Subject: Temporary Flight Restriction (TFR) Charting: Recommendations of the RTCA Tactical Operations Committee

Background/Discussion:

In 2016, Lynn Ray, Vice President of Mission Support Services and the Designated Federal Official of the RTCA Tactical Operations Committee, tasked industry to make recommendations regarding graphical TFRs. The committee, co-chaired by AOPA and Jeppesen, delivered their final report to the FAA in December 2016, which contained several charting recommendations.

1. Long-term TFRs should be charted on Sectional and Terminal Area Charts.

The FAA does not have standardized criteria for determining when a TFR should be depicted on a Sectional or Terminal Area Chart. Several TFRs of lengthy duration, specifically Kennedy Space Center, Camp David, and Washington D.C., have been charted for years while in 2016, the Disney Land and Disney World TFRs were added to their geographically affiliated chart. Charting TFR airspace has been shown to increase awareness and compliance. The most notable impact has been the reduction in the incursion rate occurring in the Washington D.C. area.

The 2005 Volpe study on TFRs noted the benefits of having long-term TFRs charted as it increases awareness of the restrictions within an area thereby increasing compliance. Charting this airspace also increases comprehension of the NOTAM and reduces the opportunity for an incursion. Human factors dictate that a visual depiction enhances awareness and vastly reduces loss of information in translating large sections of text into an avoidance area along a pilot's route of flight.

The VFR pilots who choose not to talk to air traffic control are the target audience for this intervention as they are the individuals most likely to violate a TFR unknowingly. Sectional and Terminal Area Charts are the primary resource for VFR navigation and are therefore the most important resources on which TFRs could be charted.

2. Long-term TFRs should be identified using standardized criteria.

In order for a TFR to be designated ‘long-term’ and charted, it should first meet certain criteria. Most TFRs last a limited amount of time so few will need to be charted. Recommended criteria for identifying long-term TFRs include the following:

1. It will be necessary to issue a TFR for this airspace in the foreseeable future.
   a. Foreseeable future is considered to be at least two sectional chart cycles or 12 months.
2. The flight restriction will be consistently defined with the same lateral limits.
3. Flight restrictions will impact the airspace:
   a. At least 30 separate days of the year; or
   b. The airspace is subject to routine TFR issuance (i.e., Camp David, Kennedy Space Center).
Certain metroplex areas, such as Los Angeles and New York, are frequently impacted by VIP TFRs that encompass all of the Class B airspace. There is no benefit to charting VIP TFRs for these expansive areas as they are impacted inconsistently despite possibly meeting the 30 day per year threshold.

Exceptions dictate that the FAA discuss the projected TFR need and long-term plan with the TFR proponent prior to charting the TFR area. It is also important that the TFR proponent be engaged by the FAA regularly to ensure the TFR need is understood and that changes are optimally aligned with the VFR charting cycle.

The committee determined that the following TFRs not currently published on charts meet the proposed criteria for charting:

- Andersen Air Force Base – Radiation area (example, FDC 6/5131)
- Beale Air Force Base – Unmanned Aircraft area (example, FDC 6/3017)
- Corpus Christi Naval Air Station – Unmanned Aircraft area (example, FDC 6/2539)
- Dallas, Texas – Former President Bush (example, FDC 9/2934)
- Grand Forks Air Force Base – Unmanned Aircraft area (example, FDC 6/3025)
- Kilauea, Hawaii – Volcano (example, FDC 5/7637)
- Libby Army Airfield – Unmanned Aircraft area (example, FDC 6/4292)
- Vieques, Puerto Rico – Naval Training Range unexploded ordinance area (example, FDC 6/1484)
- *New York, New York – Trump Tower (example, FDC 7/5997)

*Not originally in report

Case study

Two examples are presented below. These airspaces have had countless TFRs issued over multiple years for unmanned aircraft operations with the same lateral and vertical limits always being restricted. The multiple complicated shapes, defined by latitude/longitude points and arcs, are difficult for pilots to interpret.

3. The FAA should retain the issuance process for long-term TFR NOTAMs, regardless of part-time or full time activation, even after that TFR NOTAM has been charted.
Maintaining the existing NOTAM process for charted TFRs is important for ensuring pilot awareness, facilitating electronic depiction of the impacted area by automation, and ensuring that operators who do not use FAA products have access to the information in a standardized manner. Continuing to utilize the NOTAM process will ensure that those TFRs which are charted, but have irregular schedules, continue to be briefed to pilots by Flight Service specialists.

4. **The FAA should standardize the charting requirement documents for TFRs to ensure consistency and to reduce pilot confusion.**

The FAA does not have a standard charting specification for TFRs on Sectional or Terminal Area Charts. The following areas are currently charted: Disney Land and Disney World, Kennedy Space Center, Washington DC, and Camp David. Each location has a different depiction method. Standardizing the symbology will improve pilot recognition, facilitate simpler education and allow uniform guidance.

![Unique charting depictions for areas governed by a TFR. From left to right, the Kennedy Space Center, Washington DC and Camp David.](image)

Additionally, the applicable TFR altitude restrictions are not being charted. Depicting the altitude floor and ceiling, such as how it is depicted for Class C airspace, would provide further dimensional information to the restriction and improve pilot compliance.

The following depiction standards for Sectional and Terminal Area Charts are suggested:

1. Utilize Disney Land/Disney World charting standard (embraces Volpe recommendation; similar to Part 93 areas).
2. Depict TFR altitude floor and ceiling in MSL similar to Class C airspace (Volpe recommendation).
3. Sustain the TFR note inclusion with reminder for the pilot to check NOTAMs.
4. For multiple TFRs in the same area, or multiple areas within the same TFR, delineate the different areas and provide the altitude floor and ceiling for each area. We recommend utilizing the same solid blue line used for the boundary to define the different individual areas.
5. If a long-term TFR area has inconsistent altitude restrictions but consistent lateral dimensions (e.g., Grand Forks AFB), do not depict the altitudes on the chart, but include within the TFR a note stating that impacted altitudes vary and to check NOTAMs.
5. **The FAA should modernize the Sectional and Terminal Area Chart production process to achieve a 56-day charting cycle.**

The FAA should transition to automated, electronic chart production for Sectional and Terminal Area Charts as soon as possible to allow for reduced time between publication cycles. Reducing the amount of time between publication cycles would better facilitate the charting of TFRs and the ability to conduct “data driven” charting. Using automation would allow FAA Sectional and Terminal Area Charts to be layered so that users, at their discretion, could turn on and off certain charting symbology which would facilitate reductions in chart clutter near TFR areas.

6. **The FAA should make sporting event venues and their 3NM radius lateral rings available on controller charts.**

The FAA should provide sporting event TFR locations on the controller chart as well as the 3NM rings associated with them. Below is a mockup of a controller chart with sporting event TFR locations depicted along with the 3NM circle restrictions.

There are inconsistencies among ATC and FSS facilities in regards to passing on TFR graphics to specialists. For example, OASIS allows Flight Service specialists to see a graphic but, given they are not always available, there is potential for missing this in briefings. This is similar to a pilot missing a TFR because there is no graphic provided. The FAA should make it mandatory that every ATC facility provide a TFR graphic to their controllers and allow the controllers to depict the impacted areas on their displays.
If an actual graphic depiction is consistently attached to the TFR data, that depiction could be distributed to ATC. An account has been provided by a committee member detailing a current practice of TFR circles and polygons being hand drawn on an applicable portion of a sectional chart. The "graphic" is then copied on a printer and placed at each affected sector desk.

7. **The FAA should depict sporting event venues with over 30,000 seats on ATC radar maps.**

This would allow exact location of the venue to be depicted for controllers.

8. **The FAA should depict long-term TFRs on ATC radar maps.**

This requirement will ensure consistency between facilities and reduce the need for the manual creation of the restricted area.

ERIDS can fail to parse out a TFR depending on the NOTAM’s format. ERIDS displays all NOTAMs for the area covered. If the NOTAM is valid, it will be displayed in ERIDS. If the NOTAM does not populate in ERIDS, the controller will not have the information to display the TFR. There are times when the TFR is in adjacent airspace and the controller may not have the TFR NOTAM in their ERIDS. However, controllers regularly deal with operational situations where a constraint near a sector impacts operations. In such situations, controllers regularly coordinate with each other.

**Recommendations:**

1. Long-term TFRs should be charted on Sectional and Terminal Area Charts.

2. Long-term TFRs should be identified using standardized criteria.

3. The FAA should retain the issuance process for long-term TFR NOTAMs, regardless of part-time or full-time activation, even after that TFR NOTAM has been charted.

4. The FAA should standardize the charting requirement documents for TFRs to ensure consistency and to reduce pilot confusion.

5. The FAA should modernize the Sectional and Terminal Area Chart production process to achieve a 56-day charting cycle.

6. The FAA should make sporting event venues and their 3NM radius lateral rings available on controller charts.

7. The FAA should depict sporting event venues with over 30,000 seats on ATC radar maps.

8. The FAA should depict long-term TFRs on ATC radar maps.

**Comments:**

One additional recommendation pertinent to charting was also noted by the RTCA committee. It is provided below for awareness.

1. The FAA [Sporting Event TFR] depiction is adequate and the FAA should sustain their sporting venue charting effort.
Until this year, the FAA had not depicted all venues impacted by the sporting event blanket TFR on Sectional or Terminal Area Charts. Failing to chart these locations and uniquely depict them as a location impacted by the blanket TFR increases the chance for unintentional non-compliance. The committee agreed that charting the area impacted 3NM (nautical mile) radius around sporting event TFR locations was not preferred, as these areas are inactive a majority of the time. Their depiction could create the falsehood of a constant 3NM radius restriction around stadiums.

The FAA has begun charting all venues impacted by the blanket sporting event TFR (30,000+ seats) with the symbol below:

◆ STADIUM

The STADIUM, RACEWAY, etc. naming would accompany the diamond symbol at the actual location that the TFR is predicated upon.

The participant list of the RTCA Graphical TFR Task Group that drafted the report that was approved by the Tactical Operations Committee is below (FAA participants provided subject matter expertise and do not necessarily endorse the recommendations).

Rune Duke, Aircraft Owners and Pilots Association
Julie Stewart, Bureau of Land Management
Dave Bear, Federal Aviation Administration
Trish Gay, Federal Aviation Administration
Talwyn Haley, Federal Aviation Administration
Michael Helwig, Federal Aviation Administration
Chris Henne, Federal Aviation Administration
Brian Hint, Federal Aviation Administration
Lynette Jamison, Federal Aviation Administration
Scott Jerdan, Federal Aviation Administration
Scott Leis, Federal Aviation Administration
Bob McMullen, Federal Aviation Administration
Chris Moody, Federal Aviation Administration
Tiffany Narowski, Federal Aviation Administration
Jim Perkins, Federal Aviation Administration
Ajay Sawant, Federal Aviation Administration
Matthew Thompson, Federal Aviation Administration

Mark Tomicich, Federal Aviation Administration
John Collins, Foreflight LLC
Jeremy Holman, Garmin Ltd.
Lauren Haertlein, General Aviation Manufacturers Association
Paul Freeman, Harris Corporation
Jon Reisinger, Jeppesen
Joe Daniele, Leidos
Heather Rittiner, Leidos
William L Geoghanan, National Air Traffic Controllers Association (NATCA)
Jim McClay, National Business Aviation Association
George Percivall, Open Geospatial Consortium (OGC)
Trin Mitra, RTCA, Inc.
Jim Mills, U.S. Air Force
David von Rinteln, U.S. Air Force

Submitted by: Rune Duke
Organization: AOPA
Phone: 202-509-9515
E-mail: rune.duke@aopa.org
Date: 10 March 2017
MEETING 17-02

Rune Duke, AOPA, briefed the new item. Rune said that there has been a big push from the Radio Technical Commission for Aeronautics (RTCA) on this issue. Rune stressed that making Temporary Flight Restriction (TFR) information easily accessible to pilots is very important. He stated that VFR pilots are suffering more violations because of a lack of easily accessible and timely TFR information. The RTCA Tactical Operations Committee has 8 recommendations for ways to improve how TFRs are communicated:

- Recommendation 1 – “Long-term TFRs” should be charted on Sectionals and TACs
- Recommendation 2 – “Long-term TFRs” should be identified using standardized criteria
- Recommendation 3 – Retain NOTAMs for “Long-term TFRs” even after charting
- Recommendation 4 – Standardize TFR charting depiction
- Recommendation 5 – 56-day chart cycles for Sectionals and TACs
- Recommendations 6 – Add sporting event 3 NM rings to controller charts and RVMs
- Recommendations 7, 8 – Add sporting event 3 NM rings and “Long-term TFRs” to radar video maps (RVMs)

Rune went over Recommendations 1 and 2 by briefing TFRs that are charted today on the VFR Charts and introducing the additional TFRs that are being recommended for charting. He recommended standard criteria that could be used to identify TFRs for charting (Slide #5). Rick Fecht, FAA/AJV-5223, said that he would have to take the request back for further study and discussion. He would have to investigate the definition of a long-term TFR and look at ways to identify those that meet charting criteria. Valerie Watson, FAA/AJV-553, mentioned that the NOTAM office might help with identification of “long-term TFRs” by encouraging the proponents of those areas to publish 12-month NOTAMs describing the areas. Otherwise, Valerie voiced her doubt that these areas will be able to be definitively identified as “long-term”, explaining the difficulty of adding lifespans of NOTAMs that could potentially add up to 12 months. Lynette (Jamison) McSpadden, FAA/AJR-B11, will consider how to approach that idea. It was also suggested that perhaps these long-term TFRs could be handled the same way that Special Use Areas (SUAs) are today. Valerie took the action to reach out to the Airspace and Rules office to investigate that possibility.

Rune then talked about the lack of standardization in the charting of TFRs. He feels it is important that they all be charted in exactly the same way so that pilots always know what to look for. Valerie explained that there are very specific categories of TFRs and they charted differently because they are different, particularly in the degree of consequence if they are violated. She explained that there are much graver consequences for violating the Camp David TFR when active than for violating a stadium TFR.

Ted Thompson, Jeppesen, pointed out that when certain TFRs are masked or made more prominent it gives the user the impression that that information is more important than other information, such as Special Use Areas, that are in that vicinity.

Rich Boll, NBAA, suggested that, once decided, the charting criteria would need to be explained in the AIM so users can understand why some TFRs are charted and others are not.

Discussion then shifted to Recommendation 3 regarding NOTAMs. The recommendation is that FAA retain the issuance for long-term TFR NOTAMs even after they have been charted. Lynette said that TFR NOTAMs could potentially remain active in the NOTAM system even if charted, but that she would need to investigate that policy further and report back.

Rick Fecht, FAA/AJV-5223, provided a response to Recommendation 5 regarding moving to a 56-day chart cycle for VFR Charts. Rick stated that there is no timeline yet for that change, but that this is one of AJV-5
objectives. He made clear that a 56-day VFR chart cycle would not happen until after the Visual charts have been fully automated and shared that the automation process is in its beginning stages.

Valerie commented on Recommendations 6, 7, 8 regarding adding sporting venues and TFR information to controller charts. She stated that the controller charts specifications are not under the purview of AJV-5, but under the authority of ATC. If ATC requests the addition of the data, AJV-5 can and will chart it. Bennie Hutto, NATCA, said that he would talk to the RTCA ATC representative and get more information about what this request would entail. Regarding the addition of data to Radar Video Maps (RVM), Valerie shared that these products are custom created by AJV-5, are unique for each facility and are compiled as per specific guidance from local ATC. If an ATC facility asks for the 3NM stadiums, for instance, to be added to their maps, AJV-5 will add them, all the facilities have to do is send in the request per their normal process for revisions to their maps. Bennie will communicate this to ATC.

Scott Jerdan, FAA/AJV-533, reported that he is part of an internal working group formed to respond to the RTCA recommendations which totaled over 50. He suggested that actions in the ACF should ensure that they are working in-line with this established working group.

STATUS: OPEN

ACTION: Rick Fecht, FAA/AJV-5223, will investigate “long-term” TFR definition and ways to identify those that meet charting criteria.

ACTION: Lynette (Jamison) McSpadden, FAA/AJR-B11, to investigate the possibility for “long-term TFRs” to be published as 12 month NOTAMs so that they can be identified as “long-term”. Lynette also will research NOTAM policy to determine if NOTAMs on “long-term TFRs” can remain active after the TFR has been charted.

ACTION: Valerie Watson, FAA/AJV-553 will reach out to the Airspace and Rules office regarding the possibility of publishing and charting “long-term TFRs” as SUAs.

ACTION: Rick Fecht, FAA/AJV-5223, will look at the various depictions of currently charted TFRs and report back on possible standardization if it is believed that is prudent.

ACTION: Bennie Hutto, NATCA, will talk to the RTCA ATC representative and get more information about what they are looking for regarding the addition of sporting venues and TFR information to controller charts. He will also communicate that 3NM stadium rings may be added to RVMs upon ATC request.

MEETING 18-01

Valerie Watson, FAA/AJV-553 reviewed the issue and provided an update. She said that she has reached out to the Airspace and Rules Office, FAA/AJV-11, regarding the possibility of publishing and charting “long-term TFRs” as Special Use Airspace that could be activated via NOTAM. She was told that no, this is not a viable solution. Valerie and Scott Jerdan, FAA/AJV-533, then reached out to the Systems Operations Security Office, FAA/AJR-24, to ask if that office could reach out to the proponents of the TFRs to ask if they could assign them an end date of permanent. She also suggested that as an alternative to that, the Systems Operations Security Office could be the authoritative source and provide AJV-5 with a memo requesting charting of those areas they deem appropriate for charting. A meeting is scheduled for May 2018 with AJV-5 and the Systems Operations Security Office to discuss possible solutions.
Rick Fecht, FAA/AJV-5223, then spoke about his action to look at the various depictions of currently charted TFRs. Rick stated there are very specific categories of TFRs and they are charted differently because they are different, particularly in the degree of consequence if they are violated. He said that VFR Charting would prefer to continue to show the existing ones the way they are currently charted, and then determine what symbology should be used for the new TFRs that are being requested.

Rune Duke, AOPA, stated that he would still prefer that all TFRs are depicted the same way so that pilots will always know what they should be looking for on the charts, but stated that if/when new symbology is proposed, he would like to have the chance to comment. Rick said he will continue to look how TFRs are charted currently, consider how the new ones will be shown and will report at the next meeting.

Scott then provided an update on the progress made on adding sporting event 3 NM rings and Long-term TFRs to Radar Video Maps and Controller Charts. Scott reported that AJV-5 has been working with Air Traffic Services, FAA/AJT, on this item and have provided prototypes for their review. It is currently in internal coordination. Once approved, they can begin implementation.

**STATUS: OPEN**

**ACTION:** Scott Jerdan, FAA/AJV-533 and Valerie Watson, FAA/AJV-553 will coordinate with Systems Operations Security Office regarding solutions to the sourcing of “long-term TFRs” for charting.

**ACTION:** Rick Fecht, FAA/AJV-5223, will continue to examine the various depictions of currently charted TFRs and develop a proposed depiction for “long-term TFRs”.

**ACTION:** Scott Jerdan, FAA/AJV-533, to provide an update on adding sporting event 3 NM rings and Long-term TFRs to Radar Video Maps and Controller Charts.

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**MEETING 18-02**

Scott Jerdan, FAA/AJV-533, reviewed the issue. He said that AJV-5 met with Talwyn Haley of the Systems Operations Security Office, FAA/AJR-24, in May 2018 and that they have agreed to be the charting source for a number of what will be called “National Defense Airspace TFRs” that are currently only published as TFR NOTAMs but are intended for charting on FAA VFR products. Scott said the two offices are currently working on a Memorandum of Agreement (MOA) that states that Sys Ops Security will commit to providing and maintaining the TFR information so that AJV-5 can keep the data current.

Rick Fecht, FAA/AJV-5223, showed the audience a graphic example of how National Defense Airspace TFRs will appear on the VFR chart. Valerie Watson, FAA/AJV-553, said that the charting specification is in process. Once the MOA is signed, the data is submitted, and the specification change is approved, Visual will start charting National Defense Airspace TFRs.
Scott also reported that sporting event 3 NM rings have been added to Radar Video Maps and Controller Charts. The National Defense Airspace TFRs will be added to those products once the data has been submitted by the Sys Ops Security Office.

**STATUS: OPEN**

**ACTION:** Scott Jerdan, FAA/AJV-533 will continue to coordinate with Systems Operations Security Office regarding the status of the Memorandum of Agreement (MOA) and subsequent submission of the data for charting.

**ACTION:** Valerie Watson, FAA/AJV-553, will process the Interagency Air Committee (IAC) Specification change to add National Defense Airspace TFR depiction to the VFR charts.

**ACTION:** Scott Jerdan, FAA/AJV-533, to provide an update on adding National Defense Airspace TFRs to Radar Video Maps and Controller Charts.

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**MEETING 19-01**

Valerie Watson, FAA/AJV-A250, reviewed the topic. She reported that the Interagency Air Committee (IAC) Specification change to add National Defense Airspace TFR Area depictions to the VFR charts has been approved. The implementation is on hold until the National Flight Data Center (NFDC) can secure a source for the data. Scott Jerdan, FAA/AJV-A310, reported that the System Operations Security Office, FAA/AJR-24, has agreed to be the charting source, but he did not get AJV-A support for a Memorandum of Agreement (MOA) as the means to document that commitment. Scott is now working with Lynette McSpadden, FAA/AJR-B3, to add a paragraph to the NOTAM Order that will document the System Operations Security Office’s obligation to provide and maintain these areas to AJV-A. Lynette reported that she had received support for this plan from Talwyn Haley of the System Operations Security Office, FAA/AJR-24. She stated that that since the latest iteration of the NOTAM Order was recently released, it will likely be two years before the next version is published.

Rune Duke, AOPA, expressed concern about the two year delay and asked if there is something that can be done in the interim so that these areas can be charted sooner. Scott said he would look into options. He suggested that perhaps they could use an interim policy agreement.

**STATUS: OPEN**

**ACTION:** Lynette McSpadden, FAA/AJR-B3, to work on updates to the NOTAM Order for the submission of National Defense Airspace TFR data to AJV-A from the Systems Operations Security Office.

**ACTION:** Scott Jerdan, FAA/AJV-A310, will research an interim mechanism for the submission of National Defense Airspace TFR data until the NOTAM Order can be updated.
MEETING 19-02

Scott Jerdan, FAA/AJV-A310 reviewed the issue. He stated that the charting specification for publication of National Defense Airspace TFR Areas on VFR charts is in place and publication is awaiting updates to the NOTAM Order. The revised Order will document the System Operations Security Office’s obligation to serve as the authoritative source for these areas. Publication of the revised Order is expected in January 2020. Scott reported that he has already received the list of TFRs requested for charting, so implementation can follow quickly after the Order is effective.

STATUS: OPEN

ACTION: Scott Jerdan, FAA/AJV-A310, to provide an update on publication of the NOTAM Order and subsequent charting implementation of National Defense Airspace TFRs on VFR Charts.

MEETING 20-02

Scott Jerdan, FAA/AJV-A310, reviewed the issue. He stated that publication of National Defense Airspace Temporary Flight Restriction (TFR) Areas on Visual Flight Rules (VFR) charts is awaiting publication of the next update to FAA Order 7930.2. The revised Order will document the System Operations Security Office’s obligation to serve as the authoritative source for these areas. Publication of the revised Order is expected in November 2020. He said he expects publication on the charts by early 2021.

Valerie Watson, FAA/AJV-A250, confirmed that that the charting specification for depiction of National Defense Airspace TFR Areas on VFR charts is already in place and as soon as source is obtained, publication on the charts will begin.

Joshua Fenwick, Garmin, asked how the data will be sourced to the public. Scott said the current plan is to use open data source in the same way sporting event locations are sourced today. He said they will not be sourced in the National Airspace System Resource (NASR).

Valerie said this issue will be left open until the publication is complete.

STATUS: OPEN

ACTION: Scott Jerdan, FAA/AJV-A310, to provide an update on publication of the NOTAM Order and subsequent charting implementation of National Defense Airspace TFRs on VFR Charts.