**U.S. DEPARTMENT OF TRANSPORTATION**
FEDERAL AVIATION ADMINISTRATION
National Policy

**ORDER**
**JO 7910.1G**

**Effective Date:**
October 4, 2022

**SUBJ:** Radar Video Map Program

**1. Purpose of This Order.** This order establishes procedures for the preparation and procurement of digital video map data and supporting video map products data for radar equipped FAA terminal air traffic control (ATC) facilities.

**2. Audience.** This order applies to all ATO personnel, FAA contract tower employees, and anyone using ATO directives in the preparation and procurement of digital video maps and supporting map products data.

**3. Where Can I Find This Order**? This order is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/ and on the FAA Web site at http://www.faa.gov/regulations_policies/orders_notices/.

**4. Cancellation.** Order 7910.1F, Radar Video Map Program dated December 19, 2019 is canceled.

**5. Distribution.** This order is distributed to the following ATO service units: Air Traffic Services (AJT), Mission Support Services (AJV), Safety and Technical Training (AJI), all Terminal Air Traffic facilities; Mike Monroney Aeronautical Center (MMAC); and the William J. Hughes Technical Center (WJHTC).

**6. Background**. Radar Video Maps are used for real-time air traffic management and must be geographically accurate for real-time navigation purposes. Aeronautical Information Services (AJV-A), with liaison between Air Traffic Services (AJT), air traffic facilities, Service Area Directors of Air Traffic Operations, and Radar Video Mapping Group (AJV-A23), is responsible for the coordination, and development of digitally formatted video mapping data and supporting products.

**7. Explanation of Change.** Additional map symbology representing wind turbines, DME-only facilities, Stadiums for TFRs, and Bridges for VFR maps have been added to Appendix B at the request of the Radar Video Mapping Group (AJV-A23).

**8. Responsibility.**

**a. ATO Responsibility.** Air Traffic Services (AJT) responsibilities are divided between the Program Office and the FAA WJHTC. The Program Office is responsible for funding the development of the initial maps prioritized by site. The FAA WJHTC is responsible for managing the adaptation data received from the OSF and facilities, then forwarding this information to AJV-A23 for development.

**b. AJV-A23 Responsibilities.** The responsibility of AJV-A23 is to supply new and revised digital video maps and supporting products to the air traffic terminal facilities. AJV-A23 analyzes information provided by facilities to ensure it is accurate and verified in the data base. AJV-A23 ensures that data, provided by the facility, is accurately represented in appropriate digital formats. AJV-A23 certifies the integrity of the data in new and revised digital maps delivered to air traffic terminal facilities but any subsequent altering of these maps invalidates the certification.

**c. Air Traffic Terminal Facilities' Responsibilities.** Air traffic terminal facilities are responsible for submitting requests for new maps and map revisions. The Air Traffic Terminal facility specifies the content of the requested radar video map displays. Map data shown on each individual map is the responsibility of the facility manager, consistent with air traffic facility requirements. Facilities must ensure that all radar video maps prepared by AJV-A23 are operationally suitable for their use. As such, the video map should present an accurate representation of the airways, fixes, boundaries, runway approaches, etc., to meet the individual requirements of each facility.

**d. Operational Support Facilities (OSF).** Operational support facilities are responsible for the adaptation of radar video maps into the Standard Terminal Automation Replacement System (STARS) adaptation software.

**9. Video Systems.**

**a. Standard Terminal Automation Replacement System (STARS)**

**b. Stand Alone Tower Display System (SATDS)** - SATDS surveillance technology utilizes STARS Local Integrated Tower Equipment (LITE). This system is a scaled down version of the Full STARS system.

**10. Map Standardization.**

**a. Symbology.** There are standard map symbology that are used by AJV-A23 in map production. However, the depiction of any of these symbols can be customized at the air traffic facility and AJV-A23's discretion. See appendix B for additional information.

**b. Map Ranges.** Controllers can select one of many maps or can overlay multiple maps until all video maps are shown. Map ranges typically vary from 10 to 60 nautical miles. STARS equipment have the capability to utilize long range radar maps out to 250 nautical miles, and AJV-A23 will provide support for this additional capability.

**c. Survey Positions.** A point of tangency predicates System Plan Map types, such as FUSION. The coordinating FAA OSF Office supplies surveys to AJV-A23.

**d. Magnetic Variation.** Radar video maps produced for the STARS equipment are produced without a magnetic variation. STARS applies the declination when the maps are added to the equipment on site.

**e. Map/Data Delivery.** Deliverables for STARS systems are placed on a computer server by AJV-A23 and retrieved by the OSFs.

**11. Requests for Aeronautical Video Maps and Digital Data**.

**a. New Terminal Facilities.** Terminal facilities must submit their requirements for new maps or programs via a memorandum to the Service Area Directors of Air Traffic Operations for forwarding to the Director, Operations-Headquarters, AJT-2. The memorandum must include system specification and map symbology specifications as well as other pertinent information. The program office will fund the initial map requirements and then maps will be constructed for testing. After commissioning, facilities will contact AJV-A23 directly for updates and revisions.

**b. New/Revised Maps.** Existing terminal facilities must request new/revised maps by using the FAA ATC products email address 9-AJV-HQ-ATCProducts@faa.gov. This electronic copy must have any additions shown in blue and any deletions shown in red. Any facility which is unable to comply with this requirement, must contact AJV-A23 for additional guidance for handling their requests.

**c. Time for Obtaining Maps.** Facilities are urged to allow sufficient time for planning and ordering video maps. Depending on the complexity of the new/revised maps and the number of radar video maps requests received from air traffic terminal facilities, allow three (3) weeks for delivery. **New maps which involve conversion to a different automation system require six (6) to eight (8) weeks from receipt of the complete package; large TRACONs could take up to 12 weeks.** AJV-A23, the facility, and the service areas OSFs must keep lines of communication open to ensure timely map delivery. Facilities must allow time for servicing OSFs to process video maps through adaptation software. The normal OSF delivery of STARS adaptation occurs on a monthly schedule, typically the 1st or 15th of the month. Any job request requiring delivery in less than three (3) weeks will need justification from the requesting Air Traffic Manager. Approval rests with AJV-A23 team lead.

Michael R. Beckles

Digitally signed by Michael R. Beckles
Date: 2022.09.01 11:47:35 -04'00'

Michael R. Beckles
Director (A), Policy, AJV-P

# Appendix A. Definitions

**a. ADS-B:** ADS-B is a key, enabling technology supporting the implementation of the Next Generation Air Transportation System. The incorporation of ADS-B as a surveillance source requires the incorporation of multiple surveillance sources such as ASR, ARSR, ADS-B, and multilateration into existing and future air traffic control automation systems. It has been determined that FUSION is the best method to accomplish this. The Surveillance and Broadcast Services (SBS) Air Traffic Computer-Human Interface CHI Workgroup was established to ensure functional standardization and usability of multiple surveillance sources integration in both the terminal and en route domains.

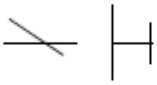
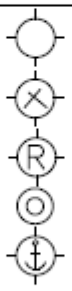
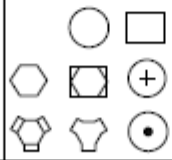
**b. FUSION:** FUSION is the combination of all available surveillance sources (airport surveillance radar [ASR], air route surveillance radar [ARSR], ADS-B, etc.) into the display of a single-tracked target for air traffic control separation services. FUSION is the equivalent of the current single-sensor radar display. FUSION performance is characteristic of a single-sensor radar display system. Terminal areas use mono-pulse secondary surveillance radar (ASR-9, Mode S). The performance of this system will be used as the baseline radar system to ensure minimal degradation of current separation operations within the NAS.

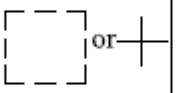
**c. SATDS: Stand Alone Tower Display System** is installed at Visual Flight Rules (VFR) airport traffic control towers (ATCTs) that are not associated with a parent Terminal Radar Approach Control (TRACON). Certified SATDS sites utilize a surveillance source to display information. The SATDS surveillance technology utilizes STARS Local Integrated Tower Equipment (LITE): This system is a scaled down version of the Full STARS system. RVMs developed and delivered for STARS LITE are the same as for the full STARS.

**d. STARS: Standard Terminal Automation Replacement System** is a digital system that tracks all aircraft in real-time within a 250 nautical mile range of the facility. STARS provide the platform needed to facilitate increasing levels of automation functionality, improved weather display, and better surveillance. The final product is a 32-bit binary file delivered in a ZIP file to the facility via Internet. STARS displays Terminal Controller Workstation (TCW) and its tower configuration, Tower Display Workstation (TDW), are air traffic control stations which employ high-resolution color monitors with a graphical interface for the display of radar tracks and targets.

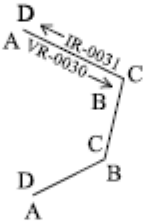
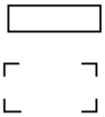
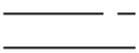
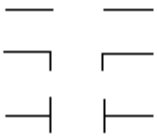
# Appendix B. Radar Video Map (RVM) Symbology

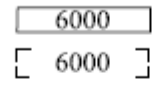
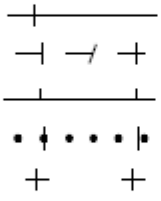
General Statement: Symbol sizes, line patterns, and line lenghts per Facility requests.

| | | |
|---|---|---|
| AERONAUTICAL OR TOPOGRAPHICAL MAP INFORMATION | | |
| Airports shown by runway (rwy) patterns |  | To scale |
| Airports with extended rwy centerlines |  | Useable rwy(s) drawn to scale. Centerlines drawn using either .5 or 1NM increments (mile space, mile line) starting from the end of rwy. Length of hatch marks .25 NM to 1 NM. |
| Minor airports<br>Minor airports with rwy patterns<br>Restricted airports<br>Military airports<br>Seaplanes |  | |
| Heliports |  | With or without circle |
| Navaids |  | Standard RVM symbol<br>Facility may use the standard RVM symbol or the symbols as shown |
| Fan marker |  | |

| | | |
|---|---|---|
| AERONAUTICAL OR TOPOGRAPHICAL MAP INFORMATION | | |
| Airways (Awy) |  | Use solid or dash linework.<br>NO DOTS. |
| Awy intersection(s)/off awy intersections(s) or handoff point. When used as an ILS final approach fix, triangle apex will point towards the rwy end. |  | |
| Radar Handoff Area or Point (for Terminal Area Approach or Departure or Enroute Handoff) |   | |
| Airport Surveillance Radar (ASR) |  | |
| Long Range Radar (LRR) Letter used to identify radar. |   | |
| Standard Terminal Arrival Route (STAR) fix |  | |
| Waypoint |  | |
| Obstructions: towers, buildings, etc. |  | |

| AERONAUTICAL OR TOPOGRAPHICAL MAP INFORMATION | | |
|---|---|---|
| Spot elevation (mountain peaks) |  | |
| Visual Check Point (VCP): Shopping Mall, Golf course, etc. |  | |
| VFR Point |  | |
| Holding Pattern |  | |
| Nuclear Facility |  | |
| Point of Tangeny (POT) |  | |
| Permanent Echo (PE), Parrot, MTI Reflector |  | Apex of symbol aligned towards the ASR<br>For STARS, the length will be .5 NM |
| CMPE, MTI Reflector |  | |
| Stadium |  | Depict stadiums with a capacity of 30,000 plus and criteria set by the DHS |

| | | |
|---|---|---|
| AERONAUTICAL OR TOPOGRAPHICAL MAP INFORMATION | | |
| Sport arenas, fields, tracks, etc |  | |
| Medical facility: hospital, clinic etc<br>May also be used to indicate medical heliport |  | |
| MTR linework identified with route and turn points idents. |  | Solid or dashed linework, with or without turn point letters per Facility request. |
| Special Use Airspace<br>Prohibited, Restricted, Alert and Warning Areas<br>Military Operations Areas |  | Drawn to scale.<br>Solid or dash linework per Facility request |
| ADIZ, ARTCC boundary<br>Sector boundary, Facility Airspace boundary and Internal Sector boundaries<br>Class Airspace. |  | NO DOTS.<br>Solid or dash linework per Facility request.<br>When dash linework is requested, the Facility may specify the line and space lenghts. |
| Arrival and Departure gates |  | Gates may be portrayed by any of the examples listed |

| AERONAUTICAL OR TOPOGRAPHICAL MAP INFORMATION | | |
|---|---|---|
| ATC Assigned Airspace Areas |  | Drawn to actual shape. Solid lines or dash corners. Altitudes as required. |
| Cultural Features: Roads<br>Shorelines, Rivers, Lakes<br>Railroads<br>Contours<br>Bridges |  | Text may be added to indentify feature (Lake Mead, I-95, etc.)<br><br>With or without elevation text |
| Final Approach Course and associated Fixes |  | Linework can be: solid, dash (1 nm space, 1 nm line or .5 nm space, .5 nm line) or dots.<br>Approach Fixes portrayed as hatch marks, lengths vary .25nm to 1 nm or per Facility request, or waypoints. |
| Non-Transgression Zone (NTZ) |  | Dots |
| Azimuth Change Pulse (ACP) box<br><br>with text |  | ACP box size is +/- .25 nm, along radial, by +/- 11 ACPs (+/- .967 degree).<br>Text in box indentifies radar on which it is predicated. |

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# RADAR VIDEO MAP SYMBOLS

| | | | | |
|---|---|---|---|---|
|  AIRPORT |  FAN |  MEDICAL |  SEAPLANE |  VFR POINT |
|  ARROW |  HELIPORT |  MILITARY AIRPORT |  STADIUM |  VISUAL CHECK POINT |
|  ARTC |  HIGHWAY |  NAVAID |  STADIUM TFR |  VOR |
|  BRIDGE |  INTERSTATE HIGHWAY |  NDB |  STAR |  VORDME |
|  DIAMOND |  JOINT AIRPORT |  NUCLEAR |  TRACK |  VORTAC |
|  DME |  JUMP ZONE |  OBSTRUCTION |  TACAN |  WIND TURBINE |
|  DOT |  MARINE BEACON |  RESTRICTED AIRPORT |  TRIANGLE |  WAYPOINT |