

Foreign Military Sales (FMS) Checklist for Preparing a Letter of Request (LOR) for Air Combat Maneuvering Instrumentation (ACMI)



The P5 Combat Training System (P5CTS) is the latest ACMI System.
Its superior capabilities let you...

“Train the Way You Fight.”

THIS ACMI FMS CHECKLIST WILL BE USED TO CAPTURE REQUIREMENTS AND DEVELOP A LETTER OF REQUEST (LOR). AS SUCH, IT SHOULD NOT BE CHANGED WITHOUT REVIEW AND AGREEMENT BY ALL STAKEHOLDERS BEFORE A LETTER OF OFFER AND ACCEPTANCE (LOA) IS SIGNED.

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1.0	PARTNER AND LOA GENERAL INFORMATION
1.1	Purchasing Country:
1.2	Name of Primary Country Contact for ACMI Requirements:
1.3	Country Contact's Position:
1.4	Country Contact's Title/Rank/Grade:
1.5	Country Contact Can Be Reached: (tel)
	(email)
	(post)
1.6	SAPM for LOA
1.7	Case Designator (if established):
1.8	Name of SAPM Primary Contact for ACMI Requirements:
1.9	SAPM Contact's Position:
1.10	SAPM Contact's Title/Rank/Grade:
1.11	SAPM Contact Can Be Reached: (tel)
	(email)
	(post)

2.0	CAPABILITY REQUIREMENTS	Desired (check one)	Yes	No
2.1	Training Range Operation Using ACMI			
2.2	Range-less Operation of ACMI (an inherent feature, but may influence 4.4 decision)		(standard)	
2.3	Live Monitoring of ACMI During Training Range Operation			
2.4a	Precision TSPI (P(Y)-coded GPS)			
2.4b	Coarse TSPI (C/A-coded GPS)			
2.5a	Precision Simulation of Weapon Employment with RTKN & NDWS (classified sims)			
2.5b	Coarse Simulation of Weapon Employment with RTKN & NDWS (commercial sim's)			
2.5c	SimBuilder® for Purchaser's Self-Designed Sims			
2.5d	MACE® for Desktop Simulated Air Combat Training			
2.6	Joint Helmet Mounted Cueing System (JHMCS) Input for Weapon Simulations			
2.7	Post-Mission Merge/Display of JHMCS Data			
2.8	Post-Mission Merge/Display of Other ACMI System Data (e.g., P5 and KITS)			
2.9	Post-Mission Synchronization of Head-Up Display (HUD) Recording			
2.10	Post-Mission Hypothetical Simulation of Weapon Employment (Hypothesizer)		(std w/sims)	
2.11	Other Desired Capabilities (e.g., Range Radios):			

3.0	SCHEDULE REQUIREMENTS
3.1	Month/Year of Full Operational Capability at Primary Operating Base:
3.2	Month/Year of Full Operational Capability at All Locations:
3.3	Other Schedule Needs:

4.0	EQUIPMENT REQUIREMENTS	Quantity
4.1	Airborne Subsystem (AS) or "pod"	
4.2	Transportable Ground Subsystem (TGS)	

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4.3	Transportable Ground Subsystem with Live Monitor (TGS-LM)	
4.4	Portable Ground Subsystem (PGS)	
4.5	Synchronized Device Feeds (Identify in addendum, e.g., HUD, JHMCS) (total)	
4.6	Control Display Unit (CDU) (Carrying case with wheels for portability included)	
4.7	General Support and Test Equipment (GSE)	
4.8	Initial Spares of AS/GS components, assemblies, and shop replaceable units (months)	
4.9	Other Equipment (e.g., Range Radios for RTO-to-cockpit voice comm)	

5.0	BASING AND SUPPORT REQUIREMENTS (Equip Distr)	AS	TGS	TGS-LM	PGS	CDU	SE	Spares
5.1	Base or Location:							
5.2	Base or Location:							
5.3	Base or Location:							
5.4	Base or Location:							
5.5	Base or Location:							
5.6	Base or Location:							
5.7	Base or Location:							
5.8	Base or Location:							
5.9	Base or Location:							
5.10	Base or Location:							
5.11	Repair and Return Program (beyond std 1-year warranty) (months, if not desired "0")							
5.12	Contractor Logistics Support (CLS) (months, if not desired "0")							
5.13	Familiarization Training of Host Country Operators (# personnel)							
5.14	Familiarization Training of Host Country Maintainers (# personnel)							
5.15	Other Support Requirements:							

6.0	TECHNOLOGY SUSTAINMENT AND MODERNIZATION		
6.1	Equipment Obsolescence/Upgrade Program Participation (yes/no)		
6.2	System Software Obsolescence/Upgrade Program Participation (yes/no)		
6.3	Weapon Sim Sustain/Upgrade Program Participation (yes/no)		

7.0	OTHER REQUIREMENTS		
7.1	Aircraft Variant, Block, and Configuration (e.g. F-16C/D, Block 52, with EW pod)		
7.1a	First A/C, Block, Config: (OFP Suite/Tape)		
7.1b	Second A/C, Block, Config: (OFP Suite/Tape)		
7.1c	Third A/C, Block, Config: (OFP Suite/Tape)		
7.1d	Additional US or Non-US A/C, Blocks, or Config's? (If so, create addendum.) (yes/no)		
7.2	Airworthiness Certification Authority for Pod Carriage/Operation (US or Purchaser):		
7.3	Environmental Protection & HAZMAT Handling Standards (US or Purchaser):		
7.4	Operating Frequencies for ACMI: L-Band () or S-Band ()		
7.5	Sole Source Procurement to P5CTS/TCTS Manufacturer Explicitly Expressed? (yes/no)		
7.6	Sole Source Procurement of CLS for P5CTS/TCTS Explicitly Expressed? (yes/no)		
7.7	Addendum with Complete Weapon Designators and Proof(s) of Ownership (yes/no)		

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7.8	Services Above Standard Levels of Service (specify):
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8.0	ACMI SYSTEM DESCRIPTION
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The US Air Force's P5 Combat Training System (P5CTS, or Tactical Combat Training System (TCTS), as it is known by the US Navy) is the latest generation of ACMI and the current US Air Force and US Navy ACMI system of record. The P5CTS/TCTS provides an enhanced capability for fighter pilots to fly their own fighters and train in air combat maneuvering, in simulated launching of air-to-air weapons, and in simulated releasing of air-to-surface weapons far beyond the standard training modes inherent in fighter aircraft. These enhancements provide a superior capability for reinforced tactile and intellectual learning of exactly what happens during engagements and attacks; in other words the P5CTS/TCTS lets you "train the way you fight." Several design features of the P5CTS/TCTS make this possible.

First of all, the AS's (pods) provide continuous tracking and recording of each other's TSPI in engagements, meaning both target and shooter aircraft are cooperative. This enables two capabilities that enhance training:

- 1) **Realistic weapon fly-out.** If weapon simulations are installed in the P5CTS/TCTS, then *realistic weapon fly-out* for engagement and attack scoring is realized. Maneuvering air targets are tracked cooperatively between the shooter and the target aircraft pods so that the weapon sim can model the behavior of an actual seeker missile all the way to termination. Both shooter and target pilots are notified of the "kill" (or miss) at the actual time of closest approach. This function is called "Real Time Kill Notification." The "cockpit sim" (native to the aircraft OFP) does not actually track the moving/maneuvering target; as such it is a nearly instantaneous sim and therefore does not achieve perfect fidelity to the realism of combat maneuvering to escape the kill. For attacks, up to 100 ground targets can be loaded in the P5CTS/TCTS mission planning system for the ability to score hits (miss distance and azimuth) for unguided weapons using sims to avoid dropping actual ordnance. (Even practice bombs can be simulated and, to some extent, even guided weapons can have sims that have training value.) This function is called "No Drop Weapon Scoring."
- 2) **Visual Debrief of Recorded Tracks.** The post-mission debrief becomes an invaluable opportunity to examine the tactics, techniques, and procedures employed in any engagement or attack and ask the "what-if" questions. Whether the simulations hypothesizer is used or not, to see if changes in any particular weapon release would have made a difference, debrief with *visual display of the recorded tracks* of aircraft (and any simulated weapons' trajectories) is an excellent method for understanding and reinforcement. Debrief with integrated display of HUD recordings, other ACMI systems' tracks (for example, KITS), and even JHMCS recordings round out an excellent post-mission learning environment.

If P(Y)-coded GPS is purchased as part of the TSPI measuring device, TSPI data are as accurate as possible and support more accurate scoring. **P(Y)-coded GPS can be sold via FMS only** due to the nature of the technology. (More information is to be found in the instructions for lines 2.4a and 2.4b.)

Second, weapon sims can be provided that exhibit a high degree of fidelity to the actual performance of

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the US weapon variant belonging to the country. ***These are classified sims and therefore can be sold via FMS only.*** Unclassified sims may be sold commercially, but will not be as accurate a reflection of the weapon's performance. (More information is to be found in the instructions for lines 2.5a and 2.5b.)

Third, cueing of simulated weapons, where applicable, can be realistically integrated with JHMCS to provide realistic training with JHMCS. (See the instruction at lines 2.6, 2.7, and 4.5.)

Fourth, the P5CTS/TCTS Block 3 and above provide for up to 100 "high-activity aircraft" or "participants" to engage at the exercise level. Any one participant can simultaneously capture up to 8 RTKNs.

Fifth, the system can be operated in a rangeless mode with up to 80 nautical miles (NM) separation between any two participating aircraft. This means training can be conducted "anywhere" without the need for a range and ground links. Since all participating aircraft are linked together via P5CTS/TCTS, as long as the 80 NM chain is unbroken, all aircraft maneuvers (and weapons' simulated employments, if purchased) are recorded.

Sixth, P5CTS/TCTS is portable. Purchase of the PGS makes it feasible to "take your system with you" to participate in training, such as joint exercises, at training ranges other than your own.

Seventh, in addition to the post-mission playback, training participation can be monitored, live and visually, by range training officers and commanders. Tracks and other features are shown live on the Individual Combat Aircrew Debrief System® (ICADS) when TGS-LM is purchased.

These are the seven wonders of P5CTS/TCTS. Now to the instructions for specifying requirements.

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9.0 INSTRUCTIONS FOR SPECIFYING REQUIREMENTS IN SECTIONS 1 - 7

Introduction

It is the desire of the Range Systems International Branch to provide a Total Package Approach (“cradle-to-grave”) in supporting the ACMI air combat training capability for foreign partners. The checklist is designed to that end. Herein are line-by-line instructions and advice for choosing P5CTS/TCTS capabilities, quantifying equipment and spares, expressing basing and support needs, and specifying other requirements that will accelerate the process of completing an LOR for a complete ACMI program. All instructional information below is aligned to the lines in sections 1 through 7 above.

It is presumed that a US official, such as an AFSAC country case manager or a security cooperation officer, will assist a foreign official in completing the checklist. As clarification or further assistance is needed, the Range Systems International Branch (AFLCMC/EBYI, Eglin AFB Florida) should be contacted.

Instructions for Specifying Requirements

- 1.0 Partner and General LOA Information. The terms “partner” and “purchaser” found here and elsewhere in the checklist are synonymous with the name of the “country” purchasing the ACMI system.
- 1.1 Enter the full name of the country purchasing the ACMI system as it will be shown in English on the LOA.
 - 1.2 Enter the name using simple English lettering of the primary person, representing the purchasing country, who will work on finalizing requirements for the LOA.
 - 1.3 Enter the contact’s position or “job title” so that it is clear how this person relates to other officials in the purchasing country.
 - 1.4 Enter the contact’s title and/or rank or grade so that it is clear how to address the person.
 - 1.5 Enter the best telephone number to reach the contact. Suggest best hours to reach the contact. Be sure to enter the country code and inland area codes with full exchange and extension. The contact might have a US number, but that might not be obvious. Enter a reliable, official email address for the contact, if available. Try to avoid using commercial email addresses. Enter the complete postal address for document delivery.
 - 1.6 Identify the US program office, that manages the sale of aircraft or other equipment, and that is the steward of the LOA. It is possible for the Range Systems International Branch to be the ACMI SAPM, but typically ACMI is sold as a line on an aircraft case.
 - 1.7 Enter the FMS case designator, if it has been established.
 - 1.8 Enter the SAPM’s primary point of contact to finalize ACMI requirements.
 - 1.9 Enter the SAPM contact’s position title.
 - 1.10 Enter the SAPM contact’s title and/or grade/rank. Also, enter the desired form of address.
 - 1.11 Enter the SAPM contact’s communication links as shown.
- 2.0 Capability Requirements. This section will capture desired features, functionality, and interface requirements. Items in this section relate to the equipment and basing requirements in sections 4.0 and 5.0. Fill out section 2.0 first, then follow instructions for sections 4.0 and 5.0 to ensure harmony with desired capabilities.
- 2.1 Do you, the purchaser, have a range you wish to regularly use for air combat training? The size and shape of the range, along with topographical features, will influence the layout and

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- selection of GS equipment, in particular RRUs. Mountainous terrain will require placement of RRUs (potentially extra RRUs) to achieve full geographic coverage for the datalink.
- 2.2 It is not necessary to see the answers to items 2.1 and 2.2 as mutually exclusive. Range-less operation of the P5CTS/TCTS is a **standard** capability regardless of whether the system is used on a training range or deployed to locations without facilities the country can use. A number of fighters may participate in isolation in air combat maneuvering, including employing simulated weapons, and all data will be recorded. Later, the data can be downloaded for debrief using whatever GS capability/equipment is selected (Section 4.0). Also, note that selection of PGS equipment (item 4.4) may be desirable for the country to provide its own temporary range set-up away from home bases, but it will not negate the range-less operation capability.
- 2.3 Live monitoring (LM) enables realtime visual display of a map of the training area and the identifiable tracks of all active participants. Standard LM is provided via projection equipment for debrief rooms. Large screen televisions can be employed for this purpose, say, in an auditorium setting. Any such non-standard requirement should be expressed in 2.11 and the equipment specified in 4.9.
- 2.4 (a) Precision TSPI is a valuable feature of P5CTS/TCTS. Precision TSPI results from the installation of “military GPS user equipment” (MGUE) or GPS that operates with encrypted P(Y) code, otherwise known as the Precise Positioning Service (PPS) signal, for a significantly higher degree of accuracy than commercial GPS equipment. The export of MGUE is governed by DoD policy and **MGUE will generally be sold via FMS only**. Provision of the firmware for P(Y)-coded GPS is overseen by the GPS program office at Los Angeles AFB CA. **A line note will be inserted into the LOA delineating “special terms and conditions for GPS PPS Host Application Equipment (HAE).” Also, in order for the P5CTS/TCTS to obtain and use the P(Y)-coded GPS, the purchaser must have signed a special “communications interoperability and security memorandum of agreement (CISMOA,” separate from the LOA, which governs how the keying equipment may be stored and maintained.**
- (b) Coarse TSPI is available, but not recommended, if the purchaser already has approval to use P(Y)-coded GPS. Coarse TSPI results from the installation of commercially available “coarse acquisition” or C/A-coded GPS equipment. It will not provide the high degree of accuracy that underpins high-accuracy performance of weapon simulations as explained in the system description in section 8.
- 2.5 (a) Weapon sims can be provided for most US weapons (air-to-air missiles such as AIM-120 and AIM-9, unguided and precision guided munitions used in direct or area attack such as JDAM-kitted Mk-82 or BLU-109 bombs, and ammunitions) in the weapon variant sold to the purchasing country. Due to a US ban on the export of cluster munitions, only two specific cluster munition sims (for the two munitions that meet the restrictions delineated in the ban) can be made available. Therefore, with respect to banned cluster munitions, even if the purchasing country already owns the munition, no sim or any ability to acknowledge or record the release of the weapon will be provided. This same policy will apply in future to any other weapon export bans put in place after limited export has occurred. **High-fidelity (precision) sims, reflecting the performance of the actual variant the country owns, are classified. In order for classified sims to be provided for any weapon, the purchaser must provide two critical pieces of information for each weapon: (1) exact weapon designator and (2) proof of ownership. (See line 7.7 and its instructions.)**
- (b) The purchaser has the option (not recommended) to obtain unclassified weapon sims that are designed with lower fidelity (less precision) in their performance. **(See the caveat in the instructions for line 7.7.)**

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(c) The purchaser can obtain the SimBuilder® design tool that enables the design of any weapon sim the purchaser may wish. Extensive training in the use of the tool is necessary. **(See the caveat in the instructions for line 7.7.)**

(d) The purchaser can obtain the Modular Air Combat Environment (MACE®) tool to practice air combat weapon employment in a desktop Windows® environment. **This provides additional ground training capability (classroom or office space) and presumes that the purchaser has or is purchasing sims.** MACE® can be operated in a classified or unclassified environment.

- 2.6 If the purchaser owns JHMCS, then JHMCS can be integrated as a sensor input for weapon cueing in sims. JHMCS integration for weapon sims is recommended.
- 2.7 JHMCS recordings, regardless of whether used as a sensor input for weapon sims or not, can be displayed in post-mission debriefs on ICADS®. Extra equipment, to be integrated into the GS, will be required to synchronize playback of JHMCS.
- 2.8 If the purchaser owns another ACMI system, or systems, employed concurrently with P5CTS/TCTS, all ACMI systems can be integrated into the post-mission debrief. Extra equipment will likely be required. Live monitoring of the systems (unclassified) might also be feasible. Quantify the synchronized device feeds in 4.8
- 2.9 HUD recordings can be synchronized (merged) and played back with the ACMI mission recordings for discussion during debrief. HUD merge will depend on the recording technology used and country desires. There may be additional funding required for technology not already supported by the P5CTS/TCTS. Attach an addendum to identify the HUD technology used in the purchasing country's fighter aircraft.
- 2.10 When weapon sims are purchased (classified or unclassified), hypothetical changes can be made in their employment to see if any changes (kill/hit or miss) would have occurred. The Hypothesizer will be provided as a standard capability when sims are purchased.
- 2.11 Express any other desired capabilities that come to mind (e.g., SimBuilder® or MACE®). These will be discussed as to their feasibility and practicality before pricing and availability information is requested.

3.0 Schedule Requirements

- 3.1 To make a realistic projection of this date, consider that the P5CTS/TCTS will typically be provided as part of an FMS case that includes the sale of fighter aircraft and/or air weapons. The ACMI line on the case will contain appropriate quantities of articles and services based on what the purchaser specifies via the LOR. (A Letter of Offer and Acceptance (LOA) for only ACMI capability is also possible, but is not necessary when there is an aircraft or weapon LOA under which to include the ACMI requirement.) When the LOR is finalized, pricing and availability of all the military articles and services in it will be sought from US industry sources, and the LOA for the case will be finalized. If the purchaser expresses in writing a requirement to have the current ACMI manufacturer (and current CLS provider, if applicable) provide the ACMI system, then within several months after the LOA is signed, a contract will be signed for the production of articles and the development and integration of weapon sims, if purchased, and provision of services that mirror what the US Air Force and Navy receive. The P5CTS/TCTS equipment will be produced, delivered, installed, and final-tested at the primary air base beginning approximately 20 months after contract award. (Awarding a contract through competition will take longer and may result in a system that is not as interoperable with US forces.) Delivery, installation, and final testing at the primary base will require a few to several weeks. The fighter aircraft upon which the airborne subsystem of the P5CTS/TCTS will be mounted must be available in sufficient quantity to support testing, as must also the facilities (and range, if applicable) for the use of

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the system. As indicated in the instructions for lines 7.2 and 7.4, the country must have also in place the approvals of airworthiness and radio frequencies. Completion of on-site final testing represents the immediate availability for use, starting with any required familiarization training of national personnel. Any required CLS support will also be arranged and set up to begin immediately at the end of testing.

- 3.2 Additional sites (if any) will typically be installed in a matter of a few to several weeks each.
- 3.3 If the purchaser has important deadlines or constraints affecting schedule, these should be expressed and the Range Systems International Branch will try to determine a plan of cooperation to achieve it. If the schedule includes a lengthy development/integration time for any capability that is not crucial to the fundamental capability (TSPI), an incremental or "split" capability delivery may be desirable. If the purchaser does not have a critical national need to meet a specific target date, there may be an opportunity to leverage economies of scale by combining purchases of equipment with other US or other nation orders. The US does not share insight into the details of the purchases of other nations, but will explain opportunities if they arise.

4.0 Equipment Requirements

- 4.1 Minimal quantities of pods are 1 pod per 2 aircraft in the fleet. This ratio assumes that about half the aircraft fleet will not be training at any one time. There is no value in exceeding 1 pod per aircraft. Though not required, two spare pods are recommended to be added into the total pod order. These will be used for system integration testing before final delivery. If a split capability delivery is desirable (as described in 3.3), all other pods can be delivered for early partial capability.
- 4.2 Minimal quantities of TGSs are 1 per flight operations facility for classified post-mission debrief using ICADS® display. The classified debrief can also be fed to larger screen monitors, but any external facility and feeds to and housing these monitors would have to be secured. Therefore TGS-LM might be a more efficient choice of equipment for auditoriums to provide both unclassified live monitoring and classified debrief. The primary advantages of TGS without the LM capability are that it is transportable and does not require an RRU since there is no live monitoring.
- 4.3 Minimal quantities of TGS-LMs are 1 per flight operations facility auditorium. The unclassified LM capability can provide several feeds to external screens (e.g. to the commander's office, etc.)
- 4.4 Recommend several PGSs for individual crew reviews at will at home base. PGS is a "take-it-with-you" capability for deployments away from the squadron's home base. It is comprised of a laptop computer, a HUD reader, and a projector for debrief.
- 4.5 Quantify the devices for synchronized display, and enter the total number of feeds required from all sources. In an addendum, identify by product/device name and model the devices to be synchronized in either the debriefing or live-monitoring environment, or both, and quantify the number of feeds to be presented simultaneously. Classified ACMI information will not be displayed on live monitor since there is no encrypted data link. Therefore, the live monitor function will not be set up for physical connection with classified feeds, lest the entire GS workstation and its facility be declared classified and controlled thereas. Therefore, synchronized content will be different in an unclassified, live-monitoring environment versus in a classified, debriefing environment. This may affect quantification.
- 4.6 Minimal quantities of CDUs are 1 CDU per pod maintenance facility or "pod shop." Consider specifying more, if deployments are anticipated.
- 4.7 Minimal quantities of GSE are as in 4.5, one lot per pod shop. GSE includes hand tools, diagnostic devices, chairs, benches, pod stands, CDU containers, etc.

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- 4.8 Minimal months of supply of spares (excluding the components and assemblies in the 2 spare pods in 4.1) are 24. During the warranty period, spares will be replenished to full complement, if the warranty conditions are met. After the warranty period, spares will be consumed at a rate that depends on storage (shelf life) and usage conditions (e.g., accumulated flight hours) and will be provided initially based on a projection of the consumption rate. Actual consumption rates might be more or less than projected, which is one reason why the spare levels should be conservatively estimated. A “repair and return” program (line 5.11), if purchased, will replenish spares to full levels, notwithstanding effects of supply chain and repair times.
- 4.9 Express any non-standard equipment requirements (e.g., flatscreen TVs for live monitor feeds to unit commander’s office and range radios--quantities/spec’s).
- 5.0 Basing and Support Requirements. This section allows for up to 10 bases or other locations (e.g., headquarters) (5.1 – 5.10) to receive the ACMI system and its GS equipment. The distribution of equipment across the bases should be a breakout of the totals in section 4.0. If there are more than 10 bases, then identify them in an addendum. Consider using the 10 lines for basing to identify distinct organizations (e.g., squadrons), on one base, that will require a distinct installation of the ACMI system. The spares quantity, in months, will typically be the same number for all bases unless spares are to be centrally stored for one or more bases. In that case, please indicate that central location and increase the number of months of spares for that location while decreasing accordingly the number(s) for the other affected (reduced spares) location(s). Finally, for P&A purposes typically 1 RRU is to be expected for each operations facility. The final number of Remote Range Units (RRUs) will be determined by site survey to take into account large ranges or obscurations on any range. Therefore, RRUs are not mentioned in section 4.
- 5.11 Enter the number of months required for this type of support. Repair and return (R&R) support is described in the instruction for line 4.8. Eventually, some items may no longer be repairable due to obsolescence of some of their components, including incompatibility between hardware and software changes. An R&R program is recommended to start at the conclusion of the warranty period to run for up to another 5 years, in general.
- 5.12 Enter the number of months required for this type of support. CLS provides for over-the-shoulder training, assistance, and advising of national maintenance personnel and includes organizational level of repair (removing and replacing SRUs along with minor repair of connectors, fasteners, and the like). It also includes pod diagnostic maintenance and preparation for flight as well as diagnosis and logistics advice and assistance for returning items to depot in the US for major repairs. Finally, CLS personnel facilitate the understanding of necessary changes to technical manuals, when issued. CLS is a standard service during the warranty period and helps minimize the likelihood of disputes about warranted failures while national maintenance personnel become expert at maintaining the ACMI system. CLS may be desirable beyond the warranty period.
- 5.13 Enter the number of training officers and other personnel the purchaser wishes to receive familiarization training in the operation of the ACMI system. Training will be conducted in English. This is the same training that USAF and USN personnel receive.
- 5.14 If the purchasing country wishes to establish an indigenous maintenance capability for the ACMI system in lieu of CLS (not recommended), enter the number of maintenance personnel to be trained. Familiarization training will be conducted in English. This is the same training that USAF and USN personnel receive.
- 5.15 If there are other support requirements peculiar to the country, identify them here.
- 6.0 Technology Sustainment and Upgrades. When hardware or software technology becomes obsolete in the system, and spare levels do not appear to be sufficient for the remainder of the country’s

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intended service life of the program, a sustainment program can be put in place. Sustainment will restore equipment and/or software technology to its originally intended performance. During the service life of the ACMI system, new capabilities might be realizable. An upgrade to the equipment or software would be involved in realizing the new capabilities.

- 6.1 Enter whether the country is interested in hardware sustainment or upgrades.
- 6.2 Enter whether the country is interested in software sustainment or upgrades.
- 6.3 Enter the whether the country is interested in sustainment or upgrades (including establishing capability for newly purchased weapons) to weapon sims.

7.0 Other Requirements.

- 7.1 (a, b, c, and d) Enter the indicated information for up to three US fighter aircraft variants and note in (d) if there is a desire for ACMI on non-US aircraft. If the aircraft are not US fighter variants, a more extensive integration effort will be required. The aircraft should provide a signals interface to the ACMI pod optimally by way of a US MIL-STD-1553 interface to include an ACMI message with weapon and sensor information. There may well be flight and EMI/EMC testing to confirm the pod is safe for carriage and operation in combat training performance envelopes on non-US aircraft or unusual variants of US aircraft.
- 7.2 Identify which country will hold airworthiness authority. If the answer is a combination or if analysis and test is likely to be required, explain in an addendum.
- 7.3 Identify which country's standards will apply. If the answer is a combination, explain in an addendum.
- 7.4 Enter the country's ACMI operating radio frequencies. ***It is the responsibility of the purchaser to obtain clearance for the applicable frequencies.*** Most countries in the Middle East and Europe can obtain frequency clearances for a segment in the S-band (2200 – 2400 megahertz). Most countries in the Pacific Region obtain clearances for a segment in the L-band (1755 – 1850 megahertz). The US uses the L-band. Only two frequencies are needed in either band, as long as the two frequencies are separated by a minimum of 11 megahertz. The pod will radiate with 100 watts of radio frequency power. If a reduced power output is required, explain this in an addendum. Reduced power will reduce the physical range boundaries for training, but may be necessary if training ranges or commonly used areas are near other nations' borders. Reduced power or selection of frequencies outside the bands described above will require increased funding and will likely lengthen the schedule.
- 7.5 In order to have the same ACMI system the US Air Force and US Navy use, it is necessary for the purchaser to explicitly request the current name of the system "P5CTS/TCTS" or the prime company that produces the system, Cubic Defense Applications (CDA) Failing to include such a request does not mean that ACMI cannot be purchased. It does mean, however, that interoperability with US forces may be compromised and procurement of the ACMI capability will likely take much longer in months, with no guarantee of the competition winner.
- 7.6 In order to have the same service contractor who is familiar with supporting the current and older ACMI systems overseas and in the US, it is necessary for the purchaser to explicitly request this company in the LOR. Procurement of the support service will likely take longer and may affect desired delivery, if the country chooses in the interest of competitive pricing to not explicitly request CDA.
- 7.7 If weapon sims are to be part of this purchase, enter "yes" in this line and prepare an addendum with the information indicated. A complete weapon designator with version and installation codes is necessary to create a proper sim. Proof of the country's legal ownership is necessary to comply with US export restrictions. Proof is most obviously found in the inclusion of the weapon in current or prior LOA(s) or with the presentation of an

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export license or other documentation of a proper sale. If proof is not readily available, there are other more time consuming means to verifying ownership. CAVEAT: The pod must be physically connected to receive messages from the aircraft MIL-STD-1553 data bus. The aircraft operational flight program (OFP) must include an ACMI message, sent on the MIL-STD-1553 data bus to the pod, with appropriate word content to enable the proper function of any particular weapon sim, especially those with moving targets. The Range Systems International Branch works with the US aircraft program office to ensure the interface between the aircraft OFP and the P5CTS/TCTS contains the correct ACMI message, but cannot perfectly control changes in the OFP interface or guarantee the timely opportunity to verify the interface. Further, if the purchaser uses SimBuilder® to design sims, the sims must still be integrated by the P5CTS/TCTS manufacturer into the P5CTS/TCTS (as in all cases) to function.

- 7.8 Many of the ACMI standard product features and services have been illustrated in detail in the instructions above. If features or services are desired above those already described, or if there are questions about other desired features or services not mentioned, describe them here. A description of the standard levels of service for the Range Systems International Branch is available. Included is the number of review meetings to be supported, for example.

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10. ABBREVIATIONS AND ACRONYMS

A/C	Aircraft
ACMI	Air Combat Maneuvering Instrumentation
AFSAC	Air Force Security Assistance Center
AS	Airborne Subsystem of the P5CTS/TCTS
C/A	Coarse/Acquisition GPS waveform
CDA	Cubic Defense Applications
CDU	Control Display Unit of the P5CTS/TCTS
CISMOA	Communications Interoperability and Security Memorandum of Agreement
CLS	Contractor Logistics Support
CWTS	Cubic Worldwide Technical Services
Config	Configuration
Distr	Distribution
DCS	Direct Commercial Sale
DoD	Department of Defense (US)
E.g.	Exempli Gratia (meaning “for example”)
ECP	Engineering Change Project
EMI/EMC	ElectroMagnetic Interference / ElectroMagnetic Compatibility
Equip	Equipment
EW	Electronic Warfare
FMS	Foreign Military Sale

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GPS	Global Positioning System
GS	Ground Subsystem of the P5CTS/TCTS
GSE	Ground Support Equipment
HAZMAT	Hazardous Material
HAE	Host Application Equipment
HUD	Head-Up Display
ICADS®	Individual Combat Aircrew Debrief System
JHMCS	Joint Helmet Mounted Cueing System
KITS	Kadena Instrumentation Training System
LOA	Letter of Offer and Acceptance
LOR	Letter of Request
MACE®	Modular Air Combat Environment
MGUE	Military GPS User Equipment
MIL-STD	Military Standard
NDWS	No-Drop Weapon Scoring
NM	Nautical Miles
NRC	Non-Recurring Cost
OFP	Operational Flight Program
P5CTS/TCTS	P5 Combat Training System (USAF) / Tactical Combat Training System (USN)
P&A	Price (Pricing) and Availability
P(Y)	Precision Y-coded (encrypted) GPS waveform
PGS	Portable Ground Subsystem of the P5CTS/TCTS

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PPS	Precise Positioning Service
R&R	Repair and Return
RRU	Remote Range Unit
RTKN	Real-Time Kill Notification
RTO	Range Training Officer
SAPM	Security Assistance Program Manager
Sim	Simulation
Spec	Specification
SRU	Shop Replaceable Unit
Std	Standard
Tel	Telephone
TGS	Transportable Ground Subsystem of the P5CTS/TCTS
TGS-LM	Transportable Ground Subsystem of the P5CTS/TCTS with Live Monitor
TPA	Total Package Approach
TSPI	Time-Space Position Information
TTPs	Tactics, Techniques, and Procedures
TV	Television
US	United States
USAF	United States Air Force
USN	United States Navy