

PAGE NO.24.

11. Starter: Insert the hand crank and wind until maximum revs off the starter have been obtained.
12. Switch on (Position 1 &2) & Generator Main Line switch ON.
13. Engage the starter from the cockpit.
14. As soon as the engine starts, move the primer slowly until the engine begins to rev up. Then lock the primer in position. If the oil pressure does not pick up to 2.7 H.P.2. Shortly after starting, then stop the engine
15. When the oil pressure reaches 2.7 H.P.2. place the air screw in fine pitch.
16. When the engine is idling, open the throttle slowly to 1000 R.P.M. for running up

Attention: When the engine is cold, do not open or close the throttle too quickly as there is a danger of backfiring and the consequent fire hazard.

WARMING UP

1. Mixture control should be set at "Full Rich"
2. Keep the engine turning at 1000 R.P.M. until the oil temp. reaches 40°C in normal weather or 10°C in Cold weather

PAGE NO.21.

Adjusting the Rudders:- The rudders are adjusted by means of levers on the inside of each pedal. These levers operated by the feet, disengage the spindles, and allow the adjustment tubes to be lengthened or shortened, as the pilot wishes.

Seat Adjustment:- The seats are equipped with a shock cord arrangement, allowing them to be raised or lowered. A handle controlling the release spindle is situated on the right side of each cockpit.

Opening and Closing of the Enclosed Cockpits:
The sliding hoods may be opened or closed from the inside by means of a handle and from the outside by a small lever. Both handles and levers are on the pilots left.

PAGE NO. 22.

ENGINE DATA
GENERALITIES:

Engine : "Wright Whirlwind" R-975-E3

Characteristics:

(Consult the manufacturers power curve)
Specification #125L of the Wright Aeronautical Corporation.

Fuel: 80 Octane O.F.R.

Specification #5802 of the Wright
Aeronautical Corp.

Oil : Viscosity 115-125
Specification #5815 of the Wright
Aeronautical Corp.

Power at Rated R.P.M.

Take-Off: 456 H.P. at 2250 R.P.M. with a
manifold pressure of 122 pieces
(at sea level for one minute only)

Normal:- 426 H.P. at 2200 R.E.M. with a
manifold pressure of 116 pieces
at 1400'

Useful R.P.M.: Considering that fine pitch
is a compromise between the optimum pitch
for take-off and the optimum pitch

PAGE NO. 23.

for climbing. The true R.P.M. of the engine
for take-off will be about 200 less than
the maximum.

Starting the Engine

1. Head the aircraft into wind.
2. Turn the airscrew at least three times
by hand in the direction of rotation,
in order to clear the oil from the cylinder

N.B. This operation must be done with the

switches off.

3. Lock the parking brakes.
4. Fuel - right tank on.
5. Carburettor Air Heat COLD.
6. Airscrew: CoarsePitch
7. Mixture Control - Full Rich ("g")
8. Throttle - Open 1" (approx) measured on
the quadrant.
9. Hand Fuel Pump - Pressure 0.17 -0.24 H.P.
10. Priming: Give the engine from four to six
strokes of the primer when the engine is
cold and from 2-4 when it is warm. Never
prime the engine when it is at its working temp.

N.B. The handle of the primer must be in
the locked position when not in use. To
lock it, press in and turn to the right.

the engine is turning over at 600 R.P.M. and hold at this R.P.M. until the cylinder head temp is 150°C or less. If the engine must be stopped before being suitably cooled, do so from 1000 to 1200 R.P.M.

4. Open the mixture control to "0", the engine will stop almost immediately. Do not touch the throttle or the switches before the engine is completely stopped.
 5. Switch off, Generator Main Line Off, all other switches off.
- MIXTURE CONTROL: The mixture control adjustment calibrated in kilometres, must be at the "9" mark for take offs for climbing at full power, or nearly full power and for prolonged high speed below 1200M. Above 1200M. the mixture may be leaned out for smoother running of the engine, by getting the mixture control at the figure corresponding to the height of the aircraft in kilometres, taking care however that the engine runs smoothly. The mixture control must be placed in the rich position (moved rearward)

SELECTORS FOR THE GYRO INSTRUMENTS:-

The Gyro Instruments may be driven either by the engine driven pump or by Venturis provided for this purpose. Two selectors are provided at the left end of the instrument panel of the front cockpit. The top selector, which controls the suction pump has two positions, closed and open. For the instruments of both cockpits. The Venturis are controlled by the bottom selector which has three positions, "STOPPED" for the instruments of both cockpits. "FORWARD" for the instruments of the front cockpit and "REAR" for the instruments of the rear cockpit. Use the Venturis only in case of failure of the engine driven pump. N.B. When one of two selectors is open make sure that the other is closed.

Electrical Controls:- All the switches and rheostats of the electrical installation are placed in the control panel. (elec) These shielded panels are situated on the left side of the switches and rheostats is clearly designated. All the fuses, except one situated in the control panel of the generator are situated in the electric panel on the left.

under the instrument panel of the front cockpit. The rear electrical panel only carries switches for the rear instrument panel. The gas guages and some navigation lights. All other electrical controls with the exception of the individual lights on each cockpit are located in the instrument panel of the front cockpit.

Locking of the Flight Controls: The mechanism for locking the controls is mounted on a pivot immediately in front of the control column on the floor of the front cockpit. The handle painted red, is situated to the left and in front of the foot of the control column. To lock the controls, put the rudders and the ailerons in neutral position and the control column fully forward. Pull the handle towards the back in the direction of the control column and press fully down. Pressing it down in this manner will lock the catch, which is naturally released by the back and forth movement of the control column. To unlock, simply pull the lever towards the back and released it.

Parachute Flare Controls:- Two handles for dropping parachute flares are found on the lower right hand side of the front cockpit near the pilots seat. The flares are controlled individually by each handle

3. Open the throttle to 100 pieces (max) man. pressure long enough to test each magneto by turning the switch to No. 1 then No.2 position. The drop in revs on each magneto should not exceed 100 R.P.M. See that the fuel pressure is from 0.175-0.245 H.P.2 and that the oil pressure is from 4.1 - 5.5 H.P.2.
4. Continue to warm up the engine if the oil pressure drops as the throttle is opened.
5. For take-off the oil temp. must be at least 40°C.
6. The cylinder head temp. must not exceed 260°C on the ground.
7. On the take-off the cylinder head Temp. ought to be between 120 and 205°C.

STOPPING THE ENGINE

1. The engine should be stopped as soon as possible after landing to avoid heating up/
2. Place the air screw in "Coarse Pitch" and run up the engine until the blades are in full coarse pitch in this position, the cylinder of of the pitch changing mechanism, covers and protects the piston .
3. Close the throttle until .

CYLINDER HEAD TEMPERATURES.

The temperature given below must never be exceeded:-

1. During short climbs, and for periods not exceeding 5". Maximum of 260°C
2. Cruising R.P.M. 232°C

During long steep climbs, the cylinder head temp. may rise considerably in such a case it will be necessary to maintain a higher airspeed than that for the most efficient climbing angle (153 kilometres /h) in order to cool the engine sufficiently.

An increase of from 8-16 Km/h airspeed will lessen the cylinder head temperature considerably with a negligible decrease in the rate of climb.

THE AIRSCREW

The aircraft NA-64 P.2. is provided, with a two bladed, to position, Hamilton Standard variable pitch airscrew, diameter 2.74 M. The blades are mounted so as to give the maximum pitches, given below. The pitch is measured from a section taken at a distance of 106.7 C.m. from the centre of rotation.

Angle of fine pitch
(high R.P.M.)

..... 13° APPROX.

Angle of coarse pitch
(low R.P.M.)

..... 18° APPROX.
The airscrew will be in fine pitch for take off

Each control has four positions

Closed, Right, Left and Reserve
Starting Controls:-

The starting Control is mounted on a panel situated immediately under the instrument panel on the right side of the front cockpit. To operate the control, pull the handle. To engage the hand inertia starter with the engine after having cranked the starter by means of the starting crank, provided in the baggage compartment. In pulling on the handle which engages the starter, the starter dog is automatically engaged.

ANCILLIORY CONTROLS

Flap Controls:- A crank controls the flaps, and is mounted on the same support as the elevator trimming control and the hand operated fuel pump. On the left of each of the pilots cockpits. The flaps are raised by turning the crank clockwise and lowered by turning in the opposite direction. An indicator of the position of the flaps graduated in degrees, is placed immediately in front of the elevator trim in the front cockpit and behind the elevator trim in the rear cockpit.

NOTE:- Do not lower the flaps at any indicated airspeed greater than 200 Km/h, 124 M.P.H.

PAGE NO.18.

BRAKE CONTROLS:- The brake pedals are incorporated with the rudders, they are hydraulic and are operated individually either from the front or rear cockpit. A device for locking the brakes is in the front cockpit on the right of the instrument panel. To lock the brakes, pull the handle out and press both brake pedals, release the pedals and then the handle. The brakes may be unlocked from either cockpit by pressing on the pedals.

HEATING CONTROL OF THE PITOT TUBE:- A switch on the electrical panel of the front cockpit is provided for the heating element of the Pitot and Static Head. Heating should only be employed to anticipate the formation of ice and dampness in the static and pitot heads during cold weather.

FRESH AIR INTAKE FOR THE COCKPIT:- The duct which controls the ventilation is situated between the brake pedals on the floor of the front cockpit at the end of the FRESH AIR intake tube. The opening of the duct is controlled by the foot, by means of a butterfly and a toothed disc. The rotation of the disc, ahead of the closed position, opens the FRESH AIR intake. A ventilation door, operated by a knob, is situated to the left of the rear cockpit under the fire extinguisher. In addition to this method of ventilation, the sliding hoods of the cockpit may be opened.

PAGE NO.27.

before any manoeuvre entailing a loss of height. See pages 31 and 32. For use of the mixture control in conjunction with the carburettor Air Heat Control.

Attention:- Do not lean the mixture out too much to avoid over heating the engine. In weak mixture the cylinder head temperature must be carefully watched. Be sure and set the mixture control at "Full Rich" "9" before exceeding cruising R.P.M. or when diving, or when gliding in to land.

Adjustment of the Mixture Control For Economic R.P.M. in level flight at 2000 R.P.M. or less, a more economical fuel consumption will be obtained if the mixture control is opened until a drop of 10-20 R.P.M. is noted. The throttle setting remaining the same. This drop should be obtained as soon as the control is opened e.i., moved forward. At cruising speed the mixture must never be leaned out sufficiently to cause the cylinder head temp. to rise to 230°C.

IDLING CUT-OUT By moving the mixture control to the full lean position ("0") the idling jet is cut out, stopping the engine quite quickly. When using this method, it is useless to shut off the gas before the engine has completely stopped.

PAGE NO.30.

<u>OIL PRESSURE</u>		
Maximum	5.5 H.P.Z.
Optimum	4.1 - 5.5 H.P.Z.
Minimum Allowable (cruising speed)	4.1 H.P.Z
Minimum (Idling)	1.5 H.P.Z

OIL TEMPERATURE

Minimum Allowable for take-off	40°C
Optimum	60°C
Maximum Allowable	88°C

The oil feed system is comprised of a tank with oil lines to the engine and return. The tank is provided with a heating chamber, to shorten the warming up period. This cylindrical chamber has a capacity of 5.7 litres (approx) only the oil contained in this chamber circulates at the time of heating. As this oil is used, relatively fresh oil is admitted from the tank which allows an interval between clearings.

Placed on the feed line from the engine to the tank is an oil radiator equipped with a "By-pass" worked by a spring, so as to allow the oil when it is warm (lessening the pressure on the line) to go through the radiator, and when it is cold to return directly to the tank. The oil circulation takes place in this manner:-

PAGE NO.15.

To make the aircraft tail heavy, turn the control towards the back (counter-clockwise), this depresses the flettner and in this way raises the elevator, giving the required movement for the nose heavy condition turn the control forward (clockwise).

The rudder is provided with a fixed metal trimming tab which is only adjustable on the ground. The ailerons are also provided with trimming tabs, which may be shortened or lengthened, for lateral stability.

ENGINE CONTROLS

The engine controls are of the rigid type (steel tubes) the throdle, mixture control, and pitch control. The control levers for the above, are all mounted on the same quadrant found on the left side of each cockpit. These are joined to the rods. These controls act in the following manner:

<u>CONTROL</u>	<u>POSITION (BACK)</u>	<u>POSITION (FORWARD)</u>
Throdle	closed	open
Mix. control	Rich	Lean

PAGE NO.16.

The forward movement of the pitch control lessens the pitch with increase in engine revolutions. The backward movement of the control increased the pitch with a decrease in engine R.P.M.

CARBURETTOR AIR HEAT CONTROL

Warm air from an arrangement on the exhaust manifold can be sent into the carburettor by means of a pipe leading into the air intake underneath the carburettor. The control which is a vernier adjustment is situated on the lower left hand corner of the panel below the instrument panel in the front cockpit. The control must be lowered to raise the temperature of the ingoing air and raised to lower it. The temp. of the mixture leaving the carburettor is shown by a thermometer mounted on the instrument panel.

Hand Operated Fuel Pump

The handle of this pump is situated on the left of each cockpit, between the elevator trimming control and the flap operator, it is painted yellow.

GAS SELECTOR COCK

These control, painted yellow, are placed to the left of each pilots' cockpit and are directly connected to a selecting arrangement common to both.

PAGE NO.29.

and for climbing.

<u>FUEL SYSTEM</u>	
Total Fuel capacity	394 Litres
Reserve	62.45 Litres (included in the) (total capacity)

<u>Fuel Pressure</u>	
Minimum	0.175 H.P.Z.
Optimum	0.175 - 0.245 H.P.Z.
Maximum	0.245 H.P.Z.

The fuel is distributed between two tanks, each having the capacity of 197 litres, which are located in the main part of the wing. This capacity allows an approximate endurance of 5 hours at cruising speed. The fuel line from the left tank leaves a balance of 62.45 litres. The fuel line of the reserve is at the bottom of tank. A fuel selector cock is situated at the left of each cockpit. The fuel tanks are independant of each other. It is necessary then to go from one to the other then to the reserve to exhaust the fuel. When the fuel level in the right tank is very low, or when using the left tank in flight, the selector cock must be turned on RESERVE, before diving, taking off, landing or any manoeuvre at all. When level flight is resumed, go back to the same tank in order to save the reserve.

<u>OIL SYSTEM</u>	
<u>Oil capacity</u>	- 36 litres.

PAGE NO.14.

Fixed on a mounting of light alloys which is mounted on the aileron controls. The tube is braced in two places on the members of the fuselage. Stops are provided on the assembly to limit the movements of the control column. The control column of the rear cockpit is removable, and when not in use should be placed in the support provided for this purpose on the right of this cockpit.

RUDDERS:- Direction is controlled by two pedals, adjusted according to the wishes of the pilot. The rudders of both cockpits are (interconnected). The rudder movement is limited by stops. On the beam of the fixed vertical plane. The rudder also controls the movement of the tail wheel.

TRIMMING TAB CONTROLS:- The elevators are equipped with adjustable trimming tabs, controlled by a system of cables and pulleys, which are actuated by the trimming control on the left of each cockpit. The control cables are attached to the tabs by means of a drum and a non-reversible mechanism, provided in the leading edge of each flettner. This mechanism is joined to the tab by a rigid control. To place the trimming control neutral position, wind the trimming control until the mark on the wheel coincides with the mark on the longeron.

PAGE NO.31.

A line from the bottom of the tank goes to the engine driven pump. After having circulated through the engine, the scavenge pump returns the oil to the tank through the cuno filter and the oil radiator.

HEATING OF THE CARBURETTOR:- The practice of heating the carburettor is necessary, in order to avoid or abolish the formation of ice, which is usually produced in the carburettor air intake, when the throttle is partly open (moderate or low manifold pressure) during conditions of high humidity at different temperatures. Icing of the carburettor can generally be detected at cruising speed by a gradual diminishing of the manifold pressure and R.P.M.'s for a fixed throttle setting in constant level flight. When the throttle is wide open, icing may be detected by the roughness of the engine.

PRECAUTIONS AGAINST ICING: To prevent icing in unfavourable conditions, the mixture in the carburettor must be kept at a temperature of from 3° - 5° C. When the temperature of the carburettor air falls below 3°C, the carburettor air heat control should be moved to the WARM position, until a temperature

of 5 C is obtained. Before moving the heat control to warm or cold, the mixture must be enriched. Having regulated the heating, lean out the mixture until the engine runs smoothly.

CAUTION: - If the mixture is not enriched before adjusting the heating control, there is danger of the engine stopping completely.

DE ICING: - To de-ice the carburettor, put the heat control to WARM, until the manifold pressure and engine R.P.M. pick up, indicating that the carburettor air intake is free from ice. NEVER exceed an indicated mixture temperature in the carburetor of 400 C. Owing to the high manifold pressure at take-off it is very important that the carburettor heat control is set at COLD before the take-off, except in unusually cold or damp weather conditions. (in that case regulate the heating of the carburetor from 3°-5°C) The high mixture temperature resulting when the heat control is set at warm, causes a loss of engine power, and may lead to detonation and its serious consequences.

Left part of the upper transverse tubes of the fuselage. An adjustable rear vision mirror is situated to the right of the cowl. A head rest is mounted on the nose-over structure behind the pilot.

GLASSED-IN CABINS

The two cockpits are in tandem, in the same cabin, with sliding cockpit covers for the entry & exit of the crew. These may be locked open in 3 intermediate positions in the rear cockpit, and 4 in the front. The side panels of the sliding covers may be widened by grips provided on the inner lower right part of the panels so as to permit the exit of the crew.

EXTINCTEUR A hand extinguisher is situated inside the fuselage on a door on the left-hand side of the rear cockpit. It is just as easy to reach from the rear cockpit in flight as it is while the aircraft is on the ground. To reach the extinguisher, from the outside, press on the red button above the door.

FLIGHT CONTROLS
Each cockpit is equipped with a complete set of Flight Controls.

CONTROL COLUMN
The control column for the ailerons and elevators is a tapered tube.

PERFORMANCEGENERALITIES:-

The following graphs of the flight control are based upon the normal tare weight of the aircraft. The first (page 35) allows the pilot to control the power in level flight by giving the relation between power, manifold pressure and R.P.M. at that height. Graphs 2&3 (page 36 and 37) give first the relation between indicated altitude, temperature of the surrounding air, and the altitude corrected for temperature and secondly, true airspeed at any altitude for an indicated airspeed at any percentage of maximum power. The fourth (page 38) gives the fuel consumption in litres per hour, in relation to the percentage of power given by the first or third graph.

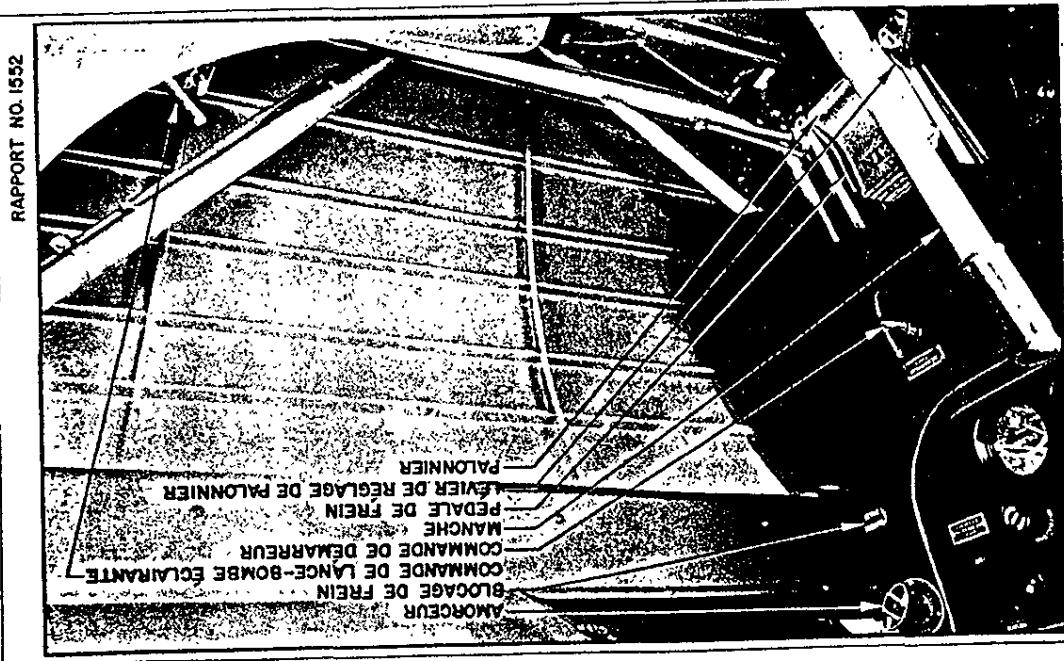
USE OF THE POWER CONTROL GRAPH:

To regulate the power for a fixed throttle setting at any height, consult the power control graph and proceed as follows:-

1. Determine on the graph the percentage power corresponding to a given R.P.M. and manifold pressure.

Example:-

At 1950 R.P.M. for a manifold pressure of 93 pieces the power is 314 cv (H.P.)

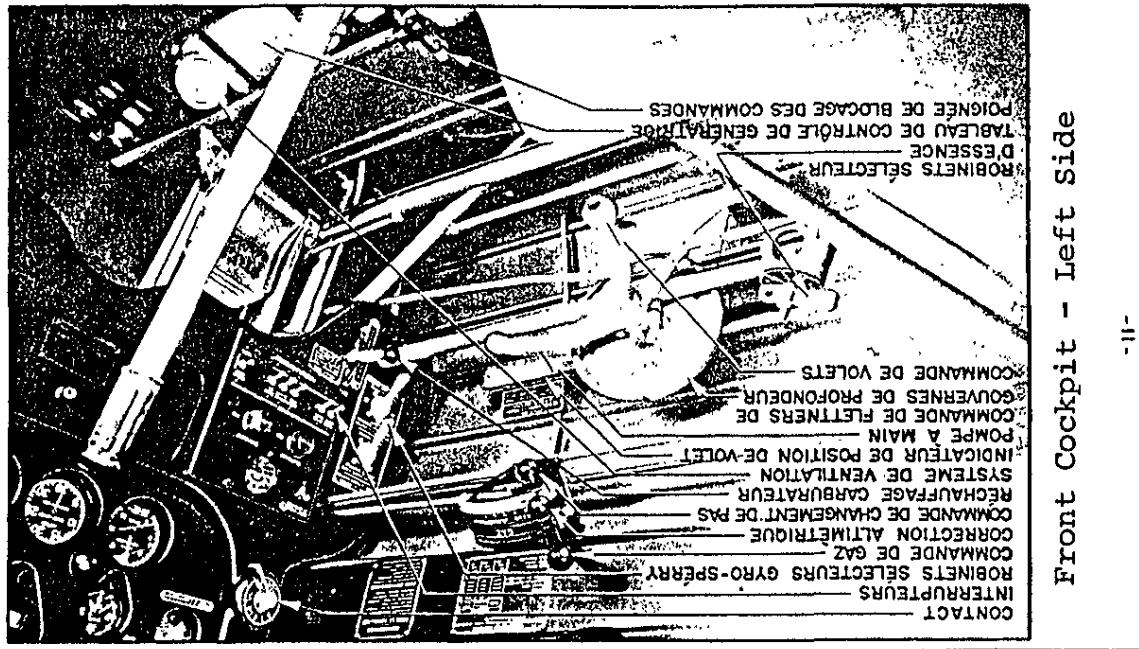


Front Cockpit - Right Side

From this point draw a parallel to A-A, for a given altitude. This curve will give, on the left, the power and on the right the percentage power.
Example:- at 2000 M. 314 cv (h.p.) is 74% of the maximum power.

NOTE: The power varies with the altitude on the parallel A-A independently of the R.P.M. and the manifold pressure.

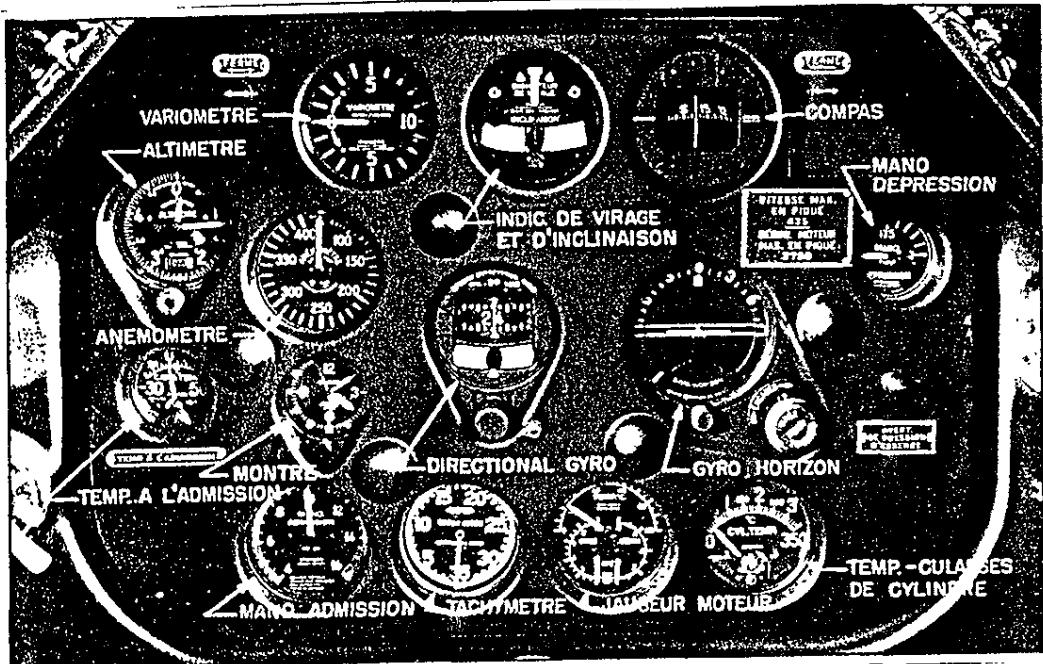
3. The variation of the power with the temperature of the carburetor mixture is about 1% for a variation of 5°C of the temperature of the mixture at the given altitude (the power diminishes with an increase in temperature)



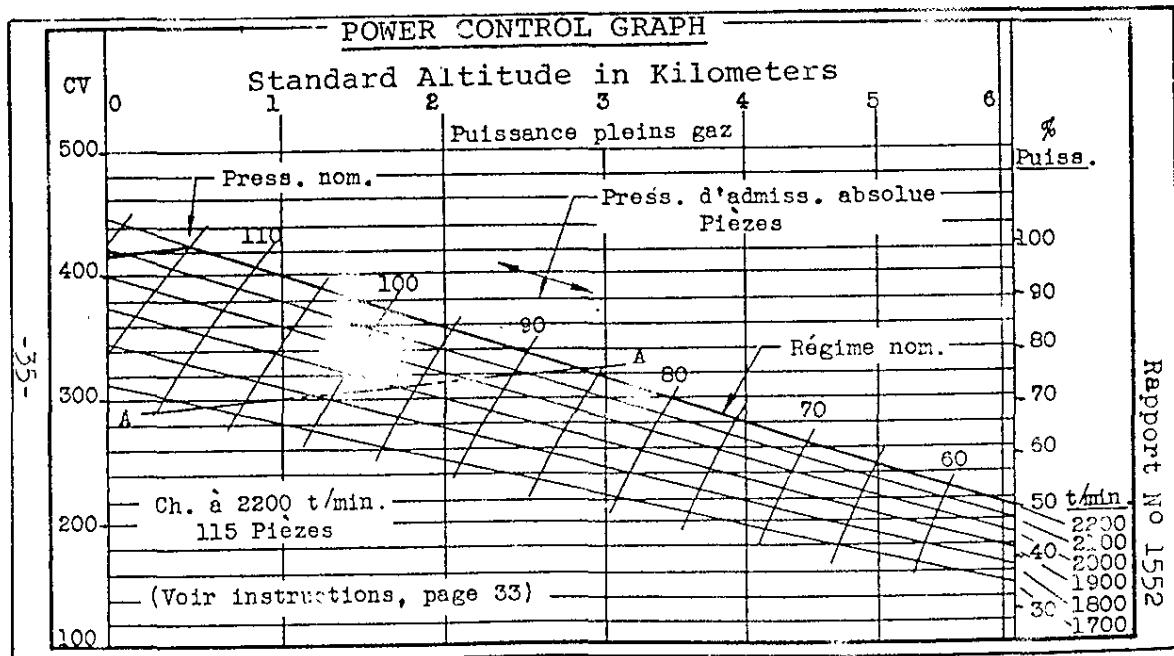
Front Cockpit - Left Side

Instrument Panel - Front Cockpit

-10A-



RAPPORT NO 1552



ARRANGEMENT OF PILOTS COCKPITS-CONTROLS

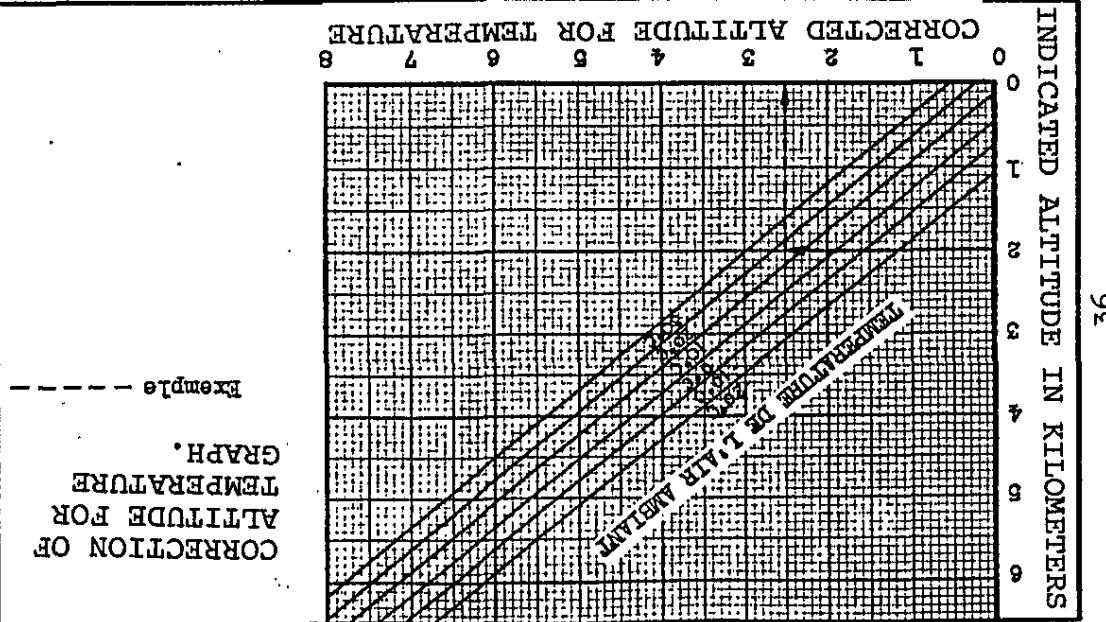
ARRANGEMENT

GENERALITIES:- The two cockpits are arranged in a similar manner; the essential difference being that certain instruments are found only in the front cockpit.

The engine instruments, the flight instruments & navigation instruments are mounted in groups on the instrument panel situated in front of each cockpit.

An empty compartment is provided in the centre of the bottom panel of the instrument panel in the front cockpit. It is opened by pressing the button downwards. A map compartment is found on the right side of the rear cockpit. A baggage compartment is provided in the monocoque part of the fuselage behind the rear cockpit. To open press the upper part then pull the lower part of the lever. A hinge is provided to hold the door open. The door has a lock, the keys of which are supplied with the aeroplane. The seat of each cockpit is designed to accommodate a back type parachute; It is equipped with a cushion, a safety belt and a urinal device. Hooks are now provided on each side of the seats to hook onto the belts, when not in use. A bracket for the rip cord is provided immediately behind each seat in the

CORRECTION OF
ALTIMETER FOR
TEMPERATURE
GRAPH.



PAGE NO.9.

GENERAL CHARACTERISTICS

AIRCRAFT NA-64-P2

LANDING SPEED AT SEA LEVEL 96.5 Km/h
(flaps lowered) (60 M.P.H.)

Flaps Raised 112.5 Km/h
(70 M.P.H.)

Maximum Rate of Climb 342M/M
1120'/Min

Take off/run to Clear an
Obstacle 50' (15.25 287M
(950')

Landing Run after Clearing
Obstacle 50' (15.25M) 266.5M
875 Ft.)

Time reqd. to climb to 3320 M 11.36 Mins
(10,000)

Ceiling Aircraft Fully Loaded 5350 M
17,500 Ft.

Endurance at Cruising Speed 5 hrs.
1175 Km
(730 M)

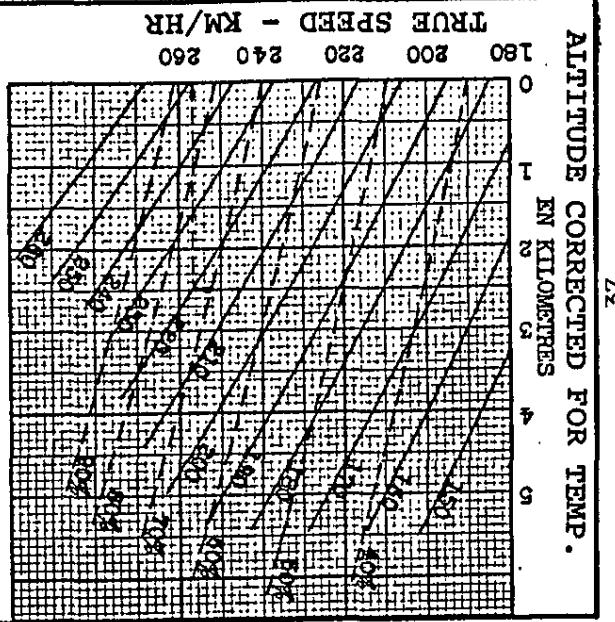
Range at Cruising Speed 2 hrs. 48m.
765 Km
Range at Max. Speed (Rated Alt.) (475 M)

Report No 1552

GRAPHIQUE DE CORRECTION DE
L'ALTITUDE EN fonction DE
LA TEMPERATURE

TRUE SPEED

Exemple ————— % POWER
———— INDICATED SPEED
———— Projeter l'altitude soit sur
la courbe de vitesses indi-
quées soit sur celle du
pourcentage de puissance et
rappelez la vitesse réelle.



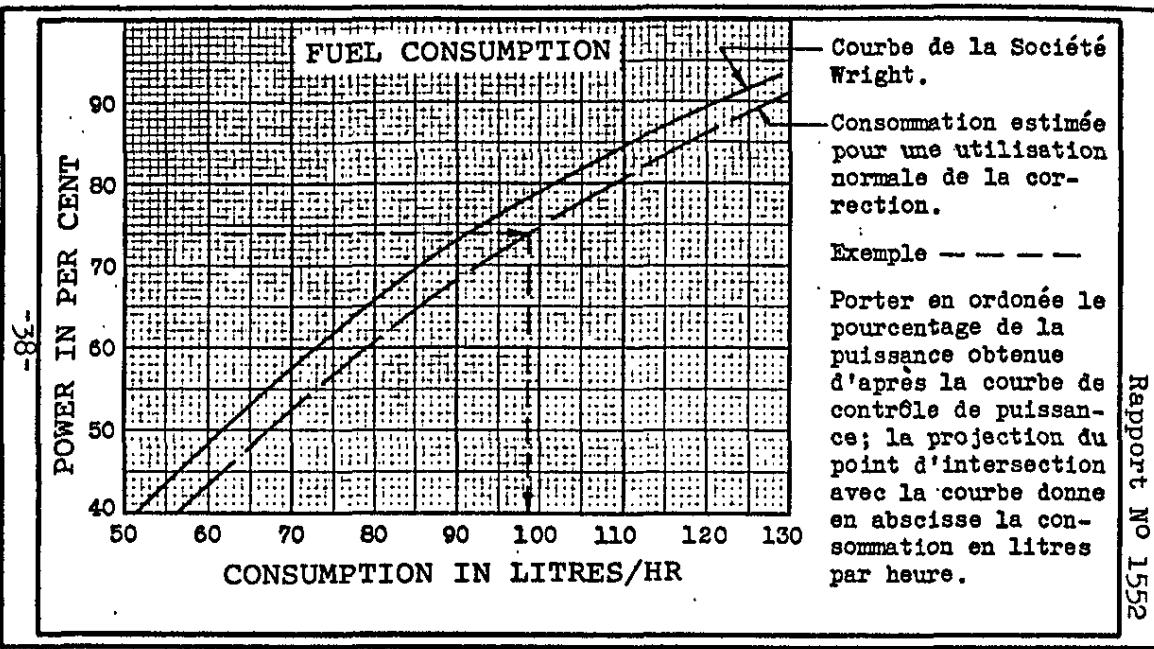
ALTITUDE CORRECTED FOR TEMP.

-37-

Rapport No 1552
Report #1552

GENERAL CHARACTERISTICS

AIRCRAFT NA-64 P2

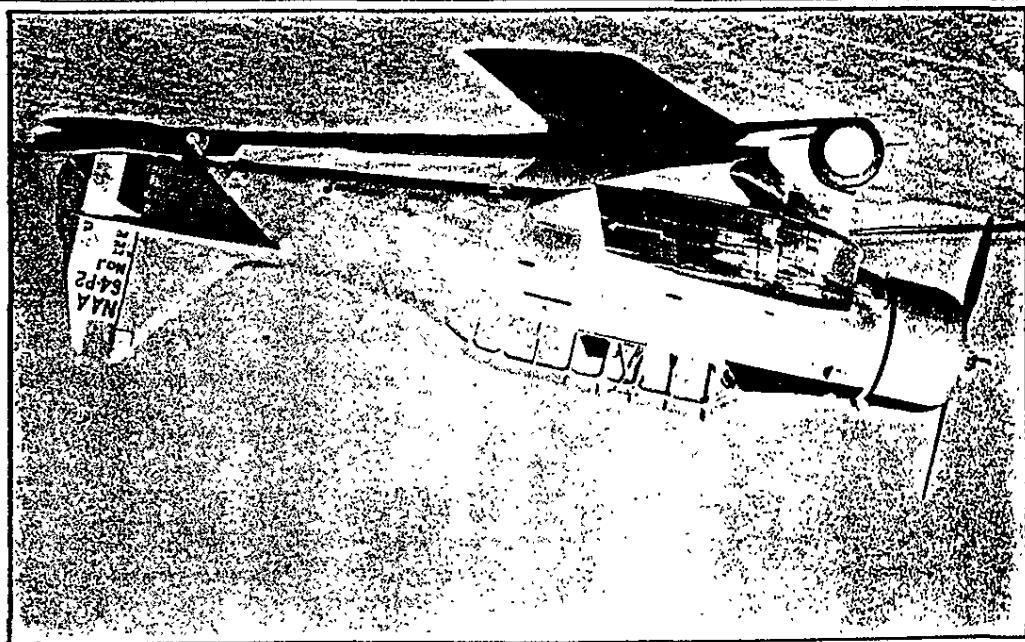


Normal Take Weight	1946 KG (4291#)
Total Capacity of Fuel Tanks	394 L. (104 Gals)
Fuel Reserve (included in Total)	62.45 L. 16.5 Gals.
Wing Area	22.42M2 241.672 Ft.
Wing spread	12.20 M. 40'1 7/16"
Rated H.P. of the Engine	426 Cv. (420 H.P.)
Rated Altitude	425 M. (1400 ft) ³
Wing Loading	86.7 Kg/M ² 17.76 lbs./ S.Ft.
Wt. Per H.P.	(10.22 lbs. /H.P.)
Maximum Speed at Rated Alt.	274 Km/h 170.2. M.P.H
Maximum Speed at Sea Level	267 Km/h (166.M.P.H.)
Cruising Speed at rated altitude, with 64% power (throttle partly open)	235 Km/h 146 M.P.H.

NORMAL READINGS OF THE INSTRUMENTS

As an example of the normal readings of the instruments the following may be taken from R.P.M. in level flight at cruising speed.

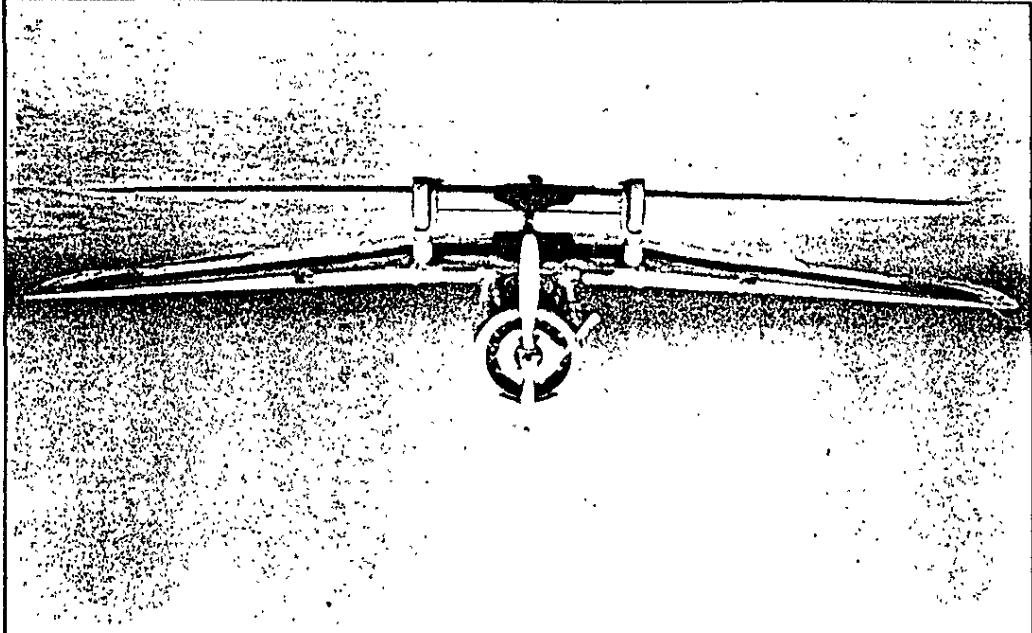
Height	2000 M
Pitch	Coarse
Airspeed	220 KM/hr.
Manifold Pressure	93 pieces
R.P.M.	1950 R.P.M.
Mixture Control	"2"
Carburettor Air Heat	Cold
Oil Pressure	49 H.P.Z.
Oil Temperature	65° C
Fuel Pressure	0.21 H.P.Z.
Air Intake Pressure	0° C
Cylinder Head Temp.	180° C



NA-64 P-2 Aeroplane - Left Side

NORMAL READINGS OF THE INSTRUMENTS

As an example of the normal readings of the instruments, the following may be taken from R.P.M. in level flight at cruising speed.



NA-64 P-2 Aeroplane - Front View

PAGE NO. 5.

FORWARD

The object of this manual is to provide instructions for pilots on Type NA-64 P-2 Aircraft.

More detailed information may be found in the Maintenance and Repair Manual, from the description manual and from the use of the aircraft, which are also supplied.

PAGE NO. 40.
ELECTRICAL INSTALLATION

The electrical installation is the single wire type, for more detailed instructions consult the blue print which is in the map case on the right hand side of the rear cockpit.
Spare lamps and fuses are found in an accessible box. Situated on the rudder support in the rear cockpit.
All the lamps of the instrument panel and cockpits can be replaced in flight.

PAGE NO. 41.
FLYING CHARACTERISTICS

The trimming tabs for the elevators are controlled from each pilot's cockpit, thus making it possible to obtain longitudinal stability of the aircraft. Trimming tabs are also provided on the ailerons in order to facilitate their operation fixed trimming tab is also provided on the rudder, for directional stability of the aircraft.

TAKE-OFF (normal characteristics)

In addition to the starting procedure, and the recommended readings of the instruments, the pilot, before taking off must observe the following rules:-

- Fuel - Open
- Controls - unlocked
- Mixture Control - "9"
- Airscrew - fine pitch (high R.P.M.)
- Flaps - Check their position
- Trimming Control - neutral
- Carburettor Air Heat - Cold. (closed)
To clear obstacles on the take-off, lower the flaps 20°, the flaps must not be raised immediately

PAGE NO. 4.

ILLUSTRATIONS

<u>PAGE</u>	<u>ILLUSTRATIONS</u>	<u>PAGE</u>
Aircraft NA-64 P-2 Front View	6	
Aircraft NA-64 P-2 Loft Side	7	
Instrument Panel, Front Cockpit	10A	
Front Cockpit, Left Side	11	
Front Cockpit, Right Side	12	

PAGE NO.3.

TABLE OF CONTENTS

	<u>PAGE</u>
De-Icing	32
Performance	33
Generalities	33
Use of the Power Graph	33
Power Graph	35
Temperature Pressure Corrections	36
Airspeed Corrections	37
Fuel Consumption Graph	38
Normal Readings of the Instruments	39
Electrical Installation	40
Flying Characteristics	41
Trimming Controls	41
Take-Off	41
Manoeuvres	42
Landing Characteristics	43
Taxying	44

PAGE NO.42.

After the take-off or when near the stalling speed, in case of engine failure in such cases, it is extremely important that the flaps be lowered. A sudden raising of the flaps may bring about a loss of speed.

MANOEUVRES Before diving the pilot must be sure that the flaps are closed, that the mixture control is FULL RICH ("9"), that there is enough fuel in the tanks, and that the throttle is approximately one-third open. Put the airscrew in Coarse Pitch (Low R.P.M.)

While diving, the R.P.M. will become too great if the airscrew is in fine pitch. With the throttle partly open in prolonged dives, the engine will tend to exceed the maximum allowable R.P.M. (2700) However, when the throttle is partly open it will prevent the engine from getting too cold, and will allow it to consume the excess fuel in the dive, ensuring that it works smoothly. Under NO circumstances exceed the maximum allowable R.P.M. (2700), and all operations over 2200 R.P.M. should be reduced as much as possible.

In diving do not exceed the maximum allowable speed 483 K.M/h (Indicated A/S)

✓62

PAGE NO.43.
LANDING CHARACTERISTICS

The landing characteristics are normal. The trimming control may be used as needed, before landing the pilot must observe the following rules:-

Mixture Control -- Full Rich ("O")

Flaps -- Lowered

Airscrew -- Fine Pitch

Carburettor Air Heat Control -- Cold

PAGE 2

TABLE OF CONTENTS

	<u>PAGE</u>
Fresh Air Intake for the Cockpit	18
Selectors for Gyro Instruments	19
Electrical Controls	19
Locking Device for the Controls	20
Parachute Flare Controls	20
Rudder Adjustment	21
Seat Adjustments	21
Sliding Hood Controls	21
Engine Data	22
Generalities	22
Power at Rated Revolutions (Max)	22
Useful Revolutions	22
Starting the Engine	23
Warming up the Engine	24
Stopping the Engine	25
Mixture Control	26
Regulation of Mixture for -Economy Revs.	27
Idling Cutout	27
Cylinder Head Temperatures	28
Airscrew	28
Fuel System	29
Fuel Pressure	29
Oil System	29
Oil Pressure	30
Oil Temperature	30
Carburettor Heating	31
Precaution against Icing	31

PAGE NO. 1.

TABLE OF CONTENTS

PAGE

Illustrations	4
Forward	5
General Characteristics	8
Arrangement of the Pilots' Cockpits	10
- Control	
COCKPIT LAYOUT	10
<u>Generalities</u>	10
Enclosed Cockpit	13
Fire Extinguisher (hand operated)	13
FLYING CONTROLS	13
Control Column	13
Rudder Pedals	14
Trimming Tab Controls	14
ENGINE CONTROLS	15
Throttle, Mixture Control, Pitch Con.	15
Carburator Air Heat Control	16
Hand Operated Fuel Pump	16
Gas Selector Cock	16
Starting Controls	17
ANCILLARY CONTROLS	
Flap Controls	17
Brake Controls	18
Heating Control of the Pitot Tube	18

PAGE NO. 44.

TAXYING WITH ENGINE

Taxying is done in a normal manner. The flaps should be completely closed, to prevent any possibility of damage.

FORWARD

PILOTS MANUAL

AIRCRAFT TYPE NA-64-P.F.

(The A/C Perfect)

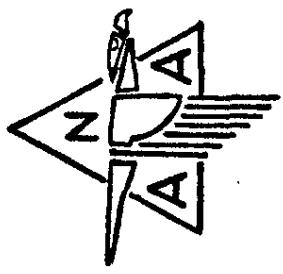
Manufactured By

North American Aviation Inc.

Inglewood, California, U.S.

MANUEL DE PILOTAGE

AVION NA-64 P-2



**NORTH AMERICAN AVIATION
INGLEWOOD, CALIF., U.S.A.**

Everything about...



**NORTH AMERICAN
AVIATION**





S I C U R O
E N G I N E E R I N G