hitec

$\mathcal{P}$RISM 7

PCM / PPM

OUTPUT

P7—AIRF
PCM7PPM

The R/Car's Partner hitec

OPERATION MANUAL

THE AEROBATIC FLIER'S CHOICE

7 CHANNEL PROGRAMMABLE RADIO CONTROL SYSTEM
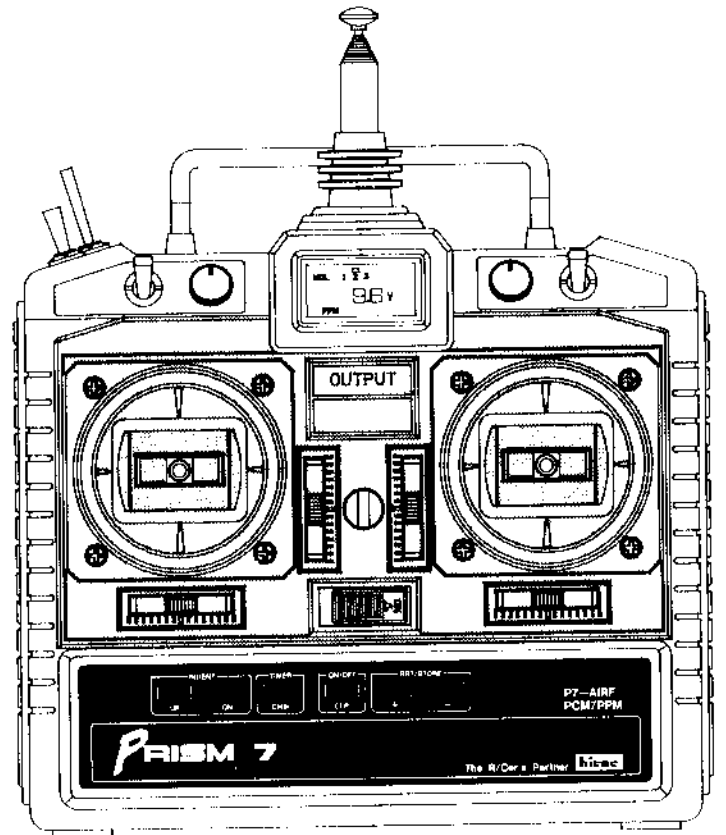
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1. INTRODUCTION

The PRISM 7 radio is a user friendly, microprocessor controlled radio system made primarily for aircraft use. It is capable of operating with PCM (Pulse Code Modulation) and standard PPM (Pulse Position Modulation) radio systems. Because of the wide range of system capabilities, the PRISM 7 satisfies the needs of the Sunday sport flier, and the rigorous demands of the experienced Pattern pilots. PRISM 7 is unique in that we have eliminated many of the "bells and whistles" that are not likely to be used, and instead, we concentrated on the fundamental functions from which most pilots will benefit. These fundamental functions have then been enhanced by the addition of many useful trim functions that allow fast and accurate aircraft set up for the modeler.

The PRISM 7 also has a number of safety and convenience features desired by modelers. These include a built in timer alarm, low battery power warning, and a trim lock fail safe feature. The system allows the modeler to use this radio for up to three separate models, with the aircraft set up being retained in the system memory for up to 10 years without the use of a backup battery. An E^2P ROM chip inside the PRISM provides nonvolatile memory capability. The PRISM 7 case is ergonomically designed for a comfortable fit to the pilot, allowing extended flight times without transmitter fatigue. And a unique non-reflective lens over the LCD display panel makes reading the LCD display easy at all times.

Please take the time to read through this manual and familiarize yourself with the features of the PRISM 7 system. It will allow you to take full advantage of the versatility provided to you, and make your flying pleasure all that much more easier.

NOTE: Prior to actually using the radio system, make sure that the transmitter and receiver batteries are charged up. While reading through this manual, you may want to begin placing the radio system on charge in anticipation of use during this familiarization period. Your PRISM 7 is furnished with a standard PPM type receiver system, although the transmitter is capable of working both PCM and PPM type receivers.

2. FEATURES AND SPECIFICATIONS

A. TRANSMITTER

- 7 channel Microprocessor controlled system
- Capable of PCM or PPM transmission modes.
- Memory for 3 separate models
- Model Set up data copy capability
- In-flight timer and alarm
- Stick Mode change function
- Low battery power warning for the transmitter (audible alarm)
- End Point Adjustment for all channels.
- Single switch Dual Rate function
- Exponential rates for channel 1, 2, and 4
- Sub trim capability for all channels.
- Trim Memory for channels 1,2,3, and 4.
- Trim Rate Adjustment for channels 1,2, and 4 (Trim Lock function)
- Trim Reset function
- Snap Roll switch (4 directions possible)

- Landing Attitude mixer
- Wing Mixing functions (Delta wing, V-tail, Flaperon, Etc.)
- Fail Safe mode in PCM
- Master Data Reset capability

Power Supply : 9.6 volt (8 each Ni-cad Cells)
Power Consumption : 200 mA

B. RECEIVER (HFD-08RD / HFD-07RA)

- Dual Conversion FM type.
- Ultra Narrow bandwidth for maximum sensitivity and adjacent channel signal rejection.
- Minimized 2nd and 3rd order intermodulation interference.
- Highly resistant to metal-to-metal noise

Intermediate Frequency	: 455 Khz, 10.7 Mhz
Power Requirement	: 4.8 volts (4 cell Ni-cad)
Current Drain	: 22 mA (Receiver only)
Dimensions	: 1.4" x 2.3" x 0.8"
Weight	: 1.34 oz.
Receiver Range	: 3,000 ft. or greater in the air
Operating Voltage	: 3.7 - 7.0 volts DC

C. SERVOS (HS-422/425)

- Dual Oilite/Ball Bearing output for long life and low wear.
- Indirect drive gear train strengthens and protects gears.
- Hitec custom I.C. features narrow dead band and high resolution.
- SMT (Surface Mount Technology) components for reliability.
- Precision cut servos gears insure minimum backlash with high resolution.

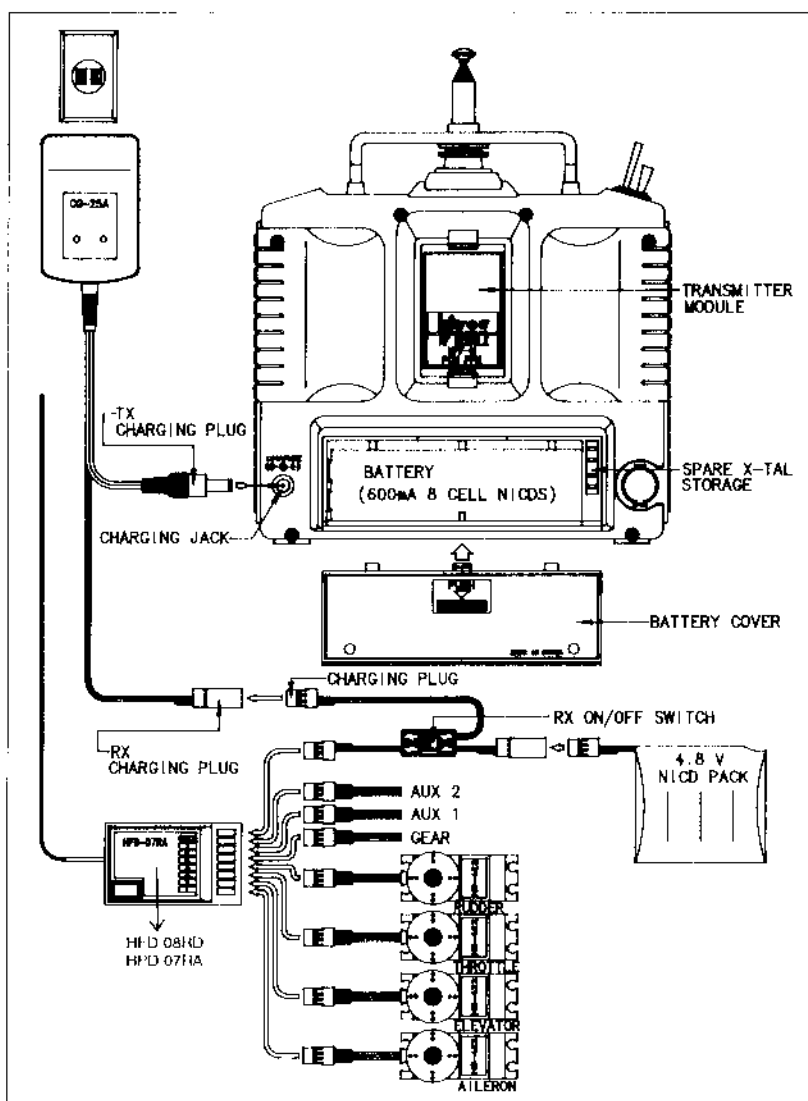|	
Control Compatibility	: Pulse Width (1550 u-S/N)
Maximum Deflection	: 45 degrees +/- from center.
Current Drain	: 8 mA at idle (6.0 volt power)
Output Torque	: 43.4 oz/inch
Operating Speed	: 0.20 sec/60 degrees
Dimensions	: 1.6" x 0.8" x 1.4"
Weight	: 1.6 oz each

3. SYSTEM LAYOUT DIAGRAM
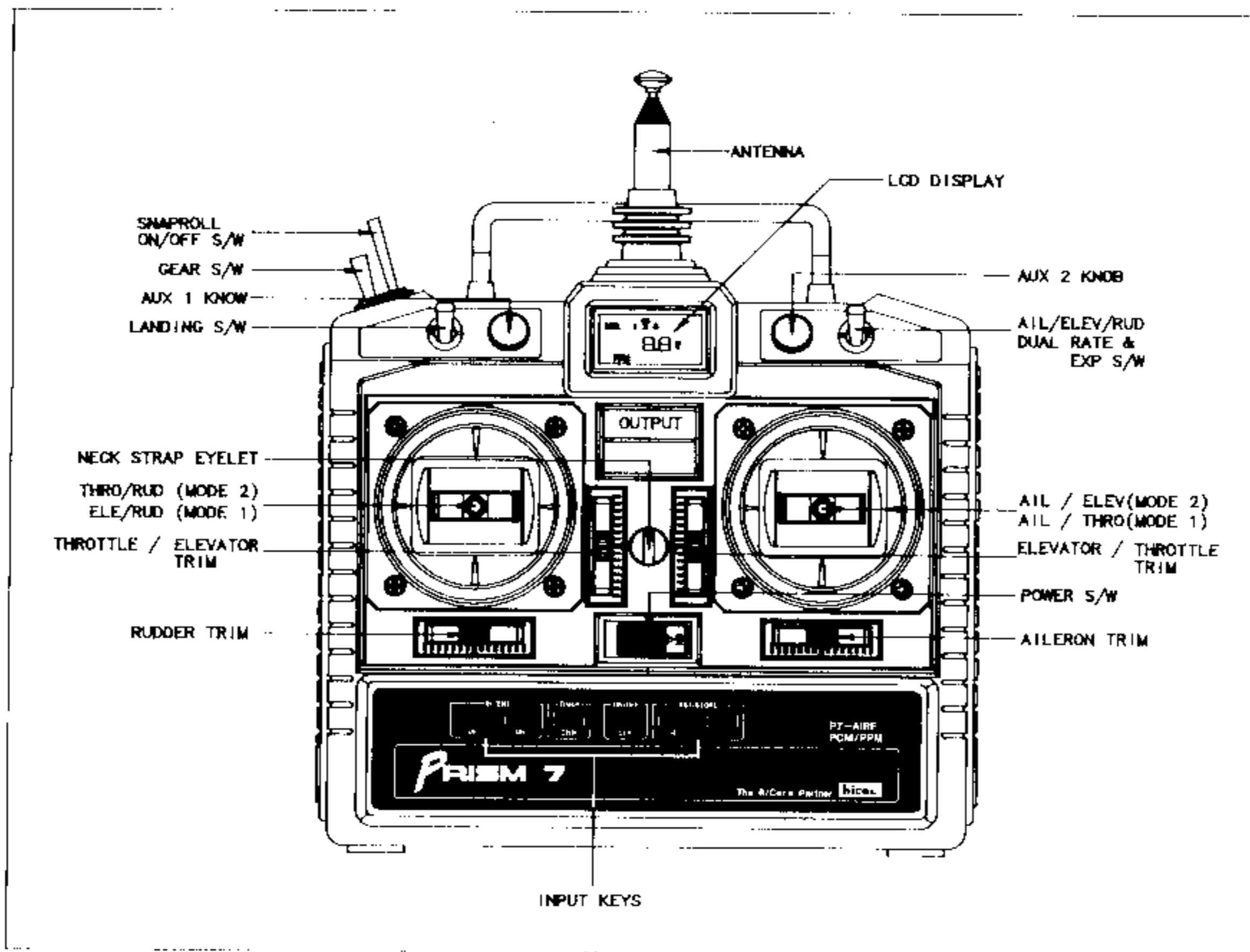
A. CHANNELS

- CH 1. Aileron

- CH 2. Elevator

- CH 3. Throttle

- CH 4. Rudder

- CH 5. Retractable Landing Gear (non-proportional)

- CH 6. Auxiliary Channel (Flap, Air Brake, Etc.)

- CH 7. Auxiliary Channel (Flap, Air Brake, Etc.)

The primary four channels are found in the normal position on the sticks of the transmitter. Mode 1 and Mode 2 is available from the Factory and you can program to change it at your convenience. Channel 5, the non-proportional Landing Gear switch, is located on the top left corner of the transmitter (Mode II), closest to the front of the transmitter face. Channel 6, a proportional Auxiliary channel, is a dial switch located on the upper front face of the transmitter, just to the left of the LCD display panel. Channel 7, also a proportional Auxiliary channel, is just opposite channel 6 on the right side of the LCD display panel.

The Dual Rate switch for Aileron, Elevator and Rudder is located on a single switch, on the upper right corner of the transmitter face. This single switch controls the dual rate for all three primary flight surfaces at once. All data input keys for the system are located on the lower portion of the transmitter. The transmitter sticks are adjustable in length via threaded stick posts.

TRANSMITTER MODULE
-TX CHARGING PLUG
CHARGING JACK
BATTERY (600mA 8 CELL NICDS)
SPARE X-TAL STORAGE
BATTERY COVER
CHARGING PLUG
RX ON/OFF SWITCH
RX CHARGING PLUG
4.8 V NICD PACK
AUX 2
AUX 1
GEAR
RUDDER
THROTTLE
ELEVATOR
AILERON
HFD 08RD
HFD 07RA

B. CHANGING FREQUENCY

If you want to change the frequency on the Prism, you must replace the whole transmitter RF module (available as optional part) rather than changing just the crystal. (It is illegal to do so in the U.S. by the F.C.C and some other countries also prohibit this so please consult the rule of your country) Please do not forget to change the frequency on your receiver to match your new frequency on the transmitter.

C. CHARGING INSTRUCTIONS

The transmitter batteries must be thoroughly charged before operation. You may use the AC charger (usually provided with the system) to charge both the transmitter battery and the receiver battery at the same time. Turn the transmitter power "off" as well as the receiver switch harness and plug in both batteries and the AC charger to the wall. Make sure both LED lights up. If the light does not come on, recheck all the connection again. Charge for at least 16 hours before the first use to make sure the batteries are fully charged. Re-charge t least 10 hours hours after each use or before flying.

D. PRECAUTION FOR INSTALLATION

1. Carefully check to ensure that all connectors are properly seated when you connect the servos, batteries and switch harness.

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2. Turn the transmitter power "ON" first, then the receiver switch "ON". Always remember to turn the transmitter before you turn the receiver switch, otherwise your receiver may receive other interfering signal from other radio source and jitter.

3. Check to see if the servos correspond to the control stick movement. Improper servo direction is corrected with Servo Reverse Menu in the Main Edit Mode.

4. Install linkage rod to produce the maximum freedom of movement possible with the minimum amount of slop and friction. Let Hitec "JAM CHECKER" help you detect the friction.

5. Both the transmitter and the receiver antenna must be fully extended when in use. Be careful that you do not cut off the excess receiver antenna wire or bundle it.

6. Protect the receiver from excessive vibration by wrapping it in the sponge rubber: Hitec "Flight Preserver" provided with system.

E. CONTROL STICK LENGTH AND TENSION ADJUST

1. The length of the control stick can be adjusted. The head of control stick is composed of two parts as the drawing shows. First unscrew the top part of head to the counter clockwise till the desired length. And then twist the bottom part to lock the whole stick head.

2. The unique open-style stick assembly provides fully adjustable stick tension "feel". To adjust stick tension, open the transmitter back case and turn the tension adjustment screw. Turning counter clockwise will decrease the tension of spring and clockwise will increase it.

● Set to the desired length by turning the knob, then lock.
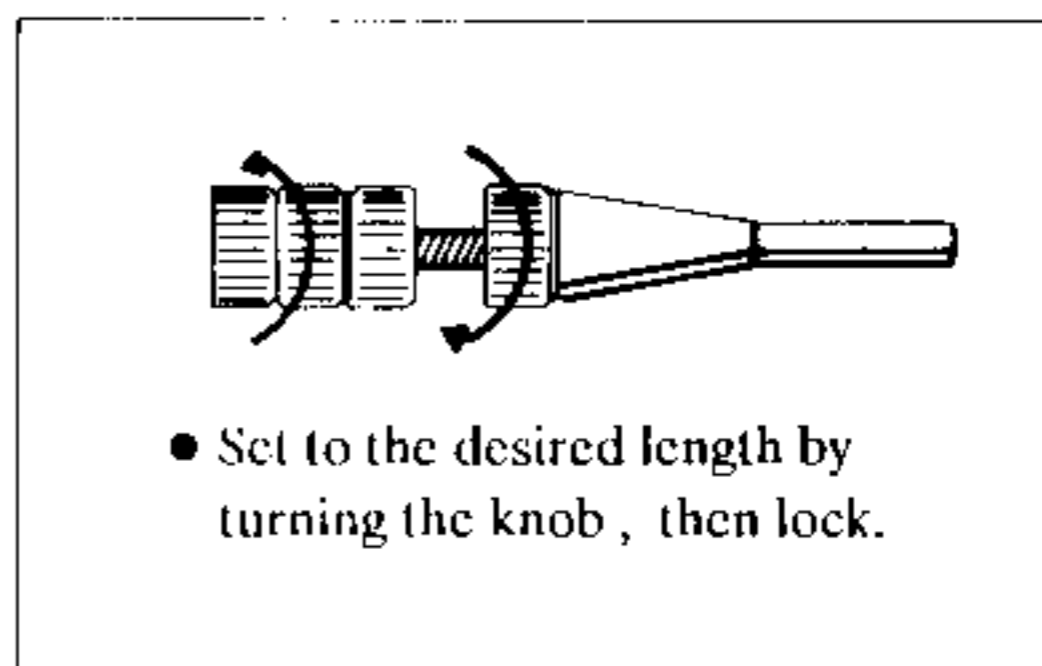
F. THROTTLE RATCHET CHANGE

You may need to change the stick mode from Mode I to Mode II or vice versa by first changing the program in the Stick Mode Change Menu and then the ratchet of the transmitter throttle stick. After the program is changed, you must now open the transmitter case and move the ratchet mechanism. The following example shows a change from Mode II to I (Please note since the drawing shows the backside of the sticks, the throttle is now on right side of the picture which we now want to move to the left side of the picture.)

1. Move the Ratchet Copper piece from (a) to (a)'.
2. Move the Stick Travel Limit Bracket from (b) to (b)'. (both top and bottom)
3. Add spring tension on (c) by turning the screw clockwise and then loosen tension by turning counter-clockwise the (c)'screw.
4. Move the spring limit bracket from (d) to (d)'.
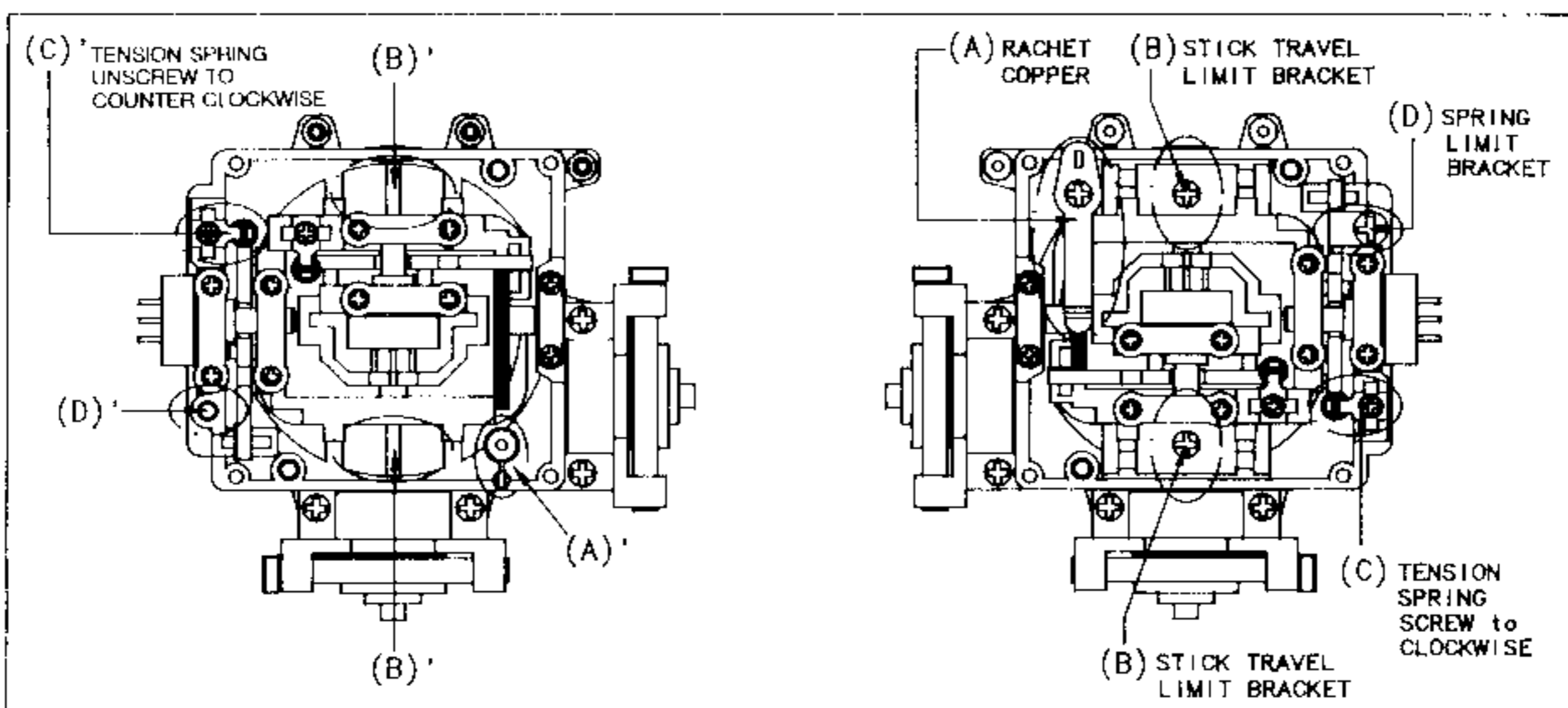
4. MAIN SYSTEM FUNCTIONS

A. LCD DISPLAY AND INPUT KEYS

The Prism 7 features an LCD type display to indicate system information and allow changes to the system. When power is turned "ON", the first display shown will be the normal operating display. The display will indicate the model number selected, PCM or PPM mode, and battery voltage. The Low Battery alarm is displayed visually in this mode, as well as an audible signal made when the transmitter voltage drops to 9.2 volts or below. When you hear this signal while flying, LAND IMMEDIATELY! The Low Battery indicator will also flash when power is low.
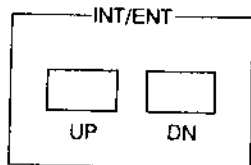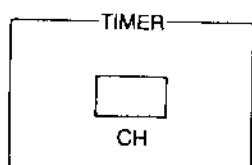
NORMAL OPERATING DISPLAY

CHANNEL CURSOR
SELECTED MODEL
TRANSMITTER BATTERY VOLTAGE
SELECTED MODULATION MODE
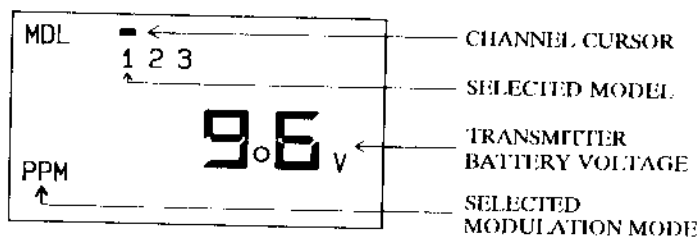
LOW BATTERY ALARM
(VOLTAGE INDICATOR FLASHING)

INPUT KEYS
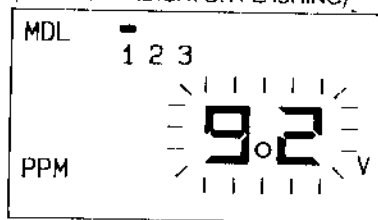
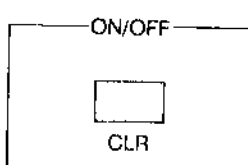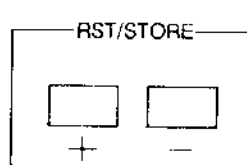| INT/ENT	TIMER	ON/OFF	RST/STORE
UP DN	CH	CLR	+ —
FUCNTION SELECT KEY	TIMER AND CHANNEL SELECT KEY	PROGRAM ON / OFF AND CLEAR KEY	DATA RESET / STORE AND DATA INCREASE DECREASE KEY

To access the software menu of the Prism 7, study the diagram below showing the input keys of the Prism. The following programs can be accessed from the Initial Mode setting of the software:
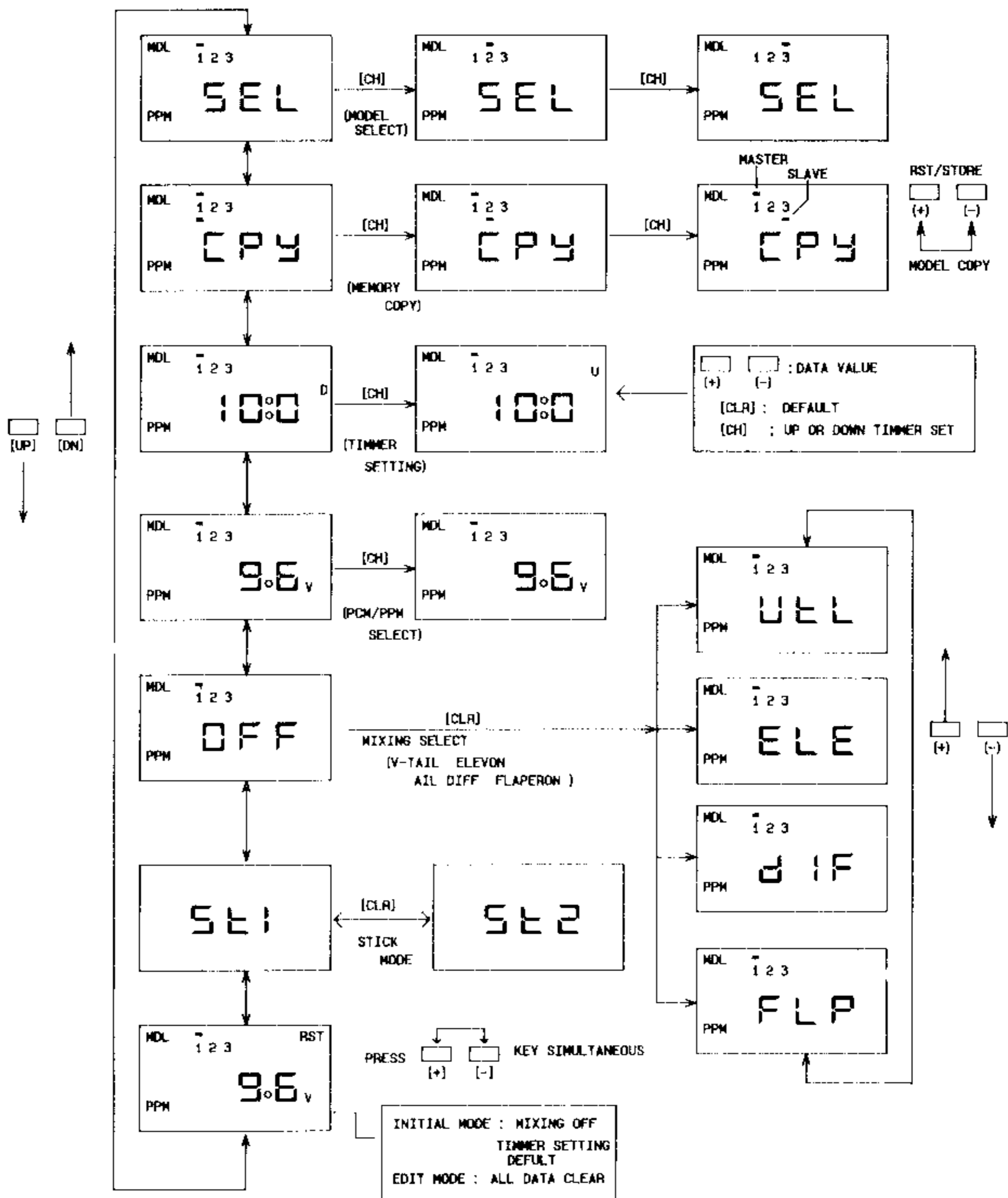
- Model Select
- Memory Copy
- Timer Setting
- Modulation Mode Selection
- Mixing Function Selection
- Stick Mode Change
- Data Reset

These functions are considered the Initial Mode functions, and can be accessed by depressing both the "INI/ENT" (UP and DOWN) keys down while turning the main power switch "ON". There is no other way to access the Initial Mode, and prevents accidental changes to the modes. To select a menu of the Initial Mode, you may use the "UP" or "DOWN" keys to run through the menu. Once we get into the actual programming, you will find that the use of these keys is quite easy. After you complete settings of each menu, you do not need touch any of keys To save it. Because the PRISM 7 offers the DIRECT MEMORY SYSTEM, you can move to the other menu to be set up or simply turn the power "OFF" without depressing any of keys to save the progrmming.

At this time, you should study the Initial Mode Flow Chart to understand how the menu selection works within the software. Don't be shy, we are going to guide you all the way to a perfect aircraft set up.

B INITIAL MODE FLOW CHART

※ PRESS [UP] [DN] KEY SIMULTANEOUS AND POWER SWITCH "ON"

```
MDL  1 2 3          [CH]        MDL  1 2 3          [CH]        MDL  1 2 3
                  ──────→                        ──────→
   SEL            (MODEL           SEL                             SEL
PPM               SELECT)       PPM                             PPM
```

```
MDL  1 2 3          [CH]        MDL  1 2 3          [CH]        MDL  1 2 3   MASTER
                  ──────→                        ──────→              SLAVE      RST/STORE
   CPY                             CPY                             CPY          (+)   (−)
PPM               (MEMORY        PPM                             PPM              ↑     ↑
                  COPY)                                                         MODEL COPY
```

```
MDL  1 2 3                      MDL  1 2 3   U                  [ ] [ ] : DATA VALUE
                    [CH]                     ←──────            (+) (−)
   10.0        D  ──────→           10.0                       [CLR] : DEFAULT
PPM               (TIMER         PPM                           [CH]  : UP OR DOWN TIMMER SET
                  SETTING)
```

```
MDL  1 2 3          [CH]        MDL  1 2 3                                    MDL  1 2 3
                  ──────→
   9.6 v          (PCM/PPM         9.6 v                                         UtL
PPM               SELECT)        PPM                                          PPM
```

```
MDL  1 2 3              [CLR]                                                 MDL  1 2 3
                  ─────────────→
   OFF            MIXING SELECT                                                  ELE
PPM               (V-TAIL  ELEVON                                            PPM
                   AIL DIFF  FLAPERON )
```

```
MDL  1 2 3           [CLR]       MDL  1 2 3                                   MDL  1 2 3
                  ←───────→                        (+)   (−)
   St1            STICK             St2                                          d IF
                  MODE                                                        PPM
```

```
MDL  1 2 3  RST                 PRESS [+] [−]  KEY SIMULTANEOUS              MDL  1 2 3
   9.6 v
PPM                                                                             FLP
                                                                             PPM

                  ┌─ INITIAL MODE : MIXING OFF
                  │            TIMMER SETTING
                  │                 DEFULT
                  └─ EDIT MODE : ALL DATA CLEAR
```

[UP] [DN]

[+] [−]

5. INITIAL MODE SOFTWARE CHANGES

A. MODEL SELECTION (SEL displayed)

The Prism 7 allows you to store the settings for up to three separate aircraft into memory. To select a model from the menu, access the Initial Mode, as noted above, and use the "UP" or "DOWN" key until the display shows the SEL function. To select a model, use the "TIMER" (also known as "CH") key to move the cursor to the correct model desired. Turn the transmitter "OFF" and when the power is turned on once again, the model you selected will be displayed.

CURSOR MOVING BY [CH] KEY

MDL
1 2 3

SEL

PPM
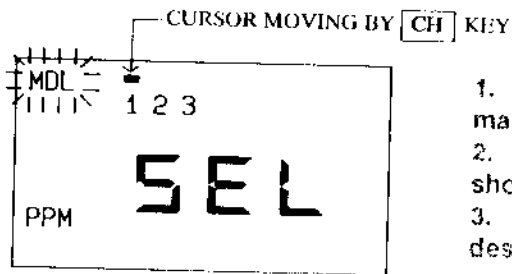
1. Press both [UP] and [DN] keys down while turning main power switch "ON".
2. Use either [UP] or [DN] key until the display shows the model select menu.
3. Use [CH] key to move the cursor to the model desired.

B. MEMORY COPY (CPY displayed)

The Memory Copy function of the Prism allows you to copy the model set up information of one model number to another model number. This is useful if you wish to retain the set up to fall back on if you experiment on the set up for enhanced flight capabilities. In this example, we will show you how to store the set up from Model 1 to Model 3

From the Initial Mode menu, use the "UP" or "DOWN" key until the display shows the CPY function. In this mode, note that there are two cursors displayed by the model numbers. The cursor above the model number is the master model being copied, and the cursor below the model number is the receiving model number. First, set the master model by accessing the Model Select menu, and then access the CPY menu here. To select the receiving model number, use the "TIMER" (also known as the CH) key to select the model number receiving the information. To effect the copy, depress both the RST/STORE keys. If no information copy is to be made, move the lower cursor to the same position as upper cursor position.
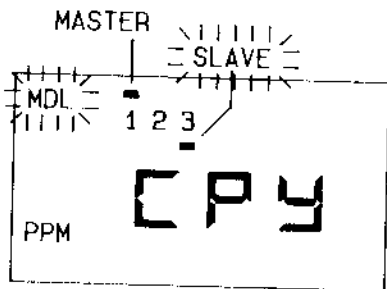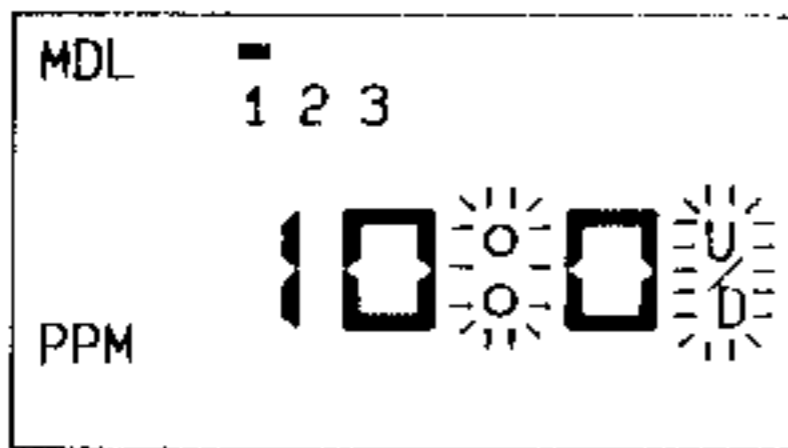
MASTER
SLAVE
MDL
1 2 3

CPY

PPM

1. Press both [UP] and [DN] keys while turning main power switch "ON".
2. Use either [UP] or [DN] key until the display shows the Copy menu.
3. Use [CH] key to move the SLAVE cursor to the receiving the information from the MASTER model.
4. Depress both [+] and [−] keys to copy the DATA.

C. TIMER OPERATION

The Prism 7 has a built in timer capable of counting in ten second increments, upward or downward, and can be set for any time period desired by the pilot, up to 30 minutes. To access the Timer menu, use the "UP" or "DOWN" key from the initial Mode menu until the display shows a steady time screen. If no setting has ever been made, the factory default of 10:0 is shown.

To change the length of time for the timer operation, use the "+" or "-" keys to change the time. To select the counting down or counting up function, use the "TIMER" (also known as the CH) key until the correct mode is found. To save the timer setting, simply turn the radio system "OFF". When the radio system is turned back on, you may begin the timer function by pressing the "TIMER" key. The timer will display elapsed time in increments of ten seconds. When the time has elapsed, an audible alarm will sound for the final ten seconds, and the display will return to the normal mode. You may stop the timer clock at any time during the counting mode by pressing on the "TIMER" key. The timer will automatically return to the preset time you have programed.

TIMER SETTING

1. Press both [UP] and [DN] keys while turning main power switch "ON".
2. Use either [UP] or [DN] key until display shows Timer function.
3. Use [+] or [-] key to input time value.
4. Use CH key to select either the counting down or up function.

TIMER OPERATION

1. Press [CH] key to begin the Timer during radio system operating.
2. Press [CH] key to stop the Timer.
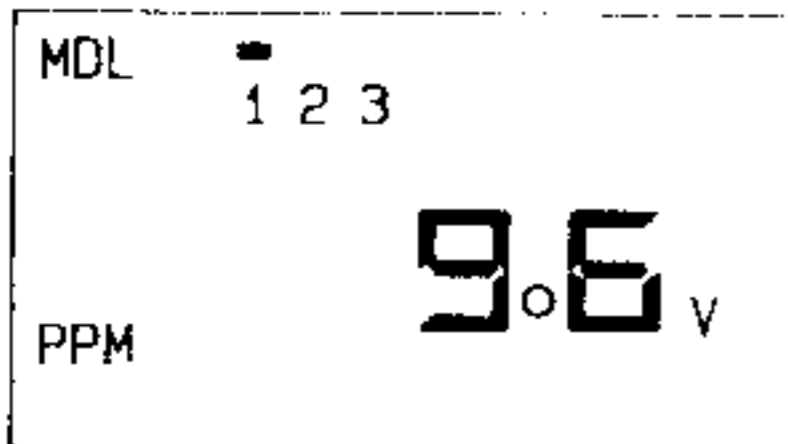
PRESS [CH] KEY TO START OR STOP TIMER
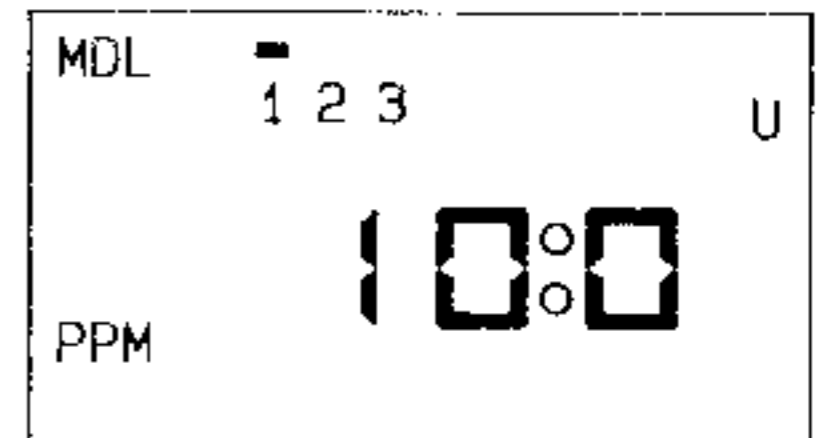
⑪ MODULATION MODE SELECTION (PCM or PPM Select)

The Prism 7 is capable of operating using either PCM (Pulse Code Modulation) or PPM (Pulsed Position Modulation) transmission. To select the mode of transmission, access the Modulation Mode menu from the Initial Mode. This screen will show a flashing PCM or PPM indicator in the lower left corner of the LCD display. To select a transmission mode, use the "TIMER" (also known as the CH) key. The mode desired will begin flashing and acting upon selection.

CAUTION: You may not use a PCM type receiver with PPM transmission or vice versa. They are incompatible and will not work.
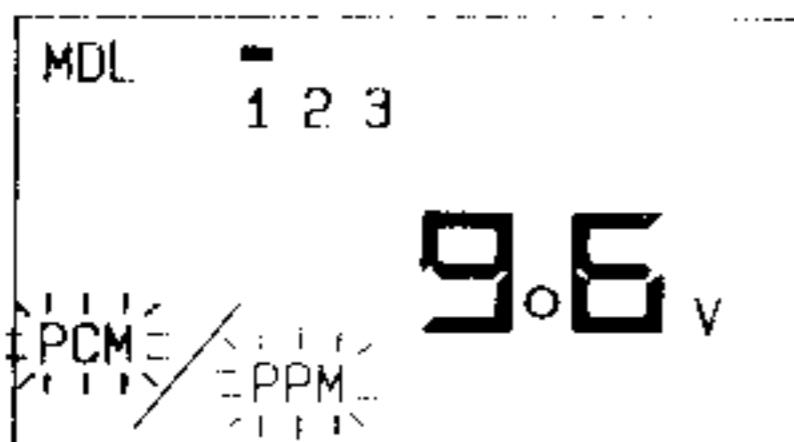
1. Press both [UP] and [DN] keys while turning main power switch "ON".
2. Use either [UP] or [DN] key until display shows Modulation Mode Selection menu.
3. Select either PCM or PPM mode by [CH] key.

℃. MIXING FUNCTIONS MENU AND SELECTION

From here, you may set up the various mixing options for your aircraft. These options include: V-Tail mixing, Elevon mixing, Differential mixing, and Flaperon mixing. Follow along with us and you'll see how easy this operation is.
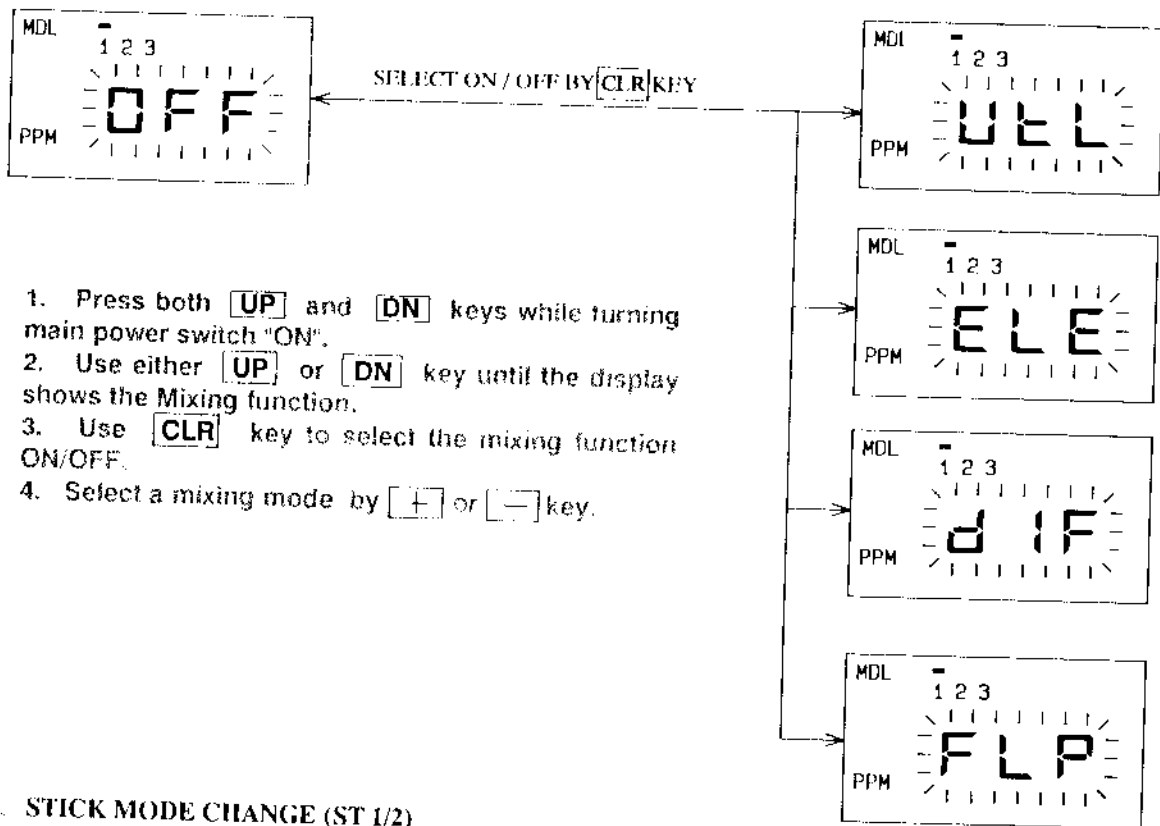
From the Initial Mode menu, select the Mixing Mode by using the "UP" or "DOWN" keys. If no mixing mode has been selected, the display will show "OFF" when the Mixing Mode menu is selected. Now, to access any mixing function from here, depress the "ON/OFF" (also known as CLR) key once, and you can select a mixing mode by using " + " or "-" key.

a. For V-Tail Mixing, the display will show VTL. This will mix channels 2 and 4 (elevator and rudder) together to act as one for elevator and separate to act as the rudder in a V-tailed model.

b. For Elevon mixing, the display will show ELE. This allows channels 1 and 2 (ailerons and elevator) to mix for delta wing or flying wing type aircraft.

c. For using two servos from two channels in the aileron function instead of using a "Y" harness, the Differential Mixing mode can be used. The display will show DIF in this mode. It will allow mixing of channels 1 and 7 (aileron and Aux 2) to function as the ailerons. The servo reversing function for channel 7 is used to reverse the channel 7 if needed. In this mode, the Aux 7 dial is non-functional.

d. To effect Flaperon mixing, the display will show FLP. This mixes channels 1 and 6 (aileron and Aux 1) together for aircraft that utilizes the ailerons for flaps as well. In the standard aileron operation, channel 6 will work hand-in-hand with the ailerons. By utilizing the Aux 6 dial, flaps can be used, while still maintaining full use of the ailerons as normal.

1. Press both [UP] and [DN] keys while turning main power switch "ON".
2. Use either [UP] or [DN] key until the display shows the Mixing function.
3. Use [CLR] key to select the mixing function ON/OFF.
4. Select a mixing mode by [+] or [–] key.

## ℈. STICK MODE CHANGE (ST 1/2)

The PRISM 7 allows you to change the control stick mode from mode I (Elevator on left and throttle on right) to mode II (Elevator on right and throttle on left) or vice versa. To change stick mode, first change the program and then the ratchet of throttle stick. As to the change of ratchet, refer to page 6. To change program, from the Initial Mode menu, use the "up" or "down" key until the display shows the St 1 or St 2 menu, and then press the "ON/OFF" (also known as CLR) key to select the stick mode desired.

```
5 ヒ 1 ／ 2
```

G. DATA RESET (RST)

This is the final menu available under the Initial Mode menu. The Data Reset menu allows the pilot to clear all settings for a particular model from the memory. The settings will revert to the factory defaults with no mixers in force. To perform a reset function, use the "UP" or "DOWN" keys to select the Data Reset mode, which is signified by the letters RST flashing in the upper right corner of the LCD display. Reset all data by depressing both " + " and "-" key (also known as the RST/STORE) key on the transmitter. The radio will beep twice when this function is initiated, and the data is now cleared from memory. (All the data of Main Edit Mode come back to default value. Mixing function of Initial Mode goes "off" and Timer setting goes factory preset time. The other function of Initial Mode such as PCM/PPM selection and Stick mode will remain). BE CAREFUL TO USE THIS FUNCTION not to lose any important data YOU MAY NOT WANT TO LOSE.
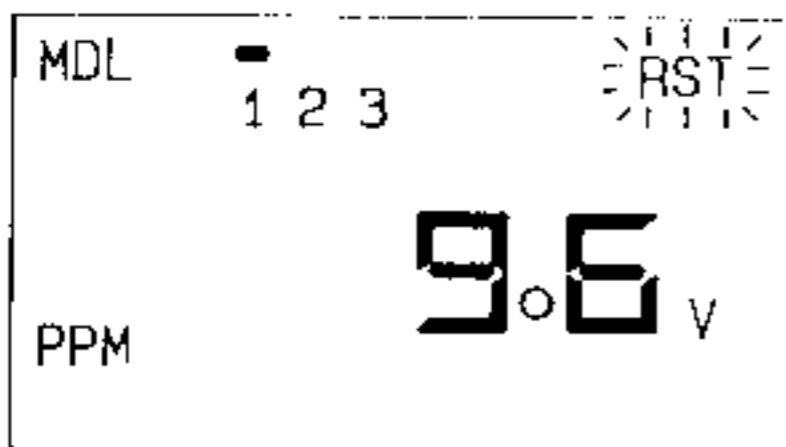
```
MDL    -          ⋮RST⋮
       1 2 3

         9.6 v
PPM
```

1. Press both [UP] and [DN] keys while turning main power switch "ON".
2. Use either [UP] or [DN] key until display shows Data Reset menu.
3. Press both [+] and [−] key to reset all the memory.

6. MAIN EDIT MODE SOFTWARE CHANGES

In this mode, the pilot can perform all of the normal servo adjustments required when setting up his aircraft. This includes setting the end points, dual rates, travel adjust, etc. Again, this is an easy operation to perform, and by following along with us, you can learn how to quickly install a radio system and set it up for any particular model you desire. Study the Main Edit flow chart a minute, and you can see how the menu selection works.
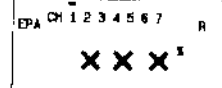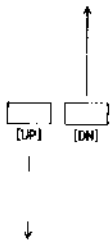
To access the Main Edit mode, leave the radio in the "ON" position, and then depress both the "UP" and "DOWN" keys at one time. This will bring you into the Main Edit mode of the system, and it will display all functions in order. To scroll through to any particular function, use the "UP" or "DOWN" keys to make a selection. Just same as the Initial Mode Setting. After you complete settings of each menu, you do not need touch any of keys To save it. You can move to the other menu to be set up or simply turn the power "OFF" without depressing any of keys to save the programming. Now, let's set up an aircraft.
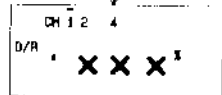
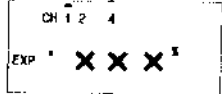# MAIN EDIT MODE FLOW CHART

* POWER SWITCH "ON"

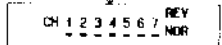* [UP] [DN] KEY PRESS

* POWER SWITCH "OFF" - MAIN EDIT MODE SAVE

EPA CH 1 2 3 4 5 6 7 R
XXX¹ — EPA DATA VALUE

CH 1 2 4
D/R XXX¹ — DUAL DATA VALUE

CH 1 2 4
EXP XXX¹ — EXP DATA VALUE

CH 1 2 3 4 5 6 7 REV/NOR — NOR/REV SETTING

CH 1 2 3 4 5 6 7
XXX¹ TRM — SUB TRIM DATA VALUE
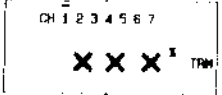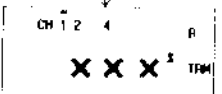
CH 1 2 4 R
XXX¹ TRM — TRIM RATE DATA VALUE

CH 1 2 4
XXX¹ TRM — TRIM MEMORY DATA VALUE

CH 1 2 4 RST
XXX¹ TRM — TRIM RESET
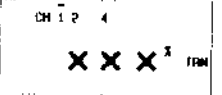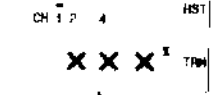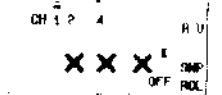
CH 1 2 4 R U
XXX¹ OFF SNP ROL — SNAP ROLL DATA VALUE

XXX¹ — FLAP ADJ DATA VALUE

[UP] [DN]

AIL DIFF DATA VALUE
1 7
+XXX¹
DIF

DIF MIX

CH 2 6
XXX¹
LD ON (LANDING DATA VALUE)
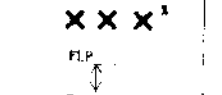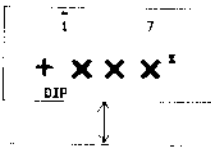
FLP MIX

FLAPERON DATA VALUE
XXX¹
DIF FLP

FLP

MIX OFF

NOL 1 2 3
FLS
PCH OFF
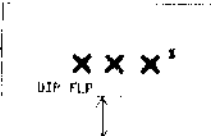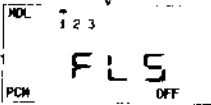
(FAIL SAFE)

(AT PCH MODE)

A. END POINT ADJUSTMENT (EPA)

The End Point Adjustment function allows you to fix the throw of the servo to the desired distance. This allows you to forget adjusting the pushrod position on the control horns for proper throw. Adjustment of any channel can be effected from zero movement to 125% of the normal movement. (Normal movement is considered to be 90 degrees).

To make the endpoint adjustments, select the channel desired using the "CH" key. A cursor will appear above the selected channel. The main display will also show the amount of throw currently allowed in percentages. Use the " + " or "-" keys to change the end points. Each direction can be adjusted separately by using the control stick or knob that corresponds to the channel. For example, to adjust the aileron end point, select channel 1. Hold the aileron stick to the right, and begin making the adjustments as needed with the " + " or "-" keys. Now, move the stick to the left, and make any adjustments desired again. Repeat this step for the elevator function, only use the elevator stick to determine which direction of end point travel is adjusted.

The LCD display will also assist you by telling you which direction is being affected. Small letters, "R", "L", "U", "D", will be displayed on the right of the LCD display. Channel 5 will show a " + " or "-" sign on the left of the percentage number, as will channel 6 and 7.
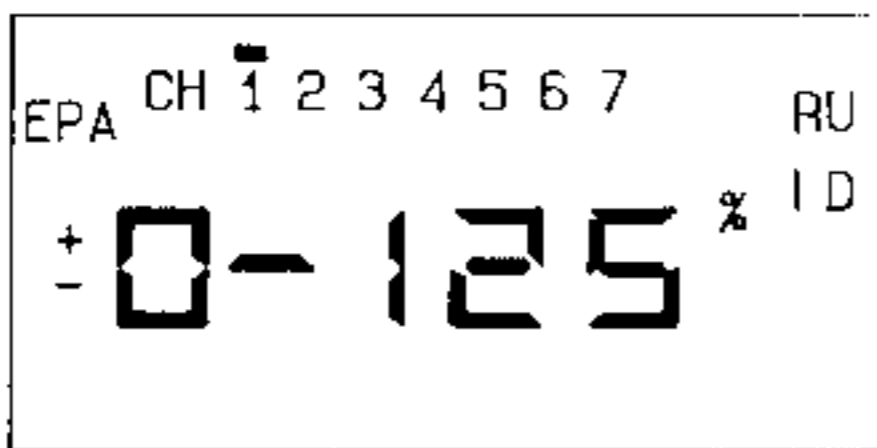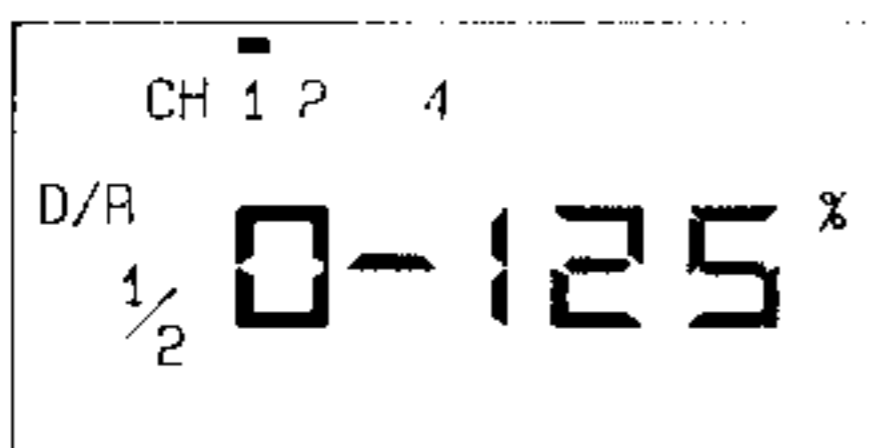
|EPA CH ‾1 2 3 4 5 6 7   RU|
| ±□‐125 %   ID|

1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows End Point Adjustment menu.
3. Select desired channel by [CH] key.
4. Adjust end point travel by [+] or [−] key while selecting direction of servo by control stick, knob or gear switch.
5. Use [CLR] key to reset data of each channel.

B. DUAL RATE (D/R)

The Prism features a singular dual rate switch that affects any one or all of the three primary channels, Aileron, Elevator and Rudder. The D/R switch is located at the upper right corner of the face of the transmitter, and access to this portion of the menu is done through the Main Edit Menu.

Use the "UP" or "DOWN" key to arrive at the D/R menu. This function will show the available channels along the top of the LCD display, with a cursor shown over the channel being set up. Leave the dual rate switch in the upper position and select the channel. If no dual rate is selected, the value displayed will be 100%. For a decrease in throw rate when the dual rate switch is activated, use the " + " or "-" keys to change the percentage setting. You may have the receiver and servos "ON" at this time to set the servo throw desired. Once you have determined the setting, you may now select the next channel for adjustment. Flip the dual rate switch back and forth to observe the change in rate throws.

NOTE: The dual rate switch has no "ON" or "OFF" position, as the pilot is free to choose this. In either case, you may leave the "OFF" position as desired and then set the dual rates in the other switch position. The LCD display will assist here in that it shows which direction the switch lies while in this mode. Also, you may exceed the normal throw movement by 125% in this mode, as well as zero motion. When activating the dual rate switch, all channels programed for dual rate movement will be affected.

| CH ‾1 2   4|
|D/R   □‐125 %|
| 1/2|

1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Dual Rate menu.
3. Leave dual rate switch in the desired position either 1 or 2.
4. Select desired channel by [CH] key.
5. Adjust servo throw by [+] or [−] key.

C. EXPONENTIAL RATES (EXP)

Exponential rate throws are available to the primary flight surface channels, Aileron, Elevator and Rudder. It is also switchable using the Dual Rate switch to activate the option. With this option, it is possible to have the same throws or dual rate throws, with or without exponential in either mode.

Exponential rate throws means that the servo movement moves with a variable ratio of movement of the control stick. Normally, the servo will move in an exact, or linear, motion with the control stick. In exponential movement, the servo can move very slowly around neutral and then speed up the movement as the stick deflection increases. This allows a very sensitive aircraft to be tame around neutral, where fine control is desired, yet still be capable of wild maneuvering when the sticks are deflected hard over.

To access the Exponential menu, use the "UP" or "DOWN" keys to find the EXP screen. If no rates have been set in this mode, then 0% will be displayed. A cursor will lie above the affected channel for adjustment, and can be moved using the "TIMER" (also known as CH) key. Use the "+" or "-" keys to change the exponential rate setting, and you can also use the dual rate switch to determine if exponential rates are effective at high rate, low rate, or both. The closer the value displayed on the screen is to zero percentage, the more linear the servo will be to your command. As the percentage rate increases, the more nonlinear the movement of the servo will be to the stick movement. You can leave the receiver and servos "ON" to observe the effect of the exponential settings.

Note that you may set the exponential rate for more movement at center by using percentages above zero, up to 100%. For less movement at center, such as in a sensitive model, use percentages below zero, down to -100%. Also, all channels set for exponential will activate with the use of the D/R switch when set up.
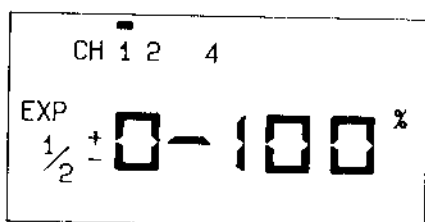
CH 1 2 4 EXP ½ ± 0 - 100 %	1. Press both [UP] and [DN] keys with main power switch "ON". 2. Use either [UP] or [DN] key until display shows Exponential menu. 3. Select dual EXP position by dual rate switch. 4. Adjust exponential rate by [+] or [—] key.

D. SERVO REVERSING (REV/NOR)

All of the channels within the Prism 7 can be reversed at will from the transmitter. Again, this allows rapid aircraft set up. To access the Servo Reversing menu, use the "UP" or "DOWN" keys from the Main Edit Menu. The LCD display will show all channels with a flashing cursor on the channel selected for reversing. To reverse a servo, use the "+" or "-" key to move the cursor to the proper direction. The receiver and servos can be left "ON" during this operation to show the direction being selected.
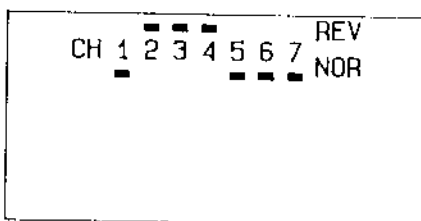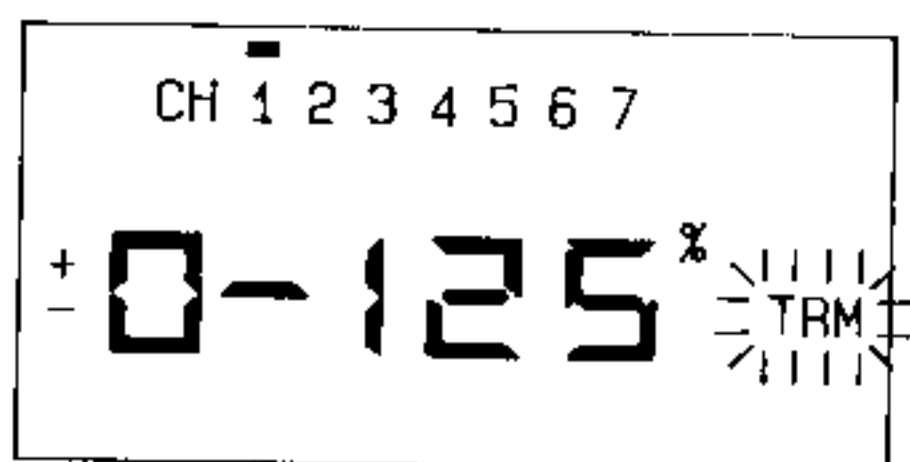
CH 1 2 3 4 5 6 7 REV NOR	1. Press both [UP] and [DN] keys with main power switch "ON". 2. Use either [UP] or [DN] key until display shows Servo Reverse menu. 3. Select desired channel by [CH] key. 4. Use [+] or [—] key to determine servo direction.

E. SUB TRIM FUNCTION (TRM)

The Sub Trim function is an option that allows you to set the neutral position of a flight surface without using the normal trim levers or adjusting the push rods. In operation, adjusting the sub trim will slew the servo as desired without affecting the normal trim levers or total throw of the servo. To access this function, use the "UP" or "DOWN" keys from the Main Edit menu. The display screen will show all channels available and the TRM indicator will be flashing. You may now adjust the neutral position of any servo by first selecting the desired channel using the "TIMER" (also known as CH) key. The cursor will indicate which channel you have selected. Now, use the "+" or "-" keys to adjust the neutral position of the channel. Once the position has been found, you may exit the screen back to the normal operation mode or any other option screen.

Note that you can overthrow the mechanical travel limits of a servo with this option. Use this option carefully as excessive movement away from the center point of a servo could cause the servo to travel beyond the design limits of the servo and damage it. When setting up a new model, it is wise to have the control surfaces as close as possible to a neutral setting, and the sub trim set at zero. This allows maximum flexibility of this option.
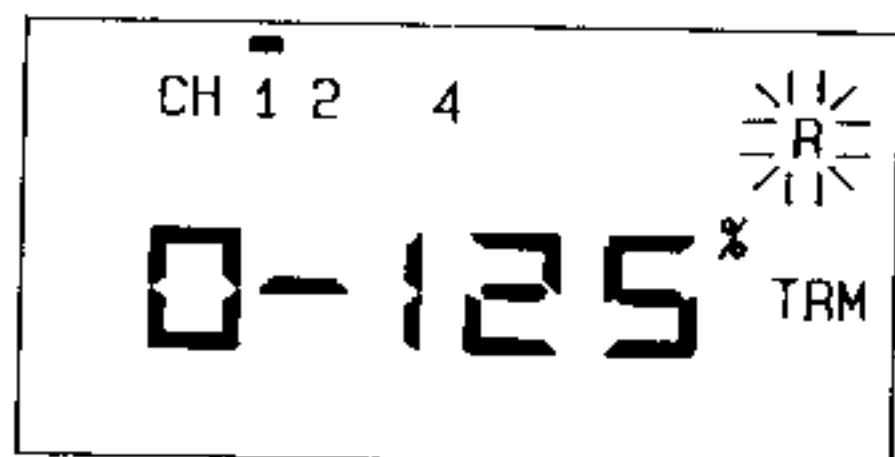
1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Sub Trim menu.
3. Select desired channel by [CH] key.
4. Adjust neutral position by [+] or [-] key.

F. TRIM RATE ADJUSTMENT (TRM R)

With the Trim Rate Adjustment option, you can determine how much trim authority is allowed by the mechanical trim levers on the transmitter. You may use any amount of rate adjustment from zero movement to 125% travel movement. This option applies only to channels 1, 2, and 4, Aileron, Elevator and Rudder.

To access the Trim Rate Adjustment option, use the "UP" or "DOWN" keys from the Main Edit menu until you reach this option screen. Here, you will find only channels 1,2, and 4 represented on the screen, and the TRM indicator will be a steady display, but letter "R" will flash. Use the "TIMER" (also known as CH) key to select the channel desired. The cursor will move to the selected channel. Now, you may use the "+" or "-" keys to change the percentage rates for trim. The system also has built in default settings of zero, 30% and 100% trim rates. To utilize a factory setting, use the "ON/OFF" (also known as CLR) key to choose a default setting.

Note that you can actually set up an aircraft so that it has no trim lever adjustment, preventing someone from bumping the trim lever out of position. To do this, you will fly the aircraft to establish the position of the flight surfaces. Note the exact position of the surfaces and then use the Sub Trim function to fix the surface in position. Now, set the Trim Rate Adjustment function to zero for that channel. The trim levers can now be moved anywhere without effect on the servo. This is a desirable situation for a well trimmed aircraft, however, you must remember that you can no longer make in-flight adjustments in this mode.
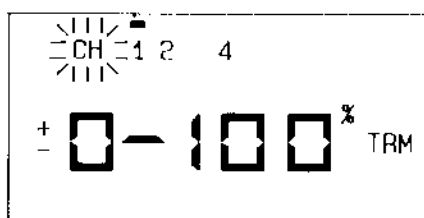
1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Trim Rate Adjustment menu.
3. Select desired channel by [CH] key.
4. Adjust trim rate by [+] or [-] key.
5. Use [CLR] key to activate a factory setting of 0%, 30% and 100% trim rates.

G. TRIM MEMORY FUNCTION (TRM)

The Trim Memory option allows you to maintain the position of any trim switch at center, despite the real trim position being somewhere else. This is especially handy when models of different trim settings are used and remembering where the trim levers should be is not possible. To access this option, use the "UP" or "DOWN" keys from the Main Edit menu until this option is selected. The LCD display will show the channels affected, No. 1, 2, and 4, and the small "CH" will flash to the left of the channel numbers.

To use this option, it will require you to have flown the model to establish the setting of the trims. Leave the trims in place, and then press both the " + " and "-" keys at the same time. Now, move the trimmer for that channel to the center position on the transmitter. That's it, the trim lever position is now centered and becomes the neutral point for that channel. There is an audible signal made by the transmitter when the neutral point on the mechanical trim lever is found.

Try not to use this option when the trimmer switch affected is at the extreme end of the trim position. You may end up going beyond the mechanical limits of the servo during normal operation and damaging the servo. Make an adjustment from the control linkage first. Used correctly, this feature allows all models in memory to share the exact same trim setting on the trim levers, making your life much easier.
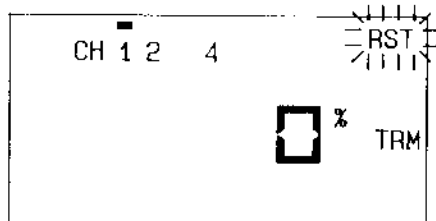
1. Pre-Determine neutral position of trim lever by test-flying.
2. Press both [UP] and [DN] keys with main power switch "ON".
3. Use either [UP] or [DN] key until display shows Trim Memory menu.
4. Select desired channel by [CH] key.
5. Press both [+] and [—] key to memorize the neutral point of trim.
6. Move trim lever to the center position.

H. TRIM MEMORY RESET FUNCTION (TRM/RST)

This function will allow you to reset the Trim Memory back to zero, if changes are necessary to the Trim Memory. Do not attempt to re-establish the trim memory position without first resetting the Trim Memory to zero under this function. You'll only make things worse.

To access this function, use the "UP" or "DOWN" keys from the Main Edit menu until this option screens appears. The display screen will show the channels affected, No. 1, 2, and 4, and the letters "RST" will flash on the upper right of the screen. Use the "TIMER" (also known as CH) key to select the channel to reset. To reset the channel, depress both the " + " and "-" keys at the same time. An audible signal from the transmitter will confirm the reset function has been used.

1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Trim Memory Reset menu.
3. Select desired channel by [CH] key.
4. press both [+] and [—] keys to reset the trim memory.

I. SNAP ROLL SWITCH (SNP ROL)

The Snap Roll function is a program function affecting the primary three flight control channels to perform a snap roll while airborne. The use of the Snap Roll switch will override the sticks, so use caution.

The direction and attitude of the snap roll can be set from this menu, and the command for this switch is effective as long as the Snap Roll switch is moved.

To access this option, use the "UP" or "DOWN" keys to locate the proper screen. The display will show the channels affected along with the "SNP ROL" sign in the lower right corner of the screen. To activate the Snap Roll switch, use the "TIMER" (also known as CH) key to scroll over to the flashing OFF or ON indicator in the display. To toggle between ON and OFF, use the "ON/OFF" (also known as CLR) key to select the mode. To select the direction of the snap roll, use the "+" or "-" keys to scroll through the flashing letters. RU is Right and Upward, RD is Right and Downward, LU is Left and Upward, and LD is Left and Downward.

You must now select the amount of surface throw each flight surface will receive when the option is activated using the Snap Roll switch. Use the "TIMER" (also known as CH)" key to select the channel, and then use the "+" or "-" keys to program in the amount of throw each surface will move when activated. Zero percentage means that the surface will not be affected by the snap roll switch, while 100 % will provide full throw to the surface. The percentage rates will provide up to 125% of the programed throw on a servo.

Because this is a complicated maneuver, if you have little experience in performing this maneuver, it may help to enlist the assistance of an experienced pilot for setting up this option. Also note that the direction of the snap roll on the menu screen assumes that all servos are moving in direction as set from the factory, and not reversed. It will help to leave the receiver and servos "ON to confirm the direction of the snap roll during the set up of this function.
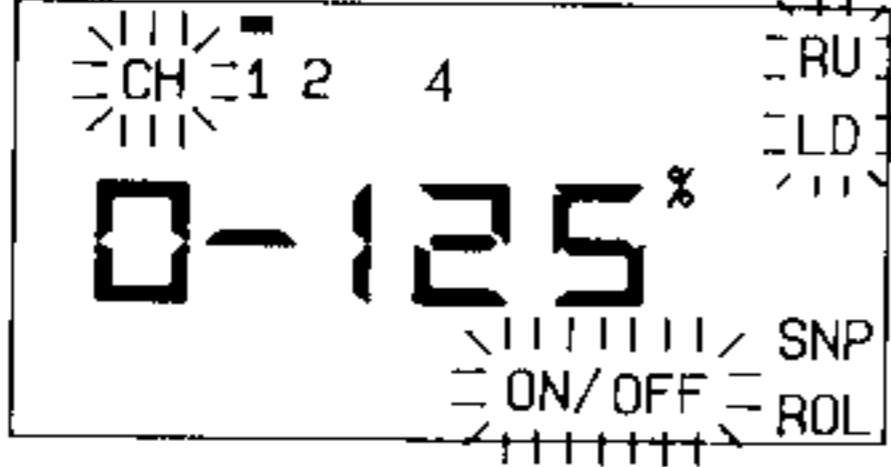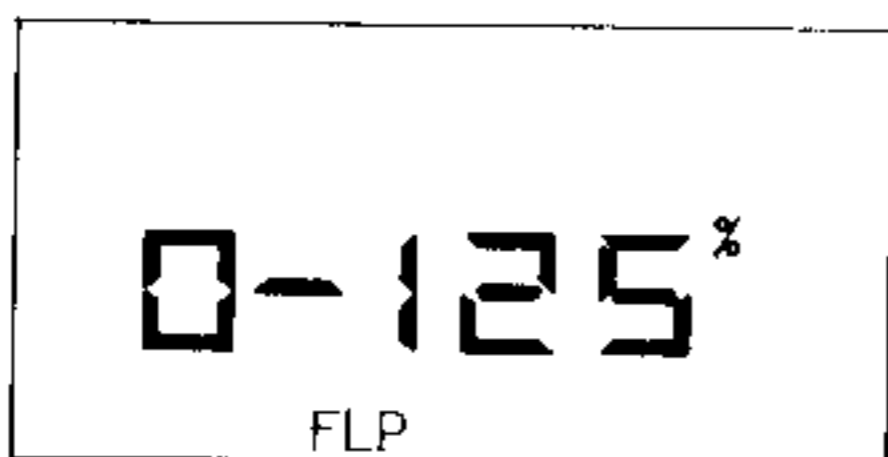
1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Snap Roll menu.
3. Press [CH] key three times to scroll over to "ON/OFF" selecting.
4. Use [CLR] key to activate Snap Roll function "ON".
5. Determine Snap Roll direction by [+] or [-] key.
6. Select desired channel by [CH] key.
7. Adjust servo throw by [+] or [-] key.

J. FLAP ADJUSTMENT (FLP)

This option allows the pilot to set the amount of movement available under channel 6, for flaps. It is controlled by the Aux 1 channel knob on the upper left face of transmitter. With this function, you can use the factory default settings of zero (no flap movement), 30% or 100%. You may also program in your own percentage settings .

To access this option, use the "UP" or "DOWN" keys under the Main Edit menu until the screen is selected. This screen will simply show the percentage currently being used and the FLP sign at the bottom of the screen. Use the "ON/OFF" (also known as CLR) key to select one of the factory default settings, or you may use the "+" or "-" keys to set your own percentages. During this operation, you may leave the receiver and servos "ON" to confirm the amount of movement being programed.

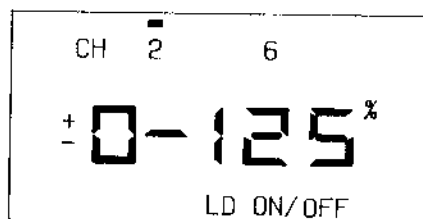1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Flap Adjustment menu.
3. Adjust flap amount by [+] or [-] key.
4. Use [CLR] key to activate a factory setting of 0%, 30% and 100% flap amount.

K. FLAP-ELEVATOR MIXING (LANDING MODE) (LD ON/OFF)

The Flap Landing Mix option allows the pilot to compensate for any pitching tendency the plane may have when the flaps are lowered. It mixes in the Channel 6 Flap function to the Channel 2 Elevator function. This is especially useful when using flaps as an airbrake for landing and the elevator must compensate for the increased pitching movement when the flaps are lowered. The pilot can concentrate more on the landing rather than trying to hold the nose in position.

To access this option, use the "UP" or "DOWN" keys in the Main Edit menu to locate the option screen. The option screen will show the channel 2 and 6, plus the letters "LD" will appear at the bottom center of the display screen. By flipping the Landing toggle switch on the face of the transmitter, you can see the option being activated or turned off.

To set up this option, you will have to pre-determine by test-flying how much flap deflection will be used and how much elevator compensation is required. Note that when this option is used, both elevator and flaps will move to the point you program in here. This option works independent of the normal flap controller knob. Select the channel you wish to program using the "TIMER" (also known as CH) key. Use the " + " and "-" keys to set the amount of movement desired by both the elevator and flaps in this mode. Note that the option allows movement in either direction from center up to 125% of normal servo travel. Caution should be exercised here in that you can cause the servo to travel past its mechanical limits and damage the servo. Once the percentages have been set up, you may activate this option at any time using the LANDING switch on the transmitter. To disable this option, set both percentages to zero percent.
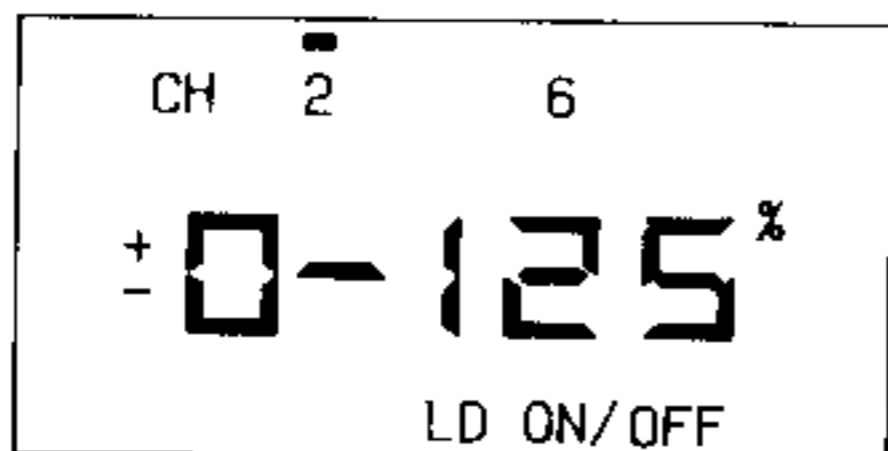

1. Press both [UP] and [DN] keys with main power switch "ON".
2. Use either [UP] or [DN] key until display shows Flap-Elevator mixing.
3. Activate the mixing by landing toggle switch "ON".
4. Select desired channel by [CH] key.
5. Use [+] or [—] key to set the amount of Flap and Elevator mixing.

L. FLAPERON LANDING MIXING (LD ON/OFF)

This option allows the use of ailerons as flaps, and mixed into the elevator for pitch compensation or coordination. It will require that you utilize a separate servo for each aileron, with channel 1 and 6 used to actuate the ailerons. This option allows the pilot to mix the flaperons into the elevator the same as the Flap Landing Mix option above, but without separate flaps being built into the aircraft.

To access this option, you must return to the Initial Mode menu and access the display screen for Mixing Select. If no mixing is being utilized, the screen will display "OFF". Use the "ON/OFF" (also known as CLR) key to activate the mixing options and stop when you reach the "FLP" screen. Now turn the radio system off and then back on for normal operation. Depress both the "UP" and "DOWN" keys to access the Main Edit menu, and select the Flap Landing Mix option screen, as described above. Use the "TIMER" (also known as CH) key to select which channel to program, and then use the " + " or "-" keys to program in the amount of flap and elevator movement desired. You may leave the radio receiver and servos ON during this time to confirm the movement desired. To activate the option, use the LANDING toggle switch on the transmitter. You may program in zero percentage to defeat the option and the toggle switch.
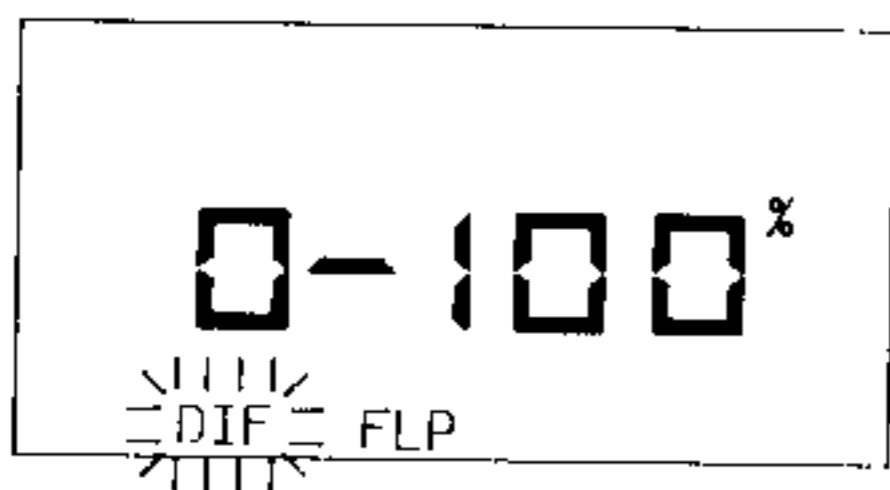
```
CH   2      6
  +┌─┐ ┌─┐ ┌─┐ %
   │ │ │ │ │ │
  -└─┘ └─┘ └─┘
           LD ON/OFF
```

1. Select Flaperon Mixing in the Initial Mode menu.
2. Turn the power switch "OFF" and then back "ON".
3. Press both [UP] and [DN] keys to get to the Main Edit Mode menu.
4. Use either [UP] or [DN] key until display shows Flaperon Landing Mixing.
5. Activate the mixing by landing toggle switch "ON".
6. Select desired channel by [CH] key.
7. Use [+] or [—] key to set the amount of flap and elevator mixing.

M. FLAPERON DIFFERENTIAL MIXING (DIF FLP)

This option allows the use of a flaperon set up for the ailerons and have differential movement. Differential movement of the ailerons allows a more axial roll to be performed, and normally means that the aileron moving upwards has more motion than the opposite aileron moving downward. The flap feature of the flaperon set up remains intact and can be used with the Aux 1 control knob. Aerodynamically, the downward moving aileron causes more drag than rolling motion, which results in the rolling maneuver being less than axial.

To utilize this option, you must first access the Flaperon Mixing option in the Initial Mode menu. Again, this means that the aircraft will have separate ailerons servos, using channel 1 and 6. Once the Flaperon Mixing option has been activated in the Initial Mode Menu, return to the normal operation mode and access the Main Edit Menu. Select the DIF FLP screen within the Main Edit menu. This screen will display a flashing DIF prompt with a non-flashing FLP prompt. Use the " + " or "-" keys to program in the amount of differential movement desired in the ailerons. Note that you can only add differential movement, and not subtract. The proper amount of differential movement is dependent on the aircraft and the pilot, so you will have to experiment with this option to get the differential motion to your liking.
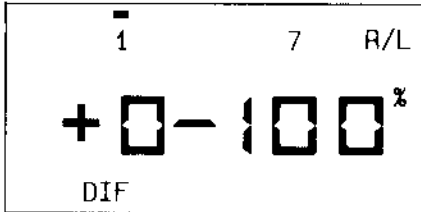
```
 ┌─┐ ┌─┐ ┌─┐ %
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 └─┘ └─┘ └─┘
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 ─DIF─ FLP
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```

1. Select Flaperon Mixing in the Initial Mode menu.
2. Turn the power switch "OFF" and then back "ON".
3. Press both [UP] and [DN] keys to get to the Main Edit Mode menu.
4. Use either [UP] or [DN] key until display shows Flaperon Differential mixing.
5. Use [+] or [—] key to set the amount of the differential movement.

N. AILERON DIFFERENTIAL (DIF)

In this option, you may use aileron differential without using the ailerons as flaps, as in the previous flaperon set up. In this case, the aircraft either has separate flaps, or no flaps are present and aileron differential is desired. The aileron function will use two separate servos, plugged into channel 1 and 7 for this option.

To access this option, you must access the Initial Mode menu and select the Mixing Options. If no mixing options are being used, the display will show "OFF". Use the "ON/OFF" (also known as CLR) key to activate the Mixing Options and then select the "DIF" screen using the " + " or "-" keys. Turn the radio "OFF" and then back on to normal operation. Access the Main Edit menu by depressing both the "UP" and "DOWN" keys at the same time and access the "DIF" screen using the "UP" or "DOWN" keys. This screen will show the channels affected, No. 1 and 7, plus "DIF" will appear in the lower left corner of the display.

You may now program in the amount of differential desired by using the "+" or "-" keys to change the percentages. Note that you may change the percentages from 100% down to zero only. You may leave the receiver and servos on at this time to confirm the movement desired in this option. By returning to the normal mode of operation, the option is saved and active.

1. Select Differential Mixing in the Initial Mode menu.
2. Turn the power switch "OFF" and then back "ON".
3. Press both $\boxed{\text{UP}}$ and $\boxed{\text{DN}}$ keys to get to the Main Edit Mode menu.
4. Use either $\boxed{\text{UP}}$ or $\boxed{\text{DN}}$ key until display shows Aileron Differential mixing.
5. Select desired channel by $\boxed{\text{CH}}$ key.
6. Use $\boxed{+}$ or $\boxed{-}$ key to set the amount of the aileron differential movement while selecting direction by aileron control stick.

O. FAIL SAFE (FLS)

The Fail Safe mode of operation is used when a PCM type receiver is in service and PCM mode is selected within the Prism 7. The Fail Safe feature allows the radio receiver to move all servos to a predetermined position should a loss of signal occur while in operation. Normal operation will resume once the radio signal returns to the receiver.

To use the Fail Safe option, you must access the Initial Mode menu by holding down both the "UP" and "DOWN" keys and turning the radio system ON. Use the "UP" or "DOWN" key to locate the Transmission Mode screen, which displays a flashing PPM or PCM prompt on the left of the screen. Use the "TIMER" (also known as CH) key to select PCM mode. (Again note that Fail Safe is only possible with PCM operation). Once the PCM mode is selected, turn the system OFF and then back ON to return to normal operation.

Now, access the Main Edit Menu by depressing the "UP" and "DOWN" keys at the same time while in the normal operation mode. Using the "UP" or "DOWN" key, locate the Fail Safe screen, or "FLS". This screen will display the model numbers in which Fail Safe is available, the letters FLS, and a flashing prompt at the lower center of the screen. It will flash either OFF or ON. Use the "ON/OFF" (also known as CLR) key to toggle the Fail Safe mode.

Once you have activated the Fail Safe mode, turn the receiver system on with all servos plugged in. Place the control sticks of the transmitter into the position where you would like the servos to be when Fail Safe occurs. Now, depress both the "+" and "-" keys at the same time to lock in this position to the Fail Safe memory. The radio will issue an audible beep to confirm the setting. You may now return to the normal mode of operation for flying and the Fail Safe feature can now be utilized.
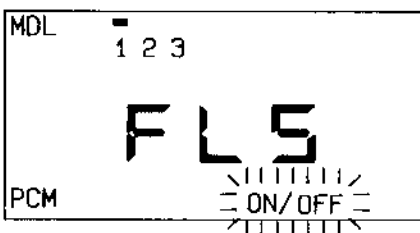
1. Pre-determine PCM mode in the Initial Mode menu.
2. Turn the power switch "OFF" and then back "ON".
3. Press both $\boxed{\text{UP}}$ and $\boxed{\text{DN}}$ keys to get to the Main Edit Mode menu.
4. Use either $\boxed{\text{UP}}$ or $\boxed{\text{DN}}$ key until display shows Fail Safe menu.
5. Press $\boxed{\text{CLR}}$ key to activate Fail Safe "ON".
6. Determine the Fail Safe position by control sticks and/or trim levers.
7. Press both $\boxed{+}$ and $\boxed{-}$ key to memorize the Fail Safe position set by control sticks and/or trim levers.

Here are some recommendations on setting the Fail Safe position on the Prism 7 radio:

For Sailplane or gliders:
Aileron or Rudder at Neutral, Elevator slightly "UP", Throttle (flap) "DOWN"

For Trainer or Sport Ships:
Aileron or Rudder at Neutral, Elevator slightly "UP", Throttle at idle or "OFF"

For fast Sport and Pattern models:
Aileron at Neutral, Elevator at Neutral, Throttle at idle or "OFF" Retracts are "DOWN" (if used).

These are only recommendations and only the pilot can determine which setting properly suits the aircraft and flying style being used. To confirm the settings used in the Fail Safe mode, you may turn the transmitter OFF while leaving the receiver ON. The servos should travel to the Fail Safe positions and hold there until you turn the transmitter back ON once again.

This concludes the programming portion of the Prism 7 software options. As you can see, the Prism 7 is a very capable system, with many useful options. We ask that you now take the time to read over the general instructions for the care and use of the Prism 7 in order to get the most from your system.

7. GENERAL INSTRUCTIONS

Your Prism 7 system is a complete outfit, including batteries and charging system. The Prism 7 features rechargeable Ni cad batteries for long life and consistent service. Please follow the next few paragraphs of instruction carefully for best performance results.

CHARGING: The Prism 7 system comes with a 110 VAC or 220 VAC wall type system charger. Separate LED lights allow the user to confirm that the charger and batteries are connected for charging. Use only this system charger with your Prism 7, as other chargers may cause extreme damage to the system.

Do not leave the charger connected to the transmitter or receiver any longer than recommended. Over charging of the system batteries could severely damage the batteries, resulting in system failure.

SYSTEM USE: The Prism 7 radio is a solid state electronic device. As such, it can be damaged with abuse. Never drop or throw the system components, as this can severely damage the components. There is no need to lubricate the servos in any way, although if you should damage a servo due to a crash or other accidents, you should know that there is a lubricant applied to the servo gears. We recommend that damaged components be returned to the factory for proper service and care.

Because this system is prone to vibration and some electronic wear, we recommend that the system be checked and tuned at least once a year by an authorized Hitec Service Center. This will insure that your system operates with highest reliability and you will fly with confidence.

Do not expose the system components to direct sunlight or sources of heat for any period of time. Your Prism 7 system features an LCD type display, which may darken with long exposure to direct sunlight. Removal of the system into the shade will return the LCD display to normal in a short time.

Always operate this system in a safe and sane manner. Never fly in areas where it is risky to operate or where other pilots may fly in close distance to you without their knowledge. You should always fly in accordance with the Safety Rules as adopted by the official association such as either the Academy of Model Aeronautics (AMA) or the Sport Fliers Association (SFA) in U.S.A. Never fly alone. This is risky, and it's always more fun to fly with a friend to share the experience.

Always range check the radio before sending the aircraft up to fly. A proper range check with the Prism 7 system should allow you to operate the system at a distance of at least 125 feet from the aircraft with the antenna collapsed, or DOWN. If you cannot achieve this range, do not fly. Have the system checked and live to fly again another day.

We at Hitec wish you the best in flying and hope you enjoy the Prism 7 system. If you have any questions concerning the Prism 7 system, or any other Hitec product, please contact Hitec dealer in your area.

Good Luck!