Cessna 172 S (PH-HBW) Difference Training document compared to C172R (OOCVE) model

In the table below you can find the most important differences to be taken into account

	PH-HBW	OO-CVE	
Subject	C172 S	C172R	Comment
Engine power rating Lycoming IO-360 BHP	180	160	S model has increased performance @ higher certified MTOW
max speed Knots at S/L	126	123	
service ceiling Ft	14000	13500	
MRW Lbs	2558	2457	S model increase by 100 Lbs (45kg)
MTOW Lbs	2550	2450	S model increase by 100 Lbs (45kg)
MLW Lbs	2550	2450	S model increase by 100 Lbs (45kg)
Basic Empty weight Lbs (AFM)	1663	1639	
Propeller fixed pitch diameter Inches	76	75	S model is 2,54 cm larger
Usable Fuel Capacity USG	53	53	PH-HBW has indicators in USG (OOCVE litres)
LIMITATIONS			
Va Maneuvering speed KIAS	105 - 90	99 - 82	due to higher certified weight
Static RPM range (full throttle before rolling)	2300-2400	2065-2165	higher on S model (carefull when checking T/O pwr)
RPM indicator red line	2700	2400	R model is limited compared to S model
Fuel flow (FF) indicator GPH	0-12	0-11	S model has slightly higher consumption for same % PWR setting
abrupt use of controls is prohibited above KIAS	105	99	see Va maneuvering speed
Stall speed Vs1 KIAS	48	44	
Stall speed Vs0 KIAS	40	33	
EMERGENCY PROCEDURES			
engine failure after take off flaps up/dwn KIAS	70 - 65	65 - 60	due to higher certified weight
Maximum Glide KIAS	68	65	see AFM for amplified procedures
Precautionary Ldg w/ PWR	65	60	see AFM for amplified procedures
Ldg without PWR flaps UP / DWN	70 - 65	65 - 60	see AFM for amplified procedures
NORMAL PROCEDURES			
Normal Climb out speed	75 - 85	70 - 80	
Short Field T/O flaps 10 speed at 50ft obst	56	57	
Vy best rate of climb S/L	74	79	
Vx best angle of climb S/L	62	60	
PERFORMANCE			

See tables below as to compare

S model	R model

MAXIMUM RATE-OF-CLIMB AT 2550 POUNDS

CONDITIONS:

Flaps Up
Full Throttle

PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM			
		-20°C	0°C	20°C	40°C
S.L.	74	855	785	710	645
2000	73	760	695	625	560
4000	73	685	620	555	495
6000	73	575	515	450	390
8000	72	465	405	345	285
10,000	72	360	300	240	180
12,000	72	255	195	135	- - -

MAXIMUM RATE-OF-CLIMB AT 2450 POUNDS

CONDITIONS:

Flaps Up
Full Throttle

PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM			
		-20°C	0°C	20°C	40°C
S.L.	79	830	770	705	640
2000	77	720	655	595	535
4000	76	645	585	525	465
6000	74	530	475	415	360
8000	72	420	365	310	250
10,000	71	310	255	200	145
12,000	69	200	145	- - -	- - -

BETTER PERFORMANCE WITH INCREASING ALTITUDE

PERFORMANCE

See tables below as to compare

S model

CRUISE PERFORMANCE

CONDITIONS:
2550 Pounds
Recommended Lean Mixture At All Altitudes (Refer to Section 4, Cruise)

PRESS ALT FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2000	2550	83	117	11.1	77	118	10.5	72	117	9.9
	2500	78	115	10.6	73	115	9.9	68	115	9.4
	2400	69	111	9.6	64	110	9.0	60	109	8.5
	2300	61	105	8.6	57	104	8.1	53	102	7.7
	2200	53	99	7.7	50	97	7.3	47	95	6.9
	2100	47	92	6.9	44	90	6.6	42	89	6.3
4000	2600	83	120	11.1	77	120	10.4	72	119	9.8
	2550	79	118	10.6	73	117	9.9	68	117	9.4
	2500	74	115	10.1	69	115	9.5	64	114	8.9
	2400	65	110	9.1	61	109	8.5	57	107	8.1
	2300	58	104	8.2	54	102	7.7	51	101	7.3
	2200	51	98	7.4	48	96	7.0	45	94	6.7
	2100	45	91	6.6	42	89	6.4	40	87	6.1
6000	2650	83	122	11.1	77	122	10.4	72	121	9.8
	2600	78	120	10.6	73	119	9.9	68	118	9.4
	2500	70	115	9.6	65	114	9.0	60	112	8.5
	2400	62	109	8.6	57	108	8.2	54	106	7.7
	2300	54	103	7.8	51	101	7.4	48	99	7.0
	2200	48	96	7.1	45	94	6.7	43	92	6.4

R model

CRUISE PERFORMANCE

CONDITIONS:
2450 Pounds
Recommended Lean Mixture At All Altitudes (Refer to Section 4, Cruise)

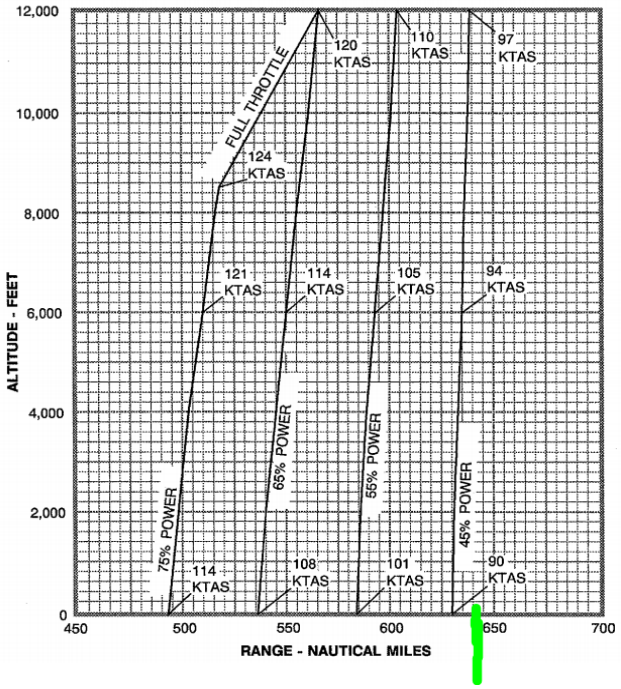
PRESS ALT FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2000	2250	---	---	---	79	115	9.0	74	114	8.5
	2200	79	112	9.1	74	112	8.5	70	111	8.0
	2100	69	107	7.9	65	106	7.5	62	105	7.1
	2000	61	101	7.0	58	99	6.6	55	97	6.4
	1900	54	94	6.2	51	91	5.9	50	89	5.8
4000	2300	--	---	---	79	117	9.1	75	117	8.6
	2250	80	115	9.2	75	114	8.6	70	114	8.1
	2200	75	112	8.6	70	111	8.1	66	110	7.6
	2100	66	106	7.6	62	105	7.1	59	103	6.8
	2000	58	100	6.7	55	98	6.4	53	95	6.2
	1900	52	92	6.0	50	90	5.8	49	87	5.6
6000	2350	--	---	---	80	120	9.2	75	119	8.6
	2300	80	117	9.2	75	117	8.6	71	116	8.1
	2250	76	115	8.7	71	114	8.1	67	113	7.7
	2200	71	112	8.1	67	111	7.7	64	109	7.3
	2100	63	105	7.2	60	104	6.9	57	101	6.6
	2000	56	98	6.4	53	96	6.2	52	93	6.0

S MODEL SEES 10% more Fuel Burn for same speed but takes 100 LBS extra weight

S model

RANGE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

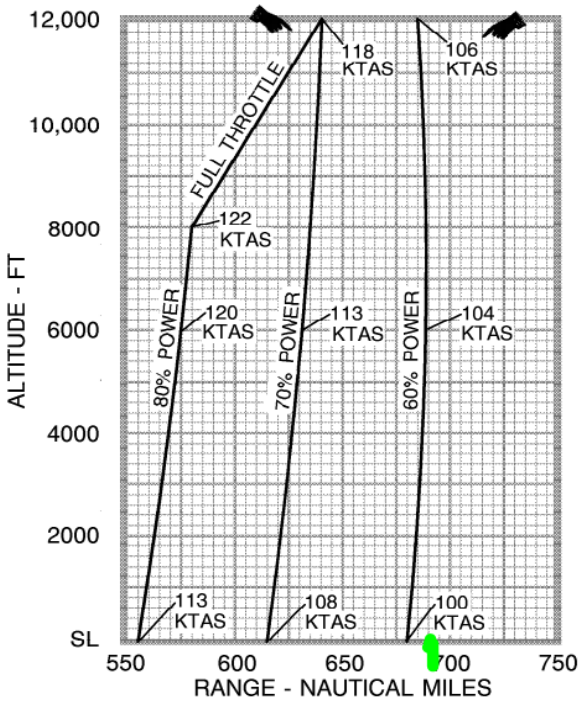
CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature
Zero Wind



R model

RANGE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2450 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature
Zero Wind



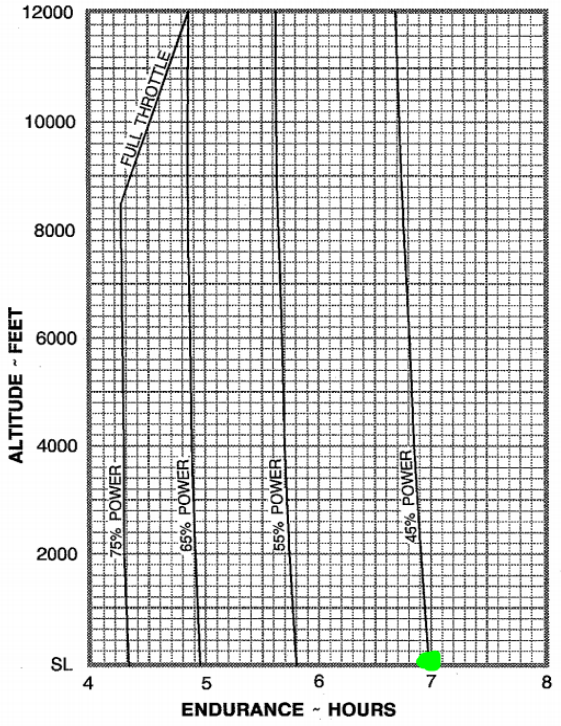
PERFORMANCE

See tables below as to compare

S model

ENDURANCE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

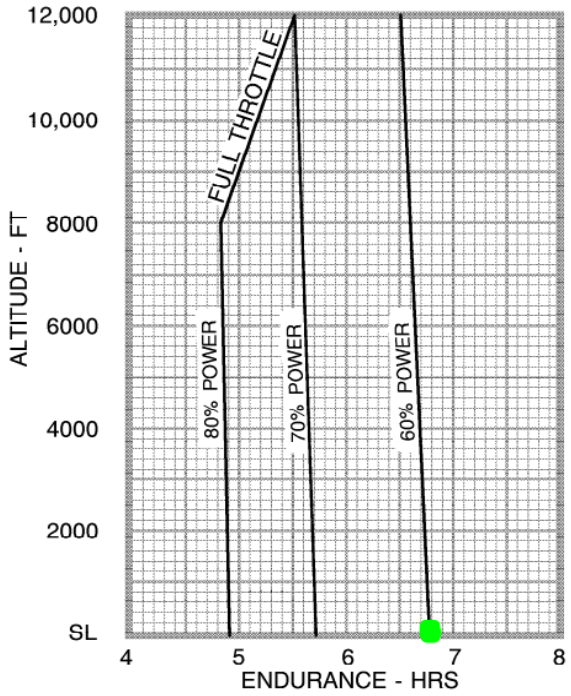
CONDITIONS:
2550 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature



R model

ENDURANCE PROFILE
45 MINUTES RESERVE
53 GALLONS USABLE FUEL

CONDITIONS:
2450 Pounds
Recommended Lean Mixture for Cruise At All Altitudes
Standard Temperature



S model

SHORT FIELD TAKEOFF DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 51 KIAS
Speed at 50 Ft: 56 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	860	1465	925	1575	995	1690	1070	1810	1150	1945
1000	940	1600	1010	1720	1090	1850	1170	1990	1260	2135
2000	1025	1755	1110	1890	1195	2035	1285	2190	1380	2355
3000	1125	1925	1215	2080	1310	2240	1410	2420	1515	2605
4000	1235	2120	1335	2295	1440	2480	1550	2685	1660	2880
5000	1355	2345	1465	2545	1585	2755	1705	2975	1825	3205
6000	1495	2605	1615	2830	1745	3075	1875	3320	2010	3585
7000	1645	2910	1785	3170	1920	3440	2065	3730	2215	4045
8000	1820	3265	1970	3575	2120	3880	2280	4225	2450	4615

R model

SHORT FIELD TAKEOFF DISTANCE AT 2450 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 51 KIAS
Speed at 50 Ft: 57 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	845	1510	910	1625	980	1745	1055	1875	1135	2015
1000	925	1660	1000	1790	1075	1925	1160	2070	1245	2220
2000	1015	1830	1095	1970	1185	2125	1275	2290	1365	2455
3000	1115	2020	1205	2185	1305	2360	1400	2540	1505	2730
4000	1230	2245	1330	2430	1435	2630	1545	2830	1655	3045
5000	1355	2500	1470	2715	1585	2945	1705	3175	1830	3430
6000	1500	2805	1625	3060	1750	3315	1880	3590	2020	3895
7000	1660	3170	1795	3470	1935	3770	2085	4105	2240	4485
8000	1840	3620	1995	3975	2150	4345	2315	4775	---	---

BELOW SHORT FIELD LANDING DISTANCE AT 2550 / 2450 WEIGHTS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	525	1250	540	1280	560	1310	580	1340	600	1370
1000	545	1280	560	1310	580	1345	600	1375	620	1405
2000	565	1310	585	1345	605	1375	625	1410	645	1440

PH-HBW

GENERAL :

PH-HBW is a 1999 model Cessna 172 SP also referred to mostly as **C172 S model**

Performance of the aircraft can be compared as the same, but with increased engine pwr and weight, some performance figures are different
There are no significant changes in handling , but a S model will give improved performance at the same weight > hence you will notice this
This means that for the same amount of fuel and passengers carried, the aircraft will feel a bit more performant in all phases of flight

Please be assisted by an APCK Flight Instructor, before you are released on the aircraft in order to perfectly understand all differences.
In preparation it is wise to read the appropriate AFM.

Below you can find additional info on installed avionics
The main Instrument here is a GARMIN GNS530 COM-NAV-GPS all in one TSO certified unit
This GNS530 is one of the most performant avionics that can be installed in GA aircraft > hence it's complexity if one wants to use it to the maximum.
Luckily this unit has simple basic functions to be used in flight, **it is of most importance that you gain DIFFERENCE TRNG from an APCK FI**

While wishing every APCK member safe flights, I hope this document helps you already to familiarize.

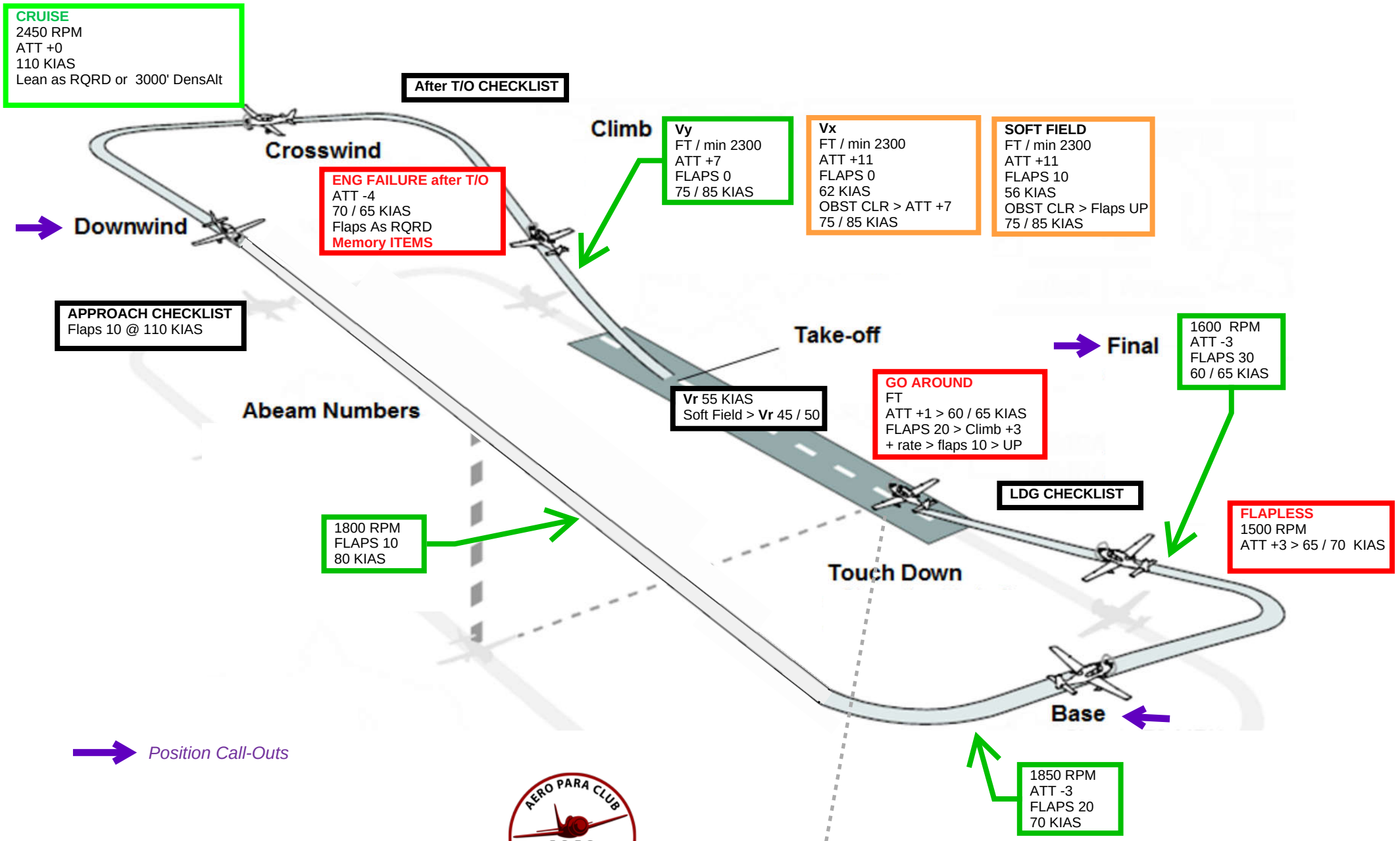
Below some links to intersting documents :

GNS530 from GARMIN AVIONICS

GNS530 Simulator software (also CD-ROM available at clubhouse)
https://www8.garmin.com/support/download_details.jsp?id=3529
GNS530 Pilot Guide
https://www.aeroclub-hof.de/download/GNS530_PilotsGuide.pdf

SOME EXTRA's

AERO PARA CLUB
E B Z R
1973
DER KEMPEN



C172 S Pattern

Standard settings for reference > NO WIND & GOOD PILOT JUDGEMENT

WALK AROUND (AFM)	
SAFETY CHECK	PERFORMED
ENGINE OIL	6 - 8 QTS
FUEL DRAINS (13)	PERFORM

BEFORE START	
PAPERS	ON BOARD
TROUBLE REPORT	CHECKED
SCAN	COMPLETED
CHOCKS AND TOW BAR	REMOVED
PITOT COVER	REMOVED
SEATS & BELTS	FASTENED
AVIONICS MASTER	OFF
ELECTRICAL SWITCHES	ALL OFF
MAGNETOS	OFF
BATT / ALT	OFF
ALTERNATE STATIC	NORMAL
TRIMS	SET
FUEL SELECTOR	BOTH
FUEL SHUTOFF	PUSH IN
BRAKES	ON
FLIGHT CONTROLS	FREE / CORRECT
BATT / ALT	ON
ANNUNCIATOR	CHECKED
CIRCUIT BREAKERS	CHECK
ANTICOLLISION LIGHT	ON

ENGINE START		
PRIME	FF - 4SEC	1SEC
MIXTURE	OFF	OFF
THROTTLE	1/4	1/2
START		

ADVANCE MIXTURE WHEN ENGINE FIRES

CHECK AFM IF UNSUCCESFULL

AFTER START / BEFORE TAXI	
OIL PRESSURE	CHECKED
SUCTION	CHECKED
AMPS	CHECKED
ANNUNCIATOR	CHECKED
AVIONICS MASTER	ON
AUDIO PANEL / GNS530	SET
XPDR (CODE)	STBY / GND
FLIGHT INSTRUMENTS	CHECKED
ATIS	NOTE
ALTIMETER	SET
NAV LIGHTS	ON
FLAPS	UP / AS RQRD

TAXI	
TAXI LIGHT	ON
BRAKES	CHECK
FLIGHT INSTRUMENTS	CHECK
FUEL CROSSFEED	CHECK

RUN UP	
TAXI LIGHT	OFF
ENNGINE INSTR	GREEN
PARKING BRAKES	SET
RUN UP AREA	FREE
FUEL SELECTOR	BOTH
MIXTURE	RICH
THROTTLE	1800 RPM
MAGNETO CHECK	150 / 50
IDLE	CHECKED

BEFORE TAKE OFF	
WINDOWS / DOORS	CLOSED
SEATS / BELTS	FASTENED
FUEL SELCTOR	BOTH
FUEL SHUTOFF	PUSH IN
FUEL QTY	CHECKED
FLIGHT INSTRUMENTS	CHECKED
RADIOS & NAVAIDS	SET
FLAPS	SET FOR T/O
MIXTURE	RICH
TRIM	SET
MAGNETOS	BOTH
T/O BRIEFING	PERFORMED
DEP BRIEFING	PERFORMED
ALTIMETER	SET

LINE UP	
LDG LIGHT	ON
PITOT HEAT	ON
STROBES	ON
XPDR	ALT
MIXTURE	SET
TRIM	SET
FUEL SELECTOR	BOTH
QFU / QNE / TIME	CHECKED

TAKE OFF	
POWER	MIN 2300
Vr	55
Vx FLAPS 10 - CLEAN	56 - 62
Vy	74

4-7-2018

PH-HBW C172S

AERO PARA CLUB EBZR 1973 DER KEMPEN

AFTER TAKE OFF	
LDG LIGHT	OFF
FLAPS	UP
ENGINE INSTR	GREEN
XPDR	CHECKED

CRUISE	
CRUISE POWER	SET
MIXTURES	ADJUST
ENGINE & FUEL GAUGES	CHECK
DG	X-CHECK

DESCENT	
THROTTLES	ADJUST
MIXTURES	ENRICH
ALTIMETERS	SET

APPROACH	
SCAN	COMPLETED
LDG LIGHT	ON
DIRECTIONAL GYROS	ALIGNED
ALTIMETERS	SET
FUEL SELECTOR	BOTH
MIXTURE	ADJUSTED

BEFORE LANDING	
FLAPS	AS REQUIRED
MIXTURE	RICH

AFTER LANDING	
PITOT HEAT	OFF
LANDING LIGHT	OFF
TAXI LIGHT	ON
STROBES	OFF
TRANSPONDER	STBY
FLAPS	UP

SHUTDOWN	
BRAKES	AS RQRD
AVIONICS MASTER	OFF
MIXTURES	CUT-OFF
MAGNETOS	OFF
ALL ELECTRICAL SWITCHES	OFF
BATTERY MASTER	OFF
CONTROL GUST LOCK	INSTALL
PITOT COVER	INSTALL
FUEL SELECTORS	AS REQUIRED

		Flaps	KIAS
Vr			**55**
Vx	S/L		**62**
Vx	short field	10	**56**
Vy	S/L		**74**
Vy	cruise		**75-85**
Vfe		10	**110**
		20-30	**85**
Va	2550 lbs		**105**
	2200 lbs		**98**
	1900 lbs		**90**
Vso			**40**
Vs1			**48**
V windows			**163**
Vne			**163**
Vref		clean	**65-75**
		30	**60-70**
	short field	30	**61**
Go Around	retract to 20		**60**
Best Glide		clean	**68**
Eng Fail T/O		clean	**70**
		10	**65**
X-wind limit demonstrated			**15**

MRW	2558 lbs
MTOW	2550 lbs
MLW	2550 lbs
Max Continuous PWR	**2700 RPM**
Useable Fuel	**53 USG**
UN-Useable	**3 USG**

std settings for reference (no wind corrections)

Fase	*Power*	*ATT*	*flaps*	*ft/min*	*kts*
climb Vy/Vx	**full**	**+ 7/11**	**0**		**74/62**
75% cruise	**2450**	**0**	**0**	**0**	**110**
cruise descent	**1900**	**-3**	**0**	**500**	**110**
circuit descent	**1600**	**-3**	**10**	**500**	**85**
downwind	**1850**	**0**	**10**	**0**	**80**
base	**1850**	**-3**	**20**	**350**	**70**
final	**1800**	**-3**	**30**	**300**	**65**

AERO PARA CLUB EBZR 1973 DER KEMPEN

PH-HBW C172S