



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
WASHINGTON, DC 20380-0001

MCO 8420.12  
SST  
22 Jul 91

MARINE CORPS ORDER 8420.12

From: Commandant of the Marine Corps  
To: Distribution List

Subj: MATERIEL FIELDING PLAN (MFP) FOR THE PRECISION  
GUNNERY TRAINING SYSTEM (PGTS)

Ref: (a) MCO P5000.10C  
(b) MCO P4105.3  
(c) MCO 8390.6A  
(d) MCO P5290.1

Encl: (1) Materiel Fielding Plan for Precision Gunnery  
Training System (PGTS)

1. Purpose. In accordance with reference (a) through (d), this Materiel Fielding Plan (MFP) is published to provide each command receiving the Precision Gunnery Training System (PGTS) with the logistic planning data necessary for PGTS device support.

2. Information. A requirement exists to substantially improve the first round hit probabilities of Tube Launched, Optically Tracked, Wire Command Link (TOW) missiles and Dragon anti-armor weapon system gunners. The PGTS was developed to meet this requirement. Enclosure (1) provides coordination and implementation instructions and descriptive information for the PGTS.

3. Action. The commanders of each organizational element concerned shall ensure implementation of the provisions of this Order.

4. Reserve Applicability. This Order is applicable to the Marine Corps Reserve.

*RA. TIEBOUT*

R. A. TIEBOUT  
By direction

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MATERIEL FIELDING PLAN

1. Introduction

a. Source of the Requirement. Source of the requirement is Required Operational Capability (ROC) No. 211.3.2 for the Precision Gunnery Training System (PGTS), dated 7 November 1986.

b. Points of Contact. All questions concerning the PGTS shall be directed to these personnel in writing.

<u>NAME</u>	<u>COMMAND/TELEPHONE</u>
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c. Fielding Methodology

(1) General Fielding Plan. The delivery of production items will be vertical, concurrent with production schedules.

(2) Method of Fielding

(a) The PGTS will be shipped to appropriate Training and Audiovisual Support Centers (TAVSC's) who will receive and

ENCLOSURE (1)

retain custodial responsibility for issue to using organizations.  
The PGTS will be located at the following Marine Corps sites:

Camp Lejeune, NC	Camp Pendleton, CA
Twentynine Palms, CA	Kaneohe Bay, HI
Camp Butler, Okinawa	Guantanamo Bay, Cuba
Selected Marine Corps Reserve Units	

(b) Requests for modifications by using units will be prepared and submitted in accordance with procedures established by the local TAVSC/Training Support Center (TSC) and NAVTRASYS/CENINST 4720.1 (Procedures for Field Requests for Changes to Cognizance Symbol 2"0" Training Systems) with information copies to PMTRASYS, MCRDAC. Modifications, when deemed necessary, will be performed through Contractor Operator Maintenance of Simulator (COMS).

d. Replaced Systems Equipment. The following systems will be replaced by the PGTS:

Type	TAMCN	IDN	Nomenclature	Make/Model	Series
TOW	E3194	07724A	Training Set		M70
Dragon	E1055	07584A	Monitor Set	AN/TSQ-T1	
Dragon	E1163	08074A	Pedestal, Infrared		M5
Dragon	E3192	07596A	Launch Effects Trainer		M57
Dragon	E3197	07904A	Field Handling Trainer		M57
Dragon	E3197	07595A	Transmitter		M89E1

Age, lack of adequate maintenance capability, failure to address precision gunnery training, along with an increased capability in the state-of-the-art in precision gunnery simulation, have outmoded these two early training aids. Disposition will be provided through a phase-out plan, to be published by the Commanding General, Marine Corps Logistics Base, Albany, GA.

## 2. System Description

### a. Administrative Information

(1) Nomenclature. Precision Gunnery Training System (PGTS).

(2) TAMCN. E1256

(3) SAC. N/A

ENCLOSURE (1)

(4) NSN

TOW GT	6920-01-299-2676
TOW FTT	6920-01-299-2678
DRAGON GT	6920-01-299-2284
DRAGON FTT	6920-01-299-2677

(5) Unit of Issue. Each

(6) Unit Cost

(a) TOW GT	\$22,358
(b) Dragon GT	24,000
(c) Instructor Station TOW	10,504
(d) Instructor Station Dragon	10,504
(e) TOW FTT	27,788
(f) Dragon FTT	26,000

(7) Support Cost. Universal ground Marine Corps Contractor Operation and Maintenance of Simulator (COMS). See paragraph 3, below.

(8) Petroleum, Oil, and Lubricants (POL). N/A

(9) Equipment Density. N/A

(10) Readiness Reporting. N/A

b. Physical Characteristics

(1) Dimensions (w = width, h = height, d = depth) and weights of PGTS cases are listed below. The TOW/Dragon gunnery trainers and TOW/Dragon field tactical trainers are pictured in Figures 1 through 4. The following dimensions are for the TOW/Dragon/Station containers, the primary configurations for the systems.

(2) Both the TOW/Dragon gunnery and field tactical trainers require 110 voltage, pool power, for operation of the instructor stations.

ENCLOSURE (1)

MCO 8420.12  
22 Jul 91

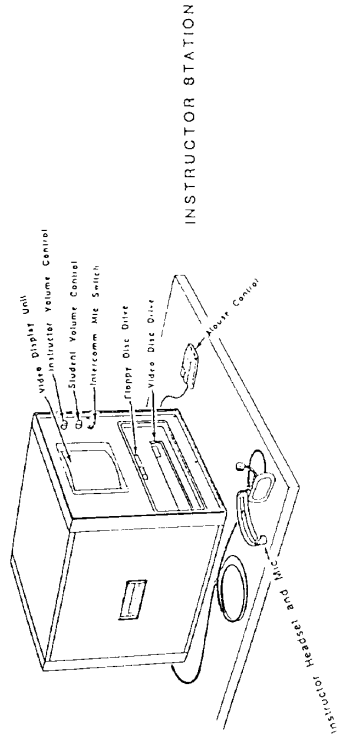
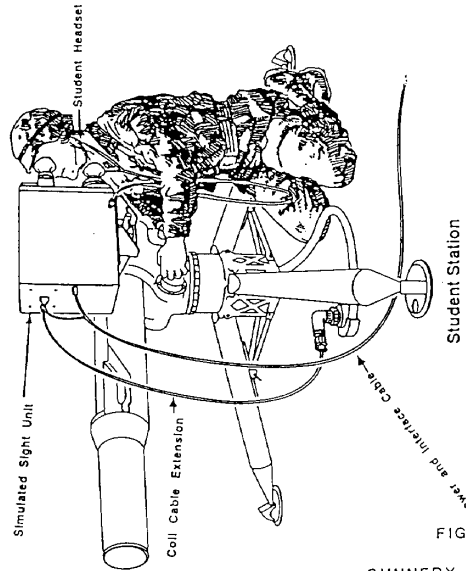
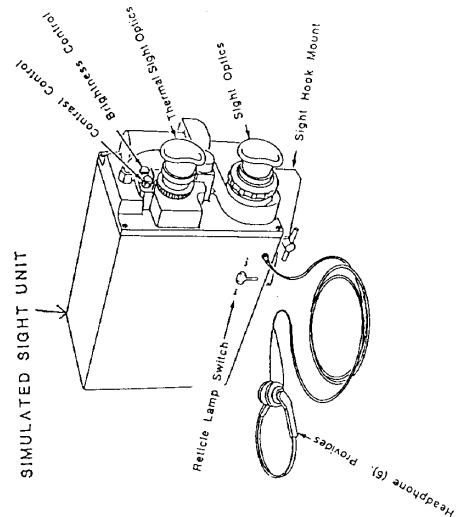


FIGURE 1

GUNNERY TRAINER - TOW

ENCLOSURE (1)

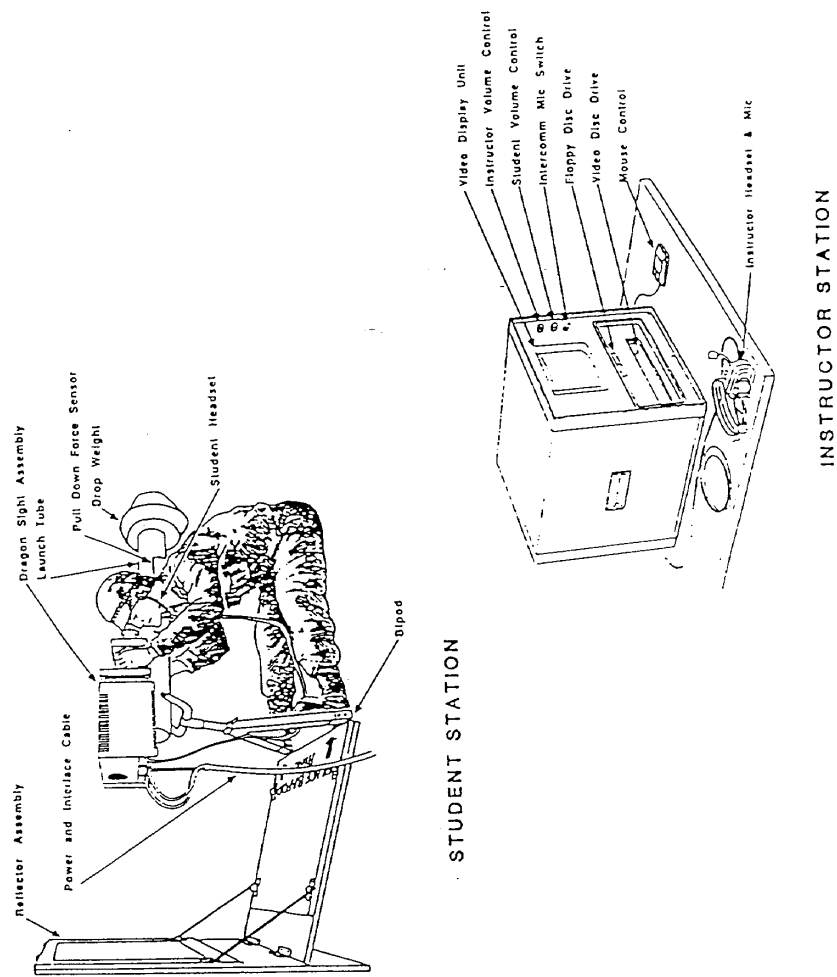


FIGURE 2

GUNNERY TRAINER - DRAGON

ENCLOSURE (1)

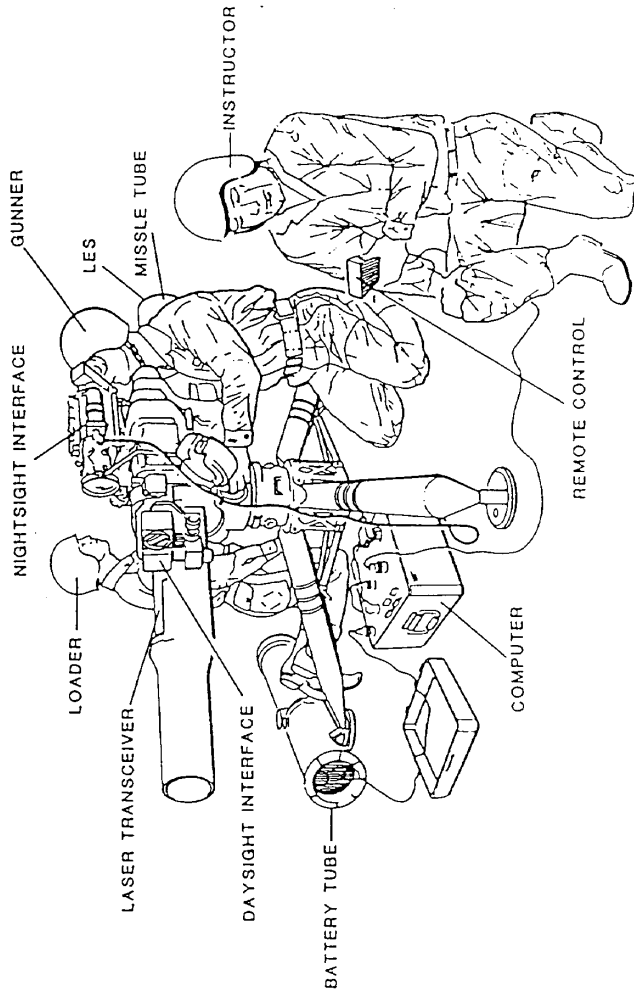


FIGURE 3

FIELD TACTICAL TRAINER - TOW

ENCLOSURE (1)

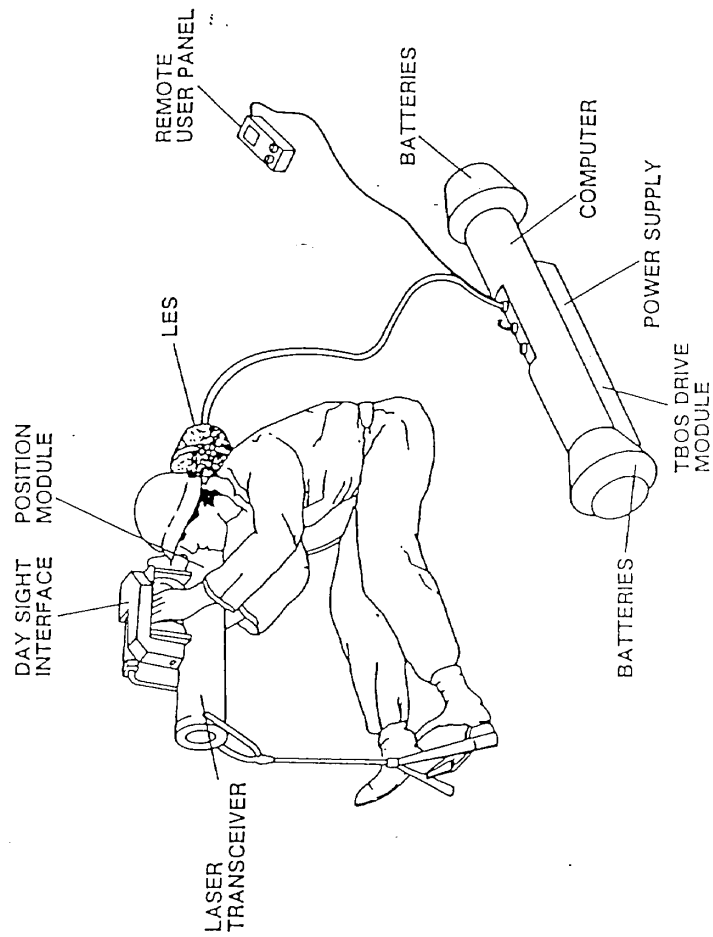


FIGURE 4

FIELD TACTICAL TRAINER - DRAGON

ENCLOSURE (1)



<u>System</u>	<u>W</u>	<u>d</u>	<u>h</u>	<u>lbs</u>	<u>ft</u>
Case #1 TOW FTT	5.5'w	x 2.1'd	x 1.6'h	74	18
Case #2 TOW FTT	1.6'w	x 5.0'd	x 1.6'h	41	13
Case #1 Dragon FTT	5.5'w	x 2.1'd	x 1.6'h	74	18
Case #2 Dragon FTT	1.6'w	x 5.0'd	x 1.6'h	41	13
Case #1 TOW GT (Instructor Sta.)	2' w	x 2.5'd	x 2' h	64	10
Case #2 TOW GT (Student Sta.)	2' w	x 3' d	x 2' h	42	12
Case #1 Dragon GT (Instructor Sta.)	2' w	x 2.5'd	x 2' h	64	10
Case #2 Dragon GT (Student Sta.)	2' w	x 3' d	x 2' h	42	12
Case #3 DRAGON GT (Dragon Tube)	1.7'w	x 5' d	x 2' h	20	14

(NOTE: Container size, weight and cube may change)

c. Operational Characteristics

(1) General Description. The PGTS is a training system that supports TOW and Dragon gunnery training. The PGTS for each weapon system consists of a gunnery (indoor) training device (GT) made up of a generic instructor station and a student station (figures 1 and 2), and a field tactical (outdoor) training device (FTT) (figures 3 and 4).

(a) TOW Gunnery Training Device. The simulated M220E4 TOW 2 missile system replicates the actual system in shape and physical size, and accommodates the tripod ground mount configuration and the pedestal mount for the High Mobility Multi-purpose Wheeled Vehicle (HMMWV). The training device simulates the TOW 2 target acquisition and engagement sequence including all missile flight characteristics.

(b) Dragon Gunnery Training Device. The simulated Dragon M47 Surface Guided Attack Missile device replicates actual system in shape and physical size. The device also simulates the Dragon target acquisition and engagement sequence including all missile flight characteristics.

(c) TOW Field Tactical Training Device. The TOW training device provides advanced precision gunnery and tactical training in the outdoor environment. The device simulates the TOW 2 engagement sequences including all missile flight characteristics and blast effects. The TOW training device accommodates the tripod/ground mount configuration and the pedestal mount for the HMMWV.

ENCLOSURE (1)

(d) Dragon Field Tactical Training Device.

The Dragon device provides advanced precision gunnery and tactical training in the outdoor environment. The device simulates the Dragon engagement sequences including all missile flight characteristics. The Dragon training device provides for the use of the system in the sitting, kneeling, and foxhole-supported standing positions.

(2) Laser Safety Requirements. The PGTS FTT laser transceiver incorporates three semiconductor laser diodes to transmit an invisible, pulse, low power laser beam to a target equipped with a retroreflector (precision mirror). The reflected laser beam is received by the laser transceiver and the system commuter provides the gunner with indication of tracking ability and mission success or failure. Laser radiation is only accessible at the exit aperture of the transceiver. The laser beam is safe at zero range for intra-beam viewing with the unaided eye, but special care must be taken with magnification optics such as aiming sights or binoculars. The Navy Laser Safety Review Board has approved use of the PGTS FTT laser in the Navy and Marine Corps and established its laser hazard classification as a class 3a, military exempt laser, with the following laser hazard distances:

<u>Type of Viewing</u>	<u>Hazard Distance (meters)</u>
Unaided	0
5 centimeter optics (7x50 binoculars)	154
8 centimeter optics (tanks)	262
12 centimeter optics (bigeyes)	406

d. Associated Systems and Equipment. Both the TOW and Dragon field tactical trainers are compatible with the Multiple Integrated Laser Engagement System (MILES).

3. Logistic Support

a. Maintenance Support. The PGTS maintenance concept is to provide proper maintenance services with a minimum of interruptions to the training mission. These services will be provided to using commands through Contractor Operator Maintenance of Simulators (COMS). COMS contracts will be initiated and monitored by NTSC Orlando. Contracting Officers Technical Representatives (COTR's) for COMS will be assigned at each TAVSC. Daily readiness testing will be performed by operators prior to device use. Diagnostic testing using built-in-test (BIT) and standard computer diagnostic programs will be used to locate and isolate faulty parts. Service requests will be made to local TAVSC's. Repairs will be accomplished by the service support contractor. The emphasis is placed on selective replacement

ENCLOSURE (1)

of defective parts rather than attempting repair of the parts while installed.

(1) Organizational level maintenance for PGTS is preventive and corrective maintenance. It will be performed by the instructor and will consist of visual inspection, use of the BIT and self-diagnostics for fault isolation, replacement of minor components such as light bulbs, lubrication, cleaning, and minor adjustments/alignments not requiring special tools and equipment. Since PGTS is a COMS supported system, there is no official designation of "intermediate" maintenance between that operator and depot.

(2) Depot level maintenance will be performed by trained contractor technicians with skill levels adequate to affect repair of designated replaceable modules and assemblies. Depot level maintenance will be performed by contractors onsite or at contractors facilities in support of the TAVSC on a return-to-TAVSC basis. This level of maintenance will consist of bench checks, repair, test and adjustment actions required to restore to a serviceable condition those items diagnosed as faulty at the organizational level. Depot level maintenance, including overhaul, rebuild, and major repair or modifications, will be accomplished by COMS.

b. Contractor Support Requirements. On-call contracted services will be furnished on an as needed basis and at the discretion of the program manager.

c. Manpower, Personnel, and Training

(1) Personnel Requirements. The introduction of the PGTS will not require table of organization (T/O) changes, additions or deletions to FMF or garrison organizations. The PGTS is a significant upgrade to on-going TOW and Dragon training programs within the Marine Corps. Training will be provided to an initial group of instructors in the operation and use of the devices. This initial group of Marine Corps instructors in turn will train other Marines.

(2) Training Requirements

(a) No specific military occupational specialty (MOS) is required to operate the PGTS as an instructor. Because the device is used to train Marines with MOS's 0351 and 0352, instructors should be well qualified in TOW and/or Dragon gunnery techniques.

(b) Instructor and Key Personnel Training (I&KPT). Instructors from the Schools of Infantry and key personnel from

ENCLOSURE (1)

the FMF will receive operator training. Quotas for this training will be promulgated by the PGTS project officer in sufficient time for orders to be written.

(c) Contractor personnel will be present after delivery of devices to each receiving site to provide limited operator set-up training. Supporting instruction materials and supplemental video tapes will be provided for sustainment training of field instructors.

(d) The Schools of Infantry will maintain resident instructor expertise in operating the PGTS. Organizations requiring operator training subsequent to fielding will request it from the closest School of Infantry at their own expense.

(e) Associated correspondence courses available from the Marine Corps Institute (MCI) are: TOW Weapon System Crewman (0355B) and Dragon Weapon System Crewman (0356C). MCI will make applicable changes to these courses.

(3) Training Support Items. Applicable manuals will be overpacked to assist operator training. Formal schools will receive courseware deliverables to facilitate integration of PGTS into existing courses.

d. Supply Support. Repair parts support will be provided for PGTS through NTSC Orlando supervised contractor support services. The supply support program for PGTS is intended to provide provisioning information for the procurement and positioning of spare parts to support PGTS. PGTS will be operated and maintained throughout its life by COMS support contracts. COMS will be in effect at the time of delivery. The supply support program will provide the support contractor with provisioning documentation and maintenance information. The PGTS provisioning process will integrate the logistic support analysis and spare parts selection and quantification. Spare parts requirements will be defined and data provided that will meet the support needs of PGTS equipment through contractor support services.

e. Support Equipment

(1) Special Tools. There are no special tools or test equipment (T&TE) required for operational users and none will be furnished.

(2) Special Purpose Test Equipment. Special purpose test equipment is the responsibility of the COMS contractor and not issued at the using unit level.

ENCLOSURE (1)

(3) General Purpose Test Equipment. General purpose test equipment is the responsibility of the COMS contractor and not issued at the using unit level.

(4) Other Support Equipment

(a) Initial Issue Provisioning (IIP) package will consist of spares (repairable items) and repair parts required to support and maintain the PGTS system. Additional systems spares and repair parts will be provided as needed during system life expectancy.

(b) DODIC L-592, TOW Blast Simulator, used with both the outdoor TOW and the outdoor Dragon devices to simulate blast effects, will be requisitioned by using commands along with other training ammunition requirements. Both outdoor TOW and Dragon devices may be used without the blast effects simulator at the discretion of the instructor.

f. Technical Publications

(1) Operator manuals will be overpacked with trainers. All other manuals will be force-fed to cognizant TAVSC's. Replacement copies of both operator's and maintenance manuals can be obtained from the Marine Corps Logistics Base (Code 876), Albany, GA.

(a) NTSC Orlando will hold master copies of all PGTS publications, and will be able to supply single copies upon request. Should multiple copies of a publication be required, the user will have to either request a copy from NTSC and reproduce additional numbers at unit expense, or contact the U.S. Army.

(b) Publications for PGTS were developed with Army funds, and that service will serve as primary distribution point for all PGTS manuals.

(2) The following manuals will apply to the PGTS program:

TOW GUNNERY TRAINER, SYSTEM MAINTENANCE MANUALS

System Maintenance Manual	SMM 9-6920-452	VOLUME I
Commercial Documentation	SMM 9-6920-452	VOLUME II
Diagrams	SMM 9-6920-452	VOLUME III
Technical Manual	SMM 9-6920-452	VOLUME IV

ENCLOSURE (1)



i. Packaging, Handling, Storage and Transportability

(1) Packaging. When not required for training, store and ship the PGTS in the containers provided with the system.

(2) Handling. The PGTS is a high technology training simulator. Although portions of the device are (or are designed to simulate) the actual equipment, the system as a whole is ruggedized in accordance with MIL-STD-810D. It should be afforded care similar to that provided a personal computer, television set or large optical instrument. Loaded PGTS containers are not to be transported by helicopter external lift or forklift material handlers.

(3) Storage. The PGTS may be set-up and remain ready for training indoors in appropriate classrooms. Elements of the system not in regular use shall be packed in their original containers for storage in command approved spaces.

(4) Transportation. Each element of the PGTS system (instructor station and indoor and outdoor student situations) will be delivered in reusable, man-portable containers. These containers are suitable for shipboard use, storage and transportation of the PGTS. These containers are not water tight. Containers are resistant to salt water corrosion, dust, sand, and weather intrusion.

j. Warranties. N/A

4. Actions Required To Place Equipment In Service

a. Gaining Commands. The following actions should be accomplished by the gaining command:

(1) Select qualified personnel to attend instructor training.

(2) Designate work area for COMS personnel.

(3) Designate area for storage of spare components.

(4) Procedures should be implemented for the reporting of system failures to the cognizant TAVSC/TSC.

b. CG MCRDAC

(1) Effect the timely interface and coordination between NTSC Orlando and the maintenance contractor for fielding.

(2) Issue quota assignments for initial instructor training.

ENCLOSURE (1)

22 Jul 91

c. CG MCCDC. Provide for follow-on operator training at the Schools of Infantry.

d. MCLB Albany

(1) Formulate disposition instructions for phase-out/disposal of replaced training systems.

(2) Phase-out and terminate training of maintenance operators of replaced training systems.

ENCLOSURE (1)



LIST OF ALLOWANCES AND DELIVERY SCHEDULES (TOW)

UNIT TITLE	UNIT ALLOWANCE (FTT/GT)	ACTUAL ALLOWANCE (FTT/GT)	PLANNED FY QTR 91				PLANNED FY QTR 92			
			1	2	3	4	1	2	3	4
SOI (W)	4/3	4/3				x				
1st MarDiv	15/6	15/6				x				
TBS	1/0	1/0				x				
SOI (E)	4/3	4/3				x				
2d MarDiv	*16/6	15/6							x	
3d MarDiv	10/4	10/4							x	
1st MEB	6/2	6/2							x	
MCAGCC	4/4	4/4							x	
4th TOW Co (Miami, FL)	3/3	3/3							x	
TOW Plt Co (Worcester, MA)	3/3	3/3							x	
AT (TOW) Co Broken Arrow, OK)	1/1	1/1							x	
TOW Plt HQ Co (Broussard, LA)	1/1	1/1							x	
TOW Plt Kansas City, MO)	1/1	1/1							x	

\* 1 FTT to be distributed to Guantanamo Bay, Cuba

Appendix A to  
ENCLOSURE (1)

LIST OF ALLOWANCES AND DELIVERY SCHEDULES (DRAGON)

UNIT TITLE	UNIT ALLOWANCE (FTT/GT)	ACTUAL ALLOWANCE (FTT/GT)	PLANNED FY QTR 92				PLANNED FY QTR 93				
			1	2	3	4	1	2	3	4	
SOI (W)	5/5	5/5	x								
1st MarDiv	24/9	24/9		x							
SOI (E)	5/5	5/5	x								
2d MarDiv	24/9	24/9		x							
3d MarDiv	15/6	15/6			x						
1st MEB	9/3	9/3			x						
MCAGCC	9/9	9/9			x						
1/25 (Topshaw, ME)	1/1	1/1			x						
1/23 (Shreveport, LA)	1/1	1/1			x						
2/23 (Port Hueneme, CA)	1/1	1/1			x						
3/23 (Baton Rouge, LA)	1/1	1/1			x						
1/23 (Toledo, OH)	1/1	1/1			x						
2/24 (Waukegan, IL)	1/1	1/1			x						
3/24 (St. Louis, MO)	1/1	1/1			x						
2/25 (Garden City, NY)	1/1	1/1			x						
3/25 (Moundsville, WV)	1/1	1/1			x						

Appendix A to  
ENCLOSURE (1)

SCHEDULE OF EVENTS

Contract Award (TOW and Dragon) 14 Aug 87

TOW

I&KPT (40 hours) - Ft. Benning	29 Aug - 2 Sep 88
User Test - Ft. Benning	6 Sep - 4 Oct 88
Ship System to Camp Pendleton	12-27 Mar 89
Operator Training, TOW, Camp Pendleton	3-7 Apr 89
Ready for Training - 2 TOW Systems	10 Apr 89
IOC TOW	10 Apr 91
Start of Production - TOW	May 90
Fielding begins TOW	Sep 90
FOC TOW	Sep 91

Dragon

Verification	Jun 91
Ready for Training - 2 Dragon System	Jul 91
IOC - Dragon	Jan 92
Start of Production - Dragon	Sep 91
Fielding begins Dragon	Dec 91
FOC - Dragon	Jun 92

Appendix B to  
ENCLOSURE (1)