CHAPTER 8

TARGETS AND ASSOCIATED EQUIPMENT

Aerial targets and associated equipment are used in gunnery, rocketry and for missile practice by ships and shore installations. They are also used in air-to-air firing exercises. Firing at targets that simulate moving aircraft improves the battle efficiency of the Navy and provides useful information for evaluating armament control/weapons systems under development for operational use by the fleet.

Target systems are divided into three categories: aerial targets, land targets, and tow target systems. Table 8-1 depicts a matrix of targets by category and type. In the following paragraphs we will discuss aerial targets and tow target systems.

Tow target systems are divided into two subsystems: aerial tow reeling machine and launchers and aerial tow. Both systems are discussed in the following text.

TOWED TARGETS, SYSTEMS, AND EQUIPMENT

LEARNING OBJECTIVE: *Identify towing systems and associated equipment to include external gunnery tow systems, tow target reeling machine-launcher systems, and tow cables and associated equipment. Describe the operating theory of the external gunnery tow system.*

There are two basic classes of tow targets—textile and rigid tow targets. Textile tow targets are flexible targets woven from a synthetic fiber, such as nylon.

Rigid tow targets are made of a rigid material, such as fiberglass. They are shaped and constructed to prevent drag and withstand severe air loads when towed at high speeds. This type of target is normally finned stabilized. All rigid targets provide an auxiliary aid for the radar fire control system in the attacking aircraft.

Table 8-1.—Target Categories and Types

Target	Aerial Target		Land Target	Tow Target Systems	
	Subscale	Full Scale		Aerial Tow Reeling Machine	Aerial Tow
BQM-34A/S	X				
BQM-34E/T	X				
BQM-74C/E	X				
AQM-37C	X				
RMK-19/A47U-3				X	
RMK-31/A47U-4				X	
RMK-34/A47U-4/A				X	
RM-1				X	
TDU-32A/B					X
TDU-34A/A					X

TEXTILE TOW TARGETS

The TDU-32A/B and TDU-32B/B aerial banner tow targets (fig. 8-1) are effective low-cost devices for air-to-air and surface-to-air gunnery training. They are constructed of nylon fabric and are rectangular in shape. The TDU-32B/B is laser retroflective, while the TDU-32A/B is radar reflective.

The TDU-32A/B and TDU-32B/B banner tow targets have a weighted steel tow bar and bridle assembly attached to the rectangular fabric panel. There is 60-foot safety nylon webbing bridle attached between the tow bar and tow cable. Both nonradar- and radar-reflective panels are 7 1/2 feet by 40 feet. For visual tracking, the panels have a 12-inch orange border and a 48-inch orange bull's eye centered on the white portion.

The targets, attached approximately 1,800 feet behind the tow aircraft, are launched from the runway by standard drag takeoff procedures. Target recovery is accomplished by dropping the target in a recovery area following the mission.

RIGID TOW TARGET

A rigid target is specially designed to simulate high-speed aircraft in speed and maneuverability. It can be towed by jet aircraft at speeds within the attacking range of jet fighters. The target is aerodynamically designed to reduce drag and limit the performance of the tow plane as little as possible. A rigid target can be used for air-to-air and surface-to-air gunnery and guided missile training.

The TDU-34/A aerial tow target (fig. 8-2) is a training device that will replace other tow targets now in use, with the exception of the banner targets discussed in this chapter. Its primary purpose is for air-to-air and surface-to-air missile and gunnery training.

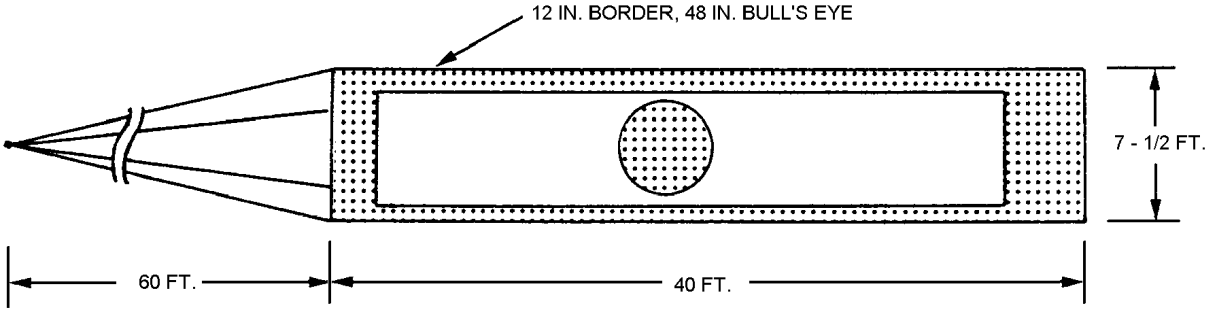
The TDU-34/A is a passive radar target. It can be adapted to carry other payloads internally. It consists of a reinforced aluminum tube body, four aluminum fins, a steel towline adapter, and radar-reflective nose and tail sections. The nose is a thin, fiberglass shell with four aluminum corner reflectors and a lead ballast weight bonded inside. The tail section is a short ABS plastic tube with a single aluminum corner reflector riveted inside. The dimensions and weight of the target are shown in figure 8-2.

The TDU-34/A can be towed by any aircraft capable of using the A/A47U-3 or A/A47U-4 reeling machine-launcher systems.

REVIEW NUMBER 1

Q1. What are the two basic classes of tow targets?

Q2. Textile targets are made of _____.



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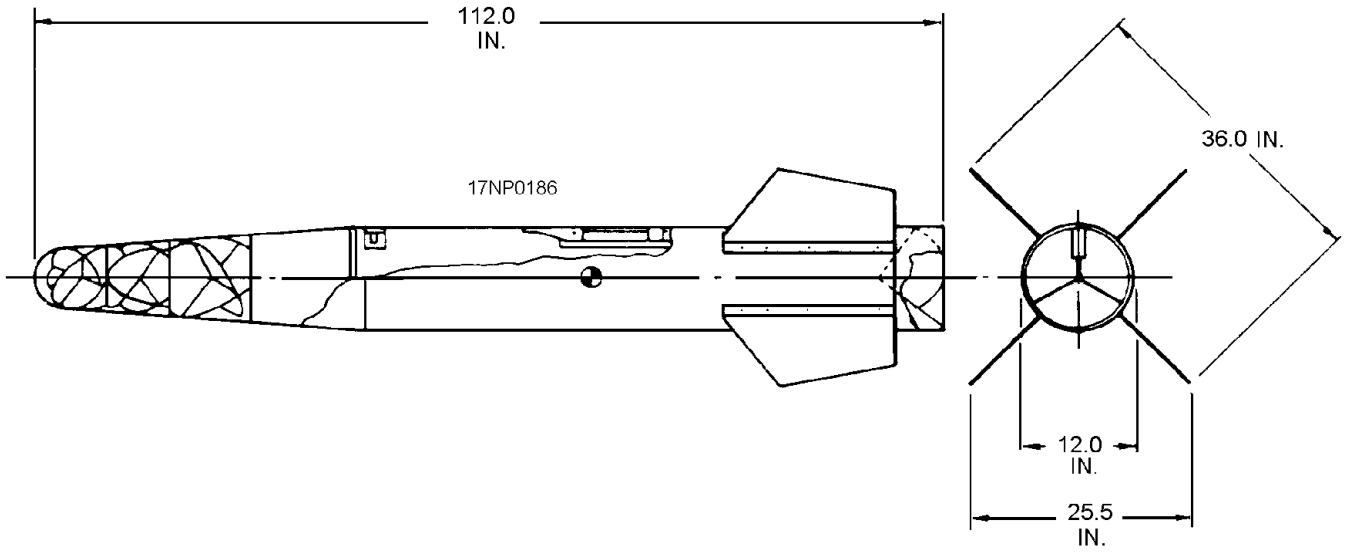
RADAR REFLECTIVITY	90% (AB), 0% (B)
SCORING	VISUAL HOLE COUNT
COLOR	WHITE, ORANGE BORDER AND BULL'S EYE
WEIGHT	23 POUNDS
MAXIMUM TOWING VELOCITY	250 KNOTS
TOW AIRCRAFT	A-4, T-2, A-6, F-4, F-14, A-7, F/A-18
AUGMENTATION	NONE

Figure 8-1.—Characteristics of the TDU-32A/B and TDU-32B/B aerial banner tow target.



ALTITUDE	35,000 FEET
WEIGHT	75 POUNDS
MAXIMUM TOWING VELOCITY	0.9 MACH
TOW AIRCRAFT	A-4, 1-6, F-4
AUGMENTATION	RADAR REFLECTIONS

Figure 8-2.—Characteristics of the TDU-34/A aerial tow target.

Q3. What type of target is an auxiliary aid for the radar fire control system in the attacking aircraft?

Q4. List the textile targets that are effective low-cost devices for air-to-air and surface-to-air gunnery training.

Q5. Describe the difference between the TDU-32A/B and TDU-32B/B targets.

Q6. What is the size of the TDU-32A/B?

Q7. Rigid tow targets are specifically designed to _____.

Q8. What tow target is a passive radar target that can be adapted to internally carry other payloads?

A/A47U-3A AND A/A47U-4 TOW TARGET REELING MACHINE-LAUNCHER SYSTEMS

The A/A47U-3A tow target reeling machine-launcher system (fig. 8-3) is an airborne

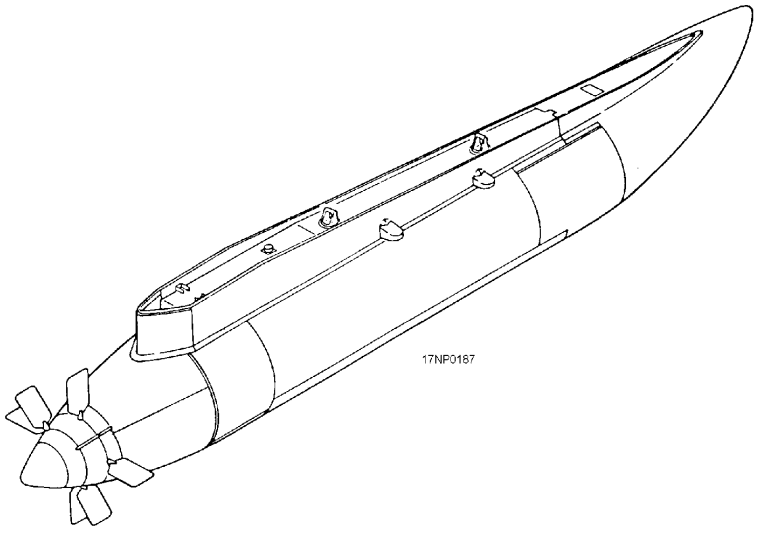


Figure 8-3.—A/A47U-3A tow target reeling machine-launcher system.

weapon training system. It is used to tow aerial targets for gunnery and aircraft missile firing exercises. The system is a semiautomatic tow-reel and target-launching mechanism externally mounted on the aircraft.

The A/A47U-3A system consists of an RMK-19A/A47U-3 reeling machine launcher, a PEK-84/A47U-3 reeling machine-launcher control, and the applicable interconnection cable assemblies. The system uses saddle-mounted aerial targets from 7 to 12.5 inches in diameter that weigh up to 225 pounds. Target towlines, which have constant diameters or stepped diameters with combinations of monofilament and/or stranded wire, are used. The system operates with various towline splices, ranging in diameter up to 0.250 inch and with flexible lengths up to 106 inches. Typical towlines consist of 10,000 feet of 0.190-inch diameter 3 by 7 stranded steel cable (5,400-pound tensile strength) or 42,000 feet of 0.097-inch diameter 1 by 7 stranded steel cable (2,060-pound tensile strength). The reeling machine-launcher system has a nominal reeling speed capability of 3,500 feet of towline per minute. Adjusting the power unit blade angle limitations increases the speed to a maximum of 5,000 feet per minute.

The operator manually controls the system, and it provides launcher up/down, brake on/off, and reel in/out functions. You can control target reeling and recovery speeds by manually adjusting the power unit blade angle. Operation of the system is controlled from the PEK, which is located in the cockpit of the launching aircraft.

The A/A47U-4 tow target reeling machine-launcher system is identical to the A/A74U-3A except for weight and size. The lighter weight and smaller size design of the A/A47U-4 was developed to adapt this towing system to a variety of aircraft.

If you want more information on the A/A47U-3A tow target reeling machine-launcher system, refer to *Tow Target Reeling Machine-launcher System A/A47U-3A*, NAVAIR 28-10A-16.

TOW CABLES AND ASSOCIATED EQUIPMENT

Steel cables used in target towing are manufactured specifically for that purpose. Three of the several types of cables used are discussed here: the 3/32-inch, 7 by 7 cable; the 1/8-inch, 7 by 19 cable; and the 1/8-inch, 1 by 19 armored cable.

The 3/32-inch cable comes in 10,000-foot spools, has a minimum breaking strength of 920 pounds when new, and is 7 by 7 in construction. It consists of seven strands; each strand has seven wires, and is commonly referred to as 7 by 7. This cable weighs 1.5 pounds per 100 feet.

The 1/8-inch cable is shipped in either 11,500- to 12,500-foot spools or 7,000- to 7,500-foot spools. It has a minimum breaking strength of 2,000 pounds when new. It is 7 by 19 in construction (7 strands, 19 wires per strand) and weighs 2.9 pounds per 100 feet.

The 1/8-inch-armored cable is shipped in spools. It has a minimum breaking strength of 2,160 pounds. It is constructed of one strand of 19 wires, with a flat armoring wire swaged spirally around the strand with a minimum of 6 turns per inch. The armored cable weighs 4 pounds per 100 feet. Cross-sectional views of these three cables are shown in figure 8-4.

These cables are not lubricated. The use of grease, oil, paraffin, or other lubricants on the cable is a fire hazard. An explosive vapor is created in the towing aircraft as the cable is reeled out at high speeds. Since the cables are not lubricated, they must be stored in a dry place, or cleaned and coated with corrosion-preventive compound according to instructions.

Continual use of a cable reduces its strength. Target towing subjects the cable to severe stress in addition to the damage caused by gunfire. You need to inspect cables frequently. The cable should be repaired or replaced if there are indications of fraying (broken wires), birdcaging (partial unwinding of the strands along the cable), or snarling (unwinding of the strands

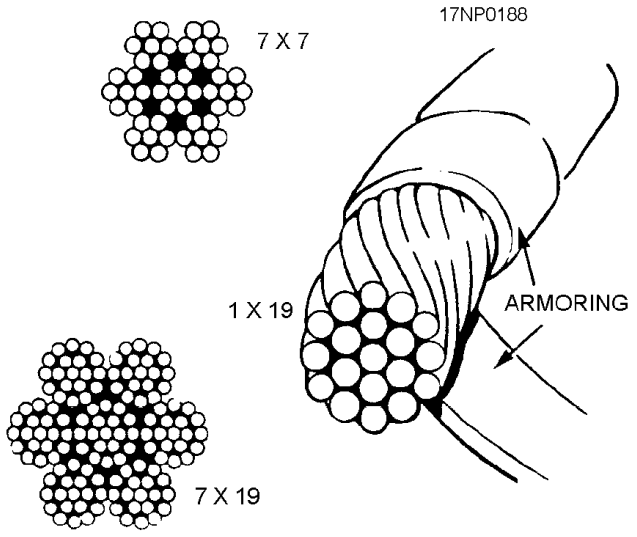


Figure 8-4.—Cross-sectional view of tow cables.

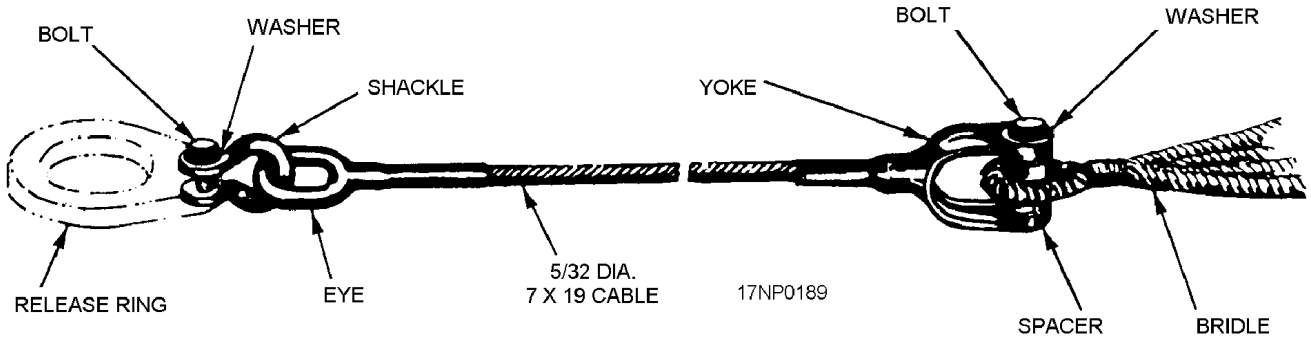


Figure 8-5.—Mk 1 target leader.

and wires at the end of the cable). Running a cloth along the cable will help you locate broken wires, as they will catch in the cloth. Never run your bare hand along the cable because the broken wires will catch in the flesh. Also, you should never use a knot to attach a target, since the knot weakens the cable by 50 percent or more. An eye splice is recommended for this purpose.

Mk 1 Target Leader

The Mk 1 target leader (fig. 8-5) is used to attach targets and target-release messengers to the release ring. In turn, the target ring is held by the Mk 7 Mod 4 target release. When the target is dropped, the leader and ring drop with it.

REVIEW NUMBER 1 ANSWERS

A1. The two basic classes of tow targets are the textile and rigid tow targets.

A2. Textile targets are made of woven synthetic fiber, such as nylon.

A3. The rigid tow target is an auxiliary aid for the radar fire-control system in the attacking aircraft.

A4. The TDU-32A/B and TDU-32B/B textile targets are effective low-cost devices for air-to-air and surface-to-air gunnery training.

A5. The TDU-32B/B target is 90-percent radar reflective.

A6. The TDU-32A/B is 7 1/2 feet by 40 feet.

A7. Rigid tow targets are specifically designed to simulate high-speed aircraft.

A8. The TDU-34/A tow target is a passive radar target that can be adapted to internally carry other payloads.

The leader is a 34-inch length of 5/32-inch diameter 7 by 19 steel cable swaged into a yoke at one end with an eye at the other end. To use the leader, you attach the bridle eye of the target to the yoke of the leader. Then, secure the eye end of the leader with a shackle to the release ring or snarl catcher that slides along the tow cable.

Mk 8 Target Release Ring

The Mk 8 target release ring (fig. 8-6) is made of casehardened alloy steel and is about 3 inches long. The smaller eye is 1/2 inch in diameter, while the larger eye is 1 1/2 inches in diameter. You should attach the target leader to the smaller eye (securing eye). The larger loop (hole) slides along the cable, and is held by the target release when the target is towed with a reel.

Release rings are also used in drag takeoffs and container launchings. In container launchings, you

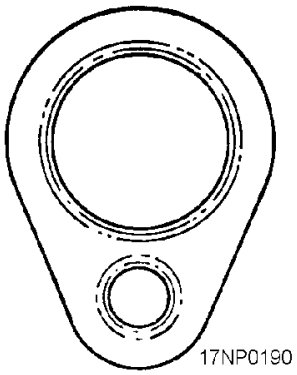


Figure 8-6.—Mk 8 target release ring.

should attach the ring directly to the towline, and then to the target-release device of the aircraft.

Klein "Chicago" Grip

The Klein "Chicago" grip (fig. 8-7) provides a means of transferring the target drag load from the reel to a structural member of the towing aircraft. This procedure is used to take the strain off the reel while the target is streamed.

The grip is a standard commercial item. It is about 10 inches long and composed of a series of spring-loaded linkages and a shackle. Compressing the entire grip in line with the extended shackle opens the jaws. It will grip bare wires, solid or stranded, from 0.081 to 0.162 inch in diameter.

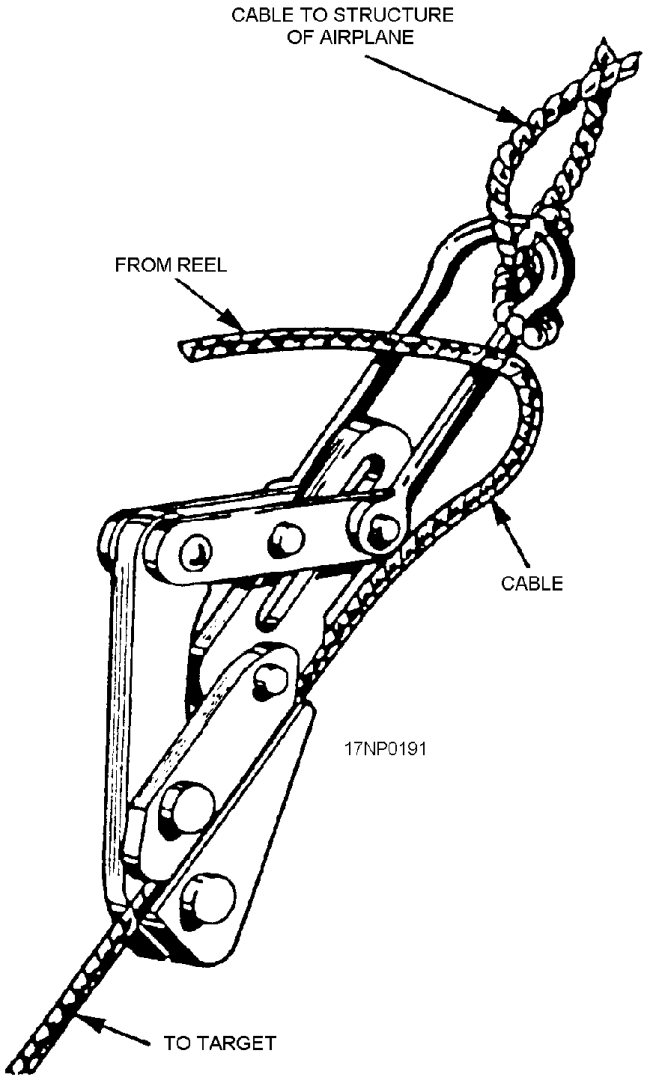


Figure 8-7.—Klein "Chicago" grip.

A cable to the aircraft's internal structure first secures the grip. Then, it is attached to the tow cable near the outrigger sheave. Slightly unwinding the reel transfers the load from the reel to the grip. The greater the drag load, the tighter the jaws grip the cable.

CAUTION

Do NOT apply loads greater than 1,500 pounds to the grip. It will accept cable with a much greater breaking strength than that of the grip itself. As a safety measure, set the reel brake while the grip is in use, keep the clutch in the IN position, and keep the slack in the tow cable between the grip and reel at a minimum.

REVIEW NUMBER 2

Q1. The one-way reel mounted in the center section of the tow-reel pod carries _____ on its spool.

Q2. List the components of the A/A47U-3A tow target launching system.

Q3. What is the major difference between the A/A47U-3A and A/A47U-4 tow target reeling machine-launcher systems?

Q4. List the types of steel cables used in target towing.

Q5. Why are cables frequently inspected?

Q6. The Mk 8 target release ring is made of _____.

Q7. What component provides a means of transferring the target drag load from the reel to a structural member of the towing aircraft?

Q8. What maximum load can be applied to the Klein "Chicago" grip?

AERIAL TARGETS

LEARNING OBJECTIVE: *Identify aerial targets to include the missile target, target drone, and target system*.

The Navy uses three aerial targets—the AQM-37C missile target, BQM-74C/E target drone, and BQM-34A/S and BQM-34E/T target system. A simplified discussion of aerial targets is presented in this section of the NRTC.

AQM-37C MISSILE TARGET

The AQM-37C missile target (fig. 8-8) is a realistic simulation of offensive missile and aircraft threats. It is used to conduct weapons systems evaluation, operationally train air-to-air missile crews, and exercise missile weapons systems. The AQM-37C missile target is an expendable, rocket-powered missile target capable of flying at various altitudes and cruise speeds. The target is designed for straight-and-level flight at selectable speeds from Mach 0.7 to Mach 4.0 at cruise altitudes of 1,000 to 100,000 feet, with a maximum range of approximately 155 nautical miles.

The AQM-37C is an air-launched target. It is launched from both carrier- and land-based aircraft. The launcher carries the target as an external store. The target's mission profile is determined by launch altitude, speed, and heading. This profile has controlled rocket engine thrust, cruise altitudes, and flight time parameters preset by ground crew personnel before flight.

The target is equipped with a gyro-referenced autopilot, radar augmentation, infrared augmentation, antennas, and an aerodynamic destruct system for flight termination. It is powered by the LR-64 liquid propellant rocket engine, which is a self-contained propulsion system. The maximum weight of the target, including radar augmentation, IR flares, and scorer, is 559 pounds.

Scoring System

The AQM-37C missile target contains the antennas and necessary interconnecting cables for the installation of the AN/DRQ-4 transponder. The primary purpose of the transponder is to receive a frequency-modulated signal from the missile, convert the signal to a new center frequency-modulated signal, and transmit the new signal to the miss-distance measuring system ground station.

The ground station receiver compares the shifted frequency of the target signal with the reference frequency of the strike missile signal. The outputs from the ground station accurately measure the miss distance between the target and the missile. The transponder is installed only in a target that is used for a surface-to-air missile with a telemetering head. The transponder is not

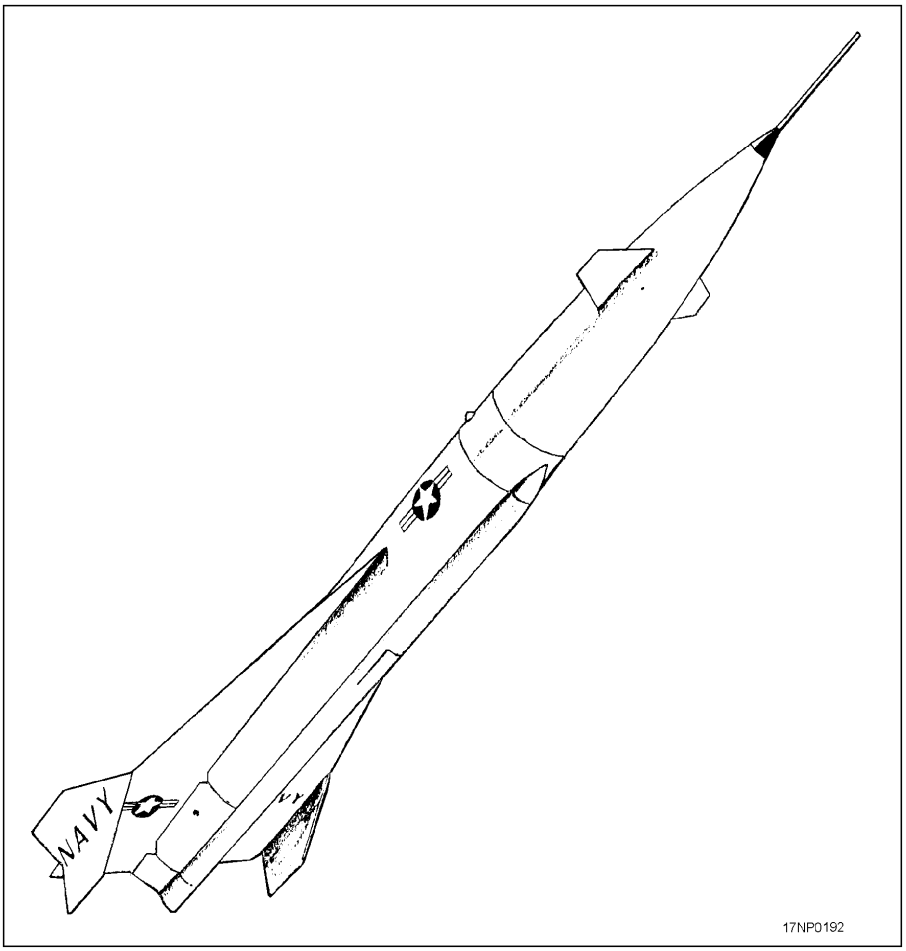


Figure 8-8.—AQM-37C missile target.

used in an air-to-air weapons system. Only one telemetering missile at a time should be shot at a target. After the first missile has destructed, a second shot may be attempted if the target was not destroyed.

REVIEW NUMBER 2 ANSWERS

A1. The one-way reel mounted in the center section of the tow reel pod carries 2,000 feet of 3/16-inch cable or 5,000 feet of 1/8-inch cable on its spool.

A2. The A/A47U-3A tow target launching system consists of an RMK-19A/A47U-3 reeling machine launcher, a PEK-84/A47U-3 reeling machine launcher control, and applicable interconnecting cable assemblies.

A3. The major difference between the A/A47U-3A and A/A47U-4 tow target reeling machine-launcher systems is their weight and size.

A4. The types of steel cables used in target towing are 3/32-inch, 7 by 7 cable; 1/8-inch, 7 by 19 cable; and 1/8-inch, 1 by 19 armored cable.

A5. Cables are frequently inspected because continual use reduces its strength.

A6. The Mk 8 target release ring is made of case-hardened steel alloy.

A7. The Klein "Chicago" grip provides a means of transferring the target drag load from the reel to a structural member of the towing aircraft.

A8. The maximum load that can be applied to the Klein "Chicago" grip is 15,000 pounds.

Aerodynamic Destruct System

The AQM-37C missile target's aerodynamic destruct system causes the target to enter a spiral dive to impact. This prevents the target from becoming a hazard to other aircraft or impacting the ground in undesired areas. Any one of four conditions activates the destruct system:

1. Flight timer setting (ground adjustable at 2-minute intervals after 4 minutes of flight time have elapsed)
2. Off-course flight (more than 10-degree heading deviation) for a period of 30 seconds or longer
3. Loss of electrical power or low-battery voltage
4. 12.5 seconds after jettison from the launching aircraft

For further details concerning the AQM-37C missile target, you should refer to *Manual Operational Mission Planning Guide for Navy Model AQM-37C Missile Target*, NAVAIR 01-90TBA-1T. Procedures for loading/unloading of the AQM-37C are contained in the appropriate aircraft airborne weapons/stores-loading manual.

BQM-74C/E TARGET DRONE

The BQM-74C/E target drone (fig. 8-9) is a high midwing monoplane of conventional design with an

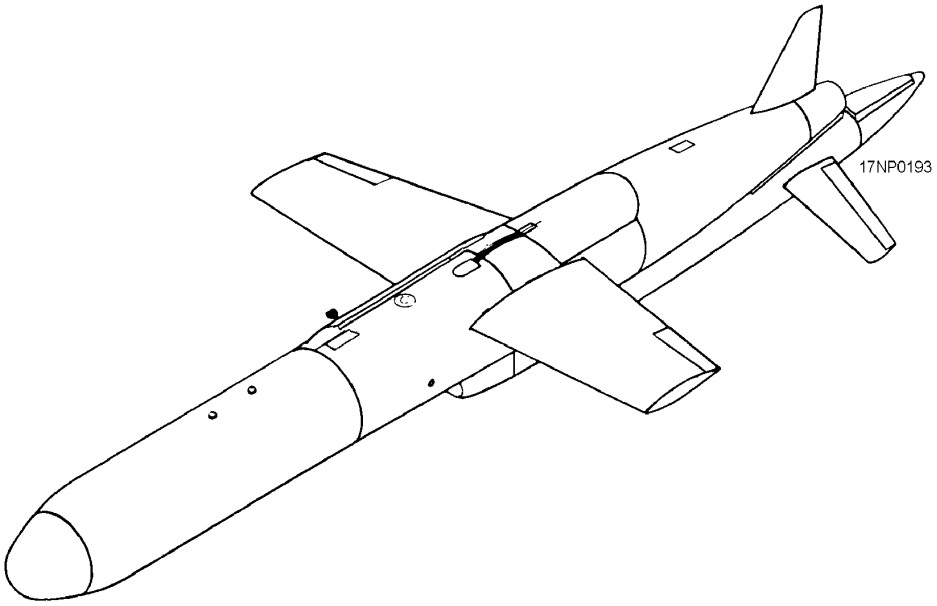


Figure 8-9.—BQM-74C/E target drone.

inverted-Y empennage. The airframe is a modified monocoque structure made of aluminum alloy and reinforced fiberglass construction. There is a vertical rack in the target nose section for mounting equipment. Equipment is mounted on both sides of the rack for convenient equipment removal, installation, and checkout. The target is powered by a YJ400-WR-403 variable speed, turbojet engine, which produces a minimum of 190 pounds (240 pounds of thrust E model) of static thrust at sea level. The 16.2-gallon fuel tank is mounted in the fuselage center section.

The BQM-74C/E target drone is air launched from either the A-6E or TA-4J aircraft. The target can be surface launched from the ground or a ship. The target flight path is remote controlled by radio commands. A gravity-erected, two-axis, vertical displacement gyroscope maintains target stabilization. The target is equipped with a parachute recovery subsystem and an active flotation subsystem. After water entry, these subsystems keep the target afloat for a minimum of 24 hours. The target has retrieval attachments that are compatible with shipboard or helicopter retrieval equipment.

When the basic BQM-74C/E target drone is configured for mobile sea range (MSR) and on-range target (ORT) operations, specific mission-peculiar equipment is added. The mission-peculiar equipment and installation and checkout procedures are listed in *Maintenance Manual Instructions*, NAVAIR 01-BQM-74C-2-1. For further information concerning the basic BQM-74C/E target drone, you should refer to *Maintenance Instructions Target Drone Navy Model BQM-74C/E*, NAVAIR 01-BQM-74C-2-2.

BQM-34A/S TARGET SYSTEM

The BQM-34A/S target system (fig. 8-10) is a recoverable, jet-powered target with a service ceiling of 50,000 feet and a maximum speed of 600 knots. Unlike the AQM-37C, this target requires extensive support equipment and preparation before launching.

BQM-34E/T MISSILE TARGET

The BQM-34E/T missile target is a remotely controlled, supersonic, recoverable target capable of speeds up to Mach 1.7 and altitudes of up to near 60,000 feet. It is propelled by a Y-69 turbojet engine and is capable of performing preset maneuvers up to 5 G.

Mk 28 Mod 3

This target flare is used to provide an infrared source on the BQM-74C/E target during missile firings.

Mk 37 Mod 0

This target flare is used to provide an infrared source on the missile target to enhance survivability of the target during missile firings.

REVIEW NUMBER 3

Q1. List the three aerial targets used by the Navy.

Q2. The AQM-37C has a speed range between _____.

Q3. What means is used to launch the AQM-37C?

Q4. What propellant is used in the self-contained propulsion system of the AQM-37C?

Q5. What is the purpose of the aerodynamic destruct system of the AQM-37C?

Q6. The BQM-74C/E is powered by a _____.

Q7. What aircraft are used to launch the BQM-74C/E target drone?

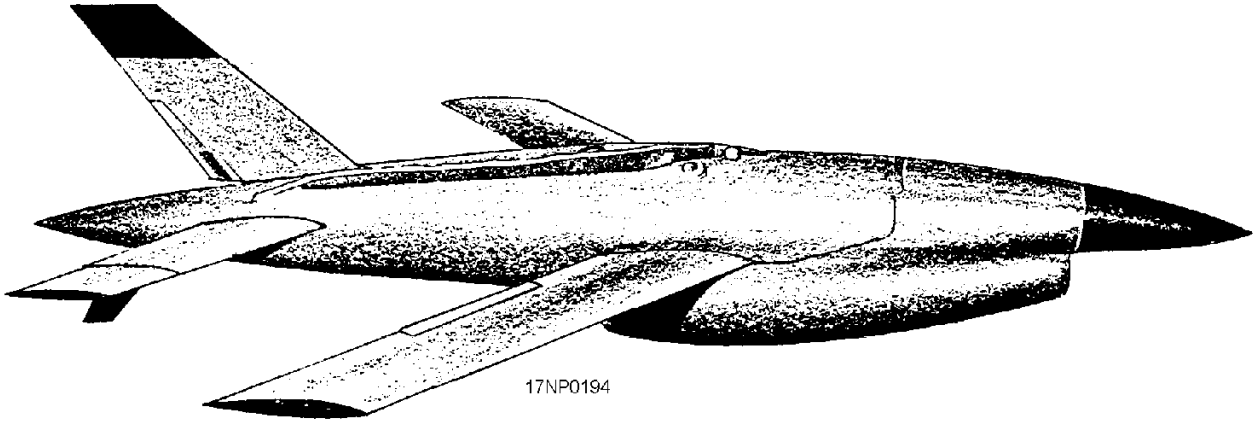


Figure 8-10.—BQM-34A/S target system.

Q8. What is the maximum speed of the BQM-34A/S target system?

AIR-LAUNCHED DECOY

LEARNING OBJECTIVE: *Identify the purpose and use of the air-launched decoy.*

Air-launched decoys are air-launched vehicles whose purpose is to minimize, nullify, or confuse enemy air defense systems.

The tactical air-launched decoy (TALD) (fig. 8-11) is a nonpowered, air-launched, aerodynamic vehicle. The TALD provides false imagery to defense acquisition systems by using chaff/electromagnetic and radar signature augmentation. There are three TALD vehicles: A/B37U-1(V)1, chaff vehicle; A/B37U-1(V)2, RF vehicle; and ADM-141 A, RF vehicle. TALD vehicles are loaded on multiple or triple ejector racks (IMER/ITER/BRU-41/BRU-42). The TALD (fig. 8-12) consists of a nose cone, left and right antenna/wing assembly, an empennage, a vertical stabilizer, left and right stabilizer, a vertical fin, a flight computer, a pilot battery, and a main battery.

RECORD KEEPING AND REPORTING

LEARNING OBJECTIVE: *Identify the purpose and use of target logbooks, aerial target expenditure reports, and target performance reports.*

Maintenance performed on targets is based on the concept that maintenance should be performed at the lowest maintenance level capable of performing the work. All maintenance is performed in accordance with approved NAVAIRSYSCOM maintenance plans, maintenance instruction manuals, and maintenance requirement cards.

Organizational maintenance activities are responsible for maintaining target logbooks, target discrepancy books, target performance reports, and the Visual Information Display System/Maintenance Action Forms (VIDS/MAFs).

TARGET LOGBOOKS

Logbooks are maintained for each target, and are the administrative means of providing managers with target age, status, operational history, modification, configuration, and transfer and receiving data. This information is maintained throughout the target's life cycle. Refer to OPNAVINST 8000.16 for a list of all applicable publications for target systems.

TARGET DISCREPANCY BOOK

The Target Discrepancy Book, maintained by maintenance control, for each target assigned is set up

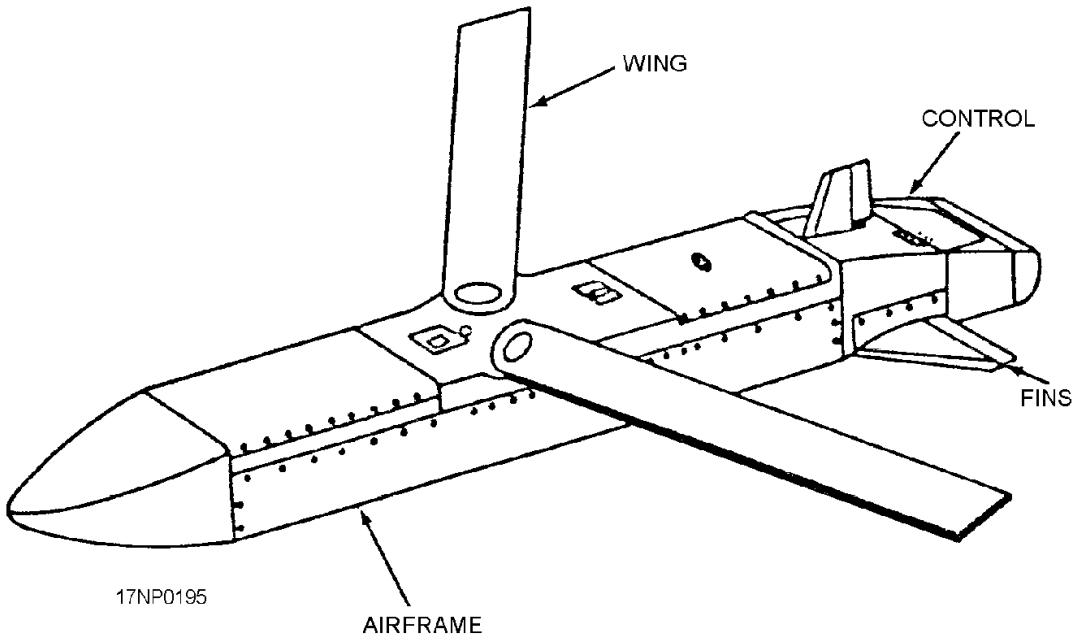


Figure 8-11.—Typical tactical air-launched decoy (TALD).

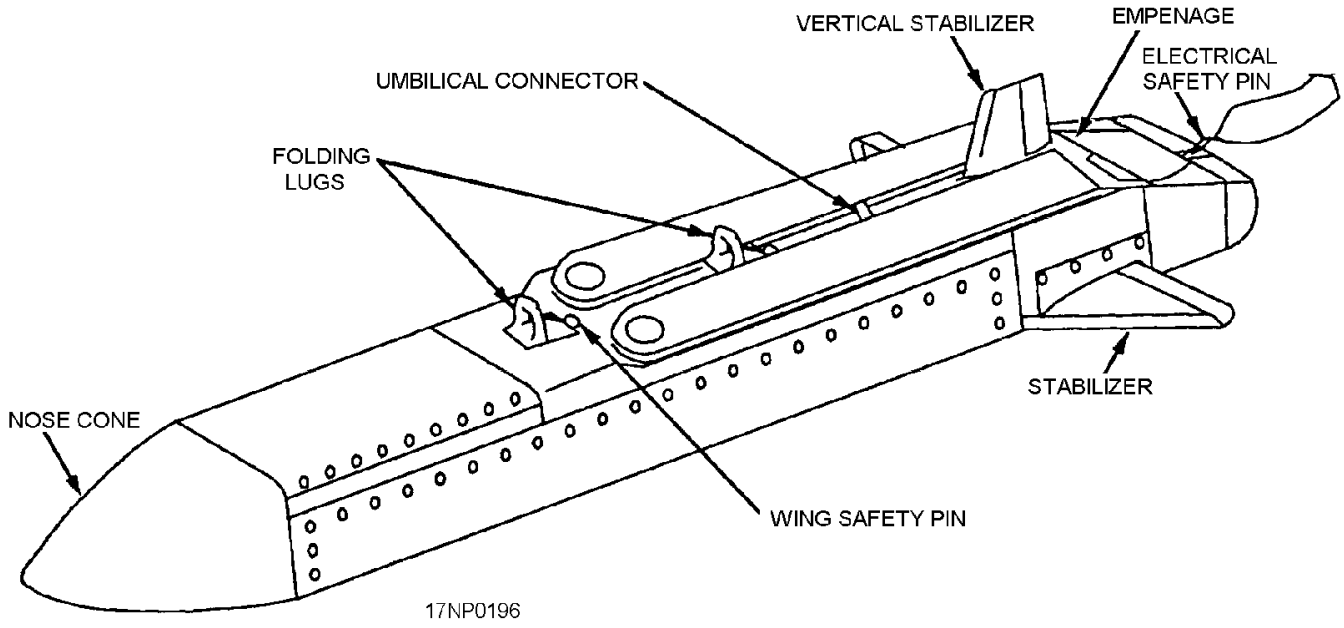


Figure 8-12.—Typical tactical air-launched decoy (TALD) component locations.

by target serial number, which must accurately reflect the status of all pending maintenance requirements as shown on the maintenance control and work center VIDS board. Discrepancy books are not maintained on tow banners and tow lines. The Aircraft Inspection and Acceptance Record, OPNAV 4790/141 (fig. 8-13) separate flight records on target drones.

AIRCRAT INSPECTION AND ACCEPTANCE RECORD — OPNAVINST 4790.2D

1. A/C BU/SER NO.	2. T/M/S	3. RPT. CUST.	4. OXY	5. FUEL		6. OIL					7. DATE
				GRADE	QTY	GRADE	1	2	3	4	

8. ORDNANCE/SPECIAL EQUIPMENT/LIMITATIONS/REMARKS	9. I have personally inspected this aircraft IAW the applicable MRCs/checklists. Any discrepancies noted have been entered on OPNAV Form 4790/38.
	SIGNATURE OF PLANE CAPTAIN — RANK/RATE
SAMPLE	10. Certification of safe for flight condition by the MO, MMCO, or MCO. Other persons may sign this for if authorized.
	SIGNATURE — RANK/RATE
	11. I have inspected the last____discrepancy reports, insure proper filing of weight and balance data and accept this aircraft for flight.
	SIGNATURE OF PILOT IN COMMAND — RANK/RATE

OPNAV 4790/141 (REV. 2-86) REPLACES OPNAV 3760/2D WHICH MAY BE USED UNTIL SUPPLIES ARE EXHAUSTED S/N 0107-LF-047-9706

17NP0197

Figure 8-13.—Aircraft Inspection and Acceptance Record.

TARGET PERFORMANCE REPORT (TPR)

1. OPs Act 3M ORIG/UIC

2. Act Report No.

2a. Revised

3. Date From (YYDDD)

4. TARGET TYPE

	AQM-37C		QF-4N
	BQM-34S		QF-86F
	BQM-74C		TDU-34A
	BQM-74E		TDU-34A/A
	MQM-8G		QLT-1C
	MQM-8GER		
	OTHER:		

5. TARGET SERIAL NUMBER

6. TARGET DISPOSITION

	REUSABLE
	OPERATIONAL EXPEND
	HIT & KILLED
	ADMIN EXPEND

7. POC:

DSN & COMMERCIAL:

8. USER

	C3F		COMSOLANT
	C6F(NAVEUR)		CVWR-20
	C7F		CVWR-30
	CF2		FMFLANT
	CG4MAW		FMFPAC
	CNAL		SNFL -
	CNAP		VC-
	CNATRA		VX-
	CNSP		
	FMS COUNTRY:		
	TARGET CASE NO.:		
	OTHER:		

10. TARGET AUGMENTATION/AUXILIARY SYSTEMS USED

(S=Satisfactory/U=Unsatisfactory)

	RADAR AUG		INFRARED AUG
	TWT		IR CRUCIBLES
	SOLID STATE AMPLIFIER		IR FLARES
			IR TOW BODY
	CORNER REFLECTOR		SMU-114/A
	LUNEBERG LENS		
			VISUAL AUG/CM EQUIP
	ELECTRONIC/IR		BANNERS
	ALE-29		REFLECTORS
	ALE-33		SMOKE
	ALE-44		STROBE LIGHT
	AN/ALQ-167		
	AN/DLQ-3		EMIT/SEEK SIM
	AN/ULQ-21		AN/AST-4
			AN/DPT-1
	CMD & CTRL		AN/DPT-2
	AN/DKT-59		AN/DPT-2A
	AN/DKW-2A		ARME
	AN/DKW-3A		
	AN/DKW-4(V)1		MISCELLANEOUS
	AN/DKW-4(V)2		AN/DRN-13
	AN/DRW-29		APN-194
	FTR-551		FTR-550
	R-2499(V)DRW		RF TOW BODY
			HEADING HOLD
	SCORING		RALACS KIT
	AN/DRQ-4A		RT1378Z
	AN/DRQ-4B		AN/UPT-2
	AN/DSQ-37		R-CUBED UNIT
	AN/DSQ-50		TGAS
	KS-161-A		
	WISS		OTHER:
	LOC AT/TBK BEACON		
	AN/DPN-78		
	AN/DPN-88		
	DKT-59TM		
	DPN-90(V1)		
	DPN-90(V2)		
	RT-1203/D		
	T-1438/D		

9. Multiple Target Operation

	Target Type:
	Serial Number:
	Target Type:
	Serial Number:

11. TARGET LAUNCH PLATFORM

TYPE		SPEED(KIAS/MACH)		ALTITUDE
	A/C		KIAS	
	GROUND		MACH: .	
	SHIP			

SAMPLE

12. PRIMARY MISSION

	FLEET TRAINING
	MSR
	TARGET TEST
	T&E WEAPON FIRING
	OTHER:

13. TYPE PRESENTATION

	FIRING
	TESTING
	TRACKING
	OTHER:

14. TARGET OPERATIONAL INFORMATION

TARGET	KIAS	MACH	ALTITUDE
MIN		.	
MAX		.	
AT FOX		.	

16. TOTAL TARGET FLIGHT TIME (MM:SS)

17. TARGET PRESENTATION TIME (MM:SS)

18. AERIAL TARGET OPERATIONAL SEQUENCES

S=SAT/U=UNSAT/A=ABORT

	LAUNCH
	FLIGHT
	RECOVERY
	RETRIEVAL

19. TOW SYSTEMS DATA

REEL TYPE

	RMK-19
	RMK-31
	RMK-34

CABLE SIZE

CABLE LENGTH

TOW TARGET OPERATIONAL SEQUENCES

S=SAT/U=UNSAT/A=ABORT

	LAUNCH
	REEL OUT
	OPERATION
	REEL IN
	RETRIEVAL

15. SHOOTER

	TYPE SHIP AND/OR AIRCRAFT	QUANTITY
1		
2		
3		

		TYPE WEAPON(S) FIRED	QTY/RNDS	WARHEAD TYPE: INERT	TM	W/H	EFFECT ON TARGET: NOT HIT	HIT	H&K	TARGET MANEUVER AT FOX: CLIMB	DIVE	JINK	TURN	NONE
1	A													
	B													
	C													
2	A													
	B													
	C													
3	A													
	B													
	C													

20. REMARKS:

MAIL COMPLETED TPR TO:
COMMANDER
CODE - P38522
NAVAIRWARCENWPNDIV
521 9TH STREET
POINT MUGU CA 93042-5001

17NP0198

OPNAVINST 8600/15(REV 6-94)

Figure 8-14.—Target Performance Report.

TARGET PERFORMANCE REPORTS

The information contained on a Target Performance Report targets performance, and is consolidated into an automated database for Navywide use. Target performance data is submitted on OPNAV 8600/15 (fig. 8-14).

TARGET EXPENDITURE REPORTING

Target operating activities are required to transmit a message report (fig. 8-15) within 24 hours of target loss listing target, serial number, calendar date, activity charged, weapons system used. All aerial towed targets (TDU-32, TDU-34, etc.) may be transmitted weekly. Reports must be timely and accurate because they are used to determine allocations for the current fiscal year and out years.

REVIEW NUMBER 3 ANSWERS

A1. *The three aerial targets used by the Navy are the AQM-37C, BQM-74C, and BQM-34A/S.*

A2. *The AQM-37C has a speed range between Mach 0.7 and Mach 4.0.*

A3. *The AQM-37C is an air-launched target.*

A4. *LR-64 liquid propellant is used in the self-contained propulsion system of the AQM-37C.*

A5. *The aerodynamic destruct system of the AQM-37C is used to prevent the target from becoming a hazard to other aircraft and from impacting the ground in undesired areas.*

A6. *The BQM-74C/E is powered by a YJ400-WR-402 variable speed, turbojet engine.*

A7. *The A-6E and TA-4J aircraft are used to launch the BQM-74C/E target drone.*

A8. *The maximum speed of the BQM-34A/S target system is 600 knots.*

SAFETY PRECAUTIONS

LEARNING OBJECTIVE: *Identify safety precautions to follow when working with aerial targets and associated equipment*.

There are many safety precautions associated with the target towing service. Some of these safety precautions are:

- Preservatives and lubricants may NOT be used on tow cables. Friction caused by high-speed reeling-out generates heat. This heat can generate explosive vapors from the lubricants in the tow compartment.
- A cable should be uncoiled by standing the coil on its edge, holding the end, and unrolling the coil. Do NOT attempt to take cable from either a coil or roll by pulling the cable when the coil or roll is lying flat. The cable will snarl and kink.
- When you cut nylon towline, the ends have to be bound. Otherwise, apply enough heat to the cut ends to melt the nylon. This prevents raveling.
- Safety tow webbing must be used between the target and the end of the towline. When the pilot shoots off the towline, this webbing can prevent it from becoming tangled in the target. Multistrand safety webbing's (100 feet long) are used with banner targets.
- The snarl catcher must NOT be used during air-to-air gunnery exercises. It may clamp on the towline before it reaches the end of the cable. This means there will be a long, free section of the cable whipping about behind the target.
- All personnel involved in target towing operations must know the standard hand signals for controlling aircraft on the ground.
- Perform a preflight inspection of all tow equipment.
- Make sure you are clear of the cable when launching a target.
- Do NOT wear loose clothing when operating rewind equipment. Keep your hands clear of moving parts when the equipment is in operation.
- Observe RADHAZ precautions when working with cable cutting cartridges and tracking flares.
- Exercise caution when it is necessary to work in close proximity of pneumatic, hydraulic, spring, or cartridge-operated components.

FM ACTIVITY

TO COMNAVAIRWARCENWPNDIV POINT MUGU CA//P3855//

INFO TYCOM//AIRLANT//AIRPAC//
PEOCMPANDUAV WASHINGTON DC//PMA-208//
CDM CHARGED//

BT
UNCLAS //N08840//

SUBJ: AERIAL TARGET EXPENDITURE REPORT//

MSGID/GENADMIN/

REF/A/DOC/OPNAVINST 3110.18S
REF/B/DOC/OPNAVINST 8600.2B

NARR/REF A IS OPNAVINST 3110.18S. REF B IS OPNAVINST 8600.2B TARGET EXPENDITURE REPORTING REQUIREMENTS//

POC/ / /DSN /TEL: //
RMKS/1. FOL AERIAL TARGETS EXPENDED IS REPORTED IAW REFS A AND B

TGT TYPE	SER NBR	DATE	CMD CHARGED	WEAPONS SYS
BQM-74C	123456	10 FEB 93	CNAL	HIT & KILLED 76MM

BT

17NP0199

Figure 8-15.—Aerial Target Expenditure Report.