AIRCRAFT GENERATION EQUIPMENT
EMISSIONS ESTIMATOR (AGEEE)

G.D. SEITCHEK, D.D. BERLINRUT, L.A. RAMOS

ENVIRONICS DIVISION
ENVIRONMENTAL SCIENCES BRANCH

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# Aircraft Generation Equipment Emissions Estimator (AGEEE)

**Title:** Aircraft Generation Equipment Emissions Estimator (AGEEE)

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**Abstract:**
This report is designed to serve as a handbook for computing emissions from aircraft generation equipment (AGE), both by hand and by using a microcomputer. Emissions factors and the required equations are provided, along with examples which illustrate how to perform the calculations. The techniques described in the report are approximations, and should only be used for estimating emissions.
This report was prepared by the Air Force Engineering and Services Center (AFESC), Tyndall AFB, Florida. The work was accomplished under Job Order Number 21039015. Capt Dan Berlinrut and Lt Glenn Seitchek were the project officers.

The methodology presented in this report was developed to assist base-level environmental personnel in calculating annual airbase emissions produced by aircraft generation equipment (AGE). The model was developed by the Air Force for the purposes of predicting air pollutant concentrations in the vicinities of airports. The results and recommendations do not represent Air Force policy, but can be used by base personnel to estimate the impact of equipment operations on local air quality.

This report has been reviewed by the Public Affairs Office (PA) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nationals.

This report has been reviewed and is approved for public release.

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Deputy Director
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SECTION I
INTRODUCTION

The Aircraft Generation Equipment Emissions Estimator (AGEEE) is a screening methodology to indicate any significant air quality impact from U.S. Air Force aircraft. This report contains all the data needed to perform AGEEE analyses. Aircraft type, number of missions, annual mean temperature, annual temperature variation, and AGE type are the only input data required for an AGEEE analysis. The analysis will estimate AGE emissions resulting from base operations. If AGEEE indicates a possible air pollution problem, a more detailed base air quality analysis (e.g., Air Quality Assessment Model) may have to be performed.

The AGEEE air quality analysis is not site-specific. The analysis can be performed by base-level personnel at any Air Force base. AGEEE will allow for preliminary air quality impact analysis of mission changes at base level, and result in the more effective use of Air Force manpower and resources.
SECTION II
BACKGROUND

The preliminary assessment of an Air Force base-wide emissions inventory is usually performed at the base level. In the past this analysis has been primarily an update of the aircraft emissions inventory. Emissions from Aircraft Generation Equipment (AGE) have generally been neglected, because adequate information has not been available.

Base personnel do not have the resources to spend on complex dispersion evaluations, (i.e., AQAM). They only require a tool to determine the annual emissions and the worst-case downfield pollution concentrations to obtain an estimate of the impact of base sources on air quality. This estimate gives base personnel an indication of a potential air pollution problem. If the estimate indicates a possible problem, a more detailed air quality analysis will be required.

The base-level personnel require an analytical method to determine the emissions from AGE and the impact of these emissions on air quality. The procedure must contain all the data required to make an AGE emission and an air quality impact analysis. It must only require minimal data to eliminate the wasted man-hours. AGEEE was developed for these reasons, and thus will aid in making the base emissions inventory more accurate.
SECTION III
METHODOLOGY

A. AGE EMISSION FACTORS

Aircraft generation equipment emission factors were determined by Dr J.E. Sickles, and Dr J.G. Haidt of Research Triangle Institute, under work funded by the AFESC (ESL-TR-81-60). Emissions data are not available in most cases, because the engines have been in production and/or service for over 20 years and no regulations exist now or at the time of the engine acquisition to require emissions testing. As a result, most of the emission factors assigned to the AGE were based on the data in Reference 1. A comprehensive list of AGE is shown in Table 1.

Average emissions factors for selected AGE are listed in Table 2. Emissions factors can be determined on the basis of horsepower and/or fuel consumption rate. Both methods were used to determine emission factors for AGE. Except as noted to the contrary, the values given in Table 2 represent averages of emissions factors determined by the two methods. The discrepancies between the two methods generally did not exceed a factor of two, but in a few cases they were as high as a factor of ten.

It should be noted that the SO$_2$ emissions factors were calculated based on observed fuel consumption rates and assumed 0.01 weight percent sulfur in Mogas and 0.05 weight percent sulfur in JP-4 (Reference 2). In addition, survey results indicate that JP-4 is generally used in both diesel and turbine-driven AGE. Emissions factors for the turbine-powered AGE burning JP-4 were secured from Garrett Air Research. No emissions factors, however, are available for diesel engines burning JP-4 instead of diesel fuel. Therefore, it was assumed that emissions factors for diesel engines burning diesel fuel are identical to those for diesel engines burning JP-4.

To determine the emission factors for AGE not listed in Table 2, the user must interpolate the factors which are available by using the known characteristics of the desired piece of AGE, and those characteristics for which emission factors are
TABLE 1. COMPREHENSIVE LIST OF AGE

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<tr>
<th>Type</th>
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</tr>
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<td>A3</td>
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<td>MA1A(CLR)</td>
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<tr>
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<tr>
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<td>C26</td>
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<td></td>
<td>90G20P</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MB17</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Generator-D</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>AM32A60</td>
<td>3</td>
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<tr>
<td></td>
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<td>EMU12E</td>
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<tr>
<td></td>
<td>D5</td>
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<td></td>
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<td>Light Cart</td>
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<td>Pressure Tester</td>
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<td></td>
<td>V4</td>
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<td></td>
<td>MB1</td>
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<td>Deicer-G</td>
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<td>Welder-D</td>
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TABLE 1. COMPREHENSIVE LIST OF AGE (CONCLUDED)

<table>
<thead>
<tr>
<th>Type</th>
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<td>Tug-G</td>
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<tr>
<td></td>
<td>Lift-G</td>
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</tr>
<tr>
<td></td>
<td>Loader-G</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pickup-G</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Van-G</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MB4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>U18</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Lift-D</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Loader-D</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MB2</td>
<td>2</td>
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<td></td>
<td>TD300SL</td>
<td>2</td>
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</tbody>
</table>

<sup>a</sup>1=gasoline piston; 2=diesel piston; 3=turbine
given. This procedure is sound, because the emission factors that are given are only estimates, not actual values. There is no necessity for absolute accuracy, only relative accuracy.

B. AIRBASE-DEPENDENT ELEMENTS

1. Availability Factor ($\beta$)

The availability factor is intended to account for the possibility that an airbase possesses AGE of different types which are functionally equivalent and used interchangeably, depending on availability. The availability factor is calculated based on the percentage of the total shared by each type of interchangeable AGE. For example, the H1 and lH1 heaters are interchangeable. If a given airbase has 13 H1s and 7 lH1s, then the availability factors are .65 and .35, respectively.

2. Temperature Factor ($\gamma$)

Temperature affects the frequency of use of heaters and coolers. Generators are used for every landing and takeoff (LTO), while heaters find use during only a fraction of the annual LTOs. Therefore, fuel consumption and emissions per LTO of heaters and coolers on an average basis must be reduced. A temperature factor is introduced to account for this reduction. For a given annual mean temperature, ($\overline{T}$) and temperature variation ($\Delta T$) at an airbase, Equation (1) defines the factor for heaters and Equation (2) for coolers.

\[
\gamma_{\text{heater}} = \frac{\left(40 - \frac{\overline{T}}{2} + \frac{\Delta T}{2}\right)^2}{2 \left[\frac{\Delta T}{2}\right]^2} \quad \text{unless if } 40 - \frac{\overline{T}}{2} + \frac{\Delta T}{2} \leq 0 \text{ then } \gamma = 0
\]

\[
\gamma_{\text{cooler}} = \frac{\left(\frac{\overline{T}}{2} + \frac{\Delta T}{2} - 80\right)^2}{2 \left[\frac{\Delta T}{2}\right]^2} \quad \text{unless if } \frac{\overline{T}}{2} + \frac{\Delta T}{2} - 80 \leq 0 \text{ then } \gamma = 0
\]

All temperatures are in °F.
SECTION IV
HAND CALCULATIONS:

A. PROCEDURE

This section contains examples of how AGE emissions could be calculated by hand.

The steps to be taken are as follows:
1. Determine the aircraft in question
2. Determine the desired AGE and associated temperature factor (\( \gamma \))
   a. Heater - Equation (1)
   b. Cooler - Equation (2)
   c. Other AGE - \( \gamma = 1 \)
3. Calculate the availability factor (\( \beta \))

\[
\beta = \frac{\text{Number of specific AGE}}{\text{Total number of general type AGE}}
\]

Use \( \beta = 1 \) unless a base has different types of AGE which function equivalently.
See Section III.B.1 for more information.
4. Find the Standard Universal Operating Time (\( t \)) in Table 3.
5. Calculate the Average Service Time (\( t \)).

\[
\bar{t} = \gamma t \beta
\]
6. Calculate the average emissions (\( \bar{W} \)) using the emission factors (\( \pi \)) in Table 2.

\[
\bar{W} = \frac{\pi \bar{t}}{1,000} = \text{kg pollutant per LTO}
\]

To determine the total pollutants (\( W \)), multiply \( \bar{W} \) by the total number of LTOS (\( L \)).

\[
W = \bar{W}L
\]
## TABLE 2. AVERAGE EMISSIONS FACTORS FOR SELECTED AGE

<table>
<thead>
<tr>
<th>Type</th>
<th>Designation</th>
<th>Engine Characteristics</th>
<th>Factors (g/hr)</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td>in³</td>
<td>HP</td>
</tr>
<tr>
<td>Heater</td>
<td>H1</td>
<td>7.1</td>
<td>2.5</td>
</tr>
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<td></td>
<td>1H1</td>
<td>17.3</td>
<td>3.6</td>
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<td>Cooler</td>
<td>MA-3</td>
<td>471.0</td>
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<td>32A-60</td>
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<td></td>
<td>MA-1A</td>
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<td>25.0</td>
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</table>

a Unless noted otherwise, emission factors were taken from Reference 1 (AP-42). These factors are the average of factors based on horsepower and on fuel consumption.
b Personal communication with Bob Stefun on Garrett Air Research.
c Extrapolated from data received from Bob Stefun of Garrett Air Research.
d Personal communication with Joe Lange of Hatz Diesel.
e Estimated from oil-fired turbine electric generators Reference 1 (AP-42).
f Calculated from fuel consumption and assumed 0.01 wt% sulfur in Mogas and 0.05 wt% Sulfur in JP-4, see Reference 2.
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<thead>
<tr>
<th>AGE</th>
<th>B52</th>
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<th>A37</th>
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B. EXAMPLES

1. Example 1

Given: F-4 aircraft, H1 gas heater, $T = 50^\circ F$, $\Delta T = 40^\circ F$, 10 total LTO

Find: Total emissions

Solution:

Step 1: F-4
Step 2: H1 gas heater

Therefore,

$$Y_{heater} = \frac{\left(40 - \bar{T} + \frac{\Delta T}{2}\right)^2}{2 \left(\frac{\Delta T}{2}\right)^2}$$

$$Y_{heater} = .125$$

Step 3: $B = 1$
Step 4: $t = .70$ hrs (from Table 3)
Step 5: $t = YtB = .125(.70)(1) = .0875$ hrs
Step 6: From Table 2:

- $n(CO) = 3376$ g/hr
- $n(HC) = 212$ g/hr
- $n(\text{NOX}) = 67$ g/hr
- $n(\text{SOX}) = 2.1$ g/hr
- $n(\text{Part}) = 6.1$ g/hr

$$W = \frac{\pi TL}{1000}$$

$$W(\text{CO}) = \frac{3376(0.0875)(10)}{1000} = 2.954 \text{ kg CO}$$

$$W(\text{HC}) = \frac{212(0.0875)(10)}{1000} = .1855 \text{ kg HC}$$

$$W(\text{NOX}) = \frac{67(0.0875)(10)}{1000} = .0586 \text{ kg NOX}$$
2. Example 2
Given: B-52 with 10 total LTO, 14 H1 heaters, 6 1H1 heaters, $\bar{T} = 50^\circ$F, $\Delta \bar{T} = 40^\circ$F
Find: Total emissions
Solution:
Step 1: B-52
Step 2: 14 H1 heaters, 6 1H1 heaters
Therefore,

$$\gamma_{\text{heater}} = \left( \frac{40 - \bar{T} + \frac{\Delta \bar{T}}{2}}{2 \left[ \frac{\Delta \bar{T}}{2} \right]^2} \right)^2$$

$$\gamma_{\text{heater}} = .125$$

Step 3: $\beta(\text{H1}) = \frac{14}{20} = .70$

$$\beta(\text{1H1}) = \frac{6}{20} = .30$$

Step 4: $t(\text{H1}) = 2.69$

$$t(\text{1H1}) = 2.69$$

Step 5: $\bar{t}(\text{H1}) = \gamma t \beta = (.125)(2.69)(.70) = .235 \text{ hrs}$

$$\bar{t}(\text{1H1}) = .125(2.69)(.30) = .101 \text{ hrs}$$
Step 6: For H1

\[ \pi(\text{CO}) = 3376 \text{ g/hr} \]
\[ \pi(\text{HC}) = 212.0 \text{ g/hr} \]
\[ \pi(\text{NOX}) = 67 \text{ g/hr} \]
\[ \pi(\text{SOX}) = 2.1 \text{ g/hr} \]
\[ \pi(\text{Part}) = 6.1 \text{ g/hr} \]

For IH1

\[ \pi(\text{CO}) = 64 \text{ g/hr} \]
\[ \pi(\text{HC}) = 28.0 \text{ g/hr} \]
\[ \pi(\text{NOX}) = 291 \text{ g/hr} \]
\[ \pi(\text{SOX}) = 7.3 \text{ g/hr} \]
\[ \pi(\text{Part}) = 21.0 \text{ g/hr} \]

\[ W = \frac{\pi L}{1000} \]

\[ W(\text{CO}) = \frac{3376 \times 0.235}{1000} + \frac{64 \times 0.101}{1000} = 8.01 \text{ kg CO} \]

\[ W(\text{HC}) = \frac{212.0 \times 0.235}{1000} + \frac{28.0 \times 0.101}{1000} = 0.53 \text{ kg HC} \]

\[ W(\text{NOX}) = \frac{67 \times 0.235}{1000} + \frac{291 \times 0.101}{1000} = 0.45 \text{ kg NOX} \]

\[ W(\text{SOX}) = \frac{2.1 \times 0.235}{1000} + \frac{7.3 \times 0.101}{1000} = 0.01 \text{ kg SOX} \]

\[ W(\text{Part}) = \frac{6.1 \times 0.235}{1000} + \frac{21.0 \times 0.101}{1000} = 0.04 \text{ kg Part} \]
SECTION V
COMPUTER CALCULATIONS

A. PROCEDURE

The AFESC has adapted the AGEEE handbook for use on the Apple II microcomputer. The program enables the user to save time and effort by inputting minimal information, while eliminating the need to search through tables and make calculations. A copy of the source listing can be found in Appendix A.

B. EXAMPLES

1. Example 1

Given: F-4 aircraft, Hi gas heater, \( \bar{T} = 50^\circ F \), \( \Delta T = 40^\circ F \), 10 LTOs

Find: Total emissions

Solution:

1. Pick the aircraft you would like to find the AGE pollutant emissions for and enter the name just as it is shown in the menu. F-4
2. How many LTOs do you want the AGE emissions calculated for? 10
3. What is the Annual Mean Temperature (F)? 50
4. What is the Temperature Variation (F)? 40
5. Input necessary AGE information for a heater that best describes your AGE.

Responses: 0 = No emissions calculated for a heater
1 = Mogas
2 = Diesel/JP-4
3 = Both Mogas and Diesel/JP-4

Enter your response. 1
6. Do you have anymore AGE that you would like to calculate the pollutant emissions for, [Y] or [N]? N

Total AGE emissions from all F-4 LTOs (kg)

\[
\begin{align*}
\text{CO} &= 2.954 \\
\text{HC} &= .1855 \\
\text{NOX} &= .058625 \\
\text{SOX} &= 1.8375E-03 \\
\text{PM} &= 5.3375E-03
\end{align*}
\]
2. Example 2

Given: B-52 aircraft, 14 H1 heaters, 6 L1 heaters, T = 50°F, ΔT = 40°F, 10 LTOS

Find: Total emissions

Solution:
1. Pick the aircraft you would like to find the AGE pollutant emissions for and enter the name just as it is shown on the menu. B-52
2. How many LTOS do you want the AGE emissions calculated for? 10
3. What is the Annual Mean Temperature (F)? 50
4. What is the Temperature Variation (F)? 40
5. Input necessary AGE information for a heater that best describes your AGE.
   Responses: 0 = No emissions calculated for a heater
   1 = Mogas
   2 = Diesel/JP-4

   Enter your response. 3
6. How many Mogas heaters do you have? 6
7. How many Diesel/JP-4 heaters do you have? 14
8. Do you have anymore AGE that you would like to calculate the pollutant emissions for, [Y] or [N]? N

Total AGE emissions from all B-52 LTOS (kg)

CO = 8.01082
HC = .52724
NOX = .4512475
SOX = .01230675
PM = .035541625
SECTION VI
CONCLUSIONS

Anyone needing to calculate emissions from aircraft generation equipment no longer has to operate a large air quality model to obtain limited results. With the handbook, a user can compute the emissions on a handheld calculator, or the source listing in Appendix A can be input into a microcomputer for further ease of operation.
APPENDIX A
PROGRAM SOURCE LISTING

This appendix presents a source listing for the computer program developed by AFESC to aid in calculating AGE emissions with the Apple II microcomputer.
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20 REM DESIGNED BY LISA RAMOS
30 HOME : PRINT "***************
40 PRINT ; PRINT ; PRINT ; PRINT ; PRINT TAB(11)"AIRCRAFT GENERATION"
50 PRINT ; PRINT TAB(6)"EQUIPMENT EMISSIONS ESTIMATOR"
60 PRINT ; PRINT TAB(17)"AGEE E:
70 PRINT ; PRINT ; PRINT ; PRINT ; PRINT
80 PRINT TAB(10)"DESIGNED BY LISA RAMOS"
90 PRINT ; PRINT TAB(22)"AUGUST 2, 1983"
100 PRINT ; PRINT ; PRINT "***************
110 FOR PAUSE = 1 TO 5000: NEXT PAUSE
120 CLEAR
130 HOME : PRINT "BELOW IS A MENU THAT LISTS THE DIFFERENT AIRCRAFT AVAILABLE FOR THIS PROGRAM."
140 FOR PAUSE = 1 TO 2000: NEXT PAUSE
150 HOME : PRINT TAB(13)"FIGHTER AIRCRAFT"
160 PRINT TAB(12)"-------------
170 PRINT TAB(B)"F-4"
180 PRINT ; PRINT TAB(18)"F-15"
190 PRINT ; PRINT TAB(18)"F-16"
200 PRINT ; PRINT TAB(18)"F-10"
210 PRINT ; PRINT TAB(18)"F-10"
220 PRINT ; PRINT TAB(18)"F-11"
230 PRINT ; PRINT ; PRINT TAB(11)"OBSESSION AIRCRAFT"
240 PRINT TAB(10)"-------------
250 PRINT TAB(18)"O-2"
260 PRINT ; PRINT TAB(18)"OV-1"
270 PRINT ; PRINT ; PRINT IF YOU ARE READY TO SEE THE REST OF THE MENU, PRESS RETURN."
280 HOME : PRINT TAB(14)"CARGO"
620 IF YS = 'Y' THEN GOTO 130
630 IF YS = 'YES' THEN GOTO 130
640 IF YS = '<Y>' THEN GOTO 130
650 HOME: PRINT "PICK THE AIRCRAFT AFT YOU WOULD LIKE TO FIND THE TEMPERATURE VARIATION AND ENTER THE AIRCRAFT NAME JUST AS IT IS SHOWN IN THE MENU.":A$  
660 PRINT: PRINT: INPUT "HOW MANY Diesel/JP-4 HEATERS DO YOU HAVE":B2  
670 PRINT: PRINT TAB( 19)""H-3"
680 PRINT: PRINT TAB( 19)"H-53"
690 PRINT: PRINT TAB( 19)"H-12"
700 PRINT: PRINT TAB( 19)"H-24"
710 PRINT: PRINT TAB( 19)"T-33"
720 PRINT: PRINT TAB( 19)"T-37"
730 PRINT: PRINT TAB( 19)"T-43"
740 PRINT: PRINT TAB( 19)"T-47"
750 PRINT: PRINT TAB( 19)"T-52"
760 PRINT: PRINT TAB( 19)"H-1"
770 PRINT: PRINT TAB( 19)"H-3"
780 PRINT: PRINT TAB( 19)"H-9"
790 PRINT: PRINT TAB( 19)"H-15"
800 PRINT: PRINT TAB( 19)"H-21"
810 PRINT: PRINT TAB( 19)"H-37"
820 PRINT: PRINT TAB( 19)"H-53"
830 PRINT: PRINT TAB( 19)"T-39"
840 PRINT: PRINT TAB( 19)"T-43"
850 PRINT: PRINT "ANY MOCAS HEATERS DO YOU HAVE":B4
860 PRINT: PRINT "HOW MANY Diesel/JP-4 HEATERS DO YOU HAVE":B3
870 LET B3 = B1 + B2
880 LET B4 = B1 / B3
890 LET B5 = B2 / B3
900 IF A$ = "F-4" THEN UT = .7
910 IF A$ = "F-15" THEN UT = .7
920 IF A$ = "F-16" THEN UT = .7
930 IF A$ = "F-105" THEN UT = .7
940 IF A$ = "F-106" THEN UT = .7
950 IF A$ = "F-111" THEN UT = .7
960 IF A$ = "O-2" THEN UT = 0
970 IF A$ = "OV-10" THEN UT = 0
980 IF A$ = "C-5" THEN UT = 3.21
990 IF A$ = "C-7" THEN UT = 3.21
1000 IF A$ = "C-9" THEN UT = 3.21
1010 IF A$ = "C-130" THEN UT = 3.21
1020 IF A$ = "C-131" THEN UT = 3.21
1030 IF A$ = "C-135" THEN UT = 3.21
1040 IF A$ = "C-141" THEN UT = 3.21
1050 IF A$ = "KC-135" THEN UT = 3.21
1060 IF A$ = "T-33" THEN UT = .7
1070 IF A$ = "T-37" THEN UT = .7
1080 IF A$ = "T-39" THEN UT = 0
1090 IF A$ = "T-39" THEN UT = .7
1100 IF A$ = "T-43" THEN UT = 0
1110 IF A$ = "A-7" THEN UT = .23
1120 IF A$ = "A-10" THEN UT = .2
1130 IF A$ = "A-37" THEN UT = .2
1140 IF A$ = "B-52" THEN UT = 2.69
1150 IF A$ = "FB-111" THEN UT = 2.69
1160 IF A$ = "H-1" THEN UT = 1
1170 IF A$ = "H-3" THEN UT = 0
1180 IF A$ = "H-53" THEN UT = 1
1190 IF F1 = 1 OR F1 = 2 THEN GOTO 900
1200 LET A1 = B4 * TF * UT
1210 LET A2 = B5 * TF * UT
1220 IF F1 = 3 THEN GOTO 1240
1230 LET A1 = A1 + TF * UT
1240 IF F1 = 1 THEN EM = 3376
19
1250 IF F1 = 2 THEN EM = 64
1260 IF F1 = 3 THEN U1 = 3376
1270 IF F1 = 3 THEN U2 = 64
1280 IF F1 = 3 THEN GOTO 1310
1290 LET E1 = EM * A1 * NA / 100
0
1300 IF F1 = 1 OR F1 = 2 THEN GOTO 1340
1310 LET G1 = U1 * A1 * NA / 100
0
1320 LET G2 = U2 * A2 * NA / 100
0
1330 LET E2 = G1 + G2
1340 IF F1 = 1 THEN EM = 67
1350 IF F1 = 2 THEN EM = 28
1360 IF F1 = 3 THEN U1 = 67
1370 IF F1 = 3 THEN U2 = 28
1380 IF F1 = 3 THEN GOTO 1410
1390 LET E2 = EM * A1 * NA / 100
0
1400 IF F1 = 1 OR F1 = 2 THEN GOTO 1440
1410 LET G1 = U1 * A1 * NA / 100
0
1420 LET G2 = U2 * A2 * NA / 100
0
1430 LET E2 = G1 + G2
1440 IF F1 = 1 THEN EM = 67
1450 IF F1 = 2 THEN EM = 291
1460 IF F1 = 3 THEN U1 = 67
1470 IF F1 = 3 THEN U2 = 291
1480 IF F1 = 3 THEN GOTO 1510
1490 LET E3 = EM * A1 * NA / 100
0
1500 IF F1 = 1 OR F1 = 2 THEN GOTO 1540
1510 LET G1 = U1 * A1 * NA / 100
0
1520 LET G2 = U2 * A2 * NA / 100
0
1530 LET E3 = G1 + G2
1540 IF F1 = 1 THEN EM = 2.1
1550 IF F1 = 2 THEN EM = 7.3
1560 IF F1 = 3 THEN U1 = 2.1
1570 IF F1 = 3 THEN U2 = 7.3
1580 IF F1 = 3 THEN GOTO 1610
1590 LET E4 = EM * A1 * NA / 100
0
1600 IF F1 = 1 OR F1 = 2 THEN GOTO 1640
1610 LET G1 = U1 * A1 * NA / 100
0
1620 LET G2 = U2 * A2 * NA / 100
0
1630 LET E4 = G1 + G2
1640 IF F1 = 1 THEN EM = 6.1
1650 IF F1 = 2 THEN EM = 21
1660 IF F1 = 3 THEN U1 = 6.1
1670 IF F1 = 3 THEN U2 = 21
1680 IF F1 = 3 THEN GOTO 1710
1690 LET E5 = EM * A1 * NA / 100
0
1700 IF F1 = 1 OR F1 = 2 THEN GOTO 1740
1710 LET G1 = U1 * A1 * NA / 100
0
1720 LET G2 = U2 * A2 * NA / 100
0
1730 LET E5 = G1 + G2
1740 GOSUB 7700
1750 PRINT "PRINT: PRINT: INPUT 'DO Y OU HAVE ANYMORE 'AGE' THAT Y OU WOULD LIKE TO CALCULATE THE POLLUTANT EMISSIONS FOR, <Y> OR <N> ?":
1760 IF WS = "N" THEN GOTO 7490
1770 IF WS = "NO" THEN GOTO 7490
90
1790 HOME: PRINT "INPUT NECESSARY 'AGE' INFORMATION FOR A COOLER THAT BEST DESCRIBES YOUR 'AGE':"
1800 PRINT "PRINT: RESPONSES: 0quine-emissions-calculated"
1810 PRINT TAB(14)"FOR A COOLE"
1820 PRINT "PRINT: TAB(12)"1-MA
1830 PRINT: INPUT "ENTER YOUR RESPONSE:":F2
1840 IF F2 = 0 THEN GOTO 2320
1850 IF F2 = 0:AT = 0:UT = 0:A1 = 0:
1860 LET NT = MT / TV / 2 - 30
1870 LET TF = N2 ^ 2 / (2 * (TV / 2) ^ 2)
1880 IF N2 < 0 THEN TF = 0
1890 IF TF > 0 THEN TF = 0
1900 IF TF > 1 THEN TF = 1
1910 LET A1 = 1
1920 IF A9 = "F-4" THEN UT = .58
1930 IF A9 = "F-15" THEN UT = 0
1940 IF A9 = "F-16" THEN UT = 0
1950 IF A9 = "F-105" THEN UT = 0
1960 LET A9 = "F-106" THEN UT = .58
1970 IF A9 = "F-111" THEN UT = 0
1980 IF A9 = "O-2" THEN UT = 0
1990 IF A9 = "O-10" THEN UT = 0
2000 IF A9 = "C-5" THEN UT = 1.3
2010 IF A9 = "C-7" THEN UT = 1.3

20
2200 IF A$ = "C-130" THEN UT = 1
2210 LET TF = 3.33
2220 IF A$ = "T-39" THEN UT = 0.5
2230 IF A$ = "A-7" THEN UT = 0
2240 IF A$ = "A-10" THEN UT = 0
2250 IF A$ = "A-37" THEN UT = 0
2260 IF A$ = "B-52" THEN UT = 2.
2270 IF A$ = "FB-111" THEN UT = 0
2280 IF A$ = "H-1" THEN UT = 0
2290 IF A$ = "H-3" THEN UT = 0
2300 IF A$ = "H-53" THEN UT = 0
2310 LET A1 = A1 + TF + UT
2320 LET E1 = 24036 + A1 + NA / 1000
2330 LET E2 = 939 + A1 + NA / 10
2340 LET E3 = 623 + A1 + NA / 10
2350 LET E4 = 3.9 + A1 + NA / 10
2360 LET E5 = 40 + A1 + NA / 100
2370 COSUB 7700
2380 PRINT: PRINT "INPUT 'DO YOU HAVE ANYMORE 'AGE' THAT YOU WOULD LIKE TO CALCULATE THE POLLUTANT EMISSIONS FOR? (<) OR ('NO')?": W$ = 0
2390 IF W$ = "NO" THEN GOTO 7490
2400 IF W$ = "(N)" THEN GOTO 74
2410 HOME: PRINT "INPUT NECESSARY INFORMATION FOR A GENERATOR THAT BEST DESCRIBES YOUR 'AGE'."
2420 PRINT: PRINT "RESPONSES: 0 NO EMISSIONS CALCULATED"
2430 PRINT TAB(14) FOR A GENERATOR
2440 PRINT: PRINT TAB(12) "=D"
2450 PRINT: PRINT TAB(12) "=D"
2460 PRINT: PRINT TAB(12) "=D"
2470 PRINT: PRINT TAB(12) "=D"
2480 PRINT: PRINT TAB(12) "=D"
2490 PRINT: PRINT TAB(12) "=D"
2500 PRINT: PRINT TAB(12) "=D"
2510 PRINT: PRINT TAB(12) "=D"
2520 PRINT: PRINT TAB(12) "=D"
2530 PRINT: PRINT TAB(12) "=D"
2540 PRINT: PRINT TAB(12) "=D"
2550 PRINT: PRINT TAB(12) "=D"
2560 PRINT: PRINT TAB(12) "=D"
2570 PRINT: PRINT TAB(12) "=D"
2580 PRINT: PRINT TAB(12) "=D"
2590 PRINT: PRINT TAB(12) "=D"
2600 PRINT: PRINT TAB(12) "=D"
2610 PRINT: PRINT TAB(12) "=D"
2620 PRINT: PRINT TAB(12) "=D"
2630 PRINT: PRINT TAB(12) "=D"
2640 PRINT: PRINT TAB(12) "=D"
2650 PRINT: PRINT TAB(12) "=D"
2660 IF A8 = "C-5" AND F3 = 1 THEN UT = 3.12
2670 IF A8 = "C-5" AND F3 = 2 THEN UT = 7.6
2680 IF A8 = "C-5" AND F3 = 3 THEN UT = 3.85
2690 IF A8 = "C-7" AND F3 = 1 THEN UT = 3.12
2700 IF A8 = "C-7" AND F3 = 2 THEN UT = 0
2710 IF A8 = "C-7" AND F3 = 3 THEN UT = 0
2720 IF A8 = "C-9" AND F3 = 1 THEN UT = 3.12
2730 IF A8 = "C-9" AND F3 = 2 THEN UT = 0
2740 IF A8 = "C-9" AND F3 = 3 THEN UT = 0
2750 IF A8 = "C-130" AND F3 = 1 THEN UT = 3.12
2760 IF A8 = "C-130" AND F3 = 2 THEN UT = 0
2770 IF A8 = "C-130" AND F3 = 3 THEN UT = 0
2780 IF A8 = "C-131" AND F3 = 1 THEN UT = 3.12
2790 IF A8 = "C-131" AND F3 = 2 THEN UT = 0
2800 IF A8 = "C-131" AND F3 = 3 THEN UT = 0
2810 IF A8 = "C-135" AND F3 = 1 THEN UT = 3.12
2820 IF A8 = "C-135" AND F3 = 2 THEN UT = 7.6
2830 IF A8 = "C-135" AND F3 = 3 THEN UT = 3.85
2840 IF A8 = "C-141" AND F3 = 1 THEN UT = 3.12
2850 IF A8 = "C-141" AND F3 = 2 THEN UT = 7.6
2860 IF A8 = "C-141" AND F3 = 3 THEN UT = 3.85
2870 IF A8 = "KC-135" AND F3 = 1 THEN UT = 5.16
2880 IF A8 = "KC-135" AND F3 = 2 THEN UT = 5.91
2890 IF A8 = "KC-135" AND F3 = 3 THEN UT = 4.68
2900 IF A8 = "T-33" AND F3 = 1 THEN UT = .33
2910 IF A8 = "T-33" AND F3 = 2 THEN UT = 0
2920 IF A8 = "T-33" AND F3 = 3 THEN UT = 0
2930 IF A8 = "T-37" AND F3 = 1 THEN UT = .25
2940 IF A8 = "T-37" AND F3 = 2 THEN UT = 0
2950 IF A8 = "T-37" AND F3 = 3 THEN UT = 0
2960 IF A8 = "T-38" AND F3 = 1 THEN UT = .53
2970 IF A8 = "T-38" AND F3 = 2 THEN UT = 0
2980 IF A8 = "T-38" AND F3 = 3 THEN UT = 0
2990 IF A8 = "T-39" AND F3 = 1 THEN UT = .33
3000 IF A8 = "T-39" AND F3 = 2 THEN UT = 0
3010 IF A8 = "T-39" AND F3 = 3 THEN UT = 1.1
3020 IF A8 = "T-43" AND F3 = 1 THEN UT = 0
3030 IF A8 = "T-43" AND F3 = 2 THEN UT = 0
3040 IF A8 = "T-43" AND F3 = 3 THEN UT = 3.85
3050 IF A8 = "A-7" AND F3 = 1 THEN UT = 0
3060 IF A8 = "A-7" AND F3 = 2 THEN UT = .5
3070 IF A8 = "A-7" AND F3 = 3 THEN UT = .25
3080 IF A8 = "A-10" AND F3 = 1 THEN UT = 0
3100 IF A8 = "A-10" AND F3 = 3 THEN UT = 4.41
3110 IF A8 = "A-37" AND F3 = 1 THEN UT = 2.5
3120 IF A8 = "A-37" AND F3 = 2 THEN UT = 0
3130 IF A8 = "A-37" AND F3 = 3 THEN UT = 5
3140 IF A8 = "B-52" AND F3 = 1 THEN UT = 3.11
3150 IF A8 = "B-52" AND F3 = 2 THEN UT = 5.61
3160 IF A8 = "B-52" AND F3 = 3 THEN UT = 5.06
3170 IF A8 = "FB-111" AND F3 = 1 THEN UT = 0
3180 IF A8 = "FB-111" AND F3 = 2 THEN UT = 0
3190 IF A8 = "FB-111" AND F3 = 3 THEN UT = 5.06
3200 IF A8 = "H-1" AND F3 = 1 THEN UT = .64
3210 IF A8 = "H-1" AND F3 = 2 THEN UT = 0
3220 IF A8 = "H-1" AND F3 = 3 THEN UT = 0
3230 IF A8 = "H-3" AND F3 = 1 THEN UT = .64
3240 IF A8 = "H-3" AND F3 = 2 THEN UT = 0
3250 IF A8 = "H-3" AND F3 = 3 THEN UT = 0
3260 IF A0 = "H-53" AND F3 = 1 THEN 3620 PRINT "ENTER " ENTER YOUR RESPONSE":F4
UT = .64
3270 IF A0 = "H-53" AND F3 = 2 THEN 3630 IF F4 = 0 THEN GOTO 5130
UT = 0
3280 IF A0 = "H-53" AND F3 = 3 THEN 3640 UT = 0:AI = 0:UT = 0:AI = 0;
UT = 0
3290 LET A1 = AI * TF * UT 3650 LET TF = 1:AI = 1
3300 IF F3 = 1 THEN EM = 24124 3660 IF A0 = "F-4" AND F4 = 1 THEN
3310 IF F3 = 2 THEN EM = 724 3670 IF A0 = "F-4" AND F4 = 2 THEN
3320 IF F3 = 3 THEN EM = 1688 3680 IF A0 = "F-4" AND F4 = 3 THEN
3330 LET E1 = EM * A1 / NA / 100 3690 IF A0 = "F-4" AND F4 = 4 THEN
0 3700 IF A0 = "F-4" AND F4 = 1 THEN
3340 IF F3 = 1 THEN EM = 936 3710 IF A0 = "F-15" AND F4 = 2 THEN
3350 IF F3 = 2 THEN EM = 129 3720 IF A0 = "F-15" AND F4 = 3 THEN
3360 IF F3 = 3 THEN EM = 14 3730 IF A0 = "F-15" AND F4 = 4 THEN
3370 LET E2 = EM * A1 / NA / 100 0 3740 IF A0 = "F-15" AND F4 = 1 THEN
0 3750 IF A0 = "F-16" AND F4 = 2 THEN
3380 IF F3 = 1 THEN EM = 625 3760 IF A0 = "F-16" AND F4 = 3 THEN
3390 IF F3 = 2 THEN EM = 1395 3770 IF A0 = "F-16" AND F4 = 4 THEN
3400 IF F3 = 3 THEN EM = 332 UT = .58
3410 LET E3 = EM * A1 / NA / 100 0 3780 IF A0 = "F-105" AND F4 = 1 THEN
0 3790 IF A0 = "F-105" AND F4 = 2 THEN
3420 IF F3 = 1 THEN EM = 3.9 UT = .58
3430 IF F3 = 2 THEN EM = 8.8 3800 IF A0 = "F-105" AND F4 = 3 THEN
3440 IF F3 = 3 THEN EM = 79.1 UT = .58
3450 LET E4 = EM * A1 / NA / 100 0 3810 IF A0 = "F-105" AND F4 = 4 THEN
3460 IF F3 = 1 THEN EM = 40 UT = .58
3470 IF F3 = 2 THEN EM = 97 3820 IF A0 = "F-16" AND F4 = 1 THEN
3480 IF F3 = 3 THEN EM = 45 UT = .58
3490 LET E5 = EM * A1 / NA / 100 0 3830 IF A0 = "F-16" AND F4 = 2 THEN
0 3840 IF A0 = "F-16" AND F4 = 3 THEN
3500 GOSUB 7700 3850 IF A0 = "F-16" AND F4 = 4 THEN
3510 PRINT: PRINT: INPUT "DO Y OU HAVE ANYMORE 'AGE' THAT Y OU
3860 IF A0 = "F-111" AND F4 = 1 THEN
WOULD LIKE TO CALCULATE THE POLLUTANT EMISSIONS?" OR "(N)?":E$:W$ 3870 IF A0 = "F-111" AND F4 = 2 THEN
3520 IF W$ = "N" THEN GOTO 7490 UT = .58
3880 IF A0 = "F-111" AND F4 = 3 THEN
3530 IF W$ = "NO" THEN GOTO 749 0 UT = .58
3890 IF A0 = "F-111" AND F4 = 4 THEN
3540 IF W$ = "(N)" THEN GOTO 7490 0 UT = .58
3850 IF A0 = "F-106" AND F4 = 1 THEN
3550 HOME: PRINT "INPUT NECESSARY 'AGE' INFORMATION FOR A
3860 IF A0 = "F-106" AND F4 = 2 THEN
COMPRESSOR THAT BEST DESCRIBES YOUR 'AGE'."
3870 IF A0 = "F-106" AND F4 = 3 THEN
3560 PRINT: PRINT "RESPONSES: 0 " = NO EMISSIONS CALCU LATED"
3880 IF A0 = "F-106" AND F4 = 4 THEN
3570 PRINT TAB(14) "FOR A COMPR ESSOR ERROR"
3890 IF A0 = "F-106" AND F4 = 1 THEN
3580 PRINT: PRINT TAB(12) "1-MOCAS WITH HP=30"
3860 IF A0 = "F-111" AND F4 = 1 THEN
3590 PRINT: PRINT TAB(12) "2-MOCAS WITH HP=10.3"
3870 IF A0 = "F-111" AND F4 = 2 THEN
3600 PRINT: PRINT TAB(12) "3-D ISEL/JP-4"
3880 IF A0 = "F-111" AND F4 = 3 THEN
3610 PRINT: PRINT TAB(12) "4-D ISEL WITH TURBINE ENGINE*"
3890 IF A0 = "F-111" AND F4 = 4 THEN
3900 IF A0 = "0-2" AND F4 = 1 THEN
3910 IF A0 = "0-2" AND F4 = 2 THEN
3920 IF A0 = "0-2" AND F4 = 3 THEN
IF A$ = "C-141" AND F4 = 2 THEN UT = .75
3930 IF A$ = "O-2" AND F4 = 4 THEN 4230 IF A$ = "C-141" AND F4 = 2 THEN
3940 IF A$ = "OV-10" AND F4 = 1 THEN 4240 IF A$ = "C-141" AND F4 = 3 THEN
3950 IF A$ = "OV-10" AND F4 = 2 THEN 4250 IF A$ = "C-141" AND F4 = 4 THEN
3960 IF A$ = "OV-10" AND F4 = 3 THEN 4260 IF A$ = "KC-135" AND F4 = 1
3970 IF A$ = "OV-10" AND F4 = 4 THEN 4270 IF A$ = "KC-135" AND F4 = 2
3980 IF A$ = "C-5" AND F4 = 1 THEN 4280 IF A$ = "KC-135" AND F4 = 3
3990 IF A$ = "C-5" AND F4 = 2 THEN 4290 IF A$ = "KC-135" AND F4 = 4
4000 IF A$ = "C-5" AND F4 = 3 THEN 4300 IF A$ = "T-39" AND F4 = 1 THEN
4010 IF A$ = "C-5" AND F4 = 4 THEN 4310 IF A$ = "T-39" AND F4 = 2 THEN
4020 IF A$ = "C-7" AND F4 = 1 THEN 4320 IF A$ = "T-39" AND F4 = 3 THEN
4030 IF A$ = "C-7" AND F4 = 2 THEN 4330 IF A$ = "T-39" AND F4 = 4 THEN
4040 IF A$ = "C-7" AND F4 = 3 THEN 4340 IF A$ = "T-39" AND F4 = 1 THEN
4050 IF A$ = "C-7" AND F4 = 4 THEN 4350 IF A$ = "T-39" AND F4 = 2 THEN
4060 IF A$ = "C-9" AND F4 = 1 THEN 4360 IF A$ = "T-39" AND F4 = 3 THEN
4070 IF A$ = "C-9" AND F4 = 2 THEN 4370 IF A$ = "T-39" AND F4 = 4 THEN
4080 IF A$ = "C-9" AND F4 = 3 THEN 4380 IF A$ = "T-38" AND F4 = 1 THEN
4090 IF A$ = "C-9" AND F4 = 4 THEN 4390 IF A$ = "T-38" AND F4 = 2 THEN
4100 IF A$ = "C-130" AND F4 = 1 THEN 4400 IF A$ = "T-38" AND F4 = 3 THEN
4110 IF A$ = "C-130" AND F4 = 2 THEN 4410 IF A$ = "T-38" AND F4 = 4 THEN
4120 IF A$ = "C-130" AND F4 = 3 THEN 4420 IF A$ = "T-39" AND F4 = 1 THEN
4130 IF A$ = "C-130" AND F4 = 4 THEN 4430 IF A$ = "T-39" AND F4 = 2 THEN
4140 IF A$ = "C-131" AND F4 = 1 THEN 4440 IF A$ = "T-39" AND F4 = 3 THEN
4150 IF A$ = "C-131" AND F4 = 2 THEN 4450 IF A$ = "T-39" AND F4 = 4 THEN
4160 IF A$ = "C-131" AND F4 = 3 THEN 4460 IF A$ = "T-43" AND F4 = 1 THEN
4170 IF A$ = "C-131" AND F4 = 4 THEN 4470 IF A$ = "T-43" AND F4 = 2 THEN
4180 IF A$ = "C-135" AND F4 = 1 THEN 4480 IF A$ = "T-43" AND F4 = 3 THEN
4190 IF A$ = "C-135" AND F4 = 2 THEN 4490 IF A$ = "T-43" AND F4 = 4 THEN
4200 IF A$ = "C-135" AND F4 = 3 THEN 4500 IF A$ = "A-7" AND F4 = 1 THEN
4210 IF A$ = "C-135" AND F4 = 4 THEN 4510 IF A$ = "A-7" AND F4 = 2 THEN
4220 IF A$ = "C-141" AND F4 = 1 THEN 4520 IF A$ = "A-7" AND F4 = 3 THEN
UT = .1
4820 IF A* = "A-7" AND F4 = 4 THEN
4830 IF F4 = 1 THEN EM = 4685
4840 IF F4 = 2 THEN EM = 2466
4850 IF F4 = 3 THEN EM = 122
4860 IF F4 = 4 THEN EM = 65
4870 LET E1 = EM + A1 + NA / 100
4880 IF F4 = 1 THEN EM = 162
4890 IF F4 = 2 THEN EM = 155
4900 IF F4 = 3 THEN EM = 65
4910 IF F4 = 4 THEN EM = 6.7
4920 LET E2 = EM + A1 + NA / 100
4930 IF F4 = 1 THEN EM = 122
4940 IF F4 = 2 THEN EM = 49
4950 IF F4 = 3 THEN EM = 128
4960 IF F4 = 4 THEN EM = 159
4970 LET E3 = EM + A1 + NA / 100
4980 IF F4 = 1 THEN EM = 1.3
4990 IF F4 = 2 THEN EM = .79
5000 IF F4 = 3 THEN EM = 5.6
5010 IF F4 = 4 THEN EM = 37.2
5020 LET E4 = EM + A1 + NA / 100
5030 IF F4 = 1 THEN EM = 7.7
5040 IF F4 = 2 THEN EM = 4.4
5050 IF F4 = 3 THEN EM = 24
5060 IF F4 = 4 THEN EM = 21
5070 LET E5 = EM + A1 + NA / 100
5080 GOSUB 7700
5090 PRINT : PRINT : INPUT "DO YOU HAVE ANYMORE 'AGE' THAT YOU WOULD LIKE TO CALCULATE THE POLLUTANT EMISSIONS FOR. <Y> OR <N>: "<A>
5100 IF W$ = "Y" THEN GOTO .7490
5110 IF W$ = "N" THEN GOTO .7490
5120 IF W$ = "(N)" THEN GOTO .7490
5130 HOME : PRINT "INPUT NECESSARY 'AGE' INFORMATION FOR A HYDRAULIC TEST STAND THAT DESCRIBES YOUR 'AGE'.";
5140 PRINT "RESPONSES: "<A>"NO EMISSIONS CALCULATED"
5150 PRINT TAB(14)"FOR A HYDRAULIC TEST STAND"
5160 PRINT : PRINT TAB(12)"1-M OCAS"
5170 PRINT : INPUT "ENTER YOUR RESPONSE:"<F5>
5180 IF F5 = 0 THEN GOTO 5610
5190 TF = 0:AI = 0:UT = 0:AI = 0:
5200 LET TF = 1:AI = 1
5210 IF A$ = "F-4" THEN UT = .3
5220 IF AS = "F-15" THEN UT = .3
5230 IF AS = "F-16" THEN UT = 0
5240 IF AS = "F-105" THEN UT = 0
5250 IF AS = "F-106" THEN UT = 0
5260 IF AS = "F-111" THEN UT = 0
5270 IF AS = "O-2" THEN UT = 0
5280 IF AS = "OV-10" THEN UT = 0
5290 IF AS = "C-5" THEN UT = 1.1
5300 IF AS = "C-7" THEN UT = 0
5310 IF AS = "C-9" THEN UT = 0
5320 IF AS = "C-130" THEN UT = 1
5330 IF AS = "C-131" THEN UT = 0
5340 IF AS = "C-135" THEN UT = 0
5350 IF AS = "C-141" THEN UT = 1
5360 IF AS = "KC-135" THEN UT =
5370 IF AS = "T-33" THEN UT = 0
5380 IF AS = "T-37" THEN UT = 0
5390 IF AS = "T-38" THEN UT = 0
5400 IF AS = "T-39" THEN UT = 0
5410 IF AS = "T-43" THEN UT = 0
5420 IF AS = "A-7" THEN UT = .14
5430 IF AS = "A-10" THEN UT = 0
5440 IF AS = "A-37" THEN UT = 0
5450 IF AS = "B-52" THEN UT = .0
5460 IF AS = "FB-111" THEN UT =
5470 IF AS = "H-1" THEN UT = 0
5480 IF AS = "H-3" THEN UT = .5
5490 IF AS = "H-53" THEN UT = .5
5500 LET AI = AI + TF * UT
5510 LET E1 = 23141 + AI * NA / 1000
5520 LET E2 = 902 + AI * NA / 1000
5530 LET E3 = 600 + AI * NA / 1000
5540 LET E4 = 3.4 + AI * NA / 1000
5550 LET E5 = 38 + AI * NA / 1000
5560 COSUB 7700
5570 PRINT: PRINT "YOU HAVE ANYMORE AGE THAT YOU
5580 IF AS = "A-10" THEN UT = 0
5590 IF AS = "A-37" THEN UT = 2.
5600 IF AS = "A-7" THEN UT = 3.
5940 IF A$ = "FB-111" THEN UT = 0
5950 IF A$ = "H-1" THEN UT = 0
5960 IF A$ = "H-3" THEN UT = 0
5970 IF A$ = "H-53" THEN UT = 0
5980 LET AI = AI + TF * UT
5990 LET E1 = 4685 * AI / NA / 1000
6000 LET E2 = 162 * AI / NA / 10
6010 LET E3 = 122 * AI / NA / 10
6020 LET E4 = .79 * AI / NA / 10
6030 LET E5 = 7.8 * AI / NA / 10
6040 LET E4 = 4460
6050 PRINT: PRINT "INPUT "DO Y OR <N> "YOU HAVE ANYMORE "AGE".
6060 IF W$ = "N" THEN GOTO 7490
6070 IF W$ = "NO" THEN GOTO 749
0
6080 IF W$ = "<N>" THEN GOTO 749
0
6090 HOME: PRINT "INPUT NECESSARY "AGE" INFORMATION FOR A LIGHT CART THAT BEST DESCRIBES YOUR "AGE".
6100 PRINT: PRINT "RESPONSES: "NO EMISSIONS CALCULATED"
6110 PRINT TAB(14) "FOR A LIGHT CART"
6120 PRINT: PRINT TAB(12) "I=MHz"
6130 PRINT: PRINT "ENTER YOUR RESPONSE:"F7
6140 IF F7 = 3 THEN GOTO 6570
6150 IF F7 = 0 THEN GOTO 6570
6160 LET TF = 1:AI = 1
6170 IF A$ = "F-4" THEN UT = 1.2
25
6180 IF A$ = "F-15" THEN UT = 1.
25
6190 IF A$ = "F-16" THEN UT = 1.
25
6200 IF A$ = "F-105" THEN UT = 1
25
6210 IF A$ = "F-106" THEN UT = 1
25
6220 IF A$ = "F-111" THEN UT = 1
25
6230 IF A$ = "0-2" THEN UT = .5
6240 IF A$ = "0V-10" THEN UT = .5
6250 IF A$ = "C-5" THEN UT = 3.1
8
6260 IF A$ = "C-7" THEN UT = 3.1
8
6270 IF A$ = "C-9" THEN UT = 3.1
8
6280 IF A$ = "C-130" THEN UT = 3
.18
6290 IF A$ = "C-131" THEN UT = 3
.18
6300 IF A$ = "C-135" THEN UT = 3
.18
6310 IF A$ = "C-141" THEN UT = 3
.18
6320 IF A$ = "KC-135" THEN UT = 4.66
6330 IF A$ = "T-39" THEN UT = 1.25
6340 IF A$ = "T-37" THEN UT = 0
6350 IF A$ = "T-38" THEN UT = 0
6360 IF A$ = "T-39" THEN UT = 1
6370 IF A$ = "T-43" THEN UT = 0
6380 IF A$ = "A-7" THEN UT = .23
6390 IF A$ = "A-10" THEN UT = .2
6400 IF A$ = "A-37" THEN UT = .2
6410 IF A$ = "B-52" THEN UT = 3.36
6420 IF A$ = "FB-111" THEN UT = 3.36
6430 IF A$ = "H-1" THEN UT = .83
6440 IF A$ = "H-3" THEN UT = .83
6450 IF A$ = "H-53" THEN UT = .8
6460 LET AI = AI + TF * UT
6470 LET E1 = 2466 + AI / NA / 1000
6480 LET E2 = 155 + AI / NA / 1000
6490 LET E3 = 49 + AI / NA / 1000
6500 LET E4 = .74 + AI / NA / 1000
6510 LET E5 = 4.4 + AI / NA / 1000
6520 COSUB 7700
6530 PRINT: PRINT "INPUT "DO Y OR <N> "YOU HAVE ANYMORE "AGE".
6540 IF W$ = "N" THEN GOTO 7490
6550 IF W$ = "NO" THEN GOTO 749

6560 IF W$ = "(N)" THEN GOTO 74 90
6570 HOME: PRINT "INPUT NECESSARY INFORMATION FOR A PRESSURE TESTER THAT BEST DESCRIBES YOUR 'AGE'."
6580 PRINT: PRINT "RESPONSES: 0 NO EMISSIONS CALCULATED"
6590 PRINT: TAB(14)"FOR A PRESSURE TESTER"
6600 PRINT: PRINT TAB(12)"1=M GAS"
6610 PRINT: PRINT "ENTER YOUR RESPONSE.": IF
6620 IF FS = 0 THEN GOTO 7050
6630 TF = 0: AI = 0: AI = 0: UT = 0:
EM = 0: E1 = 0: E2 = 0: E3 = 0:
E4 = 0: E5 = 0
6640 LET TF = 1: AI = 1
6650 IF AS = "F-4" THEN UT = .04
6660 IF AS = "F-15" THEN UT = .0 4
6670 IF AS = "F-16" THEN UT = .0 4
6680 IF AS = "F-105" THEN UT = 0
6690 IF AS = "F-106" THEN UT = .0 4
6700 IF AS = "F-111" THEN UT = .0 4
6710 IF AS = "0-2" THEN UT = 0
6720 IF AS = "0V-10" THEN UT = 0
6730 IF AS = "C-5" THEN UT = 0
6740 IF AS = "C-7" THEN UT = 0
6750 IF AS = "C-9" THEN UT = 0
6760 IF AS = "C-130" THEN UT = 0
6770 IF AS = "C-131" THEN UT = 0
6780 IF AS = "C-135" THEN UT = 0
6790 IF AS = "C-141" THEN UT = 0
6800 IF AS = "KC-135" THEN UT = 0
6810 IF AS = "T-33" THEN UT = .0 4
6820 IF AS = "T-37" THEN UT = 0
6830 IF AS = "T-38" THEN UT = 0
6840 IF AS = "T-39" THEN UT = 0
6850 IF AS = "T-43" THEN UT = 0
6860 IF AS = "A-7" THEN UT = .13
6870 IF AS = "A-10" THEN UT = .1
6880 IF AS = "A-37" THEN UT = 0
6890 IF AS = "B-32" THEN UT = 0
6900 IF AS = "FB-111" THEN UT = 0
6910 IF AS = "H-1" THEN UT = 0
6920 IF AS = "H-3" THEN UT = 0
6930 IF AS = "H-53" THEN UT = 0
6940 LET AI = AI = TF = UT
6950 LET E1 = 21530 * AI + NA /
6960 LET E2 = 846 * AI + NA /
6970 LET E3 = 558 * AI + NA /
6980 LET E4 = 2.4 * AI + NA /
6990 LET E5 = 35 * AI + NA /
7000 GOSUB 7700
7010 PRINT: PRINT "INPUT "DO YOU HAVE ANYMORE "AGE" THAT YOU WOULD LIKE TO CALCULATE THE POLLUTANT EMISSIONS FOR, <(>) OR <(>)?"
7020 IF W$ = "N" THEN GOTO 7490
7030 IF W$ = "NO" THEN GOTO 7490
7040 IF W$ = "(N)" THEN GOTO 74 90
7050 HOME: PRINT "INPUT NECESSARY INFORMATION FOR A PRESSURE TESTER THAT BEST DESCRIBES YOUR 'AGE'."
7060 PRINT: PRINT "RESPONSES: 0 NO EMISSIONS CALCULATED"
7070 PRINT TAB(14)"FOR A JACKETED MANIFOLD"
7080 PRINT: PRINT TAB(12)"1=M GAS"
7090 PRINT: INPUT "ENTER YOUR RESPONSE.": IF
7100 IF FS = 0 THEN GOTO 7490
7110 TF = 0: AI = 0: UT = 0: AI = 0:
EM = 0: E1 = 0: E2 = 0: E3 = 0:
E4 = 0: E5 = 0
7120 LET TF = 1: AI = 1
7130 IF AS = "T-4" THEN UT = 0
7140 IF AS = "F-15" THEN UT = 0
7150 IF AS = "F-16" THEN UT = 0
7160 IF AS = "F-105" THEN UT = 0
7170 IF AS = "F-106" THEN UT = 0
7180 IF AS = "F-111" THEN UT = 0
7190 IF AS = "0-2" THEN UT = 0
7200 IF AS = "0V-10" THEN UT = 0
7210 IF AS = "C-5" THEN UT = .38
7220 IF AS = "C-7" THEN UT = 0
7230 IF AS = "C-9" THEN UT = 0
7240 IF AS = "C-130" THEN UT = .38
7250 IF AS = "C-131" THEN UT = 0
7260 IF AS = "C-135" THEN UT = .38
7270 IF AS = "C-141" THEN UT = .38
7280 IF AS = "KC-135" THEN UT = .19
7290 IF AS = "T-33" THEN UT = 0
7300 IF AS = "T-137" THEN UT = 0
7310 IF AS = "T-38" THEN UT = 0
7320 IF AS = "T-39" THEN UT = 0
7330 IF AS = "T-43" THEN UT = 0
7340 IF AS = "A-10" THEN UT = 0
7350 IF AS = "A-37" THEN UT = 0
7360 IF AS = "A-52" THEN UT = .19
7370 IF AS = "FB-111" THEN UT = 0
7380 IF AS = "H-1" THEN UT = 0
7390 IF AS = "H-3" THEN UT = 0
7400 IF AS = "H-53" THEN UT = 0
7410 IF AS = "K-52" THEN UT = .4
7420 LET AI = AI + TF * UT
7430 LET E1 = 4367 * AI * NA / 1000
7440 LET E2 = 152 * AI * NA / 1000
7450 LET E3 = 113 * AI * NA / 1000
7460 LET E4 = 1.1 * AI * NA / 1000
7470 LET E5 = 7.1 * AI * NA / 1000
7480 COSUB 7700
7490 HOME : INPUT "IF YOU WOULD LIKE TO PRINT YOUR RESULTS ON THE PRINTER, ENTER (Y), OTHERWISE ENTER (N)." : P$
7500 IF P$ = "N" THEN GOTO 7550
7510 IF P$ = "NO" THEN GOTO 7550
7520 IF P$ = "<N>" THEN GOTO 7550
7530 PRINT : INPUT "MAKE SURE YOUR PRINTER IS TURNED ON AND IS ON LINE. IF YOUR PRINTER IS TURNED ON PRESS RETURN." : R$
7540 프 1
7550 HOME : PRINT TAB(7)"TOTAL AGE EMISSIONS FROM ALL" : PRINT TAB(13)AS : LTO'S (KG)
7560 프 5
7570 PRINT TAB(5)"----------"
REFERENCES


