



# Air Land Sea Application Center

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<https://www.alsa.mil>

## Kill Box Update 2022

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An MQ-9 Reaper flies a training mission over the Nevada Test and Training Range, July 15, 2019. MQ-9 crews can utilize kill boxes to perform air interdiction missions. (USAF photo by A1C William Rio Rosado)

### Introduction

In the fall of 2008, members of the inaugural and second MTTP *Kill Box* joint working groups published an article called, “Kill Box Update,” in the Air Land Sea Bulletin.<sup>1</sup> Large changes in MTTP *Kill Box* and the need to consolidate information and decisions generated from a joint staff joint fires area test motivated the authors to publish an update to the field. History repeats itself, and again, 13 years later, another kill box update is necessary to educate the joint force on the results of a joint test affecting the development of MTTP *Kill Box*.

In the fall of 2020, the Air Force and Army doctrine centers requested an in-depth review of MTTP *Kill Box* to ensure the MTTP was executable in fielded command and control (C2) systems. The resulting research revealed the 2014 and 2018 versions of MTTP *Kill Box* contained doctrinally correct, but tactically incorrect, instructions to execute a kill box in a standardized way across the joint force. Ultimately, another joint test was needed to ensure the next published version of MTTP *Kill Box* contained standardized and executable TTP for kill box. This kill box update is intertwined with the history of MTTP *Kill Box* leading to the 2021 joint kill box test.

## **Kill Box and C2 Automation History**

The historical instances of large-scale combat operations requiring joint fires interdiction against fielded forces are intermittent. As such, MTTP *Kill Box* has changed with peacetime tests, exercises, doctrine, and technology. MTTP *Kill Box*, as an operationally planned and jointly integrated tactic, technique, and procedure relies heavily on fielded C2 capabilities. Therefore, the limitations and applicable details of C2 automation systems are provided as well.

During the late 1970s in South Korea and in West Germany, planners created a grid system to enable quick C2 of airspace and identified them as kill boxes (two words). These kill boxes were used to coordinate bomber, fighter, attack helicopter, and artillery attacks.

From 2001 to 2003, killboxes (one word) were used extensively in Operation ENDURING FREEDOM and Operation IRAQI FREEDOM as a grid system for navigation, force deconfliction, and control during a variety of missions including air interdiction, strike coordination and reconnaissance, airborne alert interdiction, and airborne surveillance and reconnaissance. The killboxes did not imply or require support relationships or prior coordination. Killboxes were synonymous with the theater's common geographic reference system (CGRS) used in Operation ENDURING FREEDOM and Operation IRAQI FREEDOM. The Global Area Reference System (GARS) had not been developed yet, and killboxes were also not integrated onto the airspace control order (ACO).

In 2001, the Theater Battle Management Core System (TBMCS) replaced the Contingency Theater Air Planning System (CTAPS) in the USCENTAF Coalition Air Operations Center (CAOC). TBMCS was an enormous leap forward for air tasking order (ATO) and ACO capabilities. TBMCS generated the ATO and ACO into a data format called United States Message Text Format (USMTF) 2000 that enabled periodic digitally integrated updates across the joint force. TBMCS and USMTF became the backbone for CAOC operational wartime planning and is still the backbone in 2022.

In 2004 (published 2005), the inaugural MTTP *Kill Box* was penned to codify the lessons learned of killbox use in Operation IRAQI FREEDOM while refining and expanding the concept for worldwide use. This refinement re-adopted the historical term kill box (two words), moved the concept towards a fire support coordination measure and introduced the idea of color coding the kill box as blue or purple. An assumption was made that as an official MTTP, the refined and expanded kill box concepts would be integrated to fielded C2 digital systems. This assumption did not happen and this erroneous assumption would not be recognized until 2020.

In 2005, the Defense Information Systems Agency (DISA) USMTF Change Control Board captured the MTTP *Kill Box* updates for inclusion into the USMTF 2006 baseline. To enact the change, DISA used a recently outdated code, KILLB, and modified it to KILLBX. Six characters was also the safe digital limit preventing the full use of the two words. As is common practice with data standards, the authors of the standard, DISA, could not control which entities implemented the standard and USMTF 2006 was never adopted into TBMCS and therefore the ACO.

In 2006, the Secretary of Defense directed the development of the standardized GARS defined in Joint Publication (JP) 2-03, *Geospatial Intelligence in Joint Operations*. The GARS is a common reference system across the surface of the world. The GARS standard allowed the navigation and deconfliction aspects of the killboxes used in Operation IRAQI FREEDOM to have standardized naming and apply across the globe.

In 2007, the USAF decided that TBMCS would be replaced. However, in 2022, that TBMCS replacement has yet to be fielded. The TBMCS replacement decision resulted in TBMCS entering sustainment funding. This decision meant TBMCS would not be adequately funded to upgrade beyond USMTF 2004. The USMTF 2004 data format was penned based off standing doctrine in 2003. Effectively, this meant that the ATO and ACO content was frozen with the code options and terminology provided in USMTF 2004. Ultimately, as a result of having the ATO and ACO trapped in a singular digital format for more than 17 years there arose two major consequences.

As a negative consequence, adding any modified tactic, developed after 2003, to the ACO, such as kill box, became impossible until a TBMCS replacement could be fielded. Warfighters developed local workarounds to meld new ideas into the old format.

As a positive consequence, the usage of USMTF 2004 remained the only option for ATO and ACO dissemination and became an anchor point. This inadvertent anchor point ensured digital interoperability as the general pace of software development increased from 2004 to 2022.

In fact, CJCSI 6241.04D directs the services to utilize the most current version of USMTF, USMTF(B), for digital interoperability. Although, CJCSI 6241.04D has been ignored in extant practice for over 17 years as a low priority for the allocation of service acquisitions funds. DISA still produces new versions of USMTF based on doctrine even though updated versions are not widely implemented regarding ATO and ACO messages and formats.

In 2007, the joint staff concluded a joint test titled, Joint Fires Coordination Measures, which introduced the concept of a Joint Fires Area for integrating and coordinating joint fires. The services reviewed the test and concepts but ultimately consolidated many of the results into MTTP *Kill Box* in 2009. The major update was basing kill boxes around GARS and adding the kill box coordinator (KBC). The joint test results were not incorporated fully as fielded systems could not keep pace with conceptual updates.

Unfortunately, post 2007 MTTP *Kill Box* volumes continued to be published without conducting fielded systems tests to ensure their tactical validity. Unbeknownst to the authors, the extant practice in the field was limited to using USMTF 2004 language and

workarounds, meaning that many of the instructions in MTTP *Kill Box* version 2014 and 2018 were not executable within digital systems.

In 2020, the Army and Air Force doctrine centers initiated an in-depth review to ensure doctrine alignment for MTTP *Kill Box* with JP 3-52 *Joint Airspace Control*. The centers requested an update to MTTP *Kill Box* to specify which type of restricted operations zone (ROZ) should be used for the ACM portion of the kill box in the ACO. The review noted the type of ROZ selected for the ACM portion of the kill box would have implications in critical digital fires systems. More importantly, the review revealed that the FSCM term KILLBX was not available for use in an ACO produced from TBMCS.

In 2021, in order to ensure a valid and executable MTTP, and consistent with joint all domain command and control (JADC2) efforts, the ALSA center conducted a multiservice test to evaluate the extent of digital interoperability of kill boxes. The test focused specifically on ACO dissemination and processing. An executable standard was developed to ensure kill boxes are transmittable across the joint force on a USMTF 2004 ACO and incorporated into this manual. The doctrine test also confirmed that kill box execution still requires manual C2 status battle tracking regarding fires and airspace status of kill boxes throughout all theater air ground system (TAGS) echelons.



A U.S. Air Force KC-10 Extender refuels an F-35A Lightning II above an undisclosed location, April 30, 2019. F-35As can utilize kill boxes to conduct air interdiction missions. (USAF photo by Staff Sgt. Chris Drzazgowski)

## Conclusion

The results of the 2021 joint kill box test and history of kill box led the joint working group to make two major update recommendations to MTTP *Kill Box*.

The first recommendation was that in order to ensure joint force synchronization, a kill box should appear on an ACO or ACO update. The entire purpose of kill box is to represent pre-coordinated intra-component communication to the warfighter to allow for expedient target execution. The best way to represent this coordination as complete and as an official order, while minimizing the chances for friendly fire, is to leverage the existing infrastructure and procedures that allow for an ACO update. Historical large-scale combat operations show ACO updates may have happened up to 12 times a day during initial actions. The MTTP also provides options for evolving or unexpected targets that do not provide time to conduct an ACO update. If a kill box does not appear on the ACO, it will be very difficult to ensure all players are aware of the kill box's existence and thus able to conduct coordinated operations.

The second major update was to specify the manner in which a kill box should be schematically constructed on the ACO. The specific ACO construction is considered controlled unclassified information data so it does not appear in this article and will be available in the MTTP. The kill box ACO construction represents the best set of tradeoffs to ensure that MTTP *Kill Box* is executable in digital C2 systems across the joint force. Apart from ensuring basic transmission and processing, the tested kill box standard also ensured that AFATDS responds to the portions of a kill box correctly and further enhanced usability for C2 operators. The approach was live-tested on the joint C2 systems listed in the table below in December of 2021.

Joint C2 Systems Tested in 2021 Kill Box Test				
US Air Force	US Army	US Marine Corps	US Navy	All/Joint
TMBCS	TAIS	TBMCS	TBMCS	JADOCS
- WEBAD	AFATDS	AFATDS	AFATDS	GCCS
- WARP	AMDWS	CAC2S	CAC2S	FV
- MCAMP			JMPS	
- MAPTK			E-2C	
- ESTAT				
ASMA-FP				
Legend AFATDS—Advanced Field Artillery Tactical Data System AMDWS—Air and Missile Defense Workstation ASMA-FP—Air Space Management Application Functional Prototype CAC2S—Common Aviation Command and Control System E-2C—Hawkeye		JADOCS—Joint Automated Deep Operations Coordination System JMPS—Joint Mission Planning System MAPTK—Master Air Attack Plan Toolkit MCAMP—Marine Corps Air Mission Planner TAIS—Tactical Airspace Integration System TMBCS—Theater Battle Management Core Systems		

ESTAT—Execution Status and Monitoring FV—Falcon View GCCS—Global Command and Control System	WARP—Web-Based Airspace Request Processor WEBAD—Web-Based Airspace Deconfliction
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On a macro level the kill box test illustrates that digital joint interoperability remains a difficult task, even with older systems. There are many levels of nuance involved with joint interoperability that involves not only the technology, interfaces, and data formats required but also the manner in which warfighters interact with systems. As new systems are fielded and doctrine advances to support joint all domain command and control, the kill box experience shows that operational tests and joint exercises remain an essential step along the development path. Any assumed, and not tested, digital linkage represents risk to the joint force.

The 2022 version of MTTP *Kill Box* containing the recommended updates is currently out for worldwide review and has an expected publication date of July 2022.<sup>2</sup>

Warfighters can download a copy of MTTP *Kill Box* at <https://www.alsa.mil/mttps/killbox>

## Endnotes

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1. Col (Ret) David Neuenswander, USAF, Mr Bo Bielinski, Col (Ret) Russ Smith, USAF. *Kill Box Update*. Originally published September 2008. <https://www.alsa.mil/News/Article/2656499/kill-box-update/>
  2. United States Message Text Format (USMTF) Website. <https://disa.deps.mil/ext/cop/jintaccs/USMTF/default.aspx>
  3. CJCSI 6241.04D, 12 January 2021, Policy And Procedures For Management And Use Of United States Message Text Formatting, <https://www.jcs.mil/Portals/36/Documents/Library/Instructions/CJCSI%206241.04D.pdf>
  4. MTTP Kill Box. <https://www.alsa.mil/mttps/killbox/>

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