WEIGHT & BALANCE INFORMATION

for the

G103 TWIN ASTIR, G103 TWIN II ACRO, and Schleicher ASK-21 Gliders

along with

SPECIFIC DATA FOR ALL FIVE CURRENTLY OWNED GLIDERS

in the form of

INDIVIDUALLY TAILORED LOADING GRAPHS

Updated 10 May 2025 by

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Weight & Balance considerations for the GROB G103s and ASK-21 can get just a bit confusing, largely because of the "method of presentation" to be found in the Flight Manuals. This presentation is partially intended as an attempt at identifying and clarifying certain of those Weight and Balance issues. First, note the following peculiarity:

From the Graphs provided herein, it may be seen that there exist areas well within that envelope defining overall fore and aft Center of Gravity and Maximum Gross Weight operating limitations, but within which the Flight Manual imposed constraints identified below effectively deny conduct of flight operations.

1. The Flight Manuals impose a 242 lb. Maximum Pilot Weight in either seat.

2. The Flight Manuals impose a 154 lb. minimum weight in the front seat for all flight operations. (*This should not be confused with "minimum front seat weight for solo operation," which may be more than 154 lbs., but never less than 154 lbs.)*

3. The Flight Manuals offer no explanation for the above limitations, but it appears that EASA has (for whatever reason) established Operational Requirements corresponding to a specific Certification Requirement for two-place gliders (ref: CS 22.23 load distribution limits). Then, in the Twin II Acro, the 154 lb. minimum front seat weight limitation may be compensated for by the installation of one or both 12.3 lb. trim weights, but this action is not without a peculiarity of its own, which it may sometimes be necessary to take into account. A subsequent slide will go into more detail on this matter.

LOADING GRAPH PRINCIPALS:

The first graph displayed for each glider will outline the *entire envelope* within which the glider *could* operate without exceeding either Center of Gravity or Maximum Gross Weight operating limits.

Then, on both graphs, that *limited portion* of this envelope within which the Flight Manuals specify that all flight operations are to be conducted will be prominently outlined with a red border

The next two slides will show by example how the loading graphs that are herewith provided are to be interpreted and used

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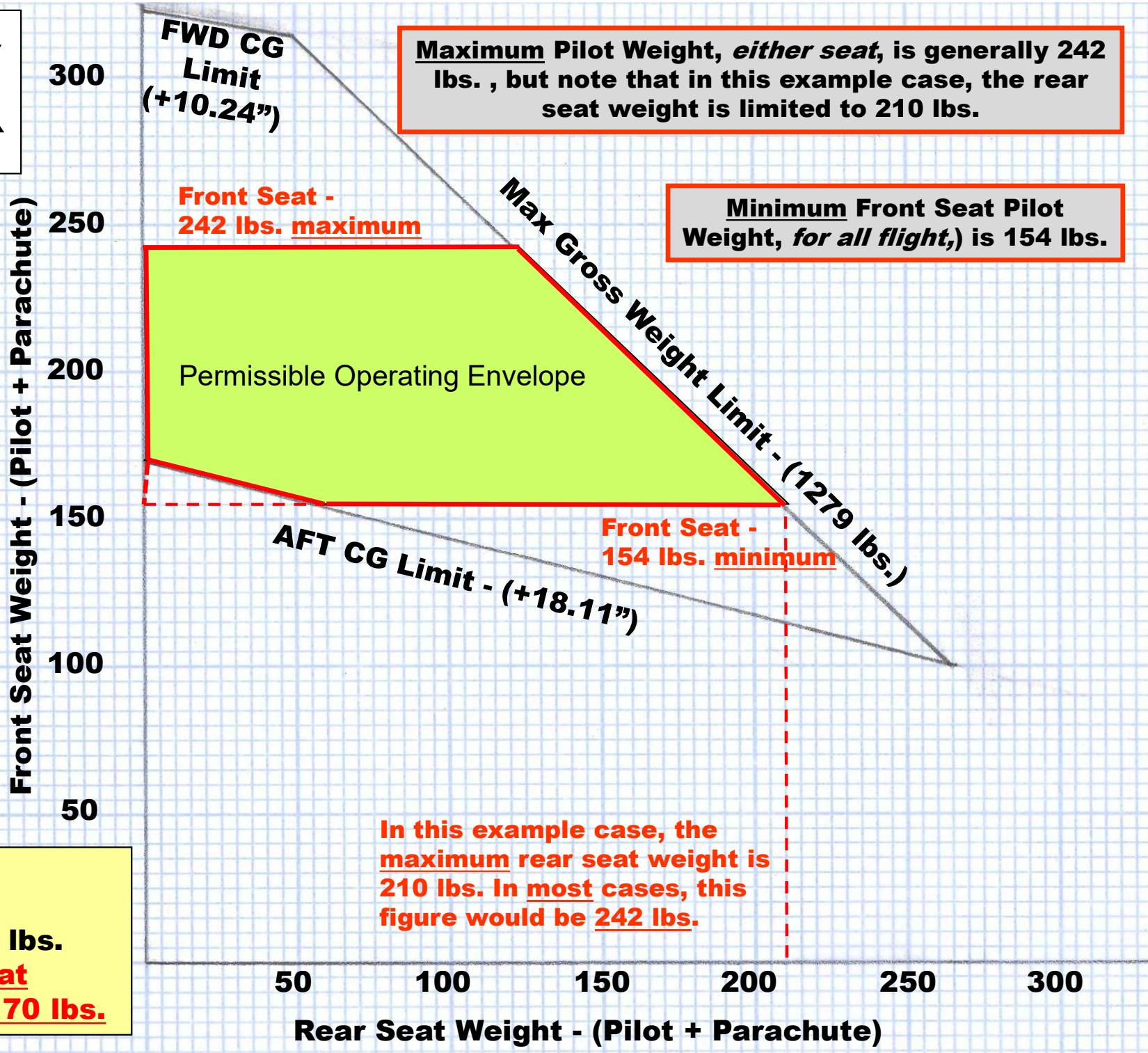
Remember, these are only examples, and are therefore not to be taken as specifically representative of any particular USA owned glider

XXX

GROB 103
Twin II Acro
Nxxxx
Serial No.
xxxxxxx

This graph is Based on the weighing, and the Weight & Balance calculations performed on xxxxxxxxxxx



E.W. = 916.0 lbs.
EWCG = +29.85
Useful Load = 363 lbs.
Minimum Front seat weight for solo – 170 lbs.

XXX

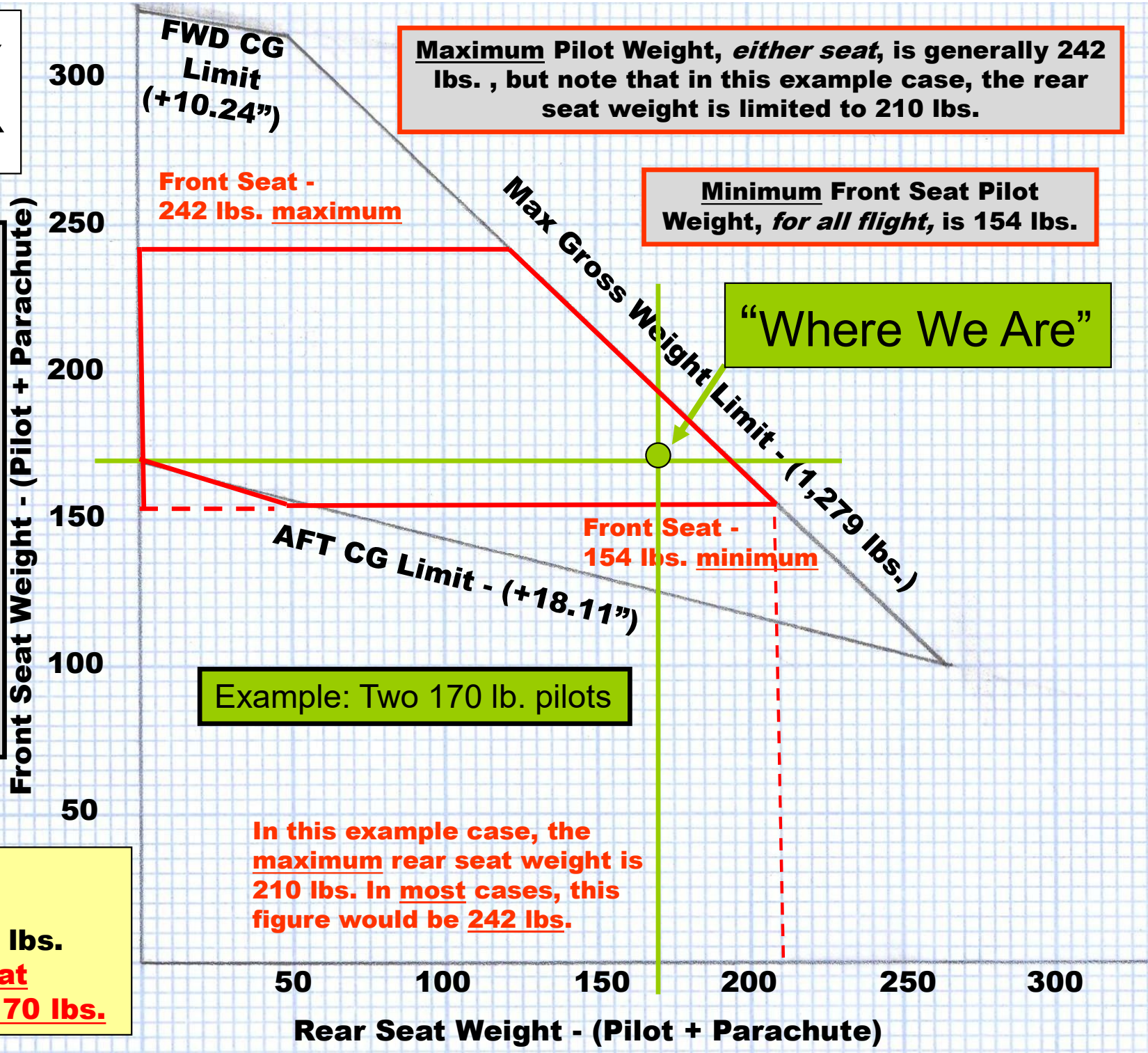
GROB 103
Twin II Acro
Xxxxxxx
Serial No.
xxxxxxxxx

This graph is Based on the weighing, and the Weight & Balance calculations performed on xxxxxxxxxxxxx

E.W. = 916.0 lbs.
EWCG = +29.85
Useful Load = 363 lbs.
Minimum Front seat weight for solo – 170 lbs.

Maximum Pilot Weight, *either seat*, is generally 242 lbs. , but note that in this example case, the rear seat weight is limited to 210 lbs.

Minimum Front Seat Pilot Weight, *for all flight,* is 154 lbs.



O.K. — Having experienced the demonstration, let us proceed on to individual loading graphs tailored to specific gliders - - -

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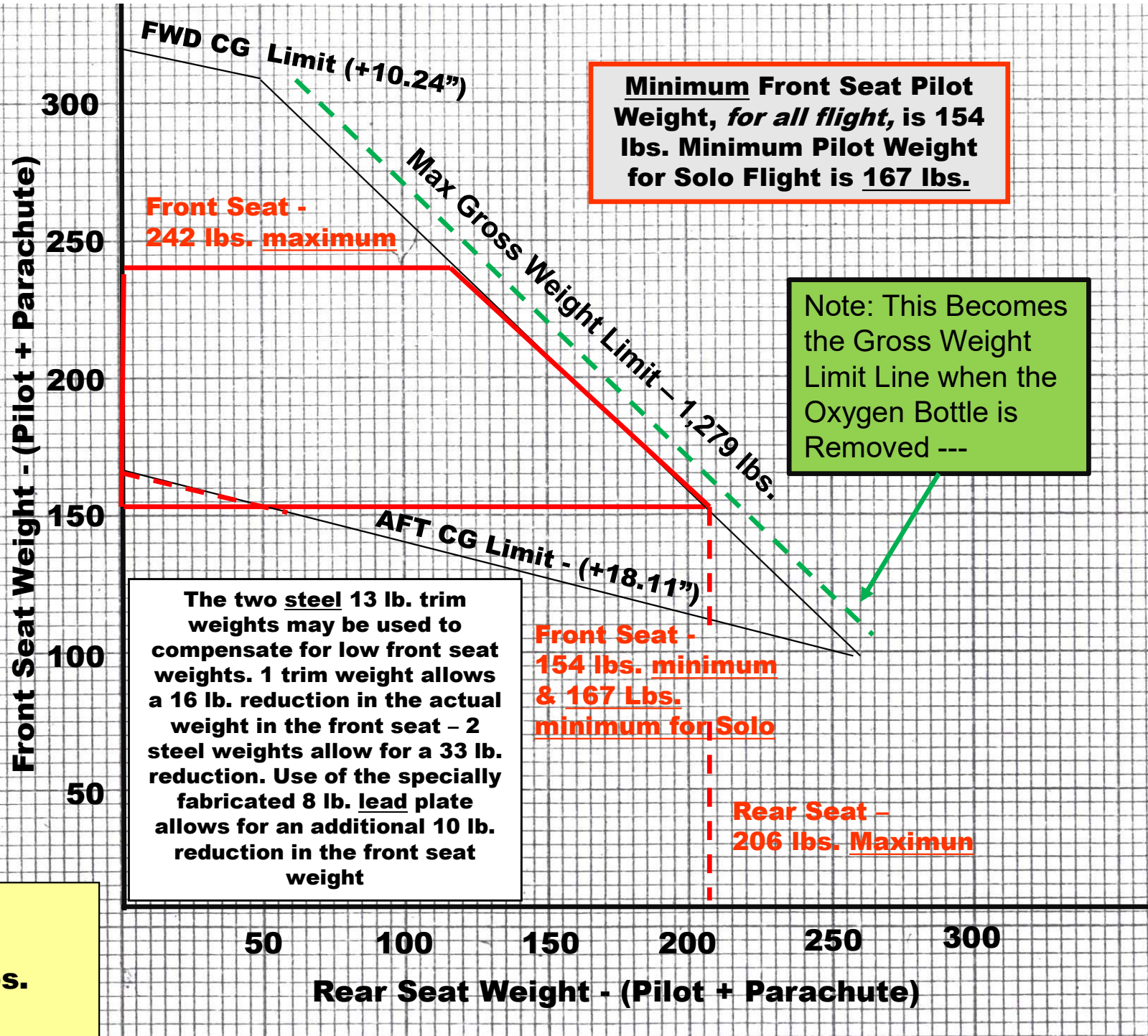
These graphs will be provided in two different versions, one “very busy” with lots of notes and data, the other in an easier to use *expanded format* of just that part of the overall W&B envelope within which all flight operations are to be conducted - - -

8BG

GROB 103
Twin II Acro
N228BG
Serial No.
33995-K-228

This Graph is Based on the Weight and Balance Data of 20 Mar 2018



Minimum Front Seat Pilot Weight, *for all flight,* is 154 lbs. Minimum Pilot Weight for Solo Flight is 167 lbs.

Note: This Becomes the Gross Weight Limit Line when the Oxygen Bottle is Removed ---

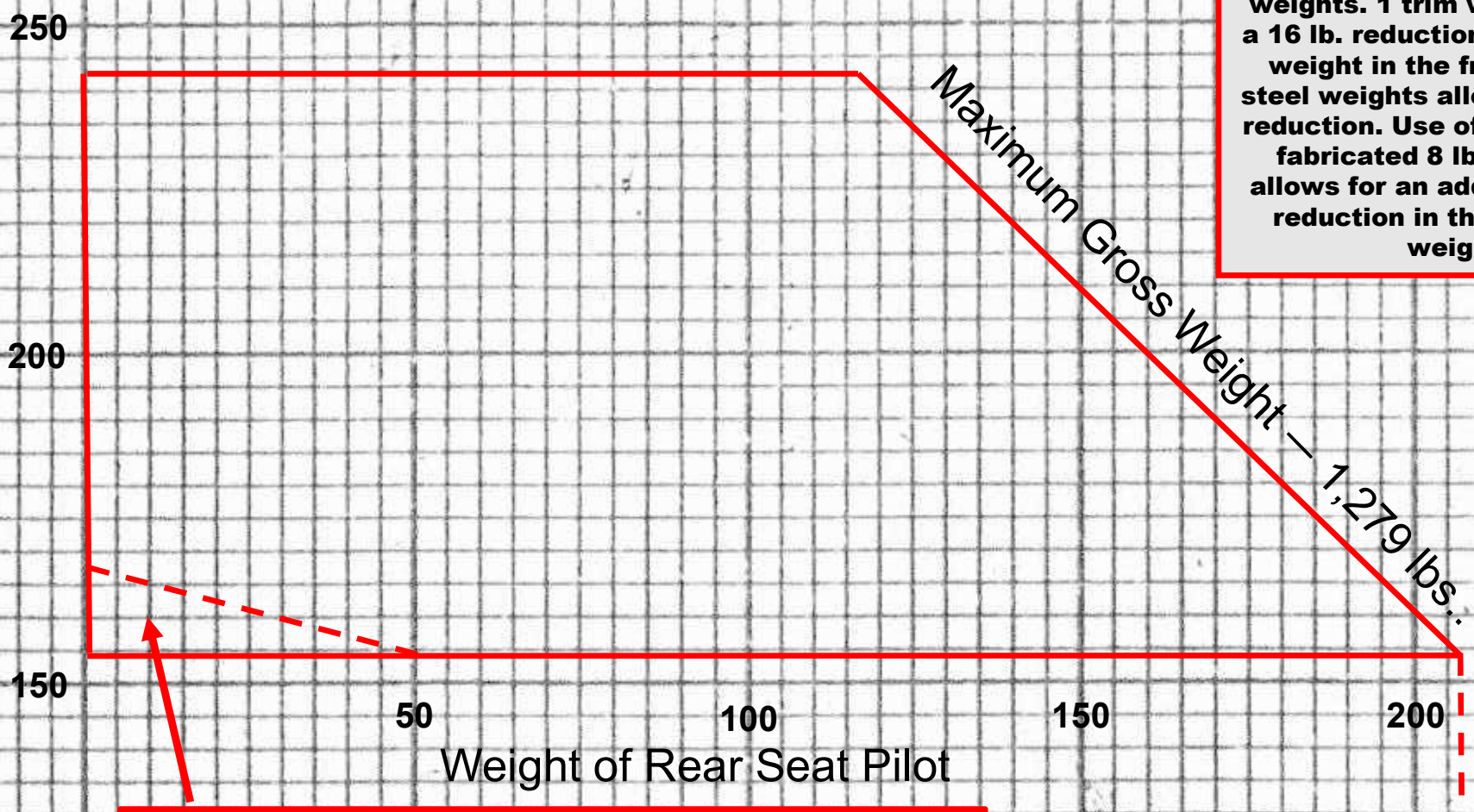
The two steel 13 lb. trim weights may be used to compensate for low front seat weights. 1 trim weight allows a 16 lb. reduction in the actual weight in the front seat – 2 steel weights allow for a 33 lb. reduction. Use of the specially fabricated 8 lb. lead plate allows for an additional 10 lb. reduction in the front seat weight

E.W. = 919.0 lbs.
EWCG = +29.6
Useful Load = 360 lbs.
Minimum Front seat weight for solo = 167 lbs.

8BG — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

Graph Based on W&B data of 20 Mar 2018

The two steel 13 lb. trim weights may be used to compensate for low front seat weights. 1 trim weight allows a 16 lb. reduction in the actual weight in the front seat – 2 steel weights allow for a 33 lb. reduction. Use of the specially fabricated 8 lb. lead plate allows for an additional 10 lb. reduction in the front seat weight



Solo Flight in This Area Must be Avoided
Minimum Solo Flight Weight = 167 Lbs.

Rear Seat – 206 lbs. maximum

Specific to 8BG - Because the trim weights are installed at a location that is somewhat forward of the front seat, both their actual weights as well as their *weight change effects* must sometimes be taken separately into account. Neither does the Flight Manual identify the station where these weights may be installed. (Computations and measurement reveal this station to be approximately 59 inches forward of the datum.)

The effective front seat weight change upon installation of a single weight is 16 lbs., and the effective front seat weight change when both weights are installed is 33 lbs. If it becomes necessary to use trim weights to achieve the necessary front seat minimum weight, it must be remembered that the effective weight so used will be greater than the actual weight added to the glider (16 and 33 lbs., versus 12.3 and 24.6 lbs., respectively). Not a lot of difference, but perhaps just enough to sometimes push the *derived* operating Gross Weight just beyond it's limit of 1,279 lbs. Taking into proper account the lessor actual weight added, as opposed to the front seat effective weight change figure, may sometimes serve to get the operating Gross Weight figure back within limits. Because of 8BG's low useful load figure, this small "gain" may sometimes be quite beneficial.

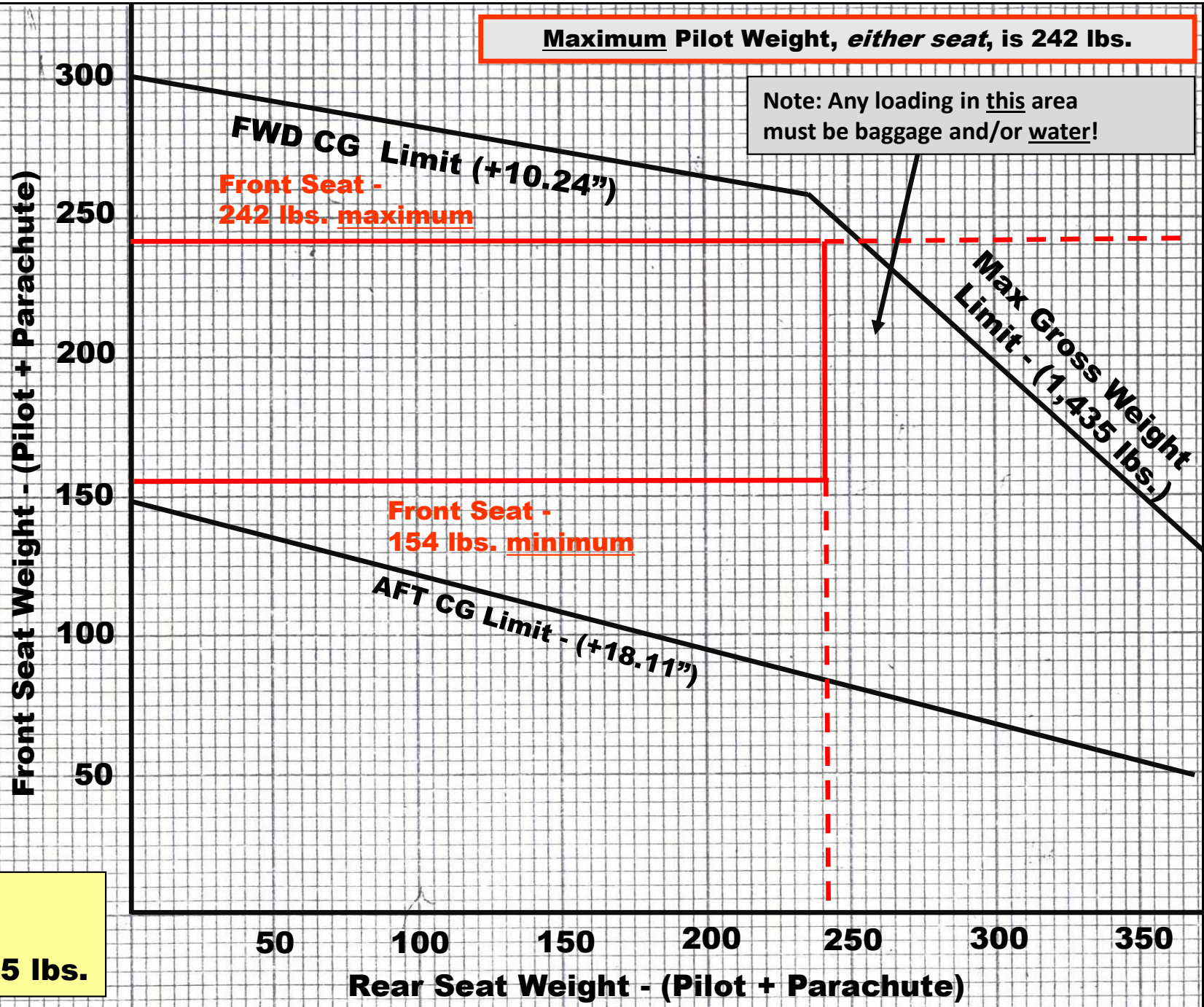
Still a bit confusing? I shouldn't wonder! But hey, I didn't put all these "ifs, ands and buts" into the Flight Manual. I am just attempting to give a little bit better insight into something I believe the Flight Manual covers rather poorly.

85W

GROB
Twin Astir
N8485W
Serial No.
3290

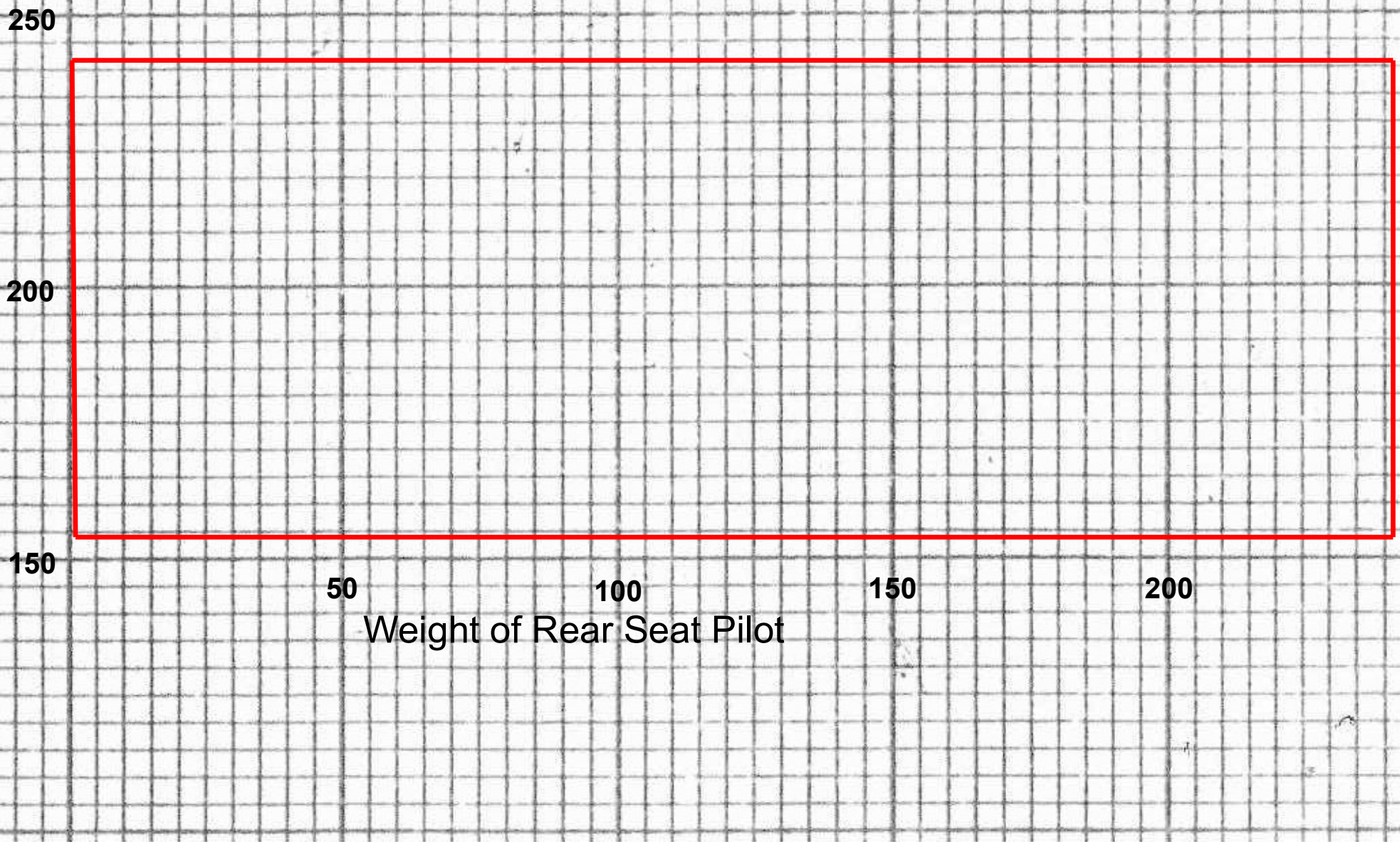
This graph is based on the weighing, and the Weight & Balance calculations performed on 17 Oct 2013

E.W. = 940.0 lbs.
EWCG = +28.26
Useful Load = 495 lbs.



85W — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

Graph Based on W&B data of 17 Oct 2013

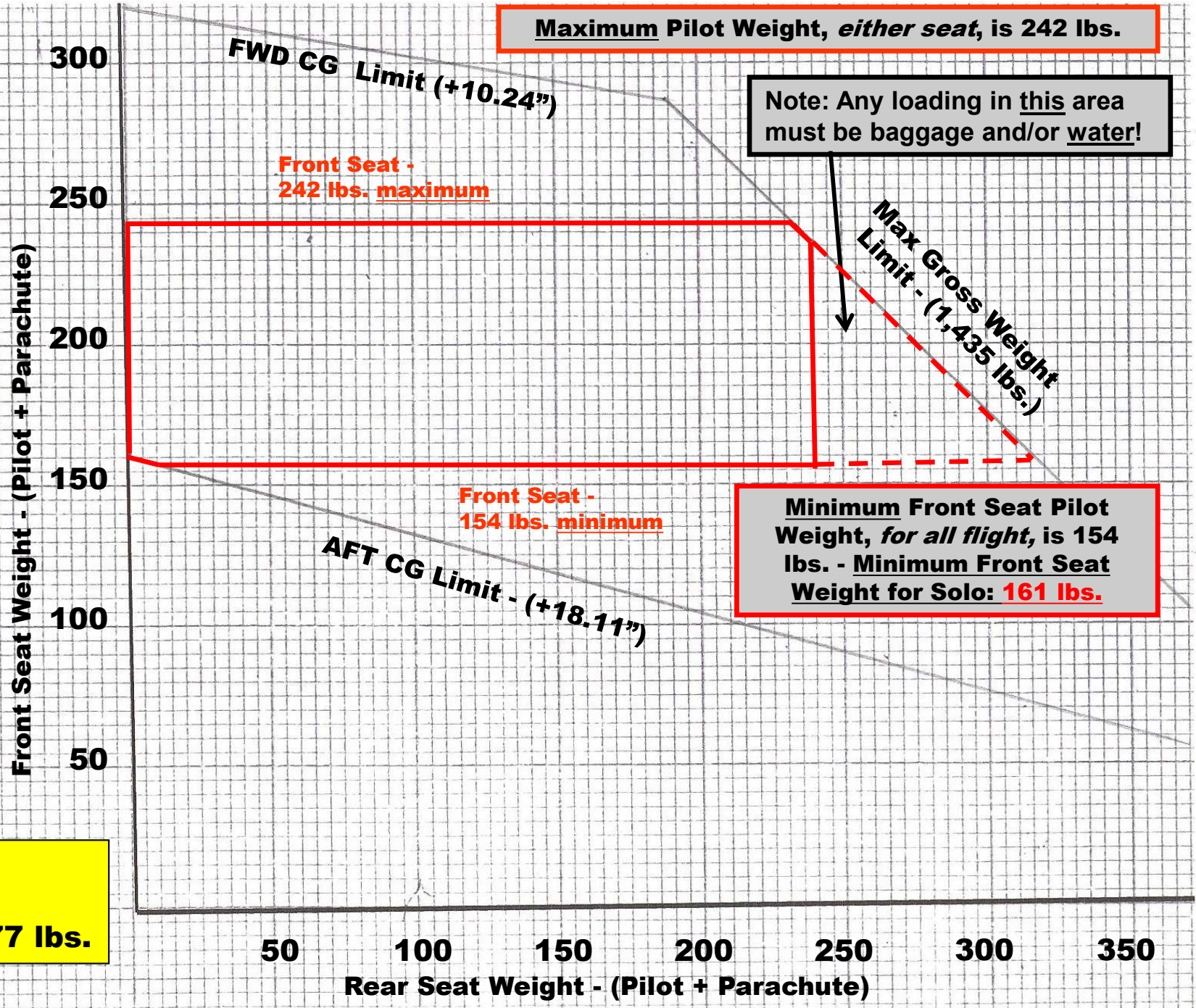


7813

GROB
Twin Astir
N7813
Serial No.
3178

This graph is based on the Weight & Balance Data Computed on 15 March 2018

E.W. = 958.0 lbs.
EWCG = +28.75
Useful Load = 477 lbs.



7813 — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

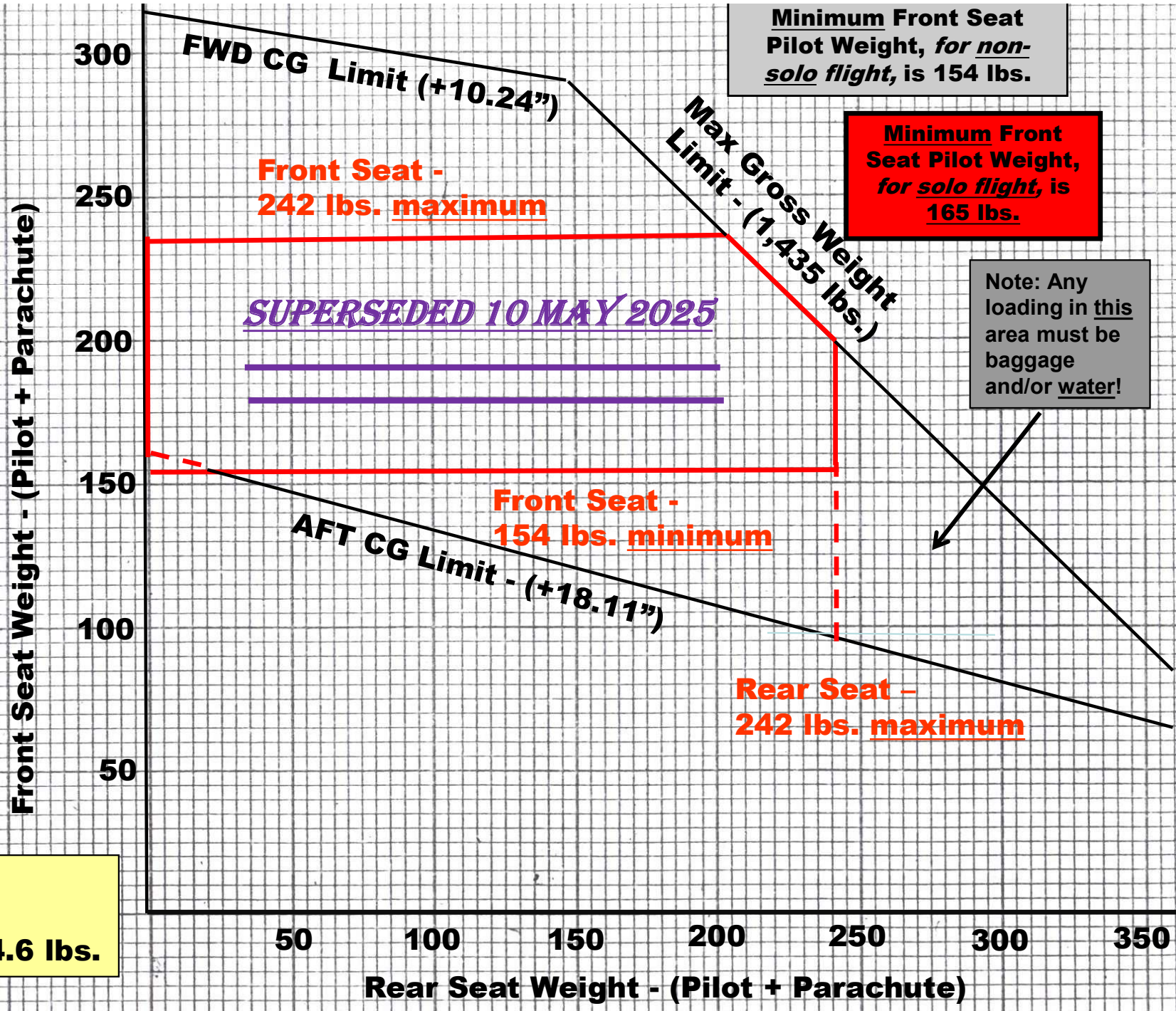
Graph Based on W&B data of 15 March 2018

Solo Flight in This Area Must be Avoided - Minimum Solo Pilot Weight is 161 lbs.

2TW

GROB
Twin Astir
N792TW
Serial No.
3184

This graph is based on the Weight & Balance Data of Xxxxxx XXXXXX

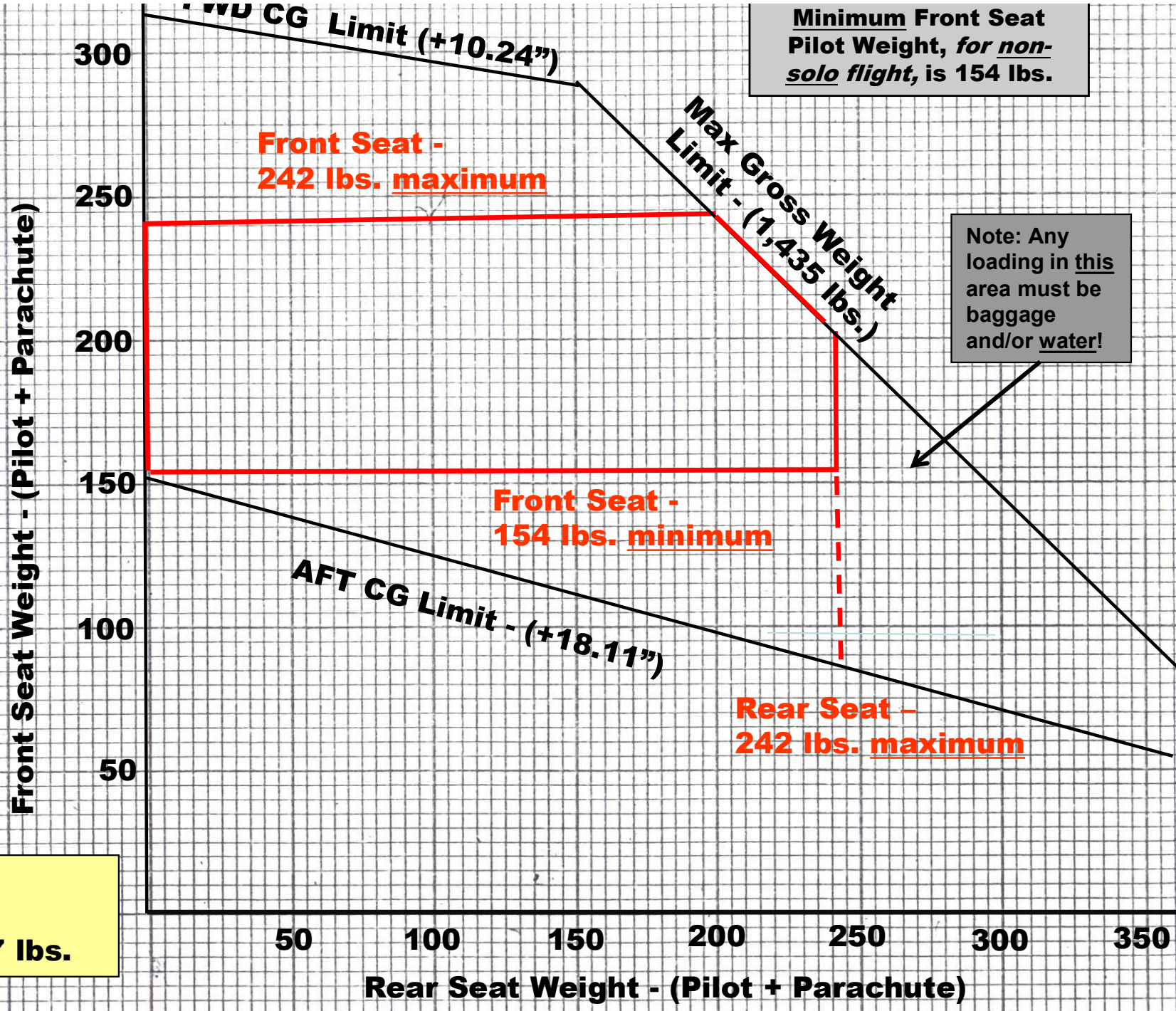


E.W. = 980.4 lbs.
EWCG = +28.68
Useful Load = 454.6 lbs.

2TW

GROB
Twin Astir
N792TW
Serial No.
3184

This graph is based on the Weight & Balance Data of 10 May 2025



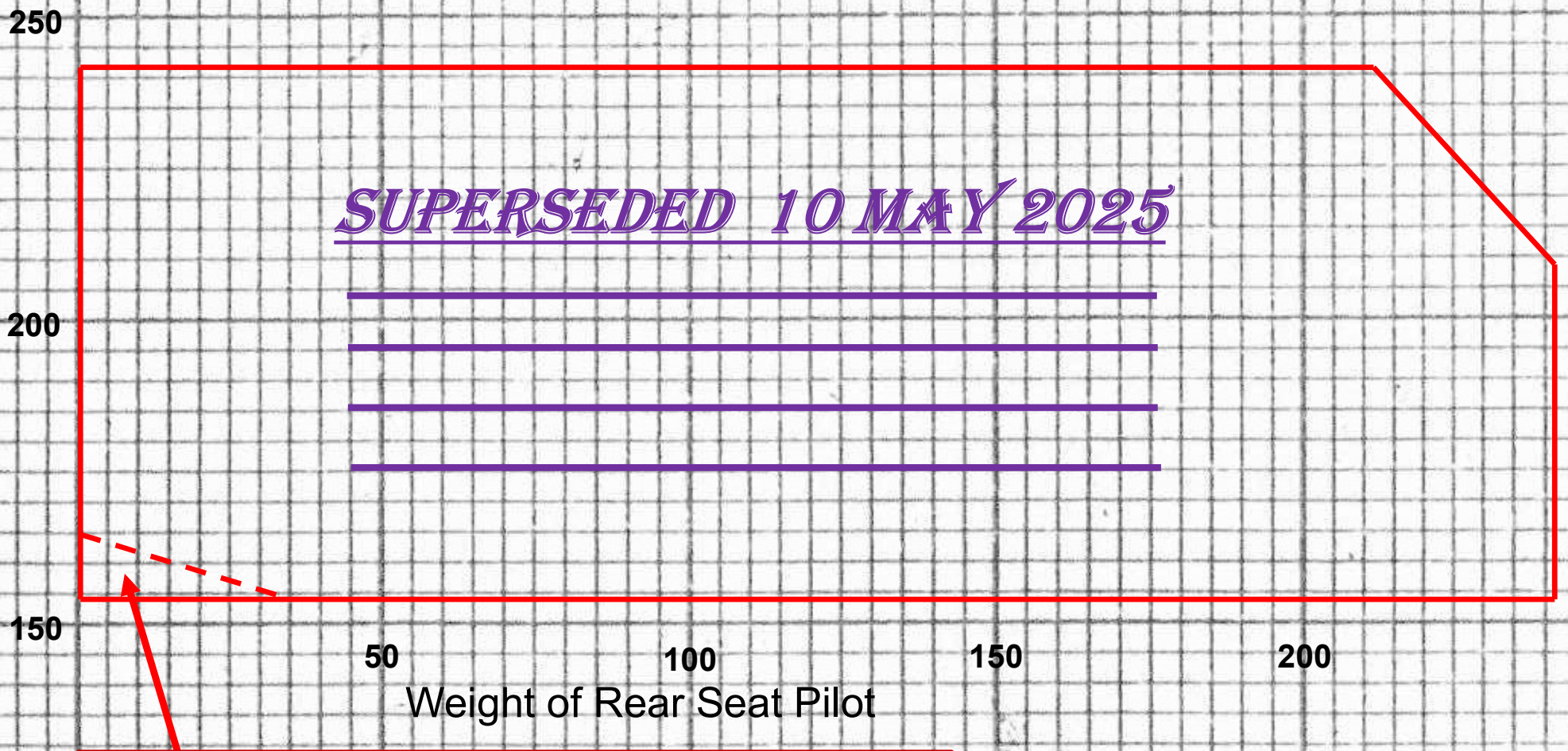
Minimum Front Seat Pilot Weight, *for non-solo flight,* is 154 lbs.

Note: Any loading in this area must be baggage and/or water!

E.W. = 988.0 lbs.
EWCG = +27.77
Useful Load = 447 lbs.

2TW — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

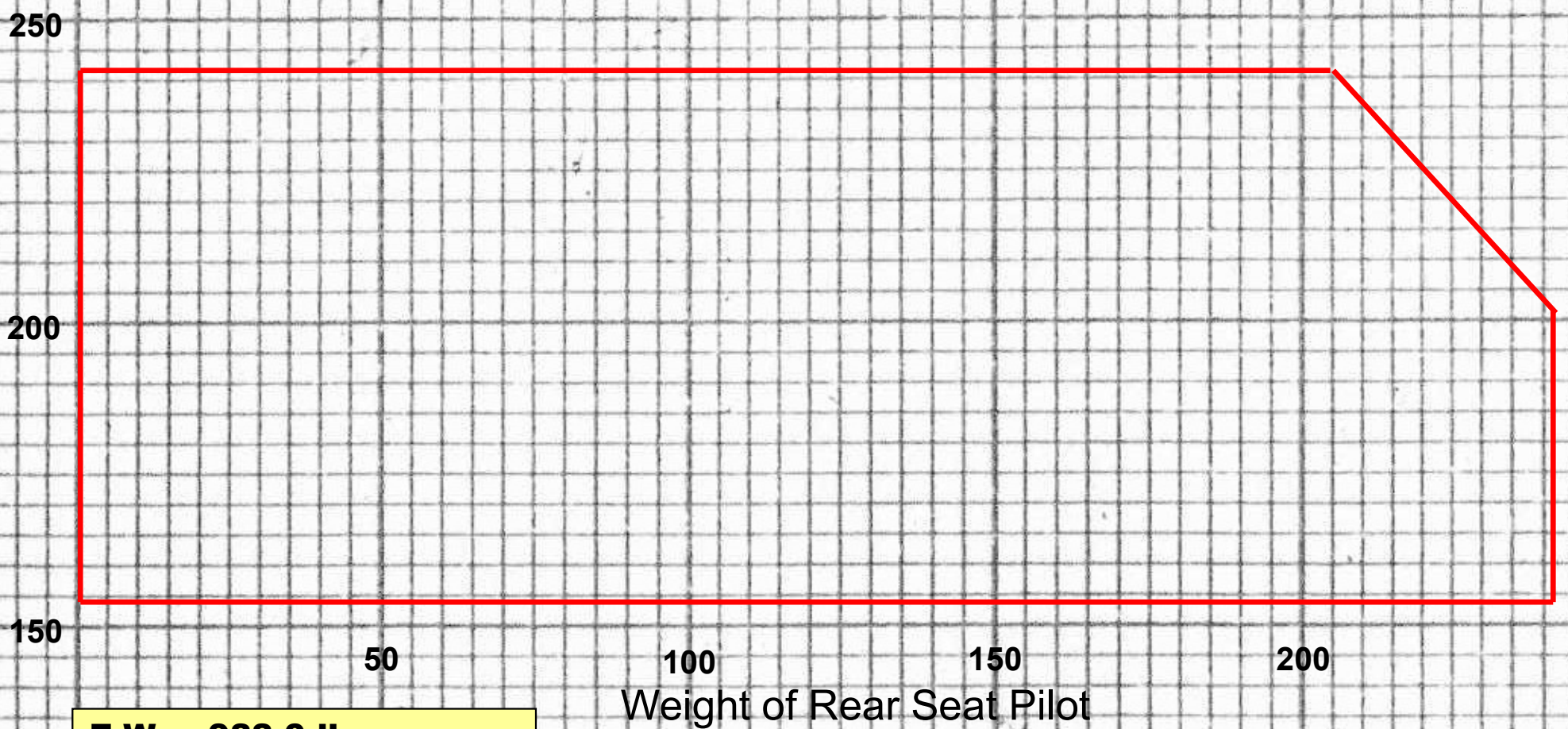
Graph Based on W&B data of xx xx xxxx



Solo Flight in This Area Must be Avoided - Minimum Solo Pilot Weight is 165 lbs.

2TW — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

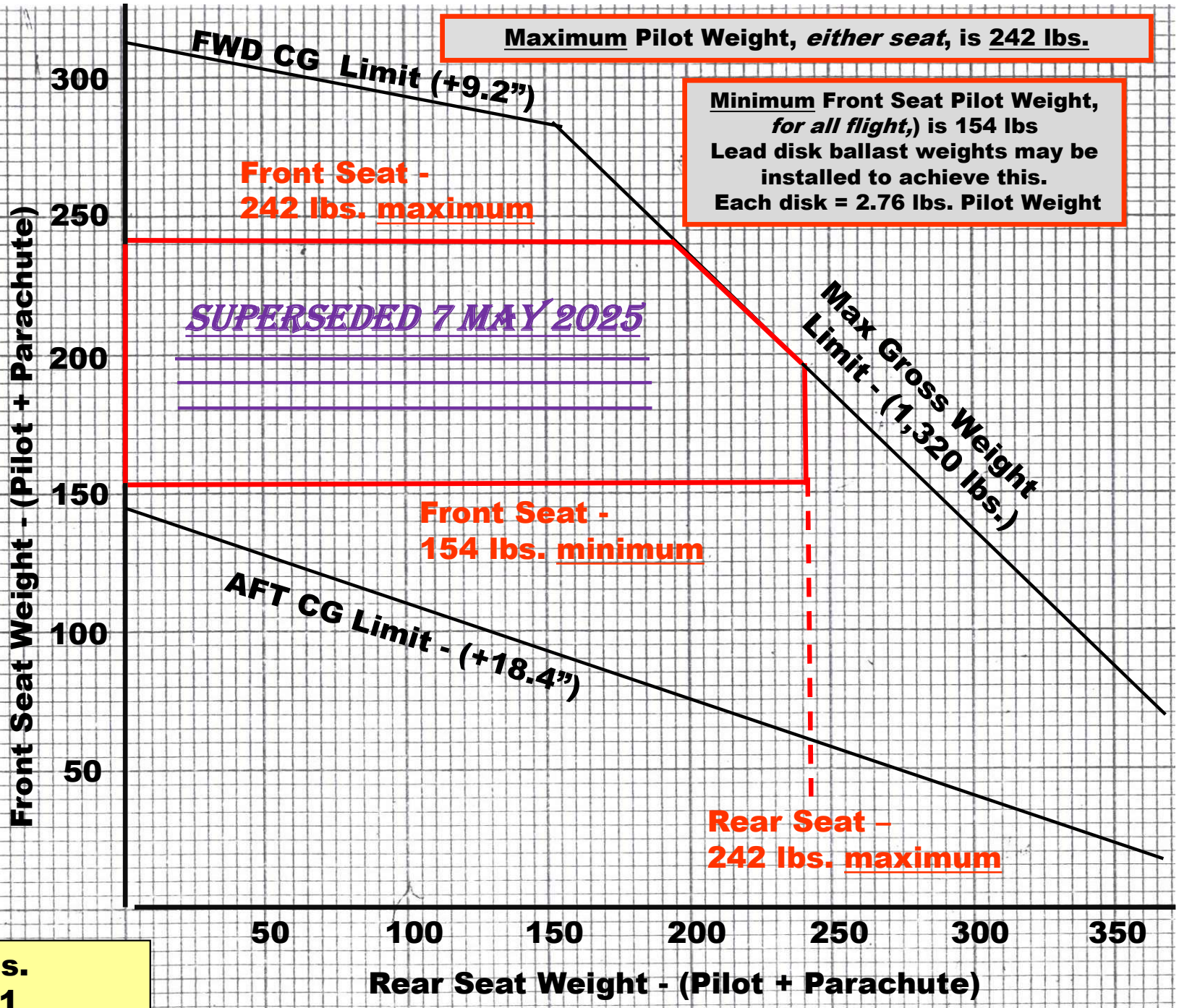
Graph Based on W&B data of 10 May 2025



E.W. = 988.0 lbs.
EWCG = +27.77
Useful Load = 447 lbs.

21QU

Schleicher ASK-21 N21QU Serial No. 21272 This graph is based on Weight & Balance Data dated 07/19/2024

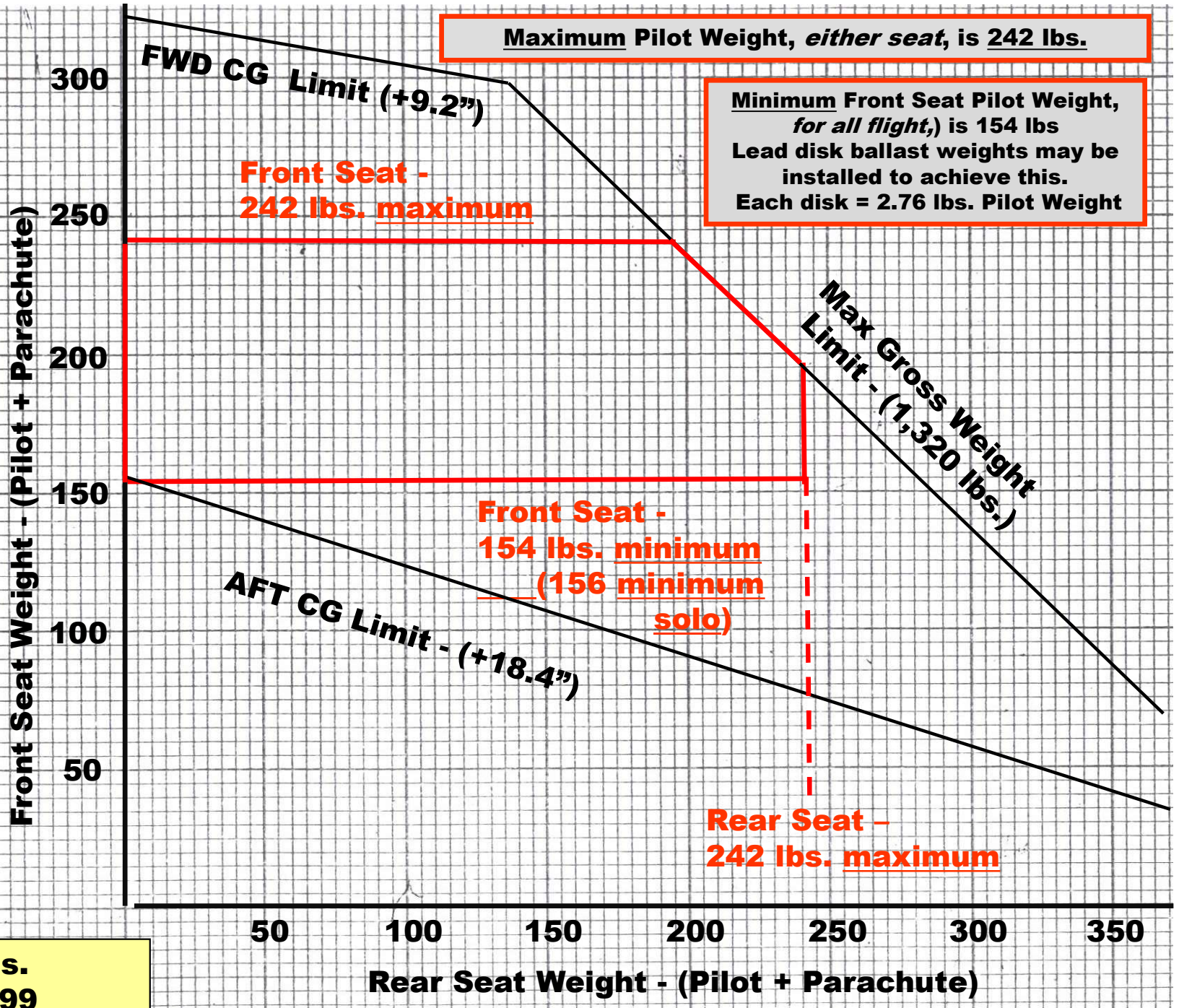


B.O.W. = 880.8 lbs.
B.O.W. CG = +29.1
Useful Load = 439.2 lbs.

Note: This graph is built around Basic Operating Weight (with battery) rather than Empty Weight

21QU

Schleicher ASK-21
N21QU
Serial No. 21272
This graph is based on Weight & Balance Data dated 04/22/2025 & 05/07/2025

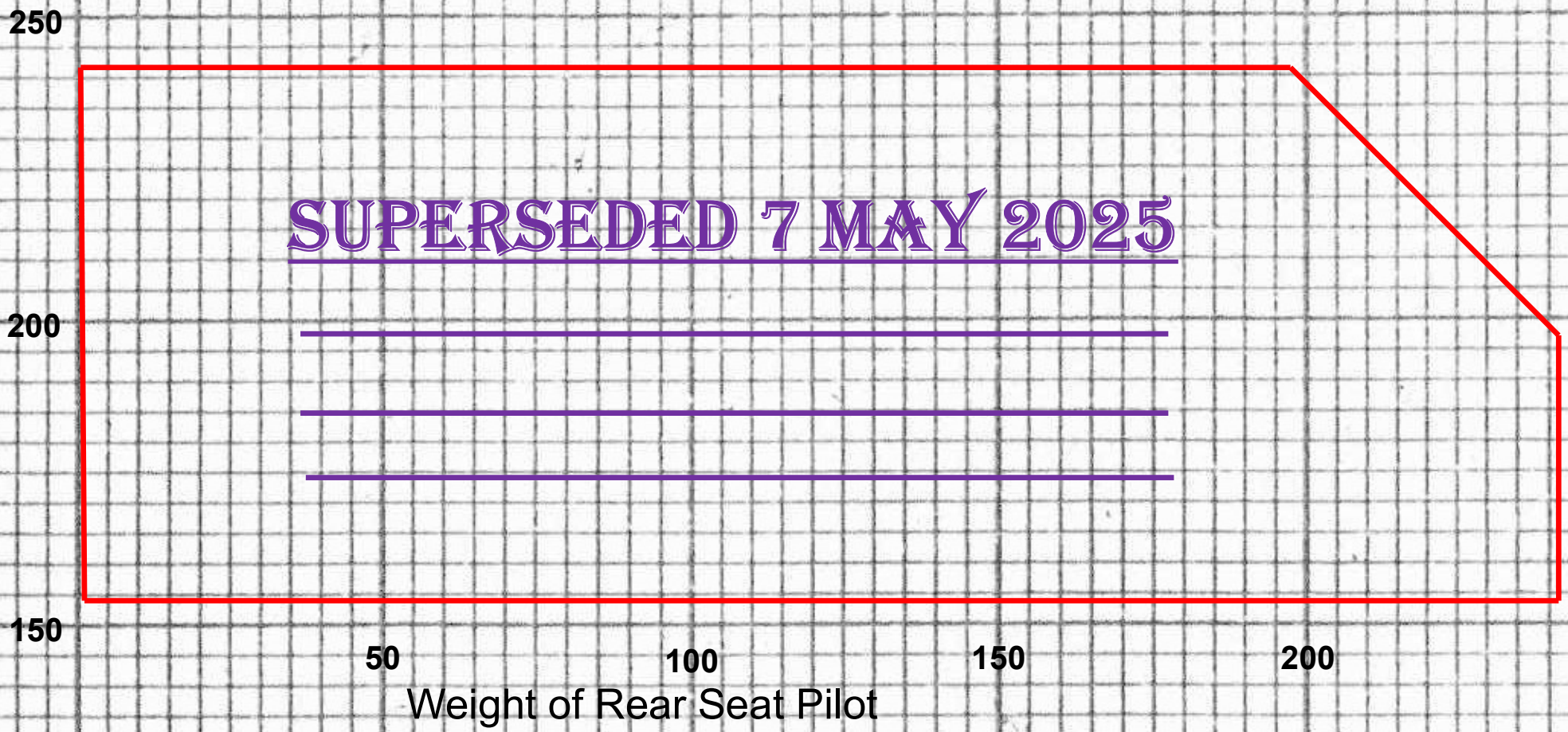


B.O.W. = 879.7 lbs.
B.O.W. CG = +29.99
Useful Load = 440.3 lbs.

Note: This graph is built around Basic Operating Weight (with battery) rather than Empty Weight

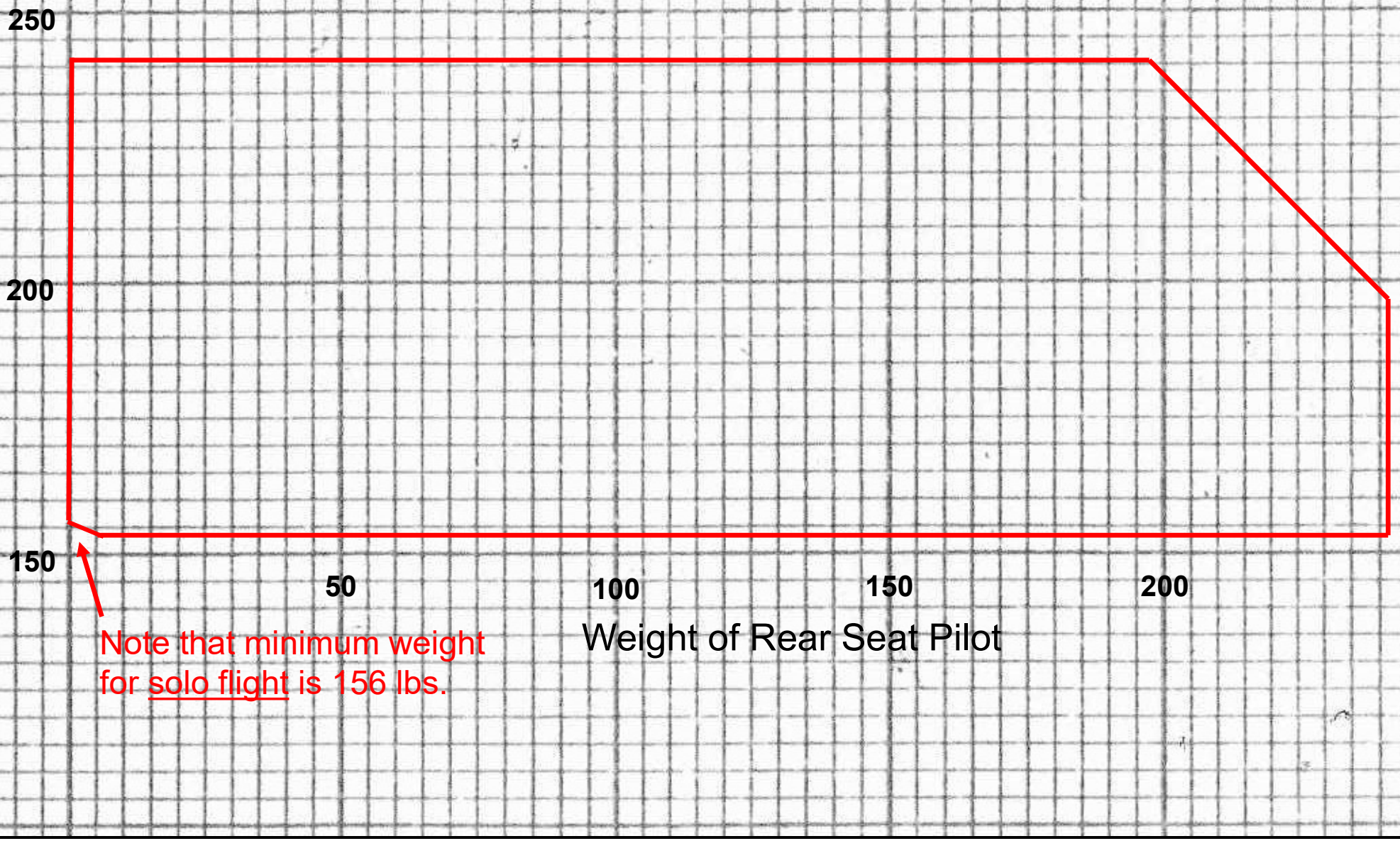
21QU — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

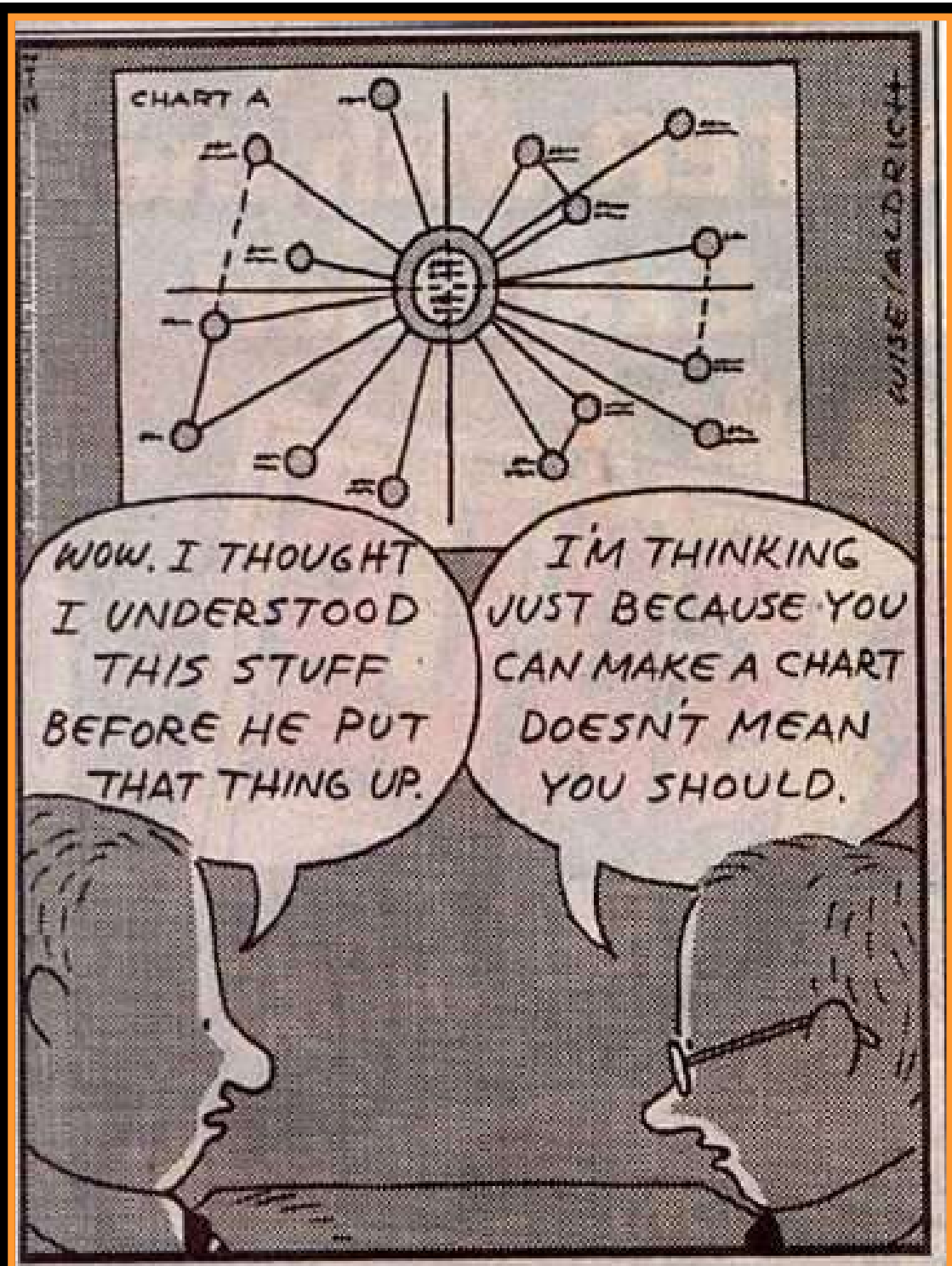
Graph Based on W&B data of 19 July 2024



21QU — Useable portion of the CG/Maximum Gross Weight Envelope for this glider. All plots must fall within the red boundary lines.

Graph Based on W&B data of 22 April 2025 & 7 May 2025





Another PowerPointless presentation.