TH-2 XPR Universal Mixer – Tandem CCPM Swash Plate Mixing Example

This tutorial assumes you downloaded and installed the UM-XPR-1 software onto your computer and you know how to load it into the TH-2 XPR. If not, start here

http://www.tech-mp.com/th-2_xpr_support.htm#TH-2%20Software%20Installation

Items needed.

TH-2 XPR, input cable(s), USB cable
Transmitter, receiver, battery
6 servos, optional swash plates

Step 1. Load the software and settings files.

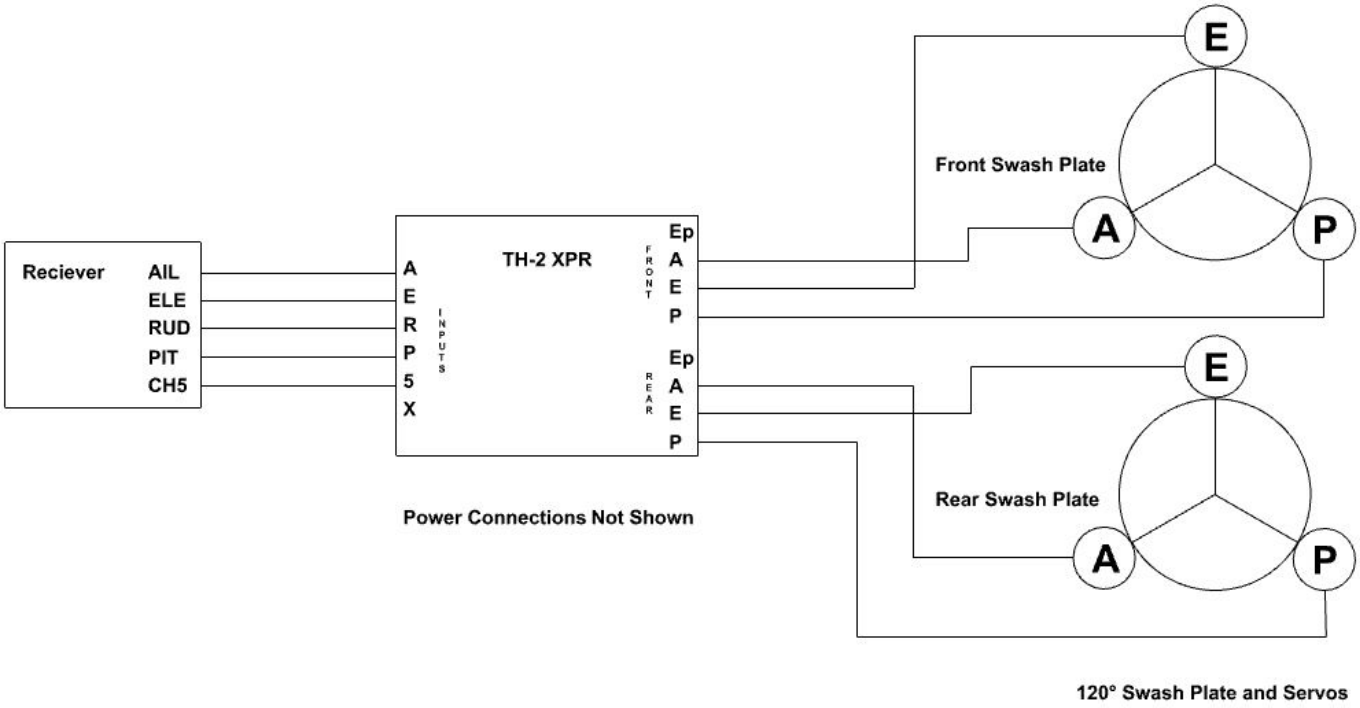
Software: UM-XPR-1.hex
Settings: UM-XPR-1.cst

Step 2. Connect the following TH-2 XPR inputs to the receiver.

Aileron
Elevator
Rudder
Pitch
CH5 - DCP; This is a program mix in the Tx with Elevator as master and CH5 a slave.

Step 3. Connect the following TH-2 XPR outputs to the servos.

Connect Front A output to front A servo
Connect Front P output to front P servo
Connect Front E output to front E servo
Connect Rear A output to rear A servo
Connect Rear P output to rear P servo
Connect Rear E output to rear E servo



Connection Diagram

Step 4. Modify the TH-2 settings to create the mixing.

Pitch function

All servos move collectively.
This is done by creating mixes for each output A, E, P from the pitch input as follows:

Modify settings:

39 H-Mode Pitch CH Mix to Front A Output -> Set to 100
40 H-Mode Pitch CH Mix to Front E Output -> Set to 100
41 H-Mode Pitch CH Mix to Front P Output -> Set to 100
43 H-Mode Pitch CH Mix to Rear A Output -> Set to 100
44 H-Mode Pitch CH Mix to Rear E Output -> Set to 100
45 H-Mode Pitch CH Mix to Rear P Output -> Set to 100

Test this out .... Use the servo reversing settings (1) to get the servos moving in the proper direction as needed.

Use the transmitter servo reversing to reverse the function at the joystick if needed.

Aileron function

The A and P servos move inversely and E servo is fixed.
This is done by creating mixes for each output A, P from the Aileron input as follows:

Modify settings:

23 H-Mode Aileron CH Mix to Front A Output -> Set to 100
25 H-Mode Aileron CH Mix to Front P Output -> Set to -100
27 H-Mode Aileron CH Mix to Rear A Output -> Set to 100
29 H-Mode Aileron CH Mix to Rear P Output -> Set to -100

Again Test this out ....

Use the transmitter servo reversing to reverse the function at the joystick if needed.

Elevator function

The A and P servos move collectively and the E servo moves inversely.

Notice the A and P control points on the swashplate are half the distance from the center compared to the E control point. This means the A and P servos must move half as much. This is done by creating mixes for each output A, P, E from the Elevator input as follows:

Modify settings:

31 H-Mode Elevator CH Mix to Front A Output -> Set to 50
32 H-Mode Elevator CH Mix to Front E Output -> Set to -100
33 H-Mode Elevator CH Mix to Front P Output -> Set to 50
35 H-Mode Elevator CH Mix to Rear A Output -> Set to 50
36 H-Mode Elevator CH Mix to Rear E Output -> Set to -100
37 H-Mode Elevator CH Mix to Rear P Output -> Set to 50

Again Test this out ....

Use the transmitter servo reversing to reverse the function at the joystick if needed.

Rudder function

A and P servos move inversely and E servo is fixed.
The front servos move inversely with the rear servos.
This is done by creating mixes for each output A, P from the Aileron input as follows:

Modify settings:

47 H-Mode Rudder CH Mix to Front A Output -> Set to 100
49 H-Mode Rudder CH Mix to Front P Output -> Set to -100
51 H-Mode Rudder CH Mix to Rear A Output -> Set to -100
53 H-Mode Rudder CH Mix to Rear P Output -> Set to 100

Again Test this out ....

Use the transmitter servo reversing to reverse the function at the joystick if needed.

CH5 - DCP function

All servos move collectively. Front servos move inversely with rear servos. This is done by creating mixes for each output A,E,P from the CH5 input as follows:

Modify settings:

55 H-Mode CH5 CH Mix to Front A Output -> Set to 100
56 H-Mode CH5 CH Mix to Front E Output -> Set to 100
57 H-Mode CH5 CH Mix to Front P Output -> Set to 100
59 H-Mode CH5 CH Mix to Rear A Output -> Set to -100
60 H-Mode CH5 CH Mix to Rear E Output -> Set to -100
61 H-Mode CH5 CH Mix to Rear P Output -> Set to -100

Reduce the input gain of CH5 to 25% or less since the control power of this function is very strong.

16 H-Mode CH5 Channel Input Gain -> Set to 25

To visualize the DCP function better, temporarily set the elevator input gain to zero.
This will remove the cyclic component and keep just the DCP.

13 H-Mode Elevator Channel Input Gain -> Set to 0

Again Test this out ....

Use the transmitter servo reversing to reverse the function at the joystick if needed.