

**XL2P Pistol Grip  
R/C System**



***AIRTRONICS***®

# XL2P Pistol Grip R/C System

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## THANK YOU FOR SELECTING AIRTRONICS

We appreciate your purchase of this new Airtronics XL2P Two-Channel Radio Control System. These instructions are intended to acquaint you with the many unique features of this advanced radio. Please read them carefully so that you may obtain maximum success and enjoyment from its operation.

We ask that you pay particular attention to the design of the transmitter. Notice that it has been human engineered for the most natural and precise operation of all land and water-borne models; it is not just another model airplane transmitter with some channels omitted! This unprecedented design was arrived at after careful study of the requirements imposed by the fast and maneuverable car and boat models of today. It is no longer necessary to build and operate your models within the limitations imposed by the transmitter design . . . this transmitter was made especially for them!

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## SAFETY

R/C modeling is one of the most enjoyable and rewarding hobbies available today. The rewards and satisfaction from R/C are only there if safety is on the R/Cer's mind whenever he is operating his equipment. You must keep in mind at all times that you are responsible for the safety of not only yourself but those spectators or other modelers that are near you whenever you operate your R/C model. This is not a responsibility that should be taken lightly.

Though model car and boat operation is not considered as potentially dangerous as model airplanes, both are now capable of attaining speeds fast enough to damage themselves and to cause injury to anything or anybody they may happen to come in contact with at high speeds.

The instructions and installation guidelines presented in this manual should be followed at all times. Deviating from the instructions could create an unsafe condition and cause your model to not respond properly to your commands. If you are new to the R/C hobby, it is best to ask advice of an experienced modeler who can check your radio installation.

The rules for radio control model operation and competition and the safety standards for their operation are carefully laid down by national and in some cases, international organizations. They also sponsor and manage all meets and contests; all local clubs belong to these national associations. They, both the local and national clubs, are your best source of technical and competition information. Depending on your particular modeling interests, we suggest that you contact one of the groups listed, who will in turn direct you to the nearest club.

### MODEL POWER BOATS, RACING

- International Model Power Boat Association.  
38355 Hidden Lane  
Mt. Clemens, MI 48003
- NAMBA International, Inc.  
6073 Sunrise Dr.  
Lower Lake, CA 95457

### MODEL POWER BOATS, SCALE

- North American Scale Warship Combat Ass'n.  
P.O. Box 116  
Gig Harbor, WA 98335

### MODEL SAIL BOATS

- American Model Yacht Ass'n.  
2716 Briarwood Dr., West  
Arlington Heights, IL 60005

### MODEL CARS, RACING

- Radio Operated Auto Racing  
P.O. Box 29362  
Cumberland, IN 46229

### MODEL CARS, OFF ROAD

- Off Road R/C Ass'n.  
P.O. Box 8938  
Calabasas, CA 91302-8938



## AIRTRONICS FEATURES

### TRANSMITTER

- High, 500 milliwatt R.F. output.
- Unique pistol grip design, with reversible handle for left handed operation.
- Trigger operated throttle, with proportional brake, trim, end point adjustments, and servo reverse.
- Multi-function "Back" switch for reverse, preset throttle and/or brake operations.
- Wheel type directional control, with trim, variable dual rate, and servo reverse.
- Externally adjustable steering wheel tension.
- Calibrated R.F. power output meter.
- High visibility LED "ON" indicator.
- Safety strap hook and carrying handle.
- Available on all approved 27 and 75 MHz Amplitude Modulation frequencies. 27 MHz frequencies changed by plug-in crystals; 75 MHz frequency changes require Service Center crystal change and tuning.
- 27 MHz Crystals easily accessible on front panel.
- Easily changed alkaline battery power.
- Ni-Cd battery conversion and charger available.
- Short retractable antenna, 24" in length.
- Measurements overall: 6.9" x 9.5" x 5.25".
- Weight, including alkaline cells: 24 ounces.

### RECEIVER

- Small size, 1.9" x 1.2" x 0.75"
- Lightweight, 1.0 ounce with crystal.
- Ruggedized shock resistant construction.
- Externally accessible crystal for rapid changes.
- Standard Airtronics connectors for compatibility with all Airtronics servos and accessories.
- Power required, 4.8 - 6.0 volts: supplied from alkaline or Ni-Cd cells; from speed controller; or from drive batteries with proper regulator.
- Short, easily installed 19" antenna.

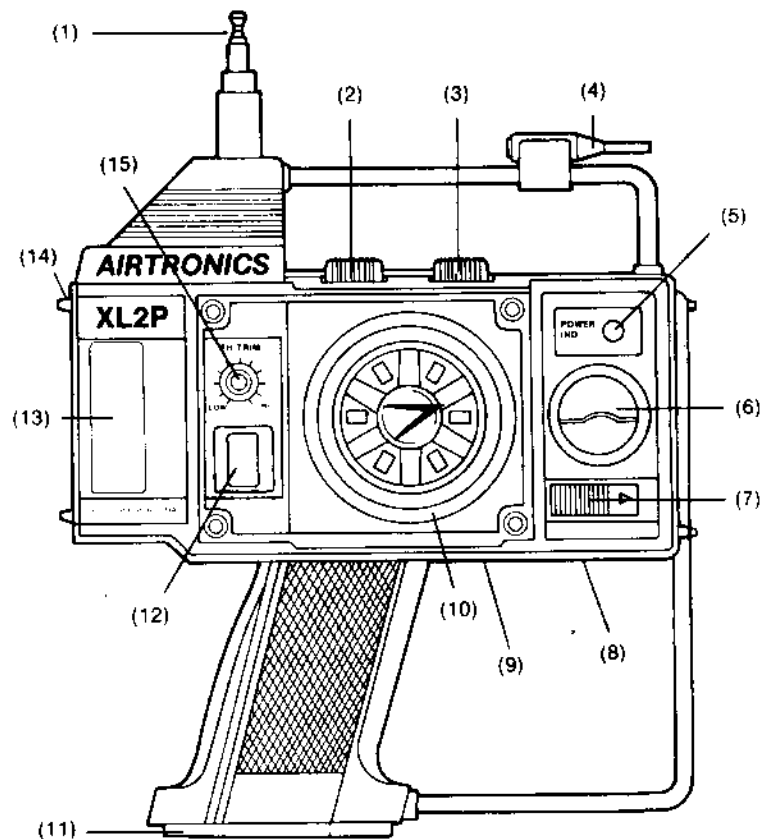
### SERVOS

The Airtronics XL2P is available in three versions with different servos for specific applications.

- XL2P/102 with Heavy Duty Standard Servos. Weight 1.8 oz. Torque 48 oz. in. Size 1.54" x 0.70" x 1.42". Transit time (90°) .03 sec.
- All feature I.C. amplifiers and carbon pots with carbon button wipers for precision and long life.
- Compatible plug-in speed controllers and sail winches available for specialized applications.

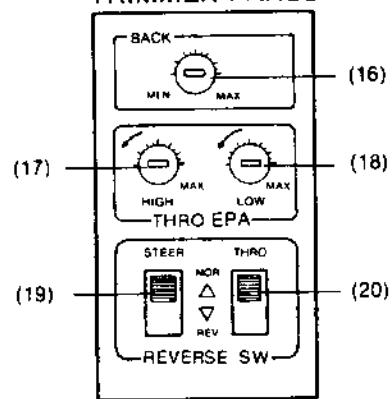


# AIRTRONICS XL2P TRANSMITTER



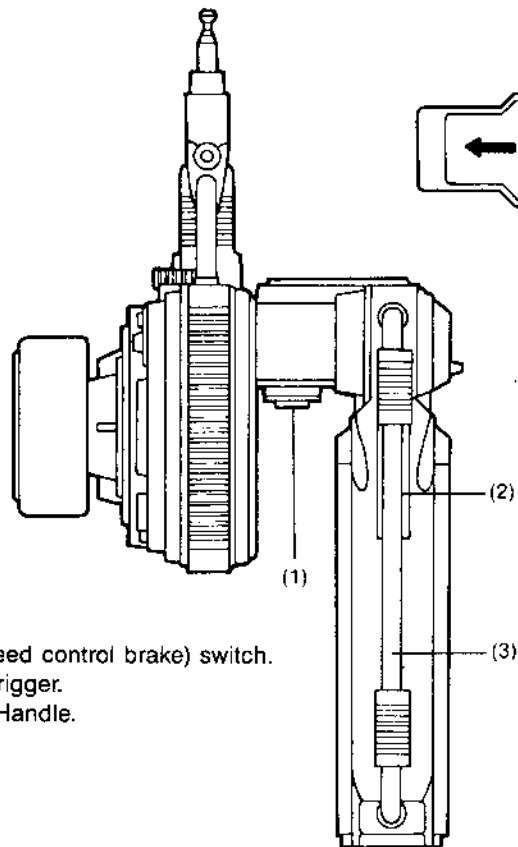
1. Retractable Antenna
2. Steering Dual Rate Adjust
3. Steering Trim
4. Mini Screwdriver Holder
5. LED "ON" Indicator
6. R.F. Output Meter
7. "ON-OFF" Switch
8. Ni-Cd Charging Jack
9. Steering Tension Adjust
10. Steering Wheel
11. Battery Compartment Cover
12. Crystal Holder
13. Trimmer Panel Cover
14. Safety Strap Hook
15. Throttle Trim
16. "Back" Control Adjust
17. Throttle E.P.A. High
18. Throttle E.P.A. Low
19. Steering Servo Reverse Switch
20. Throttle Servo Reverse Switch

## TRIMMER PANEL



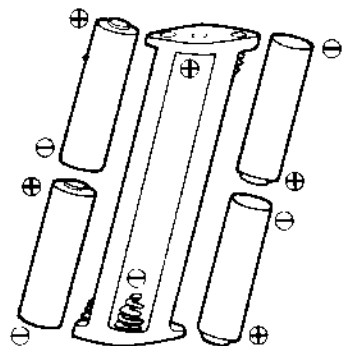
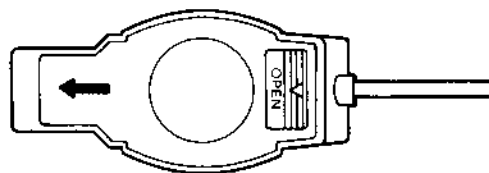


## TRANSMITTER SIDE VIEW



Back (Speed control brake) switch.  
Throttle Trigger.  
Carrying Handle.

## TRANSMITTER BATTERY INSTALLATION



The transmitter batteries are located in the pistol grip handle. To install or replace, first open the bottom cover. Press down on the end marked "OPEN," and slide cover in the direction of the arrow.

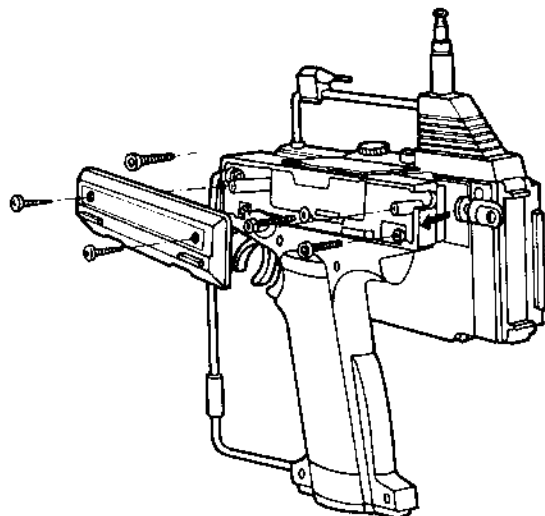
The battery holder will now drop out. Install eight Alkaline Type "AA" dry cells as shown. Observe the polarity (positive and negative) markings on the cells and on the sides of the battery holder. Notice that the contact springs inside the holder always go to the cell negative end.

Install the battery holder back in the handle; the slanted ends should match and the end of the battery holder with the two contacts goes in first. Replace the compartment cover.

An Airtronics rechargeable Ni-Cd battery pack is also available. It is installed in the same manner, except that the wire harness from the battery must be plugged into a socket located under the compartment cover. Charging is through the socket under the switch.



## TRANSMITTER HANDLE REVERSE

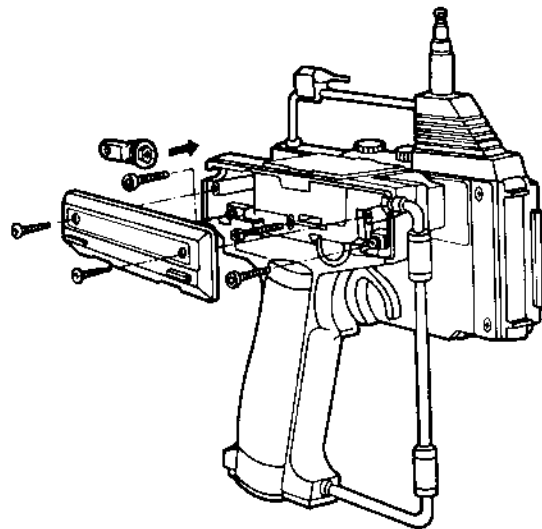


### TO REMOVE HANDLE:

1. Remove the two screws holding the rear handle cover; remove the cover.
2. You will now see three Allen Head screws holding on the handle. Using a 3/32" Allen wrench, remove these screws.
3. Remove the safety strap hook from its socket.
4. Remove the pistol grip handle, including the metal carrying handle. Notice the two wire harnesses still connected.

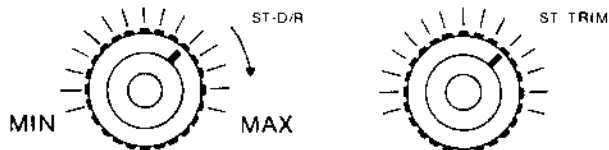
### TO REINSTALL HANDLE:

1. Rotate handle half a turn and place into position. The carrying handle now fits into the socket previously occupied by the safety strap hook. Route the wires out of the way.
2. Replace the safety strap hook in the opposite socket.
3. Replace the three Allen Head screws. Do not over tighten.
4. Replace the rear handle cover and reinstall the two retaining screws. Do not over tighten.
5. Check for proper operation. There is no control reversal!





## TRANSMITTER STEERING ADJUSTMENTS



### STEERING DUAL RATE ADJUSTMENT

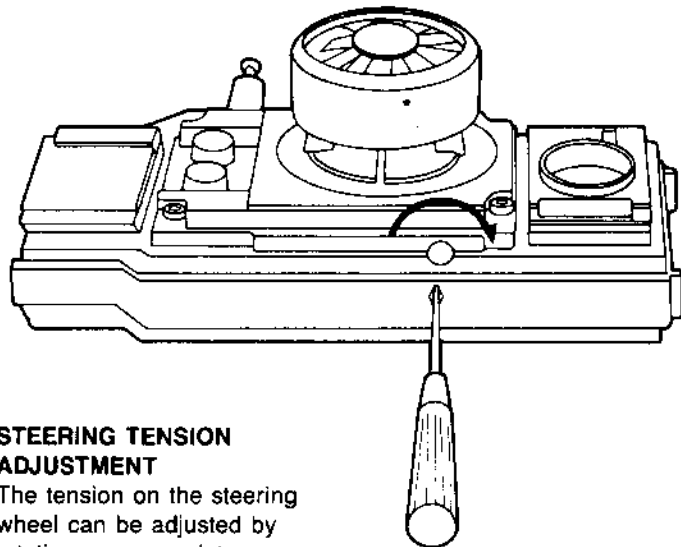
The Steering Dual Rate Adjustment is the left of the two knobs located on top of the transmitter. It is used to reduce the overall throw of the steering servo. With the Dual Rate knob at MAX, the servo will rotate 90° with full steering wheel movement. At the MIN position of the Dual Rate knob, the servo throw is reduced to 45°. Servo rotation is reduced equally on both sides. It is recommended that the Dual Rate be set in its center position, and steering ratio adjustments be made with the mechanical linkages. Once the proper ratio is found, in-motion under- and over-steering adjustments can be made with the Dual Rate knob.

### STEERING TRIM ADJUSTMENT

The Steering Trim Adjustment is the right of the two knobs located on top of the transmitter. It is used to make any small corrections required to maintain the model in a perfectly straight course. The Steering Trim has a wide range; about 15°. It is recommended that permanent mechanical adjustments be made to the model's steering arms, so the Trim knob is centered, and thus retains full trim capability . . . and is easy to remember!

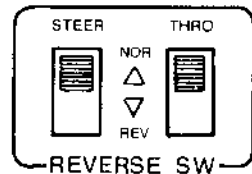
### SERVO REVERSE SWITCHES

The Steering and Throttle Servo Reverse Switches are located on the trimmer panel. They are used to reverse the direction of rotation of the respective servos.



### STEERING TENSION ADJUSTMENT

The tension on the steering wheel can be adjusted by rotating a cross-point screw accessible through a hole in the bottom of the transmitter. Clockwise increases tension!

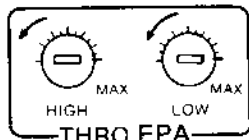
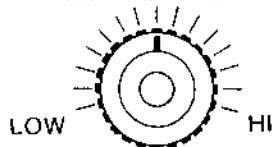






## TRANSMITTER THROTTLE ADJUSTMENTS

TH—ALT—TRIM



## TRANSMITTER THROTTLE/BRAKE ADJUSTMENTS

The trigger operated Throttle/Brake normally provides 80° of throttle servo throw and 30° of brake servo throw. Servo movement can be varied with the following two controls.

### THROTTLE TRIM

The Throttle Trim is the front panel mounted knob located just over the crystal holder. It will vary the servo center position between throttle and brake by 18°, effectively changing the point at which the brake takes effect. Soft or hard brake action is possible.

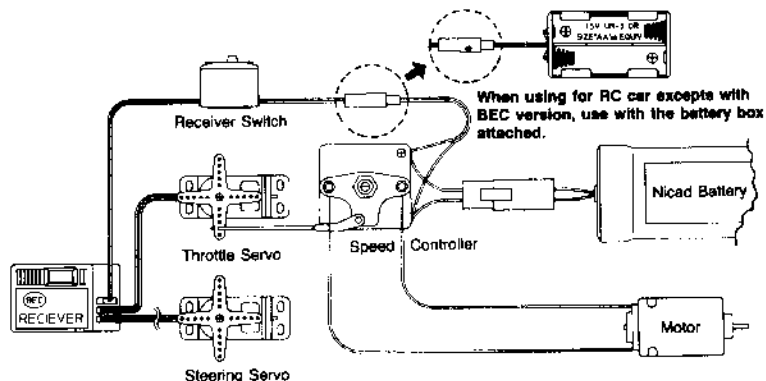
### THROTTLE END POINT ADJUSTMENTS

The Throttle End Point Adjustments (EPA) are located on the trimmer panel. They control the amount of servo travel for the throttle and brake. The trimmer marked "HIGH" will vary throttle servo travel from 20 to 80°, the one marked "LOW" will vary brake servo travel from 10 to 30°. The effect of the EPA trimmers is reversed whenever the Throttle Reverse Switch, located next to the Steering Reverse Switch, is in the "REV" position.

### BACK SWITCH

The Back Switch is located on the underside of the transmitter, between the handle and the front section. It is operated by the thumb of the trigger hand. It can be used to provide "BACK" (reverse) or throttle/brake action as determined by the "BACK" trimmer.

## SYSTEM CONNECTIONS



Shown here are the connections for the model mounted components. The sockets for the battery (BATT), throttle (THRO) and steering (RUDD) are clearly marked on the receiver's case. If Ni-Cd batteries are used, a switch harness with a charging connector is available. The rubber and metal grommets furnished should be used whenever possible in mounting the servos.



## GENERAL INFORMATION

### RECEIVER BATTERY INSTALLATION

The receiver uses four alkaline "AA" batteries for power. They should be installed in the holder furnished, observing carefully the polarity (positive and negative) markings on the inside of the holder.

### RECHARGEABLE BATTERY CONVERSION

An Airtronics Rechargeable Battery Conversion is available for greater convenience and reliability. It consists of an eight cell transmitter battery, a four cell receiver battery, and a dual charger. Initially, the new Ni-Cds should be charged for 24 hours; subsequently, they will require only 10 - 12 hour charges. It is recommended that charging take place overnight prior to each day's operation.

### OPERATING TIME

Operating times vary depending on the nature of the model and the equipment being used. Normally, a fresh set of alkaline cells is good for 4 to 5 hours of operation. A freshly charged set of Ni-Cds will provide 2 to 3 hours, however they have the advantage of starting off with full capacity every time and they may be revived hundreds of times.

### METER AND INDICATOR LED

It is recommended that the meter and indicator LED be visually checked every time the transmitter is turned "ON". They are your Go-No-Go signals, if either is not indicating normally, model control will be affected. The meter should be in the silver; yellow is marginal and red is a definite No-Go. Abnormal indications will generally be caused by low batteries, which must be replaced if dry, or recharged if Ni-Cd. Continuous abnormal indications should be checked by Airtronics or an authorized Service Center. If needed, call our Customer Service Section for information.



## OPERATING FREQUENCIES

The Airtronics XL2P R/C system is available on the following non-flying model AM frequencies. Colors and channels shown are as established for identification.

27 MHz			64	75.470	Blue/Yellow
Frequency	Color		66	75.510	Blue/Blue
26.995	Brown		68	75.550	Blue/Gray
27.045	Red		70	75.590	Purple/Black
27.095	Orange		74	75.670	Purple/Yellow
27.145	Yellow		76	75.710	Purple/Blue
27.195	Green		78	75.750	Purple/Gray
27.255	Blue		80	75.790	Gray/Black
			82	75.790	Gray/Red
75 MHz			84	75.870	Gray/Yellow
Channel	Frequency	Color			
	62	75.430			Blue/Red

27 MHz frequency changes to both the transmitter and the receiver may be made by changing the crystals.

75 MHz frequency changes to the receiver may be made by changing the crystal, however 75 MHz frequency changes to the transmitter may only be done by the Airtronics Service Center. Band changes, from 27 MHz to 75 MHz, or vice versa, can not be made.

Only Airtronics crystals will work in this system with the proper precision and power. They are available on all of the above frequencies at all times. New frequencies are scheduled to be available in 1988, and again in 1991, they will be added to our list as soon as they are legal for use.

Frequency identification with antenna-mounted flags of the colors as indicated above is very important to prevent interference to each other. Flags of the proper type and color are available from Airtronics Customer Service Section.



## GENERAL OPERATING INSTRUCTIONS

### RANGE

Your Airtronics XL2P R/C System has more than adequate range to operate the average sized model well beyond the visual range possible. However, its range can be somewhat reduced by radio noise generated within the model. A drive motor with dirty or worn brushes, or a metal to metal, make and break linkage, are examples. It is very important that this noise be detected and eliminated if it is present. To do so, place your model on a non-metallic support, such as a wooden chair. Support the rear wheels off the surface if it is a car, be sure the propeller is clear if it is a boat. With the XL2P system turned on, transmitter antenna down, and without the drive motor operating, walk away from the model, with the antenna aimed directly at it. Operate the steering servo only; a distance of from 30 to 60 feet will be obtained. At some point, the servo will operate erratically, indicating the end of the operating range. Now, operate the motor, be it electric or glow plug, and again check this range. Some decrease is normal, and 10 - 15% is acceptable, but anything over that should be corrected before running the model.

Most electric motors generally have some noise reduction capacitors connected across the brushes. If yours does not, check its or the model's instructions for the proper type and value. Glow engine noise can be eliminated by the use of plastic control clevises or bonding wires connected to metallic moving parts. With the aid of an assistant, an antenna extended test, with the model on the ground or water, should result in a greater usable range than that at which the model will normally be operated. Do not attempt to run the model without it.

### TRANSMITTER ANTENNA

The transmitter antenna should always be fully extended during operation of the model. The antenna is shorter than usually found on R/C transmitters, for less physical interference with nearby drivers during competition events. It is extended by pulling it out by the tip, however, when it is being retracted, do so from the base, a couple of sections at a time. Pushing on the tip to collapse the antenna will sometimes cause it to bend or kink, after which it will not operate easily and often break at the damaged point.

### MAINTENANCE

Your Airtronics R/C System requires very little maintenance under normal operating conditions. It should be kept clean, and stored in a protected area when not in use. Keeping the transmitter in a plastic bag except when actually using it is recommended, cleaning should be done with a slightly dampened rag. If the equipment is not to be used for any period of time, charge the Ni-Cds, if used, before putting it away. If it is alkaline powered, remove all cells from the equipment and from the holders.

After each day of operation, you should carefully check all the connections and mounting screws of your radio equipment. No matter how securely you installed those items, they may eventually work loose. Periodic inspection can eliminate the possibility of model damage.

Another good maintenance habit is to "preflight" your equipment religiously before each day's operation. This should include a range check as previously described, a test of the servos for normal operating speed, and general physical condition of all components.