

# **VAN'S AIRCRAFT**

## **TOTAL PERFORMANCE**

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## **RV-12 SKYVIEW PRE-SETS READ-ME**

SV-PRE-SETS-READ-ME 01-25-17 Rev 7

*Overall it is our hope that use of the settings files will make installing new products and maintaining current software on older EFIS screens much easier.*

### **What's New:**

*We realize that you may have read this document many times before. Here is a heads up on major changes to look for. It is still strongly encouraged to read the entire document as many small changes may have been incorporated as well.*

- 1) *Added reminder step for AOA setup.*

## Read These Notes First:

**NOTE: Canopy Safety Switch** Addition of this software will add functionality for the Canopy Open Safety Switch. Purchase and install retro-fit kit ES-00300 before installing the software and settings update.

**NOTE: Software Level Mismatch** Van's Aircraft usually releases these settings files some weeks after Dynon release their generic firmware updates. If you update to a higher software level using the generic files, you will not be able to load a lower level settings file from Van's. For example if you downloaded and installed software version 13.0 from Dynon you would not be able to load the Van's Aircraft 12.0 file.

**NOTE: Using the Dynon Quick Update / Software** If you download a software level from Van's Aircraft you may install the equivalent software level from Dynon. This may be useful when installing the Quick Update Package from Dynon that includes the latest Aviation, Obstacles TFR Database etc... Files that are redundant between the Van's and Dynon updates will be ignored during the second installation. Although these may be installed in any order it is HIGHLY RECOMMENDED that you wait until the approved Van's Aircraft has been released. Van's Aircraft files include changes to settings that may be required with new software. This will also allow time for discovery and vetting of incompatibilities between new software and the RV-12...although this is no guarantee we will find all problems, let us know if you find any and we will work on them as priority and time permits.

**NOTE: Upgrading an EFIS below Software Level 4.0** If updating from software prior to version 4.0, first download and install the latest firmware (SkyView System Software Update) from the Dynon web site under the individual SkyView files section. This is a single file not combined into a package with databases, sensor definitions, etc.

**NOTE: Replacing or Servicing a Display** The software and settings files available on the Van's Aircraft web site assume that the display was initially setup as an RV-12 at the factory. If you are installing a replacement display that has not been previously set up for an RV-12 (the RV-12 Logo will appear on one of the boot screens if it has been set up for the RV-12) contact Van's Aircraft and we will supply upon request a .dfg that will reset the display to its original RV-12 shipping configuration. If you are returning an EFIS display for replacement, request that Dynon load the settings from your old display onto the new display (or if that is not possible at minimum load the RV-12 baseline shipping configuration).

## Download

**CAUTION:** When downloading, right click the file name and select “save target as”. Left clicking will load the file in your browser and when saved will add browser formatting to the file that will render it unusable.

**Step 1:** Go to the [downloads](#) page of the Van’s Aircraft web site and download 12-SVxx.x -Software&Settings.zip

**Step 2:** Extract the .duc file and .dfg files from the zip file. Place the files on a USB memory stick. Do not place the files in a folder.

## .duc Installation

The main software and settings file “12-SVXX.X-PRE-SETS-MM-DD-YY.duc” combines the Van’s Aircraft factory settings with the latest software (firmware) and sensor files released from Dynon.

If you have already installed the latest software (firmware) from Dynon you can still use the software and settings file to update your settings. The EFIS will recognize the new software matches and skip ahead.

This file will not overwrite aircraft specific data such as hobbs & tach time, transponder, hex code, etc...

The pre-sets .duc does not include the autopilot, ADS-B, GPS, COM, or dimmer settings. These will need to be loaded separately.

**Step 3:** Connect a battery charger compatible with the battery to the aircraft.  
Remove all memory sticks from USB ports (Chart files, WiFi adapters, etc.)

**Step 4:** Turn ON the following: **1.** Master. **2.** Avionics, **3.** Autopilot, **4.** Com radio.

**Step 5:** Insert the USB stick into the USB port for the [main](#) display.

Enter the setup menu then select “SYSTEM SOFTWARE” then load the .duc file.

If this is unclear refer to Dynon documentation. Wait for the unit to load the file and reboot. Depending on the update after the initial boot, the system may continue other loading operations and reboot again.

Wait and make sure that the loading process has completely finished then remove the USB from the screen.

**Step 6 : (Dual Screen only):** Insert the USB stick into the USB port for the [second](#) display. Enter the setup menu then under “SYSTEM SOFTWARE” load the .duc file. Wait for the unit to load the file and reboot. Depending on the update after the initial boot, the system may continue other loading operations and reboot again. Wait and make sure that the loading process has completely finished then remove the USB from the screen.

**CAUTION:** Step 6 must be completed on the second dual screen before proceeding to further steps!

## .dfg Installation

A .dfg file includes no software. The file automatically changes the settings inside the setup menu that otherwise would need to be setup manually. If you have previously loaded a .dfg file there is no need to re-load these files unless a more recent version is available or you wish to reset back to the factory defaults.

**NOTE:** If a second dual screen is installed perform .dfg Installation steps below from the primary screen only.

### Autopilot:

Two separate autopilot setup files have been made available one for **simplified mode** and the other for **expert mode**.

**NOTE:** If the optional SV-AP-PANEL and SV-KNOB-PANEL modules are installed, you must install the **expert mode** settings and operate the autopilot using **expert mode**. If they are not installed, you have the choice to install and operate either mode.

**CAUTION:** Both autopilot files will overwrite autopilot settings (sensitivity, rates, gain values etc.) and set them back to the factory default. If you have customized these settings record them from the setup manual before proceeding.

If you do not have the SV-AP-PANEL and SV-KNOB-PANEL installed and wish to operate in simplified mode complete Step 7 otherwise skip ahead to Step 8.

**Step 7:** (Simplified mode only) Load 12-APSIMP-PRE-SETS-MM-DD-YY.dfg to set the display up for operation in simplified mode. You have now completed the autopilot setup for simplified mode. Continue to the **ADS-B** section of this read-me (if installed). If ADS-B is not installed skip ahead to the **Dimming** section.

If you have the SV-AP-PANEL and SV-KNOB-PANEL installed or wish to operate an installation without those modules in expert mode complete step 8.

**Step 8:** (Expert): Load 12-APEXPERT-PRE-SETS-MM-DD-YY.dfg to set the display up for operation in expert mode. If you do not have the SV-AP-PANEL and SV-KNOB-PANEL you have completed the autopilot setup. Continue to the **ADS-B** section (if installed). If ADS-B is not installed skip ahead to the **Dimming** section.

**NOTE:** The remaining steps are for setup of auto-trim. If this step has been completed in the past you do not need to repeat this step, proceed to the ADS-B section if installed or dimmer section if ADS-B is not installed.

Auto-trim is controlled by the SV-AP-PANEL module which must be installed for auto trim to function.

This also requires installation of a new "AUTOPILOT" harness. Order "AV SV-AP/KNOB PANEL" from Van's Aircraft.

The 12-APEXPERT-PRE-SETS-MM-DD-YY.dfg file includes the settings for auto trim. Even though the settings are setup by the dfg file a test will need to be completed to define for the SV-AP-PANEL which direction is Trim Up and Trim Down before auto-trim can function.

Auto-trim provides variable trim motor speed with changes in airspeed and will automatically re-trim the aircraft as it flies under autopilot control.

The SV-AP-PANEL controls the trim motor independent of the trim switch on the panel. If the SV-AP-PANEL were to fail, the switch on the panel would still control the trim motor at full rate trim. The following calibration test will not affect the function of the trim switch on the panel.

**Step 9:** (SV-AP-PANEL): Set trim tab to approximately the center of its range of motion.

**Step 10:** (SV-AP-PANEL): Under the main setup menu select "HARDWARE CALIBRATION>TRIM MOTOR CONFIGURATION>MOTOR 1>AUTO-TRIM FUNCTION" then toggle the right knob to the right to activate the calibration test.

Press "START" to begin the calibration. The trim tab will automatically move in a direction. Pauses during tab movement are normal.

If the trailing edge of the trim tab moved down choose "PITCH NOSE UP". If the trailing edge of the trim tab moved up select "PITCH NOSE DOWN".

Select "OK".

Note the movement of the tab and select "PITCH NOSE UP" or "PITCH NOSE DOWN" again. Select "OK" to continue. Select "BACK" to finish the calibration.

### **ADS-B In (SV-ADSB-470):**

Load the appropriate ADS-B presets file if initially setting up ADS-B.

**NOTE:** ADS-B out will require installation of the new SV-GPS-2020 antenna see notification N 16-01-15 available on the RV-12 service information page of the Van's Aircraft web site.

**Step 11:** (No ADS-B installed): If no ADS-B input device is installed load 12-ADS-B-NONE-PRE-SETS\_MM-DD-YY.dfg.

**Step 12:** (ADS-B 470 installed): If setting up a SV-ADSB-470 input device for the first time load 12-ADS-B-470-PRE-SETS\_MM-DD-YY.dfg.

### **GPS/GPS ADS-B Out:**

There are two GPS antennas used with the RV-12. SV-GPS-250 is the stock antenna sold with the RV-12. An optional SV-GPS-2020 GPS antenna is available after January 2016 for those aircraft requiring ADS-B out compliance.

**NOTE:** All 5 serial ports (ELT, ADS-B, XPNDR, COM, GPS) are in use. There is no room for a second GPS (if upgrading there is no room for the old SV-GPS-250). Some older aircraft not using an ELT may consider using that port for a second GPS, you are on your own if you go down this path! We consider the positional accuracy provided by GPS data to the ELT during a emergency situation to be of greater safety benefit than a second GPS. Remember this is a VFR aircraft.

**Step 13:** (SV-GPS-250): If setting up a SV-GPS-250 GPS antenna for the first time load 12-GPS-250-PRE-SETS\_MM-DD-YY.dfg.

**Step 14:** (SV-GPS-2020): If setting up a SV-GPS-2020 GPS antenna for the first time load 12-GPS-2020-PRE-SETS\_MM-DD-YY.dfg.

## Dimming:

There are two generations of control modules supplied by Van's Aircraft. Control modules have a Rev level label on the bottom side. Control modules Rev 2 or later use a dimmer knob (shipped since November 2014). Earlier rev control modules accomplished dim control through the SkyView EFIS screen.

There are no dimming presets in the main .duc file. If the correct dimmer file has been loaded in the past there is no need to reload the dimmer file (this is not overwritten by the main .duc file) although there is no harm in loading it twice.

**Step 15:** (EFIS Controlled Dimming) If the dimmer is controlled through the EFIS Display load 12-SV-EFIS-DIM\_MM-DD-YY.dfg (using a R0 or R1 control module).

**Step 16:** (Panel Knob Controlled Dimming) If the dimmer is controlled through a knob on the panel load 12-PANEL-KNOB-DIM\_MM-DD-YY.dfg (using R2 or later control module).

## COM:

**GTR200 or SL-40:** Before release of SkyView software 12.0 the GTR200 used the SL-40 settings inside of the SkyView. Software release 12.0 added individualized settings for each COM.

The main .duc file no longer has COM setup information. Choose and load the .dfg file specific for your COM radio.

**NOTE:** Both of the COM files only setup the connection between the COM and the EFIS Display (allowing communication such as pushing frequencies). These files do not change the settings inside the COM.

If you are having problems with your COM's performance settings the COM internal settings themselves may need to be changed. Read the help information in Section 5 of the kit assembly instructions and your COM's installation manual. A PDF document of the internal settings within your COM is available from Van's Aircraft upon request.

**Step 17:** (GTR200 COM) If setting up a Garmin GTR200 for the first time load 12-GTR200-PRE-SETS\_MM-DD-YY.dfg.

**Step 18:** (SL-40 COM) If the settings have been altered and you would like to return to the original settings for a Garmin SL-40 load 12-SL40-PRE-SETS\_MM-DD-YY.dfg.

## Dual Screen Final Setup:

**Step 19:** If updating a dual screen installation perform a Network Configure to push the settings from the primary flight display to the second co-pilot display.

Within the setup menu on the PFD primary display

Under System Setup > SkyView Network Setup choose "Configure".

**Step 20:** Re-install any USB sticks (WiFi, Charts, etc.) that were previously removed.

**Step 21:** The second screen does not have a backup battery installed. Enter the setup menu on the MFD second display. Under Local Display Setup > Battery Backup set the Battery Connected to "NO".

## Initial Installation:

**Step 22:**

**If this is an initial installation complete all steps under the "Initial Installation" section below before proceeding.**

## Transponder:

**NOTE:** This update should be done from the “Master” PFD display (pilot display) on dual screen installations.

**NOTE:** If your SkyView system shipped before September 2012 check in the SkyView installation manual that you have met the TSO labeling requirements of your transponder when upgrading from a software level below 2.02.

**Step 23:** Within the setup menu navigate to TRANSPONDER SETUP then note the “STATUS” line. If the information is shown in YELLOW a transponder update is ready to be installed. If you have already upgraded your transponder software skip this step.

Scroll up to the STATUS line then select “LOAD” in the lower right corner (If an update is not available it will be impossible to scroll up to the status line).

On the following confirmation page select “YES”.

**Step 24:** After the software is installed power off the transponder by turning off the AVIONICS switch, wait for a few seconds then turn the switch back on.

**Step 25:** Look several lines further down the TRANSPONDER SETUP page and find the line GPS DATA. If you have a SV-GPS-250 GPS antenna installed the system will automatically setup the GPS DATA line for you as DYNON SV-GPS-250 with a SIL level of 1. If operating in the US you are done with this section. If operating outside the US check with your controlling aviation authority (CAA) to determine what SIL level is right for your aircraft.

If operating in the US and you have installed a SV-GPS-2020 for ADS-B out compliance you will need to set this line to DYNON SV-GPS-2020. In the future this may update automatically.

**Step 26:** If operating in the US make sure that your transponder has been properly tested and inspected per FAR 91.413.

**Step 27:** We have tested the installation of the SV-GPS-2020 antenna and ADS-B out system and found that it meets the FAA requirements. There is therefore no requirement to request a compliance report. With the GPS antenna located beneath the cowling, we are aware that some ELSA aircraft may use paint types that may hinder the GPS signal. For this reason after flying for several hours in an area with ADS-B coverage apply for a compliance report by sending the following information to

[9-AWA-AFS-300-ADSB-AvionicsCheck@faa.gov](mailto:9-AWA-AFS-300-ADSB-AvionicsCheck@faa.gov)

N Number:

ADS-B Transmitter: Dynon Avionics SkyView SV-XPNDR-261 transponder

GPS: Dynon Avionics SV-GPS-2020

## AOA:

**Step 28:** Perform the ZERO PRESSURE IAS/AOA CALIBRATION under HARDWARE CALIBRATION > ADAHRS CALIBRATION.

**Step 29:** If setting up the AOA for the first time load 12-AOA-PRE-SETS\_MM-DD-YY.dfg.

**Congratulations your system is now up to date! Check that all systems are functioning properly.**

### **Keeping it up to date:**

Using the above procedure you now have the latest software, sensor definitions and settings but remember before flying for the first time update the SkyView Aviation and Obstacle Databases, Base Map/Cultural Data and SkyView Terrain Databases.

These are available from the Dynon [web site](#). Aviation and obstacle databases should be updated monthly. When making this monthly update check that you have the latest copies of the terrain and base map databases.

For a dual screen installation SkyView Aviation and Obstacle Databases, Base Map/Cultural Data and SkyView Terrain Databases will need to be loaded independently to [both screens](#).



## Initial Installation:

If you are performing your initial setup of a SkyView System, perform the following steps to ensure that all components are configured and all that all of your SkyView Network modules are communicating with each other:

**Step 1:** From the primary display only, set the Tail Number. If in the US Hex Codes for US tail numbers starting with N will be computed automatically.

Non-US Customers must also set the Hex Code under SETUP MENU > SYSTEM SETUP > AIRCRAFT INFORMATION  
The websites [http://registry.faa.gov/aircraftinquiry/NNum\\_Inquiry.aspx](http://registry.faa.gov/aircraftinquiry/NNum_Inquiry.aspx) and <http://www.airframes.org> (non-US) provides HEX Codes for most countries' aircraft that can be directly inputted into SkyView.

**Step 2:** With your entire SkyView system powered on, including the autopilot switch, go to SETUP MENU > SYSTEM SETUP > SKYVIEW NETWORK SETUP > CONFIGURE and to perform a SkyView Network configuration.

**Step 3:** Enable Autopilot function by calibrating the autopilot servos. This is done under SETUP MENU > HARDWARE CALIBRATION > AP SERVO CALIBRATION > CALIBRATION...

**Step 4:** Perform calibrations for your **fuel tanks** and **elevator trim** to enable these indications. These can be found in SETUP MENU > HARDWARE CALIBRATION > EMS CALIBRATION.

**Trim:** When the AST (Anti Servo Tab) is in the takeoff position and the stabilator is moved to its full up position, their relative position should look like photo below:



**CAUTION:** The exact neutral trim position for take-off will depend on loading and the individual aircraft. The pilot should be ready to apply forward or aft control pressure as necessary to establish and hold the desired take off attitude.

### Takeoff Position

With the AST in the correct position for take-off, raise the trailing edge of the stabilator until it hits the control stop. The AST should be in the position shown.

- a) Enable the Auto-Pilot Auto-trim feature if the SV-AP-PANEL and SV-KNOB-PANEL are installed by performing the required calibration steps. This is covered in Steps 9 and 10 above for aircraft that are upgrading from a software version before 12.0 software, which introduced this feature to all customers. It also applies to new installations.
- b) If you have a SkyView SV-BAT-320 backup battery installed, perform the required Initial Backup Battery Test. Full instructions for this procedure are in the SkyView System Installation Guide.

## Common errors and mistakes:

**Red X on Com and/or Transponder:** Is the avionics switched on?

**Numerous functions randomly have a red X:** Most likely the battery voltage has dropped too low. Place the aircraft on a battery charger.

**Transponder will not switch out of standby mode:** Have you entered the HEX CODE?

**ADS-B/TIS** shows “Not Available”: See Step 11 and Step 12.

**Autopilot not functioning:** Is the autopilot switch on? Is the Autopilot fuse blown? Did you load the incorrect autopilot .dfg file or forget to load the file? See Steps 7 & 8. Have you performed the initial autopilot configuration steps? If you've never used the autopilot, it must be configured per the Dynon SkyView System Installation Guide.

**RV-12 SkyView Installation does not display frequencies from the COM radio on the SkyView:** Download Section 42K from the RV-12 Service Information page of the Van's Aircraft web site. Complete the last page of the section to add a missing wire that is most likely causing the problem.

**Difficulty with the system recognizing other items on the network:** This could be the second screen, autopilot servos, etc. Try performing a network configure and/or force network load to clear up the problem.

If you have a second dual screen both displays have to be at the same version of software / firmware. Update both displays to the latest software / firmware.

**EGT:** Some aircraft in the past have experienced EGT's swapped left and right. After installing the software and settings from the Van's Aircraft web site double check using a hair dryer or heat gun that the EGT's are installed on the correct (left or right) side of the aircraft. If the sensors are backwards then swap the sensors at the junction of the thermocouple wires to the firewall forward harness. See KAI Section 48.

**Settings / flight data writing to USB but USB Stick is blank:** If a USB memory stick is installed in the USB ports built into the back of the EFIS data will be written to those USB locations before being written to the remote USB location below the panel. Remove all Wi-Fi adaptors and USB sticks with charts etc from the back of the screen to regain functionality of the remote USB location.

**USB not recognized by EFIS screen:** Try a different USB stick. Try a different computer. Try reformatting the USB stick.

**Mapping Software Error:** The mapping software code is entered into the primary EFIS display before shipment to the customer. This code is loaded on the primary EFIS screen (PFD). The code will automatically transfer to the second screen (MFD) when connected to the primary.

If your screen is displaying the error “Map Trial Mode” or “Trial Expired” then you do not have a map license entered. This could be because:

- 1) You bought an EFIS screen from another party (in which case you will need to purchase a new map license from Dynon)
- 2) The screen was repaired and returned from Dynon and the mapping code was not transferred to the new screen. Contact Dynon with the serial number on the back of your PFD screen and your RV-12 builder information. A new mapping code will be sent to you.
- 3) A new screen was shipped to you and the code was not setup before shipment. Contact Dynon with the serial number on the back of your PFD screen and your RV-12 builder information. A new mapping code will be sent to you.

*NOTE: If any the links or references within this read me are out of date, please notify us and as soon as time permits we will update this document.*

## **Revision Summary:**

*This summary tracks changes to the software settings files and the readme document.*

### *Rev 5 02-19-16*

- 2) *Support and Setup Information has been added for ADS-B out. We have added a new section for GPS and TRANSPONDER setup. ADS-B out will require installation of the new SV-GPS-2020 antenna, see notification N 16-01-16 available on the RV-12 service information page.*
- 3) *NOTE: Second GPS All 5 serial ports (ELT, ADS-B, XPNDR, COM, GPS) are in use. There is no room for a second GPS (if upgrading there is no room for the old SV-GPS-250 to be installed as a second GPS). Some older aircraft not using ELT may consider using that port for a second GPS (you are on your own if you go down this path!). We consider the positional accuracy provided by GPS data to the ELT to be of greater safety benefit than a second GPS. Remember this is a VFR aircraft.*
- 4) *Updated transponder software that must be installed from the EFIS setup menu after loading the main .duc file. We have added a step in the dfg section for transponder to help with this process.*
- 5) *Added best glide speed  $V_g$  and sink rate at  $V_g$  to the main settings file as well as turning on the glide ring by default. The best glide airspeed and sink rate will change with aircraft weight. The best glide parameters used are for a weight in the middle of the range between the stated RV-12 solo weight and max gross weight. These numbers are derived from testing with the engine stopped (simulating an emergency situation).*
- 6) *ADS-B is no longer reset as if not installed by the main settings file.*

### *Rev 6 06-16-16*

- 1) *Added a rev level and revision summary to the readme document to communicate rev changes to customers.*
- 2) *12-SVXX.X-PRE-SETS-MM-DD-YY.duc File: Turned on terrain warning by default*
- 3) *12-SVXX.X-PRE-SETS-MM-DD-YY.duc File:  $V_a$  (maneuvering speed) changed to  $V_a$  min (maneuvering speed at minimum weight) 72kts.  $V_a$  was 90kts or maneuvering speed at  $V_a$  max (maneuvering speed at gross weight).*
- 4) *Added "Mapping Software Error: ...." to the Common Errors & Mistakes section.*
- 5) *Under Dual Screen Final Setup a new Step 21 was added to turn off the default connection of the second screen to a backup battery. In a dual screen installation there is only one backup battery installed on the PFD (due to current limitations of the Rotax 912ULS generator).*

### *Rev 7 01-25-17*

- 1) *Added reminder step for AOA setup.*