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SECURITY INFORMATION

PROVISIONAL INTELLIGENCE REPORT

COMPUTATION OF INPUT REQUIREMENTS
OF THE AIRCRAFT INDUSTRY OF THE USSR

CIA/RR PR-19

October 1952

ANNEX

ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR

Note

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(ORR Project 38-51)S-E-C-R-E-T
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ANNEX

ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR

Item	Number of Pieces	Finished			Pounds Bill Of Materials		
		Dural	Steel	Total	Dural	Steel	Total
A. Wing Group.							
<u>Wing</u>							
Front Spar, O.B.							
Web, Dural Sheet .057 x 8-3/4 x 11 1/4 (10 in. x 3 in. hole)	1		4.3			6.3	
Cap, Dural Sheet .080 x 2 x 11 1/4	1		1.8			1.8	
Rivets, 3/16 @ 3/in.	350		0.3			0.6	
Front Spar, I.B. (E-E)							
Web, Dural Sheet .113 x 7 x 139 (75-ST)	1		9.7			9.7	
Cap, Alcoa 79-T x 139 in.	2		8.3			8.3	
Cap, Zee .265 in x 2 1/4 in. x 139 in.	2		16.7			16.7	
Rivets, 3/16 @ 3/in.	840		0.8			1.5	
Rear Spar, O.B.							
Web, Dural Sheet .0975 x 5-7/8 x 133 (11 in. x 3 in. holes)	1		7.5			11.0	
Cap, Dural Sheet .093 x 2 x 133 (75-ST)	1		2.7			2.7	
Cap, Dural Sheet .067 x 1 x 133 (75-ST)	1		0.9			0.9	
Cap, Dural Sheet .067 x 1 1/2 x 133	1		1.4			1.4	
Rivets, 3/16 @ 3/in.	400		0.4			0.7	
Rear Spar, I.B.							
Web, Dural Sheet .0975 x 8 1/4 x 84	1		6.9			6.9	
Cap, Dural Sheet .093 x 3 x 84	1		2.4			2.7	
Cap, Dural Sheet .067 x 2 x 84 (75-ST)	1		1.2			1.3	
Cap, Dural Sheet .067 x 1 1/2 x 84 (75-ST)	1		0.9			0.9	
Rivets, 3/16 @ 3/in.	250		0.2			0.5	
Diagonal Spar							
Web, Dural Sheet .080 x 5 1/2 x 63	2		5.6			6.5	
Caps, Steel "T" Stock: 3 1/2 x 2 1/2 x 63	2		103.0			306.0	
Bolts, @ 3/4 in Pitch, 3/8 in. d x 2 in. lg	170		8.5			17.0	

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Pounds Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Nuts, 3/8 in. (Staked)	170		6.8			6.8	
Drag Strut							
Web, Dural .080 x 6-3/4 x 41.5	1		2.3			2.3	
Caps, .063 x 2 1/2 x 41.5	1		0.7			0.7	
Rivets, 3/16 in. # @ 3/in	250		0.2			0.5	
Cap, Dural .31 x 1-3/4 x 41.5	1		2.2			2.2	
Struts, Alcoa 79-AGE x 10	3		0.7			0.7	
Rivets, 3/16 in. # @ 2/in.	60		0.1			0.1	
Drag Strut							
.094 x 2 1/2 x 41.5	1		1.0			1.0	
False Spar (L.B. fwd)							
Cap, Top, .11 x 2 1/4 x 24 in.	2		1.1			1.1	
Cap, Lower, .11 x 2 1/4 x 11 in.	2		0.5			0.5	
False Spar (Aileron Hinge)							
Cap, Sheet Section, Similar to Alcoa 22022 x 60 in.	1		2.2			2.2	
Drag Rib							
Caps, .125 x 2 1/2 x 29 in.	2		1.7			1.7	
Web, Dural .037 x 9 in. x 68 in.	1		1.7			2.3	
Rivets, 1/8 in. # @ 3/in. (Skin Included)	900		0.2			0.6	
Stringers, Leading Edge I.B. (Extruded Sections; Closest US Shape Is Quoted)							
1 Alcoa 10135 - 1003 x 76	1		1.2			1.2	
2 Alcoa 10135 - 1003 x 97 in.	1		1.6			1.6	
3 Alcoa 10135 - 119 in.	1		1.1			1.1	
4 Alcoa 10135 - 0601 135 in.	1		1.0			1.0	
5 Alcoa 10135 - 0601 97 in.	1		0.7			0.7	
Stringers, Leading Edge, O.B.							
1 .094 x 1 1/2 x 38 in.	1		0.5			0.5	
2 .094 x 1 1/2 x 98 in.	1		1.3			1.3	
3 .094 x 1 1/2 x 48 in.	1		0.6			0.6	
4 .094 x 1 1/2 x 59 in.	1		0.8			0.8	
5 .094 x 1 1/2 x 98 in.	1		1.2			1.2	
Rivets, 1/8 in @ 3/in. (Skin)	2700		0.7			1.4	

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Pounds Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Stringers, between Spars							
6 Alcoa 10135 - 0601 x 64	2		0.9			0.9	
7 Alcoa 10135 - 0601 x 119	2		1.8			1.8	
8 Alcoa 10135 - 0601 x 52	2		0.8			0.8	
6 .06 x 1 1/4 x 54	2		0.5			0.5	
8 .06 x 1 1/4 x 70	2		1.0			1.0	
Ribs, (Counting Flap and Aileron Ribs Twice)							
Dural Sheet, .037 x 8 1/2 x 62 (3 x 3 in. ϕ Holes, 1/2 Flange All Around)	9		25.0			25.0	37.0
Rib Clips, .06 x 1 1/2 x 7 in	36		2.2			2.2	2.2
Rivets, 1/8 in @ 3/in. (Includes Skin)	5100		1.3			1.3	2.6
Skin:							
Root L.B., .074 x 42 x 27 Skin (Upper)	1		8.5			8.5	9.5
Root L.B., .100 x 42 x 27 Doubler (Upper)	1		11.7			11.7	14.5
Root L.B., .066 x 33 x 36 Skin (Upper and Lower)	2		16.0			16.0	29.2
Root L.B., .100 x 33 x 36 Doubler (Upper and Lower)	2		23.8			23.8	43.6
L.E. Inboard, .072 x 50 x 102	1		25.0			25.0	38.2
L.E. O.B., .055 x 50 x 102	1		24.2			24.2	28.6
Between Spars, .054 x 30 x 125 (Upper and Lower)	2		31.4			31.4	42.0
T.E. Inboard (Upper), .054 x 20 x 115	1		12.1			12.1	12.9
Rivets (Along Spars), .054 x 20 x 115	1		12.1			12.1	12.9
Rivets (Along Spars), 1/8 @ 3/in.	3000		1.0			1.0	2.0
Wing Tip, .054 x 24 x 60	1		5.8			5.8	12.0
Wing Connector							
.125 x 2 1/2 x 57"	1		3.5			3.5	3.5
Aileron Hinge Fittings							
Steel .063 x 6 x 4	2						
.063 x 6 x 2	4						
.063 x 2 x 2	4						
.063 x 3 x 2	2						
Total			1.8			1.8	1.8

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Flap Hinge Fittings			1.8			1.8	
Spoiler Hinge Fittings			1.8			1.8	
Wing Weights	1		65.0			65.0	
Handhole Cover, Alcoa 23787 x 72	1	1.9			1.9		
Aileron Differential Bracket (est.)	1	5.0			5.0		
L.G. Hinge Fitting (est.)	1		25.0			35.0	
Fence (est.)	1	5.0			6.0		
Wing Panel, Total	-	<u>317.8</u>	<u>213.7</u>	<u>531.5</u>	<u>416.3</u>	<u>435.2</u>	<u>851.5</u>
<u>Flap</u>							
Bottom Skin, .040 x 19 x 107	1	8.1			8.6		
Top Skin, .037 x 20 x 107	1	8.6			9.2		
Nose Skin, .040 x 2 x 107	1	0.9			1.0		
Trail Edge, .060 x 2 x 107	1	1.3			1.3		
Ribs, .040 x 4 x 19 (See Wing)	11	1.9			3.3		
Rivets, 1/8 in. @ 2/in.	2350	0.7			1.4		
Flap Hinge Fittings	2		1.8			1.8	
Spar, .040 x 4 x 107	1	1.7			1.7		
Total		<u>23.2</u>	<u>1.8</u>	<u>25.0</u>	<u>26.5</u>	<u>1.8</u>	<u>28.3</u>
<u>Aileron</u>							
Spar, .040 x 6 x 60	1	1.4			1.4		
Tail Edge, .060 x 2 x 57	1	0.8			0.8		
Ribs, .037 x 6 x 18 (See Wing)	2	0.8			1.5		
Skin, .054 x 18 x 63	2	11.4			12.4		
Hinges	2		1.8			1.8	
Rivets (See Flap)		0.4			0.8		
Total		<u>14.8</u>	<u>1.8</u>	<u>16.6</u>	<u>16.9</u>	<u>1.8</u>	<u>18.7</u>
<u>Wing Carry-through Structure</u>							
Front, .23 x 8 x 52 in.	1	13.3			13.3		
Fittings, Steel	2		5.0			10.0	
Rear, Cap Steel T (See Wing) x 56 in.	2		91.4			272.0	
Web, Dural .080 x 5 x 52	2	42.0			42.0		
Bolts (See Wing)			8.5			17.0	
Nuts			6.8			6.8	
Total		<u>55.3</u>	<u>111.7</u>	<u>167.0</u>	<u>55.3</u>	<u>305.8</u>	<u>361.1</u>

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
(Continued)

Item	Number of Pieces	Finished			Pounds Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Total Wing (Two Wings Plus Carry-through)		766.9	546.3	1313.2	948.9	1183.4	2132.3
Spoilers		4.6			4.6		
Total Wing Group		771.5	546.3	1317.8	953.5	1183.4	2126.9

B. Tail Group.Fin

Spar Cap Tee, 2 x 3 x 3/8 x 97 in.	2		99.4			345.0	
Webbs, Dural, .080 x 7 x 97 (75-ST)	2	11.0			16.0		
Lead Edge, .0465 x 10 x 11/2	2	7.1			8.5		
.0465 x 4 x 11/2	2	2.8			3.3		
Bolts, @ 3/4 in. Pitch 3/8 in. ϕ x 1 in. lg.	380		32.0			38.0	
Nuts, 3/8 in.	380		11.4			11.4	
Trail Edge, .054 x 4 x 112	1	2.2			2.2		
Stringers, Alcoa 10135 - 1003 x 125 in.	2	4.1			4.1		
10135 - 1003 x 122 in.	2	3.9			3.9		
10135 - 1003 x 117 in.	2	3.7			3.7		
Ribs, .037 x 6 x 36 (3 x 3 in. ϕ holes)	10	7.2			10.11		
Ribs Clips, .06 x 2 x 6 in.	20	1.5			1.5		
Fuselage Attach, .125 x 2 1/4 x 82 in.	2	4.4			4.4		
Hinge Brackets, .065 x 4 x 3	4						
.065 x 4 x 2	8						
.065 x 2 x 2	8						
.065 x 2 x 2	4	2.9			2.9		
Skin, .047 x 57 in. x 36	2	19.7			28.6		
.037 x 24 x 47	2	8.6			21.1		
Rivets, 1/8 in. ϕ @ 2/in.	2350	1.1			1.4		
Total		80.2	142.8	223.0	111.7	394.4	506.1

Rudder

Spar, .054 x 4 x 112	1	2.2			3.3		
Trail Edge, .060 x 2 x 24	1	0.3			0.3		
Fab, .046 x 1 x 40	1	0.2			0.2		
Ribs, .034 x 4 x 18	12	2.3			3.8		
Rib Clips, Alcoa 79-M x 6 in.	12	0.9			0.9		

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Skin, .036 x 18 x 36	2	5.2			5.8		
.036 x 18 x 51	2	7.4			8.2		
Hinge Brackets (mag- nesium alloy)	4	(1.0 magnesium alloy)*			(1.0 magnesium alloy)		
Horn .065 Wall x 3 in. O.D. x 2 1/2 in.	1		4.1			4.1	
Rivets, 1/8 in. ϕ @ 2/in. 1440		0.6			1.0		
Total Frame of Rudder		19.1	4.1		23.5	4.1	
Static Balance, @ 70%			17.0			17.0	
Total		<u>19.1</u>	<u>21.1</u>	<u>41.2</u>	<u>23.5</u>	<u>21.1</u>	<u>45.6</u>
<u>Stabilizer (One Side)</u>							
Spar, Inboard, I beam, 55 in. lg 1 1/2 x 2 in. ϕ Holes	1		35.0			217.0	
Spar, Outboard, Channel .064 x 6 x 36	1		3.9			4.2	
Spar, Trail Edge, Dural .054 x 4 x 75	1	1.5			1.5		
Ribs, .046 x 4 x 25	7	3.2			5.4		
Rib Clips, .06 x 2 x 1 1/2	30	0.5			0.5		
Skin, .040 x 25 x 80	2	16.0			23.5		
Stringers, .06 x 1 1/4 x 57	2	0.8			0.8		
.06 x 1 1/4 x 62	2	0.8			0.8		
.06 x 1 1/4 x 40	2	0.5			0.5		
Hinge Bracket .065 x 4 x 3	2						
.065 x 4 x 2	4		1.5			1.5	
.065 x 2 x 2	6						
Total		<u>23.3</u>	<u>40.4</u>	<u>63.7</u>	<u>33.0</u>	<u>222.7</u>	<u>255.7</u>
<u>Elevator (One Side)</u>							
Spar, .054 x 4 x 75	1	1.5			1.7		
Trail Edge, .060 x 2 x 42	1	0.5			0.5		
Ribs, .046 x 3 x 11	7	1.3			2.2		
Rib Clips, .06 x 2 x 5/8	7	0.1			0.1		
Skin, .040 x 11 x 70	2	6.2			8.6		
Hinge Brackets (See Stabilizer)			1.5			1.5	
Horn 3 in. OD x .065 Wall x 10 in.	1		2.0			2.0	
Rivets 1/8 in. @ 2/in.	780	0.3			0.5		
Total Frame of One Elevator		9.9	3.5		13.6	3.5	

* All paranthetical entries are excluded from dural and steel totals but appear in the over-all totals.

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Pounds					
		Finished			Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Static Balance @ 70%			9.4			9.4	
Total		9.9	12.9	22.8	13.6	12.9	26.4
Total Tail Group		165.7	270.5	437.2	228.2	886.7	1115.9

C. Body Group.

Longerons, Alcoa 12061 x 310 in.	6	91.8			91.8	
12061 x 154 in.	2	15.2			15.2	
12061 x 72 in.	2	7.1			7.1	
12061 x 260 in.	2	25.5			25.5	
Alcoa 10135 - 0601 x 156 in.	2	6.6			6.6	
Dural .065 x 4 x 156	4	16.5			16.5	
Stringers, Alcoa 10135 - 0601 x 124	2	1.9			1.9	
10135 - 0601 x 166	2	2.5			2.5	
10135 - 0601 x 310	2	4.7			4.7	
10135 - 0601 x 235	2	3.5			3.5	
10135 - 0601 x 280	2	4.2			4.2	
10135 - 0601 x 310	2	4.7			4.7	
10135 - 0601 x 250	2	3.9			3.9	
10135 - 0601 x 310	6	14.1			14.1	

Frames:

Station		1			
10	.125 x 5 x 116	1	6.8		6.8
20	.125 x 5 x 130	1	7.7		7.7
30	.125 x 5 x 145	1	8.5		8.5
44.4	.125 x 5 x 158	1	9.4		9.4
59.6	.125 x 5 x 126	1	7.5		7.5
78.3	.125 x 5 x 130	1	7.7		7.7
82.8	.125 x 5 x 134	1	7.9		7.9
94.5	.125 x 5 x 138	1	8.2		8.2
105	10136 - 2402				
	182	1		23.2	23.2
119	.125 x 5 x 182	1	10.8		10.8
129	10136 - 2402				
	182	1		23.2	23.2
134	.125 x 5 x 182	1	10.8		10.8
148	.125 x 5 x 182	1	10.8		10.8
162	10136 - 2402				
	182	1	8.2		8.2
174	.125 x 5 x 182	1	10.8		10.8
184	.125 x 5 x 182	1	10.8		10.8
193	.125 x 5 x 182	1	10.8		10.8
202	.125 x 5 x 174	1	10.3		10.3
211	.125 x 5 x 172	1	10.2		10.2
222	.125 x 5 x 170	1	10.1		10.1
234	.125 x 5 x 165	1	9.8		9.8
245	.125 x 5 x 153	1	9.1		9.1
257	.125 x 5 x 142	1	8.4		8.4
270	.125 x 5 x 132	1	7.8		7.8
279	.125 x 5 x 121	1	7.2		7.2

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Pounds		
		Finished		
		Dural	Steel	Total
		Bill of Materials		
		Dural	Steel	Total
Station				
300 .125 x 5 x 50	1	2.9		2.9
309 .125 x 5 x 84	1	5.0		5.0
320 .125 x 5 x 67	1	4.0		4.0
Ducts				
0 to 44; Dural .065 x 84 x 48	1	24.8		29.0
44 - 105 .065 x 75 x 60	2	59.0		75.0
105 - 162 .065 x 48 x 55 (Top)	2	53.3		75.0
104 - 162 .065 x 65 x 55 (Lower)	2	72.2		90.0
Frame 44; Web .032 x 18 x 36	1	2.1		8.0
Struts .094 x 1 1/2 x 12	4	4.5		4.5
Duct Stiffener .094 x 1 1/2 x 84 in.	1	7.8		7.8
Frame 105; Web .032 x 24 x 60	1	4.6		5.7
Struts .094 x 1 1/2 x 24	5	2.2		2.2
Stiffener Alcoa .094 x 1 1/2 x 84 in.	2	7.0		7.0
Frame 162; Web .015 x 36 x 60 (18-8)	1		(19.8 stainless)	
Stiffeners, .094 x 1 1/2 x 48	2	9.0		9.0
Stiffeners, .094 x 1 1/2 x 65	2	12.1		12.1
Struts .094 x 1 1/2 x 24	5	11.2		11.2
Cockpit Floor .060 x 60 x 50	1	18.0		18.0
Alcoa 10135 - 0601 x 60	7	3.2		3.2
10135 - 0601 x 10	30	2.3		2.3
Fuselage Skin				
0-44; .045 x 45 x 134	1	24.1		46.6
44-105; .045 x 61 x 132	1	32.2		32.2
44-134; .058 x 90 x 44	1	9.5		23.8
105-162; .048 x 57 x 90	1	20.5		20.5
105-162; .045 x 57 x 90	1	20.5		20.5
105-210; .020 x 105 x 180	1	37.8		37.8
162-234; .042 x 72 x 172	1	49.5		49.5
234-320; .044 x 86 x 120	1	41.3		79.8

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Bill of Materials		
		Dural	Steel	Total	Dural	Steel	Total
Tail Pipes							
(18-8) .032 x 63 x 30	1		(17.2 stainless)		(17.2 stainless)		
Flange 1/8 x 1 1/2 x 32	1		(1.7 stainless)		(1.7 stainless)		
Canopy	1	(44 glass and plastics)			(44 glass and plastics)		
Armor Plate	1		330		330		
Total Body Group		<u>952.4</u>	<u>376.4</u>	<u>1411.5</u>	<u>1094.4</u>	<u>376.4</u>	<u>1566.7</u>
Landing Gear							
Wheel	3	(30 magnesium)			(159 magnesium)		
Brakes	3		55			165	
Tire, 6.6 x 26	3	(69 rubber)			(69 rubber)		
Tubo	3	(15 rubber)			(15 rubber)		
Oleos, Main	2		100			400	
Nose	1		70			280	
Total Landing Gear			<u>225</u>	<u>339</u>		<u>845</u>	<u>1088</u>
Fuel Tanks							
Aft Fuel Tank							
Rear End, .040 x 190 sq. in.	1		1.9			3.1	
Front, .040 x 819 sq. in.	1		3.1			5.0	
Wrapper, OS .040 x 79 x 36	1		11.0			11.0	
Wrapper, I.S., .040 x 38 x 36	1		5.3			5.3	
Tops, .040 x 11 x 36	2		3.0			3.0	
Baffles .040 x 650 sq. in.	2		5.0			8.1	
Total Aft Fuel Tank			<u>29.3</u>	<u>29.3</u>		<u>35.5</u>	<u>35.5</u>
Forward Fuel Tank, at .3 lb./gal.	1		(85 rubber)			(85 rubber)	

	Dural	Steel	Stainless Steel	Magnesium and Alloys	Rubber	Glass and Organic Plastics	Total
Finished Weight	1919.0	1150.0	39		169	44	3661.8
Bill of Materials	2337.4	3335.9	52	160	169	44	6098.3

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ESTIMATED FINISHED WEIGHT AND BILL OF MATERIALS
FOR MIG-15 AIRFRAME AND LANDING GEAR
 (Continued)

Item	Number of Pieces	Finished			Bill of Materials			Pounds
		Dural	Steel	Total	Dural	Steel	Total	
Engine Mount 2½ in. OD								
x .065 x 24	2		6.8			6.8		
2½ in. OD x .065 x 36	2		10.2			10.2		
2½ in. OD x .065 x 30	2		8.4			8.4		
Firewall Fittings, 6 cu. in. est.	6		10.3			12.0		
Engine Fittings, 7 cu. in. est.	3		6.0			7.0		
			<u>41.7</u>			<u>44.4</u>		

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