

RETRO-LOADSHEET ON AMSTRAD CPC!

by SAKIS KAFFESAKIS 2018

PROGRAM MANUAL

**IMPORTANT NOTE: THIS PROGRAM MUST NOT BE USED FOR REAL FLIGHTS, AS
DATA ARE NOT ACCURATE AND PROGRAM IS ONLY PARTIALLY TESTED.**

IT HAS TO BE USED ONLY FOR FUN!

1. Instructions for loading program

In order to run this program, you need an emulator of Amstrad Cpc. You can go to <http://www.winape.net/downloads.jsp> and download Version 2.0b2. After you extract program using winrar/winzip, go the extracted folder and double click file Winape.exe. Amstrad emulator is going to start.

Then, at the bottom/left of the emulator screen, press change disc icon. Then press open, and insert the dsk file (from where you have saved it). Press ok to confirm. Disk then should be loaded. Then type

RUN"RETROLS (for typing " pls press shift+2)

and press Enter

Program then should start!

See screenshots in the end for more detailed info.

2. Information for the program

The program <Retro-Loadsheet on Amstrad CPC!> was created just for fun and also to show that retro technology, despite its limits, has the potential to make complicated calculations and become useful not only for gaming. It produces a loadsheet for a NOT real aircraft, but in a similar way that a loadsheet is calculated. Due to memory capacity problems, this way was further simplified, which caused more inaccuracy. **These unexpected memory capacity problems unfortunately made impossible the calculation of balance (trimsheet) for A320 (for A320 only weightsheet is available). But full loadsheet (weight and balance calculations) is available for B737-800.**

For logging in type for user <OPS> and for password <4>.

3. Menu

AIRCRAFT:

In this section you can choose aircraft. You can choose B737-800 or A320. For B737-800 a basic trimsheet can be produced, while for A320 only weightsheet can be provided. Initially it was planned that trimsheet would be provided for both aircrafts, but due to limited memory of Amstrad, only data for B737-800 could be inserted.

You can also edit some aircraft's data as basic weight, crew weight calculation, and pantry code (for pantry 0-500 is accepted). These data affect only calculation of System Calculated DOW and DOI. System DOW and DOI are being proposed later, but the user decides to accept them or deny them and insert new DOW/DOI.

Loadsheet/Trimsheet calculations are based on DOW/DOI and not on these data.

In the case of ULD aircraft you will also determine ULD weight (per unit).

Pls note that if you change aircraft, most data will be lost (Pax, bag, and special load data only will remain unaffected).

FLIGHT DATA:

In this section you enter basic flight data as date, flight number, station, and destination (3 letter code for station and destination). You also choose (or enter new) passenger weights that you want to be used (for male, female, children and infants). Total pax (passengers) weight will be calculated based on the weights you have chosen. **Selected pax weights are used only for weight calculations and not for trim calculation** (pax trim is based only on section data).

PAX/BAG DATA:

In this section you enter pax and bag data. You have to enter pax figures (male, female, children, infants) and bags/kilos. In bag data entering, you can choose actual kilos or standard weights (for example 13 kilos per bag).

Then you have to enter the sections. Sections show how many passengers are seated in each section of the aircraft (eg section OA, rows 1-11, has max 63 seats in B737-800). You must respect limits of each section, and the total of the sections must agree with the pax (male+female+children) total (pls note that **infants** don't occupy a seat, so they **must not be added in sections**). For example if total passengers are 100 + 2 infants, then total sum of sections must be 100. Sections data are set to zero if you change aircraft, because the other aircraft's sections are different, and data must be re-entered.

SPECIAL LOAD:

In this section you may enter any special load. You can enter 2 special loads. In <code>, you enter 3 or 4 letter code (eg AVIH or CGO). Then you have to choose if special load is included in PW (Pieces-Weight). This means if the special load is included in bag data that you inserted. Special load included in PW must be 1 piece and its weight will be calculated as a mean of other bags. If it is not included in PW, it will be added to total bag weight.

LOAD DISTRIBUTION:

In this section you choose where to load bags and special loads. Your choices must respect the maximum for each compartment. Also, bag total that you enter must be the same as bags in PW (bag data).

When a special load is not included in PW, weight is added in the compartment.

BUT: if a special load is included in PW, then you must have placed already the BAG in entering bag data (eg, program will not accept entering a special load included in PW in a compartment that there are no bags). So the total of bags that you enter, must be the total of bags that you had entered in PAX/BAG DATA (section 3) and not -1.

If aircraft is A320 and you have chosen ULD type (ULD is a container in which bags are loaded into and then ULD is loaded in the compartment), you will be asked to enter how many ULDs will be loaded in each compartment (for compartment 1 maximum 3, and for compartments 3 and 4 maximum 2 for each one).

When load distribution is completed, then RO (ramp open) is changed to RF (ramp finalized). Completing load distribution is essential for producing loadsheet. Pls note that if you edit anything that affects compartment data (eg bag weight), you must go again to the Load distribution and get new approval (in order to avoid producing loadsheet with old data). In this case, if you enter Load distribution again, you will see in the first row the new data that you have entered, but inside the compartments the old data. When you have load distribution approval again, then the compartments will show the new data. We chose this method (not to erase compartment data) because it is better to have a view of the previous distribution (eg if you added 1 bag only). At any case, you have to complete again load distribution to get a new approval. **Approval does not mean that your choice of loading is correct or appropriate.** It only means that all new data related to compartment loading will be entered again, so that it is secured that these new data will be calculated for the loadsheet.

TRIP INFO:

In this section you enter fuel figures. You also have to decide to accept or not system calculated DOW/DOI or enter new ones. **Pls note that what you choose here is what will be used for loadsheet calculation.** If you want to enter a decimal number for DOI (eg 39,2) pls enter point by dot, **as amstrad accepts decimals in that way** (eg type **47.9 and not 47,9**). Program accepts DOW 40000-55000 and DOI 30-70. Cockpit crew can be 2-4 and cabin crew can be 0-6.

LOADSHEET:

At first you will see a table of aircraft maximum limits which will inform you for current status and any limitations. If aircraft does not exceed limits you will then see the loadsheet (or weightsheet for A320). If aircraft exceeds limits, go back and fix what is necessary and then return in loadsheet section.

NOTOC:

If you have entered any special load, you will have access in this section and see the Notification to Captain.

RESTART:

Pls use this section when you want to restart the program.

REMARK: The program tries to prevent you in some degree from entering false data, but it cannot prevent you from that in a very high degree. **In addition, pls don't use decimals (2 decimals are allowed only in entering new DOI)** as this will cause trouble in showing data (and maybe in calculating).

Try to enter data following the menu (from 1 to 7) so that it is easier for you, in order not to go back in each section many times.

ADDITIONAL INFO:

This program was designed just for fun and did not have the purpose to be accurate. Despite of that, weight calculations seem to have fine accuracy, although not tested in detail. Trim calculations are not so accurate, due to the fact that some trim calculations were simplified due to memory problems. For example trim of pantry is not so accurate (+0.1 for every 70 kgs). Trim of fuel and trim of crew seem to be more accurate. Trim of pax and compartment although not very accurate is not bad at all. Accuracy of calculating aircraft trim limits is more low. But we can say that the basic principle of trimming is followed, and you will understand that if you load an aircraft (pax and bag) all in front or all in the back – it will be out of limits. Low accuracy also happens as the aircraft is not a real aircraft- data of aircrafts and calculations are not based on one specific real aircraft's data, but from data of various B737-800 aircrafts (differencies are not so big, but they exist).

Of course there are probably some mistakes or errors, as program is only partially tested. Pls feel free to notify if you discover any errors!

At any case, we are happy to have completed a program that can provide a basic loadsheet and trimsheet!

In next pages there are some explanations for not aviation-familiar users.

Hope you enjoy the program! Have fun!

Welcoming you comments at skafesakis@yahoo.gr

BRGDS**SAKIS KAFFESAKIS****Heraklion, Crete, Greece.**

INFORMATION FOR NOT AVIATION-FAMILIAR USERS

1. WEIGHT LIMITS

Aircraft has a basic weight, which means the weight of the aircraft when it is completely empty (no crew, no pantry, no passengers, no fuel, no bags). In this basic weight we add crew weight and pantry (if there is any) and we then have **DOW (Dry operating weight)**. So, if basic weight is 40000, and crew is 2 plus 4 (for example crew weight is calculated for 90 kgs) and there is 100 kgs pantry, then DOW will be $40000+90 \times 6+100=40640$. DOW provides us a basis on which all other weights will be added.

On pax weights used section (on section 2 flt data), you choose the weight for the specific types of passengers (male, female, children, infants). So, **Total pax weight** is male x male weight + female x female weight + children x children weight + infants x infants weight.

Total weight of compartments (deadload) is the total weight of bags (added by user) + any other load not included in pw (special loads).

If you sum all these then you have **Actual Zero fuel weight** (weight of aircraft without added fuel). **AZFW= DOW + Total pax weight + Total weight of compartments**. (Pls note that Total traffic load= Total Pax weight + Total weight in compartments).

BLOCK FUEL: the fuel quantity that is in the aircraft at the moment of starting to go in the runway (quantity accepted in Litres, program accepts 2501-25000)

TAXI: fuel that is going to be burned in the runway before take off (program accepts 51-1000)

TRIP: fuel that is going to be burnt from take off until arriving in destination.

Actual take off weight: Actual take off weight is the weight of the aircraft at the moment of take off.

So, $ATOW = AZFW + BLOCK - TAXI$

Actual landing weight: Actual landing weight is the weight of the aircraft at the moment of landing at destination airport.

So, $ALAW = AZFW + BLOCK - TAXI - TRIP$

Aircraft has at least 3 weight limits. There is a limit for AZFW, ATOW and for ALAW (**MAXZFW, MAXTOW and MAXLAW**). These limits are stable for the aircraft and each weight must not be over the maximum limit (**AZFW must not be over MAXZFW, ATOW must not be over MAXTOW and ALAW must not be over MAXLAW**). If any of these three limits is exceeded, weight must be reduced in order to be under the limit. But weight reduced has to be specifically chosen: for example, reducing BLOCK fuel will not have effect if AZFW is over the limit, **as AZFW does not include fuel weight**, so AZFW will remain over the limit despite reducing fuel.

Underload is the maximum of kilos that, when added to aircraft weight, will not exceed any limit. So, if AZFW is 1000 under the limit, ATOW is 2000 under the limit, and ALAW is 3000 under the limit, then underload is 1000. In other words, underload informs us of how many kilos we can further add and still be under the weight limits.

2. BALANCE LIMITS

The same philosophy exists for balance limits. The aircraft must not be too nose-heavy or tail-heavy. So, avoid loading passengers and bags all in front or all in the back as you will then exceed balance limits. Balance limits exist again for the three weights: AZFW, ATOW, and ALAW.

In the same way as for basic weight, aircraft has a basic index (balance is showed in a number that has to be between two limits). This index shows the balance of the aircraft when it is completely empty. Then, the effect of crew and pantry is added to the basic index and we then have DOI. For example, if basic index is 47 and we have 2 pilots only (and no pantry), DOI

will be reduced to at about 45 (as the 2 pilots sit in front). **Have in mind that any weight added in front has an effect of minus (-), so it reduces index, and any weight added in the back has an effect of plus (+), so it increases index.** Pls note that crew weight chosed in section 1 is calculated in crew's index correction (if crew weight is increased, effect will be higher). The program does not allow you to enter a basic index when you correct basic weight, but you can correct DOI and enter the new one if needed at section 6 (TRIP INFO). **DOI is used for loadsheet calculations.**

After entering DOI and moving to loadsheet section, the system calculates the effect of passengers and compartment load. If most passengers sit in front (section OA) or most sit in the back (section OC), then aircraft balance will probably be out of limits. Of course, the effect of, eg passengers sit most in front, can be reduced by loading bags in the back, but pls note that usually passengers have a higher effect (if they are many) on the balance of the aircraft, as their weight is usually much more higher than their bags weight. But there are exceptions for that: eg, if there are 5 passengers only but you have a CARGO of 2000 kgs, then cargo plays the main role. At any case, **placing passengers or load in compartments in front reduces index, and placing passengers or load in compartments in the back increases index** (compartments 2 and 3 on B737-800 that are in the middle have a lower effect in index in comparison with compartments 1 and 4. Regarding passengers, pls note that section OB has no effect in the index). After all, we now have **LIZFW, which is the index of the aircraft without having added the index correction of fuel.**

The correction of fuel is not analogous or in one direction only (minus or plus). Speaking generally, it has a plus effect until 8000 (+9 index correction at 8000), and after 8000 effect is decreased to 0 at 14000, and to -10 at 20800. This fuel index correction is based on the aircraft fuel tanks. Program calculates the index fuel correction for take of weight (so it finds and adds to LIZFW the index correction for the specific amount of take off fuel) and then we have **LITOW (index of the aircraft at the moment of take off)**. In a similar way, we have LILAW (we add to LIZFW the effect of fuel that is in the tanks at

the moment of landing- **LILAW is the index of the aircraft at the moment of landing**). There are different limits of balance for the 3 indexes: LIZFW, LITOW and LILAW.

The difference of these limits in comparison with the weight limits is that **balance limits are not stable**. In reference to weight limits, for example, MAX ZFW is eg 61000 and it just must not be exceeded. **But limits of index depend on the weight (AZFW, ATOW or ALAW in every case) of the aircraft and they are not stable**. There are other limits for LIZFW if AZFW is 50000 and different limits if AZFW is 60000. In the same way limits are calculated for LITOW and LILAW (other limits of LITOW if ATOW is 65000 and different if ATOW is 70000, etc). There are two limits for each one of LIZFW, LITOW and LILAW. **Being under the lower limit means that aircraft is loaded too much in the front, and being over the higher limit means that aircraft is loaded too much in the back**. (eg if LIM of LIZFW is 22,6/65,4, then if LIZFW is 20 it means that you added too much weight in the front, and if LIZFW is 70 it means that you added too much weight in the back). It is better to avoid being very close to the limit. At any case, if aircraft is beyond any limits (weight or balance), you can go and fix what is needed and come back in Loadsheets section. When aircraft is inside all limits, then Loadsheets can be produced.

In conclusion, a loadsheet is needed for any flight, as it certifies that the aircraft, loaded in a certain way (as for pax, bag, fuel and everything else), is ok to fly, as it does not exceed the operational limits.



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Latest Release

Version 2.0b2

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Contribute to WinAPE

WinAPE is provided free of charge, but a lot of time and effort goes into its development. It's always nice to receive good feedback, and that's what keeps me going with the project. I often have to take time off from other paying projects to find the time these days, so if you're feeling generous, a little contribution would be much appreciated.

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WinAPE Downloads

Version	Release Date	Notes
2.0b2	05-Jan-2016	Improved IN and OUT emulation, Improved CRTG 1 Reg 5 emulation. New version of ParaDOS 1.2 included.
2.0b1	26-Nov-2015	Too much to list. See the whats-new.rtf file included.
2.0a18	26-Jul-2011	Improved sound emulation, Debugger enhancements, plus more.
2.0a17	9-Sep-2008	PAL Emulation, Graphics Rotate, various bug fixes.
2.0a16	30-Aug-2008	FDC emulation rewrite. Huge update again, see whats-new.rtf.
2.0a15	29-Oct-2007	Huge update, too much to list, see whats-new.rtf.
2.0a14	17-Sep-2007	FDC Emulation enhancements and bug fixes.
2.0a13	8-Aug-2007	Too much to list, see included whats-new.rtf.
2.0a12	17-Feb-2007	Plus PPI and snapshot handling. Bug fixes.
2.0a11	11-Dec-2006	Enhanced Tape support, various bug fixes and enhancements.
2.0a10	19-Sep-2006	Disc Editor, WAV and YM writing and more.
2.0a9B	24-Aug-2006	Bug fixes for 2.0A9 plus some extra assembler features.
2.0a9	14-Aug-2006	Source breakpoints, Graphics finder, Printer support and more.
2.0a8	21-May-2006	Disassemble to File. Auto Run Disc Images.
2.0a7	17-May-2006	Symbiface Emulation, AVI Creation, V3 Snapshots.
2.0a6	12-Jun-2004	NEW ZIP and other archive support. Improvements to debugger and Screenshot saving.
2.0a5b	16-Aug-2002	Bug fix re-release of 2.0 Alpha 5.
2.0a5	12-Aug-2002	NEW RAM Management, threaded emulation, User Interface improvements.
2.0a4	10-Apr-2002	NEW Tape Support, Screen Shots in many formats, Menus, Brightness control and much more.
2.0a3	17-Mar-2002	NEW Pokes Database, Breakpoints Window, and lots of other fixes. For a full list, see the included whats-new.txt in the ZIP file.
2.0a2	20-Feb-2002	Once again, many improvements to all aspects of the emulation, debugger and assembler. Added support for Multiface II and Joystick/Game Pad. See the included whats-new.txt in the ZIP file.
2.0a	4-Nov-2001	The most accurate CPC and CPC Plus emulation, many improvements to all aspects of the emulation, debugger and assembler. See the included whats-new.txt in the ZIP file.
1.8b	15-Dec-1999	New splash screen, Full help system, Ability to toggle between full screen and normal (windowed) mode, Debugger, Memory Dump and Disassembler enhancements.
1.7b	25-Jul-1999	Added a new command in the assembler: run addr[;breakpoint] and activated the associated run menu option (F9). Fixed bugs in the assembler listing dialog. Added storage mechanism in INI file for open assembler files.

Other Downloads

Name	Description
Acomsoft Pacman	A CPC clone of the Acomsoft version of Pacman (sometimes known as Snapper) from the BBC B Micro.
Acomsoft Pacman Source	Source code for Pacman. Requires the ASM Library below.
ASM Library	Some library ASM modules for Firmware, Key Numbers, Palette, ASIC etc. Used by many of my source files, including Frogger.
CP/M Plus	CP/M Plus disc image, patched to run with any OS and BASIC version.

Amstrad 64K Microcomputer (v1)

©1984 Amstrad Consumer Electronics plc
and Locomotive Software Ltd.

ParaDOS V1.2 ©2015 BitWise Systems.

BASIC 1.0

Ready



Amstrad 64K Microcomputer (v1)

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and Locomotive Software Ltd.

ParaDOS V1.2 ©2015 BitWise Systems.

BASIC 1.0

Ready



CPC Emulator for Windows - Drive Setup

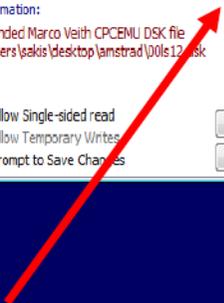
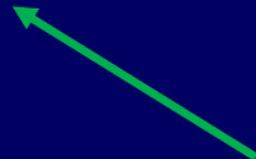
A: B:

None Floppy A: Floppy B: Disk File

Format:

Information:
Extended Marco Veith CPCEMU DSK file
c:\users\sakis\Desktop\amstrad\001s12.dsk

Allow Single-sided read
 Allow Temporary Writes
 Prompt to Save Changes



Amstrad 64K Microcomputer (v1)

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ParaDOS V1.2 ©2015 BitWise Systems.

BASIC 1.0

Ready
RUN"RETROLS■

