BY ORDER OF THE SECRETARY OF THE AIR FORCE

AFI 11-2C-130V3 CL-5
1 APRIL 2000

Flying Operations

NAVIGATOR CHECKLIST

This checklist establishes procedures for the operation of C-130 aircraft employed by Mobility Air Forces (MAF) to accomplish their worldwide missions.

This checklist complements AFI 11-2C-130V3, *C-130 Operations Procedures*, and is printed on standard 8 ½" x 11" bond paper then trimmed to a unique size 4 ½ " x 6 ½" that will fit the standard plastic C-130 aircrew checklist binders. Units may request copies of this checklist printed on a water proof-based media (in the size outlined) from the OPR. This product reduces weight and eliminates the need for plastic inserts. Limit water proof copies to aircrew only for use in-flight and training purposes.

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WEATHER MINIMUMS FOR TAKEOFF

Mission Visibility See AFI 11-2C-130V3, Table 6.2.

Operational. RVR 1000: When less than RVR 1600, but equal to or greater than RVR 1000, the crew may take off, provided the runway has dual RVR readouts and display (minimum RVR 1000 on both) and is operational. For any takeoff below 1600 RVR, the crew must be fully qualified.

All Others. RVR 1600: For runways with more than one operating RVR readout, RVR must read 1600 minimum on all.

NOTE 1: When weather is below approach and landing minimums (ceiling or visibility) a takeoff alternate is required (See 11-2C-130V3, Paragraph 6.19).

NOTE 2: If no RVR readout is available for the departure runway, visibility must be reported to be 1/2 mile (800 meters).

NOTE 3: A departure alternate is required if ceiling or visibility is below landing minimums for an available approach (at departure aerodrome). Do not use category II ILS minimums to determine if a departure alternate is required.

DEPARTURE ALTERNATES

Suitability of Departure Alternates. When departure alternate is required, the aircraft must be capable of maintaining the MEA or MOCA, whichever is higher, to the alternate using one engine out performance criteria. To qualify as a departure alternate the airfield must meet one of the following conditions:

Existing weather at an alternate within 30 minutes flying time must be equal to or better than the published approach minimums and forecast to remain so until 1 hour after takeoff, but in no case forecast to be lower than 200-1/2 (RVR 2400), or;

The existing weather at an alternate within 2 hours flying time must be at least 500-1 above the lowest compatible published approach minimums, but in no case lower than 600-2 for a precision approach or 800-2 for a non-precision approach, and forecast to remain so for 1 hour after ETA at the alternate.

DESTINATION REQUIREMENTS

(F*or filing purposes*) The forecast destination weather will be according to AFI 11-202V3 and the following:

File two alternates when:

The forecast weather is less than required minimums for the lowest compatible approach.
The forecast surface winds (intermittent or prevailing) exceed limits corrected for RCR.

File an alternate, regardless of forecast weather, when the departure or destination aerodrome is outside the CONUS.

EXCEPTION: Intratheater flights outside CONUS that do not exceed 3 hours, comply with basic AFI 11-202V3. If the destination is remote or an island, with no alternate available, add holding fuel in lieu of an alternate according to AFI 11-2C-130V3, Table 6.3.

A remote or island destination is defined as any aerodrome which, due to its unique geographic location, offers no suitable alternate (civil or military) within 2 hours flying time. The forecast weather at the remote or island destination must meet the following criteria:

The prevailing surface winds, corrected for RCR, must be within limits at ETA and forecast to remain so for 2 hours thereafter, and

The prevailing ceiling and visibility must be equal to or greater than published minimums for an available non-precision approach, for ETA plus 2-hours.

NOTE: If a precision approach is available, the ceiling or visibility may be intermittently below non-precision approach minimums (excluding ASR), but not below precision approach minimums (for ETA plus 2-hours).

FUEL CORRECTIONS FOR ADDED DRAG INDEX

***NOTE*:** These corrections are for use with the 55-15/19/45/46 series fuel planning publications to account for additional drag caused by rough paint and SKE radome.

1. CRUISE CEILING: Decrease computed cruise ceiling by 800 feet.

2. ENROUTE FUEL: For planned 280, 290, or 300 KTAS, add the following:

Enroute Time	Added Fuel
Less than 4 hours	800 pounds
4 to 8 hours	1600 pounds
Over 8 hours	2000 pounds

3. ENDURANCE and FUEL ETE: For preflight endurance or inflight fuel ETE computations subtract the following from Actual Ramp and Fuel Remaining (Rem) before entering the fuel charts:

Actual Ramp/Fuel Rem	Subtracted Fuel
Less than 18,000 pounds	800 pounds
18,000 to 36,000 pounds	1600 pounds
Over 36,000 pounds	2000 pounds

***NOTE*:** When using T.O. 1C-130X-1-1 for fuel planning, use Plus 11 (rough paint) and Plus 7 (SKE radome) drag indices in addition to the current published drag index.

ETP COMPUTATIONS

WIND FACTOR OPTIONS

Option 1	**WF 1**	LSAF to midpoint
	WF 2	Midpoint to FSAF
Option 2	**WF 1**	Level off to midpoint
	WF 2	Midpoint to planned descent point
Option 3	**WF 1**	Level off to midpoint
	WF 2	Midpoint to IAF or destination
Option 4	**WF 1**	Last waypoint or radio aid within 100 NM of LSAF to midpoint
	WF 2	Midpoint to first waypoint or radio aid within 100 NM of FSAF

NOTE: Midpoint is the approximate midpoint in the flight plan. Use the waypoint closest to the approximate halfway point between the FSAF and LSAF.

WF 1 = Average GS - Planned Average TAS

$$\frac{\text{Wind Factor 1 Distance}}{\text{Wind Factor 1 Time}} = \text{Average GS}$$

WF 2 = Average GS - Planned Average TAS

$$\frac{\text{Wind Factor 2 Distance}}{\text{Wind Factor 2 Time}} = \text{Average GS}$$

ETP COMPUTATION

Total Wind Factor Distance is the NM from LSAF to FSAF

$$\frac{\text{Total Wind Factor Distance}}{(\text{WF2} - \text{WF1}) + 2\ (\text{Planned TAS})} = \frac{\text{T (Time from ETP to FSAF)}}{60\ \text{minutes}}$$

Time from departure to ETP = Total Time to FSAF - "T"

ALTIMETER SETTINGS

QFE: Indicates zero elevation on the ground or altitude above the aerodrome providing the setting. (Absolute Altitude).

QNE: Standard altimeter setting of 29.92 inches or 1013.2 millibars. (Pressure Altitude).

QNH: Indicates field elevation on the ground or altitude above mean sea level. (True Altitude).

DEPARTURE/APPROACH GUIDE

1. PUBLICATIONS

IFR Supplement
Approach plates
STAR/SID
High/Low/Terminal area charts
Terrain chart (ONC, TPC, or JOG)
Flight Information Handbook
Airfield Suitability and Restrictions Report

2. BRIEFING ITEMS

Route of Flight Emergency safe and minimum safe altitudes
General terrain description
High terrain/obstacles
Restricted areas
NOTAMs
Other hazards (weather, bird activity, air traffic, etc)

3. NAVAIDS

Tune, Identify, and Monitor applicable NAVAIDS
INS/SCNS set
GPS Initialized
Radar Tuned

OVERWATER GUIDE

1. PREFLIGHT

Sextant correction, if required
Operable radar, as required
Operable compass systems
Operable sextant mount, sextant correction as required
Operable INS, SCNS, GPS, as required

2. DEPARTURE/CLIMBOUT

Record takeoff/departure time
Monitor SID and departure
Ensure a crewmember clears below 10,000 feet, as applicable
SCNS DVS to SEA MODE, as applicable
Compute ETAs
Install sextant, if required
Set QNE (29.92) at transition altitude

3. LEVEL OFF

Initial cruise fix, as applicable
Deviation check and , as applicable
In-flight fuel management readings
TAS check

4. COAST-OUT FIX

Determine fix time
Select NAVAIDs/radar targets
Record initial pressure reading
Freeze or hold SCNS/INS/GPS
Record selected NAVAIDs/radar readings
Resolve position and alter heading

ENROUTE FIX

Record pressure reading
Shoot celestial
Freeze or hold SCNS/INS/GPS
Plot cel, PLOP, SCNS/INS/GPS
Resolve fix and alter heading
Pass ATA/ETA information

5. ENROUTE

Record drift, groundspeed, headings (DR averaging)
Compute and plot DR for next fix
Celestial precomp, as applicable
Plot/advance assumed position
Can log work/pressure data
In-flight fuel management readings
Deviation checks, as necessary

PRESSURE PATTERN K FACTORS

LAT	K
14	89
15	83
16	78
17	73.5
18	69.5
19	66
20	63
21	60
22	57.5
23	55
24	53
25	51
26	49
27	47.5
28	46
29	44
30	43
31	42
32	40.5
33	39.5
34	38.5
35	37.5

LAT	K
36	36.5
37	35.5
38	35
39	34
40	33.5
41	33
42	32
43	31.5
44	31
45	30.5
47	29.5
49	28.5
51	28
53	27
55	26
57	25.5
59	25
65	24
70	23
75	22
90	21.5

NOTE: Use of pressure pattern computations between 20 N and 20 S is unreliable.

PRESSURE PATTERN PLOTTING

HEMISPHERE	ZN POSITIVE	ZN NEGATIVE
NORTH	LEFT	RIGHT
SOUTH	RIGHT	LEFT

PRESSURE PATTERN FORMULAS

Whiz Wheel Formula for finding ZN:

$$\frac{D2 - D1}{ETAS} = \frac{ZN}{K\ Factor}$$

Whiz Wheel Formula for finding Bellamy Drift:

$$\frac{ZN}{Grnd\ Dist} = \frac{DCA}{57.3}$$

PRESSURE PATTERN ALTITUDE CHANGE

FORMULA METHOD

1. S = 4 X temp dev @ new level off altitude
2. Total S = S X number of 1000 feet altitude change
3. S is positive for climb - negative for descent
4. Next D1 = Total S + previous D2

Example with a +10 temp dev after climbing from FL200 to FL220:

TIME	1600		1700
ABS ALT	20,500	S=4x10	22,700
PRESS ALT	20,000	S=40	22,000
D2	500		700
D1	400	Total S = 40x2	580
D2-D1	+ 100	Total S=80	+ 120
ETAS	280		280
ZN	+ 13.4	Next D1=80+500	+ 15.2
MID LAT	35	Next D1=580	37
GD	250		250
DRIFT			

PRESSURE BY TEMPERATURE

TEMP CHANGE	1/2°	1°	2°	3°	4°
ALTITUDE	**"D"**	**"D"**	**"D"**	**"D"**	**"D"**
FL 180	36	71	143	214	285
FL 190	38	76	152	228	303
FL 200	40	80	161	241	322
FL 210	43	85	170	256	341
FL 220	45	90	180	270	360
FL 230	47	95	190	284	379
FL 240	50	100	199	299	399
FL 250	52	105	210	314	419
FL 260	55	110	220	330	439
FL 270	58	115	230	345	460
FL 280	60	120	241	361	481
FL 290	63	126	251	377	503
FL 300	65	131	262	394	525
FL 310	68	137	273	410	547
FL 320	71	142	285	427	570
FL 330	74	148	296	444	593

1. Record the True Outside Air Temperature at fix position.
2. Compute the change in temperature.
3. Enter table with Temp Change and Pressure Altitude.
4. Tabular value represents D2 - D1. Tabular value is:

   positive if temperature increased

   negative if temperature decreased

NOTE: For altitude change, record TOAT just prior to altitude change and resolve LOP to that point. Restart Pressure by Temperature upon level off.

STANDARD TEMPERATURES & PRESSURES

ALT	TEMP (C)	TEMP (F)	PRESS MILLIBARS	PRESS HG
30	-44.4	-48.0	300.9	8.89
29	-42.5	-44.4	314.8	9.30
28	-40.5	-40.9	329.3	9.72
27	-38.5	-37.3	344.3	10.17
26	-36.5	-33.7	359.9	10.63
25	-34.5	-30.2	376.0	11.10
24	-32.5	-26.6	392.7	11.60
23	-30.6	-23.0	410.0	12.11
22	-28.6	-19.5	427.9	12.64
21	-26.6	-15.9	446.4	13.18
20	-24.6	-12.3	465.6	13.75
19	-22.6	-8.8	485.5	14.34
18	-20.7	-5.2	506.0	14.94
17	-18.7	-1.6	527.2	15.57
16	-16.7	1.9	549.2	16.22
15	-14.7	5.5	571.8	16.89
14	-12.7	9.1	595.2	17.58
13	-10.8	12.6	619.4	18.29
12	-8.8	16.2	644.4	19.03
11	-6.8	19.8	670.2	19.79
10	-4.8	23.3	696.8	20.58
9	-2.8	26.9	724.3	21.39
8	-.08	30.5	752.6	22.22
7	1.1	34.0	781.8	23.09
6	3.1	37.6	812.0	23.98
5	5.1	41.2	843.1	24.90
4	7.1	44.7	875.1	25.84
3	9.1	48.3	908.1	26.82
2	11.0	51.9	942.1	27.82
1	13.0	55.4	977.2	28.86
SEA LEVEL	15.0	59.0	1013.2	29.92

MILLIBAR TO INCHES OF MERCURY CONVERSION TABLE

MILLI-BARS	IN HG	MILLI-BARS	HG	MILLI-BARS	HG
980	28.94	1000	29.53	1020	30.12
981	28.97	1001	29.56	1021	30.15
982	29.00	1002	29.59	1022	30.18
983	29.03	1003	29.62	1023	30.21
984	29.06	1004	29.65	1024	30.24
985	29.09	1005	29.68	1025	30.27
986	29.12	1006	29.71	1026	30.30
987	29.15	1007	29.74	1027	30.33
988	29.18	1008	29.77	1028	30.36
989	29.21	1009	29.80	1029	30.39
990	29.23	1010	29.83	1030	30.42
991	29.26	1011	29.85	1031	30.45
992	29.29	1012	29.88	1032	30.47
993	29.32	1013	29.91	1033	30.50
994	29.35	1014	29.94	1034	30.53
995	29.38	1015	29.97	1035	30.56
996	29.41	1016	30.00	1036	30.59
997	29.44	1017	30.03	1037	30.62
998	29.47	1018	30.06	1038	30.65
999	29.50	1019	30.09	1039	30.68
1000	29.53	1020	30.12	1040	30.71

ARA BRIEFING GUIDE

1. This will be an ARA to runway____ at _____.
2. We will fly a _____ pattern at _____ feet.
3. Mag course on final will be _____ degrees.
4. Begin descent at _____ NM from the field at approximately _____ feet per minute.
5. Glide slope is _____ degrees.
6. Desired altitudes will be given each mile from the descent point to the MDA of _____ feet MSL.
7. Desired headings will be given to make course corrections on final. The missed approach point is one (1) NM from the field.
8. Missed approach procedures are _____
   _____
   _____
9. Significant terrain and obstructions in the vicinity of the pattern, approach, and missed approach are located at _____
   _____
   _____
10. Required Items and Techniques:

    Radar identification of the airfield

    Drift and groundspeed on final (N/A with SCNS)

    Allow a 10 NM final
11. Set Heading marker firing on mag heading (unless performing a relative bearing ARA)

    Distance from airfield every NM from 10 NM out

    Glide path warning 10 seconds prior to descent

RATE OF DESCENT IN FEET PER MINUTE

GLIDE SLOPE	2.0	2.5	2.83	3.0	3.5
GROUND SPEED	**FPM**	**FPM**	**FPM**	**FPM**	**FPM**
105	371	464	525	557	651
110	388	486	550	583	682
115	406	508	575	610	713
120	424	530	600	636	744
125	441	552	625	663	775
130	459	574	650	689	806
135	477	596	675	716	837
140	494	618	700	742	868
145	512	640	725	769	899
150	530	662	750	795	930

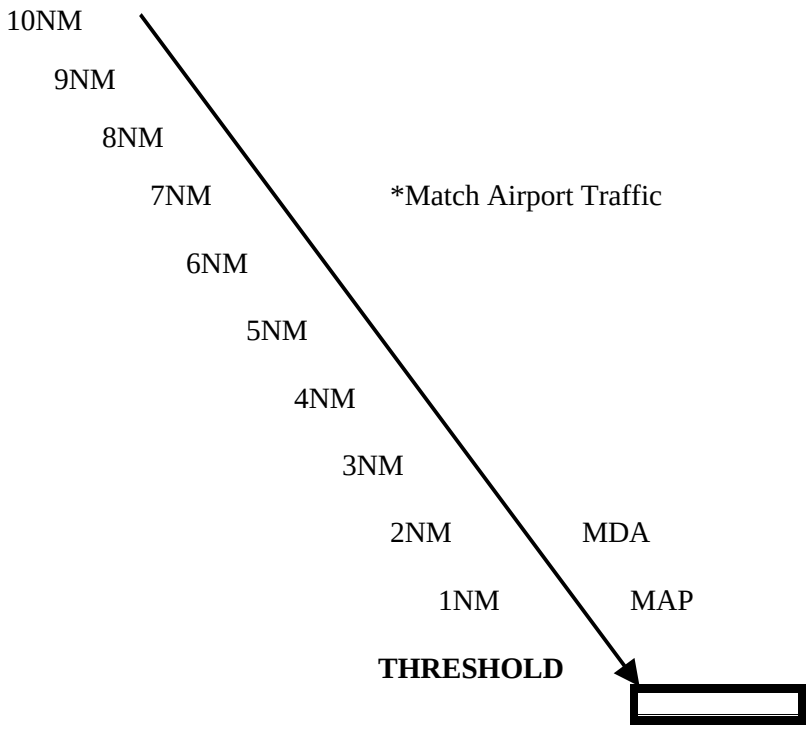
ARA GLIDESLOPE CONSTRUCTION

GLIDE SLOPE	2.0	2.5	2.83	3.0	3.5
FEET PER NM	212	265	300	318	371
DISTANCE	**ALT**	**ALT**	**ALT**	**ALT**	**ALT**
2NM	424	530	600	636	742
3NM	636	795	900	954	1113
4NM	848	1060	1200	1272	1484
5NM	1060	1325	1500	1590	1855
6NM	1272	1590	1800	1908	2226
7NM	1484	1855	2100	2226	2597
8NM	1696	2120	2400	2544	2968
9NM	1908	2385	2700	2862	3339
10NM	2120	2650	3000	3180	3710

TIMING FAF TO MAP

DIST	90	100	110	120	130	140	150
1	:40	:36	:33	:30	:28	:26	:24
2	1:20	1:12	1:06	1:00	:55	:51	:48
3	2:00	1:48	1:38	1:30	1:23	1:17	1:12
4	2:40	2:24	2:12	2:00	1:51	1:43	1:36
5	3:20	3:00	2:44	2:30	2:18	2:09	2:00
6	4:00	3:36	3:18	3:00	2:46	2:34	2:24
7	4:40	4:12	3:49	3:30	3:14	3:00	2:48
8	5:20	4:48	4:22	4:00	3:42	3:26	3:12
9	6:00	5:24	4:55	4:30	4:09	3:41	3:36
10	6:40	6:00	5:28	5:00	4:37	4:17	4:00

ARA CONSTRUCTION GUIDE



Field Elevation or Threshold..... _____

+ 500' (300' AWADS)..... _____

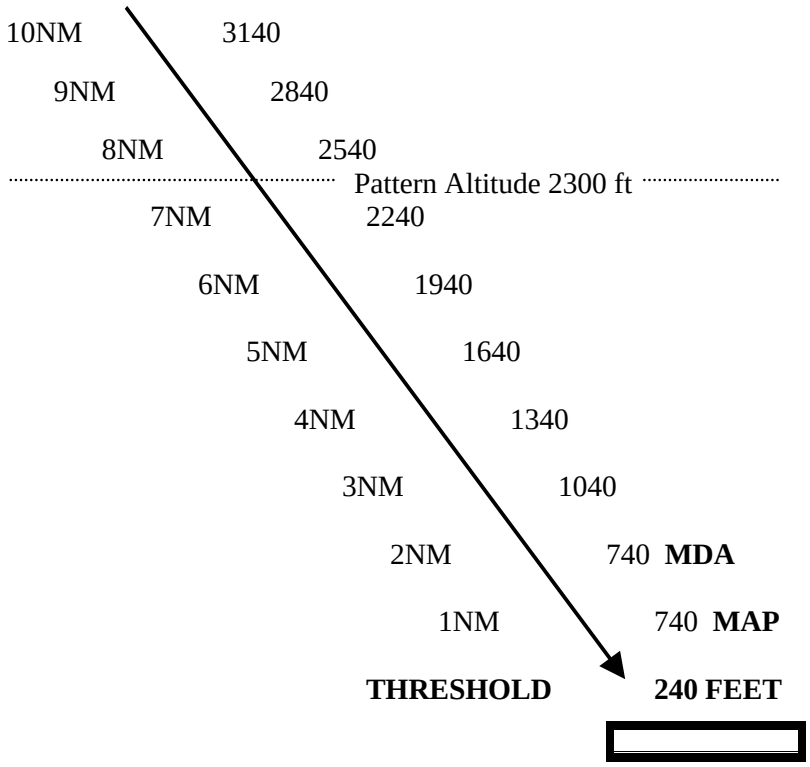
= MDA..... _____

Desired Pattern Altitude*..... _____

Final Course..... _____

Final W/V..... _____

ARA CONSTRUCTION GUIDE EXAMPLE



Field Elevation or Threshold ***240***

+ 500' (300' AWADS) ***500***

= MDA ***740***

Desired Pattern Altitude* ***2300***

Final Course ..... ***As Required***

Final W/V ..... ***TBD***

CONVERSION OF LATITUDE & LONGITUDE SECONDS TO 100THS

SEC	100ths	SEC	100ths	SEC	100ths
01	.02	21	.35	41	.68
02	.03	22	.37	42	.70
03	.05	23	.38	43	.72
04	.07	24	.40	44	.73
05	.08	25	.42	45	.75
06	.10	26	.43	46	.77
07	.12	27	.45	47	.78
08	.13	28	.47	48	.80
09	.15	29	.48	49	.82
10	.17	30	.50	50	.83
11	.18	31	.52	51	.85
12	.20	32	.53	52	.87
13	.22	33	.55	53	.88
14	.23	34	.57	54	.90
15	.25	35	.58	55	.92
16	.27	36	.60	56	.93
17	.28	37	.62	57	.95
18	.30	38	.63	58	.97
19	.32	39	.65	59	.98
20	.33	40	.67	60	1.00

EARTH RATE TABLE

LAT	RATE	LAT	RATE	LAT	RATE
1	0.26	31	7.75	61	13.15
2	0.53	32	7.97	62	13.28
3	0.79	33	8.19	63	13.40
4	1.05	34	8.41	64	13.52
5	1.31	35	8.63	65	13.63
6	1.57	36	8.84	66	13.74
7	1.83	37	9.05	67	13.84
8	2.09	38	9.26	68	1394
9	2.35	39	9.46	69	14.04
10	2.61	40	9.67	70	14.13
11	2.87	41	9.87	71	14.22
12	3.13	42	10.06	72	14.30
13	3.38	43	10.26	73	14.38
14	3.64	44	10.45	74	14.46
15	3.89	45	10.64	75	14.53
16	4.15	46	10.82	76	14.59
17	4.40	47	11.00	77	14.65
18	4.65	48	11.18	78	14.71
19	4.90	49	11.35	79	14.76
20	5.14	50	11.52	80	14.81
21	5.39	51	11.69	81	14.86
22	5.63	52	11.85	82	14.89
23	5.88	53	12.04	83	14.93
24	6.13	54	12.17	84	14.96
25	6.36	55	12.32	85	14.98
26	6.59	56	12.47	86	15.00
27	6.83	57	12.61	87	15.02
28	7.06	58	12.76	88	15.03
29	7.29	59	12.89	89	15.04
30	7.52	60	13.03	90	15.04

Earth Rate (+N / -S) +/- Precession Rate = Earth Rate for False Latitude (ERFL)

NOTE: Precession rate is cumulative once false latitude is set.

FALSE LATITUDE CORRECTION TABLE

EARTH RATE	FALSE LAT.	EARTH RATE	FALSE LAT.	EARTH RATE	FALSE LAT.
0	0	5.0	19.8	10.0	41.9
0.2	0.8	5.2	20.6	10.2	42.9
0.4	1.6	5.4	21.4	10.4	44.0
0.6	2.4	5.6	22.3	10.6	45.0
0.8	3.2	5.8	23.1	10.8	46.1
1.0	4.0	6.0	23.9	11.0	47.1
1.2	4.8	6.2	24.7	11.2	48.3
1.4	5.6	6.4	25.5	11.4	49.5
1.6	6.4	6.6	26.4	11.6	50.6
1.8	7.2	6.8	27.2	11.8	51.8
2.0	8.0	7.0	28.0	12.0	53.0
2.2	8.8	7.2	28.8	12.2	54.4
2.4	9.5	7.4	29.7	12.4	55.8
2.6	10.3	7.6	30.5	12.6	57.2
2.8	11.0	7.8	31.4	12.8	58.6
3.0	11.8	8.0	32.2	13.0	60.0
3.2	12.6	8.2	33.2	13.2	61.8
3.4	13.4	8.4	34.1	13.4	63.6
3.6	14.2	8.6	35.1	13.6	65.4
3.8	15.0	8.8	36.0	13.8	67.2
4.0	15.8	9.0	37.0	14.0	69.0
4.2	16.6	9.2	38.0	14.2	72.4
4.4	17.4	9.4	39.0	14.4	75.8
4.6	18.2	9.6	39.9	14.6	79.2
4.8	19.0	9.8	40.9	14.8	82.6
5.0	19.8	10.0	41.9	15.0	86.0

ICE-T FOR 300 KTAS

FL	T DEV	20	15	10	5	**0**	-5	-10	-15
300	TOAT	-24	-29	-34	-39	**-44**	-49	-54	-59
	IAS	178	180	182	184	**186**	189	191	193
	CAS	179	181	183	185	**187**	190	192	194
	EAS	176	177	179	181	**183**	186	188	190
	TAS	300	300	300	300	**300**	300	300	300

FL	T DEV	20	15	10	5	**0**	-5	-10	-15
290	TOAT	-23	-28	-33	-38	**-43**	-48	-53	-58
	IAS	182	184	186	188	**190**	192	194	197
	CAS	183	185	187	189	**191**	193	195	198
	EAS	180	181	183	185	**187**	189	191	194
	TAS	300	300	300	300	**300**	300	300	300

FL	T DEV	20	15	10	5	**0**	-5	-10	-15
280	TOAT	-21	-26	-31	-36	**-41**	-46	-51	-56
	IAS	185	187	189	191	**193**	195	198	200
	CAS	186	188	190	192	**194**	196	199	201
	EAS	182	184	186	188	**190**	192	195	197
	TAS	300	300	300	300	**300**	300	300	300

FL	T DEV	20	15	10	5	**0**	-5	-10	-15
270	TOAT	-19	-24	-29	-34	**-39**	-44	-49	-54
	IAS	189	191	193	195	**197**	199	201	203
	CAS	190	192	194	196	**198**	200	202	204
	EAS	186	188	190	192	**194**	196	198	200
	TAS	300	300	300	300	**300**	300	300	300

ICE-T FOR 300 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
260	TOAT	-17	-22	-27	-32	**-37**	-42	-47	-52
	IAS	192	194	196	198	**200**	202	205	207
	CAS	193	195	197	199	**201**	203	206	208
	EAS	190	191	193	195	**197**	199	202	204
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
250	TOAT	-15	-20	-25	-30	**-35**	-40	-45	-50
	IAS	195	197	199	201	**203**	206	208	210
	CAS	196	198	200	202	**204**	207	209	211
	EAS	193	195	196	198	**200**	203	205	207
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
240	TOAT	-13	-18	-23	-28	**-33**	-38	-43	-48
	IAS	199	201	203	205	**207**	209	211	214
	CAS	200	202	204	206	**208**	210	212	215
	EAS	197	199	201	202	**204**	206	208	211
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
230	TOAT	-11	-16	-21	-26	**-31**	-36	-41	-46
	IAS	202	204	206	208	**210**	213	215	218
	CAS	203	205	207	209	**211**	214	216	219
	EAS	200	202	204	206	**207**	210	212	215
	TAS	300	300	300	300	**300**	300	300	300

ICE-T FOR 300 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
220	TOAT	-9	-14	-19	-24	**-29**	-34	-39	-44
	IAS	205	208	210	212	**214**	216	219	221
	CAS	206	209	211	213	**215**	217	220	222
	EAS	203	206	208	210	**211**	213	216	218
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
210	TOAT	-7	-12	-17	-22	**-27**	-32	-37	-42
	IAS	209	211	213	215	**218**	220	222	225
	CAS	210	212	214	216	**219**	221	223	226
	EAS	207	209	211	213	**216**	217	219	222
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
200	TOAT	-5	-10	-15	-20	**-25**	-30	-35	-40
	IAS	212	214	217	219	**221**	224	226	229
	CAS	213	215	218	220	**222**	225	227	230
	EAS	210	212	215	217	**219**	221	223	226
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
190	TOAT	-3	-8	-13	-18	**-23**	-28	-33	-38
	IAS	216	218	220	223	**225**	227	230	232
	CAS	217	219	221	224	**226**	228	231	233
	EAS	214	216	218	221	**223**	224	227	229
	TAS	300	300	300	300	**300**	300	300	300

ICE-T FOR 300 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
180	TOAT	-1	-6	-11	-16	**-21**	-26	-31	-36
	IAS	219	222	224	226	**228**	231	233	236
	CAS	220	223	225	227	**229**	232	234	237
	EAS	217	220	222	224	**226**	229	231	234
	TAS	300	300	300	300	**300**	300	300	300

FL	T	20	15	10	5	**0**	-5	-10	-15
170	TOAT	+1	-4	-9	-14	**-19**	-24	-29	-34
	IAS	223	225	228	230	**232**	235	237	239
	CAS	224	226	229	231	**233**	236	238	240
	EAS	221	223	226	228	**230**	233	235	237
	TAS	300	300	300	300	**300**	300	300	300

ICE-T FOR 280 KTAS

FL	T	20	15	10	5	**0**	-5	-10	-15
300	TOA	-24	-29	-34	-39	**-44**	-49	-54	-59
	IAS	166	168	170	172	**173**	176	178	180
	CAS	167	169	171	173	**174**	177	179	181
	EAS	164	166	168	170	**171**	174	176	177
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
290	TOA	-23	-28	-33	-38	**-43**	-48	-53	-58
	IAS	169	171	173	175	**177**	179	181	183
	CAS	170	172	174	176	**178**	180	182	184
	EAS	167	169	171	173	**175**	177	179	181
	TAS	280	280	280	280	**280**	280	280	280

ICE-T FOR 280 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
280	TOAT	-21	-26	-31	-36	**-41**	-46	-51	-56
	IAS	172	174	176	178	**180**	182	184	186
	CAS	173	175	177	179	**181**	183	185	187
	EAS	170	172	174	176	**178**	180	181	183
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
270	TOAT	-19	-24	-29	-34	**-39**	-44	-49	-54
	IAS	175	177	179	181	**183**	185	187	189
	CAS	176	178	180	182	**184**	186	188	190
	EAS	173	175	177	179	**181**	183	185	186
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
260	TOAT	-17	-22	-27	-32	**-37**	-42	-47	-52
	IAS	178	180	182	184	**186**	188	190	192
	CAS	179	181	183	185	**187**	189	191	193
	EAS	176	178	180	182	**184**	186	188	190
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
250	TOAT	-15	-20	-25	-30	**-35**	-40	-45	-50
	IAS	181	183	185	187	**189**	191	194	196
	CAS	182	184	186	188	**190**	192	195	197
	EAS	179	181	183	185	**187**	189	192	194
	TAS	280	280	280	280	**280**	280	280	280

ICE-T FOR 280 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
240	TOAT	-13	-18	-23	-28	**-33**	-38	-43	-48
	IAS	185	187	189	191	**193**	195	197	199
	CAS	186	188	190	192	**194**	196	198	200
	EAS	183	185	187	189	**191**	193	195	197
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
230	TOAT	-11	-16	-21	-26	**-31**	-36	-41	-46
	IAS	188	190	192	194	**196**	198	200	202
	CAS	189	191	193	195	**197**	199	201	203
	EAS	187	188	190	192	**194**	196	198	200
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
220	TOAT	-9	-14	-19	-24	**-29**	-34	-39	-44
	IAS	191	193	195	197	**199**	201	203	206
	CAS	192	194	196	198	**200**	202	204	207
	EAS	190	192	193	195	**197**	199	201	204
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
210	TOAT	-7	-12	-17	-22	**-27**	-32	-37	-42
	IAS	195	197	199	201	**203**	205	207	209
	CAS	196	198	200	202	**204**	206	208	210
	EAS	193	195	197	199	**201**	203	205	207
	TAS	280	280	280	280	**280**	280	280	280

ICE-T FOR 280 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
200	TOAT	-5	-10	-15	-20	**-25**	-30	-35	-40
	IAS	198	200	202	204	**206**	208	210	213
	CAS	199	201	203	205	**207**	209	211	214
	EAS	197	199	201	202	**204**	206	208	211
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
190	TOAT	-3	-8	-13	-18	**-23**	-28	-33	-38
	IAS	201	203	205	207	**209**	211	214	216
	CAS	202	204	206	208	**210**	212	215	217
	EAS	200	202	204	206	**207**	209	212	214
	TAS	280	280	280	280	**280**	279	280	280

FL	T	20	15	10	5	**0**	-5	-10	-15
180	TOAT	-1	-6	-11	-16	**-21**	-26	-31	-36
	IAS	205	207	209	211	**213**	215	217	219
	CAS	206	208	210	212	**214**	216	218	220
	EAS	204	206	208	210	**212**	213	215	217
	TAS	280	280	280	280	**280**	280	280	280

FL	T	20	15	10	5	0	-5	-10	-15
170	TOAT	-1	-4	-9	-14	-19	-24	-29	-34
	IAS	208	210	212	214	216	218	220	223
	CAS	209	211	213	215	217	219	221	224
	EAS	207	209	211	213	215	217	218	221
	TAS	280	280	280	280	280	280	280	280

ICE-T FOR 260 KTAS

FL	T	20	15	10	5	**0**	-5	-10	-15
300	TOAT	-24	-29	-34	-39	**-44**	-49	-54	-59
	IAS	155	156	158	160	**162**	163	165	167
	CAS	155	156	158	160	**162**	163	165	167
	EAS	153	154	156	157	**159**	160	162	164
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
290	TOAT	-23	-28	-33	-38	**-43**	-48	-53	-58
	IAS	158	159	161	163	**164**	166	168	170
	CAS	158	159	161	163	**164**	166	168	170
	EAS	156	157	159	161	**162**	163	165	167
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
280	TOAT	-21	-26	-31	-36	**-41**	-46	-51	-56
	IAS	160	161	163	165	**166**	168	170	172
	CAS	161	162	164	166	**167**	169	171	173
	EAS	159	160	162	163	**164**	166	168	170
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
270	TOAT	-19	-24	-29	-34	**-39**	-44	-49	-54
	IAS	162	164	166	168	**169**	171	173	175
	CAS	163	165	167	169	**170**	172	174	176
	EAS	161	163	165	167	**167**	169	171	173
	TAS	260	260	260	260	**260**	260	260	260

ICE-T FOR 260 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
260	TOAT	-17	-22	-27	-32	**-37**	-42	-47	-52
	IAS	165	167	169	171	**172**	174	176	178
	CAS	166	168	170	172	**173**	175	177	179
	EAS	164	166	168	170	**171**	172	174	176
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
250	TOAT	-15	-20	-25	-30	**-35**	-40	-45	-50
	IAS	168	170	172	174	**175**	177	179	181
	CAS	169	171	173	175	**176**	178	180	182
	EAS	167	169	171	172	**173**	175	177	179
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
240	TOAT	-13	-18	-23	-28	**-33**	-38	-43	-48
	IAS	171	173	175	176	**178**	180	182	184
	CAS	172	174	176	178	**179**	181	183	185
	EAS	170	172	174	176	**177**	179	181	182
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
230	TOAT	-11	-16	-21	-26	**-31**	-36	-41	-46
	IAS	174	176	178	180	**182**	183	185	187
	CAS	175	177	179	181	**183**	184	186	188
	EAS	173	175	177	179	**181**	182	184	186
	TAS	260	260	260	260	**260**	260	260	260

ICE-T FOR 260 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
220	TOAT	-9	-14	-19	-24	**-29**	-34	-39	-44
	IAS	177	179	181	183	**185**	187	189	191
	CAS	178	180	182	184	**186**	188	190	192
	EAS	176	178	180	182	**184**	186	188	190
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
210	TOAT	-7	-12	-17	-22	**-27**	-32	-37	-42
	IAS	180	182	184	186	**188**	190	192	194
	CAS	181	183	185	187	**189**	191	193	195
	EAS	179	181	183	185	**187**	189	191	192
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
200	TOAT	-5	-10	-15	-20	**-25**	-30	-35	-40
	IAS	183	185	187	189	**191**	193	195	197
	CAS	184	186	188	190	**192**	194	196	198
	EAS	182	184	186	188	**190**	192	194	196
	TAS	260	260	260	260	**260**	260	260	260

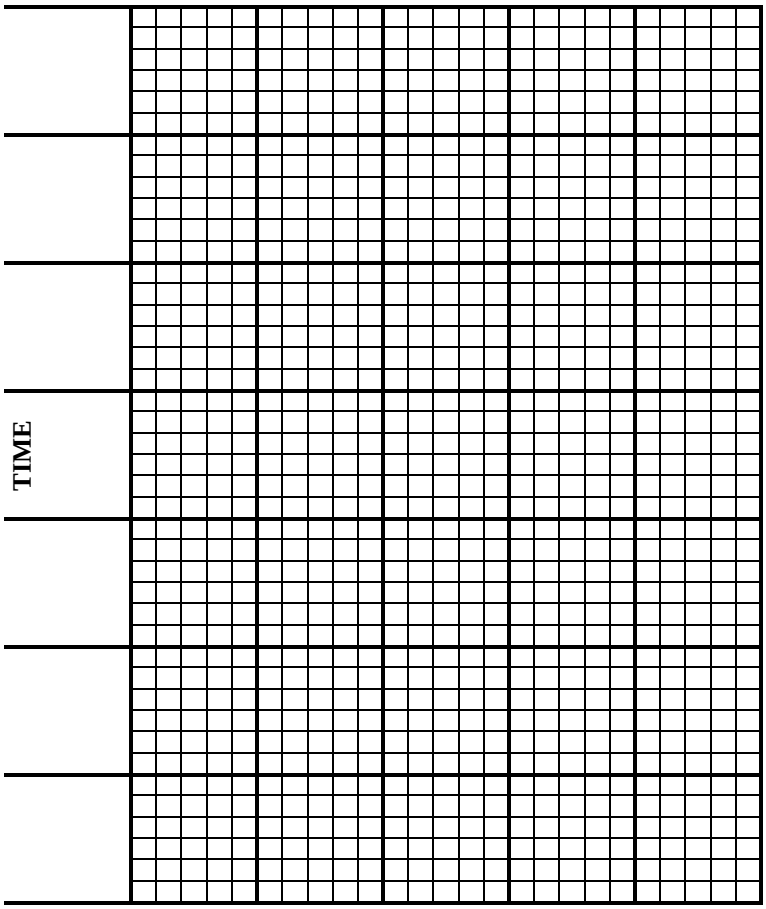
FL	T	20	15	10	5	**0**	-5	-10	-15
190	TOAT	-3	-8	-13	-18	**-23**	-28	-33	-38
	IAS	187	188	190	192	**194**	196	198	200
	CAS	188	189	191	193	**195**	197	199	201
	EAS	186	187	189	191	**193**	195	197	199
	TAS	260	260	260	260	**260**	260	260	260

ICE-T FOR 260 KTAS, Continued

FL	T	20	15	10	5	**0**	-5	-10	-15
180	TOAT	-1	-6	-11	-16	**-21**	-26	-31	-36
	IAS	190	191	193	19	**197**	199	201	203
	CAS	191	192	194	196	**198**	2	202	204
	EAS	189	190	192	194	**196**	198	200	202
	TAS	260	260	260	260	**260**	260	260	260

FL	T	20	15	10	5	**0**	-5	-10	-15
170	TOAT	+1	-4	-9	-14	**-19**	-24	-29	-34
	IAS	193	195	197	199	**200**	203	205	207
	CAS	194	196	198	200	**201**	204	206	208
	EAS	192	194	196	198	**199**	202	204	206
	TAS	260	260	260	260	**260**	260	260	260

CELESTIAL ZN GRAPH



ZN OF BODY

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