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FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

MOONEY M20R, M20TN, M20U, M20V
Garmin G1000 With SYNTHETIC VISION SYSTEM (SVS)

MODEL NO. _____

REG. NO. _____

SERIAL NO. _____

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the GARMIN G1000 SYNTHETIC VISION SYSTEM (SVS) is installed in accordance with Mooney Drawing Numbers 810515, 810525, and 810535. The information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED: _____

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Manager, Aircraft Certification Office
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DATE: 17 July 2019

LOG OF REVISIONS

REV.	PAGES REVISED	DESCRIPTION	FAA APPROVED	DATE
–	ALL	Original Issue		10-06-2008
A	ALL ALL Title Page 17	Incorporated M20U and M20V model aircraft to supplement. Updated Notes, Cautions, & Warnings to new style. Added Drawing Numbers 810525 and 810535 Updated the Garmin CGR from –04 to –05.		

NOTE: All changes are indicated by a black vertical line along the left margin.

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SECTION I – GENERAL

Garmin G1000 General

The optional Synthetic Vision System (SVS) is a visual enhancement to the Garmin G-1000 Integrated Avionics System. SVS depicts a forward–looking attitude display of the topography immediately in front of the aircraft. The field of view is 30 degrees to the left and 35 degrees to the right. SVS information is shown on the Primary Flight Display (PFD), or on the Multifunction Display (MFD) in Reversionary Mode. The depicted imagery is derived from the aircraft attitude, heading, GPS three–dimensional position, and a nine arc–second database of terrain, obstacles, and other relevant features. The terrain data resolution of nine arc–seconds, meaning that the terrain elevation contours are stored in squares measuring nine arc–seconds on each side, is required for the operation of SVS. Loss of any of the required data, including temporary loss of the GPS signal, will cause SVS to be disabled until the required data is restored.

The SVS terrain display shows land contours, large water features, towers, and other obstacles over 200' AGL that are included in the obstacle database. Cultural features on the ground such as roads, highways, railroad tracks, cities, and state boundaries are not displayed even if those features are found on the MFD map. The terrain display also includes a north–south east–west grid to assist in orientation relative to the terrain. The colors used to display the terrain elevation contours are similar to that of the topo map display.

FIGURE 1–1 SYNTHETIC VISION IMAGERY

SYNTHETIC VISION SYSTEM (SVS) – OPERATION

1. SVS is activated from the PFD using the softkeys located along the bottom edge of the display. Pressing the softkeys turns the related function on or off. When SVS is enabled, the pitch ladder increments are reduced to 10 degrees up and 7.5 degrees down.

2. SVS functions are displayed on three levels of softkeys. The **PFD** Softkey leads into the PFD function softkeys, including synthetic vision. Pressing the **SYN VIS** Softkey displays the SVS

feature softkeys. The softkeys are labeled **PATHWAY**, **SYN TERR**, **HRZN HDG**, and **APTSIGNS**. The **BACK** Softkey returns to the previous level of softkeys. Synthetic Terrain must be active before any other SVS feature may be activated.

3. **HRZN HDG**, **APTSIGNS**, and **PATHWAY** Softkeys are only available when the **SYN TERR** Softkey is activated (gray with black characters). After activating the **SYN TERR** Softkey, the **HRZN HDG**, **APTSIGNS**, and **PATHWAY** softkeys may be activated in any combination to display desired features. When system power is cycled, the last selected state (on or off) of the **SYN TERR**, **HRZN HDG**, **APTSIGNS**, and **PATHWAY** softkeys is remembered by the system.

   a. **PATHWAY** (if activated) – Softkey enables display of rectangular boxes that represent course guidance.

-NOTE-

It is recommended that the PATHWAY feature be flown in a number of flight profiles (Enroute, Approach, etc.) under VFR conditions to determine its usefulness to the Pilot in Command under future IMC conditions. In some flight profiles (such as Crosswind Approach and Landing), the SVS may display the Pathway and Flight Path Marker to one side or other of the aircraft because the synthetic terrain is referenced to the aircraft's heading, and the Pathway and Flight Path Marker are referenced to the aircraft's course. While this is an accurate depiction of the aircraft on Approach heading, but "crabbing" due to wind direction, some Pilots may find Pathways distracting. It is recommended that the PATHWAY feature be disabled during Approach if the Pilot in Command finds it distracting.

   b. **SYN TERR** – Softkey enables synthetic terrain depiction.

   c. **HRZN HDG** (if activated) – Softkey enables horizon heading marks and digits.

   d. **APTSIGNS** (if activated) – Softkey enables airport signposts.

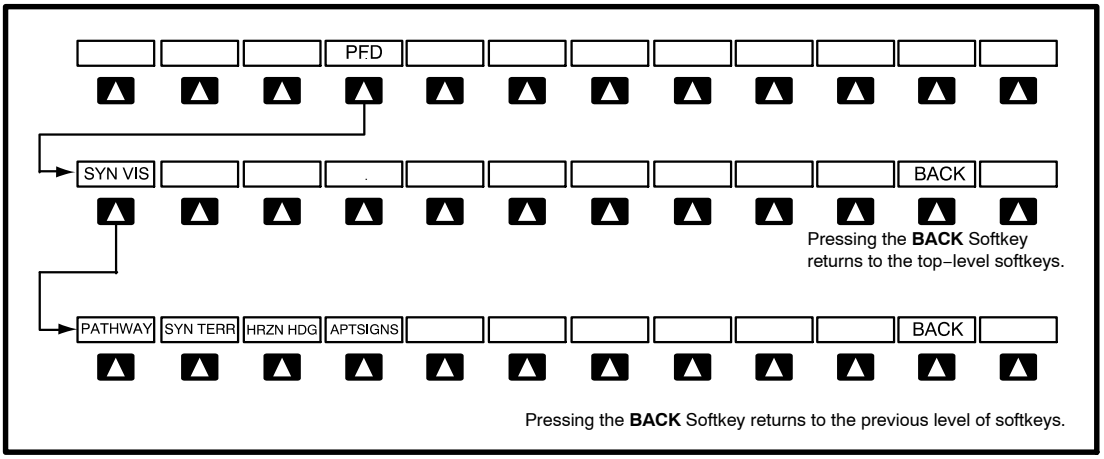

FIGURE 1–3 SVS SOFTKEYS

Activating and deactivating SVS:

1) Press the **PFD** Softkey.
2) Press the **SYN VIS** Softkey.
3) Press the **SYN TERR** Softkey. The SVS display will cycle on or off with the **SYN TERR** Softkey.

Activating and deactivating Pathways: (To toggle use "4-1-1" press softkey 4, softkey 1, softkey 1)

1) Press the **PFD** Softkey.
2) Press the **SYN VIS** Softkey.
3) Press the **PATHWAY** Softkey. The Pathway feature will cycle on or off with the **PATHWAY** Softkey.

Activating and deactivating Horizon Headings:

1) Press the **PFD** Softkey.
2) Press the **SYN VIS** Softkey.
3) Press the **HRZN HDG** Softkey. The horizon heading display will cycle on or off with the **HRZN HDG** Softkey.

Activating and deactivating Airport Signs:

1) Press the **PFD** Softkey.
2) Press the **SYN VIS** Softkey.
3) Press the **APTSIGNS** Softkey. Display of airport signs will cycle on or off with the **APTSIGNS** Softkey.

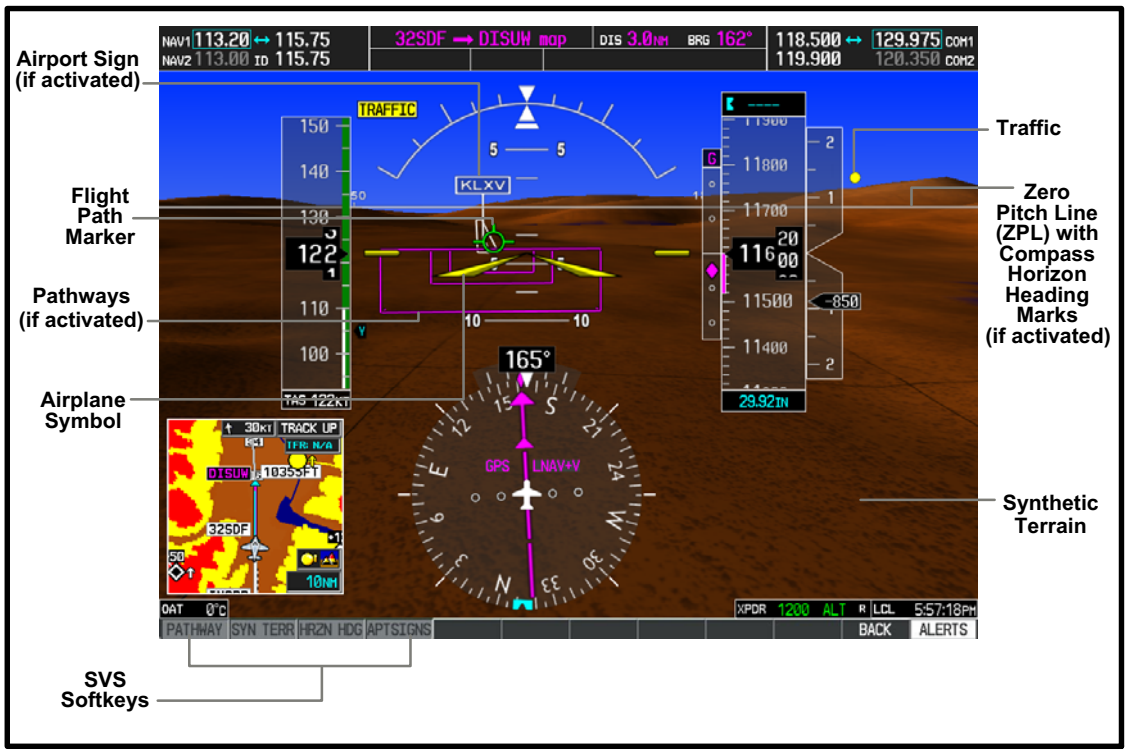

FIGURE 1–2 SYNTHETIC VISION ON PRIMARY FLIGHT DISPLAY

-NOTE-

Pathways and terrain features are not a substitute for standard course and altitude deviation information provided by the CDI, VSI, and VDI.

SYNTHETIC VISION SYSTEM (SVS) – FEATURES

PATHWAYS (If activated)

Pathways provide a three–dimensional perspective view of the selected route of flight shown as colored rectangular boxes representing the horizontal and vertical flight path of the active flight plan. The box size represents 700 feet wide by 200 feet tall during enroute, oceanic, and terminal flight phases. During an approach, the box width is 700 feet or one half full scale deviation on the HSI, whichever is less. The height is 200 feet or one half full scale deviation on the VDI, whichever is less. The altitude at which the pathway boxes are displayed is determined by the higher of either the selected altitude or the VNAV altitude programmed for the active leg in the flight plan (Figure 1–2). The color of the rectangular boxes may be magenta, green, or white depending on the route of flight and navigation source selected. The active GPS or GPS overlay flight plan leg is represented by magenta boxes that correspond to the Magenta CDI. A localizer course is represented by green boxes that correspond to a green CDI. An inactive leg of an active flight plan is represented by white boxes corresponding to a white line drawn on the Inset map or MFD map indicating an inactive leg.

FLIGHT PATH MARKER:

The Flight Path Marker (FPM), also known as a Velocity Vector, is displayed on the PFD at ground speeds above 30 knots. The FPM depicts the approximate projected path of the aircraft accounting for wind speed and direction relative to the three–dimensional terrain display.

The FPM is always available when the Synthetic Terrain feature is in operation. The FPM represents the direction of the flight path as it relates to the terrain and obstacles on the display, while the airplane symbol represents the aircraft heading.

The FPM works in conjunction with the Pathways feature to assist the pilot in maintaining desired altitudes and direction when navigating a flight plan. When on course and altitude the FPM is aligned inside the pathway boxes as shown (Figure 1–2).

-NOTE-

Flight Path Markers should not be used solely for establishing aircraft approach angle to landing.

The FPM may also be used to identify a possible conflict with the aircraft flight path and distant terrain or obstacles. Displayed terrain or obstacles in the aircraft's flight path extending above the FPM could indicate a potential conflict, even before an alert is issued by TAWS. However, decisions regarding terrain and/or obstacle avoidance should not be made using only the FPM.

ZERO PITCH LINE:

The Zero Pitch Line is drawn completely across the display and represents the aircraft attitude with respect to the horizon. It may not align with the terrain horizon, particularly when the terrain is mountainous or when the aircraft is flown at high altitudes.

HORIZON HEADING (If activated):

The Horizon Heading is synchronized with the HSI and shows approximately 60 degrees of compass heading in 30.degree increments on the Zero Pitch Line. Horizon Heading tick marks and digits appearing on the zero pitch line are not visible behind either the airspeed or altitude display. Horizon Heading is used for general heading awareness, and is activated and deactivated by pressing the **HRZN HDG** Softkey.

TRAFFIC:

-WARNING-

Intruder aircraft at or below 500 ft. AGL may not appear on the SVS display or may appear as a partial symbol.

Traffic symbols are displayed in their approximate locations as determined by the related traffic systems. Traffic symbols are displayed in three dimensions, appearing larger as they are getting closer, and smaller when they are further away. Traffic symbols and coloring are consistent with that used for traffic displayed in the Inset map or MFD traffic page. If the traffic altitude is unknown, the traffic will not be displayed on the SVS display. For more details refer to the traffic system discussion in the Hazard Avoidance section.

AIRPORT SIGNS (If activated):

Airport Signs provide a visual representation of airport location and identification on the synthetic terrain display. When activated, the signs appear on the display when the aircraft is approximately 15 nm from an airport and disappear at approximately 4.5 nm. Airport signs are shown without the identifier until the aircraft is approximately eight nautical miles from the airport. Airport signs are not shown behind the airspeed or altitude display. Airport signs are activated and deactivated by pressing the **APTSIGNS** Softkey.

RUNWAYS:

Runway data provides improved awareness of runway location with respect to the surrounding terrain. As runways are displayed, those within 45 degrees of the aircraft heading are displayed in white. Other runways will be gray in color. When an approach for a specific runway is active, that runway will appear brighter and be outlined with a white box, regardless of the runway orientation as related to aircraft heading. As the aircraft gets closer to the runway, more detail such as runway numbers and centerlines will be displayed.

1. Overview

With the introduction of Synthetic Vision Technology (SVT), Garmin added a feature whereby three dimensional representations of airport runways were added to the PFD display. Recent flight testing has identified a possible scenario wherein the position of the runway display on the PFD appears at an altitude noticeably different (higher in nearly all cases) than the actual altitude of the runway end point.

2. Analysis

When depicting an airport environment synthetically; there are many elevations to consider including airport terrain, airport (field) elevation, runway elevations at each end of each runway, and the touchdown zone elevations reported with instrument approaches. In order to provide an easily understandable depiction of the airport environments with multiple runways at differing altitudes, Garmin SVT software currently “Levels” the airport environment on the PFD display by using the airport field elevation as the altitude reference for all runways (lower altitude runways are synthetically raised up to the airport field elevation). “Leveling” the airport environment was a design decision intended to avoid the following undesirable effects that would otherwise be present at certain locations if using the actual runway elevations along with the available terrain database:

- Depiction of intersecting runways at different elevations when only the runway endpoint elevations are known.
- Misalignment of terrain and runway surfaces.
- Possibility of subterranean depiction.
- Minimize possibility of the aircraft appearing above the runway when it is actually on it.

The airport field elevation was chosen as the level reference, as it is identified by the ARINC Navigation Systems Database Specification 424–18 as the highest elevation of any landing surface on the airport in most cases. The choice to use the highest runway end elevation (the airport field elevation) was chosen for conservatism.

The result of “leveling” the airport environment yields less than 10’ of error in elevation at over 25,000 runways worldwide. At a select few airports with runways with end point altitudes significantly different than the airport field elevation, the resultant artificially raised runway altitude can result in a three dimensional runway image on the PFD that does not match the position as viewed from the cockpit when in close proximity to the runway (less than 200’ AGL, 2800’ from the runway). The degree to which the pilot can detect the mismatch is dependent on both the magnitude of altitude difference as well as the distance from the runway. At larger distances to the runway, the difference in the actual runway and displayed runway is small. Closer to the runway, the mismatch becomes more observable at those runways with significant altitude variations (runway altitude variations greater than 100’ from field elevation) due to the increased size of the synthetic display of the airport environment.

3. Operational Impact

As part of the initial Garmin SVT certification, multiple Garmin and FAA test pilots evaluated the operation of the FPM and display of runways and found it acceptable (did not detect any noticeable error in the runway depiction on those runways evaluated). The difference associated with depicting the runway elevation is zero or undetectable (at 200' AGL, 2800' from runway end) on approximately 99.6% of all runways worldwide.

For the purposes of determining acceptable altitude variation on the PFD runway display, the following flight scenario was considered:

• Garmin considered the conservative condition where an aircraft might be flying a precision approach in IMC to decision height (200' above ground level).

• Analysis was conducted assuming a standard three degree glideslope (2800' from runway end), such that the aircraft transitioned to visual flight conditions and acquired the airport environment at the decision height.

To conduct the simulation, altitude was artificially adjusted to reproduce the runway depiction that might be seen with the various runway and airport field elevation differences while holding the above variables constant. The following screen shots provide a sample comparison of the PFD display of SVS runways at 200' AGL and 2800' from the runway threshold:

FIGURE 1–3 Runway Depiction with Zero Altitude Error

FIGURE 1–4 Runway Depiction with 100’ Altitude Error

FIGURE 1–5 Runway Depiction with 200’ Altitude Error

As can be seen in the above screen shots, with 200 or more feet of difference between airport field elevation and runway end point elevation, the runway environment becomes nearly invisible due to the three dimensional perspective when drawn at the airport field elevation. Based on past flight experience and the actual displayed runway size at the condition analyzed, Garmin assesses that runway placement within one FPM diameter of the actual runway threshold is within a range that would otherwise not be detectable at the condition analyzed (200' AGL, 2800' from runway threshold). As such, Garmin asserts that runway elevation differences of 100' or less (from the airport field elevation) would likely not be detectable by most pilots.

Based on review of the current 0808 navigation database, there are only 135 runways (listed below) worldwide (out of >33,000) where the elevation depiction difference is greater than 100'.

Identifier	Runway	Elevation Difference	City	State	Name
SPJB	RW05	430	CAJABAMBA		PAMPA GRANDE
SPJB	RW23	430	CAJABAMBA		PAMPA GRANDE
PAEH	RW14	311	CAPE NEWENHAM	AK	CAPE NEWENHAM LRRS
FAMI	RW04	300	MARBLE HALL		MARBLE HALL
FAMI	RW22	300	MARBLE HALL		MARBLE HALL
SCBE	RW13	275	TOCOPILLA		BARRILES
SCBE	RW31	275	TOCOPILLA		BARRILES
CFZ3	RW36	260	MEDICINE HAT	AB	SCHLENKER
SVMD	RW06	217	MERIDA		ALBERTO CARNEVALLI
CFZ3	RW25	214	MEDICINE HAT	AB	SCHLENKER
ZMUB	RW14	213	ULAANBAATAR		CHINGGIS KHAAN INTL
LFLJ	RW22	212	COURCHEVEL		COURCHEVEL
ZMUT	RW16	208	ULIASTAI		ULIASTAI
LDZU	RW13	207	UDBINA		UDBINA
ZMUB	RW15	206	ULAANBAATAR		CHINGGIS KHAAN INTL
PASV	RW34	202	SPARREVOHN	AK	SPARREVOHN LRRS
SLLP	RW10	202	LA PAZ		EL ALTO INTL
LFJE	RW03	197	LA MOTTE		CHALANCON
AYMN	RW17	195	MENDI		MENDI
HECA	RW05L	192	CAIRO		CAIRO INTL
ZMED	RW34	191	ERDENET		ERDENET
CFZ3	RW18	190	MEDICINE HAT	AB	SCHLENKER
SCCF	RW10	189	CALAMA		EL LOA
PAIM	RW24	184	UTOPIA CREEK	AK	INDIAN MOUNTAIN LRRS
HECA	RW23R	183	CAIRO		CAIRO INTL
HECA	RW16	181	CAIRO		CAIRO INTL
HADR	RW33	179	DIRE DAWA		DIRE DAWA INTL
OAZI	RW01L	172	CAMP BASTION		CAMP BASTION
UTFN	RW28	170	NAMANGAN		NAMANGAN
OAZI	RW01R	168	CAMP BASTION		CAMP BASTION
OIII	RW29L	168	TEHRAN		MEHRABAD INTL
AYMN	RW35	165	MENDI		MENDI
OIII	RW29R	165	TEHRAN		MEHRABAD INTL
KBIL	RW28R	164	BILLINGS	MT	BILLINGS LOGAN INTL
SPTN	RW02	163	TACNA		COL CARLOS CIRIANI SANTA ROSA
CFZ3	RW07	162	MEDICINE HAT	AB	SCHLENKER
ZMAH	RW32	161	ARVAIKHEER		ARVAIKHEER
OPPC	RW34	159	PARACHINAR		PARACHINAR
KSAA	RW23	158	SARATOGA	WY	SHIVELY
LFHU	RW06	158	L ALPE D HUEZ		L ALPE D HUEZ
SPZO	RW28	158	CUZCO		TNTE FAP ALEJANDRO VELAZCO AST

Identifier	Runway	Elevation Difference	City	State	Name
LFIP	RW10	157	PEYRESOURDE		BALESTAS
WY00	RW10	156	TEN SLEEP	WY	RED REFLET RANCH
OAZI	RW19L	155	CAMP BASTION		CAMP BASTION
OAZI	RW19R	152	CAMP BASTION		CAMP BASTION
ZMKD	RW15	152	KHOVD		KHOVD
LFJD	RW12	151	CORLIER		CORLIER
SCRG	RW03	151	RANCAGUA		DE LA INDEPENDENCIA
SCRG	RW21	151	RANCAGUA		DE LA INDEPENDENCIA
SVVL	RW21	148	VALERA		DR ANTONIO NICOLAS BRICENO
KPUC	RW36	145	PRICE	UT	CARBON COUNTY REGIONAL BUCK DA
LFKC	RW18	145	CALVI		ST CATHERINE
UTDK	RW01	145	KULYAB		KULYAB
KPUC	RW32	144	PRICE	UT	CARBON COUNTY REGIONAL BUCK DA
SLPO	RW24	144	POTOSI		NICOLAS ROJAS
ZMHU	RW09	143	KHUJIRT		KHUJIRT
KCOS	RW35L	142	COLORADO SPRINGS	CO	CITY OF COLORADO SPRINGS MUN
KASE	RW15	140	ASPEN	CO	ASPEN PITKIN CO SARDY
KDEN	RW26	140	DENVER	CO	DENVER INTL
FYWH	RW26	139	WINDHOEK		HOSEA KUTAKO INTL
KEED	RW20	139	NEEDLES	CA	NEEDLES
KANK	RW24	138	SALIDA	CO	ALEXANDER
OITK	RW15	138	KHOY		KHOY
W24	RW28	138	LYNCHBURG	VA	FALWELL
KLAS	RW25R	137	LAS VEGAS	NV	MC CARRAN INTL
MMIO	RW17	136	SALTILLO		PLAN DE GUADALUPE INTL
SVSO	RW29	136	SANTO DOMINGO		MAYOR BUENAVENTURA VIVAS INTL
SPQU	RW09	135	AREQUIPA		RODRIGUEZ BALLON
KFHU	RW21	134	FT HUACHUCA	AZ	SIERRA VISTA MUN LIBBY AAF
SVMI	RW27	134	MAIQUETIA		SIMON BOLIVAR INTL
KLAS	RW25L	133	LAS VEGAS	NV	MC CARRAN INTL
KVBG	RW12	131	LOMPOC	CA	VANDENBERG AFB
SETM	RW06	131	LA TOMA		CAMILO PONCE ENRIQUEZ
KONM	RW33	129	SOCORRO	NM	SOCORRO MUN
OYTZ	RW01	129	TAIZ		TAIZ INTL
UTFF	RW18	128	FERGANA		FERGANA
SKMU	RW02	127	MITU		LEON BENTLEY
FAPI	RW08	126	PIETERSBURG		PIETERSBURG
SKMU	RW20	124	MITU		LEON BENTLEY
LGEL	RW36	123	ELEFSIS		ELEFSIS AB
FALA	RW24R	120	LANSERIA		LANSERIA INTL
HALL	RW10	120	LALIBELLA		LALIBELLA
KFHU	RW26	120	FT HUACHUCA	AZ	SIERRA VISTA MUN LIBBY AAF
LUKK	RW26	120	CHISINAU		CHISINAU INTL
KOLS	RW03	119	NOGALES	AZ	NOGALES INTL
OPSS	RW05	119	SAIDU SHARIF		SAIDU SHARIF
KBIL	RW25	118	BILLINGS	MT	BILLINGS LOGAN INTL

Identifier	Runway	Elevation Difference	City	State	Name
KTHP	RW19	118	THERMOPOLIS	WY	HOT SPRINGS CO MUN
OYSQ	RW21	116	MOORI		SOCOTRA INTL
SASJ	RW34	116	JUJUY		GOBERNADOR HORACIO GUZMAN
KDMA	RW12	115	TUCSON	AZ	DAVIS MONTHAN AFB
KMHV	RW30	115	MOJAVE	CA	MOJAVE
LEMD	RW33R	114	MADRID		BARAJAS
MPTO	RW03R	113	PANAMA CITY		TOCUMEN INTL
KDEN	RW16R	112	DENVER	CO	DENVER INTL
SEAM	RW01	112	AMBATO		CHACHOAN
OETF	RW25	111	TAIF		TAIF
SPLP	RW01	110	LIMA		LAS PALMAS
17XS	RW01	108	DUBLIN	TX	QUAHADI RANCH
FVHA	RW05	108	HARARE		HARARE INTL
KBJC	RW29R	108	DENVER	CO	ROCKY MOUNTAIN METROPOLITAN
SKMZ	RW28	108	MANIZALES		LA NUBIA
FALA	RW24L	107	LANSERIA		LANSERIA INTL
KDEN	RW34L	107	DENVER	CO	DENVER INTL
KFHU	RW12	107	FT HUACHUCA	AZ	SIERRA VISTA MUN LIBBY AAF
KPRC	RW21R	107	PRESCOTT	AZ	LOVE
LTCN	RW07	107	KAHRAMANMARAS		KAHRAMANMARAS
OBBS	RW33	107	BAHRAIN		SHAIKH ISA
SPJA	RW16	107	RIOJA		RIOJA
SPJA	RW34	107	RIOJA		RIOJA
DNMN	RW05	106	MINNA		MINNA
FATZ	RW24	106	TZANEEN		TZANEEN
KDEN	RW17L	106	DENVER	CO	DENVER INTL
YPXM	RW36	106	CHRISTMAS I	WA	CHRISTMAS I
LDPL	RW09	105	PULA		PULA
LKPA	RW15	105	POLICKA		POLICKA
SASA	RW24	105	SALTA		GEN DON MARTIN MIGUEL DE GUEM
KAPV	RW08	104	APPLE VALLEY	CA	APPLE VALLEY
KFHU	RW30	104	FT HUACHUCA	AZ	SIERRA VISTA MUN LIBBY AAF
YMML	RW34	104	MELBOURNE	VI	MELBOURNE INTL
CEL6	RW12	103	TWO HILLS	AB	TWO HILLS
CEL6	RW30	103	TWO HILLS	AB	TWO HILLS
OMFJ	RW29	103	FUJAIRAH		FUJAIRAH INTL
OSKL	RW03	103	KAMISHLY		KAMISHLY
SCFA	RW01	103	ANTOFAGASTA		CERRO MORENO INTL
FKKR	RW09	102	GAROUA		GAROUA
KMRY	RW10R	102	MONTEREY	CA	MONTEREY PENINSULA
KREI	RW08	102	REDLANDS	CA	REDLANDS MUN
LFHM	RW16	102	MEGEVE		MEGEVE
UMM	RW03	102	SUMMIT	AK	SUMMIT
BGBW	RW07	101	NARSARSUAQ		NARSARSUAQ
GMMB	RW14	101	BENSLIMANE		BENSLIMANE
KLAS	RW19L	101	LAS VEGAS	NV	MC CARRAN INTL
KTYL	RW21	101	TAYLOR	AZ	TAYLOR MUN
LPPS	RW36	101	PORTO SANTO		PORTO SANTO

4. Mitigating Factors

When considering the impact of the above condition, the following mitigating factors should be considered:

• The SVT system and PFD display of the runway environment is clearly intended to provide increased situational awareness and should not be relied upon as a sole means to maneuver the aircraft.

• The position of the runway environment is ONLY raised to the position of the airport field elevation for purposes of PFD runway display. All SVS−Terrain and TSO−C151b TAWS−B alerting functionality is correctly triggered based off of the actual location of the terrain data. In other words, no nuisance or missing terrain alerts would occur as a result these differences between the airport field elevation and runway end point elevation.

• The required navigational aids are correct in all instances. The vertical deviation / glideslope indicator correctly provides the appropriate vertical navigation information that the pilots must be following at all times when conducting an instrument approach.

• When landing at most any runway at any airport, the depiction error, when present, causes the pilot using FPM guidance to attempt to land at an altitude higher than needed (not lower than needed), which puts the aircraft in a stabilized descent to a point above the runway threshold and not below.

5. Affected Aircraft

All G1000−equipped aircraft with GDU v9.00 or later software and SVT enabled are affected. A future TBD GDU software version is currently planned to implement improvements in this functionality. This issue will be fully resolved in later GDU software versions starting with GDU software version 9.02.

6. Field Notification

To provide general awareness for currently fielded SVT installations on the intended operation of PFD runway display at airports with multiple runways with more than 100’ of elevation difference, Garmin is tentatively planning to release a Service Advisory within the next two weeks to inform users of this operation at the 135 affected runways. Garmin intends to provide OEM organizations a copy of the planned Service Advisory as soon as it becomes available.

7. Corrective Action

Garmin is committed to improve the performance of the SVT system when used close to the runway environment at locations where the runway/airport field elevation differences exceed 100’. To mitigate this issue for present certifications, Garmin recommends that a temporary notice regarding this issue may be provided in the Airplane Flight Manual (AFM) that includes a list of the 135 affected airports.

TERRAIN–SVS and TAWS ALERTING:

Terrain alerting on the synthetic terrain display is triggered by Forward–looking Terrain Avoidance (FLTA) alerts, and corresponds to the red and yellow X symbols on the Inset Map and MFD map displays. For more detailed information regarding Terrain–SVS and TAWS, refer to the Hazard Avoidance Section. In some instances, a terrain or obstacle alert may be issued with no conflict shading displayed on the synthetic terrain. In these cases, the conflict is outside the SVS field of view to the left or right of the aircraft.

FIGURE 1–6 TERRAIN ALERT

OBSTACLES:

Obstacles are represented on the synthetic terrain display by standard two–dimensional tower symbols found on the Inset map and MFD maps and charts. Obstacle symbols appear in the perspective view with relative height above terrain and distance from the aircraft refer to figure 1–7. Unlike the Inset map and MFD moving map display, obstacles on the synthetic terrain display do not change colors to warn of potential conflict with the aircraft's flight path until the obstacle is associated with an actual FLTA alert. Obstacles greater than 1000 feet below the aircraft altitude are not shown. Obstacles are shown behind the airspeed and altitude displays.

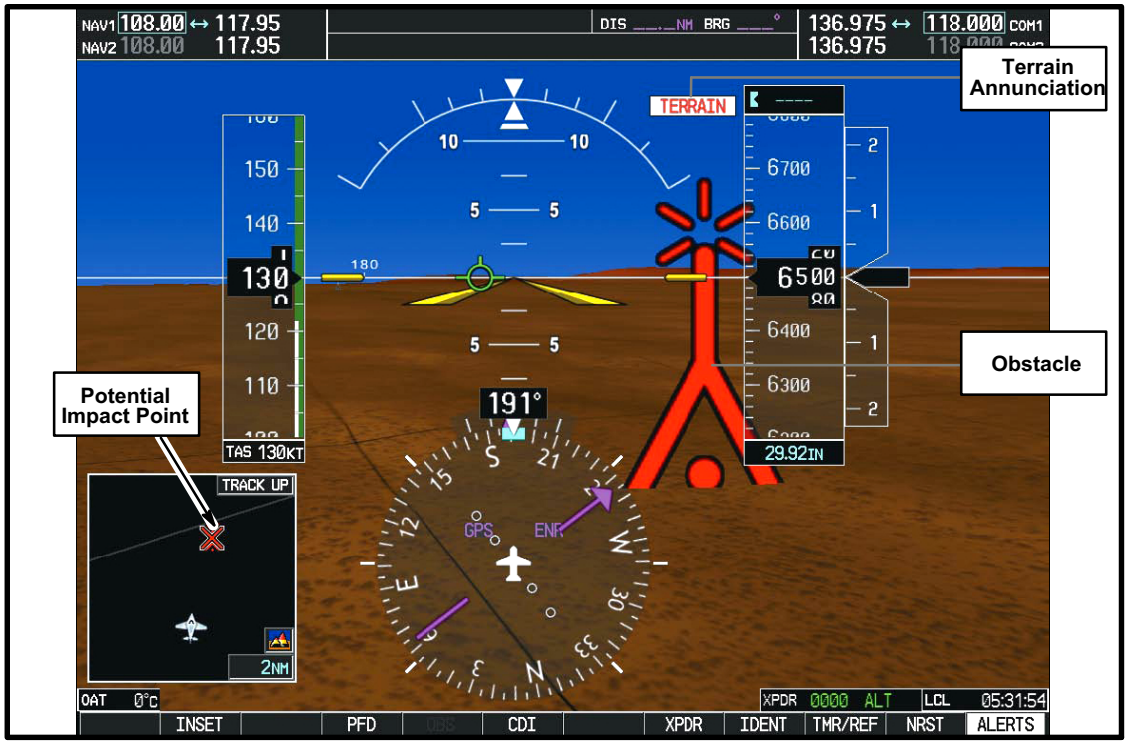

FIGURE 1–7 OBSTACLE ALERT

SECTION II – LIMITATIONS

-NOTE-

SVS is not intended to be used alone for aircraft control, navigation, obstacle and terrain avoidance, or to avoid other aircraft. Do not rely on SVS for Taxi, Take-Off and Landing.

GENERAL

1. The GARMIN G1000 Cockpit Reference Guide for the M20R, M20TN, M20U, AND M20V Series aircraft, P/N 190–00450–05, Revision A or later FAA approved revision must be immediately available to the flight crew.

2. The terrain display is intended for situational awareness only. It may not provide the accuracy or fidelity on which to base decisions and plan maneuvers to avoid terrain or obstacles. Navigation must not be predicated solely upon the use of the Terrain – SVS or TAWS terrain or obstacle data displayed by the SVS. The following SVS enhancements appear on the PFD:

- Pathways (if activated)
- Flight Path Marker
- Horizon Heading Marks (if activated)
- Traffic Display
- Airport Signs (if activated)
- Runway Display
- Terrain Alerting
- Obstacle Alerting

SECTION III – EMERGENCY PROCEDURES

No Changes to Section III.

SECTION IV – NORMAL PROCEDURES

No Changes to Section IV.

SECTION V – PERFORMANCE

PERFORMANCE CONSIDERATIONS

No changes to Section V.

SECTION VI – WEIGHT AND BALANCE

No changes to Section VI.

SECTION VII – AIRPLANE AND SYSTEM DESCRIPTION

No changes to Section VII.

SECTION VIII – HANDLING AND SERVICING

No changes to Section VIII.

SECTION IX – SUPPLEMENTAL DATA

Add this supplement to this Section

SECTION X – SAFETY TIPS

No changes to Section X.