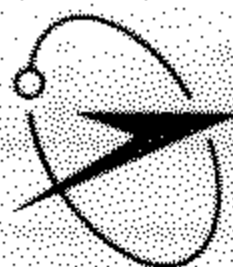
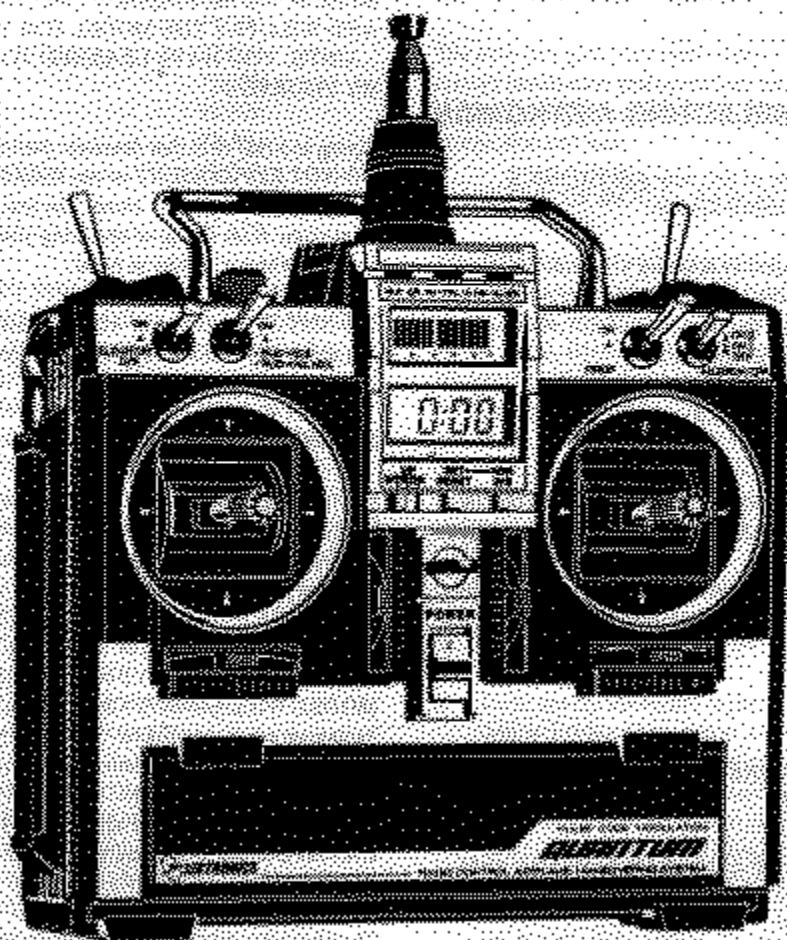


COPY



AIRTRONICS[®] INC

QUANTUM PCM 8P
RADIO CONTROL INSTRUCTION MANUAL



QUANTUM PCM 8P

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NOTE: FOR BATTERY CHARGING INFORMATION AND INSTRUCTIONS ON LEARNING TO USE YOUR AIRTRONICS RADIO CONTROL SYSTEM, PLEASE SEE THE AIRTRONICS INSTALLATION FUNDAMENTALS AND GUIDELINES MANUAL.

THANK YOU FOR SELECTING AIRTRONICS

We appreciate your purchase of this new AIRTRONICS Quantum PCM 8P Radio Control System.

These instructions are intended to acquaint you with the many unique features of this modern, state-of-the-art equipment. 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 control of your choice of flying models.

Be certain to read all of the material in this manual, as well as that in the Fundamentals and Guidelines Manual.

SECTION I

SAFETY FIRST FOR YOURSELF, FOR OTHERS, AND FOR YOUR EQUIPMENT

"Safety First" is more than just a slogan when operating radio controlled models. Thus, we urge, especially with respect to radio controlled aircraft that:

FOR YOUR SAFETY:

Recognize that radio controlled models are not harmless toys and can be dangerous missiles if carelessly or improperly flown. You are responsible because the reliability and safe operation of the radio equipment is largely dependent upon its proper installation and utilization.

THEREFORE, INSTALL YOUR RADIO CONTROL SYSTEM CORRECTLY AND BE CERTAIN YOU CAN FLY WELL ENOUGH TO CONTROL YOUR AIRCRAFT UNDER ALL CONDITIONS.

FOR THE SAFETY OF OTHERS:

Remember that you are responsible for the safety of all spectators and in fact, everyone that may foreseeably be injured by your model.

DO NOT FLY where your model could injure any person or property.

DO NOT FLY over the heads of spectators or persons in the area of your flying field. This includes taking off, actual flight and landing. Keep everyone, except experienced and knowledgeable persons who are assisting you in flying, away from your model even when it is on the ground and you are preparing to fly.

DO NOT FLY unless and until you have an experienced instructor who has completely CHECKED OUT THE MODEL AND WILL FLY THE MODEL FOR YOU AND WITH YOU, ...UNTIL YOU HAVE LEARNED TO FLY COMPETENTLY BY YOURSELF.

Flying is a real skill that demands patience, practice and caution. DO NOT EXPERIMENT or run RISKS. KNOW that you can fly safely before you fly alone. The real pleasures and satisfactions come from flying or operating your model with SAFETY and competence always in mind.

DO NOT FLY in adverse weather conditions. Strong winds, for example, may cause loss of control of your aircraft and cause injury or damage to you or to others.

AT THE FIELD...

DO NOT FLY unless your frequency is "clear". The transmitting signal channel (frequency) is shown on the transmitter and YOU MUST NOT turn on your transmitter when someone is flying or operating their model on that same frequency. **WARNING: IF YOU DELIBERATELY OR ACCIDENTALLY TURN ON YOUR TRANSMITTER WHILE ANOTHER MODEL IS FLYING OR IN OPERATION, THAT MODEL WILL GO OUT OF CONTROL.** The same will happen to yours, so observe "clearing" the frequency: Only one person using a given frequency at a time. DO USE CHANNEL IDENTIFIER (FREQUENCY) FLAGS for the frequency your system uses and attach the appropriate flags to your transmitter antenna. DO OBSERVE all the rules of the flying or operating site.

The channels and frequencies associated with them are as follows:

72 MHz Band (Aircraft Only Channels)

| CHANNEL NUMBERS | FREQUENCIES |
|-----------------|-------------|
| 12 | 72.030 |
| 38 | 72.550 |
| 40 | 72.590 |

TABLE (cont.)

| <u>CHANNEL NUMBERS</u> | <u>FREQUENCIES</u> |
|------------------------|--------------------|
| 42 | 72.630 |
| 44 | 72.670 |
| 46 | 72.710 |
| 48 | 72.750 |
| 50 | 72.790 |
| 52 | 72.830 |
| 54 | 72.870 |
| 56 | 72.910 |

CHANNELS 14 THROUGH 34 are added as of JANUARY 1, 1988. Narrow band transmitters are required to operate on Channels 12 through 34 inclusive. Channel number plaques are used to identify a specific channel in the 72 MHz band. The QUANTUM PCM 8P meets narrow band requirements.

| <u>CHANNEL NUMBER</u> | <u>FREQUENCY (MHz)</u> |
|-----------------------|------------------------|
| 14 | 72.070 |
| 16 | 72.110 |
| 18 | 72.150 |
| 20 | 72.190 |
| 22 | 72.230 |
| 24 | 72.270 |
| 26 | 72.310 |
| 28 | 72.350 |
| 30 | 72.390 |
| 32 | 72.430 |
| 34 | 72.470 |

WARNING: The 72 MHz frequencies above are allocated for Model Aircraft Radio Control use and are exclusive. Other 72 MHz frequencies are assigned to communications and other services. Under particular circumstances they may cause you to lose control of your model, possibly causing injury to yourself, to others, or property damage. Before operating your Model, check with the Federal Communications Commission (FCC) Regional Office in your area to determine whether there is potential danger of interference from other radio users. There are also 75 MHz Channels assigned by the FCC for use by model cars, boats, etc.

SO REMEMBER...

1. **DO NOT OPERATE** your transmitter at the field until you are certain your frequency is "clear".
2. **DISPLAY** your channel identification plaques on the antenna of your transmitter.
3. **REMEMBER** that channel identifier plaques do not usually state the frequency on them, and therefore, ask and be certain. If you have an eyesight limitation, double check to be sure of channel plaque designations.
4. Turn your transmitter on only when you are sure no one else is using your frequency.
5. **WARNING:** Your model will go out of control and may do serious injury or damage if someone else turns on a transmitter on your frequency while you are operating your model.
6. Respect all the rules of the flying field or site.
7. At any time during the operation of your model, should you

sense, feel or observe any erratic operation or abnormality, end your flight as quickly and as sagely as possible. **DO NOT** operate again until you are certain the problem has been corrected. **TAKE NO CHANCES.**

ADDITIONAL WARNING:

Radio Controlled models are generally attractive, exciting and inviting in looks and performance. Realize that young persons, and inexperienced adults may try to operate the equipment without understanding the dangers to that person or others. It is your responsibility to guard against unskilled and unknowing hands for their protection as well as for the safety of your equipment and model.

The key to R/C pleasure is the proper use of your System, and all of the other model components. If you fail to follow instructions, heed the warnings given, misuse or abuse the system through improper operation or installation, the consequences may be harm or destruction of your system, or injury to yourself or the person or property of others.

AS TO YOUR EQUIPMENT:

The care you give your radio control equipment, and to its correct installation and operation, are the factors that make the difference between safe and successful flying or injury, damage, destruction and loss.

ACADEMY OF MODEL AERONAUTICS (AMA)

The Academy of Model Aeronautics is the leading national organization made up of aircraft modeling people with headquarters near Washington, D.C. Its address is 1810 Samuel Morse Drive, Reston, VA 22090, and we urge you to examine the benefits of membership including liability protection in the event of certain injuries. The Academy has adopted simple and sane rules, a few which are especially pertinent for radio controlled flight as the **OFFICIAL AMA SAFETY CODE**. Abide by these rules for your protection, the protection of others and your equipment. Excerpts are as follows:

1. I will not fly my model aircraft in competition or in the presence of spectators until it has been proven to be airworthy by having been previously successfully flight tested.
2. I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right of way to and avoid flying in the proximity of full scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full scale aircraft.
3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
4. I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.
5. I will not fly my model aircraft in the presence of spectators until I become a qualified flyer, unless assisted by an experienced helper.
6. I will perform my initial turn after takeoff away from the

pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.

7. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only licensed amateurs are authorized to operate equipment on amateur band frequencies.)

NOTE: These basic safety precautions are for your safety, the safety of others, and of your equipment. Consider carefully all of what has been stated and obey all precautions as well as those appropriate to your particular use. Good common sense must also be used at all times in the operation of your equipment.

SECTION II

FEDERAL LICENSING REQUIREMENTS AND SPECIAL OPERATING STANDARDS FOR MODEL AIRPLANES

The Federal Communications Commission no longer requires a license to operate an R/C model transmitter.

However, the Federal Aviation Administration has announced guidelines for operation of model aircraft. We are reprinting those guidelines here and encourage your study and cooperation.

1. **Purpose:** This advisory circular outlines safety standards for operators of model aircraft and encourages voluntary compliance with these standards.
2. **Background:** Attention has been drawn to the increase in model aircraft operations, and the need for added caution in the case of free-flight and radio controlled types to avoid creating a noise nuisance or a potential hazard to full-scale aircraft and persons and property on the surface.
3. **Operating Standards:** Modelers, generally, are concerned about safety and do exercise good judgement when flying model aircraft. However, in the interest of avoiding undue criticism from affected communities and airspace users. **COMPLIANCE WITH THE FOLLOWING STANDARDS IS ENCOURAGED BY OPERATORS OF RADIO CONTROLLED AND FREE FLIGHT MODELS.**

- a. Exercise vigilance for full-scale aircraft (get other people to help if possible) so as not to create a collision hazard.
- b. Select an operating site at a sufficient distance from populated areas to avoid creating a noise problem or a potential hazard.
- c. Do not fly higher than 400 feet above the surface.
- d. Do not operate closer than three miles from the boundary of an airport unless permitted to do so by the appropriate air traffic control facility in the case of an airport for which a control zone has been designated, or by the airport manager in the case of other airports.
- e. Do not hesitate to ask for assistance in complying with these guidelines at the airport traffic control tower, or air route center nearest the site of the proposed operations.

Direction, Air Traffic Service
Federal Aviation Administration
Washington, D.C.

Under SAFETY, we encourage your participation in the

Academy of Model Aeronautics as a member. Many flying fields require that you be a member of the AMA before they will allow you to use their field. They want to know that all pilots are knowledgeable concerning the AMA SAFETY CODE and through membership have the liability insurance.

SECTION III

QUANTUM PCM 8P FEATURES

TRANSMITTER

- * High Power (500 MW) RF Module Frequency Control
- * Advanced Gimbal Design with Individual Control Stick Length and Tension Adjustment
- * Finely Ratcheted Trims for Accurate Adjustments
- * Liquid Crystal Display (LCD) R.F. Indicator
- * Low Battery Indication by Flashing LED's
- * Front Panel Mounted LCD Digital Up, Down, Intg. Timer
- * Servo Reversing Available on All Eight Channels
- * Cassette Type NiCd Battery Pack for Ease of Changing and Extending Operating Time Requirements
- * Adjustable Travel Volume on Elevator, Throttle, Aileron, Rudder and Propeller Pitch
- * Attractive Brushed Chrome, Black Plastic Case with Internally Collapsible Ten Section Antenna
- * Trim Travel Adjustments on Aileron, Elevator and Rudder Channels
- * Adjustable Dual Rates on Elevator, Aileron and Rudder Channels
- * Exponential or Linear Control Selection on Aileron, Elevator and Rudder Channels
- * Low Throttle Adjust
- * Programmable Fail Safe with Inhibit Capability
- * Three Position Flap Mixing
- * Preset Flap Trim
- * Rudder-Elevator and Rudder-Aileron Mix Capability
- * Throttle Idle Up Potentiometer
- * Retractable Gear Switch
- * Propeller Pitch Adjustment
- * Snap Roll Inputs Adjustable in Elevator, Aileron and Rudder
- * Auto Dual Rate Rudder with Inhibit and Adj. Position
- * Bi-Directional Mixing Elevator-Flap and Flap Elevator Mixing
- * Landing Gear-Air Brake Capability
- * Mixture Control Adjustment

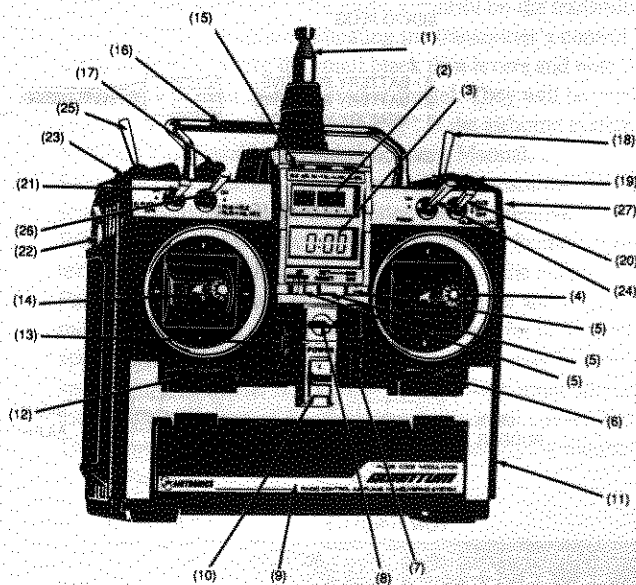
RECEIVER

- * Dual Conversion 8 Channel PCM Narrow Band of advanced design to achieve outstanding range, noise suppression, and adjacent channel rejection
- * Compact Size, Only 2-13/32" L x 1-5/32" W
- * Lightweight, Only 2.0 Ounces, Including Crystals
- * Gold Plated Connectors Used for Low Contact Resistance
- * Plug-In Crystal for Service Facility Frequency Change

SERVOS

The AIRTRONICS Quantum PCM 8P unit is available with our new generation of High Performance Contest Servos.

The AIRTRONICS Quantum PCM 8P transmitter is primarily intended for the flying of fixed wing model aircraft.



1. Retractable Antenna
2. L.C.D. RF Indicator
3. Digital LCD Timer
4. Control Stick; Horizontal-Ailerons, Vertical-Throttle (Mode I); Elevator (Mode II)
5. Timer Control Switches
6. Trim Lever, Ailerons
7. Trim Lever, Throttle (Mode I); Elevator Trim (Mode II)
8. Neck Strap Connecting Hook
9. Trimmer Panel Cover
10. Power Switch
11. Charging Receptacle and Modular NiCd Transmitter Battery (Side)
12. Trim Lever, Rudder
13. Trim Lever, Elevator (Mode I) Throttle Trim (Mode II)
14. Control Stick, Horizontal-Rudder, Vertical-Elevator (Mode I), Throttle (Mode II)
15. Power and Warning L.E.D. Monitor Lamps
16. Carrying Handle
17. Mixture Control Knob
18. Flap Mix Switch (3 Position)
19. Fail Safe Programing Push Button
20. Aileron Dual Rate Switch
21. Elevator Dual Rate Switch
22. Proportional Idle Up Lever
23. Snap Roll Button
24. Propeller Pitch Switch
25. Retract Switch
26. Rudder-Elevator; Rudder-Aileron Mix Switch
27. High Pitch Propeller Trim
28. Radio Frequency (RF) Module (rear)
29. SNAP Roll Select Switch
30. Stop Watch Start/Stop Switch

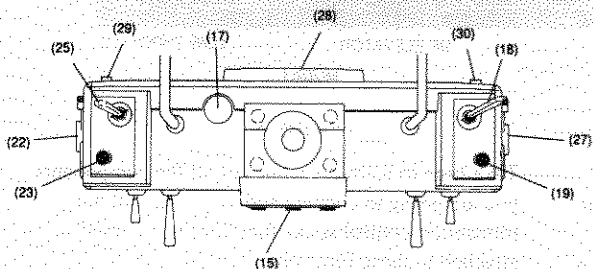


FIGURE 1

SECTION IV

UNPACKING AND SETTING UP YOUR AIRTRONICS QUANTUM PCM 8P RADIO CONTROL SYSTEM

The packaging of your AIRTRONICS Quantum PCM 8P radio control system was especially designed for safe transportation and storage of the components. **DO NOT DISCARD THESE CONTAINERS**, as they can be used for storage or returning equipment for repair. We recommend the following procedure to familiarize yourself with the components of your Quantum system and as preparation for installation in your model:

1. Remove the transmitter from the packaging box.
2. Affix channel (frequency) identifier plaques to the transmitter.
3. Charge the receiver and transmitter batteries as stated in the Installation and Guidelines Manual.

4. Extend the transmitter antenna (1) to its full height, switch on the transmitter by pushing the power slide switch upwards and note that the power and warning Light Emitting Diode (L.E.D.) lamps illuminate and the movement of the two color Liquid Crystal Display (L.C.D.) meter indicating that the unit is operating.
5. The L.C.D. meter reads R.F. output, and is an indication of the state of charge of the internal NiCd battery pack. With a fully charged NiCd battery, the meter will read approximately 10 units in the black area. With continued use, the meter indication will read less.

A reading of 4 at the red-black dividing line indicates a marginally discharged battery; while a reading in the red below 4 indicates caution should be observed since the battery is discharged below an acceptable level. Operation should cease and the battery be recharged.

WARNING: Do not attempt to use the transmitter unless the meter is reading totally in the black area with the antenna fully extended.

CAUTION: IF NO MOVEMENT IS NOTED ON THE METER WHEN YOU TURN THE TRANSMITTER SWITCH ON, THE BATTERY PACK WITHIN THE TRANSMITTER IS MORE THAN LIKELY DISCHARGED. CHARGE THE BATTERIES AS OUTLINED UNDER SECTION IV, BATTERY CHARGING, IN THE INSTALLATION AND GUIDELINES MANUAL.

REMEMBER THAT A TRANSMITTER WHOSE PERFORMANCE HAS DROPPED MAY FAIL TO SEND THE SIGNALS NECESSARY TO ADEQUATELY AND SAFELY CONTROL THE MODEL RESULTING IN A POSSIBLE CRASH.

6. Switch "off" the transmitter and remove all of the other components from the foam packing box containing your AIRTRONICS Quantum PCM 8P Radio Control System.
7. Figure 2 shows how to connect the components of your system together. Note the servo and switch harness plugs are inserted in the receiver so that pin #3 is towards the bottom of the receiver. When using any auxiliary equipment or testers, the connections as shown in Figure 3 should be observed. At this point, your objective is to get the system operating on your workbench. Once connected, you must then refer to the corresponding diagram for your system (Figure 4), showing the transmitter control sticks' function. Note that a special switch harness is supplied with the Quantum PCM unit that should only be used with the PCM system. It applies "Keep Alive" voltage to the memory circuit in the receiver, therefore, it should only be inserted into the battery "B" receptacle of the receiver.

3 • BATTERY POSITIVE
2 • BATTERY NEGATIVE
1 • CONTROL SIGNAL



SERVO PLUG

3 • BATTERY POSITIVE
2 • BATTERY NEGATIVE
1 • MEMORY VOLTAGE



SWITCH HARNESS PLUG

FIGURE 3

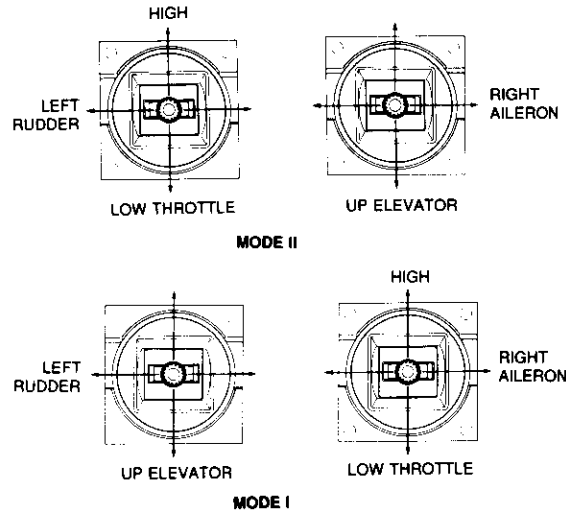


FIGURE 4

Take time to learn the names of all the components you are going to connect and to identify all the transmitter control sticks functions and named attached to these functions.

NOTE THE FOLLOWING AT THIS POINT:

- a. It is of no consequence at this point which servo you plug into which function since your aim is simply to learn and see how the system operates on your bench. The numbered channel outputs are indicated on the receiver case. See figure 2 for channel identification.
- b. The connectors on your AIRTRONICS Radio Control System are rugged but should be handled with care. There are three socket contacts in the servo connector, numbered 1 through 3. The #1 is the signal pin, #2 is negative and #3 (RED) is positive. Be sure to insert the plugs into the receiver so that the #3 pin is towards the bottom of the receiver.
- c. Do not attempt to force the servo plugs into the receiver; properly align each plug and it will move into place. The same is true of the plug leading from the receiver battery pack and switch harness.

8. Once you have followed the diagrams for connecting the airborne components of your AIRTRONICS QUANTUM PCM 8P Radio Control

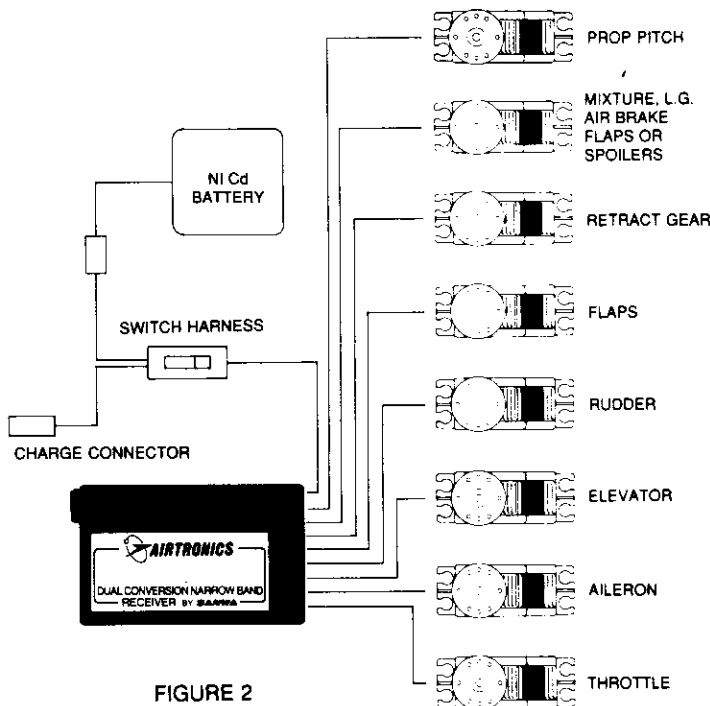
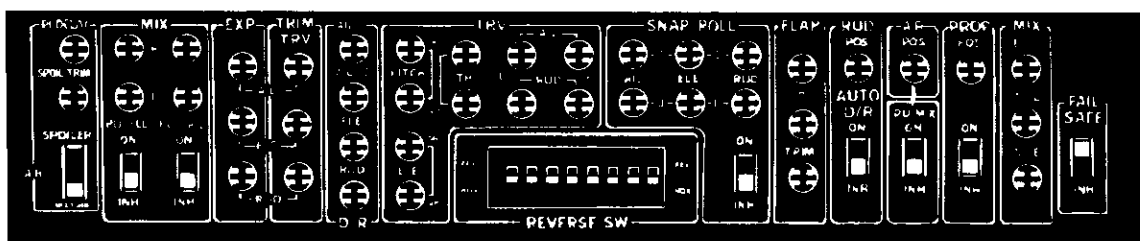


FIGURE 2

- System and you have studied and understood all of the components as well as having studied and understood the diagram illustrating the transmitter control stick functions, you are ready to energize the System and study its actual operation.
9. Switch on the transmitter, then switch on the airborne package. The System is now energized, There may be some initial movement in the servos even though you have not moved the transmitter sticks. This is normal. Once they have found a position, they will stay there until you move a control on the transmitter.
 10. Now follow the diagram indicating the transmitter's control functions by moving each stick and watching the reaction of the servo or servos. Move the small black trim levers and note the slight servo movements. Keep these all centered through the installation of your System in your model. They will be used in actual flight operation of the model to adjust servo position slightly...a process called "trimming". If the airborne system fails to operate, charge the battery pack as outlined in the Battery Section IV of Installation and Guidelines Manual.
 11. Switch off the receiver, then switch off the transmitter. Get used to this sequence: When turning the System on, the proper sequence is to turn on the transmitter, then the receiver.
 12. When performing range checks, as indicated in Section V of the installation and Guidelines Manual, do not remove the transmitter antenna. Range checks are performed with the antenna fully collapsed. Adjustments of the functions available on the Trimmer Panel will be addressed in Section V, Operation and Adjustments. A basic transmitter configuration is shown in Figure 5 to indicate the correct switch positions. Please refer to Section IV for information as to servo connections and aircraft control application. The Quantum PCM 8P transmitter may be operated as a basic 5 channel system by disabling or zeroing all of the special functions; that is, they can be used for normal aileron, elevator, throttle, rudder, and retract gear flying of any type of model. The first part of Section V of this manual covers those basic channels and features of your Quantum PCM 8P transmitter. The numbers indicated in the text are the identifying numbers to be found on transmitter sketches throughout the manual.



BASIC TRANSMITTER CONFIGURATION

FIGURE 5

SECTION V

OPERATION AND ADJUSTMENTS

FOR SAFE AND SUCCESSFUL OPERATION OF YOUR RADIO CONTROL MODEL, IT IS IMPORTANT TO CAREFULLY FOLLOW THE INSTRUCTIONS BELOW AND OBTAIN TRAINING IN THE OPERATION OF YOUR MODEL FROM A WELL EXPERIENCED INDIVIDUAL.

At this point, having followed all of the instructions, directions and guidelines contained in the earlier sections of this manual and having completed your model and installed your Quantum PCM 8P System observing the directions and guidelines contained the separate manual entitled "FUNDAMENTALS AND GUIDELINES FOR INSTALLATION OF YOUR AIRTRONICS SYSTEM", we present here general instructions concerning the process of learning to operate and adjust your Quantum PCM 8P System. Most of what is stated is directed toward those using the System in a powered model aircraft. However, it is equally applicable to sailplanes. Take a few minutes to familiarize yourself with all the features and functions of this advanced radio control system and its many advantages that now permit easily made all electronic installations. It should be re-emphasized that, no matter what your experience level, you should have an experienced R/C modeler check your radio installation. We recommend the individual(s) who are "checking out" your model review all our instruction manuals to make certain you have followed all directions and guidelines and understand the warnings that have been given. This should be done even if you are obtaining flight training from experienced and competent flyers.

Basic Quantum PCM 8P Transmitter Operation

As stated previously, the Quantum PCM 8P system can be used as a basic R/C system without applying any of the special functions. Please refer to Section IV for information as to servo connections and aircraft control application. To use the system in the basic configuration mode, swing down and open the Trimmer Panel Cover (9) to expose all of the various switches and adjustments. Rotate

all of the trimmers to positions shown in Figure 5 and position the switches to INHIBIT (INH). The small plastic screwdriver that clips to the carrying handle should be used to turn the trimmers. Notice that all of the trimmers operate approximately 1/2 turn (180°). In spite of its many special features and functions, the Quantum PCM 8P transmitter is easily to set up and use in a basic configuration. The sketch of the panel (Figure 5) shows all of the trimmers set for the basic configuration with fail safe "ON".

Throttle Servo Adjustment

Your Quantum PCM 8P transmitter has the capability to independently adjust both the high and low throttle positions of the throttle servo. The throttle trim located on the control gimbal is only effective at low throttle position. The throttle Hi and Low travel volume adjustment trimmers located on the adjustment panel (Figure 6) can be used to electronically set the low and high throttle positions. This will be especially useful when initially setting up the low and high limits in your model. Use the TRV trimmers under the panel to set the throttle trim on the transmitter in the low position. Your throttle trim can then be advanced to fine tune the engine idle as well as used for engine cut-off, since it is only effective at low throttle control stick position, Figure 7.

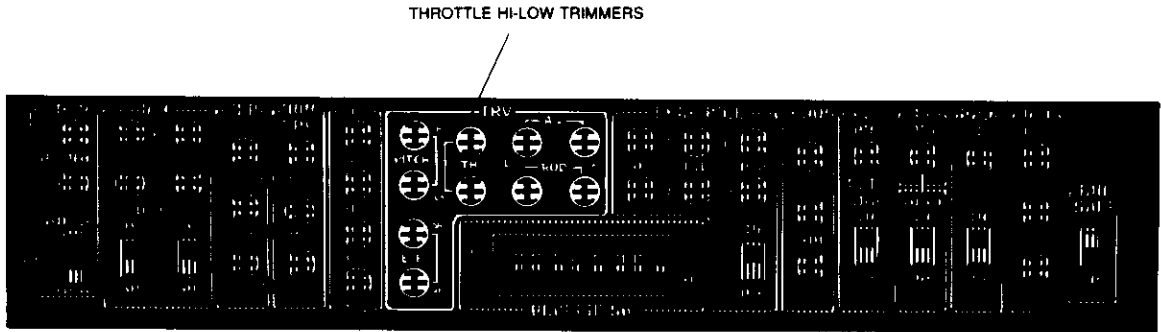
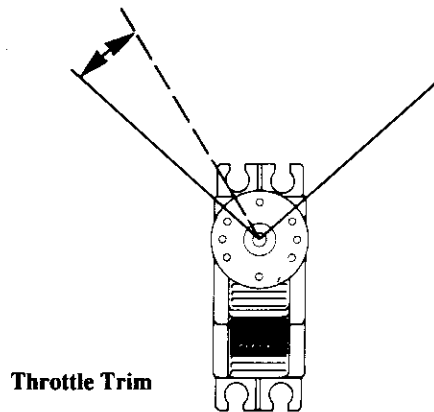


FIGURE 6



Throttle Trim

The transmitter throttle trim lever (13) only functions when the throttle control stick is in the low position.

FIGURE 7

Transmitter RF Output Indicator and Low Voltage Alarm

The Quantum PCM 8P transmitter features a Liquid Crystal Display (L.C.D.) RF output indicator that also provides you an indication of the state of charge of the transmitter NiCd batteries. The meter should read in the upper black portion of the meter face (approximately 10) after a full charge of 12-14 hours. A reading less than 4 in the red zone indicates a transmitter battery that is discharged below an acceptable level. Since the meter indicates RF output, the transmitter module must be in place and operational in order to obtain an L.C.D. meter reading. You should note where the meter reads after the transmitter NiCd battery has been completely charged. If this reading changes significantly in the future, it may indicate a drop off in battery or RF module performance, and the unit should be returned to AIRTRONICS for service. **WARNING:** Do not attempt to use the transmitter unless the L.C.D. RF indicator reads in the black.

CAUTION: If no RF indication is present on the L.C.D. meter when the transmitter power switch is turned "ON", the NiCd battery pack within the transmitter is more than likely discharged. Charge the batteries as outlined in Section IV, Battery Charging, in the Installation and Guidelines Manual.

REMEMBER: A transmitter whose performance has dropped may fail to send the signals necessary to adequately and safely control your model, resulting in a crash.

When the transmitter NiCd battery is almost fully discharged, the three RED Power and Warning L.E.D. Monitor Lamps will blink rapidly. If this occurs while flying, land immediately and take corrective action to recharge the transmitter NiCd battery for a period of 12 to 14 hours prior to your next flying session. Transmitter operating time for safe operation after a full charge can be expected to be approximately six to seven 10 minute flights. Recharge as indicated above.

Plug-In Modular Transmitter NiCd Pack:

The NiCd batteries in your Quantum PCM 8P transmitter are pre-packaged and can be easily removed for cell replacement or entire replacement with a fully charged pack when extended operating time is required. To do so, locate the Slide Catch, Figure 8, on the right side of the transmitter at the charge socket. Push down on the Slide Catch until it clears the transmitter and remove it. Extract the battery pack by grasping the plastic handle and pulling the pack straight out. Reverse the procedure to replace.

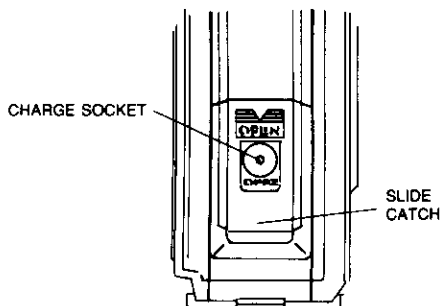


FIGURE 8

Control Stick Length and Tension Adjustment:

The length and spring tension of the control sticks (4) and (14) can both be adjusted as required by the individual flyer. Both procedures are simple.

To adjust the spring tension, first remove the frequency module and battery pack as described. Then, remove the six rear cover screws as indicated on the sketch below (Figure 9). Carefully pry out the side pieces slightly to allow the rear cover to clear the Stop Watch and Snap Roll Select controls. The rear cover can now be lifted off. Three of the four screws indicated on the right hand sketch of a Mode II transmitter will now be visible. They control stick tension as follows: (1) Elevator Mode II; (2) Rudder; (3) Aileron; (4) Elevator Mode I. Adjust the screw "in" for more tension. Do Not touch or move any other component!

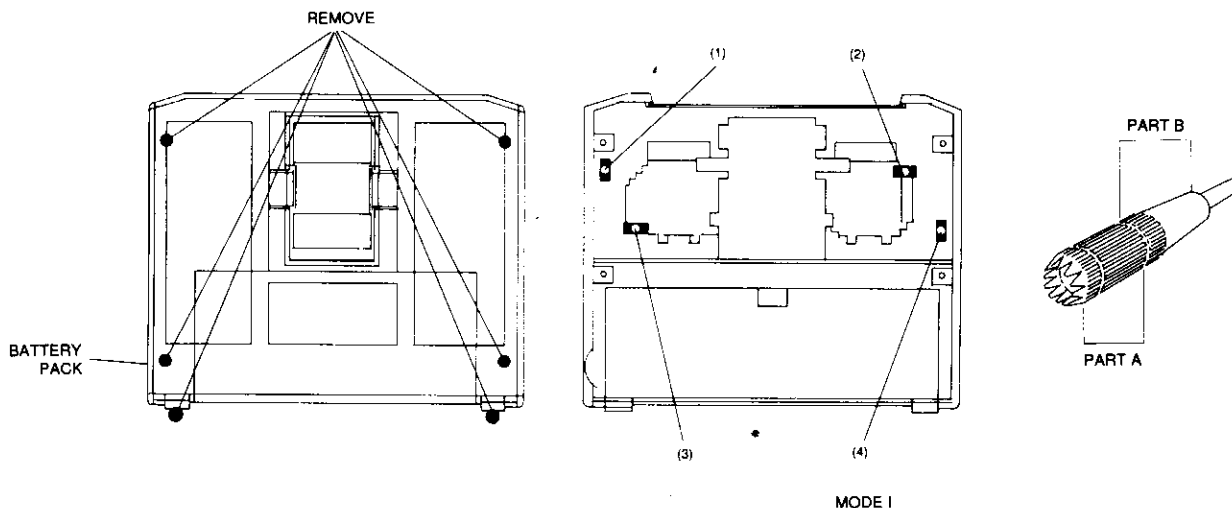


FIGURE 9

Adjusting the control stick length is even easier. To do so, hold Part B with the fingers and unscrew Part A counterclockwise to loosen the two pieces. Now screw Part A in or out to the desired position, and lock it in place by screwing Part B against it. It is recommended that at least four threads be left inside Part A at its longest length for best mechanical security. Do not overtighten.

FREQUENCY MODULE

Changing the AIRTRONICS Quantum PCM 8P transmitter frequency module is rapidly and easily done. Simply press in on the two module locking tabs and lift it out. Be sure to remove it straight up, always parallel to the transmitter case to prevent bending the multi-connector pins on the lower side. To replace the new module, drop it in place, again parallel to the case, and press it into position. Transmitter module crystals cannot be changed without having the module realigned at AIRTRONICS (Figure 10).

Obviously, a change in the receiver's frequency must also be made whenever the transmitter module is changed. We do not recommend that the modeler change frequency of the receiver by plugging in crystals; since to insure optimum performance it is necessary to align the unit. Be sure to always install the proper channel (frequency) identifier flag or plaque on your transmitter to prevent conflict or confusion to your fellow R/C modelers at the flying field.

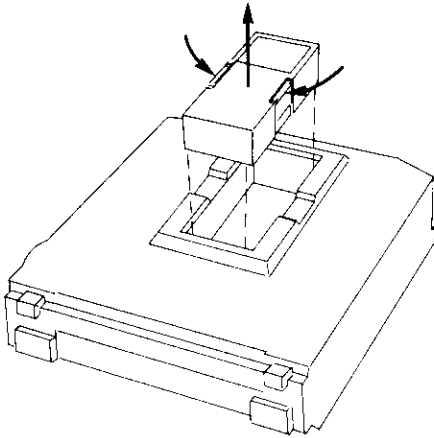


FIGURE 10

Fail Safe Programming:

The Quantum PCM 8P Transmitter and Receiver have microprocessors for processing control information. If the control position data received at the receiver is not valid, or is being interfered with, etc., the data will not be accepted. Your Quantum PCM 8P system gives you the choice of two types of fail safe modes. The first type is defined as "Hold". If the signal is lost or incorrect data is received by the receiver, the servos will stay at the position determined by the last good command and remain there until good data is restored. The second programmable fail safe "Position Mode" will cause the servos, after loss of good signal data for more than one second, to go to pre-determined positions, until such time as good data is received. You can select either mode of operation or delete the fail safe capability altogether by placing the fail safe switch, (Figure 11) on the trimmer panel in the "INH" position. To operate in either the first or second fail safe mode, the fail safe switch must be set to "ON", which is the recommended position.

If you are going to operate your system in the "Hold" mode nothing further is required other than turning the transmitter and receiver switches to the "ON" position. To operate in the pre-determined servo position mode you must first turn both the transmitter and receiver switches "ON", and check the operation of the servos. Next, position the control sticks so that the models control surfaces and throttle are at the desired positions, i.e., maximum low throttle, slightly up elevator, etc., then, press the Fail Safe Program Push Button (19) located on the top right of the transmitter, (Figure 12). The control inputs you have set-in will be memorized and retained until such time as you disconnect the receiver battery or it is discharged. The receiver microprocessor will retain the memorized data inputs since it is furnished "KEEP ALIVE" voltage by a special switch harness. You can check the fail safe operation by turning your transmitter "OFF" and "ON", or by turning another transmitter "ON" that is on the same channel. The servos should move to the programmed positions when an interfering signal is present, or when your transmitter is off. CAUTION: If you remove the receiver battery, or if it is discharged, you must reset the desired control memory data at the transmitter, otherwise, if you don't, you will be in the "HOLD" fail safe mode of operation.

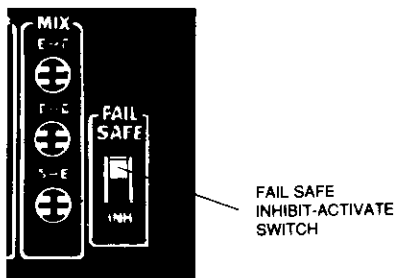


FIGURE 11

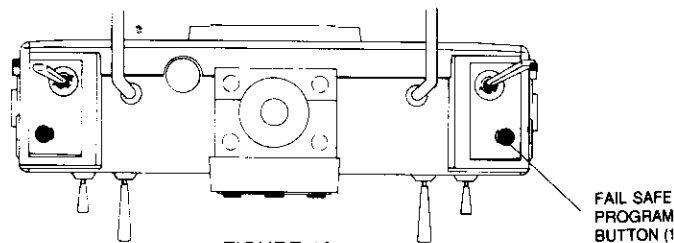


FIGURE 12

Servo Reverse and Adjustable Travel Volume Adjustments

Your PCM 8P transmitter is equipped with servo reversing on all its eight channels. This simplifies the servo installation in your model since you do not have to be concerned about the movement of the servos in the proper direction, but only in their most effective hook-up. After servo installation is complete, simply move the "Reverse-Normal" switches for proper control operation as necessary. None of the other functions will be affected (see Figure 13). The servo reversing switches are located under the panel on the front of the transmitter.

After you have completed setting the controls to operate in the proper direction, it is equally simple to set them to do so in the correct amount. This is accomplished by use of the Adjustable Travel Volume (ATV) adjustments on elevator, aileron, throttle, rudder and prop pitch controls, which allows you to vary the amount of servo throw on either side of neutral. This is especially useful for setting the low and high throttle limits on your engine. The "TRV" adjustment trimmers located under the front panel (Figure 13) can reduce the normal 90 degree servo rotation to as little as 35 degrees. Be careful when making adjustments using the plastic adjustment tool furnished with the unit. The trimmers should turn easily, therefore do not exert excessive torque or pressure on the trimmers. Clockwise rotation of the TRV Trimmers increases servo throw to maximum, and counter-clockwise (CCW) rotation will reduce servo throw. Prop pitch ATV will be addressed later in this manual.

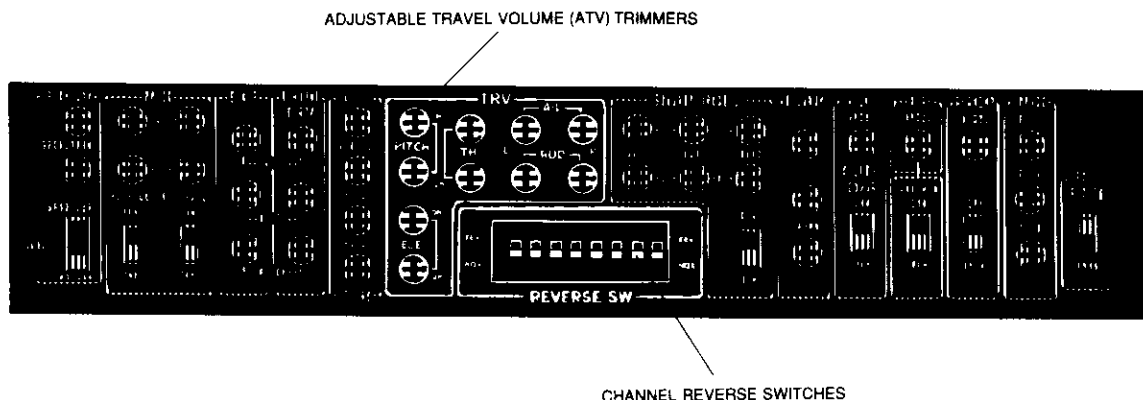


FIGURE 13

When dual rates are in the low "ON" position, an equal amount of lessened servo action will take place.

DIGITAL L.C.D. TIMER

Integrating Timer:

Set the transmitter power switch (10) to "ON", and INTG-UP-DN switch to "INTG" Figure 14. The blinking dots on the timer display indicate that timing has begun, and the total elapsed time that the transmitter is on will be displayed. For example 0:04 indicates that 4 minutes have elapsed. If the transmitter power switch (10), is set to "OFF", counting stops. When the transmitter power switch is turned back on, counting continues. The integrating timer function can be started and stopped every time the transmitter power switch is set to "ON" and "OFF". To clear a count, depress the "Set-Reset" button, with the transmitter switch either "ON" or "OFF". When the transmitter is turned back "ON", a new count will begin. The total elapsed time can be used to forecast remaining NiCd battery capacity as well as other applications. Total time of operation can be displayed such as 1:25, i.e., 1 hour, 25 minutes etc.

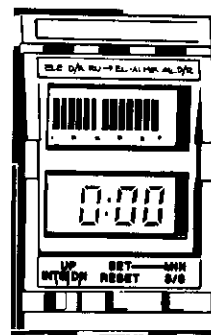


FIGURE 14

Up-Timer:

The "Up-Timer" can be activated with the transmitter on or off. The "Up-Timer" can be started or stopped by either the button labeled "S/S" on the front panel or by the Start/Stop stopwatch button on the right rear (30), of the transmitter. When the transmitter power switch (10) is set to "ON" an audible beep tone will be heard at each elapsed minute as well as when the Start/Stop button(s) are depressed. The count can be stopped and/or count resumed by pressing the Start/Stop button(s). The total elapsed time of the count is displayed on the liquid crystal display panel, Figure 14. For example, 1:02 indicates that 1 minute and 02 seconds has elapsed. The count can be cleared by depressing the "Set-Reset" button on the front panel.

Count-Down Timer:

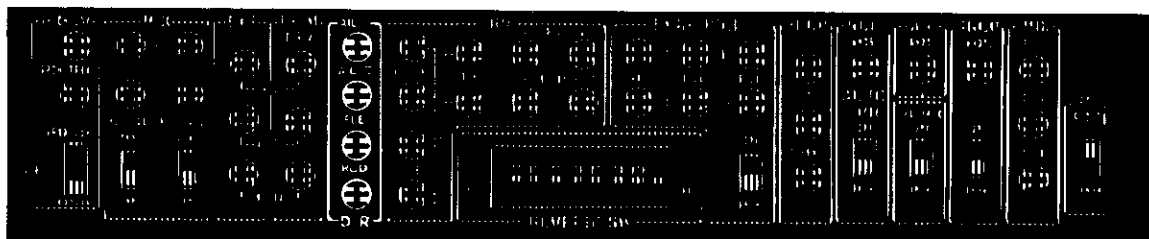
The count-down timer function can be selected by positioning the "INTG-UP-DN" select switch to the "DN" position. 0:00 will appear on the display if a time has not previously been programmed. If it has, then that reading will appear on the liquid crystal display. To program the count-down timer for the desired start time, depress and hold down the "Set-Reset" button on the face of the transmitter. Now depress and hold down the "MIN-S/S" button until the selected time is reached for the start of the count-down. Release both buttons when the selected time has been reached. To start the count-down, momentarily depress the "MIN-S/S" button on the face of the transmitter or the "Start-Stop" button located on the left rear of the transmitter back. A beep will be heard if the transmitter power switch is "ON". Either button will control the timer. Example: timer is set for 10:00. After the "MIN-S/S" button has been pushed the timer starts counting down, and an audible beep tone will be heard at each elapsed minute. If you desire to stop and then continue the count-down, depress the "MIN-S/S" button twice. When the count-down reaches 10 seconds, a beep tone will be heard as each second elapses, until zero seconds 0:00 are reached at which time a continuous tone will be heard for a few seconds. If you do not press the set-reset or "MIN-S/S" buttons the timer will continue to count and continue to do so until it reaches 59:59 at which time it will again count-down. Anytime during the count-down cycle you can depress the "Set-Reset" button to reset the timer to the original programmed count-down start time. To reset to zero, depress and hold the "Set-Reset" and the "MIN-S/S" button momentarily. The timer will return to 0:00 and a new count-down start time will have to be re-programmed. Note that the beep tone will only be heard if the transmitter power switch is "ON".

DUAL RATE ADJUSTMENT (D/R):

The Quantum PCM 8P transmitter is equipped with dual rate functions on ailerons (20) and elevator (21) and adjustable auto dual rate on the rudder channel (see Figure 1). With the dual rate switch turned on, the amount of normal control action up to a maximum of 90° of servo rotation is set with the associated "D/R adjust" trimmers located under the front panel Figure 15. The use of low rate on these primary flight controls will generally help in flying smoother maneuvers, since it will reduce the servo throw even when the control sticks are moved to their maximum position. Use the small plastic screwdriver supplied with the unit that attaches to the carrying handle when adjusting the dual rate trimmers. Be careful not to apply a tremendous amount of pressure to the trimmers, since they should turn easily. The screwdriver is made so that it can be clipped to the carrying handle to make it readily available. Note that there are two different dual rate settings for the aileron channel, i.e., AIL I and AIL II.

To set the aileron and elevator dual rates, turn on the entire system; transmitter, receiver and servos. Set the dual rate switches (20) (21) to the "OFF" position. Operate the elevator and aileron channel control stick (4) over its full deflection and observe the corresponding servos, note that you get full servo movement. Now switch the elevator dual rate to the "ON" position and Aileron dual rate to the "ON I" position and operate the same controls. The elevator and aileron L.E.D.'s will blink. You should see less servo rotation than previously when operating the controls. If not, the dual rate trimmers on the panel may be set to full travel (no travel reduction). Assuming this is the case, insert the small screwdriver into the associated D/R trimmer slot and rotate the control counter-clockwise until, with the control stick held to full deflection, some reduction in servo travel is seen. Continued rotation of the D/R trimmer will cause servo travel to be reduced as much as 90%. Now adjust aileron dual rates. Operating the dual rate switches to off will return servo travel to its normal full movement.

You may set the reduced travel trimmer adjustment anywhere within its range, and when the associated D/R switch is set to "ON", servo travel on that channel is reduced to the pre-set amount.



DUAL RATE TRIMMERS

FIGURE 15

WARNING: Be certain that you pay careful attention to the position of rate switches, especially during take offs and landings. Improper or unexpected rate switch settings could cause insufficient control, resulting in a crash and/or injury to yourself or others.

The Quantum PCM 8P transmitter provides for automatic rudder dual rate when the rudder Auto-INH switch on the trimmer panel is placed in the "Auto" position, (Figure 16). The point where the auto dual rate becomes effective is controlled by the trimmer labeled "POS", and by the position of the throttle stick.

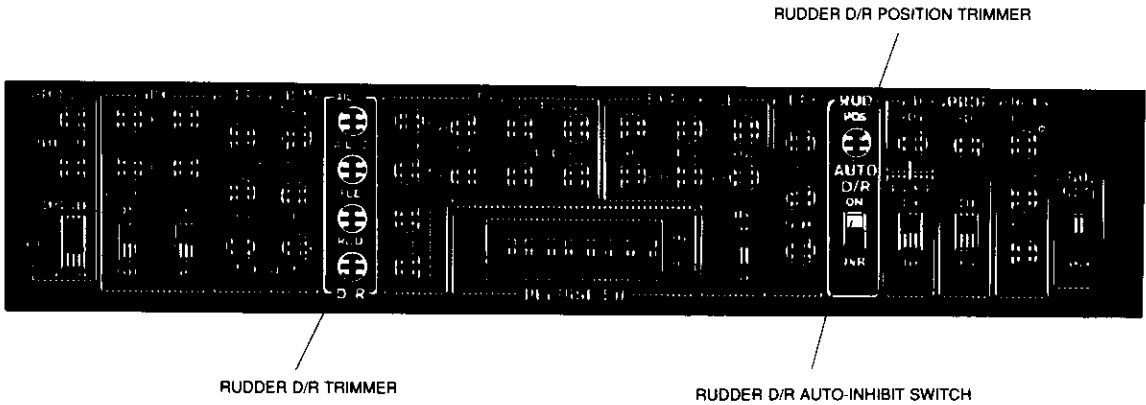


FIGURE 16

To utilize the auto rudder dual rate function, place the Auto-INH switch in the Auto position. Adjust the "POS" trimmer to determine the point where the rudder dual rate is activated or deactivated when the throttle stick is advanced or retarded. When the rudder "POS" trimmer is rotated fully counter-clockwise, auto rudder dual rate will occur at the lowest throttle setting. Advance and retard the throttle while simultaneously holding rudder control and observe the resultant effect. Adjust the rudder D/R trimmer for the amount of rudder travel to as little as 20%. You can therefore achieve full rudder control action at reduced throttle travel and less as the throttle is advanced. When the rudder D/R trimmer is set at maximum counter-clockwise, minimum rudder servo travel is achieved at full throttle.

Snap Roll Functions

The use of the Snap Roll Button (23) assures you of perfectly executed snap rolls every time. (Figure 17). By proper positioning of the Snap Roll Trimmers, either left or right from center position, for aileron, elevator, and rudder, you can select the type of snap roll desired. For safety reasons, the snap roll function can be completely disabled by placing the SNAP ROLL switch, (Figure 18) located on the trimmer panel in the "INH" position. The SNAP ROLL L.E.D. will blink when the snap roll switch is placed in the "ON" position. Depressing the Snap Roll button (23) activates the snap function. Snap direction is determined by the position of the snap roll trimmers. Centering the trimmers will produce minimum control surface deflection. Note that Snap Roll I or II can be selected by the Snap Roll Select Switch (29).

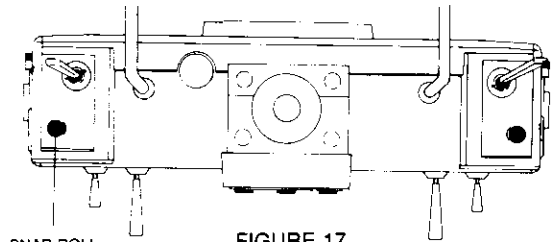


FIGURE 17

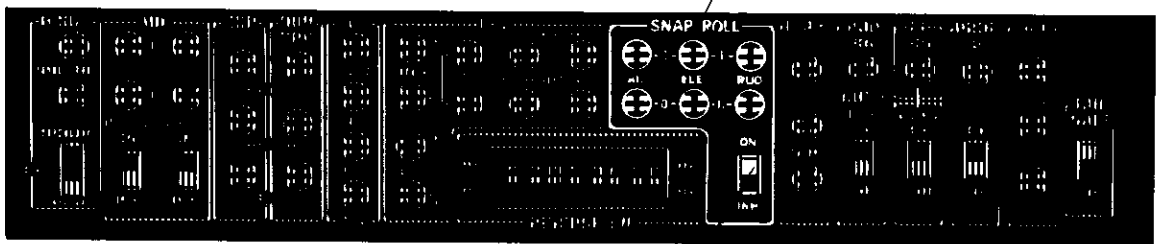


FIGURE 18

SNAP ROLL INH-ON SWITCH

The SNAP ROLL BUTTON can also be used to accomplish slow rolls by zeroing out the elevator and rudder trimmers, and adjusting the aileron trimmer for the degree and direction of roll response desired.

Rudder-Aileron Mixing

The Quantum PCM 8P transmitter provides for rudder→aileron mixing when the RUD→AIL MIX switch (26) on the upper front left of the transmitter is in the "ON" position. Mixing of the aileron control with operation of the rudder control is useful in certain aerobatic maneuvers such as knife edge flight. The amount and direction of the mixing is determined by the associated RU-AIL trimmers located under the front panel trimmer cover. To obtain rudder→aileron mixing the RU-AIL Mix "INH-ON" switch must be in the "ON" position, L and R trimmers adjusted, (Figure 19), and RUD→AIL Mix switch (26) be in the "ON" position. The RU→AIL Mix L.E.D. will blink rapidly when the RUD→AIL switch (26) is in the "ON" position.

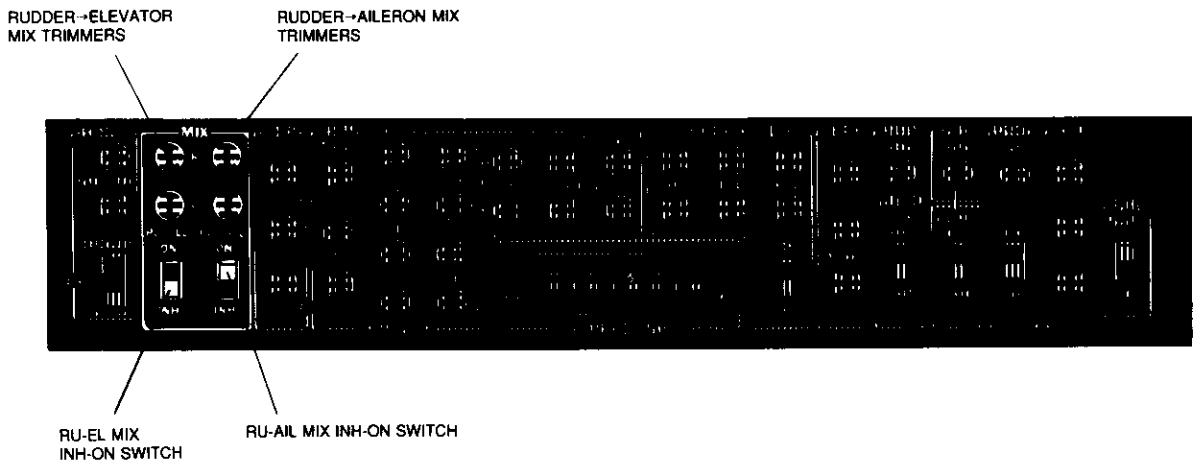


FIGURE 19

If no Rudder→Aileron mixing is desired, place the RU-AIL mix switch in the INHIBIT position.

Rudder-Elevator Mixing

The Rudder→Elevator mixing function use and adjustments are similar to that addressed above for Rudder→Aileron mixing. To activate RUD→ELE mixing, switch (26) must be in the "ON" position and the RU→EL mix "INH-ON" switch on the trimmer panel, Figure 19, be placed in the "ON" position. Adjust the associated RU→EL trimmers above the switch for the amount of elevator up or down correction required for the specific maneuver. The upper trimmer is associated with right rudder and the lower with a left rudder stick command. The RU→EL mix L.E.D. will blink rapidly when the RUD→ELE switch is in the "ON" position. To completely disable mixing action, place the RU-EL mix "INH-ON" switch in the INHIBIT position.

Exponential Adjustment

An important feature of your Quantum PCM 8P Radio Control System is the ability to select either linear or exponential control movement for ailerons, elevator and rudder controls. Linear control movement will cause the servo to rotate the same percentage as the control stick, i.e., 50% control stick movement gives you about 50% rotation. Selecting the exponential control functions will provide a continually changing ratio of stick to servo to aircraft control surface movement with reduced servo response in the vicinity of the center position. As the control stick is moved farther from center in the exponential mode, the control surface will begin to move farther and farther, increasing proportionally to the amount of control stick movement. This allows you to tailor servo movement to the demands of the model, especially controls which are overly sensitive around neutral, while maintaining full servo travel when the control stick is deflected to its extreme. This helps the aircraft to be flown in a smoother manner and lessens the skill required to perform certain maneuvers by either novice or expert flyer modelers. The graph at Figure 20 shows the range of operation of exponential from none (normal linear) to full exponential.

To adjust the amount of exponential control, turn the "EXP" trimmers associated with aileron, elevator and rudder on the trimmer panel clockwise (CW) to obtain maximum exponential control, (Figure 21). Full counter-clockwise (CCW) rotation of the trimmer removes the exponential function.

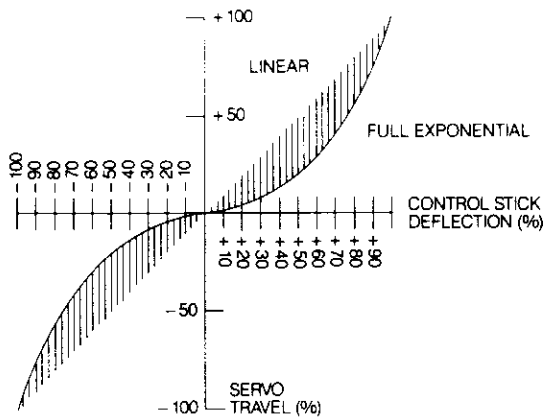
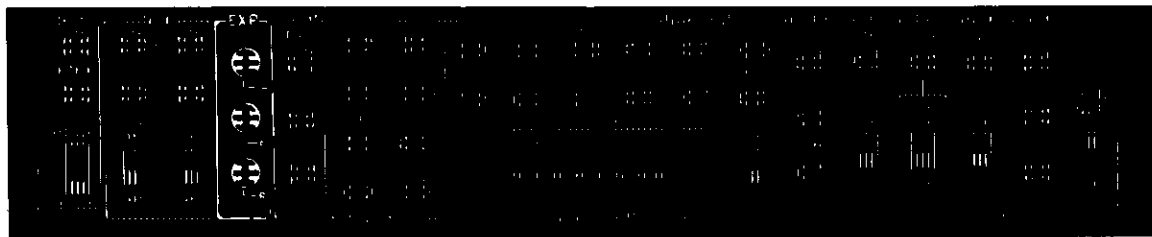


FIGURE 20



EXPONENTIAL CONTROL TRIMMERS

FIGURE 21

When using dual rates with the exponential function, the exponential effect will be very pronounced around neutral, especially at greatly reduced rate settings.

Proportional Idle-Up Control Lever

The Quantum PCM 8P transmitter provides the capability to maintain the engine speed at a predetermined point above idle even though the throttle control stick is moved to the low throttle position to produce a change in propeller pitch. The Idle-Up position is controlled by the lever (22) located on the left side of the transmitter, Figure 22.

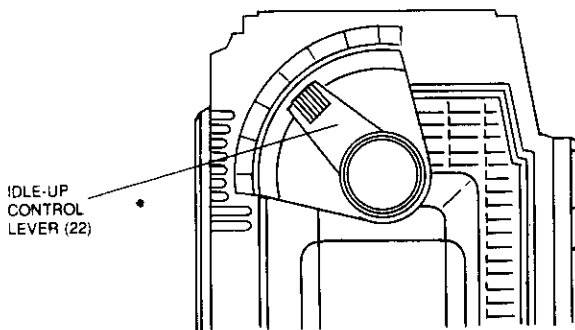


FIGURE 22

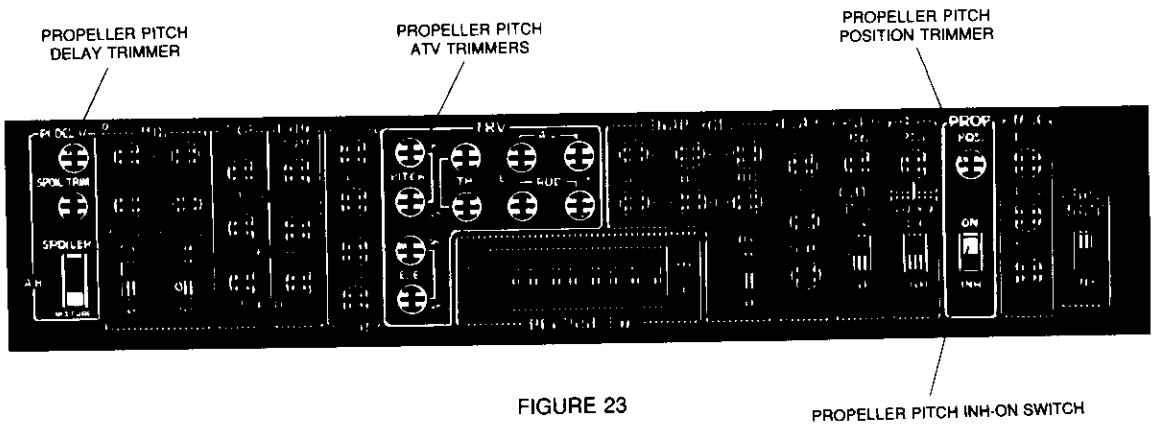
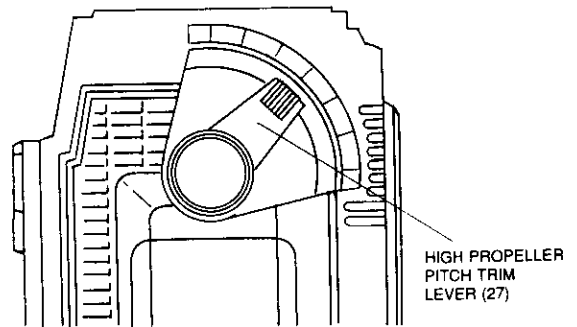


FIGURE 23

The Idle-Up feature can only be utilized when the propeller pitch “INH-ON” switch on the trimmer panel, Figure 23, is in the “ON” position and the Propeller Pitch switch (24) is also “ON”.

Propeller Pitch Control

A feature of the Quantum PCM 8P is the ability to control propeller pitch automatically as you retard or advance the throttle control stick. In order to activate this function, the Propeller Pitch “INH-ON” switch on the trimmer panel must be placed in the “ON” position and the “PROP-ON” switch (24) on the top right of the transmitter front panel must also be in the “ON” position. The “PROP-POS” trimmer, Figure 23, will control the point where the prop pitch servo will respond to the advance and retard of the throttle control stick. If the “PROP-POS” trimmer is rotated fully clockwise (CW), the prop pitch servo will be activated earlier, as the throttle stick is retarded, than when the trimmer is turned counter-clockwise (CCW). To adjust the Propeller Pitch control, position the Throttle Control stick (14) at the position below mid throttle for the desired engine speed. Turn the “PROP-POS” trimmer fully CCW, and then slowly CW until the prop pitch servo activates. The Prop Pitch ATV trimmers, Figure 23, can be used to adjust both the high side and low side of the prop pitch servo travel. Prop pitch high side can also be adjusted in flight by use of the High Propeller Pitch Trim lever (27) located on the right side of the transmitter, Figure 24. The PI delay trimmer located on the trimmer panel is used to delay or slow down the action of the prop pitch servo when the engine throttle is retarded, i.e., moved to the low throttle position. Maximum delay occurs when the PI delay trimmer is turned fully clockwise.

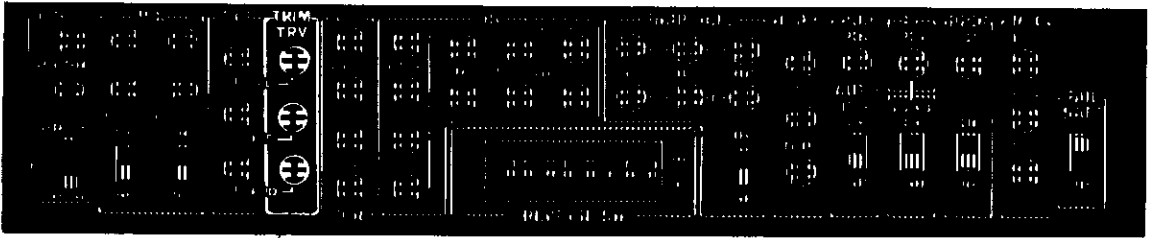


RIGHT SIDE OF TRANSMITTER

FIGURE 24

Trim Travel Trimmers

The Quantum transmitter provides you with the capability to vary the amount of servo trim travel for aileron, elevator and rudder channels by use of the "TRIM TRV" trimmers located on the trimmer panel, Figure 25. Minimum trim travel is achieved by rotation of the associated AIL, ELE or RUD TRV trimmers counter-clockwise.



TRIM TRAVEL TRIMMERS

FIGURE 25

Flaps and Flap Mixing Functions

The Quantum PCM 8P transmitter provides three types of flap action, as determined by the setting the Flap Mixing Switch (18). One position moves the flaps upon movement of the elevator control stick. The second position adjusts the elevator upon movement of the Flap Mixing Switch, (Figure 26). This allows the elevator to move when the Flaps are moved to compensate for pitch changes caused by lowering the Flaps. The third flap action is flap and spoiler to elevator mix. The following paragraphs describe the action.

1. Elevator/Flap Mix

With the Flap Mixing Switch (18 on transmitter) in the rear (E>>F) position, the Flaps are linked to the Elevator control. The amount of Flap to Elevator movement is set by the Elevator>>Flap Mix Trimmer (Figure 27) located under the panel cover. Full clockwise (CW) rotation of the E>>F Mix Trimmer will provide maximum flap servo rotation of ± 25 degrees. Full counter-clockwise (CCW) rotation of the trimmer removes Elevator-Flap mixing. Flap servo trim is accomplished by use of the Flap U-D trim control on the panel.

FLAP MIXING SWITCH (18)

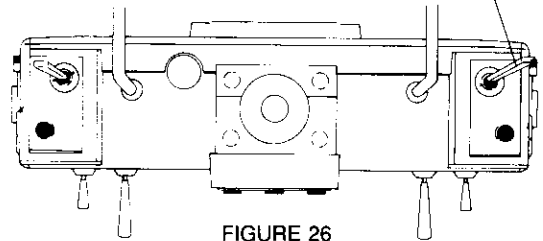
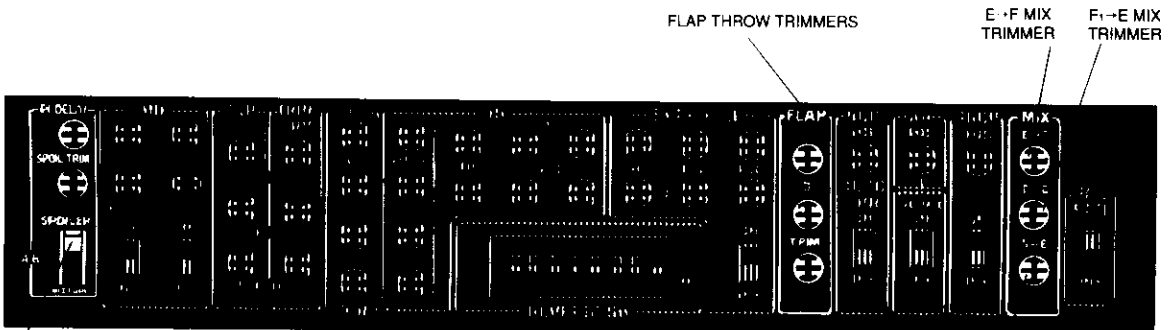


FIGURE 26



FLAP THROW TRIMMERS

E > F MIX TRIMMER

F1 -> E MIX TRIMMER

FIGURE 27

SPOILER-AIR BRAKE-MIXTURE CONTROL SWITCH

F2 & S + E MIX TRIMMER

2. Flap/Elevator Mix

When the Flap Mixing Switch (18 on transmitter) is in the center (F₁>>E) position, the Flaps will move as far as the amount preset with the flap #1 adjustment trimmer on the panel and mixing will occur with the elevator channel providing that the F>>E Mix trimmer is not centered. If the F>>E Mix trimmer, (Figure 27) is centered, no mixing will occur. Full clockwise rotation (CW) of the F>>E Mix trimmer will cause the Elevator servo to operate in one direction and with the trimmer fully CCW, the servo will rotate in the opposite direction. The "Flap I" trimmer setting can vary the flap servo rotation from 0-90°, and maximum flap servo rotation occurs with the "Flap I" trimmer fully clockwise. The "Flap Trim" trimmer sets flap servo trim.

3. Flap II and Spoiler/Elevator Mix

With the Flap Mixing Switch (18) in the forward F₂ & S→E position, the Flaps will move as far as pre-set with the Flap II adjustment trimmer and mixing will occur from Flaps to Elevator. When the Spoiler-Air Brake-Mixture switch, (Figure 27) is placed in the Spoiler position, mixing will occur from spoiler to elevator. The amount of elevator servo throw is set by the "S→E Mix" Trimmer on the panel, (Figure 27). The channel number 7 servo which is normally used for mixture control will operate as the spoiler servo when configured in this manner. The Mixture Control knob (17) will then be able to control the position and amount of throw of the Spoiler and Elevator servos. Maximum throw is obtained when the Mixture Control knob is turned fully clockwise and the Flap switch (18) is forward in the F₂ & S→E position.

Mixture Control

When the Spoiler-Air Brake-Mixture Control switch (Figure 27) is in the Mixture position, the Mixture Control knob (17) will control the channel 7 servo for a total throw of 90 degrees.

Air Brake

The channel 7 servo can also be used for air brakes when the spoiler air brake mixture control switch, figure 27, is placed in the "A.B." position. The retract gear switch (25) will then control the action of the channel 7 servo. Throw adjustment is accomplished by use of the mixture control knob (17) located on the top left of the transmitter. The throttle control stick (14) can also be used to activate the channel 7 servo, which will occur when the throttle control stick is above one quarter low throttle position and the "A.B. POS" trimmer is fully counter clockwise (CCW). The "A.B. POS" trimmer can be used to set the point where the landing gear retract switch (25) will activate the channel 7 servo as the throttle control stick is advanced to high throttle. The mixture control knob (17) will again determine the amount of total servo throw.

When the MIX-A.B.-SPOILER switch on the trimmer panel is in the A.B. position and the throttle stick is at 1/4 or higher position, the landing gear retract switch (25) can be used to control the L.G. channel #6 as well as channel #7 air brake. The point where this occurs on the throttle stick setting is determined by the setting of the "A.B. POS" trimmer. If the trimmer is fully counter clockwise (CCW), then the channel #7 air brake servo will operate when the throttle control stick is at the 1/4 low position as the landing gear switch (25) is operated. The point where this occurs is determined by the "A.B. POS" trimmer.

The "RU-INH" switch also can be used in conjunction with the "A.B. POS" trimmer to determine the throttle control stick position point where RUDDER→ELEVATOR and RUDDER→AILERON MIX occurs. Position the "RU-INH" switch to "ON"; place the RU-EL, RU-AIL INH-ON switches on the trimmer panel as well as the RUD-ELE, RUD-AIL MIX switch (26) on the front panel in the "ON" position. The MIXTURE-A.B.-SPOILER switch on the trimmer panel can be in either position. RUDDER to AIL and EL MIX occurs as the throttle control stick is advanced to the high throttle position. The point where the mix occurs is determined by the "A.B. POS" trimmer. Use the RU-EL and RU-AIL D-U and L-R trimmers to set the amount of mix desired as you deflect the RUDDER channel control stick either left or right. Note that the RU-EL, AL MIX L.E.D. will blink at the point where mixing occurs as the throttle stick is advanced. If the "A.B. POS" trimmer is fully clockwise (CW), the mix will occur only at high throttle stick position.

When the RU MIX ON-INH switch is the INH position, mixing will occur at all throttle stick positions.

| SYMPTOM | POSSIBLE CAUSE | FIX |
|--|---|--|
| 8. Aileron, Elevator or Rudder servos do not linearly follow control stick movement. | 8. Exponential (EXP) trimmers on panel are not positioned fully CCW. | 8. Reposition trimmers fully CCW to eliminate exponential effect. |
| 9. No throw reduction on Elevator or Aileron servo(s) when Dual Rate switch(es) are "ON". | 9. Elevator and Aileron Dual Rate Trimmers on panel are turned fully clockwise. | 9. Position "ELE" and/or "AIL" I & II dual rate trimmers CCW for desired servo throw reduction. |
| 10. Rudder servo travel is not reduced as throttle is advanced for Auto Dual Rate Rudder. | 10A. Rudder Dual Rate Auto "ON-Inhibit" switch is in "INH" position. 10B. Dual Rate Rudder Trimmer on panel is positioned fully clockwise. | 10A. Position Auto-Inhibit switch to "ON". 10B. Position rudder Dual Rate trimmer CCW to achieve desired rudder servo throw as throttle stick is advanced. Adjust rudder "POS". Trimmer to achieve the desired point as throttle is advanced where the rudder throw is reduced. |
| 11. Elevator servo operates in conjunction with rudder servo when rudder control stick is activated. | 11. Rudder-elevator mix "ON-INHIBIT" switch is "ON" and "RUD-ELE" mix switch on top of transmitter is "ON". | 11. Place "ON-INH" switch on panel to "INH" and "RUD-ELE" switch to "OFF". |
| 12. L.C.D. RF meter on transmitter does not indicate any output. | 12. Transmitter battery is discharged or RF Module is not in place. | 12. Recharge transmitter battery with P/N 95030 charger. Install or replace RF Module, P/N 93782. |
| 13. Elevator servo neutral shift. | 13. Flap switch was inadvertently moved. | 13. Return flap switch to original position, or recenter F→E trimmer so that activation of flap switch does not cause any elevator servo movement. |

FOR WARRANTY INFORMATION, PLEASE SEE SECTION VII OF THE INSTALLATION FUNDAMENTALS AND GUIDELINES MANUAL.

TROUBLE SHOOTING CHART

The following chart is included to assist you in isolating and correcting any malfunction caused by incorrect control or switch-positions on either the trimmer panel or transmitter.

QUANTUM PCM 8P TROUBLE SHOOTING CHART

| SYMPTOM | PROBABLE CAUSE | FIX |
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| 1. Aileron Servo operates in conjunction with Rudder Servo when Rudder Control Stick is activated. | 1. Rudder-Aileron mix "ON-INHIBIT" switch is "ON", and "RUD-AIL" mix switch on top of transmitter is "ON". | 1. Place "ON-INH" switch on panel to "INH" and "RUD-AIL" switch off. |
| 2. Pre-programmed fail safe doesn't work, i.e., when the transmitter is turned off or another transmitter on the same channel is turned on, the servos all remain in present position. | 2A. Fail Safe Program Button was not depressed after turning receiver switch harness "ON". 2B. Fail Safe-Inhibit switch on trimmer panel in the "INH" position. 2C. Incorrect switch harness in stalled, or not plugged into "B" receptacle. | 2A,B. Place "Fail Safe-INH" switch on trimmer panel to "ON" position. Turn receiver and transmitter switches on. Move throttle control stick to low throttle position, elevator to slight up, etc. and depress Fail Safe push button. Move throttle to high, and re-test. 2C. Use P/N 97005 switch harness in "B" receptacle. |
| 3. Elevator servo moves when Flap switch is activated. | 3. Flap-Elevator (F»E) mix trimmer on trimmer panel is not centered. | 3. Re-center F»E mix trimmer so that activation of Flap switch does not cause any elevator servo movement. |
| 4. Flap servo moves when Flap mix switch is in E»F position, and elevator control stick is activated. | 4. Elevator-Flap (E»F) mix trimmer on panel is turned clockwise causing mixing action to take place. | 4. Turn E»F trimmer fully CCW to eliminate mixing. |
| 5. Servos rotate in wrong direction for control stick action. | 5. Reverse switch(es) in wrong position. | 5. Place appropriate reverse switch in proper position. |
| 6. Aileron, Elevator, and Rudder servos do not move when Snap Roll button is depressed, or snaps in wrong direction. | 6A. Snap Roll "ON-INHIBIT" switch on trimmer panel is in the "INH" position. 6B. AIL, ELE, RUD Trimmers on trimmer panel are centered at zero command. 6C. Snap roll select switch in wrong position. | 6. Place Snap Roll "ON-INH" switch in "ON" position. Position AIL, ELE, RUD trimmers for desired servo response, and select I or II snap roll capability by the switch on left rear of transmitter. |
| 7. Rudder, Elevator or Aileron servos have unequal travel.. | 7. Travel Volume(TRV) trimmers on panel are not positioned fully clockwise. | 7. Reposition trimmers for desired servo throw. |

Trouble Shooting Chart is continued on other side . . .