This Sabreliner Cockpit and Flying guide has been produced to make getting acquainted with your new Sabreliner both simpler and more fun. To this end, this is not an “official” pilot’s manual and should not be considered such.

The North American Rockwell Sabreliner is an aviation icon, representing a time in the U.S. aerospace industry when it was all “pedal-to-the-metal” in the race to develop the world’s fastest and most technically advanced jet aircraft. This was the late 50’s when space-race was in its infancy the Korean War was all but finished and the 60’s were just around the corner.

The original design prototype combined two different roles - a fast personnel transport and a combat-readiness trainer, was powered by two General Electric YJ85 turbojets and took to the air in September 1958. It was not until April 1963 that the type received its FAA certification.

Military Sabreliners were designated with type number T-39A and were powered with the new Pratt&Whitney JT12A-8 turbojets. The layout and specifications of the T-39 and early civilian versions’ wing were those of the renowned F-86 Sabre jet fighter and the Sabreliner became a test-bed for research into improved wing-shapes and performance. The result was the “super-critical” wing. Most recognisable by a deep trough in the underside just behind the leading edge of the wings, the super-critical design was used in many front-line fighters of the day and also in the Sabreliner 65 series which together with powerful twin Garrett TFE turbofans created one of the fastest, most fuel-efficient executive jets of the day.

We present just 3 of the wide variety of Sabreliner versions - the ones that are most widely recognised. These are the T-39A, its stretched cousin, the 60 and of course the ubiquitous 65 executive jet.

### North American Sabreliner

#### LEADING PARTICULARS

(details may change depending on year and modifications. Many examples were modified so bring them up to later standard.)

- **Power Plant:**
  - Two Pratt&Whitney J60-P-3 turbojets developing 3,300 lbf

- **Performance:**
  - Maximum speed: 478 kts
  - Cruising speed: 435 kts
  - Rate of climb: 4,700 fpm
  - Service ceiling: 40,000ft (12,200m)
  - Takeoff ground roll: 2,500ft.
  - Landing ground roll: 1,850ft.

- **Wings:**
  - Wing span: 44ft. 6ins. (13.56m)
  - Wing area: 342.1 ft² (31.79 m²)

- **Fuselage:**
  - Monocoque Composite/Alloy
  - Length: 44ft. (13.41m)
  - Height: 16ft. (4.88m)

- **Airfoil:**
  - NACA 64A212 (modified)

- **Fuel capacity:** 1087 US gallons (7284lbs) in two tanks, one in each wing.

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### Performance:

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- Landing ground roll: 1,850ft.

### Accommodation:

- Enclosed cabin seating for Pilot, Co-Pilot and up to 8 passengers.
Partially designed as a combat-readiness trainer for the new breed of jet pilot, the T-39s were fast, agile and immensely satisfying to fly. The North American F-86 Sabre fighter had already chalked up an impressive career during the Korean conflict and lessons learned were quickly incorporated into the T-39 to keep the design current.

T-39s were flown by all three branches of the armed forces, albeit with differing levels of equipment and specification. Many of these aircraft carved out a reputation of their own making in later conflicts in South East Asia.

They were both sophisticated and raucous at the same time. The early GE turbojets were loud and smoky. Acceleration was brisk to say the least and T-39s could be seen on many an airbase performing aerobatics and putting on informal (and often unauthorised!) airshows for the locals.

A stretched version of the T-39, the 60 Series was produced with a luxurious cabin and a flight deck befitting a fast executive jet. With their military training heritage they were the perfect tool for major airlines looking for a fast, sophisticated flight trainer for their growing numbers of jet-liner pilots. Crews could train not only in jet procedures and handling but also in new avionics technologies as they entered service.
In its day, the Sabreliner 65 was one of the finest, fastest and most luxurious executive jet packages one could buy. Even today it can give much more modern machinery a run for their money. Many examples have undergone continual upgrade programmes throughout their lives and the current crop of avionics and computerised navigation systems make a re-furbished Sabreliner a genuine contender in the corporate market.

The twin Garretts and super-critical wing deliver competitively high performance and handling. Cockpit fit-out incorporates everything one would expect to find in a modern small jetliner. Our simulation allows for integration with commercially available, third-party Garmin suites such as Flight1’s GTN and RPX GTN packages. Weather radar packages can also be accommodated. (ReX/MilViz WRX has yet to be updated for V5 and 5.1 but the 3D unit is present on the panel)

A sumptuous interior is fully modeled behind the cockpit (65 series only) with soft Italian leathers and deep carpet, high-gloss teak furniture and gold-plated fittings.
There's a lot to take in here but it is all laid out in a logical manner with everything essential close to hand and minor controls, switches and systems information grouped into their own panel sections or in some case, separate pods.

From a simulation point of view, just about everything works in this virtual cockpit so it is worth the time to study the following guides closely so that when you next enter the cockpit, you will already be familiar with most of it.

Don't forget the overhead panels as there are a few items up there which are quite important.

We have followed the layouts supplied in official factory manuals and flight handbooks for these guides and have divided the cockpit into major panel areas:


---

**Pilot Panel**

Co-Pilot Panel
21. Synchroscope
22. Warning Panel
23. Flight Director Panel
24. Cabin Pressure
25. Ambient Temperature
27. AHI
28. DME
29. Airspeed Indicator
30. Altimeter
31. Kohlsman Knob
32. Mach Indicator
33. VSI
34. HSI
35. RMI
36. Flap Indicator
37. Marker Lights
38. Glareshield Panel

Flight-crew
On the right lower panel is a switch marked “Static pressure alternate source selector valve” Loosely translated that means “Remove pilots”. Use this switch to add or remove the flight crew when at an airstrip or starting from cold-dark.

Instruments
Later in this guide we will discuss the functions and operating procedures for the major gauges on these panels. For example, the HSI units fitted have dual channel capability and are independently selectable.

Also, for those who are not acquainted with Flight Directors, we will explain how this important avionics component functions and how to use it.

The Alternate Static Source switch on the co-pilot’s lower panel serves as a switch to remove or add the pilots in the exterior model/view.
The Alternate Static Source switch on the co-pilot's lower panel serves as a switch to remove or add the pilots in the exterior model/view.
Pedestal

39. U/C Warning Lights
40. Left Lamp Mode Switch
41. Right Lamp Mode Switch
42. Left Landing Light Switch
43. Right Landing Light Switch
44. Left Fuel Pump
45. Right Fuel Pump
46. Engine Reversers
47. Throttles
48. SpeedBrake Switch
49. Left Starter
50. Left Throttle Lock
51. Right Throttle Lock
52. Right Starter
53. Left Fuel Heat Switch
54. Fuel CutOff Valve
55. Left Fuel Heat Switch
56. Right Master Ignition
57. Fuel Tank Selector
58. Right Fuel Heat Switch
59. Servos (INOP)
60. AutoPilot Master Switch
61. Nose Gear Steering Switch
62. AutoPilot Turn Control
63. Flaps Control
64. AutoPilot Bank Adjuster
65. Heading Hold
66. AutoPilot Mode Selector
67. AutoPilot Pitch Adjuster
68. RamAir Switch
69. Altitude Hold
70. Speed Hold
71. NAV/GPS Switch

Pedestal AutoPilot

59. Servos (INOP)
60. AutoPilot Master Switch
61. Nose Gear Steering Switch
62. AutoPilot Turn Control
63. Flaps Control
64. AutoPilot Bank Adjuster
65. Heading Hold
66. AutoPilot Mode Selector
67. AutoPilot Pitch Adjuster
68. RamAir Switch
69. Altitude Hold
70. Speed Hold
71. NAV/GPS Switch

AutoPilot

You have a choice of AutoPilots in the Sabreliner cockpit. When the “Digital” panel is selected, you can use either the Digital AutoPilot on the instrument panel or the “old-school” AutoPilot controls at the rear of the centre console Pedestal.
Overhead Panels
72. Windshield Wiper Controls
73. Hydraulic Switches
74. Electrical Master Switches
75. De-Icing Panel
76. Lighting Panel
77. Courtesy Panel

Sidewall Panels
78. Interior Lights Rheostats
79. Oxygen Panel
80. Audio Panel

Switches
All the switches in this cockpit are clearly labelled and should be self-explanatory. Three-way switches are usually operated with left and right mouse buttons.

The same goes for any knobs and some of these will respond to centre wheel as well. Please note that not all of the switches, despite being animated and clickable, will actually function.

The Audio and Oxygen Panels.
When the oxygen supply switch is turned ON, the supply will flow and the light will indicate this flow. The meter is for show ONLY.

Audio switches are self explanatory and will toggle on the various audio pulses (morse) for the two NAV and ADF frequencies when tuned and also swap between COM 1 and COM2.
Radios and Nav Aids.

Your Sabreliner is fitted with a variety of radios, navigation aids and has provision for a weather radar. If you have access to the Flight 1 GTN750 suite you can install it in the Sabreliner and have it display on the 3D instrument panel (using the panel switcher button provided). Most of the other excellent Garmin simulations on the market today can also be adapted quite easily with appropriate changes to the panel CFG. Most packages come with full instructions on how to do this.

If the conventional “digital” panel is employed, you will have the following units at your disposal:

1) GNS 430
2) KR87 ADF Radio
3) Transponder
4) Transponder
5) Digital AutoPilot
6) Digital Audio Panel
7) Weather Radar Unit (Dependent on type)

Using the Fire Control Panel.

In the unlikely event of an engine fire, it is comforting to know that such a fire can be extinguished very quickly by using the extinguisher controls mounted on the windshield pillar. We’ll now go through a typical engine fire routine.

As soon as a fire is detected the big red warning light will glow. Immediately shut down the affected engine by cutting its fuel. It is now necessary to ARM the relevant fire extinguisher system. You do this by CENTRE-CLICKING (mouse wheel or centre button) the large red fire extinguisher handle. You will see the handle pop out toward you. Now LEFT-CLICK the handle and HOLD it in the turned position. Continue to hold until the red warning light extinguishes. The fire will be extinguished.

You can test the system at any time by pushing the red warning lights inward. They should light to indicate a healthy system.
By keeping the FD Bar level you are steering the aircraft correctly to achieve your heading or course. Much like the HSI it sits above, the FD is also equipped with a CDI needle and a Glideslope Indicator. The final component is the Pitch Command Indicator (3 & 8). This is adjusted to indicate the pitch attitude required to fly a glideslope or attain a desired altitude.

Instruments explained.

The instrumentation in the Sabreliner is quite straightforward with the exception of a few critical units which require further description to get a better understanding of how they function and how you use them.

Let’s take the HSI (Horizontal Situation Indicator) first. The HSI (10 and 34 on the panel guides) is an extremely useful instrument when navigating. It can allow you to set a course and/or show you your current course. It can display your current heading and allow you to set one for the autopilot to follow.

When you have tuned your navigation radios, the long course needle in the centre of the instrument (3) will point to the course required to intercept the navigation radial selected. The centre section of this needle (4) is a separate section and can travel independently to the main needle, in a lateral direction across the CDI Scale (5). This is your CDI or “Course-Deviation-Indicator”.

AN IMPORTANT FIRST RULE with using an HSI, your heading is NOT NECESSARILY your course. In the illustration we are on a heading of 120. The Course required to the radial is 110. We know we are heading toward the radial because there is a “TO” marker triangle (12) showing. If we were heading away from the radial this triangle would be inverted. (the “FROM” marker) The marker triangles always point in the direction of the radial.

As we near the radial the CDI will begin to traverse the scale. When it lines up with the rest of the needle, you are on course to intercept.

The HSI.
1. Lubber line
2. Heading bug
3. Course needle
4. CDI
5. CDI Scale
6. Compass Card
7. DME display
8. Course
9. Glideslope pointer
10. Heading Bug adjuster
11. Course Setting Knob
12. TO/FROM indicators

By turning the aircraft until the heading matches the course you will then be lined up for the airstrip or the centre of the VOR radial you are using as a waypoint.

If you are on approach, the yellow Glideslope Indicator (9) will guide you onto the correct glide path for landing. Keep the pointer centred on the scale and you will reach the runway threshold on target for a perfect landing.

In the example we are currently heading a little right of the required course and right of the target. If we were to turn the aircraft to the left at this point, you would see the CDI begin to march across the scale toward the centre and the course needle line up with the lubber line (1). By maintaining this lateral position and adjusting the vertical attitude to keep the glideslope centred, we would be on target for our landing or interception of the selected waypoint.

The Flight Director.

Flight Directors are extremely useful instruments which assist in making perfect course and heading adjustments. Up on the right glare-shield is the control panel for the FD. This panel duplicates the functions of the small control knob on the instrument itself (6 & 9). The various components of the Flight Director are overlaid over the conventional Artificial Horizon display (AHI). The key component is the FD bar. (2) This double-wedge-shaped bar will indicate the direction you need to bank the aircraft to make the correct turn when turning onto a selected heading or VOR radial direction dependent on the function you set for the Flight Director.

The Flight Director.
1. Bank Indicator
2. FD Bar
3. Pitch Command
4. Attitude Indicator
5. Glideslope
6. Function Knob
7. Attitude adjuster
8. Pitch Command
9. Function Control
10. FD Master Switch
11. Auxiliary Altitude Hold Switch

By keeping the FD Bar level you are steering the aircraft correctly to achieve your heading or course. Much like the HSI it sits above, the FD is also equipped with CDI needle and a Glideslope Indicator. The final component is the Pitch Command Indicator (3 & 6). This is adjusted to indicate the pitch attitude required to fly a glideslope or attain a desired altitude.
Flying the Sabreliner

We are going to make the assumption that you have some hours time, flying in flight simulators like P3D. Also, it is not our intention to teach you how to fly, real or virtual.

Right, having got the disclaimers out of the way, let's have some fun.

We'll begin by going through the procedures for a “cold-dark” start. That is, all switches are off and all knobs, levers and controls are at their minimums. This is the best way to get maximum immersion from a simulation like the Sabreliner.

Switches are either left or right click or a combination of both.

So, the only switches that should be ON at this time are the “Secure Air Vers and controls are at their minimums. That is, all switches are off and all knobs, levers and controls are at their minimums. This is the best way to get maximum immersion from a simulation like the Sabreliner.

Before going any further, ensure that engines start. It is easy to forget an important step and frustrating when you can’t get the engines started. A brief process follows.

1) Fuel Tank Selector (57) to FUSE
2) Fuel CutOff Valves (44&45) ON
3) Tank Heaters (53&55) ON
4) Fuel Pumps (44&45) ON
5) Throttle Locks (50&51) OFF
6) Master Ignition Switches (55&56) ON
7) Depress Starter (49 or 52)
8) Depress Starter (49 or 52)
9) Depress Starter (49 or 52)

Monitor the instruments as the engines begin to spool up and eventually “catch”. If they do not “catch”, then you have most certainly left something out of the pre-start procedure. Reset everything and start again.

OK, with engines running at idle (around 55% RPM), go through the pre-takeoff checklist and taxi on out to the runway and hold there.

A couple of things to check before takeoff - any navigation aids like the Flight Director should be on and functioning. Flaps should be UP. On the versions fitted with leading edge slats, you will notice them down. This is normal as they are automatic in function and will retract at flying speed. Also check that your speedbrake(s) are stowed.

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5) Throttle Locks (50&51) OFF
6) Master Ignition Switches (55&56) ON
7) Depress Starter (49 or 52)

When running, smoothly increase the throttles to about 3/4 throttle and release the brakes. As you accelerate down the runway, keep her straight with rudder inputs and advance the throttle to maximum. The Sabreliner will take off in approx. 2,500 ft.

At around 115 knots indicated, pull the yoke back gently to lift the nose. The aeroplane will lift off smoothly. Before reaching 180 knots, raise the gear.

The Sabreliner is a rapid climber and can climb at above 4000ft per minute. Cruise at 489 knots.

The 65 is equipped with thrust reversers (usual keystroke is F2 and hold F1 to cancel) for extra braking assistance.

The North American Sabreliner has owes its existence to the Sabre jet fighter and thereby has inherited a lot that aircraft’s qualities. Not the least of which is that the design is approved for aerobatics! The only executive jet to carry such an approval rating.

Remember that these engines spool up and down relatively slowly by modern standards. So reducing power to reduce speed needs to be planned, especially on approach and of course, when landing. Get into the habit of reducing power early and you should not have any problems getting your Sabreliner back on the ground. Use the speed brakes sparingly, the speed will come off quickly. If you forget them on approach or landing, it could all end in a catastrophic stall.

On approach, reduce speed and lower the landing gear. Lower flaps if required but remember that they are large and drag will be a major component. Save your flaps for when you are on final.

Descend at 500-1000 fpm and keep your speed around 150 knots. On final, easing the runway, apply your flaps progressively to achieve a good balance of descent speed and control-lability. Touch down at around 120 knots and when rolling, apply the brakes.

We would recommend however, that you restrict your impromptu air shows to the T39. Your VIP in the 65 for instance, would not appreciate losing their coffee in a gentle barrel roll or loop!

If you study this manual carefully and follow the procedures in the checklists, you will have no problems flying the Sabreliner. You will find it a most enjoyable experience on short hops or long distance excursions. If you have third party GTN avionics, you will have the perfect fast, stable long-distance executive jet for all your navigation adventures.

We hope you enjoy your Sabreliners as much as we did building them.

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ADDITIONAL CREDITS:

SOUNDS - SKYSONG SOUNDWORKS
FLIGHT TESTING - MICHAEL MAINIERO
## CHECKLISTS

### PRE-START

<table>
<thead>
<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Brake</td>
<td>ON</td>
</tr>
<tr>
<td>Battery Master</td>
<td>Set to ground power or ON (full up)</td>
</tr>
<tr>
<td>Generators</td>
<td>ON</td>
</tr>
<tr>
<td>Inverters</td>
<td>STDBY</td>
</tr>
<tr>
<td>Throttle</td>
<td>CLOSED</td>
</tr>
<tr>
<td>Fuel Selector</td>
<td>FUSELAGE</td>
</tr>
<tr>
<td>Fuel Valves</td>
<td>OPEN</td>
</tr>
<tr>
<td>Fuel Heaters</td>
<td>ON</td>
</tr>
<tr>
<td>Fuel Pump</td>
<td>ON</td>
</tr>
<tr>
<td>Master Ignition</td>
<td>ON</td>
</tr>
<tr>
<td>Throttle Locks</td>
<td>OFF</td>
</tr>
<tr>
<td>Electrical Master</td>
<td>ON (overhead)</td>
</tr>
<tr>
<td>Seatbelt Signs</td>
<td>ON</td>
</tr>
<tr>
<td>Pitot Heat</td>
<td>OFF</td>
</tr>
<tr>
<td>Hydraulics Pump</td>
<td>ON</td>
</tr>
<tr>
<td>Aux Hydraulic Pwr</td>
<td>ON</td>
</tr>
<tr>
<td>Speedbrake</td>
<td>TEST</td>
</tr>
<tr>
<td>Aux Hydraulic Pwr</td>
<td>OFF</td>
</tr>
<tr>
<td>Flaps</td>
<td>UP</td>
</tr>
<tr>
<td>Airspeed Indicator</td>
<td>Set for V speeds and max warning</td>
</tr>
<tr>
<td>Flight Director</td>
<td>NAV mode</td>
</tr>
<tr>
<td>Gear Emergency</td>
<td>HANDLE IN</td>
</tr>
<tr>
<td>Gustlock</td>
<td>IN</td>
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</table>

### START

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<th>Pre-Start</th>
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</thead>
<tbody>
<tr>
<td>Parking Brake</td>
<td>OFF</td>
</tr>
<tr>
<td>Inverters</td>
<td>NORMAL</td>
</tr>
<tr>
<td>Fuel Selector</td>
<td>CHECK INSTRUMENTS</td>
</tr>
<tr>
<td>Fuel Pump</td>
<td>ON</td>
</tr>
<tr>
<td>Master Ignition</td>
<td>ON</td>
</tr>
<tr>
<td>Throttle Locks</td>
<td>OFF</td>
</tr>
<tr>
<td>Electrical Master</td>
<td>ON (overhead)</td>
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<tr>
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<td>OFF</td>
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<td>ON</td>
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<td>TEST</td>
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<td>Aux Hydraulic Pwr</td>
<td>OFF</td>
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<td>HANDLE IN</td>
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<td>IN</td>
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### PRE-TAKEOFF

<table>
<thead>
<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engines</td>
<td>CHECK INSTRUMENTS</td>
</tr>
<tr>
<td>Fuel Pumps</td>
<td>ON</td>
</tr>
<tr>
<td>Fuel Selector</td>
<td>NORM</td>
</tr>
<tr>
<td>Throttle</td>
<td>IDLE</td>
</tr>
<tr>
<td>Flaps</td>
<td>UP</td>
</tr>
<tr>
<td>Trim</td>
<td>ALL SET</td>
</tr>
<tr>
<td>Doors</td>
<td>CLOSED AND LOCKED</td>
</tr>
<tr>
<td>Landing Light</td>
<td>ON</td>
</tr>
<tr>
<td>Xpdr</td>
<td>TUNED AND ON</td>
</tr>
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### TAKEOFF

<table>
<thead>
<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brakes</td>
<td>RELEASE</td>
</tr>
<tr>
<td>Throttle</td>
<td>SMOOTHLY TO MAX RPM</td>
</tr>
<tr>
<td>Rotation</td>
<td>115 KIAS</td>
</tr>
<tr>
<td>Gear</td>
<td>RETRACT BEFORE 180 IAS</td>
</tr>
</tbody>
</table>

### CLIMB

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<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle</td>
<td>REDUCE TO MAINTAIN 240 KIAS IN THE CLimb</td>
</tr>
<tr>
<td>Seatbelt Signs</td>
<td>OFF</td>
</tr>
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</table>

### CRUISE

<table>
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<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle</td>
<td>TO MAINTAIN 450 KIAS</td>
</tr>
<tr>
<td>Trim</td>
<td>ALL REQUIRED</td>
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### PRE-TAXY

<table>
<thead>
<tr>
<th>Pre-Start</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverters</td>
<td>NORMAL</td>
</tr>
<tr>
<td>Electrical Gauges</td>
<td>CHECK</td>
</tr>
<tr>
<td>Navigation Equip.</td>
<td>ON</td>
</tr>
<tr>
<td>Altimeter</td>
<td>SET</td>
</tr>
<tr>
<td>Parking Brake</td>
<td>OFF</td>
</tr>
<tr>
<td>Chocks Etc.</td>
<td>REMOVED (secure aircraft switch off)</td>
</tr>
<tr>
<td>Parking Brake</td>
<td>OFF</td>
</tr>
</tbody>
</table>
CHECKLISTS

DESCENT
THROTTLE  REDUCE AS REQUIRED

APPROACH
THROTTLE  REDUCE FOR 140KIAS
SPEEDBRAKE  AS REQUIRED
FLAPS  AS REQUIRED
SEATBELT SIGNS  ON

PRE-LANDING
FUEL PUMPS  ON
FUEL TANKS  FUSELAGE
FUEL HEATERS  ON
LANDING LIGHT  ON
FLAPS  AS REQUIRED
LANDING GEAR  DOWN
THROTTLES  REDUCE FOR 118KIAS

LANDING
FLAPS  FULL
THROTTLE  TO ACHIEVE 90-110 KTS IAS
SPEEDBRAKES  STOWED
THROTTLE  CLOSED (OVER THRESHOLD)
REVERSERS  DEPLOY (IF FITTED) TO 35KIAS THEN RETRACT
FLAPS  UP
THROTTLE  IDLE/TAXY SPEED