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Aircraft Performance Program Part 7: Error messages Programs APP02 and APP03



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**AIRCRAFT PERFORMANCE PROGRAM
PART 7: ERROR MESSAGES
PROGRAMS APP02, APP03**

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AIRCRAFT PERFORMANCE PROGRAM PART 7: ERROR MESSAGES PROGRAMS APP02, APP03

1. INTRODUCTION

(Note: In this Data Item, data options and facilities which are not available in the current release of the program are presented in *italic script*.)

Descriptive error and warning messages are produced by the Flight Performance Program (APP02) when an error is found in the input data or during calculation of the aircraft performance. Some of the Flight Performance Program messages also occur when the Interpolation Program (APP03) is used because it uses the same table input (which includes syntax checking) and interpolation routines as the Flight Performance Program. This Data Item contains more complete descriptions of the errors encountered than is given in the output error messages.

2. GENERAL

Most of the error messages follow directly after the lines to which they refer. Messages are categorised in order of severity, as follows.

- **Warnings (W series)**

The programs will continue. The warning message provides extra information to the user.

- **Errors (E series)**

Data input will continue but the data file may not be as intended.

When the error is in the Flight Performance Program, the case will be abandoned giving a brief output summarising the main input variables. It will continue to process the next case.

- **Fatal Errors (F series)**

Data input and checking will continue to the end of the file but will not allow the performance calculations to run.

Data input messages (W0000, E0000 and F0000 series) are listed in Section 3.

Performance calculation messages (F1000, F2000, E2000, E3000, E4000, W2000 and W3000 series) are listed in Section 4. Some of the messages refer to program subroutines (*e.g.* Subroutine MAXSPD).

The messages summarised in the following Sections contain dummy characters in bold italics (*e.g. calc_type, trim_type, XGMAINi*) to represent items that are replaced by the actual keywords, variable names or values found by the program. Alternative sections of text in the messages are separated by a vertical bar (*e.g. start|finish*).

3. DATA INPUT ERROR MESSAGES

3.1 Warnings (W0000 Series)

Data input will continue but the data file may not be as intended, the performance calculations will continue.

W0001: Keyword **keyword** has already been found. The last value will be taken as the correct data.

The given keyword was assigned a value earlier in this data set and has been redefined by this assignment. The most recently assigned value will be used.

W0002: You cannot use CANCEL with **keyword**. Reassign the variable if you want to change it.

The given keyword cannot be changed by using the keyword CANCEL; change the value by reassigning the keyword. CANCEL is primarily intended to allow the data to be changed to use a different item from a set of options (*e.g.* WEIGHT instead of MASS) where only one of the set may be used at a time. It can also be used to suppress warning message W0001.

W0003: Keyword **keyword** has been CANCELED before it has been defined.

The cancel keyword (CANCEL) has been used with the given keyword, but that keyword has not been given a value in the data file. It may have been assigned a default value by the program.

W0004: Range gives **number_values** values, maximum of 100 permitted.

The given range ($X_1(\Delta X) X_f$) will produce more than 100 cases when expanded. Increase the increment (ΔX) or split the range into a number of smaller data sets, separated by the END_CASE keyword. [This restriction will be removed in a later issue.]

W0005: More than **number_values** real values found on data line.

More than the given number of data values were found on the line following the keyword than were expected. The extra values have been ignored.

W0006: Synonym '**synonym**' for variable **keyword** is the same as the standard table variable.

The synonym assigned to the given variable is the same as one of the standard table variables, see ESDU 00035 (Reference 10). The synonym cannot be used as a table variable (see fatal error F1166).

W0007: Total of 100 combination variable values exceeded. Combination data for this variable omitted.

The sum total of all the data values input in combination lines (@ precedes the data values after the keyword) for the current data set must not exceed 100. The line of data preceding this message has exceeded this limit and has been ignored. Split the combination between data sets or reduce the number of variable keywords used. Only the first value input will be used.

W0008: Total of 100 permutation variable values exceeded. This permutation limited to **number_values** values.

The sum total of all data values input in permutation lines (including ranges which are expanded) for the current data set must not exceed 100. The line of data preceding this message has exceeded this limit and the data have been reduced to the given number of values. Split the permutation between data sets or reduce the number of variable keywords used. Only the first value input will be used.

W0009: Range only contains one value.

The given range (X1 (DeltaX)Xf) will produce only one case when expanded. It will be treated as a single value input.

W0010: More than **number_lines** units conversion lines found in UNITS_TO.SI file. Program will continue.

A total of the given number of sets of conversion factors and increments used to convert from an input unit type to the appropriate SI unit is allowed which includes the standard conversions built into the program. The extra conversions found in the UNITS_TO.SI file have exceeded this limit. The program will continue provided none of the missing conversion factors is required.

W0011: No extra units conversion lines found in UNITS_TO.SI file. Program will continue.

The UNITS_TO.SI file has been opened but no extra sets of conversion factors and increments have been found. Check that the format of the file is correct. The program will continue provided no undefined conversion factors are required.

W0012: Error reading UNITS_TO.SI file around line **line_number**. Program will continue.

While reading the UNITS_TO.SI file an error has occurred around the given line number. Check the format of the file. The program will continue provided no undefined conversion factors are required.

W0013: Error **error_number** while attempting to open UNITS_TO.SI file. Program will continue.

The given FORTRAN error number has occurred whilst opening the UNITS_TO.SI file. The program will continue provided no undefined conversion factors are required.

W0014: ENGVAR**ij** has been re-assigned to VARIABLE**k**.

The given engine miscellaneous variable (ENGVAR) has already been assigned to the given general miscellaneous variable (VARIABLE). The new assignment will be used.

W0015: ENGVAR**ij** was previously assigned to VARIABLE**k**.

The given engine miscellaneous variable (ENGVAR) was originally assigned to the given general miscellaneous variable (VARIABLE). This assignment is cancelled and the new data will be used.

W0016: For calculation type **calc_type**, corrections to N due to real Earth option **track** are for information only.

In the given calculation type, the corrections to normal load factor due to the local acceleration due to gravity, centripetal and Coriolis forces for the given real Earth option will not be used to define the apparent normal load factor (Napp) because the normal load factor has been defined by an input (*i.e.* N, TURNRATE or TURNRAD). It is assumed that performance is required at the implied or input value of normal load factor.

If the apparent normal load factor is required, the program should be allowed to use the default input (see W0140).

W0017: **Option** output option already set as "**=key1**"; also input as "**key2**".

Extra output data has been requested twice for the given option. The second key letter will be ignored. The key letters are as follows.

<u>Option</u>	<u>Extra Output</u>	<u>Key</u>
H and V	height and speed output	H
Engine	engine data output	1, 2, 3, 4, 5, E, X
<i>Gear</i>	<i>undercarriage and brake data</i>	<i>G</i>
MODTABs	MODTAB variables in use	M
Trimming	trim correction output	T
<i>Plotting</i>	<i>plotting output</i>	<i>P</i>

W0018: Error in OUTPUT option "X": no extra engine variables.

W0018: Error in OUTPUT option "**key**": last engine set is **engine_set**.

Extra output has been requested (using the OUTPUT keyword +X). No extra engine variables (ENGVAR*ij*) data have been input.

Extra output has been requested (using the OUTPUT keyword) for the given engine set. No data have been input for this engine set which has a higher set number than the engine sets that have been input.

W0019: PEC correction marker, **pectype**, has been set, but no correction data are input.

The PECTYPE keyword allows the user to specify which Pitôt-Static correction method will be used. Two methods are available, see ESDU 00035 (Reference 10).

1. SIMPLE option.
PECONH is essential and PECONM and/or PECONV may also be input,
- OR 2. Pressure Coefficient options.
One of the PECTYPE keywords (PT-PS:IND, PT-PS:TRUE, QD:IND or QD:TRUE) is required, DCP_STATIC is essential and DCP_TOTAL may also be input.

No correction data have been input for the given marker setting.

W0020: Only PEC correction to height input. Speed corrections will assume total pressure is correct.

The options for applying Pitôt-Static corrections allow the input of data to correct both the height and speed. For this case only data to correct height have been input (PECONH or DCP_STATIC depending on the PEC option used). If no other data are input, the corrections to indicated Mach number and airspeed will be made assuming that the measured total pressure is correct.

Two methods of Pitôt-Static correction are available,

1. SIMPLE option.
PECONH is essential and PECONM and/or PECONV may also be input,
- OR 2. Pressure coefficient options.
One of the PECTYPE keywords (PT-PS:IND, PT-PS:TRUE, QD:IND or QD:TRUE) is required,
DCP_STATIC is essential and DCP_TOTAL may also be input.

W0021: The table factor and increment will be applied as,
[TAB(*table_name*) */*factor*] +|- *increment*

W0021: The speed factor and increment will be applied as,
[*special_speed* */*factor*] +|- *increment*

For the given table file or special speed the factor and increment have been defined in the wrong order. The factor is applied before the increment is added as shown by the brackets in the message (e.g. [BUFFET*1.05] +10]), this may not achieve the required result. Change the input line to the correct order. The message is also used when the increment is very small (less than 10^{-30}) and a zero value is then used.

When variables are used to factor or increment tables or special speeds (MODTAB variables), the keyword identifying the MODTAB variable or its synonym are output for the factor and/or increment.

W0022: The table factor is equal to zero.

W0022: The speed factor is equal to zero.

A table or speed factor has been found which is zero. The calculation will continue using the value of the factor that has been found.

W0023: MODTAB keyword, **keyword**, has been input as a constant.

One of the variables that are used to factor or increment tables or special speeds (a MODTAB variable), shown by the given keyword, has been input with a constant value. This constant will be applied when the MODTAB variable is used, but the factor or increment would be better applied directly to the table or special speed to which it refers (e.g. TAB(XG_TABLE) *1.05).

By inputting a range or list of constant values for a MODTAB variable, the facility could be used to produce a permutation on (say) a range of engine thrust factors or buffet onset speed margins.

W0025: No operating engines are specified for engine set **engine_set**

The number of engines operating (NOPT) in the given engine set has been input as zero. The calculation will continue using no operating engines in this engine set.

3.2 Defaults (W0100 Series)

Data input will continue with default values used in the data. The performance calculations will be run. These default warning messages can be suppressed by using the keyword DEFAULT at the start of the data file.

W0100: The output unit type, OUTPUT, has not been defined. The default setting, SIUNIT, will be used.

The units used for parameters generated by the calculation are determined by the OUTPUT keyword (input data that also appear on the output are presented in the original input units). If the OUTPUT keyword is not used new output values will be in SI units (*i.e.* OUTPUT SIUNIT).

W0101: The trimming type, *trim_type*, has not been defined. The default setting, TRIMMED, will be used.

The program provides the option for five types of trimming calculation (*TABLES*, *TAILLESS*, *TAILFIX*, *TAILMOVE*, *CANARDFIX* and *CANARDMOVE*) to balance the aircraft in pitch about the Y-axis. If the TRIMTYPE keyword is not used, the program will use the TRIMMED option (*i.e.* TRIMTYPE TRIMMED).

W0102: The limiting CL type, LIMITCL, has not been defined. The default setting, *lift_limit*, will be used.

The LIMITCL keyword allows the user to specify which of the limiting lift coefficient or angle of attack conditions (BUFFET, USABLE or MAXIMUM) should be taken to be the most critical. The given value will be used. It is the highest one (in the sequence BUFFET, USABLE, MAXIMUM) for which data are available.

W0103: Default output file, *filename*, in PORTRAIT/LANDSCAPE format

The name of the output file has been created from the input file name with a file type of .OUT (*e.g.* input file name, DATA.IN, would result in the output file, DATA.OUT). The format (PORTRAIT or LANDSCAPE) takes the default PORTRAIT, this may be changed by using the OUTPUT keyword (*e.g.* OUTPUT IMPUNIT LANDSCAPE).

W0104: No PEC correction marker, but data for the SIMPLE option are input. The SIMPLE option will be used.

The PECTYPE keyword allows the user to specify which Pitôt-Static correction method will be used. Data have been input (*e.g.* PECONH and PECONM and/or PECONV) to allow the SIMPLE method of correction to be used.

W0110: The numbers of engines, NENG_{*i*} and NOPT_{*i*}, have not been defined. Default values of 1 (unity) will be used.

No engine numbers (NENG and NOPT) have been input for this engine set (indicated by the given suffix). It will be assumed that there is one engine in the set with that one engine operating (*i.e.* NENG1 1, NOPT1 1).

W0111: Operating number of engines, NOPT_i, has been set equal to NENG_i

W0111: Total number of engines, NENG_i, has been set equal to NOPT_i

One of the keywords NENG or NOPT has not been input for this engine set (indicated by the given suffix). The missing item will be made equal to the item shown that has been defined.

W0112: No engines are operating in engine set **set_number**

The number of engines operating (NOPT) in the given engine set has been input as zero. The calculation will continue using no operating engines in this engine set.

W0113: The engine jet thrust angle, ENGANG_i, has not been input. A value of zero will be used.

W0113: The engine jet splay angle, SPLAY_i has not been input. A value of zero will be used.

An engine gross thrust angle (ENGANG or SPLAY) has not been input for this engine set (indicated by the given suffix). A zero angle will be used (e.g. ENGANG1 0 deg or SPLAY3 0 deg).

When engine thrust components are resolved (i.e. RESOLVE JET or ALL) the relevant engine thrust angles (ENGANG, SPLAY) are required for this engine set.

W0114: Thrust resolution marker, RESOLVE, has not been input. The default setting, ALL, will be used.

The RESOLVE marker allows the user to control how the engine thrust components are resolved. The default value, ALL, will allow all jets (XGMAIN or XNMAIN as appropriate) to be fully resolved into body and air-path axes.

W0116: *When fuel flow volume rate units are used, the fuel specific gravity, FUEL_SG_i, is required. The value has been set to FUEL_SG1.*

If any of the engine data keywords, FEMAIN, FEWIND, MLPMAIN or DM/DT, are input using volume rate units (e.g. gal/hr, l/s) the fuel specific gravity is needed to convert these values to mass flows (kg/s). No fuel specific gravity has been input for this engine set (indicated by the given suffix); the fuel specific gravity for engine set 1, FUEL_SG1, will be used.

W0117: The fuel flow for the windmilling engines, FEWIND_i, has not been defined. A value of zero will be used.

Data for a windmilling engine has been input as thrust (e.g. XGWIND or XDWIND) but the fuel flow for the failed engine (indicated by the given suffix) has not been input. A zero fuel will be used.

W0120: The wing setting angle, ALW–ALB, has not been defined. A value of zero will be used.

The angle between the wing reference plane and the aircraft body reference plane (which defines angle of attack) is used to find the wing angle of attack table variable, ALPHAW. If no value is input, a zero angle is used (i.e. ALW–ALB 0 deg).

W0124: The downwash, DOWNWASH, has not been defined. A value of zero will be used.

The local flow angle at the trimming surface relative to the angle of attack is defined by the keyword DOWNWASH. If no value is input, zero downwash will be assumed (*i.e.* DOWNWASH 0 deg)

W0125: The trimming surface pitching moment, CMTAIL, has not been defined. A value of zero will be used.

The aerodynamic pitching moment of the trimming surface about the trimming surface moment reference centre and based on the trimming surface geometry can be defined. If no value is input a zero pitching moment will be used (*i.e.* CMTAIL 0)

W0126: The trimming surface effective kinetic pressure ratio has been set to 1.0

The local kinetic pressure at the trimming surface can be defined as a factor (QT/QFS) times the free stream kinetic pressure. If no value is input, a factor of one will be used (*i.e.* QT/QFS 1.0).

W0127: The trimming surface setting angle, ETATO has not been defined. A value of zero will be used.

The trimming surface setting angle, ETATO, is used to find the trimming surface angle of attack, ALPHAT or ALPHAC. If no value is input, a zero setting angle is used (*e.g.* ETATO 0 deg).

W0128: The CG chord length, CG_CBAR, has not been defined. The default value, CBAR, will be used.

When the centre of gravity position is defined using a percentage of the mean chord length (CG%CBAR) the mean chord length (CG_CBAR) is also required. It has been made equal to the wing mean chord (*i.e.* CG_CBAR = CBAR).

W0130: The atmosphere type, ATMOSTYPE, has not been defined. The default setting, ISA, will be used.

The program allows the choice of a range of atmosphere definitions including the input of a user atmosphere. If no atmosphere type is defined the default ISA will be used (*i.e.* ATMOSTYPE ISA).

W0131: One of the atmosphere temperature options, DELTAT or TAMB, must be defined.
The default value, *atmos_type* + 0 C, will be used.

The temperature relative to the current atmosphere definition (DELTAT) or the static temperature (TAMB) at the initial height must be defined. If no value is input the current atmosphere definition will be used with no temperature increment added (*i.e.* DELTAT 0 C).

W0132: One of the atmosphere start height options, PAMB or HP|HG|HGEOM|HIND, may be defined.
The default value, HP = 0, will be used.

W0132: One of the atmosphere finish height options, ENDPAMB or ENDHP|HG|HGEOM|HIND, may be defined.
The default value, ENDHP = 0, will be used.

For the calculation option chosen, a start height (PAMB, HP, HG, HGEOM, HIND or their

synonyms STARTPAMB *etc.*) and/or finish height (ENDPAMB, ENDHP, ENDHG, ENDHGEOM or *ENDHIND*) should be input. The program is able to assume a default of zero height for the current calculation option (*i.e.* HP 0 m or ENDHP 0 m).

W0133: When HGEOM or ENDHGEOM height is used, LATITUDE is also required.

The default value of 45.5425 deg (North) will be used.

W0133: When USERALTZ height is used, USERLATD is also required.

The default value of 45.5425 deg (North) will be used.

W0133: Nominal LATITUDE of 45.5425 deg (North) will be used.

When geometric height (keywords HGEOM, STARTHGEOM, ENDHGEOM or USERALTZ) is input, latitude is required to convert the geometric height to geopotential height. If latitude is not input the default value which is consistent with the accepted value of the acceleration due to gravity ($g_0 = 9.80665 \text{ m/s}^2$) is used (*i.e.* LATITUDE 45.5425 deg).

W0134: The atmosphere temperature increment, DELTAT, must be defined for CEILING calculation.

The temperature increment (DELTAT) relative to the selected atmosphere model must be input. Only the DELTAT option is available for CEILING and CEILING+ performance options because the height is unknown. If no value is input the current atmosphere definition will be used with no temperature increment added (*i.e.* DELTAT 0 C).

W0135: Initial height or pressure is not required for the **calc_type** calculation
The input units of height will be used for output.

W0135: Initial height or pressure is not required for **calc_type** calculation when INITIALSEP or INITIALROC are used.
The input units of height will be used for output.

For the CEILING and CEILING+ performance options and DESCENTs when INITIALSEP or INITIALROC are used, no input value of height or ambient pressure is required. If height is input, the value will be ignored but the unit input is used to control the units used for output.

W0135: Given speed, **speed_type**, is not required for the **calc_type** calculation
The input units of speed will be used for output.

For the given performance options (MAXSPEED, MINDRAG or MINSPEED), no input value of the given speed is required. When speed is input, the value will be ignored but the unit input is used to control the units used for output. A Special Speed input can be used to apply a factor and/or increment and to define the output units.

W0136: The pressure at zero height, USERPSO, has not been defined. A value of 101325 Pa will be used.

When the user atmosphere option (ATMOSTYPE USERATMOS) is used and the temperature profile is defined using geopotential (USERALTG) or geometric (USERALTZ) height, the pressure at zero height may be input. If no value is input, the standard atmosphere value of 101325 Pa is used. If pressure height (USERALTP) is used to define the user atmosphere, the pressure at zero

height is defined by the standard atmosphere.

W0137: The longitude, LONGITUDE, has not been defined. A value of 0 deg (Greenwich) will be used.

When real Earth corrections are used (*e.g.* CIRCULAR RHUMB_L), the longitude may be input. If no value is input, the value of zero for the Greenwich meridian is used.

W0138: For PATH calculation **calc_type** in a circle on a flat Earth, the heading must be specified. A value of zero will be used.

For PATH calculations CRUISE or LOITER around a circle (normal load factor greater than one) and on a flat Earth, the initial heading (HEADING) is required. The headwind component (see WIND and WINDDIRN) and the change in heading can then be calculated.

W0140: For calculation type **calc_type** the N may be specified. It has been set to the default value of 1.0

W0140: For calculation type **calc_type** the N may be specified It has been set to the default value cos (GAMMA).

For the given calculation type, calculations can be done for different values of the normal load factor. Calculations CRUISE and LOITER can also use climb angle (GAMMA) turn rate (TURNRATE) or radius of turn (TURNRAD) to define the normal load factor. If no value is input, a normal load factor of 1 (level flight) or, for CRUISE and LOITER, cos (GAMMA) will be used.

W0141: For calculation type **calc_type** the GAMMA may be specified. It has been set to the default value of 0.0 deg.

W0141: For PATH calculation **calc_type** at constant HGEOM, GAMMA will be calculated to give Const. HGEOM.

W0141: For PATH calculation **calc_type** at constant HIND, GAMMA will be calculated to give Const. HIND.

Sustained turn, instantaneous turn, cruise and loiter calculations can be done for the aircraft at a steady climb angle (GAMMA). If the climb angle is not input a value of zero is used (*i.e.* GAMMA 0 deg).

Special trajectories at constant height where no climb angle (GAMMA) is input.

1. For constant geometric height (HGEOM) on a real Earth, the rate of change of geopotential height (the integration variable) that achieves constant geometric height is a function of latitude and is derived from the equations for motion around the real Earth.
2. For constant indicated height (HIND), an empirical value for the rate of climb or descent is found that keeps the indicated height constant as the pressure error correction changes. To avoid rapid changes in flight path, this correction is limited to a flight path angle of 45 deg or half the available specific excess power.

Notes.

- (i). If indicated cruise speeds (IMN or IAS) are also used, an additional acceleration or deceleration is found to keep the indicated cruise speed constant.
- (ii). If a level cruise at constant pressure or geopotential height is required, a zero value of climb angle should be input (GAMMA 0 deg); the input height (HGEOM or HIND) will then be used as the initial value.

W0142: For calculation type MAXSPEED the LONGACCN may be specified. It has been set to the default value of 0.0 (m/s)/s.

The maximum speed calculation can be done with an excess thrust margin at the maximum speed condition. The thrust margin can be defined as a residual longitudinal acceleration (LONGACCN) or as specific excess power (SEPLIM). If no input is given a zero excess thrust margin is used (*i.e.* LONGACCN 0 (m/s)/s).

W0143: For calculation type **calc_type** the ROCLIM may be specified. It has been set to the default value of 0.0 m/s.

For CEILING and CEILING+ calculations, the aircraft ceiling is found for a given specific excess power (SEPLIM) or rate of climb, rate of change of pressure height (ROCLIM). If no limit is input, zero rate of climb is used (*i.e.* ROCLIM 0 m/s). (N.B. Specific Excess Power is rate of climb at constant true airspeed).

W0144: For calculation type **calc_type** final height not input. Minimum rate of climb, ROCLIM, of 0.5 m/s will be used.

For the given type of climb calculation, a finish height (*e.g.* ENDHP, ENDHG) is needed. If no value is input a minimum rate of change of pressure height of 0.5 m/s (98.4 ft/min) will be used (*i.e.* ROCLIM 0.5 m/s).

W0144: For calculation type **calc_type** initial height not input. Height for minimum rate of climb, INITIALROC, of 0.5 m/s will be used.

For the given type of descent calculation, an initial height (*e.g.* HP, STARTHG) is needed. If no value is input the height for the minimum rate of change of pressure height of 0.5 m/s (98.4 ft/min) when using the maximum power on all the engine sets for which RATING1*i* is available will be used (*i.e.* INITIALROC 0.5 m/s). The maximum power for at least one engine set should be input.

W0150: The type of speed required for calculation **calc_type** has not been defined. Variable TMN has been set to special speed **special_speed**

For the given calculation, the type of airspeed required in the output has not been specified. The program will output true Mach number (and calibrated airspeed) for the given special speed marker. If a different speed output is required this should be specified on the input (*e.g.* EAS MAX kt). The true Mach number is always output along with one other airspeed (by default this is calibrated airspeed).

W0151: For special speed **special_speed** the N is required. It has been set to 1.0

When the special speeds BUFFET, USABLE, STALL, STALL_PO or MINDRAG are used, the speed can be found for different values of the normal load factor. If no value is input, a normal load factor of 1 (level flight) will be used.

W0152: For special speed MAX the LONGACCN is required. It has been set to 0.0 (m/s)/s.

When the special speed MAX is used, the maximum speed can be found with an excess thrust margin at the maximum speed condition. The thrust margin can be defined as a residual longitudinal acceleration (LONGACCN) or as specific excess power (SEPLIM). If no input is given a zero excess thrust margin is used (*i.e.* LONGACCN 0 (m/s)/s).

W0153: For special speed OPTIMUMP the special speed increment is not used. The value will be ignored.

When using the optimum performance parameter speed, OPTIMUMP, only the factor on the performance parameter is used by the program. If an increment has been input (*e.g.* OPTIMUMP*0.9 +2 kt), the value of the increment is ignored. The input units will be used to determine the units used for the output speed.

3.3 Non-Fatal Errors (E0000 Series)

Data input will continue but the data file may not be as intended. The performance calculations will be run.

E0004: Input data line longer than 100 characters. End of input is: **"input_data"**

The line of data found is longer than 100 characters. All data after this point will be ignored. The last 12 characters of the line of data are output. Any comment (starting with '!') on the line will be truncated. If the data are for a combination or permutation, the data will have to be split between two data sets.

E0005: A value in the data line is outside the range **minimum < value < maximum**

The given value of a parameter (in the units used for input) assigned to a keyword is outside the gross minimum and maximum error limits defined in the program. This message is only precautionary and the program will continue.

E0006: A value in the data line is outside the range **minimum < value < maximum**

The given value of a parameter assigned to one of the special keywords used to define user atmosphere data is outside the gross minimum and maximum error limits defined in the program. This message is only precautionary and the program will continue.

E0007: Keyword **keyword** is not part of the USERATMOS input.

The given input keyword cannot be used when user atmosphere data (following ATMOSTYPE USERATMOS) are being input. Only the keywords ATMOSTEXT, USERALTP|G|Z, USERTEMP, USERLATD, USERPSO or NALTS may be used. This line of data will be ignored.

E0008: The program name should be PROGRAM APP02

The PROGRAM keyword followed by the program name (APP02) is incorrect. This data item is
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only provided for reference.

- E0009: Input file names are different
 DOS Command: APP_input_file
 Data File: INFILE_filename
 Full Name: **Full_Name**
- E0009: Output file names are different
 DOS Command: APP_output_file
 Data File: OUTFILE_filename
 Full Name: **Full_Name**

The input (INFILE parameter) or output (OUTFILE parameter) file name shown is not the same as the file name from the DOS command line. The DOS file name, the INFILE or OUTFILE parameter file name and full name of the file are output. These data items are only provided for reference.

- E0010: The number of engines, NENG_{*i*}, is not a whole number. The value has been truncated to **number**.
- E0010: The number of engines, NOPT_{*i*}, is not a whole number. The value has been truncated to **number**.

The numbers of engines (NENG) or the number of engines operating (NOPT) in this engine set (indicated by the given suffix) should be a whole number. The value input has been **truncated** to the value given. If the effect of fractional engine numbers is required, the table factor facility should be used to modify the engine performance (XGMAIN, XDMAIN, XNMAIN and FEMAIN). This is also checked during the performance calculations - see E2282.

- E0016: Both XDMAIN_{*i*} and MLPMAIN_{*i*} input. XDMAIN_{*i*} will be used.

When jet engine gross thrust, XGMAIN, is used, the engine intake ram (or momentum) drag, XDMAIN, may be input directly or calculated from the engine intake mass flow, MLPMAIN. If both XDMAIN and MLPMAIN are input, only the values of XDMAIN will be used; the MLPMAIN data will be ignored.

- E0018: Windmill jet engine data has been input for engine set **engine_set**, but no operating jet engine data is provided.

Data for a failed engine have been input for the given engine set but no data for the operating engine have been input. For an operating jet engine the thrust data may be input as, see also ESDU 00035 (Reference 10),

- 1. Gross Thrust, XGMAIN, and Ram Drag, XDMAIN,
- OR 2. Gross Thrust, XGMAIN and Intake Mass Flow, MLPMAIN,
- OR 3. Net Thrust, XNMAIN.

- E0019: RESOLVE marker has been set to "JET" but there is no jet engine data.

The RESOLVE marker that controls how the engine thrust components are resolved, has been set to, JET, but no jet engine has been defined for any engine set.

E0025: PEC correction marker, **pectype**, has been set, but data for the SIMPLE option are input. The marker has been changed to SIMPLE.

The PECTYPE keyword allows the user to specify which Pitôt-Static correction method will be used. The given value has been input but only data for the SIMPLE option have been input. Two methods are available,

1. SIMPLE option.
PECONH is essential and PECONM and/or PECONV may also be input,
- OR 2. Pressure Coefficient options.
One of the PECTYPE keywords (PT-PS:IND, QD:IND, PT-PS:TRUE or QD:TRUE) is required, DCP_STATIC is essential and DCP_TOTAL may also be input.

The marker has been changed to SIMPLE.

E0030: For calculation type **calc_type**, none of the final speed definitions should be used.

For the given calculation type, input of a final speed (*e.g.* ENDTMN, ENDEAS) is not required. This line of data will be ignored.

E0031: For POINT calculation **calc_type**, the wind speed inputs (HEADWIND or WIND & WINDDIRN) are not used.

E0031: For POINT calculation **calc_type**, the path end condition input **end_condition** is not used.

E0031: For POINT calculation **calc_type**, the descent initial condition input **start_condition** is not used.

E0031: For POINT calculation **calc_type**, the descent initial condition input **start_condition** is not used.

For the given type of point performance calculation, the wind speed options (*i.e.* HEADWIND or WIND & WINDDIRN) are not used in the calculations. If wind effects are required for a CRUISE or LOITER calculation, additional input data are required to define the calculation as a PATH trajectory (*e.g.* a special end condition or an integration step length).

E0032: N-TURNS or TURNANGLE cannot be used with calculation type **calc_type** and real Earth option **track**.

The number of turns (N-TURNS) and the angle turned through (TURNANGLE) can only be used for CRUISE and LOITER type calculations either on a flat Earth or using the real Earth options TURN_RT or TURN_LT.

E0032: ENDLAT or ENDLONG cannot be used with calculation type **calc_type** and real Earth option **track**.

Final latitude (ENDLAT) or longitude (ENDLONG) cannot be used for CRUISE and LOITER type calculations on a flat Earth (*e.g.* CIRCULAR RT_FLAT). Only the change in heading is calculated and no account is taken of other implied changes in position on the Earth, as a result geometric height is found at the input value of latitude.

E0033: For , **calc_type**, calculation, VDOTREQD cannot be used.

When the climb or descent speed is known the required acceleration cannot be used.

E0034: Indicated speed, **speed_type**, cannot be used with AIRSPEED option. The values will be ignored.

The given indicated speed cannot be converted to the other speed options using the AIRSPEED calculation option. Only true speed definitions (*i.e.* TMN, EAS, CAS or TAS) may be used. Any indicated speed input will be ignored.

E0035: PEC data is not required for the **calc_type** calculation. The input will be ignored.

The ATMOS and AIRSPEED calculation options cannot use indicated height or speed. Any PEC data input will be ignored.

3.4 Fatal Errors (F0000 Series)

After many of these errors, data input will continue to the end of the file. The performance calculations will not run.

F0001: No space after keyword.

Each keyword must be followed by at least one space before the data value is input.

F0002: The keyword **keyword** not identified.

F0002: The target keyword **keyword** not identified.

F0002: Extra output key letter "**key**" not identified.

The given input keyword has not been identified by the program. Check the spelling (capital and lower case letters and leading spaces do not affect identification) and that the keyword is not more than ten characters long.

When an ENGVAR variable is assigned, the target keyword should be one of VARIABLE1 to VARIABLEO.

The given key letter defining the extra output required has not been identified by the program. The key letter will be ignored. The key letters are as follows.

<u>Extra Output Option</u>	<u>Key</u>
height and speed output	H
engine data output	1, 2, 3, 4, 5, E, X
<i>undercarriage and brake data</i>	G
MODTAB variables in use	M
trim correction output	T
<i>plotting output</i>	P

F0003: No data|qualifier|keyword following keyword **keyword**

The given keyword has been identified but (in the order of the above message),

- no data values follow the keyword,
- no qualifying keyword that is used with STEP, CLBUFF, CLUSE or CLMAX can be found, (e.g. STEP TIME , CLMAX CLWING),
- no secondary keyword has been found following CALCTYPE, TRIMTYPE, ATMOSTYPE, OUTPUT, LIMITCL, RESOLVE or CANCEL (e.g. CALCTYPE SEP, RESOLVE JET).

The keyword, its data and the units definition, see ESDU 00035 (Reference 10) must be on the same line (maximum length 100 characters); each item separated by at least one space.

F0006: The input and output files have the same name :
filename

The given filename has been used for both the input and output file; the program cannot write the results to the input file. Change the name of the output file.

F0007: No input data file specified.

No data file name has been input for the first parameter following the APP program (APP02v##.EXE) file name.

F0008: Input filename does not exist
Filename was "**filename**"

The input file does not exist. Check the name and its location.

F0009: Error during file opening
Filename was "**filename**"

An error has occurred when opening the given input or output file. Check that the file exists in the current user directory, and that access is permitted.

F0011: No space before units name at end of data string :-
input_data

F0011: No space before units name or synonym at end of data string:-
input_data

The data value(s) following a keyword should be separated from their unit description, or synonym, by one or more spaces. The given line of data being processed has no space before the unit description, or synonym.

F0012: Converting units from *input_unit* to *SI_unit*.

The program cannot convert the given input unit to the appropriate SI unit to allow the calculation to be performed in SI units. Check that the input unit name is correctly spelled and in the correct capital and lower case letters, see ESDU 00035 (Reference 10).

F0014: Error opening debug output file, *debug_file*.DB1

An error has occurred whilst trying to create the given data input debug output file which is produced when DEBUG 7 is used. Check that this file does not already exist in the current user directory.

F0015: The calculation type, CALCTYPE, has not been defined.
Data checking abandoned.

The CALCTYPE keyword must be used to specify which performance option is required.

F0016: Data abandoned. Ten consecutive lines of data have fatal errors.

Too many fatal errors (F series error messages) have been found in ten consecutive lines of the data file. Data input run has been abandoned and the performance calculations will not be run. Correct the errors shown in the output file and resubmit the data file.

F0017: No table|speed factor or increment found.

F0017: No table|speed factor or increment found following “operator”.

No value has been found for a table or speed factor and/or the increment in the data following the given operator (*, /, + or –) after a table name or a special speed keyword.

This error can occur when variables are used to factor or increment tables or special speeds (MODTAB variables) because the MODTAB variable has not been defined before it is used or the “MODTAB” name or its synonym has been mis-spelt.

F0020: No data values on line.

No values were found following the keyword. The data value(s) following a keyword should be separated from the keyword by one or more spaces.

F0021: Error reading real data value from “*input_data*”

An error has occurred whilst trying to read numeric values from the given data input line. Check that there are no non-numeric characters in the data. This error can occur when variables are used to factor or increment tables or special speeds (MODTAB variables) because the MODTAB variable has not been defined before it is used or the “MODTAB” name or its synonym have been mis-spelt.

F0022: Error reading user atmosphere height and temperature pairs.

An error has occurred whilst reading the height and temperature pairs for a user atmosphere (ATMOSPTYPE USERATMOS). Check the number of values provided (NALTS) and check for non-numeric characters in the data.

F0023: Unknown unit, **input_unit**, assigned to MODTAB variable, **name** [synonym].

The given units, assigned to one of the variables that are used to factor or increment tables or special speeds (a MODTAB variable) shown by the given name (and synonym), has not been recognised. Check that the unit name is correctly spelled and in the correct upper and lower case letters, see ESDU 00035 (Reference 10).

F0024: Indicated height cannot be used with **calc_type** calculation.

Indicated height (HIND) cannot be used with the ATMOS or AIRSPEED calculation options. These utilities only accept true pressure height, geopotential or geometric heights.

F0030: Items missing during reading range of data values, or TAB(...) error.
Values found = **start_value (increment) final_value**

Some of the items expected to be found when a range (X_1 (DeltaX) X_f) is defined are missing. The items found have been interpreted as shown in the error message. The data items will have been misinterpreted and the missing item(s) may be output as random value(s). This error can also occur in some instances of an incorrect table input (e.g. TAB(table_name)).

F0031: Increment in X_1 (DeltaX) X_f is zero.

The increment DeltaX input for a range (X_1 (DeltaX) X_f) has a zero value.

F0032: In X_1 (DeltaX) X_f the sign of DeltaX is inconsistent with the values of X_1 and X_f .

The sign of the increment DeltaX input in a data range (X_1 (DeltaX) X_f) is not the same as the direction indicated by the values of the initial (X_1) and final (X_f) values of the range. The sign of the increment may be either positive or negative but must be consistent with the initial and final values (e.g. 1 (1) 5, -5 (1) -1, -1 (-1) -5).

F0033: No value for increment in X_1 (DeltaX) X_f .

No value has been found between the parentheses enclosing the increment DeltaX in a range specification.

F0034: Pair of parentheses do not match.
input_data