Photograph not available.

Borescopes allow quick but thorough evaluation of wear and tear deep inside engines (Photo courtesy Lenox Instrument Co., Inc.).

Borescopes Help Solve Inspection and Maintenance Problems in Aviation

If you can look at something, you can better understand it; if you cannot see it, then understanding is more difficult, and reckoning enters the picture. In our world of inspection and maintenance, there are many instances of a technician not being able to see clearly the object to be inspected. Often it is hidden out of sight, within a closed system, down a piping run, inside a chamber, or inside a vessel containing dangerous materials. When inspection itself becomes difficult, we must guard against failure to properly perform inspections. Otherwise the results could be disastrous. Enter the "inside look" of the borescope.

The primary types of borescope are the rigid and flexible variants. The rigid borescope is much like a telescope: a long tubular instrument with optical lenses. However, although a telescope narrows the field of vision for the observation at a distance, a borescope spreads the field of vision for close-up work. The borescope also has relay lenses along its length to preserve precise resolution. The magnification is usually three to four times (3X-4X).

Rigid borescopes are made in one or more modular sections for ease of storage and handling. Self-illumination is provided either by internal lamps at the view head or through the use of fiber optics that lead the light to the subject. The view head itself can provide right angle, bottoming, circumference, forward oblique, or retrospective (recall) views through the use of mirrors and prisms. Rigid borescopes are available in lengths from three to 100 feet, and in diameters from 0.118 to 2.75 inches.

Flexible borescopes are useful in applications that provide no straight passageway to the point of observation. These operate entirely with an internal fiber optic light source. A flexible borescope holds two optical bundles — each consisting of as many as 40,000 individual strands of glass fibers. One bundle carries light to the inspection area and the other carries the image back to the eyepiece. These optical bundles, protected by a housing of sealed flexible stainless steel conduit, allow the borescope to bend around corners while sending back to the viewer a sharp, clear image.

With this tool, a technician can inspect for such problems as: imperfect welds in piping, heat exchangers, or pressure vessels; cracks or foreign object damage (FOD) in aircraft engine components; blade wear in gas turbines, and the presence of contaminants and surface flaws in casting and tubing. Other borescope targets are: cracking or stress in structural members, metal corrosion in systems carrying chemicals or fluids and instances where there is a need to inspect a component in all corners and behind working parts.

Aircraft operators use the borescope to check rubber hoses and aircraft fueling lines for flaws. Overhaul and repair facilities use the borescope to make thorough inspection to better estimate repair jobs. Decisions to scrap or repair can be made on the spot and much time saved as a result. This capability can be a boon to both the owner and the repair facility — and all because a direct look inside was possible. Recently, an aircraft manufacturer set up the use of a borescope variant, called a chamberscope, to examine incoming engines for corrosion within combustion chambers—

a problem that otherwise would not turn up until final testing and inspection, where it would be very expensive to rectify.

There are major points to consider in selecting a borescope. The difference between the right borescope and the almost-right borescope is the difference between easy inspections and troublesome ones. Consider your uses and particular requirements before settling on one type. The rigids, the flexible and the periscope types all are useful at an aviation repair and overhaul facility. The professional aircraft inspector may need all versions, too. Critical factors to consider in selecting a borescope are illumination, environment, reflectivity, power, black light, camera or recorder needs, and whether flexible or rigid fits the need.

From the aviation technician's viewpoint, you can usually get more applications out of the rigid borescopes than the flexible type. For example, if you want to inspect the inside of a gas cylinder, you might believe that a flexible scope would let you examine every inch, and you would be correct — but it would be a very slow process. In this case, a rigid scope with a quartz lamp, a movable mirror, and with variable magnification (zoom capability) would accomplish the job in much less time.

One aircraft mechanic told of using his borescope for two hours to locate a problem and only one-half hour to fix it. The same job, without a borescope, previously had taken five hours to determine the trouble and three hours to fix it.

Although the borescope serves a basic and simple purpose, the technology of its operation and its application is fairly complex. You have so many choices in borescope components, and every inspection job has its own special characteristics. You should share every bit of information you can with your borescope manufacturer's application engineer, so he can suggest the components to do the job best.♦

NEWS & TIPS

Aviation Maintenance Technician Of 1989 Honored in U.S.

Dwight Dean Law of McHenry, Maryland, U.S., was named the 1989 Aviation Maintenance Technician of the Year by the U.S. aviation industry and the U.S. Federal Aviation Administration (FAA). The annual national award recognizes the vital role played by professional aviation technicians in

Photograph not available.

Dwight Dean Law is awarded the Aviation Meaintenance Technician of the Year Award by FAA Administrator James B. Busey.

aviation safety and the promotion of aviation technology.

FAA Administrator James B. Busey presented the FAA award to Law in ceremonies honoring the maintenance technician of the year and the flight instructor of the year. During the presentations held at FAA headquarters in Washington, D.C. November 2, 1989, Busey praised their high level of "professionalism, creativity, skill, charisma, excellence and contributions to safety" and said, "It's dedication and performance such as demonstrated by these two that keep the spirit of general aviation growing," Law is the director of maintenance and an FAA-authorized inspection mechanic for Lakeside Aviation, Inc., of McHenry, Maryland. His intense concern for aviation safety led to his development of an aircraft battery that disconnects upon impact, thus preventing post-accident aircraft fires that that could be caused by the battery's internal charge. Law is now working with Aerosafe, Inc., and Ohio State University at Columbus, Ohio, to further develop the patented safety battery.

Law has been employed by an aircraft repair facility in Petersburg, West Virginia, and previously served as a mechanic on U.S. Army helicopters during the Vietnam War.

The award program is sponsored by the AOPA Air Safety Foundation, General Aviation Manufacturing Association, Helicopter Association International, National Business Aircraft Association, National Air Transportation Association and the FAA. Editorial coordinator, Robert Phillips, of the Flight Safety Foundation *Aviation Mechanics Bulletin* has served on the judging panel since the inception of the program in 1966.

Frostbite Warning Worth Repeating

Exposed skin is always susceptible to frostbite when the temperature drops below freezing — and tissue can be frozen even though covered. Here are a few tips to prevent cold damage to the human part of the aviation maintenance safety equation.

• Wear enough clothing for protection, Protect the face in high winds. Wear loose-fitting and well-ventilated clothing in layers for best protection.

• Do not touch bare metal with bare skin in extremely cold temperatures. This is one “don’t” that requires conscious effort when working on aircraft outside. One mechanic was observed to take off his gloves to touch aircraft skin to check for a loose rivet; he quickly pulled his finger away as if it had been burned, which is exactly what it appeared to be to first aid room personnel. It took an incident like this to convince him to keep his gloves on in the future and to use a tool, such as a screwdriver, to use as a probe instead of his bare skin when working with frozen metal.

Carrying the Flame Is Only for Love And the Olympics

The story goes that an electrician was checking emergency power lead-acid batteries that were on a trickle charge in a poorly lighted area. Not having a flashlight, he used a cigarette lighter to provide illumination to check the battery water level. As the mechanic bent forward toward the opened batteries, the fumes exploded, throwing battery acid into his face. The result was serious burns and permanent disability. Warnings about using an open flame to check things in flammable atmospheres have been given to us so often for so long that some of us may have become deadened to them. However, there’s always that two percent that does not get the word, and newcomers who can profit from safety messages, no matter how unnecessary they may sound to old timers.

Trade Shows Coming Up

The 19th Annual Trade Show and Symposium will be hosted by the **Professional Aviation Maintenance Association** (PAMA) February 27 through March 1. In a special seminar devoted to safety, the subject of hazardous chemicals as it affects the aviation industry will be examined and discussed. Site of the 1990 meeting will be the George R. Brown Convention Center in Houston, Texas, U.S.

PAMA has scheduled a wide variety of technical seminars for I.A. (Inspector Authorization) certificate renewal and to maintain the high level of professionalism in the aviation maintenance industry. Topics on many aspects of aviation maintenance and safety will be presented from the viewpoint of both the technician and management. One panel will address industry concerns over revisions to U.S. Federal Aviation Regulation (FAR) Part 65, "Certification: Airmen Other Than Flight Crewmembers." The association expects approximately 200 aviation maintenance suppliers to exhibit their products and services at PAMA '90.

More details are available from PAMA at Suite 401, 500 Northwest Plaza, St. Ann, MO 73074, U.S. Telephone 314-739-2580.

On March 1 and 2, the M**innesota Aviation Maintenance Conference** will be held at the Thunderbird Hotel in Bloomington, Minnesota, U.S. Sponsored by the Minnesota Department of Transportation Aeronautics Office, in cooperation with the U.S. Federal Aviation Administration (FAA), the conference is open to aviation mechanics, aircraft refueling technicians, students and pilots interested in keeping up-to-date on maintenance technology.

Program features will include education and safety presentations, industry exhibits and recognition of the outstanding Minnesota aviation maintenance technician of the year. More information on the conference is available from Donald Goserud, Office of Aeronautics, Minnesota DOT, Transportation Building, Room 417, St. Paul, MN 55155, U.S. Telephone 612-296-7285.

The fourth annual **International Aviation Maintenance and Ground Support Equipment Tradeshow and Conference** (AMTECH 90) will be held at the

Dallas Convention Center, Dallas, Texas, U.S. March 26-28. Sponsored by *Aviation Equipment Maintenance* magazine, the activities will include seminars and forums as well as product exhibits by approximately 200 companies, with a first-time outdoor exhibit of large equipment and vehicles.

A special seminar program will identify the differences between ground support equipment (GSE) needs and what is available today, the purpose of which is to promote better understanding between the end-user and the manufacturer. A technical forum will be devoted to addressing the needs of GSE and maintenance equipment, with presentations by industry representatives. Other sessions will include presentations during which various companies will describe new maintenance procedures and practices they have developed for the improvement of maintenance quality and safety.

With This Ring I Put Thee at Risk

Jewelry may be attractive, but it can be a hazard in the workplace. We continue to see accident and incident reports of people whose finger rings get caught in machinery. One mechanic, whose loyalty exceeded his safety consciousness, swore that he would never remove the wedding band from his left hand ring finger. One wonders how he would be able to wear a ring on a finger that has been amputated because the original ring got caught in moving machinery. For some other reason, the same person also continued to wear a signet ring on his right hand while operating machinery.♦

MAINTENANCE ALERTS

The following information on accidents and incidents is intended to provide an awareness of problem areas through which such occurrences may be prevented in the future. Maintenance Alerts are based upon preliminary information from government agencies, aviation and other sources. The information may not be complete.

Fatigue Fractures Flap Fitting

The Boeing 747 was on a scheduled flight from Los Angeles, U.S., to London, U.K. The aircraft, with 313 occupants, took off at 0122 hours and had an uneventful flight until approaching its destination.

The aircraft was turning on to the ILS centerline at Heathrow Airport with the captain flying a manual approach. Shortly after the flaps were lowered from 10 to 20 degrees, a bang was heard from the right side of the aircraft; there was also a light vibration throughout the aircraft. Simultaneously, three stewardesses working on the right side of the aircraft reported hearing a bang that they initially thought was a bird strike.

There were no abnormal indications on the flight deck and the captain had no difficulty controlling the aircraft. The landing was normal and the aircraft disembarked the passengers at the terminal without incident.

The first indication of what had occurred was a report from the ground crew that the number 16 Krueger (leading edge) flap adjacent to the number 3 engine was damaged. The flap had travelled above its normal position and was pointed upward. It had scraped against the engine pylon on the way up, which had caused a portion of the front flap section, the "bull nose," to break off. This had struck the fuselage.

Later examination showed that the extra movement of the flap had been caused by the failure of the gimbal fitting that links the ballscrew transmission system (mounted in the wing) with the support arms of the Krueger flap. With the failure of the fitting, the section of flap was free to move upwards beyond its normal limits and the outboard section of the bull nose scraped against the engine pylon.

Detailed metallurgical examination of the failed piece showed a small area of fatigue cracking around an area of undercut on one of the side-plates; fatigue fracture in this titanium material is characterized by an extremely small critical crack length. The side plate failed in rapid overload. The missing sections of the fitting and the Krueger flap were not recovered.

Drag Stay Didn't

The Piper PA-23-250 Aztec had made an uneventful flight and was landing at Cambridge Airport, U.K. There were three passengers and the pilot. The touchdown was normal.

However, before the pilot applied brakes, the aircraft began to veer to the right and the right wing began to settle to the runway. The pilot kept the aircraft straight and shut down the engines. After the aircraft came to rest, the occupants were unable to leave through the passenger door, so they had to evacuate through the emergency exit. There was no fire and there were no injuries. After the aircraft was jacked up, the passenger door became free.

Later examination of the right landing gear revealed that the drag stay had failed, which allowed the gear leg to pivot to the rear and become wedged under the wing. The center pivot bolt of the drag stay was found to have failed near its midpoint. Detailed examination of this bolt showed that it had failed in reverse bending fatigue and that it was generally in poor condition. Most of the shank showed signs of pitting corrosion and there was surface damage, consistent with the effects of the bolt rotating under load, in the upper drag link and the two lower drag links it connected. The bolt holes in the links were oval. Inspectors also found that the machined antirotation flat on the inboard lower drag link had been damaged by the bolt head to the point that rotation was possible. A bronze bushing in the center (upper) drag link also exhibited some ovality.

Investigators concluded that after the bolt flat had been damaged by its rotation, wear had occurred because of continued rotation on the unlubricated outer links which also had no bushings. The bolt then was no longer under shear stresses alone, but could also experience bending stresses. These, in turn, caused two fatigue cracks that began at the point of corrosion pits.

The two bolts that attach the drag brace to the airframe and landing gear also showed varying signs of pitting corrosion. The antirotation flat for the leg attachment bolt had been damaged by the head of the bolt, but not enough to allow rotation.

Engine Failure

The WW II vintage Spitfire took off from its home airport in the United Kingdom and was seen carrying out a series of climbing and turning maneuvers. Witnesses reported not seeing or hearing anything to indicate that it was performing abnormally.

After the aircraft departed the airport area, several ground witnesses heard the engine misfiring and saw a trail of vapor streaming from it. A Mayday call was heard indicating that the pilot would attempt a landing at a nearby airport, followed within seconds by another call that changed the intended point of landing to a field near the airport.

The aircraft was seen with its propeller stopped as it barely cleared high tension cables and maneuvered to the field. The aircraft struck the ground in a nose-down attitude and caught fire immediately. The pilot was killed and the entire center section of the aircraft was destroyed by fire.

The force of the impact had been absorbed mainly by the engine, which was embedded in the ground. The propeller blades had failed in a rearward direction indicating that they had not been under power at the time of impact. The tail section, starboard wing, outer left wing and engine had survived the fuel fire.

The upper and lower surfaces of the starboard tailplane were stained with oil, and fragments from the shattered cockpit canopy that had been thrown clear also were covered in oil. Although the engine was buried, an oil deposit was seen in the exhaust stub from cylinder 1A, and the fractured end of a connecting rod was found lodged outside the crankcase. When the engine was uncovered, the crankcase was found to have holes on both sides.

Corrosion Again Rears its Ugly Head

The McDonnell Douglas DC-8-62 was lined up for takeoff on runway 23 at Stansted Airport, U.K. When the tower cleared the aircraft for takeoff, the controller gave the crew the latest winds from 101 degrees at 10 knots. The captain then requested a different runway since the the aircraft's takeoff weight was too high for that tail wind.

The tower granted permission to use another runway and the aircraft was backtaxied along the entire length of the runway. Before the aircraft reached the end of the runway, there was a muffled bang which the crew and the tower controller assumed was a compressor stall. However, the controller then reported that the aircraft had blown a tire. He told the crew to hold position and initiated an airport alert. The aircraft was then taxied to the end of the runway and turned off. A second bang was heard and the crew announced a second blown tire. Shortly afterwards the controller informed the crew that the landing gear was on fire and upgraded the airport alert for emergency services to respond.

The passengers were evacuated with only one passenger injured when he fell from the aft slide and sustained head injuries that required hospitalization. The fire in the left undercarriage area was quickly extinguished.

Later examination revealed that the number 8 wheel assembly had failed around the mid tubewell because of fatigue emanating from multiple corrosion pits, releasing the outer rim and the tire. The adjacent number 7 tire then failed from overload. The aircraft had rolled on the remaining rims until the aircraft began to turn off the runway. At that time the rims failed, causing the wheels to skid and erode the hubs through to the brake units. The number 8 wheel assembly had been manufactured in 1959 and was cleared to a maximum takeoff gross weight of 315,000 pounds, 20,500 pounds less than the aircraft's takeoff weight. The number 7 assembly was cleared to a gross takeoff weight of 35,500 pounds less than the actual weight.

Brake Failure Wreaks Ramp Havoc

The de Havilland DHC-6 Twin Otter was being prepared for a cargo flight scheduled to depart at 2130 hours from Southend Airport, U.K. The pilot, using a flashlight to preflight, found the brakes and tires satisfactory. The engines were started using external power.

When he looked up to signal to the ground controller to disconnect the ground power cable, the pilot realized that the aircraft had begun to move even though he had not released the brakes. There was another aircraft parked a short distance ahead and the pilot had to use the nosewheel steering to avoid a collision. The toe brakes proved ineffective and the pilot shut down the engines. By then the aircraft had turned through 120 degrees to the left and was heading towards two other aircraft parked to the left.

This time the pilot could not avoid a collision and the left propeller of the Twin Otter struck a Britten Norman Trislander and caused minor damage to the Trislander's left wing. The right propeller struck a Cessna 177 and removed the outboard section of the Cessna's right wing. The Twin Otter stopped and the pilot evacuated without injury. There was no fire.

It was later found that the left brake caliper had failed through the casting and had separated from the disc. A piston from the caliper was found in a pool of hydraulic fluid close to the Twin Otter's original parking place.

Later inspection revealed that the failure had started at a fatigue crack with multiple origins on one side of the caliper slot. Some cracks were also found on the other side. In both cases the crack origins had initiated from corrosion on the horizontal surface, an area normally corrosion-protected during manufacture. Although there was evidence that some corrosion protection had been applied, it was apparent to investigators that it had not remained effective during the estimated 8,000-hour/8,000-landing life of the caliper.♦

NEW PRODUCTS

Information on the following products, services and literature is published in the interest of improving aviation safety through a well-informed, better-equipped aviation mechanic.

Program Introduced To Prevent Back Injuries on the Job

Du Pont Safety and Environmental Services has introduced a three-module safety training program aimed at increasing back-safety awareness to improve safety and health. The aviation industry has contributed its share of serious back injuries to the total since many aircraft components are heavy and working within tight quarters is commonplace.

Du Pont's back injury prevention program identifies everyday activities that contribute to back injury and related illnesses and presents ways to modify behavior that can lead to back problems both on and off the job.

The program provides techniques from the company's Safety Training Observation Program (STOP). Users learn to apply the program's five-step process (Decide, Stop, Observe, Think, and Act) as a way to identify and modify behavior that contribute to back injury and illness. The program modules focus on three areas that are important to back health: biomechanics (the theory and movement of the spine), ergonomics and fitness.

Module 1 examines biomechanics and how to avoid injury to the vertebrae and discs due to repetitive activities such as reaching, lifting, stretching, bending and twisting. Module II focuses on ergonomics and how to structure environments so they reduce strain on the spinal areas. Module III describes the role of fitness in improving and maintaining the health of the spine, and provides suggestions for daily exercise routines. The program components include an administrator's and leader's guide with step-by-step instructions for implementing the program; three video tapes and accompanying participant meeting guides; and a back injury prevention booklet for reference by employees and their families.

These program modules could be used by employees during lunch hours or training breaks, and they could assist in reducing injuries both off and on the job.

For further information contact Back Safety, Du Pont Safety and Environmental Services, Montgomery Building, P.O. Box 80800, Wilmington DE 19880-0800, U.S. Telephone 800-532-SAFE.

Carpet Tape Resists Fire

Orcon Corp. has introduced a lightweight pressure-sensitive aircraft carpet tape. Double-sided with differential tack, the tape will adhere to aircraft floor panels and is removable from the panels for up to one year after installation without leaving a residue. The OT-30 aircraft carpet tape meets flammability requirements of FAR 25.853 and has a self-extinguishing time of less than one second and a burn length of 2.2 inches (5.6 cm).

According to the manufacturer, the tape weighs 75 percent less than the most currently specified aircraft carpet tapes, and therefore can offer two-and-a-half times more tape per roll than other brands.

Photo not available.

The two-inch-wide OT-30 is specifically designed so that it will not delaminate when wet. However, for areas where a wider tape would make installation easier, OT-30 can be custom cut up to 50 inches in width.

For additional information contact Orcon Corp., 1570 Atlantic Street, Union City, CA 94587 U.S. Telephone 415-489-4699. For Europe, contact American Aviation, 180 Varick Street, New York, NY 10014-4699 U.S. Telephone 212-620-4500.

Monitor ‘Cleans’ Aviation Fuel

Facet Quantek fuel monitors are installed on delivery facilities to eliminate the need for other water defense devices and to provide maximum water removal, solids holding capacity and shutdown protection to assure clean and water-free fuel. The heart of the monitor is the filter cartridge.

The monitor continually checks the entire fuel flow, not just samples, for contamination by water or solids. In the process, it absorbs free and emulsified water, removes ultra-fine solids and shuts down the system flow when hit with a localized slug of water. Thus, the device performs the three most essential jobs required in the delivery of fuel, even when surfactants and fuel additives are present. The monitor is designed to operate at a maximum 150 psi working pressure on jet fuel and aviation fuel at flow rates up to 36 gpm.

The single cartridge housing is said to be easy to maintain and requires only a two-inch base clearance for cartridge change. Both the interior and exterior surfaces of the carbon-steel body are epoxy coated to protect against corrosion. The stainless steel V-band closure is designed for ease of handling and holds the die-cast aluminum head and O-ring seal to the body.

The cartridge incorporates layered and pleated multi-media sections with inner support shells and an outer wrap. A special water absorbant media retains water, which causes the pleats to expand. As the maximum water-holding capacity is reached, a reduction in flow occurs, indicating that the cartridge should be changed. The cartridge's maximum operating temperature is 240 degrees F (115 degrees C). For more information, contact Facet Quantek, Inc., a subsidiary of Facet, P.O. Box 50096, Tulsa, OK 74150, U.S. Telephone 800-888-9129.

Bulletins Describe Use and Care of Aviation Tires

The Rubber Manufacturers Association (RMA) has released several tire information service bulletins covering a variety of care and service aspects of aircraft tires. They include: *Aircraft Tire Recommended Operating Inflation Pressure Maintenance Criteria; Use of Aircraft Tires and Wheels in Other Than Aircraft Service; Aircraft Tire and Tube Storage Recommendations; Aircraft Tire Bursts; and Radial Aircraft Tire/Wheels Compatibility.*

The bulletin on inflation pressure lists criteria to maximize tire serviceability for in-service aircraft. Bulletin information includes tire inflation tips, service pressure recommendations, frequency of pressure checks, reinflation procedures, removal from service recommendations, notes on removal of tire and axle mate from service and removal of blown fuse plug recommendations.

The Use of Aircraft Tires and Wheels in the Other Than Aircraft Service bulletin warns that the bead seat diameters of aircraft wheels are different from those of ground vehicles. If an attempt is made to mount a tire on a wheel other than one for which it is designed, the tire could break with explosive force and cause serious injury or death.

The tire storage bulletin includes details on avoidance of adverse conditions, so prevalent in many storage facilities, and recommendations concerning tire and tube age limits. Included are suggestions about placing stored tires into service, rotating tire stock and shipping tips.

The bulletin on aircraft tire bursts emphasizes the extreme danger resulting from the force of tire bursts, includes the reasons for these occurrences and reminds the reader that extra caution must be observed during deflation and inflation procedures.

The bulletin concerning radial aircraft tire/wheel compatibility emphasizes that the stresses which radial tires impose on wheels are different from the stresses imposed by bias tires.

All of these bulletins stress safety aspects that maintenance personnel should address when working with aircraft tires and tubes. The five aircraft tire information service bulletins are free of charge and be requested by writing: Rubber Manufacturers Association, Publications Desk, 1400 K Street, N.W., Suite 900, Washington, DC 20005, U.S. Please included a stamped, self-addressed business-size envelope.

Photo not available.

Call for Nominations for The Joe Chase Award

A call for nominations is being made for the Joe Chase Award, administered by the Professional Aviation Maintenance Association (PAMA) and presented in conjunction with Flight Safety Foundation events. This year's award will be presented during the Foundation's Corporate Aviation Safety Seminar in Montreal, Canada, April 18-20, 1990.

Joe Chase, known in aviation circles as the champion of the forgotten man — the aviation technician — originated publication of the *FSF Aviation Mechanics Bulletin*. He used the *Bulletin* and other means to raise the status of the aviation maintenance technician. Chase recognized that technicians play a vital role in aviation safety and strove to communicate this belief throughout the industry.

Foundation readers are encouraged to participate in the Joe Chase Award program and to **submit nominations by February 1, 1990 to PAMA Headquarters**, 500 NW Plaza, Suite 401, St. Ann, MO 63074. Phone (314) 739-2580; FAX (314) 739-2039.

Eligibility Requirements

One or more of the following is needed for the candidate to qualify for the award:

1. Candidate should show dedication to learn and continuously educate himself or herself and communicate what is learned to others in the aviation field.
2. Candidate must show dedication to the improvement of communications between employer and employee in the aviation industry.
3. Candidate must show dedication to the communications methods which advance the knowledge of the aircraft technician.
4. Candidate must show dedication to the improvement of the role of the aviation technician.

This dedication to the improvement of communications and increased learning must be conducted beyond the normal work requirements.

Nomination for Joe Chase Award

Nominee Information

Name ______________________________

Address ______________________ City ______________

State ____ Zip ________ Telephone (Home) ______________

(Office) ______________

Employer ______________________________

Employer's Address ______________ City ______________

State ____ Zip ________ Telephone ______________

Nominee's position ______________________________

FAA License # ______________________________

FAA Certificate # ______________________________

PAMA National # (if applicable) ______________________

Nomination submitted by ______________________

Address ______________________ City ______________

State ____ Zip ________ Telephone (Home) ______________

(Office) ______________

Signature ______________________ Date ______________

• Please use a separate sheet of paper to list nominee's achievements.