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FAA APPROVED FLIGHT MANUAL

FIRST EDITION

NOTE

THIS DOCUMENT MUST BE KEPT IN

THE AIRPLANE AT ALL TIMES

AERO COMMANDER
MODEL 100-180

Serial #_____

N_____

Federal Aviation Administration

Approved by: H. E. Mannick
Supervisor, ATL EMDO
Approval Date: September 25, 1967

FAA APPROVED FLIGHT MANUAL

AERO COMMANDER MODEL 100-180

LOG OF REVISIONS

Revision Number	Page Number	FAA Approval	FAA Date
1	6	H. E Mannick Supervisor, ATL EMDO	4/17/68
2	1	H. E Mannick Supervisor, ATL EMDO	4/30/68
3	4 & 6	H. E. Mannick Supervisor, ATL EMDO	8/13/68

H

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AIRPLANE FLIGHT MANUAL

LIMITATIONS

The following limitations must be observed in the operation of this airplane:

Engine:	Lycoming O-360-A2F
Engine Limits:	For all operations 2700 RPM, (180 HP)
Fuel:	100/130 Octane minimum grade aviation fuel
Propeller:	McCauley 1A170/CFA 7660 fixed pitch

Power Instruments:

(a) Oil Temperature:

Unsafe if indicator reads greater than 245°F (Upper red line)

(b) Oil Pressure:

Unsafe if indicator reads less than 25 PSI (Lower red line) or greater than 90 PSI (Upper red line)

(c) Tachometer:

Do not exceed red line, 2700 RPM

(d) Fuel Quantity Gauge:

Unsafe if gauge indicates zero (0) - red line (calibrated zero usable fuel)

(e) Fuel Pressure Gauge:

Unsafe if indicator reads less than 0.5 PSI (Lower red line) or greater than 8.0 PSI (Upper red line)

Airspeed Limits: (C.A.S.)

Never Exceed	176 MPH
Maximum Structural Cruising	140 MPH
Maneuvering	116 MPH
Flaps Extended	105 MPH

Flight Load Factors:

Maximum Positive (flaps up)	3.8 G's
Maximum Positive (flaps down)	2.0 G's
Maximum Negative	-1.52 G's

Maximum Gross Weight ..... 2450 Lb

Center of Gravity (C.G.) Range:

Datum is the firewall; (+) is measured aft of the datum; +36.15 inches at 2100 pounds, varying linearly to +40.55 inches at 2450 pounds, to 46.25 inches aft limit at 2450 pounds.

ALPHABETICAL INDEX

A

B

C

AIRSPEED CORRECTION TABLE									
INDICATED AIRSPEED	60	70	80	90	100	110	120	130	140
WING FLAPS UP CAS	62	72	81	90	100	109	119	128	138
WING FLAPS DOWN CAS	63	73	82	91	100	---	---	---	---

NOTE: It is the responsibility of the airplane owner and pilot to assure that the airplane is properly loaded. Refer to the weight and balance data for loading procedures.

Types of Operations:

Day and night, VFR and IFR, non-icing conditions (when required equipment installed).

Airspeed Instrument Markings and Their Significance:

(a) Radial red line marks the never exceed speed which is the maximum safe airspeed. (176 MPH C. A. S.)

(b) Yellow arc denotes range of speeds in which operations should be conducted with caution and only in smooth air. (140-176 MPH C. A. S.)

(c) Green arc denotes normal operating range. (63-140 MPH C. A. S.)

(d) White arc denotes speed range in which flaps may be safely lowered. (60-105 MPH C. A. S.)

NOTE: Maneuvers involving approach to stalling angle or full application of elevator, rudder, or ailerons should be confined to speeds below maneuvering speed.

Placards:

(a) On Instrument Panel:

"All intentional acrobatic maneuvers (including spins) prohibited. Retract flaps immediately if spin is inadvertently entered. Operate in normal category in compliance with approved Flight Manual. "

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(b) On Baggage Compartment:

"Maximum weight in baggage compartment not to exceed 120 lbs. See Weight & Balance information for allowable loading."

(c) On Trim Tab Cable Slot:

"Nose down" at forward end of slot
"Nose up" at aft end of slot
"Tab Neutral" at neutral position

(d) Aft of Flap Handle:

1st notch	10^{o}
2nd notch	20^{o}
3rd notch	30^{o}

(e) On Fuel Selector Handle Recession:

Forward:	Both
Aft:	Off
Right:	Right (Usable 20 gal.)
Left:	Left (Usable 20 gal.)

(f) Forward of Wing Tank Filler Neck:

FUEL 100 OCTANE MINIMUM. 20 GALLONS USABLE"

(g) Behind Rear Window on Aft Fuselage Top:

Centerline "Level Point"

5000	2600	85	132	13.0	3.1	405	7500	2540	77	126	11.0	3.6	460	10,000	2490	70	121	10.0	4.0	485
	2500	77	126	11.4	3.5	440		2500	74	124	10.5	3.8	470		2400	64	114	9.0	4.4	500
	2400	69	119	10.1	4.0	470		2400	67	117	9.5	4.2	490		2300	59	105	8.3	4.8	505
	2300	63	112	9.0	4.4	500		2300	61	109	8.6	4.6	505		2200	54	95	7.7	5.2	495
	2100	51	96	7.4	5.4	520		2200	56	101	7.9	5.1	510							

NOTE: For Definition of Maximum Power Mixture, See O-360 Owner's Manual

CRUISE AND RANGE PERFORMANCE

Gross Weight - 2450 LBS
Standard Temperature
Zero Wind

Maximum Power Mixture
40 Gal Usable Fuel
(No Reserve)

ALT	RPM	% BHP	TAS MPH	GAL/ HOUR	ENDR. HOURS	RANGE MILES
0	2675	100	138	16.3	2.5	340
	2600	95	134	14.5	2.8	370
	2500	86	128	12.6	3.2	405
	2400	77	122	11.0	3.6	445
	2200	63	109	8.6	4.7	510
	2000	50	93	7.1	5.7	525
2500	2625	93	135	14.3	2.8	380
	2600	91	134	13.7	2.9	390
	2500	82	127	11.8	3.4	430
	2400	74	121	10.3	3.9	470
	2200	60	108	8.4	4.7	515
	2000	48	92	7.0	5.7	525

PROCEDURES

This airplane is to be operated as a CAR-3 normal category airplane only. No acrobatic maneuvers (including spins) are approved. Night time operations are authorized if the necessary night lighting equipment is installed.

(a) On go around, apply power and retract flaps slowly. After power application, carburetor heat should not be used unless there are indications of carburetor icing, since the use of carburetor heat results in a decrease in power which may be critical in the event of a go-around.

(b) If spin is inadvertently encountered, retract flaps immediately to avoid exceeding limiting flap speeds.

(c) Operation of the electric fuel pump is required at all times during takeoff and landing operations.

(d) For some flight attitudes it will not be possible to drain the last two gallons of fuel from each tank. Fuel remaining in tanks when indicator reads "0" cannot safely be used in flight.

(e) Fuel tanks will cross-feed when selector is on "Both" or "Off". If the airplane is parked with the wings not level, fuel may run out the vent line. This fuel drainage can be stopped by placing selector in "Left" or "Right".

(f) To preclude water entrapment in the fuel lines, park the airplane level or in a nose down attitude.

(g) Except as noted above, all operating procedures for this airplane are conventional.

NOTE: Stall warning system is inoperative when master switch is turned off.

CAUTION: If the alternator circuit breaker is pulled in flight, the following procedure should be followed:

(1) Push the alternator circuit breaker in.
(2) Cycle the electrical master switch.
(3) Check the ammeter for a neutral or positive indication.

AIRCRAFT OPERATING LIMITATIONS WITH DOOR REMOVED

1. This aircraft may be flown with the right door removed, provided the aircraft is operated in accordance with the applicable Federal Aviation Regulations and the following limitations.

a. Maximum speed should not exceed 111 MPH indicated airspeed.

b. No acrobatic maneuvers are permitted.

c. Maximum yaw angle 10°; maximum bank angle 15°.

d. An FAA (CAA) approved safety belt installation must be provided for each occupant.

e. No smoking permitted.

f. When operations other than parachute jumping are conducted, a suitable guardrail or equivalent safety device must be provided for the doorway.

g. All loose articles must be tied down or stowed.

h. No baggage may be carried.

MAXIMUM RATE-OF-CLIMB DATA

GROSS WEIGHT 2450 LBS - IAS 83 MPH

Sea Level and 59°F	2500' and 50°F	5000' and 41°F	7500' and 32°F	10,000' and 23°F	11,100' and 19°F
Rate-of-Climb 718 FPM	Rate-of-Climb 550 FPM	Rate-of-Climb 410 FPM	Rate-of-Climb 275 FPM	Rate-of-Climb 157 FPM	Rate-of-Climb 100 FPM

STALLING SPEEDS

GROSS WT 2450 IBS - POWER OFF - MPH-CAS

WING FLAP POSITION	ANGLE OF BANK 0°	20°	40°	60°
FLAPS UP	63	65	72	89
FLAPS 30°	60	61	68	84

TAKEOFF PERFORMANCE

LEVEL HARD SURFACE RUNWAY - GROSS WT 2450 LBS - FLAPS UP - NO WIND

IAS-MPH at 50-FT HEIGHT	Sea Level and 59°F		2500 Ft and 50°F		5000 Ft and 41°F	
	Ground Run	Distance To Clear 50-Ft Obs.	Ground Run	Distance To Clear 50-Ft Obs.	Ground Run	Distance To Clear 50-Ft Obs.
74	1050	1650	1230	2015	1430	2520

NOTE: Increase distance 10% for each 25°F above standard temperature for altitudes shown.

LANDING PERFORMANCE

IDLE POWER - LEVEL HARD SURFACE RUNWAY - GROSS WT 2450 LBS - FLAPS 30° - NO WIND

APPROACH IAS MPH	Sea Level and 59°F		2500 Ft and 50°F		5000 Ft and 41°F	
	Ground Roll	Distance To Clear 50-Ft Obs.	Ground Roll	Distance To Clear 50-Ft Obs.	Ground Roll	Distance To Clear 50-Ft Obs.
75	840	1280	900	1350	970	1420

1. Jumpers' static lines must be kept free of pilot's controls and control surfaces.

2. The following placard must be placed on the instrument panel in full view of the pilot:

   "For flight with door removed, see Aircraft Operating Limitations with Door Removed."

3. A copy of these limitations must be carried in the aircraft when flight operations are conducted with the door removed.

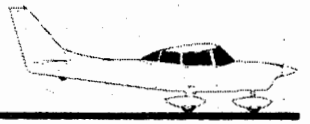
   NOTE: When parachute jumping operations are being conducted, it is recommended that all occupants wear parachutes.

4. When parachute jumping operations are conducted, the right front seat must be removed from the aircraft.

5. Operations limited to VFR conditions.

6. Cabin door hold-open clips installed on wing brace struts and/or under surface of wing must be removed prior to conducting parachute jumping or sky diving operations.

SECTION V
OPERATIONAL DATA



GENERAL

Data for operating the Lark, which has been established through extensive operational tests of the Lark, is presented in tabular form on subsequent pages of this Section. This data will be of considerable value to the pilot when planning flights in the Lark.

The data is presented at various altitudes, temperatures, and maximum gross weights for takeoff, rate-of-climb, and landing; various angles of bank for stall speeds; and airspeed correction with flaps UP and flaps down 30 degrees. Cruise and Range Performance is presented at altitudes from sea level to 10,000 feet and at various engine power settings. The performance presented can be expected from the Lark through properly servicing and thoroughly maintaining the aircraft in a "like new" condition.

The Lycoming O-360 owners manual should be consulted regarding the power settings for obtaining desired performance of the engine.

OWNER'S MANUAL

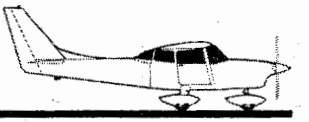
Lark Commander

Aero Commander Division
North American Rockwell Corporation
One Rockwell Ave., Albany, Georgia

Aero Commander Lark

"Ready for Takeoff"

SECTION IV
OPTIONAL EQUIPMENT



The Lark may be modified to furnish several optional equipment installations that afford increased operational capability and safety. Optional equipment not installed during factory assembly is available from your dealer for installation in the field. This equipment primarily consists of an instrument "flight" group, a "Comflite" Avionics Foundation Kit, a complete "Comflite" Avionics Package, and several individual packages of avionics equipment consisting of transmitters, receivers, and antennas. In addition, map cases, sun visors, turn coordinators, tow bars, wheel fairings, fire extinguishers, and many other individual items are available for field installation.

Discuss your individual desires for increasing the operational capability and flight safety and improving the flight comfort of your Lark, with your Aero Commander Lark dealer. He will be your best advisor for adding the additional optional equipment that YOU DESIRE on your LARK.

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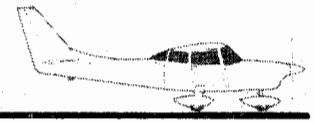
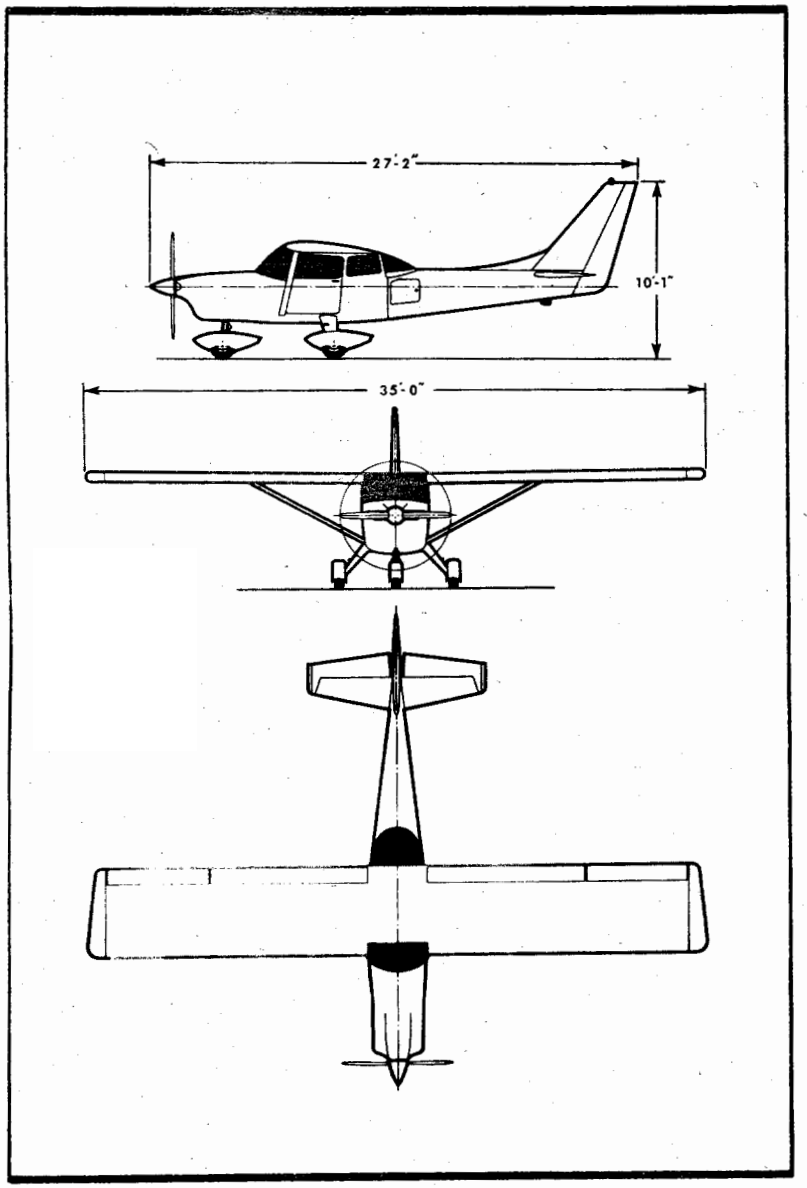




SERVICE SCHEDULE

Perform each operation at EACH interval as shown.

SERVICE OPERATION	PRE-FLT	25 HRS	50 HRS	100 HRS	AS REQ
Service Fuel Tank	X				X
Drain Fuel Filter	X				
Check Engine Oil Level	X				
Check Carburetor Air Filter	X				X
Check Engine For Evidence of Oil Leakage	X				
Check Safety of All Drain Plugs and Covers	X				
Check Carburetor and Fuel Lines For Leakage	X				
Check Nose Gear Strut Extension	X				
Clean Fuel Sediment Bowl and Screen				X	
Change Engine Oil			X		
Clean Engine Oil Screen			X		X
Drain Moisture From Engine Oil Sump			X		
Service Shimmy Damper Cylinder					X
Clean Carburetor Air Filter			X		X
Service Hydraulic Brake Fluid Reservoir			X		
Check Nose Strut Air Pressure Reservoir				X	X
Tires For Proper Inflation		X			X
Check Battery Electrolyte Level			X		X
Clean and Check Spark Plugs				X	X
Check Magneto Timing and Synchronization				X	
Check Generator Drive Belt Tension		X			
Check Electrical Wiring For General Condition				X	
Check Engine Baffles For Security and Condition				X	
Check Cylinders For Cracked or Broken Fins				X	
Check Engine Air Intakes For Deformation				X	
Check Engine Mount Bolts and Bushings				X	
Clean Vacuum Air Filter Screen			X		X
Check Propeller Blades For Damage				X	
Check Propeller and Spinner Bulkhead Mounting Bolts				X	
Check Propeller Blade Tracking				X	X
Repack Wheel Bearings				X	X
Lubricate All Lubrication Fittings				X	

— WARRANTY —

Aero Commander, Inc. (Aero) warrants that under normal use and service each new airplane manufactured by it, including factory-installed equipment and accessories, will be free from (1) defects in the composition of substance of material, (2) defects in workmanship or processes of manufacture, and (3) defects or faults inherent in design, excluding however any parts, units or items which are subject to scheduled replacement through normal use; provided, however, that the liability of Aero under this warranty is limited to replacing or repairing any parts or parts which shall, within one hundred eighty (180) days or one hundred fifty (150) total hours of operation, whichever occurs first, after delivery of the airplane to the original retail purchaser or first user, be returned to Aero, with transportation charges prepaid, at Albany, Georgia, or such other place as Aero may designate, and which shall upon examination by Aero be disclosed to Aero's satisfaction to have been thus defective. AERO EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE. The provisions of this warranty shall not apply to any airplane, equipment or accessory which has been subject to misuse, negligence or accident, or which shall have been repaired or altered outside of Aero's factory in any way so as in the judgment of Aero to affect adversely its performance, stability or reliability.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATION OR LIABILITY ON THE PART OF AERO OF ANY NATURE WHATSOEVER, AND AERO NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME FOR IT ANY OTHER OBLIGATION OR LIABILITY.

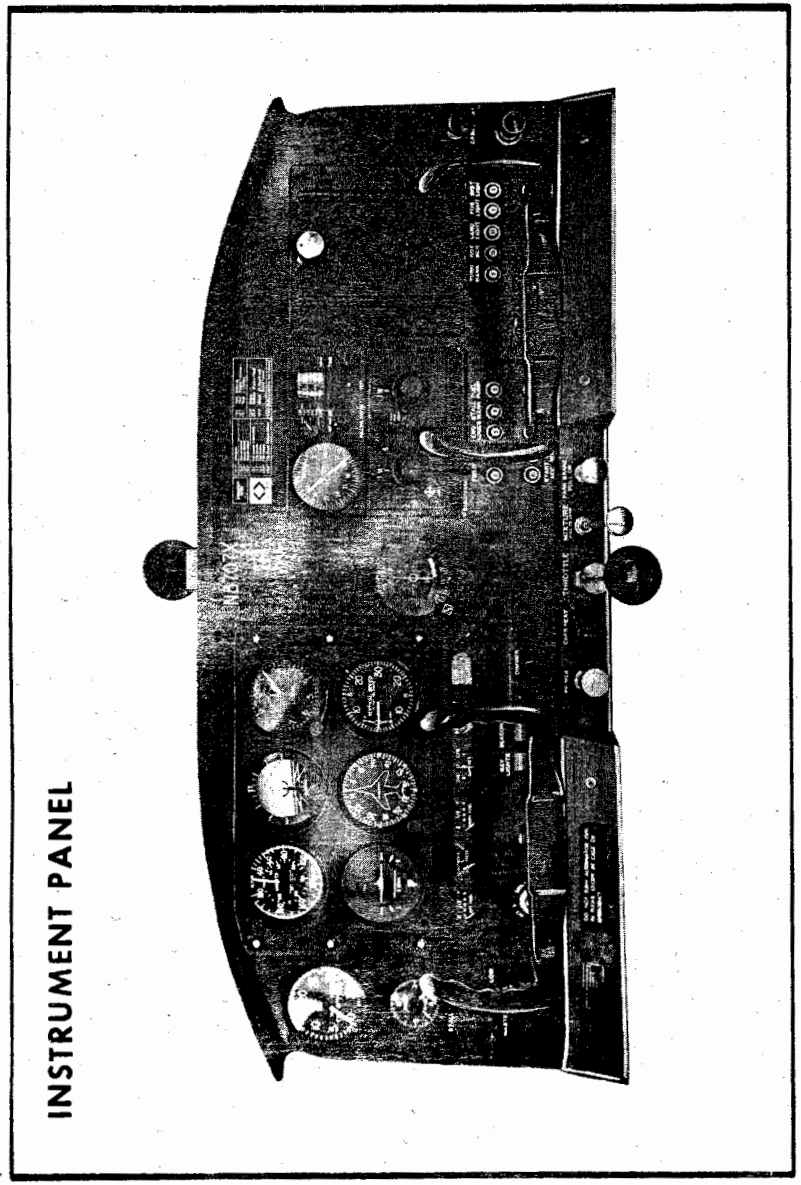
This agreement shall be construed under and governed by the laws of the State of Georgia. It constitutes the entire agreement between the parties. It may not be amended or modified except by an instrument in writing executed by both parties. It may not be assigned by Dealer without the prior written consent of Aero.

SPECIFICATIONS

PERFORMANCE:	
GROSS WEIGHT, pounds	2450
EMPTY WEIGHT, pounds	1511
USEFUL LOAD, pounds	939
MAXIMUM SPEED IAS, miles per hour	140
CRUISE SPEED TAS, miles per hour (2500 RPM, 7500' (74% power)	124
RANGE, statute miles, no reserve (2200 RPM, 7500' (56% power)	510
RANGE, statute miles, 45-minute reserve (2200 RPM, 7500' (56% power)	435
RATE-OF-CLIMB, feet per minute (Sea Level, 59°F)	718
BEST RATE-OF-CLIMB SPEED, miles per hour	80
STALL SPEED, miles per hour (Flaps - 30 degrees)	60
STALL SPEED, miles per hour (No flaps)	63
SERVICE CEILING, feet	11,100
ABSOLUTE CEILING, feet	13,100
TAKEOFF GROUND RUN, feet (Sea Level)	1420
LANDING GROUND ROLL, feet (Sea Level)	840
DESIGN:	
WING SPAN, feet	35
WING AREA, square feet	181
LENGTH, feet and inches	27-2
HEIGHT, feet and inches	10-1
WING LOADING, pounds per square foot	13.5
POWER LOADING, pounds per horsepower	13.6
FUEL CAPACITY, gallons	44
BAGGAGE, pounds	120
SEATS	4

ENGINE:
LYCOMING O-360-A2F, rated 180 HP at 2700 RPM. Normal Cruise at 2450 RPM.

PROPELLER:
McCAULEY 1A170 CFA 7660 fixed-pitch, all-metal, 76-inch diameter.



INSTRUMENT PANEL

material which would have a tendency to absorb electrolyte. Battery cell filler caps must be kept tight at all times except when battery is being recharged. Terminal posts should be kept clean and lubricated to prevent corrosion. Inspect battery for electrolyte level at least every 50 hours. Distilled water should be added to bring electrolyte up to proper level.

BRAKE SYSTEM

Service brake reservoir to full mark every 50 hours, or as needed. Bleed brake system and adjust brakes any time brakes are spongy or braking action fades.

LUBRICATION

a. Clean and repack main landing gear wheel bearing each time the wheel is removed.
b. Lubricate grease fittings at strut attach bushings and Fiberglas spring link rods every six months.
c. Repack nose landing gear wheel bearings each time the wheel is removed.

TIRE INFLATION

Maximum service from the landing gear tires may be obtained only through proper inflation and tire maintenance. Tires should be inflated to a pressure of 28 psi. The tires and wheels are balanced assemblies and the red dot on the tire must align with the valve stem. If tires are suspected of being out of balance they may be balanced with automotive balancing equipment. When new tires are installed it will be necessary to rebalance the wheel and tire. When cleaning tires, use only soap and water. Do not use solvents for cleaning tires. The tires should be rotated frequently whenever the aircraft is stored for prolonged periods of time. This will prevent flat spotting the tires.

BATTERY SERVICE

The 12-volt battery is installed in a frame support attached to the right forward side of the engine firewall. The battery area should be kept clean at all times to prevent an accumulation of foreign

SECTION I
GENERAL DESCRIPTION

GENERAL

The LARK is a four-place, high-wing, all-metal aircraft powered by a Lycoming O-360-A2F series engine equipped with a McCauley 1A170 CFA 7660 fixed-pitch, all-metal propeller. The movable control surfaces, including the 3-position wing flaps, are constructed of aluminum. Access to the cabin is through doors located on each side of the aircraft, which are equipped with exterior locks. The two forward cabin seats are mounted on tracks secured to the cabin floor, and may be adjusted for pilot comfort. Each seat back may be moved forward to permit easy access to the rear seat. Cabin heat from an engine exhaust system heater muff is distributed through an outlet assembly forward of the rudder pedals. A cable control is connected to a hot air valve to permit the regulation of cabin heat. Cabin ventilation is furnished by four Wemac outlets. The cabin windshield is molded from a single piece of acrylic plastic and affords unobstructed forward visibility from the two front seats. The arrangement of the cabin windows permits visibility in all other directions for passenger viewing pleasure and flight safety. All engine and flight instruments are conveniently located in the instrument panel and may be easily seen from either the left or right seat. The aircraft is equipped with a tricycle landing gear. Nose wheel steering is provided by mechanical linkage connected to the rudder pedals. Hydraulic brakes, provided on each main landing gear wheel, are operated by toe brakes on the pilots rudder pedals. The brake master cylinders can be locked in the brake ON position, to provide a parking brake. Each main landing gear is attached to the cabin structure by trunnion fittings. The strut is mechanically linked to a Fiberglas spring and link rod, which absorbs landing shocks and cushions the aircraft during taxi. A tail skid installed on

the lower part of the empennage prevents damage to the aircraft in the event of a tail low landing.

CABIN INSULATION AND UPHOLSTERY

Fiberglas insulates and soundproofs the cabin, attractive carpets cover the floors, and a contrasting fabric headliner covers the top of the cabin interior. Side panels, made of aluminum and covered with Naugahyde and carpet, complete the cabin enclosure. The windows are encased in molded frames and tightly sealed against wind and moisture.

CABIN SEATS

Cabin seating comfortably accommodates four persons. The aft seat is constructed as a single unit and seats two persons while the two front seats are individual units. Both front seats are mounted on rollers and attached to seat tracks, and may be adjusted fore and aft to assure the pilot(s) of the most comfortable and safe flying position. The seat locking and release handle, protruding slightly forward of the seat, operates a plunger which engages holes in the seat tracks to assure that the seat is firmly locked in the desired position. Stops are incorporated in the seat tracks to prevent the seat from accidently sliding off the track. The back of each front seat will fold forward to permit easy access to the rear seat. The framework of the seat is padded with two inches of Paratex and two inches of foam rubber and is covered with durable fabric. A long safety belt, which will cross over the laps of both passengers, is furnished for the back seat, and individual safety belts are provided for the two front seats. Maximum safety is provided by securing the safety belts to structural members of the airframe.

FLIGHT CONTROLS

Movable flight controls include the wing flaps, ailerons, rudder, elevator, and elevator trim tab. The flight controls are of all-

OIL SYSTEM

When checking the oil quantity prior to each flight, check the cleanliness of the oil. Oil that is dirty and contains sludge deposits should be changed regardless of the time since last oil change.

a. Remove oil sump plugs, drain engine oil system, and fill with new oil every 50 hours.
b. Remove engine oil screen every 50 hours, clean by washing in solvent, and allow screen to air dry.

NOSE STRUT

To service the nose strut, compress the strut completely and fill with Mil-H-5606 hydraulic fluid. Charge the strut with compressed air or nitrogen until strut extends 2-3/4 inches with the aircraft empty. With aircraft loaded, strut extension should be 2 inches.

CARBURETOR AIR CLEANER

Remove carburetor air cleaner and clean in solvent any time visual inspection reveals evidence of filter contamination. Remove and clean air filter at least once every 50 hours.

HEATER MUFF

Check heater muff for cracks and exhaust gas leakage every 50 hours.

conditions will determine the extent and frequency of cleaning required. The aircraft should be washed frequently when operating near salt water, or the salt-laden moisture in the air will cause corrosion of the metal surfaces. To wash the aircraft use a mild soap and water solution and rinse thoroughly with clear water. The exterior painted surfaces should be waxed; however, do not wax until the paint has been allowed to cure for 90 days. It is recommended that a windshield and window cleaner be used for cleaning the cabin windows and windshield. Be sure the cleaner, which can be supplied by your Aero Commander dealer, is especially made for cleaning plastic surfaces. If windshield cleaner is not available wash the surfaces with clear water, using the hand to dislodge any dirt. Dry with a clean moist chamois. Use care not to scratch the surface of the plastic. Clean the interior of the aircraft frequently with a vacuum cleaner. Use a good grade rug and upholstery cleaner to remove spots and stains from fabric-covered surfaces.

SERVICING

If you will carefully perform a preflight check of your aircraft, thoroughly check the operation of all aircraft systems during every flight, and follow these servicing suggestions you can be sure the Aero Commander LARK will give you safe dependable service between annual inspections. You can operate your aircraft economically and with great dependability by correcting minor discrepancies promptly and by not allowing servicing requirements to accumulate.

FUEL SYSTEM

When servicing the wing fuel tanks, use caution not to scuff or damage the wing leading edge or skin. It is best to keep the fuel tanks full of fuel to reduce moisture accumulation in the fuel tanks and lines.

a. Drain fuel filter prior to each days flying.
b. Remove fuel sediment bowl and clean bowl and screen every 50 hours flying time.

metal construction, with sealed bearing hinge fittings for attachment of the rudder and elevator.

WING FLAP CONTROLS

The wing flaps are mechanically operated by a flap control handle located between the two forward cabin seats, which has four positions: full up, full down, and two intermediate positions. In the full up position the flaps are streamlined with the wing. The first intermediate down position is 10 degrees, the second position is 20 degrees, and the full down position is 30 degrees. The flap control handle is attached to the flap control cables which are routed through pulleys attached to the fuselage truss members and extend out through the forward side of the aft wing spar to each flap bellcrank. The bellcrank is connected to the flap horn located at the center flap rib, and actuates the flaps when the flap control handle is moved. Return springs assist in returning the flap to the up position.

AILERON CONTROLS

The ailerons are controlled by rotating the control wheels, which are interconnected and synchronized through use of push-pull tubes and a bellcrank pulley. The push-pull tubes connect between short bellcranks attached to the forward end of each aileron control wheel shaft and the bellcrank pulley located at the top of the control column. The aileron control cables are attached to the bellcrank pulley. The cables are routed from the bellcrank pulley through a dual pulley assembly at the bottom of the control column, then through a system of pulleys and cable guides to the aileron bellcranks located in the trailing edges of the wings. An adjustable link rod connects the aileron bellcranks to the aileron control horns. A balance cable connected between the aft arms of the wing aileron bellcranks completes the aileron control system.

ELEVATOR CONTROLS

The elevators are controlled by fore and aft movement of the control wheel shaft which passes through a housing and bearing assembly in the instrument panel and is attached to the tee bar of the elevator control column. The elevator control column pivots between two pivot fittings secured to the cabin floor structure. This allows the control column to be moved fore and aft around the point of attachment, which is located above the lower end of the column. The distance between the column pivot point and the top of the control column provides a mechanical advantage which assures smooth, easy movement of the elevators. A push-pull rod is connected between the lower end of the control column and the elevator bellcrank assembly, located just forward of the aft fuselage attachment point. The bellcrank assembly is attached to a fitting on the cabin truss members. The elevator control system is completed by cables connected between the elevator bellcrank assembly and the torque arms of the elevator horn. These cables are routed through pulleys and cable guides to assure freedom and ease of cable movement.

ELEVATOR TRIM TAB

A controllable trim tab, hinged to the upper side of a short stringer, is installed on the inboard trailing edge of the left elevator. The trim tab actuator assembly is installed within the horizontal stabilizer structure and connected to the trim tab horn by a link rod. A trim tab control wheel, secured within a housing on the left centerline of the forward cabin, controls the movement of the trim tab. The trim tab control wheel is within the immediate reach of the pilot occupying either the left or right seat. The trim tab is actuated by rotating the trim tab control wheel fore or aft. Aft movement of the wheel moves the trim tab downward to raise the nose of the aircraft. Forward movement of the trim tab control wheel produces the opposite effect. The elevator trim tab is actuated by cables which have sprocket chains attached at each end. One chain operates in a sprocket wheel attached to the trim tab control wheel and the other rotates a sprocket wheel at the trim tab actuator. An indicator clip attached to the upper sprocket chain, at the trim tab control wheel housing, provides a visual indication of trim tab travel.

cause of its all-metal construction. It is well to remember that an aircraft in storage is subject to deterioration. Therefore, a frequent short flight is beneficial to the care of your aircraft. If long-term storage is necessary it is recommended that the aircraft be placed in a hangar and that the engine be preserved in accordance with the manufacturers instructions. During storage of short duration, keep the propeller clean and covered with a light coat of engine oil, and place the blades in a horizontal position to prevent moisture from draining into the propeller hub. The engine should be pulled through several revolutions by hand at least every seven days to keep the internal parts lubricated. It is suggested that a short engine-run be accomplished during every 14 days the aircraft is inactive. This will keep the battery charged as well as assuring lubrication of all parts of the engine. Tire pressures must be maintained, and the tires rotated to prevent deterioration and flat spotting of the tires. Proper mooring of the aircraft is an important part of its storage. The use of parking brakes while the aircraft is in storage is NOT recommended. Be especially thorough in the performance of the preflight check and aircraft servicing when removing the aircraft from storage.

JACKING

The aircraft can be rotated on the main landing gears when it is necessary to change a nose wheel tire or perform other minor maintenance. When it is necessary to remove the nose gear strut, support the aircraft on a cradle positioned directly below the engine firewall at the forward fuselage bulkhead. To jack the main landing gear insert a steel bar in the landing gear axle, on the inboard side of the wheel, to serve as a jack point. A regular commercial hydraulic or scissors jack may be used for jacking the aircraft.

CLEANING

The exterior of the aircraft has been painted with a high quality synthetic paint that will protect the metal skin and give years of lasting beauty if it is properly cared for. Climate and operating

3/8-inch nylon or manila rope. If manila rope is used for mooring, be sure to allow enough slack to compensate for contraction of the rope, caused by moisture accumulation. To moor the aircraft proceed as follows:

a. Head the aircraft into the wind.
b. Place chocks on the forward and aft sides of each wheel and tie the chocks together.
c. Place a rope around the nose gear strut, using a halfhitch, and allow the two ends of the rope to extend an equal distance on each side of the wheel. Secure to tie-down rings or stakes tight enough that the nose gear will remain in contact with the ground.
d. Secure the main landing gear by placing a rope around the strut above the step and attaching it to a tie-down ring or stake. The tie-down point should be far enough away from the strut to permit attachment of the rope at a 45° angle toward the nose of the aircraft.
e. Secure each wing by attaching a rope to the tie-down fitting, located at the wing strut attachment point, and lash the end of the rope to a tie-down point that will place the rope at an angle of 45 degrees to the wing surface.
f. The tail of the aircraft is moored by attaching a rope to the tail skid and securing it to a tie-down point, aft of the tail cone.

It is strongly recommended that exterior control surface locks be locally fabricated and used anytime the aircraft is moored. The forward seat belts can also be used to lock control surfaces by looping the belts over the control wheel in full aft position.

CAUTION

If external control locks are not available, always lower flaps to 30 degrees when mooring aircraft to prevent wind from buffeting the spring-loaded flap system.

STORAGE

Short-term storage of the aircraft in the open is practical be-

RUDDER CONTROLS

A dual set of rudder pedals, mounted on a rudder bar assembly, are located immediately forward of the two front cabin seats. Each end of the rudder bar assembly, which extends across the forward cabin, is inserted into a bearing and bracket bolted to a fuselage truss member on each side of the aircraft. Two push-pull tubes are attached to the rudder bar with control arms welded to the bottom of the rudder bar. The other end of the push-pull tubes are connected to welded steel bellcranks. The bellcranks are synchronized by a transverse link rod under the cabin floor, that connects to parallel arms welded onto the lower body of the rudder actuating bellcranks. Cables from the rudder pedal bellcranks extend beneath the forward cabin floor, through pulleys and cable guards, to the rudder horn, to position the rudder when the rudder pedals are moved. Nose wheel steering is also controlled by rudder pedal movement. A rudder centering device is connected to the rudder bar and extends rearward to attachment lugs on the cabin truss tubes. Mechanical stops, located in the aft fuselage, limit rudder travel in both directions.

LANDING GEAR

The aircraft is equipped with a tricycle landing gear, and 600 x 6, four-ply tires are installed on all three landing gear wheels. An air/oil landing gear strut assembly is used on the nose gear and Fiberglas springs are employed on the main gears to absorb landing and taxiing shock loads. Main landing gear wheels are equipped with hydraulic brakes, which are operated by toe brakes located on the pilots rudder pedals.

WHEELS AND BRAKES

All landing gear wheels are equipped with 600 x 6, four-ply tube type tires, which are normally inflated to 28 pounds. The main landing gear wheel inner section consists of a brake drum that fits over the wheel brake shoes. The brake shoes are bolted to a back plate welded to the landing gear strut. The main landing gear wheel rotates on inner and outer roller bearings, which

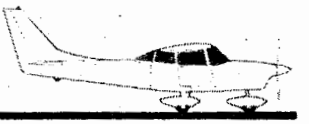
roll on bearing races that are press-fitted into the wheel body. Each main landing gear has a streamlined wheel cover attached to the strut. The nose wheel is attached to the nose wheel fork by an axle shaft, spacers, and caps, and an axle rod which passes through the axle shaft. Wheel bearings, which are parts of the nose wheel assembly, are located on each side of the wheel. The nose wheel is secured by nuts on each side of the shaft. The nose wheel and tire are balanced assemblies and the red dot on the tire must align with the valve stem. If nose wheel shimmy is encountered on takeoff or landing and the shimmy damper is not loose, the nose wheel and tire assembly should be balanced with automotive balancing equipment.

FUEL SYSTEM

The aircraft fuel supply is contained in two welded and baffled metal tank assemblies. Each tank has a usable fuel capacity of 20 gallons and is located at the inboard end of each wing between the forward and aft wing spars. The filler neck and cap, located at the forward edge of the tank, are flush with the upper wing skin. A splash guard is installed at each filler port to prevent fuel from entering the wing cavity around the filler neck. A fuel vent line, which is common to both tanks, is routed from a tee fitting in the upper cabin panel to the left side of the aircraft where it extends overboard through the lower cabin skin. This vent line relieves excess fluid or vapors, resulting from temperature expansion, from each fuel tank. Fuel from each tank is routed to the engine through a fuel tank selector valve installed on the cabin floor between the two forward seats. The tank selector valve, which has four positions: OFF, LEFT TANK, RIGHT TANK, and BOTH, is normally in the BOTH position when the engine is operating. This permits fuel to feed to the engine through the main fuel filter, located on the lower midsection of the engine firewall. When the fuel selector is in the BOTH position fuel is used at an equal rate from each tank. Since this is basically a gravity feed fuel system the fuel tank selector valve should be placed in the OFF position when the engine is not operating. The fuel selector valve may be positioned to use fuel from either the left or right tank. This permits the fuel load to be leveled by using fuel from only one tank. The two tanks are vented to each other; therefore, no fuel will be

SECTION III

SERVICING AND GENERAL MAINTENANCE



Your aircraft will require personal attention and care if its original beauty and reliability are to be retained. If you will conscientiously perform the inspections contained in the operators checklist and follow the recommended servicing instructions you will always be aware of the overall condition of the aircraft. This will permit you to maintain the aircraft on a planned basis, which will preclude the accumulation of minor discrepancies, keep your maintenance cost at a minimum, and assure constant availability of a reliable aircraft.

GROUND HANDLING

The nose landing gear is equipped with a tow bar attachment fitting. Tow the aircraft by hand only, as the use of a towing vehicle will place excessive loads on the nose gear strut. Damage to the nose gear and steering system will also occur if the nose wheel is turned far enough to forcibly engage the rudder stops. Towing assistance may be provided by pushing on the wing strut, at a point near its attachment to the fuselage. Remove baggage from the baggage compartment before towing the aircraft, to prevent the nose wheel from coming off the ground. When necessary to back the aircraft use caution to prevent the aft fuselage from dropping down on the tail skid.

MOORING

The aircraft should be hangered when it is not in use. However, it can be protected from strong or gusty wind by mooring with

c. 2450 pounds at 46.25 inches aft of the datum. This is the aft limit.

NOTE

Refer to weight and balance data for aircraft loading procedures.

AIRSPEED INSTRUMENT MARKINGS

a. Red line - absolute maximum airspeed.
b. Yellow arc - range of airspeeds where caution must be used. Authorized in smooth air only.
c. Green arc - normal airspeeds.
d. White arc - airspeeds for safe use of wing flaps.

CAUTION

Maneuvers involving an approach to stall speed or full application of the movable flight controls must be confined to airspeeds below 116 MPH.

SUPPLEMENTARY DATA

a. Maximum weight in baggage compartment - 120 pounds.
b. For some flight attitudes it is not possible to use the last two gallons of fuel in each fuel tank. The fuel quantity system is calibrated to show zero when all usable fuel is consumed.

lost as the result of temperature expansion unless both tanks are completely full and under equal amounts of pressure. When this occurs, fuel will vent overboard through a common vent.

NOTE

When the aircraft is parked with one wing low the fuel selector should be on right or left tank to prevent high tank from cross feeding and causing fuel to flow from tank vent.

FUEL QUANTITY INDICATING SYSTEM

A fuel level unit, consisting of a float, arm, and transmitter are installed in each fuel tank and are electrically connected to fuel quantity indicators on the left side of the instrument panel. The fuel indicating system for each fuel tank is calibrated to read EMPTY when two gallons of fuel remain in the tank. This amount of fuel is unusable in some flight conditions and must never be considered as available fuel. The transmitter installed in each fuel tank is calibrated at the factory and should give unlimited trouble-free service.

POWER PLANT

The aircraft is equipped with a Lycoming O-360 series, horizontally opposed, 4-cylinder engine. This engine has its own oil supply and distribution system; therefore a separate airframe-mounted oil tank and lines are not necessary. The engine is rated to produce 180 hp at 2700 rpm engine speed. An engine operator's manual is supplied with each aircraft, and should be consulted for complete engine specifications, construction, and operation data.

IGNITION SYSTEM

The engine is equipped with dual magnetos. The left magneto fires the top plugs of the left cylinders and the bottom plugs on the right cylinders. The right magneto fires the lower plugs on the left cylinders and the top plugs on the right cylinders. This arrangement assures at least one spark plug in each cylinder will fire in event of a magneto failure. The left magneto incorporates an impulse coupling to aid in engine starting. The magnetos are controlled from the engine start and ignition switch, located on the lower center section of the instrument panel.

ALTERNATOR

A 12-volt, 40-amp alternator is installed at the front of the engine on the lower right side. Alternator voltage is controlled by a voltage regulator installed on the upper right side of the engine firewall and is further protected by an overvoltage control relay. A belt from the alternator pulley is driven by a pulley which is integral to the aft propeller flange. Alternator belt tension should be maintained to provide a mid-point depression of 1/4-3/8 inch when pressed inward with thumb pressure. Alternator belt tension is adjusted by loosening the alternator attaching bolts, pulling the alternator outward until proper belt tension is obtained and then retightening the attaching bolts. The alternator attaching brackets are slotted to permit this adjustment. A ram air blast tube extends from the forward engine baffle to the aft alternator cap to supply cooling air to the alternator. An ammeter, installed in the instrument panel, indicates the alternator output.

STARTER

The starter is installed at the front of the engine on the lower left side. This starter drive unit engages a gear which is integral with the aft propeller flange, to provide direct cranking of the engine. A starter switch relay, installed on the right side of the firewall, is engaged by a key operated spring-loaded start and ignition switch on the left side of the instrument panel.

FLIGHT LIMITATIONS

Limitations: Acrobatic maneuvers are prohibited. Other flight limitations are as follows:

a. 2700 RPM, 180 HP.
b. Oil temperature - 245°F.
c. Oil pressure: Min - idle rpm 25 psi.
Max - full rpm 90 psi.

FUEL GRADE

a. 100 Octane, Minimum.

AIRSPEED (True Indicated)

a. Maximum - 176 MPH.
b. Maximum cruise - 140 MPH.
c. Maneuvering - 116 MPH.
d. Flaps extended - 105 MPH.

FLIGHT LOAD FACTORS

a. Maximum positive (flaps up) - 3.8 G's.
b. Maximum positive (flaps down) - 2.0 G's.
c. Maximum negative (to maximum cruise) - 1.5 G's.

MAXIMUM GROSS WEIGHT

a. 2450 POUNDS.

C. G. RANGE (Datum: Firewall)

a. 2100 pounds at 36.15 inches aft of the datum, varying linearly to 2450 pounds at 40.55 inches aft of the datum.
b. 2450 pounds at 40.55 inches aft of the datum, varying linearly to 2450 pounds at 46.25 inches aft of the datum.

DATUM: FRONT FACE OF ENGINE FIREWALL

	Weight (Lbs)	Arm (Inches)	Moment (In-Lbs)
Empty Weight	1510	38.20	57,682
Less Oil (7 Qts.)	-13	-21.0	273
Plus Undrainable Oil	1	-21.0	-21
Plus Unusable Fuel	24	50	1,200
Licensed Empty Weight	1522	38.85	59,134
Plus Oil	13	-21	-273
Pilot & Front Seat Pass.	340	41	13,940
2 Rear Seat Pass.	340	75	25,500
Fuel (35 Gal.)	210	50	10,500
Baggage	25	112	2,800
Total Takeoff Weight and Moment	2450	45.55	111,601
Less 30 Gal. Fuel	-180	50	9,000
Total Landing Weight and Moment	2270	45.20	102,601

Figure 2-3. Sample Loading Problem

ENGINE CONTROLS

Since the aircraft is equipped with a fixed-pitch propeller the primary engine controls are concerned only with air induction and fuel/air mixture. These controls are: the throttle, mixture control, and carburetor heat controls. The three controls are closely grouped and located in the lower center portion of the instrument panel, and within easy reach of either occupant of the two front cabin seats. All controls are operated by flexible shaft push-pull cables which are attached to a control knob. The push-pull cables extend from the aft side of the instrument panel through grommets in the engine firewall to the attaching arms on the carburetor and the carburetor heat flapper valve.

PROPELLER

The aircraft is equipped with a McCauley 1A170 CFA 7660 fixed-pitch, metal propeller. A propeller spinner is attached to the hub to streamline the aircraft and to assure a smooth flow of cooling air into the engine air intake. Clean the propeller with a shop towel dampened in carbon tetrachloride and then apply a thin coat of engine oil to each blade to prevent corrosion.

INSTRUMENTS

The instruments, modern rocker type electrical switches, circuit breakers, radio controls, engine controls, parking brake, and cabin heat controls, are located within the instrument panel, and in easy reach or view of either occupant of the two front seats. The instrument panel is illuminated by an instrument panel light located on the overhead speaker-light panel. Intensity of the light is controlled by a dimmer rheostat on the instrument panel directly in front of the pilot. The flight instruments are mounted in the basic "T" design on an isolated sub-panel, which controls the range of frequencies (vibrations) normally encountered. The airspeed indicator, electric turn and bank indicator, directional gyro, artificial horizon, altimeter and rate-of-climb indicator are all located on the sub-panel. The engine instrument group consists of the oil pressure gage, fuel pressure gage, oil tem-

perature indicator, ammeter and a left and right fuel gage. These instruments are installed in a strip cluster located directly beneath the isolated sub-panel. The tachometer, high and low vacuum light, and 8-day clock are mounted on the main panel. The outside air temperature gage is located on the right corner of the windshield.

ELECTRICAL SYSTEM

The LARK offers one of the finest electrical systems in the light aircraft industry. The aircraft utilizes a 12-volt dc electrical system, which consists of an engine-mounted 12-volt, 40-amp alternator, a 12-volt heavy duty 35-amp battery, and a transistorized voltage regulator and an overvoltage control relay to regulate the electrical power and protect expensive radio equipment from surges of high current. The battery is installed in a frame support attached to the right forward side of the engine firewall. The voltage regulator and overvoltage control relay are mounted on the upper center firewall. An ammeter is electrically connected to the battery solenoid and buss bar and located on the instrument panel, and monitors the current flow of the electrical system. The lead-acid, 12-volt battery provides the power required for engine starting and absorbs any minor surges in alternator power output. All electrical system switches are located directly in front of the pilot. A master switch is located on the left hand side of the instrument panel and must be placed in the ON position before the remainder of the electrical system can be energized by the individual switches. This includes the starter, which is incorporated in the ignition switch, but DOES NOT INCLUDE THE IGNITION. Circuit breakers are utilized for protection of the alternator buss circuit, alternator field circuit engine group, radio circuits, lights, and accessories. The engine starter, located on the left front of the engine, is operated by a starter solenoid which is electrically energized by the start-ignition switch. The solenoid is mounted on the forward right side of the engine firewall directly above the master switch solenoid. The overhead instrument light, located on the speaker-light panel, has a slide switch for a white light for map reading, and a red light for the instrument panel. Other components of a typical electrical system are navigation lights, landing and taxi

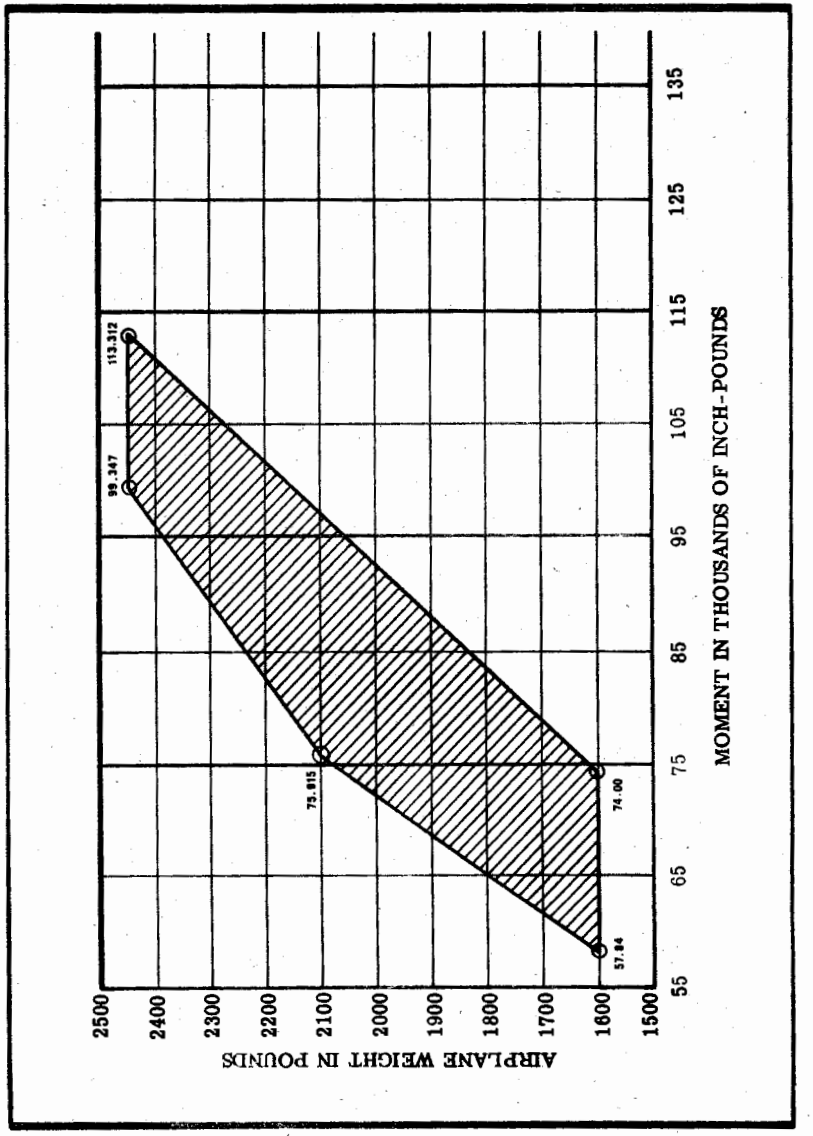


Figure 2-2. Center of Gravity Envelope

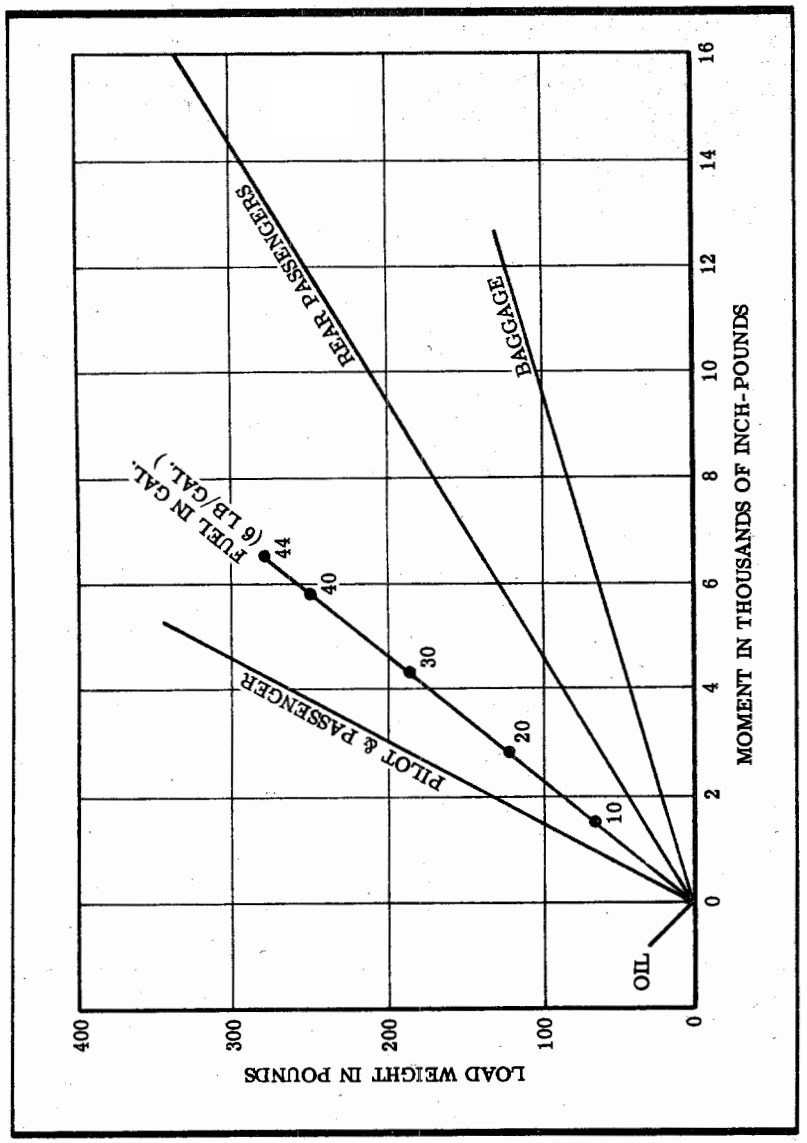


Figure 2-1. Weight and Balance Chart

light, instrument lights, and the radio equipment. A dome light is located on the speaker-light panel for night time convenience.

STALL WARNING SYSTEM

The stall warning system uses a vane-actuated switch installed in the left wing leading edge, to energize a red warning light and horn located in the cockpit. The stall warning switch is located in the lower leading edge of the left wing and is adjusted to operate at 5 - 10 mph above the actual stall speed. The vane is installed in a position which causes the switch to actuate when the angle of attack approaches maximum lift angle of the wing and airflow over the wing tends to burble.

HEATING AND VENTILATING SYSTEM

The engine exhaust heat muff assembly acts as a heat exchanger to provide the cabin heat source and furnish hot air for the carburetor anti-icing system. Ambient air is directed to the exhaust heat muff assembly by a flexible air duct attached to the forward engine baffle. This air is circulated through the exhaust heat muff and then passed into the hot air ducts leading to the carburetor air scoop and the cabin heat valve. When cabin heat or carburetor heat is not being used the hot air is dumped overboard through ports in the carburetor air scoop and the underneath side of the forward cabin. When the cabin heat control, located on the extreme right of the instrument panel, is pulled out, a flexible shaft opens the heater control flapper valve to admit heated air to the cabin heat outlet assembly. The outlet assembly serves as a plenum chamber and the warm air is forced out into the forward cabin area to fill the entire cabin with heated air. The amount of heated air entering the cabin is regulated by positioning the heater control. Excess heated air is dumped overboard at the dump port. A defroster unit furnishes heated air to two Wemac outlets under the windshield. Heated air is available to the windshield whenever the cabin heat control is pulled out.

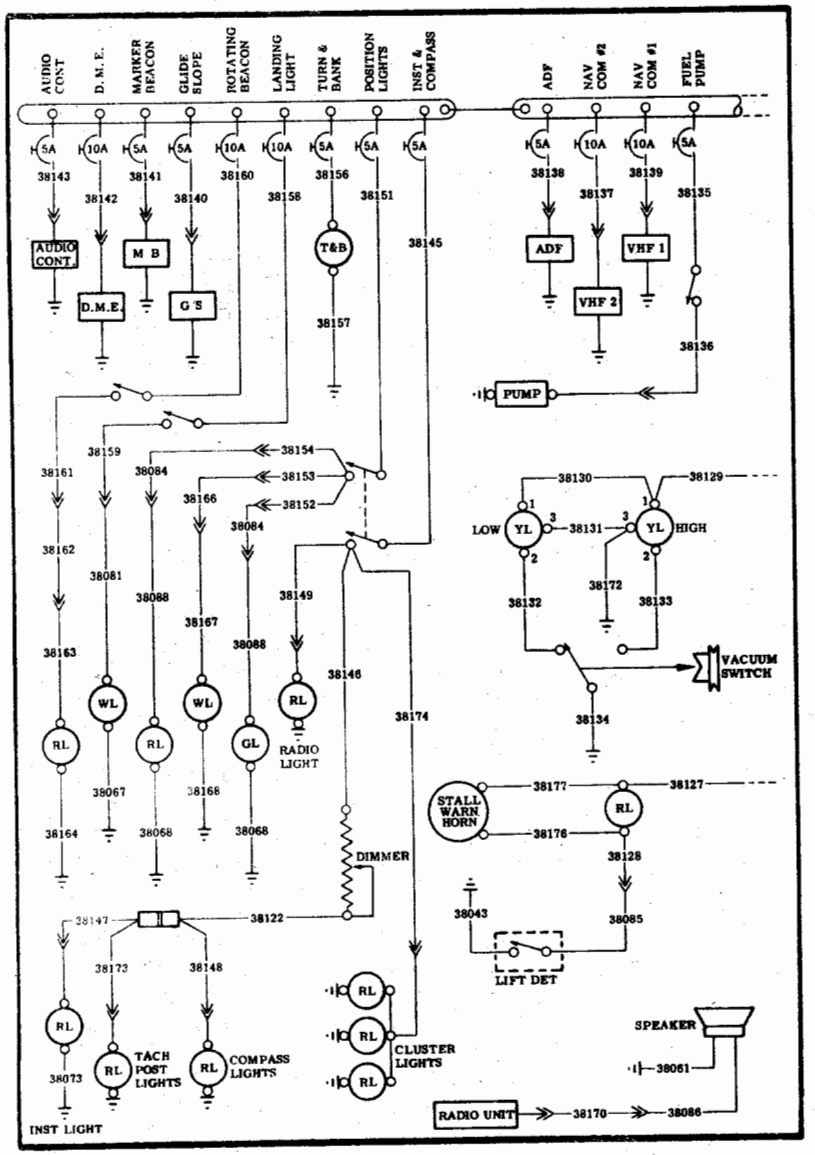


Figure 1-1. Electrical System (Sheet 1 of 2)

INADVERTENT SPIN

If a spin is encountered, immediately retract the wing flaps, retard throttle, and execute standard NACA recovery techniques.

FLIGHT OPERATION

Reduce power to the best rate of climb (80 mph) as soon as possible after a safe altitude has been reached. Immediately after reaching the planned flight altitude, reduce engine power to cruise (75% max continuous) and trim the aircraft for best flight attitude, and turn the electric fuel pump off.

ENGINE CONTROLS

The aircraft uses a fixed-pitch propeller, therefore, the throttle controls both propeller and engine rpm. When operating at altitudes below 5000 feet the mixture control must be maintained in the FULL RICH position. At altitudes above 5000 feet the fuel/air ratio may be adjusted by moving the mixture control toward the LEAN position. The best power setting is obtained when the maximum rpm is obtained for any given throttle setting. Be sure to readjust the mixture control for every change in throttle setting. Always return the mixture control to the FULL RICH position when operating below 5000 feet. Carburetor heat should be used when the outside air temperature is conducive to icing. Carburetor icing is usually indicated by a gradual drop in engine rpm, which cannot be restored by advancing the throttle.

LANDING

Standard flying technique is used to land the aircraft. Select the required flap setting for the airspeed and glide angle desired. Turn the electric fuel pump ON, place mixture control in FULL RICH position and adjust engine power as necessary to maintain airspeed above the stall speed. During a long glide it is recommended that the throttle be advanced momentarily to "clear" the engine and assure availability of maximum power should a go-around be required. If a go-around is necessary, apply power smoothly and retract the wing flaps slowly.

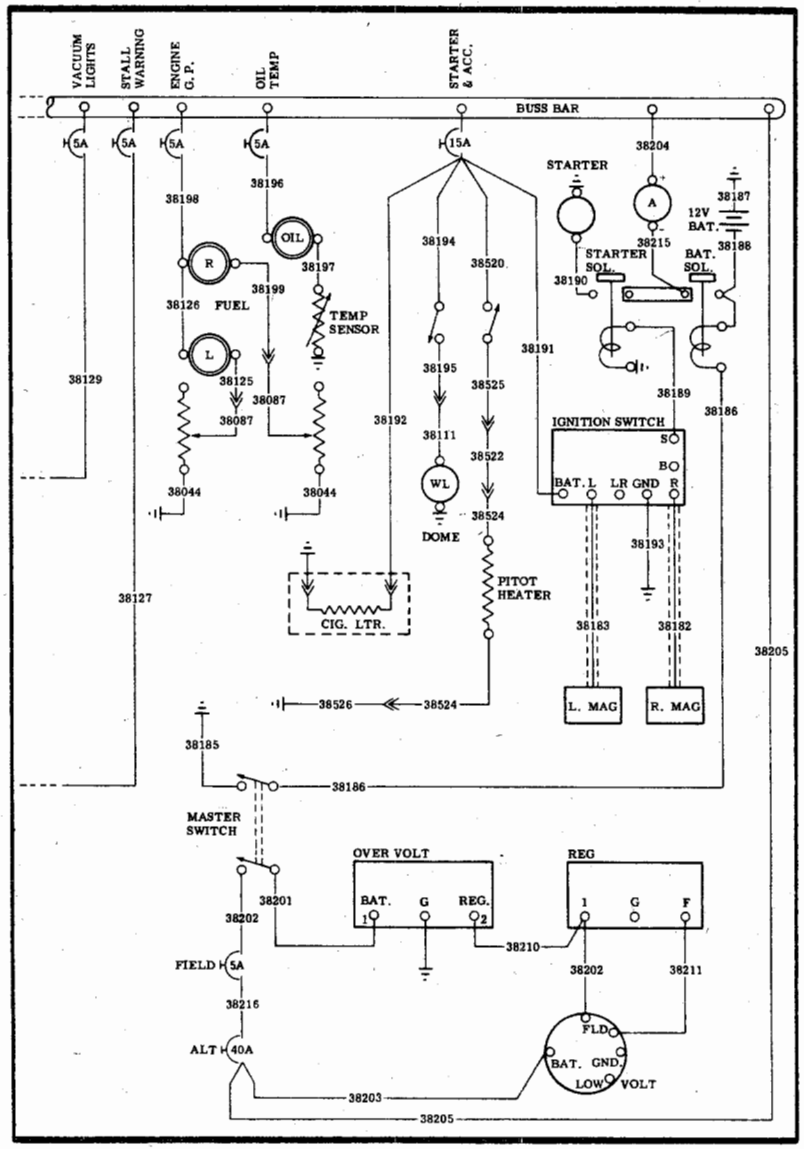


Figure 1-1. Electrical System (Sheet 2 of 2)

ENGINE WARM-UP AND GROUND CHECK

Operate engine at 1200 RPM for a minimum of two minutes, to warm up the engine, prior to ground check.

a. Throttle - 2200 RPM.
b. Oil pressure - 60-85 PSI.
c. Oil temperature - 60°F (min).
d. Magneto check - LEFT (rpm drop 125 max).
- RIGHT (rpm drop 125 max).
e. Carburetor heat - RPM DROP.
f. Alternator - CHARGING.

TAXIING

a. Nose gear - STEERING.
- STRUT ACTION.
b. Main gear - STRUT ACTION.
c. Brakes - BRAKING ACTION.

BEFORE TAKEOFF

a. Mixture - RICH.
b. Instruments - NORMAL.
c. Flaps - UP (normal)
d. Flight controls - FREE.
e. Elevator trim tab - NEUTRAL.
f. Seat belts - BUCKLED.
g. Cabin door - LATCHED.
h. Electric fuel pump - OFF.

TAKEOFF

Conventional flying techniques are used for takeoff. Position the nose wheel straight ahead before applying power. Advance the throttle to full power evenly and check for full engine rpm. Apply slight back pressure on the control column to raise nose wheel as the aircraft approaches flying speed. Use rudder to maintain directional control during the takeoff roll.

EXTERIOR INSPECTION

Perform a walk-around Exterior Inspection of the aircraft as illustrated and shown on the preceeding pages.

BEFORE STARTING ENGINE

Head aircraft into the wind when possible before beginning the engine prestart check.

a. Parking brake - SET.
b. Master (battery) switch - ON.
c. Fuel quantity indicator - CORRECT READING.
d. Fuel tank selector - BOTH.
e. Wing flaps - UP.
f. Cabin lights - ON (night flight).
g. Elevator trim tab - NEUTRAL.
h. Altimeter - SET (airport altitude).
i. Clock - SET.

STARTING ENGINE

a. Electrical accessories - OFF.
b. Carburetor heat - COLD.
c. Mixture control - RICH.
d. Throttle - OPEN (1/10 of travel).
e. Primer - NORMAL (as required).
f. Electric fuel pump - ON.
g. Ignition switch - START (release when engine fires).
h. Electric fuel pump - OFF (to determine that engine-driven pump is operating).

NOTE

Limit starter operation to 12 seconds in every 5-minute period.

SECTION II
OPERATING INSTRUCTIONS

Now that you are familiar with the various features of the aircraft and how each system functions, the next step is to acquaint you with the aircraft operating procedures. We have emphasized quality, simplicity, and high performance in the manufacture of your LARK. It is now up to you to sustain and enhance these qualities by giving personal attention to the suggested operating procedures. Careful attention to these operating procedures will assure that every flight is made safely and will establish your confidence in the aircraft. Acrobatic maneuvers, including spins, are prohibited. Nighttime operations are authorized when the required night lighting equipment is operating properly.

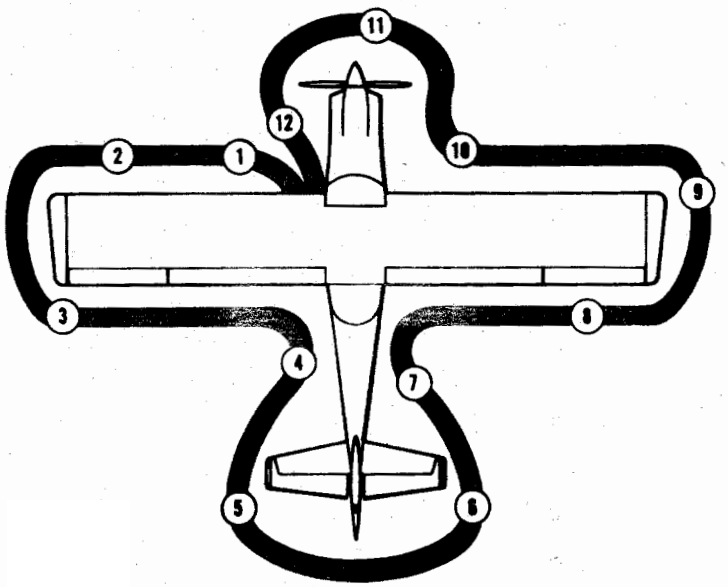
PREFLIGHT CHECK

Flying safety and aircraft reliability demand the accomplishment of a careful preflight check. A thorough preflight check will give you a day to day picture of the overall condition of your aircraft. Correction of any minor defects will assist in eliminating the development of major problems.

INTERIOR INSPECTION

a. All electrical switches - OFF.
b. Master (battery) switch - ON.
c. Fuel quantity indicator - CHECK.
d. Master (battery) switch - OFF.
e. Ignition switch - OFF.
f. Trim tabs - NEUTRAL.
g. Circuit breakers - IN.

EXTERIOR INSPECTION **WALK AROUND**



Before performing the exterior inspection remove and store the wheel chocks and surface control locks. Also remove the tie-downs from the nose and main landing gear, and from the wings and tail cone. If a night flight is planned, turn master switch on and check that all exterior lights operate properly.

EXTERIOR INSPECTION

LEFT SIDE OF AIRCRAFT

1. Static Air Source ..... UNOBSTRUCTED
   Wheel Strut ..... CONDITION
   Wheel Fairing ..... SECURITY
   Wheel Brake Line ..... CONDITION & SECURITY
   Tire ..... CONDITION & INFLATION
   Fuel Vent Line ..... CONDITION
   Wing Strut ..... CONDITION & SECURITY

2. Wing Leading Edge ..... CONDITION
   Stall Warning Device ..... CONDITION
   Pitot Tube ..... COVER REMOVED
   Wing Tip ..... CONDITION

3. Aileron & Hinges ..... CONDITION
   Wing Flap, Hinges & Rods.. CONDITION
   Fuel Filler Cap ..... SECURE

4. Baggage Door ..... LOCKED
   Aft Fuselage ..... CONDITION

5. Horizontal Stabilizer ..... CONDITION
   Elevator & Hinges ..... CONDITION
   Vertical Stabilizer ..... CONDITION
   Rudder & Hinges ..... CONDITION
   Tail Cone ..... CONDITION

RIGHT SIDE OF AIRCRAFT

6. Horizontal Stabilizer ..... CONDITION
   Elevator & Hinges ..... CONDITION

7. Aft Fuselage ..... CONDITION

8. Fuel Filler Cap ..... SECURE
   Wing Flap, Hinges & Rods.. CONDITION
   Aileron & Hinges ..... CONDITION

9. Wing Tip ..... CONDITION
   Wing Leading Edge ..... CONDITION

10. Wing Strut ..... CONDITION
    Tire ..... CONDITION & INFLATION
    Wheel Brake Line ..... CONDITION & SECURITY
    Wheel Fairing ..... SECURITY
    Wheel Strut ..... CONDITION
    Static Air Source ..... UNOBSTRUCTED

11. Propeller & Spinner ..... CONDITION
    Nose Wheel Strut ..... CONDITION & INFLATION
    Nose Wheel Fairing ..... SECURITY
    Nose Tire ..... CONDITION & INFLATION

ENGINE

12. Oil Quantity ..... 6-8 Quarts
    Air Scoop ..... UNOBSTRUCTED
    Engine Cowling ..... SECURE
    Fuel Strainer Quick Drain ..... CHECK FOR WATER