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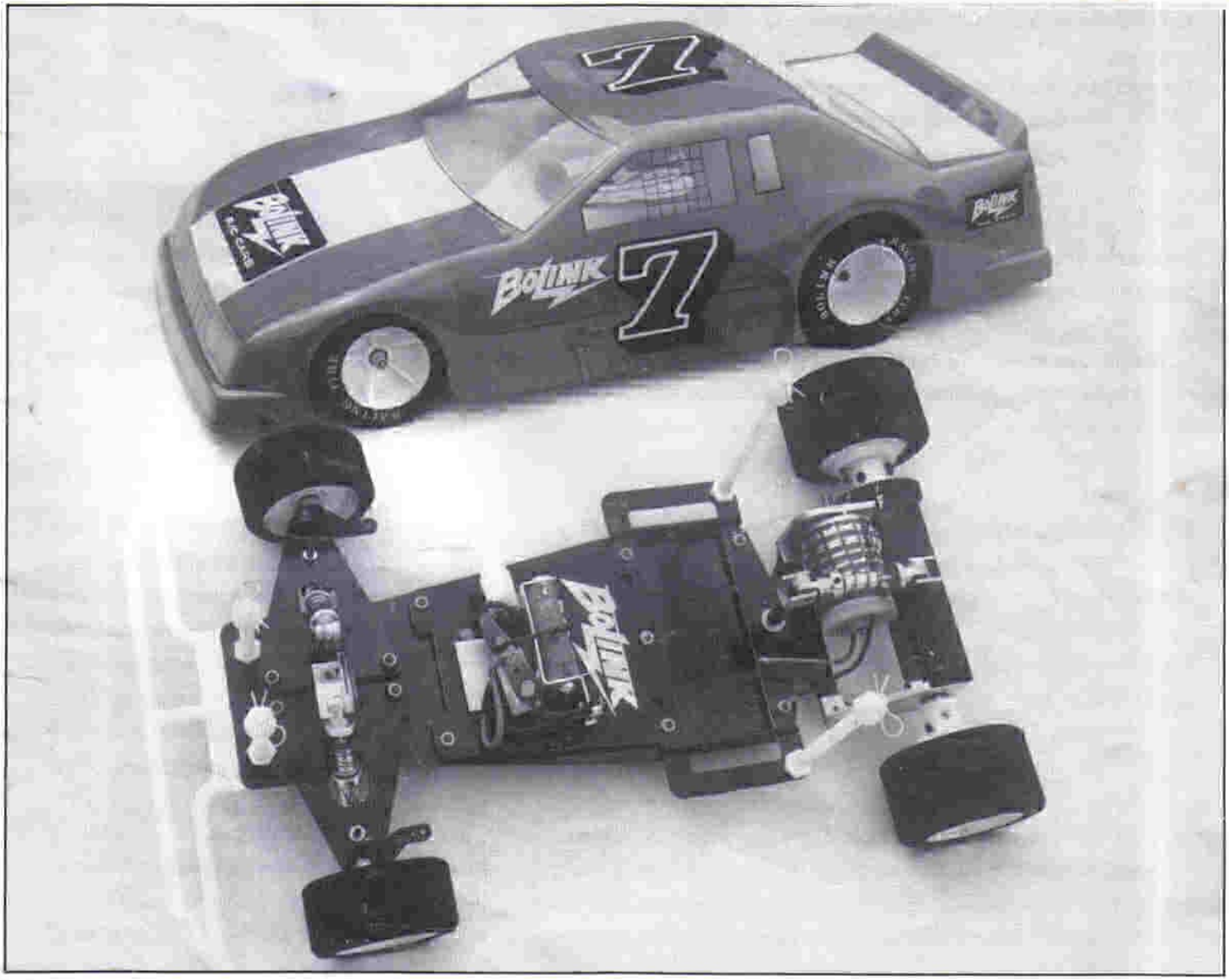
INVADER

INSTRUCTION MANUAL

BL-1361 KIT DOES NOT INCLUDE SPEED CONTROL OR MOTOR



BOLINK R/C CARS

420 HOSEA ROAD
LAWRENCEVILLE, GEORGIA 30245
(404) 963-0252

READ THIS FIRST!!

INVADER KIT INSTRUCTIONS

This manual is included with INVADER chassis kits and complete kits.

#BL-1361 INVADER Sprint Car Kit less electrics contains no motor or speed control.

#BL-1360 Stock Car Kit contains the above parts, plus Bags #11 and 17. Both kits contain body and antenna tube. Both 1361 and 1360 require a 6 cell stick type battery pack and charger.

The car requires a 2-channel radio control system with almost any size servos.

The assembly of this car requires mechanical assembly and the following tools:

Small Needle Nose Pliers
A Small Adjustable Wrench
A 1/4" Nutdriver
A 7/16" Nutdriver or Socket Wrench

We recommend the use of a liquid thread lock in some parts of this assembly. The best we have found for this use is Loctite 242 (Blue). It keeps threaded parts from vibrating loose yet the parts can be disassembled when necessary.

Be careful assembling your INVADER and you will have a race car that will work well and last a long time. Before beginning the assembly, look at the drawings and pictures to familiarize yourself with the car and parts.

ASSEMBLY INSTRUCTIONS

1. Find bag #1 and remove the contents. Note that the hardware is in a smaller bag inside the large one. Refer to the Chassis assembly drawing for this part. Mount the radio tray standoffs to the Chassis as shown in the drawing. You will use 6 screws, 4⅛" thick spacers, the 5163 T-Brace, 2 1/16" spacers and 6 jam nuts first. Put the screws through the 5060 Chassis, install spacers and jam nuts. Note on the center set that the T-Brace goes on first, then 1/16 spacers and jam nuts. All hex wrenches to hold socket screws while tightening nuts are located in bag 6.

Now install the 5160 radio tray as shown and use locknuts to attach. You should have 1 screw, 1-⅛" spacer and 1 locknut left. These will be used later to attach the front of the T-plate to Chassis and radio tray. Take the rubber grommet and lube it with a little oil and push it into the large hole in the rear of the radio tray. Make sure it is all the way in. Now stretch the large rubber O-rings over the sides of the radio tray and into the notches there. They will hold your battery pack in place.

2. Open bag #2 - Front end parts. Note that assembly drawing shows only right side of suspension. All parts for both sides are identical except for shock brackets. Attach 5168-2 shock tower to 5168-1 brace with ¼" flathead screws and this assembly to Chassis plate as shown. Wrench to fit these screws is in bag 6. Note that this assembly fits with shock tower to rear in center set of holes on front of Chassis.

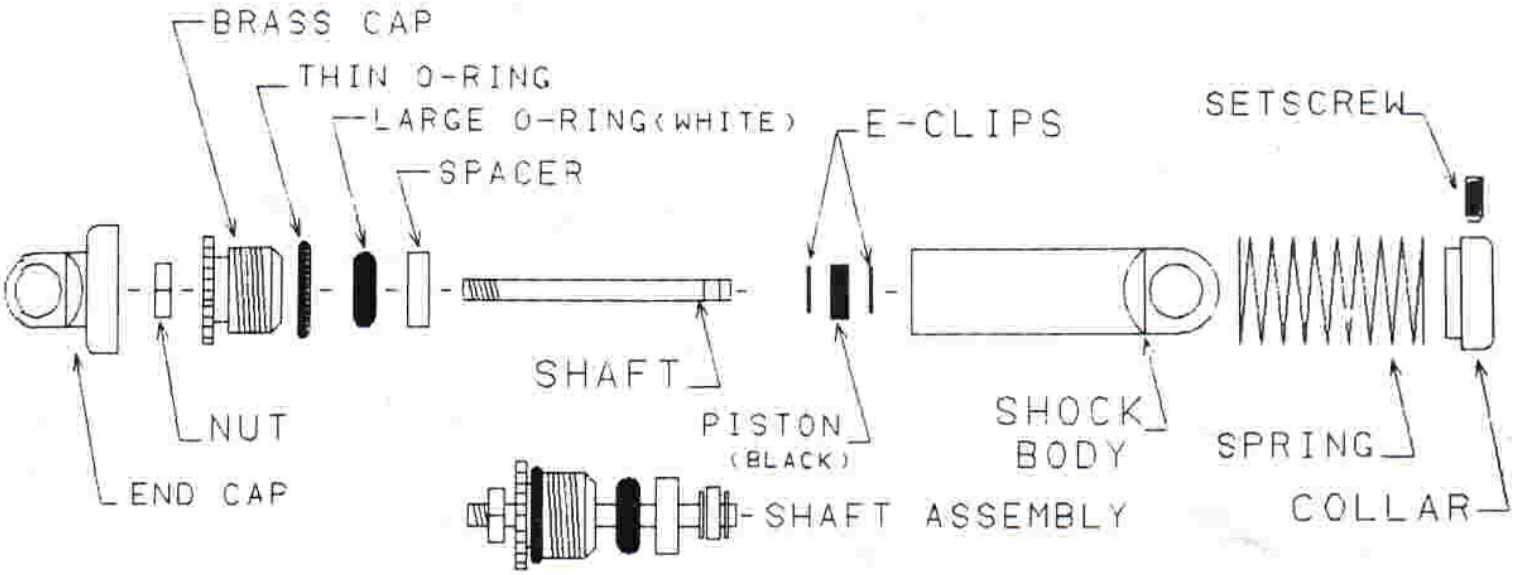
Now find four ⅝" screws. Put through Chassis and install spacers and jam nuts over them. Note the 1/16" thick spacers go on front screws before jam nuts, rear screws get jam nuts only. Tighten these screws and nuts. Now put one rubber washer on each screw. Lube screws with grease or silicone lube from shock bag. Slide swing arms on screws; install second rubber washer and locknut. Tighten locknuts only enough to remove play. Do not over tighten. If arms are tight on screws, open up the holes slightly with a small file.

Now find 2-5303 steering blocks and 2-5174 stub axles. Tap stub axles into steering blocks, install E-clip and tap until E-clip is against block as shown. Find shock brackets. Note — Vertical portion (angled) goes toward rear of each swing arm. Attach brackets to arms with 5-40 cap screws from bottom and install nuts on top. Do not tighten yet.

Find 5358-S king pins and thread a jam nut all the way on to them. Put threaded end through swingarm and shock bracket and install locknut. You should use pliers with smooth jaws to hold king pins so you will not score or mark them. If you do, take a small file and carefully remove the burrs so that steering block will fit easily. Lube top of king pins with silicone lube and install steering block assembly. Note that long portion with linkage holes goes to rear. Install 1/32" spacer and E-clip. If steering block has too much vertical play, or you cannot get E-clip on, adjust height of king pin by loosening locknut and adjusting jam nut up or down slightly. Now tighten the other screws that hold shock bracket in place. Note — This screw appears to be longer than needed. Extra length provides a stop for the steering block. Extra E-clips are for spares. ⅛" spacers are for spacing on stub axle behind wheels. Please refer to picture 3A.

3. Open bag #3 and dump contents carefully. Note that 5162 T-plate is offset and bottom side is countersunk for flathead screws. Attach 5165 motor mount to narrow side with two flathead screws but do not tighten. Attach 5166 L axle carrier to wide side with same type screws. Do not tighten. Attach 5164 brace with four 4-40 cap screws. Note the center hole should be closer to the motor mount and the front. We recommend the use of a thread locking liquid on this and some other assemblies. The best we have found that will hold and still be removable is Loctite 242 (Blue). Now tighten these and the 4 on bottom. Press in 5452 bearing in both axle holes. Install 6-32 x 1" long screw in rear mounting hole for T-plate, thread T-nut on it and tighten. A small adjusting wrench or ⅜" socket will do the job. Please refer to picture 1A.

Now find the screw, spacer and locknut you had leftover from bag 1. They will hold front of T-plate to chassis and radio tray. Slide spacer between rear of radio tray and T-brace and attach T-plate to Chassis. Install front screw from bottom and lockr on top. Parts to attach T-nut will come later.



BL-5171 SHOCK ASSEMBLY

4. Remove all parts from bag. Make sure no small parts are left inside shock body. Snap one of the small E-clips on to the groove closest to the middle of the shaft. Slide the piston (black plastic) onto the shaft and install the other E-clip. Slide the white plastic spacer down the shaft, then the white rubber o-ring.

Carefully install the thin black o-ring down past the threads on the brass end cap. Look inside the shock body, you will see a ridge about ⅛" below the bottom of the threads. Fill shock to approximately ⅛" below the ridge with BL-6028 shock fluid. Now push shaft assembly into shock slowly. Push it all the way to the bottom to remove any air in the bottom and lift up about ⅛". Carefully install brass end cap. If tightening of brass cap forces shaft out of shock, you have too much fluid in it. Remove a small amount and re-install shaft and brass end cap. Hold flat part of shock and tighten cap. DO NOT HOLD BODY OF SHOCK WITH PLIERS. This can destroy shock. Now extend shaft, install brass nut and end cap. Make sure nut is tight against cap. Use thread lock if you wish.

Slide spring down over shock body and install collar and set screw. DO NOT OVER TIGHTEN SET SCREW. These shocks come with soft springs. Stiff springs are available, order BL-5173.

5. Bag #5 contains the mount parts. Refer to included drawing for proper assembly. Tighten 4-40 x ½ screws shown carefully. Overtightening these will cause the shocks to bind on the shock bushings. Make sure to put flat washers on screws first to keep shocks from coming off. The cap screws will self-thread into the post and the other uses the enclosed nut under brace. Note that brace is offset. Center holes are closer to right side.

6. The parts you have left are the steering linkage parts. After completing your car with the parts you supply, refer to our racing hints section on how to adjust the suspension. For those of you who bought the complete kit, put the linkage parts in a bag and set aside until radio installation.

7. Differential Assembly. Remove the parts from bag 28-A. Make sure your work bench is fairly clean — dirt in your diff. will not make it work better. Take the axle out of the bag and slide it into the rear pod from the motor mount side. If it fits tight, you will need to align the bearings. Do this by sliding it through one bearing and stopping it just before it goes through the other one. Look through the bearing to see if the axle is lined up; if not, push the axle in the direction it should go to line up. Put the axle in from each side to check this, then slide it through both. If it still is not very free, put an electric drill on the end without threads, oil the bearing and run the drill for a few minutes. This will help align the bearings and polish the axle surface. Clean the axle, slide one aluminum axle washer on the long end and slide the axle in from the motor side. Put the other aluminum washer on the opposite side and slide on one of the 3511 adaptors. Find the two 10-32 set screws and carefully start them into the holes in the adaptor. Tighten them carefully — you can strip them by over tightening. Spin the axle to see if the hub runs true. If it does not, try loosening one set screw a little and tightening the other a little. It would be a good idea to take a flat file and put a small flat spot on the axle where the set screw hits. This will keep the adaptor from slipping. Check the axle to see that you have left a small amount of side play (the spacers are not tight against the bushings). Now slide one drive ring on the threaded end of the axle. Next take the same silicone you used to lube the shocks and put a small amount in each of the small holes near the center of the large axle gear.

Now open the small bag with the steel balls in it and place one in each hole. Slide the gear onto the axle. Press the aluminum adaptor into the 3511 hub as shown in the diff. drawing. Place the second drive ring on the adaptor and slide the assembly onto the axle. If it is not free on the axle, use a ¼" drill to remove any burrs from the hub, then reinstall the assembly. After the adaptor, slide the thin small diameter steel washer on, then the blue ball cage, followed by the thick steel washer. Now stop and check to see that you have the parts in the proper order. Any deviation can cause your diff. to slip and not work correctly. Now that you have checked the diff. assembly, put the bowed or cone washer on the axle with the bow or top of the cone to the outside. Install the locknut; tighten the locknut only until you have taken the side play out of the diff. parts. Hold the left adaptor while doing this. Tighten it a little at a time and check by holding both adaptors and using your thumb to turn the gear. You should tighten it until you can hold the adaptors and the gear is fairly hard to turn. Now you should be able to hold the gear, turn one adaptor and the other side will rotate backwards. Final adjustment will be done when you first run the car. You should have 4 screws left. These will be used to attach the rear tires to the adaptors.

8. Bag #8 contains the tires. Take the two larger tires and use the screws from bag 28-A to attach them. Get both screws started, then tighten both to make sure you get the tire on straight. Install the four BL-5457 bushings in the front wheels. Oil the front axles and install tires, spacers left from bag #2 and retain with 5-40 locknuts from bag #2.

9. Remove body post parts from bag #9. Mount the two front posts with two flathead screws to the two holes in the front of the Chassis. Attach the spacers and remaining two posts to the rear corners of the radio tray. Screw one nylon nut onto each post. Adjustments will be made when mounting body.

10. Open bag #17 — Motor Parts. Motor plug comes attached to wire — solder to tabs on motor. Plug has red and black wire; red is positive (+). Make sure to solder motor capacitors across positive and negative on motor. This will keep brush ARC from interfering with radio receiver. Install pinion gear on shaft with set screw provided. Back of gear should be approximately ⅛" from motor housing and set screws should be seated on flat side. Make sure pinion gear is up with spur gear. Use screws with washers to attach motor. Slide motor back until gears mesh. Run screws down until they are snug. Move motor until you feel a very small amount of play between gears, then tighten motor screws. Turn gears and make sure adjustment is correct. Note: Make sure to use short (¼") motor mounting screws.

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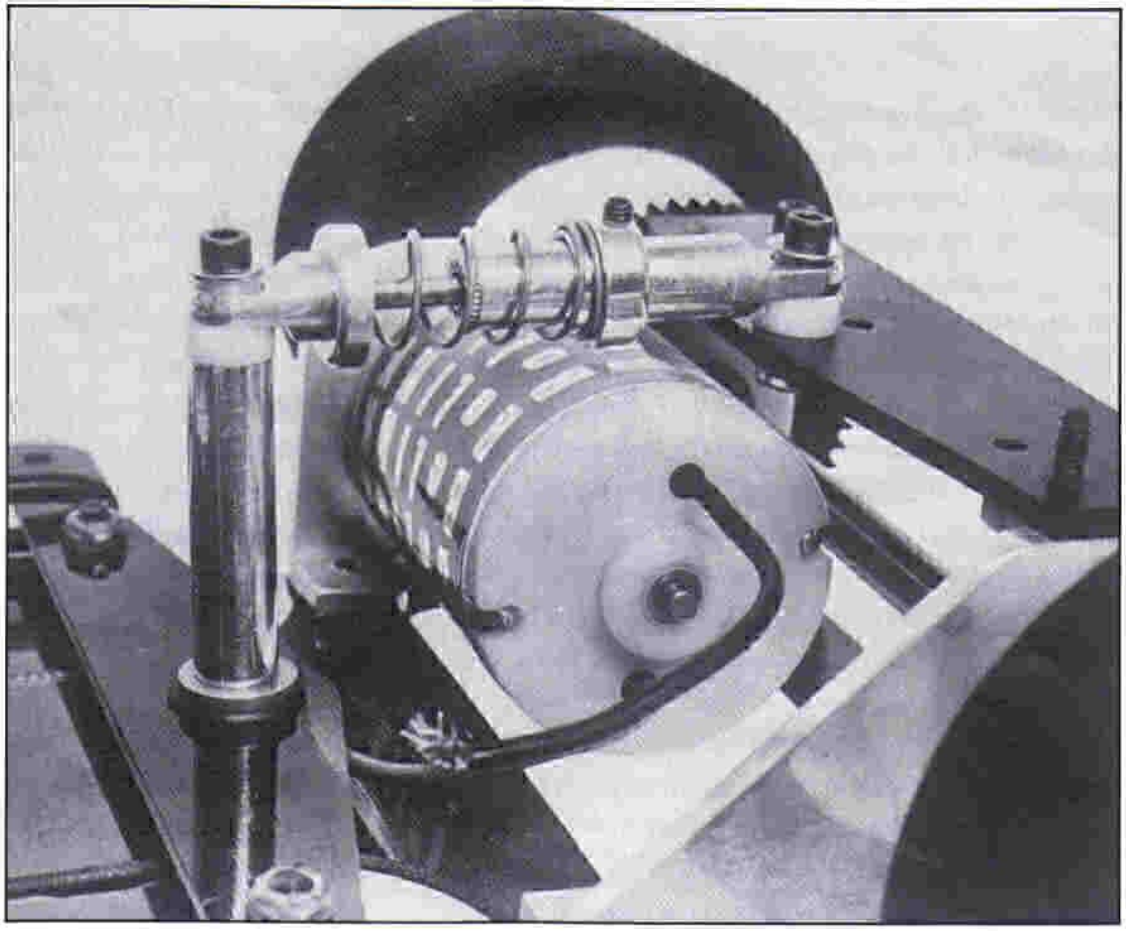
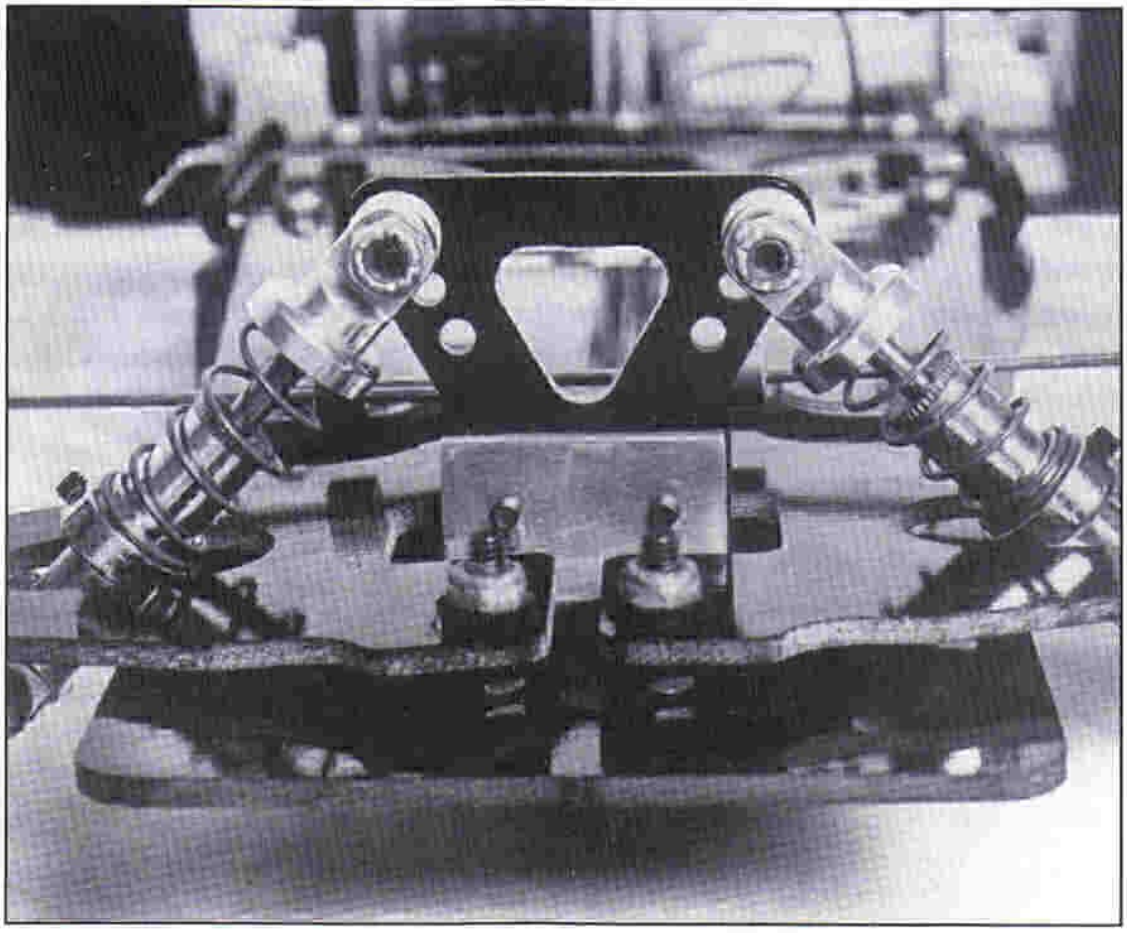


BoLINK #1-A



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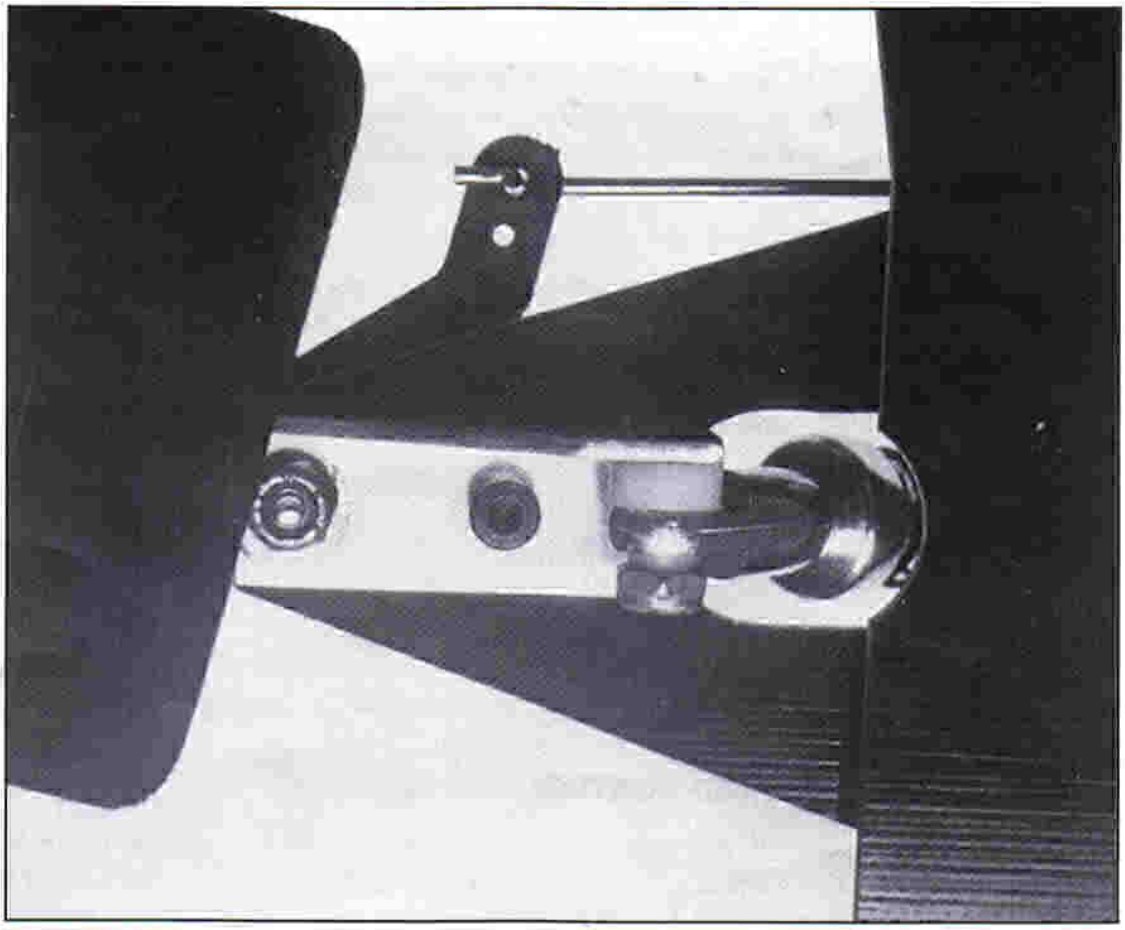
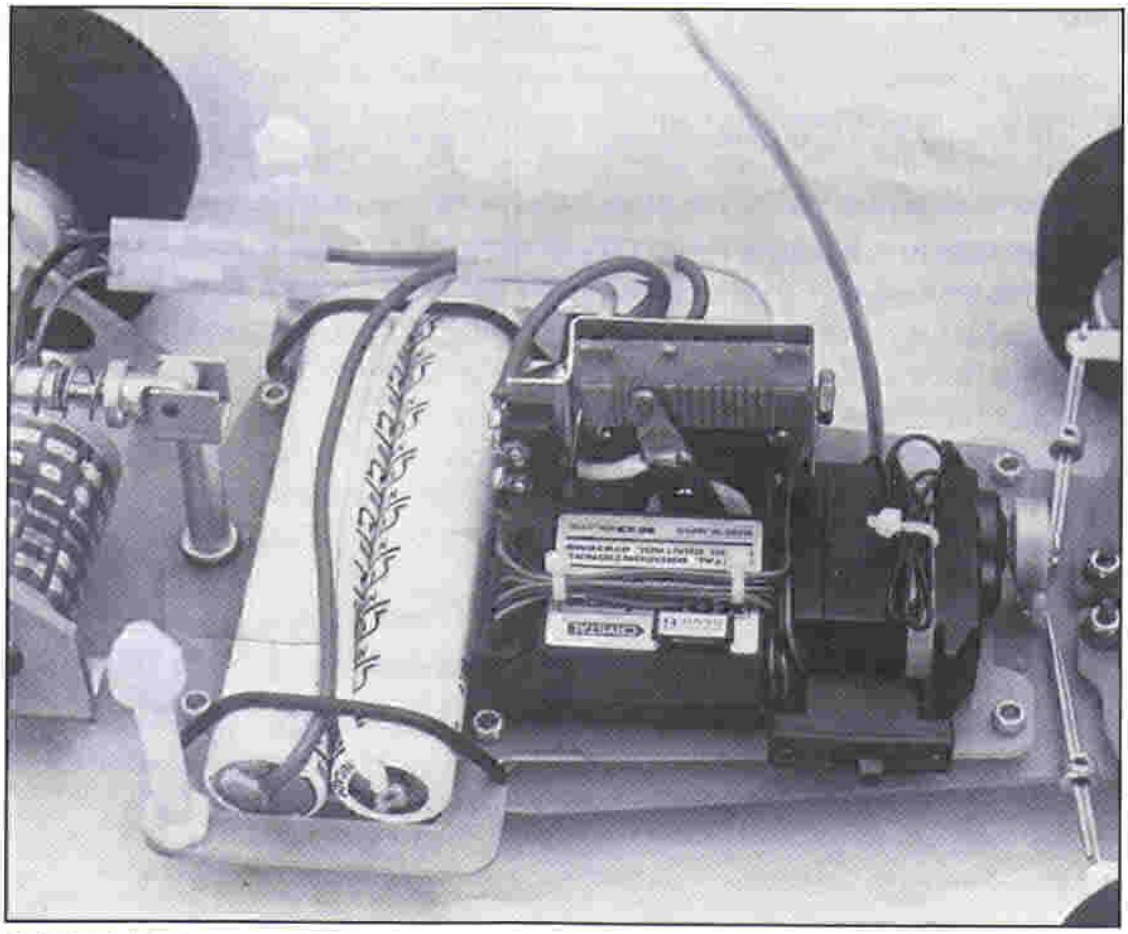


BoLINK #3-A



BoLINK #4-A

RADIO INSTALLATION

This car requires a two channel radio with two servos. The Invader radio tray is large enough to accomodate almost any size receiver and servos. After mounting your speed control to the throttle servo as described below, lay the radio gear out on the radio tray to give you an idea of how you will mount it.

STEERING SERVO

The steering servo should be mounted on the front of the radio tray with the output arm in the center of the tray and hanging down. Notice that there are two ¼" holes toward the front of the radio tray that are offset to one side. Your steering servo should be set up so that the body of the servo is offset in the same direction so that you can use a tie strap through these holes to help the steering servo in place.

We recommend the use of a servo saver on the steering servo to keep from damaging the gears in case of a hard crash. See the BoLINK price sheet for the correct one to fit your servo. If your steering servo arm hits the chassis plate, trim a little off or raise the servo slightly. Wipe the bottom of the servo and radio tray with a dry rag and apply a piece of servo tape supplied in bag #11, or if you bought the Chassis Kit, use BL-1857. Stick the servo down firmly with the output arm in the center. Use the wire linkage parts from bag #6 to go between the servo output and each steering block. After making sure steering servo is centered, set linkage so front tires are straight and have 0 to 1/16" of toe-in.

SPEED CONTROL AND SERVO

The BoLINK 4620 speed control is pre-wired and ready to mount to almost any size servo. The servo and bracket should be wiped clean before installation. Cut a piece of servo tape large enough to cover flat part of bracket and stick it on. DO NOT remove protective paper from the other side. Hold bracket against one side of servo, align it so that servo output is centered on the speed resistor and the top of the speed resistor is about level with the top of the servo wheel. Mark the servo or bracket for alignment, then peel the protective paper and stick the bracket to the servo.

If you plan to operate your receiver from the car battery pack instead of the one that comes with radio, you will have to cut the lead wires going to the receiver battery pack and wire them to the speed control as shown in the wiring diagram.

Charge your car battery pack according to the instructions that came with it so you can test your radio. Hook up all receiver and servo wires; install batteries in your transmitter and turn on transmitter and receiver. Move throttle on transmitter to full speed and turn receiver switch off while holding it there. This will stop steering servo in the full speed position so you can mount the wiper arm. Mount wiper arm to servo wheel so that wiper button is on full speed band to speed control. Make sure that wiper makes good contact with resistor. Now turn radio system on and set low speed throttle stop so that the wiper arm stops somewhere in braking area as shown on wiring diagram. Moving the throttle back on your transmitter should make the wiper arm contact the lever on the speed control micro switch for reverse. The wiper also must be in contact with the brake band on the speed control. You can increase the amount of braking power by setting your transmitter throttle stop to make the wiper stop closer to the micro switch.

Now make sure that the steering trim lever on your transmitter is centered. If the servo arm on your steering servo is not pointed straight down, remove and replace so that it is. Now adjust the steering linkage so front wheels are straight. Now that all radio gear is working, turn it off so you can mount the rest of it to the radio tray.

One good way to mount the speed control is to lay the servo down on the radio tray with the wiper arm towards the center of the car. The micro switch should be just in front of the batteries. There are two holes in the radio tray that you can use to run a tie strap around the servo and speed control bracket to help the servo tape hold the bracket to the servo and the servo to the radio tray. Please refer to Radio Installation picture.

Now mount the receiver and radio switch to the radio tray. BoLINK has provided an antenna support tube so you can use your receiver without cutting the antenna wire. Drill a 1/8" hole in the radio tray for mounting the antenna. Screw one of the #6 nuts from bag #11 about 1/4" onto antenna tube. Now thread the antenna wire through the other nut, through the fiberglass and through the tube itself. Tie a small knot in the end of the antenna. Put tube through the radio tray; slide the nut up the wire and screw onto the tube and tighten. Pull excess wire back and tape it and extra length of servo wire to steering servo or receiver.

Your Invader race car should now be complete with the exception of the body. Refer to body mounting instructions next.

BODY PAINTING INSTRUCTIONS

All of BoLINK's bodies are made from the highest quality polycarbonate (lexan) available. BoLINK uses no mold releases or other chemicals that will affect the adhesion of paints that are made for polycarbonate. Several brands are available in spray cans or bottles that can be brushed or thinned and sprayed. Most types of automotive lacquers will stick, but you should be careful not to use a type of thinner that will attack the body and cause it to craze or crack. Some types of paint may seem to go on O.K., but will cause the body to become brittle.

You should not cut out the body before painting, but it is a good idea to set the body over the chassis and mark the holes for the body posts, wing wires and even mark the wheel cutouts. You can go ahead and drill the post holes and cover them on the outside with tape before painting.

Mask off windshield, other windows and other areas not to be painted, then mask areas for separate colors. One way to add fancy designs or stripes is to lay the tape on a clean piece of glass and cut out the designs, then peel it off the glass and stick it inside the body. Another method that works well is to put a large piece of tape inside the body, draw out your design, and then cut it out very carefully with a hobby knife. If you cut too deep, you will cause the body to crack along the cut line. You can use automotive pinstriping tape to make narrow stripes or outline large areas, then fill in with masking tape. The plastic type tape gives a sharper line than masking tape.

Make sure to press down all tape edges just before you start painting. Most types of paint will work better painted in two light coats rather than one heavy coat.

After the body is completely dry, cut out on the bottom trim line and cut out wheel wells. Trimming can be done in several ways. One way is to use scissors or tinsnips. Another is to score the body with a hobby knife, then bend the body away from the cut side and it will break along the line. Air scoops or grill areas that you want to be flat black should be painted on the outside.

BoLINK makes a large variety of decals to finish out and dress up your R/C body. You can get racing numbers in several styles, logos for assorted manufacturers that will make your body look more like a race car. Some of BoLINK's decals, including our "Rad-Cals", are available in bright dayglo colors.

After completing the body, your Invader should be ready to race. There are still some adjustments to make for good performance. Fully charge the battery pack according to the instructions. Take your Invader out to a large open area to begin.

The differential will likely be your first adjustment. Set the car down and give it full throttle for a second. You should hear the diff. slip slightly (the motor should pick up speed slightly before the car moves out). If the diff. is too loose tighten it a very small amount at a time. If it is too tight, your car may spin out too easily. Play with it until you find what is best for you. With the car sitting on the ground, the front tires should be sitting flat. As you begin to run the car, keep a close eye on the front tire wear. If the tires start to wear on the inside, tighten the springs on the front shocks.

Adjusting the spring on the rear shock also will change the car's handling characteristics.

Good handling is a balance of front and rear traction. You should always run the hardest combination of tires that will make your car handle well. You can affect the car's handling without changing tire compounds by using a traction compound such as BoLINK's Max-Trak (BL-6029) for outdoor racing or BoLINK's carpet tack for carpet. For instance, if you car has good front bite and the rear is a little loose, use the carpet tack or Max-Trak on the rears to bring up the bite without going to a softer tire that may cause your car to hop. This is usually caused by the rear roll being too loose or having tires that get enough traction to cause the car to lift up on the inside, lose traction and then get bite again. Listed below are the tire compounds available from BoLINK at the present time.

FRONTS		REARS	
Orange Dot	Extra Firm	Blue Dot	Firm
Blue Dot	Firm	Green Dot	Medium
Green Dot	Medium	Green/Yellow	Split
Yellow Dot	Medium Soft	Yellow	Medium Soft

By paying attention to what happens each time you make an adjustment to the suspension, differential, gear radio, etc., you will learn quickly what you need to do to set up your car for different types of tracks and track surfaces.

BoLINK has a complete line of replacement parts for this car, a large variety of bodies, different tire compounds, as well as new accessories to customize and improve the performance of your Invader.

INVADER PARTS LIST 1360

BL-5060	$23.00	Invader chassis
BL-5162	10.00	Invader T-plate
BL-5165	15.00	Motor mount
BL-5166	13.00	Left axle carrier
BL-5164	3.00	Rear brace
BL-5163	3.00	T-brace
BL-5160	16.00	Radio tray
BL-5161	10.00	Front swing arms (pr.)
BL-5168	6.00	Shock tower and support
BL-5169	3.50	Shock brackets
BL-5305	2.00	Steering blocks
BL-5174	3.50	Stub axle (pr.)
BL-5358-S	4.00	King pin post (pr.)
BL-5356	2.75	T-nut and damper
BL-5167	4.50	Rear shock mount
BL-5457	1.25	Front wheel oilite bushing
BL-5452	1.50	Rear axle oilite bushing
BL-5152	2.50	Battery hold down O-rings
BL-4620	24.95	Resistor speed control
BL-5308	2.50	Steering linkage kit
BL-5728	5.50	Replacement diff. axle
BL-5733	4.00	Service kit for BoLINK diff.
BL-5733-B	1.00	Replacement balls for BoLINK diff.
BL-5735	2.25	Thrust bearing with washers
BL-5737	2.00	Replacement cone washer for diff.
BL-7217	1.50	Replacement diff. nuts ¼ 20 nylon
BL-3511	3.95	Nylon wheel hubs (pr.)
BL-1851	1.00	Antenna support tube with hardware

Fut 5269

HARDWARE

BL-7010	1.50	4/40 x ¼" flat head socket screws (T-plate to motor mounts)
Bl-7015	1.50	5/40 x ½" flat head socket screws (Radio tray mounts)
BL-7016	1.50	5/40 x ⅝" flat head socket screws (Swing arm to chassis)
BL-7025	1.50	4/40 x ¼" socket head cap screws (Shock plate)
BL-7031	1.50	5/40 x ½" socket head cap screws (Wheel screws)
BL-7206	1.50	5/40 Jam nuts
BL-7207	1.50	5/40 Lock nuts
BL-7020	1.50	6/32 x 1" flat head phillips (T-plate)
BL-7501	1.50	⅛" I.D. Rubber washer (swing arms)
BL-7506	1.50	3/16" I.D. Rubber Grommet (T-nut)
BL-5253	1.30	Nylon spacer asst. (Radio tray & swing arms)
BL-5221	1.00	C-clips (for King pins)
BL-7600	1.50	Hex wrench set

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