report was submitted by a facility employee with the chief's approval. Is this possible? Now our chief has told another facility employee that anyone who submits a UCR will receive a lower EAR. Can he lower an EAR on that basis?

A. We will answer the two parts of your question separately. First, you do not indicate the nature of the unsatisfactory condition. If it related directly to a matter that should have been noted and corrected by the chief but that higher levels of management had to correct after receiving the UCR, it is possible he was not performing in an entirely satisfactory manner. In such a case, a lowered performance rating might result. On the other hand, if your chief was "punished" for forwarding a UCR that made higher management "look bad," that was wrong. If your chief, or anyone else, thinks his performance was rated low on the basis of reasons not related to his performance, he can and should take advantage of the review and appeal procedures available to him in Chapter 10 of Handbook 3430.3, Evaluating and Improving Employee Performance.

The other part of the question relates to the chief's threat to penalize employees who submit UCRs by assigning them lower performance ratings. The threat is contrary to agency policy (see paragraph 6c of Order 1800.6A), and the chief should be questioned to assure that he was not misunderstood. Of course, if any employee believes his performance rating has been lowered because he submitted a UCR, he should follow the procedures in Chapter 10 of Handbook 3430.3.

Q. During a 1971 illness, I used over 1,400 hours of sick leave. In that period, I built up a large backlog of use-or-lose annual leave. I requested that 13 days of sick leave be converted to annual leave in order to save sick leave and use as much use-or-lose annual leave as possible. Can such a substitution be made?

A. Considerable flexibility is allowed by law and regulation on the subject of leave substitution. For example, when sickness occurs within a period of annual leave, the period of illness may be charged as sick leave. And the Comptroller General has held that an employee may elect to use annual leave instead of sick leave, provided the approving official approves the substitution and would have granted the annual leave initially. However, the rules get stickier when the substitution appears to be solely for the purpose of avoiding forfeiture of annual leave. The absence may be charged to annual leave if the employee requests the use of annual leave during the period of illness, or not later than the date on which he initials the T&A report covering the illness. But the retroactive substitution of annual leave for regular sick leave requested and granted is prohibited (38 C.G. 354). A more detailed discussion of this whole subject can be found in paragraph 41 of Handbook 3600.4, Absence and Leave.

Data Systems Staff members (left to right) Derek Black, Dave Hernandez, Hugh Adams and Adam Quandt discuss the Model 3c data base and the adaptation of the Los Angeles Center's geographic data to be incorporated.

Standardized programming creates

THE COMPUTER THAT NEVER FORGETS

In FAA's world of sophisticated computers for air traffic control, you don't get much more than a hum without a program—but it's the kind of program that makes the difference in a smoothly functioning integrated system capable of keeping apace of aviation's growth.

The need was to equip the NAS Enroute Stage A hardware with standardized-base programs worked up by controllers for controllers to which local programming could be added. But from the blank sheets of paper at the start of constructing the program to a flawless performance by an ATC computer, there was a journey of hundreds of thousands of man-hours.

For the air traffic controllers, data systems specialists and technicians at the Oakland and Los Angeles ARTCCs, the culmination of all that work came in May when the shakedowns there of the carefully tuned, new computer program showed it could operate efficiently in a real-life air-traffic-control environment.

"I'd say that we've had fewer problems than we anticipated," said Eugene Campione, a data systems specialist at Oakland. "The program relies a great deal on adaptation, you know. It's far more flexible than the old program and provides better output for the controllers; but naturally, this means a larger vocabulary for the memory banks. The program structure is simpler, but there is a greater variety of information to be adapted."

The program that was "hung" at the Oakland and Los Angeles centers is formally known as Model 3c—a vastly improved computer "script" that tells the computer what to do, how to do it and when to do it.

"With the Model 3 program," explained Cam-

The photos in this story were taken by Frank J. Piraino, developmental controller at the Los Angeles center, and Jesse Dillon, data systems specialist at the Oakland center.

ATCS Alan Adgate mans the radar position as ATCS Mike McDaniel enters flight-plan data via a computer entry device (CED), part of the computer update equipment at Los Angeles. The square screen in front of him is an alphanumeric computer readout, and the six-button panel to the keyboard's right is a Quick Action Keypack (QAK), which permits McDaniel to enter some information quickly.

pione, "the controller can make dynamic updates: He can keep the computer informed of changes as a flight progresses, as well as get more help and reliability out of the system."

Earlier versions, particularly the Model 2 in operation in 10 of the 20 enroute centers in the U.S., are a big step forward from the days of no computer assistance at all. But they are essentially lightning-fast calculators and flight-strip printers.

The most obvious problem with the earlier programs is the lack of a full update capability; that is, a truly automatic refiguring and distribution of all flight information throughout the air-traffic-control system, whenever and wherever it is needed.

Before automation, controllers had to write flight information manually and calculate estimated times of arrival. Whenever there was a change in routing, altitude or time, this had to be noted or recalculated by hand. Other controllers needing the information were contacted by telephone, intercom or by "runners" carrying the updated information.

Model 2 relieved controllers of much of the writing and calculating estimated times at checkpoints. The system neatly prints flight strips and delivers them—once. But after this first printout, controllers must resort to the manual system again. "Once a flight is off the ground," explained "Ace" Carter, chief of the Automation Branch in Los Angeles, "and the computer puts the departure on a flight strip, the computer is through!"

With Model 3, however, the computer never forgets. What's more, the controller can talk to it through a special keyboard at his control position. It can help answer some tough questions for him, such as "What's the weather now at Albuquerque?" or "If the flight changes its speed to 520 knots, when will it get to Boston?" "Furthermore," Carter added, "the controller is answerable to the computer, too; it will nudge him if he doesn't keep the computer current on a flight."

Because this new program is ready for just about any change in signals, said Oakland's Campione, it requires more information storage and has to manipulate each piece of information for a longer period of time.

"Our biggest challenge was to take the basic structure provided by headquarters and NAFEC and add to it all of our local information—every radio navigation aid, airway, airway mileage, airport location, etc. There's an almost-unbelievable amount of ATC information that's meaningful only here at Oakland."

How much data has to be memorized by the computer? Bob Lee, Terminal Systems Branch chief in Washington Headquarters, said that the national standard Model 3 program skeleton takes about 360,000 computer words; then each center must add another 250,000 to 300,000 to adapt it to local conditions.

"It's really difficult to grasp the numbers and the complexity of the system we're talking about," he said. "Getting all of these centers, towers and other facilities—some automated and some not—working together is a monumental job. You've got to tie in not only centers and towers but also flight service stations, airlines and weather-observation and military facilities. We need information from all of these sources. I'm not sure how each center's computer program will stack up against what may be the world's largest—NASA's for the Apollo program, but I'll bet that when all of ours are tied together, they'll make up the largest computer net in the world."

What's happening at Los Angeles and Oakland is soon to happen at nine more ARTCCs. Expected to pass their Operational Readiness Demonstration with the Model 3 by the end of this year are systems at New York; Washington, D.C.; Cleveland; Fort Worth; Indianapolis; Kansas City; Boston; Seattle; and Houston. Data-systems specialists, technicians and controllers who anguished with the birth pains in California will hopefully have eased the burden for the others. In all, there are nearly 500 data-systems specialists responsible for installation and maintenance of the computer programs.

The data systems specialists involved in the project as well as those at the centers have to absorb many weeks of special training. It takes 16 weeks of formal computer-programming training and another nine weeks of advanced training in the specific field program they are concerned with, all conducted at the FAA Academy.

Air traffic controllers need special training, as well. On dead-ringer mockups of the consoles they use, they get 40 hours of tough handshaking with the hardware itself and the basic procedures used in working with the new program. Then comes another 100 hours of on-the-job training, while the computer equipment and program is going through installation and checkout. The system is not used for control of actual air traffic until final commissioning.

By December 1973, the Model 3 program for flight data processing is expected to be operational at all 20 enroute centers.

The development of the new program goes back more than three years, when the new-generation computers ordered for the NAS Enroute Stage A system in 1964 were beginning to report for active duty at the centers with earlier models of computer programming.

"There were obvious limitations to the program," Lee recalled. "They resulted in people from the field being brought in to study the program's potential for growth in a rapidly expanding air-transportation world.

Los Angeles center personnel check out the new computer program at the system-console position, where system-control messages are entered through an input/output typewriter (IOT). From the left, Howard Gordon, NAS support controller; Carl Sheetz, DSS; John McCurry, computer operator; and Arman Dreier, computer crew chief.

Discussing Model 3c program characteristics with Oakland center flow controller Joe Brubaker, seated at a 1052 typewriter, are (from the left) data systems specialists Bob Taylor, Daryl Finch and Irv Chandler.

"We found out a lot about our computer problems with the shakedown of the Model 2 program in 1969. Now we've got 10 centers using this program and four still using their own home-grown programs.

"The fact that our data-systems specialists are capable of producing programs on their own is a tremendous tribute to their talents, but we need a standardized systems program that will enable each facility to work automatically with all the rest and one that is easy to maintain."

To put hard-core air-traffic-control experience into the job of reworking the Model 2 program, a new division was organized in the Air Traffic Service, and a task force of about 25 controllers and controllers-turned-automation-experts were assembled at NAFEC from all over the country. Intimately involved in the project was the National Airspace System Program Office with overall program responsibility; the Airway Facilities Service that installs and maintains the agency's equipment; and the industry contractor, IBM.

Eight months after the new Automation Division in ATS was created, in April 1970, a five-inch-thick document was delivered—the instruction book for the industry programmers who were going to write the "script." This specification was handed to the Automation Division chief, Al Ridenour, on April Fool's Day. He maintains steadfastly that "there's absolutely no significance in the date."

Working elbow to elbow, the controllers and programmers labored for another 18 months to prepare the computer's own "instruction book." In September 1971, the program was ready for testing. "Hung" with an imaginary center's myriad details, the program had to prove that it could run for 72 hours without interruption, while providing controllers with real help.

The task-force controllers sat down at nine typical enroute consoles at NAFEC, and the program was fed into NAFEC's computer. Flight-plan information came in from phantom flight service stations, imaginary airport towers and synthetic military and airline operations offices.

The ebb and flow of air traffic was carefully scripted in advance, leaning heavily on actual recorded air movements, with the objective of putting every possible control challenge to the computer. It was authentic, but unlike real air-traffic situations, the test program could be stopped for analysis and trouble-shooting.

The program worked without disabling flaws,

Repairing a computer IOT and a computer update equipment (CUE) keypack are Los Angeles center AF sector technicians Guy Manscill (left) and Roland DeMond.

Reviewing test results of the new computer program at the Oakland center are (left to right) data systems specialists Bob Cyphers, Charles Bassett and Leonard Klopfenstein.

even sniffing out some of its own defects and healing them without human assistance. But it couldn't anticipate all eventualities. As Los Angeles's Carter said, "You have problems any time you build a big software program in a sterile environment."

The Model 3 program framework was delivered to Los Angeles last November and to Oakland last December—26 months after work began. The computer equipment differs somewhat in each location, and the stage of automation achieved was different. Both were ideal test-beds—both busy, with over a million operations a year. Los Angeles is heavy on flights originating and terminating in its area, while Oakland handles heavier overflights.

When all of the initial strangeness is past and when controllers at all the ARTCCs have become as familiar with the new system as with their present systems, their confidence in it will likely echo that of Washington tower controllers in the checkout days of their ARTS III equipment:

When maintenance technicians turned off part of the new system for additional work, a newspaper writer present reported an audible groan from the controllers.

—By Don Byers

ANSWERS TO ELECTION QUIZ ON PAGE 7

1. In 1920, the Democratic nominee for the Vice Presidency was the young Franklin Roosevelt. He ran unsuccessfully with James Cox, the Democratic candidate for President. Running with Thomas E. Dewey in 1948, the unsuccessful Vice Presidential hopeful was Earl Warren, later Chief Justice of the Supreme Court.

2. In the election of 1800, Thomas Jefferson defeated the incumbent John Adams for President. Adams had served in both Washington Administrations as Vice President, and Jefferson had been Adams' Vice President.

3. The first Republican nominated for the Presidency was John C. Fremont in 1856, while Abraham Lincoln was the first Republican elected President.

4. There were four: Thomas Jefferson lost to John Adams in 1796, then defeated Adams in 1800; Andrew Jackson lost to John Quincy Adams in 1824, then came back to beat him in 1828; William Henry Harrison lost to Martin Van Buren in 1836, then topped him in 1840; Grover Cleveland lost reelection to Benjamin Harrison in 1888, then won in 1892.

5. President Grover Cleveland defeated James Blaine in 1884, then lost to Benjamin Harrison in 1888. He ran again in 1892 to beat Harrison and became the only President ever to have separate terms of office.

6. Grover Cleveland, 1884-1888; 1892-1896; and Woodrow Wilson, 1912-1920.

7. No President has ever resigned his office and only one Vice President has. John C. Calhoun was Vice President during Jackson's first term, but resigned to serve in the Senate on Dec. 12, 1832.

8. It occurred twice, in 1800 and 1824. In 1800, both President and Vice President were elected on the same ballot, the Presidency going to the individual with the most electoral votes and the Vice Presidency to the man with the second highest. Thomas Jefferson and Aaron Burr tied with 73 votes each. The House of Representatives named Jefferson President and Burr Vice President. In the election of 1824, the popular and electoral votes were divided among Andrew Jackson, John Quincy Adams, Henry Clay and William H. Crawford. Although Jackson had the lead, none had a majority of the electoral college. The election was decided in the House, with Clay throwing his support to Adams.

9. James Monroe in 1820 got 231 votes with only one electoral vote cast against him. Three votes were not cast. The highest percentage of all votes in the Electoral College went to Franklin Roosevelt in 1936. FDR received 523, while Alf Landon garnered only eight.

10. In the first election for President in 1789, no political parties were represented among the candidates, which included George Washington, John Adams, John Jay and others. The four candidates in the 1824 election were John Quincy Adams, Andrew Jackson, William H. Crawford and Henry Clay. None were supported by parties. The disintegration of the Democratic-Republican Party had led to nominations by state legislatures.

11. The Civil Service Act of 1883 protects career civil servants from efforts to force them to render political service or tribute. The Hatch Act of 1939 provides that employees generally cannot render political service even if they are willing to do so.

12. He was right about driving his car in the parade. This kind of participation in a partisan campaign is outlawed by the Hatch Act. He could have placed the bumper sticker on his car, however, if he had wanted to.

Errata

In the name of accuracy, we are mopping up a few slips twixt the cup and the lip in the story on "Injury Compensation" in the June issue.

In the first paragraph on page 17, item (3), it should read: "if totally disabled for useful and efficient service, apply for disability retirement *or compensation.*"

In the third paragraph, the form designation should read: "*CA-2a,* Recurrence of Disability."

The third paragraph from the end of the story should begin: "An injured employee cannot receive both *Employee Compensation Benefits* and Civil Service Retirement."

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THE YOUNG PROBLEM-SOLVERS

Twice each month, a group of 16 FAA employees conference in Washington Headquarters to ponder ways of bettering the agency . . . but they aren't top management. This is the Junior Management Board implementing its mandate to explore areas of innovation and change in FAA.

Designed to bring a group of younger employees —all members are under 35—into direct contact with agency executives to create a two-way awareness of management processes and younger viewpoints, the board serves as a problem solver and as a review body for potential problems on projects initiated by management and the board itself. The board is responsible to the Deputy Administrator through the Associate Administrator for Administration.

Out of such meetings has come JMB's proposal to study the introduction of a four-day, 40-hour workweek, for which FAA's Executive Committee (EXCOM) recently gave the green light. The JMB collected data about industry and Federal Government investigations into the idea and suggested it was time for FAA to look into it.

The approach will be to use one Washington office as a pilot this month to develop study techniques and to provide a guide to the values of restructuring the workweek. This will be followed by a Headquarterswide survey conducted by all past and present members of the Junior Management Board. JMB will then report its findings by 15 January on the value of instituting the 4/40 workweek in Headquarters and other agency segments concurrently working a five-day, 40-hour week. If the results are promising, a separate study would have to be conducted for employees working on a shift schedule in the field.

This spring the board delivered its report on a study of the Employee Suggestion System. Among its recommendations were automating the system for standardization and speed, a simplified form and instructional pamphlet and a cost-effectiveness study on the system.

To maintain continuity of the board and its projects, half of the board members, who serve for one year, are replaced every six months through nominations requested from office and service directors. Membership is open to Headquarters employees under 35 in technical and professional positions.

The present members of JMB are: Rodney Guishard, RD, chairman; Bill Cress, AF, vice chairman; Phyllis Burbank, HQ, secretary; Anthony Amato, TR; Patricia Beardsley, MS; David Clemens, AS; Mike Dundon, BU; Mike Dunlop, MN; Ed Faberman, GC; Rich Hakkarinen, MS; Ed Huntzinger, LG; Frank McCabe, IA; Johnny McQuaig, NS; Bill Reddick, VS; Raymond Weil, EC; Gene White, AT; and Jim Moreland, SM, former member now serving as a project advisor.

At work on their 4/40 proposal are some Junior Management Board members. Then chairman Bob Marlott, FS, discusses the survey with members (counterclockwise from the left) Rich Hakkarinen, MS, board secretary; Bill Cohen, HQ; Lynne Sparks, AS; David Clemens, AS; Frank McCabe, IA; Mike Dundon, BU; and Bill Cress, SM.