
FLIGHT MANUAL
AS-365N2 DAUPHIN II FOR FLY! II

NOT TO BE USED FOR REAL LIFE REFERENCE

We dedicate this to Richard Harvey, the creator of Fly!

TABLE OF CONTENTS

	Page
Limitations -----	2
Instrument Markings -----	6
Cockpit Layout -----	7
Views Map -----	11
Preflight Procedure Fly! II -----	12
Preflight Procedure AS-365N2 -----	12
Interior Checklist -----	12
Pre-Start Checklist -----	13
Starting Procedures -----	15
Post Starting Checklist -----	17
Pre-Taxiing Checklist -----	18
Taxiing, Takeoff & Climbing -----	19
Level Flight -----	20
Approach – Landing -----	21
Engine and Rotor Shutdown -----	22
EMERGENCY PROCEDURES -----	23
Miscellaneous -----	27
Hints & Tips -----	28
Credits -----	29
Donations -----	30
Installation -----	31
Known Bugs -----	31
End User License Agreement -----	32

LIMITATIONS

Prohibited Maneuvers:

- Aerobatics.
- Intentional running landings on soft ground.
- Takeoff and landings on slopes steeper than 10°.
- Intentional full autorotation landings.
- Intentional single-engine flight in normal operation.
- Single-engine training and demonstration flight above takeoff power rating.
- Moving the pedals when rotor is stopped.

- Maximum approved gross weight ----- 8,507 lbs
- Power-off flight absolute Vne ----- 135 kt
- Power-on flight Vne ----- 140 kt
- Maximum landing gear operation/extend speed ----- 135 kt
- Maximum rolling landing speed ----- 55 kt

Free Turbine Speed:

- Minimum ----- 320 rpm
- Maximum transient for 5 sec. ----- 420 rpm
- Maximum continuous ----- 378 rpm

Main Rotor rpm Limits:

- Normal ----- 350 rpm ± 10
- Minimum value for single engine failure during takeoff, climb or landing ----- 320 rpm
- Minimum emergency transient value ----- 295 rpm

Power-Off Flight:

- Maximum permissible emergency transient----- 420 rpm
- Maximum steady state----- 395 rpm
- Minimum----- 320 rpm
- Minimum permissible emergency transient ----- 295 rpm

Rotor Brake Limitations:

- Maximum rotor speed for rotor brake application ----- 170 rpm
- Minimum waiting time between consecutive brakings ----- 5 minutes
- Rotor brake application is prohibited prior to engine shutdown.

Taxiing Limits:

- Maximum wheel braking speed ----- 38 kt

Transmission System Limitations:

Maximum Permissible Twin Engine Torque

- Maximum total permissible transient torque for yaw control in hover flight ----- 107 %
- Hover flight and, during acceleration prior to climb (Vy)
Total torque (Eng.1 + Eng.2) ----- 100 %
- Forward flight:
Total torque (Eng.1 + Eng.2) ----- 88 %

Maximum Permissible O.E.I. Torque:

- Maximum transient (20-sec) rating ----- 68 %
- Maximum 2.5-minute rating ----- 57 %
- Maximum continuous rating ----- 55 %

NOTE: 100% torque represents 965 kW at 350 rpm rating

- With one engine inoperative, maximum transient torque is automatically controlled by fuel-flow control limit.

Engine Limitations

The helicopter is powered by two Turbomeca “ARRIEL 1C2” engines. Engine operating limitations are determined by the gas generator speed (Ng) (Varying with altitude and O.A.T. and displayed on an analog (Δ Ng) and digital (Ng) indicator), the exhaust gas temperature (t4), maximum torque or the free turbine speed (Nf) depending on the operating conditions.

Gas Generator Speed:

ONE-ENGINE INOPERATIVE (O.E.I.)		
OPERATING SPEED	TIME LIMIT	PERMITTED ΔN_g
Transient	5 seconds	+ 5 %
Takeoff	5 minutes	0 %
Max. continuous	Unlimited	- 3.5 %

ONE-ENGINE INOPERATIVE (O.E.I.)		
OPERATING SPEED	TIME LIMIT	PERMITTED ΔN_g
2.5-minute	2.5-minutes	+ 1.5 %
30-minute	30 minutes	0 %
Max. continuous	Unlimited	- 3.5 %

NOTE: - 100 % N_g = 51,800 rpm
Minimum steady state N_g = 67 %
- Max. governed N_g rating between 103.9 and 104.6 % permitted for 12 seconds on engine failure

Exhaust Gas Temperature (t_4):

- Twin-engine operation:
 - maximum t_4 temp at takeoff rating -----845 °C
 - maximum t_4 temp at max continuous -----775 °C
- OEI:
 - maximum t_4 transient for 12 sec -----920 °C
 - maximum t_4 temperature at 2.5 minutes rating -----885 °C
 - maximum t_4 temperature at 30 minutes rating -----845 °C
 - maximum t_4 temperature at max continuous rating -----775 °C

NOTE: The above limitations will not normally be exceeded at appropriate ΔN_g speeds for engines in good condition.

- Engine starting:
 - maximum transient overtemperature -----865 °C
 - maximum continuous t_4 temperature -----783 °C

Engine Oil Pressure & Temperature:

Oil pressure:

- In flight: - normal range between ----- : 1.8 bar and 5 bars
(26.1 and 72.5 psi)
 - minimum (Ng above 85 %)----- : 1.8 bar (26.1 psi)
 - minimum (Ng between 70 and 85 %)----- : 1.3 bar (18.9 psi)
- On starting, the oil pressure may safely exceed 5 bars (72.5 psi). This pressure should never be exceeded.

Oil temperature:

- Maximum ----- : 115° C
- Minimum for power-on flight:
 - 5 cSt oil ----- : 0° C
 - 3 cSt o 3.9 cSt oil----- : -10° C

Hydraulic System Limitations:

Hydraulic Systems:

- Hydraulic Fluids: must comply with specifications
 - MIL-H-82382 for all temperature ranges
 - AIR 3520 only at temperatures not exceeding + 30° C or similar specifications:
MIL-H-SGDG, DTD 585, NATO H 515.

Hydraulic fluids of both specifications may be mixed if necessary, provided the O.A.T. does not exceed + 30° C.

- Main hydraulic system pressures:
 - Nominal hydraulic pressure-----60 ± 8 bar (870 ± 116 psi)
 - Maximum hydraulic pressure----- 72 bar (1,044 psi)

INSTRUMENT MARKINGS

Color code:

- Red and White line -----: Limit speed in autorotation
- Red line-----: Minimum or maximum safety limit
- Yellow arc -----: Caution range
- Yellow line-----: Caution range limit
- Green arc -----: Normal operating range
- Red triangle -----: Emergency transient limits
- White triangle -----: Equipment item operating limit
- Yellow radial dotted line-----: 10-min. rating limit
- Red radial dotted line-----: 2.5-min. rating limit

INSTRUMENTS		MARKINGS	RANGE	
AIRSPEED INDICATOR		<ul style="list-style-type: none">- White triangle- Green arc- Red & white line- Yellow arc- Red line	20 knots 0-155 knots 135 knots 155-175 knots 175 knots	37 km/h 0 - 287 km/h 250 km/h 287 – 324 km/h 324 km/h
DUAL TORQUE INDICATOR NOTE: O.E.I. displayed on torque indicator means ONE ENGINE INOPERATIVE		OUTER RING: TWIN-ENGINE RATING (1+2)		
		<ul style="list-style-type: none">- Green arc- Yellow arc- Red line- Red triangle	0 – 88 % 88 – 100 % 100 % 107 %	
		INNER RING: SINGLE-ENGINE RATING		
		<ul style="list-style-type: none">- Fine yellow arc- Red line	55 – 57 % 57 %	
ROTOR & FREE TURBINE TACHOMETER	ROTOR (NR)	<ul style="list-style-type: none">- White triangle- Red triangle- Red line- Yellow arc- Green arc- Yellow arc- Red line- Red triangle	170 rpm 295 rpm 320 rpm 320-340 rpm 340-360 rpm 360-395 rpm 395 rpm 420 rpm	
	FREE TURBINE (Nf)	<ul style="list-style-type: none">- Red line- Yellow arc- Green arc- Red line- Red triangle	320 rpm 320-340 rpm 340-375 rpm 378 rpm 420 rpm	
Δ Ng INDICATOR		<ul style="list-style-type: none">- Green arc- Yellow line- Yellow arc- Red line- Yellow radial dotted line- Red radial dotted line- Red triangle	Below – 3.5 % - 3.5 % - 3.5 % to 0 % 0 % 0 % + 1.5 % + 6 %	

COCKPIT LAYOUT

Main Panel



- | | | | |
|---------------------------|-----------------------------|-------------------------|--------------------------------|
| 1 LIMIT LIGHT | 20 WARNING/CAUTION PANEL | 39 ENGINE 1 OUT | 58 AUX HYD SWITCH |
| 2 ALARM LIGHT | 21 PITCH TRIM | 40 Ng INDICATOR ENG 1 | 59 EMERGENCY HYD PUMP |
| 3 COUPLER REPEATER LIGHTS | 22 ROLL TRIM | 41 Ng INDICATOR ENG 2 | 60 ALTERNATOR |
| 4 SPEED INDICATOR | 23 YAW TRIM | 42 ENGINE 2 OUT | 61 VOLT/AMMETER SELECTOR |
| 5 ATTITUDE INDICATOR | 24 STBY COMPASS | 43 FUEL CONTENTS IND. | 62 SHED BUS SWITCH |
| 6 ALTITUDE INDICATOR | 25 T4 TEMP ENG 1 | 44 TORQUEMETER | 63 CARGO TMP AND SERVO TEST |
| 7 TURN-BANK INDICATOR | 26 T4 TEMP ENG 2 | 45 MARKER | 64 LANDING GEAR INDICATORS |
| 8 RADAR ALTIMETER | 27 OIL TEMP ENG 1 | 46 FUEL PRESS INDICATOR | 65 LANDING GEAR HANDLE |
| 9 VERTICAL SPEED IND. | 28 OIL TEMP ENG 2 | 47 COUPLER | 66 FLOAT GEAR SWITCH |
| 10 HSI | 29 OIL PRESS ENG 1 | 48 RADAR | 67 RMI INDICATOR |
| 11 CLOCK | 30 OIL PRESS ENG 2 | 49 INVERTER 1 | 68 LANDING GEAR WARNING |
| 12 NAV SELECTION | 31 FUEL PRESS PUMPS 1 AND 3 | 50 GENERATOR 1 | 69 STBY COMPASS |
| 13 NR INDICATOR | 32 FUEL PRESS PUMPS 2 AND 4 | 51 EMERGENCY CUTOFF | 70 THROTTLE 1 |
| 14 FIRE/FAIL LIGHT | 33 HYD PRESS SYSTEM 1 | 52 GENERATOR 2 | 71 THROTTLE 2 |
| 15 FIRE EXTINGUISHER | 34 HYD PRESS SYSTEM 2 | 53 INVERTER 2 | 72 CLICK AREA FOR THR 1 CUTOFF |
| 16 FIRE/FAIL TEST SWITCH | 35 MGB OIL PRESS | 54 EMERGENCY RESET | 73 CLICK AREA FOR THR 2 CUTOFF |
| 17 WARNING PANEL TEST | 36 MGB OIL TEMP | 55 BATTERY SW 1 | 74 CLICK AREA FOR EXT POWER |
| 18 WARNING PANEL DIM | 37 VOLTMETER | 56 BATTERY SW 2 | 75 CLICK AREA FOR BOTH BATT. |
| 19 DME INDICATOR | 38 AMMETER | 57 AUX HYD TEST | SWITCHES SIMULTANEOUSLY ON |

Overhead Panel



- 1 COPILOT LIGHTS
- 2 OVERHEAD CONSOLE LIGHTS
- 3 PILOT LIGHTS
- 4 STORM LIGHTS
- 5 EMERGENCY LIGHTS
- 6 MAIN LIGHTING SWITCH
- 7 CABIN LIGHTS
- 8 NOTICES LIGHT SWITCH
- 9 HEEL LIGHTS SWITCH
- 10 ANTI COLLISION LIGHT
- 11 POSITION/STROBE LIGHTS
- 12 ICE DETECT SWITCH

- 13 HOT MIKE SWITCH
- 14 STEP SWITCH
- 15 ALTERNATE STATIC PRESS
- 16 HYD ISOLATE SWITCH
- 17 MISSION CONTROL SELECTOR
- 18 STANDBY HORIZON SWITCH/LIGHT
- 19 NCU/CDU SWITCH
- 20 TRIM FEEL CYCL SWITCH
- 21 PITOT 1 HEATER
- 22 PITOT 2 HEATER
- 23 LEFT WINDSHIELD ANTI ICE
- 24 RIGHT WINDSHIELD ANTI ICE

- 25 ATC SWITCH
- 26 AVAD SWITCH
- 27 HORN SWITCH
- 28 WIPERS SWITCH
- 29 WINDSHIELD WASH
- 30 CRANK ENGINE 1
- 31 CRANK ENGINE 2

Pedestal



- 1 COM 1
- 2 GYRO CONTROL PANEL
- 3 COM 2
- 4 NAV 1
- 5 GPS CONTROL PANEL
- 6 HOVER LIGHT SWITCH
- 7 LANDING LIGHT SWITCH

- 8 NAV 2
- 9 ADF
- 10 WINDSHIELD WIPER SWITCH
- 11 FUEL MANAGEMENT PANEL
- 12 FUEL PUMP 1
- 13 FUEL TRANSFER PUMP
- 14 FUEL PUMP 2

- 15 FUEL PUMP 3
- 16 FUEL QUANTITY TEST BUTTON
- 17 FUEL PUMP 4
- 18 PARKING BRAKE HANDLE
- 19 LANDING LIGHT SELECTOR SWITCH
- 20 TRANSPONDER

Δ Ng and Torquemeter Indicators



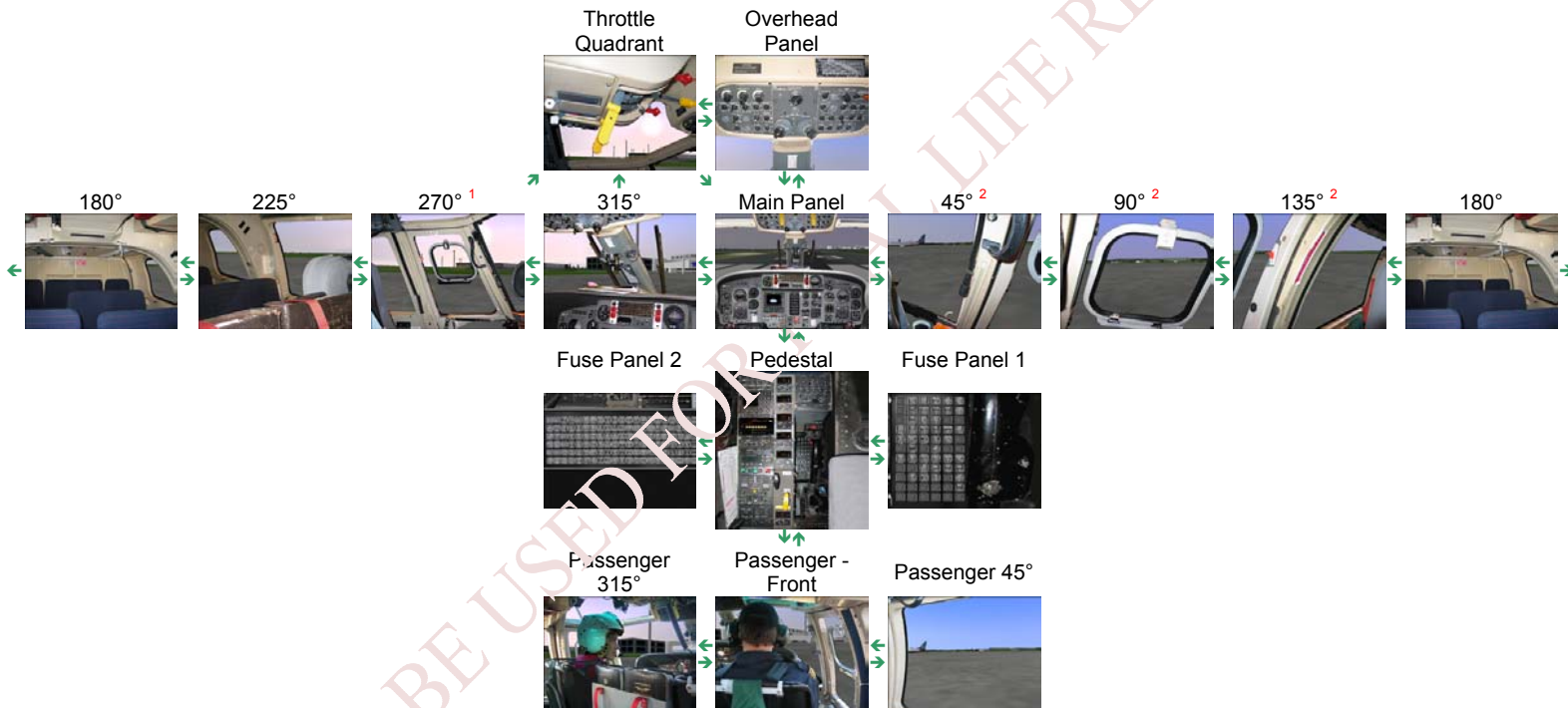
Ng INDICATORS

- 1 MAX CONTINUES POWER DUAL ENGINES
- 2 MAX TAKEOFF POWER LIMIT: 5 MIN. OR OEI INTERMEDIATE CONTINGENCY POWER LIMIT: 30 MIN OR UNLIMITED
- 3 MAX OEI CONTINUES POWER : 2 1/2 MIN.
- 4 MAX Ng TRANSIENTLY : 20 SEC.
- 5 BLEED VALVE INDICATOR FLAG. WHEN FLAG IS VISIBLE, VALVE IS OPEN
- 6 Ng INDICATOR TEST BUTTON

TORQUEMETER

- 7 MAX TOTAL PERMISSIBLE TRQ FOR YAW CONTROL IN HOVER FLIGHT
- 8 HOVER FLIGHT AND ACCLERATION PRIOR TO CLIMB (Vy) TRQ
- 9 FORWARD FLIGHT MAX TRQ
- 10 MAX PERMISSIBLE OEI TRQ
- 11 TORQUE READING SELECTOR SWITCH
- 12 ENGINES 2+1 OR ENGINE 2 NEEDLE
- 13 TORQUEMETER FLAG. INDICATES ENGINE UNBALANCE OR POS. 2 OF SELECTOR SWITCH
- 14 ENGINE 1 NEEDLE

VIEWS MAP



NOTES:

¹ In this view, there are two click areas, the one on the left adds a co-pilot, the other one (to the right) opens and closes the door.

² In this view there is a click area that opens and closes the door.

PREFLIGHT PROCEDURE FLY!II

- Scan through all the side views so that Fly! II don't stutter later when changing view in flight.
- It's advisable to have a slightly higher seat position than a fixed wing aircraft (if necessary, press the] key twice).
- Set the sensitivity for your flight controls in the Aircraft-Options Menu. 0% is very sensitive, 100% is slow. We recommend 30% for Pitch and Roll. 100% for Yaw. Try with your own controls, and apply whatever is best for you.
- Set 100% realism, all boxes checked in the Helicopter Realism Menu. Set Angular and Hover Damping gain to 50%.

PREFLIGHT PROCEDURE AS-365N2

- Get familiar with the different views, panels, instruments and switches.
- Default view is the Main Panel. One up is the Overhead Panel. One down the Pedestal. Two down the "Passenger View"
- To the left and right of the Pedestal are the fuse panel views.

INTERIOR CHECKLIST

- | | |
|--------------------------------|---|
| - Cabin ----- | General Check (Condition, Freight tied-down, passenger arrangement, etc |
| - Doors ----- | Closed and locked, flag not visible, jettison mechanism snap-wired. |
| - Fire extinguisher ----- | In place (safety pin snap-wired) |
| - Circuit breakers ----- | All engaged. |
| - Yaw pedals----- | Adjusted. |
| - Seats ----- | Adjusted. |
| - Seatbelts and harnesses----- | Fastened. |

Note: If the copilot's seat is unoccupied, check that the seatbelt is fastened.

PRE-START CHECKLIST

Determine aircraft performance with respect to planned flight conditions. Check that aircraft weight and CG position are within permissible limits.

	TOTAL CAPACITY				UNUSABLE CAPACITY		
	Liters	Kg *	US gal		Liters	Kg *	US gal
GROUP 1 LH ENGINE	573	453	151		15	12	3.96
GROUP 2 RH ENGINE	585	462	155		8.5	7	2.24

* Specific gravity = 0.79

CAUTION: THE CG POSITION VARIES WITH FUEL DISTRIBUTION IN THE TANKS; THE CONTENTS OF BOTH TANKS SHOULD BE DECREASED BY THE SAME QUANTITY TO ENSURE THAT CG LIMITS WILL NOT BE EXCEEDED. THE CG POSITION VARIES APPRECIABLY WITH THE AIRCRAFT FULL LOAD. IF THE PRE-FLIGHT, CG POSITION IS BETWEEN 3.85 m (151.6 in) and 3.99 m (157.1 in) THERE IS NO DANGER OF DEVIATING FROM THE APPROVED RANGE. BEYOND THESE POSITIONS IT IS NECESSARY TO CHECK THAT THE CG LIMITS ARE NOT EXCEEDED AS THE FUEL QUANTITY DECREASES.

Check and perform the following points:

- Switches----- All off
- Voltmeter reading----- Check
- Battery contactors 1 & 2 ----- Switch on simultaneously (place the mouse pointer between the two switches)
- Check **BATT SW1** and **BATT SW2** lights are out; if not, repeat operation
- Instrument lighting----- As necessary
- Heating and ventilation controls ----- Off
- Fuel flow control levers (throttles) ----- Fully aft
- Fuel shutoff control levers ----- Forward and locked
- Rotor brake control lever ----- Released, fully forward
ROT BK light off
- Static pressure selector ----- Locked on NORMAL
- Hydraulic isolate switch----- Norm
- Mission selector ----- As required
- Aural alarm ----- On. **HORN** light off.
- Emergency locator transmitter ----- Set to arm (if installed)
- ATC transponder switch (if installed)----- On Normal
- Steps (if installed)----- Closed, **STEP** light off
- Passenger's ordinance lights ----- Switch on

- Emergency lighting system (HEEL) ----- Set EMERG LT switch on overhead panel to TEST; the emergency lighting system should illuminate. Return switch to ARM for flight.
- Position lights ----- As required
- Anti-collision light----- Switch on
- Standby magnetic compass ----- Check
- Indicator light test function ----- Check all lights on (Caution Advisory Panel, fuel management panel, landing gear)
- LIMIT push button light test function (press it) ----- Check
- Engine fire system test ----- Check both positions:
 - o FIRE and ENG.FIRE lights come on & ALARM light flashes
 - o FAIL light comes on (detection circuit failure)
- O/SPEED lights ----- On
- PWR LOSS lights----- On
- ΔNg indicators----- Test. Check that each O-SPEED light extinguishes while testing
- Torquemeter ----- Selector set to 1 + 2 (flag retracted)
- Generators 1 & 2 ----- On
- Static inverters 1 & 2 ----- On. INV 1 and INV 2 lights off
- Alternator (if fitted)----- On
- EMERGENCY ELECTRICAL CUTOFF bar ----- ALT light on
- SERVO and CARGO test----- Up and snapwired
- SERVO light goes out.
- CARGO, F and O/HEAT lights come on as pushbutton is pressed
- Aux hydraulic switch----- Norm (up and snap-wired)
- Landing gear pump switch----- Norm
- Landing gear downlock switch----- Down with safety pin removed
- Clock ----- Set
- Altimeter ----- Set
- Pilot Radar Altimeter----- On
- Copilot Radar Altimeter----- On
- Gyro switches VG 1 and VG 2----- On (not all versions)
- Standby horizon----- On
- Fuel management panel
 - o Test----- Fuel gauges read below zero
 - o Transfer pump ----- Test (green arrow + audible signal)
 - o Booster pumps 1, 2, 3 and 4 ----- On. FUEL P lights off

Note: When fuel tanks are almost empty, the feeder tank level FUEL Q light may illuminate on the fuel management panel, and will go out only when get pumps have filled the feeder tank.

- Parking brake lever ----- Up (brake applied)
- Load detection system (**LIMIT** light) check:
May be carried out only prior to the first flight of the day.
 - o Set landing gear emergency extension switch L/G PUMP to TEST position. **L/G PUMP** light should come on, and HYD 1 pressure should slowly rise to approx. 60 bar.
 - o Move cyclic stick over whole longitudinal travel range. Check that **LIMIT** light + GONG comes on.
 - o Set L/G PUMP switch to EMERGENCY position. **L/G PUMP** light should go out, then immediately come on again to indicate that the emergency extension system is again operational.

STARTING PROCEDURES

CAUTION: CHECK THAT THE CYCLIC STICK IS IN NEUTRAL POSITION AND THE COLLECTIVE LEVER LOCKED TO LOW POSITION. DON'T MOVE THE CONTROLS IF HYDRAULIC POWER IS NOT SUPPLIED. MOVING THE PEDALS WHEN THE ROTOR IS STOPPED IS PROHIBITED.

STARTING

CAUTION: IN ORDER TO PREVENT OVERHEATING OF THE STARTER GENERATOR, ONLY 5 CONSECUTIVE ENGINE STARTS OR CRANKING CYCLES ARE ALLOWED. WAIT 20 MINUTES BEFORE TRYING AGAIN.

OPERATIONS	RESULTS
<p>1. STARTING ENGINE 1:</p> <p><u>Note:</u> Engine fuel control lever must be in cutoff position, or at max 20% for starter to operate.</p> <ul style="list-style-type: none"> - Press starter switch, advance fuel flow control (throttle) to 20%. Check that Ng starts to rise. Continue to advance control to 30%. <p>When t4 temperature exceeds 500°C, control max t4 value by moving fuel flow control slightly aft.</p> <p>CAUTION: IMMEDIATELY SHUT DOWN THE ENGINE IF FREE TURBINE POINTERS MOVES BEYOND ROTOR SPEED POINTER ON TRIPLE INDICATOR</p>	<ul style="list-style-type: none"> - Check battery voltage. If below 15V, stop starting sequence (battery insufficiently charged) - Check: <ul style="list-style-type: none"> o That generator rotates and t4 temperature rises within 10 seconds. o The Ng, t4 and Nf indicators. <p>O/SPEED light goes out at approx. 85 rpm (equivalent NR).</p>

OPERATIONS	RESULTS
<ul style="list-style-type: none"> - Release starter switch when Ng reaches 40% and accelerate by moving the control lever to the full forward position. - “Gong” alarm test As soon as oil temperature pointer begins to move, advance the fuel flow control lever until a torque of approx. 25% is obtained transiently, then accelerate rotor by slowly moving flow control to flight notch. 	<ul style="list-style-type: none"> - Max. t4 temperature: 785°C - Max. overtemperature: 865°C - A series of “gong” strokes can be heard when the torquemeter flag appears. - Check that warning lights go out: <ul style="list-style-type: none"> o ENG 1, and the fuel flow control o GEN 1 when Ng = 65% o HYD 1, HYD 2, SERVO, MBG.P and PWR LOSS when Nf = 110 rpm (equivalent NR). o Horn sounds when NR is between 170 and 335 rpm.
<p>CAUTION: ABORT THE STARTING PROCEDURE BY MOVING THE FUEL CONTROL AFT AND CLICKING ON THE CUTOFF AREA TO THE LEFT OF THE LEVER:</p> <ul style="list-style-type: none"> - IF t4 LIMIT IS EXCEEDED - IF ENG 1 LIGHT IS STILL ON WHEN Ng REACHES 20% 	
<p>2. <u>STARTING ENGINE 2</u></p> <ul style="list-style-type: none"> - Proceed as for starting Engine 1. 	<ul style="list-style-type: none"> - Check the Ng, t4 and Nf indicators. O/SPEED goes out at approx. 85 rpm (equivalent NR). - NR stabilizes at 345-350 rpm. - Check that triple indicator pointers (NR, Nf1, Nf2) are superimposed. - Check that warning lights go out: ENG 2, and the fuel flow control 2, GEN 2 and BUS CPL when Ng = 65% PWR LOSS when Nf reaches 310 rpm (equivalent NR).

NOTE: Engines may be started in any order.

CRANKING

The cranking procedure is applicable only after a false start or for verification purposes.

Proceed as follows:

- Check that the relevant engine fuel flow control is in shutdown (closed or cutoff) position.
- Press the CRANK push-button for no longer than 15 seconds.

CAUTION: DO NOT CRANK THE ENGINE IF THE MANUAL FUEL SHUTOFF VALVE IS CLOSED AS THIS COULD DAMAGE THE ENGINE FUEL PUMP.

POST STARTING CHECKLIST

OVERALL CHECKS

- Ground power unit----- Disconnected (receptacle door closed)
- Exterior lights ----- As required
- Windshield wiper selector ----- As required
- PITOT 1 & 2 heating ----- On
- Caution Advisory Panel----- All lights off
- Temperature & pressure readings----- Checked
- Electrical parameters ----- Checked
- Engine & flight instruments ----- Checked
- Auxiliary hydraulic system test ----- **AUX HYD** light should come on, after 15 sec.
- Servo and cargo TEST ----- **SERVO**, **CARGO.F**, **O/HEAT** lights should come on.
- Tail rotor servocontrol isolation test:
 - set HYD ISOLATE switch to OFF: **ALARM** + **HYD.LEVEL** + **SERVO** warning lights should illuminate
 - set switch to ON: warning lights should go out.
- Booster pump test: ----- For each engine carry out the following in turn:
 - Switch both pumps off:
 - relevant **FUEL P** light illuminates on fuel management panel
 - **FUEL** light illuminates on caution advisory panel
 - pressure drop is read on relevant fuel pressure indicator
 - Check the following after switching ON again each pump in turn:
 - warning lights go out
 - pressure returns to normal
 - Check that the four switches are set to ON.

SPECIAL CHECKS

Testing the Electrical system on the ground

With the ground power unit disconnected and the aircraft electrical systems normally supplied, both generators and the battery are interconnected.

The **BAT SW 1** & **BAT SW 2**, **GEN 1** & **GEN 2** and **BUS CPL** lights on the caution advisory panel are off.

- Switch off GEN 2 and BAT RLY 2 switches. Check that **GEN 2**, **BAT SW 2** and **SERVO** lights come on and **BUS CPL** light remains off.
- One second later, switch on the BAT RLY 2 switch. Check that the **BAT SW 2** light remains on (the battery contactor is not closed) and the **BUS CPL** light remains off.
- Switch on the GEN 2 switch. Check that the **GEN 2** light remains on (as the protection circuit is working properly GEN 2 is not connected).
- Momentarily set GEN 2 switch to RST. Check that **GEN 2** and **BAT SW 2** lights go out. The aircraft power systems are now normally supplied again.
- Select the GEN 1 followed by BAT. RLY 1 switches OFF, check:
 - that the **GEN 1** and **BAT.SW 1** followed by **PITOT 1** warning lights are lit.
 - that the **BUS.CPL** warning light is extinguished
- Perform the same sequence as described above, but check when the GEN 1 switch is momentarily selected to RST, that all the warning lights are extinguished.

PRE-TAXIING CHECKLIST

- Radionavigation systems----- Tested
- Radiocommunication systems----- Tested
- Collective pitch lever----- Released; friction lock adjusted
- It is recommended that sufficient friction be maintained to prevent collective lever oscillations during taxiing and landing.
- Pressure & temperature readings----- Normal
- Warning lights----- All off
- Heating and ventilation----- As required
- Autopilot ----- Cut off (not functional at present)

TAXIING, TAKEOFF & CLIMBING

TAXIING

- Release the parking brake.
- Increase the collective pitch to obtain 30% torque, then move Cyclic stick forward moderately to initiate low speed taxiing.
- Do not exceed cyclic stick forward or aft position in which the **LIMIT** light comes on (and the “gong” stroke is heard).
- Steer the aircraft with the yaw pedals, and not the wheel brakes, which are normally used only to slow down and stop the aircraft.
- Check that the brakes operate properly (press b once, then again to release the brakes)

TAKEOFF AND HOVERING

- Switch off the heating system.
- Enter hover IGO at a height compatible with the airspeed-height envelope chart.
- Check that all warning lights are off and that pressure and temperature readings are normal.

NOTE: In neutral lateral CG position and maximum rotor rpm trim position, the rotor speed should be approximately 350 rpm.

TRANSITION TO FORWARD FLIGHT

- Increase collective pitch while remaining within limitations.

CAUTION: THE TAKEOFF PATH MUST BE OUTSIDE THE HEIGHT/SPEED ENVELOPE DEFINED IN THE CHART. IT IS ADVISABLE TO REACH V_y IN A VERY SLIGHT CLIMBING ATTITUDE.

- Retract landing gear at V_y .

CLIMBING

- Passenger ordinance lights----- As required
(if no ashtrays are fitted, the ordinance lights must remain illuminated permanently).

The recommended climbing speed (V_y) is TAS 75 kt (139 km/h). For practical purposes it will be assumed here that TAS = 75 kt (139 km/h), less 1 kt per 1,000 ft. of altitude or 3 km/h per 500m.

CAUTION: THE MAXIMUM RATE OF CLIMB IS DETERMINED BY WHICHEVER OF THE FOLLOWING LIMITS IS REACHED FIRST:
MAX. CONTINUOUS ΔN_g , OR MAX. FORWARD FLIGHT TORQUE (REFER TO LIMITATIONS).

LEVEL FLIGHT

CRUISING FLIGHT

The best-range cruise is obtained:

- In twin engine flight: by selecting the airspeed given in the "level flight performance" charts (add half of headwind velocity or subtract half of tailwind velocity)
- In single engine flight: at maximum approved power rating:
High speed cruise is determined by whichever of the following limits is reached first: max. continuous ΔN_g or max. level flight torque.
- Maximum endurance is obtained by flying at V_y (refer to CLIMBING –above–).

MANEUVERING

During maneuvers (turns, pull-ups), the **LIMIT** light warns the pilot that too high a load factor is reached. As soon as this light comes on, lower collective pitch moderately but instantaneously so as to reduce the load factor.

Sudden maneuvers causing the load factor to be reached abruptly must in all cases be avoided.

In power-off flight, with a heavy weight and/or during maneuvers, the rotor speed can increase rapidly. As soon as the MAX.NR audio warning sounds, do not hesitate to operate the collective pitch lever to keep the rotor rpm limits. Keep torque reading 2+1 pointer at no less than 10-15% to avoid rotor rpm rising above limitations.

CAUTION: AT A HEIGHT ABOVE 15,000 ft DO NOT LOWER THE COLLECTIVE PITCH TOO QUICKLY AS THIS MAY CAUSE THE PERMISSIBLE FREE TURBINE SPEED LIMITS TO BE EXCEEDED.

FLYING IN TURBULENCE

- Fly at best-range speed cruising speed.

APPROACH - LANDING

- Passengers ordinance lights----- Illuminated

APPROACH

Extend the landing gear and check the following:

- Gear down and locked.
- Parking brake released.
- Caution advisory panel and instrument readings.
- Hating system switched off.

The recommended final approach speed is 45 kt (83 km/h). The descent path must remain outside the risk zone specified in the height/airspeed diagram (refer to “LIMITATIONS”).

LANDING

When taxiing, open the steps (if installed).

After landing, cut off autopilot (not in Fly! II)

ENGINE AND ROTOR SHUTDOWN

OPERATIONS	RESULTS
<ul style="list-style-type: none">- Set flight controls to neutral positions, and secure the collective lever in low pitch.- Set engine fuel flow control levers (throttle) to idle position (20 %).- Wait for 30 seconds before shutting down engines.- Click twice on CUTOFF area to the lower left of each throttle.- Move engine fuel flow control levers (throttle) fully aft (0 %).- Switch off booster pumps.- Apply rotor brake when rotor speed is below 170 rpm.- Switch OFF all switches.	<ul style="list-style-type: none">- Minimum rotor rpm alarm operates at NR below 335 rpm. <p>NOTE: Engine coast-down time must be at least 30 s. from 30% Ng to zero.</p>
CAUTION: ROTOR BRAKE APPLICATION IS PROHIBITED BEFORE ENGINE SHUTDOWN.	

EMERGENCY PROCEDURES

ENGINE FAILURE DURING TAKEOFF

Before CDP (Critical Decision Point)

- Abort the takeoff:
 - Reduce pitch by entering a 15° nose up attitude and reducing pitch to maintain a constant height.
 - When the helicopter starts to sink, gradually increase collective pitch.
 - If rotor underspeed horn sounds, reduce nose up attitude.
 - Just before touchdown, restore level attitude, apply Max. collective pitch if necessary.
 - Apply wheel brakes.

After CDP

- Continue takeoff:
 - Accelerate to and maintain V_{TOSS} (Takeoff Safety Speed)
 - Reduce collective pitch to maintain rotor speed at no less than 325 rpm.
 - Set the 2.5-minute rating or the 2.5-minute torque.
 - Climb to 500 ft and retract landing gear.
 - At 500 ft increase level flight speed to V_y .
 - At V_y , slightly decrease collective pitch to obtain 30 minute power rating.
 - Check rotor speed.
 - Continue climb at V_y .

Hover OGE (Out of Ground Effect)

- Apply a 20° to 25° nose down attitude.
- Reduce collective pitch to maintain NR at approximately 335 rpm, monitor through the audio warning.
- Increase speed to 45 kt.
- When aircraft nears the ground, reduce airspeed and increase collective pitch to cushion touchdown.
- Do not allow rotor speed to drop below 295 rpm.
- Landing speed will vary with weight.

EMERGENCY PROCEDURES

ENGINE FAILURE DURING CRUISING FLIGHT

- In the event of a single engine failure, the power of the remaining engine is automatically increased. If the required power exceeds single engine capability, the rotor speed will drop, causing the alarm horn to sound at 335 rpm.
- Reduce collective pitch to prevent further drop in rotor speed.
- Switch off heating systems.
- Move the failed engine fuel control lever fully aft.
- Land as soon as practicable.

NOTE 1: Optimum climb performance configuration:

- Landing gear retracted.
- Airspeed at V_y .
- 30-minute engine rating.

NOTE 2: Perform a fuel transfer operation to maintain fuel levels within cg limits.

ENGINE FAILURE DURING LANDING APPROACH

The following procedure is valid only over flat unobstructed ground.

- Continue the approach.
- Check that landing gear is extended and that parking brake is released.
- Maintain:
 - Rotor rpm above 340 rpm
 - Airspeed at 45 kt
 - Sink rate less than 500 fpm
- As aircraft nears the ground, reduce airspeed and increase collective pitch to cushion touchdown.
- Do not allow rotor speed to drop below 295 rpm.
- Landing speed will vary with aircraft weight.

NOTE: Rotor speed may be less than 295 rpm in case the engine should fail in hover IGE (In Ground Effect) at heavy gross weight.

EMERGENCY PROCEDURES

AUTOROTATIVE LANDING

Over land:

- Quickly reduce collective pitch.
- Control rotor speed as soon as max rotor rpm horn sounds.
- Maintain rotor speed at approximately 370 rpm, or full low pitch setting. If this speed cannot be maintained, maintain IAS at about V_y .
- Extend landing gear, and head aircraft into wind.
- Check that parking brake is released.
- Close the fuel emergency shutoff levers.
- Switch off booster pumps and static inverters.
- Initiate a flare at a height of about 70 feet to obtain a 15° to 20° nose up
- Attitude (25° Max.) and adjust the rate of flare to prevent the aircraft from climbing or descending too fast.
- Just prior to tailskid impact, begin increasing collective pitch to reduce remaining speed and cushion the possible tailskid impact.
- Restore aircraft to level attitude.
- Continue to apply collective pitch to cushion main landing gear touchdown.
- Return flight controls to neutral, reduce collective pitch and apply wheel brakes.
- Move the fuel flow control levers fully aft.
- Apply rotorbrake below 170 rpm.
- Jettison the doors if necessary and evacuate the aircraft.

Ditching (Without Emergency Flotation Gear):

Same procedure as for ground landing except for the following:

- Reduce speed as much as possible during final flare, and jettison doors before impact with water.
- On impact, keep the aircraft level.
- Do not reduce collective pitch setting.
- Move the fuel flow control levers fully aft.
- Apply the rotorbrake.
- Unfasten seatbelts when the cabin is fully submerged.
- Inflate life jackets only after evacuating the aircraft.

EMERGENCY PROCEDURES

TAILROTOR FAILURE

A tail rotor failure in power-on flight is indicated by a yawing motion. The rate of turn depends on the aircraft power and airspeed at the time of failure.

In Hover or At Low Airspeed:

- Quickly reduce collective pitch and land immediately.

Failure During Climb at Altitude:

- Reduce collective pitch, maintain aircraft heading by roll control.
- Increase airspeed and select power setting to maintain adequate flight control.
- Look for a landing site that will permit a rolling landing.
- Extend the landing gear.
- Check that the parking brake is released.
- Approach the landing site with aircraft slipping to left with an airspeed above 60 kt.
- Slowly reduce airspeed at ground level.
- Land when the nose swings into alignment. Touchdown speed should be 45-55 kt.
- After touchdown slowly reduce collective pitch and steer with the wheel brakes.

Failure In Level Flight:

- Yawing motion will be minimal due to the low thrust component of the shrouded tail rotor.
- Proceed as for failure in climb.

FIRE IN FLIGHT

- Reduce engine power on relevant engine and airspeed to approx. 80 kt.
- Close the fuel shut off lever.
- Move the fuel control lever fully aft.
- Switch off the heating system.
- Switch off the relevant engine booster pump(s).
- Actuate the first engine fire extinguisher and check that the **EXT LH** or the **EXT RH** light comes on.
- If the **EXT LH** or **EXT RH** lights remain off, or if the **FIRE** and **ENG.FIRE** lights do not go out within 1 minute, actuate the second engine fire extinguisher.
- If the fire persists, land immediately.
- If the fire is extinguished, land as soon as possible.

MISCELLANEOUS

TAKEOFF AND LANDING ON SLOPES

Slope must be less than 10°.

Takeoff:

- Perform takeoff with parking brake applied.

Landing:

- Apply parking brake before touchdown.
- Before fully reducing collective pitch, move cyclic stick to neutral to prevent the **LIMIT** light from coming on.

HELIPAD OPERATIONS

Takeoff:

- Set the altimeter and radio altimeter.
- Hover over the downwind end of the takeoff area.
- Climb vertically while slightly increasing collective pitch without exceeding limitations (rate of climb less than 200 fpm)
- From a height of 20 ft, slowly initiate backward flight to keep the landing area in sight just below the canopy arch member at the side of the instrument panel.
- At CDP (130 ft) simultaneously apply takeoff power and enter 10° nose down attitude.
- When speed reaches 30 kt, decrease the nose down attitude and accelerate to Vy.
- Maintain Vy up to the desired altitude and select the maximum continuous power rating.

Note: If engine failure occurs at CDP before the aircraft tilts forward, abort the takeoff.
If engine failure occurs while or after the aircraft tilts forward, continue takeoff.

Landing:

- Approach helipad to reach LDP (Landing critical Decision Point 130 ft, 30 kt) at 30 kt with vertical speed between 300 and 400 fpm.
- Continue approach while slowly decreasing the airspeed, so that the airspeed pointer comes against the white triangle (20 kt approximately) at about 80 ft, in order to enter hover at a height of 20 ft above the landing area.
- Initiate a slow vertical descent.

HINTS & TIPS

Fuel Flow (Throttle) Levers, Start Buttons and Rotor Brake:

- The START buttons can be found both, in the main view as well as in the throttle quadrant view (one up and left from the main view). While in the main view the fuel flow levers (throttles) are animated, in the throttle quadrant view they are static; only the buttons are animated.
- If a joystick is not controlling the throttles, their setting can be changed by left- and right-clicking over each lever. The current setting % is indicated by the popup help label in the main and the throttle quadrant views, and also by the animation in the main view.
- If the rotor brake is applied, the throttles can't be moved from the full aft position.
- Conversely, if the throttles are not in the full aft position, the rotor brake lever cannot be applied.
- If the throttles are at a setting greater than 21%, the START button cannot be pressed.
- If the engines are running and the START button is pressed, the Starter will not engage.

Built In Checklist:

In addition to the checklist in this manual, we have included yet another condensed checklist that is visible in the 45° view (forward-left). To flip the pages, simply left- and right-clicking in the area above the coffee cup. We are also working on an "E" checklist, which will be released soon.

CREDITS

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25% of what is donated will go to the Richard Harvey Memorial Scholarship and
25% will go to the Lauren Harvey Educational Trust.

Thank you,

The F2FD Group.

NOT TO BE USED FOR REAL LIFE REFERENCE

INSTALLATION

- Copy the dauphin.pod file to the \aircraft subfolder within your Fly! II folder.
- Copy the dauphin.dll file to the \modules\pc subfolder in your Fly! II folder.
- READ THIS MANUAL
- Read the README.txt file for last-minute updates/corrections.

- If you are using a joystick or flight yoke, we strongly recommend that you assign buttons to all the trim controls. Go to the “Options” menu, select “Keys & Buttons...” and from the drop-down list select “Helicopter Keys”.

- The PC version comes with a working searchlight. The searchlight can be aimed using the keyboard. Go to the “Options” menu, select “Keys & Buttons...” and from the drop-down list select “Global Keys”. The entries are “Dauphin Srch Dwn”, “Dauphin Srch Lft”, “Dauphin Srch Rgt” and “Dauphin Srch Up”. We are working on an option to control the searchlight with joystick buttons. Currently, it can only be controlled with the keyboard.

- The PC version also allows you to assign a key to extend and retract the landing gear. The default “G” key does not work for helicopters due to a bug or a design limitation in Fly! II. Make sure you assign this function to something other than the “G” key or else you won’t be able to operate the gear with the “G” key in fixed-wing aircraft. Go to the “Options” menu, select “Keys & Buttons...” and from the drop-down list select “Global Keys”. The entry is “Dauphin gear”.

MAC USERS: You must download the MAC version, which doesn’t include the searchlight, the animated steps (if installed), the animated wipers (in external view), the animated doors, and the keyboard control for the landing gear.

KNOWN BUGS

- If after selecting the Dauphin, you change aircraft and then change back to the Dauphin, Fly! II will CTD due to a loop in the DLL. We are currently working on a fix for this nuisance.
- The Co-pilot’s RMI (built into the HSI) indicator switch displays ADF 1 and NAV 2 but it is really indicating NAV 1. This is hard-coded and we can’t change the help tag.
- Due to a bug or a design limitation, in Fly! II the toe brakes don’t work on helicopters, however the parking brake does.
- The red and white flag in the torque indicator(s) that indicate either a difference greater than 22% between engines or that the instrument is only showing torque 2, is not visible during the night. We are trying to find a solution to this and will try to fix it in a future update.

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