SECTION 3 - NON-NORMAL PROCEDURES

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This section provides detailed information about the procedures required to deal with Non-Normal events whilst operating G-STRV.
The **G-STRV Checklist** document is a set of Flight Reference Cards (FRCs), which summarises this section and provides a convenient reference in the cockpit. Red bands in the left margins of the FRCs highlight these procedures.

Blue italic text in this section offers background and explanatory information about the checklist items.

FIRE ON THE GROUND

FUEL PUMP	OFF
THROTTLE	CLOSED
MIXTURE	ICO
FUEL SELECTOR	OFF
IGN L & R	OFF

The preceding memory items shut down the engine and isolate the fuel supply.

RADIO	"MAYDAY"
IBBS	OFF
BAT	OFF
PARK BRAKE	OFF

Park Brake OFF enables aircraft to be pushed as required.
Vacate the aircraft to a safe distance up wind.

ENGINE FIRE IN THE AIR

LAND **ASAP**

Immediate Actions	Best Glide 84kts
FUEL PUMP	OFF
THROTTLE	CLOSED
PROPELLER	MIN
MIXTURE	ICO
COWL FLAP	CLOSE

Reduces air supply into cowling.

FUEL SELECTOR	OFF
IGN L & R	OFF

The preceding memory items shut down the engine and isolate the fuel supply.

CABIN HEAT L & R	OFF

Isolates cockpit behind the firewall.

COCKPIT FIRE

LAND **ASAP**

Electrical Source Identified
Equipment — OFF
VPX CB — Deselect

In the unlikely event the offending equipment is identified, consider turning OFF the power supply via an electronic VPX CB .

If fire continues:
BAT — OFF

Turning OFF the BAT will remove all power supply, leaving only the standby equipment.

COM 1 — "MAYDAY"

GTN 650Xi is still available even though the GMA 245 audio panel is unpowered if the BAT switch is OFF.

If fire continues:
IBBS — OFF

Removes power from the standby equipment, leaving only the G5.

G5 — Fly

External power to this unit is removed, but will still be powered by it's integral battery.

CO WARNING / FUMES IN THE COCKPIT

CABIN HEAT L & R — OFF
Air Vents — OPEN
COWL FLAP — OPEN

Opening the COWL FLAP will help to dissipate fumes inside the cowling.

LAND **ASAP**

Immediate Actions

Best Glide V_{BG}	84kts
Consider Smart Glide	
DIRECT-TO	Press & Hold

Even if no airfield is identified within range, Smart Glide will still reduce workload since the AP automatically engages and will target 84kts wings level.

Plan	Wind, Surface, Size, Shape, Slope, Surround

Committed Checks

FUEL PUMP	OFF
THROTTLE	CLOSED
PROPELLER	MIN
MIXTURE	ICO
FUEL SELECTOR	OFF
IGN L & R	OFF

The preceding memory items shut down the engine and isolate the fuel supply.

CABIN HEAT L & R	OFF
PARK BRAKE	OFF
Harness	Tight
Radio	"Mayday"
Transponder	7700
Passenger	Brief

Short Finals

FLAPS	LANDING

Consider

IBBS	OFF
BAT	OFF
G5	Fly

This would remove all electrical power from the cockpit, a possible advantage should the landing result in damage. However, the only flight instrument left will be the G5, and it would need a key pressed to prevent

ENGINE MECHANICAL FAILURE

Immediate Actions

Best Glide V_{BG}	84kts
Consider Smart Glide	
DIRECT-TO	Press & Hold

Even if no airfield is identified within range, Smart Glide will still reduce workload since the AP automatically engages and will target 84kts wings level.

Plan	Wind, Surface, Size, Shape, Slope, Surround

DO NOT ATTEMPT A RESTART

Engine Shut Down

FUEL PUMP	OFF
THROTTLE	CLOSED
PROPELLER	MIN
MIXTURE	ICO
FUEL SELECTOR	OFF
IGN L & R	OFF
CABIN HEAT L & R	OFF

Force Landing Checklist	Action

ENGINE FAILURE

Immediate Actions

Best Glide V_{BG}	84kts
DIRECT-TO	PRESS & HOLD

Activates Smart Glide

Check for cause of failure

FUEL PUMP	ON
MIXTURE	FULL RICH
ALT AIR	PULL
FUEL SELECTOR	CHANGE TANK
IGN L & R	ON
START Button	PRESS
If no restart	
Force Landing Checklist	Action

ENGINE FAILURE AFTER TAKE OFF

Best Glide V_{BG}	84kts
Below 800 ft agl	Select Landing Area
Above 800 ft agl	Consider Turnback

Pilot should be well practised before attempting a turn back.

RADIO	"MAYDAY"
Harnesses	Tight
FUEL PUMP	OFF
FLAP	As required
THROTTLE	CLOSED
PROPELLER	MIN
MIXTURE	ICO
FUEL SELECTOR	OFF
IGN L & R	OFF

Shut down the engine and isolate the fuel supply if time allows.

Consider

IBBS	OFF
BAT	OFF
G5	Fly

This would remove all electrical power from the cockpit, a possible advantage should the landing result in damage. However, the only flight instrument left will be the G5, and it would need a key pressed to prevent auto-shutdown.

ROUGH RUNNING

FUEL PUMP — ON

In case the engine driven fuel pump has failed.

MIXTURE — FULLY RICH

Fuel — Check

FUEL SELECTOR — As required / change

If fuel starvation is the cause the preceding memory items may solve the problem.

IGN L & R — OFF in turn

If rough running stops by turning off an IGN switch leave it OFF. The timing or some other malfunction in he unit may have occurred which is disrupting the engine.

ALT AIR — PULL

This provides an alternative air intake source. NB Once pulled maintenance action is required to reset.

Attempt to maintain or gain altitude

Flying at best glide speed 84kts is the point at which the lift/drag ratio is highest and thus the amount of power needed to maintain level flight the lowest.

Force Landing Checklist — Prepare to action

LOW OIL PRESSURE

Loss of oil pressure in normal flight

Power	Reduce
Possible Sender Failure	Crosscheck

The MT propeller has counterweights, meaning that the blades will move to coarse pitch if oil pressure is lost. Hence RPM reducing may confirm pressure loss.

LAND **ASAP**

Consider:

Engine Mechanical Failure Checklist	Action

HIGH OIL TEMPERATURE

Power	Reduce
COWL FLAP	OPEN

LAND **ASAP**
If unable to maintain within limits.

Flying at best glide speed 84kts is the point at which the lift/drag ratio is highest and thus the amount of power needed to maintain level flight the lowest.

HIGH CHT

CAS — **CHT**
Or CAS — **YELLOW** range

Power — Reduce
Reduces heat output.

COWL FLAP — OPEN
IAS — Increase
Increases cooling.

LOW FUEL PRESSURE

CAS — **FUEL PRESS**
Or CAS — **YELLOW** range

FUEL PUMP — ON
Possible failure of engine driven fuel pump.

MIXTURE — FULL RICH
Maximum fuel flow

FUEL SELECTOR — CHANGE TANK
In case there is a fuel line restriction from one of the tanks feeds.

ALTERNATOR FAILURE

Confirmation

CAS — **ALT AMPS**

Abnormally low alternator current

VOLTS M — < 13.5V

Normal alternator voltage is 14.6V, so a fall in Volts M to battery voltage combined with an abnormally low alternator current indicates an ALT output failure.

If PPS ALT FAULT light — OUT

No PPS ALT FAULT light confirms an alternator failure.

Procedure

STBY ALT — ON

Load Shed Checklist — Action

The standby alternator has a reduced output so may not satisfy the equipment current demand. Switch off non-essential items as required.

If PPS ALT FAULT light — ON

PPS ALT FAULT Checklist — Action

An illuminated PPS fault light indicates a fault in the PPS alternator circuit, which may be successfully reset.

PPS ALT FAULT

Confirmation

CAS	**ALT AMPS**
VOLTS M	< 13.5V
PPS ALT FAULT light	ON

An illuminated PPS fault light indicates a fault in the PPS alternator circuit, which may be successfully reset.

Procedure

PPS ALT FAULT switch — RESET

If no reset

STBY ALT — ON

The primary alternator may be causing the problem in the PPS, so try the standby.

PPS ALT FAULT switch — RESET

The PPS still may need a reset to reconnect the alternator feed.

If no reset

ALT — OFF

Load Shed Checklist — ACTION

PPS BAT FAULT

Confirmation

All services lost except:

- G5
- PFD
- GTN 650Xi

The IBBS will supply essential equipment if selected ON.

PPS BAT FAULT light — ON

Fault light ON indicates the PPS main output re-established by a PPS reset.

Procedure

PPS BAT FAULT switch — RESET

If no reset

Load Shed Checklist — Action

TIMER	START

Useful to plan load shedding dependent on required flight time.

ACAS POWER	OFF
AP POWER	OFF
PITOT HEAT	OFF
NAV LTS	OFF
TAXI LTS	OFF
LDG LTS	OFF
STROBE LTS	OFF
ANTI COL	OFF
FUEL PUMP	OFF

Turn off the rocker switches from right to left. This will result in a current draw of approximately 20A, giving approx 30mins from a 72% charged EarthX Battery.

Capacity

STBY ALT output limited to approx 30A

Main Battery discharge capacity (fully charged):

18A	45 mins
12A	70 mins
6A	140 mins

IBBS discharge capacity (fully charged):

6A	55 mins
3A	110 mins
1.5A	240 mins
G5	4 hrs

Current Draw

LDG LTS	11A
PITOT HEAT	9A
TAXI LTS	8A
ANTI COL	5A
STROBE LTS	3A
TRIG	3A
NAV LTS	2A

External lighting draws the highest current, so is a good place to start reducing load.

AP POWER	1.5A
AUDIO PANEL	1A

All the above items have individual switches.

AVNCS 2 3.25A

Lost items:

MFD, GTX 45R Transponder, L & R LEMO, GD40 CO Detector

These items are powered when the AVNCS 2 switch is ON, but do not have individual switches. NB they may be selectively de-powered via the PFD VPX page if available.

If flaps required consider AVNCS 1 off to conserve main bat. NB IBBS capacity will deplete since now powering primary LRU's.

AVNCS 1 13A

This is during the max load when the IBBS is charging at highest rate, and the GTN 650Xi is transmitting.

Lost items:

L & R PMag aircraft power	0.5A
IBBS Charge	4A

Turning OFF AVNCS 1 will only loose these two services since the IBBS will take over the services normally powered by AVNCS 1.

IBBS

With AVNCS 1 OFF, IBBS powers the following items:

GTN 650Xi	2A (6A when Tx)
PFD	2A
GEA 24 Engine monitor	0.5A
GSU 25 ADHARS	0.2A
GAD 29 Data Interface Adapter	0.2A
GMU 11 Magnetometer	0.1A

The IBBS will generally be supplying 5A, occasionally 9A when the GTN 650Xi is transmitting. The fully charged IBBS will provide power for the above services for approximately 55 mins.

CAS **EARTHX FAULT**

Several battery conditions may cause the CAS message to illuminate steady or flash, as per the table below. However, the only condition requiring immediate action is if an OVER VOLTAGE is occurring. This is to stop excessive battery charging.

If **VOLTS M** or **VOLTS E** CAS present
OVER VOLTAGE checklist — Action

Otherwise — No action required

The table below is included for complete information about the EARTHX FAULT CAS messages.

CAS	Volts E	Cause	Action
Slow Flashing (5s on/5s off)	>15.2	Over-charging	ALT STBY If flashing continues: ALT OFF
Slow Flashing (5s on/5s off) (<30 min period)	13.2 - 14.6	Cell to cell charge levels are not balanced	May come on briefly during periods of high current charging until the cells are automatically balanced.
Slow Flashing (5s on/5s off)	<12.8	Battery over-discharged	Once charged, the light will stop flashing.
Slow Flashing (5s on/5s off) (>1 hr period)	13.2 - 14.6	Weak or failing cell	If in conjunction with a charging system failure: ALT STBY If warning continues: ALT OFF Otherwise not an immediate issue.
Solid Light	Any	BMS electronic issue	
Short Flashing (2s on/2s off)	Any	High battery temp (> 170°F)	
Solid Light that turns off after 3 minutes	Any	Short Circuit protection was activated	None

VOLTS M

CAS — **VOLTS M**

This indicates a main bus voltage > 15.4V, possibly caused by a primary alternator voltage regulator fault. NB Over-voltage protection is also provided by the VP-X if the voltage reaches 16V. In this case the VPX turns off the alternator by removing the field supply.
The EarthX battery should be isolated from a voltage charge > 15.4V.

PRIM ALT — OFF
STBY ALT — ON

Change to the standby alternator which uses an external voltage regulator.

If overvoltage persists

STBY ALT — OFF

In the unlikely event that this does not solve the problem, remove alternator power.

Load Shed Checklist — ACTION

LAND **ASAP**

VOLTS E

CAS — **VOLTS E**

This indicates an IBBS charge voltage > 15V.

IBBS — OFF

The IBBS should be protected from a charge voltage >15V. Turning it OFF removes its battery from the charging circuit.

NB in the event of a PPS or VPX power failure no backup will be available for the IBBS powered items, the most important being the PFD and GTN 650Xi.
Approximately 4hrs service is available from a fully charged G5 battery

LAND **ASAP**

Stuck Transmit Trigger

Confirmation

GTN 650Xi
"COM push-to-talk is stuck" message

or

Trig TY91
"Stuck Mic" message

Procedure

STICK ENABLE — Select other joystick
This isolates all joystick buttons on the deselected side from aircraft systems, in addition to the transmit trigger.

One or more buttons / switches inoperative

Procedure

STICK ENABLE — Select other joystick
This isolates all joystick buttons on the deselected side from aircraft systems. This will recover control by the active joystick buttons/trigger.

Uncommanded Pitch Trim

PITCH TRIM — OFF

Stops trim movement

PITCH TRIM — STANDBY

Enables standby trim control, enabling removal of the uncommanded trim displacement and further control as required.

Uncommanded Roll Trim

ROLL TRIM — OFF

Stops trim movement

ROLL TRIM — STANDBY

Enables standby trim control, enabling removal of the uncommanded trim displacement and further control as required.

Pitch Trim Failure

PITCH TRIM — STANDBY

Enables standby trim control

Roll Trim Failure

ROLL TRIM — STANDBY

Enables standby trim control

Uncommanded Flap Movement

FLAP — OFF
IAS — < 100 kts

The FLAP switch in the OFF position removes all power from the flap motor. Hence the flaps will be fixed at the setting when the switch is selected OFF.