

**BY ORDER OF THE COMMANDER
AIR EDUCATION AND TRAINING
COMMAND**

AETC INSTRUCTION 21-109

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Maintenance**



**MAINTENANCE MANAGEMENT TRAINER
DEVELOPMENT**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction **implements AFPD 21-1, *Aircraft Rules and Procedures*, 14 January 2005**. It establishes the maintenance management system for AETC trainer development activities. This instruction prescribes procedures and responsibilities necessary to operate and obtain support from trainer development activities at Keesler, Kirtland, Randolph, and Sheppard AFBs. It does not apply to Air National Guard and Air Force Reserve Command units. Ensure all records created as a result of processes prescribed in this publication are maintained according to AFMAN 33-363, *Management of Records*, and disposed of according to Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/frims/frims/>.

Submit recommendations to change or improve this instruction or to obtain a waiver on AETC Form 1236, *Request for Improving/Changing AETC Maintenance Publications*. Requests must have the approval of the appropriate group commander. Forward to 2 AF/TTOC-O, 721 Hangar Road, Suite 102, Keesler AFB MS 39534-2804, for coordination and approval. Forward approved 2 AF/TTOC-O requests to HQ AETC/A4M, 555 E Street East, Randolph AFB TX 78150-4440, for action by HQ AETC/A4MMP. Attachment 1 contains a glossary of references and supporting information used in this instruction.

SUMMARY OF CHANGES

This **document has been substantially revised and must be completely reviewed**. This instruction updates all applicable 2 AF and HQ AETC office symbols throughout; changes procedures in quarterly status reporting for trainer development activities (paragraphs 33, 33.1,

33.2, and 33.3; deletes the requirement for a quarterly manpower utilization report; and deletes Attachment 3, Attachment 4, Attachment 5, and Attachment 6.

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Section A—Managing AETC Trainer Development Activities

1. Function. AETC trainer development activities design, develop, fabricate, and assemble training equipment to meet the definition prescribed for federal stock class (FSC) group 69. www.DRMS.DLA.mil/asset/fsclist.html. Additionally, trainer development activities produce training equipment not meeting the criteria of FSC 69 when the training equipment’s sole purpose directly supports an Air Force career field education and training plan item. These activities support the AETC training mission at training wings (TRW), flying training wings (FTW), fighter wings (FW), special operations wings (SOW), and air mobility wings (AMW).

Additional responsibilities include quality control, modification, repair, refurbishment, and maintenance of manufactured training devices. Trainer development activities provide life-cycle support (depot) for all trainers they develop. AETC trainer development activities can accept project orders (PO) for funding according to Department of Defense (DoD) 7000.14-R, *DoD Financial Management Regulation*, Volume 11A, *Reimbursement Operations, Policy and Procedures*, Chapter 2, *Project Orders*.

1.1. Requests for trainer development services from units normally supported by the wing owning the trainer development activity (wing to which the trainer development activity is assigned) will be referred to as internal requests for the purpose of this instruction (paragraph 2).

1.2. Requests for trainer development services from units not normally supported by the owning wing will be referred to as external requests for the purpose of this instruction. Requests resulting in transfer of funds to a trainer development activity from an organization outside the wing are considered external even if the wing conducts the training. For example, a local training detachment conducts training, and the using command funds the project.

2. Organization. Air Force organizational structures are located in AFI 38-101, *Air Force Organization*. Trainer development activities will be located within the training/support squadron, maintenance squadron or group, as applicable. Trainer development activities determine the internal organization most efficient for their activity, ensuring all responsibilities in this instruction are assigned within the activity. Trainer development activities vary in personnel authorizations, design capabilities, and craft skill availability. These differences are due to the variety of missions and unique nature of these activities. Trainer development activities are encouraged to participate in lateral support due to the unique design capabilities of each activity. Each trainer development activity is normally responsible for providing support to the following organizations or activities:

2.1. Keesler and Sheppard AFB trainer development activities support their respective TRWs. The Keesler trainer development activity also provides support to the training group at Vandenberg AFB in the event the local 30 operational support squadron trainer development activity is unable to support a development/fabrication requirement.

2.2. Randolph AFB trainer development activity supports all AETC FTWs, FWs, AMWs, San Antonio area AETC bases, and Goodfellow AFB.

2.3. Kirtland AFB trainer development activity supports the SOW, other AETC units at Kirtland, and the USAF Survival School at Fairchild AFB.

Section B—Responsibilities

3. HQ AETC/A4/7. HQ AETC/A4/7 approves all operating policies and procedures for AETC trainer development activities governed by this instruction.

4. HQ AETC/A4MMP. HQ AETC/A4MMP is the office of primary responsibility (OPR) for procedures prescribed by this instruction.

5. 2 AF/TTOC-O. The 2 AF/TTOC-O provides centralized staff management for AETC trainer development activities governed by this instruction. The 2 AF/TTOC-O executes maintenance and modification support policies for AETC-developed training equipment, and functions as the

production approval official for all external trainer development requirements. Specifically, 2 AF/TTOC-O can task one trainer development activity to provide lateral support to another trainer development activity, or task a trainer development activity with trainer fabrication requirements in support of other Air Force organizations or government agencies if the capability exists. Route the 2 AF/TTOC-O tasking through the tasked trainer development activity's group commander. Accomplish command approval of such projects on an AETC Form 375, *Training Equipment Request*. Prioritization of these projects will normally follow the priorities prescribed in Table 1, but 2 AF/TTOC-O may grant exceptions.

6. Group Commander. The group commander responsible for the trainer development activity:

6.1. Ensures a training equipment review and production approval system for trainer cost and feasibility studies and fabrication requests originating within his or her area of authority is established. The group commander designates the following duties and/or functions:

6.1.1. Training Equipment Reviewing Official. The training equipment reviewing official is designated by name or office symbol. More than one person may be designated due to the potential volume of requests.

6.1.1.1. The official reviews internally generated AETC Form 375s, evaluates the mission need of the item, number of students in the class, number of classes per year, length of training, and whether the potential cost of the item justifies its need.

6.1.1.2. The official forwards approved requests to trainer development or returns disapproved requests with rationale to the requester, as applicable.

6.1.2. Trainer Development Function. The trainer development function provides a cost and feasibility study to determine capability, ability to meet need time, commercial availability, etc. This function forwards requests not rejected to the production approval official or requester, as applicable, and returns rejected requests, with rationale, to the reviewing official or requester, as applicable.

6.1.3. Internal Production Approval Official. Internal production approval officials are normally organizationally aligned above the trainer development activity responsible for forecasting training requirements.

6.1.3.1. These officials perform a comprehensive evaluation of the request. Officials must measure the true cost for estimated labor (even if not passed on to the requester) and materials, and determine if the request is mission essential. If provided, officials evaluate commercial availability or General Services Administration (GSA) equivalents that could fulfill the requester's needs. Officials then compare the request to the estimated labor, material, and life-cycle costs. If a commercially available equivalent is more cost effective, the requester procures it. If production approval officials approve the request, they assign a work priority to the project (Table 1) and forward it to the trainer development activity for fabrication. Officials return disapproved requests, with rationale, through the training equipment reviewing official to the requester.

Table 1. Trainer Development Priority System.

L I N E	Force Activity Designator (FAD) (notes 1 and 2)	A	B	C	D	E
		Priority Justification Category (PJC) (note 3)				
1	I	1	5	5	5	11
2	II	2	6	7	8	12
3	III	3	7	8	9	13
4	IV	4	8	12	10	14

Notes:

1. Use the weapon system FAD if an open program management directive exists; for example, B-1B, FAD I-1. If the weapon system FAD is not established, use the FAD of the gaining MAJCOM if that MAJCOM is the major user of course graduates. If course graduates are used by multiple commands (example, precision measurement equipment laboratory), use the AETC FAD. If the fabrication requester possesses an organic FAD below FAD III, use the requester's organic FAD; for example, Air National Guard, FAD IV.
2. AFMAN 23-110, *USAF Supply Manual*, Volume 2, Part 2, Chapter 11, Attachment 11A-12, A12.2.1. *Issue Systems*, authorized use of higher FAD.
3. PJCs A, B, and C are the only categories authorized to support the UMD manning. PJCs D and E, when authorized and approved by 2 AF/TTOC-O, may be used to earn manpower authorizations.

PJC LEGEND:

- A**—Training equipment required to directly support a Career Field and Education Training Plan (CFETP) training item in an AETC resident course. A training deviation will result without the training equipment.
- B**—Same as A except a training deviation will not result without the training equipment.
- C**—Training equipment used in resident courses, not based on a CFETP requirement. Training equipment will enhance the instruction.
- D**—External non-AETC projects directed by 2 AF/TTOC-O.
- E**—Other projects directed by 2 AF/TTOC-O.

- 6.1.3.2. Internal production approval officials advise trainer development of an order of need for each approved request. This allows trainer development to properly schedule the fabrication request.
- 6.2. Establishes local procedures to prevent the misuse of trainer development facilities, and ensures the most economical use of skills assigned.
- 6.3. Establishes a trainer development activity orientation program for appropriate personnel in normally supported units.
- 6.4. Ensures a maintenance and supply requirement review is completed for equipment fabrication requests. As a minimum, address life-cycle support in critical design reviews and design, and planning function evaluations.
- 6.5. Ensures subordinate formal training course commanders annually forecast their training equipment development requirements. Ensures they report these requirements to the local

organization responsible for the trainer development activity. Requirements will reflect organization, course number, equipment nomenclature, funding for training fabrication, and quantity desired. Make every effort to program for training equipment needs. This will reduce or eliminate financial reimbursement between different organizational elements operating from a common FTW or TRW operation and maintenance fund. For different funding plans, coordinate requests through HQ AETC/FM and 2 AF/TTOC-O channels.

6.6. Ensures the trainer development activity provides design, planning, fabrication, technical writing, major maintenance, modification, overhaul, and refurbishment of training equipment. Portions of this support may be accomplished through the use of contract sources at the determination of the group commander.

6.7. Provides a management system to record disposition and modification of fabricated training equipment requiring configuration similarity to AETC life support, egress, and aircrew training equipment. AETC-fabricated equipment includes, but is not limited to, life support, egress, and other aircrew training devices possessing a combined labor and material value of more than \$7,500.

7. Trainer Development Chief. The trainer development chief manages the activity and has overall supervision of its function. The chief is responsible to the support squadron, maintenance squadron, or group commander for the management of the trainer development activity. The chief serves as the senior technical adviser within assigned areas of responsibility. In addition, the chief:

7.1. Annually estimates and programs for trainer design and fabrication, equipment, personnel, training, and facility requirements by reviewing workloads and mission assignments.

7.2. Establishes procedures in coordination with unit and technical administration to ensure documents and reports are accurate, complete, and distributed to meet the suspense.

7.3. Monitors and controls those aspects of additional duties, leave, training, and details that take personnel away from the daily work force.

7.4. Reviews shift manning, skill levels, start times, distribution of supervision, and makes adjustments as necessary.

7.5. Maintains the master personnel roster.

7.6. Establishes an in-house review and production scheduling system.

7.7. Monitors work priorities to ensure project completions by the approved need date. Initiates action if a conflict of need occurs or an inability to meet the project completion date exists.

7.8. Develops and establishes a tool management operating instruction (OI) that meets the needs of the trainer development activity. The OI must provide for accountability, responsibility, and control of composite tool kits (CTK), individual tool kits (ITK), special tools, and storage and facility requirements. The program must include procedures for:

7.8.1. Tool accountability, to include periodic and systematic inspections and inventories of CTKs, ITKs, and tool storage.

7.8.2. User's responsibilities when assigned an ITK or special tool.

7.8.3. Guidance on tool storage, special tools, tool kits, and security.

7.8.4. Guidance for management of shop and operating stock that provides for control of use and materials.

7.9. Establishes a technical order (TO) management system according to AFI 21-101, *Aircraft and Equipment Maintenance Management*, AETC Sup 1, and TO 00-5-1, *AF Technical Order System*.

7.10. Establishes a precious metals recovery program according to TO 00-25-113, *Conservation and Segregation of Critical Alloy and Precious Metal Bearing Parts and Scrap*, and AFMAN 23-110, *USAF Supply Manual*, Volume 6, Chapter 4, *Precious Metals Recovery Program (PMRP)*.

7.11. Ensures strict compliance with supply requisition procedures, and that surplus supplies and equipment are properly turned in to base supply according to AFI 21-101, AETC Supplement and AFMAN 23-110, *USAF Supply Manual*, Volume 2, Part 2, Chapter 13, *Returns (Turn-Ins) to the Retail Supply System*.

7.12. Establishes a hazardous material management program according to AFI 32-7086, *Hazardous Material Management*.

7.13. Manages the work area safety program, including safety indoctrination of personnel, and ensures availability of industry and safety publications and programs.

7.14. Establishes a funds expenditures program to ensure projects can be completed within allotted funding. Appropriate action is taken when lack of funds affects the project.

7.15. Ensures all personnel complete the shop-level pollution prevention training according to DoD 4715.4, Section 4.2.6, *Pollution Prevention*.

7.16. Ensures all personnel complete any environmental safety and occupational health training requirements as applicable.

7.17. Appoints a unit environmental coordinator (UEC). The UEC will coordinate development activities with the installation environmental flight for compliance requirements, for example environmental impact analysis process (EIAP), air, hazardous materials, hazardous waste, waste water, etc.

8. Trainer Development. Trainer development activities determine the organizational structure most efficient for their activity. The following functions may be assigned completely or in part to different units within the organization:

8.1. Fabrication Function. The fabrication function supervisor is responsible for managing, supervising, and training assigned personnel, and managing fabrication resources to achieve quality production. The fabrication function:

8.1.1. Monitors daily workloads with special emphasis on work center backlogs, and coordinates with workload control to resolve discrepancies.

8.1.2. Ensures coordination between the project leader and applicable shop units to ensure fabricated items meet requirements established by the engineering function.

8.1.3. Maintains a record of inspection, lubrication, and maintenance on industrial type equipment (according to TO 34-1-3, *Inspection and Maintenance - Machinery and Shop Equipment*), and other support equipment.

8.1.4. Reviews tool and special equipment requirements upon receipt of new, changed, or revised publications, and takes appropriate action.

8.1.5. Inspects hazardous waste accumulation and storage areas daily to ensure adequate containers are available, properly segregated, labeled, secured, cleaned, undamaged, and free of leaks. Ensures waste accumulation is not excessive.

8.1.6. Serves as the point of contact for hazardous waste spill or storage problems, and notifies applicable agencies of problems.

8.2. Engineering Function. The engineering function supervisor is responsible for managing, supervising, and training assigned personnel, and managing resources for the design and development effort needed to fabricate training devices. The engineering function:

8.2.1. Processes work order requests received from workload control.

8.2.2. Prepares feasibility and design studies. **Note:** Consider the simulator interface management-ware (SIMWARE) concept when developing computer-based simulators or trainers. The SIMWARE concept does not make use of SIMWARE mandatory; however, it must be one of the alternatives considered when developing new and/or making major modifications to existing computer-based simulators or trainers. The SIMWARE concept puts control of the operational software into the hands of the user. SIMWARE is a software shell, giving users the ability to create, select, add to, or modify computer-based simulator or trainer functions without the need of specialized computer programmers, or the purchase of nonstandard proprietary software or hardware.

8.2.3. Determines the most cost-effective method of procuring and fabricating training equipment or other approved items.

8.2.4. Assigns a design, part, or serial number to each work order requiring design or development according to AETCI 21-301, *Air Education and Training Command Technical Manuals*.

8.2.5. Prepares engineering drawings, AETC Form 715, *Bill of Materials*, or equivalent, and logistic data necessary for the design, fabrication, maintenance, and supply support of training equipment.

8.2.6. Performs acceptance of completed training equipment produced, using AETC Form 376, *Training Development Acceptance Record*.

8.2.7. Develops technical manuals (TM) for training equipment according to AETCI 21-301 and maintains master copies.

8.2.8. Maintains configuration of current TMs and sends changes or revisions to users.

8.2.9. Maintains configuration of current training equipment drawings and stores them as long as needed.

8.2.10. Prepares a trainer development portfolio as described in paragraph 31.

8.2.11. Maintains a comprehensive file of technical documents and literature required to maintain currency in applicable technical areas.

8.2.12. Ensures sufficient TOs are on hand to meet design needs, and TO files are maintained and requisitioned according to TO 00-5-1.

8.2.13. Determines training requirements necessary to gain and maintain currency in applicable technical areas.

8.2.14. Maintains engineering data for items produced according to AF RDS located at <https://www.my.af.mil/gcss-af61a/afrims/afrims/>. This data may be maintained in electronic media. If data is stored electronically, maintain a listing and/or cross-reference to indicate location of files, disks, or other means of storage. Mark storage media to identify project. Backup electronic files appropriately to prevent loss of data. Data should include (due to the varying complexity of projects, not all of the following data is included in each file):

8.2.14.1. AETC Form 375 authorizing a feasibility study or production.

8.2.14.2. Completed feasibility or design study.

8.2.14.3. Project order or direct funds cite.

8.2.14.4. Memorandum of agreement (MOA).

8.2.14.5. Statement of work.

8.2.14.6. Design specification.

8.2.14.7. Photographs.

8.2.14.8. Engineering and technical information related to the item.

8.2.14.9. Engineering drawings, blueprints, or lists.

8.2.14.10. AETC Form 715 or equivalent.

8.2.14.11. AETC Form 380, *Trainer Fabrication Man-Hour and Material Cost Record*, or equivalent.

8.2.14.12. Applicable TM or reference to TM location.

8.2.14.13. AETC Form 376 or equivalent.

9. Workload and Materiel Control Function. The workload and materiel control function exercises central control for scheduling work order requests, keeping records, analyzing manpower, computing trainer costs, submitting reports, and acting as the supply requesting and issuing agency. This function:

9.1. Serves as the production focal point.

9.2. Recommends workload scheduling and leveling.

9.3. Works in conjunction with the trainer development engineering, fabrication, and supply personnel to ensure the efficient and timely processing of work orders.

9.4. Schedules approved work order requests.

- 9.5. Maintains status of production work orders. Annually revalidates work orders not started.
- 9.6. Maintains AETC Form 380, AETC Form 428, *Training Services Time Card*, and AETC Form 714, *Trainer Development Work Order Register*. Alternate electronic or computer-generated data and time cards may be used if more appropriate.
- 9.7. Conducts production and personnel utilization studies, and prepares analysis reports required by higher headquarters or other agencies.
- 9.8. Works with the engineering and fabrication functions to determine the cost of materials.
- 9.9. Computes the final trainer labor and material cost on AETC Form 380, or equivalent, upon project completion.
- 9.10. Requests, receives stores, inspects, distributes supplies and equipment, and advises engineering and fabrication functions of availability of parts and materials.
- 9.11. Maintains due-in records and document register.

10. Specific Work Center Function. Work center functions fabricate parts, subassemblies, assemblies, and complete trainers. Work centers use TOs, TMs, blueprints, and sketches as guides for work, and as quality checks for each item. Work centers install training equipment, and perform on-site maintenance and modification. Work centers generally consist of machine, electrical, welding, paint, woodwork, sheet metal, and assembly functions. Some functions may be combined to accomplish the unique mission of the work center as follows:

- 10.1. The machine function provides fabrication and repair of trainer parts, assemblies, and tools according to engineering prints, sketches, and oral instructions. It ensures machine tool setup procedures, machine cutting operations, hand operations, and general machine function operations adhere to approved procedures. It also ensures proper selection of specified material before fabrication.
- 10.2. The electrical function fabricates and repairs electronic and electro-mechanical training equipment and components according to engineering prints, sketches, and oral instructions by using conventional electrical, solid state electronics, and printed circuit construction.
- 10.3. The welding function fabricates repairs, modifies, and welds metal components according to engineering prints, sketches, and oral instructions. It ensures proper selection of specified materials and equipment for welding.
- 10.4. The paint function prepares and masks components, and assembles them in preparation for the painting process. The function follows engineering prints, sketches, and oral instructions to paint components with the correct equipment and paint specified. It removes old paint coatings, cleans components, and assembles components as directed.
- 10.5. The woodworking function fabricates repairs, modifies, and assembles training equipment and components out of wood and plastics according to engineering prints, sketches, and oral instructions. It prepares resin castings and moldings.
- 10.6. The sheet metal function provides for the fabrication of sheet metal, fiberglass and plastic components, related hardware, jigs and fixtures, and master production templates according to engineering prints, sketches, and oral instructions. It ensures required testing is completed on fabricated metal tubing, conduits, and cables.

10.7. The assembly function assembles and repairs training equipment and components according to engineering prints, sketches, and oral instructions. It prepares trainers for final inspection and shipment.

Section C—Trainer Development Services/Support

11. Overview. Trainer development activities support AETC resident or formal training courses. Each organization plans, designs, develops, fabricates, maintains, modifies, repairs, and refurbishes locally fabricated AETC training equipment. As instructed by AETCI 21-301, the organization also develops and publishes TMs that provide part identification and information on the assembly, installation, operation, service, disassembly, overhaul, and reassembly of trainers.

12. Design. Trainer development activities possess a trainer design and planning function that designs and develops training equipment fabrication packages according to requester's needs. These planning packages contain design drawings, material and labor cost estimates (including overtime and/or over hires), and additional remarks. Trainer development activities provide a database for designated production-approval officials to evaluate training equipment requests. These activities reject requests when there is a readily available, cost-effective commercial or GSA substitute, the item is not within the function's capability to design and fabricate, or personnel are not available.

13. Fabrication. Typical shop skills usually available include machine, sheet metal, welding, metalworking, plastic, wood, corrosion, painting, electronics, electrical, fiberglass, fabric, leather, rubber, and production assembly. Training equipment fabricated by AETC development activities must:

13.1. Satisfy authorized requirements.

13.2. Technically be suitable.

13.3. Be in compliance with all DoD and Air Force policies and directives.

13.4. Fabricate normally according to best commercial practices, as opposed to military specification (MILSPEC) standards.

14. Modification. Trainer development activities provide modification support services for AETC fabricated training equipment within their capability.

15. Repair Services. Trainer development activities provide maintenance and repair support for locally fabricated training equipment when such maintenance and repair is beyond the capability of other maintenance activities. AETC Form 394, *Trainer Development Instruction Slip*, or equivalent, is used for in-house repairs and maintenance dispatch. Organizations outside the trainer development activities request trainer repair or maintenance support using AETC Form 375. Trainer development activities support scheduled and unscheduled maintenance for equipment fabricated in their activities. Scheduled and unscheduled maintenance support applies only to training equipment fabricated by AETC trainer development facilities that support AETC resident training courses. Trainer developments using unit manning document (UMD) assigned personnel to perform field maintenance on other than fabricated trainers will develop local OIs for this activity. (**Note:** Repair services support may be accomplished through unit maintenance contracts.) Procedures in the OI will document approved man-hour usage from 2 AF/TTOC-O and account for man-hours expended.

16. Storage. Trainer development activities will provide an area for storing and screening excess training equipment if such equipment is for the trainer development activity's use, reuse, or disposal, and if:

16.1. A strong potential exists for future need based on historical demands for similar equipment.

16.2. Excess equipment is of sufficient quantity or possesses recoverable high cost components that are useful to future projects. **Note:** Storage, screening, or control costs could be prohibitive or not cost-effective when compared to actual procurement costs. Use good judgment to prevent excessive accumulation of reclaimed equipment.

16.3. Excess equipment contains components whose value makes them cost-effective to store for support of like fabricated equipment remaining in service.

Section D—Fabrication Cycle Procedures

17. Overview. The training equipment fabrication cycle consists of request initiation, review, design and planning, production approval, and training equipment fabrication.

18. Request Initiation. Use AETC Form 375 to request design, fabrication, feasibility studies, modification, or repair services of fabricated training equipment from AETC trainer development facilities. Identify specific training equipment needs and requirements. This request package serves as a statement of training equipment requirements. Use only AETC Form 375 for FSC 69 type trainers or those approved by 2 AF/TTOC-O. See paragraph 20 for other projects.

19. Review. The training equipment reviewing official conducts a complete review of the information provided on the AETC Form 375 and accompanying documents. The reviewing official determines if the request is worth continuing with design and planning. Send approved requests to design and planning. Return requests disapproved to the original requester with reasons for disapproval.

20. Design and Planning. Design and planning includes a review of available AETC training equipment, commercial training equipment, or GSA publications (catalogs, pamphlets, portfolios, etc.) to determine if equipment portrayed in these publications satisfies the requirements. This equipment may be available locally or at other AETC bases.

20.1. Determine if previously completed local or other AETC base planning packages can fulfill a part of the requester's needs, saving duplication of the entire planning process. 2 AF/TTOC-O determines whether the trainer development supporting the requester will receive the planning package or the developing activity will support the request if another activity develops a planning package.

20.2. Determine if commercial training equipment or GSA-listed property has the potential to fulfill the requester's needs and is available. If cost-effective equipment items are available (estimated labor plus materials), trainer development prepares a memorandum of explanation. Trainer development references sources in the memorandum and attaches the memorandum to the AETC Form 375 request. Return the memorandum and AETC Form 375 through the reviewing official.

21. Production Approval. This involves a complete review of the planning package by the production approval official. The minimum elements of this review are the total estimated labor

(including overtime and/or over hire), materials cost, the project priority (suggested by the reviewer), maintainability requirements, and use of requested training equipment. The approved package is sent to the trainer development activity. Return disapproved packages, through the reviewing official, to the original requester with the reasons for disapproval.

22. Training Equipment Fabrication. Upon workload control receipt of an approved planning package, schedule it for production according to work scheduling priorities, materials to be ordered, requester's need date, and established labor skill cycle (for example, metal shop, electronic shop, wood shop, paint shop). Trainer development activities use AETC Form 714, or equivalent, to record and monitor training fabrication requests. In addition, use AETC Form 715, or equivalent, (by quantity, part number, stock number, nomenclature, costs, etc.) for all materials and parts required for a specific work order (development project).

Section E—Internal General Support Projects and Non-AETC Mission Support

23. Internal General Support Projects. Process internal general support projects (projects that are not trainers and do not fit trainer development guidelines) produced by trainer development personnel as follows:

23.1. Submit requests by memorandum to the trainer development activity for approval or disapproval.

23.2. Examine each request to ensure fabrication will not conflict with commercial procurement and contract policies.

23.3. Analyze the cost to build, buy, or contract.

23.4. Approve requests (trainer development activities) if the total cost (including labor and materials) is \$7,500 or less. The applicable group commander approves requests exceeding \$7,500.

23.4.1. The internal production approval authority determines which local activity is most capable of accomplishing the approved request.

23.4.2. Approved internal general support projects will be accomplished on a noninterference basis and will not impair the activity's ability to perform primary requirements.

23.5. Maintain documentation for each request, to include the cost decision (worksheets, cost comparisons, etc.), and the original letter requesting the project.

23.6. Internal general support projects will not be documented as trainer development, and will not be used as a basis for manpower authorization determination. Internal general support projects (to include local manufacture projects) must not exceed 5 percent of the unit's quarterly man-hour availability.

24. Non-AETC Mission Support. Under certain conditions, AETC provides limited trainer development support to external requesters outside of AETC. Generally, activities can support these external requests with available work hours providing these requests do not adversely affect AETC resident course support. AETC course support has priority.

24.1. Submit AETC Form 375 (completed through block 18) to 2 AF/TTOC-O for non-AETC support approval (external requests should be submitted by the applicable

[MAJCOM]). The tasked trainer development activity evaluates the work request and determines if it can meet the specified project requirements. A MOA will be accomplished between the tasked trainer development activity, the requesting activity, and 2 AF/TTOC-O. If the trainer development activity determines the request is beyond its capability, 2 AF/TTOC-O will route the request to another trainer development activity for evaluation. Both trainer development activities and requesting organizations will participate fully in the coordination process as follows:

24.1.1. Send formal communications, except technical information exchanges, through 2 AF/TTOC-O.

24.1.2. Trainer development activity returns a copy of the AETC Form 375 to 2 AF/TTOC-O with work order number entered in block 21.

24.2. The trainer development activity, with 2 AF/TTOC-O and MAJCOM coordination, initiates an MOA for the project. The MOA should address funding, officials authorized to represent the requester's design limits, office symbols, life-cycle logistics support, standards used during design and production, operating and TO requirements, and anticipated production completion dates. Local development activities can submit additional items as required.

24.3. Trainer development activities will develop procedures to dedicate equivalent man-hours to a non-AETC requester's project when overtime or over hires are authorized and funded. Over hire personnel may work on other projects, and direct personnel may work on non-AETC projects as deemed necessary by the trainer development chief to make the most efficient use of resources. Ensure overtime or over hire labor hours are charged for reimbursement from the requester only when those hours are expended in support of the requester's project.

24.4. For non-AETC projects, the requestor provides funding directly to the trainer development activity once 2 AF/TTOC-O has approved the project. Coordinate PO funding changes directly between the trainer development activity and the requester.

24.4.1. PO and direct fund cite funding include cost for materials, shipping, special project equipment, temporary duty (TDY), AF IMT 9, *Request for Purchase*, contract services expenditures, personnel overtime, and over hires. The trainer development chief is authorized to certify funds available on AF Form 9 contract expenditures for services and commodities.

24.4.2. Normally, the DoD organization making the request is not charged for civilian labor unless overtime or over hire is required to complete the project.

24.5. A trainer development activity tasked with an external project will have overall engineering responsibility and final decision authority for the external project.

Section F—Work Priorities

25. Overview. The production approval official assigns a work priority to trainer development requests using a force activity designator (FAD) according to AFMAN 23-110, *USAF Supply Manual*, Volume 2, Part 2, Chapter 11, and priority justification category (PJC) code listed in Table 1.1 of this instruction. The production approval official will further prioritize work

requests of equal FAD-PJC priority by establishing a realistic date required in AETC Form 375, block 3a. The earliest date required will normally determine the work scheduling order. **Note:** Trainer development activities may, in coordination with the local school activities, establish and utilize a local prioritization system for internal projects.

26. Scheduling Priorities. The production approval official forwards prioritized work requests to the workload control function for production scheduling. Work requests in the fabrication process will not be interrupted for a higher priority work request without the approval of the trainer development chief.

27. Priority Waivers. When a production deviation becomes necessary, the production approval official initiates, in writing, a waiver (priority change) describing the circumstances and/or reasons for the deviation from the approved production order of merit. The official will attach the waiver to the appropriate AETC Form 375, and send the package back to the development activity. **Note:** Coordinate deviations to 2 AF/TTOC-O tasked fabrication projects with 2 AF/TTOC-O.

28. Deferred Priorities. The production approval official, through coordination with the requester, reaffirms the need for approved and prioritized work requests that have not been placed into production within 1 year.

29. 2 AF/TTOC-O-Directed Priorities. The 2 AF/TTOC-O will use AETC Form 375 to task development activities for external projects, after coordinating requirements, feasibility, etc. The 2 AF/TTOC-O, or designated official, signs the AETC Form 375 production approval block and assigns a work priority. Deviation to these priorities requires 2 AF/TTOC-O approval.

30. Work Backlog. Prioritize work backlogs into the design and fabrication process. Monitor work backlog locally for planning purposes. Do not use backlogged work to report manpower utilization or support additional UMD manning.

Section G—General Information

31. Supply Procedures. Process requests for locally fabricated training equipment according to AFMAN 23-110, *USAF Supply Manual*, Volume 2, Part 2, Chapter 9, *Requisitioning*, and AFMAN 23-110, *USAF Supply Manual*, Volume 2, Part 2, Chapter 27, *Research and Records Maintenance*, and their respective supplements.

32. Assignment of an Expendability, Recoverability, and Reparability Code (ERRC):

32.1. Assign locally fabricated training equipment an ERRC of NF3 or XB3 as appropriate.

32.2. Locally fabricated training equipment with repairable components that have an Air Force Materiel Command assigned ERRC are assigned an ERRC no lower than the highest ERRC assigned to any integral component.

33. Man-Hour Accounting. Document man-hours expended in the design study, development, and fabrication process against a specific work order. Use total man-hours expended for the cost computation of trainer value. Use AETC Form 428 or equivalent to document man-hours. Guidelines for computing labor costs are in paragraph 34 of this instruction. AETC Form 380, or equivalent, may be used as a record for labor and material costs. If used, retain AETC Form 380, or equivalent, with AETC Form 375 upon completion of a trainer development request.

34. Establishing a Standard Shop Rate:

34.1. Apply the trainer development shop rate to determine the cost of estimated labor required for a project. This rate will apply whether a project involves planning and design only; planning, design, and limited craft skills support, or all capabilities. The shop rate is a management tool that allows the development manager and training manager to make cost-effective build or buy decisions for training equipment acquisition.

34.2. Count personnel assigned to the trainer development activity to develop a comprehensive shop rate. Include personnel assigned, for example, supervisors, clerical support, assigned work center supply support, planning and design personnel, technical writers, drafters, illustrators, direct labor, over hires, etc. Compute the shop rate on an annual basis by 1 October. Include scheduled civilian government service pay raises. Additionally, compute the shop rate for assigned personnel changes of 10 percent or more.

34.3. Determine the total work-year trainer activity cost for civilians (general schedule [GS], wage grade [WG], wage leader [WL], and wage supervisor [WS]) as follows:

34.3.1. List each assigned grade and total personnel for that grade. See Attachment 2, Table A2.1, for a sample format in this instruction.

34.3.2. Contact the base financial management office to identify the applicable pay grade table for GS civilians. Select the corresponding annual pay from the column titled accelerated annual pay. For each grade, compute and list the total accelerated annual pay by multiplying the number of personnel listed in that grade by the accelerated annual pay value.

34.3.3. For WG, WL, and WS civilian, compute and list each grade's total work-year hours by multiplying the number of personnel listed in each grade by 2,087 hours per year. Using the applicable base pay rates, select and list the applicable employee hourly base pay rate at step 3 (contact the base financial management office for the current rate). Use the acceleration factor (contact the base financial management office for the current factor) to accelerate and list the hourly base pay rate including summed factors for civilian retirement and benefits. Apply summed factors directly to the base rate; they are not compounded. For each grade, compute and list the total accelerated annual pay by multiplying the accelerated hourly base rate by that grade's total work-year hours.

34.3.4. Determine the total work-year cost for assigned personnel by summing the total accelerated annual pay of each listed pay grade.

34.4. Determine the total available productive direct labor hours as follows:

34.4.1. Identify direct labor personnel as those who can document their man-hour expenditures in the man-hour accounting system, paragraph 33.

34.4.2. Multiply the number of direct labor personnel by the total work-year hour factor (2,087 hours). Take into account part-time direct labor personnel by estimating what percentage of their time is devoted to direct labor in trainer development.

34.4.3. Sum the computed available productive direct labor hours.

34.5. Compute the standard shop rate by dividing the total work-year cost, paragraph 26.3.4 by the total available productive direct labor hours, paragraph 26.4.3.

35. Quality Control. Each trainer development activity will develop a comprehensive and thorough quality control program, and implement the program by publishing a local OI. Assign personnel from within the trainer development activity to perform quality verification inspections on fabricated training equipment. Use craft shop procedures and workmanship guidelines prescribed in the following TOs to develop the quality control program:

35.1. TO 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance, and Test of Electronic Equipment.*

35.2. TO 1-1A-1, *General Manual for Structural Repair.*

35.3. TO 1-1A-8, *Structural Hardware.*

35.4. TO 1-1A-9, *Aerospace Metals - General Data and Usage Factors.*

35.5. TO 1-1A-14, *Aircraft Electrical and Electronic Wiring (Installation Practices).*

35.6. TO 1-1A-15, *General Maintenance Instructions for Support Equipment.*

36. Materiel Control. Manage bench operating stock and shop stocks. Before initiating turn-in actions, coordinate with other trainer development activities for possible use of excess assets.

37. Screening Excess Property for Parts. AETC trainer development activities are encouraged to screen excess property located at the local Defense Reutilization and Marketing Office. Property items may be issued when they are used for training purposes. Take care to prevent the misuse of excess property.

37.1. Ensure selected property items have strong potential for use in future fabrication projects or for the repair of existing AETC-fabricated training equipment.

37.2. Caution should be used when selecting "nice-to-have" excess property. It could exceed reasonable storage and property control capabilities available to trainer development activities.

37.3. Identify and store excess property to provide reasonable retrieval and environmental protection. The minimum information required for identification is the FSC, part number (if available), and noun. **Note:** Each trainer development activity must work with base supply to develop a procedure to notify the development activity when there is a turn-in of any 6910L (locally fabricated) stock numbered items. The fabrication activity may then screen the items for recoverable components, assemblies, etc.

38. Trainer Development Portfolio. Trainer development activities will prepare a portfolio (paper or electronic), which includes information specific to each activity, highlights its capabilities, describes and shows a representative sampling of training equipment fabricated by the activity, and provides information needed by a potential customer. Descriptions in the portfolio should be in sufficient detail for the customer to easily determine the purpose and capability of each trainer. Review the portfolio periodically and update so the contents represent the current capability of the trainer development activity. Distribute copies to 2 AF/TTOC-O, customers, and others on request. Trainer development activities are encouraged to also provide this information on the Internet.

39. Drawings and Photographs. The 2 AF/TTOC-O is the OPR and official release authority for AETC trainer development technical drawings or photographs. The 2 AF/TTOC-O reviews each request on a case-by-case basis, and provides rationale for disapproval. Any drawings or

photographs released for use by DoD activities will not be passed on to non-DoD activities without 2 AF/TTOC-O concurrence. Any drawings or photographs approved for release will clearly display the following statement: "This drawing or photograph is the property of the United States Air Force. It may contain proprietary data and is not releasable in whole or in part to any non-DoD activity or agency." Additionally, if 2 AF/TTOC-O authorizes the release to a non-DoD activity or agency, the responsible trainer development activity will include instructions emphasizing to the non-DoD activity or agency that they cannot release the drawings or photographs in part or whole without prior approval of 2 AF/TTOC-O.

39.1. When foreign activities request drawings or photographs, 2 AF/TTOC-O forwards the request to the Air Force Security Assistance Center (AFSAC/COMV) at Wright Patterson AFB for coordination.

39.2. AFI 36-2251, *Management of Air Force Training Systems*, and AFI 21-402, *Engineering Drawing System*, paragraph 6, exclude AETC trainer developments from Air Force engineering drawing and associated list requirements when preparing engineering data for one-of-a-kind training aids in direct support of AETC resident course.

40. Computer Products. Approved computer-equivalent products or computer-generated data may be used in place of nonfillable forms.

Section H—Reporting

41. Quarterly Status Report for Trainer Development Projects. Trainer development activities tasked with external and internal projects will forward a quarterly status report in the form of an electronic spreadsheet with the following tabs: Projects Pending, Projects in Work, and Projects Completed. The report will cover calendar quarters and is due by the 20th day of the month following the close of a quarter. The project is open until the trainer is delivered to the customer. **Note:** This report is exempt from the RCS requirement according to AFI 33-324, *The Information Collections and Reports Management Program: Controlling Internal, Public, and Interagency Air Force Information Collections*, paragraph 2.11.12.

41.1. The Projects Pending tab will show: Work Order Number, Project Title, STS/CTS Item Supported, Benefit (eliminate training deficiency reduced training time, improved training quality, cost avoidance, etc.), Estimated Project Labor Cost, Estimated Project Material Cost, Estimated total cost, Estimated completion date, Shop priority, Internal or external tasking.

41.2. The Projects in work tab will show: Work Order Number, Project Title, STS/CTS Item Supported, Benefit (eliminate training deficiency reduced training time, improved training quality, cost avoidance, etc.), Estimated project labor cost, Estimated project material cost, Estimated total cost, Estimated completion date, Shop priority, Internal or external, Percentage completed.

41.3. The Projects Completed tab will show: Work Order Number, Project Title, STS/CTS Item Supported, Benefit (eliminate training deficiency reduced training time, improved training quality, cost avoidance, etc.), Project labor cost, Project material cost, Total cost, Completion date.

Section I—Prescribed and Adopted Forms

42. Prescribed Forms: AETC Form 375, *Training Equipment Request*AETC Form 376, *Training Development Acceptance Record*AETC Form 380, *Trainer Fabrication Man-Hour and Material Cost Record*AETC Form 394, *Trainer Development Instruction Slip*AETC Form 428, *Training Services Time Card*AETC Form 714, *Trainer Development Work Order Register*AETC Form 715, *Bill of Materials***43. Adopted Forms:**AF IMT 9, *Request for Purchase*AETC Form 1236, *Request for Improving/Changing AETC Maintenance Publications*

GARRY B. RICHEY, SES
Deputy Director of Logistics, Installations and
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Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DoD 4715.4, *Pollution Prevention*, June 18 1996

DoD 7000.14-R, *DoD Financial Management Regulation*, Volume 11A, *Reimbursement Operations, Policy and Procedures, Chapter 2, Project Orders*, 2 November 2002

DoD 7000.14-R, Volume 11A, Chapter 2, *Reimbursable Operations Policy and Procedures*, May 2007

AFPD 21-1, *Aircraft Rules and Procedures*, 14 January 2005

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 29 June 2006

AFI 21-101_AETCSUP, *Aircraft and Equipment Maintenance Management*, 22 June 2007

AFI 21-402, *Engineering Drawing System*, 8 September 2003

AFI 23-111, *Management of Government Property in Possession of the Air Force*, 25 July 2005

AFI 32-7080, *Pollution Prevention Program*, 12 May 1994

AFI 32-7086, *Hazardous Material Management*, 1 November 2004

AFI 33-324, *The Information Collections and Reports Management Program: Controlling Internal, Public, and Interagency Air Force Information Collections*, 1 June 2000

AFI 36-2251, *Management of Air Force Training Systems*, 5 June 2009

AFI 38-101, *Air Force Organization*, 4 April 2006

AFI 38-201, *Determining Manpower Requirements*, 30 December 2003

AFMAN 23-110_AETCSUP, Volume 2, Part 2, Chapter 9, *Requisitioning*, 25 June 2005

AFMAN 23-110, Volume 2, Part 2, Chapter 11, *Customer Requirements*, 1 April 2008

AFMAN 23-110, Volume 2, Part 2, Chapter 13, *Returns (Turn-Ins) to the Retail Supply System*, 6 January 2007

AFMAN 23-110, Volume 2, Part 2, Chapter 27, *Research and Records Maintenance*, 6 June 2005

AFMAN 23-110, Volume 6, Chapter 4, *USAF Supply Manual*, Chapter 4, *Precious Metals Recovery Program (PMRP)*, 15 July 2008

AFMAN 33-363, *Management of Records*, 1 March 2008

AETCI 21-301, *Air Education and Training Command Technical Manuals*, 5 July 2007

TO 00-5-1, *AF Technical Order System*, 1 May 1995

TO 00-25-113, *Conservation and Segregation of Critical Alloy and Precious Metal Bearing Parts and Scrap*, 30 April 1995

TO 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance, and Test of Electronic Equipment*, 1 August 1988, Change 36, 13 August 2007

TO 1-1A-1, *Engineering Handbook Series for Aircraft Repair General Manual for Structural Repair*, 1 March 1999, Change 21 September 2002

TO 1-1A-8, *Structural Hardware*, 30 June 2008

TO 1-1A-9, *Engineering Manual Series for Aircraft and Missile Repair Structural Hardware Aerospace Metals - General Data and Usage Factors*, 27 June 2005

TO 1-1A-14, *Aircraft Electrical and Electronic Wiring (Installation Practices)*, 15 May 2007

TO 1-1A-15, *General Maintenance Instructions for Support Equipment*, 15 January 2008

TO 34-1-3, *Inspection and Maintenance - Machinery and Shop Equipment*, 11 September 2006

32 CFR 989 1, *Title 32-National Defense, Subtitle A—Department of Defense, Title 32 National Defense, Chapter VII—Department of the Air Force, Subchapter T—Environmental Protection, Part 989, Environmental Impact Analysis Process (EIAP)*, 15 July 1999

32 CFR 989 1_AETCSUP, *Title 32-National Defense, Subtitle A—Department of Defense, Title 32 National Defense, Chapter VII—Department of the Air Force, Subchapter T—Environmental Protection, Part 989, Environmental Impact Analysis Process (EIAP)*, 6 June 2007

Abbreviations and Acronyms

AMW—Air Mobility Wing

CFETP—career field education and training plan

CTK—composite tool kit

DoD—Department of Defense

EIAP—environmental impact analysis process

ERRC—expendability, recoverability, and reparability code

FAD—force activity designator

FSC—federal stock class

FTW—flying training wing

FW—fighter wing

GS—general schedule

GSA—General Services Administration

ITK—individual tool kit

MAJCOM—major command

MILSPEC—military specification

MOA—memorandum of agreement

OI—operating instruction

PJC—priority justification category

PO—project order

RDS—records disposition schedule

SIMWARE—simulator interface management-ware

SOW—special operations wing

TDY—temporary duty

TM—technical manual

TO—technical order

TRW—training wing

UEC—unit environmental coordinator

UMD—unit manning document

WG—wage grade

WL—wage leader

WS—wage supervisor

Attachment 2

ANNUAL SHOP RATE COMPUTATION

A2.1. Annual Shop Rate Computation. To compute the annual shop rate, you must first determine the total work year cost (see Table A2.1); then calculate available direct labor hours and divide the total work year cost by the total available direct labor hours.

Table A2.1. Annual Shop Rate Computation.

L I N E	A	B	C	D	E	F
	Grade	Number of Personnel Assigned	Total Work Year Hours	Hourly Base Rate	Accelerated Hourly Base Pay (1.318) (note 1)	Total Accelerated Annual Pay
1	GS-12	1				\$57,012
2	GS-11	1				\$47,014
3	GS-9	3				\$116,580
4	GS-7	2				\$64,284
5	GS-4	1				\$22,986
6	WS-11	1	2,087	\$14.65	\$19.31	\$40,300
7	WS-10	1	2,087	\$13.92	\$18.35	\$38,296
8	WG-12	1	2,087	\$14.58	\$19.22	\$40,112
9	WG-11	3	6,261	\$12.97	\$17.09	\$107,000
10	WG-10	4	8,348	\$12.50	\$16.48	\$137,575
11	WG-9	2	4,174	\$12.06	\$15.90	\$66,367
12	Total	20			Total Work Year Cost	\$737,526

Note: Acceleration factor (1.318) may change each year. Contact base financial management office for current figure.

Example:

Column B x 2,087 = Column C

Column D x acceleration factor (or military hourly base rate) = Column E

Column B x Column E = Column F

	Total Personnel Assigned	Number that are Direct Labor	Total Work Year Hour Factor	Total (note)
CIVILIAN	20	16	2,087	33,392

Note: Multiply the total number of personnel assigned to the activity who are categorized as direct labor by 2,087 (total work year hour factor).

SHOP RATE (note 1)	$\frac{\$737,526}{33,392} = \22.09 (note 2)
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Notes:

1. Compute the shop rate by dividing the total work year cost by the total available direct labor hours.
2. Multiply the total number of personnel assigned to the activity who are categorized as direct labor by 2,087 (total work year hour factor).