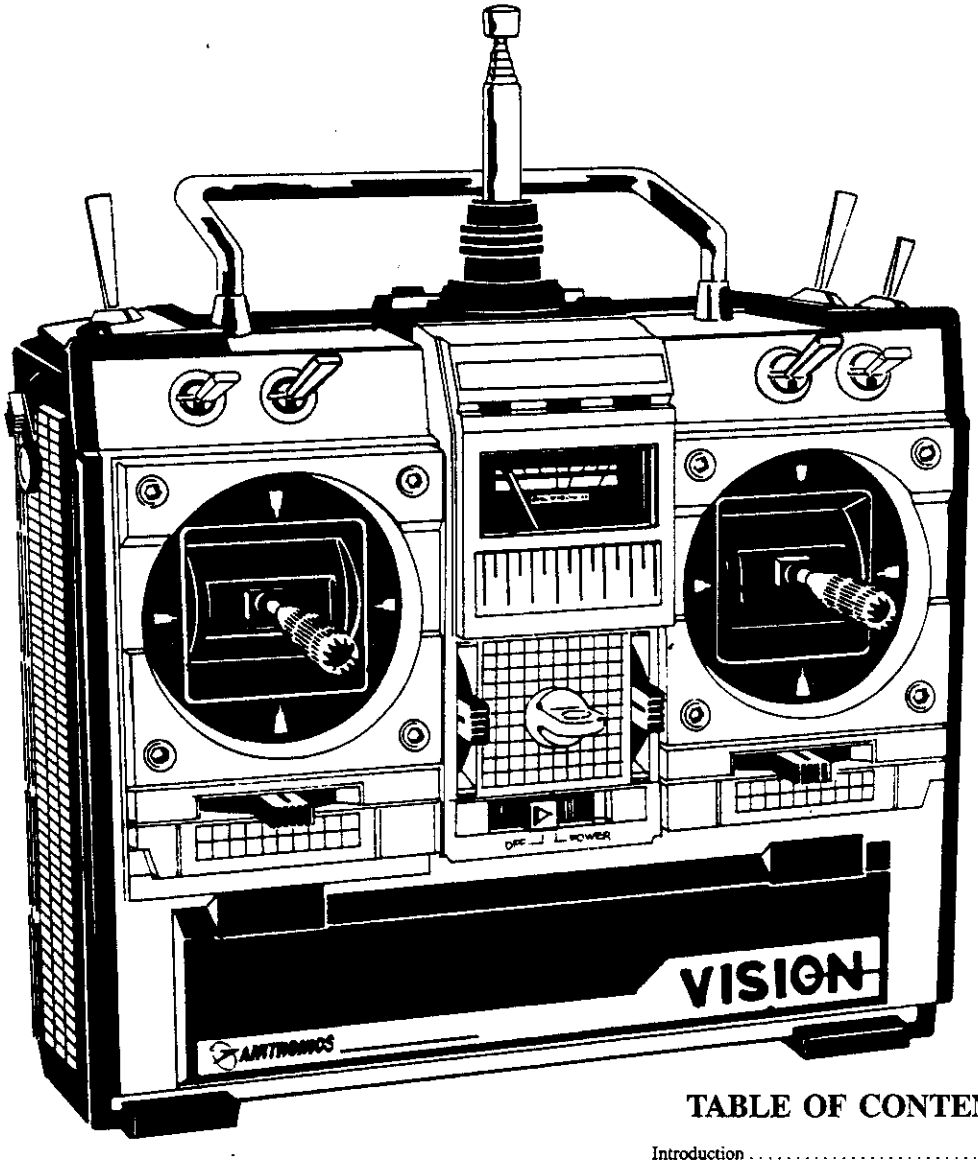
AIRTRONICS

VISION 8P PCM

RADIO CONTROL INSTRUCTION MANUAL



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INTRODUCTION

Thank you for selecting an Airtronics Vision Radio System. In designing the Vision we have made every effort to provide you with a radio that will allow you to extract the maximum performance from your airplane while at the same time simplifying the task of setting up and adjusting your model.

These instructions are written in great detail to help you understand what your Vision's capabilities are and how you can use them to your advantage while flying. Because of the many features of the Vision, this manual is quite long. Don't be intimidated! To actually use the ATRCS (Pronounced A-Tracks) system, you only need to read "Section IV: Learning to Use the ATRCS System". The balance of this book is made up of material to help you get the most from your Vision. You won't have to read the entire manual just to fly your model!

We do strongly recommend that you read the entire sections concerning safety and R/C frequencies before flying your Vision. Proper attention to safe operation and frequency usage is vital to everyone who is involved in R/C.

We once again would like to say how much we appreciate your selection of an Airtronics System and wish you many hours of flying enjoyment with your new Vision.

SECTION I: SAFETY FIRST

"**SAFETY FIRST!**" is not just a slogan when it comes to radio controlled models. The key to R/C pleasure is the proper use of your radio system and all other modeling components. **If you fail to follow instructions, fail to heed the warnings given, or fail to install and operate your system according to the instructions provided with the unit the result may be the partial or total destruction of your system and injury to yourself or to the person or property of others.**

For your own safety and the safety of others you must recognize that radio controlled models are not harmless toys and can become dangerous missiles if carelessly or improperly flown. **REMEMBER THAT YOU ARE RESPONSIBLE FOR THE SAFETY OF ALL SPECTATORS AND MAY BE HELD LIABLE FOR ANY DAMAGE OR INJURY CAUSED BY YOUR MODEL.** You are responsible because the safe operation of radio control equipment depends largely on its proper installation and utilization.

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

FOR YOUR SAFETY AND THE SAFETY OF OTHERS:

ALWAYS INSTALL YOUR RADIO CONTROL SYSTEM CORRECTLY, MAINTAIN IT PROPERLY AND BE CERTAIN THAT YOU CAN FLY WELL ENOUGH TO CONTROL YOUR AIRCRAFT AT ALL TIMES.

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 an experienced instructor has completely checked over your model and radio installation and test flown the model for you.

DO NOT FLY if you are a newcomer to R/C unless you have an experienced instructor who will fly with you until you have learned to fly competently by yourself.

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

DO NOT EXPERIMENT OR RUN RISKS. Flying is a real skill which demands patience, practice and caution. The real pleasures and satisfactions come from flying or operating your model SAFELY and competently at all times.

DO NOT FLY unless your frequency is clear. Only one person can use a given frequency at a time. DO NOT turn on your transmitter when someone else is flying or operating their model on the 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.

ACADEMY OF MODEL AERONAUTICS (AMA)

The Academy of Model Aeronautics is the leading national organization made up of aircraft modelers, 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 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 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 the right of way to and avoid flying in the proximity of full scale aircraft. When 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 take off away from the 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 Commision. Only licensed amateurs are authorized to operate equipment on amateur frequencies.

FEDERAL AVIATION ADMINISTRATION (FAA)

The Federal Aviation Administration has announced guidelines for operation of model aircraft. We are reprinting these guidelines here and encourage you to study and follow them.

1. Purpose: This advisory circular outlines safety standards for the operators of model aircraft and encourages voluntary compliance with these standards.
2. Background: Attention has been drawn to the increase in model

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 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.

FINAL NOTE:

The 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 in this manual, as well as any others appropriate to your particular activity. And remember that good common sense must also be used at all times during the operation of your equipment.

SECTION II: R/C FREQUENCIES

Every radio control system operates on a particular frequency. There are twenty two license free frequencies currently available for radio control aircraft use, but only one model can be flown on a single frequency at any time. **Before** turning on your equipment at the flying site, be sure that no one else is currently flying or operating on your frequency.

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 your model if someone turns on while you are flying, so it is very important that everyone who operates radio equipment get in the habit of clearing their frequency before turning on.

Frequencies which are used for radio controlled models are assigned two digit Channel Numbers to make identification easier. The channels and the frequencies associated with them are listed below.

72 MHz BAND FREQUENCIES (Aircraft Use Only)

LOWER BAND

CHANNEL NUMBER	FREQUENCY
12	72.030
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

UPPER BAND

CHANNEL NUMBER	FREQUENCY
38	72.550
40	72.590
42	72.630
44	72.670
46	72.710
48	72.750
50	72.790
52	72.830
54	72.870
56	72.910

Note that the channels are divided into upper and lower bands, with channel 36 not in use at the current time. Transmitters operating on the lower band, Ch. 12 through Ch. 34 inclusive, will be required to meet the Narrow Band Requirements published by the AMA. Transmitters operating on the upper band do not have to meet requirements as strict. Your Airtronics system meets all requirements for Narrow Band operation so you may use any frequency in either the upper or lower band.

WARNING: The 72 MHz frequencies above are allocated for Model Aircraft use, and are exclusive; however, they are in close proximity to other types of radio use in certain areas. Before operating your model, check with the Federal Communication Commision (FCC) Regional Office in your area to determine whether there is potential danger of interference from other radio users. If you are flying at a site regularly used by a club or other modelers you should also check with them if there are any frequencies that are known to have interference problems at that site. "Outside" radio interference may cause you to lose control of your model, possibly causing injury to yourself, to others, or to property.

YOUR AIRTRONICS RADIO MEETS AND EXCEEDS ALL PUBLISHED REGULATIONS AND GUIDELINES CONCERNING THE PERFORMANCE OF R/C EQUIPMENT. IT IS YOUR RESPONSIBILITY TO BE SURE THE AREA WHERE YOU OPERATE YOUR EQUIPMENT IS FREE FROM OUTSIDE INTERFERENCE. AIRTRONICS CANNOT BE HELD RESPONSIBLE FOR DAMAGE TO EQUIPMENT OR PERSONS CAUSED BY A LOSS OF CONTROL DUE TO RADIO INTERFERENCE.

REMEMBER THE FOLLOWING POINTS FOR PROPER FREQUENCY USE:

DO NOT OPERATE your transmitter at the field until you are certain your frequency is clear.

DISPLAY your channel identification plaques on the antenna of your transmitter.

REMEMBER that channel identification plaques can be hard to read or improperly displayed. Ask to be certain of a fellow modeler's frequency. If you have an eyesight limitation, double check to be sure of channel plaque designations.

FOLLOW any and all frequency control procedures in place at your flying site.

LAND as soon as is safely possible if you sense, feel or observe any erratic operation or abnormality in your model's operation. DO NOT operate again until you have determined the cause of the problem and corrected it.

TAKE NO CHANCES! Your enjoyment of the hobby depends on the safe operation of your equipment. If you suspect that there is a problem of any kind with your equipment, model, or outside interference DO NOT FLY.

SECTION III: GETTING FAMILIAR WITH YOUR VISION

UNPACKING

The packaging of your Airtronics Vision has been especially designed for the safe transportation and storage of the radio's components. After unpacking your radio, DO NOT DISCARD THE CONTAINERS. You should set the packaging aside for use if you ever need to send your radio in for service or to store your radio in if you do not plan to use it for an extended period of time.

BATTERY CHARGING

The first thing you should do after unpacking your Vision is to charge the transmitter and receiver batteries. The charging procedure is completely explained in Section IV, page 9 of the INSTALLATION FUNDAMENTALS AND GUIDELINES MANUAL included with your radio.

There is one major exception you need to make note of when charging your Vision. The Vision is supplied with 700 MAH battery packs for the transmitter and receiver. This is to offset the slightly higher current drain of the transmitter due to the microprocessor and the drain of the additional servos which are likely to be installed in planes using the Vision. The higher battery capacity allows the Vision to have the same amount of operating time as the rest of our radio systems. **BECAUSE THE VISION HAS 700 MAH TRANSMITTER AND RECEIVER BATTERIES, YOU SHOULD CHARGE THE PACKS FOR 17 HOURS WHEN USING THE 95030 CHARGER TO OBTAIN A FULL CHARGE.**

Other than this one item the procedures and warnings contained in the INSTALLATION FUNDAMENTALS AND GUIDELINES MANUAL all apply to the Vision. You should still charge the system for a full 24 hours prior to using it for the first time.

AIRBORNE COMPONENTS

While the system's batteries are charging, you can familiarize yourself with the airborne portion of your radio. The airborne portion of the radio refers to any components which are mounted in your plane and carried aloft when you fly. The airborne components consist of the receiver, which receives the signals from the transmitter, decodes them, and relays the commands to the servos; the servos, which are simply motors used to move the controls of the plane; the battery pack, which provides power for the receiver and servos to operate; and the switch harness which allows you to turn the airborne package on and off.

The basic connection scheme for these components is shown in Figure 1. The number and type of servos you actually use will vary depending on the type of plane you are going to install the radio in.

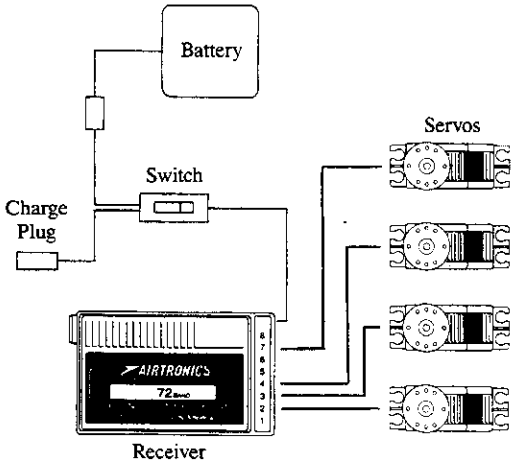


Figure 1: Typical Airborne Component Hookup

Which Channel output of the receiver each servo will be plugged into will change depending on the Aircraft Template you plan to use (For a complete explanation of Aircraft Template see page 11).

For the purpose of getting familiar with the Vision on your bench, plug one servo into Channel 2 of the receiver, one servo into Channel 3, one servo into Channel 4 and one servo into Channel 7. This manual uses the **2A 1F 1E T** Aircraft Template as an example in **Section V: Operation and Adjustment of the ATRCS System**, and connecting the servos in this way will allow you to see how the adjustments you make while programming will affect the servos. The template names may seem odd until you understand that the characters in them refer to the number of servos assigned to each function. In the **2A 1F 1E T** Template, **2A** stands for two aileron servos, **1F** stands for one flap servo, **1E** stands for one elevator servo and **T** stands for one throttle servo. When using the **2A 1F 1E T** Template, Channel 2 of the receiver controls the elevator, Channel 3 controls the rudder, Channel 4 controls the left aileron and Channel 7 controls the throttle. Mark the four servos with their functions now so that you will know which adjustment will affect which servo later in the manual. If you already have all of the servos you will require for your airplane, you may plug them all into the receiver now, using the Connection Table on page 28 to determine which receiver channel will control which function.

The connectors on your Airtronics 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. The Plug configuration is shown in Figure 2. When you are inserting the servo connectors into the receiver, be certain that the #3 pin is toward the bottom of the receiver. Do not attempt to force the plug into the receiver; properly align each servo plug and it will move into place.

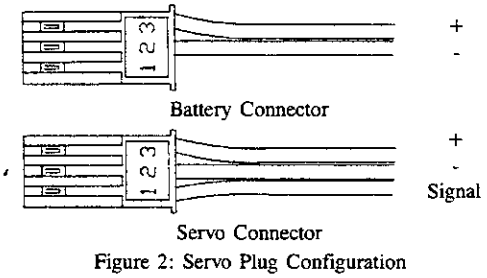


Figure 2: Servo Plug Configuration

TRANSMITTER LAYOUT

The general arrangement and the location of controls of the Vision 8P transmitter is shown in Figure 3. Refer to this illustration as you are becoming familiar with the Vision if you have any question in regard to what the function of a particular switch or stick is, or if you wish to locate a particular control.

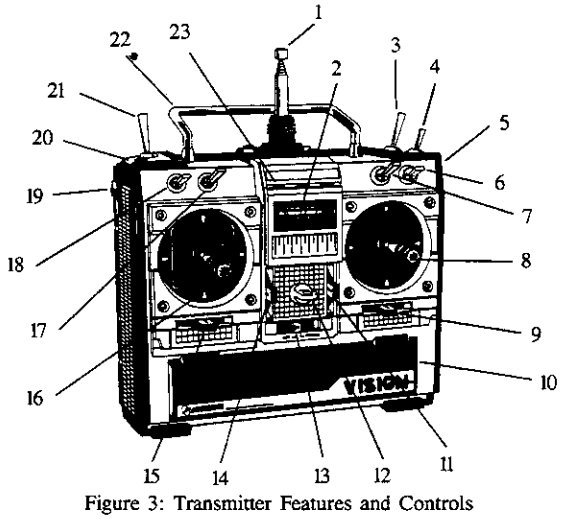


Figure 3: Transmitter Features and Controls

1. Retractable Antenna
2. R.F. Meter
3. Three Position Switch, #10, 11 and 12
4. Two Position Switch, #13 and 14
5. Auxillary 2 Control Lever
6. Two Position Switch, #8 and 9
7. Three Position Switch, #5, 6 and 7
8. Control Stick (Mode I Aileron/Throttle, Mode II Aileron/Elevator, Mode III Rudder/Elevator)
9. Trim Lever (Mode I & II Aileron, Mode III Rudder)
10. Control Panel Cover
11. Trim Lever (Mode I or Mode II & III with cross trims Throttle, Mode II & III or Mode I with cross trims Elevator)
12. Neck Strap Hook
13. Power Switch
14. Trim Lever (Mode I or Mode II & III with cross trims Elevator, Mode II & III or Mode I with cross trims Throttle)
15. Trim Lever (Mode I & II Rudder, Mode III Aileron)
16. Control Stick (Mode I Rudder/Elevator, Mode II Rudder/Throttle, Mode III Aileron/Throttle)
17. Alternate Setup Switch
18. Two Position Switch, #3 and 4
19. Auxillary 1 Control Lever
20. Snap Roll Button
21. Two Position Switch, #1 and 2
22. Carrying Handle
23. Power On L.E.D. and Dual Rate On Warning L.E.D.s

TRANSMITTER R.F. METER

The meter on the front of the Vision reads R.F. Current and is an indication of the strength of the signal the unit is sending and the state of charge of the transmitter battery.

With the transmitter antenna fully extended the meter will read in the upper portion of the silver section on the meter face. If the meter reads in the orange portion it indicates that the signal has weakened and the battery is marginally discharged. A reading in the red indicates that the signal is very weak and the battery is discharged below an acceptable level.

When the transmitter has just been fully charged and the antenna is extended you should get a reading in the silver. Make a note of where the needle moves to after a full charge. If in the future there is a sustantial change in the position the needle assumes right after a full charge it may be an indication of a drop in battery performance and the unit should be returned to Airtronics for inspection. If you get a reading in the red or orange after a full charge it is an indication of defective cells and the battery should be replaced.

If there is no movement of the meter when the transmitter is first turned on it indicates one of two things. First check to be sure that the R.F Module is installed in the transmitter and completely seated within its socket. With the Module removed there is no signal being sent and the R.F. Meter will indicate this by not moving. If the meter doesn't move with the R.F. Module installed, the battery is most likely completely discharged. Charge the battery pack as described in Section IV of the INSTALLATION FUNDAMENTALS AND GUIDELINES MANUAL, keeping in mind that the 700 MAH batteries of the Vision requires a slightly longer charging time.

DO NOT ATTEMPT TO OPERATE A TRANSMITTER UNLESS THE METER READS IN THE SILVER WITH THE ANTENNA FULLY EXTENDED. IF YOU NOTICE THE METER READING HAS DROPPED INTO THE ORANGE WHILE FLYING, LAND IMMEDIATELY. A TRANSMITTER WHOSE PERFORMANCE HAS DROPPED MAY NOT SEND THE SIGNALS REQUIRED TO ADEQUATELY AND SAFELY CONTROL THE MODEL RESULTING IN A POSSIBLE CRASH.

AUDIO LOW VOLTAGE ALARM

Your Vision is equipped with an Audio Alarm which will sound whenever the transmitter batteries drop below 9.59 volts during transmitter operation. If the alarm sounds while you are flying, land immediately and don't operate the transmitter until it has been charged for 17 hours. The transmitter should normally operate for seventy to eighty minutes before the alarm sounds. If the alarm sounds even after the batteries have been on charge for the required time it indicates that there is a problem with either the battery pack or the transmitter, and you should contact Airtronics about service.

TRANSMITTER R.F. MODULE

The operating frequency of the Vision transmitter is controlled by the R.F. Module plugged into the back of the unit. If you wish to change the transmitter frequency of your radio you will have to change this entire Module. **Individual transmitter crystals can not be changed.**

If you change the R.F. Module you will obviously have to change the frequency of the receiver to match the new transmitter frequency. **We strongly recommend that you send the R.F. Module and receiver in to Airtronics' Service Center to be precisely tuned to each other any time you make a frequency change.** If you do not wish to send the components to Airtronics for tuning make a very careful range check to be sure you have the same ground range on the new frequency as you did on the radio's original frequency. If there is any loss of range the receiver and R.F. Module should both be sent to Airtronics for alignment.

Removing the R.F. Module is rapidly and easily done. Press in on the two Module locking tabs and lift out. Be sure to lift the Module straight out from the unit, always parallel to the transmitter case to keep from bending the multi-pin connector on the lower edge of the Module. See Figure 4. To replace the Module, drop it in place, again being sure to keep it parallel to the case, and press it into position until the two tabs snap into place.

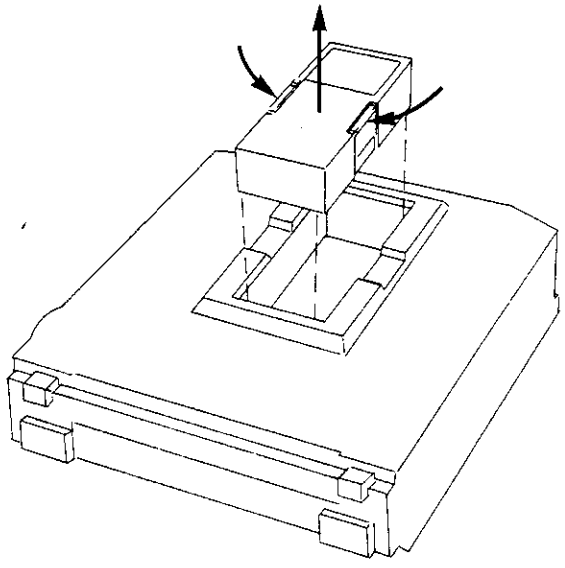


Figure 4: R.F. Module Removal

PLUG-IN MODULAR TRANSMITTER BATTERY

The battery pack in your Vision is a self contained unit and can easily be removed and replaced with a fully charged pack to extend the operating time. The Vision has a non-volatile memory, which means the program does not require any battery power or backup batteries to remember the settings you have programmed into the radio, so unplugging the battery and switching to a fresh pack will not cause you to lose any information. Additional packs are sold separately as an accessory item under the Airtronics P/N 95014.

To remove the pack, locate the two slide catches on the bottom of the transmitter and slide them inwards. Push the pack straight down the back of the transmitter until it clears the connector at the upper right corner of the pack, then lift the battery free. See Figure 5. Reverse the procedure to replace the pack.

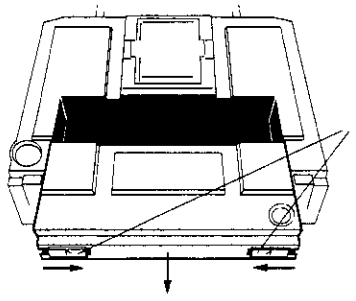


Figure 5: Transmitter Battery Removal

CONTROL STICK ADJUSTMENT

The sticks in your Vision are adjustable in length and spring tension to allow you to tailor their feel to your personal preference.

Refer to Figure 6 if you want to adjust the length of the sticks. To adjust the length, 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 best to leave at least four threads inside Part A when screwed out to its longest length for the best mechanical security. Do not overtighten when you screw the two parts together.

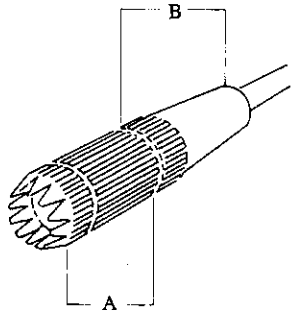


Figure 6: Stick Tip

To adjust the spring tension of the sticks you need to get inside the back of the transmitter. First remove the R.F. Module and the battery pack from the back of the transmitter. Then remove the eight screws which hold the rear of the transmitter case in position. There are two on the top of the transmitter, four on the back, and two on the bottom. Remove the case back and refer to Figure 7.

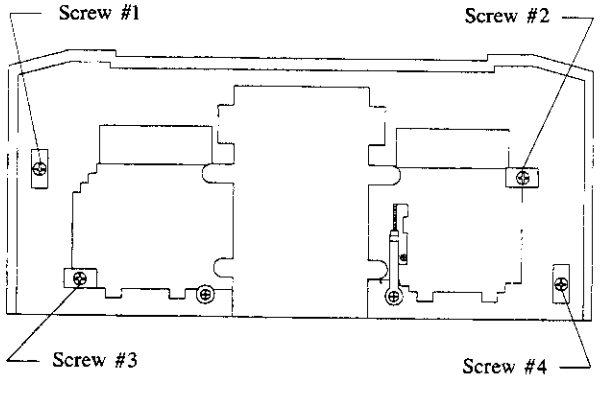


Figure 7: Stick Tension Adjustment Screws

There are four possible locations for the stick adjustment screws as you can see in Figure 7. Your Vision will only have three screws because the stick controlling the throttle is ratcheted and has no tension adjustment. Depending on whether you fly Mode I or Mode II (See page 9), either screw #1 or screw #4 will not be installed. The #1 screw adjusts the tension for the vertical motion of the right hand stick. The #2 screw adjusts the tension for the horizontal motion of the left stick. The #3 screw adjusts the tension for the horizontal motion of the right stick. And the #4 screw adjusts the tension for the vertical motion of the left stick.

To make the tension adjustment, use a small phillips type screwdriver to turn the adjustment screws. Turning the screw clockwise will increase the stick tension, turning it counterclockwise will decrease the tension.

Once you have completed the adjustment, replace the case back and install the eight screws.

SECTION IV: LEARNING TO USE THE ATRCS SYSTEM

The heart of your new Vision is the transmitter and the ATRCS (Pronounced A-tracks) system, and this section will explain how to operate and adjust your Vision to take full advantage of the program's capabilities. Before you begin to read this section, there are several steps you should take. First, the transmitter's batteries should be charged completely as outlined in Section III on page 4. Since you won't need to send out a signal while you are getting familiar with ATRCS, remove the R.F. Module from the back of the transmitter. Having the Module removed will reduce the drain on the battery and allow you more operating time. Finally, set aside a block of time which will allow you to go over this section without being interrupted. The ATRCS system is not difficult to learn and use, but like anything new it will take some time for you to become comfortable with it.

GENERAL

The ATRCS system is the link which allows you to talk with the microprocessor inside the Vision transmitter. The **A**dvanced **T**echnology **R**adio **C**ontrol **S**ystem (ATRCS) has been developed by modelers in California's Silicon Valley to be as simple as possible to use when setting up a model. ATRCS consists of a Menu, which is really just a list of questions, and a six button control panel used to move around in the Menu and answer the questions. The display in the transmitter only shows one program function at any one time, and all you will ever be required to do when setting up is to answer either yes/no or increase/decrease depending on the type of question being asked.

MENU STRUCTURE

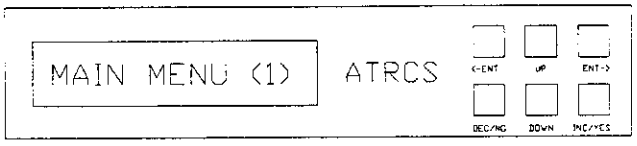
The easiest way to become familiar with the Menu structure of the Vision is to look at the sample Menu on page 28. You can see that the Menu items are grouped into six different columns. All of the items in a particular column are similar to each other in some way and related to the group heading at the top of the column. When you have worked with the ATRCS system and become familiar with the six group headings you will be able to very rapidly move to any position in the Menu and make the desired adjustment or change, without the need to refer to a list of codes or a complicated map of the Menu items.

In practice, an adjustment is made to the ATRCS system by first moving to the appropriate group heading, then moving down the column until you have reached the desired Menu item. Once there, you will need to answer yes or no to the question asked or to increase or decrease the value on the display. Moving to another Menu item or to a different group heading automatically stores whatever change you have made. That's all there is to use the system.

MOVING THROUGH THE MENU

Flip down the front panel of the Vision transmitter and you will see the liquid crystal display, known as the LCD, on the left and six push buttons on the right. Below each of the buttons is a label describing

its function. The two buttons in the center are labelled **UP** and **DOWN**. These two buttons are used to move up and down within one of the columns in the menu. In the top row of buttons the two outside buttons are labelled **<-ENT** and **ENT->**. These two buttons are used to move either one column to the left or one column to the right. Together these four buttons create the method of moving through the ATRCS menu.



Vision 8P Control Panel

Turn on your transmitter and watch the display. The program will quickly go through its start up routine and flash three messages on the display; one saying the RAM is being loaded, a second saying that ATRCS is copyrighted and and a third identifying the version of the software. Once the start up is completed, the display will read **Main Menu (1)**. This is telling you that you are at the top of the Main Menu column and the setup you will be working with is for Plane #1. Press the **ENT->** button once and the display will read **Basic Confg (1)**. You have now moved one column to the right and are at the top of the Basic Configuration column and the setup is for Plane #1. Press the **ENT->** a second time and the display will read **Asign Switch (1)**, showing that you are at the top of the Assign Switch column. Pressing **ENT->** again will change the display to **Surface Adj (1)**, meaning you are at the top of the Surface Adjustment column. Pressing **ENT->** again will change the display to **Mixer Adj (1)**, letting you know you are at the top of the Mixer Adjustment column. Pressing **ENT->** one final time will change the heading to **Presets/DR (1)**, indicating the top of the Presets and Dual Rates column. This is the last column on the right of the Menu. Pressing **ENT->** will have no affect when you are at the top of this column. To move back through the Menu you will have to press **<-ENT**.

Once you are at the top of a column you can use the **UP** and **DOWN** buttons to move to different items in the column. Use the **<-ENT** or **ENT->** buttons to move to the **Surface Adj (1)** column. Press the **DOWN** button once and the display will read **Center Ail:0%**. Press and hold the **DOWN** button until the display reads **Rudder RTV:66%**. Note that when you press and hold the button down you will scroll quickly throught the Menu. This is true for all four of the buttons which allow you to move through the Menu. Once you have reached **Rudder RTV:66%** pressing the **DOWN** button will have no further effect because this is the last Menu item in the column. To move back up the column you need to press the **UP** button.

Press the **UP** button until the display reads **Elev DTV:66%**. Now press the **ENT->** button. This will change the display to read **Mixer Adj (1)**. By pressing **ENT->** you moved one column to the right and directly to the top of the column. In the ATRCS system it is not necessary to move back to the top of the column you are in before moving to the right or the left. Keep in mind however that every time you do change from one column to another you will automatically move to the top of the new column. There are certain Menu items where you can not move from one column to another. When addressing these items you must first move up or down to a different item before changing columns. Which specific items this applies to will be covered later in the manual.

ENTERING INFORMATION

The two remaining buttons are used to enter information into the ATRCS system. These two buttons are labelled **DEC/NO** and **INC/YES**. As the names indicate, the two buttons are used to either answer Yes or No to a question or increase or decrease a value.

Move to the top of the **Surface Adj** column, then press the **DOWN** button to move down one line to the Menu item that reads **Center Ail:0%**. (For the moment we will only use this item as an example for entering information; its function will be fully explained later in this manual) Press the **INC/YES** button and the percentage will change. Pressing and releasing the button will change the value by 1%, pressing and holding the button will cause the value to change rapidly. The **DEC/NO** button will also cause the value to change, but in the opposite direction.

At this point the value on the display is not zero but some number you arrived at as you were experimenting. Press both the **INC/YES** and **DEC/NO** buttons at the same time. The value should change back to zero, which is the default value for this particular Menu item; that is, the value which the system starts at before any programming has been entered. Remember that you can reset any value back to the default value by pressing both **INC/YES** and **DEC/NO** buttons simultaneously. This will quickly allow you to undo any mistakes in programming or any settings which you do not want to keep.

To enter a new value or setting into memory, **you must move from that Menu item to another Menu item**. Moving to another Menu item or to the top of a column automatically enters the setting into memory. If you turn the transmitter off without moving to another Menu item to lock in the change you made, the new value **will not** be stored in memory. Move to the Menu item **Center Ail:0%**, which is the first item under the **Surface Adj** column. Change the value to read 5%, then turn off the transmitter without moving to another Menu item. Turn the transmitter back on and return to the same Menu item. The value has returned to 0%, because the change was not locked in by moving to a different Menu item. Now change the value to read 5% once again, then press the **UP** button to return to the top of the column and turn the radio off. Turn the system on and return to **Center Ail** and you will find the value was saved as 5%. **IT IS CRITICAL THAT YOU REMEMBER TO LOCK IN ANY CHANGES YOU MAKE BY MOVING TO A DIFFERENT MENU ITEM AFTER YOU CHANGE A VALUE.**

Now return to the top of the **Main Menu** column. Move down one step so that the display reads **L Setup(ENT) (1)**, which indicates that the setup for Plane #1 is currently loaded. Certain Menu items have a major impact on the entire operation of the ATRCS system, such as this one which selects which aircraft setup you want to load. When a Menu item has major significance, you will see the **(ENT)** abbreviation to the right of the item name. What this means is that you must press both **<-ENT** and **ENT->** at the same time to enter new information at the particular Menu item. Press the **INC/YES** button twice so that the number reads (3). Now press both **ENT** buttons simultaneously. You will see the display flash the message *****Ram Loaded***** to indicate that the information has been entered. Pressing just one of the **ENT** buttons will not cause this message to flash. Use the **DEC/NO** button to return the Setup number to (1) and press both **ENT** buttons to load Setup 1.

SECTION V: OPERATION AND ADJUSTMENT OF THE VISION

This is the section where we will go through the capabilities and adjustment of the Vision 8P in depth. If you are already familiar with the characteristics and mixing requirements of high performance or complex aircraft you may find that this section has more detail than you need, and you might want to use the Quick Reference Guide (See page 25) when setting up your plane and refer to this section only on those items where you need additional information. If you are not familiar with all of the control possibilities and mixing options or you want to be completely familiar with every aspect of the Vision you should read through this section thoroughly.

When you go through this section for the first time it will be of tremendous benefit if you have the transmitter and airborne components of the Vision on the bench in front of you so you can learn "hands on". Connect the airborne components as outlined in Section III so that the four servos will work for the **2A 1F 1E T** Aircraft Template. This template is used for demonstration because it has samples of all types of Menu items and will allow us to cover the complete range of features without changing templates.

Before you continue, you will need to change the template in the transmitter to the one we will be using as an example in this section. To load the **2A 1F 1E T** Template, turn on the transmitter. Press the **ENT->** button once to move to the top of the **Basic Config** column. Press the **DOWN** button once and the display will read **1A 1F 1E T (ENT)**. Press the **INC/YES** button once so the display reads **2A 1F 1E T (ENT)**. Now press both of the **ENT** buttons simultaneously. The message **Templated inited** will flash on the screen to let you know that the new template has been loaded into the transmitter. You will now be able to follow along with the examples in this section as you get familiar with your Vision.

In Section IV you removed the R.F. Module to conserve the transmitter battery. In this section there will be times when you want to send a signal so you can see the effect a certain adjustment has on the servos. At those times you should plug the Module back into the transmitter, but keep it removed as much as possible to conserve the battery.

With the R.F. Module plugged in, turn on the Vision transmitter, then turn on the airborne package. The system is now energized. There may be some initial movement of the servos even though you have not moved the sticks. **This is normal.** Once the servos have moved to a set position they will stay there until you move a control on the transmitter.

When your Vision is brand new, there are two tasks you need to perform before beginning any programming. First you will have to decide whether you want your transmitter configured for Mode I, II or III operation. A complete description of the Modes and how to set up the transmitter for each is in **Transmitter Mode Selection** on page 9. After selecting the transmitter Mode, you will have to calibrate the center positions of the control pots in the transmitter. The procedure for doing this is described in **Calibrating Zero Points** on page 10. Once you have completed these two operations you are ready to start using the ATRCS system.

THE MAIN MENU GROUP

Sample display: **Main Menu (1)**

The Main Menu Group is made up of commands which affect the transmitter itself or the entire aircraft set up you are going to be working with. Most of the settings you enter in the Main Menu group will not be changed on a regular basis; in actual use of your Vision you will set them and forget them. The exceptions to the "set and forget" rule are the Menu items which deal with loading and copying the setups for different models.

Press the **DOWN** button to move to Load Setup.

LOAD SETUP

Sample display: **L Setup(ENT) (1)**

This is where you decide which aircraft setup the transmitter will use. Each aircraft setup stores the information needed to fly one airplane with the ATRCS program. Once you have programmed a setup for a particular model, you may recall that setup at any time by following the procedure below and pressing both **ENT** buttons simultaneously. In your Vision 8P you can store up to three different aircraft setups at any one time. These three setups are numbered (1) through (3). When you move to the Load Setup item, the display will read **L Setup(ENT) (1)**. To load a particular setup, use the **INC/YES** or **DEC/NO** buttons to change the number to the setup you wish to load. Once the proper number is displayed in the parentheses, press both **ENT** buttons at the same time. The message ***RAM Loaded*** will flash to let you know that the setup has been changed. Once you have loaded a setup, it remains loaded in the transmitter until you you use the Load Setup function to change it. This means that if Setup 2 is loaded in the transmitter when you turn it off, the program will still be in Setup 2 when you turn the transmitter back on.

The Load Setup item is one of the Menu items where you will not be able to move directly to another column. To move to the next column to the right you will have to either move up or down one Menu item and then over.

Press the **DOWN** button once to move to Access Level.

ACCESS LEVEL

Sample display: **Access Level 3**

The Access Level item allows you to protect the setup information you have programmed from being changed. In practice, it allows you to lock your setup to prevent any accidental changes from being made. There are four levels of Access protection, numbered 0 through 3.

Level 0 allows no settings in the program to be changed. Once you are satisfied that you have completely trimmed out your airplane and plan to make no further changes, it is a good idea to set the Access Level to 0.

Level 1 allows you to change the centering positions of the control surfaces and your Dual Rate settings, but no other Menu items. This level is useful if you want the ability to make small corrections to surface positions on the flightline to compensate for any shifts due to temperature variation or changes in flying conditions.

Level 2 allows you to change all of your surface adjustments for centering and throw, all of your mixer gains, and the generic mixers. This is the level you should use when you are in the process of flight testing and trimming out an airplane and expect to be adjusting many of the Menu items. This level will still not allow you to change any of the basic configuration items such as servo reversing or receiver type.

Level 3 allows you to change anything in the program. This is the level you should use when you are installing the Vision in an airplane and setting it up for the first time.

If you attempt to make a change that is not allowed by the Access Level you have assigned, the display will flash the message **ALevel 2, Denied**. What this tells you is that the Access Level must be set to level 2 or greater in order to make a change to that Menu item. To actually make a change you would need to go to the Access Level Menu item and change the level. The number in the message may read 1, 2 or 3, depending on the level needed to change the particular item.

Press the **DOWN** button once to move to Save Setup.

SAVE SETUP

Sample display: **S Setup(ENT) (1)**

The Save Setup function allows you to copy the currently loaded aircraft setup into another setup with the press of just two buttons. This can save a great deal of time when programming similar aircraft setups. You can use Save Setup when you are setting up a plane which is similar to one which you are already flying, when you want to do some experimenting with settings but don't want to affect a known "good" setup, or when you are using the Alternate Setup function.

To use Save Setup, go to the proper Menu item under the **Main Menu** heading. The display will read **S Setup(ENT) (1)**. When you first go to this menu item, the number in parentheses indicates the setup currently loaded in the transmitter, which is the one you will be

copying into another setup. If the number displayed is not the setup you wish to copy, you need to go to the Load Setup function and load the desired setup before continuing. When the number first displayed is the setup you wish to copy, you are ready to continue.

Press the **INC** or **DEC** buttons to change the number in the parentheses to the number of the setup which you want to copy to. Be very certain that the proper number is displayed, because the Save Setup function will erase all of the information which may already be in the setup you are copying to. Once you are ready, press both the **ENT** buttons at the same time. The message ****Setup Saved***** will flash on the display to let you know that the information has been copied. You now have two setups which are exactly the same. Any changes you make to one will in no way affect the other setup.

The Save Setup function is one of the Menu items where you will not be able to move directly to another column. To move to the next column over you will need to move up or down one Menu item and then press the DOWN button once to move to Alternate Setup.

ALTERNATE SETUP

Sample display: **Alternate (OFF)**

The Alternate Setup function is unique to the ATRCS system. It allows you to switch from one aircraft setup to one of the remaining two setups in flight with the flip of one switch. At first this feature may sound dangerous, but let's go through the advantages and built in safeguards before you make the decision on whether or not to use Alternate Setup.

When you are first setting up and trimming out an airplane, all of the control surface throws are set to an amount which is your "best guess" of what they should be. Then you fly the model and decide you would like a little more aileron throw or a little less elevator, etc. The problem is that you have to land and make the adjustments and then fly the model again. Now you have to decide if the new throws you have programmed in are better than the old ones you had. This can become difficult to do from memory if you have had to wait a span of time between the two test flights. The problem is even worse when you are experimenting with mixing values and preset positions and trying to optimize the performance of your aircraft.

What Alternate Setup lets you do is switch back and forth in flight between two different setups and compare them directly without the need to land the aircraft. You can do a roll, level the plane, flip to an alternate setup which you have programmed with more aileron throw and perform a second roll in less time than it takes to read this sentence. It becomes very easy to decide which setup you prefer because you can flip back and forth as many times as necessary to make your decision. If you find that neither one is to your liking, you can land, enter a different setting in your alternate setup, and try again. This process can be used for all of your control settings and mixing values until you arrive at the exact settings you feel most comfortable with.

There are several safeguards in the Alternate Setup function to prevent accidents with this feature. The first is that the feature can be entirely turned off. To do this, go to the Alternate Setup Menu item and press the **DEC** button until the display reads **Alternate (OFF)**, which completely inhibits the feature. The second safeguard is that the Alternate Setup you select must be compatable with the Standard Setup in the critical areas of receiver type and aircraft template. If the setup you select as the Alternate Setup is not compatable with the Standard Setup the display will flash the message **NOT COMPATABLE!!** when you move the Alternate Setup switch from the STD SET UP to the ALT SET UP position. The final safeguard is that the program will not go to the Alternate Setup unless the switch on the transmitter is physically moved from the STD SET UP position to the ALT SET UP position when the transmitter is on. This means that if the switch is accidentally bumped in the pits or transmitter impound while the transmitter is turned off the program will not go to the Alternate Setup. To go to the Alternate Setup the pilot would have to physically move the switch to the STD SET UP position and then back to the ALT SET UP position when the transmitter was turned on.

There are three steps to go through when setting up to use the Alternate Setup function. Let's go through an example where Setup 1 will be the Standard Setup and Setup 2 will be the Alternate Setup.

First make sure that Setup 1 is loaded in the transmitter. To do this, go to the **L Setup(ENT)** Menu item under the Main Menu column. The number in the parentheses to the right of **L Setup(ENT)** should be **(1)**. If it isn't, use the **INC** or **DEC** button to change it to **(1)** and then press the two **ENT** buttons simultaneously to load the setup.

Next you need to copy the Standard Setup to the Alternate Setup. This will assure that the two setups are compatable. Go to the **S Setup(ENT) (1)** Menu item under the Main Menu column. Use the **INC** or **DEC** button to change the number in parentheses to the setup you wish to use as the Alternate Setup, in this example **(2)**. Press both **ENT** buttons to copy Setup 1 to Setup 2. Pressing the **ENT** buttons will copy the setup and automatically load Setup 2 into the transmitter, so after you do this you will have to reload Setup 1. To do this, go back to the **L Setup(ENT)** Menu item and press the **DEC** button until the number in parentheses reads **(1)**, then press both **ENT** buttons simultaneously.

Now go to the Alternate Setup Menu item and use the **INC** button to change the number in the parentheses to **(2)**. Return to the top of the Main Menu column. The display will read **Main Menu (1)**. Now flip the Alternate Setup switch to the ALT SET UP position. The display will now read **Main Menu (@2)**. This is telling you that you are in Setup 2, but you are there through the Alternate Setup function. Move to the Surface Adjust column and go to the **Center LAil:0%** item. Flip the Alternate Setup switch between ALT SET UP and STD SET UP and you will see that there is no change in value. With the switch in the ALT SET UP position use the **INC** button to change the value to 5%. Now move the switch to STD SET UP and the value will change back to 0%. It is useful to remember that you do not need to go through the Load Setup function to make setting changes in the Alternate Setup. All that is required is to go to the desired Menu item, move the switch to the ALT SET UP position and make the change.

Return to the Main Menu column and press the **DOWN** button five times to move to Alter Mode.

TRANSMITTER MODE SELECTION

Sample display: **Alter Mode? Yes** and **Mode B? No**

The Vision transmitter can be operated as either Mode I, Mode II or Mode III without having to do any rewiring of the transmitter. If you have any doubt which Mode your transmitter is set for go to the section below for the Stick Function Test and it will explain how you can quickly check what Mode you are in. In Mode II operation, the aileron and elevator functions will be on the right stick and the rudder and throttle functions will be on the left stick. If you fly this Mode there is no need for you to make any changes since your Vision has been delivered set up to operate in this Mode. Mode I has the ailerons and throttle on the right stick and the rudder and elevator on the left stick. If you wish to fly Mode I you will need to make a change in the software and move the ratchet from the left stick to the right stick as outlined below. Mode III has the rudder and elevator on the right stick and the ailerons and throttle on the left stick. To fly this mode you only need to make one software change.

It is important to remember that the definitions of Mode I, Mode II and Mode III all assume you are flying a airplane with ailerons for roll control. If you are installing the Vision in a plane which only has rudder for turning control you substitute the rudder

function for the aileron function in the definitions. So on a rudder type airplane the rudder is controlled from the right stick in Modes I and II and from the left stick in Mode III.

MODE I OPERATION

Under the Main Menu column go to the Menu item **Alter Mode? Yes**, and press the **DEC/NO** button so the display reads **Alter Mode? No**. This changes the software from Mode II to Mode I so that the elevator and all of its associated functions will operate off the left stick and the throttle and all of its associated functions will operate off the right stick.

To make the mechanical changes necessary you will need a small phillips screwdriver and a pair of needle nose pliers. Take both the R.F. Module and the battery pack out of the transmitter. Remove the eight screws which hold the transmitter case back in place. There are four on the back of the transmitter, two on the top and two on the bottom of the transmitter. Pull the back away from the transmitter and you will find the wiring for the battery leading from the right side of the back. Unplug this lead and set the case back aside.

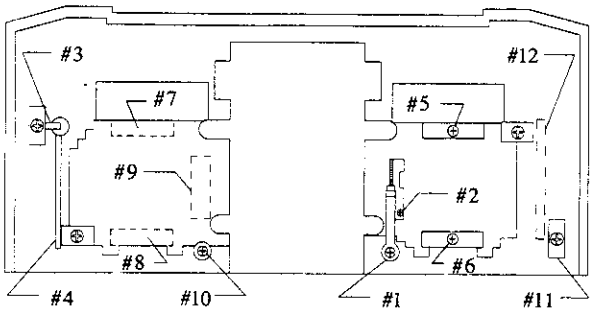


Figure 8: Changing from Mode II to Mode I

Refer to Figure 8 as you read through these next paragraphs. Take out the screw holding in the copper tensioning arm located at position 1 in the diagram and set the tensioning arm aside. Reinstall the screw and washer. Carefully remove the screw at position 2 which holds the brass ratchet in place. Slide the ratchet itself toward the top of the transmitter so that the notch in the ratchet aligns with the plastic retaining clip and the ratchet may be removed from the stick assembly.

Unhook the spring from the stick tension adjusting block at position 3 and remove both the spring and the block from the transmitter. Remove the centering scissor at position 4, taking note of how it is hooked over the pin at the extreme bottom end of the stick assembly and passes underneath the two pins near the center of the stick.

Remove the two screws located at positions 5 and 6. These screws hold the two plastic throttle stick stops in place. Use a pair of needle nosed pliers to remove the two stops, noting how they fit in place with the notches in them toward the center of the stick assembly. Insert the two stops at positions 7 and 8 and reinstall the retaining screws.

Install the ratchet at position 9 by fitting the notch in the ratchet over the plastic retaining clip and sliding the ratchet toward the top of the transmitter. Once the ratchet is properly positioned hold it in place with the short retaining screw. Remove the screw which holds the cable support in place at position 10, then fit the copper tensioning arm in place underneath the cable support and reinstall the screw to hold it and the cable support in place. Be careful not to overtighten the screw and strip out the plastic mounting lug.

Slide the stick tension adjusting block into place at position 11 with the hook on the block toward the center of the transmitter. Install the centering scissor at position 12 by passing it under the two pins near the center of the stick assembly and hooking it over the pin nearest the top of the transmitter. Now hook one end of the spring over the centering scissor and the other end of the spring over the hook on the tension adjusting block, being extremely careful not to stretch the spring.

Check to see that both sticks are working properly. The right stick should now hold its position with the ratchet and the left stick should be spring loaded to return to center. If you feel that you do not want to tackle the mechanical changes to change from Mode II to Mode I we will be happy to do it for you at the Airtronics repair facility for no charge. All that will be required of you is to send the transmitter back to us with a note requesting we switch the Mode of the transmitter.

MODE III OPERATION

To operate on Mode III, all that is required is a software change. Under the Main Menu column, go down to the Menu item which reads **Mode B? No**. When this item reads no, the ailerons will operate off the right stick and the rudder will operate off the left stick. If you wish to reverse this press the **INC/YES** button so the display reads **Mode B? Yes**. This switches the rudder to the right stick and the ailerons to the left stick.

Press the **Down** button to move to Cross Trims.

CROSS TRIMS

Sample Display: **Cross Trims? No**

This function allows you to have the trim levers for the elevator and throttle on the opposite side of the transmitter from the sticks themselves.

As an example, in Mode II operation the throttle trim and stick would both be on the left side, while the elevator trim and stick would both be on the right side. By using the Cross Trim feature, you can configure the transmitter so that throttle trim is on the right side next to the elevator stick and the elevator trim is on the left side next to the throttle stick. This allows you to make adjustments to the elevator trim with your left hand without removing your right hand from the elevator stick.

When you first go to this Menu item, the display will read **Cross Trims? No**, which means that the elevator and throttle trims are on the same side of the transmitter as their respective sticks. Pressing the **INC/YES** button will change the display to read **Cross Trims? Yes**, which will put the elevator and throttle trims on the opposite side from their sticks.

Press the **Down** button to move to Zero Sticks.

CALIBRATING ZERO POINTS

Sample display: **Zero Sticks(ENT)**

Under the Main Menu column there is a Menu item which reads **Zero Sticks(ENT)**. This item is used to calibrate the values of the control stick potentiometers when the sticks are in the neutral position. You should perform this operation when you first get your Vision radio and then perhaps once every six months or so to correct for any drifting of the pots due to temperature or climatic changes.

Move all of the transmitter trims to their neutral positions. The throttle stick should be moved to the bottom end of its travel, with the throttle trim in neutral. Move the right side Auxillary Lever to the center of its travel range. If you are going to use the left side Auxillary Lever to control the flaps, move this Lever to the position it will be in when the flaps are fully raised, either all the way forward or all the way back. If you are not going to use the left Lever to control the flaps, move it to the center of its travel range. All of the controls must be in these positions when you calibrate the transmitter. If they are not in these positions, you run the risk that one of the pots may go beyond its value limits during operation of the transmitter and either cause a loss of servo travel in that direction or the servo to actually move to one extreme or the other. If you ever experience a problem with the servo response, especially with the auxillary or throttle servos, recalibrate the system making sure that the controls are all in the proper positions.

Once all the controls are properly positioned, press both **ENT** buttons at the same time. The display will scroll through all of the pots as it reads the values, starting with **->Aileron**, then **->Aileron Trim**, then **->Elevator**, etc. When the calibration is complete the display will return to reading **Zero Sticks(ENT)**.

The Zero Sticks Menu item is one of the items where you will not be able to move directly to another column. To move to the next column over you must first move up one Menu item.

Press the **DOWN** button to move to Memory Test.

MEMORY TEST

Sample display: **EEP(ENT):0,24577** (Note: Value may be different)

This Menu item tests the setup memory of the transmitter to see if the ATRCS program is functioning properly. It is primarily used when the transmitter is being built at the factory, but it is useful if you ever have a doubt about whether your Vision is storing information properly.

When you go to this item under the Main Menu column, the display will read **EEP(ENT):0,24577**. Note the number in the display may be different depending on the aircraft setup that is currently loaded in the transmitter. Press both **ENT** at the same time and the display will read **TESTING:** with rapidly scrolling numbers to the right of the colon. If there are no problems with the program or the memory storage chips the display will return to the original **EEP(ENT):0,24577**. If there is a problem the display will read **ERROR**. If an error reading does come up, the transmitter should be sent in for service. If no error reading comes up then everything is functioning normally.

The Memory Test Menu item is one of the items where you can not go directly to another column. You must first go down one item before you can move to the next column over.

Press the **DOWN** button to move to Stick Function Test.

STICK FUNCTION TEST

Sample display: **Aileron 124** (Note: Value may be different)

This Menu item allows you to check what stick or trim lever is controlling what function in the ATRCS program. It is used when the transmitter is wired at the factory to verify that all connections to the control pots have been made properly. It is valuable as a means to check which Mode the transmitter is set up to operate in.

Go to the Menu item under the Main Menu column which reads **Aileron 124**. The value may actually read anywhere from 115 to 135 for the main flight controls and their trims and from 0 to 240 for the throttle and auxillary channels depending on your particular transmitter. What the display is telling you is that the aileron function is being displayed and what the current value for that function is. Don't be concerned if the value is switching between two numbers; all that indicates is that the pot is right on the line between two values, and the switching won't affect the servo centering or resolution. If you move the right stick side to side the value will change. Press the **INC/YES** button once and the display will read **Aileron Trim 125**. Moving the trim lever on the right side of the transmitter from side to side will cause the value to change.

Note that moving the aileron stick to the right caused the value to decrease. When you looked at the aileron trim you may have noticed that moving the aileron trim to the right caused the value to increase. This is normal and should not concern you. Since the transmitter sticks and trims each have their own individual potentiometers, the program looks at each value independently. In some cases, it is more convenient for the programming process to have the stick value and trim value for the same function operate in different directions.

Also note that when you are using Cross Trims, this particular test will not indicate that the trim pots are on the opposite side from their respective sticks. In this test the same pot will be identified as the elevator trim whether the trims are crossed or not. This is because the Stick Function test is read at the very beginning of the software program, before the reversal of trims for the Cross Trim item is performed.

Pressing the **INC/YES** and **DEC/NO** buttons will allow you to step through and look at each of the functions of the transmitter which is controlled by a potentiometer. If you need to check the Mode of your transmitter use the **INC/YES** button to change the display to read **Elevator 125**, and move the right stick up and down. If the value changes then you are set up for Mode II. If the value doesn't change, try moving the left stick. If this causes the value to change then the transmitter is set up for Mode I. You can use the same method to check for Mode III by checking the ailerons instead of the elevator.

Press the **DOWN** button to move to Switch Test.

SWITCH TEST

Sample display: **01010101001010@S**

This Menu item is used at the time the transmitter is built to check that all the switches on the radio are functioning properly.

Each number in the display represents one of the fourteen assignable switch positions on the transmitter. The first number in the display is for the #1 switch position located on the upper left corner of the transmitter. Move the two position switch toward the rear of the transmitter so that it is in the position labelled **1**. The first digit in the display will read **1**, indicating that whatever function that has been assigned to the #1 switch position is activated. Moving the switch toward the front of the transmitter will cause the first digit in the display to change to **0**, indicating that the function assigned to tha switch position is deactivated, and the second digit in the display to change to **1**, indicating that the function assigned to the #2 switch position has been activated. The same process applies to all of the assignable switches, with a **0** in the display indicating the assigned function for the switch position is active, a **1** indicating the function is not active.

There are two switches which are not assignable, the Snap Roll button and the Alternate Setup Switch. These two switches are indicated at the far right side of the display. Pressing the Snap Roll button will cause an **S** to appear for as long as the button is held down. Moving the Alternate Setup Switch into the **ALT SETUP** position will cause @ to appear in the display.

This is the last Menu item in the Main Menu column. Press the **ENT->** button to move to the Basic Configuration column.

BASIC CONFIGURATION GROUP

Sample display: **Basic Confg (1)**

The Basic Configuration Group is made up of functions which affect only a particular aircraft setup. The entries you make in this group will change from plane to plane depending on what type of model it is that you are going to be flying.

Press the **DOWN** button to move to Template Select.

TEMPLATE SELECTION

Sample display: **2A 1F 2E R (ENT)**

Aircraft templates determine how each servo plugged into the receive is going to be controlled by the ATRCS system. For example, you ca choose a template which will assign a separate servo to control each aileron. This lets you have separate centering and throw adjustments for each aileron because each of the aileron servos functions entirely independently of the other. It also makes it simple to adjust aileron differential electronically instead of mechanically. In the same manne there are templates which let you select separate servos for each flap or for each throttle or for each elevator. The template names may

seem odd until you understand that the characters in them refer to the number of servos assigned to each function. In the **2A 1F 2E T** Template, **2A** stands for two aileron servos, **1F** stands for one flap servo, **2E** stands for two elevator servos and **T** stands for one throttle servo. The five Aircraft Templates available are described in more detail in the reference section of this manual.

To select a template, first determine which one of the templates in the reference section has the type of control setup you want for your plane. Then go to the Template Selection Menu item, which is the first Menu item under the Basic Configuration column. The display will read **1A 1F 1E T (ENT)**. That means that this particular template has one aileron servo, one flap servo, one elevator servo and one throttle servo. All of the templates have one rudder servo and one gear servo. Pressing the **INC/YES** button will cause the program to scroll through the other Aircraft Templates. When you reach the **1A 1F E 2T** Template you will have to use the **DEC/NO** button to move back through the templates. Once the template you want to use is on the display, press both **ENT** buttons at the same time. The display will flash the message **Template Inited** to let you know that the template you selected has been initiated.

Be very sure that you want to make a template change for a particular setup, because switching to a new template will cause all of the information previously stored in that setup to be erased. This is the reason you must push both **ENT** buttons to change a template, to help prevent an accidental loss of information.

The Template Selection Menu item is one of the items where you can not go directly to another column. You must first move up or down one Menu item before you can move to the next column.

Press the **DOWN** button to move to the Trim Memory Function.

TRIM MEMORY

Sample display: **S Ail Trim(ENT)**

The Trim Memory Menu item allows you to store the position of the aileron, elevator and rudder trim levers in memory and then move the levers back to their center positions.

The advantage of Trim Memory is that it allows you to always have the trim levers in their center positions when you change from one plane setup to another. This means that you won't have to remember to change the positions of the trim levers each time you switch planes; the proper trim settings for each plane will be stored in memory.

There is a separate Menu item for each of the aileron, elevator and rudder trims. To use the Trim Memory feature, test fly your airplane and move the trim levers as required to achieve proper flying trim. Once the plane is trimmed out, land and shut off the receiver without moving the transmitter trim levers. Now move to the Menu item for the trim you want to save. Press both **ENT** buttons at the same time. You will see the message -> **Trim Saved** flash on the display to let you know that the trim position has been stored in memory. Now move the trim lever back to its center position. Repeat the process with each of the other trims you wish to save.

When you turn the receiver back on you will see that the control surfaces did not shift from the position they were in at the end of your flight even though you have moved the trim levers. If you were to use Trim Memory while the receiver were still on, you would see the surfaces jump out to twice the distance from neutral when you pressed the **ENT** buttons, and then return to their proper trim position when the trim levers were returned to the center.

Keep in mind that Trim Memory is limited to the range the trim levers would normally have. For example, if you were to move the aileron trim lever all the way to the left, and enter that position in memory and center the lever, the Trim Memory function would be at the limit of its range. You would not be able to move the lever all the way to the left again and enter the new position into memory. The trim lever would still move the surface, but there would not be enough range in the Trim Memory to store the new position. If you have an airplane which is out of trim enough to exceed the limit of the Trim Memory function, you should change the centering of the particular surface using the Electronic Surface Centering described on page 16.

To reset the Trim Memory, move the trim levers to their center positions and press both **ENT** buttons. You should also remember that the Trim Memory will be automatically reset any time you change the template for a particular setup or you calibrate the zero points of the transmitter potentiometers.

Trim Memory is one of the items where you will not be able to move directly to another column. You must first move up or down one Menu item and then over.

Press the **DOWN** button once to move to Flap Control Location.

FLAP CONTROL LOCATION

Sample display: **L Side Flap? Yes**

This Menu item allows you to decide whether the flaps will be controlled by the Lever on the left side of the transmitter which normally controls the Auxillary I function, or by a two or three position switch.

Answering **Yes** at this Menu item will cause the flap function to be controlled by the Lever on the left side of the transmitter case, giving you completely proportional control and allowing you to position the flaps anywhere throughout their range. This type of control setup gives you the greatest flexibilty where the flaps are concerned, but makes it difficult to precisely locate the flaps in the same position time after time, such as the optimum setting for take off. It also means both the Flap and Auxilliary I functions will be controlled by this same lever.

Pressing the **DEC/NO** button at this item will change the display to read **L Side Flap? No**, and cause the flap function to be controlled by either a two or three position switch. Having switch controlled flaps allows you to have the flaps move to exactly the same position every time they are used. If you assign the flaps to a two position switch, you will have the choice of flaps up or flaps down, with electronic adjustment of both the up and down positions. If you assign the flaps to a three position switch, you will have three adjustable flap positions.

For more information on assigning the flaps a particular switch and for adjusting the flap travel, see the **ASSIGN SWITCH GROUP** on page 15, the **SURFACE ADJUSTMENT GROUP** on page 16 and the **PRESETS AND D/R GROUP** on page 23.

Press the **DOWN** button once to move to Auxillary II Control Location.

AUXILLARY II CONTROL LOCATION

Sample Display: **R Side Aux II? Yes**

This Menu item allows you to choose if the Auxillary II function will be controlled by the Lever on the right side of the transmitter or by a two position switch.

When the display reads **R Side Aux II? Yes**, the Lever on the right side will control the Auxillary II function and allow you to position the control anywhere in the range of the Lever's travel.

Pressing the **DEC/NO** button at this Menu item will cause the display to read **R Side Aux II? No**, allowing you to assign the control of the Auxillary II function to a two position switch on the transmitter. Assigning this function to a switch will cause it to act like another Landing Gear channel, with the servo moving from on extreme to the other when the switch is activated.

Note that the Auxillary II function is not available on the **2A 1F 2E T** or **2A 2F 1E T** Templates.

For further information on assigning the Auxillary II function to a particular switch see the **ASSIGN SWITCH GROUP** on page 15.

Press the **DOWN** button once to move to Auto Dual Rate Rudder.

AUTO DUAL RATE RUDDER

Sample display: **Auto D/R Rd? No**

This Menu item allows you to choose switch activated Rudder Dual Rate or Automatic Rudder Dual Rate.

Answering **No** to this item means that the Rudder D/R will be controlled by a switch on the transmitter. (For a complete explanation of Dual Rate see page 24)

Answering **Yes** to this item means that the Rudder D/R will be automatically turned on when the throttle stick is moved to the high throttle position, without the need to move a switch on the transmitter. When the throttle stick is in the lower one third of its range of movement, full rudder throw is available. This allows you to have a large amount of rudder throw for positive control while taxiing and when the plane is flying very slowly. During the middle third of throttle stick movement, the amount of rudder throw smoothly transitions from high rate to low rate. This means that as you advance the throttle there is no abrupt jump in rudder travel as the switch is made from high rate to low rate. Once the throttle stick has been advanced into the upper one third of its travel range the rudder will be switched to a reduced amount of throw. This makes the rudder less sensitive at high speeds.

The amount of throw available when using the Auto Dual Rate feature is adjusted at the **Rudd D/R:100%** Menu item under the Presets and Dual Rates column. The lower the value in the display of that Menu item, the less the rudder will move when the throttle stick is in the high position.

Press the **DOWN** button once to move to Variable Trace Ratio.

VARIABLE TRACE RATIO (VTR)

Sample display: **VTR Ail? No**

These two Menu items allow you to choose VTR control response for the ailerons or elevator in place of linear response.

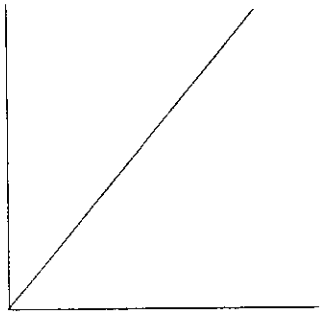


Figure 9: Linear Control Response

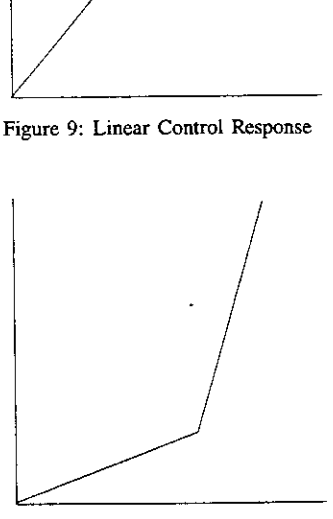


Figure 10: VTR Control Response

In most radios, the standard mode of operation is linear control response, which means that a given percentage of control stick movement results in the same percentage of servo movement. (See Figure 9) So if you were to move the stick 50% of its travel, the servo would move 50% of its travel. The same would hold true for 30% travel, 75% travel or 100% travel. The amount of servo movement is always a direct 1 to 1 ratio to the amount of stick movement.

When you select VTR control response, the amount of servo movement is not directly proportional to the amount of stick movement. The VTR routine in your Vision 8P allows you to adjust how much servo movement you will have when the control stick reaches 70% of its travel, then will automatically calculate the ratio of servo movement to stick movement from 0% to 70% and from 70% to 100%. (See Figure 10)

What VTR allows you to do is to have a reduced amount of throw available up to 70% of stick travel, and then a rapidly increasing amount of throw available after you move the stick past the 70% point. The effect is similar to turning a dual rate switch off to increase the responsiveness of the aircraft, except that you don't have to physically move the switch; moving the stick past 70% of its travel will automatically increase the responsiveness of the plane.

With VTR, you can set up your plane so that in normal turns, heading corrections, climbs or descents you have a reduced amount of throw and the plane tracks smoothly without being overly sensitive. But when you want to do aerobatics and start moving the sticks into the corners for snaps, rolls or loops, VTR lets you automatically have increased control throws to give you the response necessary to perform the maneuvers with precision and authority.

Your Vision 8P allows you to choose VTR control response on the ailerons and on the elevator. Each control has its own Menu item, but since operation for both is identical we will only cover the ailerons as an example. If VTR sounds interesting to you but you are unsure of whether you would like this type of control response, use the Alternate Setup feature (See page 9), and configure your Standard Setup with linear response (**Ail VTR? No**) and your Alternate Setup with VTR. Then you can take off in linear, fly to altitude, and flip the Alternate Setup Switch and give VTR a try. If you don't like it, you can flip the switch off and immediately return to linear response.

To use VTR, go to the Menu item under the Basic Configuration Group which reads **Ail VTR? No**. When this item reads **No**, the VTR function will be disabled. Pressing the **INC/YES** button will change the display to read **Ail VTR? Yes**. This does two things; it activates the VTR routine and disables the normal dual rate function.

To adjust the amount of servo movement at 70% of stick movement, go to the **Aileron D/R:100%** item under the Presets and Dual Rates Group. Use the **INC** or **DEC** buttons to set the number in this item to the desired value. Normally this value will be set at 69% or less. If the number is set at 70%, you will have linear response even with the VTR activated. If the number is greater than 70%, control will actually become less responsive as you move the stick past the 70% point. When you have made the desired change, remember to go to another Menu item to lock in the value before turning the transmitter off.

The VTR function can be turned on and off in flight using the Dual Rate Switch. If you want VTR to remain on all the time, go to the Menu item under the Assign Switch Group which reads **ADRon:(8);S=0**. This is where the location of the Aileron Dual Rate Switch is assigned. (For a complete description of Switch Assignment, see page 15) Press the **INC/YES** button until the display reads **ADRon:ON**. This will cause the VTR to be on all the time. You can also use this same Menu item to choose the location of the switch which would turn the VTR on and off. If desired, both the Aileron and Elevator VTR can be assigned to the same switch so that they will both go on and off at the same time.

Press the **DOWN** button twice to move to Exponential Curve Selection.

EXPONENTIAL CURVE SELECTION

Sample Display: **Expo Ail:OFF**

These three Menu items allow you to select the control response curves for the ailerons, elevator and rudder. You can choose straight linear response or one of 7 Exponential curves.

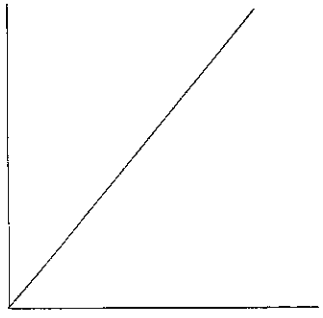


Figure 11: Linear Control Response

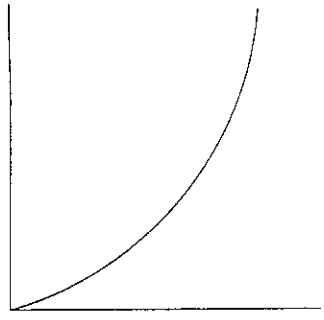


Figure 12: Exponential Control Response

In most radios, the standard mode of operation is linear control response, which means that a given percentage of control stick movement results in the same percentage of servo movement. (See Figure 11) So if you were to move the stick 50% of its travel, the servo would move 50% of its travel. The same would hold true for 30% travel, 75% travel or 100% travel. The amount of servo movement is always a direct 1 to 1 ratio to the amount of stick movement.

When you select an Exponential response curve, the amount of servo movement is not directly proportional to the amount of stick movement. Instead of the straight line shown in the graph of linear response (Figure 11), the graph of Exponential response shows a curve (Figure 12). As you move the stick farther from neutral, you get a progressively greater amount of servo movement in relation to stick movement.

When you are flying with Exponential, small movements of the stick will produce very little servo movement, a condition sometimes referred to as a "soft neutral". This means that an airplane set up with very sensitive controls for aerobatics can still be flown without over controlling when small control inputs are required because moving the stick near neutral will cause very slight movement of the servos. At the same time, large movements of the stick will result in progressively larger amounts of servo movement, allowing the plane to be very responsive for aerobatics or in emergency situations.

The Vision 8P allows you to choose Exponential response on the ailerons, elevator and rudder. Each control has its own Menu item, but since operation for all three is identical we will only cover the ailerons as an example. If Exponential sounds interesting to you but you are unsure of whether you would like this type of control response, use the Alternate Setup feature (see page 9), and configure your Standard Setup with linear response (**Expo Ail:OFF**) and your Alternate Setup with Exponential response. Then you can take off in linear, fly to altitude, and flip the Alternate Setup Switch and give Exponential a try. If you don't like it, you can flip the switch off and immediately return to linear response.

To use Exponential, go to the Menu item under the Basic Configuration Group which reads **Expo Ail:OFF**. When this reads **OFF** the control response will be linear. Pressing the **INC/YES** button will cause a number to be displayed after the colon. When a number is in the display it means that one of the Exponential response curves has been turned on. There are seven curves to choose from, numbered 1 through 7. The higher the number, the greater the amount of Exponential, and the "softer" the neutral of the stick will be. You can select which curve will be in operation by pressing the **INC** or **DEC** buttons until the number of the curve you desire is displayed. Once you have made your selection, be sure to move to another Menu item to lock in the change before turning the transmitter off.

When an Exponential response curve is activated, either dual rate or VTR will also be available and may be used in conjunction with Exponential. But beware that using Exponential with extreme dual rate or VTR settings can cause some very strange control responses. For example, using Curve 7 and setting the VTR value to 25% will result in almost no servo movement at all over the first 70% of stick travel and then radical control movement once the stick passes the 70% mark. We recommend that you do not use either VTR or dual rate with Exponential unless you have **very carefully** studied the effect each option has on control response **before** flying the aircraft.

Press the **DOWN** button three times to move to Receiver Selection.

RECEIVER SELECTION

Sample display: **PCM 8**

Your Vision transmitter will work with many different Airtronics receivers. This Menu item allows you to select which receiver you will be using for a particular setup. Use the **INC/YES** or **DEC/NO** buttons to move to the receiver you want. You can select from 4, 5, 6, 7 or 8 channel Airtronics FM/PPM receivers, or the 8 channel Airtronics FM/PCM receiver.

Press the **DOWN** button to move to Servo Reversing.

SERVO REVERSING

Sample display: **Reverse:NNNNNNNN**

In place of the usual reversing switches, the ATRCS system lets you reverse the direction of servo rotation electronically through the program. Being able to reverse the rotation of the servos lets you install your mechanical control linkages in the most direct and convenient manner and then get the proper direction of control surface movement after the installation is complete.

Go to the Menu item under the Basic Configuration column which reads **REVERSE:NNNNNNNN**. Note the small underline, called a cursor, under the first N. This indicates that Channel 1 is the channel you can reverse at the moment. Press the **ENT->** button and you will see that the cursor move to the right, allowing you to pick which channel you want to reverse. Pressing the **<-ENT** button will move the cursor to the left. Move the cursor back under the first N. Now press the **INC/YES** button. Two things will happen. The first N will change to a Y, indicating that the servo rotation has been reversed. The cursor will also move one space to the right. If you wish to reverse the next channel press **INC/YES** again, if not, use **ENT->** to move to the next channel you do want to reverse. If you reverse a channel by mistake use **<-ENT** to move the cursor back under the particular channel and then press the **DEC/NO** button to return the servo to normal rotation.

Which control is reversed by which Y/N character in the display changes for the different Aircraft Templates and receiver types, so

refer to the Template information in the Reference Section to determine which channel is reversed by what character.

The Servo Reverse Menu item is one of the items where you can not go directly to another column. First you must move two items up, then you can go to the next column.

Press the **DOWN** button to move to Servo Pulse Width Selection.

SERVO PULSE WIDTH SELECTION

Sample display: **1.32msS:NNNNNNNN**

ATRCS has the unique ability to let you select the center pulse width for each particular receiver channel. All Airtronics servos and the majority of servos being sold now center at approximately 1.5ms, and this is the standard center pulse width programmed into your Vision. Some manufacturers' older servos have a center pulse width of 1.3ms. Using one of these servos with a transmitter set for 1.5ms will cause the servo to be out of center and possibly cause a loss of servo travel in one direction. If you are using older 1.3ms type servos with the Vision you can use this Menu item to set the center pulse width for the controls where you are using those servos set for 1.3ms.

To change the center pulse width on a particular channel, go to the Menu item under the Basic Configuration column which reads **1.32msS:NNNNNNNN**. The process you follow to effect the change is identical to the one for servo reversing outlined above. If the character for a particular channel reads N then that channel is set for a 1.5ms width, if the character reads Y then the channel is set for 1.3ms.

Which channel is represented by which character in the display changes depending on the Aircraft Template and receiver type, so refer to the Template information in the Reference Section to determine which channel will be affected by which character.

The Servo Pulse Width Menu item is one where you can not go directly to another column. To go to the next column you must first move three Menu items up before you move over.

This is the last Menu item in the Basic Configuration column. Move three items up and then press the **ENT->** button to move to the Assign Switch column.

ASSIGN SWITCH GROUP

Sample display: **Asign Switch (1)**

The Menu items in the Assign Switch Group control what function each of the switches on the top of the Vision will actuate. Using the items in this Group, you can custom tailor the switch layout of your transmitter.

Press the **DOWN** to move to Switch Assignment.

SWITCH ASSIGNMENT

Sample display: **PROG1on:(10);S=1**

One of the most unique features of your Vision 8P is the ability to assign any switched function to any one of fourteen switch positions on the top of the transmitter. Unlike transmitters of the past, the Vision 8P will not force you to accept someone else's idea of the perfect transmitter control layout. **You** can assign the functions which you feel are most important to the switches which are easiest for you to reach.

The following is a list of the functions which can be assigned:

DISPLAY	FUNCTION
FLAP1on	Flap Position 1
FLAP2on	Flap Position 2
FLAP3on	Flap Position 3
	(Above three items appear only if Flap function has been assigned to a switched location. See page 12, **Flap Control Location**)
PROG1on	Flight Program 1
PROG2on	Flight Program 2
PROG3on	Flight Program 3
CMIX1on	Compensation Mixer 1
CMIX2on	Compensation Mixer 2
E2Fon	Elevator to Flap Mixing
ADRon	Aileron Dual Rate
EDRon	Elevator Dual Rate
RDRon	Rudder Dual Rate
A2RM1on	Aileron/Rudder Coupling Level 1
A2RM2on	Aileron/Rudder Coupling Level 2
GEARon	Landing Gear
AUX2on	Auxillary II
	(Above item appears only if Auxillary II has been assigned to a switched location. See page 12, **Auxillary II Control Location**)

All of the functions which can be assigned will appear under the Assign Switch column. Depending on how you answer some of the questions in the Basic Configuration column, there can be as many as sixteen different functions which you can assign to the switches on the transmitter. The procedure for assigning a function to a particular switch is the same for all sixteen functions, so we will go through only one example in detail. After going over the basic assignment routine, we will present some suggestions regarding different ways you can use the Switch Assignment feature in regard to each of the functions.

First we will get familiar with the display used in the Assign Switch column. Move to the top of the Assign Switch column and press the **DOWN** button until the display reads **ADRon:(8);S=0**. This is the Menu item used to assign the position of the Aileron Dual Rate function. There are three items of information in the display. The first part identifies the function being assigned, the number in parentheses identifies the switch position which will turn on the function, and the final number indicates whether the function is currently on or off. Move the switch labelled **8** and **9** to the **8** position. This will cause the number to the right of the equals sign in the display to change from **0** to **1**. The **1** means that the function has been activated. Moving the same switch to the **9** position will change the final number back to **0**, telling you the function is turned off. You should use the last number in the display to confirm that moving the switch you want will turn the desired function on and off.

To change the switch that the Aileron Dual Rate is assigned to, press the **INC** or **DEC** buttons. This action will cause the number in parentheses to change. As previously stated, this number represents the switch position controlling the function, so if the number is 12, moving the proper switch to the number **12** postion will turn the function on. If the number is 3, the switch position labelled **3** controls the function. So all you have to do to assign the Aileron Dual Rate function to the switch position you want is enter the number of that position in the parentheses. When you have the correct number in the parentheses, remember to move to another Menu item to lock in the change.

The Assign Switch function also gives you the option to have a particular function on all the time or off all the time. If you press and hold the **INC**, the number in the parentheses will rapidly increase until the display changes to read **ADRon:ON**. This means that the function will always be on, with no way to turn it off with any switch. If you press and hold the **DEC** button, the number in the parentheses will rapidly decrease until the display reads **ADRon:OFF**. This completely disables the function and means the function can not be used at all. It is always a good idea to turn off any functions you don't plan to use to prevent accidentally activating them by bumping the wrong switch.

Now that you understand the basic procedure for assigning the switches, it's time to think about how you want to assign them. First

of all, you should know that you don't have to assign the switches yourself to use them. **Every time you initiate an Aircraft Template** (See page 11), **the switch assignments return to their default positions.** This means that each time you change the template for a particular Setup you will have to go through the process of assigning switches. The default assignments are switch positions stored in the ATRCS program memory which place the various functions on the switches where they are most commonly found on transmitters without switch assignability. A list of the functions and their default positions follows this paragraph. If you are comfortable with the defaults, you have no reason to assign any of the switch positions. But if you want to change any switch locations or use a function which is turned off in the default list you will have to follow the procedure outlined above.

Function	Default	Function	Default
FLAP1on	5	E2Fon	ON
FLAP2on	6	ADRon	8
FLAP3on	7	EDRon	3
PROG1on	10	RDRon	OFF
PROG2on	11	A2RM1on	1
PROG3on	12	A2RM2on	2
CMIX1on	ON	GEARon	13
CMIX2on	ON	AUX2on	OFF

If you do decide to change the switch assignments from the default positions, keep in mind that more than one function can be assigned to a particular switch. In fact, you could assign all sixteen functions to one switch if you so desired! This allows you to turn on a group of several functions with one switch. A good example would be if all three dual rates were assigned to the same switch. This would let you desensitize the ailerons, elevator and rudder all at once by moving one switch rather than having to flip three individual switches. Another example would be assigning the landing gear and one of the mixers to the same switch. In this case lowering the gear would automatically turn on a mixing function you might want when landing, such as a higher level of Aileron/Rudder Coupling. Study your own flying habits, and if you realize that you are throwing two or three different switches to achieve a single operation in flight, consider putting all of those functions on one switch.

The opposite of assigning two functions you use together to the same switch position is assigning two functions which you do not want in effect at the same time to opposite sides of the same switch. An example would be assigning the landing gear to switch position 14 and one of the mixers to switch position 13. Both of these positions are on the same switch, but they are on opposite sides of that switch. Moving the switch to turn one of the functions on forces you to turn the other one off. In this case lowering the gear would automatically turn off a mixing function you might not want when landing, such as Elevator/Flap Mixing.

One thing you can **not** do when assigning switches is assign the same function to more than one switch. It becomes too confusing if more than one switch can actuate a function, especially if the function is a mixer which would not have an obvious visual indication when it was turned on and off.

After you have made all of the desired switch assignments, press the **ENT->** button to move to the top of the Surface Adjust Column.

SURFACE ADJUSTMENT GROUP

Sample display: **Surface Adj (1)**

The Menu items in the Surface Adjustment Group control the centering and movement of the control surfaces themselves.

Press the **DOWN** button to move to Surface Centering.

ELECTRONIC SURFACE CENTERING

Sample display: **Center LAil:0%**

Electronic Surface Centering lets you adjust the neutral position of the servo without affecting its throw in either direction. In practice, this function is used the same way you would use a clevis to get the control surface positioned exactly where you want it when the transmitter sticks and trims are centered. The main advantage of Electronic Centering is that instead of disconnecting the clevis, twisting it in or out, and then reconnecting it to the surface, you simply go to the appropriate Menu item under the Surface Adjust column and press a button. This feature is the ideal solution to the problem of making adjustments to linkages which are difficult to get to, such as servos installed out in the wing.

The basic procedure for using Electronic Centering is the same for all surfaces, so we will go over only one example. First install the servo in the plane and hook it up to the control surface, getting the surface position close to the neutral point you want. Then make sure that the surface moves in the proper direction, and if necessary reverse the servo rotation. If you do not set the servo direction before making the centering adjustment you run the risk of adjusting the neutral position in the opposite direction from what you need. Finally, make sure that both the control stick and trim lever are centered.

Now go to the Menu item which controls the centering for the particular control surface. A typical display reading would be **Center LAil:0%**. This indicates that you are working with the left aileron and the current center position is at zero. Pressing the **INC** or **DEC** buttons will cause the value on the display and the neutral position of the servo to change. You can easily adjust the centering position until the control surface is exactly aligned. Once you have the surface position adjusted remember to move from the Centering Adjust Menu item to another item to lock in the change. If you fail to do this the new centering information will be lost when you turn off the transmitter.

You can use the Centering Adjustment function for each control surface that has its own servo with the exception of the throttle, which has its own set of adjustments, landing gear and the right side auxillary. If you are using a template which has two aileron servos, two elevator servos, or two flap servos you will have the ability to adjust the centering of the right hand control independently of the left hand control.

When you are adjusting the flap channel, the centering adjustment will affect the position of the flaps when they are fully raised. This is the position they would be in when the Lever on the left side of the transmitter is fully forward or fully back, depending on how you set the Lever when you calibrated the transmitter.

Pressing the **DOWN** button will allow you to step through all the Menu items for adjusting the centering of the various surfaces until you reach the Throttle Response Curve Adjustments.

THROTTLE RESPONSE CURVE

Sample display: **Idle Adj:0%** AND **Thrt 66 Aj:66%**

These four Menu items allow you to adjust the response characteristics of individual engines to suit your particular style of throttle operation.

Your Vision offers four distinct throttle adjustments to use when setting up your engine. With these four points you can adjust the position of the throttle servo when the throttle stick is at idle, 33% of its travel, 66% of its travel and at full travel. Traditionally, radios have offered adjustments only at the two extremes of throttle travel. The addition of the 33% and 66% adjustments, which let you adjust how much the throttle servo will move when the stick is moved to its 33% and 66% positions, allows you tailor any engine's power curve to your preferred type of throttle response.

In many engines, the power comes up very rapidly in the first one third of the carburetor's movement, then there is a relatively small amount of power increase as the carb opens up the remaining two

thirds of its travel. This makes the throttle response very sensitive as you first start to advance the stick and then the throttle stick has very little effect as you move it from halfway to full on. Of course there are other engines which behave in the opposite manner, with very little increase in power until the last third of the carburetor's travel when engine starts to come on like gangbusters. Smoothly advancing the throttle stick will not produce a correspondingly smooth acceleration from the engine. In many installations it seems there is a point in the throttle stick travel that trips a switch which shifts the engine from low to high. It is much easier to achieve smooth throttle operation if the engine's response is spread evenly throughout the full range of the stick's motion.

The 33% and 66% adjustments are the keys to spreading an engine's power curve over the full range of the throttle stick. If you set the 33% and 66% adjustments to values of 15% and 25% you would spread the first 25% of the carburetor's motion over 66% of the throttle stick's movement. This would make an engine that is sensitive in the first part of its carburetor movement much easier to smoothly control. You can smooth out an engine which is sensitive in the upper end of its response by setting the 33% and 66% adjustments to 45% and 90%, which would spread the last 10% of the carburetor's movement over 33% of the throttle stick's travel.

To set up the throttle of a particular plane, move the throttle stick to its fully closed position toward the bottom of the transmitter and the throttle trim all the way to the top of its range. Setting the engine's idle point with the trim all the way up will allow you to use the trim to kill the engine by moving it down when the stick is in its fully closed position.

Go to the Menu item under the Surface Adjust column which reads **Idle Adj:0%**. This is where you will adjust the idle of the engine. Pressing the **INC** or **DEC** buttons will cause the value to increase or decrease and move the position of the throttle servo. Make sure that as you adjust the idle position the throttle stick remains fully closed. **IT IS VERY IMPORTANT THAT YOU ADJUST THE IDLE POSITION FIRST WHEN SETTING UP.** The Idle Adjustment affects the whole range of throttle response, so moving the idle position will affect the other three adjustments as well. This is so that regardless of where you need to set the idle you will have the full range of servo movement available for the throttle.

Next go to the Menu item which reads **Thrt 100 Aj:100%**. This is where you will adjust the upper end of the servo movement. Move the throttle stick to its fully opened position toward the top of the transmitter. The throttle servo will most likely open the barrel of the carburetor all the way and then try to keep moving, causing the servo to buzz in a stalled position. If the throttle barrel does not fully open when the display reads 100%, you will have to make a change to your mechanical setup to get more throw from your throttle servo. This can be done by either using a longer servo arm or moving the linkage in a hole on the carburetor control arm. Once you have set up the linkage so that the servo will fully open the carburetor, press the **DEC** button until the servo no longer buzzes in the fully opened position. Move the stick through its range several times and be certain that there is no binding in the linkage or buzzing from the servo when the throttle is fully opened.

Once the idle and high end are set, you can adjust the mid-range of the throttle. Move the throttle stick to its 33% position. This is 10 clicks of the ratchet up from the idle position. Go to the Menu item which reads **Thrt 33 Aj:33%**. Pressing the **INC** or **DEC** button will cause the value to change and alter the position of the servo when the stick is at the one third position. The higher the number in the display, the greater the amount of servo movement you will get as you move the stick to its one third open position.

Now is the time you will have to decide the type of throttle response you want to have. If you want to have a strictly linear throttle, without any sort of compensation for irregularities in your engine's power curve, you will need to enter a value that is one third the setting you have in the **Thrt 100% Aj** Menu item. If the full open position is 90%, you would enter 30%, if the full open position is 75% you would enter 25%, if the full open position is 60% you would enter 20%, etc. If you want to adjust the response curve to suit a certain engine, remember that setting the 33% adjustment higher than one third the value of the throttle 100% adjustment will make the throttle more responsive in the first third of stick movement. Setting the 33% adjustment lower than one third the value of the 100% adjustment will make the throttle less responsive in the first one third of stick movement.

The final adjustment is the **Thrt 66% Aj** Menu item. Move the throttle stick to its two thirds open position, which is 20 ratchet clicks up from the idle position. The adjustment procedure is the same as the one used for the 33% adjustment; use the **INC** or **DEC** buttons to either raise or lower the value. For a straight linear throttle set the 66% value to two thirds of the value of the **Thrt 100% Aj** item. A value less than two thirds of the 100% value will make the throttle more responsive in the upper one third of the stick's movement; a value more than two thirds will make the throttle less responsive in the last one third of stick movement.

To control how responsive the throttle is in the middle third of control stick movement, you can vary the difference between the values in the 33% and 66% adjustments. The greater the distance between the values, the more responsive the throttle will be in the middle third of stick movement, while the less the difference is the less responsive the throttle will be in the middle third if stick movement. So having values of 20% and 80% will make the middle third more responsive, while values of 45% and 55% will make the middle third less responsive.

IT IS VERY IMPORTANT THAT THE VALUE FOR THE 33% ADJUSTMENT BE LESS THAN THE VALUE FOR THE 66% ADJUSTMENT AND THAT THE VALUE FOR THE 66% ADJUSTMENT BE LESS THAN THE VALUE FOR THE 100% ADJUSTMENT. If you notice any irregularity in the operation of your throttle, the first thing you should check is that the values for each of the three adjustments get larger as the throttle stick is advanced. If the value of an adjustment is greater than the value of the adjustment above it, the throttle will open up and then start to close again as the stick is advanced.

When you are using the **1A 1F E 2T** Template, each of the two throttle servos will have its own adjustment curve, allowing you to match the response characteristics of one engine to the other engine.

Take note of the fact that the throttle trim in your Vision 8P becomes less effective as you advance the throttle stick. What this means is that at low throttle positions the trim will have full authority and allow you to make large changes in the throttle position, but when the stick is all the way up the trim will not have any effect at all. This allows you to make adjustments to the engine's idle speed to suit varying weather conditions without affecting the high end settings.

Press the **DOWN** button to move through the throttle adjustments until you reach the Travel Volume Adjustments.

TRAVEL VOLUME ADJUSTMENT

Sample display: **LAil LTV:66%**

The Travel Volume function allows you to adjust how far a control surface will move in a particular direction. For the three primary flight controls of aileron, elevator and rudder there is an adjustment for each direction the control surface moves; i.e. up and down or left and right will each be adjustable independently of the other. For the flap function you can adjust how far the flaps will lower when you move the Lever on the left side of the transmitter.

When you first go to the Travel Volume adjustment for a particular surface you will notice that the value reads 66%. The program is written like this so that you will be able to increase or decrease the throw of a particular surface. If the Travel Volume were set to 100% and you wished to increase the amount of throw you could not do it electronically. You would have to make a mechanical adjustment to get more movement. When you are first setting up a plane, try not to have any of your Travel Volumes set at 100%, as this gives you no room for increasing the adjustment in that direction. Get in the habit of leaving yourself some range of adjustment in both directions so you can either increase or decrease the amount of throw when you go flying. If it is neccessary to make a mechanical adjustment to increase control surface throw it is easier to make the adjustment in your workshop at home than out at the field.

Since all of the Travel Volume adjustments work in the same way, we will only go through one example. First go to the Menu item **L Ail LTV:66%** under the Surface Adjust column. This item indicates that you are adjusting the amount the left aileron will move when you are turning left. Pressing the **INC** button will cause the value to grow larger, which will increase the amount the left aileron will move up. Pressing the **DEC** button will cause the value to decrease, reducing the amount the aileron will move up. Use the **INC** or **DEC** buttons to adjust the value until you have the amount of control movement you desire. Once you have made the adjustment remember that you will have to move to another Menu item to lock in the change you made.

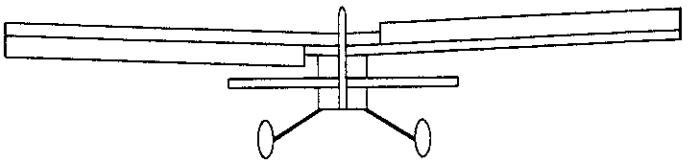
The following list describes all of the Travel Volume display readouts and the surfaces they adjust. Remember that not all of these displays will appear in any one Aircraft Template.

Aileron LTV= Aileron left travel with a single aileron servo
Aileron RTV= Aileron right travel with a single aileron servo
L Ail LTV= Left aileron left travel with individual servos
L Ail RTV= Left aileron right travel with individual servos
R Ail LTV= Right aileron left travel with individual servos
R Ail RTV= Right aileron right travel with individual servos
LFlap TV= Left flap travel with individual flap servos
Flap TV= Flap travel with a single flap servo
RFlap TV= Right flap travel with individual flap servos
Elev UTV= Elevator up travel with a single elevator servo
Elev DTV= Elevator down travel with a single elevator servo
LElev UTV= Left elevator up travel with individual servos
LElev DTV= Left elevator down travel with individual servos
RElev UTV= Right elevator up travel with individual servos
RElev DTV= Right elevator down travel with individual servos
Rudder LTV= Rudder left travel
Rudder RTV= Rudder right travel

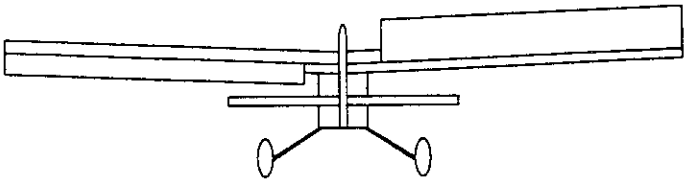
AILERON DIFFERENTIAL

With the Travel Volume adjustments available in the Vision, it is possible to electronically adjust the amount of Differential between the two ailerons, **as long as you are using a template which has two individually adjusted aileron servos**. You accomplish this by setting the values for the up movement of the ailerons to be higher than the down movement values. For example, the **LAil LTV** item would be set with a value of 80%, while the **LAil RTV** item would be set at 40%. These settings would give you twice as much movement in the up direction as the down direction.

Aileron differential is used to compensate for the effects of adverse yaw, the tendency of the nose of aileron equipped airplanes, especially those with high wings and relatively low flying speeds, to move in the opposite direction of the desired turn when aileron control is actuated. To do this, the ailerons move up a greater amount than they move down. This creates more drag on the inside wing (the one where the aileron moves up) and helps to pull the nose of the plane in the desired direction. A typical setup would have the ailerons moving up two or three times more than down. However, the amount of differential needed for smooth turning varies greatly between different airplanes, so it is desirable to be able to adjust the ratio of up movement versus down movement to optimize the performance of the plane. If the differential throw of the ailerons is accomplished by mechanical means such as offset control horns or servo arms it can be extremely difficult to make any changes to the amount of differential.



Right Turn Without Differential (From rear of plane)
Ailerons move the same amount up and down



Right Turn With Differential (From rear of plane)
Ailerons move more up than down

The Travel Volume adjustments are the last Menu items in the Surface Adjust column. Press the **ENT->** button to move to the Mixer Adjustment Group.

MIXER ADJUSTMENT GROUP

Sample display: **Mixer Adj (1)**

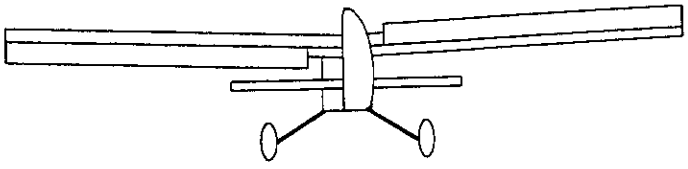
The Mixer Adjustment group contains all of the adjustments for surface mixing for your plane. The mixing capabilities of the Vision are what really set it apart from other radios on the market today. In this section we will go over the uses and effects of each type of mixing as well as how to adjust the mixers themselves. Even if you feel that you will have no use for the mixing, read over this section. You may learn about a type of mixing which will help your particular plane in ways you haven't thought of before.

Press the **DOWN** button to move to Aileron/Rudder Coupling.

AILERON/RUDDER COUPLING

Sample display: **1 Ail->Rudd:0%**

Aileron/Rudder Coupling is used to compensate for the effects of adverse yaw, the tendency of the nose of an aileron equipped model to move in the opposite direction of the desired turn when aileron control is actuated. To do this, rudder movement is automatically fed in whenever the aileron stick is moved, causing the nose of the plane to move in the desired direction.



Right turn with Aileron/Rudder Coupling (From rear of plane)

The amount of rudder required to get a smooth turn varies from plane to plane, so the ability to easily adjust the amount of rudder movement to aileron movement is quite useful. Too little rudder in a turn will cause the plane's nose to point upward in the turn, a condition called skidding which produces a great deal of drag. Too much rudder will cause the plane's nose to point down in the turn, creating a tendency for the plane to tighten up the turn and start to spiral down. When the proper amount of rudder is added in the turn, the nose of the model will be relatively level and the plane will track cleanly through the turn.

There are two levels of Aileron/Rudder Coupling which you can adjust in the ATRCS program. Both are adjusted in the same manner, so we will go through only one example of how to set up the coupling. Go to the Menu item which reads **1 Ail->Rudd:0%**. This is where you adjust the amount of rudder which will be added in when you move the ailerons. Pressing the **INC** button will cause the value to increase and cause the rudder to move when the aileron stick is moved. The higher the value the more rudder movement you will get. To reduce the amount of rudder movement press the **DEC** button. Once you have programmed the desired amount of coupling, remember to move to another Menu item to lock in the change.

Because the amount of rudder required to achieve a smoothly coordinated turn can vary when a plane is moving at different speeds, the ATRCS program actually provides you with three different options for Aileron/Rudder coupling:

1. **Ail/Rudd Coupling Off**. The Ail/Rudd Coupling can be completely turned off by moving the switches which have been assigned to control Levels 1 and 2 to their "off" positions.
2. **Ail/Rudd Coupling Level 1**. This is the amount of rudder which will be fed in with aileron when the switch asigned to control Level 1 is turned "on". The display for this item reads **1 Ail->Rudd:0%**.
3. **Ail/Rudd Coupling Level 2**. This is the amount of rudder which will be fed in with aileron when the switch assigned to control Level 2 is turned "on". The display for this item reads **2 Ail->Rudd:0%**.

Remember that the switches controlling both Aileron/Rudder coupling functions can be assigned to any location on the top of the transmitter. Depending on how you assign the switches, you can set up the transmitter so that turning one level of coupling off will automatically turn the other on, or so that both levels can be turned off so there is no coupling, or that one level will automatically be turned when another control is activated, such as moving the flap switch to its landing position. (For a full explanation of Switch Assignment see page 15) Note that if both Levels of coupling happen to be turned on at one time the program will automatically use the highest level of coupling.

One thing to remember about the Aileron/Rudder Coupling function is that you always have manual override with the rudder stick regardless of the Coupling option you are using. What this means is that if you are in a right turn and feel you want less rudder movement, moving the rudder stick to the left will reduce the amount of rudder. If you are in the same right turn and feel you would like more rudder, moving the rudder stick to the right will increase the amount of rudder.

When you are first trimming out an airplane, it is very helpful to use the Alternate Setup Function (See page 9) to compare two different levels of Aileron/Rudder Coupling in flight.

Press the **DOWN** twice to move to Elevator/Flap mixing.

ELEVATOR/FLAP MIXING

Sample display: **Elev->Flap:0%**

This Menu item allows you to mix the Elevator and Flap functions. With the Elevator/Flap Mixing turned on, whenever you pull up elevator, an amount of down flap will be automatically fed in at the same time. This mixing will also feed in up flap whenever you push down elevator. The amount of flap which will be fed in is adjusted at the Menu item **Elev->Flap:0%**.

Using Elevator/Flap Mixing enhances the plane's responsiveness to pitch control inputs. In other words, if you pull up elevator, the plane's nose will pitch up more sharply if gets down flap at the same time it gets up elevator. The same principal in reverse is true if the plane gets up flap at the same time as down elevator. The reason for this is that as the flaps are moved, they change the lift characteristics of the wing. Lowering the flaps on most aircraft will cause the nose of the plane to pitch up, while raising the flaps above the trailing edge of the wing will cause the nose to pitch down. To maintain level flight some amount of elevator would normally have to be trimmed in to compensate for the movement of the flaps. But if the desired result of a control input is to have the plane change heading in the pitch axis, the pitch changes caused by moving the flaps can be used along with the elevator to bring about the change of heading.

In practical use, Elevator/Flap Mixing will do two things; it will help make the corners of any "square" pattern type maneuver sharper, and it can help an airplane turn more quickly in a sharply banked turn. The key to get a sharp corner in any maneuver is to have the aircraft change heading in the pitch axis as quickly as possible. This minimizes the time it takes for the plane to transition from a horizontal heading to a vertical heading. The less time the plane spends transitioning from the horizontal to the vertical, the less time the eye has to see the plane as is "rounds" the corner, causing the mind to perceive the corner as square. As discussed before, Elevator/Flap Mixing helps the plane to make changes in pitch heading more quickly, so it makes corners in maneuvers appear sharper. In a steeply banked turn, you would be pulling up elevator, which means that the flaps would be lowered if you were using Elevator/Flap Mixing. This increases the amount of lift the wing produces while you are in the steeply banked condition, preventing the plane from stalling and allowing you to turn tighter. It also causes the nose of the plane to pitch up, which in a steep bank is in the direction of the turn and brings the plane around more quickly.

To adjust the amount of flap you will get with the elevator, go to the menu item which reads **Elev->Flap:0%**. Pressing the **INC** or **DEC** button will cause the value in the display to change. The higher the number in the display, the greater the amount of flap movement you will get when you move the elevator. Press the **INC** button until you have a value of **20%** on the display. Now operate the elevator stick. As the elevator moves up the flaps should move down. If both the flaps and elevator move up, use the **DEC** button to change the display to read **-20%**. If you get no movement from the flaps as the elevator moves, go to the Menu item in the Assign Switch column which controls the Elevator/Flap Mixing (**E2Fon**) and make sure that the mixing has either been turned on all of the time or that the switch that the mixing is assigned to is turned on, then return to the Mixer Gains column. Once you have established that the mixing is turned on and working in the correct direction, use the **INC** and **DEC** buttons

to adjust the flap movement with elevator to the amount desired.

Press the **DOWN** button to move to Flap/Elevator Mixing.

FLAP/ELEVATOR MIXING

Sample display: **Flap->Elev:0%**

This Menu item allows you to have an amount of elevator control automatically fed in whenever the flaps are actuated.

Whenever a plane's flaps are moved, they change the lift characteristics of the wing. Lowering the flaps on most aircraft will cause the nose of the plane to pitch up, while raising the flaps above the trailing edge of the wing will cause the nose to pitch down. To maintain level flight some amount of elevator would normally have to be trimmed in to compensate for the movement of the flaps. By using Flap/Elevator Mixing, you can have the elevator move to the proper trim position automatically as the flaps move, eliminating the need to compensate for the flaps with the elevator stick itself. Since flaps are normally deployed on landing approach, it can be vary advantageous to have one less thing to worry about as you are concentrating on bringing your plane in for a smooth touchdown.

To adjust the amount of elevator you will get with flaps, go to the menu item which reads **Flap->Elev:0%**. Pressing the **INC** or **DEC** button will cause the value in the display to change. The higher the number in the display, the greater the amount of elevator movement you will get when you move the flaps. Press the **INC** button until you have a value of **20%** on the display. Now operate the flap Lever or switch. As the flaps move down the elevator should move down. If the elevator moves up, use the **DEC** button to change the display to read **-20%**. Once you have the mixing working in the correct direction, use the **INC** and **DEC** buttons to adjust amount of elevator movement you get when the flaps are deployed. The best way to check that you have the correct amount of elevator is to lower the flaps with the plane in the air and see if there is any pitch change. If the nose pitches up, you need more down elevator; if the nose pitches down, you need less down elevator.

The Flap/Elevator Mixing function is always active as long as the value in the display is a value other than zero. There is no way to assign this mixing function to a switch to be turned on and off in flight.

Press the **DOWN** button to move to Compensation Mixers.

COMPENSATION MIXERS

Sample display: **CMst 1:OFF**

The Vision 8P has two separate Compensation Mixers available for your use. Each of these mixers allows you to couple any two channels you choose together in a Master/Slave relationship. The program allows you to select the Master and Slave channels, the amount and direction the Slave will move when the Master is moved, and whether you will have the ability to turn the mixer on and off in flight.

The Compensation Mixers are one of the most flexible features in your Vision, and are really limited only by your imagination in using them. Before we go through how to set up and adjust the Compensation Mixers, let's go over some of the ways that they can be used. As the name implies, this type of mixer is used to compensate for a factor that affects how the airplane flies. The three most common types of compensation mixers are already built into your Vision. They are Aileron/Rudder Coupling, Elevator/Flap Mixing and Flap/Elevator Mixing. The two additional Compensation Mixers which are provided allow you to select the functions that will be mixed so that you can use the mixers in the way that best suits your airplane.

The key point to remember is that the two channels will be coupled together in a Master/Slave relationship. What this means is that when the Master channel is moved, the Slave channel will also move, but when the Slave channel is moved it will have no effect on the Master channel. The classic example of this type of relationship is the Aileron/Rudder Coupling described on page 18. When the ailerons, in this case the Master channel, are moved, they will cause the rudder, the Slave channel, to move as well. But moving the rudder will not affect the ailerons in any way. With this setup, the rudder automatically compensates for the adverse yaw created when the ailerons are deflected, but can still be used as an independent control when the situation calls for it.

A second important thing to remember is that each of the Compensation Mixers can be assigned to a switch on the top of the transmitter and turned on and off during flight if you desire. This is very useful for mixing which you would not want to have on during the entire flight. (For a complete explanation of Switch Assignment, see page 15) If you wish to have a mixer remain active all of the time you can also assign it to be on, regardless of the position of any of the switches.

As an example of how to use a Compensation Mixer in a scale type aircraft, let's consider the landing gear of the Navy's F6F Hellcat WW II fighter. The gear of this plane retracts rearward, instead of folding in toward the center of the fuselage like many other aircraft. What this means is that when the gear is down, the wheels are near the leading edge, in front of the center of gravity. As the gear is retracted, the wheels move near the trailing edge, **behind** the center of gravity. This results in the plane's CG shifting rearward, altering the pitch trim. You could manually correct for this factor by moving the elevator trim. Or you could use a Compensation Mixer to correct the trim automatically. By selecting the landing gear as the Master channel and the elevator as the Slave channel, you can have the elevator move automatically whenever you move the landing gear. But since the two are mixed together in a Master/Slave relationship, moving the elevator will not cause the gear to go up and down! The amount and direction the elevator will move when the gear goes up is completely adjustable, so you can get the exactly correct amount of elevator needed so there will be no apparent change in the attitude of the plane when the gear is extended or retracted.

An example of how a Compensation Mixer would be useful in a pattern type aircraft would be during knife edge flight. To maintain a knife edge attitude, with the wings of the plane vertical but the direction of flight still parallel to the ground, most planes require a large amount of rudder control. In many cases, this large deflection of the rudder can also cause a tendency for the plane to roll slightly in the direction the rudder has been moved. To keep the plane moving straight and in the proper attitude, a small amount of opposite aileron must be fed in to overcome the rolling tendency caused by the rudder. You could manually correct for the roll by holding the aileron stick slightly deflected, or you could use a Compensation Mixer to have the aileron fed in automatically when you hold the rudder. By selecting the rudder as the Master channel and the ailerons as the Slave channel, the ailerons would move automatically when you deflected the rudder, but moving the ailerons would have no effect on the rudder. In this example, you would want to take advantage of being able to turn the Compensation Mixer on and off during flight, since the coupling of the rudder and ailerons is useful only during the knife edge maneuver.

When you are trying to decide how to use the Compensation Mixers, go over in your mind how you fly your plane and carefully analyze the control inputs you make. If you find that you are always using one control to counteract undesireable tendencies caused when you use another control, consider using a Compensation Mixer. If you find that you are using one control to correct for tendencies caused by another only during certain maneuvers, consider using a Compensation Mixer which is assigned to a switch so you can turn it on and off as needed.

Now we will go through how to set up and adjust the Compensation Mixers item by item. Since the process is identical for both of the Mixers, we will only go through the set up procedure for Compensation Mixer 1, with the understanding that the same procedure is to be used for Compensation Mixer 2.

COMPENSATION MIXER MASTER CHANNEL SELECTION

Sample display: **CMst 1:OFF**

This Menu item indicates which function will act as the Master channel when the Compensation Mixer is activated. Pressing the **INC** or **DEC** buttons will cause the names of the various functions to appear in the display. Use the **INC** or **DEC** buttons until the name of the function you want to be the Master channel appears in the display. When you first go to this item, or if you press the **DEC** button enough, the display will read **CMst 1:OFF**, which means the Mixer is disabled entirely. Once you have selected the desired function, be sure to move to another Menu item to lock in your choice.

Press the **DOWN** button to move to Slave Channel Selection.

COMPENSATION MIXER SLAVE CHANNEL SELECTION

Sample display: **CSlv 1:OFF**

This Menu item indicates which function will act as the Slave channel when the Compensation Mixer is activated. Pressing the **INC** or **DEC** buttons will cause the names of the various functions to appear in the display. Use the **INC** or **DEC** buttons until the name of the function you want to be the Slave channel appears in the display. When you first go to this item, or if you press the **DEC** button enough, the display will read **CMst 1:OFF**, which means the Mixer is disabled entirely. Once you have selected the desired function, be sure to move to another Menu item to lock in your choice.

Press the **DOWN** button to move to Master Channel Adjustment.

MASTER CHANNEL ADJUSTMENT

Sample Display: **CMix 1 MAj:0%**

This Menu item adjusts how much affect the Master channel will have on the Slave channel. The value in the display represents the percentage the Slave will move when the Master is moved to its full travel. The higher the value, the more the Slave will move when the Master is moved. When the value is **0%**, the Slave will not move at all. When the value is **100%**, the Slave will move to the full extent of its travel when the Master is moved to full travel.

To adjust the amount of Slave movement, first be sure that the Mixer is turned on and that you have selected both the Master and Slave channels. Then move the Master channel to its full travel and watch the Slave channel. Pressing the **INC** button will cause value in the display to increase and cause the Slave channel to move. If the Slave channel moves in the proper direction, continue to press the **INC** button until the Slave moves the desired amount when the Master is at full deflection. If the slave moves in the opposite direction from what is desired when you press the **INC** button, start to press the **DEC** button. This will cause the value in the display to go negative and reverse the direction the Slave moves. Continue to press the **DEC** button until the Slave moves the desired amount when the Master is at full throw. Now operate the Master channel and double check that the Slave moves in the direction you want. Once you have the value set for the proper amount of movement, remember to move to another Menu item to lock in the change.

Press the **DOWN** button to move to Slave Channel Adjustment.

SLAVE CHANNEL ADJUSTMENT

Sample display: **CMix 1 SAj:100%**

This Menu item allows you to limit the total amount throw available on the Slave channel when the Compensation Mixer is turned on. It does not affect how far the Slave will move when the Master moves; it limits how far the Slave will move on its own. In effect it acts like a dual rate for the Slave channel when the mixer is activated.

When you first go to this Menu item, the display will read **CMix 1 SAj:100%**. This means that 100% of the Slave channel's movement will be available when the mixer is active. Pressing the **DEC** button will cause the value in the display to get smaller and reduce the amount of throw available for the Slave channel. In the vast majority of situations you will leave the value at 100%, but having this adjustment available does give you the flexiblity to have a reduced amount of Slave movement if a specific situation requires it.

Press the **DOWN** button five times to move to Compensation Mixer Options.

COMPENSATION MIXER OPTIONS

Sample display: **CMixOps:NNNNNNNN**

In the ATRCS program there are four specialized options available which will affect how each Compensation Mixer operates. At this Menu item you select which, if any, of the options you want to utilize.

Go to the Menu item under the Basic Configuration column which reads **CMixOps:NNNNNNNN**. Note the small underline, called a cursor, under the first N. This indicates that Option 1 for Compensation Mixer 1 is the Option you can select at the moment. Press the **ENT->** button and you will see that the cursor moves to the right, allowing you to pick which Option you want to activate. Pressing the **<-ENT** button will move the cursor to the left. Move the cursor back under the first N. Now press the **INC/YES** button. Two things will happen. The first N will change to a Y, indicating that the Option has been activated. The cursor will also move one space to the right. If you wish to use the next Option press **INC/YES** again, if not, use **ENT->** to move to the next Option you do want to activate. If you select an Option by mistake use **<-ENT** to move the cursor back under the particular Option and then press the **DEC/NO** button to turn the Option off.

There are eight N's to the right of the colon in the display. Each of these represents one of the Compensation Mixer options, and indicates that the Option is currently turned off. Positions 1 through 4 are for Compensation Mixer 1, while Positions 5 through 8 are for Compensation Mixer 2. Below is a description of the effect each of the Options has on the Mixers.

Position 1 (Comp. Mixer 1) and Position 5 (Comp. Mixer 2):

This option allows the Mixer to be turned on only if the Roll Button is depressed. If you answer yes to this option for one of the Mixers, there is no way that Mixer can be activated without depressing the Roll Button. This is useful if you have Mixing which you only want to be turned on for short periods during flight, such as Rudder/Aileron mixing for knife edge flight.

Since you can also still assign the Mixer to be turned on and off with one of the switches on the top of the transmitter, it is possible to deactivate the Mixer with the assigned switch and use the Roll Button without any mixing.

Position 2 (Comp. Mixer 1) and Position 6 (Comp. Mixer 2):

This option allows the Mixer to work only when the Master channel moves in one direction. Answering yes means that moving the Master stick one way would cause the Slave to move, but moving the Master the other way would have no effect on the Slave. The following list indicates which direction of Master channel control movement will activate the mixing if this option is selected:

Left Aileron	Mixing
Right Aileron	No Mixing
Lower Flaps	Mixing
Down Elevator	No Mixing
Up Elevator	Mixing
Right Rudder	No Mixing
Left Rudder	Mixing
Gear Down	No Mixing
Gear Up	Mixing

Position 3 (Comp. Mixer 1) and Position 7 (Comp. Mixer 2):

This option allows the Mixer to work only when the Master channel moves in one direction, but it is the direction opposite from the second option described above. Answering yes means that moving the Master stick one way would cause the Slave to move, but moving the Master the other way would have no effect on the Slave. The following list indicates which direction of Master channel control movement will activate the mixing if this option is selected:

Left Aileron	No Mixing
Right Aileron	Mixing
Lower Flaps	No Mixing
Down Elevator	Mixing
Up Elevator	No Mixing
Right Rudder	Mixing
Left Rudder	No Mixing
Gear Down	Mixing
Gear Up	No Mixing

Position 4 (Comp. Mixer 1) and Position 8 (Comp. Mixer 2):

This option causes the Slave channel to move in the same direction all the time, regardless of the direction of Master movement. As an example, if the aileron channel were the Master and elevator were the Slave when this option was active, giving right aileron would cause the elevator to move up and giving left aileron would cause the elevator to move up. This example would be useful when you are first introducing someone to flying, as it would automatically feed in a bit of up every time the novice made a turn, regardless of the direction of that turn.

Press the **DOWN** button to move to Bi-Directional Mixers.

BI-DIRECTIONAL MIXERS

Sample display: **BMix1 Ch1:OFF**

Your Vision 8P has two Bi-Directional Mixers available. This type of Mixer takes two channels and mixes them both together so that each channel will affect the other channel. This type of Mixer is used when you need to have specialized control surface configurations such as a V-Tail, Flaperons or Elevons.

In practice, you select the two channels which will be mixed together. In the case of a V-Tailed plane, the functions would be rudder and elevator. What the Bi-Directional Mixer does is mix each of these two functions into the other one. With the Mixer activated, moving just the elevator stick will cause both of the servos to move in the same direction, and moving just the rudder stick will cause both the servos to move in opposite directions. This is so you can connect each of the servos to one of the V surfaces and get the proper control action; moving the elevator stick will cause both of the surfaces to move up or down for pitch control, moving the rudder stick will cause one surface to move up and the other to move down for turning control. The same conditions hold true for Flaperons or Elevons; when the aileron stick is moved the two servos move in opposite directions for roll control, when the flap Lever or elevator stick is moved both servos move in the same direction for flap or pitch control.

Since the type of mixing the Bi-Directional Mixers are used for is always required by the specialized control setups, there is no way to turn off the Bi-Directional Mixers in flight. Once you have selected a control for Channel 1 and a control for Channel 2 the Mixer will always be on. If there is no control selected for both Channel 1 and Channel 2 then the Mixer will be off.

There are some special rules for adjusting the centering, rotation direction and travel volumes when a Bi-Directional Mixer is being used. When using the Mixer each of the two servos involved is connected to a separate control surface. Adjustments to either centering or the direction of movement apply to the servos themselves and have nothing to do with the control sticks. For example, in a V-Tailed plane the rudder servo would be attatched to the right side V surface and the elevator servo would be attatched to the left side V surface. If you need to adjust the centering of the right side V surface or reverse the direction of its movement you would use the adjustments for the rudder. In the same manner to adjust the centering or movement of the left surface you would use the adjustments for the elevator. Making these types of adjustments will in no way affect the other V surface. When the time comes to make travel volume adjustments, these relate to the control stick. If you want to have less up elevator, you would make the adjustment at the up elevator travel volume adjustment just as if you were not using a Bi-Directional Mixer. Reducing the value will cause both servos to move less so that you will get less movement on both of the control surfaces when the elevator stick is moved.

Now we will go through how to set up and adjust the Bi- Directional Mixers item by item. Since the process is identical for both of the Mixers, we will only go through the set up procedure for Bi-Directional Mixer 1, with the understanding that the same procedure is to be used for Bi-Directional Mixer 2.

BI-DIRECTIONAL MIXER CHANNEL 1 SELECTION

Sample display: **BMix1 Ch1:OFF**

This Menu item indicates which function will act as Channel 1 for the Bi-Directional Mixer. Pressing the **INC** or **DEC** buttons will cause the names of the various functions to appear in the display. Use the **INC** or **DEC** buttons until the name of the function you want to be Channel 1 appears in the display. When you first go to this item, or if you press the **DEC** button enough, the display will read **BMix1 Ch1:OFF**, which means the Mixer is disabled entirely. Once you have selected the desired function, be sure to move to another Menu item to lock in your choice.

Press the **DOWN** button to move to Channel 2 Selection.

BI-DIRECTIONAL MIXER CHANNEL 2 SELECTION

Sample display: **BMix1 Ch2:OFF**

This Menu item indicates which function will act as Channel 2 for the Bi-Directional Mixer. Pressing the **INC** or **DEC** buttons will cause the names of the various functions to appear in the display. Use the **INC** or **DEC** buttons until the name of the function you want to be Channel 2 appears in the display. When you first go to this item, or if you press the **DEC** button enough, the display will read **BMix1 Ch2:OFF**, which means the Mixer is disabled entirely. Once you have selected the desired function, be sure to move to another Menu item to lock in your choice.

Press the **DOWN** button to move to Bi-Directional Mixer Balance Adjustment.

BI-DIRECTIONAL MIXER BALANCE ADJUSTMENT

Sample display: **BMix 1 Bal:0%**

This Menu item allows you to adjust how much affect one of the two channels being mixed has on the other.

When the value in the display is zero, both of the channels being mixed will have equal control authority as long as their travel volume adjustments are set to the same amounts. The Balance adjustment lets you reduce the amount of surface movement you will get when one of the controls is moved without affecting the amount of movement when the other control is operated.

To make the adjustment, go to the Menu item under the Mixer Adjust column which reads **BMix 1 Bal:0%**. Pressing the **INC** button will cause the value in the display to grow larger and reduce the amount of throw when the stick for Channel 1 is moved. The higher the number in the display, the less effect Channel 1 will have on the servos. Pressing the **DEC** button will cause the value in the display to

go negative and reduce the amount of throw when Channel 2 is activated. The higher the negative number in the display, the less effect Channel 2 will have on the servos. Once you have achieved the desired balance between the two channels move to another menu item to lock in the value.

Press the **DOWN** button four times to move to Bi-Directional Mixer Options.

BI-DIRECTIONAL MIXER OPTIONS

Sample display: **BMixOps:YYYY**

Go to the Menu item under the Basic Configuration column which reads **BMixOps:YYYY**. Note the small underline, called a cursor, under the first Y. This indicates that Option 1 for Bi-Directional Mixer 1 is the Option you can select at the moment. Press the **ENT->** button and you will see that the cursor moves to the right, allowing you to pick which Option you want to deactivate. Pressing the **<-ENT** button will move the cursor to the left. Move the cursor back under the first Y. Now press the **DEC/NO** button. Two things will happen. The first Y will change to an N, indicating that the Option has been deactivated. The cursor will also move one space to the right. If you wish to use the next Option press **INC/YES** again, if not, use **ENT->** to move to the next Option you do want to deactivate. If you select an Option by mistake use **<-ENT** to move the cursor back under the particular Option and then press the **INC/YES** button to turn the Option on.

There are four Y's to the right of the colon in the display. Each of these represents one of the Bi-Directional Mixer options, and indicates that the Option is currently turned on. Positions 1 and 2 are for Bi-Directional Mixer 1, while Positions 3 and 4 are for Bi-Directional Mixer 2. Below is a description of the effect each of the Options has on the Mixers.

Position 1 (Bi Mixer 1) and Position 3 (Bi Mixer 2):

Answering Yes to this Option allows Channel 2 to be mixed into Channel 1, meaning that both servos will move when either the Channel 1 or the Channel 2 control stick is moved. Answering No to this option will stop Channel 2 from being mixed into Channel 1, meaning that both servos will move when the Channel 1 stick is moved, but only the Channel 2 servo will move when the Channel 2 stick is moved.

Position 2 (Bi Mixer 1) and Position 4 (Bi Mixer 2):

Answering Yes to this Option allows Channel 1 to be mixed into Channel 2, meaning that both servos will move when either the Channel 2 or the Channel 1 control stick is moved. Answering No to this option will stop Channel 1 from being mixed into Channel 2, meaning that both servos will move when the Channel 2 stick is moved, but only the Channel 1 servo will move when the Channel 1 stick is moved.

As an example of how the Bi-Directional Mixer Options can be used, let's consider the Air Force's F-15 Eagle. In this plane the all flying stabilizers move together for pitch control, but move in opposite directions for roll control. By doing this, the stabilizers work together with the ailerons to increase the roll rate of the plane. The same would apply to a model of an F-15 if it were possible to have the stabilizers work as both elevators and ailerons, or Tailerons. The problem you run into trying to achieve this is that while you want both the ailerons and the stabilizers to move when you move the aileron stick, you want only the stabilizers to move when you move the elevator stick.

Your Vision makes it possible to have Taileron control. First you would have to select the **2A 1F 2E T** Template, so that you would have an individual servo for each stabilizer. This is necessary because sometimes the stabilizer servos need to move in the same direction and at others they need to move in opposite directions. Next you would set up Bi-Directional Mixer 1 with the left aileron as Channel 1 and the left stabilizer as Channel 2. Then you would set up Bi-Directional Mixer 2 in a similar manner, except that you would use the right stabilizer and aileron in place of the left. If you were to move your controls at this point, moving the aileron stick to the left would cause the left aileron and stabilizer to move up and the right aileron and stabilizer to move down. Unfortunately, pulling up on the elevator stick would cause all four surfaces to move up.

This is were the Bi-Directional Mixer Options come into play. By allowing Channel 1 of each Mixer to mix into Channel 2, but preventing Channel 2 from mixing into Channel 1, you will achieve the desired control response. The display for the Mixer Options Menu item would read **BMixOps:NYNY**. And when you moved the aileron stick the ailerons and the stabilizers would move, but when you moved ther elevator stick only the stabilizers would move.

The only other factor to consider in our example is the direction the control surfaces themselves move when they are mixed together. The proper way would be for the aileron and stabilizer on the same side of the plane to move in the same direction when the aileron stick is moved. Depending on the particular installation, it may turn out that when the aileron is moving in the proper direction for roll control and the stabilizer is moving in the proper direction for pitch control, the two surfaces move in opposite directions when the aileron stick is moved. If this is the case, you need to reverse the Channel selection of the Mixers, and set the left aileron to mix with the **right** stabilizer and the right aileron to mix with the **left** stabilizer.

This is the last Menu item in the Mixer Adjustment column. Press the **ENT->** button to move to the Presets and Dual Rates column.

PRESETS AND DUAL RATES GROUP

The Presets and Dual Rates column contains Menu items which let you alter the flying characteristics of the plane in flight by moving switches or pressing the Roll Button on the transmitter.

Press the **DOWN** button to move to Roll Button Programs.

ROLL BUTTON PROGRAMS

Sample display: **Prog 1 Ail:0%**

The Roll Button Programs allow you to press the spring loaded button on the upper left corner of the transmitter and have the ailerons, elevator and rudder move instantaneously to positions you have preset without having to move the control sticks. As long as you hold the button down, the surfaces will be offset to the preset positions. As soon as you release the button, the three controls will return to their normal neutral positions. Even when you are holding down the button, you always have the ability to move the controls with the sticks, so you can override the preset positions to make any control corrections that may be required.

The Vision 8P has three different Roll Button Programs available. You can use one, two or all three as required. By assigning each of the three to a different switch on the top of the transmitter, you can select in flight which of the Programs will be activated when you press the Roll Button. The usual way to assign the Programs is to put one of them on each position of a three position switch; that way, when one is turned on you are sure that the other two are off. If you decide to assign the programs to individual switches and mistakenly turn more than on program on, the Vision will use the program with the lowest number; Program 1 would be used before Program 2, and Program 2 would be used before Program 3.

The amount each of the three controls will move when the Roll Button is pressed and the direction of movement is fully adjustable and completely independent of the other two controls.

For example, for Program 1 you could set all three of the controls to 100% movement; full right aileron, full up elevator and full right rudder. Pressing the Roll Button when Program 1 was active would produce an inside snap roll to the right without touching any of the

sticks. For Program 2, you could set the ailerons and the rudder the same as Program 1, but set the elevator to -100%, for full **down**. Pressing the Roll Button with Program 2 selected would produce an outside snap roll to the right. In both cases the snap rolls will always be consistant because each of the three controls will reach full travel at exactly the same time every time you press the button.

Now for the interesting part. Say that for Program 3 you set the ailerons to 50% throw and leave the elevator and rudder at 0%. Now when you press the Button, the ailerons will move and the plane will start to roll. Since the sticks retain full authority even when the Roll Button is depressed, you can follow through with the elevator as the plane goes through the slow roll. The roll rate will remain constant throughout the roll because the ailerons will stay deflected the exact same amount throughout the maneuver. Or you could set Program 3 so that you will get 75% rudder and leave the ailerons and elevator at 0%. Now you can roll the plane to a knife edge attitude, press the Roll Button and have the proper amount of rudder to maintain knife edge while still being able to make corrections with the ailerons and elevator.

The procedure for setting up the Roll Programs begins with deciding how you will select between the Programs. If you are only going to use one of the Programs, you can go to the Switch Assignment Column and turn one Program on and the other two off. This will mean that whenever you press the Button you will get the presets programmed into the one active Program. If you are planning to use two Programs, we strongly recommend that you assign each of the Programs to the opposite side of the same two position switch. That way, whenever you select one Program, the other will automatically be turned off. The third Program should of course be turned off at the appropriate menu item under the Assign Switch column. If you are planning to use all three Programs, we again strongly recommend that each one be assigned to a different position on the same three position switch so that only a single Program can be activated at any one time.

The process for actually setting the position a control surface will assume when the Button is pressed is the same for all of the nine settings available in the three Roll Button Programs, so we will go through only one example. Go to the Menu item under the Presets and Dual Rates column which reads **Prog 1 Ail:0%**. Make sure that Program 1 has been activated by placing the appropriate switch in its proper position. Press and hold the Roll Button. Now press the **INC** button. This will cause the value in the display to increase and the ailerons to move. If the ailerons are moving in the direction you want them to, continue pressing the **INC** button until they reach the position you want them to be in for Program 1. If the ailerons are moving in the opposite direction from the one you want, press the **DEC** button. This will cause the number in the display to go negative and move the ailerons in the opposite direction. Once you have set the position you want, release the Roll Button. Press the Button again to confirm that the ailerons move in the direction and the amount that you want them to, then press the **DOWN** button to move to the next control to be programmed. Repeat this procedure until you have programmed all the controls for all the Roll Button Programs you plan to use.

If you are using the Lever on the left side of the transmitter to control the flaps, press the **DOWN** button until you reach Dual Rates.

If you have assigned the flaps to be controlled by a three position switch, press the **DOWN** button until you reach the Flap Presets.

FLAP PRESETS

Sample display: **Set Flap 1:0%**

If you have assigned the flaps to be controlled by a three position switch on the transmitter instead of the Lever on the left side of the transmitter, the Flap Preset Menu items will appear under the Presets and Dual Rates column. If you are using the Lever to control the flaps these items will not appear.(See page 12, **Flap Control Location**)

The Flap Presets are where you will adjust the deflection of the flaps when the switch controlling the flaps is in any one of the three preset positions.

The adjustment of the three Flap Presets is identical, so we will only go through one example of how to set up each of the Presets. Before adjusting the Presets, you should go to the Assign Switch column and make sure that you have assigned the control of the flaps to the desired switch on the top of the transmitter.

Go to the menu item which reads **Set Flap 3:66%**. This is where you will adjust the amount of flap movement you will get when the switch controlling the Flap Position #3 is activated. Position #3 is normally used for flaps fully extended or down. Activate the switch controlling Flap Position #3 and watch the flaps. They should move down. If they try to move up, you need to reverse the flap servo rotation. Once the servo is moving in the proper direction, you can adjust how far the flaps will move. If you want the flaps to move more when the switch for Position #3 is on, press the **INC** button. This will cause the value in the display to increase and move the flaps farther down. Continue pressing the **INC** button until the flaps reach the position you want them to be in when the Position #3 switch is activated. If you want the flaps to have less movement, press the **DEC** button. Once you have set the flap position with the **INC** and **DEC** buttons, move to another Menu item to lock in the value you have programmed.

The typical setup is to have Flap Position #1 be flaps fully closed, Flap Position #2 be flaps partially lowered for take off and Flap Position #3 be flaps fully lowered for landing. But any of the three Flap Presets can be set to have any amount of flap travel from 0% to 100%, so you can set the Presets up in whatever manner best suits your particular requirements.

Press the **DOWN** button to move to Dual Rates.

DUAL RATES

Sample display: **Aileron DR:100%**

The Dual Rate Function allows you to have two different amounts of control throw depending on the position of the D/R Switch. This allows you to have a large amount of throw for slow speed flight and then reduce the throw for high speed flight. Or you can set the Rates up so that you have the proper amount of throw for take offs, landings and normal flight and larger amounts of throw for aerobatics. It is also useful to have when you are test flying an airplane and are not sure what the throw should be. The Dual Rates will allow you to set up two amounts of throw so that if you find the plane is too sensitive you can reduce the throw with a flip of a switch.

You should adjust the Dual Rates after the control throws have been set up using the Travel Volume adjustments. Go to the Menu item which reads **Aileron D/R:100%**. This is where you will adjust what percentage of throw you will have available when the Dual Rate is turned on. When the value is 100%, you will have full throw available and the D/R Switch is effectively disabled. Pressing the **DEC** button will lower the value on the display and reduce the amount of throw you will have available when you turn the switch on. Once you have used the **INC** and **DEC** buttons to select the value you want, move to another Menu item to lock in the value. The adjustment process for the Elevator and Rudder Dual Rates is the same.

When using the Dual Rate function keep in mind that the higher amount of control throw is available when the Rate is off, and the reduced throw is available when the Rate is on. You should also understand that the D/R reduces throw in each direction by the same percentage, so that if you have your elevator set for more up than down, with the Dual Rate activated you will still have more up than down, but less of each.

The Dual Rates are the last items in the Presets and Dual Rate column.

SECTION VI: REFERENCE

This section of the manual contains material which allows you to quickly use the ATRCS system without a great deal of reading. Once you are familiar with how to use ATRCS and the features of the Vision you can use this section to check on how to program a certain function very quickly. If you need more information about a Menu item than is contained in this section, look the item up in Section V for a more in depth description.

QUICK REFERENCE GUIDE

The Quick Reference Guide allows you to look up a particular Menu item and get basic information about what it affects in the program and how it is adjusted. If you need more information about an item than is available in the Quick Reference Guide, look the item up in Section V.

QUICK REFERENCE GUIDE 8P PCM

MAIN MENU GROUP

L Setup	Loads desired aircraft setup into transmitter. Use INC or DEC button to select desired setup number and press both ENT buttons to load.
Access Level	Sets Access Level of setup. Use INC or DEC buttons to select level.
S Setup	Copies current setup to another setup. Use INC or DEC buttons to select setup to copy to, then press both ENT buttons to copy.
Alternate	Selects Alternate Setup to be used with current setup. Use INC or DEC buttons to select number of setup to be used as Alternate Setup.
Alter Mode?	Selects between Mode I and Mode II. Answer No for Mode I, Yes for Mode II.
Mode B?	Selects between Mode III and Standard operation. Answer Yes for Mode III, No for Standard.
Cross Trims?	Switches elevator and throttle trims to opposite sides of transmitter from control sticks. Answer No to have trims next to sticks, Yes to have trims opposite from sticks.
Zero Sticks	Calibrates neutral points of potentiometers. Move all sticks and trims to their center positions, the flap stick all the way up, and press both ENT buttons to calibrate.
EEP(ENT)	This tests the memory of the system. Press both ENT buttons. If no ERROR message appears, the system is functioning properly.
Aileron 124	This tests which stick controls which function. The stick controlling the aileron will cause the value to change. Use INC or DEC buttons to step through the different functions.
01010100101010	This displays which switch positions are activated. 0 means the switch is OFF, 1 means it is On.

BASIC CONFIGURATION GROUP

2A 1F 1E T	This selects which template will be used for the setup. Use the INC or DEC buttons to select the desired template and then press both ENT buttons to initiate the template.
S Ail Trim	Saves trim lever position of identified control so that lever may be returned to center. Set trim to desired position during flight, press both ENT buttons to save trim setting, and return lever to center position.
L Side Flap?	Determines location of flap control. Yes has flaps controlled by Lever on left side of transmitter. No has flaps controlled by a three position switch whose location can be user assigned.
R Side Aux2?	Determines location of Aux II control. Yes has Aux II controlled by Lever on right side of transmitter. No has Aux II controlled by two position switch whose location can be user assigned.
Auto D/R Rd?	Yes answer causes rudder D/R to be automatically activated when throttle stick is moved to high position. No lets D/R be assigned to a switch.
VTR Ail?	Answering No causes identified function to have linear control response. Answering Yes causes function to have VTR control response.
Expo Ail:	Word Off to right of colon indicates identified function will have linear control response. Number 1 through 7 to right of colon means function will have exponential response. Use INC or DEC buttons to change number in display. 1 is least amount of expo, 7 is most amount of expo.
PCM 8	This is where the receiver type for the setup is selected. Use the INC or DEC buttons to display the desired receiver.
Reverse:NNNNN	Reverses the servos. Press DEC/NO button to have normal servo rotation, INC/YES button to reverse the servo rotation.
1.32msS:NNNNN	Selects servo center pulse width for servos. Press DEC/NO button for 1.5 pulse width, INC/YES button for 1.32 pulse width.

ASSIGN SWITCH GROUP

PROGIon	Use INC or DEC buttons until number of switch desired to control identified function appears in parentheses.

SURFACE ADJUSTMENT GROUP

Center LAil	Adjusts the neutral position of the identified control surface. Use the INC or DEC buttons to make the adjustment.
Idle Adj	Adjusts position of throttle servo with throttle stick fully closed. Use the INC or DEC buttons to make the adjustment.
Thrt 33 Aj	Adjusts position of throttle servo when throttle stick is at indicated percentage of its movement. Use the INC or DEC buttons to make the adjustment.
LAil LTV	Adjusts the amount of travel for the identified control surface in the identified direction. Use the INC or DEC buttons to make the adjustment.

MIXER ADJUSTMENT GROUP

NOTE: All items in the Mixer ADJUSTMENT Group are adjusted by using the INC or DEC buttons.

1 Ail->Rudd	Adjusts amount of rudder movement with ailerons for Level 1 of Aileron/Rudder Coupling.
2 Ail->Rudd	Adjusts amount of rudder movement with ailerons for Level 2 of Aileron/Rudder Coupling.
Elev->Flap	Adjusts amount of flap movement with elevator.
Flap->Elev	Adjusts amount of elevator movement with flaps.
CMst 1	Selects Master Channel of identified Compensation Mixer. Use INC or DEC button until desired channel appears in display.
CSlv 1	Selects Slave Channel of identified Compensation Mixer. Use INC or DEC button until desired channel appears in display.
CMix 1 MAj	Adjusts how far Slave Channel will move when Master Channel moves when using identified Compensation Mixer.
CMix 1 SAj	Limits amount of total Slave Channel movement available when identified Compensation Mixer is turned On.
CMixOps	Controls which of four options affecting Compensation Mixers is activated.
BMix 1 Ch1	Selects Channel 1 for identified Bi-Directional Mixer. Use INC or DEC button until desired channel appears in display.
BMix 1 Ch2	Selects Channel 2 for identified Bi-Directional Mixer. Use INC or DEC button until desired channel appears in display.
BMix 1 Bal	Adjusts which channel will have more effect in identified Bi-Directional Mixer.
BMixOps	Controls which of two options affecting Bi-Directional Mixers is activated.

PRESETS AND DUAL RATE GROUP

NOTE: All items in the Presets and Dual Rates Group are adjusted by using the INC or DEC buttons.

Prog 1 Ail	Adjusts how far identified control will move when Roll Button is pressed when indicated program is active.
Set Flap 1	Adjusts amount of flap deflection when switch controlling indicated Flap Position is activated.
Aileron D/R	Adjusts amount of throw available when indicated D/R Switch is activated.

AIRCRAFT TEMPLATES AND CONFIGURATIONS

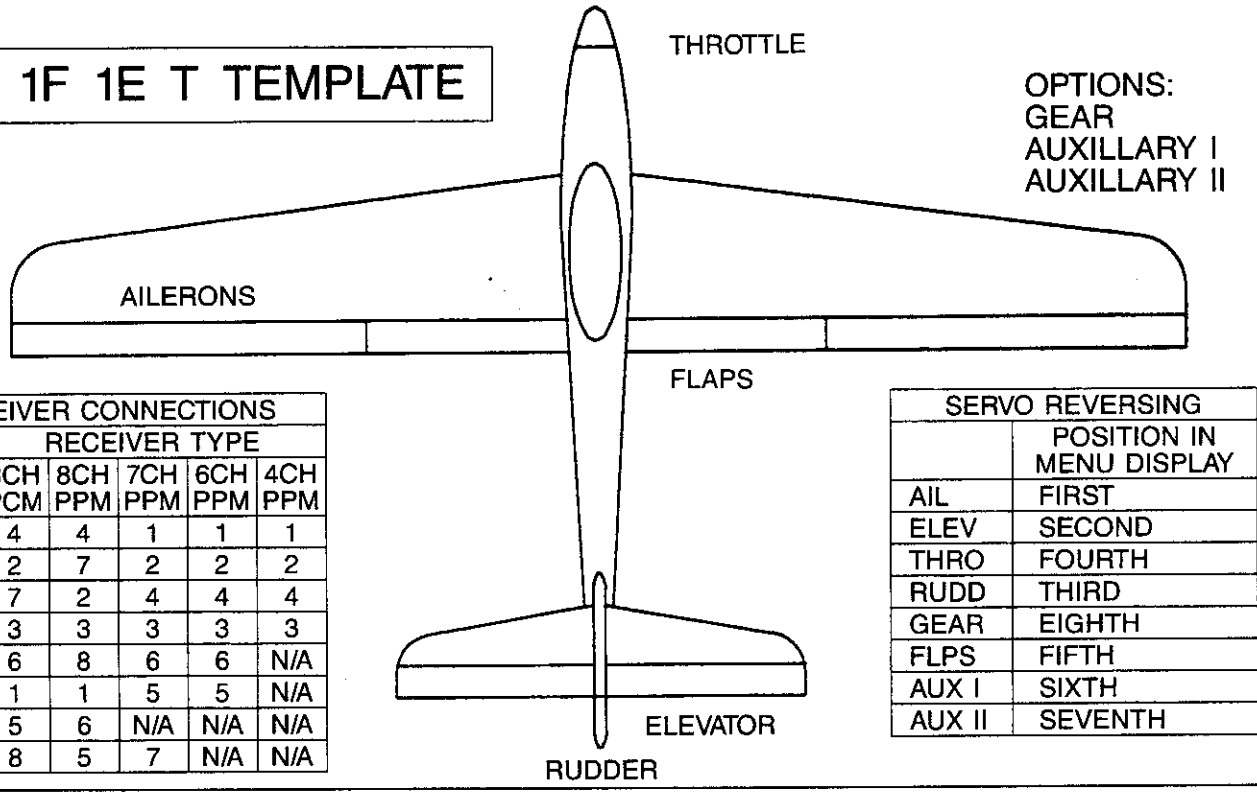
This part of the Reference Section contains the information about the Aircraft Templates. For each template there is a diagram of a plane identifying various control surfaces and a table showing which receiver Channel Number controls which surface when you are using that template. There is also information identifying which character in the servo reversing Menu item will reverse which function in the particular template.

To identify the appropriate Aircraft Template for your plane, find the diagram in this section which matches the type of control setup and servo arrangement you plan to use. For instance, if you plan to use two individual flap servos, you need to find a template where each flap surface is identified by a different number. If there is only one flap identified, it means that there is only one receiver Channel assigned to the flaps and you will not have two separate flap servos in that template. Once you have found the right Aircraft Configuration Diagram, look at which template is called out. That is the template you need to use for the particular plane.

There is also a Menu structure for each of the Aircraft Templates. This structure is like a map to the entire ATRCS Menu for that particular template, and will allow you to see all of the Menu items contained in the template and where they are located.

AIRCRAFT CONFIGURATION

1A 1F 1E T TEMPLATE



RECEIVER CONNECTIONS					
	RECEIVER TYPE				
	8CH PCM	8CH PPM	7CH PPM	6CH PPM	4CH PPM
AIL	4	4	1	1	1
ELEV	2	7	2	2	2
THRO	7	2	4	4	4
RUDD	3	3	3	3	3
GEAR	6	8	6	6	N/A
FLPS	1	1	5	5	N/A
AUX I	5	6	N/A	N/A	N/A
AUX II	8	5	7	N/A	N/A

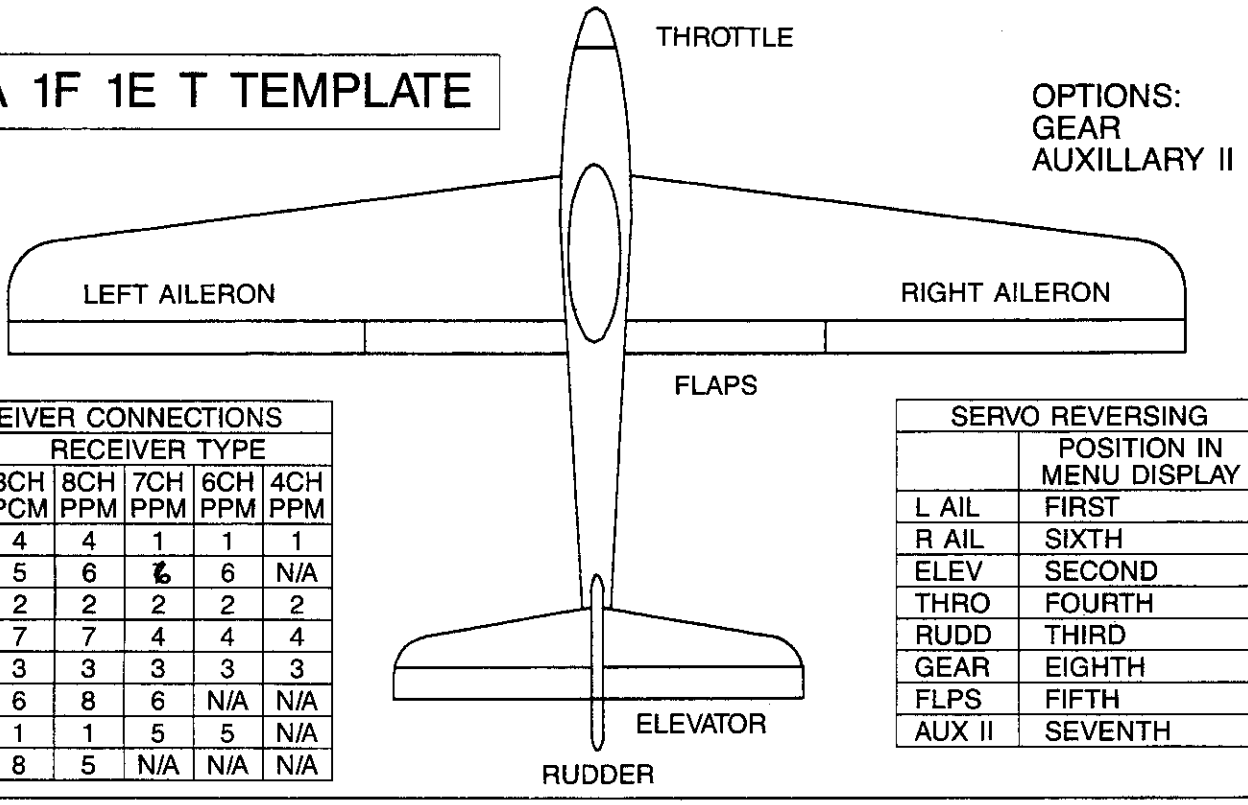
SERVO REVERSING	
	POSITION IN MENU DISPLAY
AIL	FIRST
ELEV	SECOND
THRO	FOURTH
RUDD	THIRD
GEAR	EIGHTH
FLPS	FIFTH
AUX I	SIXTH
AUX II	SEVENTH

1A 1F 1E T MENU STRUCTURE

MAIN MENU GROUP	BASIC CONFIGURATION GROUP	ASSIGN SWITCH GROUP	SURFACE ADJUSTMENT GROUP	MIXER ADJUSTMENT GROUP	PRESETS/ DUAL RATES GROUP
Load Setup	Template Selection	Program 1	Center Aileron	Ail/Rudd Coupling 1	Program 1 Ail Adj
Access Level	Save Aileron Trim	Program 2	Center Flap	Ail/Rudd Coupling 2	Program 1 Elev Adj
Save Setup	Save Elevator Trim	Program 3	Center Elevator	Elevator/Flap Mix	Program 1 Rudd Adj
Alternate Setup	Save Rudder Trim	Compensation Mixer 1	Center Rudder	Flap/Elevator Mix	Program 2 Ail Adj
Alter Mode?	Left Side Flap	Compensation Mixer 2	Idle Adjust	Comp Mixer 1 Master	Program 2 Elev Adj
Mode B?	Right Side Aux II	Elevator/Flap Mixing	Throttle 33% Adjust	Comp Mixer 1 Slave	Program 2 Rudd Adj
Cross Trims?	Auto D/R Rudder	Aileron Dual Rate	Throttle 66% Adjust	Comp Mixer 1 Master Adj	Program 3 Ail Adj
Calibrate Zero Points	VTR Aileron	Elevator Dual Rate	Throttle 100% Adjust	Comp Mixer 1 Slave Adj	Program 3 Elev Adj
EEP Memory Test	VTR Elevator	Rudder Dual Rate	Ail Left Travel Adj	Comp Mixer 2 Master	Program 3 Rudd Adj
Stick Function Test	Exponential Aileron	Ail/Rudd Coupling 1	Ail Right Travel Adj	Comp Mixer 2 Slave	Ail Dual Rate Adj
Switch Test	Exponential Elevator	Ail/Rudd Coupling 2	Flap Travel Adj	Comp Mixer 2 Master Adj	Elev Dual Rate Adj
	Exponential Rudder	Landing Gear	Elev Up Travel Adj	Comp Mixer 2 Slave Adj	Rudd Dual Rate Adj
	Receiver Selection		Elev Down Travel Adj	Comp Mixer Options	
	Servo Reversing		Rudd Left Travel Adj	Bi Mixer 1 Channel 1	
	Servo Pulse Width Selection		Rudd Right Travel Adj	Bi Mixer 1 Channel 2	
				Bi Mixer 1 Balance	
				Bi Mixer 2 Channel 1	
				Bi Mixer 2 Channel 2	
				Bi Mixer 2 Balance	
				Bi Mixer Options	

AIRCRAFT CONFIGURATION

2A 1F 1E T TEMPLATE



RECEIVER CONNECTIONS					
	RECEIVER TYPE				
	8CH PCM	8CH PPM	7CH PPM	6CH PPM	4CH PPM
L AIL	4	4	1	1	1
R AIL	5	6	6	6	N/A
ELEV	2	2	2	2	2
THRO	7	7	4	4	4
RUDD	3	3	3	3	3
GEAR	6	8	6	N/A	N/A
FLPS	1	1	5	5	N/A
AUX II	8	5	N/A	N/A	N/A

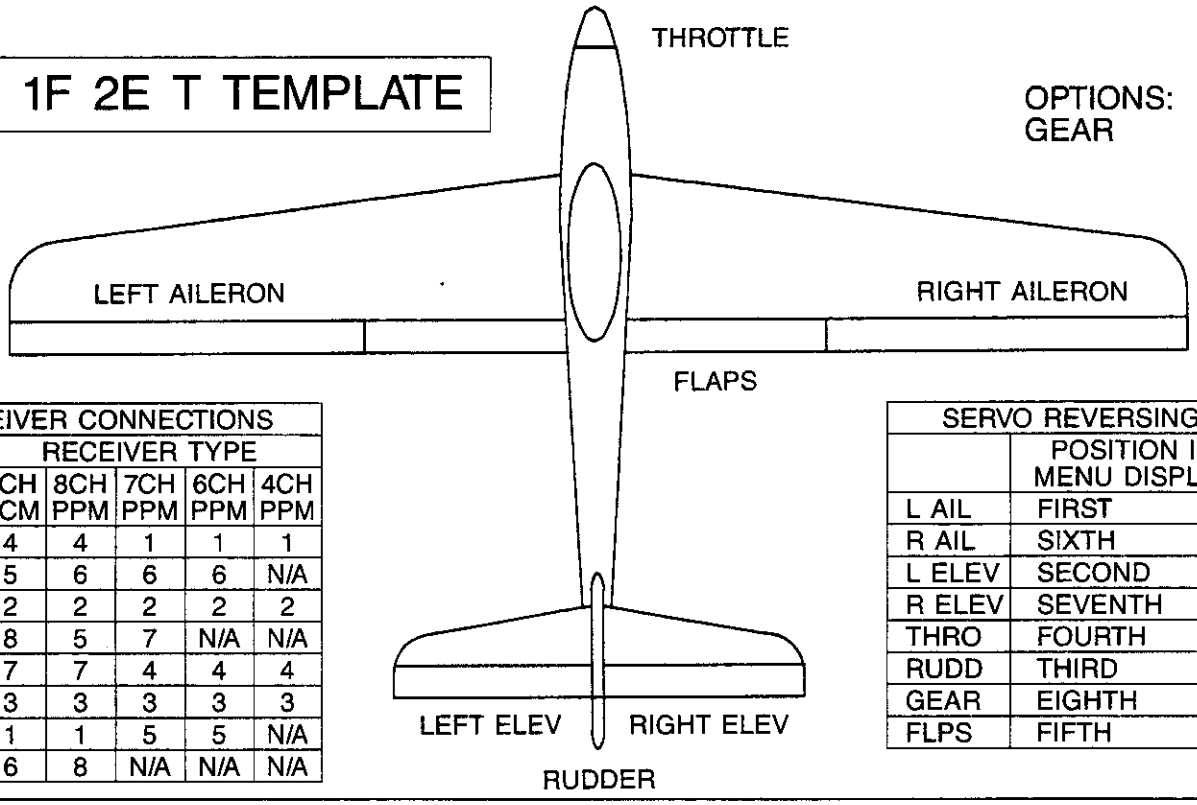
SERVO REVERSING	
	POSITION IN MENU DISPLAY
L AIL	FIRST
R AIL	SIXTH
ELEV	SECOND
THRO	FOURTH
RUDD	THIRD
GEAR	EIGHTH
FLPS	FIFTH
AUX II	SEVENTH

2A 1F 1E T MENU STRUCTURE

MAIN MENU GROUP	BASIC CONFIGURATION GROUP	ASSIGN SWITCH GROUP	SURFACE ADJUSTMENT GROUP	MIXER ADJUSTMENT GROUP	PRESETS/ DUAL RATES GROUP
Load Setup	Template Selection	Program 1	Center Left Aileron	Ail/Rudd Coupling 1	Program 1 Ail Adj
Access Level	Save Aileron Trim	Program 2	Center Flap	Ail/Rudd Coupling 2	Program 1 Elev Adj
Save Setup	Save Elevator Trim	Program 3	Center Right Aileron	Elevator/Flap Mix	Program 1 Rudd Adj
Alternate Setup	Save Rudder Trim	Compensation Mixer 1	Center Elevator	Flap/Elevator Mix	Program 2 Ail Adj
Alter Mode?	Left Side Flap	Compensation Mixer 2	Center Rudder	Comp Mixer 1 Master	Program 2 Elev Adj
Mode B?	Right Side Aux II	Elevator/Flap Mixing	Idle Adjust	Comp Mixer 1 Slave	Program 2 Rudd Adj
Cross Trims?	Auto D/R Rudder	Aileron Dual Rate	Throttle 33% Adjust	Comp Mixer 1 Master Adj	Program 3 Ail Adj
Calibrate Zero Points	VTR Aileron	Elevator Dual Rate	Throttle 66% Adjust	Comp Mixer 1 Slave Adj	Program 3 Elev Adj
EEP Memory Test	VTR Elevator	Rudder Dual Rate	Throttle 100% Adjust	Comp Mixer 2 Master	Program 3 Rudd Adj
Stick Function Test	Exponential Aileron	Ail/Rudd Coupling 1	Left Ail Left Travel Adj	Comp Mixer 2 Slave	Ail Dual Rate Adj
Switch Test	Exponential Elevator	Ail/Rudd Coupling 2	Left Ail Right Travel Adj	Comp Mixer 2 Master Adj	Elev Dual Rate Adj
	Exponential Rudder	Landing Gear	Right Ail Left Travel Adj	Comp Mixer 2 Slave Adj	Rudd Dual Rate Adj
	Receiver Selection		Right Ail Right Travel Adj	Comp Mixer Options	
	Servo Reversing		Flap Travel Adj	Bi Mixer 1 Channel 1	
	Servo Pulse Width Selection		Elev Up Travel Adj	Bi Mixer 1 Channel 2	
			Elev Down Travel Adj	Bi Mixer 1 Balance	
			Rudd Left Travel Adj	Bi Mixer 2 Channel 1	
			Rudd Right Travel Adj	Bi Mixer 2 Channel 2	
				Bi Mixer 2 Balance	
				Bi Mixer Options	

AIRCRAFT CONFIGURATION

2A 1F 2E T TEMPLATE



RECEIVER CONNECTIONS					
	RECEIVER TYPE				
	8CH PCM	8CH PPM	7CH PPM	6CH PPM	4CH PPM
L AIL	4	4	1	1	1
R AIL	5	6	6	6	N/A
L ELE	2	2	2	2	2
R ELE	8	5	7	N/A	N/A
THRO	7	7	4	4	4
RUDD	3	3	3	3	3
FLPS	1	1	5	5	N/A
GEAR	6	8	N/A	N/A	N/A

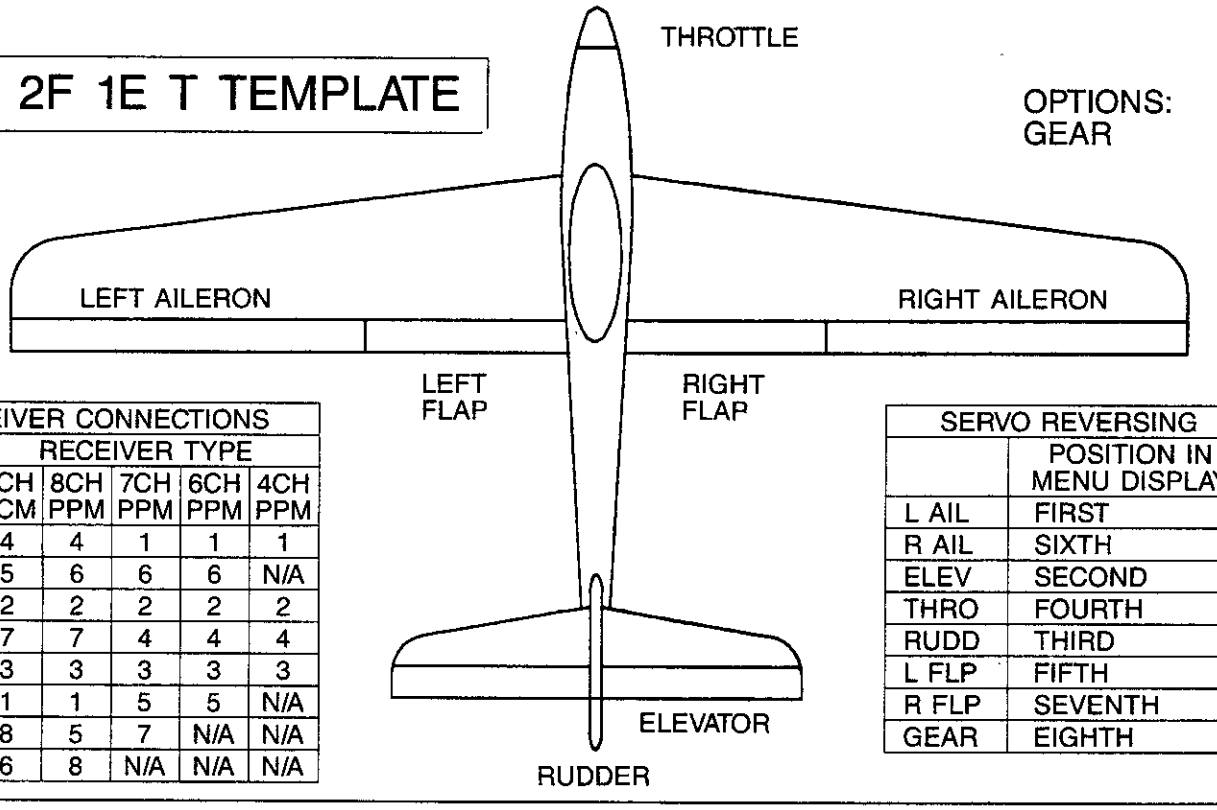
SERVO REVERSING	
	POSITION IN MENU DISPLAY
L AIL	FIRST
R AIL	SIXTH
L ELEV	SECOND
R ELEV	SEVENTH
THRO	FOURTH
RUDD	THIRD
GEAR	EIGHTH
FLPS	FIFTH

2A 1F 2E T MENU STRUCTURE

MAIN MENU GROUP	BASIC CONFIGURATION GROUP	ASSIGN SWITCH GROUP	SURFACE ADJUSTMENT GROUP	MIXER ADJUSTMENT GROUP	PRESETS/ DUAL RATES GROUP
Load Setup	Template Selection	Program 1	Center Left Aileron	Ail/Rudd Coupling 1	Program 1 Ail Adj
Access Level	Save Aileron Trim	Program 2	Center Flap	Ail/Rudd Coupling 2	Program 1 Elev Adj
Save Setup	Save Elevator Trim	Program 3	Center Right Aileron	Elevator/Flap Mix	Program 1 Rudd Adj
Alternate Setup	Save Rudder Trim	Compensation Mixer 1	Center Left Elevator	Flap/Elevator Mix	Program 2 Ail Adj
Alter Mode?	Left Side Flap	Compensation Mixer 2	Center Right Elevator	Comp Mixer 1 Master	Program 2 Elev Adj
Mode B?	Right Side Aux II	Elevator/Flap Mixing	Center Rudder	Comp Mixer 1 Slave	Program 2 Rudd Adj
Cross Trims?	Auto D/R Rudder	Aileron Dual Rate	Idle Adjust	Comp Mixer 1 Master Adj	Program 3 Ail Adj
Calibrate Zero Points	VTR Aileron	Elevator Dual Rate	Throttle 33% Adjust	Comp Mixer 1 Slave Adj	Program 3 Elev Adj
EEP Memory Test	VTR Elevator	Rudder Dual Rate	Throttle 66% Adjust	Comp Mixer 2 Master	Program 3 Rudd Adj
Stick Function Test	Exponential Aileron	Ail/Rudd Coupling 1	Throttle 100% Adjust	Comp Mixer 2 Slave	Ail Dual Rate Adj
Switch Test	Exponential Elevator	Ail/Rudd Coupling 2	Left Ail Left Travel Adj	Comp Mixer 2 Master Adj	Elev Dual Rate Adj
	Exponential Rudder	Landing Gear	Left Ail Right Travel Adj	Comp Mixer 2 Slave Adj	Rudd Dual Rate Adj
	Receiver Selection		Right Ail Left Travel Adj	Comp Mixer Options	
	Servo Reversing		Right Ail Right Travel Adj	Bi Mixer 1 Channel 1	
	Servo Pulse Width Selection		Flap Travel Adj	Bi Mixer 1 Channel 2	
			Left Elev Up Travel Adj	Bi Mixer 1 Balance	
			Left Elev Down Travel Adj	Bi Mixer 2 Channel 1	
			Right Elev Up Travel Adj	Bi Mixer 2 Channel 2	
			Right Elev Down Travel Adj	Bi Mixer 2 Balance	
			Rudd Left Travel Adj	Bi Mixer Options	
			Rudd Right Travel Adj		

AIRCRAFT CONFIGURATION

2A 2F 1E T TEMPLATE



RECEIVER CONNECTIONS					
	RECEIVER TYPE				
	8CH PCM	8CH PPM	7CH PPM	6CH PPM	4CH PPM
L AIL	4	4	1	1	1
R AIL	5	6	6	6	N/A
ELEV	2	2	2	2	2
THRO	7	7	4	4	4
RUDD	3	3	3	3	3
L FLP	1	1	5	5	N/A
R FLP	8	5	7	N/A	N/A
GEAR	6	8	N/A	N/A	N/A

SERVO REVERSING	
	POSITION IN MENU DISPLAY
L AIL	FIRST
R AIL	SIXTH
ELEV	SECOND
THRO	FOURTH
RUDD	THIRD
L FLP	FIFTH
R FLP	SEVENTH
GEAR	EIGHTH

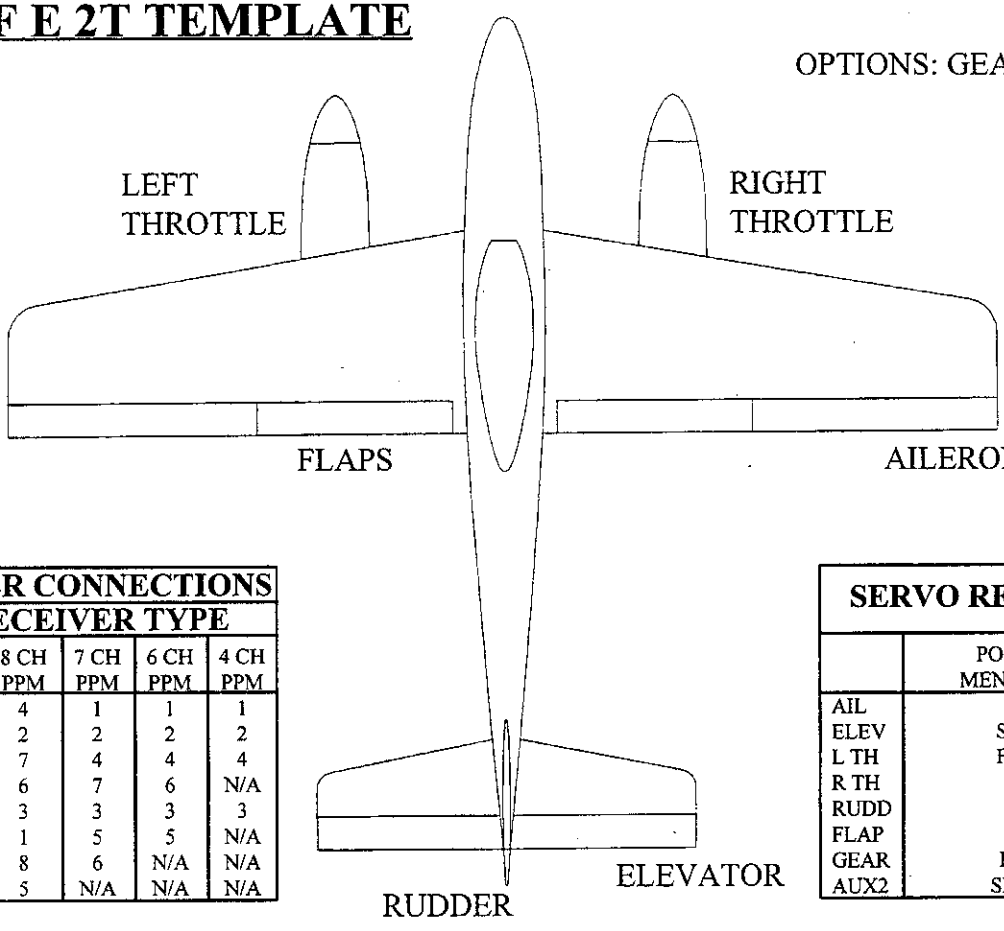
2A 2F 1E T MENU STRUCTURE

MAIN MENU GROUP	BASIC CONFIGURATION GROUP	ASSIGN SWITCH GROUP	SURFACE ADJUSTMENT GROUP	MIXER ADJUSTMENT GROUP	PRESETS/ DUAL RATES GROUP
Load Setup	Template Selection	Program 1	Center Left Aileron	Ail/Rudd Coupling 1	Program 1 Ail Adj
Access Level	Save Aileron Trim	Program 2	Center Left Flap	Ail/Rudd Coupling 2	Program 1 Elev Adj
Save Setup	Save Elevator Trim	Program 3	Center Right Flap	Elevator/Flap Mix	Program 1 Rudd Adj
Alternate Setup	Save Rudder Trim	Compensation Mixer 1	Center Right Aileron	Flap/Elevator Mix	Program 2 Ail Adj
Alter Mode?	Left Side Flap	Compensation Mixer 2	Center Elevator	Comp Mixer 1 Master	Program 2 Elev Adj
Mode B?	Right Side Aux II	Elevator/Flap Mixing	Center Rudder	Comp Mixer 1 Slave	Program 2 Rudd Adj
Cross Trims?	Auto D/R Rudder	Aileron Dual Rate	Idle Adjust	Comp Mixer 1 Master Adj	Program 3 Ail Adj
Calibrate Zero Points	VTR Aileron	Elevator Dual Rate	Throttle 33% Adjust	Comp Mixer 1 Slave Adj	Program 3 Elev Adj
EEP Memory Test	VTR Elevator	Rudder Dual Rate	Throttle 66% Adjust	Comp Mixer 2 Master	Program 3 Rudd Adj
Stick Function Test	Exponential Aileron	Ail/Rudd Coupling 1	Throttle 100% Adjust	Comp Mixer 2 Slave	Ail Dual Rate Adj
Switch Test	Exponential Elevator	Ail/Rudd Coupling 2	Left Ail Left Travel Adj	Comp Mixer 2 Master Adj	Elev Dual Rate Adj
	Exponential Rudder	Landing Gear	Left Ail Right Travel Adj	Comp Mixer 2 Slave Adj	Rudd Dual Rate Adj
	Receiver Selection		Right Ail Left Travel Adj	Comp Mixer Options	
	Servo Reversing		Right Ail Right Travel Adj	Bi Mixer 1 Channel 1	
	Servo Pulse Width Selection		Left Flap Travel Adj	Bi Mixer 1 Channel 2	
			Right Flap Travel Adj	Bi Mixer 1 Balance	
			Elev Up Travel Adj	Bi Mixer 2 Channel 1	
			Elev Down Travel Adj	Bi Mixer 2 Channel 2	
			Rudd Left Travel Adj	Bi Mixer 2 Balance	
			Rudd Right Travel Adj	Bi Mixer Options	

AIRCRAFT CONFIGURATION.

1A 1F E 2T TEMPLATE

OPTIONS: GEAR AUX II



RECEIVER CONNECTIONS	RECEIVER TYPE				
	8 CH PCM	8 CH PPM	7 CH PPM	6 CH PPM	4 CH PPM
AIL	4	4	1	1	1
ELEV	2	2	2	2	2
L TH	7	7	4	4	4
R TH	5	6	7	6	N/A
RUDD	3	3	3	3	3
FLAP	1	1	5	5	N/A
GEAR	6	8	6	N/A	N/A
AUX2	8	5	N/A	N/A	N/A

SERVO REVERSING	
	POSITION IN MENU DISPLAY
AIL	FIRST
ELEV	SECOND
L TH	FOURTH
R TH	SIXTH
RUDD	THIRD
FLAP	FIFTH
GEAR	EIGHTH
AUX2	SEVENTH

MAIN MENU
Load Setup
Access Level
Save Setup
Alternate Setup
Alter Mode
Mode B
Cross Trims
Zero Sticks
Memory Test
Stick Test
Switch Test

BASIC CONFIG
Template Select
Save Ail Trim
Save Elev Trim
Save Rudd Trim
Left Sde Flap
Right Side Aux 2
Auto D/R Rudder
VTR Ail
VTR Elev
Expo Ail
Expo Elev
Expo Rudd
Receiver Select
Servo Reversing
Servo Pulse Width

ASSIGN SWITCH
Flap Position 1
Flap Position 2
Flap Position 3
Program 1
Program 2
Program 3
Comp Mixer 1
Comp Mixer 2
Elev/Flap
Ail Dual Rate
Elev Dual Rate
Rudd Dual Rate
Ail/Rudd 1
Ail/Rudd 2
Gear
Aux 2

SURFACE ADJUST
Center Ail
Center Flap
Center Elev
Center Rudd
Left Idle Adj
Left Thr 33% Adj
Left Thr 66% Adj
Left Thr 100% Adj
Right Idle Adj
Right Thr 33% Adj
Right Thr 66% Adj
Right Thr 100% Adj
Ail Left TV Adj
Ail Right TV Adj
Flap TV Adj
Elev Up TV Adj
Elev Down TV Adj
Rudd Left TV Adj
Rudd Right TV Adj

MIXER ADJUST
Ail/Rudd 1
Ail/Rudd 2
Elev/Flap
Flap/Elev
CMix 1 Mast
CMix 1 Slave
CMix 1 Mast Adj
CMix 1 Slave Adj
CMix 2 Mast
CMix 2 Slave
CMix 2 Mast Adj
CMix 2 Slave Adj
CMix Options
BMix 1 Ch 1
BMix 1 Ch 2
BMix 1 Balance
BMix 2 Ch 1
BMix 2 Ch 2
BMix 2 Balance
BMix Options

PRESETS AND D/R
Program 1 Ail
Program 1 Elev
Program 1 Rudd
Program 2 Ail
Program 2 Elev
Program 2 Rudd
Program 3 Ail
Program 3 Elev
Program 3 Rudd
Set Flap Pos 1
Set Flap Pos 2
Set Flap Pos 3
Aileron D/R Adj
Elevator D/R Adj
Rudder D/R Adj

AIRTRONICS® INC

SUPPLEMENT TO VISION 8P R/C INSTRUCTION MANUAL

VISION 8P 3.0 UPGRADE

Congratulations, and thank you for purchasing an Airtronics computer radio control system. Your Vision transmitter has been updated to include the 3.0 version software which provides increased capability. The attached is a supplement which covers the features in the updated 3.0 software, and should be used in conjunction with the basic manual which was written for the previous version of the software. The new high speed microprocessor and enhanced software will now allow the storage of flight programming data for up to (8) eight aircraft. Other features include Model Naming, VTR, Compensation and Bi-directional Mixer changes, the ability to program Fail-Safe for a PCM receiver, compatibility with Futaba type FM (72 MHz only) or other generic FM receivers, as well as other enhancements and improvements. A sample menu structure for the 2A 1F E T Template is also included. You can compare the changes in it with the original template in the instruction manual. The VISION Pattern Setup Note page includes all of the menu items that can be accomplished by all templates with this transmitter. We recommend you reproduce this note page and use it to record each aircraft's set-up data. Use the note page in conjunction with the template data which is published in the VISION 8P Instruction Manual. If you need further technical assistance contact AIRTRONICS at [redacted]

800 - 262 - 1178

ATRCS VERSION 3.0 ENHANCEMENTS

Vision Pattern Transmitter

Setup Memory:

The Setup memory has been expanded to 8 setups. These can be used, as before, in any combination of primary and alternate setups. Each alternate setup will use one of the setup memory locations.

Setup Naming:

You can name your setups, using the Name Setup menu item found under the main menu, with up to a seven character name. The increment and decrement keys are used to scroll through the alphanumeric characters to the character you want. Spaces or symbols can be used in the name. The arrow keys are used to move from one character to the next or backwards. After placing the cursor under a character, it can be changed using the increment or decrement keys. You do not need to push the enter keys after you have completed the name. The name will automatically be saved by moving to a new menu item.

You can erase a setup name by selecting spaces instead of characters. After erasing, the setup name reverts back to a number. If you do not enter any names, all setups (1 through 8) will have numbers automatically assigned.

Alternates are chosen using the setup name, if it exists, or the setup number, if it was not named.

The name, if assigned, or number of setup you are currently in will be displayed at the top of each menu group.

Flaperons:

A soft switch has been added under the Config Menu which allows you to enable the flaperon function in the 2A 1F 1E T template and the 2A 1F 2E T template. Setting this switch to "YES" allows you to enter mixing values for flap to left aileron and flap to right aileron found in the Mixer menu group.

C Mix Menu Changes:

The compensation mixers have been completely seperated into C Mix 1 and C Mix 2 groups by creating an options menu item for each group. Each of the options menu items now require only four Yes/No flags instead of the eight flags the old version required. The function of each of the four flags remain the same as before.

Bi Mix Menu Changes:

The Bi Mixer option menu item has been split into two items as well. Each group's options menu now contains two option flags. The function of each flag is the same as before.

VTR Function:

You no longer need to select between VTR and Dual rate since the VTR function is always available. The switch assigned to enable Dual Rate allows the turning off of both Dual Rate and VTR simultaneously. The other switch position can now enable Dual Rate, VTR or both.

Example:

Tx Switch Position	Function	VTR Value
Dual Rate OFF	D/R OFF-VTR OFF	Don't Care
Dual Rate ON	D/R ON-VTR OFF	Set to 70%
Dual Rate ON	D/R ON-VTR ON	Not 70%
Dual Rate ON	D/R OFF-VTR ON (Set D/R=100%)	Not 70%

Automatic Rudder Dual Rate:

Automatic Rudder D/R is now enabled with a soft switch in the menu. It does not disable the Rudder Dual Rate function when active as it did before. You can turn Rudder Dual Rate ON and OFF with an assigned switch without affecting the Auto Rudder D/R function.

To disable the Auto Rudder D/R function, set the soft switch in the configuration menu to "NO". This will give you only Rudder Dual Rate which can be switched via as assigned switch on the transmitter.

Trim Memory:

Saving of trim memory to the Setup memory has been modified for easier use. Trim memory information will now be saved with a menu transition just like all other menu items. You still need to enter the trim positions by pushing both ENTER keys.

Enable Failsafe:

This soft switch, found under the Config menu, enables the ability to use a preset failsafe position instead of just the failsafe hold.

This soft switch must be set to "Yes" before failsafe information can be sent to the receiver.

Send Failsafe Information:

With Enable Failsafe set to "Yes" and the PCM receiver on, the surfaces can be moved into any position you desire to use for failsafe. Once these positions are determined, press both "Enter" buttons to send the positions to the PCM receiver. After you turn the transmitter off, this information will be retained by your receiver as long as the receiver is on or, if you are using the proper PCM wiring harness, until you disconnect the battery. If you are using the simple PPM type wiring harness with your PCM receiver, the receiver will not remember the failsafe information after you turn off the receiver switch and you will have to re-send the information.

Gear Travel Endpoints:

Two menu items, found toward the bottom of the Surface menu group, have been added to set the limits of the gear servo if you are using a PPM type receiver. PCM receivers are designed such that it is not possible to incorporate this feature. Thus, these limits will have no effect when using PCM. The Gear Mode soft switch, found under the Config menu, must also be set to "Yes" to see and use these menu items.

Cross Trims:

Found under the main menu, are two new cross trim entries. One cross trim entry, Cross E-T, is used to electronically swap the elevator trim lever with the throttle trim lever. The second cross trim entry, Cross A-R, swaps the aileron trimmer with the rudder trimmer. This helps when trimming a new plane which requires constant control of the elevator and aileron sticks by allowing the use of the other hand to operate the trim levers. Setting the appropriate cross trim entry to "Yes" will swap the related trimmers.

Throttle Curve:

The throttle curve has been improved by the addition of a true idle adjust point which does not affect the rest of the curve when changed. To accomplish this, an additional point and menu item, Thro 0 Aj, has been added to the curve. The old menu item, "Idle Adj", has been replaced with "Center Thro" which allows you to compensate the servos position due to linkage variations without affecting the rest of the throttle curve. In essence, it shifts all of the points on the curve by the same amount.

Futaba Receivers:

This upgrade adds the capability to use 4-8 channel PPM type Futaba receivers in addition to Airtronics PPM and PCM 8 receivers. Other receiver types and brands may be used if they follow the PPM data format of either of these two brands. (Generally, any PPM type receiver will be one or the other of these)

Calibration:

The calibration proceedure has been modified to improve the accuracy of the throttle stick. This makes the effects of the throttle curve more predictable. In order to calibrate the throttle stick, follow the proceedure listed below. **Please note, your transmitter has been calibrated during the upgrade process.** You do not have to do it again unless the throttle pot position has been changed in some way.

Calibration Proceedure;

1. Go to "Zero Sticks" under the Main menu.
2. Center all sticks, trimmers and side levers.
3. Pull the throttle stick to the bottom of travel.
4. Press the ENTER keys.
5. Look at the display, wait for the message;

   "Push Thr High(E)"
6. Push the throttle stick all the way UP to the top of travel.
7. Press both ENTER keys.

Calibration is now complete.

The auxiliary side pots are now calibrated in the center of travel which is a change from the original way of setting them for calibration. This allows for the use of the left side pot as the flap channel by making the flaps UP position the top of travel point without impacting other possible uses of the side pot.

ATRCS

Menu Structure
Vision 8P Pattern Version 3.0

2A 1F E T Template

* - New Items

Main	Config	Assign Switch	Surface	Mixers	Pre/DR
Load setup	Template Selection	Flap Position 1**	Center Left Aileron	Ail/Rudd 1	Program 1 Ail Adj
Access level	Save Aileron Trim	Flap Position 2**	Center Flap	Ail/Rudd 2	Program 1 Elev Adj
Save setup	Save Elevator Trim	Flap Position 3**	Center Right Aileron	Elevator/Flap Mix	Program 1 Rudd Adj
* Name setup	Save Rudder Trim	Program 1	Center Elevator	Flap/Elev Mix	Program 2 Ail Adj
Alternate Setup	Left Side Flap	Program 2	Center Rudder	Flap/Left Ail Mix**	Program 2 Elev Adj
Mode I or II	Right Side Aux II	Program 3	Idle Adjust	Flap/Right AilMix**	Program 2 Rudd Adj
Mode A or B	Auto D/R Rudder	C Mixer 1	Throttle 0% Adj	C Mix 1 Master	Program 3 Ail Adj
* Cross Elevator and Throttle Trims	* Flaperon	C Mixer 2	Throttle 33% Adj	C Mix 1 Slave	Program 3 Elev Adj
* Cross Aileron and Rudder Trims	Expo Aileron	Elevator/Flap Mixing	Throttle 66% Adj	C Mix 1 Master Adj	Program 3 Rudd Adj
Zero Sticks	Expo Elevator	Aileron Dual Rate	Throttle 100% Adj	C Mix 1 Slave Adj	Set Flap Position 1**
Memory Test	Expo Rudder	Elevator Dual Rate	Left Ail Left Travel	* C Mix 1 Options	Set Flap Position 2**
Stick Function Test	Select Receiver Type	Rudder Dual Rate	Left Ail Right Travel	C Mix 2 Master	Set Flap Position 3**
Switch Tests	Servo Reversing	Ail/Rudd Coupling 1	Right Ail Left Travel	C Mix 2 Slave	Ail Dual Rate Adj
	Select Servo Pulse Width	Ail/Rudd Coupling 2	Right Ail Right Travel	C Mix 2 Master Adj	Elev Dual Rate Adj
	* Enable Failsafe	Landing Gear	Flap Travel	C Mix 2 Slave Adj	Rudder Dual Rate Adj
	* Send Failsafe Info	Aux 2 ***	Elev Up Travel	* C Mix 2 Options	Auto Rudder Dual Rate 0% Throttle Position Adj***
			Elev Down Travel	B Mix 1 Channel 1	
			Rudder Left Travel	B Mix 1 Channel 2	Auto Rudder Dual Rate 50% Throttle Position Adj***
			Rudder Right Travel	B Mix 1 Balance	
			* Gear Travel 1 (PPM)	* B Mix 1 Options	Auto Rudder Dual Rate 100% Throttle Position Adj***
			* Gear Travel 2 (PPM)	B Mix 2 Channel 1	
				B Mix 2 Channel 2	
				B Mix 2 Balance	
				* B Mix 2 Options	

VTR Aileron and VTR Elevator items are no longer needed-see manual update.

** Displays only if Left Side Flap = "NO" in Config Menu.

*** Displays only if Right Side Flap="NO" in Config Menu

**Displays only if Flaperon = "YES" in Config Menu

**Displays only if Side Flap = "NO" in Config Menu

***Displays only if Auto D/R Rudder = "YES" in Config Menu

VISION 8P

08/91
JRA

WITH 3.0 SOFTWARE 8 MODEL MEMORY

ELEVONS

BASIC CONFIGURATION	SURFACE ADJUST	MIXER ADJUST
2A 1F 1E T	CENTER L AIL: ± AS REQ'D.	B MIX 1 CH 1: ELEV
L SIDE FLAP ? NO	CENTER R AIL: ± AS REQ'D.	B MIX 1 CH 2: L AIL
FLAPERON ? NO	* L AIL LTV: ≈ 70%	B MIX 1 BAL: 0%
A PPM 6	* L AIL RTV: ≈ 70%	B MIX 1 OP: YY
	R AIL LTV: 0%	B MIX 2 CH 1: ELEV
	R AIL RTV: 0%	B MIX 2 CH 2: R AIL
	* ELEV UTV: ≈ 66%	B MIX 2 BAL: 0%
	* ELEV DTV: ≈ 66%	B MIX 2 OP: YY

* ADJUSTMENT EFFECTS BOTH SERVOS

USE RX CH # 1 AND # 6 FOR RX OUTPUTS WITH 92765 6CH RX
" " " " " " " " " WITH 92775 7CH RX

VISION PCM 8P (3 AIRCRAFT MODEL)

FLAPERON SETUP

BASIC CONFIGURATION

2A IF IE T

L SIDE FLAP "YES"

(IF YOU WANT IT SWITCHED, PROGRAM AS FOLLOWS)

L SIDE FLAP "NO"

ASSIGN SWITCH

FLAP 1 ON : (1) : S=1

PRESETS/DR

SET FLAP 1 ≈ 60%

SURFACE ADJUST

FLAP TV ≈ 40%

MIXER ADJUST

BMIX 1 CH 1 = R AIL

BMIX 1 CH 2 = FLAP

BMIX 1 BAL = 0%

BMIX 2 CH 1 = L AIL

BMIX 2 CH 2 = FLAP

BMIX 2 BAL = 0%

BMIX OPS = YN YN

ELEVON SETUP

BASIC CONFIGURATION

2A IF IE T

MIXER ADJUST

BMIX 1 CH 1 = R AIL

BMIX 1 CH 2 = ΣL

BMIX 1 BAL = 0%

BMIX 2 CH 1 = L AIL

BMIX 2 CH 2 = ΣL

BMIX 2 BAL = 0%

BMIX OPS = YN YN

RE: ZERO STICKS

MAIN MENU

SERVO

ZERO CAN BE W/ FLAP LEVER UP OR DOWN

VISION 8P (3 AIRCRAFT MODEL)

FLAPERONS W/ CAPABILITY FOR SEMI CROW (AIL UP)

BASIC CONFIGURATION

2 A I F I E T

L SIDE FLAP "YES"

ASSIGN SWITCH

C MIX 1 ON: (2): S=0

NOTE: LEFT SIDE POT PROVIDES FLAPERON CONTROL. THROTTLE STICK PROVIDES UP AIL SEMI-CROW CAPABILITY.

THIS ALSO WORKS FOR 3.0 SOFTWARE

MIXER ADJUST

C MST 1: THRT
C SLV 1: FLAP
C MIX 1 MAJ: -50
C MIX 1 SAJ: 100%
C MIX 1 OP: N NNN
C MST 2: OFF

B MIX 1 CH 1: L AIL
B MIX 1 CH 2: FLAP
B MIX 1 BAL: 0%
B MIX 2 CH 1: R AIL
B MIX 2 CH 2. FLAP
B MIX 2 BAL: 0%
B MIX OPPS: YYYY

VISION 8P (ALL MODELS)

FLAPS RESPOND TO EL

BASIC CONFIG	ASSIGN SWITCH	MIXER ADJUST
2A IF IE T	C MIX 1 ON : (1) : S=1	C MST 1 : ELEV C SLV 1 : AIL C MIX 1 MAJ : ± 50 % C MIX 1 SAJ : 100 % C MIX 1 OP : NN YY

NN YY = FLAPS TRAVEL ONLY IN ONE DIRECTION WHEN EL STICK IS MOVED.

NNNN = FLAPS TRAVEL IN BOTH DIRECTIONS WHEN EL STICK IS MOVED.

SWITCH TURNS FUNCTION ON OR OFF

04/92
JRA

VISION PCM 8P
WITH 3.0 UPDATE

FLAPERON SETUP

BASIC CONFIGURATION

2A IF IE T

L SIDE FLAP "YES"

FLAPERON "YES"

SURFACE ADJUST

NO INPUT REQUIRED WHEN FLAPERONS ARE SELECTED UNDER BASIC CONFIGURATION.

FLAP CTR DOES NOT OPERATE IN FLAPERON MODE.

MIXER ADJUST

FLAP-> L AIL ± 50%

FLAP-> R AIL ± 50%

THROTTLE MIX CONTROL FOR BULLEY 75 (sp?) w/VISION 8P Tx

BASIC CONFIGURATION

2A IF IE T (OPTIONS= GEAR & AUX II)

L SIDE FLAP NO

R SIDE AUX 2 NO

ASSIGN SWITCH

C MIX 1 ON: (1); S=1 or 0 (DEPENDS ON SW PSN)

AUX 2 ON: (1); S=1 or 0 " " " "

MIXER ADJUSTMENT GROUP

C MST 1: THRT

C SLV 1: AUX 2

C MIX 1 MAJ: +42%

C MIX 1 SAJ: -93%

C MIX 1 OP: NNNY

ASSIGNED SWITCH ACTIVATES SECOND CARB WHICH IS THEN CONTROLLED BY THROTTLE STICK.

Jack Albrecht

07/16/92

DON: FAX # 754-4501

AUTO DUAL RATE RUDDER:

FOR LARGE THROW AT LOW THROTTLE
& MINIMAL AT HIGH, SET

POINT #1 = 100%
#2 = 70%
#3 = 33%

FOR OPPOSITE CONDITION INTERCHANGE
#1 & #3 SETTINGS
I.E., #1 = 33%
#3 = 100%

THESE ARE APPROX.
SET IT UP THE WAY YOU
DESIRE THE RUDDER
THROW!

CHEERS

ATTENTION!

READ THIS BEFORE FLYING!

It is important that your Vision transmitter be turned off at the completion of your flying. Do not leave the transmitter on and allow your transmitter battery to drain slowly. A slow discharge in this manner will reduce the operating voltage being supplied to the computer to a point where erratic and unpredictable behavior may occur. This behavior could include the erasure of your setup information. The unit itself is not harmed by reduced voltage but you will have to re-load your setup information if it has been lost. Please take the time to double check your transmitter since it should not be left on to cause interference after you have completed your flying. Remember, safe flying is everyone's responsibility.

9 of 9

Aircraft Name:_____

Vision Pattern Setup Notes

Date: _____

Main Menu Items

Setup Name:	
Access Level:	
Alternate Setup:	
Alter Mode:	Yes No
Mode B:	Yes No
Cross E-T:	Yes No
Cross A-R:	Yes No

Configuration Menu

Template:	
Left Side Flap:	Yes No
Right Side Aux II:	Yes No
Auto D/R Rudder:	Yes No
Flaperon:	Yes No
Expo Aileron:	
Expo Elevator:	
Expo Rudder:	
Receiver:	
Servo Reverse: _ _ _ _ _ _ _ _	
1.32 mS Servos: _ _ _ _ _ _ _ _	
Enable Failsafe:	Yes No

Assign Switch Menu

Function	Switch #
Flap 1 on:	
Flap 2 on:	
Flap 3 on:	
Program 1 on:	
Program 2 on:	
Program 3 on:	
C Mixer 1 on:	
C Mixer 2 on:	
Elev/Flap Mix on:	
Ail Dual Rate on:	
Elev Dual Rate on:	
Rudd Dual Rate on:	
Ail/Rudd Mix 1 on:	
Ail/Rudd Mix 2 on:	
Landing Gear on:	
Auxiliary II on:	

Surface Adjust Menu

Left Aileron Center:	%
Aileron Center:	%
Left Flap Center:	%
Flap Center:	%
Right Flap Center:	%
Right Ail Center:	%
Elevator Center:	%
Left Elev Center:	%
Right Elev Center:	%
Rudder Center:	%
Throt Center-Idle:	%
Left Throt Idle:	%
Right Throt Idle:	%
Throttle 0% Adj:	%
Throttle 33% Adj:	%
Throttle 66% Adj:	%
Throttle 100% Adj:	%
L Throt 0% Adj:	%
L Throt 33% Adj:	%
L Throt 66% Adj:	%
L Throt 100% Adj:	%
R Throt 0% Adj:	%

R Throt 33% Adj:	%
R Throt 66% Adj:	%
R Throt 100% Adj:	%
Aileron LTV:	%
Aileron RTV:	%
L Aileron LTV:	%
L Aileron RTV:	%
R Aileron LTV:	%
R Aileron RTV:	%
Left Flap TV:	%
Flap Travel Vol:	%
Right Flap TV:	%
Elevator Up TV:	%
Elevator Down TV:	%
L Elev Up TV:	%
L Elev Down TV:	%
R Elev Up TV:	%
R Elev Down TV:	%
Rudder Left TV:	%
Rudder Right TV:	%
Gear TV 1:	%
Gear TV 2:	%

Mixers Menu

Ail to Rudd Mix 1:	%
Ail to Rudd Mix 2:	%
Elev to Flap Mix:	%
Flap to Elev Mix:	%
Flap to L Ail Mix:	%
Flap to R Ail Mix:	%
C Mixer 1 Master:	
C Mixer 1 Slave:	
CMix 1 Mast Gain:	%
CMix 1 Slave Gain:	%
C Mix 1 Options: _ _	
C Mixer 2 Master:	
C Mixer 2 Slave:	
CMix 2 Master Gain:	%
CMix 2 Slave Gain:	%
C Mix 2 Options: _ _	
Bi Mixer 1 Channel 1:	
Bi Mixer 1 Channel 2:	
Bi Mixer 1 Balance:	%
Bi Mixer 1 Options: _ _	
Bi Mixer 2 Channel 1:	
Bi Mixer 2 Channel 2:	
Bi Mixer 2 Balance:	%
Bi Mixer 2 Options: _ _	

Presets/Dual Rates Menu

Program 1 Aileron:	%
Program 1 Elevator:	%
Program 1 Rudder:	%
Program 2 Aileron:	%
Program 2 Elevator:	%
Program 2 Rudder:	%
Program 3 Aileron:	%
Program 3 Elevator:	%
Program 3 Rudder:	%
Flap Position 1:	%
Flap Position 2:	%
Flap Position 3:	%
Aileron Dual Rate:	%
Elevator Dual Rate:	%
Rudder Dual Rate:	%
Au Rudd 0% D/R:	%
Au Rudd 50% D/R:	%
Au Rudd 100 D/R:	%
Aileron VTR:	%
Elevator VTR:	%
Rudder VTR:	%

Personal Notes: