SECTION 1

GENERAL

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1.1 INTRODUCTION

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY THE CIVIL AVIATION AUTHORITY OF NEW ZEALAND AND ADDITIONAL INFORMATION PROVIDED BY THE MANUFACTURER, AND CONSTITUTES THE CIVIL AVIATION AUTHORITY OF NEW ZEALAND APPROVED AIRPLANE FLIGHT MANUAL. THIS MANUAL ALSO CONSTITUTES THE FAA APPROVED FLIGHT MANUAL FOR UNITED STATES OF AMERICA OPERATIONS IN ACCORDANCE WITH FAR 21.29 AND THE EASA APPROVED FLIGHT MANUAL.

This pilot's operating handbook and Civil Aviation Authority of New Zealand approved flight manual shall be carried on all flights.

Sections 1, 2, 3, 4, 5 and 9 are subject to Civil Aviation Authority of New Zealand approval.

WARNING

Pilots must comply with all limitations and directions contained in this handbook and applicable supplements. This handbook is not intended as a guide for instruction or as a training manual. The pilot is responsible for ensuring the airplane is airworthy and for compliance with all applicable regulatory authority regulations and directives.

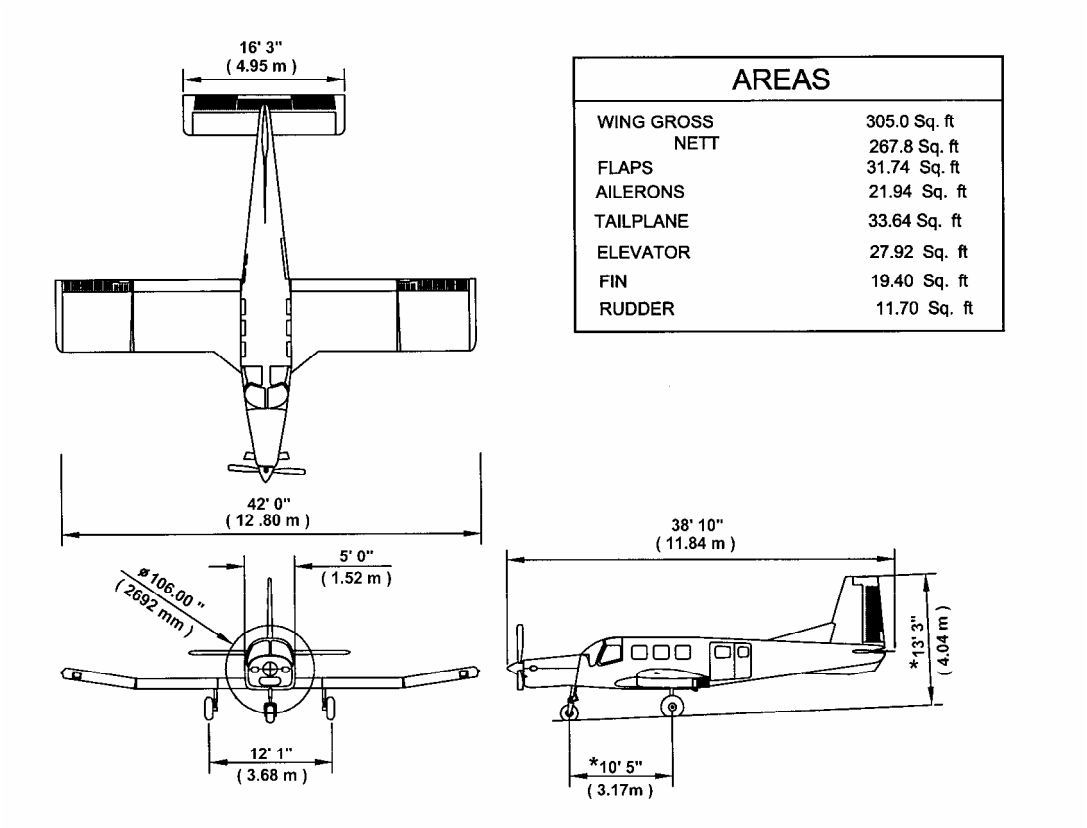
Information on optional equipment offered by Pacific Aerospace Corporation Limited will be issued in the form of supplements as part of the revisions process.

Full information on limitations, performance, and weight and balance is given in the pilot's handbook or the flight manual approved by the regulatory authority of the country of registration.

Amendments, when issued, will take the form of revised page(s) to be inserted in lieu of (or in addition to) the existing pages.

Amendments will be denoted by vertical lines in the left hand margin of affected page(s) spanning line(s) of type involved.

1.2 PRINCIPAL DIMENSIONS AND AREAS



AREAS	
WING GROSS	305.0 Sq. ft
NETT	267.8 Sq. ft
FLAPS	31.74 Sq. ft
AILERONS	21.94 Sq. ft
TAILPLANE	33.64 Sq. ft
ELEVATOR	27.92 Sq. ft
FIN	19.40 Sq. ft
RUDDER	11.70 Sq. ft

Figure 1-1

THREE VIEW DRAWING

MINIMUM TURNING RADIUS: 40’ 3 ¼ ”

PROPELLER GROUND CLEARANCE: At normal operating weights, CG limits, tire inflation and oleo extension there is a minimum of 7” propeller ground clearance.

1.3 ENGINE

NUMBER OF ENGINES: 1

MANUFACTURER: Pratt & Whitney, Canada, Incorporated (P&WC)

ENGINE MODEL NUMBER: PT6A-34

ENGINE TYPE: Free turbine, propulsion engine incorporating a multi-stage compressor, single stage compressor turbine, and independent single stage power turbine driving the output shaft through integral planetary gearing. A singular annular combustion chamber, 14 simplex fuel nozzles and two igniter plugs comprise the combustion system. Engine accessories are grouped on the rear of the engine.

HORSEPOWER: 750 shaft horsepower for 5 minutes, maximum continuous 633 shaft horsepower.

1.4 PROPELLER

NUMBER OF PROPELLERS: 1

PROPELLER MANUFACTURER: Hartzell Propeller Incorporated

PROPELLER MODEL NUMBER: HC-B3TN-3D/T10282NS+4

NUMBER OF BLADES: 3

PROPELLER DIAMETER:
Maximum: 106 inches
Minimum: 106 inches

PROPELLER TYPE: Constant speed, full feathering and reversible

PROPELLER ANGLES:
Feathered: 86.3^0
Low Pitch: 18.5^0
Maximum Reverse: -8.1^0

1.5 FUEL

APPROVED FUELS

Approved fuels are detailed in Figure 1-2. Refer to P&WC S.B. No. 1344 for specific details.

APPROVED FUELS	
Jet A /A1 (ASTM D1655)	
Jet B (ASTM D1655)	
JP-4 (MIL-T-5624)	Contains fuel system ice inhibitor
JP-5 (MIL-T-5624)	Contains fuel system ice inhibitor
F-40 (NATO Code)	Contains fuel system ice inhibitor
F-34 (Nato Code)	Contains fuel system ice inhibitor
F-44 (Nato Code)	Contains fuel system ice inhibitor

Figure 1-2, Approved Fuels

FUEL CAPACITY

The fuel capacities are detailed in Figure 1-3.

Total Capacity: 861 litres (227.4 U.S. gallons, 1512 lbs)
Total Useable: 841 litres (221 U.S. gallons, 1476 lbs)

TANK	TOTAL CAPACITY	UNUSABLE FUEL	USABLE
FRONT LEFT TANK *	284* litres, 499 lbs 75* U.S. gallons	10 litres, 18 lbs 3 U.S. gallons	274 litres, 481 lbs 72 U.S. gallons
FRONT RIGHT TANK	293 litres, 515 lbs 77 U.S. gallons	10 litres, 18 lbs 3 U.S. gallons	283 litres, 497 lbs 74 U.S. gallons
REAR LEFT TANK	142 litres, 249 lbs 37.5 U.S. gallons	0	142 litres, 249 lbs 37.5 U.S. gallons
REAR RIGHT TANK	142 litres, 249 lbs 37.5 U.S. gallons	0	142 litres, 249 lbs 37.5 U.S. gallons
TOTAL	861 litres, 1512 lbs 227 U.S. gallons	20 litres, 36 lbs 6 U.S. gallons	841 litres, 1476 lbs 221 U.S. gallons

* Includes 26 litres (6.8 U.S. gallons, 45 lbs) of fuel in sump tank

Figure 1-3, Fuel Capacity

1.6 OIL

OIL SPECIFICATION

The approved oil brands and types are detailed in Figure 1-4. Refer to P&WC S.B 1001 for full details.

BRAND	TYPE
AeroShell Turbine Oil 750	Synthetic, CPW202 (7.5 Centistokes)
Royco Turbine Oil 750	Synthetic, CPW202 (7.5 Centistokes)
Castrol 98	Synthetic, CPW202 (7.5 Centistokes)
BP Turbo Oil 274	Synthetic, CPW202 (7.5 Centistokes)
Turbonycoil 35 M	Synthetic, CPW202 (7.5 Centistokes)
AeroShell Turbine Oil 500	Synthetic, PWA 521- Type II (5 Centistokes)
Royco Turbine Oil 500	Synthetic, PWA 521- Type II (5 Centistokes)
Mobil Jet Oil II	Synthetic, PWA 521- Type II (5 Centistokes)
Castrol 5000	Synthetic, PWA 521- Type II (5 Centistokes)
BP Turbo Oil 2380	Synthetic, PWA 521- Type II (5 Centistokes)
Turbonycoil 525-2A	Synthetic, PWA 521- Type II (5 Centistokes)
Turbonycoil 600	Synthetic, PWA 521- Type II (5 Centistokes)
Mobil Jet Oil 254	Synthetic, PWA 521- Type II (5 Centistokes) THIRD GENERATION
AeroShell Turbine Oil 560	Synthetic, PWA 521- Type II (5 Centistokes) THIRD GENERATION
Royco Turbine Oil 560	Synthetic, PWA 521- Type II (5 Centistokes) THIRD GENERATION

Figure 1-4, Oil Specifications

CAUTION

Do not mix different viscosities or specifications of oil as their different chemical structure can make them incompatible. Drain the complete oil system before changing oil viscosities or specifications.

CAUTION

When changing from an existing lubricant formulation to a "Third Generation" lubricant formulation P&WC strongly recommends that such a change should only be made when an engine is new or freshly overhauled.

NOTE

Where operation will result in frequent cold soaking at ambient temperature of -18^{0}C (64^{0}F) or lower, use of a 5 centistoke oil is recommended.

OIL TANK CAPACITY 8.7 litres (2.3 U.S. gallons / 1.9 Imperial gallons)

OIL QUANTITY OPERATING RANGE The maximum limit is MAX HOT or MAX COLD as shown on the dipstick. The MAX HOT marking on the dipstick is used to check the engine oil level within 20 minutes of engine shutdown, preferably 10 minutes after shutdown. The MAX COLD marking on the dipstick is used to check the engine oil level when the engine is cold. The minimum limit is 3 quarts below the MAX HOT or MAX COLD.

WARNING

The oil dipstick must be secured and locked in the appropriate position before flight otherwise oil loss will occur and engine failure will follow.

NOTE

Filling the oil level to the maximum level may result in a high consumption rate, with the oil exiting through the accessory gearbox breather. Refer to Section 8 for the recommended procedure to establish the specific operating range for the airplane engine and acceptable consumption rates.

1.7 MAXIMUM CERTIFIED WEIGHTS

MAXIMUM CERTIFIED TAKEOFF WEIGHT: 7500 lbs

MAXIMUM CERTIFIED LANDING WEIGHT: 7125 lbs

1.8 TYPICAL AIRPLANE WEIGHTS

BASIC EMPTY WEIGHT: 3100 lbs

MAXIMUM USEFUL LOAD: 4400 lbs
(will vary with basic empty weights)

1.9 CABIN AND ENTRY DIMENSIONS

CABIN WIDTH: 54 inches
(maximum width)

CABIN LENGTH: 158 inches
(measured from behind pilot's seat to rear cabin bulkhead)

CABIN HEIGHT: 56 inches
(maximum height)

ENTRY WIDTH: 50 inches - 48 inches
(varies depending on door type)

ENTRY HEIGHT: 47 inches - 45 inches (front of door frame)
41.3 inches - 39.3 inches (rear of door frame)

SILL HEIGHT: 44 inches
(with oleos fully extended)

1.10 SPECIFIC LOADINGS

WING LOADING: 24.59 lb/ft^2

POWER LOADING: 10 lbs/shp

1.11 WING

DIHEDRAL CENTRE WING: 0°

DIHEDRAL OUTER PANELS: 8°

INCIDENCE: 2°

1.12 LANDING GEAR

TYPE: Non retracting, nose wheel steering

NOSE WHEEL STEERING RANGE: 20° to the left and 25° right of neutral

MAIN TIRES: 8.50 inches x 10 inches

NOSE TIRES: 8.50 inches x 6 inches

TIRE PRESSURES: Main 40 psi (airplane unladen)
Nose 30 psi (airplane unladen)

1.13 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

CAS	*Calibrated Airspeed* means the indicated speed of an airplane, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
KCAS	Calibrated Airspeed expressed in knots.
Ground Speed	*Ground Speed* is the speed of an airplane relative to the ground.
IAS	*Indicated Airspeed* is the speed of an airplane as shown in the airspeed indicator when corrected for instrument error. IAS values published in the handbook assume zero instrument error.
KIAS	Indicated airspeed expressed in knots.
TAS	*True Airspeed* is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature and compressibility.
KTAS	True airspeed expressed in knots.
V_A	*Maneuvering Speed* is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_{FE}	*Maximum Flap Extended Speed* is the highest speed permissible with wing flaps in the prescribed extended position.
V_{NE}	*Never Exceed Speed* is the speed limit that may not be exceeded at any time. V is expressed in knots.
V_{NO}	*Maximum Structural Cruising Speed* is the speed that should not be exceeded except in smooth air and then only with caution.
V_S	*Stalling Speed* or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	*Stalling Speed* or the minimum steady flight speed at which the airplane is controllable in the landing configuration.
V_x	*Best Angle of Climb Speed* is the speed which delivers the greatest gain of altitude in the shortest possible horizontal distance.

V_Y	*Best Rate of Climb Speed* is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

METEOROLOGICAL TERMINOLOGY

ISA	*International Standard Atmosphere* in which: (1) The air is a dry perfect gas, (2) The temperature at sea level is 15^0C (59^0F), (3) The pressure at sea level of 29.92 inches hg (1013.25 mb), (4) The temperature gradient from sea level to the altitude at which the temperature is $–56.5^0$C (-69.7^0F) is $–0.00198^0$C (-0.003564^0F) per foot and zero above that altitude. The altitude temperature relationships are shown on Graph 7.
OAT	*Outside Air Temperature* is the free air static temperature, obtained either from in flight temperature indications or ground meteorological sources, adjusted for instrument error and compressibility effects.
Indicated Pressure Altitude	*Indicated Pressure Altitude* is the number actually read from an altimeter when the barometric subscale has been set to 29.92 inches (1013.25 mb) of mercury.
Pressure Altitude	*Pressure Altitude* is the altitude measured from standard sea level pressure with 29.92. inches (1013.25 mb) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this handbook, altimeter instrument errors are assumed to be zero.
Station Pressure	*Station Pressure* is the actual atmospheric pressure at field elevation.
Wind	Wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported wind.

POWER TERMINOLOGY

Take Off Power:	The maximum power permissible for takeoff and is limited to a maximum of 5 minutes under normal operation.
Maximum Continuous Power (MCP):	Is the maximum power rating not limited by time.
Reverse Thrust:	The thrust of the propeller directed opposite the usual direction, thereby producing a braking action.
Zero Thrust:	The absence of appreciable thrust, in either direction.

Flameout:	Is the unintentional loss of combustion chamber flame during operation.
Hot Start:	Is an engine start, or attempted start, which results in an ITT of 1090 ^{0}C being exceeded.
Windmill:	Is the propeller rotation from airstream inputs.
psi:	Is pounds per square inch.

ENGINE CONTROLS AND INSTRUMENTS

Power Lever:	The lever used to control engine power, from the lowest through the highest power, by controlling propeller pitch, fuel flow, engine speed or any combination of these.
Propeller Lever:	The lever used to select a propeller speed. In the maximum decrease rpm position it will feather the propeller.
Fuel Condition Lever:	The lever is the primary control for starting and stopping the engine.
Propeller Governor:	The device that regulates the rpm of the engine/propeller by increasing or decreasing the propeller pitch, through a pitch change mechanism in the propeller hub.
ITT:	Inter-Turbine Temperature measured and indicated in degrees centigrade. It is the gas temperature in the turbine section of the engine.
$N_{G:}$	Gas generator rpm expressed as a percentage.
$N_{P:}$	Power output shaft rpm expressed as a percentage.
Torque:	Torque is a rotational force exerted by the engine on the propeller.
Beta Range:	The mode in which propeller blade pitch is controlled by the power lever.
GCU:	Generator Control Unit.
rpm:	Is revolutions per minute.
SHP:	Shaft Horsepower and is the power delivered at the propeller shaft.

AIRCRAFT PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient:	The demonstrated ratio of the change in height during a portion of a climb, to the horizontal distance traversed in the same time interval.
Demonstrated Crosswind Velocity:	The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests.
g:	Is the unit of acceleration equivalent to that produced by the force of gravity
LPH:	Is Litres Per Hour and is the amount of fuel used per hour measured in litres.
pph:	Is pounds per hour and is the amount of fuel used per hour measured in pounds.
fpm:	Is feet per minute and is the rate of climb or descent expressed in feet per minute.
nm:	Is the linear unit nautical mile which is 2025 yards or 1852 meters.
ft:	Is the linear measurement of 12 inches or 30.48 centimeters.
lb:	Is a unit of weight equal to 16 ounces or 0.4536 kilograms.
L:	Is litre.

WEIGHT AND BALANCE

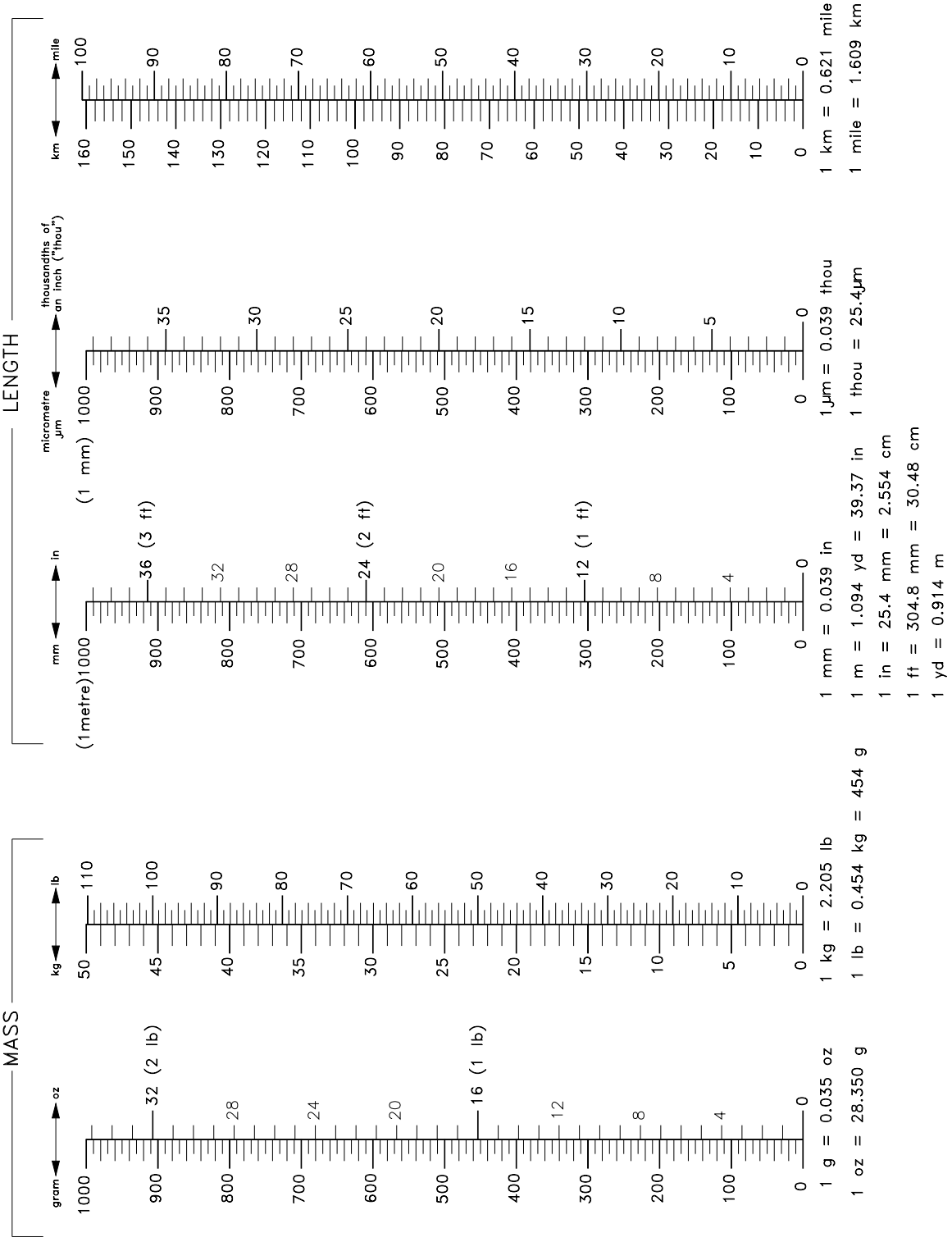
Reference Datum:	*Reference Datum* is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station:	*Station* is a location along the airplane fuselage given in terms of the distance from the reference datum.
Arm:	*Arm* is the horizontal distance from the reference datum to the centre of gravity of an item.
Moment:	*Moment* is the product of the weight of an item multiplied by its arm. Moment divided by the constant 1000 is used in this handbook to simplify balance calculations by reducing the number of digits.
Centre of Gravity:	*Centre of Gravity* is the point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

CG Arm:	*Centre of Gravity Arm* is the arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
CG Limits:	*Centre of Gravity Limits* are the extreme centre of gravity locations within which the airplane must be operated at a given weight.
Usable Fuel:	Is the amount of fuel available for flight planning.
Unusable Fuel:	Is the quantity of fuel remaining after a run out test has been completed in accordance with the governmental regulations. This fuel cannot be used in flight.
Basic Empty Weight:	The *Basic Empty Weight* includes unusable fuel, operating fluids, including engine oil and items listed as removable equipment.
Payload:	*Payload* is the weight of occupants, cargo and baggage.
Useful Load:	*Useful Load* is the difference between take off weight and basic empty weight.
Maximum Takeoff Weight :	*Maximum Takeoff Weight* is the maximum weight approved for the start of the takeoff roll.
Maximum Landing Weight:	*Maximum Landing Weight* is the maximum weight approved for landing touchdown.
kg:	Is kilogram.

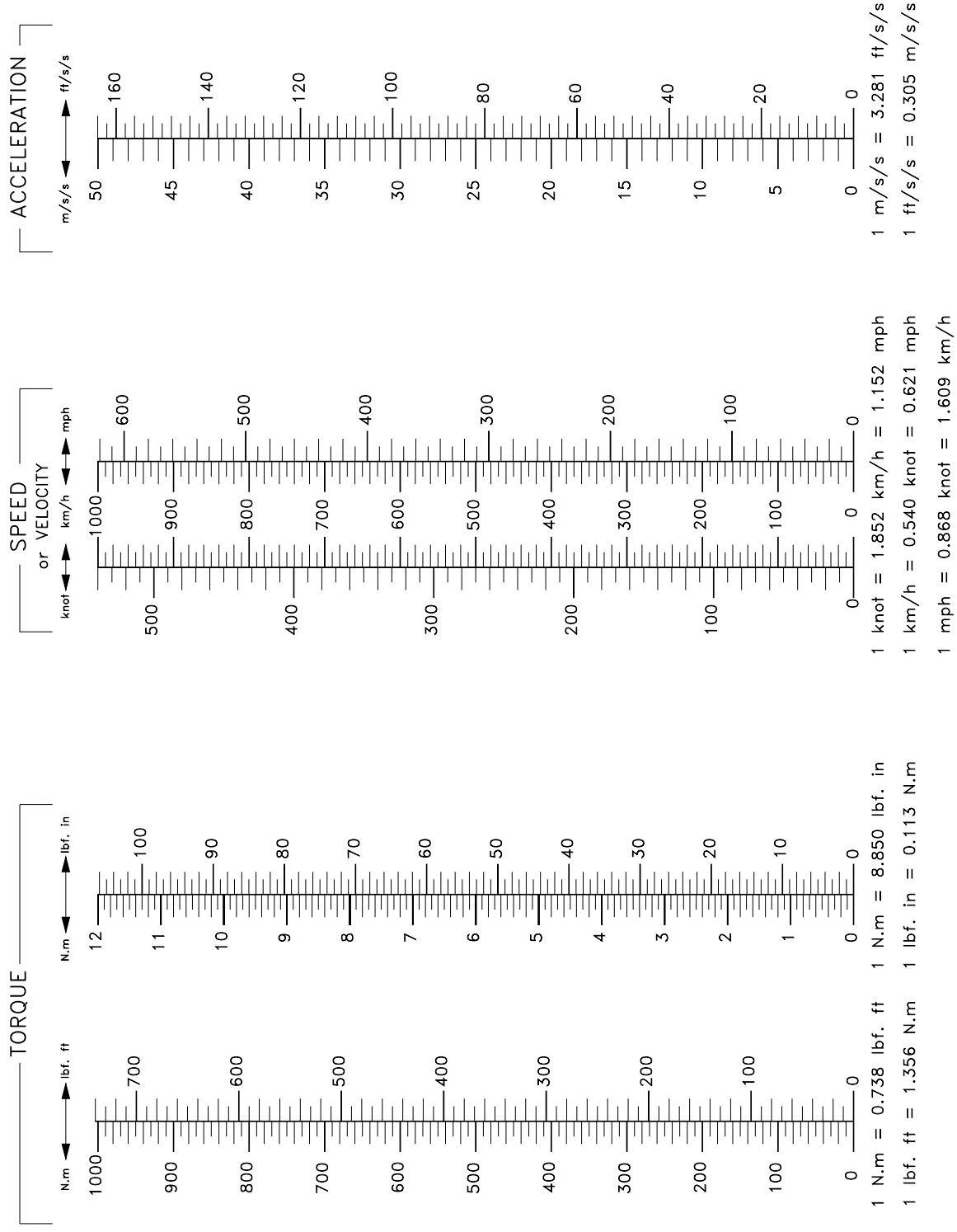
1.14 TABLES AND GRAPHS

No 1	Conversion Graph -Mass and Length
No 2	Conversion Graph -Torque, Speed and Acceleration
No 3	Conversion Graph -Area, Volume and Force
No 4	Conversion Graph –Pressure
No 5	Conversion Graph -Temperature, Energy and Power

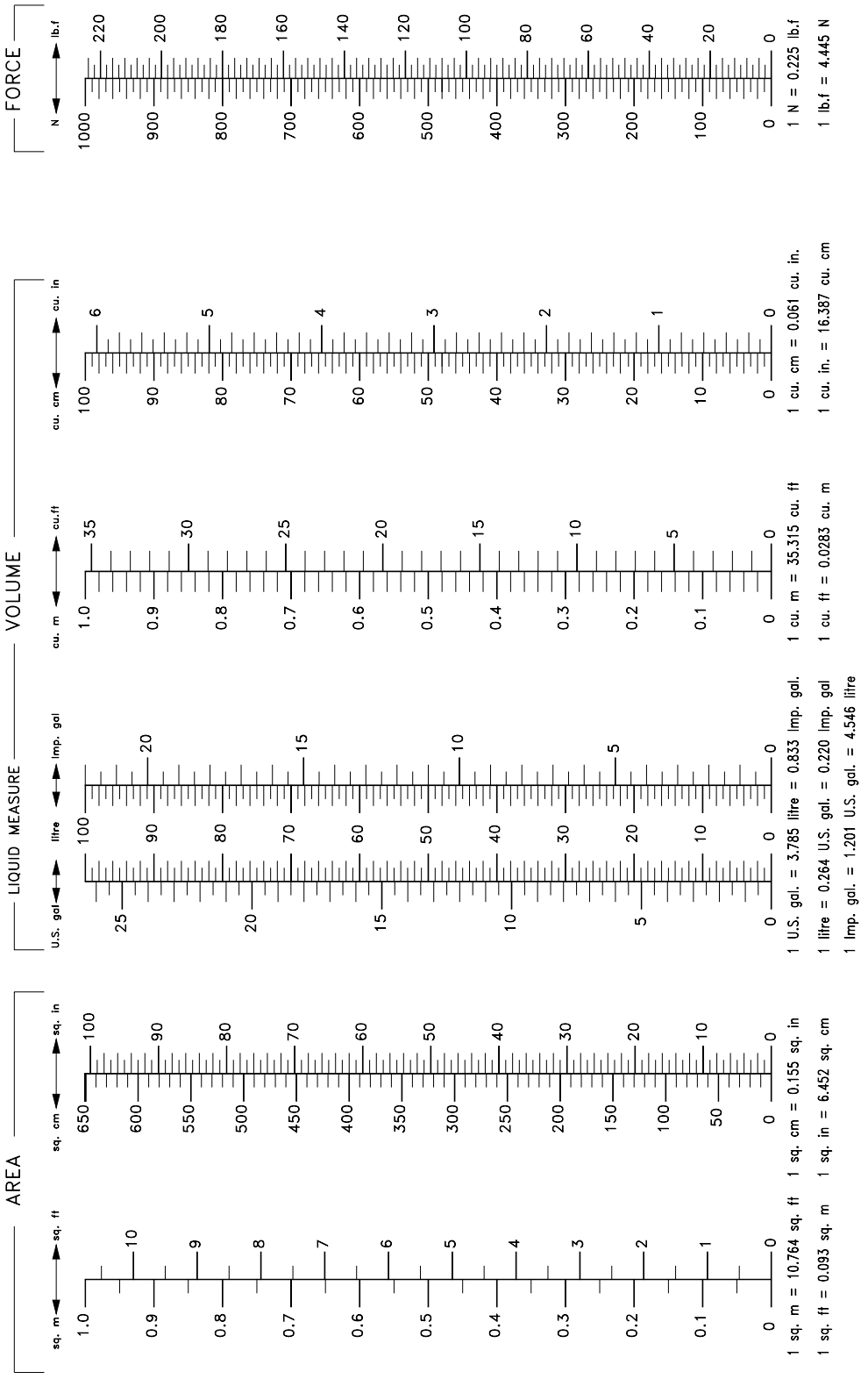
GRAPH No. 1 Conversion - Mass and Length



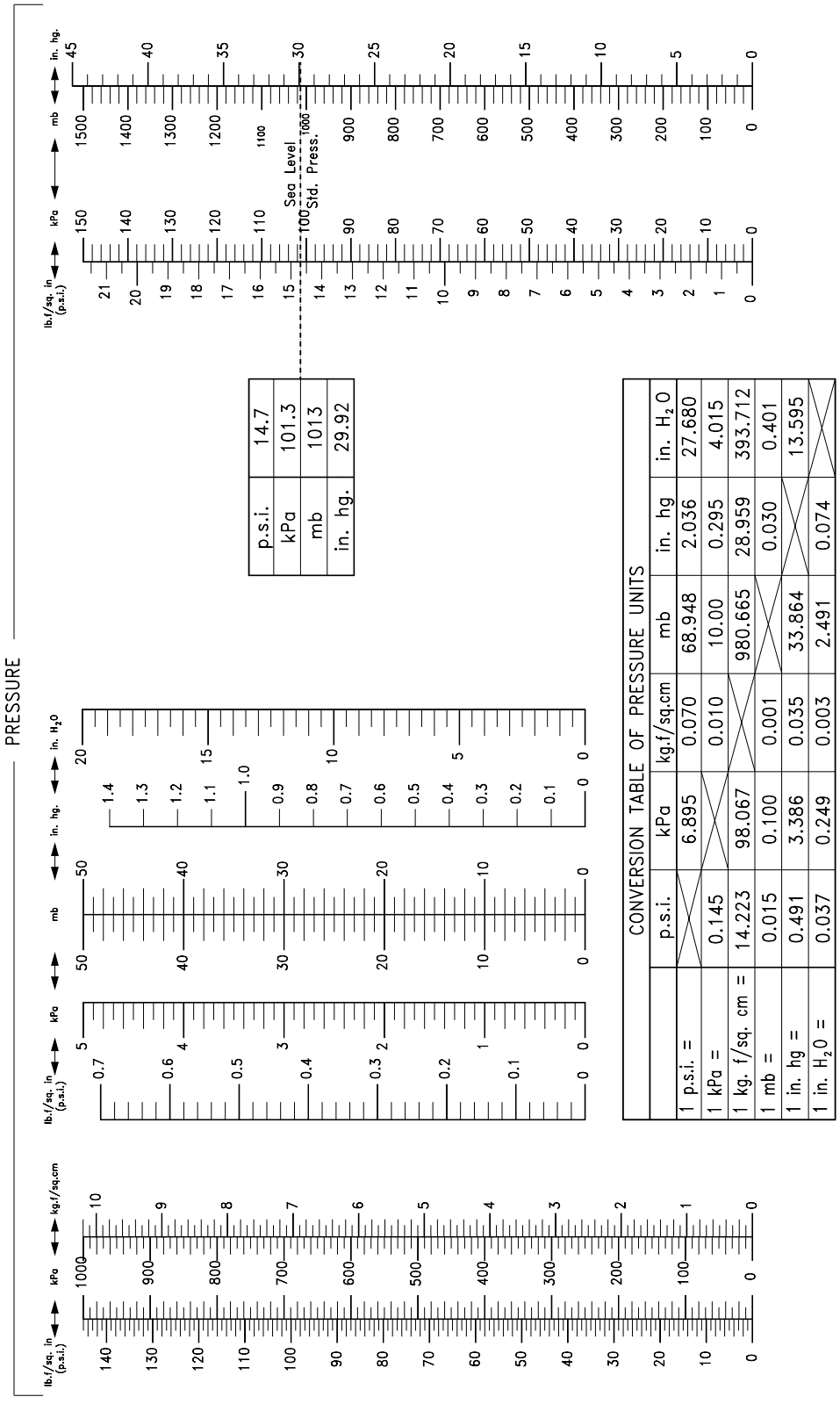
GRAPH No. 2 Conversion - Torque, Speed and Acceleration



GRAPH No. 3 Conversion - Area, Volume and Force



GRAPH No. 4 Conversion - Pressure



p.s.i.	14.7
kPa	101.3
mb	1013
in. hg.	29.92

CONVERSION TABLE OF PRESSURE UNITS

	p.s.i.	kPa	kg.f/sq.cm	mb	in. hg	in. H_2O
1 p.s.i. =		6.895	0.070	68.948	2.036	27.680
1 kPa =	0.145		0.010	10.00	0.295	4.015
1 kg. f/sq. cm =	14.223	98.067		980.665	28.959	393.712
1 mb =	0.015	0.100	0.001		0.030	0.401
1 in. hg =	0.491	3.386	0.035	33.864		13.595
1 in. H_2O =	0.037	0.249	0.003	2.491	0.074	

GRAPH No. 5 Conversion - Temperature, Energy and Power