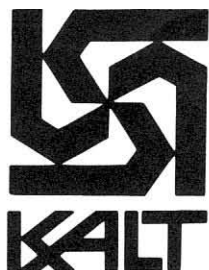


**KALT HELICOPTER**

# **60 BARON**

**INSTRUCTION MANUAL**



- Become thoroughly familiar with this manual, all parts and components prior to beginning construction or opening packages.

60 BARON kit does not include a rotor head assembly nor main rotor blades. Purchase a KALT Stabilizer System Rotor Head and install it referring to its instruction manual. In case of installing our Fly Bar Less Rotor Head, you have to change the scissors arm (C) to the scissors arm (B) and upper plate lock.

Contents of this kit were inspected several times prior to shipment. If you should find any parts missing, please contact your dealer.

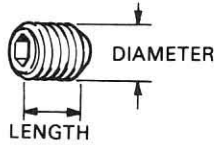
Specifications of the 60 BARON are subject to change without notice.

### **Contents of instruction manual**

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■ **Set bolt** (Grub Screw)



It has a hexagon hole in the end, but no head.

(Example) M4 × 4 Set B.  
 Diameter 4mm ————  
 Length 4mm ———— Abbreviation for Set Bolt

■ **Self locking nut**



It has a nylon insert in the top of the nut.

(Example) M3 N.N.  
 3mm ————  
 Use a 5.5mm box wrench to tighten the nuts.

■ **Self Tapping Screw**



These are hardend steel self tapping screws.  
 Drill 2mm holes prior to screw them in.

■ **Plus screw**

These are the normal familiar round head screws. Use the screwdriver for tightening.

■ **Serrated lock washer**



These are lock washers with gripping teeth around the edges.

■ All of the nuts, bolts and washers are called out by number as explained on pages 2 and 3.

■ **Use of the hexagon wrenches**

This kit contains 4 size of hex wrenches. Use for tightening cap and set bolts as follows.

Dia.	Cap bolts	Set bolts
M3	2.5mm	1.5mm
M4	3mm	2mm

The necessary nuts, bolts and washers needed for each step in construction, are listed at the end of each step. Be careful to use the correct parts as called out, as only the required number of nuts, bolts and washers are provided in the kit.

(Example)  
 [M3 × 8 Cap B.……4] Use 4 M3 × 8 Cap Bolts.

Scales are drawn at the top of each page for handy reference of bolt length.

# PARTS LIST

No.	Name	Quan.	Remarks	
B50-1-01	Subframe (L, R)	1ea.	Plywood	
B50-1-02	Servo Plate Retainer	2		
B50-1-03	Cross Member (A)	1		
B50-1-04	Body Mounting Bolt (F)	1		
B50-1-05	Front Bed	1		
B50-1-07	Body Mounting Bolt (R)	2		
B60-1-01	Main Frame (L, R)	1ea.		
B60-1-02	Gyro Mount	1		
B60-1-S	No. 1 Screw Set	1		
B60-2-01	Slide Ring Assembly	1	w/830 ball brg.	
B60-2-02	Slide Ring Holder	1		
B60-2-03	Slide Ring Shaft (A, B)	1ea.		
B60-2-04	Slide Ring Arm (L, R)	1ea.		
B60-2-05	Slide Ring Spacer	2		
B60-2-06	Pinion Gear	1		
A-102-01	Clutch Bell	1		w/lining
B60-2-07	Bearing Housing (D)	1		w/1360 brg. × 2
B50-2-05	Bearing Housing (A)	1		w/1910 brg.
B60-2-08	Bearing Housing (C)	1		w/1910 brg.
B60-2-S	No. 2 Screw Set	1		
B50-3-01	Throttle Adapter	1	For O.S.	
B50-3-02	Throttle Lever & Spacer	1ea.	For ENYA	
B50-3-03	Cooling Fan	1		
A-102-16	Pulley	1	w/pilot brg.	
A-102-17~18	Clutch Bolt (A, B)	2ea.	w/'E'ring	
A-102-19	Clutch Rubber Damper	1set		
A-102-20	Clutch Shoe	4		
B60-3-01	Engine Mounting Block	1		
B60-3-02	Cooling Shroud	1		
B60-3-03	Starting Belt	1	MB 440	
B60-3-S	No. 3 Screw Set	1		
B60-4-01	Elevator Control Ring	1	w/830 brg. × 2	
B60-4-02	Phase Adjusting Ring	1		
B60-4-03	Pitch Control Ring	1	w/ball arm	
B60-4-04	Pitch Control Rod	1		
B60-4-05	Main Shaft	1		
A-403-21~27	Scissors Arm (C) Assembly	1set		
A-401-25	Swash Plate	1		
A-401-27	Swash Plate Collar	1		
B60-4-06	Rotor Drive Gear	1	} Assembled	
B60-4-07	Bevel Gear	1		
B60-4-08	Auto Rotation Ass'y	1		
B60-4-09	Gear Spacer	1		

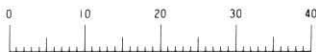
No.	Name	Quan.	Remarks
B60-4-10	Bevel Pinion Gear	1	
B60-4-11	Bearing Housing (B)	1	w/1350 brg. × 2
B60-4-S	No. 4 Screw Set	1	
B50-5-01	Cross Member (D)	2	
A-603-11	Under Carriage Damper	4	
A-603-12~13	Landing Damper Retainer (A, B)	4ea.	
A-603-15	Under Carriage Brace	2	
A-603-17	Under Carriage Clamp	4	
A-603-03	Under Carriage Skid	2	
A-603-05	Skid Cap	4	
B60-5-01	Tail Boom Support Clamp (B)	2	
B50-5-07	Fuel Tank	1set	380 cc
B60-5-S	No. 5 Screw Set	1	
B60-6-01	Tail Gear Assembly	1	Assembled
B50-6-06	Tail Rotor Hub Ass'y	1	w/1030 brg. × 4
B50-6-07	Tail Rotor Grip	1set	w/arm & w/o arm
B50-6-12	Tail Bracket	1	
B50-6-10	Tail Pitch Control System	1set	Bracket, Crank & Plastic ball
B50-6-09	Tail Pitch Control Lever	1	
A-302-08~12	Tail Pitch Control Plate Ass'y	1set	
B50-6-13	Tail Drive Music Wire	1	
A-100-04	Tail Joint	2	
A-100-05	Tail Joint Spacer	2	
B60-6-02	Tail Boom	1	
B50-6-17	Tail Drive Wire Guide	1	
B50-6-21	Vertical Fin	1	
B50-6-20	Tail Clamp	3	
A-300-08	Tail Rotor Blade	1set	
B50-6-22	Horizontal Stabilizer	1	
B50-6-18	Tail Boom Retainer	2	
B60-6-S	No. 6 Screw Set	1	
B50-7-01	Servo Frame Set	1set	
B-403-07~11	Bell Crank Ass'y	1set	w/830 brg. × 2
B50-7-05	Flexible PP Rod	1set	Black & White Rods
B50-7-06	Flexible PP Rod Bracket	4	
B50-7-S	No. 7 Screw Set	1	
B60-8-01	Body	1	
B60-8-02	Instrument Panel	1	
B60-8-03	Canopy	1	
B60-8-04	Tail Boom Support	2	
B60-8-05	Tail Boom Support End	4	
B60-8-06	Tail Boom Support Clamp (A)	1	
B60-8-S	No. 8 Screw Set	1	
B60-9-S	No. 9 Screw Set	1	
B60-M	Instruction Manual	1	This Book
B60-D	Construction Drawing & Side View Plan	1	

## SCREW SET CONTENTS LIST

Bag No.	Size & Name	Quan.	Remarks
No. 1	M3 × 8 Cap Bolt	14	} Use for all groups
	M3 × 10 Cap Bolt	3	
	M3 × 12 Cap Bolt	4	
	M3 Nylon Nut	18	
	M3 Plate Washer	4	
	1.5 Hex. Wrench	1	
	2 Hex. Wrench	1	
	2.5 Hex. Wrench	1	
3 Hex. Wrench	1		
No. 2	M3 × 8 Cap Bolt	1	
	M3 × 10 Cap Bolt	15	
	M3 × 30 Cap Bolt	2	
	M3 Nylon Nut	3	
	M4 × 4 Set Bolt	2	
	M3 × 10 × 1 Plate Washer	1	
No. 3	M3 × 10 Cap Bolt	4	For ENYA engine For ENYA engine
	M4 × 12 Cap Bolt	6	
	M4 × 15 Cap Bolt	4	
	M3 × 4 Set Bolt	2	
	M3 Nylon Nut	4	
	M3 Plate Washer	4	
	M4 Plate Washer	10	
	M4 Serrated Washer	10	
	M3 × 25 (JIS) Cap Bolt	1	
	2.4 Hex. Wrench	1	
No. 4	M3 × 8 Cap Bolt	2	
	M3 × 10 Cap Bolt	4	
	M3 × 20 Cap Bolt	1	
	M3 Nylon Nut	1	
	M3 × 4 Set Bolt	1	
	M4 × 4 Set Bolt	4	
	M3 × 4.5 × 0.2 Plate Washer	2	
No. 5	M3 × 12 Flat Head Bolt	4	
	M3 Nylon Nut	4	
	M2 × 16 ⊕ Bolt	4	
	M2 × 3 ⊕ Bolt	8	
	M2 Nut	4	
	M2 Serrated Washer	12	
	M2.3 × 5 Tapping Bolt	4	
No. 6	M3 × 8 Cap Bolt	4	
	M3 × 12 Cap Bolt	6	

Bag No.	Size & Name	Quan.	Remarks
No. 6	M3 × 15 Cap Bolt	2	
	M3 × 30 Cap Bolt	4	
	M3 Nylon Nut	12	
	M3 Plate Washer	6	
	M2 × 10 ⊕ Bolt	9	
	M2 × 12 ⊕ Bolt	2	
	M2 Nut	10	
	M2 Plate Washer	1	
	M4 × 4 Set Bolt	8	
Ball Joint	2		
No. 7	M3 × 8 Cap Bolt	4	
	M3 × 10 Cap Bolt	3	
	M3 × 12 Cap Bolt	4	
	M3 × 27 Cap Bolt	1	
	M3 Nylon Nut	12	
	M3 Nut	4	
	M3 × 4.5 × 0.2 Plate Washer	1	
	M2 × 10 ⊕ Bolt	7	
	M2 Nut	11	
	M2.6 × 10 ⊕ Bolt	20	For Servo mounting
	M2.6 Flange Nut	20	For Servo mounting
	M2.3 × 17 Threaded Rod	2	
	M2.3 × 35 Threaded Rod	1	
	M2.3 × 50 Threaded Rod	1	
	M2.3 × 65 Threaded Rod	1	
	M2.3 × 85 Threaded Rod	1	
	M2.3 × 120 Threaded Rod	1	
	Ball Arm (4-3)	1	
	Ball Joint	7	
Ball Joint Spacer	2	For Bell Crank	
Universal Link	9		
Quick Link	3		
No. 8	M3 × 10 Cap Bolt	2	
	M3 × 12 Cap Bolt	3	
	M3 × 15 Cap Bolt	1	
	M3 Nylon Nut	3	
	M3 Nut	1	
	M3 Plate Washer	3	
	M2.6 × 5 Cap Bolt	11	
	M2.6 Nut	11	
	Rubber Grommet	3	
No. 9	M3 × 20 Cap Bolt	1	
	M3 Nylon Nut	1	
	M2.3 × 85 Threaded Rod	2	
	M2.3 × 110 Threaded Rod	1	
	Universal Link	6	





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# 1 Main Frame Assembly

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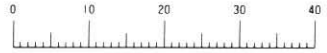
- 1 Assemble subframes and servo plate retainer, paying close attention to the proper angles.  
[M3 × 8Cap B. ....4 ]  
[M3 N. N. ....4 ]
- 2 Attach body mounting bolt (F) to cross member (A).  
[M3 × 10 Cap B. ....1 ]
- 3 Drill 6 mm and 3 mm holes to the front bed and bolt it to the front end of subframes.  
[M3 × 12 Cap B. ....4 ]  
[M3 N. N. ....4 ]  
[M3 Plate Washer ....4 ]
- 4 Attach body mounting bolt (R) to the main frames.  
[M3 × 10 Cap B. ....2 ]
- 5 The main frames bolt to the subframe. Make sure that the top of the subframe and the front edge of the main frames cross correctly at 90 degree angles.  
[M3 × 8Cap B. ....6 ]  
[M3 N. N. ....6 ]
- 6 Bolt the gyro mount between the main frames.  
[M3 × 8Cap B. ....4 ]  
[M3 N. N. ....4 ]

---

# 2 Ball Bearing Installation

---

- 7 Put the slide ring shaft (A) and (B) to the slide ring holder and attach the holder to the main frames.  
[M3 × 10 Cap B. ....2 ]
- 8 Put the slide ring ass'y in the square cut out of main frames.
- 9 Bolt the slide ring arm (L) and (R) to the slide ring ass'y with slide ring spacer (3×6×2 collar) using KALT TITE.  
[M3 × 10 Cap B. ....2 ]
- 10 Put two slide ring arms together and bolt to the slide ring holder.  
[M3 × 10 Cap B. ....3 ]  
[M3 N. N. ....1 ]
- 11 Attach the pinion gear to the clutch bell.  
[M4 × 4 Set B. ....2 ]
- 12 Bolt the pinion gear to the bearing housing (D).  
[M3 × 8Cap B. ....1 ]  
[M3 × 10 × 1 Plate Washer ....1 ]



- 13 Temporarily attach 12 into the main frame. [M3 × 10 Cap B. ....4 ]
- 14 Temporarily set bearing housing (A) and (C) into the main frame.
- |                         |
|-------------------------|
| [M3 × 10 Cap B. ....4 ] |
| [M3 × 30 Cap B. ....2 ] |
| [M3 N. N. ....2 ]       |

---

## 3 Power Unit Assembly

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※When using the O.S. Engine, remove the throttle lever and attach the throttle adapter contained in this kit to the engine, and replace, throttle lever. (In case of your engine is modified for helicopters, it is not necessary.)

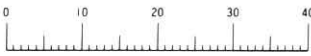
[M3 × 4 Set B. ....2 ]

※When using the ENYA Engine, remove the throttle lever and replace with the throttle lever and spacer contained in this kit with JIS standardized screw.

[M3 × 25 (JIS) Cap B. ....1 ]  
[Using 2.4 mm Hex. Wrench ]

- 15 Enlarge the hole of the cooling fan using a tapered reamer, for a close fit. Do not over enlarge the hole.
- 16 Install the cooling fan to the engine, without prop washer, and tighten firmly.
- 17 Secure the pulley to the cooling fan with 2 clutch bolts (A) and then add 2 clutch bolts (B) to the pulley.
- 18 Put the clutch dampers on the pulley.
- Notice : The 4 way clutch can be adjusted to clutch timing needs by changing the rubber dampers. There are 4 thickness of dampers included in the set. And they are numbered in order of thickness. If you install a large numbered damper, or plural dampers, the clutch timing will be delayed. For a standard set up use No. 2 and No. 3 dampers.
- 19 Add a little grease to the dampers, and put the four clutch shoes on the clutch bolts. The rubber dampers must be placed on the upper side of the pulley.
- 20 Secure shoes with "E" rings on each clutch bolt.
- 21 Bolt the engine to the engine mounting block. At this time, make sure that the screw holes on the under side of the engine mounting block are at the bottom.  
(See drawing)

[M4 × 15 Cap B. ....4 ]
[M4 Plate Washer ....4 ]
[M4 Serrated Washer ...4 ]



- 22** Bolt the cooling shroud to the main frames. Flange of the shroud must be positioned in front of the bent plates of the main frame. It is convenient to remove the upper cover of the cooling shroud until the throttle linkage is installed.

M3 × 10	Cap B. ....	4
M3	Plate Washer .....	4
M3	N. N. ....	4

- 23** Put the starting belt over the clutch bell, and mount the power unit into the main frame.

Notice : Add a little grease to the clutch pilot bearing.

M4 × 12	Cap B. ....	6
M4	Plate Washer .....	6
M4	Serrated Washer ...	6

## 4 Main Shaft, Drive Gear & Swash Plate Assembly

- 24** Attach the elevator control ring to the phase adjusting ring. At this time, file the two M3 screw hole sides of phase adjusting ring flat and adjust the width to fit the inner width of elevator control ring and two 0.2 mm thick washers. When satisfied, glue with cyanoacrylate two M3 × 4.5 × 0.2 plate washers. to the center of M3 screw holes of the phase ring and bolt elevator control ring using KALT TITE.

M3 × 8	Cap B. ....	2
M3 × 4.5 × 0.2	Plate Washer 2	

- 25** Put the phase adjusting ring on the bearing housing (C) and temporarily position using four M4 set bolts. Do not screw down set bolts yet. They will be fastened at step **31**

M4 × 4	Set B. ....	4
--------	-------------	---

- 26** Insert one end of the pitch control rod into the 2 mm hole in the pitch control ring and slide the unit on the main shaft. Then screw down M3 set bolt to fasten the pitch control rod to pitch control ring. Make sure that the pitch control rod moves freely in the main shaft. If there is any friction, check to see that bent end is exactly 90 degrees.

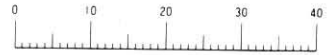
M3 × 4	Set B. ....	1
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- 27** Slide the pitch control rod about half way down the main shaft. Then insert the scissors arm unit, swash plate and swash plate collar, in that order, from the bottom of the main shaft. Pay attention to the proper position of each scissors arms.

- 28** Snap two universal links of the elevator control ring to the swash plate, and put the bent end of pitch control rod in the 2 mm hole of the slide ring ass'y. Then drop the main shaft into the bottom bearing of housing (A).

- 29** Add the gear spacer and bolt the rotor drive gear unit to the main shaft.

M3 × 20	Cap B. ....	1
M3	N. N. ....	1



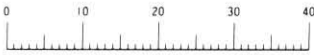
- 30** Pull the main shaft, and push down the center block of scissors arm ass'y, then tighten up the bolt on the center block. At this time, set the position of the universal link of the scissors arm, and the ball arm of pitch control ring exactly. Snap each universal link of the scissors arm to the swash plate and the pitch control ring.  
Notice : Use KALT TITE when fastning the cap bolts of the center block, Do not fasten the bolt too firmly as the center block can be broken.
- 31** Swing the elevator control ring back and forth several times, then fasten the phase adjusting ring to the bearing housing (C) using four M4 × 4 set bolts. At this time set the phase of the swash plate at zero degrees, and after test flight adjust the off-set of phase, if necessary.
- 32** Adjust the backlash between the main gear and pinion by moving the bearing housings. When moving the bearing housing (D), loosen the M4 × 12 Cap Bolts which fasten the engine mount block, and after satisfied with the backlash tighten up the bolts paying close attention to align the center of the engine and pinion gear.
- 33** Insert the shaft of the bevel pinion gear to the bearing housing (B) and secure with KALT TITE or cyanoacrylate. At this time, remove all oil from the shaft and the inner race of bearings.
- 34** Put **33** into the main frame, and adjust the clearance with the large bevel gear, and bolt it firmly. Put some grease on both bevel gears.  
[M3 × 10 Cap B. ....4 ]

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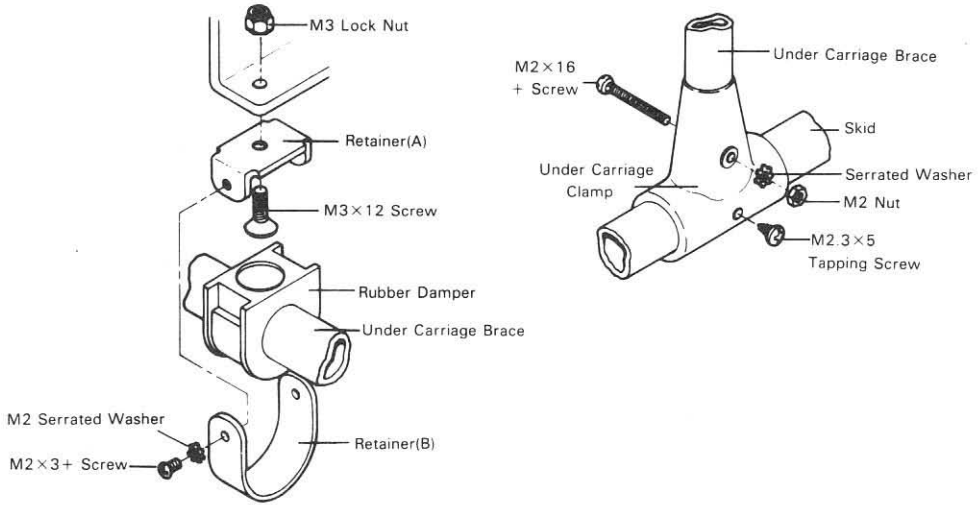
## 5 Under Carriage & Fuel Tank Installation

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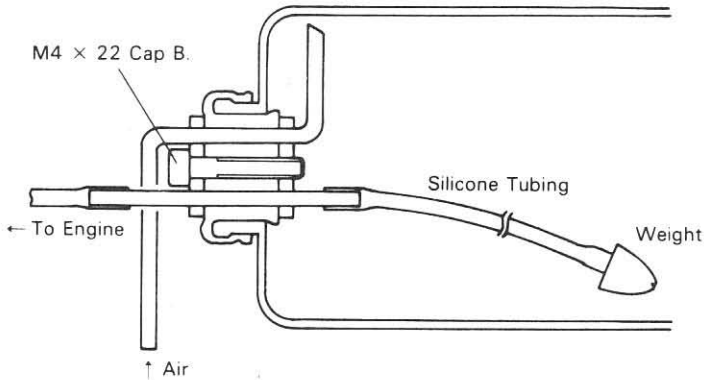
- 35** Install the cross member (D), under carriage damper retainer (A) to the bottom of main frames.  
[M3 × 12 Flat Head Bolt ....4 ]  
[M3 N. N. ....4 ]
- 36** Insert the under carriage brace into the two under carriage dampers, and attach the dampers to the retainer (A) with the retainer (B).  
[M2 × 3 ⊕ Bolt ....8 ]  
[M2 Serrated Washer ...8 ]
- 37** Put the under carriage clamps on the tip of the brace, and insert the under carriage skids. The 2.3 mm holes of the clamps must be placed inside. Before securing the clamps, add two tail support clamps (B) to the rear side brace.
- 38** Bolt the brace and the clamp with M2 × 16 ⊕ bolts and nuts.  
[M2 × 16 ⊕ Bolt ....4 ]  
[M2 Nut ....4 ]  
[M2 Serrated Washer ...4 ]
- 39** Set the position of the skids and drill 2 mm holes in the skids for tapping bolts, then secure with M2.3 × 5 tapping bolts. [M2.3 × 5 Tapping Bolt ....4 ]



- 40** Set the brace to the center and glue the landing dampers and the braces with cyanoacrylate. Glue the skid caps to the tip of the braces with cyanoacrylate.



- 41** Assemble the fuel tank cap as shown, then insert it into the tank, and secure with the M4 × 22 cap bolt.



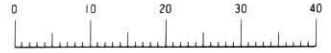
## 6 Tail Rotor Unit Assembly

- 42** Put some grease on the tail gears.
- 43** Screw on tail rotor hub (counter clockwise) to the output shaft tightly and secure with a little KALT TITE.
- 44** Bolt the tail rotor grip to the ball bearings of the tail rotor hub.

M2 × 10	⊕ Bolt	.....8
M2	Nut	.....8

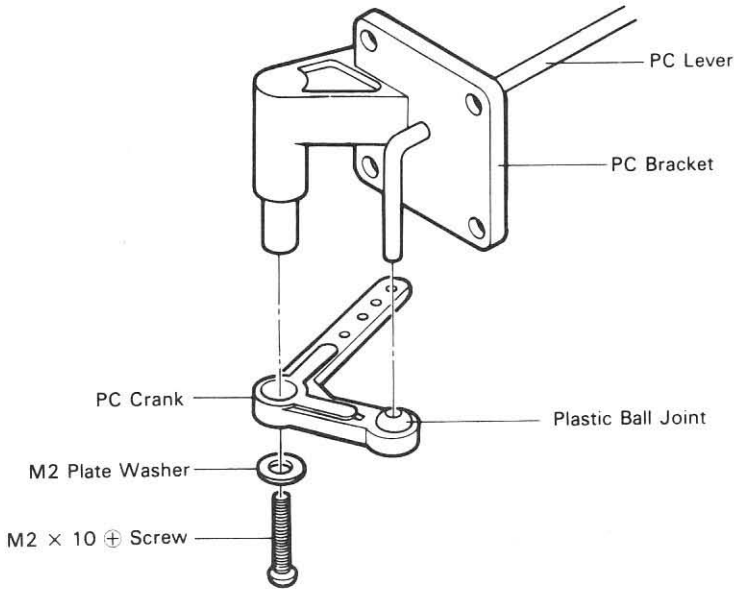
- 45** Bolt two ball joints to the arms of the tail rotor grips.

M2 × 12	⊕ Bolt	.....2
M2	Nut	.....2
Ball Joint		.....2

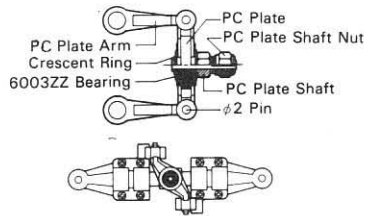


**46** Bolt the tail bracket and tail PC bracket to the tail gear housing.  
 [M3 × 8 Cap B. ....4 ]

**47** Insert the tail PC lever to the tail gear unit. And connect up the plastic ball joint to the crank. Secure the crank in the bracket with a screw and plate washer. Do not screw down too tightly as the crank has to move smoothly. See sketch.  
 [M2 × 10 ⊕ Bolt .....1 ]  
 [M2 Plate Washer .....1 ]



**48** Make sure of proper orientation of ball joints and PC plate. See drawing. Insert the PC plate shaft into the bearing, securing with a little KALT TITE, then retain it with the crescent ring. Do not get any glue in the bearings. Be careful when handling the crescent ring, as it is easily lost.

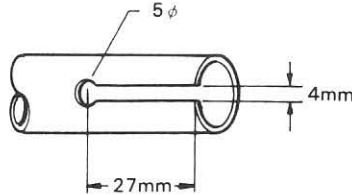


**49** Feed the PC lever into the PC plate shaft and snap the PC plate arm to the ball joints of the tail rotor grips.  
 Notice : If you cannot feed the PC lever into the shaft, file the tip of PC lever using fine sand paper.

**50** Insert the tail rotor drive music wire into the tail joint spacer and bend the wire at a 90 degree angle, 5 mm from the end of the wire. Make sure of the spacers direction and do not bend the wire too sharply.



- 51** Put the bent end of the wire into the 2 mm hole in the tail joint. Push the spacer into the tail joint and secure it with set bolts. [M4 × 4 Set B. ....2 ]
- 52** Insert the tail joint (with wire) into the input shaft of the tail unit and fasten. [M4 × 4 Set B. ....2 ]
- 53** Drill and cut the small diameter end of the tail boom as shown.



- 54** Insert the tail drive wire guide into the boom from the large end and push it into the boom for a snug fit. Make sure it is in the proper direction, and do not use too much force.

- 55** Insert the tail gear unit into the boom and bolt the vertical fin with tail clamps.
- |                |              |   |
|----------------|--------------|---|
| M3 × 12 Cap B. | .....        | 4 |
| M3             | N. N.        | 4 |
| M3             | Plate Washer | 4 |

- 56** Install tail rotor blades onto the tail rotor grips. [M3 × 15 Cap B. ....2 ]
- |    |       |   |
|----|-------|---|
| M3 | N. N. | 2 |
|----|-------|---|

Notice : Install tail rotor blades with correct surface placement. M3 × 15 cap bolts and nuts must not be tightened too much. Just tighten the blades with slight slack so they fan out by centrifugal force when the tail rotor blades are rotating.

- 57** Bolt the horizontal stabilizer to the tail boom with tail clamp. Make sure of the clearance between tail rotor blades.
- |                |              |   |
|----------------|--------------|---|
| M3 × 12 Cap B. | .....        | 2 |
| M3             | N. N.        | 2 |
| M3             | Plate Washer | 2 |

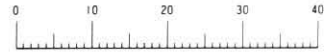
- 58** Temporarily attach another tail joint to the shaft of the bevel pinion gear. [M4 × 4 Set B. ....2 ]

Notice : Make sure of the proper direction of the tail joint.

- 59** Place the tail boom retainer on the main frame and temporarily bolt. At this time the inner flange of the retainer must be forward. [M3 × 30 Cap B. ....4 ]
- |    |       |   |
|----|-------|---|
| M3 | N. N. | 4 |
|----|-------|---|

- 60** Insert the tail boom into the retainer and mark the music wire at the 2 mm hole location of tail joint.

- 61** Remove the tail boom and cut the wire 5 mm longer than the mark. Add the joint spacer to the wire paying attention to direction and bend the wire 90 degrees at the mark.

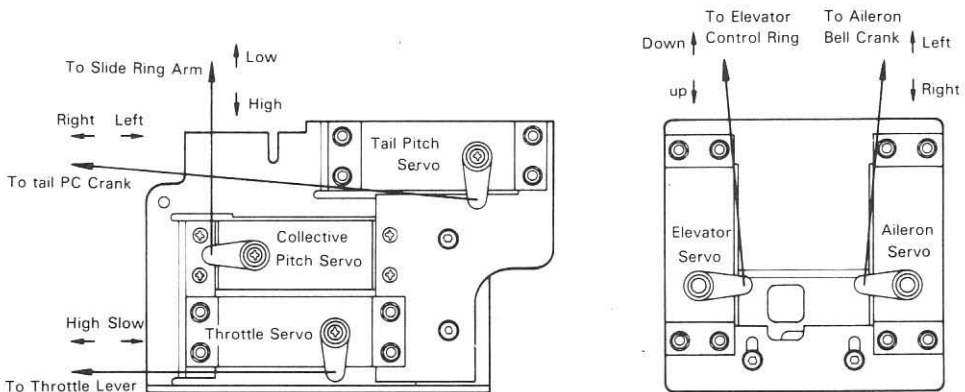


- 62 Remove the temporarily attached tail joint at step 58 and attach it to the front tip of tail drive wire. [M4 × 4 Set B. ....2 ]
  
- 63 Attach the tail boom to the main frame. Make sure the vertical fin is placed vertical, and fasten the cap bolts of the tail boom retainer.
  
- 64 Bolt the tail joint to the bevel pinion gear shaft.

## 7 R/C Equipment and Linkage Installation

- 65 Attach four cap bolts to the top front bent plates of the main frame from the bottom side with M3 nuts. [M3 × 12 Cap B. ....4 ]  
[M3 Nut .....4 ]
  
- 66 Bolt servo frames, adjusting the width to fit your servos. [M3 × 8 Cap B. ....4 ]  
[M3 N. N. ....4 ]
  
- 67 Install servos to the servo frame and bolt them to the main frame. See drawing. [M2.6 × 10 Bolt .....20 ]  
[M2.6 Flange Nut .....20 ]  
[M3 × 10 Cap B. ....3 ]  
[M3 N. N. ....7 ]

Notice : The pitch control servo must be installed from the left side of the frame. Make sure of the servo's direction. There may be a requirement for a reverse servo, or use the reverse switch on your transmitter.

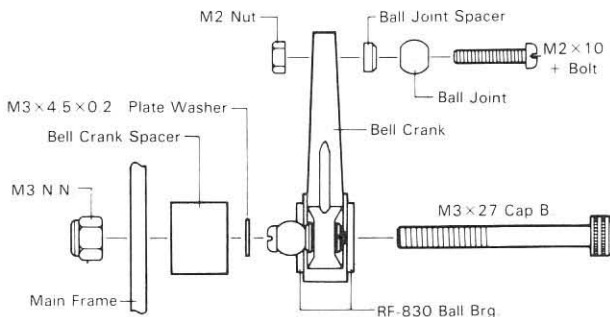






**68** Bolt two ball joints to the bell crank and install it to the main frame with spacer and small washer. Do not forget the small washer (M3 × 4.5 × 0.2). See drawing.

M2 × 10 + Bolt	2
M2 Nut	2
Ball Joint	2
Ball Joint Spacer	2
M3 × 27 Cap B.	1
M3 N. N.	1
M3 × 4.5 × 0.2 Plate Washer	1



**69** Bolt a ball joint to the aileron servo horn and connect up to the bell crank with universal links and M2.3 × 65 threaded rod. Connect up the bell crank and the swash plate with universal links and M2.3 × 50 threaded rod. The stroke of the swash plate joint ball is approximately 9mm each way.

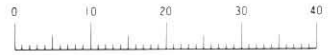
Ball Joint	1
M2 × 10 + Bolt	1
M2 Nut	2
M2.3 × 65 Threaded Rod	1
M2.3 × 50 Threaded Rod	1
Universal Link	4

**70** Attach the ball arm(4-3) to the tip of the elevator control ring arm, and bolt a ball joint to the elevator servo horn. Connect up to the servo and elevator control ring with universal links and M2.3 × 85 threaded rod. The stroke is the same as the aileron.

Ball Arm(4-3)	1
Ball Joint	1
M2 × 10 + Bolt	1
M2 Nut	2
M2.3 × 85 Threaded Rod	1
Universal Link	2

**71** Bolt a ball joint to the tip of the slide ring arm.

Ball Joint	1
M2 × 10 + Bolt	1
M2 Nut	1



- 72 Bolt a ball joint to the pitch control servo and connect up to the slide ring arm with universal links and M2.3 × 35 threaded rod. The stroke will be adjusted after installing the rotor head and measuring the pitch. Refer to the Instruction Manual of your rotor head.

Ball Joint	.....	1
M2 × 10 ⊕ Bolt	.....	1
M2 Nut	.....	2
M2.3 × 35 Threaded Rod	.....	1
Universal Link	.....	2

Notice : If the rod or universal link hits the servo frame, cut a clearance in the frame.

- 73 Bolt a ball joint to the throttle control servo and connect it to the throttle lever with M2.3 × 120 threaded rod, universal link and quick link. At this time bend the rod to avoid hitting the main frame. Throw of the throttle lever and motor control servo must be equal. Throw should be adjusted so that the engine can be stopped at will.

Ball Joint	.....	1
M2 × 10 ⊕ Bolt	.....	1
M2 Nut	.....	2
M2.3 × 120 Threaded Rod	.....	1
Universal Link	.....	1
Quick Link	.....	1

- 74 Connect up the tail PC crank and tail pitch control servo with flexible PP rod, quick links and M2.3 × 17 threaded rods. When the servo is neutral, the crank is also neutral. Throw of the tail pitch control lever (2 mm steel wire) is 5 mm each way. The flexible PP rod must be secured in several places to prevent bending or flexing during operation. Use the PP rod brackets and vinyl tape.

M2.3 × 17 Threaded Rod	.....	2
Quick Link	.....	2

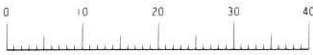
- 75 Fasten the tail PC plate shaft and nut, and temporarily set the tail rotor pitch + 5 degrees.

## 8 Body Construction

- 76 Cut the fiber glass body along the parting line.
- 77 Cut out the window and shape the inside.
- 78 Put the front and rear body together and shape the parting line.
- 79 Temporarily join the front and rear body using vinyl tape and cut top and bottom holes along the cut lines.

- 80 Decide on the body fastening bolt hole positions and drill 2.6 mm holes. The holes must be 6 mm from the body parting lines.

Notice : If you install a side mount exhaust system, a muffler cut out will be required in the body. Make sure that your mounting holes will clear the muffler cut out.



**81** Bolt the body with M2.6 × 5 cap bolts and nuts. Glue the nuts to the inside of body with epoxy glue.

M2.6 × 5 Cap B.	.....	8
M2.6 Nut	.....	8

**82** After the epoxy has cured, remove the front and rear body, and shape them to fit the frames. Drill two 6 mm holes in the center of indented positions for the body mounting bolt (R), and add the rubber grommets. Remove the tail boom from the main frame, and temporarily attach the front body.

M3 × 12 Cap B.	.....	2
M3 Plate Washer	.....	2
Rubber Grommet	.....	2

**83** Cut the rear body for the tail boom and flexible PP rod, and insert the boom into the body.

**84** Attach the tail boom to the main frame and fasten the bolts for the tail boom retainers firmly.

**85** Fit the rear body and make sure that there is no clearance between front and rear body. Check the position of the body mounting bolt (F). If there is a clearance between front and rear, or there is too much clearance between the body mounting bolt (F) and the body, the reason is the main frame and the sub frame are not fixed 90 degrees to each other.

**86** When the front and rear body fit together perfectly mark the position of body mounting bolt (F) and drill 6 mm hole and add the rubber grommet. Temporarily bolt the body to the main frame. If you use a side exhaust engine, check and mark the position of exhaust hole and cut away to fit your muffler.

M3 × 12 Cap B.	.....	1
M3 Plate Washer	.....	1
Rubber Grommet	.....	1

**87** Cut and trim the body to make clearance for linkage rods or servos. Also cut and drill for the switch mounting and antenna exit.

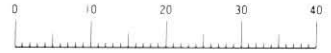
**88** Make sure that the glow plug can be changed with 8 mm box driver and can be connected to the booster cable. If necessary cut an opening.

**89** Drill holes for the needle valve exit and for adjusting the carbretor.

**90** Trim the canopy to fit the body and drill 2.6 mm holes. On the inside of the holes, glue M2.6 nuts with epoxy the same way as step **81**. Glue the instrument panel to the body using epoxy glue.

M2.6 × 5 Cap B.	.....	3
M2.6 Nut	.....	3

**91** After finishing the mounting of the body, remove the rubber grommets and sand the body surface with # 280 ~ # 360 sandpaper. Final finish the surface of the body with putty and surfacer completely, then paint. Use a fuel proof paint for the finish.



**92** Attach the finished body to the main frame. At first bolt the front body to the body mounting bolts, then insert the tail boom into the rear body and attach the boom to the frame, and fix the tail joint to the bevel gear shaft firmly, then bolt the rear body to the front one.

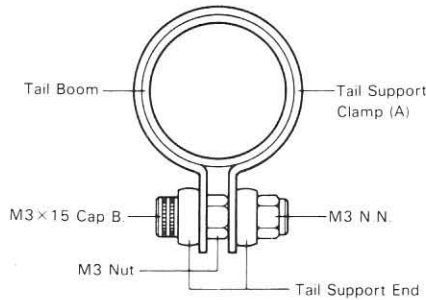
**93** Epoxy the tail support ends to each end of the tail supports. The ends must be 90 degrees to each other.

**94** Temporarily bolt the tail supports to the tail support clamps(B) located on the undercarriage brace.

M3 × 10 Cap B.	.....	2	
M3	N. N.	.....	2

**95** Bolt the tail supports the tail support clamp (A) as shown. At this time the ends must be bent a little to fit the angle.

M3 × 15 Cap B.	.....	1	
M3	Nut	.....	1
M3	N. N.	.....	1



**96** Fix the tail support clamps(B) to the brace in a position where they do not hit the body.

## 9 Roter Head Assembly Installation

**97** Install the rotor head, rotor blades and connect up the rods referring to your rotor head instruction manual.

Notice : The linkage rods and universal links are included in this kit. However, if the rods do not fit your rotor head, purchase another set. The clearance between the main and tail rotor blade must be at least 15 mm.

M3 × 20 Cap B.	.....	1	
M3	N. N.	.....	1
M2.3 × 85 Threaded Rod	.....	2	
M2.3 × 110 Threaded Rod	.....	1	
Universal Link	.....	6	

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## Important Matters of Construction and Hints

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- If the front and rear body does not fit together completely, the reason is the main and sub frame are not installed 90 degrees exactly to each other. Correct it referring to steps **5** and **85**.
- When screwing the bearing housings to the main frames, make sure that the main frames are not on a tilt, and the bottom of the frames are exactly parallel. At the same time, make sure that the top front bent plates of the left and right main frames are on the same level.
- When assembling the power unit, be careful about the center of the cooling fan and pulley and they are correctly lined up with the engine. When installing the power unit to the frame, be careful about the off center of the tip of pulley and the shaft of the pinion gear.
- When screwing the phase adjusting ring down with M4 × 4 set bolts, refer to the step **31**. If the phase ring has settled down to the wrong height, the elevator ring will not move smoothly.
- The pitch control ring and the slide ring assembly must move smoothly.
- Adjust the backlash between each gear carefully. Put some grease on the metal gear, but do not put any oil or grease on the plastic gear. It is necessary to adjust the backlash between the plastic gear and the pinion gear due to temperature changes during summer and winter.
- In the case of the gyro mount on the rear of the frame, protect its cord from engine, muffler and the sharp edges of metal parts using a cord protector and bind it to the frame.
- The drain tubing of the fuel tank must lead to the outside of the body. Put a KALT Fuel Filter between the tank and engine. The fill tube must be outside of the body.
- It is convenient idea to install a connector for plug heat on the body and wire it to the glow plug.
- Put some vinyl tape on the tail boom at the exit position from the body to avoid rubbing.

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## After Construction Checklist

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Upon completion of this kit, go back over every step to make sure that there are no loose nuts, bolts, misalignment or binding of moving components. Check all linkage for proper movement by using your transmitter.

### ■ **Center of Gravity**

This position is very critical and is located between the center of the main shaft and 5 mm forward, without fuel.

### ■ **Main Rotor Pitch Adjustment**

Follow the instructions for your rotor head. Pitch may vary according to such factors as total weight, engine power, main blade diameter and your own preferences. For initial set-up, we recommend you set a pitch of 0 degrees with minimum power, and approximately 8 degrees at maximum power.

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## **In Flight Adjustment**

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Range check your R/C equipment prior to starting the engine.

### ■ **Tracking of main rotor blades.**

Gradually open up the throttle, and when the helicopter is almost ready to lift off, watch the rotor blades to see if they are tracking the same. If not, adjust the pitch of one blade, so that they then both track the same.

### ■ **Needle valve adjustment**

Adjust mixture control screw and needle valve according to the manufactures instructions. If after flight fine adjustment is required, make sure that it is not adjusted too lean.

### ■ **Tail rotor pitch**

Face the helicopter into the wind, and gradually open the throttle. If the tail boom moves to the right (nose moving left) increase the pitch, and if it moves opposite, decrease the pitch. To adjust the tail mixing system of your transmitter, refer to the manufactures instructions.

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## **Flight Safety**

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If you are new to R/C helicopter flying, please seek assistance from an experienced R/C helicopter pilot. Initial helicopter adjustments are not easy, and a mistake in construction could bring about a serious accident. In case your helicopter should crash, or be damaged, inspect it closely for other possible damage not immediately seen. Replace all damaged or suspect parts prior to re-flying. Since control is accomplished by relatively weak radio signals, they are subject to disturbance by electric noise, so do not fly near buildings or where people or spectators are nearby. Be alert and safety conscious at all times.

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## **Spare Parts**

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Spares can be obtained from your dealer, using the parts number and name. Follow this instruction manual when repairing.

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## Specifications of 60 BARON

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- Main Rotor Diameter ..... max. 1540 mm
- Whole Length ..... 1320 mm
- Weight ..... 4.6 ~ 4.9 kg
- Engine ..... 60 size
- R / C Equipment ..... 5 or more Channel for Helicopter
- Revolution Ratio (engine : main rotor : tail rotor) ..... 10:1:5.44
- Main Rotor Rotation Direction ..... right
- Cyclic Control system ..... Bell and Hiller