

*DEDICATED TO PERPETUATING AN  
ECONOMICAL AND EFFICIENT  
PROGRAM IN RESOURCE  
MANAGEMENT AVIATION*

## AIRCRAFT ANALYSIS

### Arabian Flights

by Captain Clark Dechant

#### ASSOCIATION OBJECTIVES:

- A. To promote the recognition of the importance of sound aviation practices in resource management, with safety as the paramount factor.
- B. To encourage and develop the educational, social, and economic interests of aviation in resource management.
- C. To exchange information on operational techniques and procedures.
- D. To utilize member experiences to develop and distribute reference materials of aviation interest to the Association.
- E. To coordinate, research, and promote new techniques and equipment.
- F. To take all action necessary to further the use of aircraft in natural resource management.

Every day I do tasks not described in my contract with The National Commission for Conservation and Development. Of course, all of them have to be done, but some I like to do some more than others. I particularly enjoy one task. I give "tours" of my plane to visiting groups of Saudi students. I explain to them the function of the airplane in reintroducing birds and animals to the wild. Most of the visiting students know about the 747s of Saudi Arabian Airlines, but they cannot believe there are planes any smaller than a 737. Towards the end of my talk, I ask for questions. Abdul Rahman Khoja often translates the same question from the students, "How old is that plane?" I tell them the plane was manufactured in 1994, but the design is older than their fathers! Then, "Why do we have such an 'old' airplane?" This is a question sometimes asked within NCWCD today.



Saudi Arabia

We use the Maule simply because it does the job assigned very well. At our maintenance shop in Al Jouf, almost all repairs are completed on site. Lead-time on parts orders from the States take six months to a year. The airframe is very strong, which has proven to be a lifesaver in at least one accident. The cruising speed is adequate for our survey needs. I file for 110 knots because of the Tundra tires and tracking antennas on both struts. With the 235 Horsepower O540 B4B5 engine, density altitude is not a problem. All NCWCD Maule's have the STC to burn car gas. Avgas in Saudi Arabia is very scarce and expensive. The planes have tip tanks installed for a total fuel capacity of 70 gallons. With the Plexiglas Patrol Doors, there is great visibility for two wildlife

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## IANRP WORKSHOP

### You Are There...

Fort Collins, Colorado

The following is a synopsis of the presentations given at the IANRP Workshop in Fort Collins, Colorado,

compiled by George Green of New York:

**Dr. Len Carpenter, Colorado Division of Wildlife**, Large Mammal Specialist (deer/elk/moose), covered a lot of ground on the ethics, biology, and statistical considerations of capturing, collaring, and tracking animals. Society's ideas about what wildlife managers do, and how they should go about doing it have changed markedly. Most citizens base their judgements on their value systems, how they feel about an issue. Therefore, it is increasingly important to acquire good data and use valid sampling techniques, so data on which management decisions are made is as solid as possible in arguing your case.

He discussed the difference and advantages of the various sampling techniques currently popular (i.e. transect vs. quadrat), mentioning the importance of ethical considerations such as the tagged animal having the same chance of survival after returning to the population, and acting normally after doing so. He offered the comment that using capture-and-tag operations with no specific goal in sight, and which affect the health of animals, was probably not justifiable from an ethical viewpoint.

He then covered accuracy and precision questions concerning survey data. An example: if you work hard gathering three days of good data, and then add in two days of questionable data due to say, observer ill-

ness, or use a less competent substitute observer, the overall result is all bad data. In wildlife aerial observation work he felt that many observers were not being trained adequately. "Consistency in observed data" he stated "was more important than accuracy in many cases."

Observation, terrain, and vegetation are also critical to survey results, or perceived results. This was the case in a recent study in south western Colorado, where experienced observers attempted to get a total population count of mule deer in an enclosure with a known number of critters. The best result only accounted for 2/3 of the total population. (My notes fell short on this, but I believe the terrain was fairly open). For a given sample, quadrats will almost always show a higher count than transect methods, but you always have the problem of deciding whether an animal is in or out. The more borders you have, the more decisions you must make, resulting in more chances for error. Also, with small a plot sizes, you may miss groups of animals, but with big plots you may hit a large group, yet go another 100 plots without a hit due to the distribution. (This applied more to western populations of elk/antelope.)

Dr. Carpenter also stated that mark-recapture methods were proving successful with animals that clump together like elk. You can sample a broader area without stratifying samples, whereas in other sampling methods data groups should be stratified to reduce variance, e.g: into different areas having either a high, medium, or low density of critters.

Numerous questions followed. Of note to New York is that the most successful and least stressful method for capturing moose for tagging or transferring to

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## SAFETY CORNER

# Good Grief?

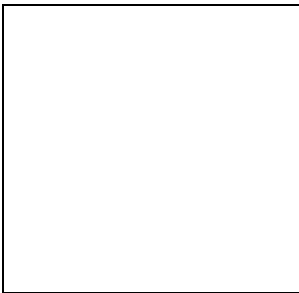
by Dennis Dura

Pilots are still coming to grief from accidents that occur because of poorly executed approaches that result in a less than perfect landing. An unstabilized and rushed approach followed by a reluctance to go-around leads the unfortunate pilot to the scene of an accident. Whether we are a fledgling pilot or have over 10,000 hours, we are susceptible to human error and need to reflect on our actions periodically. As Natural Resource Pilots, we find ourselves executing approaches to unimproved areas as well as established airports.

When executing a visual approach with a helicopter or an airplane, flying a rectangular pattern whenever possible, will allow a reconnaissance of the landing area, time to plan the approach and complete the before landing check. After turning base, the proper drift correction should be established to follow a ground track perpendicular to the extension of the centerline of the landing area. On base, confirm the landing point, get a better feel of the wind, and strengthen your resolve to go-around if the approach does not work out as planned. The turn to final should not exceed a medium bank angle and be at an elevation which allows a final long enough to achieve the touchdown point with a stabilized approach. The steeper the angle of bank, the higher the airspeed at which an airplane stalls which can be disastrous at low altitudes, such as turning base to final. A steep turn with a helicopter can result in loss of altitude due to settling if sufficient power isn't increased to account for the increase in relative weight.

A stabilized approach in an airplane or a helicopter is establishing an approach path that will allow the aircraft to

land at the designated landing point with minimum power and pitch adjustments. In the absence of the Operator's Manual recommended approach speed, 1.3V<sub>so</sub> is suggested for airplanes, and at least the minimum rate of descent in autorotation airspeed for helicopters. The airplane can be flown in a power-off or power-on approach condition. Both conditions require trimming and attention to the proper timing for use of flaps. One of the advantages of performing approaches with partial power is if the approach is too high, lower the nose and reduce power. If the approach is too low, add power and raise the nose. On final approach with an airplane, ideally, power is being reduce and drag is being increased all the way to round-out. For a helicopter, usually the airspeed is adjusted to stay out of the avoidance region of the height velocity curve until the last third of the approach and then the rate of closure and apparent ground speed dictates the deceleration to landing. Of course, with a high gross weight or density altitude, a helicopter's approach speed will be slower with more power, while avoiding settling-with-power condition. Remember the go-around option. If the approach don't look right or feel right, go-around. Pride and safety don't



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other locations is the net gun fired from a helicopter, as developed by New Zealand operators.

**Paravion Technology** of Fort Collins, Colorado gave a presentation on the capabilities of and misconceptions about various infrared technologies. Parametrics markets the Inframetrics line of infrared systems, a smaller unit than FLIR. The quick mount and dismount capability is worthy of note, as is the captioning of GPS locations on the video. They specialize in helicopter installations and have an interesting line of accessories and mounting systems for interior monitors, as well as Helicopters for moving aircraft in lieu of dollies, and improved polymer external load cables.

The first day closed with a presentation from **Dr. Marcia Politovich** and **Ben Bernstein** of the **National Center for Atmospheric Research** in Boulder, Colorado. They are trying to come up with an algorithm that will predict where in the US supercooled, large drops are likely to be using a situational approach and fuzzy logic similar to the human decision-making process. They are trying to perfect a forecast model (as yet unproven) that uses: satellite data for cloud coverage and cloud top temperature, and surface observations for heights of bases, location, and type of precipitation.

The version they have come up with is experimental, and they are trying to verify it with PIREPS and flights in NASA's twin otter into known icing. They affirmed that over comparatively short distances of, say 100 miles, you can have a completely different icing scenario They covered several:

They found that combining data from several sources is very useful and hope to come up with a forecasting version for pilots. There is a web site where you can access their work this fall. It is [www.ucar.edu/largedrop/integrated](http://www.ucar.edu/largedrop/integrated).

The second day opened with a presentation by **Dr. David Knots**, author of survival texts, and a civilian

### WARM WINTER LEADS TO OILY SPRING:

Keep your eyes peeled this spring for a new product from Shell Oil: **AeroShell 100W PLUS**. Shell's Ben Visser says the new product is a straight-weight 100W oil with the tongue-twisting additive Butylate Tri-Phenyl Phosphorous (TPP). This is the same stuff now in AeroShell 15W50 multi-vis, and in Lycoming LW-16702 "snake oil" additive. Shell says that the additive forms an oxidized film on internal parts of the engine as it cools down that helps to prevent corrosion and wear at start-up. **-John Clem**

consultant on survival for the military. A lot of ground was covered, some familiar to many who have attended survival courses, and some new:

Dr. Knots told several survival stories, and emphasized correctly that the perfect survival kit lies in your head, in the skills and knowledge that you possess. Quite often in a survival situation you might not have a survival kit, or be separated from it by the event. Also, no kit will fit every possible survival situation, and there is a lot of junk on the market.

He stressed that survival is usually a short-term affair of less than 72 hours, and emphasized the need for the priorities of shelter, warmth, and water in lieu of elaborate food preparation. A positive mental attitude overrides almost everything in a survival scenario, and having the means to start a fire can help improve that, as well as provide warmth.

He emphasized the importance of having three different means of fire starting, and covered the advantages and disadvantages of each method, as well as the importance of practicing each beforehand. He also detailed methods for putting together a personal kit from relatively cheap sources, and how to make it small enough in form to be practical.

One fact that I was unaware of regarding water purification and giardia cysts, is that iodine and chemical treatments are not effective in eliminating them, according to the National Institute of Health. Also, less expensive water filtration systems tend to clog very quickly when water has high concentrates of tannic acid, as in most northern woods. He recommended the Katadyne filtering systems for those areas.

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counters in the back, and the recorder in the front. The rear door is removable so a photographer has a good camera platform. During the majority of survey flights, there is a pilot plus one researcher aboard. This allows all four fuel tanks to be topped off. The tool box, plenty of spare parts, extra oil, the fuel transfer pump, hose and filters, plus the survival kit, and plenty of drinking water bottles are also on board.

The first Aviation Manager of NCWCD, an American, designed the NCWCD Maule instrument panel. These Maules have very complete panels. His philosophy was 'We don't need avionics spares on the parts room shelf, but in the plane'. There are two King 155 Nav Coms both with



**Husky at work in Saudi Arabia**

ILS's, plus ADF, DME, Marker Beacon, Radar Altimeter, and GPS. In addition to the two VHF coms, there is a FM transceiver for communications to Saudi Rangers, who are on the ground, in four by four vehicles. There is a HF radio to talk to the NCWCD dispatcher in Al Jouf, for weather and position reports. My NWRC base, near Taif, is 500 NM south of the NCWCD Flight Operations Headquarter in Al Jouf. The pilot also has the ability to use the FM to patch through to a telephone link with an onboard keypad. However, the only NCWCD FM ground station capable of making the patch is in Al Jouf, too far away to use from Taif. The audio panel, which brings all the avionics together, is a NAT AMS44. It will simultaneously transmit on any two of the four transmitters. The PIC can talk to Center as the observer is talking to a Ranger on the FM. The central radio stack extends above the glare shield several inches to house the added instruments. The Trimble 1000 GPs has 10 waypoints. Coordinates of the radio-collared birds and animals are recorded by hand.

Recently, some of the scientists began providing their own Garmin II GPS. By using a GPS with up to 500 waypoints, the scientist records our entire flight track plus the location of the radio signals. At the end of the flight, the information is directly downloaded from the Garmin into the scientist's computer. New aircraft will have an updated Garmin model 300 GPS/Com. The ELS 10 ELT is connected to the GPS. It will automatically transmit the coordinates of the location, as well as the registration number of the aircraft, if ever the ELT is activated. The alternator is large enough to power the avionics, plus supply power to the scientist's scanner, the portable GPS, and the noise canceling headsets.

Although the Maule airframe is considered less than "state of the art", ours have been modified to suit our specific needs. We operate surveys a long distance from base, often with little ground support. Until the mission of Flight Operations is redefined, I expect the Maule to remain in use by NCWCD Flight Operations.

I am the luckiest natural resource pilot in the world. The flying is great and, the work I do is important. The people I meet and work with are dedicated, international scientists. The countryside around the National Wildlife Research Center is enjoyable for most of the year. I fly all over Saudi Arabia and see so many things even Saudis do not get a chance to see.

**Captain Clark Dechant  
Senior Survey Pilot.**

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**IANRP WEB PAGE**

The IANRP Web Page is now on line.

The formal address is:  
**http://IANRP.org**  
Send your comments to:  
Pete Hobstetter  
mag10@prodigy.net



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A program was given by **Steve Steiner** of the **Colorado Division of Wildlife** covering a new system of transect style surveys for antelope. It was developed by **Rich Guenzel** in Laramie, Wyoming, for **Wyoming Game & Fish**, to replace the counts that have been done in the past. Colorado will also be transitioning to this method, which involves having a counting observer (not the pilot) looking out each side of the aircraft, counting animals. The counts are totals only (no age or sex groups), and are weighted by zones delineated by markings on the struts and windows.

It is important that the pilot hold AGL altitude as accurately as possible, and that the head position of observers, relative to the marks, remain constant. Confidence testing can be done with this method, but it is critical that no animals be missed that are on the line.

Fatigue factors are high due to the concentration required by pilots to hold both altitude and the GPS line with precision, and the concentration required by the observers as they count. Rich Guenzel can be contacted for further information.

The afternoon workshop consisted of a visit to the Fort Collins airport. On display were demonstration aircraft, as well as state and federal agency aircraft with installed special equipment. These included:

- A Colorado Fish & Wildlife's **C-185** with stocking tanks
- US Fish & Wildlife's **Partenavia**
- USGS's **Pilatus Porter** with sub-terrain mapping gear,
- A **Scout** from North Dakota Game and Fish,
- A demo aircraft from **Found Aircraft** of Canada,
- A **Husky** and a **Maule**.

The final day started with a safety review by **Tom Fortchner** of **FAA, Denver Office**. Tom covered several accidents in Colorado during 1997, particularly those concerning 'flatlanders', their unfamiliarity with mountainous operations, the adjustments required of flying skills, and reduction in aircraft performance.

Other hot FAA issues included operations at non-tower airports, and runway incursion problems affecting all airports.

**Gary Mowad** of the **USF&W in Colorado** gave a presentation on the use of aerial detection flights to discover and confirm wildlife kills in uncovered oil overflow pits. Gary calculated that 2,000,000 game and non-game birds are killed in the US each year. He described the programs currently underway in Colorado, Wyoming, and Kansas to make oil companies comply with regulations to cover their pits, through en-

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I herewith petition the Executive Committee of the International Association of Natural Resource Pilots for Membership.

Name \_\_\_\_\_

Department \_\_\_\_\_ Title \_\_\_\_\_

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City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip \_\_\_\_\_

Work Phone ( ) \_\_\_\_\_ Home Phone ( ) \_\_\_\_\_

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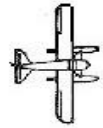
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# Con Aero Newsletter

IANRP Treasurer  
9740 Briarwood Drive  
Plain City, OH 43064



## THE INTERNATIONAL ASSOCIATION OF NATURAL RESOURCE PILOTS



Con Aero Newsletter page 4

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forcement actions and fines. He asked members help in assisting with this problem. He emphasized that although this is a non-traditional area of enforcement, the potential for using aircraft as a low-intrusion, cost-effective, means of protecting the resource, as well as a psychological deterrent is very promising.

The last two presentations before the business meeting stirred a lot of interest. Though using different technologies and approaches there appears to be a great potential for addressing several problem areas for those of us who operate in remote areas.

**Robert Kalberer** of **Echo Flight** represented the first type of technology. Those who attended last year's workshop had seen EchoFlight in a different, bulkier format. The screen unit has been slimmed down, its brightness improved, and new capabilities added. The unit uses access to a new series of low earth orbiting satellites to exchange information, such as current Nexrad weather, graphics, e-mail messaging, and perhaps most importantly, position reporting. The fee basis will consist of a monthly charge, and charge per byte of information.

The screen is small enough to mount to a post, such as Ohio has done with their moving-map Fujitsu laptop, and appears to be easily exchangeable between aircraft through a velcro type installation. The target cost of the entire system is \$6,000, and could be as low as \$1,900, if you already have a compatible laptop. Access fees are estimated to be: \$2 for a Nexrad weather update, and \$0.40 for a typical e-mail message.

A lot of folks were interested in the capability of a remote base station to query the unit's position, or of the possibility to send position report by pushing a button on the unit in the event of a forced landing. Signal access is more impervious to terrain interference, as compared to other products.

**Guy Loughbridge** of **ERM Mapping System** next gave a presentation on a different type of technology, offering similar capabilities as Echo Flight. Features included: position reporting through a satellite phone link, and a computer mapping system based on USGS or user supplied maps. The hardware consists of a combined GPS unit/ modem approximately 2"x2"x3", and a satellite phone the size of a briefcase, modified to include a gyroscope. The target base cost of the unit is \$6,000 and phone line charges are approximately \$.80 per minute. Telephone contacts are real time, as opposed to the store-and-forward system offered by Echo Flight.

ERM also markets maps that are tiled and seamless, but fairly expensive. ERM's software has the capability of accepting tracking data from any brand of GPS, thus avoiding the frustration some of us have found with mismatched GPS data & software. Aircraft can be tracked from a base location, and the software will handle a fleet of aircraft simultaneously, providing each aircraft is assigned a discrete phone line. This is the same technology that the USF&W is currently using.

-compiled by George Green

### Calendar of Events

- Feb 23-26 National Conference for State Forestry  
Aviation, FAA Technical Center  
Atlantic City, New Jersey
- Mar 8-12 Pacific Flyway Tech Meetings  
12-14 OAS Aviation Safety Meeting,  
Boise, Idaho
- Apr 5-10 Flyway Biologist Annual  
Section Meeting
- May 9-14 15th Annual Symposium on  
Biotelemetry (ISOB)  
U.S. National Marine Fisheries Service  
Auke Bay Laboratory, Juneau, Alaska

### **CLASSIFIED ADVERTISEMENTS**

#### **SALE OF AIRCRAFT 1972 CESSNA 207 SKYWAGON**

The Ohio Division of Wildlife offers for sale a 1972 Cessna 207 Skywagon. Sealed bids will be accepted through 4:00 p.m. **March 26, 1999**. The aircraft is located at the Ohio Department of Transportation Office of Aviation, Columbus, Ohio. Arrangements for an inspection can be made by contacting Paul Redman (614) 793-5062. To receive an information packet and bid requirements:

1. Contact the Ohio Division of Wildlife at (614) 265-6328 providing your name and address.
2. Send your name and address via e-mail to:  
**Joe.Barber@dnr.state.oh.us**
3. Send your name and address to:  
**Ohio Division of Wildlife**  
**Attn: Joe Barber**  
**1840 Belcher Dr. Bldg. G**  
**Columbus, OH 43224**

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