INCH-POUND

MIL-DTL-32392
27 October 2011

# DETAIL SPECIFICATION

# AIRCRAFT ARRESTING SYSTEM - TEXTILE (TAAS)

This specification is approved for use by the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification establishes the minimum design, performance and test requirements for particular types of land-based Textile Aircraft Arresting Systems (TAASs) used within the United States Air Force (USAF).

1.2 Classification. TAAS are of the following types, as specified (see 6.2).

1.2.1 Types. The types of TAAS are as follows:

Type I – TAAS 200/9/9/P (see 6.3.4)

Type II – TAAS 200/9/9/P/R (see 6.3.5)

Type III – TAAS 200/9/9/P/WITH RESET (see 6.3.6)

Type IV – TAAS 200/9/9/P/R1 (see 6.3.7)

Type V –TAAS 330/10/P (see 6.3.8)

Type VI – TAAS 330/10/P/R (see 6.3.9)

Type VII – TAAS 330/10/P/WITH RESET (see 6.3.10)

Type VIII – TAAS 200/6/9 MA-1A Modified (see 6.3.11)

Type IX – TAAS 200/6/9 MA-1A Modified/R (see 6.3.12)

Comments, suggestions, or questions on this document should be addressed to: WR-ALC/GRVEC, Robins AFB GA 31098-1813. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil.

AMSC N/A FSC 1710

Type X – TAAS 200/6/9 MA-1A Modified/WITH RESET (see 6.3.13)

Type XI – TAAS 200/6/9 MA-1A Modified/R1 (see 6.3.14)

Type XII – TAAS 200/6/9 MA-1A Barrier (see 6.3.15)

Type XIII – TAAS 200/6/9 MA-1A Barrier/R (see 6.3.16)

Type XIV – TAAS 200/6/9 MA-1A Barrier/WITH RESET (see 6.3.17)

Type XV – TAAS 200/6/9 MA-1A Barrier/R1 (see 6.3.18)

Type XVI – TAAS 330/10 BAK-15 Net Barrier (see 6.3.19)

Type XVII – TAAS 330/10 BAK-15 Net Barrier/R (see 6.3.20)

Type XVIII – TAAS 330/10 BAK-15 Net Barrier/WITH RESET (see 6.3.21)

Type XIX – TAAS 200/6/9 BAK-15 Net Barrier Interconnect (see 6.3.22)

Type XX – TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R (see 6.3.23)

Type XXI – TAAS 200/6/9 BAK-15 Net Barrier Interconnect/WITH RESET (see 6.3.24)

Type XXII – TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R1 (see 6.3.25)

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this specification to the extent specified herein.

FEDERAL STANDARDS

| | |
|---|---|
| FED-STD-595/26176 | Gray, Semi-gloss |
| FED-STD-595/31136 | Red, Lusterless |
| FED-STD-595/37038 | Black, Lusterless |

DEPARTMENT OF DEFENSE SPECIFICATIONS

| | |
|---|---|
| MIL-DTL-5541 | Chemical Conversion Coatings on Aluminum and Aluminum Alloys |
| MIL-DTL-25959 | Tie Down, Tensioners, Cargo, Aircraft |
| MIL-DTL-53030 | Primer Coating, Epoxy, Water Based, Lead and Chromate Free |
| MIL-DTL-81706 | Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys |
| MIL-PRF-23377 | Primer Coatings: Epoxy, High-Solids |
| MIL-PRF-26915 | Primer Coating, for Steel Surfaces |
| MIL-PRF-27260 | Tie Down, Cargo, Aircraft, CGU-1/B |
| MIL-PRF-85285 | Coating: Polyurethane, Aircraft and Support Equipment |

DEPARTMENT OF DEFENSE STANDARDS

| | |
|---|---|
| MIL-STD-130 | Identification Marking of U.S. Military Property |
| MIL-STD-810 | Environmental Engineering Considerations and Laboratory Tests |
| MIL-STD-882 | Standard Practice for System Safety |
| MIL-STD-889 | Dissimilar Metals |

(Copies of these documents are available online at https://assist.daps.dla.mil/quicksearch/ or from the standardization document order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AIR FORCE INSTRUCTION (AFI)

| | |
|---|---|
| AFI 32-1043 | Managing, Operating, and Maintaining Aircraft Arresting Systems |

(Copies are available through e-pubs; http://www.e-publishing.af.mil)

NAVAL AIR WARFARE CENTER (CAGE 80020)

| | |
|---|---|
| 515053 | 1 1/4 Dia. Non-rotating Wire Rope |

(Copies of this document are available from the Naval Air Systems Command, Code 4.1.4, Lakehurst, NJ 08733-5328.)

U. S. AIR FORCE (CAGE 98752)

| | |
|---|---|
| 7545764 | Support, Donut Type-Wire Cable |
| 55J6348 | Barrier-Overrun Runway, Type MA-1A |
| 201019015 | Aircraft Arresting System, TAAS TYPE I (TAAS 200/9/9/P), Installation of, Typical |
| 201019016 | Aircraft Arresting System, TAAS TYPE V (TAAS 300/10/P), Installation of, Typical |
| 201019017 | Aircraft Arresting System, TAAS TYPE VIII (TAAS 200/6/9/MA-1A MOD, Installation of, Typical |
| 201019018 | Aircraft Arresting System, TAAS TYPE XII (TAAS 200/6/9/MA-1A), Installation of, Typical |
| 201019019 | Aircraft Arresting System, TAAS TYPE XVI (TAAS 330/10/BAK-15), Installation of, Typical |

(Copies of this document are available from the WR-ALC/GRVEC, Robins AFB GA 31098-1813)

2.2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN WELDING SOCIETY (AWS)

| | |
|---|---|
| D1.1/D1.1M | Structural Welding Code–Steel |
| D1.2/D1.2M | Structural Welding Code–Aluminum |

(Application for copies should be addressed to American Welding Society, 550 N.W. LeJeune Road, Miami FL 33126) may be obtained online at http://www.aws.org .

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

# 3. REQUIREMENTS

3.1 First article. When specified (see 6.2), the TAAS shall be subjected to first article inspections in accordance with 4.2.

3.2 TAAS description, design and construction. The TAAS is a onetime emergency use (consumable) overrun aircraft arresting system (AAS) designed for use with tail hook equipped fighter aircraft, or non-hook equipped aircraft when coupled with a net barrier engaging system such as the MA-1A Barrier (see 6.3.29 and drawing 55J6348 per CAGE 98752) or BAK-15 Barrier Net (see 6.3.31, NSN 1710-01-540-7602 and NSN 1710-01-544-3977). The system utilizes the tear strength of interwoven nylon straps (see 3.10) to provide the energy absorption capability necessary to stop the forward motion of troubled aircraft. As of August 2010, the TAAS has been installed on nine active USAF airfields (10 of the TAAS 200/9/9/P versions and seven of the TAAS 330/10/P), and is typically positioned in overruns for use during emergencies i.e., during abortive aircraft takeoff or in the event of failure of the normal braking system during the landing roll. Reference Figure A2.11 and Figure A2.12 of AFI 32-1043 (April 2003 edition) for a plan view of the TAAS 200/9/9/P and TAAS 330/10/P systems.

The fundamental differences between each TAAS configuration are the original overall length of the un-torn strap, orientation of the foundations to which the modules (see 3.7 and 3.11) are anchored (allowing increased energy capacity for unidirectional engagement capability or a bidirectional engagement capability at a slightly lower energy capacity), and the total number of modules used. Systems are identifiable by subsequent numbering following the TAAS designator (see 6.3.1 through 6.3.21). The amount of energy available to be absorbed by a TAAS is directly related to the length (and number) of un-torn straps available.

This specification requires the contractor to test the following:

a. a configuration consisting of nine double strap modules per side of runway overrun, with an un-torn length of 165 feet, hereafter referred to as the TAAS 165/9/P (see 6.3.1);

b. a configuration consisting of two separate braking lines connected in series, each made up of nine double strap modules per side of runway overrun, with an un-torn length of 165 feet, hereafter referred to as the TAAS 165/9/9/P (see 6.3.2); and,

c. a configuration consisting of nine double strap modules per side of runway overrun, with an un-torn length of 330 feet, hereafter referred to as the TAAS 330/9/P (see 6.3.3).

Each of these configurations shall be connected to, and use a standard 1.25-inch diameter hook cable (see 3.12) with standard USAF six inch support disks (see 3.14) spaced on six to 10 foot intervals as the aircraft engaging device.

The TAAS shall be designed and constructed so that no parts will work loose in service. They shall be built to withstand the strains, jars, vibrations, mold, fungus, and other conditions incident to shipping, storage, installation, and service. They shall be weatherproof and aircraft engine jet blast proof and designed to prevent the intrusion of sand into critical operating components.

The TAAS design shall be based on the split-energy absorber concept, i.e., two energy absorber units sited on opposite sides of the runway, with no requirement for mechanical cross-runway interconnection other than the hook cable or net system. Further, the TAAS shall remain compliant with the requirements set forth in AFI 32-1043.

3.2.1 Materials, protective coatings, and finish.

3.2.1.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. However, used, rebuilt, or refurbished items shall not be provided.

3.2.1.2 Protective coatings. Materials that deteriorate when exposed to sunlight, weather, or operational conditions normally encountered during the service life of the item shall not be used or shall have means of protection against such deterioration that does not prevent compliance with the performance requirements specified herein. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or when exposed to heat shall not be used. Fasteners, handles, and fittings used in the assembly of the item shall also be primed and painted.

3.2.1.2.1 Surface preparation and pretreatment. Surface preparation and pretreatment shall be in accordance with the respective primer and topcoat specifications. Structures shall be cleaned, degreased, and scuffed or blasted prior to priming; primer shall be applied before any oxidation or rusting occurs. Aluminum surfaces shall have MIL-DTL-81706, Type II, Class 1A, and MIL-DTL-5541, Type II, Class 1A, chemical conversion coating applied in accordance with the manufacturer’s directions prior to priming.

3.2.1.2.2 Primer. Raw metal edges, to include fastener and drain holes, shall be coated with primer before applying topcoat.

3.2.1.2.2.1 Ferrous surfaces. Ferrous structures and surfaces shall be primed with a water reducible zinc rich primer in accordance with MIL-PRF-26915, Type II, Class B; this shall be followed, within four hours, by a coat of MIL-DTL-53030 intermediate primer in a wet-to-wet primer application. This two part primer system shall yield a dry-film thickness of 2.0-2.5 mils for the zinc primer and 0.9 to 1.1 mils for the intermediate primer. The two-primer system shall be allowed to dry and fully cure in accordance with the primer manufacturer's directions prior to top coating.

3.2.1.2.2.2 Aluminum and mixed aluminum and ferrous surfaces. Aluminum and mixed aluminum and ferrous structures and surfaces shall be primed with an epoxy primer, Type II, Class N of MIL-PRF-23377. This single part primer system shall yield a dry-film thickness of 0.6 to 0.8 mils.

3.2.1.2.3 Topcoat. Topcoat shall be polyurethane in accordance with Type I, Class H of MIL-PRF-85285. Neither Chemical Agent Resistant Coating (CARC) nor powder coating shall be used. Topcoat shall be applied to a dry film thickness of 1.6 to 2.4 mils in all instances, regardless of the primer system utilized. The coating shall be free from runs, sags, orange peel, or other defects.

3.2.1.3 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of dissimilar base metals to provide electromotively compatible abutting surfaces is acceptable. The use of dissimilar metals only when separated by suitable insulating material is permitted, except in systems where bridging of insulation materials by an electrically conductive fluid can occur. Sealants or gel type gasket materials shall be used between faying surfaces and butt joints.

3.3.1.4 Finish. The exterior finish color of the TAAS shall be Semi-gloss Gray, Color Number 26176 of FED-STD-595.

3.2.1.5 Fluid traps and faying surfaces. There shall be no fluid traps on the TAAS. Faying surfaces of all structural joints, except welded joints, shall be sealed to preclude fluid intrusion.

3.2.1.5.1 Ventilation. Ventilation shall be sufficient to prevent moisture retention and buildup.

3.3.1.5.2 Drainage. Drain holes shall be provided to prevent collection or entrapment of water or other unwanted fluid in areas where exclusion is impractical. All designs shall include considerations for the prevention of water or fluid entrapment and ensure that drain holes are located to effect maximum drainage of accumulated fluids. The number and location of drain holes shall be sufficient to permit drainage of all fluids when the unit is in a 2 degree incline in any plane. The minimum size of the drain holes shall be 0.25 inch.

3.2.2 Markings. All external devices which require an operational or maintenance interface shall be marked in accordance with MIL-STD-130. Painted markings shall be 1-inch high block letters unless prohibited by the available space. In such cases, the markings shall be the largest size possible, but shall not be less than 1/2-inch high. Markings, Information/Caution shall be Lusterless Black, Color Number 37038 of FED-STD-595, and Markings, Warning/Danger shall be Lusterless Red, Color Number 31136 of FED-STD-595.

3.2.3 Identification and information plates.

3.2.3.1 Identification plate. An identification plate in accordance with MIL-STD-130 shall be securely attached to the TAAS in a readily accessible location. The identification plate shall contain the following information: nomenclature, part number, serial number, date of manufacture, manufacturer's name, Commercial and Government Entity (CAGE) code, date of warranty expiration, and National Stock Number (NSN). The TAAS and any of its components for which the Government's unit cost is more than $5,000, is serially managed, or the procuring agency determines is mission essential, shall have Unique Identification (UID) (also known as Item Unique Identification (IUID)) information permanently affixed on or near the respective identification plate(s), marked in accordance with MIL-STD-130. UID information shall be included as both a bar code and human readable markings.

3.2.3.2 Transportation data plate. A transportation data plate shall be securely attached to the TAAS shipping box in a readily accessible location. The plate shall contain at least the following information:

a. Side and rear silhouette views of the TAAS

b. Shipping weight

c. Loading cubage

d. Overall height, width, and length

e. Tie down information

3.2.4 Safety.

3.2.4.1 System safety. The design of the TAAS shall not contain any system safety mishap risk categories greater than low as defined in Table A-IV of MIL-STD-882.

3.2.4.2 Component protection. All space in which work is performed during operation, service, and maintenance shall be free of hazardous protrusions, sharp edges, or other features which may cause injury to personnel. All rotating and reciprocating parts and all parts subject to high operational temperatures or subject to being electrically energized, that are of such nature or so located as to be hazardous to personnel, shall be guarded or insulated to eliminate the hazard.

3.2.4.3 Foreign object damage (FOD). All loose metal parts, such as pins or connector covers, shall be securely attached to the TAAS with wire ropes or chains. "Dog tag" style beaded chains shall not be provided. Removable panels, if provided, shall be attached with captive fasteners. Tire valve stem caps shall be made of plastic.

3.2.5 Fastening devices. All screws, bolts, nuts, pins, and other fastening devices shall be properly designed, manufactured, and installed with adequate means of preventing loss of torque or adjustment. Cotter pins, lock washers, or nylon patches shall not be used for this purpose, except for the attachment of trim items or as provided in commercial components. Tapped threads shall have a minimum thread engagement in accordance with Table I.

TABLE I. Minimum thread engagement.

| Material | Minimum Thread Engagement |
|---|---|
| Steel | 1.0 times the nominal fastener diameter |
| Cast iron, brass, or bronze | 1.5 times the nominal fastener diameter |
| Aluminum, zinc, or plastic | 2.0 times the nominal fastener diameter |

3.2.6 Welders and welding. All welders shall be certified to weld in accordance with AWS D1.1 and AWS D1.2, as applicable. The contractor shall make available to the Government certifications for all welders being utilized on the TAAS. Welding procedures and all welding on all components and subcomponents of the TAAS shall be in accordance with AWS D1.1 and AWS D1.2, as applicable. The surface parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the welded parts. Welds shall transmit stress without cracking or permanent distortion when the parts connected by the welds are subjected to test, proof, and service loadings.

3.2.7 Foolproofness. Where improper installation of an item causes a malfunction, an asymmetric mounting system shall be provided, where practical, to ensure proper mounting of the item.

3.2.8 Human engineering. The TAAS shall be designed in accordance with MIL-STD-1472 for ease of operation, inspection, and maintenance, including the use of arctic mittens and Mission-Oriented Protective Posture (MOPP) Level 4 Chemical Warfare Gear.

3.2.9 Service life. The TAAS shall be provided with environmental covers allowing successful operation for 10-years (minimum) service life.

3.2.10 Interconnecting components. Only high reliability interconnecting components [for example, the shear link system (see 3.15)] normally exposed to ultra violet radiation may have a service life less than 10-years. Such components must have a normal service life of two years minimum.

3.3 Environmental conditions.

3.3.1 Operating temperature range. The TAAS shall be capable of operating in ambient temperatures ranging from -40$^{o}$F to +125$^{o}$F.

3.3.2 Storage temperature range. The TAAS shall be capable of being stored in ambient temperatures ranging from -60$^{o}$F to +160$^{o}$F.

3.3.3 Precipitation.

3.3.3.1 Rain. The TAAS shall be capable of storage and operation during rainfall of 5-inches per hour for three consecutive hours and 10-inches per hour for 10 consecutive minutes, with winds of up to 35 knots; and with 6-inches of rain per hour impinging on the TAAS at angles from vertical to 45°.

3.3.3.2 Solar radiation. Exposed or unprotected nylon straps, unable to be protected by the environmental covers, shall not be adversely affected by full time exposure to solar radiation, such as those conditions encountered in desert environments.

3.3.3.3 Fungus. All materials used in the TAAS shall be fungus resistant or shall be suitably treated to resist fungus. Materials treated for fungus resistance shall retain their original physical properties, shall not present toxic hazards, and treatment shall last for the entire service life of the part. The TAAS shall be suitable for operation and storage in conditions encountered in a tropical environment.

3.3.3.4 Salt fog. The TAAS shall be capable of storage and operation in high temperature, high humidity, salt laden, and sea coast environments without damage or deterioration of performance.

3.3.3.5 Sand and dust. The TAAS shall be capable of storage and operation during exposure to wind-blown sand or dust without damage or deterioration of performance.

3.4 Transportability.

3.4.1 Surface transportability. The TAAS shall be transportable via all modes of surface shipment: rail, sea, road, etc. and shall be capable of withstanding mechanical shock and vibration characteristics of rail, sea, and road transport.

3.5 Maintainability.

3.5.1 Preventive maintenance. The recommended preventive maintenance interval (PMI) shall be at no less than 24 hour intervals. Daily preventive maintenance tasks shall not require more than one-half man-hour.

3.5.2 Inspection and servicing provisions. Routine servicing tasks and pre-use inspections shall require no hand tools other than those needed to reposition support disks or add tension to the hook cable.

3.6 Operational performance. The TAAS shall meet the following:

3.6.1 TAAS 165/9/P. The TAAS 165/9/P version shall allow bidirectional aircraft engagements, and:

a. when arresting a 31,650 lb (approximate weight) aircraft or deadload vehicle (see 6.3.33) at an engagement speed of 100 knots shall not:

i. Impose a max dynamic hook load (see 6.3.34) in excess of 58,900 lbs (target hook load 53,900 lbs), with off-center engagements of 37.5-ft in the 184-ft span

ii. Induce decelerations in excess of 1.75 Gs

iii. Produce walkback (see 6.3.26) in excess of 375-ft

iv. Pull through (see 6.3.27) the system

v. Induce end-of-arrestment decelerations in excess of 1.86 Gs

Additionally, the system shall impose a constant roll out hook load (see 6.3.35) of 50,000 lbs (+/- 5%) for the majority of the arrestment.

b. when arresting a 39,700 lb (approximate weight) aircraft or deadload vehicle at an engagement speed of 85 knots shall not:

i. Impose a max dynamic hook load in excess of 47,500 lbs (target hook load of 42,500 lbs), with on-center engagements at 164-ft span

ii. Induce decelerations in excess of 1.0 Gs

iii. Produce walkback in excess of 175-ft

iv. Pull through the system

v. Induce end-of-arrestment decelerations in excess of 0.9 Gs

Additionally, the system shall impose a constant roll out hook load of 50,000 lbs (+/- 5%) for the majority of the arrestment.

c. when arresting a 79,200 lb (approximate weight) aircraft or deadload vehicle at an engagement speed of 60 knots shall not:

i. Impose a max dynamic hook load in excess of 61,200 lbs (target hook load of 56,200 lbs), with off-center engagements of 37.5-ft in the 157-ft span

ii. Induce decelerations in excess of 0.85 Gs

iii. Produce walkback in excess of 125-ft

iv. Pull through the system

v. Induce end-of-arrestment decelerations in excess of 0.8 Gs

Additionally, the system shall impose a constant roll out hook load of 50,000 lbs (+/-5%) for the majority of the arrestment.

3.6.2 TAAS 165/9/9/P. The TAAS 165/9/9/P unidirectional engagement system shall:

a. when arresting a 79,200 lb (approximate weight) aircraft or deadload vehicle at an engagement speed of 95 knots shall not:

    i. Impose a max dynamic hook load in excess of 68,200 lbs (target hook load of 63,200 lbs), with off-center engagements of 22.5-ft in the 157-ft span

    ii. Induce decelerations in excess of 1.0 Gs

    iii. Produce walkback in excess of 195-ft

    iv. Pull through the system

    v. Induce end-of-arrestment decelerations in excess of 0.93 Gs

b. be capable of installation onto a TAAS 200/9/9/C foundations at a USAF airfield; this shall be the test configuration

Additionally, the system shall impose a constant roll out hook load of 50,000 lbs (+/-5%) for the majority of the arrestment.

NOTE: For testing of the TAAS 165/9/9/P, environmental covers on the port side, second stage only, shall be required.

3.6.3 TAAS 330/9/P. The TAAS 330/9/P bidirectional system shall:

a. when arresting a 39,700 lb (approximate weight) aircraft or deadload vehicle at an engagement speed of 145 knots shall not:

    i. Impose a max dynamic hook load in excess of 70,200 lbs (target hook load of 65,200 lbs), with on-center engagements at 184-ft span

    ii. Induce decelerations in excess of 1.70 Gs

    iii. Produce walkback in excess of 650-ft

    iv. Induce end-of-arrestment decelerations in excess of 1.17 Gs

Additionally, the system shall impose a constant roll out hook load of 50,000 lbs (+/-5%) for the majority of the arrestment.

b. be capable of installation onto existing TAAS 330/10/P foundations within USAF.

3.7 Module height and thickness. Modules shall not exceed three inches in overall height, and shall not exceed 14.00-inches in overall width.

3.8 Cable pretension winch. The TAAS shall be designed to accommodate CAGE L4045 part number T156/15P (or equal) at each runway side. The cable pretension winch shall be capable of applying a maximum tension load of 4,000 lbs. Its use shall have no adverse effects with the TAAS or its operation. After hook cable pretensioning of the TAAS, the effective hook cable height from the runway surface shall be a minimum of 2.375-inches when installed with new support disks; it shall be capable of being anchored to existing TAAS concrete foundations. The contractor shall ensure that the hook cable is under 1,500 to 2,500 lbs pretension prior to each test engagement identified in 3.6.

3.9 Jet blast. The TAAS shall meet all performance requirements specified herein when exposed to jet blasts of up to 225 feet per second at 125$^{o}$F for at least four minutes duration, repeatable up to 10 times.

3.9.1 Jet blast deflectors. The TAAS shall have jet blast deflectors incorporated into the design. They shall not exceed three inches in overall height; they shall be made of aluminum, stainless steel, or other durable material, and shall be capable of being mounted into the existing airfield TAAS concrete foundation. Jet blast deflectors may also be incorporated into the foundation design as long as the means and methods used can be duplicated and accomplished with common hand tools (see 6.3.28), materials, and craftsmen.

3.10 Strap and module material. The TAAS straps and modules shall be manufactured of 100 percent DuPont Nylon 6.6 HT (High Tenacity) material or equivalent.

3.11 Module tear strength. Each TAAS module shall require approximately 3,000 lbs (+/- 10%) tension to begin and sustain tearing under all loading and environmental conditions (i.e., when the tension load reaches the breaking strength of the interwoven stitching, a nearly constant load level is maintained as the strap is ripped apart). A minimum strap length of five feet shall be subjected to tension testing prior to operational inspection per 4.1b. Cylinder (or jaw) separation speed (to tear the module strap) shall be one inch per second minimum. If deemed as an approved method by WR-ALC/GRVEC, the contractor may substitute another means to demonstrate the tearing function/strength of the module tear strap.

3.12 Hook cable (pendant assembly or arresting cable). The TAAS shall be designed to be compatible with CAGE 80020 drawing number 515053, which shall be capable of installations at runways up to 300-ft in width.

3.13 Installation drawings and concrete foundations. The contractor's TAAS shall be capable of being 100 percent installed onto existing USAF TAAS concrete installation foundations. More specifically, the following is required:

a. the Type I through Type IV shall be installed via CAGE 98752 print 201019015 instruction/requirements;

b. the Type V through Type VII shall be installed via CAGE 98752 print 201019016 instruction/requirements;

c. the Type VIII through Type XI shall be installed via CAGE 98752 print 201019017 instruction/requirements;

d. the Type XII through Type XV shall be installed via CAGE 98752 print 201019018 instruction/requirements; and,

e. the Type XVI through Type XVIII shall be installed via CAGE 98752 print 201019019 instruction/requirements.

Additionally, the Type XIX through Type XXII shall be capable of being installed at USAF BAK-15 Net Barrier Interconnect (see 6.3.32) locations.

3.14 Support disks (where applicable). The hook cable shall be supported (above and across the runway) with CAGE 98752 drawing number 7545764 spaced on six to 10 foot intervals.

3.15 Shear link system. A textile shear link system shall be designed and included into each TAAS unit. Its purpose shall be to support an even load transition from the battery (pre-arrestment) position throughout the dynamic phase of the engagement until all TAAS modules are in league. It shall be positioned between the module connector (see 3.16) and the cable pretension winch; it shall be capable of being directly connected to the cable pretension winch.

3.16 Module connector.

3.16.1 Type I through Type VII. The Type I through Type VII TAAS shall be mechanically interconnected through the hook cable by module connectors, which shall allow connection to the shear link system. The module connectors shall be fitted with a removable protective cover that shall prevent damage to the module connector during arrestments.

3.16.2 Type VIII through Type XI. The TAAS VIII through Type XI shall be mechanically interconnected through the MA-1A Modified cable interconnect system (see 6.3.30) by module connectors. The module connectors and TAAS design and layout shall ensure that energy absorption begins at the instant the aircraft engages the MA-1A Barrier system (non-tail hook equipped aircraft) or the hook cable (tail hook equipped aircraft).

3.16.3 Type XII through Type XV. The TAAS Type XII through Type XV shall be mechanically interconnected through the MA-1A by module connectors, which shall allow connection to the shear link system. The module connectors shall be fitted with a removable protective cover that shall prevent damage to the module connector during arrestments. The module connectors and TAAS design and layout shall ensure that energy absorption begins at the instant the aircraft engages the MA-1A Barrier system.

3.16.4 Type XVI through Type XVIII. The TAAS Type XVI through Type XVII shall be mechanically interconnected through a BAK-15 Barrier Net (suitable at installations that support NSN 1710-01-540-7602 and NSN 1710-01-544-3977) in standard USAF BAK-15 installations by module connectors. The module connectors shall allow connection to the shear link system. The module connector shall be fitted with a removable protective cover that shall prevent damage to the module connector during arrestments. The module connectors and TAAS design and layout shall ensure that energy absorption begins at the instant the aircraft engages the BAK-15 Barrier Net system.

3.16.5 Type XIX through Type XXII. The TAAS Type XIX through Type XXII shall be mechanically interconnected through a BAK-15 Net Barrier Interconnect (suitable at installations that support NSN 1710-01-418-5978 and NSN 1710-01-592-2271). The module connectors shall allow connection to the shear link system. The module connector shall be fitted with a removable protective cover that shall prevent damage to the module connector during arrestments. The module connectors and TAAS design and layout shall ensure that energy absorption begins at the instant the aircraft engages the BAK-15 Net Barrier Interconnect.

3.17 Workmanship. The TAAS, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Workmanship objectives shall include freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface finish, and radii of fillets; thoroughness of welding, painting, and riveting; marking of parts and assemblies; and proper alignment of parts and security of assembled fasteners.

3.17.1 Bolted connections. Bolt holes shall be accurately punched or drilled and shall be deburred. Threaded fasteners shall be tight and shall be mechanically locked so the parts will not vibrate or work loose during testing or in-service usage.

3.17.2 Riveted connections. Rivet holes shall be accurately punched or drilled and shall be deburred. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the component.

3.17.3 Cleaning. The TAAS shall be thoroughly cleaned. Loose, spattered, or excess solder; welding slag; stray bolts, nuts, and washers; rust; metal particles; pipe compound; and other foreign matter shall be removed during and after final assembly.

## 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2).

b. Operational inspection (see 4.3).

TABLE II. Requirement verification matrix.

| Section 3 Requirement | Verification Method | Section 4 Verification |
|---|---|---|
| 3.1 TAAS description. | Not Applicable (N/A) | |
| 3.2 Design and construction. | Examination | 4.5.1 Examination of product. |
| 3.2.1 Materials, protective coatings, and finish. | N/A | |
| 3.2.1.1 Recycled, recovered, or environmentally preferable materials. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2 Protective coatings. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2.1 Surface preparation and pretreatment. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2.2 Primer. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2.2.1 Ferrous surfaces. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2.2.2 Aluminum and mixed aluminum and ferrous surfaces. | Examination | 4.5.1 Examination of product. |
| 3.2.1.2.3 Topcoat. | Examination | 4.5.1 Examination of product. |
| 3.2.1.3 Dissimilar metals. | Examination | 4.5.1 Examination of product. |
| 3.2.1.4 Finish. | Examination | 4.5.1 Examination of product. |
| 3.2.1.5 Fluid traps and faying surfaces. | Examination | 4.5.1 Examination of product. |
| 3.2.1.5.1 Ventilation. | Examination | 4.5.1 Examination of product. |
| 3.2.1.5.2 Drainage. | Examination | 4.5.1 Examination of product. |
| 3.2.2 Markings. | Examination | 4.5.1 Examination of product. |
| 3.2.3 Identification and information plates. | N/A | |
| 3.2.3.1 Identification plate. | Examination | 4.5.1 Examination of product. |
| 3.2.3.2 Transportation data plate. | Examination | 4.5.1 Examination of product. |
| 3.2.4 Safety. | N/A | |
| 3.2.4.1 System safety. | Analysis | 4.5.10 System safety hazard analysis. |
| 3.2.4.2 Component protection. | Examination | 4.5.1 Examination of product. |
| 3.2.4.3 Foreign object damage (FOD). | Examination | 4.5.1 Examination of product. |
| 3.2.5 Fastening devices. | Examination | 4.5.1 Examination of product. |
| 3.2.6 Welders and welding. | Examination | 4.5.1 Examination of product. |
| 3.2.7 Foolproofness. | Examination | 4.5.1 Examination of product. |
| 3.2.8 Human engineering. | Demonstration | 4.5.1 Examination of product. |
| 3.2.9 Service life. | Analysis | 4.5.2 Service life analysis. |

TABLE II. Requirement verification matrix - Continued

| Section 3 Requirement | Verification Method | Section 4 Verification |
|---|---|---|
| 3.2.10 Interconnecting components. | Examination | 4.5.2.1 Interconnection component certification. |
| 3.3 Environmental conditions. | N/A | |
| 3.3.1 Operating temperature range. | Test | 4.5.7.1 High temperature storage and operation test.<br>4.5.7.2 Low temperature storage and operation test. |
| 3.3.2 Storage temperature range. | Test | 4.5.7.1 High temperature storage and operation test.<br>4.5.7.2 Low temperature storage and operation test. |
| 3.3.3 Precipitation. | N/A | |
| 3.3.3.1 Rain. | Test | 4.5.8.1 Rain test. |
| 3.3.3.2 Solar radiation. | Examination | 4.5.1 Examination of product. |
| 3.3.3.3 Fungus. | Examination | 4.5.1 Examination of product. |
| 3.3.3.4 Salt fog. | Test | 4.5.5 Salt fog test. |
| 3.3.3.5 Sand and dust. | Test | 4.5.6 Sand and dust test. |
| 3.4 Transportability. | N/A | |
| 3.4.1 Surface transportability. | Analysis | 4.5.3.1 Surface transportability analysis. |
| 3.5 Maintainability. | N/A | . |
| 3.5.1 Preventive maintenance. | Demonstration | 4.6.12.1 Preventive maintenance demonstration. |
| 3.5.2 Inspection and servicing provisions | Demonstration | 4.6.12.1 Preventive maintenance demonstration. |
| 3.6 Operational performance. | N/A | |
| 3.6.1 TAAS 165/9/P. | Test | 4.5.11 Operational inspection. |
| 3.6.2 TAAS 165/9/9/P. | Test | 4.5.11 Operational inspection. |
| 3.6.3 TAAS 330/9/P. | Test | 4.5.11 Operational inspection. |
| 3.7 Module height and thickness. | Examination | 4.5.1 Examination of product. |
| 3.8 Cable pretension winch. | Examination | 4.5.1 Examination of product. |
| 3.9 Jet blast. | Analysis | 4.5.4 Jet blast analysis. |
| 3.9.1 Jet blast deflectors. | Examination | 4.5.1 Examination of product. |
| 3.10 Strap and module material. | Examination | 4.5.1 Examination of product. |
| 3.11 Module tear strength. | Test | 4.5.9 Module tensile tear strength tests. |

TABLE II. Requirement verification matrix - Continued

| Section 3 Requirement | Verification Method | Section 4 Verification |
|---|---|---|
| 3.12 Hook cable (pendant assembly or arresting cable). | Examination | 4.5.1 Examination of product. |
| 3.13 Installation drawings and concrete foundation. | Examination | 4.5.1 Examination of product. |
| 3.14 Support disks. | Examination | 4.5.1 Examination of product. |
| 3.15 Shear link system. | Test | 4.5.11 Operational inspection. |
| 3.16 Modular connector. | N/A | |
| 3.16.1 Type I through Type VII | Examination | 4.5.1 Examination of product |
| 3.16.2 Type VIII through Type XI. | Examination | 4.5.1 Examination of product. |
| 3.16.3 Type XII through Type XV. | Examination | 4.5.1 Examination of product. |
| 3.16.4 Type XVI through Type XVII. | Examination | 4.5.1 Examination of product. |
| 3.16.5 Type XIX through Type XXII. | Examination | 4.5.1 Examination of product. |
| 3.17 Workmanship. | Examination | 4.5.1 Examination of product. |
| 3.17.1 Bolted connections. | Examination | 4.5.1 Examination of product. |
| 3.17.2 Riveted connections. | Examination | 4.5.1 Examination of product. |
| 3.17.3 Cleaning. | Examination | 4.5.1 Examination of product. |

4.2 First article inspection. The first article TAAS shall be subjected to the tests, examinations and analyses described in 4.5.1 through 4.5.10. The contractor shall provide or arrange for all test equipment and facilities. First article inspection shall be accomplished prior to proceeding with section 4.3, which requires deadload vehicle testing in accordance with 3.6. The first article inspections shall be approved by WR-ALC/GRVEC prior to conducting operational inspection per 4.3.

4.3 Operational inspection. The TAAS shall be functionally tested against deadload vehicle to demonstrate compliance with the requirements specific to 4.5.11. Testing shall be conducted at United States Navy, Naval Air Systems Command (NAVAIR) Lakehurst, NJ by the Government. The contractor shall coordinate system shipping and delivery to NAVAIR and shall supply total support in the installation of each system to be tested. Further, the TAAS shall be subjected to maintainability demonstration in accordance with 4.5.12.1.

4.4 Inspection requirements.

4.4.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy. Upon request, current certificates of calibration will be available for review by Government representatives.

4.4.2 Data. During all testing specified herein, at least the following data, unless not applicable, shall be recorded. Additional data shall be provided as appropriate for any specific test.

a. date of test

b. ambient temperature

c. relative humidity

d. system configuration

e. test event number

f. deadload vehicle weight (lbs)

g. engagement speed (kts)

h. energy at arrestment (ft-lbs)

i. max hook load (lbs)

j. hook load (lbs) vs. runout (ft)

k. hook load (lbs) vs. time (milliseconds)

l. deceleration (Gs) vs. time (milliseconds)

m. end-of-arrestment G-loading (Gs)

n. walkback distance (ft)

o. maximum walkback velocity (knots)

p. initial hook cable pickup location

q. final aircraft or deadload vehicle position (with respect to runway centerline) (ft)

r. length of expended/torn textile strap (ft) vs. un-torn portion of textile brake material (ft) [if applicable]

s. number of failed/damaged straps (per side), and the cause of damage (colored digital photographs shall be provided within the report for documentation purposes)

t. miscellaneous remarks i.e., proper environmental cover tearing and function, etc

4.4.3 Test rejection criteria. Throughout all tests specified herein, the TAAS shall be closely observed for the following conditions, which shall be cause for rejection:

a. Failure to conform to first article inspections, operational and performance requirements specified herein.

b. Continued premature failure of modules during testing, affecting system performance.

c. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.

d. Evidence of corrosion or deterioration.

e. Misalignment of components.

f. Evidence of excessive wear. If excessive wear is suspected, the original equipment manufacturer's (OEM's) specifications or tolerances shall be utilized for making a determination.

g. Structural failure of any component, including permanent deformation, or evidence of impending failure.

4.5 Test methods.

4.5.1 Examination of product. Each TAAS shall be examined to verify compliance with the requirements herein prior to accomplishing any other demonstrations or tests listed in 4.5. A contractor-generated, Government-approved checklist shall be used to identify each requirement not verified by an analysis, certification, demonstration, or test, and shall be used to document the examination results. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each TAAS function shall be verified. Certifications and analyses shall be provided in accordance with Table III. Each production TAAS shall be inspected to a Government-approved reduced version of the checklist.

TABLE III. Certifications and analyses.

| Paragraph | Required Certifications and Analyses |
|---|---|
| 3.2.4.1 System safety | Contractor analysis of the service life requirement (see 4.5.10). |
| 3.2.9 Service life. | Contractor analysis of the service life requirement (see 4.5.2). |
| 3.2.10 Interconnecting components. | Contractor certification that all interconnecting components have a normal service life of two years minimum when exposed to ultra violet radiation (see 4.5.2.1). |
| 3.3.3.2 Solar radiation. | Contractor certification that the TAAS performance is not adversely affected by full time exposure to solar radiation (verification that the environmental cover is suitable for 10 years service in all weather environments), such as those conditions encountered in desert environments. |
| 3.3.3.3 Fungus. | Contractor certifications that the material(s) used in construction of the TAAS are fungus resistant or suitably treated to resist fungus. |
| 3.3.3.4 Salt fog. | Contractor analysis of the salt fog requirement (see 4.5.5) |
| 3.3.3.5 Sand and dust. | Contractor analysis of the sand and dust requirement (see 4.5.6) |
| 3.4.1 Surface transportability. | Contractor surface transportability analysis (see 4.5.3.1) and certification that the TAAS is transportable via all modes of surface shipment. |
| 3.9 Jet blast. | Contractor analysis of the jet blast requirement (see 4.5.4) |
| 3.10 Strap and module material. | Contractor certification that the material used in construction of the TAAS modules and shear link system are of Nylon 6.6 HT |

4.5.2 Service life analysis. An engineering analysis shall be performed to demonstrate compliance with the service life requirement of 3.2.9.

4.5.2.1 Interconnection component certification. Contractor certification that all interconnecting components have a normal service life of two years minimum when exposed to ultra violet radiation.

4.5.3 Transportability verification.

4.5.3.1 Surface transportability analysis. An engineering analysis shall be performed to demonstrate compliance with 3.4.1. The engineering analysis shall utilize the data for rail, ship, and road transportation modes referenced in MIL-STD-810, Method 514.6.

4.5.4 Jet blast analysis. An engineering analysis shall be performed to demonstrate compliance with the jet blast requirement of 3.9.

4.5.5 Salt fog test. A TAAS module shall be tested in accordance with MIL-STD-810, Method 509.5, to demonstrate compliance with 3.3.3.4. Test duration shall be alternating 24-hour periods of salt fog exposure and drying conditions for 24-hour periods (two wet and two dry).

4.5.6 Sand and dust test. A TAAS module shall be tested in accordance with MIL-STD-810, Method 510.5, Procedures I (12 hours) and II (90 minutes per side), to demonstrate compliance with 3.3.3.5.

4.5.7 Environmental testing.

4.5.7.1 High temperature storage and operation test. A TAAS module shall be tested in accordance with MIL-STD-810, Method 501.5, Procedures I and II, to demonstrate compliance with the high temperature storage and operating requirements of 3.3.1 and 3.3.2. Test duration shall be one 24-hour cycle for each procedure.

4.5.7.2 Low temperature storage and operation test. A TAAS module shall be tested in accordance with MIL-STD-810, Method 502.5, Procedures I and II, to demonstrate compliance with the low temperature storage and operating requirements of 3.3.1 and 3.3.2. Test duration shall be one 24-hour cycle for each procedure.

4.5.8 Precipitation tests.

4.5.8.1 Rain test. A TAAS module shall be tested in accordance with MIL-STD-810, Method 506.5, Procedure I, to demonstrate compliance with 3.3.3.1.

4.5.9 Module tensile tear strength tests. To demonstrate compliance with 3.11, the WR-ALC/GRVEC requires TAAS module straps be evaluated in each of the six conditions:

a. Ambient dry

b. Ambient wet

c. Cold dry (at -40$^{o}$F)

d. Hot dry (at 125$^{o}$F)

e. Hot wet (at 125$^{o}$F)

4.5.10 System safety hazard analysis. A system safety hazard analysis of the TAAS shall be conducted in accordance with 4.2 through 4.8 of MIL-STD-882 to demonstrate compliance with the mishap risk requirement of 3.2.4.1.

4.5.11 Operational inspection. The TAAS shall be functionally tested against instrumented deadload vehicles or aircraft to determine compliance with the requirements specified in 3.6. See TABLE IV for the operational inspection test matrix.

TABLE IV. TAAS test matrix for operational inspection.

| TAAS Version | Approximate Deadload Weight (lb) | Approximate Engagement Speed (knots) | Span (ft) | Engagement/Off-center Location (ft) |
|---|---|---|---|---|
| TAAS 165/9/P | 31,650 | 100 | 184 | 37.5 |
| TAAS 165/9/P | 39,700 | 85 | 164 | 0 |
| TAAS 165/9/P | 79,200 | 60 | 157 | 37.5 |
| TAAS 165/9/9/P | 79,200 | 95 | 157 | 22.5 |
| TAAS 330/9/P | 39,700 | 145 | 184 | 0 |

4.5.12 Maintainability analysis and demonstration.

4.5.12.1 Preventive maintenance demonstration. All recommended preventive maintenance tasks shall be performed and the task times shall be recorded. It shall be demonstrated that the forces required do not exceed those allowed in MIL-STD-1472. All preventive maintenance tasks recommended to be performed daily and at the routine PMI shall also be performed by personnel wearing arctic mittens and MOPP Level 4 Chemical Warfare Gear.

## 5. PACKAGING

5.1 For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

6.1 Intended use. The emergency Aircraft Arresting System (AAS) covered in this specification is intended for use in the runway overrun, and is designed and suitable for departure end engagements only. The TAAS is a secondary braking system available in case of failure of a successful engagement by the primary AAS i.e., Barrier Arresting Kit-12 (BAK-12) or Mobile Aircraft Arresting System (MAAS). An AAS is a military-unique application since it is capable of directly interfacing with tail hook equipped fighter aircraft during critical moments of operation.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, Type, number, and date of this standard.

b. If first article inspection is required (see 3.1).

6.3 Definitions.

6.3.1 TAAS 165/9/P. The 165 represents the length (in feet) of un-torn nylon strap per module; nine represents the number of modules per runway side; the P represents hook cable (pendant) engagement device.

6.3.2 TAAS 165/9/9/P. The 165 represents the length (in feet) of un-torn nylon strap per module; the first nine represents the number of modules per runway side for the first stage engagement; the subsequent nine represents the number of modules per runway side for the second stage engagement; the P represents hook cable (pendant) engagement device. Stage two is a redundant brake to stage one and positioned approximately 195-ft behind stage one. In general, the first stage modules are essentially consumed at the onset of the second stage engagement. The TAAS 165/9/9/P is capable of unidirectional engagement (one direction) by aircraft.

6.3.3 TAAS 330/9/P. The 330 represents the length (in feet) of un-torn nylon strap per module; nine represents the number of modules per runway side; the P represents hook cable (pendant) engagement device. The TAAS 330/9/P is capable of bidirectional engagement by aircraft.

6.3.4 TAAS 200/9/9/P (Type I). The 200 represents the length (in feet) of un-torn nylon strap per module; the first nine represents the number of modules per runway side for the first stage engagement; the subsequent nine represents the number of modules per runway side for the second stage engagement; the P represents hook cable (pendant) engagement device.

Since the TAAS 200/9/9/P is an unidirectional system, it consists of a two stage braking structure: one stage being utilized at initial tail hook pick-up, and a second stage (which is interconnected to the first stage by long connecting straps) being positioned approximately 230-ft after the first stage. In general, the first stage modules are essentially consumed at the onset of the second stage engagement. The TAAS 200/9/9/P has a kinetic energy absorption capacity of 52 million ft-lbs.

6.3.5 TAAS 200/9/9/P/R (Type II). The TAAS 200/9/9/P/R reset consists of all necessary new components required to reset the TAAS 200/9/9/P system directly following an engagement.

6.3.6 TAAS 200/9/9/P/WITH RESET (Type III). The TAAS 200/9/9/P/WITH RESET consists of a Type I and Type II TAAS.

6.3.7 TAAS 200/9/9/P/R1 (Type IV). The TAAS 200/9/9/P/R1 consists of all necessary new components required to reset the first stage brake (delineated by R1) of the TAAS 200/9/9/P (Type I TAAS). At a minimum, this includes the first stage of modules, the long connecting straps found to exist between the first and second stage brake, all directional control modules, the environmental covers for these components, and relating hardware. This would be required if the energy level during the arrestment was insufficient to begin tearing of second stage modules; it is a subsystem to the TAAS 200/9/9/P.

6.3.8 TAAS 330/10/P (Type V). The 330 represents the length (in feet) of un-torn nylon strap per module; 10 represents the number of modules per runway side; the P represents hook cable (pendant) engagement device. The TAAS 330/10/P is a bidirectional system, and has a kinetic energy absorption capacity of approximately 43 million ft-lbs.

6.3.9 TAAS 330/10/P/R (Type VI). The TAAS 330/10/P/R consists of all necessary new components required to reset the TAAS 330/10/P system (after being engaged by aircraft) into the battery position (ready to engage and arrest aircraft).

6.3.10 TAAS 330/10/P/WITH RESET (Type VII). The TAAS 330/10/P/WITH RESET consists of a Type V and Type VI TAAS.

6.3.11 TAAS 200/6/9 MA-1A Modified (Type VIII). The 200 represents the length (in feet) of un-torn nylon strap per module; the six represents the number of modules per runway side for the first stage engagement; the nine represents the number of modules per runway side for the second stage engagement. The TAAS 200/6/9 MA-1A Modified utilizes a hook cable to engage the aircraft tail hook, and an MA-1A Barrier system to lift a 7/8-inch diameter hemp core cable to engage the main gear struts for aircraft without tail hooks.

6.3.12 TAAS 200/6/9 MA-1A Modified/R (Type IX). The TAAS 200/6/9 MA-1A Modified/R reset consists of all necessary new components required to reset the TAAS 200/6/9 MA-1A Modified directly following an engagement.

6.3.13 TAAS 200/6/9 MA-1A Modified/WITH RESET (Type X). The TAAS 200/6/9 MA-1A Modified/WITH RESET consists of a Type VIII and Type IX TAAS.

6.3.14 TAAS 200/6/9 MA-1A Modified/R1 (Type XI). The TAAS 200/6/9 MA-1A Modified/R1 consists of all necessary new components required to reset the first stage brake (delineated by R1) of the TAAS 200/6/9 MA-1A Modified. At a minimum, this includes the first stage of modules, the long connecting straps that interlink the first and second stage braking, all directional control modules, the environmental covers for these components, and related hardware. This would be required if the energy level during the arrestment was insufficient to begin tearing of second stage modules; it is a subsystem to the TAAS 200/6/9 MA-1A Modified.

6.3.15 TAAS 200/6/9 MA-1A Barrier (Type XII). The 200 represents the length (in feet) of un-torn nylon strap per module; the six represents the number of modules per runway side for the first stage engagement; the nine represents the number of modules per runway side for the second stage engagement; it connects to the MA-1A Barrier system to serve as the energy absorber.

6.3.16 TAAS 200/6/9 MA-1A Barrier/R (Type XIII). The TAAS 200/6/9 MA-1A Barrier/R reset consists of all necessary new components required to reset the TAAS 200/6/9 MA-1A Barrier directly following an engagement.

6.3.17 TAAS 200/6/9 MA-1A Barrier/WITH RESET (Type XIV). The TAAS 200/6/9 MA-1A Barrier/WITH RESET consists of a Type XII and Type XIII TAAS.

6.3.18 TAAS 200/6/9 MA-1A Barrier/R1 (Type XV). The TAAS 200/6/9 MA-1A Barrier/R1 consists of all necessary new components required to reset the first stage brake (delineated by R1) of the TAAS 200/6/9 MA-1A Barrier. At a minimum, this includes the first stage of modules, the long connecting straps, all directional control modules, the environmental covers for these components, and relating hardware. This would be required if the energy level during the arrestment was insufficient to begin tearing of second stage modules; it is a subsystem to the TAAS 200/6/9 MA-1A Barrier.

6.3.19 TAAS 330/10 BAK-15 Net Barrier (Type XVI). The 300 represents the length (in feet) of un-torn nylon strap per module; 10 represents the number of modules per runway side; it is a net engaging device which is required for use with the BAK-15 Net Barrier (see 6.3.31). The TAAS 330/10 BAK-15 Net is normally a bidirectional system, and has a kinetic energy absorption capacity of 43 million ft-lbs. However, when coupled with a net engaging device, the system is unidirectional, and has a slightly higher energy capacity due to the dynamic drag created by the net. This system is not suitable for installations expecting T-38 aircraft engagements.

6.3.20 TAAS 330/10 BAK-15 Net Barrier/R (Type XVII). The TAAS 330/10 BAK-15 Net Barrier/R consists of all textile modules, covers, and connecting hardware needed to reset the TAAS 330/10 BAK-15 Net Barrier after an aircraft engagement. This system is not suitable for installations expecting T-38 aircraft engagements.

6.3.21 TAAS 330/10 BAK-15 Net Barrier/WITH RESET (Type XVIII). The TAAS 330/10 BAK-15 Net Barrier/WITH RESET consists of a Type XVI and Type XVII TAAS. This system is not suitable for installations expecting T-38 aircraft engagements.

6.3.22 TAAS 200/6/9 BAK-15 Net Barrier Interconnect (Type XIX). The 200 represents the length (in feet) of un-torn nylon strap per module; the six represents the number of modules per runway side for the first stage engagement; the nine represents the number of modules per runway side for the second stage engagement. In general, a BAK-15 is a net type aircraft arresting net barrier used primarily for emergency recovery (arrestment) of USAF non-prop trainer aircraft. Such arrestments generally occur during aborted takeoffs or during instances of internal aircraft malfunction during the landing roll. When the net barrier system (i.e., the BAK-15) is complemented with a hook cable to also allow engagement by tail hook equipped aircraft, and it is referred to as the BAK-15 Net Barrier Interconnect. In this configuration, a hook cable is positioned approximately 65-feet in advance of the BAK-15, and is mechanically interconnected to the TAAS and net barrier. This distance provides arresting potential for tail hook equipped aircraft, and, if successfully engaged, would provide the majority of the decelerating loads through the aircraft tail hook.

6.3.23 TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R (Type XX). The TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R reset consists of all necessary new components required to reset the TAAS 200/6/9 BAK-15 Net Barrier Interconnect directly following an engagement.

6.3.24 TAAS 200/6/9 BAK-15 Net Barrier Interconnect/WITH RESET (Type XXI). The TAAS 200/6/9 BAK-15 Net Barrier Interconnect/WITH RESET consists of a Type XIX and Type XX TAAS.

6.3.25 TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R1 (Type XXII). The TAAS 200/6/9 BAK-15 Net Barrier Interconnect/R1 consists of all necessary new components required to reset the first stage brake (delineated by R1) of the TAAS 200/6/9 BAK-15 Net Barrier Interconnect system. At a minimum, this includes the first stage of modules, the long connecting straps, all directional control modules, the environmental covers for these components, and relating hardware. This would be required if the energy level during the arrestment was insufficient to begin tearing of second stage modules; it is a subsystem to the TAAS 200/6/9 BAK-15 Net Barrier Interconnect.

6.3.26 Walkback. Walkback of the aircraft or deadload vehicle can result from residual or stored energy within the stretched nylon straps at the end of the arrestment cycle. The stored energy converts to reverse velocity of the aircraft or deadload vehicle while its tail hook remains engaged to the arresting system's hook cable. While moderate walkback can be managed by aircraft braking and engine thrust, excessive walkback can damage aircraft by causing the aircraft to tilt back on its tail.

6.3.27 Pull through. Pull through is when the aircraft or deadload exceeds the braking capacity of the system, and continues down the overrun or runway with any amount of residual speed.

6.3.28 Common hand tool. A non-powered tool that is likely to be found in a typical mechanic's toolbox. Common hand tools include open end, boxed end, combinations, socket (both 6- and 12-point in both standard and deep-well), and hex key wrenches, in Society of Automobile Engineers (SAE) sizes up to and including 1-inch and metric sizes up to and including 25-mm; ratchet handles, extensions, and swivels; slotted and Phillips-head screwdrivers; regular and snap-ring pliers; and a ball-peen hammer.

6.3.29 MA-1A Barrier. Per AFI 32-1043, "The MA-1A emergency arresting system consists of a net barrier and cable system designed to engage the main landing gear of an aircraft. Because it is a unidirectional system, it must always be installed in the overrun area. Most MA-1A systems employ ships' anchor chains as the energy absorber. These systems require a runout area of at least 850 feet plus the length of the aircraft.” Reference Figure A2.1 per AFI 32-1043 for a plan view of the MA-1A barrier.

6.3.30 MA-1A Modified. The MA-1A may be complemented with a hook-cable interconnect to allow engagement by tail hook equipped aircraft. In this configuration, a hook cable is positioned approximately 35 feet forward of the MA-1A barrier net. This distance would provide arresting potential for a tail hook equipped aircraft, and, if successfully engaged, would provide the decelerating loads through the aircraft tail hook (loading via MA-1A Net would not exist).

To allow braking forces at the onset of hook cable pick up, the anchor chain (or energy absorption device) is connected to the hook cable, which is positioned downwind of the MA-1A net location. The MA-1A Modified arrangement is shown in Figure A2.2 per AFI 32-1043 and detailed within USAF T.O. 35E8-2-2-1. This system will utilize the TAAS 200/6/9 MA-1A Modified systems to replace ship anchor chain.

6.3.31 BAK-15 Barrier Net. A cross-runway nylon webbing barricade or net that serves as an engaging means for arresting non-hook equipped aircraft. A BAK-15 net barrier is shown in Figure A2.10 per AFI 32-1043; it will utilize TAAS 330/10 BAK-15 Net Barrier and TAAS 200/6/9 BAK-15 Net Barrier Interconnect systems in place of ship anchor chains.

6.3.32 BAK-15 Net Barrier Interconnect. In general, a BAK-15 is a net type aircraft arresting net barrier used primarily for emergency recovery (arrestment) of USAF non-prop trainer aircraft. Such arrestments generally occur during aborted takeoffs or during instances of internal aircraft malfunction during the landing roll. When the net barrier system (i.e., the BAK-15) is complemented with a hook cable to also allow engagement by tail hook equipped aircraft, and it is referred to as the BAK-15 Net Barrier Interconnect. In this configuration, a hook cable is positioned approximately 65-feet in advance of the BAK-15, and is mechanically interconnected to the TAAS and net barrier. This distance provides arresting potential for tail hook equipped aircraft, and, if successfully engaged, would provide the majority of the decelerating loads through the aircraft tail hook

6.3.33 Deadload vehicle. A deadload vehicle is a test vehicle that is outfitted with an instrumented tailhook; it is used to simulate fighter aircraft engagements of arresting system test articles without jeopardizing pilot safety or costly aircraft. Deadload vehicles can be configured to simulate engagements at various weights, and are programmable to engage the AAS at speeds up to 200 knots.

6.3.34 Dynamic hook load. The dynamic hook load occurs during the early adjusting phase of the engagement cycle, where hook loading is ramping up and has not stabilized. Generally, the dynamic hook loading occurs within the first 200-ft to 300-ft of deadload vehicle or aircraft runout.

6.3.35 Roll out hook load. The roll out hook load occurs after dynamic hook load transitions to nearly a constant loading against the deadload vehicle or aircraft. It occurs during the majority of the arrestment cycle.

6.4 Subject term (key word) listing.

AAS
Arrestment
BAK-15
Deadload
Engagement
Hook load
Module
MA-1A
Pendant cable
Walkback

| | |
|---|---|
| Custodians<br>Air Force - 84 | Preparing activity:<br>Air Force - 84 |
| Review activities:<br>Air Force - 99 | Agent<br>Air Force - 99 |
| | (Project 1710-2011-003) |

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.daps.dla.mil