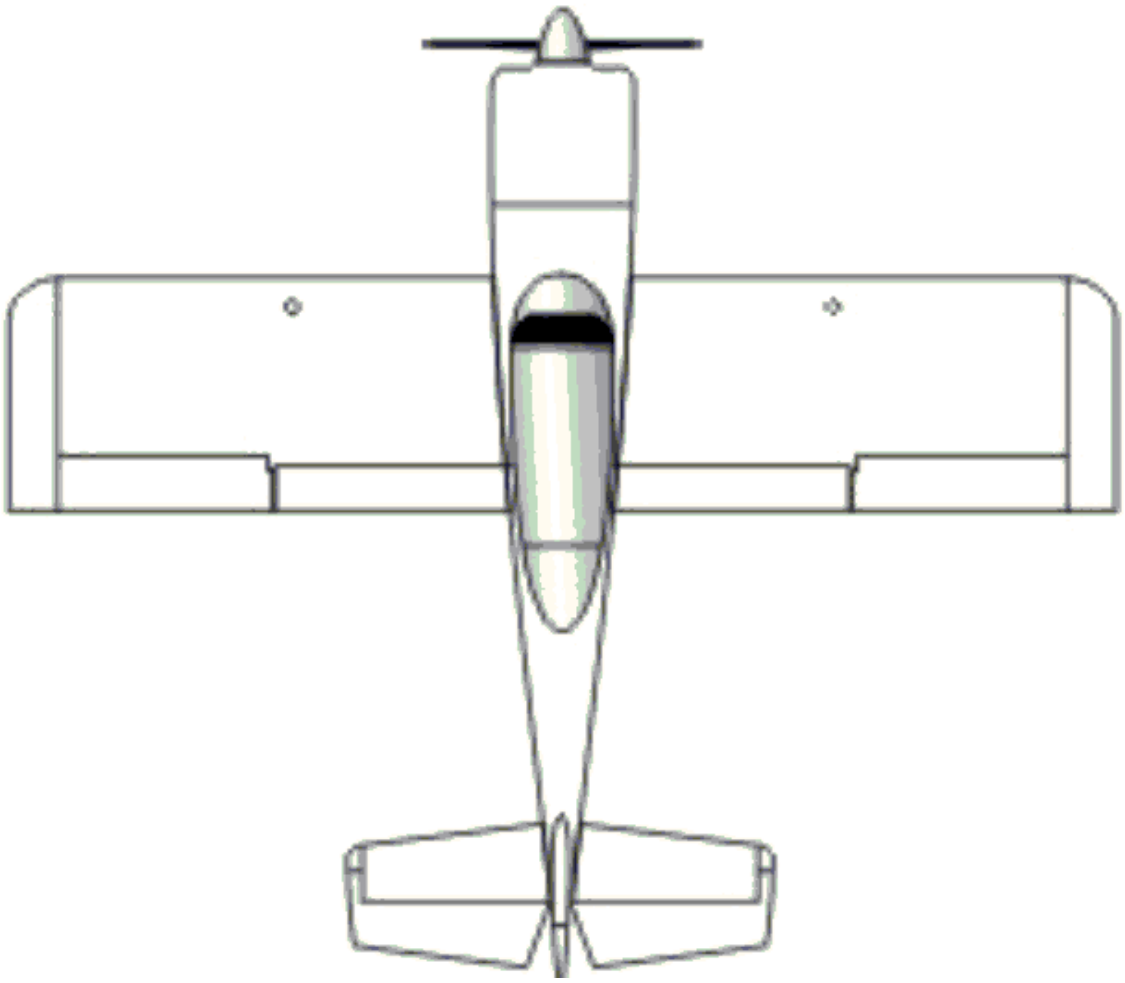
Aircraft Operating Handbook

N955DK



RV-8A Serial 81538 Amateur Built
Manufacturer: David Kumhyr

Revisions

Date	Pages	Description	Reason
13 May 05	All	Initial Version	
13 Nov 05	All	Major Update of Systems	New W&B, Upgraded avionics

Amateur Built Aircraft

This aircraft is certificated in the Amateur-Built category. The regulations governing the Amateur-Built category contain only very limited performance requirements, and no flight characteristics requirements. By virtue of its amateur built status, all persons entering this aircraft do so at their own risk.

General

Introduction

Van's Aircraft, Inc. began in 1973 with partial kits for the RV-3. These were manufactured by Van himself, working in a small shop behind his house in Reedville, Oregon. Later the company moved to North Plains, Oregon, a small town about 25 miles west of Portland. After twenty years and several expansions, the company moved to a new 60,000 square foot facility on the Aurora, Oregon airport. Currently Van's employs 70 people. The RV model line has expanded considerably in thirty-one years.

In 1995, Van's revisited the tandem concept and came up with the RV-8, a new design incorporating improvements learned from years of experience with the RV-4 and RV-6/6A. With a wider cockpit than the RV-4, two baggage compartments and increased instrument panel space, the RV-8 offers greater cross-country comfort without compromising the fighter-like feel of centerline seating. The RV-8 was designed to handle engines of 150-200 hp, and with the 200 hp IO-360 Lycoming, it sustains cruise speeds of 212 mph. Top speed is 222 mph. The RV-8A, the nose gear variant, made its first flight in April 1998.

RV Aircraft are low-wing monoplanes of traditional aluminum construction. They use steel rod landing gear. Aileron and elevators are controlled by a conventional stick driving the surfaces through pushrods and ball bearings. The rudder is controlled by stainless steel cables. Fuel is contained in two sealed, removable, portions of the leading edge, and routed through a selector valve in the cockpit to the engine driven fuel pump. An electric fuel pump is installed in the system as a backup.

The RV-8A is a monocoque design, the skins provide much of the airframe's strength. The primary bending loads of the wing are carried by the single main spar. Wing torsional and drag loads are carried by the wing skins and rear spar. The same is true of the tail surfaces. The fuselage skins, whose shape is maintained by formed aluminum bulkheads, provide torsional and bending strength. Aluminum longerons in the fuselage provide stiffening for the skin and greater strength at points of attachment.

The RV-8A is soloed from the front seat only, elevator and aileron controls for the rear seat are provided. The wide forward fuselage of the RV-8/8A provides not only more instrument panel space, cabin width and foot room, and also allows a forward baggage compartment between the instrument panel and the firewall. It holds about 4.75 cubic feet, and is accessible through an outside door. The traditional baggage compartment behind the rear seat remains. By having two places for baggage, one forward and one aft, the pilot has more loading options and is better able to control the CG.

All RV wings are low aspect ratio, NACA 230 series airfoil, constant chord designs with no taper or twist. This planform offers light weight, easy construction, and favorable stall characteristics. The wide chord maximizes the permissible CG range. It also provides generous wing area and low wing loading even with a short span. Because of this low wing loading, climb and altitude performance are unusually good. They do not require perfectly smooth surfaces to achieve good performance, so they remain almost unaffected by bugs and rain. The low pitching moment allows cruise trim drag to be kept to a minimum.

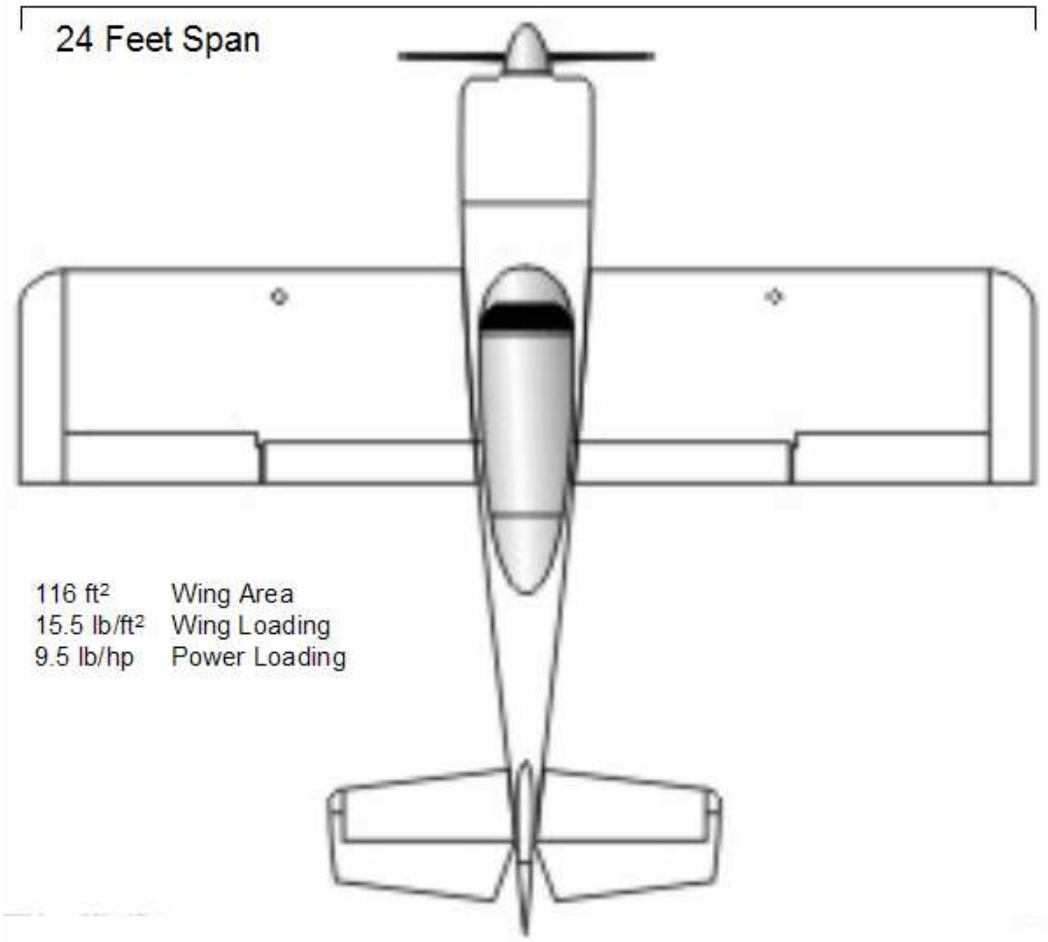
Operational safety and crash survivability, often overlooked in homebuilts, are primary concerns in Van's designs. The RV-8A has excellent controllability, gentle stall characteristics, and superb visibility. In the event of an unavoidable crash landing, (e.g. engine failure over rough terrain) their low landing speed is a lifesaver. A crash at 50 mph is 70% more survivable than one at 65 mph. This, along with the rugged cockpit structure and sturdy roll bar will permit you to walk away from, or at least survive, almost any controlled landing.

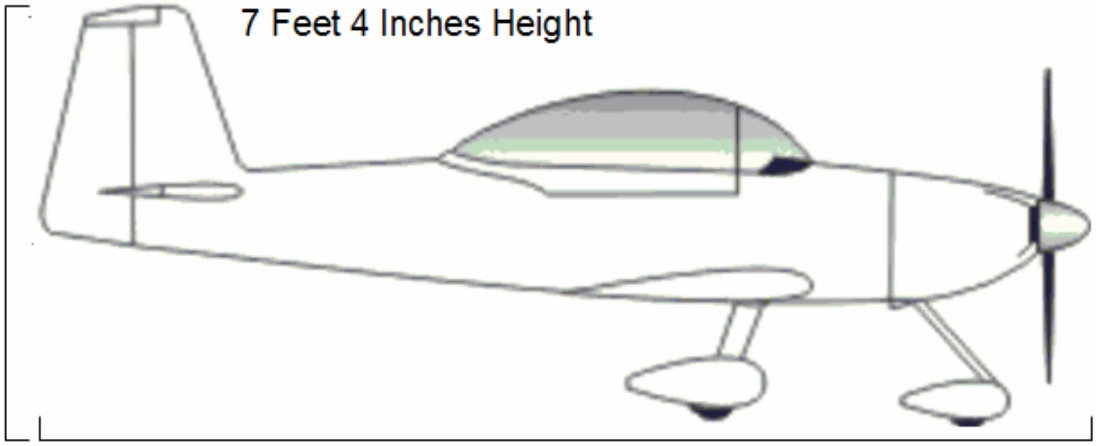
Easy maintenance is another consideration; controls, linkages and fittings are easy to install and service. Removing everything necessary for a complete annual inspection (cowl, inspection covers, fairings, etc.) takes less than an hour. The straightforward, simple airframe, control system and landing gear have only a few points that require service.

RVs are designed and built so they can be dismantled if necessary. All of the tail surfaces removable. Wings are constructed in two separate panels and bolt to the fuselage. The landing gear attaches with just a few bolts. This permits easy transport to the airport for initial assembly, or later disassembly for major maintenance. Disassembly does require disconnecting the control, electric and fuel systems, RVs are trailer able aircraft.

While the RVs are excellent cross-country airplanes, they are not simply "go-fast" machines. They have outstanding low speed characteristics and short-field capabilities. The RV-8A is capable of sport aerobatics and is fun to fly. The controls are light, responsive, and well harmonized. Cruise speeds are over 200 mph and climb rates over 2500'/minute.

Aircraft Views





20 Feet 10 Inches Length

Aircraft Technical Description

Manufacturer		David B. Kumhyr
Manufacture date		10/2005
Model		Van's RV-8A
Serial		81538
Registration		N955DK
Empty weight / gross weight		1088/1800 lbs.
Payload full fuel		468 lbs.
Useful load		711 lbs.
Engine	Lycoming	IO-360-B1A
RPM max.		2700
CHT max.		475°F
Oil capacity		8 qts. 50 wt.
Oil pressure range		55-85 psi
Oil temperature max.		245°F
Fuel pressure range		14-44 psi
Induction	Bendix Fuel Injection	RSA-5
Propeller	Sensenich	72FM85-S1
Tires		5.00x5/11x4.00x5

Airfoil	NACA 2300 Series
Wingspan	24 feet
Wing area	116 $feet^2$
Wing loading	15.5 lbs $feet^2$
Power loading	9.5 lbs / hp
Length	20 feet 10 inches
Height	87.5 inches
Wheelbase	76 x 61 inches
Acceleration limits	+3.8g @1800 lbs + 6g @ 1550 lbs

Fuel Quantity Data (U.S. Gallons)

Tanks	Usable fuel	Unusable fuel	Total fuel
Left wing	20.5	.5	21
Right wing	20.5	.5	21

Performance

Ground Performance - Solo Weight	
Takeoff Distance	275 ft
Landing Distance	350 ft
Ground Performance - Gross Weight	
Takeoff Distance	575 ft
Landing Distance	500 ft
Climb/Ceiling - Solo Weight	
Rate of Climb	2,200 fpm
Ceiling	22,000 ft
Climb/Ceiling - Gross Weight	
Rate of Climb	1,600 fpm
Ceiling	19,500 ft
Range	
Range [75% @ 8000 ft]	780 sm
Range [55% @ 8000 ft]	945 sm

Limitations

Operating Speeds

VREF	Flight Regime	Kts	Mph
Vso ……	Stall, dirty (gross) ……..		
	Stall, dirty (solo) ……..…	50	58
Vs ……..	Stall, clean (gross) ……..		
	Stall, clean (solo) ……	55	63
V1 ……..	Take-of decision ……..		
V2 ……..	Take-off safety ……		
Vref ……...	1.3 Vso ……..	65	76
Vx …….	Best angle ……..	69	80
Vbg ……	Best glide ……..	74	85
Vz ……..	Normal climb ……	87	100
Vy ……..	Best rate ……	91	105
Vfe ……	Flaps extend …….	87	100
Va ……	Maneuvering …….	123	142
Vno ……...	Max structural cruise …..	168	193
Vne ……...	Never exceed ……...	200	230

Flight operations

Operation	RPM	HP	Speed	Fuel Burn
Normal rated	2700	180		12 Gal./Hr
Performance cruise / 75% pwr	2450	135	175 Kts	11 Gal./Hr
Economy cruise / 65% pwr	2350	117	155 Kts	8.5 Gal./Hr
Cruise @ 55% power		99		7.5 Gal./Hr
Approach flaps up			72 Kts	
Approach flaps down			65 Kts	

STALLS

To be completed following flight test. Add info on stall warning, stall characteristics, stall recovery procedure and altitude loss following stall.

SPINS

To be completed following flight test. Add info on susceptibility to inadvertent spin, intentional spin entry procedure, spin recovery procedure, altitude loss during spin recovery and any relevant info on inverted spins.

AEROBATICS

Maneuvering speed is 123 Knots/142 MPH; maximum aerobatic weight is 1600 Lbs. and maximum aft CG is 85.30 when contemplating aerobatics.

The maneuvering speed is highest speed at which full and abrupt control can be applied without exceeding design loads. This is not highest permissible aerobatic entry speed, but control inputs must be limited to less than full at any speed above maneuvering speed.

The entry speeds for some maneuvers can vary over a wide range due to the large ratio of maximum speed to stall speed. For vertical maneuvers (e.g. Loops, Immelmann turns and horizontal eights) entry speed has an inverse relationship to G forces required to complete the maneuver. An entry speed at lower speeds will require a higher G pull up than for entry near top end of speed range.

WARNING: Excessive airspeed builds up very quickly, particularly in a dive. The RV-8 is a pilot limited aircraft due to the light control forces and aerodynamic cleanliness - it is the pilot's responsibility not to overstress the aircraft. Stick forces vary considerably with CG position - stick forces at aft CG are much lighter than stick forces at forward CG.

Limits +6 -3 Gs

Flight Regime	Kts	Mph
Loop / Horizontal 8	122-165	140-190
Immelman	130-165	150-190
Aileron rolls / barrel rolls	104-156	120-180
Snap rolls	70-96	80-110
Vertical rolls	156-165	180-190
Split S	87-96	100-110

Aircraft Documents

Aircraft Registration

REGISTRATION NOT TRANSFERABLE

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION
CERTIFICATE OF AIRCRAFT REGISTRATION

This certificate must be in the aircraft when operated.

NATIONALITY AND REGISTRATION MARKS: N955DK

AIRCRAFT SERIAL NO.: 81538

MANUFACTURER AND MANUFACTURER'S DESIGNATION OF AIRCRAFT

KUMHYR DAVID B — VANS RV-8A

ICAO Aircraft Address Code: 53243617

ISSUED TO:

KUMHYR DAVID B
8934 APPALOOSA RUN
AUSTIN TX 78737-4015

INDIVIDUAL

This certificate is issued for registration purposes only and is not a certificate of title. The Federal Aviation Administration does not determine rights of ownership as between private persons.

It is certified that the above described aircraft has been entered on the register of the Federal Aviation Administration, United States of America, in accordance with the Convention on International Civil Aviation dated December 7, 1944, and with Title 49, United States Code, and regulations issued thereunder.

U.S. Department of Transportation
Federal Aviation Administration

DATE OF ISSUE: November 16, 2004

Marion C. Blakey
ADMINISTRATOR

Radio Station License

Required only on international flights.

LICENSEE NAME: Kumhyr, David B

FCC Registration Number (FRN): 0011549912

FAA Number/FCC Call Sign	Radio Service	File Number
N 955DK	AC	0001904965
Type of License	**Number in Fleet**	**Classification**
Regular		Private Aircraft

Grant Date	Effective Date	Print Date	Expiration Date
10-19-2004	10-19-2004	10-19-2004	10-19-2014

Waivers/Conditions:

NONE

Bill of Sale

UNITED STATES OF AMERICA
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

FORM APPROVED
OMB NO. 2120-0042

Kit ~~AIRCRAFT~~ **BILL OF SALE**

FOR AND IN CONSIDERATION OF $ THE UNDERSIGNED OWNER(S) OF THE FULL LEGAL AND BENEFICIAL TITLE OF THE AIRCRAFT DES-CRIBED AS FOLLOWS:

UNITED STATES REGISTRATION NUMBER **N**

AIRCRAFT MANUFACTURER & MODEL
RV-8A

AIRCRAFT SERIAL No.
81538

DOES THIS 8 DAY OF September , 2004 HEREBY SELL, GRANT, TRANSFER AND DELIVER ALL RIGHTS, TITLE, AND INTERESTS IN AND TO SUCH AIRCRAFT UNTO:

Do Not Write In This Block
FOR FAA USE ONLY

PURCHASER

NAME AND ADDRESS
(IF INDIVIDUAL(S), GIVE LAST NAME, FIRST NAME, AND MIDDLE INITIAL.)
Kumhyr, David B.
8934 Appaloosa Run
Austin, TX 78737

DEALER CERTIFICATE NUMBER

AND TO EXECUTORS, ADMINISTRATORS, AND ASSIGNS TO HAVE AND TO HOLD SINGULARLY THE SAID AIRCRAFT FOREVER, AND WARRANTS THE TITLE THEREOF:

IN TESTIMONY WHEREOF HAVE SET HAND AND SEAL THIS DAY OF

SELLER

NAME(S) OF SELLER (TYPED OR PRINTED)	SIGNATURE(S) (IN INK) (IF EXECUTED FOR CO-OWNERSHIP, ALL MUSTSIGN.)	TITLE (TYPED OR PRINTED)
Van's Aircraft, Inc.		Office Manager

ACKNOWLEDGMENT (NOT REQUIRED FOR PURPOSES OF FAA RECORDING: HOWEVER, MAY BE REQUIRED BY LOCAL LAW FOR VALIDITY OF THE INSTRUMENT.)

ORIGINAL: TO FAA:

AC Form 8050-2 (9/92) (NSN 0052-00-629-0003) Supersedes Previous Edition

FAA Eligibility Statement

Form Approved
O.M.B. NO. 2120-0018

US Department of Transportation Federal Aviation Administration

ELIGIBILITY STATEMENT
AMATEUR-BUILT AIRCRAFT

Instructions: Print or type all information except signature. Submit original to an authorized FAA representative. Applicant completes

I. REGISTERED OWNER INFORMATION

Name(s) DAVID B. KUMMER

Address(es) 8534 APPALOOSA RUN
No. & Street

City AUSTIN State TX Zip 78737

Telephone No.(s) 512-301-5088 Residence 512-426-8900 Business

II. AIRCRAFT INFORMATION

Model VAN'S RV-8A

Engine(s) Make LYCOMING

Assigned Serial No. 81538

Engine(s) Serial No. L-16602-51A

Registration No. N955DK

Prop./Rotor(s) Make SENSENICH

Aircraft Fabricated: Plan ☐ Kit ☒

Prop./Rotor(s) Serial No.(s) 37227

III. MAJOR PORTION ELIGIBILITY STATEMENT OF APPLICANT

I certify the aircraft identified in Section II above was fabricated and assembled by DAVID B. KUMMER
Name of Person(s) (Please Print)
for my (their) education or recreation. I (we) have records to suppor this statement and will make them available to the FAA upon request.

-NOTICE-

Woever in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or who makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years, or both (U.S. Code, Title 18, Sec. 1001.)

APPLICANT'S DECLARATION

I hereby certify that all statements and answers provided by me in this statement form are complete and true to the best of my knowledge, and I agree that they are to be considered part of the basis for issuance of any FAA certificate to me. I have also read and understand the Privacy Act statement that accompanies this form.

Signature of Applicant (In Ink) [signature]

Date 9 Sep 4

IV. NOTARIZATION STATEMENT

State of Texas, County of Travis
Subscribed and sworn to before me this
15th of October 2004
Bonnie Bonome

BONNIE BONOME NOTARY PUBLIC STATE OF TEXAS EXPIRES 8-23-2008

FAA Affidavit of Ownership

AFFIDAVIT OF OWNERSHIP FOR AMATEUR-BUILT AIRCRAFT

U. S. Identification Number N955DK

Builder's Name KUMHYR

Model VAN's RV-8A Serial Number 81538

Class (airplane, rotorcraft, glider, etc.) AIRPLANE

Type of Engine Installed (reciprocating, turbopropeller, etc.) RECIPROCATING

Number of Engines Installed 1

Manufacturer, Model and Serial Number of each Engine Installed LYCOMING, IO-360-B1A
L-16602-51A

Built for Land or Water Operation LAND

Number of Seats 2

MUST CHECK ONE

☐ **More than 50% of the above-described aircraft was built from miscellaneous parts and I am the owner.**

☒ **More than 50% of the above-described aircraft was built from a kit (prefabricated parts) and I am the owner. The bill of sale from the kit manufacturer is attached.**

David B. Kumhyr DAVID B. KUMHYR
(Signature of Owner)

Address 8934 APPALOOSA RUN

City AUSTIN

State TX **Zip Code** 78737 **Telephone** (512) 301-5088

State of Texas

County of Travis

Subscribed and sworn to before me this 15th day of October, 2004.

My commission expires 8/23/2008.

Bonnie Bonome
(Signature of Notary Public)

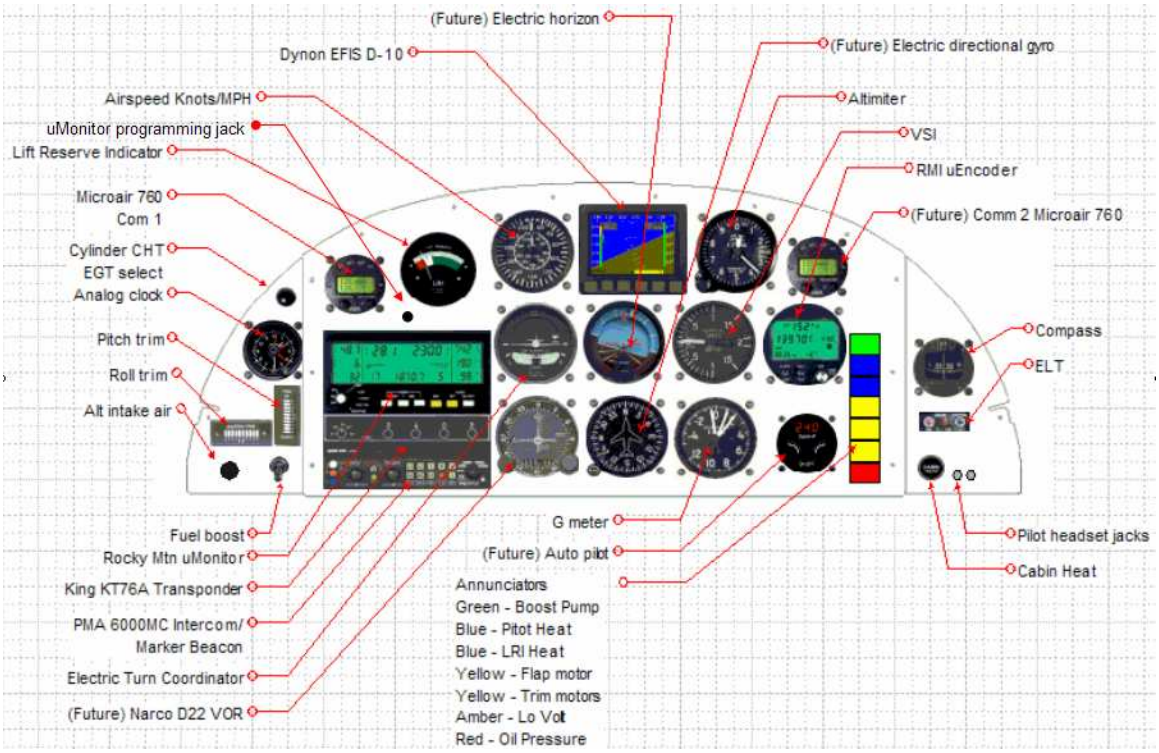
BONNIE BONOME NOTARY PUBLIC STATE OF TEXAS EXPIRES 8-23-2008

AC Form 8050-88 (7/00) Supersedes previous edition

Aircraft Systems

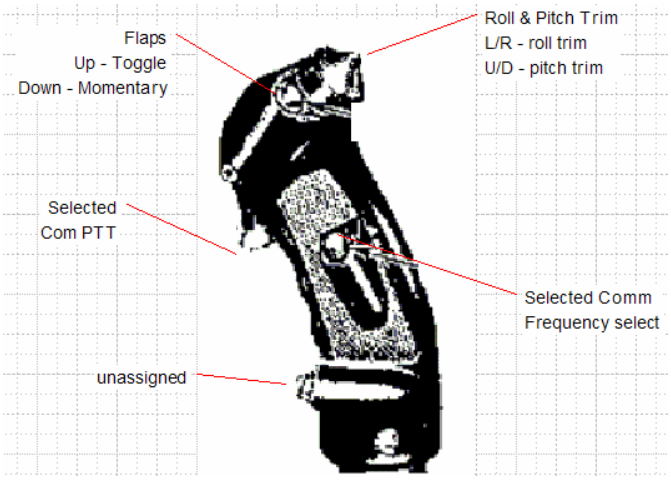
Cockpit Layout

The cockpit layout of N955DK was designed to facilitate “hands on throttle and stick” (HOTAS) operation as much as possible. Control areas are on the left side of the cockpit; throttle quadrant and fuel management, the right side electrical and lighting and a full instrument panel in front of the pilot. Dual Infinity fighter grips allow control of radio transmission, frequency flip-flop, radio memory, roll and pitch trim and flaps.



Stick Grip Controls

The Infinity stick grips allow control of radio transmission, frequency flip-flop, radio memory, roll and pitch trim and flaps. Front and rear stick controls are wired identically.



The coolie hat controls pitch and roll trim. Trim condition is indicated on two LED trim indicators on the mid right side of the instrument panel. Neutral is the center of the indicator and is marked.

Flaps are operated by a toggle switch to the right of the coolie hat. Flaps are extended by moving the toggle down. It is spring loaded and returns to neutral when released. Retraction is not spring loaded, moving the switch up causes the flaps to retract. At full retraction the flap mechanism freewheels though the motor continues to run. A flap annunciator light on the left side of the instrument panel will illuminate during motor operation.

Caution: It is possible that the passenger may inadvertently activate flap retraction if they push the flap switch up. A warning to the passenger should be a part of the preflight briefing prior to any flight. Monitor the flap annunciator after startup and during any critical phases of flight when the flaps are deployed.

Flap position is marked on the top of each flap in 10 degree increments in orange fluorescent tape and is easily seen by glancing rearward at the flaps.

The red trigger is connected to the PTT function to the selected comm radio. The pilot can always transmit; the passenger may transmit based upon the setting of the audio panel.

The green right side button on the stick controls the selected comm Radio frequency flip-flop. The black button on the left side of the stick controls the 25 frequency memory on the MicroAir radio. See Memory Programming **- The M760 has 25 programmable memories, for storing commonly used frequencies. Use the mode switch to move the display to the program mode. The word PROG will appear on the top line, with the memory number on the right hand side. On the lower line is the currently stored frequency in that memory.**on page 29 for details

Fuel Controls

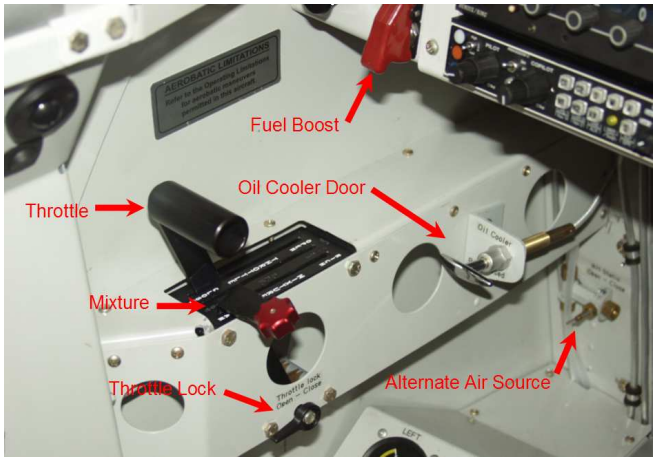
The fuel management panel is on the lower left side below the throttle quadrant.

An Andair Fuel selector has positions for OFF, feed from LEFT tank and feed from RIGHT tank. The valve locks at the off position and a locking knob must be lifted to turn the valve to right or left. It may be turned in either direction. A detent clicks into place to confirm tank selection. The point of the arrow points to the tank that is feeding fuel.

Two Van's fuel gauges show fuel level in the tanks. They are calibrated and relatively accurate in straight and level unaccelerated flight. Fuel flow and fuel time may be tracked with the µMonitor engine monitor if it is set with the current fuel quantity prior to flight. See Rocky Mountain µMonitor on page 44 for details.

Throttle Quadrant

The throttle quadrant is on the right side at mid cabin level. Throttle and mixture are standard aircraft controls. A friction lock is located below the levers at the hinge point of the throttle and mixture; it is tightened by turning clockwise. The oil cooler door is normally open it is closed by pulling the T handle.



The alternate static air source is located on the bulkhead below the oil cooler control. It is opened by turning clockwise. In normal operation it is closed.

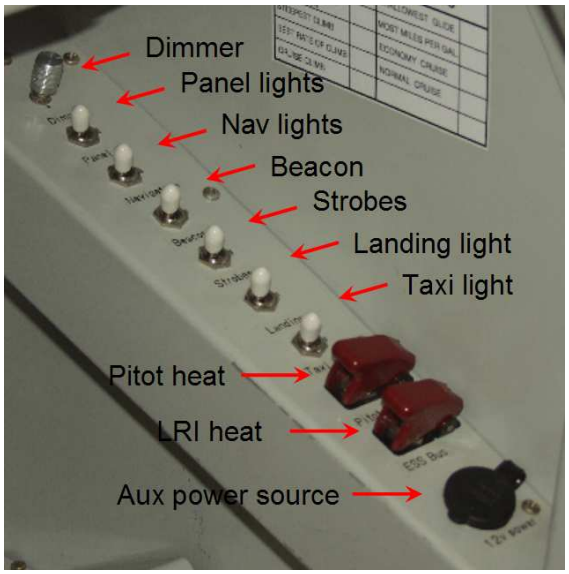
Starter Panel

The master switch and starter functions are grouped on the lower left panel of the cockpit. The Bendix key switch controls the ignition systems, left is an impulse coupled Slick magneto and the right is a non-impulse coupled Slick magneto. The starter is to the right of the both position on the Bendix key switch.

The alternator has a 60 Amp re-settable breaker. The other two breakers are INOP, pending later incorporation of an autopilot.

Lighting Panel

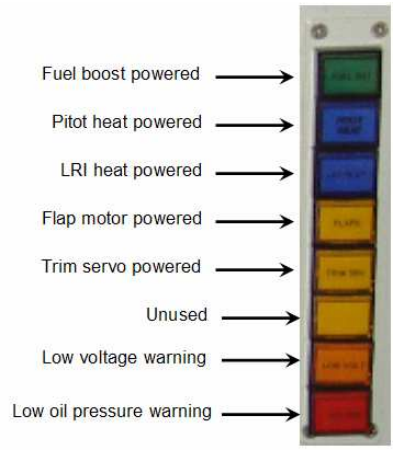
The lighting panel is located on the left cockpit wall. Switches are arranges in difficulty of flight order. The dimmer controls the electro luminescent strip for panel illumination as well as instrument lighting intensity. The µMonitor, µEncoder, and Dynon EFIS are not connected to the dimming system. These systems have internal dimming circuits using their internal menus.



Activating pitot heat will illuminate an light on the annunciator panel.

Note: INOP the LRI heater module is not installed in the LRI probe, though all wiring is in place.

Warning Annunciators



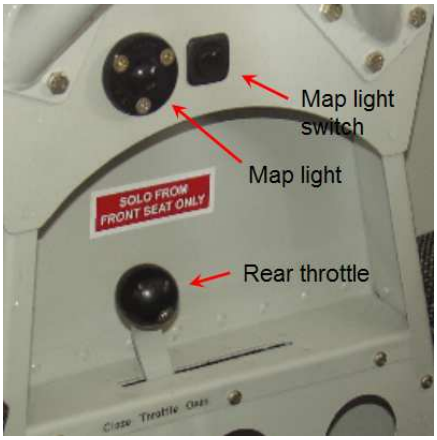
The annunciator panel communicates status on selected aircraft systems. There is no lamp test function; lamps may be tested by observing their behavior prior to startup and by activating selected systems to test for lamp illumination.

The photo shows the meaning of the lamps if they are illuminated. All lamps are labeled on their surface.

Rear Cockpit

Flight Controls

Note: Solo from front seat only.



The rear cockpit has a set of flight controls that allow basic control over the aircraft. The stick grip has the same functions as the front stick allowing control over communications, flaps and trim.

A set of rudder pedals are located in the passenger foot wells. No brakes are provided for rear position. A throttle which is connected to the pilot throttle allows engine control. Mixture is controlled from the pilot's throttle quadrant.

Avionics

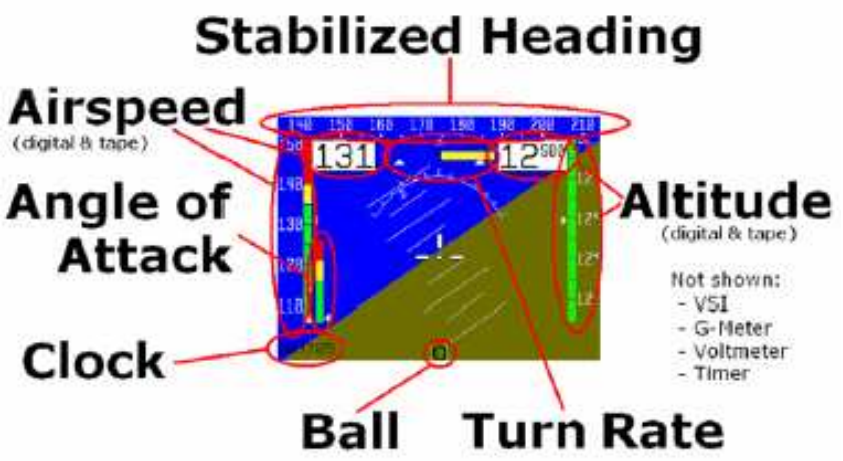
EFIS-D10 Electronic Flight Information System

The EFIS delivers heading, airspeed, altitude, altitude, slip/skid, turn rate, VSI, volt meter, G-meter and a digital clock in one display. Attitude information is obtained from 3 solid-state gyros and 3 solid-state accelerometers. Heading information is obtained from 3 solid-state magnetometers. Airspeed, altitude and angle of attack are obtained from three separate pressure transducers.

User interaction takes place via the 6 buttons along the bottom of the front panel of the unit. Feedback is given via short text messages along the bottom of the screen. An internal battery allows the unit to operate in the event of a power failure. When charged, the internal battery is rated for a minimum of 2 hours of normal operation with the EFISD10.

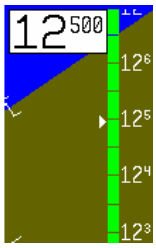
Onscreen Elements

The VSI and the G-meter are not shown and are explained in the section on the menu system.



Horizon line, pitch and roll indicators Bounded on the top by blue, and on the bottom by brown, the horizon line works in much the same way that a gyro-based artificial horizon to work. The exception to this is that it does not have a roll or pitch limitation in its display. The division between blue and brown stays parallel to the actual horizon line regardless of your pitch or roll. The parallel lines above and below the horizon line are the pitch indicator lines. Each line represents 5 degrees of pitch. Similarly the arrow rotating around the roll indicator gives you the value of your roll. Each tic mark represents 10 degrees of roll.

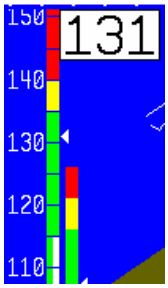
Stabilized heading tape functions like a magnetic compass. The triangle alerts you to your current heading allowing you to quickly ascertain the value in degrees based on the surrounding values.



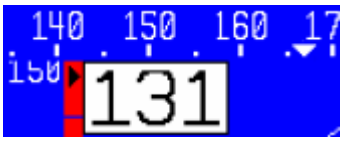
Altitude digital readout displays thousands of feet using large numbers and hundreds of feet using small numbers. The proximity to the altitude bar will allow quick association of the two screen elements. During the first 30 seconds of operation, the altitude digital readout and tape will not be displayed as the unit needs a small amount of time before altitude measurements are calibrated.

Altitude tape gives a visual representation of your altitude. The white triangle gives an analog view of current altitude while the digital readout gives you a more precise reading. Thousands of feet are displayed using large numbers while hundreds of feet are displayed in small numbers.

Airspeed digital readout is on the upper left region of the display, showing current airspeed. The airspeed tape utilizes 4 colors to give you a graphical presentation of your speed. By default all of the color thresholds are set at 0, displaying a grey tape. *Use the*



EFIS-D10 Support Program on your PC to set the values of the airspeed color thresholds.



Bugs may be set to mark a desired heading, airspeed or altitude. These bugs are represented by a black (for airspeed and altitude) or white (for heading) arrow centered in the appropriate moving bar at the desired location. If the set heading, altitude or airspeed is currently not shown on its bar, the arrow appears at the edge of the moving tape closest to the desired value.

Centered just below the heading moving tape, the turn coordinator provides real-time feedback of the plane's current yaw rate. The yellow bar grows in the direction that the plane is currently yawing. The yellow bar grows to the right or left of a black vertical anchor line. The arrows on either side of the yellow bar's anchor line point to a place on the screen with which the yellow bar must line up for the plane to perform a standard rate turn. If the turn rate is so great that the yellow bar exceeds the screen space between the airspeed and altitude digital displays, its length is decreased by and the standard turn rate arrows move closer to the black vertical anchor accordingly.

The clock is always displayed in the lower right-hand corner of the screen. All setting of the clock occurs in the value setting box, which is visible in the center of the screen above the menu lines. When a count-down or count-up timer is enabled, it is displayed in place of the clock until the timer is stopped.

Menu system and User Interaction

The menu system for the EFIS-D10 is designed to provide quick access to commonly used functions while taking up a minimum amount of space on the screen. All user interaction takes place via the 6 buttons at the bottom of the front panel of the EFIS-D10. When no menu is present, pressing any of the six buttons will bring the main menu on the screen as shown at right. The six sections of any menu correspond respectively to the six buttons below them. The overview below gives you a guide to the basics of operating the menu system. The operation section provides a more detailed look at each of the functions that can be accessed via the menu system.

When no menus are displayed, pressing any button brings up Main Menu 1. The menu system operates as a hierarchy. When in any of the 2 main menus, pressing a button will show the next level down in the hierarchy. For ease of navigation, a tab located just above the currently displayed menu alerts you to the context of the menu.

Button 6 (on the far right) is the universal ‘’back-out” button. In either of the two main menus, it is labeled EXIT and will remove the menus from the screen completely. In any other menu, it is labeled BACK and will display the menu

above the current one in the hierarchy. Aside from the two main menu lines, all menus have a tab directly above the left side of the menu line alerting the user to the context of the menu. For example, when in the barometer setting menu, the text BARO is visible in the tab above the left side of the displayed menu.

When changing values (barometer value, clock, timer, etc), pressing and holding either the INC or DEC button to change values will cause the rate of change to increase. All text for buttons is limited to 6 characters to minimize the amount of screen space the menus take up. As a result many words are abbreviated, such as MLITRY for military and BARO for barometer.

Main Menu Flow There are only 2 main menus. The following diagram shows their basic flow. As with all other menus, pressing MORE will show more options that are on the current hierarchical level.

Operation

Power on/off; when the EFIS-D10 is turned off but still has a power source via one of the three power inputs, pressing the far left button will turn the unit on. Likewise, once the unit is on and any button has been pressed, bringing up main menu 1, the leftmost button will turn the unit off. As can be seen in the picture above, this button is labeled POWER and must be held for 2 seconds to turn the unit off. While power is still connected, the unit is never fully turned off. It simply enters an extremely low-power state, allowing it to keep track of time and detect a change in state of the POWER button.
BARO ¡VSetting Barometer/Altitude
While in main menu 1, pressing button 2, labeled BARO, displays the barometer/altitude set button. The last-set barometer value, in units of inHg, is displayed in the value setting box beneath the BARO text label. The DEC and INC buttons increment the barometer value by 1/100ths as indicated by the highlighted text after the decimal place.
When the hundredths roll over the tenths digit will change accordingly. As you increment or decrement the barometer value, you will see the altitude tape on the right and the digital display above change. Adjust the barometer until the altitude indicators display the correct altitude for your location or the barometer matches the current barometric pressure value as indicated by your nearest airport.

BUGS - Setting Bug Markers; the Dynon has the ability to set a “bug” on heading, airspeed, and altitude taps.

Heading - To set a bug on a heading press BUGS while in Main Menu 1. This will bring you to the BUGS submenu. Choosing the HDING option will bring you to the HDING submenu. Pressing the TOGGLE button will toggle the currently set heading bug display on the horizontal heading bar. A white arrow located on the heading tape at the target heading represents the bug. Upon entry into the Heading Bug menu the Set Value dialog box is displayed in the lower center of

the display. Press SEL to select which digit to change and buttons 4 (DEC) and 5 (INC) to decrease and increase each value.

Airspeed - To set a bug on airspeed, press BUGS (button 3) while in Main Menu 1. This will bring you to the bugs submenu. Choosing the AIRSPD option will bring you to the following menu. Pressing the TOGGLE button will toggle the currently set airspeed bug display on the vertical airspeed bar. A black arrow located on the tape at the target airspeed represents the bug. Upon entry into the Airspeed Bug menu the Set Value dialog box is displayed in the lower center of the display. Press SEL to select which digit to change and buttons 4 (DEC) and 5 (INC) to decrease and increase each digits value.

Altitude - To set a bug on an altitude press BUGS (button 3) while in Main Menu 1. This will bring you to the bugs submenu (see below). Choosing the ALTTUD option will bring you to the following menu. Pressing the TOGGLE button will toggle the currently set altitude bug display on the vertical altitude bar. A black arrow located on the altitude tape at the target altitude represents the bug. Upon entry into the Altitude Bug menu the Set Value dialog box is displayed in the lower center of the display. Press SEL to select which digit to change and buttons 4 (DEC) and 5 (INC) to decrease and increase each digits value.

CHKLST - Using Checklists

The Dynon supports 5 checklists each containing 14 lines of text per checklist. 40 characters can fit on each line of the screen. To load checklists onto your EFIS-D10, upload them as described in the help file that comes with the EFIS-D10 Support Program. You must also have an RS232 serial port attached to the EFIS-D10 which allows for upload of new software. Pushing the CHKLST button will take you to the checklist submenu which will contain the checklist titles as defined by you during the setup process with the PC.

CAUTION: Once you select one of the checklists, the entire screen is covered up by it. Do not select a checklist unless you do not actively need to view the display of the EFISD10.

Setup - Setting Preferences In main menu 2, press the SETUP button to display the menu where configuration preferences may be set. In this submenu, you have 5 options to choose from. Each of these options is explained in more detail below.

Zero pitch – To match the normal cruise attitude for their plane to correspond to zero pitch. Zero the displayed pitch once you are flying straight and level from the SETUP submenu, press the PITCH button. This will display the pitch adjust submenu. From there, simply increment (INC) or decrement (DEC) the displayed pitch until the screen shows a zero pitch. This value is remembered by the unit and used on all subsequent flights. Keep in mind that you must change it back if

you intend for the setting to be only temporary due to an unusual weight load, for example.

Change displayed units - In the UNITS submenu, you will see two toggles for Airspeed and Altitude units. The current release of EFISD10 software supports airspeed units of Knots and Miles/Hour and altitude units of only feet. To change airspeed units between knots and mph simply press either button 2 or button 3, which corresponds to the AIRSPD: label. As mentioned, the only option for altitude units is Feet, thus you are not able to toggle this value.

Set the clock - From the SETUP submenu, press the CLOCK button. This will display the clock-setting submenu. In the value-setting box, you will see a section for the local time and a section for Zulu time. Because local time is usually an offset in hours from Zulu time, when you set the minutes for local time, you will see the minutes for Zulu time change. However, you need to set the hours for local and Zulu times independently. Once you have set Zulu time, you should never need to change it, as it is independent of daylight saving time. To change the local clock for moving through time zones or to enter daylight saving time, simply change only the hours for the local time.

Note: Connecting to the EFIS-D10 with the Support Program will reset the time; therefore, do not set the time until you have performed all of the PC interface operations.

To set the time, simply follow these guidelines: Set both the local and Zulu times in military time. This is to eliminate confusion during the clock setting process. You have the option, as described below in the Clock Format section, to display the time in either military or standard 12-hour format.

Only the highlighted digits will be affected by increments or decrements. SEL moves the highlight to the next set of digits. The order of selection is 1. Local hours, 2. Local minutes, 3. Zulu hours. When Zulu hours are selected, pressing SEL will again highlight Local hours. DEC and INC decrement and increment the selected set of digits one at a time. To speed up the process, press and hold the desired button. if you pass the desired value, you may simply back down to it by pressing the button corresponding to the opposite direction.

Incrementing or decrementing the minutes digits resets the second count, allowing you to set the clock down to the second if you so desire.

Change clock format - The clock is set using military time, you have the option to display it in either military or standard time. Additionally, if you desire, you may display either local or Zulu time in the lower right corner of the screen. To set these options, press the FORMAT button from the CLOCK submenu. This will display the FORMAT submenu as seen in the picture above. In this submenu, you toggle between local and Zulu time display by pressing either button 1 or

button 2. The status text following the colon shows the current status of the LOC/ZU toggle. To toggle between standard and military time display, press either button 3 or button 4. Again, the status text following the colon shows the current status of the 12/24 toggle.

Show/hide display items - From the SETUP submenu, press button 5 corresponding to CLUTTR. The Clutter Menu will appear with the first four options. Each option corresponds to an item on the screen that can be turned on and off. As with all other menu items, these options are abbreviated to commands containing 6 letters or fewer. Four toggle options are listed per menu line. Pressing a button corresponding to one of these four options will turn the respective onscreen item on or off, depending on its current state. The first four options are: ALTBAR (altitude moving tape), ALTDIG (altitude digital readout), ASPBAR (airspeed moving tape), and ASPDIG (airspeed digital readout). By pressing button 5, corresponding to MORE on the menu readout, four more choices are presented. These are COMPSS (moving heading tape), LATBAL (lateral acceleration ball), TURNRT (turn rate indicator), and AOABAR (angle of attack tape). Pressing button 5, corresponding to MORE, will display a third menu of items that can be toggled on and off. These are CLOCK (clock and time zone information), ROLARW (roll angle indicator), and HORIZN (blue/brown horizon indicator). Pressing MORE will display the first set of items again. The menu flow is presented in the diagram.

Check software version - The software version submenu gives you two important pieces of information: the version of EFIS-D10 software that your unit is currently running and the number of hours the EFIS-D10 has been on. From the second line (press MORE) of the SETUP submenu, press the VRSION button; this brings up the software version submenu. This submenu will also display the amount of hours of on-time the unit has had. Aside from the BACK button, there is no user interaction in this submenu. It is simply for informational purposes.

Perform magnetic calibration - Pressing the MAGCAL button will bring you to the magnetic calibration menu. To learn more about this function, please refer to the Installation Guide.

INFO - Informational Items

The informational display items submenu is reached from main menu 2 as shown in the diagram. From within this menu, you have the option to display up to two of the three options at a time. As can be seen by the INFO submenu, you may display one of the three items on the upper left of the screen and one on the upper right of the screen. More detail about each of the three items is given below.

Voltmeter - The voltmeter displays 3 rows of information corresponding to the three power inputs on the EFIS-D10. The first row, labeled M, displays the Master Switch voltage. The second row, labeled E, displays your optional external backup battery voltage. The third row, labeled I, displays the EFIS-D10 internal battery voltage. If any of the 3 voltage inputs are not present, 0.0V will be displayed for the respective voltage values. The letter V follows all three values, denoting the fact that voltages are being displayed. The EFIS-D10 will alert you when the internal battery is low by displaying a low battery alert (see Errors and Warnings below).

G-meter - The g-meter displays the current vertical acceleration experienced by the EFIS-D10 measured in Gs, where 1 G is the amount of force due to the earth's field experienced by an object at sea level. Positive g-force is defined as upward vertical acceleration, making you feel heavier. Negative g-force is defined as downward vertical acceleration, making you feel lighter. As can be seen in the picture, there are three rows of text that make up the g-meter. The top row, labeled MX, is the maximum positive g-force experienced by the EFIS-D10 since reset. The middle row, labeled CR, is the current g-force experienced by the EFIS-D10. The bottom row, labeled MN, is the minimum g-force experienced by the EFIS-D10 since reset. This last value can be viewed as the maximum negative g-force experienced by the EFIS-D10. To reset the max and min g-force values to the current g-force value, simply enter the INFO submenu and push the RSET G button.

VSI (Rate of Climb) - The vertical speed indicator (VSI) consists of a single line with your current rate of climb or descent. If you are currently gaining altitude, an up arrow is displayed to the right of the vertical speed value. If you are losing altitude, a down arrow is displayed to the right of the vertical speed value. The units of VSI are feet/minute.

DIM Changing screen brightness - From main menu 2, press the DIM button, which causes the brightness control submenu to appear. Pressing BRITR will increase screen brightness until it reaches its maximum. Pressing DRKR will decrease screen brightness until it reaches its minimum. It is not possible to turn the screen completely black via this menu to prevent confusion between a dimmed state and a turned-off state.

TIMER Setting and using a timer - To access the timer, navigate to Main Menu 2, and press the TIMER button. This will take you to the Timer menu seen in the diagram. In the value setting box, you will see either UP TIMER or DN TIMER with the current timer value below. The following points will assist you as you work with the timer.

The UP/DN button toggles the menu and timer between an up timer and a down timer. When switching to an up timer, the timer set value resets, allowing the up timer to count up from 0:00:00. To reset the timer, press the UP/DN button twice.

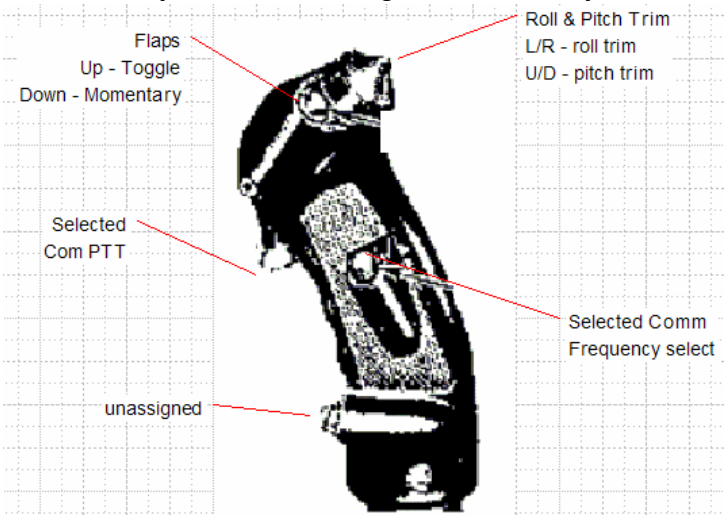
This will bring you back to the same state (i.e. UP or DOWN TIMER) that you were in before. To start the timer, press START. Once started, the button's label changes to STOP. To stop the timer, press STOP. You may not have an up timer and a down timer running at the same time.

Microair M760 Transceiver

The M760 should always be turned off before starting the aircraft to protect the radio from transient voltages. After starting adjust the squelch so static hiss can be heard. The LED annunciator will light green while the hiss is heard. Use the hiss tone to adjust the volume to an appropriate level. With the volume set, turn the squelch ring to break the squelch and eliminate the hiss. The LED annunciator light will go clear. It may be necessary to readjust the squelch with the engine at full power.

The M760 can now be adjusted to the correct active and standby frequencies, by scrolling and pressing the frequency adjust knob. The M760 will transmit when the PTT button is held down. The LED annunciator will light red. *If a radio transmission lasts longer than 40 seconds the LED annunciator will flash red.*

Control Functions - The priority switch is a push down switch. When pushed down briefly, the radio will go into memory mode, and select the frequency stored in memory 25. Memory 25 should be considered the priority channel, which the user can quickly select when required. Memory 25 must be programmed for the priority switch to operate. Memory 25 is set at the factory as the international distress frequency of 121.500MHz.



Volume / Squelch Knob - The M760 is turned on, by rotating the volume knob. A positive "click" is heard and felt at the start of the rotation to indicate the on/off position. The volume is increased by rotating the knob clockwise, and decreased by rotating counter clockwise. The squelch is adjusted by rotating the ring behind the volume knob. There is no automatic level set for the squelch, however the ring affords a large manual adjustment to suit all situations. Rotate the ring clockwise to increase the squelch threshold, and

counter clockwise to lower the threshold. When the squelch is “broken” (ie the static hiss can be heard), the annunciator LED lights green.

Annunciator LED - The LED operates red or green, and indicates the following states: Clear (off) Radio is squelched above the threshold, and is not receiving a signal Green Squelch is broken or a signal is received Red Radio is transmitting Flashing Red Radio has transmitted for over 40 seconds. *The flashing red signal may draw the user’s attention to the fact that the aircraft may have a stuck PTT button!* Transmissions in excess of 30 seconds should be avoided.

Mode Switch - The mode switch is a push down switch. When pushed down briefly the radio will step to the next operating mode. The M760 has four operating modes:

- Toggle mode - The display shows the active or in use frequency on the top line. The standby frequency is displayed on the bottom line.
- Memory Mode - The top line displays the memory or MEM number, and the lower line displays the frequency for that memory. The displayed memory becomes the frequency the moment it is displayed. The user can scroll through the programmed memories by rotating the frequency adjust knob, or by pressing the remote memory button.
- Program Mode - The MEM is replaced with PROG on the top line. The frequency stored in each memory can be set, changed, or cleared in this mode (refer memory programming).
- Scan Mode - By holding down the toggle switch for 3 seconds, the M760 goes into scan mode. The programmed memories are cycled quickly across the display. The M760 checks each memory in turn for any signal. If there is no signal the radio moves to the next programmed memory. When a signal is detected, the scan locks to that memory to receive the signal. This memory is held for 10 seconds after the signal finishes affording the user an opportunity to reply on that memory channel. The user can stop the scan operation by pressing down briefly the toggle key, or the PTT button.

Frequency Adjust Knob - The standby frequency can be changed by scrolling the frequency adjust knob. Rotate knob to scroll the MHz half of the standby frequency. Press the knob in briefly to move the cursor to the KHz half of the standby frequency. Rotate the knob again to scroll the KHz. After 5 seconds of inactivity the cursor will move back to the MHz side of the standby frequency. Only the standby frequency can be changed directly, the active frequency cannot be directly altered by the frequency adjust knob.

Toggle Switch - The toggle switch is a push down switch. When pushed down briefly, the active and standby frequencies exchange places. Hold the toggle key down for 3 seconds to activate the scan function.

Memory Programming - The M760 has 25 programmable memories, for storing commonly used frequencies. Use the mode switch to move the display to the program mode. The word PROG will appear on the top line, with the memory number on the right hand side. On the lower line is the currently stored frequency in that memory.

The cursor can be cycled through the MHz, KHz, and memory number by pressing the frequency adjust knob. Move the cursor to the memory number and select the memory number for programming, by rotating the frequency adjust knob. Press the frequency adjust knob to move to the MHz section. Rotate the frequency adjust knob to scroll to the desired value. Press the frequency adjust knob to move to the KHz section. Rotate the frequency adjust knob to scroll to the desired value. With the memory number, and frequency set to the correct values, press down the toggle switch briefly. The word STORE appears briefly on the top line. To clear a memory, scroll to the desired memory, and press down the priority switch briefly. The word CLEAR appears on the top line. The user can now move to another memory for programming. Press the frequency adjust knob to move the cursor back to the memory number, and scroll to next memory for programming. When all programming is complete, press the mode switch to move on from the program mode, back to the active/standby toggle display. When operating in memory mode, the programmed channels can be scrolled through, by rotating the frequency adjust knob, or by pressing the remote memory button. Only programmed memories are displayed. Operating the priority switch in either toggle or memory mode will move the M760 to memory 25. The user should consider carefully what frequency to program in memory 25. The factory default is the distress frequency 121.500MHz. Cycle cursor between program number, MHz, and KHz, by pressing the frequency adjust knob inwards briefly. Rotate the frequency adjust knob to change value.

Remote Memory Button - The remote memory button will allow the user to toggle (exchange) the active and standby frequencies. The remote memory button is typically mounted next to the PTT on the stick. If the user elects to operate in memory mode, the remote memory button will step through the programmed memories. If the Remote memory button is held down for 5 seconds, the M760 will go into scan mode, and automatically scroll through the programmed memories, searching for a signal.

To terminate the scan operation, the PTT is pressed briefly. The remote memory button is highly recommended. It allows the user to be able to keep hands on the controls during flight, while changing channels or scanning.

PMA6000 Intercom

The aircraft intercom system is a built in 6 place mono intercom

with a marker beacon receiver.

- Split mode allows the pilot and copilot to independently and simultaneously use both radios, even transmitting simultaneously on different frequencies
- Pilot and crew/passenger isolate functions are integral
- Dual music input jacks for passengers and crew are standard
- Independent volume and squelch controls for pilot and copilot
- Fail-safe automatically hard-wires the pilot to Com1 in the case of an outage

At power on the Marker Beacon enters a self test mode. The flickering blue marker light indicates a test in process. If the test continues for more than 10 seconds, or the lamps do not extinguish, return the unit for service.

The following four sections cover the basic operation of the intercom. They are: Audio Selector, Transceiver Selection, Intercom, and Marker Beacon Receiver.

Audio Selector - Through the use of two momentary and seven latched, push-button, back-lit switches, it is possible to select any or all receiver audio. C1 and C2 are momentary switches. When selected, an internal backlight will illuminate indicating which audio source is selected. Because the rotary switch controls what transceiver is being heard by the pilot and copilot (the crew), "Cl" (Com 1) and "C2" (Com 2) push-buttons are of the momentary type and do not remain in when selected. This is also part of the "auto function." You will always hear the audio from the transceiver that is selected by the rotary mic selector switch.

The users can identify which receivers are selected by noting which push-button switches are illuminated. Push buttons labeled Nl (Nav 1), N2 (Nav 2), D (DME), M (Marker), A (ADF), AX (auxiliary), and S (Speaker) are "latched" type switches.

When one of these buttons is pressed, it will stay in the "in" position. Press the switch again and it will be in the "out" position and remove that receiver from the audio. While selected, the switch will also be annunciated by an internal lamp.

NOTE: In Split Mode, no pushbuttons will be active. The only audio selected is the com 1 and two, as indicated by their respective lamps.

The "S" in the push-button section stands for speaker. This switch will place all selected audio on the cockpit speaker. *NOTE: There is no cockpit speaker*.

Mic Selector Switch (Fail Safe Operation) - Unit power is turned on and off by the Mic selector switch. In the OFF or "FAIL-SAFE" position, the pilot is connected directly to Com 1 allowing transmit and receive capability regardless of unit condition. Any time power is removed or turned OFF, the audio selector will be placed in the fail-safe mode. The first position clockwise from OFF is COM 1. Both pilot and copilot will be connected

to the Com l transceiver. While in the COM 1 or COM 2 mode, the intercom functions normally. Both the pilot and copilot have transmit capabilities on the selected transceiver. All hear the selected audio if the intercom is in the ALL mode. Only the person who presses their Push To Talk (PTT), will be heard over the aircraft radio. Turning the rotary switch to the COM 2 position will place pilot and copilot on Com 2.

The PMA6000-Series has an automatic selector mode. Audio from the selected transceiver is automatically heard in the headsets and speaker (when selected). You can check this function by switching from COM 1 to COM 2 and watch the selected audio light on the se lector change from C1 to C2. This ensures the pilot will never transmit on a radio that he is not listening to.

When switching the mic selector rotary switch from COM 1 to COM 2, while COM 2 audio had been selected, Com 1 audio will continue to be heard. This eliminates the pilot having to switch Com 1 audio back on, if desired.

When switching from COM 1 to COM 2 while Com 2 has NOT been selected, Com 1 audio will be switched off. In essence, switching the microphone selector will not effect the selection of Com audio.

Important: When the microphone selector is in the full counter clockwise position, the PMA6000 power is removed, and it is in the FAIL-SAFE mode. The pilot headset and microphone is connected directly to Com 1.

Microphone Selector Switch, Com 3 - In units designed to accommodate a third communications transceiver, placing the microphone selector switch in the COM 3 position connects the pilot and copilot to that radio. This is similar to COM 1 and COM 2, except that the swap mode is not active.

Swap Mode (Switch from Com 1 to Com 2 remotely) - With a yoke mounted, momentary switch, the pilot can change from the current Com transceiver to the other by depressing this switch. When "Swap Mode" is active, an LED annunciator will illuminate, indicating that the microphone selector switch position is no longer valid. To cancel "Swap Mode," the pilot may either press the yoke mounted switch again, or turn the Mic Selector Switch to the Com that is active.

Split Mode - Operation is identical to p6000, 6000M (above) except turning the mic selector clockwise to the COM 3 position places both pilot and copilot on Com 3, and exits the split mode. All selected audio inputs and intercom function return.

Note: Split Mode turns off all other (Nav, ADF, etc.) selected audio to pilot and copilot. Additionally, there is no intercom function between pilot and copilot. Passengers still have intercom capability among themselves.

Intercom - The pilot volume control knob adjusts the loudness of intercom and music in the pilot's headphones only. It has no effect on selected radio audio levels. The copilot volume control adjusts the loudness of the intercom and music in the copilot headset only. The passenger volume is factory set at a comfortable level. This is a service adjustment that can be accessed by the avionics technician. Many general aviation headsets have a built-in volume control, so volume can be adjusted "locally."

Adjusting the VOX-Squelch control - The PMA6000 provides adjustable VOX squelch controls for the pilot and copilot (the copilot's VOX control also adjusts the passengers VOX squelch). Since the number of microphones open at any one time is reduced, the amount of background noise is diminished. This also allows the use of dissimilar headsets with the same system. The user can adjust the trip level of the VOX to fit the individual's voice and microphone, which helps eliminate the frustration of clipping the first syllables.

With the engine running, set the VOX control knob by slowly rotating the SQL control knob clockwise until you no longer hear the engine noise in the headphones. When the microphone is positioned properly near your lips, normal speech levels should open the channel. When you have stopped talking, there is

a delay of about ½ second before the channel closes. This helps prevent choppy communications.

Intercom Function - The center switch is a 3-position mode selector that allows the pilot to tailor the intercom function to best meet the situation. The description of the intercom mode function is valid only when the unit is either in the COM 1 or COM 2 position of the Mic Selector switch. When the unit is in the "Split" mode, only the passengers have intercom function.

ISO: (Up Position): The pilot is isolated from the intercom and is connected only to the aircraft radio. He will hear the aircraft radio reception (and sidetone during radio transmissions). Copilot and passengers will hear the intercom and music on Entertainment 1, but not the aircraft radio receptions or pilot transmissions.

ALL: (Middle Position): All parties will hear the aircraft radio, intercom, and music from entertainment input #1. However, during any intercom communications, the music volume automatically decreases when Soft-Mute™ is active. The music volume increases gradually back to the original level after communications have been completed.

CREW (Down Position): Pilot and copilot are connected on one intercom channel and have exclusive access to the aircraft radios. They may also listen to Entertainment 1. Passengers can continue to communicate with themselves without interrupting the Crew and also may listen to Entertainment 2. Anytime the PMA6000 is in the COM 1/COM 2, COM 2/COM 1, or TEL/COM 1, ("Split Mode") the pilot and copilot do not have any intercom function. The passengers will maintain intercommunications.

Entertainment Input - The audio selector panel has provisions for up to two separate entertainment input devices. Which device is heard is determined by the position of the 3-position mode switch located in the center of the intercom section of the audio panel. (See table for overview.)

While in the ISO (Isolate) mode, only the copilot and the four passengers will hear entertainment device #1. In normal operation, whenever a person speaks or if the aircraft radio becomes active, the music will automatically mute and then will gradually return to the original listening level when the radio or intercom activity ceases. When in the ALL mode, all parties will hear the entertainment input #1.

Intercom Modes

Mode	Pilot Hears	Copilot Hears	Passenger	Comments
ISO	A/C Radio Pilot Sidetone (during radio transmission)	Copilot Passengers Music 1	Copilot Passengers Music 1	This mode allows the pilot to communicate with the air traffic control without the copilot or passengers bothered by the conversations. Copilot and passengers can continue to talk and listen to music
All	All Radios Sidetone Pilot Copilot Passengers Music 1	All Radios Sidetone Pilot Copilot Passengers Music 1	All Radios Sidetone Pilot Copilot Passengers Music 1	This mode allows all on board to hear radio reception as well as communicate on the intercom. Music and intercom is muted during intercom and radio communications
Crew	Radios Sidetone Pilot Copilot	Radios Sidetone Copilot Pilot	Passengers Music 2	A second music source is automatically enabled for the passengers.

Marker Beacon Receiver - The Marker Beacon Receiver uses visual and audio indicators to alert you when the aircraft passes over a 75 MHz transmitter. The Blue lamp, labeled "O," is the Outer Marker lamp and has an associated 400 Hertz 'dash' tone. The lamp and tone will be keyed at a rate of two tones/flashes per second when the aircraft is in the range of the Outer Marker Beacon. The Amber lamp, labeled "M," is the Middle Marker lamp and is coupled with a 1300 Hertz tone. It is keyed alternately with short 'dot' and long 'dash' bursts at 95 combinations per minute. The White lamp, labeled "A," is the Airway/Inner marker and has a 3000 Hertz 'dot' tone. The lamp and tone will be keyed at a rate of six times per second. The audio from the Marker Beacon Receiver can be heard by selecting the "M" push-button switch.

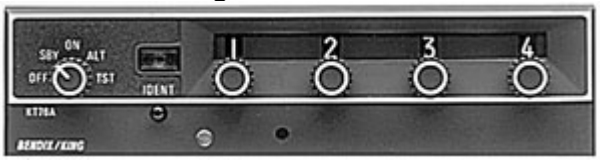
A 3-position switch is used to set the receiver sensitivity and to test the indicator lamps. Use "HIGH" sensitivity initially. This allows you to hear the outer marker beacon about a mile out. Then select the “LOW” sensitivity to give you a more accurate location of the Outer Marker. The momentary down switch position is labeled "TEST" and illuminates all three lamps simultaneously to assure the lamps are in working order.

King KT-76A Transponder

The King KT-76A transponder has 4 operating positions besides “Off”:

- Standby should be used prior to takeoff.
- On should be used when you do not wish to send altitude encoding data.
- Alt should be used in all normal flying operations.
- Test for testing.

For normal VFR flight 1200 should be set in the transmit squawk window.



Rocky Mountain µEncoderr

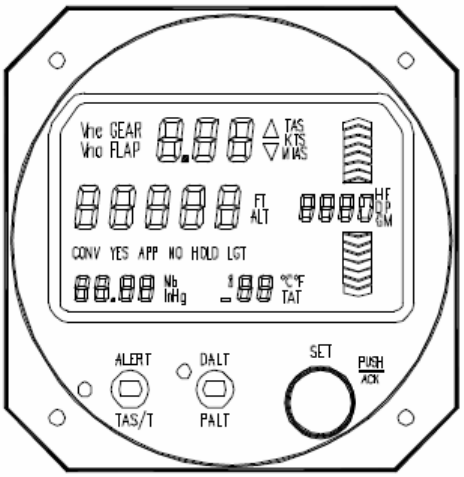
The µEncoder is a mode C altitude encoder and provides additional features. The unit combines an altitude encoder with a graphic/digital vertical speed indicator, digital airspeed indicator, sensitive digital altimeter and digital outside air temperature indicator.
With this information available to the microprocessor, additional flight information such as true airspeed, altitude alert, density altitude, pressure altitude and true air temperature are available at the touch of a switch. Front panel controls allow the user to select options and enter warning limits to tailor the µEncoder to the aircraft and personal preferences.

The combination of all these features in one quality instrument creates a space-saving and cost-effective instrument that can be used as an encoder and primary instrument for VFR sport fliers or an encoder and backup instrument for IFR pilots.

- Airspeed Indicator
- True airspeed at the touch of a switch.
- Airspeed Trend Indicators (up and down arrows) show increasing or decreasing airspeed at a glance.
- Select sensitivity of airspeed trend indicators.
- User programmed speeds for:
    - Vne - never exceed or redline speed
    - Vno - maximum normal operation speed and bottom of yellow arc
    - Gear - maximum speed for safe gear extension... or disable if no retractable gear

    - Flap - maximum speed for safe flap extension or top of white arc... or disable if no flaps
    - High Stall - upper stall warning speed or bottom of green arc
    - Low Stall - lower stall warning speed or bottom of white arc
- Select blinking warning only or blinking/audio warning for each of Vne, Vno and stall range.
- Simple, accurate front panel calibration using home-made manometer or avionics shop air-data test set.
- Altimeter
- Pressure altitude at the touch of a switch.
- Density altitude at the touch of a switch.
- True altitude at the touch of a switch.
- Versatile altitude alert warning/alarm features for:
- Converge - climb or descent to a target altitude
- Hold - maintain a target altitude
- Approach - decision height

Controls - There are only three controls of on the µEncoderr, but there are scores of functions that can be controlled. The TOGGLE SWITCHES are three position switches that return to the normal center position when released after being pressed up or down. Pressing the toggle switch up toward the [DALT] label on the panel will be shown as [DALT] and pressing the toggle switch down toward the [PALT] label will be shown as [PALT].



The SETTING SWITCH rotates clockwise or counterclockwise in "clicks" and also has an additional momentary switch that is activated by pushing the knob. In this manual turning the knob will be shown as [SET] and pushing the knob will be shown as [ACK] (for acknowledge). The basic operation of the µEncoder should be intuitive turning the knob changes the altimeter setting and pressing [DALT], [PALT] or [TAS/T] will show density altitude, pressure altitude and true airspeed/altitude/air temperature1.

Vertical Speed Indicator provides both a digital readout of feet per minute of climb or descent and a bar graph. The bar graph indicates the direction of change and the approximate amount of change while the digital readout gives an accurate rate of change. The upper bar graph represents climb and the lower bar graph represents descent. Each segment of the bar graph represents a proportionally higher rate of change. If in altitude exceeds 9990 FPM the vertical speed digits will blink and the reading will remain at 9990 FPM; the rate of climb or descent exceeds the maximum range of the bar graph.

Outside air temperature range is from 58°F to +197°F. If the outside air temperature sensor is disconnected or defective, the outside air temperature portion of the display will be °E (error). In addition, without outside air temperature available, certain functions such as density altitude cannot be calculated and will display as a group of letter E's to signify error.

View true air temperature - Pressing and holding [TAS/T] will replace the indicated temperature readout with true air temperature which is indicated temperature corrected for temperature rise due to the speed of the aircraft. While being displayed, a TAT indicator will appear next to the readout. Releasing [TAS/T] will return the display to indicated outside air temperature. Note that indicated airspeed is replaced with true airspeed and indicated altitude is replaced with true altitude at the same time.

Airspeed Indicator range is from 30 to 473 knots indicated. The displayed airspeed will remain at zero until the airspeed reaches the minimum 30.

> Airspeed Trend Indicators are located just to the right of the airspeed digits. These tell at a glance if the airspeed is increasing or decreasing. If the airspeed is increasing, the up-arrow is shown and if the airspeed is decreasing, the down-arrow is shown.

Stall - The airspeed digits will blink a warning whenever the airspeed is between the High Stall limit and the Low Stall limit (the stall range) when the airspeed has entered the stall range from the upper limit. When accelerating up through the stall range there is no warning. Decelerating down through the stall range will produce a warning and an optional alarm will sound at the Low Stall limit. The High Stall limit represents the bottom of the green arc. The Low Stall limit represents the bottom of the white arc.

.

Flap indicator represents safe flap extension speed for those aircraft with flaps. This indicator is on whenever the airspeed is between the minimum instrument range (30 or 15) and the flap limit.

Vno indicator represents the maximum structural cruising speed for the aircraft. Whenever the airspeed exceeds the Vno limit, this indicator will provide a blink warning and an optional alarm. The Vno indicator also represents the bottom of the yellow arc.

Vne indicator represents the never exceed speed for the aircraft. Whenever the airspeed exceeds the Vne limit, this indicator will provide a blink warning and an optional alarm. The Vne indicator also represents the top of the yellow arc and the start of the red arc.

View true airspeed - Pressing and holding [TAS/T] will replace the indicated airspeed readout with true air speed which is indicated airspeed corrected for temperature, pressure and compressibility. The IAS indicator will be replaced with a TAS indicator. Releasing [TAS/T] will return the display to indicated airspeed. Note that indicated outside air temperature is replaced with true air temperature and indicated altitude is replaced with true altitude at the same time.

Altimeter range is from -2000 to +46,000 feet. The display may be programmed to round the altitude to the nearest 10 foot increments or show every foot. Turning the [SET] knob adjusts the altimeter setting. Each click will change the altimeter setting by .01 InHg. If the knob is pressed in at the same time that it is turned, each click will change the altimeter setting by .10 InHg.

View density altitude - Press and hold [DALT]. Density altitude will replace indicated altitude as long as the control is held.

View pressure altitude/encoder output altitude - Press and hold [PALT]. Pressure altitude will initially replace indicated altitude. After three seconds the actual encoder output altitude is displayed. These two will alternate every three seconds as long as the switch is held. Encoder output altitude can be distinguished from pressure altitude because it is rounded to the nearest 100 feet and the last two digits are small zeros (altitude sent to transponder is also nearest 100 foot block). Pressure Altitude looks like: 1 4 5 4 0
Encoder Altitude looks like: 1 3 5 o o

Pressure altitude of the flight reference altimeter is the altitude transmitted by the transponder. The encoder altitude and pressure altitude of the µEncoder may differ if the µEncoder has been corresponded with an external flight reference altimeter (not usually done). If that is the case, the encoder output altitude should match the pressure altitude of the external flight reference altimeter. If the µEncoder is also the flight reference altimeter (not corresponded with an external flight reference altimeter), the pressure altitude and encoder output altitude will match. Note that the encoder output altitude will show 135oo during the time the pressure altitude is from 13450 to 13549. Be aware that the encoder output altitude is really a pressure altitude. The ATC radar equipment corrects the received altitude to an indicated altitude using their computer contained barometric altimeter setting to determine your indicated altitude.

View true altitude - Pressing and holding [TAS/T] will replace the indicated altitude readout with approximate true altitude which is altitude above sea level. Releasing [TAS/T] will return the display to indicated altitude. Note that airspeed is replaced with true airspeed and temperature is replaced with true air temperature at the same time. It is important to note that the calculation of approximate true altitude by the instrument requires operator entry of two variables, 1) the elevation (height above sea level) of the ground station that determined (not just transmitted) your current altimeter setting and 2) the ground

temperature (in EC) of that same ground station. The ground station should be as close as possible to your aircraft's current location

Flight level warning - The µEncoder altimeter setting automatically changes to 29.92 InHg (1013mb if selected) when ascending through 18,000 feet (adjustable for countries other than the USA) and blink a warning. The warning is provided in case there are other altimeters that need set. When descending through flight level 180 (again, adjustable) the altitude and altimeter setting will blink a warning to enter the current altimeter setting. The audio alarm may optionally be added to the warnings.

Timeout is a µEncoder characteristic that comes into use when setting the backlighting and setting altitude alert modes. Basically, it is a period of time when the normal function of a control is replaced by a different function. If the timeout period is 5 seconds, then the altered control keeps its new function until it has not been used for an amount of time equal to the timeout period. It is needed when adjusting the backlighting and all of the altitude alert modes. The timeout period ranges from 2 to 10 seconds and can be adjusted to the user's preference. After the timeout period runs out, the altered controls revert to their normal function. The next topic, backlighting, is a good example of how timeout works.
HINT: When learning the operation of the µEncoder, a higher timeout period is beneficial.

Backlighting is manually adjusted to allow for maximum control by the pilot. When the backlighting is off, pressing and releasing [TAS/T] and [PALT] at the same time turns the backlighting on. When the backlighting is first turned on, the timeout period begins and the LGT indicator on the display turns on. During the timeout period, the [SET] knob adjusts the backlight brightness instead of the altimeter setting. Turning the knob clockwise will increase the brightness and turning the knob counter-clockwise will decrease the brightness (think of a volume control). Any change of the [SET] knob during the timeout period will also continue to restart the timeout period. So even if the timeout period is 3 seconds, as long as the knob is not left idle for more than 3 seconds, it will keep its new function. At the end of the timeout period, the LGT indicator will turn off and the [SET] knob will return to being the altimeter setting control.

Turning the backlight off is a little different. Again press [TAS/T] and [PALT]. The LGT indicator will turn on, and after the timeout period the backlight and LGT indicator will turn off. Turning [SET] during the timeout period while the LGT indicator is still on will adjust the light intensity and cancel the turn off. Therefore, when the backlight intensity needs to be adjusted, the backlight does not need to be turned off and then back on. The on/off state of the backlighting is maintained in the unit's nonvolatile memory so if the backlighting is on when the FENCODER is powered down, it will be on the next time the unit is powered up.

Altitude alert has three modes 1) Converge; 2) Hold; 3) Approach. All three modes are to provide pilot assistance in altitude management. Converge mode provides warning when approaching an alert altitude. Hold mode provides warnings and optional alarms when maintaining an alert altitude. Approach mode provides warnings and optional alarms when descending to an alert altitude (decision height) during an instrument approach.

View the alert altitude - Press and release [ALERT]. The current alert altitude appears in place of indicated altitude and will remain on the display for the timeout period. example: view current alert altitude action display comment
9 5 1 0 indicated altitude press [ALERT] 4 0 0 0 current alert altitude after timeout
9 5 1 0 indicated altitude Viewing the alert altitude also cancels any alert mode in progress.

Change the alert altitude - Press [ACK] during the timeout period that the alert altitude is being viewed. 0 - - - - appears in place of the alert altitude and the [SET] knob now controls the value of the zero digit. Turning the knob clockwise will increase and counter-clockwise will decrease the value of
the digit by one for each click. When the first digit is as desired, press [ACK] and the second digit becomes zero for adjustment. Continue through all five digits.

example: change alert altitude to 18000 to 9510 indicated altitude

press [ALERT] 4 0 0 0 current alert altitude
press [ACK] 0 - - - - set 1st alert altitude digit
turn [SET] 1 - - - - one click CW to 1
press [ACK] 1 0 - - - set 2nd alert altitude digit
turn [SET] 1 8 - - - two clicks CCW to 8
press [ACK] 1 8 0 - - set 3rd alert altitude digit
press [ACK] 1 8 0 0 - set 4th alert altitude digit
press [ACK] 1 8 0 0 0 set 5th alert altitude digit
press [ACK] 9 5 1 0 indicated altitude
Each of the above steps must be started within the timeout period after the end of the previous step. If the timeout period is allowed to expire before completing the final [ACK], the alert altitude will remain the same as before the procedure was started. Note that minus alert altitudes are not allowed.

Alert altitude distances - The number of feet altitude between the alert altitude and a warning or alarm altitude in all the alert modes are programmed to suit pilot and aircraft. Two distances in feet are programmed by the user for converge and hold alert modes.

Figure 1 shows the warning and alarm altitudes created when the pre-programmed Converge Warning Distance and Hold Alarm Distance are 500 and 200 feet respectively and the alert altitude is 10,000 feet. The distances in feet extend both above and below any alert altitude that is set.

A third distance, Approach Alarm Distance, is different in that it creates only one alarm altitude which is always above the entered alert altitude (decision height). The programming section describes how to change the Converge Warning Distance, Hold Alarm Distance and the Approach Alarm Distance.

Converge mode – When approaching an alert altitude during climb or descent, a blink warning begins when the altitude remaining to the alert altitude is less than the Converge Warning Distance. When the converge blink warning starts the audio sounds a short beep to alert the pilot.
When the aircraft reaches the Hold Alarm Distance, another short beep will sound and the µEncoder will automatically enter the hold mode. At this point the blink warning is still active.

Starting converge mode - There are two ways to enter the converge mode. The easiest, automatic, and most often used is to enter/change an alert altitude. After entering the last digit of a new alert altitude, the µEncoder will automatically enter converge mode if the altitude of the aircraft is outside the Hold Alarm Distance. The second method is to press [ALERT] during the timeout period while viewing the alert altitude. This would most often be used when an alert altitude is left the same for a number of different changes of mode during practice airwork. The CONV indicator is always displayed when the µEncoder is in converge mode. Converge mode may be cancelled by pressing [ALERT] to view the alert altitude and letting it timeout.

Hold mode - When maintaining an alert altitude, a blink warning begins when the aircraft distance away from the alert altitude is more than 2 the Hold Alarm Distance. The start of the blink warning is accompanied by a short beep. If the hold mode was just automatically entered from the converge mode, this is also the reason that the converge blink warning appears to continue. If the aircraft then returns inside the warning bands, the blink warning will stop. If the aircraft continues to diverge from the alert altitude and ventures into the alarm zone defined by the Hold Alarm Distance, an alarm (if enabled by user programming) will sound. Pressing [ACK] will acknowledge and silence the audio alarm. Flying back inside the Hold Alarm Distance would also silence the alarm.

Starting hold mode - There are four ways to enter the hold mode. The easiest is an automatic entry from the converge mode as described above.
The second method is to enter/change an alert altitude. After entering the last digit of a new alert altitude, the µEncoder will automatically enter hold mode if the altitude of the aircraft is inside the Hold Alarm Distance (fourth method is easier with same result).

The third method is to press [ALERT] during the timeout period while viewing the alert altitude. This would most often be used when an alert altitude is left the

same for a number of different changes of mode during practice airwork or when the hold alarm was cancelled before flying back to the hold alert altitude.
The forth method is to press [ALERT] as if to view the current alert altitude, but continue holding the switch up until the timeout period expires and the altitude display returns to indicated altitude. Then when the [ALERT] switch is released, the unit will automatically enter hold mode after calculating and entering an alert altitude based on the current indicated altitude rounded to the nearest hundred feet. This method is handy for entering hold mode after already leveling off. Obviously the speed and ease of this method is defeated if the timeout period is set to a high number of seconds. The HOLD indicator is always displayed when the µEncoder is in hold mode. Hold mode may be cancelled by momentarily pressing [ALERT] to view the alert altitude and letting it timeout.

Approach mode – When approaching an alert altitude during descent, a blink warning and audio alarm (if enabled by user programming) begins when the altitude remaining to the alert altitude is less than the Approach Alarm Distance. The audio alarm and/or blink warning will continue for the number of Approach Alarm Seconds preprogrammed by the user or it may be cancelled by [ACK]. Setting the Approach Alarm Seconds to 2 to 4 seconds allows adequate notice of reaching decision height and then cancels itself so no further pilot action is necessary.

When in approach mode, the altitude readout will read to the nearest 10 feet or every foot depending on user pre-programming. This feature is separate from the 10/1 readout option for operation in other than approach mode. The programming section describes how to change the Approach Alarm Distance, Approach Alarm Seconds and 10/1 foot option.

Starting approach mode - There is only one way to enter the approach mode. The µEncoder must first be put in converge mode using an alert altitude that is below the aircraft altitude. Then press [ALERT] [ALERT] [ALERT]. The first press views the alert altitude and cancels converge mode. The second (within timeout period) re-enters converge mode. The third (again within timeout period) enters approach mode. The APP indicator is always displayed when the µEncoder is in approach mode. Approach mode may be cancelled by pressing [ALERT] to view the alert altitude and letting it timeout.
Pressing [ACK] after the start of the audio alarm and before the automatic cancel takes place will also cancel the approach mode.

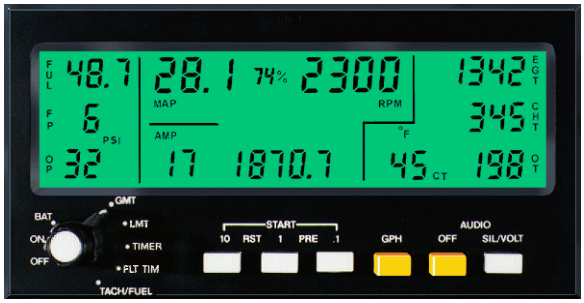
Operation Summary

- CHANGE ALTIMETER SETTING [SET] to change by .01 increments
- [ACK] & [SET] together to change by .10
- ACKNOWLEDGE/SILENCE ALARMS [ACK]
- VIEW TAS, TAT & TRUE ALTITUDE [TTASS]
- VIEW PRESSURE ALTITUDE [PALT]
- VIEW DENSITY ALTITUDE [DALT]

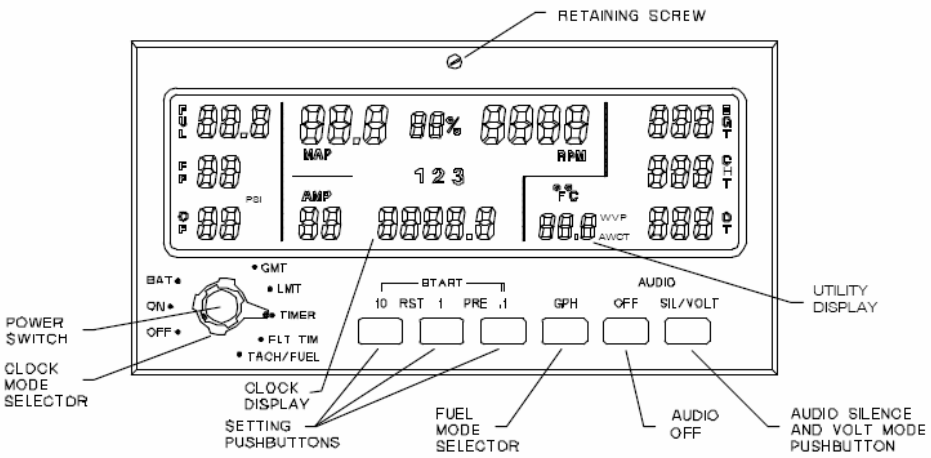
- VIEW ENCODER ALTITUDE [PALT] held for more than 3 seconds
- VIEW ALERT ALTITUDE [ALERT]
- CHANGE ALERT ALTITUDE [ALERT] [ACK] [SET] [ACK] [SET] etc.
- (unit will enter HOLD or CONV automatically)
- START CONVERGE MODE Automatic with change alert altitude
- or: [ALERT] [ALERT]
- START HOLD MODE Automatic with change alert altitude
- or: [ALERT] [ALERT]
- or: hold [ALERT] until timeout
- START APPROACH MODE [ALERT] [ALERT] [ALERT]
- BACKLIGHT ON [TAS/T] & [PALT]
- BACKLIGHT OFF [TAS/T] & [PALT] (off after timeout)
- BACKLIGHT INTENSITY [SET] during backlight ON or OFF timeout

Rocky Mountain µMonitor

The µMonitor provides the engine monitoring instrumentation. The µMonitor has 23 different functions including percent power, manifold pressure, tachometer, exhaust gas temperature, cylinder head temperature, oil temperature, carburetor temperature, ammeter, voltmeter, oil pressure, fuel pressure and outside air temperature. An integral turbine-sensor fuel totalizer provides fuel flow, fuel quantity remaining and time to dry tanks.



The µMonitor continuously displays the engine parameters. The measurements of all critical functions are compared to alarm set points that are adjustable by the user using the front panel controls. Any out-of-limit measurement activates an audio alarm, and the errant reading blinks on the display.



The µMonitor is a microprocessor controlled engine monitor for aircraft engines of all types. The µMonitor continuously monitors and displays all engine functions in a digital format. All critical engine functions have user adjusted upper and lower alarm points. Any of the critical functions that are out of limits will blink on the display and an audio alarm will sound, an external 90db+ external alarm, and a 600-ohm audio output for audio input direct to the headphones. The µMonitor uses a nonvolatile memory to store information during shutdowns. All user programmed settings for the unit, and totals of certain other functions are stored in nonvolatile memory. A logging feature allows saving all engine function readings to the nonvolatile memory on a periodic basis for later download through the serial port. The log data will hold over 16 hours of engine data when the logging period is every minute. As modifications and features are added to the software, users may download newer versions to their computer from the RMI website and then upload them to the µMonitor using the special RS232 cable that plugs into a jack located just above the µMonitor in the avionics stack.

All alarm settings, calibration, backlighting intensity and other programming are performed using front panel controls and can be done without removing the unit from the instrument panel.

µMonitor's functions:

Lower and upper range limits: function range notes:

- OIL PRESSURE 0 to 99 psi
- FUEL PRESSURE 0 to 31 psi
- MANIFOLD PRESSURE 10.0 to 59.0 InHg
- OIL TEMPERATURE -40 to +390 °F
- CYLINDER TEMPERATURE 32 to 700 °F
- EXHAUST GAS TEMPERATURE 32 to 1652 °F (No alarm)
- OUTSIDE AIR TEMPERATURE -40to +390 °F
- AMMETER -80 to +80 amp
- VOLTMETER 0 to 39.9 V (No alarm – Note: the annunciator panel will display a lo-volt flashing alarm as a function of the B&C voltage controller)
- TACHOMETER 60 to 8000 RPM
- FUEL FLOW .6 to 60 GPH (No alarms)
- FUEL QUANTITY REMAINING 0 to 99.9 gallons
- GMT 0 to 2359.9
- LMT 0 to 2359.9
- TIMER 0 to 59.9 min Alarm at zero
- FLIGHT TIME 0 to 6553.5 hr
- TACH TIME 0 to 6553.5 hr
- ENDURANCE 0 to 99.9 hr

Operating Controls

The operating controls are of two types, rotary switches and pushbutton witches. The power switch and the clock mode selector are rotary switches. The indicator lines on the knobs align with the desired mode that is printed on the panel.

The gray pushbuttons are momentary switches that have to be held in to accomplish their function. The two yellow pushbuttons are push-push switches that alternately lock in when pushed and then release when pushed again. When either yellow pushbutton is 'in' it activates the function that is printed directly above it. The utility portion of the display shows optional functions such as carburetor temperature, outside air temperature and voltage. The temperature units symbols for degrees Fahrenheit that appear just above the utility display apply to all the temperature functions grouped together to the right of the heavy line.

Power Switch

When the power switch is positioned at ON the unit is powered by the master bus. When the power switch is positioned at BAT the unit is powered independent of the master switch. The µMonitor has both an audio and visual alarm indication for any function that is out of limits. There are some functions that do not provide for an alarm. The function that is out of limits will blink on the display, and an audio alarm will pulse. The audio alarm is a 90db+ unit mounted in the cockpit. The µMonitor also has a 600 ohm audio output with volume control for input to a headset. Whenever the term 'audio' is used in this manual, it applies to both headset and cockpit audio alarms. The visual blinking will continue as long as the function is out of limits. The audio may be silenced by momentarily pressing the audio [SIL/VOLT] button. Any further alarm conditions will again sound the audio. The audio [OFF] pushbutton also disables the audio but has the feature of locking in. This pushbutton is locked in before turning on the µMonitor and starting the engine because of the alarms before and during engine start. To reduce the possibility of an intermittent alarm, the unit will not activate the alarm for most functions unless the function has been continuously out of limits for 5 seconds

Audio off pushbutton - The audio [OFF] pushbutton is a push-push type switch. When the pushbutton is in the "in" position the audio portion of the alarm is shut off. Any alarm condition that occurs will still blink the display, but there will be no sound. This pushbutton should be "in" before turning on the µMonitor to prevent annoying alarms before engine start and should be "out" before takeoff.

Audio silence pushbutton - The audio [SIL/VOLT] pushbutton, when momentarily pushed will stop the audio after an alarm condition has been activated. The function that is out of limits can then be identified by the blinking display. The display will stop blinking when the function that is out of limits returns to normal. If a function returns to normal before the audio [SIL/VOLT] (or [OFF]) push button is pushed, the audio will still have to be manually cancelled. This switch also displays the three additional functions (VOLTS, OUTSIDE AIR TEMPERATURE and ENDURANCE) when pushed.

Fuel Mode Pushbutton - The [GPH] pushbutton controls whether the fuel portion of the display shows fuel flow or fuel remaining. In the "in" position the display will show gallons per hour (LPH if selected), in the "out" position the display will show fuel quantity remaining.

Setting Pushbuttons - The three setting pushbuttons change the current value of whatever mode is selected by the rotary CLOCK MODE switch. The pushbuttons are used singly or in various combinations to perform certain changes. The three pushbuttons are the ten [10], one [1], and tenth [.1] buttons. The action performed by each depends on the mode selected and will be described in the instructions for each of the modes.

Reset command [RST] can be activated by pushing both the [10] and [1] pushbuttons at the same time. The buttons are close enough together so that both buttons can be pushed with one finger by aiming at the [RST] between the buttons. The preload command [PRE] can be activated in the same manner by pushing the [1] and [.1] buttons at the same time. The start command [START] is activated by pressing the [10] and [.1] buttons at the same time. The bar extending on either side of [START] is a pointer to the proper two buttons.

Clock mode switch - selects which time related function is displayed in the clock portion of the display. The function selected can also be changed using the setting pushbuttons as explained in the following sections.

GMT - When the clock mode switch is positioned to GMT, the clock portion of the display shows Greenwich Mean Time. The display is in a 24 hour mode and will roll over from 23 hours 59.9 minutes back to 0000.0. The smallest time division is one tenth of a minute, or six seconds. When the clock mode switch is in this position the [10] pushbutton will advance the hours and the [1] pushbutton will advance the minutes. If the [10] pushbutton is held down, the hours will continue to advance at a rate of one count per 1/2 second to the limit of 23 hours and then roll over to zero. If the [1] pushbutton is held down, the minutes will continue to advance at a rate of one count per ½ second to the limit of 59 minutes and then roll over to zero (does not increment hours). The tenths of minutes is reset to zero every time a one is added to the minutes. To accurately set the tenths, adjust the minutes using the [1] pushbutton until the minutes equal the reference clock minutes, then when the reference clock rolls over to the next minute, add a minute to the µMonitor. Adding the last minute will also reset the tenths to zero, which now matches the reference clock. No other pushbutton or pushbutton combination is effective in this mode. If the installation has provided for a direct connection to the aircraft battery for the internal clock, proper time will always be available.

LMT - When the clock mode switch is positioned to LMT, the clock portion of the display indicates Local Mean Time. The display is in a 24 hour mode and will roll over from 23 hours 59.9 minutes back to 0000.0. The smallest time division is one tenth of a minute, or six seconds. The computer only maintains one time...GMT. To display LMT the computer subtracts an hourly difference from GMT. When the clock mode switch is in this position, the [10] pushbutton changes this hourly difference. If the [10] pushbutton is held down, the hours will decrease at the rate of one count per 1/2 second until zero is reached and then roll under to 23 hours. No other pushbutton or pushbutton combination is effective in this mode. The hourly difference is stored in the nonvolatile memory of the unit.

Timer - When the clock mode switch is positioned to TIMER, the clock portion of the display shows the value of the countdown timer. The display shows only

minutes in the range of zero to 59.9. The smallest time division is one tenth of a minute, or six seconds.

- Pressing [RST] stops the timer if it was running and resets it to 0.0.
- Pressing [PRE] stops the timer if it was running and sets it to the preload value.
- Refer to the PROGRAMMING MANUAL to change the preload value.
- Pressing [10] will add ten minutes to the value shown.
- Pressing [1] will add one minute to the value shown.
- Pressing [.1] will add 1/10 minute (6 seconds) to the value shown.
- Holding down the [10], [1], or [.1] buttons will add its respective value once every 1/2 second. If the maximum of 59.9 minutes is reached or exceeded, the computer will subtract 60.0 from the result before displaying it. Generally, it is usually best to reset the timer to zero by pressing [RST] and then setting the desired count down time with the [10], [1], and [.1] pushbuttons. Pressing the [START] combination ([10] & [.1]) starts the timer counting down. The timer won't change value for six seconds, so the audio emits a short beep to acknowledge that the computer received the start signal. When the timer reaches 0.0 the alarm will sound and the clock portion of the display will blink to indicate time-out. Then the timer will count up. Pressing the [SIL/VOLT] pushbutton will silence the alarm and stop the display from blinking but the timer will continue to run. Thereafter, every time the timer passes through zero (every hour) the alarm will sound, until the timer is stopped. When the timer reaches 0.0 the alarm will sound and the clock portion of the display will blink regardless where the clock mode switch is positioned. If the preload value of the timer is 30.0 minutes, the preload value can be loaded and the timer started at takeoff. Then the clock mode switch can be set to GMT or LMT. The alarm will sound in 30 minutes and every hour thereafter as a reminder for fuel tank changes.

Caution: Pressing the [10], [1], or [.1] pushbuttons will add to the value of the timer even when it is already running when the CLOCK MODE switch is in the TIMER position.

Caution: Whenever the [SIL/VOLT] pushbutton is pushed to silence an alarm occurring at the same time as the timer alarm, it will stop the clock portion of the display from blinking.

The timer is intended primarily as an approach timer and a fuel tank change reminder. It can be used as an elapsed time clock (keeping in mind the 59.9 minute maximum and the alarm when the timer goes through 0.0). Set the start time to 0.0 using the [RST] pushbuttons and then start the timer. There is no provision for stopping the timer other than resetting back to 0.0, however. The timer value is stored in the nonvolatile memory. However, the computer signals that indicate that the timer is running and whether up or down are not stored. When the unit is turned back on, the timer value at turnoff is restored but the

timer will be stopped. So, if you're using the timer for fuel tank changes and want to maintain the timing cycle after stopping for lunch, you merely switch the clock mode switch to TIMER and [START] the timer at takeoff.

Flight time setting - When the clock mode switch is positioned to FLG TIM, the clock portion of the display shows flight time. The display is in hours and 1/10's of hours and ranges from 0.0 to 6553.5 hours. The flight time readout is a convenient way to keep log book time. A separate Hobbs timer that can be accessed only through the programming mode is better used to keep track of aircraft total hours, even though flight time can maintain a large number of total hours. Pressing [RST] will reset the flight time readout to zero. The flight time clock only runs when there is over 200 RPM, which means the engine is running. Multiple leg flight time can be accurately kept for the log book. Reset flight time to zero after recording the time. Flight time is stored in the nonvolatile memory.

Tach/fuel setting - When the clock mode switch is positioned at TACH/FUEL, the clock portion of the display shows tachometer hours. The display is in hours and 1/10's of hours and ranges from 0.0 to 6553.5 hours. The tachtime recorded is the same time based on RPM as shown on standard tachometers. If the tachtime counter (MSC/ttrPM menu item in the programming manual) of the unit is set at 2400 rpm, the tachometer hours shown by the µMonitor will increase by one hour for every actual clock hour if the engine is running at 2400 rpm. If the engine is running at 1200 rpm, the tachometer hours shown by the µMonitor will increase 1/2 hour for each actual clock hour that the engine is running No other pushbutton or pushbutton combination is effective in this mode. When the clock mode switch is positioned at TACH/FUEL, the setting buttons are used to change the fuel quantity remaining, since the tachometer hours are not changeable during normal operation (refer to programming manual on how to set the µMonitor's beginning engine TACHTIME). The fuel remaining is displayed in the FUL section of the display when the [GPH] pushbutton is in the out position.

- Pressing [RST] resets the fuel quantity to zero.
- Pressing [PRE] sets the fuel quantity to the preload value.
- Refer to the MSC/FLPrE menu item in the programming manual section to change the preload value.
- Pressing [10] will add ten gallons to the value shown.
- Pressing [1] will add one gallon to the value shown.
- Pressing [.1] will add 1/10 gallon to the value shown.
- Holding down the [10], [1], or [.1] buttons will add its respective value once every 1/2 second. If the maximum of 99.9 gallons (or 999 liters) is reached or exceeded, the computer will subtract 100.0 (or 1000 liters) from the result before displaying it. If the [GPH] pushbutton is in the in position, so the FUL portion of the display is showing fuel flow, the three setting buttons are disabled so that you are not changing something you can't see. When the fuel quantity reaches the alarm value, the alarm will sound and the fuel portion of the display will blink to indicate low. The fuel portion

of the display will blink even if the [GPH] pushbutton is in the in position to display fuel flow instead of fuel remaining. Pressing the [AUDIO SIL/VOLT] pushbutton will silence the audio. The display will continue to blink and will continue to indicate the correct fuel remaining.

Before engine start, the fuel quantity actually aboard the aircraft must be entered into the µMonitor. There are three different ways to enter the fuel amount. 1) If the actual amount of fuel in the aircraft is known by measurement or calculation, the fuel quantity remaining can be [RST] to zero and then changed to actual with the SETTING PUSHBUTTONS. 2) If the aircraft is partially refueled and the current quantity of fuel remaining is accurate, the amount delivered to the aircraft can be added to the current fuel quantity remaining. 3) If the tanks are topped off and the preload value is equal to the aircraft capacity, [PRE] can be pressed to change the fuel quantity remaining to indicate full tanks.

The alarm value for low fuel and the preload value for full tanks can be adjusted. Refer to the ALr/LOFUL and ALr/FLPrE menu items in the programming manual. Tachometer Display Because of the smoothing action of the software, the RPM will not indicate other than zero on the display for about five seconds when the engine is started, or when the FMONITOR is turned on with the engine already running. This is intended to prevent erroneous readings until enough tachometer pulses have been received to establish a filtered average.

WARNING: The fuel totalizer MUST NOT be used as the only indication of fuel remaining. Like all totalizers, the unit relies on the PILOT to insure that the amount of fuel stored in the unit is CORRECT before flight. Also, the fuel remaining and endurance provided by the unit is based on measuring the amount of fuel going to the engine—so the totalizer CANNOT detect loss of fuel due to a leaking gas cap or other fuel malfunction as can an in-flight sight gage or internal tank sensor type fuel gage.

Displaying Utility Functions & Endurance - Pressing the [SIL/VOLT] pushbutton displays the additional functions of VOLTAGE, OUTSIDE AIR TEMPERATURE and ENDURANCE while the pushbutton is held in. When the pushbutton is released, the display will return to normal. The usual purpose of this pushbutton is to silence the audio alarm, but it also doubles to show additional functions. The utility portion of the display shows (in priority order) carburetor temperature, bus voltage and air temperature. If installed, carburetor temperature will normally appear in the utility spot with the designator letters CT. If carburetor temperature is disabled (see Calibrate Menu section of the programming manual), then volts becomes the primary function to display in the utility portion of the display, and outside air temperature will display when the [SIL/VOLT] button is pressed (if not also disabled).
Voltmeter

Air Temperature - When the [SIL/VOLT] pushbutton is held in, the utility portion of the display will read the outside air temperature when the designator shows AT. If carburetor temperature is installed, the air temperature will alternate with voltage at three second intervals. If the carburetor temperature is not installed, holding down the pushbutton will continuously show air temperature. If RMI's µEncoder is installed (it has, and needs OAT) you may want to use the µMonitor air temperature function to read engine compartment or cabin temperature.

Endurance - When the [SIL/VOLT] pushbutton is held in, the clock portion of the display indicates the time to fuel exhaustion in hours and 1/10's. While the endurance is being displayed, the first digits of the clock portion of the display will read E=, as a reminder. If the fuel flow is zero, the display will read E=OFF. The endurance is calculated using the amount of fuel remaining and the fuel flow in gallons per hour - both of which can be displayed in the FUL portion of the display.

Backlight Control - becomes UP to increase the intensity, and the 1 button becomes DOWN to decrease the intensity. To enter the backlight control, press ALL THREE of the setting pushbuttons at the same time. The display will show L=xxx in the clock portion of the display, with the xxx indicating the current percentage of backlight intensity from 5% to 100%.

[THREE SETTING PUSHBUTTONS] [YELLOW] - If you enter the backlight control, and don't change the intensity, that is a signal to turn the backlight on if it was off, or turn the backlight off it was on. There is a three second limit (or timeout) when in the backlight control is being used. Three seconds after the last button has been pressed, the timeout will return the operation to normal. As an example, to turn the backlight off, press the three setting pushbuttons. The display will show L=xxx. After three seconds, the unit will turn the backlight off and return to normal operation. The backlight intensity and on/off state are saved in nonvolatile memory, so when the µMonitor is turned on, the backlight will revert to the same state as when the µMonitor was turned off. Experiment with backlighting intensity. Many users find that in daylight, the contrast of the display is better with the backlight completely off, and that only dusk and nighttime need backlight.

Lift Reserve Indicator (LRI)

The LRI provides a continuous visual display of the condition of the aircraft's lift throughout its slow speed envelope regardless of the many variables which act upon an aircraft. The LRI also provides a continuous visual reference of an aircraft's margin over stall at any airspeed. This allows a pilot to continuously track his aircraft's performance since the LRI responds instantaneously to pilot control and wind conditions.

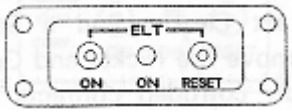
Slow approaches should be made with reference to the LRI. Stall can be precisely anticipated allowing a maximum angle of attack, slowest possible approach.

The LRI provides:

- Integration of Airspeed and Angle of Attack
- Wind shear Protection
- Stall Warning
- Continuous Lift Reserve Readouts During:
- Maximum Angle of Climb - Without Computation

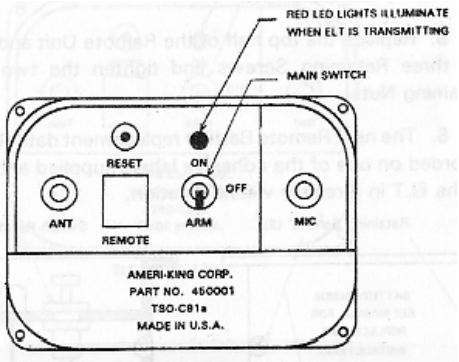
ELT – Ameri-King 450

The Aircraft emergency locator transmitter (ELT) is an Ameri-King 450. The transmitter is located on the rear baggage shelf, with the fixed aircraft antenna under the empennage fairing.



The remote control panel is located on the right side instrument sub panel directly below the compass. The controls are; a red LED to indicate activation of the ELT; a reset button to reset the ELT to armed but not activated state; and an 'ON' button to activate the ELT.

The ELT is removable and has a voice transmit feature. A mic jack is located on the face of the ELT. An aircraft headset can be used as the microphone. An external antenna is attached on the side of the ELT.



ELT Description

- Dual operation, for both automatic fixed and portable mode.
- Voice transmission capability.
- Visual ON light located on ELT unit to indicate when ELT is transmitting. (Important for portable Use.)
- Remote control panel with independent battery built-in, interface with aircraft electrical power is not required.
- Standard D size alkaline batteries.
- Dual Antennas, fixed and portable.
- Heavy duty ABS case
- Light weight: 2.62 Lbs.
- Small: (2.95"h X 4.27"w X 5.64"l).

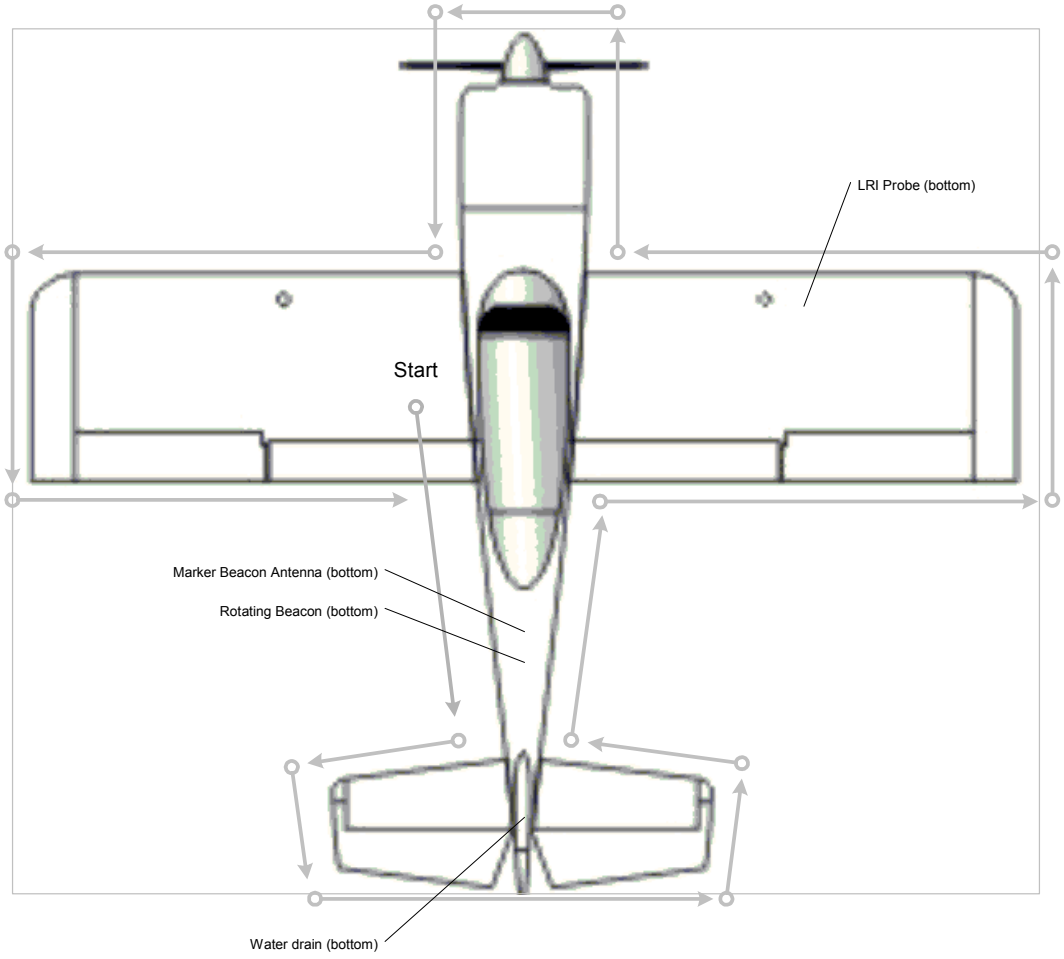
Electroluminescent Lighting

The EL (Electroluminescent Lighting) strips are very flexible and light weight and do not generate heat like conventional lighting. The light strips have to be driven by a small inverter that converts the aircraft 12Vdc into 120Vac. The frequency of this drive voltage is in the Kilohertz range to maximize the EL light strip's brightness or efficiency. The lighting level is controlled by a dimmer on the right side electrical control panel. The rheostat is above the cockpit light switch on the right side switch console.

Checklists

Preflight

Preflight walk around pattern:



Cockpit

1.	Control lock ……..	REMOVE
2.	Ignition switch…….....	OFF
3.	Master ……	ON
4.	Flaps ……..	FULL DOWN
5.	Fuel quantity …….	CHECK
6.	Landing light …….	CHECK
7.	Taxi light ……	CHECK
8.	Nav lights ……..	CHECK
9.	Pitot heat ……...	CHECK
10.	Beacon ……..	CHECK
11.	Strobes ……..	CHECK
12.	Lights …….	OFF
13.	Master ……	OFF
14.	Ballast ……	CHECK

Left fuselage

1.	Brakes ……	CHECK
2.	Main wheel ……	CHECK
3.	Marker beacon antenna ……..……	CHECK
4.	Beacon ……..	CHECK

Empennage

1.	Left stabilizer …….	CHECK
2.	Left elevator ……..	CHECK
3.	Trim tab …….	CHECK
4.	Water drain ……...	CHECK
5.	Rudder cables ……..	CHECK
6.	Rudder ……..	CHECK
7.	VOR antenna ……	CHECK
8.	Right elevator ……..….	CHECK
9.	Right elevator ……	CHECK
10.	Right stabilizer ……..	CHECK

Right fuselage

1.	Brakes ……	CHECK
2.	Main wheel ……	CHECK

Right wing

1.	Flap ……	CHECK
2.	Aileron ……	CHECK
3.	Tip ……..	CHECK
4.	Leading edge ……	CHECK
5.	Fuel level ……...	REQUIRED LEVEL
6.	Fuel cap …….	SECURE
7.	Fuel sump …….	DRAIN

Engine

1.	Right fuel vent ……..	CHECK
2.	Battery space ……	CHECK
3.	Baggage door ……..	SECURE
4.	Oil level ……..	4 QUARTS MIN
5.	Oil overflow ……...	EMPTY
6.	Nose gear ……..	CHECK
7.	Cowl plugs …….	REMOVE
8.	Propeller ……	CHECK
9.	Cooling intakes …….	CLEAR
10.	Generator belt ……..	CHECK
11.	Air filter ……..	CLEAR
12.	Gas collator ……..	DRAIN
13	Left fuel vent ……	CHECK

Left wing

1.	Fuel level ……...	REQUIRED LEVEL
2.	Fuel cap …….	SECURE
3.	Fuel sump …….	DRAIN
3.	Pitot cover …….	REMOVE
4.	Pitot tube ……...	CLEAR
5.	Static air …….	CHECK
6.	Pitot heat ……...	CHECK
7.	Leading edge ……	CHECK
8.	Tip ……..	CHECK
9.	Aileron ……	CHECK
10.	Flap ……	CHECK

Cockpit Check

1.	Charts, approach plates, computer, log	CHECK
2.	Weight & balance …….	CORRECT
3.	T/O reject distance ……..	CALCULATED
4.	Pilot Parachute……..……	ADJUST & SECURE
5.	Passenger……..	SECURE STATIC LN
6.	Seat belts ……..	SECURE
7.	Canopy stop (for solo opns. Only)……..	CHECK
8.	Rudder …….....	FREE
9.	Front stick …….	FREE & FULL MOVE
10.	Front stick pin & connector ……	SECURE
11.	Rear stick (if installed) ……	FREE
12.	Rear stick pin & connector …….	SECURE
13.	Alternate air ……..	CLOSED
14.	Throttle ……..	FREE & CLOSED
15.	Mixture ……..	FREE & FULL LEAN
16.	Friction lock ……..	FREE
17.	Alternate Air Door…….	CLOSE
18.	Alternate Static Source……	CLOSE
19.	Oil cooler door ..……	OPEN
20.	Fuel selector …….	OFF
21.	Switches ……	OFF
22.	Clocks ……	SET
23.	uMonitor audio silence ……	IN
24.	uMonitor …….	ON
25.	uMonitor fuel quantity ……..	ADJUST
26.	uMonitor voltage ……..	CHECK
27.	Avionics …….	OFF
28.	ELT ……	ARMED
29.	Breakers ……	IN
30.	Brakes ……..	ON
31.	Master battery ……..……	ON
32.	Flaps ……..……	UP
33.	Flap annunciator ……..	LIT
34.	Trim annunciator ……..	LIT
35.	Oil and low-volt annunciators ……..	LIT

Normal Procedures

Pre-Start

1.	Master ……	ON
2.	Alternator ……..……	ON
3.	Beacon ……..	ON

Engine Start

1.	Fuel selector …….	FULLEST TANK
2.	Throttle ……..	1/4 FORWARD
3.	Mixture …….....	RICH
4.	Fuel boost …….	ON TO PRESSURIZE
5.	Clear ……..	CLEAR PROP
6.	Key switch …….....	START
7.	Throttle ……..	RETARD TO IDLE

Engine Hot Start

1.	Fuel selector …….	FULLEST TANK
2.	Mixture …….....	IDLE CUT-OFF
3.	Fuel boost …….	OFF
4.	Throttle ……..	FULL
5.	Clear ……..	CLEAR PROP
6.	Ignition ……...	BOTH
7.	Starter ……	ENGAGE AND START
8.	Throttle ……..	RETARD
9.	Mixture ……...	ADVANCE TO RICH
10.	Throttle ……..	IDLE 900 RPM
11.	Alternator ……..	ON

Post Start

1.	uMonitor …….	ON
2.	Fuel pressure ……	25 PSI MIN
3.	Oil pressure ……..	25 PSI MIN
4.	Oil temperature ……	RISING
5.	Com 1 ……	CHECK 121.5
6.	Com 1 & 2 …….	SET FREQ
7.	Intercom…….	ON
8.	Transponder …….	STBY & 1200
9.	ELT …….	CHECK
10.	Altimeter ……	SET BARO
11.	uMonitor …….	CHECK TIME
12.	uEncoder ……...	SET
13.	uEncoder ……...	CHECK DALT
14.	Dynon …….	SET BARO
15.	Dynon …….	SET BRIGHT
16.	Dynon …….	CHECK TIME

Taxi

1.	ATIS / Clearance ……..	CHECK/OBTAIN
2.	Radio ……..	ANNOUNCE
3.	uMonitor audio silence ……	OUT
4.	Taxi, Landing, Nav Lights …….....	ON
5.	Flight instruments ……	CHECK IN TAXI

Runup

1.	Flight controls ……..	FREE ALL AXES
2.	Flight instruments ……..	CHECK
3.	Altimeter ……..	FIELD ELEV CHECK
4.	Density altitude ……	CHECK
5.	Fuel selector ……	FULLEST TANK
6.	Roll trim …….	NEUTRAL
7.	Pitch trim ……..	SET TAKE-OFF
8.	Mixture ……....	RICH
9.	Throttle ……..	1800 RPM
10.	Magnetos ……..	L/R CHECK
11.	Ammeter ……	CHECK
12.	Oil temperature ……	CHECK
13.	Oil pressure ……..	CHECK
14.	Fuel pressure ……	CHECK
15.	Flaps ……..	SET
16.	Transponder …….	ALT
17.	Strobes ……..	ON
18.	Seat belts ……..	CHECK
19.	Parachutes ……	CHECK
20.	Canopy ……..	CLOSE / LOCK

Normal Take-Off

1.	Canopy ……..	CHECK
2.	Compass / DG …….	RUNWAY HEADING
3.	Fuel boost …….	ON
4.	Throttle ……..	MAX POWER
5.	V1 ……...	CALLOUT
6.	Rotate ……	Vr 65 Kts
7.	Runway T/O distance …….	REJECT & BRAKE
8.	Climb …….	Vx 69 | Vz 87 | Vy 91

Short Field Take-Off

1.	Compass / DG ……..	RUNWAY HEADING
2.	Flaps ……..	10 DEGREES
3.	Brakes ……	ON
4.	Fuel boost ……	ON
5.	Throttle ……..	MAX POWER
6.	Brakes ……	RELEASE
7.	Throttle ……..	MAX POWER
8.	Rotate ……	Vr 65 Kts
9.	Climb …….	Vx 69 Kts
10.	Flaps ……..	RETRACT

Departure / Climb

1.	Climb …….	Vx 69 | Vz 87 | Vy 91
2.	Fuel boost …….	OFF
3.	Level ……..	PUSH OVER
4.	Trim …….	SET LEVEL FLT
5.	Power …….	CRUISE 2250 RPM
6.	Mixture ……...	ADJUST
7.	Fuel timer ……..	SET 1 HOUR

Cruise

Switch tanks at 1 hour intervals

1.	Barometric pressure ……	RESET 50 NM
2.	Fuel status match plan ……	CHECK

Aerobatics

Switch tanks at 1 hour intervals, min altitude 3000 ft. AGL

1.	Weight ……	ACCEPTABLE
2.	Loose articles ……	SECURE
3.	Seat belts ……..	SECURE
4.	Parachutes ……	SECURE

Descent

1.	Fuel boost …….	ON
2.	Mixture ……..	RICH
3.	Throttle ……..	RESET
4.	Fuel ……	FULLEST

Approach

1.	ATIS / Clearance ……..	OBTAIN
2.	Seat belts ……..	SECURE
3.	Taxi / landing lights ……..	ON

Normal Landing

1.	Radio call ……..	ANNOUNCE
2.	Pattern entry …….	Vbg 74 Kts
3.	Throttle ……..	1400 RPM
4.	Decelerate ……	70 Kts
5.	Flaps downwind ……	10° - 3 SECONDS
6.	Flaps base …….	20° - 3 SECONDS
7.	Flaps final ……..	FULL - 3 SECONDS
8.	Throttle ……..	IDLE

Teardrop Entry Landing

1.	Radio call ……..	ANNOUNCE
2.	Pattern entry …….	Vbg 74 Kts
3	Abeam midfield ……	80 Kts 60° BANK
4.	Flaps final ……..	FULL - 9 SECONDS
5.	Throttle ……..	IDLE

Balked Landing

1.	Throttle ……..	FULL
2.	Flaps …….	RETRACT HALF
3.	Climb ……..	Vx 69 Kts
4.	Positive rate of climb ……	CHECK
5.	Flaps ……..……	RETRACT

After Landing

1.	Flaps …….	RETRACT
2.	Fuel boost …….	OFF
3.	Strobes	OFF
4.	Transponder …….	SBY
5.	uMonitor audio silence ……	IN
6.	Radio ……..……	ANNOUNCE

Shutdown

1.	Lights …….	OFF
2.	uMonitor record flight time …….	RESET TO 0
3.	uMonitor fuel quantity …….	ADJUST
4.	Com 1……	121.5
5.	Avionics …….	OFF
6.	Throttle ……..	CLOSED
7.	Mixture ……..	LEAN
8.	Fuel selector …….	OFF
9.	Ignition ……...	OFF

Emergency Procedures

Rejected Take-Off

1.	Throttle ……..	CLOSED
2.	Brakes ……	MAXIMUM
3.	Fuel boost …….	OFF

Engine Failure at Take-Off

1.	Airspeed (best glide) ……..……	Vbg 74 Kts
2.	Throttle ……..	CLOSE
3.	Mixture ……..	LEAN
4.	Fuel boost …….	OFF
5.	Fuel selector …….	OFF
6.	Ignition ……..	OFF
7.	Flaps ……..	AS REQUIRED
8.	Master ……	OFF
9.	Canopy ……..	UNLATCH

Engine Failure in Flight

1.	Airspeed (best glide) ……	Vbg 74 Kts
2.	Select landing site or bailout ……..	DECISION
3.	Fuel selector …….	FULL
4.	Fuel boost …….	ON
5.	Mixture ……...	RICH
6.	Ignition ……...	BOTH
7.	Engine ……	RESTART
8.	ELT …….	ACTIVATE
9.	Transponder …….	7700

Engine Fire During Startup

1.	Starter …….	CONTINUE CRANK
2.	Fuel Boost …….	OFF
3.	Mixture …….	IDLE CUT OFF
4.	Throttle …….	CLOSED
5.	Fuel selector …….	OFF

Bail out

1.	Altitude ……	MIN SAFE
2.	Airspeed (best glide) ……	Vbg 74 Kts
3.	Heading ……	BEST
4.	Passenger ……	STATIC SECURE
5.	Throttle ……	CLOSED
6.	Mixture ……	IDLE CUT OFF
7.	Fuel boost ……	OFF
8.	Fuel selector ……	OFF
9.	Ignition ……	OFF
10.	Master ……	OFF
11.	Passenger seat belt ……	RELEASE
12.	Canopy ……	JETTISON
13.	Attitude ……	ROLL & BAIL

Weight and Balance

Aircraft Basic Data

Aircraft Empty weight	1088 lbs.
Aircraft Gross weight	1800 lbs.
Aerobatic Gross weight	1600 lbs.
Datum	70” fwd leading edge
Aircraft CG	75.90”
Fwd CG	78.70” aft of datum
Rear CG	86.82” aft of datum
Aerobatic rear CG	85.30” aft of datum
Total normal CG range	8.12”
Total aerobatic CG range	6.6”
Fwd baggage arm	85.51” aft of datum
Fuel arm	80.00” aft of datum
Pilot arm	91.78” aft of datum
Passenger arm	119.12” aft of datum
Aft baggage floor arm	138.00” aft of datum
Aft baggage floor	152.91” aft of datum

Weight & Balance Loading Examples

Solo Pilot Full Fuel (Requires ballast – 15lbs. min & min fuel)

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	0	58.51	0
Fuel (42 US gallons max)	252	80.00	20160
Pilot	180	91.78	16520.4
Passenger	0	119.12	0
Aft baggage floor (75 lb max)	15	138.0	2070
Aft baggage shelf	0	152.91	0
Aircraft within CG limits	1535	78.95	121332.80
Aircraft w/o ballast	1520	78.46	119262.80

Solo Pilot Half Tanks Fuel (Requires ballast)

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	0	58.51	0
Fuel 21 gallons	126	80.00	10080
Pilot	180	91.78	16520.4
Passenger	0	119.12	0
Aft baggage floor (75 lb max)	15	138.0	2070
Aft baggage shelf	0	152.91	0
Aircraft within CG limits	1409	78.96	111252.80
Aircraft w/o ballast	1394	78.32	109182.80

Solo Pilot 5 Gallons (Min) Fuel (Requires ballast)

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	0	58.51	0
Fuel (42 US gallons max)	30	80.00	2400
Pilot	180	91.78	16520.4
Passenger	0	119.12	0
Aft baggage floor (75 lb max)	15	138.0	2070
Aft baggage shelf	0	152.91	0
Aircraft within CG limits	1313	78.88	103572.80
Aircraft w/o ballast	1298	78.20	101502.80

Pilot & 140 Lb. Passenger, Full Fuel, Max Baggage

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	50	58.51	2925.5
Fuel (42 US gallons max)	252	80.00	20160
Pilot	180	91.78	16520.4
Passenger	140	119.12	16676.8
Aft baggage floor (75 lb max)	50	138.0	6900
Aft baggage shelf	25	152.91	3822.75
Total	1785		149587.80
CG (within CG)		83.80	

Pilot & 140 Lb. Passenger, Min Fuel, Max Baggage

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	50	58.51	2925.5
Fuel (42 US gallons max)	5	80.00	2400
Pilot	180	91.78	16520.4
Passenger	140	119.12	16676.8
Aft baggage floor (75 lb max)	50	138.0	6900
Aft baggage shelf	25	152.91	3822.75
Total	1563		131827.80
CG (within CG)		84.34	

Pilot & Passenger, Max Fuel, No Baggage

Note: Aero weight is achieved at ½ fuel load with pilot and passenger.

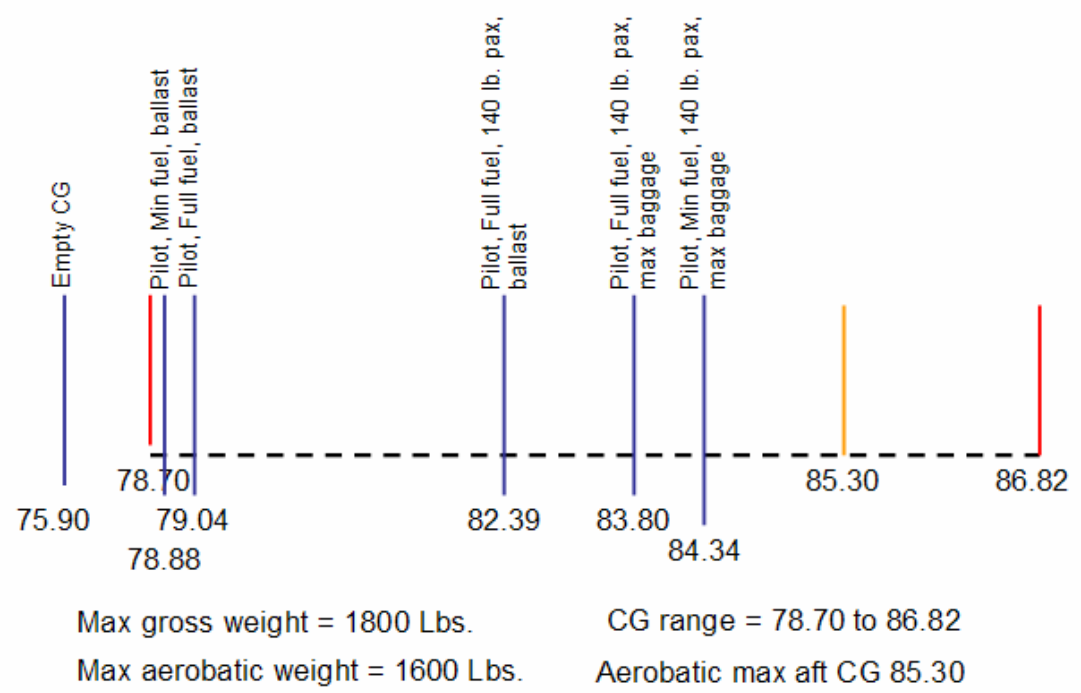
Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	0	58.51	0
Fuel (42 US gallons max)	242	80.00	20160
Pilot	180	91.78	16520.4
Passenger	180	119.12	21441.6
Aft baggage floor (75 lb max)	0	138.0	0
Aft baggage shelf	0	152.91	0
Total (100lbs over aero wt)	1700		140704.40
CG (within CG)		82.77	

Pilot & Passenger, Min Fuel, No Baggage

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)	0	58.51	0
Fuel (42 US gallons max)	30	80.00	2400
Pilot	180	91.78	16520.4
Passenger	180	119.12	21441.6
Aft baggage floor (75 lb max)	0	138.0	0
Aft baggage shelf	0	152.91	0
Total (within aerobatic wt)	1478		122944.40
CG (within CG)		83.17	

Weight & Balance Form

Component	Weight	Arm	Moment
Empty aircraft	1088	75.90	82582.4
Fwd. baggage (50 lbs max)		58.51	
Fuel (42 US gallons max)		80.00	
Pilot		91.78	
Passenger		119.12	
Aft baggage floor (75 lb max)		138.0	
Aft baggage shelf		152.91	
Total (sum column)			
CG (CG=moment/weight)			



Performance

Ground Performance - Solo Weight	
Takeoff Distance	275 ft
Landing Distance	350 ft
Ground Performance - Gross Weight	
Takeoff Distance	575 ft
Landing Distance	500 ft
Climb/Ceiling - Solo Weight	
Rate of Climb	2,200 fpm
Ceiling	22,000 ft
Climb/Ceiling - Gross Weight	
Rate of Climb	1,600 fpm
Ceiling	19,500 ft
Range	
Range [75% @ 8000 ft]	780 sm
Range [55% @ 8000 ft]	945 sm

Power

Formula: **MAP + RPM/100 = X**

X = 48 = 75%
X = 45 = 65%
X = 42 = 55%

MAP	RPM	POWER
24”	2300	**72%**
23”	2300	**69%**
22”	2300	**65%**
21”	2300	**62%**
20”	2300	**59%**
19”	2300	**55%**
18”	2300	**53%**
17”	2300	

MAP	RPM	POWER
24”	2400	**75%**
23”	2400	**72%**
22”	2400	**69%**
21”	2400	**65%**
20”	2400	**62%**
19”	2400	**59%**
18”	2400	**55%**
17”	2400	**53%**

MAP	RPM	POWER
24”	2500	**79%**
23”	2500	**75%**
22”	2500	**72%**
21”	2500	**69%**
20”	2500	**65%**
19”	2500	**62%**
18”	2500	**59%**
17”	2500	**55%**

Weight & Balance Data

Engine and Operations

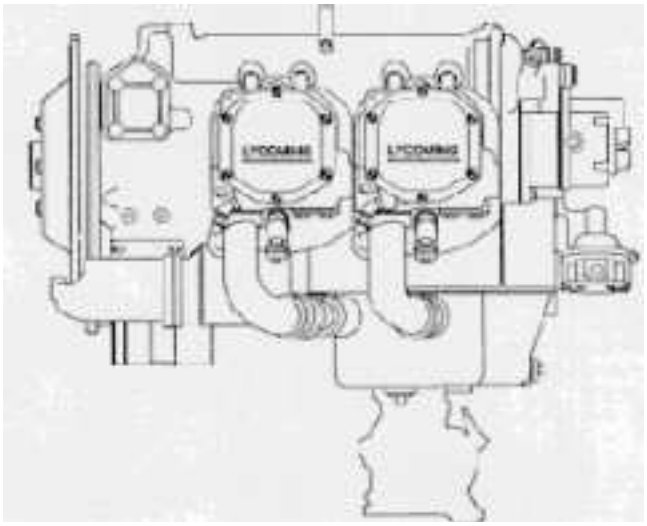
Description

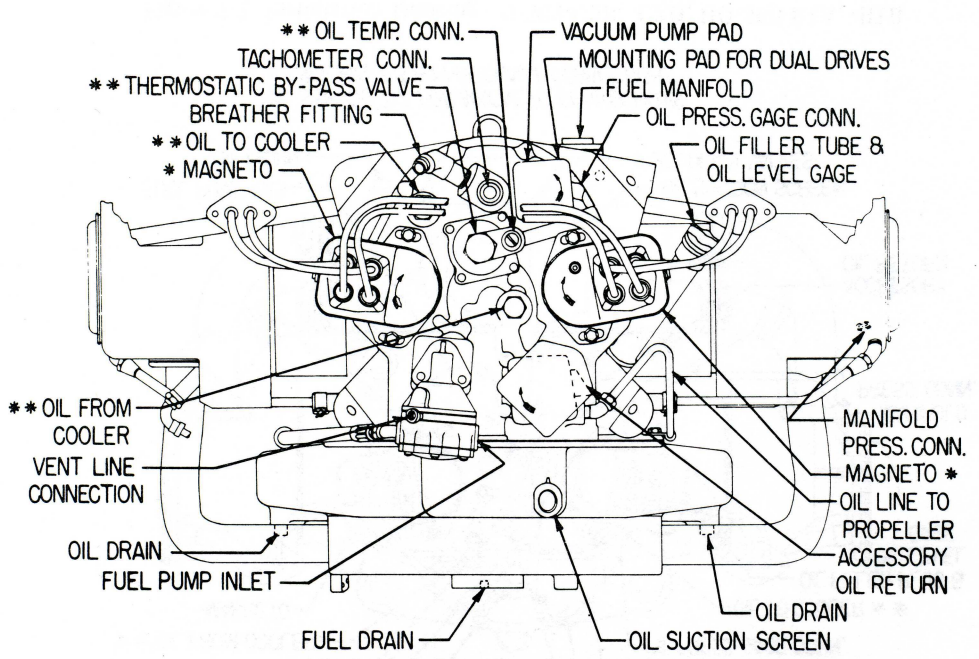
N955DK is equipped with a Lycoming IO-360-B1A

Engine	Lycoming	IO-360-A1D6
RPM max.		2700
CHT max.		475°F
Oil capacity		8 qts. 50 wt.
Oil pressure range		55-85 psi
Oil temperature max.		245°F
Fuel pressure range		14-44 psi
Induction	Bendix Fuel Injection	RSA-5

Specifications

Operating Instructions





CRUISE POWER

NOTES:

1. Mixture must be full rich when above 75% power. Lean using fuel flow meter at 75% power or less.
2. Add 0.4" M.P. for each 10°C above standard temperature.
3. Subtract 0.4" M.P. for each 10°C below standard temperature.
4. If above standard temperature precludes obtaining the desired M.P., use the next higher RPM/M.P. with appropriate temperature correction to M.P.

EXAMPLE	
CRUISE ALT.	6000 FT.
OAT	10°C
POWER	65%
RPM	2400
M.P.	21.7 (7°C correction)

			75% POWER 150 HP				65% POWER 135 HP				55% POWER 110 HP				
PRESSURE ALTITUDE (FT)		RPM	2400	2500	2600	2700	2300	2400	2500	2600	2200	2300	2400	2500	2600
	FUEL FLOW	BEST ECON.	10.1	10.3	10.4	10.7	8.9	9.1	9.2	9.4	7.7	7.9	8.0	8.2	8.3
		BEST POWER	11.9	12.1	12.2	12.5	10.5	10.7	10.9	11.0	9.1	9.3	9.4	9.6	9.8
	STD. TEMP		MANIFOLD PRESSURE — INCHES OF MERCURY												
0	15 °C		25.4	24.5	23.6	22.8	23.7	22.8	22.0	21.2	22.0	21.0	20.2	19.5	18.9
2,000	11 °C		24.9	23.9	23.1	22.3	23.2	22.3	21.5	20.7	21.5	20.5	19.7	19.0	18.4
4,000	7 °C		24.4	23.4	22.6	21.9	22.7	21.8	21.0	20.3	21.0	20.0	19.3	18.5	17.9
6,000	3 °C		23.9	23.0	22.1	21.5	22.3	21.4	20.5	19.8	20.5	19.6	18.9	18.1	17.5
8,000	-1 °C			22.5	21.7	21.1	21.9	21.0	20.1	19.4	20.1	19.2	18.5	17.7	17.1
10,000	-5 °C							20.6	19.7	19.0	19.7	18.9	18.1	17.3	16.7
12,000	-9 °C								19.3	18.7	19.3	18.5	17.7	16.9	16.4

l data from Lycoming Operator's Manual for IO-360-A, dated July 2000.

Periodic Inspections

Maintenance Procedures

Engine Oil Change

1. Drain engine oil.
2. Remove and examine the oil suction screen for any metallic particles. Retain any material that may be found for identification and replace screen.
3. Remove and cut open oil filter. For full flow spin-on oil filters use the Champion CT-470 tool shown in Figure 3 or an equivalent oil filter cutter.
4. Remove the paper element from the filter and carefully unfold while examining for material trapped in the filter

Gascolator and Filter Inspection

1. Cut gascolator safety wire and rotate locking ring to release gascolator bowl.
2. Inspect and clean bowl of any residue or trapped particles.
3. Remove and clean filter by unscrewing, cleaning in gas and blowing clean.
4. Refit filter hand tight.
5. Lubricate o-ring and replace bowl, tighten locking ring.
6. Secure with safety wire.

Trouble Shooting

Tables

Maintenance Procedures

Fuel Injection

Filter change 25 hours, then 50 hour intervals and at annual

System	Item	25 Hours	50 Hours	Annual	Reference
Bendix ? body	Clean fuel inlet filter	X	X	X	Air dry, tap out on paper, blow through, look for corrosion and particulate matter, clean with MEK or Acetone, rinse Stoddard solvent and air dry Replace o ring SB- RS44
	Fuel nozzles and restrictors			X	20-30 minute soak in Hoppe's #9 gun cleaning solvent. Inspect with 10x magnification. Torque to 40 in/lbs.SB-77 Rev. 2 , Lyc SB 1414
	Fuel supply lines	X	X	X	Inspect for cracks and leaks, fuel dye stains. Torque to 25 in/lbs or 1 flat past finger tight.

Leaning

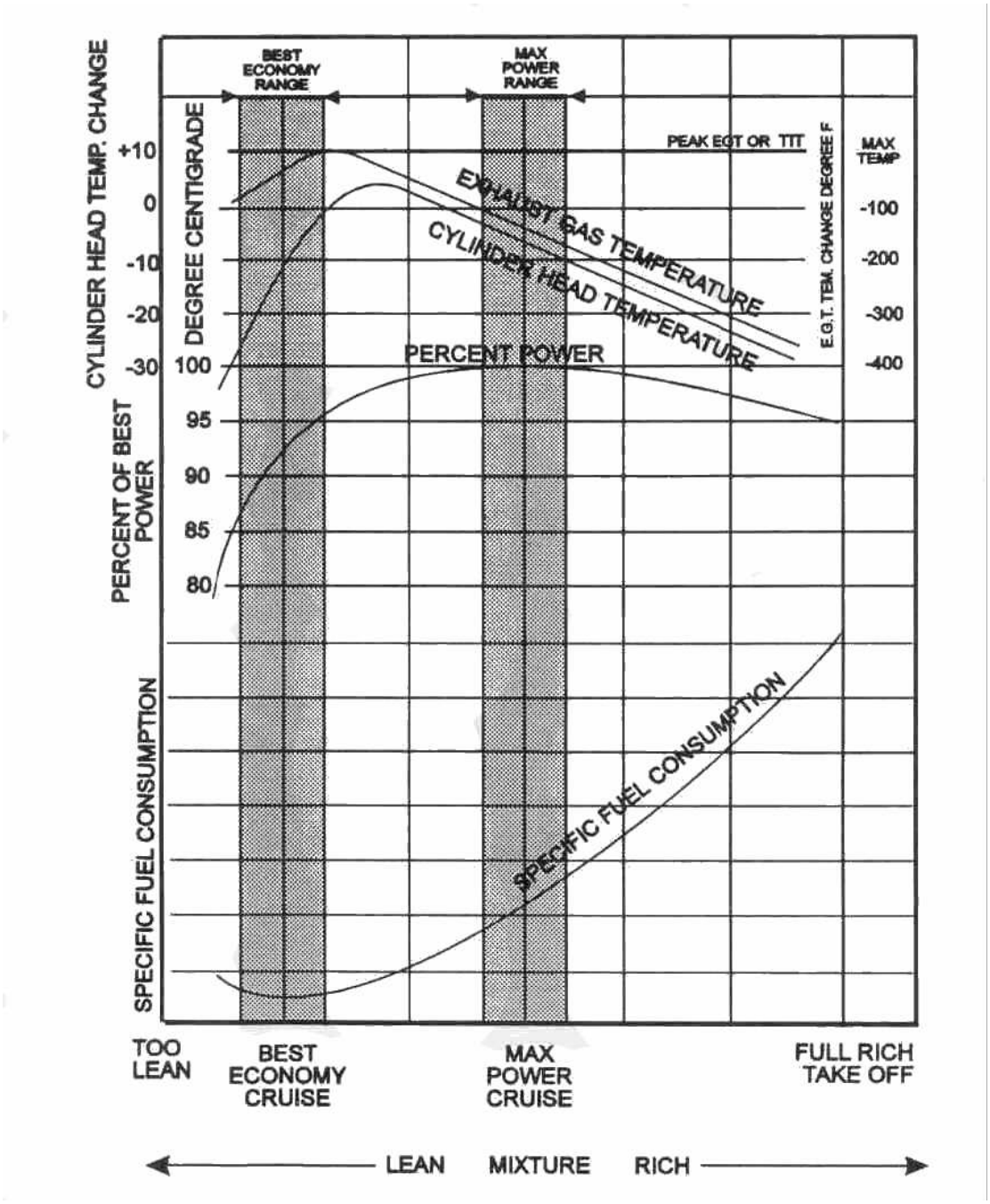
General Rules

1. Observe the red line temperature limits during take-off, climb and high performance cruise power operation.
    a. Cylinder head temperature maximum limit ???
    b. Oil temperature maximum limit ???
2. Adjust mixture should be done slowly.
3. Return mixture slowly to full rich before increasing power settings.
4. The maximum recommended temperature change should not exceed 50°F per minute.

Procedure

1. Use full rich mixture during take-off or climb. Careful observation of engine temperature instruments should be practiced to ensure temperature limits are not exceeded.

2. Above 5000 feet density altitude or in high ambient temperatures, roughness or reduction of power may occur at full rich mixture. The mixture may be adjusted to obtain smooth engine operation. For fixed pitch propeller, lean to maximum RPM at full throttle prior to take-off. Limit operation at full throttle on the ground to a minimum.
3. For cruise powers where best power mixture operation is allowed, slowly lean the mixture from full rich to maximum power. Best power mixture operation provides the most miles per hour for a given power setting. Gradually lean the mixture until either the tachometer or the airspeed indicator reading peaks.
4. For a given power setting, best economy mixture provides the most miles per gallon. Slowly lean the mixture until engine operation becomes rough or until engine power rapidly diminishes as noted by an undesirable decrease in airspeed. When either condition occurs, enrich the mixture sufficiently to obtain an evenly firing engine or to regain most of the lost airspeed or engine RPM. Some engine power and airspeed must be sacrificed to gain a best economy mixture setting. NOTE: When leaned, engine roughness is caused by misfiring due to a lean fuel-air mixture which will not support combustion. Roughness is eliminated by enriching slightly until the engine is smooth.
5. For maximum service life, maintain the following recommended limits for continuous cruise operation:
   (a) Engine Power Setting - 65% of rated or less.
   (b) Cylinder head temperatures - 400°F. or below.
   (c) Oil temperature - 165°F. - 220°F.



THIS REPRESENTATIVE DIAGRAM SHOWS THE EFFECT OF LEANING ON: CYLINDER HEAD TEMPERATURE, EXHAUST GAS TEMPERATURE OR TIT, ENGINE POWER, AND SPECIFIC FUEL CONSUMPTION FOR A CONSTANT ENGINE RPM AND MANIFOLD PRESSURE.

NOTE

TEXTRON LYCOMING DOES NOT RECOMMEND OPERATING ON THE LEAN SIDE OF PEAK EGT.

Consumables

Component	Specification
Battery	Concord 25RG-XC
Spark Plugs	RM37BY
Oil filter	
Oil	
Tires, mains	
Tubes, mains	
Tire, nose	
Tube, nose	
Andair gascolator o-ring	ORO39x2 (39x2mm Viton o-ring)
Andair gascolator fitting o-ring	ORO15x1.5 (15x1.5mm Viton o-ring
Andair gascolator bowl	GBA375-2
Gascolator o-ring	

airframe
flight controls
langding gear
engine
prop
ignition
oil sys
starter
fuel
injection
electrical
stall warn
lighting
pitot static
system
heating and vents
seats harnesses
canopy

Appendix – Manufacturing History

FABRICATION/ASSEMBLY OPERATION CHECKLIST

Company Name	KUMHYR, DAVID B.		
Address	8934 APPALOOSA RUN		
	AUSTIN TX 78737		
Aircraft Model	VANS RV-8A	Document Name and Date	
Type of Aircraft	ALUMINUM LOW WING SINGLE ENGINE MONOPLANE		
		Accomplished By	
		Kit Manufacturer	Amateur
FUSELAGE 2/02 - 6/04			
1. Fabricate Special Tools or Fixtures	2/24/2 - 2/29		21
2. Fabricate Longitudinal Members, Cores or Shells	3/31/2 - 4/14		*
3. Fabricate Bulkheads or Cross Members	"		42
4. Assemble Fuselage Basic Structure			13
5. Fabricate Brackets and Fittings	ASST. DATES		9
6. Install Brackets and Fittings	"		33
7. Fabricate Cables, Wire, and Lines			5
8. Install Cables, Wires, and Lines			6
9. Fabricate Fuselage Covering or Skin			18
10. Install Fuselage Covering or Skin			23
11. Fabricate Windshield/Windows/Canopy	11/3 - 6/10/4		12
12. Install Windshield/Windows/Canopy			~~225~~
		Total	407
WINGS			
1. Fabricate Special Tools or Fixtures	9/1/1		3
2. Fabricate Wing Spars	9/2/1		5
3. Fabricate Wing Ribs or Cores	9/15/1		23
4. Fabricate Wing Leading and Trailing Edge	9/23/1 - 9/26		19
~~5. Fabricate Drag/Anti-Drag Truss Members~~		N/A	
6. Fabricate Wing Brackets and Fittings	ASST		21
7. Fabricate Wing Tips	6/1/4 - 6/22		27
8. Assemble Basic Wing Structures	9/9/1		19
9. Install Wing Leading/Trailing Edge and Tips		N/A	
~~10. Install Drag/Anti-Drag Truss~~		N/A	
11. Fabricate Cables, Wires and Lines	3/4/2 - 3/8		16
12. Install Cables, Wires, and Lines	"		5
13. Fabricate Wing Covering or Skin	9/11/1 - 9/27/1		17
14. Install Wing Covering or Skin	2/10/2 -		21
~~15. Fabricate Wing Struts/Wires~~		N/A	
~~16. Install and Rig Wings and Struts~~		N/A	
		Total	176

FAA Form 8000-38 (12-91)

+583

FABRICATION/ASSEMBLY OPERATION CHECKLIST (Continued)

		Accomplished By	
		Kit Manufacturer	Amateur
EMPENNAGE			
1. Fabricate Special Tools of Fixtures	5/1/1		2
2. Fabricate Spars	6/10/1		3
3. Fabricate Ribs or Cores			7
4. Fabricate Leading and Trailing Edges			4
5. Fabricate Tips	4/1/04		6
6. Fabricate Brackets and Fittings			13
7. Assemble Empennage Structures			8
8. Install ~~Leading/Trailing Edges~~ and Tips	6/22/4		3
9. Install Fittings			7
10. Fabricate Cables, Wires, and Lines			2
11. Install Cables, Wires and Lines			4
12. Fabricate Empennage Covering or Skin			12
13. Install Empennage Covering or Skin			17
		Todd	88
N/A **CANARD**			
1. Fabricate Canard		N/A	
2. Assemble Canard Structure		N/A	
3. Install and Rig Canard		N/A	
LANDING GEAR			
1. Fabricate Special Tools or Fixtures			
2. Fabricate Struts			
3. Fabricate Brakes System			
4. Fabricate Retraction System		N/A	
5. Fabricate Cables, Wires and Lines			
6. Assemble Wheels, Brakes, Tires, Landing Gear			
7. Install Landing Gear System Components			
PROPULSION			
1. Fabricate Special Tools of Fixtures		N/A	
2. Fabricate Engine Mount		✓	
3. Fabricate Engine Cooling System/Baffles	1/11/04 - 5/31/4		127
4. Fabricate Induction System	2/2/04 - 3/70		97
5. Fabricate Exhaust System		Construct Velocity	9
6. Fabricate Engine Controls	7/04		72
7. Fabricate Brackets and Fittings	Asst		33
8. Fabricate Cables, Wires and Lines	Asst		92
9. Assemble Engine		Seth Hancock	
10. Install Engine and Items Listed Above	Hog		3
11. Fabricate Engine Cowling	11/26/03 - 5/04		76
12. Install Engine Cowling	6/11/4 - 6/30		12
13. Fabricate Propeller	9/15 - 1c	Sesmith - hog	8
14. Install Propeller	Spinner		4
15. Fabricate Fuel Tank	10/20/01 - 3/11/2		112
		Sub	745

FAA Form 8000-38 (12-91) +873

FABRICATION/ASSEMBLY OPERATION CHECKLIST (Continued)

	Accomplished By	
	Kit Manufacturer	Amateur
PROPULSION (Continued)		
16. Install Fuel Tank 8/20/4		128
17. Fabricate Fuel System Components Asst		37
18. Install Fuel System Components 8/20/4		12
	SUB	61
	TOTAL	806
N/A MAIN ROTOR DRIVE SYSTEMS AND CONTROL MECHANISM(S)		
1. Fabricate Special Static and Dynamic Main Rotor Rigging Tools	N/A	
2. Fabricate/Assemble Main Rotor Drive Train		
3. Install Main Rotor Drive Train Assembly		
4. Fabricate/Assemble Main Rotor Shaft and Hub Assembly		
5. Install Main Rotor Shaft and Hub Assembly		
6. Align Main Rotor Shaft-Drive Train, Shaft and Hub Assembly		
7. Fabricate Main Rotor Rotating Controls		
8. Install Main Rotor Rotating Controls		
9. Fabricate Main Rotor Non-Rotating Controls		
10. Rig Main Rotor Rotating and Non-Rotating Controls		
11. Fabricate Main Rotor Blades		
12 Install Main Rotor Blades on Rotor Hub		
13. Statically Balance and Rig Main Rotor System		
14. Dynamically Track and Balance Main Rotor System		
N/A TAIL ROTOR DRIVE SYSTEMS AND CONTROL MECHANISM(S)		
1. Fabricate Special Static Tail Rotor Rigging Tools	N/A	
2. Fabricate Vertical Trim Fin		
3. Install Vertical Trim Fin		
4. Fabricate Horizontal Stabilizer		
5. Install Horizontal Stabilizer		
6. Fabricate Tail Rotor Drive System		
7. Install Tail Rotor Drive System		
8. Fabricate Tail Cone or Frame		
9. Install and Rig Tail Cone or Frame		
10. Rig Vertical Trim Fin		
11. Fabricate Tail Rotor Shaft and Hub Assembly		
12. Install Tail Rotor Shaft and Hub Assembly		
13. Fabricate Tail Rotor Rotating and Non-Rotating Controls		
14. Rig Tail Rotor Rotating and Non-Rotating Controls		
15. Fabricate/Assemble Tail Rotor Blades		
16. Install Tail Rotor Blades		
17. Statically Balance and Rig Tail Rotor System		
18. Dynamically Track and Balance Tail Rotor System		

FAA Form 8000-38 (12-91) +894

FABRICATION/ASSEMBLY OPERATION CHECKLIST (Continued)

		Accomplished By	
		Kit Manufacturer	Amateur
FLIGHT CONTROLS			
1. Fabricate Special Tools or Fixtures	12/2/02		3
2. Fabricate Aileron Spars	12/27/04 - 12/28		6
3. Fabricate Aileron Ribs or Cores			7
4. Assemble Aileron Structure	12/30/1		4
5. Fabricate Aileron Leading and Trailing Edge			
6. Assemble Aileron Leading and Trailing Edge			3
7. Fabricate Aileron Brackets and Fittings	12/31/1 - 12/31		5
8. Install Aileron Brackets and Fittings			2
9. Fabricate Aileron Covering or Skin			
10. Install Aileron Covering or Skin			
11. Fabricate Aileron Trim ~~Tab~~ Springs tension system.		9/18/4	17
12. Install Aileron Trim ~~Tab~~			
13. Install and Rig Aileron	8/20/04		5
14. Fabricate Flap Spars	1/21/02		8
15. Fabricate Flap Ribs or Cores			2
16. Assemble Flap Structure			2
17. Fabricate Flap Leading and Trailing Edge	2/2/2		2
18. Assemble Flap Leading and Trailing Edge			1
19. Fabricate Flap Brackets and Fittings	2/2/2		4
20. Install Flap Brackets and Fittings			
21. Fabricate Flap Covering or Skin			
22. Install Flap Covering or Skin	2/2 - 3/2		4
23. Install and Rig Flap	11/6/2		7
24. Fabricate Elevator Spars	7/21/1		4
25. Fabricate Elevator Ribs or Cores			6
26. Assemble Elevator Structure			8
27. Fabricate Elevator Leading and Trailing Edge			1
28. Assemble Elevator Leading and Trailing Edge			1
29. Fabricate Elevator Brackets and Fittings		VANS	
30. Install Elevator Brackets and Fittings			2
31. Fabricate Elevator Covering or Skin	8/4/1		3
32. Install Elevator Covering or Skin			1
33. Fabricate Elevator Trim Tab			2
34. Install Elevator Trim Tab			2
35. Install and Rig Elevator	8/7/2		5
36. Fabricate Rudder Spar	8/10/1		2
37. Fabricate Rudder Ribs or Cores			2
38. Assemble Rudder Structure			2
39. Fabricate Rudder Leading and Trailing Edge			
40. Assemble Rudder Leading and Trailing Edge			
41. Fabricate Rudder Brackets and Fittings			3
42. Install Rudder Brackets and Fittings			2
43. Fabricate Rudder Covering or Skin			1
44. Install Rudder Covering or Skin			3
45. Fabricate Rudder Trim Tab		N/A	
46. Install Rudder Trim Tab		N/A	
47. Install and Rig Rudder	8/11/2		4
		Total	140

FAA Form 8000-38 (12-91)

4 1834

FABRICATION/ASSEMBLY OPERATION CHECKLIST (Continued)

		Accomplished By	
		Kit Manufacturer	Amateur
COCKPIT/INTERIOR			
1. Fabricate Instrument Panel	12/15/2 – 5/23/4		129
2. Install Instrument Panel and Instruments	12/2 – 6/4		227
3. Fabricate Seats	6/3/2 - 6/8		27
4. Install Seats	6/2		10
5. Fabricate Electrical Wiring, Controls/Switches	11/2 – 6/4		397
6. Install Electrical System Controls/Switches	11		292
		Total	1082
		800	1074
TOTAL			2116

Comments

Printed Name	Signature	Date
David B. Kuf	David Ruf	5/8/15

FAA Form 8000-38 (12-91)

Appendix – Operating Limitations Part I

U.S. Department of Transportation
Federal Aviation Administration

Flight Standards District Office
DOT, Federal Aviation Administration

10100 Reunion Place, Suite 200
San Antonio, TX 78216
(210) 308-3300, Fax: (210) 308-3399
1-800-292-2023

EXPERIMENTAL OPERATING LIMITATIONS
Operating Amateur-Built Aircraft
Phase 1
Operations in the Assigned Flight Test Area

REG. NO.	MAKE:	MODEL:	SERIAL NO:
N955DK	Hamlyk David B	VAN RV-8A	81538

NOTE: No person may operate outside the assigned flight test area prior to the completion of phase 1 flight testing. This includes the entry in the aircraft maintenance records as required by limitation #4.

1. No person may operate this aircraft for other than the purpose of meeting the requirements of 14 CFR §91.319(b) during phase 1 flight testing, and for recreation and education after meeting these requirements as stated in the program letter dated 05 Jan 05 for this aircraft. In addition, this aircraft shall be operated in accordance with applicable air traffic and general operating rules of Part 91 and all additional limitations herein prescribed under the provisions of §91.319(e). These operating limitations are a part of the FAA Form 8130-7, special airworthiness certificate, and are to be carried in the aircraft at all times for availability to the pilot in command of the aircraft.

2. During phase 1 flight testing to meet the requirements of §91.319(b) all flights shall be conducted within the geographical area described as follows: For the first Flight+Stay Close to Airport then within 300 nm of Georgetown Airport then After 40 HR Go to Phase II After 209 Bookenty

   The designated area must be over open water or sparsely populated areas having light air traffic. The size of the area shall be that required to safely conduct the type of anticipated maneuvers and tests, as appropriate.

3. This aircraft shall be operated for at least [~~NO. OF HOURS~~ 40] hours in the assigned geographic area.

4. All test flights as a minimum shall be conducted under Visual Flight Rules (VFR), day only. Guidance concerning the scope and detail of test flights can be found in Advisory Circular 90-89, Amateur-built Aircraft and Ultralight Flight Testing Handbook. Following satisfactory completion of the required number of flight hours in the flight test area, the pilot shall certify in the records that the aircraft has been shown to comply with §91.319(b). Compliance with §91.319(b) shall be recorded in the aircraft records with the following or a similarly worded statement: **" I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its normal range of speeds and throughout all maneuvers to be executed, has no hazardous operating characteristics or design features, and is safe for operation. The following aircraft operating data has been demonstrated during the flight testing: speeds Vso_____, Vx_____, and Vy_____, and the weight _____and CG location_____ at which they were obtained".**

5. Except for takeoffs and landings, this aircraft may not be operated over densely populated areas or in congested airways.

7. This aircraft is to be operated under Visual Flight Rules (VFR), day only.

(9) Aircraft instruments and equipment installed and used under § 91.205 must be inspected and maintained in accordance with the requirements of part 91. Any maintenance or inspection of this equipment must be recorded in the aircraft maintenance records.

(10) During the flight-testing phase, no person may be carried in this aircraft during flight unless that person is essential to the purpose of the flight.

(11) No person may operate this aircraft for carrying persons or property for compensation or hire.

(12) The pilot in command of this aircraft must advise each passenger of the experimental nature of this aircraft, and explain that it does not meet the certification requirements of a standard certificated aircraft.

* (13) This aircraft must contain the placards, markings, etc., as required by § 91.9. In addition, the placards and markings must be inspected for legibility and clarity, and the associated systems inspected for easy access and operation, to ensure they function as intended by the builder/owner during each condition inspection. *

(14) This aircraft must display the word "EXPERIMENTAL" in accordance with § 45.23(b).

~~(15) This aircraft is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the aircraft's attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.~~

(16) This aircraft may conduct aerobatic flight in accordance with the provisions of § 91.303. Aerobatics must not be attempted until sufficient flight experience has been gained to establish that the aircraft is satisfactorily controllable and in compliance with § 91.319(b). The aircraft may only conduct those aerobatic flight maneuvers that have been satisfactorily accomplished during flight testing and recorded in the aircraft maintenance records by use of the following, or a similarly worded, statement: **"I certify that the following aerobatic maneuvers have been test flown and that the aircraft is controllable throughout the maneuvers' normal range of speeds, and is safe for operation. The flight-tested aerobatic maneuvers are _____, _____, _____, and _____."**

(17) The pilot in command of this aircraft must hold an appropriate category/class rating. If required, the pilot in command also must hold a type rating in accordance with part 61, or a letter of authorization issued by an FAA Flight Standards Operations Inspector.

(18) The pilot in command of this aircraft must hold a pilot certificate or an authorized instructor's logbook endorsement. The pilot in command also must meet the requirements of § 61.31(e), (f), (g), (h), (i), and (j), as appropriate.

(19) After incorporating a major change as described in § 21.93, the aircraft owner is required to reestablish compliance with § 91.319(b) **and notify the geographically responsible FSDO of the location of the proposed test area. The aircraft owner must obtain concurrence from the FSDO as to the suitability of the proposed test area.** If the major change includes installing a different make and model of engine or propeller, the aircraft owner must fill out a revised Form 8130-6 to update the aircraft's file in the FAA Aircraft Registry. All operations must be conducted under day VFR conditions in a sparsely populated area. The aircraft must remain in flight test for a minimum of 5 hours or for the time the FSDO assigns. Persons nonessential to the flight must not be carried. The aircraft owner must make a detailed logbook entry describing the change before the test flight. Following satisfactory completion of the required number of flight hours in the flight test area, the pilot must certify in the records that the aircraft has been shown to comply with § 91.319(b). Compliance with § 91.319(b) must be recorded in the aircraft records with the following, or a similarly worded, statement: **"I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its normal range of speeds and throughout all maneuvers to be executed, has no hazardous characteristics or design features, and is safe for operation. The following aircraft operating data has been demonstrated during the flight testing: speeds Vso _____, Vx _____, and Vy _____, and the weight _____, and CG location _____ at which they were obtained."**

(20) This aircraft must not be used for glider towing, banner towing, or intentional parachute jumping.

21. This aircraft does not meet the requirements of the applicable, comprehensive, and detailed airworthiness code as provided by Annex 8 of the International Civil Aviation Organization (ICAO). The owner/operator of this aircraft must obtain written permission from another country's Civil Aviation Authority (CAA) prior to operating this aircraft in or over that country. That written permission must be carried aboard the aircraft together with the U.S. airworthiness certificate, and upon request, be made available to an FAA Inspector or the CAA in the country of operation.

22. No person shall operate this aircraft unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with the scope and detail of appendix D to part 43, or other FAA approved programs, and found to be in a condition for safe operation. This inspection will be recorded in the aircraft maintenance records.

23. Condition inspections shall be recorded in the aircraft maintenance records showing the following or similarly worded statement:

    "I certify that this aircraft has been inspected on (insert date) in accordance with the scope and detail of Appendix D of Part 43 and found to be in a condition for safe operation."

    The entry will include the aircraft total time-in-service, and the name, signature, certificate number, and type of certificate held by the person performing the inspection.

26. An experimental aircraft builder certificated as a Repairman for this aircraft under §65.104, or an appropriately rated FAA certificated mechanic, may perform the condition inspection required by these operating limitations.

27. Application must be made to the geographically responsible FSDO or MIDO for any revision to these limitations.

28. The pilot in command of this aircraft shall notify air traffic control of the experimental nature of this aircraft when operating into or out of airports with an operational control tower. When filing IFR the experimental nature of this aircraft shall be listed in the remarks section of the flight plan.

Richard E.Dumler
Designated Airworthiness Repersentative,
DAR # DART-717011-SW

05-22-2005
Date issued:

Appendix – Operating Limitations Part II

U.S. Department of Transportation
Federal Aviation Administration

Flight Standards District Office
DOT, Federal Aviation Administration

10100 Reunion Place, Suite 200
San Antonio, TX 78216
(210) 308-3300, Fax: (210) 308-3399
1-800-292-2023

EXPERIMENTAL OPERATING LIMITATIONS
Operating Amateur-Built Aircraft
Phase 2
Operations Outside the Assigned Flight Test Area

REG. NO.	MAKE:	MODEL:	SERIAL NO:
N955DK	HUMPHYR DAVID B	VANS RV-8A	51538

NOTE: No person may operate outside the assigned flight test area prior to the completion of Phase 1 flight testing. This includes the entry in the aircraft maintenance records as required by limitation #4.

(1) No person may operate this aircraft for other than the purpose of meeting the requirements of § 91.319(b) during phase I flight testing, and for recreation and education after meeting these requirements as stated in the program letter DATED 05-20-05 for this aircraft. In addition, this aircraft must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(e). These operating limitations are a part of Form 8130-7, and are to be carried in the aircraft at all times and be available to the pilot in command of the aircraft.

(5) Except for takeoffs and landings, this aircraft may not be operated over densely populated areas or in congested airways.

(6) This aircraft is prohibited from operating in congested airways or over densely populated areas unless directed by air traffic control, or unless sufficient altitude is maintained to effect a safe emergency landing in the event of a power unit failure, without hazard to persons or property on the ground.

(8) After completion of phase I flight testing, unless appropriately equipped for night and/or instrument flight in accordance with § 91.205, this aircraft is to be operated under VFR, day only.

(9) Aircraft instruments and equipment installed and used under § 91.205 must be inspected and maintained in accordance with the requirements of part 91. Any maintenance or inspection of this equipment must be recorded in the aircraft maintenance records.

(10) During the flight-testing phase, no person may be carried in this aircraft during flight unless that person is essential to the purpose of the flight.

(11) No person may operate this aircraft for carrying persons or property for compensation or hire.

(12) The pilot in command of this aircraft must advise each passenger of the experimental nature of this aircraft, and explain that it does not meet the certification requirements of a standard certificated aircraft.

* **(13)** This aircraft must contain the placards, markings, etc., as required by § 91.9. In addition, the placards and markings must be inspected for legibility and clarity, and the associated systems inspected for easy access and operation, to ensure they function as intended by the builder/owner during each condition inspection. *

(14) This aircraft must display the word "EXPERIMENTAL" in accordance with § 45.23(b).

(15) This aircraft is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the aircraft's attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.

(16) This aircraft may conduct aerobatic flight in accordance with the provisions of § 91.303. Aerobatics must not be attempted until sufficient flight experience has been gained to establish that the aircraft is satisfactorily controllable and in compliance with § 91.319(b). The aircraft may only conduct those aerobatic flight maneuvers that have been satisfactorily accomplished during flight testing and recorded in the aircraft maintenance records by use of the following, or a similarly worded, statement: **"I certify that the following aerobatic maneuvers have been test flown and that the aircraft is controllable throughout the maneuvers' normal range of speeds, and is safe for operation. The flight-tested aerobatic maneuvers are _____, _____, _____, and _____."**

(17) The pilot in command of this aircraft must hold an appropriate category/class rating. If required, the pilot in command also must hold a type rating in accordance with part 61, or a letter of authorization issued by an FAA Flight Standards Operations Inspector.

(18) The pilot in command of this aircraft must hold a pilot certificate or an authorized instructor's logbook endorsement. The pilot in command also must meet the requirements of § 61.31(e), (f), (g), (h), (i), and (j), as appropriate.

NOTE: This operating limitation applies to most amateur-built aircraft as a standard operating limitation (reference § 61.31(k)).

(19) After incorporating a major change as described in § 21.93, the aircraft owner is required to reestablish compliance with § 91.319(b) **and notify the geographically responsible FSDO of the location of the proposed test area. The aircraft owner must obtain concurrence from the FSDO as to the suitability of the proposed test area.** If the major change includes installing a different make and model of engine or propeller, the aircraft owner must fill out a revised Form 8130-6 to update the aircraft's file in the FAA Aircraft Registry. All operations must be conducted under day VFR conditions in a sparsely populated area. The aircraft must remain in flight test for a minimum of 5 hours or for the time the FSDO assigns. Persons nonessential to the flight must not be carried. The aircraft owner must make a detailed logbook entry describing the change before the test flight. Following satisfactory completion of the required number of flight hours in the flight test area, the pilot must certify in the records that the aircraft has been shown to comply with § 91.319(b). Compliance with § 91.319(b) must be recorded in the aircraft records with the following, or a similarly worded, statement: **"I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its normal range of speeds and throughout all maneuvers to be executed, has no hazardous characteristics or design features, and is safe for operation. The following aircraft operating data has been demonstrated during the flight testing: speeds Vso _____, Vx _____, and Vy _____, and the weight _____, and CG location _____ at which they were obtained."**

(20) This aircraft must not be used for glider towing, banner towing, or intentional parachute jumping.

(21) This aircraft does not meet the requirements of the applicable, comprehensive, and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation. The owner/operator of this aircraft must obtain written permission from another CAA prior to operating this aircraft in or over that country. That written permission must be carried aboard the aircraft together with the U.S. airworthiness certificate and, upon request, be made available to an ASI or the CAA in the country of operation.

(22) No person must operate this aircraft unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with the scope and detail of appendix D to part 43, or other FAA-approved programs, and was found to be in a condition for safe operation. As part of the condition inspection, cockpit instruments must be appropriately marked and needed placards installed in accordance with § 91.9. In addition, system-essential controls must be in good condition, securely mounted, clearly marked, and provide for ease of operation. This inspection will be recorded in the aircraft maintenance records.

(23) Condition inspections must be recorded in the aircraft maintenance records showing the following, or a similarly worded, statement: **"I certify that this aircraft has been inspected on [insert date] in accordance with the scope and detail of appendix D to part 43, and was found to be in a condition for safe operation."** The entry will include the aircraft's total time-in-service, and the name, signature, certificate number, and type of certificate held by the person performing the inspection.

(26) An experimental aircraft builder certificated as a repairman for this aircraft under § 65.104 or an appropriately rated FAA-certificated mechanic may perform the condition inspection required by these operating limitations.

(27) Application must be made to the geographically responsible FSDO or MIDO for any revision to these operating limitations.

(28) The pilot in command of this aircraft must notify air traffic control of the experimental nature of this aircraft when operating into or out of airports with an operational control tower. When filing instrument flight rules (IFR), the experimental nature of this aircraft must be listed in the remarks section of the flight plan.

05-22-2005

Richard E. Dumler
Designated Airworthiness Representative
DAR # DART-717011-SW

Date Issued: