P/N 830-0047-0
OSR 11-S-2460

NIVISYS™ LLC

OPERATOR MANUAL

Night Gunnery Aiming Laser (NGAL)

Model: GCP-2C

Nivisys, LLC
400 S. Clark Drive
Suite 105
Tempe, AZ 85281

480-970-3222 (tel)
480-970-3555 (fax)
info@nivisys.com
www.nivisys.com

OPERATOR AND ORGANIZATIONAL LEVEL MAINTENANCE MANUAL FOR

GCP-2C
COBRA
FLIGHT AIMER NIGHT GUNNERY (FANG)

NSN: 5855-01-465-2161

This page intentionally left blank.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

APPENDIXES

LIST OF FIGURES

LIST OF TABLES

This page intentionally left blank.

LASER SAFETY DATA SUMMARY
GCP-2C IR Aimer

Description	GCP-2C
Laser Output Power Continuous Wave	HI (Operation Mode) 100 mW LOW (Eye-safe Mode) 0.7 mW
Laser Beam Divergence	0.5 mR Minimum
Laser Safety Class	IIIb
Nominal Ocular Hazard Distance (NOHD) for the unaided eye	545 ft (166 m)
Laser Wavelength	830 – 840 nm ± 20 nm

- Data based on Laser Hazard Safety Analysis, Air Force Research Lab/Human Effectiveness Directorate Optical Software.
- Based on a <10 second exposure for IR wavelength.
- All output power readings are maximum values at 73ºF (23ºC).
- See also Appendix D – Laser Safety Data.

WARNINGS, CAUTIONS AND NOTES

Warnings and Cautions are used in this manual to highlight operation or maintenance procedures, practices, conditions or statements that are considered essential to the protection of personnel (WARNINGS) or equipment (CAUTION). Warnings or Cautions precede the step to which they apply. NOTES are used to highlight operation or maintenance procedures, practices, conditions or statements that are not considered essential to the protection of personnel or equipment.

WARNING

Highlights an essential operation or maintenance procedure, practice, condition or statement that, if not strictly observed, could result in injury or death of personnel or imposition of long-term health hazards.

CAUTION

Highlights an essential operation or maintenance procedure, which, if not strictly adhered to, could result in damage to or destruction of equipment or loss of mission effectiveness.

NOTE

Highlights an essential operation or maintenance procedure, practice, condition or statement that deserves additional emphasis apart from normal text.

WARNING

In hostile territory, operate the GCP-2C with caution. Remember: The enemy, using night vision equipment, can also detect the IR source used in the aimer.

WARNING

All personnel participating in training or operation that involves the use of lasers should comply with Command / Organizational Unit and LSO guidance.

WARNING

There are eye and other hazards associated with the use of the GCP-2C. Safe operation of this product requires following Warnings, Cautions and Notes contained in this Operator Manual.

WARNING

Laser Eye Protection (LEP) must be worn when operating, maintaining, servicing, or testing the GCP-2C. Store the GCP-2C when not in use, in a locked container in the OFF position, with the batteries removed. Do not turn on the unit until it is necessary to operate.

CHAPTER 1

INTRODUCTION

1.1 PURPOSE AND SCOPE.

The purpose of this manual is to provide descriptive information, operating instructions and maintenance procedures for the GCP-2C Cobra Flight Aimer Night Gunnery (FANG). (Figure 1-1). The instructions will cover all variants of the GCP-2C and all accessories required to operate the system.

1.2 LIST OF ABBREVIATIONS.

The following list of abbreviations may be used in this manual:

Table 1-1. List of Abbreviations

C	Celsius (Centigrade)
CCW	Counterclockwise
CFR	Code of Federal Regulations
cm	Centimeter
CW	Clockwise
DC	Direct Current
DoD	Department of Defense

Table 1-1. List of Abbreviations (cont'd)

DS/GS	Direct Support/General Support
F	Fahrenheit
ft	Feet
g	Grams
Gen III	Generation III
hrs	Hours
Hz	Hertz
in	Inches
IR	Infrared
ITAR	International Traffic in Arms Regulations
kg	Kilograms
km	Kilometer
m	Meter
mA	Milliampere
MAC	Maintenance Allocation Chart
min	Minutes
mm	Millimeter
MPI	Mean Point of Impact
mR	Milliradians
mW	Milliwatt
nm	Nanometer
NOHD	Nominal Ocular Hazard Distance
NSN	National Stock Number
Nivisys	Nivisys
NVG	Night Vision Goggle
oz	Ounce

Table 1-1. List of Abbreviations (cont'd)

PMCS	Preventive Maintenance Checks and Services
RA#	Return Authorization Number
V	Volt
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
yd	Yard

1.3 DESCRIPTION OF THE EQUIPMENT.

The GCP-2C is a Class IIIb laser infrared (IR) aimer and illuminator as rated by the FDA. The IR light is invisible to the unaided eye, but fully visible to Gen II and Gen III image intensified night vision devices. The GCP-2C has a power output of 100 mW. The aiming beam may be used to mark targets at ranges of 5 to 6 mi (8 to 10 km). The GCP-2C is designed and optimized to operate with the USMC (AH-1W) Super Cobra 20mm cannon.

1.3.1 The GCP-2C Kit consists of the following:

- COBRA Flight Aimer Night Gunnery (FANG)
- Protective Case
- Operator's Manual

NOTE

See Appendix A for a complete listing of all components including part numbers and other data.

1.4 FEATURES OF THE GCP-2C.

WARNING

In hostile territory, operate the GCP-2C with caution. Remember: The enemy, using night vision equipment, can also detect the IR source used in the aimer.

WARNING

Personnel to operate the GCP-2C should use Command Unit approved training and testing specific to the GCP-2C and conduct testing IAW approved hazard minimization guidelines.

WARNING

A Laser Safety Officer (LSO) should be assigned to support operational and training activities using the GCP-2C. The LSO should be adequately trained and perform training on all personnel IAW ANSI Z36.1-1993 (or latest version).

The GCP-2C is designed to provide clandestine weapon aiming for the USMC AH-1W helicopter 20 mm gun. Power is supplied from the aircraft 28 VDC power supply. The Cobra FANG is activated by the application of 28 VDC power through the connector at the rear of the unit. The power output can be reduced or maximized by adjusting output with the HI/LOW power selector switch. An

extended shroud or nose on the GCP-2C contains a series of baffles that reduce laser off axis visibility during operation. The GCP-2C base includes four mounting screws that are used to attach it to the government furnished mounting bracket. Holes in the screw heads facilitate safety wiring.

1.4.1 GCP-2C Cobra Flight Aimer Night Gunnery (FANG). (See Figure 1-1 GCP-2C Cobra Flight Aimer Night Gunnery)

WARNING

Laser Eye Protection (LEP) must be worn when servicing, testing or operating the GCP-2C.

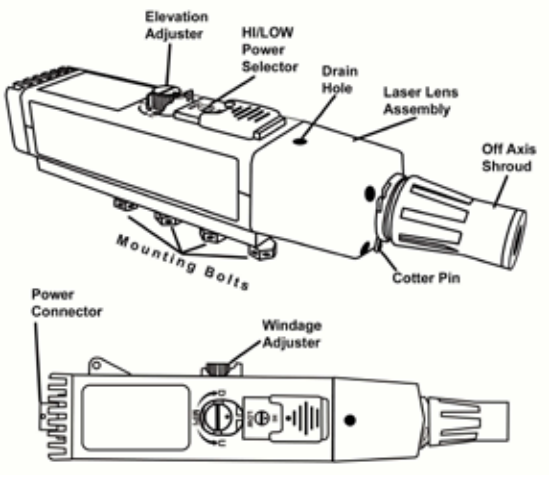

Figure 1-1. GCP-2C Cobra Flight Aimer Night Gunnery (FANG)

1.4.1.1 Power Connector. A connector at the rear of the GCP-2C is used to power the infrared laser (See Figure 1-1). The laser is activated by applying power and deactivated by removing power. Figure 1-6 shows pin location and DC power polarity.

1.4.1.2 Windage and Elevation Adjusters. The zeroing of the laser to the 20mm cannon is accomplished with the WINDAGE and ELEVATION adjusters.

1.4.1.3 HI/LOW Power Output Selector. The HI/LOW power selector permits reduction of the laser output from HI (operational mission power) to LOW (eye-safe level) for training and force-on-force exercises, and to maximum levels for combat operations. (See Figure 1-2)

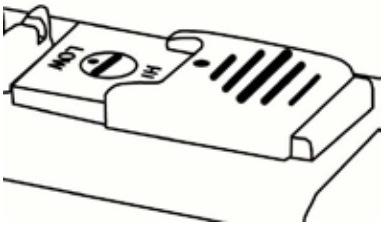

Figure 1-2. HI/LOW Power Output Selector

1.4.1.4 Laser Lens Assembly. The laser lens assembly consists of a lens that focuses the beam to 0.5 mR divergence and a sapphire optical window. The optical window may be exposed for cleaning by removing the protective shroud. The protective shroud is held in place by an O-ring seal and cotter pin, see Figure 1-1.

1.4.1.5 Laser Shroud. A replaceable protective shroud extending approximately 1-3/4 in (4.45 cm) beyond the laser lens assembly provides physical protection, reduces the off axis viewing angle to 18º, and eliminates laser splash reflecting off the aircraft surfaces. The laser shroud is removable/ replaceable by the operator should the sapphire window be scratched or unable to be cleaned. This will maintain the beam quality of the laser, see Figure 1-7.

1.4.1.6 Mounting Base. The GCP-2C mounting base is designed to fit directly to the USMC supplied AH-1W mounting Bracket. Four screws are provided, and are used to attach the laser to the mounting bracket. Holes in the screw heads facilitate safety wiring, see Figure 1-3.

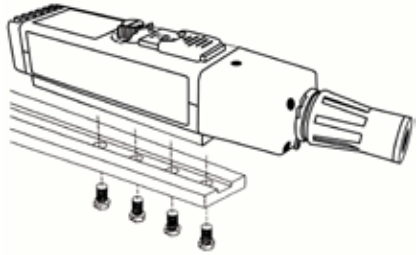

Figure 1-3. Mounting Base

1.4.1.7 Protective Soft Case. A protective soft case prevents personnel from inadvertent laser emission and provides physical protection for the unit during ground operations. A “Remove Before Flight” warning flag signals the ground crew to remove the protective soft case before take off, see Figure 1-4.

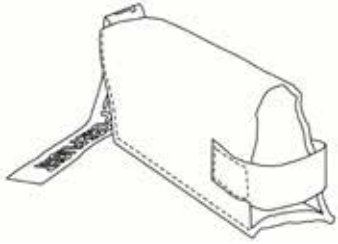

Figure 1-4. Protective Soft Case

1.5 PRINCIPLES OF OPERATION.

A functional block diagram of the GCP-2C is shown in Figure 1-5. Mechanical, optical, electronic and control functions are depicted.

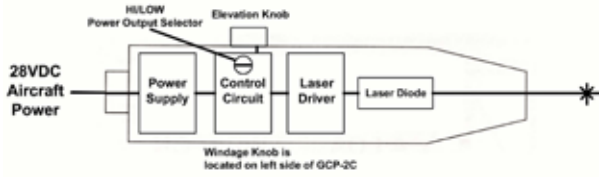

Figure 1-5. GCP-2C Functional Diagram

WARNING

Personnel to operate the GCP-2C should use Command Unit approved training and testing specific to the GCP-2C and conduct testing IAW approved hazard minimization guidelines.

WARNING

A Laser Safety Officer (LSO) should be assigned to support operational and training activities using the GCP-2C. The LSO should be adequately trained and perform training on all personnel IAW ANSI Z36.1-1993 (or latest version).

WARNING

Use of controls or adjustments or performance of procedures other than those specific herein may result in hazardous radiation exposure.

1.5.1 Mechanical Adjustments.

1.5.1.1 Elevation/Windage Adjusters. The elevation/windage adjustment knobs on the GCP-2C are used to adjust the beam during the zeroing process.

NOTE

Boresight and zeroing instructions are contained in the aircraft maintenance manual.

1.5.2 Electrical Functions.

1.5.2.1 Power Connector. The connector (MIL-DTL-38999, MS27508E8B35P) at the rear of the GCP-2C is used to power the infrared laser (See Figure 1-1) Figure 1-6 shows pin location and DC power polarity.

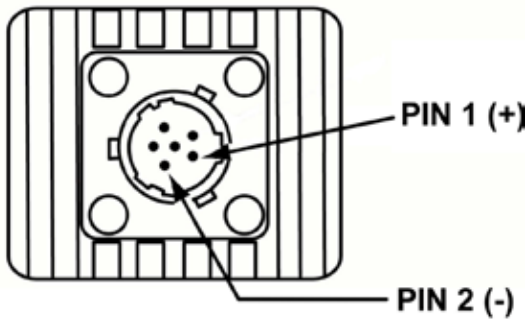

Figure 1-6. Pin Location

1.5.2.2 HI/ LO Power Selector. The HI/LOW power selector permits selection of the laser output to LOW (eye-safe level) for training and force-on-force exercises, by limiting power to the laser diode. Output selection is achieved via a 180º rotation of the HI/LOW power selector with a small slot screwdriver. (See Figure 1-2).

1.5.3 Optical Functions.

1.5.3.1 Laser Lens Assembly. The laser lens assembly consists of a lens that focuses the beam to 0.5 mR beam divergence. (See Figure 1-7).

1.5.3.2 Off Axis Shroud. The protective off axis shroud extends approximately 1-3/4 in (4.45 cm) beyond the laser lens assembly and provides physical protection for the laser lens, reduces the viewing angle to 18º off axis, and eliminates laser splash reflecting off the aircraft surfaces. (See Figure 1-7). The off axis shroud contains a sapphire glass window that protects the laser and makes cleaning easier. Should the window become scratched or pitted, the shroud should be replaced to maintain beam quality.

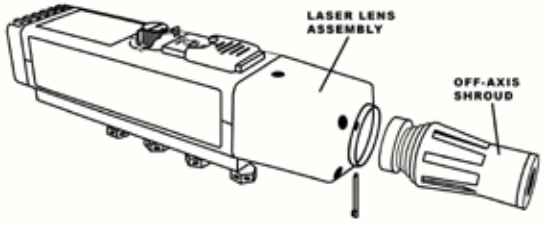

Figure 1-7. Laser Lens and Off Axis Shroud

1.6 EQUIPMENT TABULATED DATA.

Table 1-2. Equipment Tabulated Data

Electrical

ITEM	DATA
Power source	28 VDC Maximum from Aircraft

Mechanical

ITEM	DATA
Movement per click of windage adjuster	0.25 mR
Movement per click of elevation adjuster	0.25 mR
Number of turns of windage and elevation adjuster	3 turns from center (CW or CCW)

Table 1-2. Equipment Tabulated Data (cont'd)

Physical and Environmental

ITEM	DATA
L x W x H	8.1 x 1.79 x 1.83 in (20.6 x 4.5 x 4.6 cm)
Weight	10.5 oz (298 g)
Operation Temperature	-26ºF to +124ºF (-32ºC to +51ºC)
Storage Temperature	-71ºF to +160ºF (-57ºC to +71ºC)

Construction Materials

ITEM	DATA
Body	Composite Plastic
Skeletal Frame	Machined Aluminum
Case	Cordura Nylon

Optical and Laser

ITEM	DATA
Wavelength	830 - 840 nm ± 20 nm
Beam Shape	Circular
Beam Divergence	0.5 mR Minimum
Power Output: HI(Operation Mode)	100 mW Continuous Wave
Power Output: LOW (Eye-safe Mode)	0.7 mW Continuous Wave
Laser Life (Typical)	20,000 hrs

CHAPTER 2

OPERATING INSTRUCTIONS

2.1 PREPARATION FOR OPERATION.

WARNING

Personnel to operate the GCP-2C should use Command Unit approved training and testing specific to the GCP-2C and conduct testing IAW approved hazard minimization guidelines.

WARNING

A Laser Safety Officer (LSO) should be assigned to support operational and training activities using the GCP-2C. The LSO should be adequately trained and perform training on all personnel IAW ANSI Z36.1-1993 (or latest version).

WARNING

Laser Eye Protection (LEP) must be worn when servicing, testing or operating the GCP-2C.

WARNING

If you believe you have been exposed to the laser radiation, contact the Tri-service Injury Hotline number 800-473-3549.

2.1.1 Inventory. Inventory contents of the kit to be sure all mission essential components are present.

2.1.2 Powering the System. To supply power to the GCP-2C, connect the unit to the direct current (DC) power source that furnishes 5 to 28 V at 120 mA. See Figure 1-6 for pin connections.

NOTE

The GCP-2C emits invisible laser radiation, and should be operated in accordance with published safety procedures. The operator of the GCP-2C must be trained to safely use the device. All personnel who will be working within the Nominal Ocular Hazard Distance (NOHD) must be briefed about potential hazards. See APPENDIX D for NOHD chart.

2.1.3 Power Output. Select power output setting appropriate for the mission. HI = 100 mW, LOW = 0.7 mW.

2.1.4 Protective Cover. Remove the protective cover before flight.

2.1.5 Safe Operation. Once power is applied to the GCP-2C, do not point the laser toward any person who is within the NOHD. Night vision goggles (NVG) will provide protection by blocking the laser beam from directly entering the eye. However, the goggles themselves may be damaged. It is not hazardous to view the beam using night vision goggles, but do not intentionally illuminate anyone within the NOHD.

2.2 CONTROLS AND INDICATORS.

2.2.1 HI/LOW Power Output Selector. The HI/LOW power selector permits reduction of the laser output to eye-safe levels for maintenance, training and force-on-force exercises, and to maximum levels for combat operations output selection is achieved via a 180º rotation of the HI/LOW power selector with a small slot screwdriver. The white dot on the HI/LOW power output selector must be directly under HI to achieve maximum power output. If the dot is not within ±15º left or right of the 12 o'clock position, power output defaults to eye-safe (LOW) power.

Figure 2-1. HI/LOW Power Output Selector

2.2.2 Elevation Adjuster. The elevation adjustment knob on the GCP-2C is used to adjust the strike of the round up and down, during the zeroing process, at a rate of 0.25 mR per click (2.5 cm at 100 m). (See Figure 2-2)

2.2.3 Windage Adjuster. The windage adjustment knob on the left side of the unit is used to move the strike of the round left and right during the zeroing process at a rate of 0.25 mR per click (2.5 cm at 100 m). (See Figure 2-2)

Figure 2-2. Windage and Elevation Adjusters

2.3 OPERATION.

2.3.1 Firing the Laser. The GCP-2C will not emit a laser beam until the power is applied through the connector at the rear of the unit. The laser will remain ON as long as power is applied and will be turned OFF when power is removed.

WARNING

Always treat the GCP-2C as a loaded weapon and never point it at anyone or anything you do not wish to destroy!

2.3.2 After Flight. When the GCP-2C is installed on the aircraft, but not in use (on the ground), cover it with the protective case (See Figure 1-4). Follow published directives for securing the laser.

2.3.3 After Use. When no longer needed, remove the GCP-2C from the mounting bracket. First, disconnect the power source from the power connector. Next remove the safety wire and mounting screws. Remove the unit from the mount. Reinstall the screws into the laser's base. Stow the unit in the protective case, and store in accordance with published instructions.

2.3.4 Storage. Store the GCP-2C in a secure area to prevent unauthorized use and to keep it clean.

2.3.5 Safety Supervisor. Appoint an individual to serve as Safety Supervisor and to control the use of the GCP-2C. Each unit has a serial number that can be used to monitor performance and deployment.

2.4 WEAPON MOUNTING AND ZEROING.

2.4.1 Mounting. The USMC maintenance manual, for the AH-1W Cobra, contains comprehensive instructions on mounting the GCP-2C. Follow instructions in the manual exactly.

2.4.2 Zeroing. The USMC maintenance manual, for the AH-1W Cobra, contains comprehensive zeroing instructions for the GCP-2C. It is recommended that the aim dot and the point of impact not be coincident but be offset on target in the same relationship as they are mounted on the aircraft. This will ensure the same aiming point to bullet strike relationship at all engagement ranges.

2.4.3 IR Aiming Zero Adjustment. The movement of the bullet strike in relation to the dot on the target is controlled by rotating the mechanical adjuster knobs (Figure 2-2) in the appropriate direction. The instructions inscribed along the adjusters indicate MPI, where MPI = Mean Point of Impact, L = Left, R = Right, U = Up and D = Down. Each click will move the point impact 0.25 mR toward the desired direction at the rate of 2.5 cm at 100 m.

NOTE

If not previously zeroed to a weapon, the white dots should appear facing toward the front of the GCP-2C. This indicates the neutral position or that the adjusters are in the center of their mechanical travel. If mounted correctly, the first round fired at this setting should impact on the zero target. See paragraph 2.4.4 for initial zero setting.

2.4.4 Zeroing, Initial Adjustment. The initial adjustment consists of setting the adjusters to the neutral position. The neutral position is marked when the white dots on top of the adjusters are closest to the sight notch in front of the GCP-2C adjuster. Units from the factory are set to the neutral position. To set the adjuster to the neutral position, turn each adjuster clockwise (CW) to the end of travel. Now turn each adjuster counter-clockwise (CCW) to the end of travel counting the number of turns. Turn adjuster CW one-half the total number of turns. The adjuster is now set to the neutral position.

CAUTION

To prevent jamming, do not force the adjusters to rotate past their end of travel.

CAUTION

Do not use tools to turn the windage or elevation adjuster knobs.

2.5 PACKING THE CASE.

2.5.1 General. Figure 2-3 depicts the proper place for each component of the GCP-2C kit in the carrying case.

2.5.2 Clean The Components. The components should be as clean and dry as possible before replacing in the case. At a minimum, operator cleaning procedures should be followed.

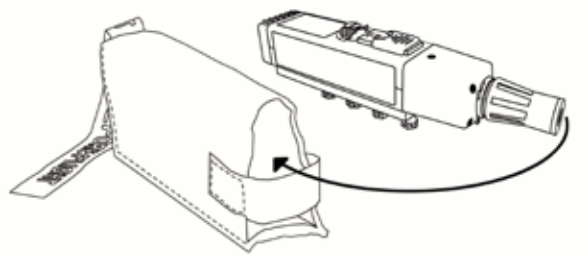

Figure 2-3. Packing the Case

This page intentionally left blank.

CHAPTER 3

OPERATOR MAINTENANCE

3.1 SCOPE.

This Chapter will address the authorized scope of maintenance that may be performed on the GCP-2C. Any fault that cannot be remedied at the operator or unit level is cause for return of the unit for replacement or repair.

3.2 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS).

Table 3-1 contains a list of actions the operator should do to ensure the GCP-2C stays in peak operating condition. These checks should be performed daily or as often as possible in the field. If the GCP-2C is in storage, these checks should be performed at least annually.

Table 3-1. Preventive Maintenance Checks and Services

Action		Time to Check			Not Usable If:
		Before	During	After	
1	Inspect kit and components for presence and serviceability	X			Key components are missing
2	Lenses are clean and free of large scratches that affect performance	X	X		Scratches affect the aimer performance
3	Check activation switches and power controls for proper function	X	X	X	Controls do not work properly
4	Check housing for signs of damage	X		X	Housing is cracked
5	Check the sapphire glass window for scratches or pits that adversely affect laser beam quality	X		X	Scratches or pits degrade laser beam quality

Table 3-1. Preventive Maintenance Checks and Services (cont'd)

	Action	Time to Check			Not Usable If:
		Before	During	After	
6	Check the 28 VDC connector for bent or missing pins or corrosion	X		X	Pins are bent or missing
7	Check drain hole to ensure it is not obstructed	X		X	Hole is obstructed and cannot be cleaned

3.3 TROUBLESHOOTING.

Table 3-2 lists some common types of deficiencies associated with laser aimers similar to the GCP-2C, the nature of the problem and some suggested corrective actions. This manual cannot list every possible problem that might occur and how to remedy these problems. Should a problem occur that couldn't be remedied, turn in the entire GCP-2C kit for replacement or repair.

Table 3-2. Troubleshooting Table

Problem	Cause	Corrective Action
1. Aimer fails to operate	Broken or frayed power cable	Replace power cable
	Defective diode	Turn in for replacement
2. Intermittent operation of aimer	Dirty connector	Clean contacts with alcohol and cotton swab or pencil eraser
	Frayed cable	Replace power cable
3. Aimer's beam is not sharply defined	Dirty lenses	Clean lenses
	Scratched lenses	Turn in for replacement
4. Aimer will not hold zero	Mount is loose or defective	Check all mount interfaces. Replace as required
Note: Aimer must be zeroed at spot beam setting only		

3.4 OPERATOR MAINTENANCE.

Operator level maintenance is limited to general cleaning of all components of the kit, replacing the off axis shroud and ensuring the kit remains complete as issued. To replace lost components of the kit or items that can be replaced by the operator, call 480-970-3222.

3.4.1 Cleaning Optical Surfaces. To clean the sapphire glass window, wipe using a soft cloth with clean water, alcohol, or general purpose glass cleaner. Polish with lens tissue or cotton tip swab.

3-5 ORGANIZATIONAL (UNIT) LEVEL MAINTENANCE.

If the unit fails to operate after completing the checks in Tables 3-1 and 3-2 return it to your supply center for further disposition. The manufacturer offers depot level warranty and non-warranty repair for the GCP-2C. See Appendix C for details.

3.6 REPLACE THE OFF-AXIS SHROUD.

The Off-Axis shroud is replaced by removing the cotter pin and pulling off the shroud and reversing the procedure to install a new shroud. Bend one leg of the cotter pin 180º to secure. (See Figure 3-1)

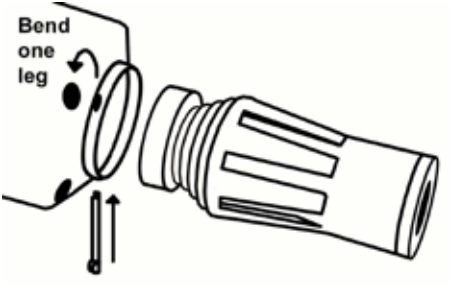

Figure 3-1. Replacing Off-Axis Shroud

APPENDIX A

COMPONENTS OF THE KIT – GCP-2C

Table A-1. Components of the Kit

Item	Part # / NSN	Description	Qty
	5855-01-465-2161	GCP-2C Kit	1 ea
1	GCP-2C (V-1)	Cobra Flight Aimer, Night Gunnery Assembly	1 ea
2	P-GCP2C-NV	Protective Soft Cover/ Case	1 ea
3	830-0047-0	Operator's Manual	1 ea
4	FHEX1032X1532-1	Mounting Bolt	4 ea
5	MISC012	Cotter Pin (Not Shown)	1 ea

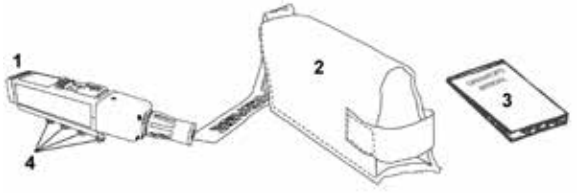

Figure A-1. GCP-2C Components

This page intentionally left blank.

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC) AND REPAIR PARTS LISTING

INTRODUCTION

B.1 SCOPE.

This appendix provides general guidelines for the conduct of maintenance and repair actions on the GCP-2C Cobra FANG assembly.

B.2 MAINTENANCE LEVELS.

The maintenance allocation chart section provides a recommended level of repair for each maintenance action authorized on the GCP-2C. Levels of repair are listed as Operator, Intermediate, and Depot level. A brief explanation of each level is as follows:

a. Operator. This level of maintenance details the actions of the equipment user and any supply personnel in the user's organization. Repair actions are limited to cleaning, changing batteries and replacing missing or unserviceable components from the supply system.

b. Intermediate (Inter DS/GS). This level of maintenance consists of tasks limited to the replacement of major assemblies and components to return the system to working order.

c. Depot / Manufacturer. This level is at the manufacturer level and consists of any repair above intermediate level required to bring the system back to working order.

B.3 REPAIR PARTS LIST.

The recommended repair parts list gives a listing of all parts required to conduct repair actions authorized by the Maintenance Allocation Chart.

Table B-1. Maintenance Allocation Chart - GCP-2C

Item	Compo-nent or Assy	Maintenance Function	Level of Repair (X.X = hrs to repair)			Remarks Special Tools Comments
			Oper /Org	Intrmd. DS/GS	Depot Mfgr.	
1a	GCP-2 Kit	Inspect components for accountability and cleanliness	0.2			Operator inventory components and replace critical components
1b		Controls and Adjustments Test	0.2			Connect power supply set power output to Low and check function with NVG
2a	GCP-2C Aiming Light Assembly	Clean Optical Surfaces	0.1			
2b		Clean Exterior Surfaces	0.2			
2c		Replace shroud	0.1			

This page intentionally left blank.

Table B-2. Repair Parts List

Item	Part # / NSN	Description	Qty
1	FHEX1032X1532-1	Mounting Bolt	4 ea
2	SHD502	Off-Axis shroud	1 ea
3	MISC012	Cotter pin	1 ea
4	P-GCP2C-NV	Protective cover	2 ea
5	830-0047-0	Operator's Manual	1 ea

This page intentionally left blank.

APPENDIX C

WARRANTY INFORMATION

Equipment Warranties And Remedy:
Seller warrants that each newly manufactured item sold hereunder and such portion of a repaired/refurbished item as has been repaired or replaced by Seller under this warranty, shall be free from defects in material or workmanship at the time of shipment and shall perform during the warranty period in accordance with the specifications incorporated herein. Should any failure to conform to these warranties be discovered and brought to Seller's attention during the warranty period and be substantiated by examination at Seller's factory or by authorized field personnel, then at its own cost, Seller shall correct such failure by, at Seller's option, repair or replacement of the non-conforming item or portion thereof, or return the unit purchase price of the non-conforming item or component. Buyer agrees that this remedy shall be its sole and exclusive remedy against Seller and that no other remedy shall be available or pursued by Buyer against Seller. In no event shall the Seller be liable for any cost or expense in excess of those described in this paragraph and expressly excluding any liability or damages for special, incidental or consequential damages.

The warranty period for newly-manufactured items shall extend 12 months from the date of shipment by Seller unless a different warranty period is agreed in writing to by Seller. The warranty period for repaired/refurbished electronic components shall extend for the unexpired warranty period or 90 days, whichever is longer, of the item repaired or replaced. The warranty period for intensifier repair/replacement shall extend six (6) months from the date of shipment by seller or the balance of original warranty, whichever is longer.

This warranty shall not extend to any item that upon examination by Seller is found to have been subject to:

a. Mishandling, misuse, negligence or accident.
b. Installation, operation or maintenance that either was not in accordance with Seller's specifications and instructions, or otherwise improper.
c. Tampering, as evidenced, for example, by broken seals, damaged packaging containers, etc.
d. Repair or alteration by anyone other than Seller without Seller's express advance written approval.

Failure to promptly notify Seller in writing upon discovery of any non-conforming item during the warranty period shall void the warranty as to such item. Buyer shall describe any such non-conformity in detail,

expressing its position as to return of any article under the remedy provided herein. No returns shall be accepted without prior approval by Seller.

Return Material Authorization Number (RMA#): Warranty and non-warranty items returned to Nivisys for repair or replacement require a RMA#. Email support@nivisys.com, call 1-480-970-3222 or fax 1-480-970-3555 with a serial number and detailed information to obtain a RMA#.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This page intentionally left blank.

APPENDIX D

LASER SAFETY DATA

The laser shall not be fired when personnel without laser eye protection at the 830 – 840 nm ± 20 nm wavelength (Optical Density OD 1.7) are within the laser beam out to the following Nominal Ocular Hazard Distances (NOHD):

WARNING

Personnel to operate the GCP-2C should use Command Unit approved training and testing specific to the GCP-2C and conduct testing IAW approved hazard minimization guidelines.

WARNING

A Laser Safety Officer (LSO) should be assigned to support operational and training activities using the GCP-2C. The LSO should be adequately trained and perform training on all personnel IAW ANSI Z36.1-1993 (or latest version).

WARNING

Never point the laser beam or illuminate unprotected personnel, or look into the output lens of the laser.

WARNING

There are eye hazards associated with the GCP-2C for both unaided and aided (binocular) viewing.

WARNING

Laser Eye Protection (LEP) must be worn when servicing, testing or operating the GCP-2C.

WARNING

Do not point the laser at specular (i.e. mirror-like) surfaces.

WARNING

Never fire the laser above the horizon or backstop (i.e. hills, trees, or large targets) without prior coordination with NORAD and the FAA. NORAD POC: Orbital Safety Officer Voice: 719-474-4496. FAA POC: Contact the FAA Regional Office for further information.

Table D-1. NOHD Summary
GCP-2C

Type of Viewing	NOHD
Unaided	545 ft (166 m)
5 cm optics (7x50 binoculars)	3,192 ft (973 m)
8 cm optics (Tanks)	4,752 ft (1,448 m)
12 cm optics (Big Eyes)	7,546 ft (2,300 m)