

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

---

OPERATOR'S, ORGANIZATIONAL, DS, GS, AND  
DEPOT MAINTENANCE MANUAL INCLUDING  
REPAIR PARTS AND SPECIAL TOOLS LISTS

VISUAL APPROACH PATH

INDICATOR

MX-7301/TVN

This copy is a reprint which includes current pages from Change 1.

---

This publication is a courtesy quick copy from the UNITED STATES ARMY  
ADJUTANT GENERAL PUBLICATIONS CENTER, ST. LOUIS, MISSOURI, to  
meet your needs while we are replenishing our regular stock.

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1970

Reproduction for nonmilitary use of the information or illustrations contained in this publication is not permitted. The policy for military use reproduction is established for the Army in AR 380-5, for the Navy and Marine Corps in OPNAVINST 5510.1B, and for the Air Force in Air Force Regulation 205-1.

**LIST OF EFFECTIVE PAGES**

Insert latest changed pages; dispose of superseded pages in accordance with applicable regulations.

**NOTE**

**On a changed page, the portion of the text affected by the latest change is indicated by a vertical bar on the outer margin of the page.**

Total number of pages in this manual is consisting of the following:

<i>Page No.</i>	<i>Change No.</i>
A .....	0
i-ii.....	0
1-1 - 1-3.....	0
2-1 - 2-12.....	0
3-1 - 3-4 .....	0
4-1 .....	0
A-1 .....	0
B-1 - B-3 .....	0
C-1 - C-4.....	0
D-1 - D-29.....	0
Authentication.....	0

\*Zero in this column indicates an original page.

TECHNICAL MANUAL }  
 No. 11-5825-248-15 }

HEADQUARTERS  
 DEPARTMENT OF THE ARMY  
 WASHINGTON, D.C., 11 March 1970

**Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual**

**Including Repair Parts and Special Tools List**

**VISUAL APPROACH PATH INDICATOR MX-7301/TVN**

			Paragraph	Page
CHAPTER	1.	INTRODUCTION		
Section	I.	General		
		Scope .....	1-1	1-1
		Indexes of publications .....	1-2	1-1
		Forms and records... ..	1-3	1-1
		Reporting of errors .....	1-3.1	1-1
	II.	Description and data		
		Purpose and use .....	1-4	1-1
		Technical characteristics .....	1-5	1-1
		Items comprising an operable equipment .....	1-6	1-1
		Components and dimensions .....	1-6.1	1-2
		Description .....	1-7	1-2
		Additional equipment required.....	1-8	1-2
CHAPTER	2.	INSTALLATION AND OPERATION		
Section	I.	Service upon receipt of equipment		
		Unpacking.....	2-1	2-1
		Checking unpacked equipment .....	2-2	2-1
		Sitting instructions .....	2-3	2-1
	II.	Assembly and installation instructions		
		Assembly .....	2-4	2-1
		Installation and operation .....	2-5	2-3
		Visual approach path indicator data .....	2-6	2-8
	III.	Operation		
		Operation of equipment .....	2-7	2-8
		Operation under unusual conditions.....	2-8	2-13
		Removal .....	2-9	2-13
CHAPTER	3.	MAINTENANCE INSTRUCTIONS		
Section	I.	Operator and Organizational maintenance		
		Preventive maintenance .....	3-1	3-1
		Periodic preventive maintenance checks and services.....	3-2	3-1
		Cleaning.....	3-3	3-1

		Paragraph	Page
Section	II.	Direct support and general support maintenance	
		Repair .....	3-4 3-1
		Lubrication .....	3-5 3-1
		Troubleshooting.....	3-6 3-1
	III.	Depot overhaul standards	
		Applicability of depot overhaul standards .....	3-7 3-4
		Applicable references .....	3-8 3-4
		Test facilities required .....	3-9 3-4
		General test requirements .....	3-10 3-4
CHAPTER	4.	SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE	
Section	I.	Shipment	
		Disassembly .....	4-1 4-1
		Repacking.....	4-2 4-1
	II.	Demolition of equipment to prevent enemy use	
		Authority for demolition .....	4-3 4-1
		Methods of destruction .....	4-4 4-1
		Report of destruction .....	4-5 4-1
APPENDIX	A.	REFERENCES .....	A-1
	B.	BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL) (Not applicable)	
	C.	MAINTENANCE ALLOCATION .....	C-1
	D.	ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE REPAIR PARTS LIST .....	D-1

## LIST OF ILLUSTRATIONS

<i>Figure No.</i>	<i>Title</i>	<i>Identification No.</i>
1-1	Visual Approach Path Indicator MX-7301/TVN, exterior components and dimensions.	EL5825-248-15-TM-1
2-1	Visual Approach Path Indicator MX-7301/TVN, packaging diagram.	EL5825-248-15-TM-2
2-2	Visual Approach Path Indicator MX-7301/TVN, siting diagram.	EL5825-248-15-TM-3
2-3	Visual Approach Path Indicator MX-7301/TVN, interior view.	EL5825-248-15-TM-4
2-4	Vertical beacon dispersion and elevation angles.	EL5825-248-15-TM-5
2-5	Visual Approach Path Indicator MX-7301/TVN, alinement.	EL5825-248-15-TM-6
2-4	Light beam dispersion distance	EL5825-248-15-TM-7
2-7	Rate of descent. and intercept altitude derivations.	EL5825-248-15-TM-8
2-8	Visual Approach Path Indicator MX-7301/TVN, schematic diagram.	EL5825-248-15-TM-9
3-1	Visual Approach Path Indicator MX-7301/TVN, parts list and repair kit.	EL5825-248-15-TM-10
D-1(1)	Visual Approach Path Indicator MX-7301/TVN (sheet 1 of 2).	EL5825-248-15-TM-11(1)
D-1(2)	Visual Approach Path Indicator MX-7301/TVN (sheet 2 of 2)	EL5825-248-15-TM-11(2)

## CHAPTER 1

### INTRODUCTION

#### Section I. GENERAL

##### 1-1. Scope

a. This manual describes the Visual Approach Path Indicator MX-7301/TVN (fig. 1-1) and covers its installation, operation, and maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to maintenance personnel.

b. The maintenance allocation chart appears in appendix C.

c. Official nomenclature followed by (\*) is used to indicate all models of the equipment item covered in this manual. Thus Visual Approach Path Indicator MX-7301(\*) TVN represents Visual Approach Path Indicators MX-7301 (A) /TVN, MX-7301-(B)/TVN, and MX-7301(C)/TVN.

##### 1-2. Indexes of Publications

a. DA Pam 3104. Refer to DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are Modification Work Orders (MWO's) pertaining to the equipment.

##### 1-3. Forms and Records

a. *Reports of Maintenance and Unsatisfactory Equipment.* Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58 (Army)/NAVSUP PUB 378 (Navy) /AFR 71-4 (Air Force) /and MCO P4030.29 (Marine Corps), and DSAR 4145.8.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in .AR 55-38 (Army) /NAVSUPINST 4610.33 /AFM 75-18/MCO P4610.19A (Marine Corps), and DSAR 4500.15.

##### 1-3.1. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commanding General, US Army Electronics Command, ATTN: AMSEL-MA-AN, Fort Monmouth, NJ 07703.

#### Section II. DESCRIPTION AND DATA

##### 1-4. Purpose and Use

The Visual Approach Path Indicator MX-7301/TVN, is a battery operated, portable aircraft navigational aid which assists rotary or fixed wing aircraft during Visual Flight Rule (VFR) night landing operations. The MX-7301/TVN an adjustable, three-color light beacon over the highest approach obstacle, thereby establishing a safe visual glide path approach to a runway or landing strip.

##### 1-5. Technical Characteristics

Application: Establish a safe visual glide path for night VFR aircraft landings.

Type of signal (beacon): Three-color light beam: amber-green-red.

Optical range of signal: 3.0 statute miles (4.83 kilometers) VFR.

Optical beacon elevation: 4° to 19° above horizon.

Power requirements: Two 6-volt dry cell batteries (Government furnished).

Equipment weight: 8.0 pounds including batteries and canvas carrying case.

##### 1-6. Items Comprising an Operable Equipment

The Visual Approach Path Indicator MX-7301/TVN (FSN 5825-918-3738) comprises the operable end item.

**1-6.1. Components and Dimensions**

<i>Item</i>	<i>Quantity</i>	<i>Height (in.)</i>	<i>Depth (in.)</i>	<i>Width (in.)</i>	<i>Weight (lb.)</i>	<i>Figure No.</i>
Case. canvas carrying Visual Approach Path Indicator MX-7301 TEEN	1	5.0	15.0	5.0	1.0	1-1
MX-7301 TVN with legs retracted	....	4.0	14.5	3.0	....	1-1
MX-7301 TVN with legs extended	....	6.5	14.5	8.25	....	1-1

**1-7. Description**

a. The MX-7301 TVN consists of a canvas carrying case which contains the MX-7301/TVN light beacon projector assembly.

b. The MX-7301 TVN projector assembly is inclosed by a weathertight, aluminum housing which has a top-mounted illuminated bubble level, a sighting tube. two front-mounted adjustable legs, and an adjustable rear leveling plate. Two government furnished 6-volt dry cell batteries provide the electrical power for MIX-7301 TVN operation. The light beam is collimated through a cylindrical lens system.

c. The rubber-padded canvas carrying case has a belt clip for attachment to the operator's trouser belt and has straps enabling easy hand transport of the MX-7301 /TVN.

d. Figure 1-1 shows the exterior view of the MX-7301 TVN and identifies the operating controls and components.

**1-8. Additional Equipment Required**

<i>Equipment</i>	<i>Purpose</i>
Battery. 6-volt dry cell, BA-200/U (2 required).	Furnish electrical power for the MX-7301/TVN.
Compass, personnel field, (1 required).	Orients the MX-7301/TVN to desired azimuth.

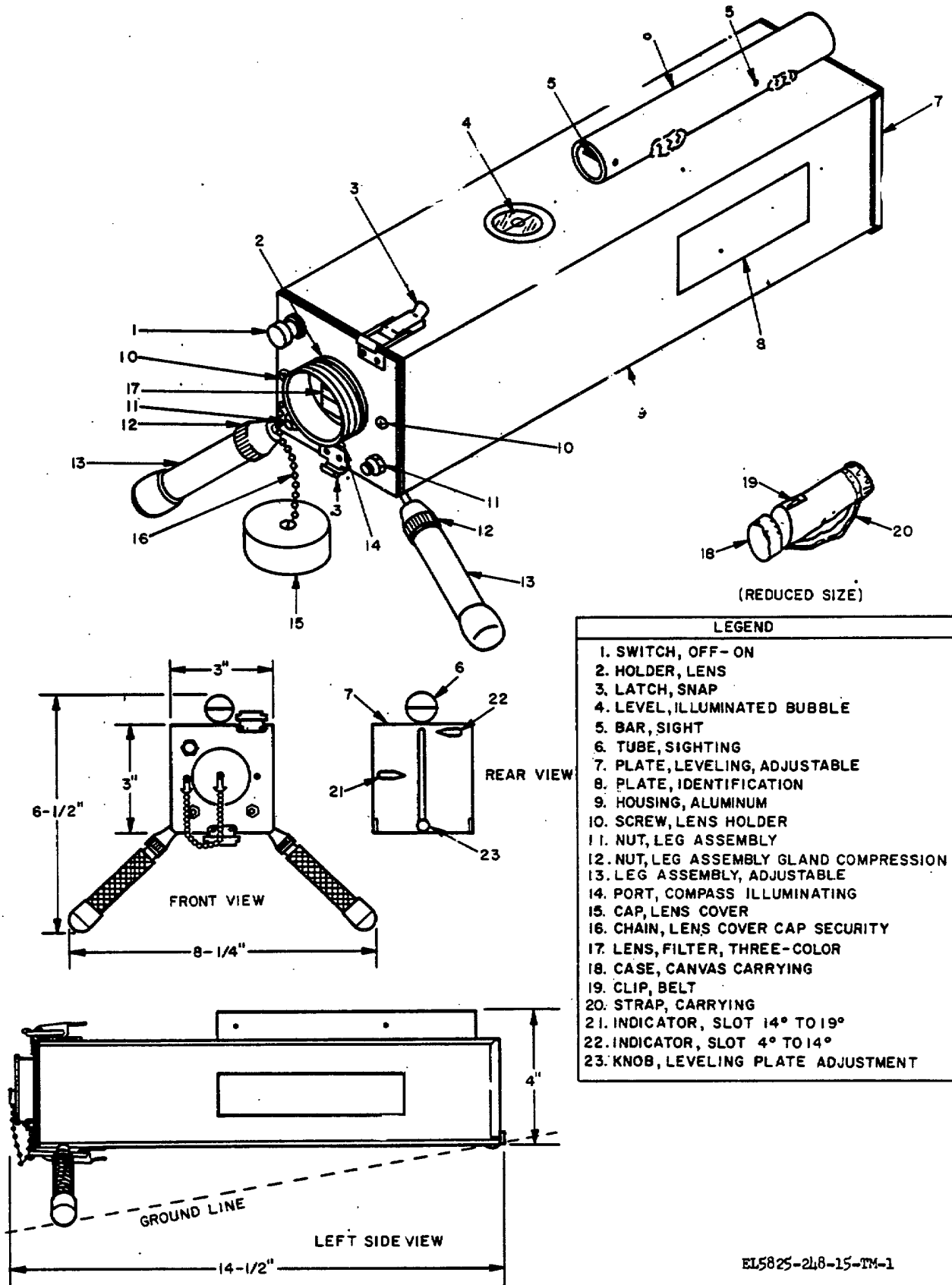


Figure 1-1. Visual Approach Path Indicator MX-7301/TVN, exterior components and dimensions.



CHAPTER 2

INSTALLATION AND OPERATIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

**2-1. Unpacking**

a. *Packaging Data.* When packaged for shipment, the MX-7301/TVN packed in a water-resistant, corrugated fiberboard shipping carton.

One MX-7301/TVN contained in each-shipping carton. A typical shipping carton, including contents, is shown in figure 2-1.

Box	Dimensions (in.)	Volume (cu. in.)	Weight (lb.)	Contents of box
Individual shipping carton	H6 W5 D16	480	8.5	One projector assembly inside of one canvas case

b. *Removing Contents.* To unpack the shipping carton, cut the tape sealing the carton. Fold back the carton flaps and remove the canvas case containing the MX-7301/TVN.

**NOTE**

Current MWO's applicable to the equipment are listed in DA Pam 310-7.

**2-2. Checking Unpacked Equipment**

a. Inspect the equipment for damage that may have occurred during shipment. If the equipment has been damaged, fill out and forward DD Form 6- (para 1-3b).

d. Check the latest issue of DA Pam 310-4 (never more than 1 year old) and its latest changes (never more than 6 months old) to see whether you have the latest editions of all applicable maintenance literature. (Equipment issued by depots may have been in stock for some time and may contain superseded manuals.)

b. Check to see that the equipment is complete as listed on the packing slip. If a packing slip is not available, check the equipment against the basic issue items list (app B). Report all discrepancies in accordance with TM 38-750: The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

**2-3. Siting Instructions**

a The MX-7301/TVN is essentially a light beacon projector; therefore, siting and positioning greatly affects the operating visual range. The MX-7301/TVN must be positioned so that the green band of the light beam clears all obstructions in the aircraft glide path, such as hills, trees, buildings, telephone poles, wires, towers, fences, etc., and so that low lying ground fog will not interfere with the light beam. See figure 2-2 for siting detail.

c. Check to see whether the equipment has been modified. If the equipment has been modified, the MWO number will appear on the side of the MX-7301/TVN housing near the nomenclature plate. Check also to see whether all MWO's current at the time the equipment is placed in use have been applied.

b. Insure that foliage, tall grass, weeds, shrubs, and bushes near the MX-7301/TVN will not obstruct the path of the light beam. Clear the area immediately in front of the MX-7301/TVN of all obstructions.

c. Electrical interference or enemy jamming action will not affect operation.

Section II. ASSEMBLY AND INSTALLATION INSTRUCTIONS

**2-4. Assembly**

After selecting a site in accordance with paragraph 2-3, assemble and check the MX-7301 TVN by performing the following steps.

a. Remove the equipment from the carrying case (18, fig. 1-1).

b. Release the two snap latches (3, fig. 1-1) mounted on the top and the bottom of the housing.

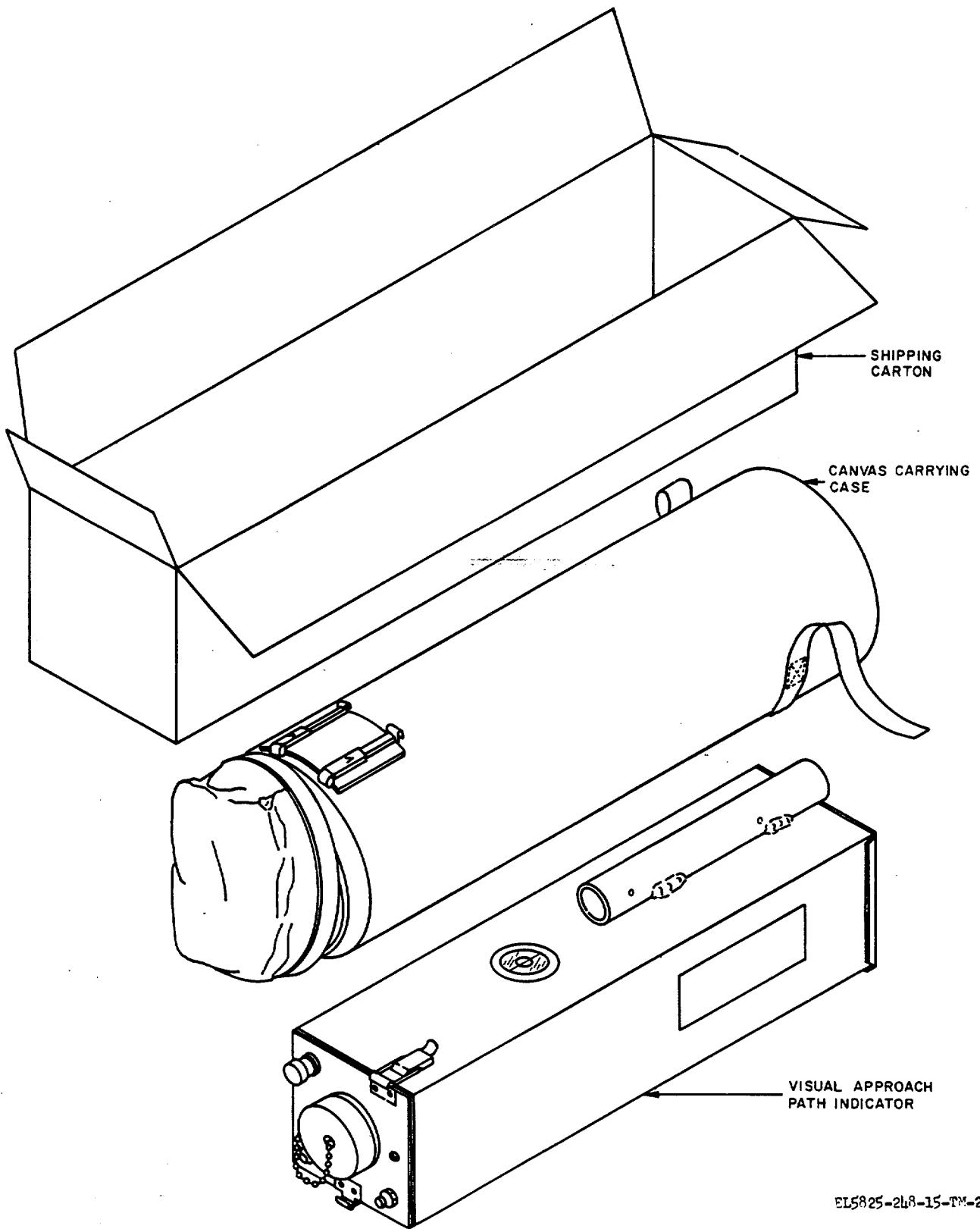


Figure 2-1. Visual Approach Path Indicator MX-7301/TVN, packaging diagram.

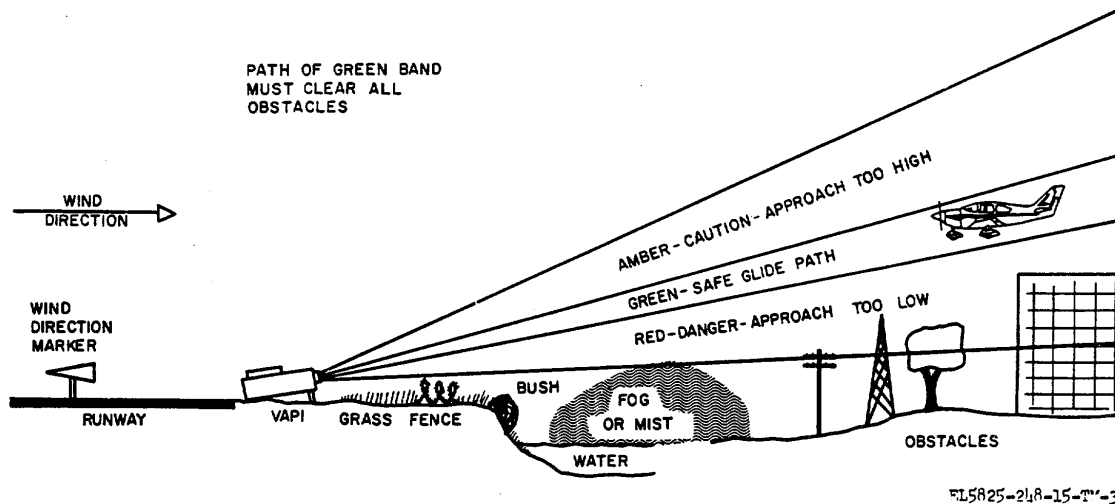


Figure 2-2. Visual Approach Path Indicator MX-7301/TVN, siting diagram.

c. Slide the inner chassis out of the housing (9, fig. 1-1) by pulling on the two snap latch flanges with one hand and holding the housing with the other.

d. Check the circuit board contact points (11, fig. 2-3) on the two printed circuit boards (10, fig. 2-3) for clean, corrosion-free surfaces.

e. Check the electrical contacts (15, fig. 2-3) on both sides of the inner chassis for clean, corrosion-free surfaces.

f. Check the spring terminals (19, fig. 2-3) on both 6-volt dry cell batteries (Government Furnished, Part No. BA-200/U) for full extension to insure positive contact with the corresponding battery contacts on the printed circuit boards (10, fig. 2-3).

g. Install the two 6-volt dry cell batteries in a bottom-to-bottom-position with the terminals of one battery facing the forward end of the MX-7301/TVN and the terminals of the other battery facing the aft end (18, fig. 2-3).

h. Remove the lens cap assembly (27, fig. 2-3) from the lens holder and check that the three-color filter lens (13, fig. 2-3) and the collimation lens (21, fig. 2-3) are clean and not broken.

i. Swing the two adjustable leg assemblies (23, fig. 2-3) outward and downward from their stowed position.

j. Turn the leg assemblies counterclockwise until the gland compression nut (24, fig. 2-3) clears the leg stop (25, fig. 2-3).

k. Slide the inner chassis into the housing making certain that the leg assemblies fit into the slots provided in the housing.

l. Check operation of lamp (20, fig. 2-3) by pressing the off-on switch (14, fig. 2-3) located next to the lens holder.

m. If lamp is inoperative, slide the inner chassis out of the housing and replace inoperative lamp with a spare lamp provided (17, fig. 2-3).

n. Slide the inner chassis into the housing making certain that the leg assemblies fit into the slots provided in the housing.

o. Check lamp operation by pressing the off-on switch.

p. Replace the lens cap assembly over the lens holder.

q. Engage the two snap latches (3, fig. 1-1) mounted on the top and on the bottom of the housing.

## 2-5. Installation and Operation

After assembling and checking the MX-7301/TVN in accordance with paragraph 2-4, install the MX-7301/TVN performing the following steps.

a. Loosen the leveling plate (8, fig. 2-3) by turning the leveling plate adjustment knob (6, fig. 2-3) counterclockwise.

b. Extend the leveling plate downward until the slot indicator (5, fig. 2-3) in the upper right-hand corner of the plate aligns with the number 4 or the 4-degree mark. This adjustment establishes a glideslope (green band centerline) pitch angle of 4 degrees above the horizon and can be elevated up to 14 degrees above the horizon.

c. Tighten the leveling plate in place by turning the leveling plate adjustment knob clockwise.

d. Place the MX-7301 TVN on level ground at the approach end of the runway or landing strip.

e. Insure that the off-on switch is in the on position by observing whether the bubble lever (4, fig. 1-1) is illuminated.

f. Place a personnel field compass on the ground approximately 12 inches in front of the MX-7301/TVN where a small beam of white light is projected from the compass illuminating port (14, fig. 1-1).

g. Aline the MX-7310/TVN to the desired azimuth as shown on the compass.

h. Level the MX-7301/TVN by turning the adjustable leg assemblies (counterclockwise for lengthening and clockwise for shortening) until the bubble in the level is centered inside of the circle mark. This adjustment establishes perpendicular or 90-degree roll angle for the three-color light beam with respect to the ground.

**NOTE**

During manufacture, a 2-degree margin of safety is preset into the red band by alignment of the sighting tube with respect to the green band centerline. Refer to figure 2-4 for dispersion angles and elevations. The centerline of the green band is 4 degrees higher than the centerline of the sighting tube (2 degrees of the red band plus 2 degrees of the green band). This 4 ¼ degrees of

the green band). This 4 1/4-degree difference in centerlines corresponds to the 4-degree marking which was set in the leveling plate slot indicator during leveling (para 2-5b). This margin of safety allows for an unintentional penetration of the red band up to 2 degrees by an aircraft while at critical altitude during the landing approach.

i. Visually aline the two horizontal sight bars (3, fig. 2-3) in the sighting tube (4, fig. 2-3) to establish the proper glideslope angle for the glide path (A, fig. 2-5).

j. If the aligned horizontal sight bars do not clear the top of the highest obstacle (B, fig. 2-5), adjust the aft leveling plate by loosening (turn counterclockwise) the leveling plate adjustment knob and moving the aft end of the MX-7301/TVN downward until the aligned sight bars clear the top of the obstacle as viewed through the sighting tube (C, fig. 2-5).

k. Tighten (turn clockwise) the aft leveling plate adjustment knob.

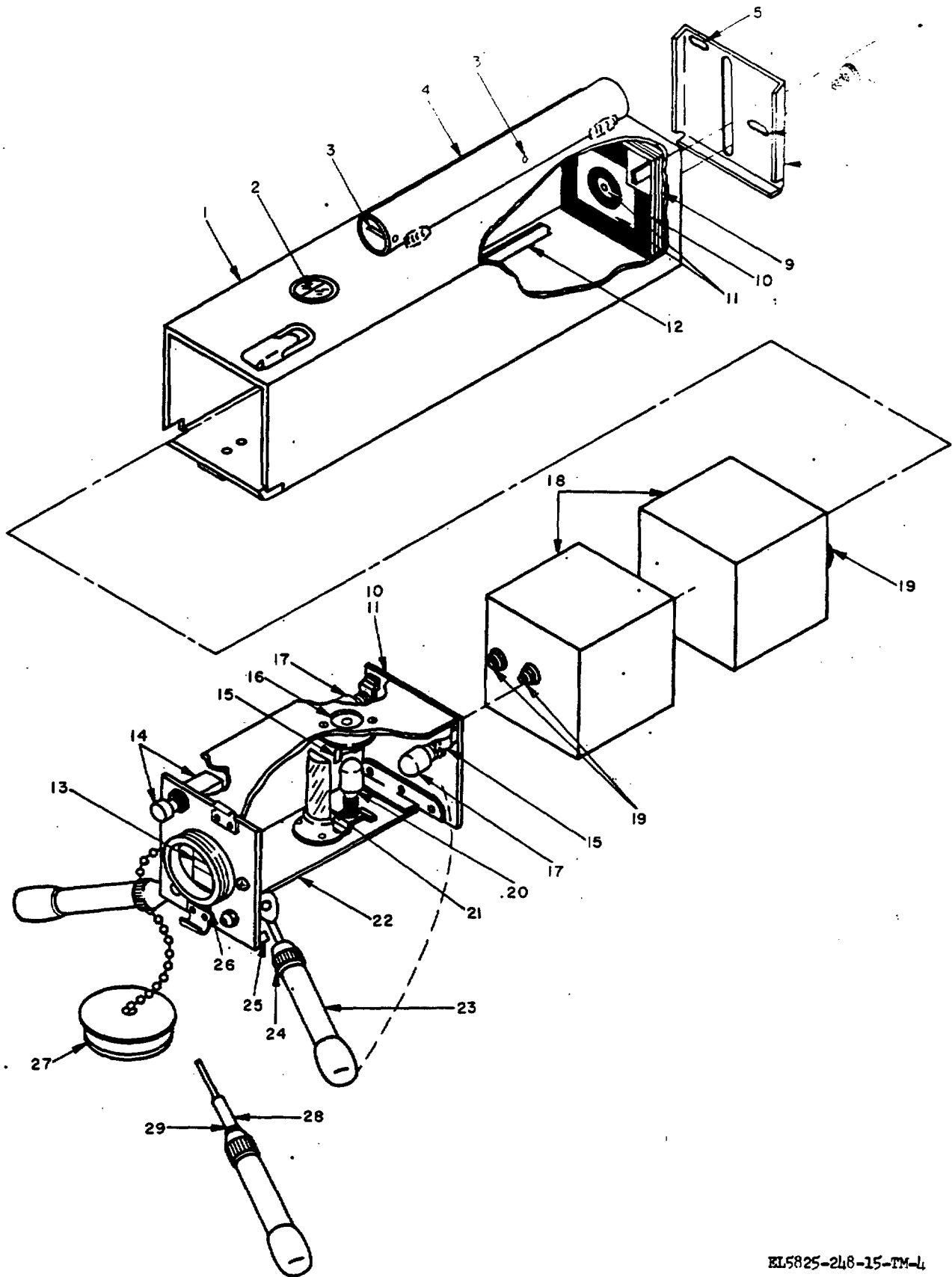
**NOTE**

The angular setting for the green light band centerline in degrees above the horizon can be viewed through the indicator slot in the upper right-hand corner of the aft leveling plate. The green band centerline elevation range in this configuration is from 4 degrees to 14 degrees.

l. Remove the lens cover from the lens holder. The MX-7301/TVN is in operation.

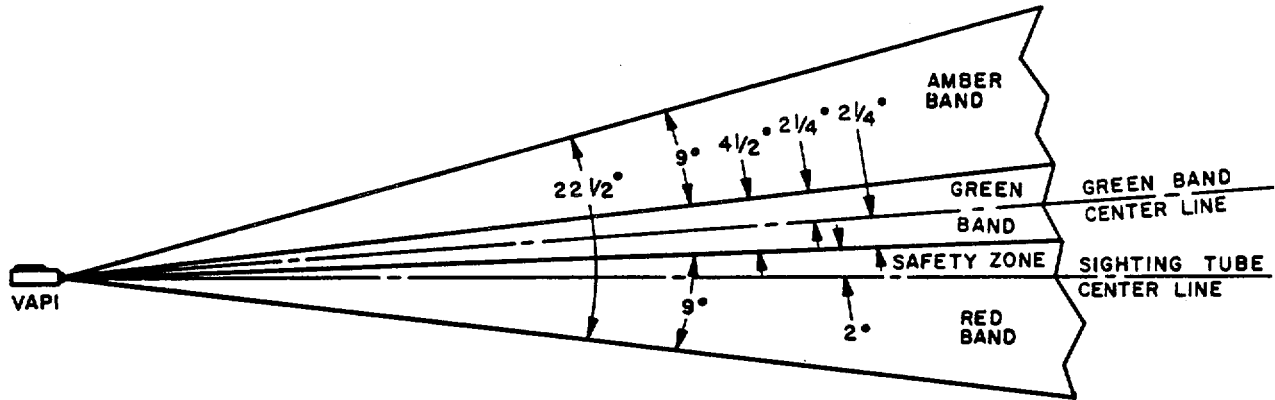
- 
- |  |                                |
|--|--------------------------------|
| 1. Housing                               | 17. Lamps, spare               |
| 2. Window, bubble level                  | 18. Batteries, 6-volt dry cell |
| 3. Bar, sight                            | 19. Terminals, spring battery  |
| 4. Tube, sighting                        | 20. Lamp, illuminating         |
| 5. Indicator, slot 4° to 14°             | 21. Lens, collination,         |
| 6. Knob, leveling plate adjustment       | horizontally, convex           |
| 7. Indicator, slot 14° to 19°            | 22. Chassis, inner             |
| 8. Plate, leveling adjustable            | 23. Leg assembly               |
| 9. Insulator, spacer                     | 24. Nut, leg assembly gland    |
| 10. Circuit board, printed               | compression                    |
| 11. Contacts, battery                    | 25. Stop, leg                  |
| 12. Bus bar, circuit                     | 26. Port, compass illuminating |
| 13. Lens, three-color, vertically convex | nating                         |
| 14. Switch, off-on                       | 27. Cap, lens cover assembly   |
| 15. Contacts, electrical                 | 28. Extension, leg assembly    |
| 16. Level, bubble, assembly              | 29. Mark, indicator, leg       |
|  | assembly extension             |

Figure 2-3-Continued

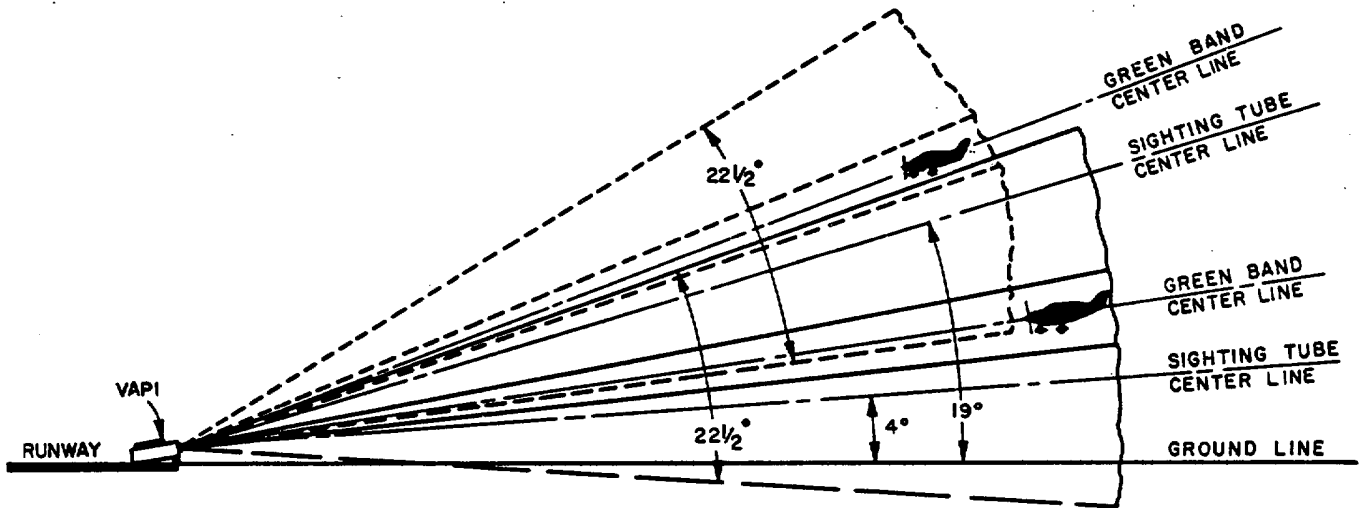


EL5825-248-15-TM-4

Figure 2-3. Visual Approach Path Indicator MX-7301/TVN, interior view.



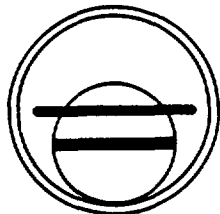
**DISPERSION ANGLES OF THREE-COLOR LIGHT BEACON**



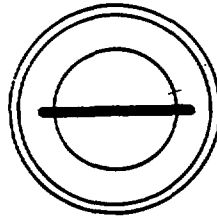
**ELEVATION ANGLES OF THREE-COLOR LIGHT BEACON**

EL5825-248-15-TM-5

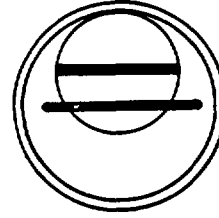
Figure 2-4. Vertical beacon dispersion and elevation angles.



SIGHT BARS NOT ALIGNED (VISUALLY)

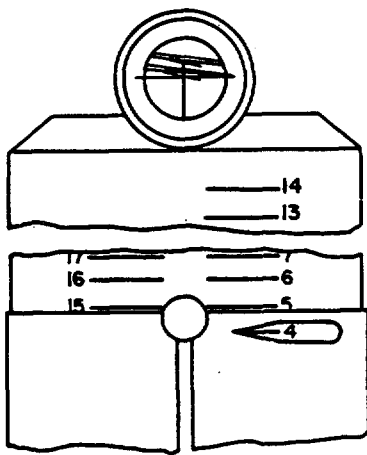


SIGHT BARS CORRECTLY ALIGNED (VISUALLY)

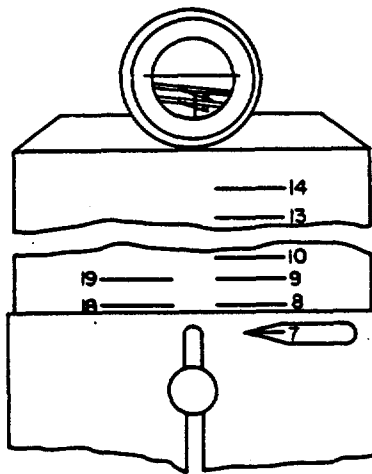


SIGHT BARS NOT ALIGNED (VISUALLY)

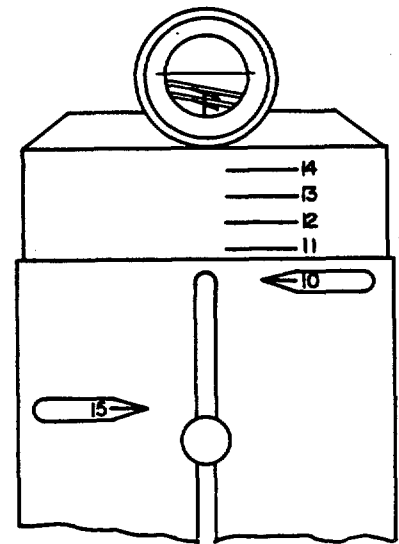
**VIEW A VISUAL ALIGNMENT OF SIGHTING TUBE**



**VIEW B**



**VIEW C**



**VIEW D**

**VISUAL ALIGNMENT OF VAPI TO ESTABLISH CORRECT GLIDE SLOPE ANGLE**

EL5825-248-15-TM-6

Figure 2-5. Visual Approach Path Indicator MX-7301/TVN, alignment.

m. If a glideslope angle between 14 degrees and 19 degrees is required for the centerline of the sighting tube to clear obstacles in the glide path, extend the adjustable leg assemblies by loosening the gland compression nut (24, fig. 2-3) at the top of each leg assembly and pulling downward on the leg assembly. Extend the leg assembly until the top of the gland compression nut aligns with the mark on the leg extension shaft (29, fig. 2-3) which is 0.9-inch from the top end of the extension shaft.

n. Tighten the gland compression nut 01. Each leg assembly.

o. Visually align the two horizontal sight bars in the sighting tube to establish the proper glideslope angle for the glide path. Refer to step i and to A, fig. 2-5 for example.

p. If the aligned horizontal sight bars do not clear the top of the highest obstacle (B, fig. 2-5), adjust the aft leveling plate by loosening the leveling plate adjustment knob and moving the aft end of the MX-7301/TVN up or down until the aligned sight bars clear the top of the obstacle as viewed through the sighting tube (D, fig. 2-5).

q. Tighten the aft leveling plate adjustment knob.

**NOTE**

The angular setting for the green band centerline in degrees above the horizon can be viewed through the indicator slot (7, fig. 2-3) in the middle left-hand side of the aft leveling plate. The green band centerline elevation range in this configuration is from 14 degrees to 19 degrees.

r. To stop MX-7301/TVN operation, press the off-on switch to the off position.

**2-6. Visual Approach Path Indicator Data**

a. The vertical and horizontal dispersion distances for the three-color light beam are shown in figure 2-6 and table 2-1. The dispersion distances cover the 3-mile operating range of the MX-7301/TVN.

b. The vertical descent speed in feet per minute with respect to the slope angle of the green band centerline is derived in figure 2-7. The 3-mile intercept altitudes for the green band are also centerline is derived in figure 2-7. Vertical descent speeds for green band centerline

slope angles from 4 degrees through 19 degrees and for forward air speeds from 30 miles per hour through 150 miles per hour are tabulated in table 2-2. Green band intercept altitudes at three statute miles are tabulated in table 2-3 for green band centerline angles from 4 degrees through 19 degrees.

c. The wiring diagram and the electrical circuit schematic are shown in figure 2-8. Essentially the MX-7301/TVN electrical circuit is a series circuit consisting of two 6-volt dry cell batteries, a lamp, and a switch connected together by insulated wire and an electrically conductive metal housing.

Table 2-1. Horizontal Light Beam Dispersion Distances

Range from VAPI		Horizontal light beam width (ft.)
Miles	Feet	
0.1	528	115
0.2	1,052	229
0.3	1,584	344
0.4	2,112	459
0.5	2,640	573
0.6	3,168	688
0.7	3,696	803
0.8	4,224	918
0.9	4,752	1,032
1.0	5,280	1,147
1.1	5,808	1,262
1.2	6,336	1,376
1.3	6,864	1,491
1.4	7,392	1,606
1.5	7,920	1,720
1.6	8,448	1,835
1.7	8,976	1,950
1.8	9,504	2,064
1.9	10,032	2,179
2.0	10,560	2,294
2.1	11,088	2,408
2.2	11,616	2,523
2.3	12,144	2,638
2.4	12,672	2,752
2.5	13,200	2,867
2.6	13,728	2,982
2.7	14,256	3,096
2.8	14,784	3,211
2.9	15,312	3,326
3.0	15,840	3,440

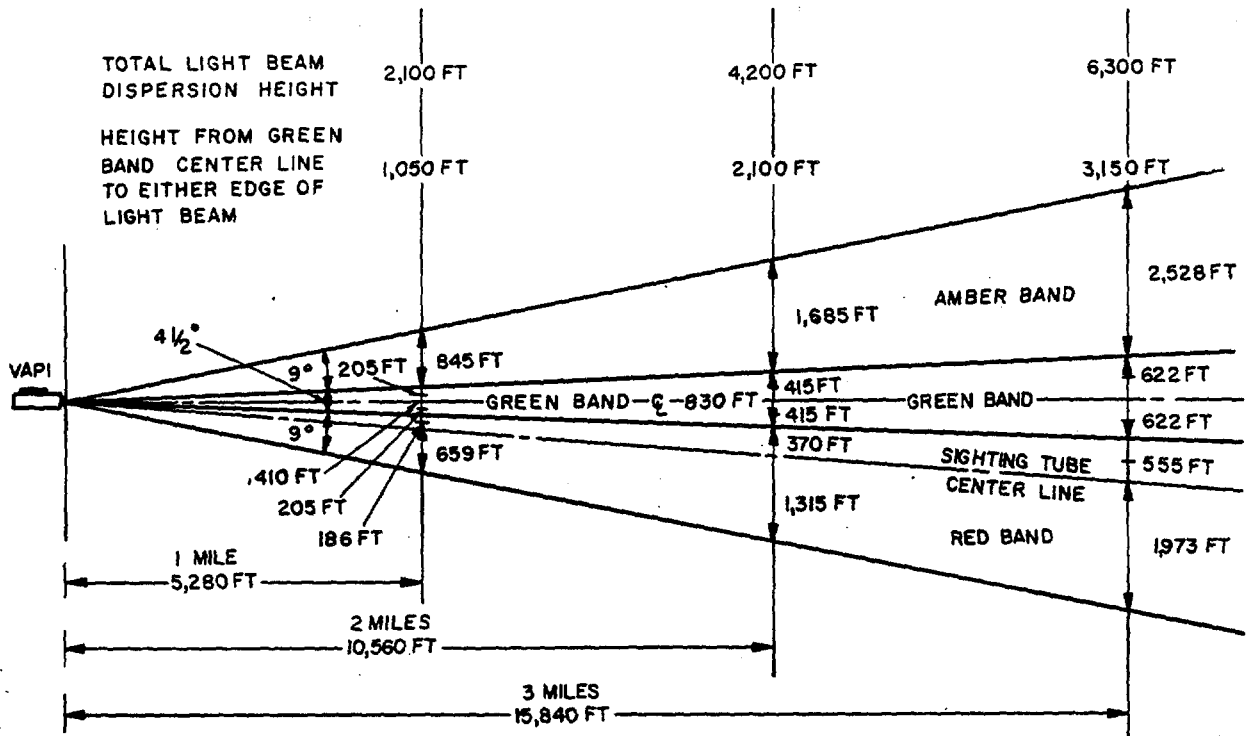
**Section III. OPERATION**

**2-7. Operation of Equipment**

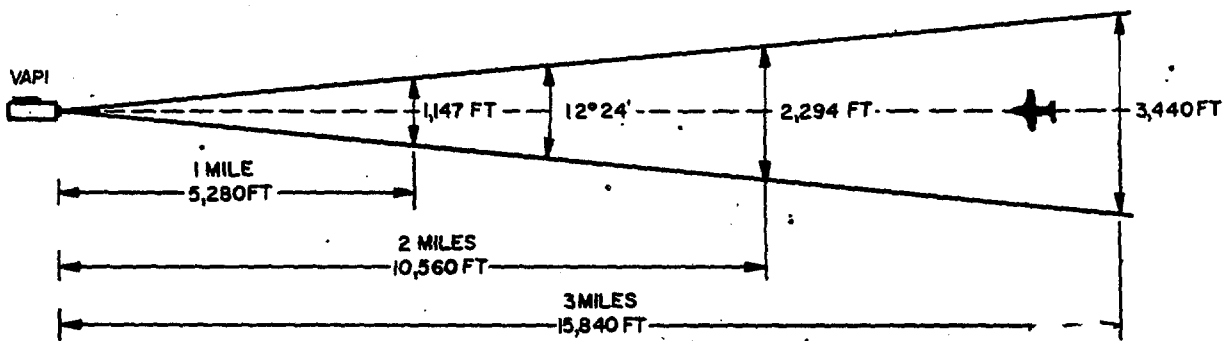
Operation of the MX-7301/TVN as a primary landing aid is limited to Visual Flight Rule (VFR) conditions for night landing operations.

Operation of the MX-7301/TVN during daylight hours is ineffective. Once the MX-7301/TVN is assembled and installed in place, specific operation activity is not required.





**VERTICAL LIGHT BEAM DISPERSION DISTANCES**

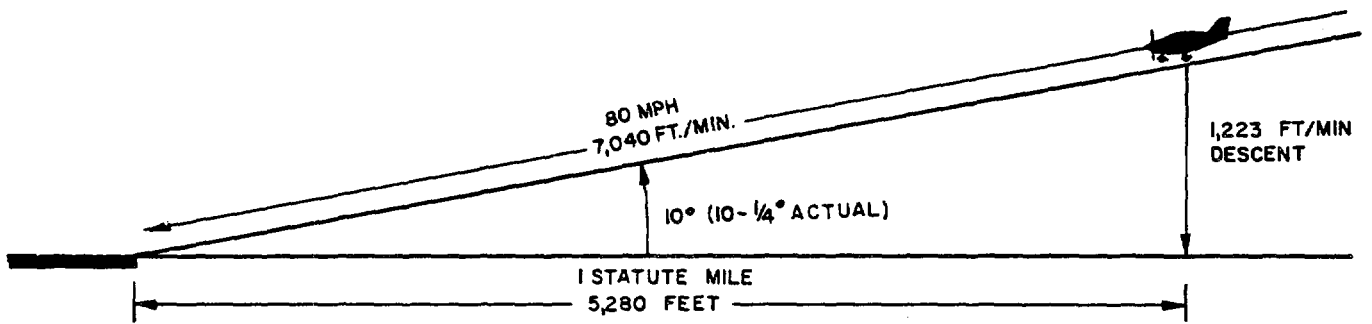


DERIVATION: LIGHT BEAM WIDTH = (TANGENT OF ONE-HALF DISPERSION ANGLE)(DISTANCE) = (0.1086)(5,280) = 1,147 FT

**HORIZONTAL LIGHT BEAM DISPERSION DISTANCES**

EL5825-248-15-TM-7

Figure 2-6. Light beam dispersion distances.

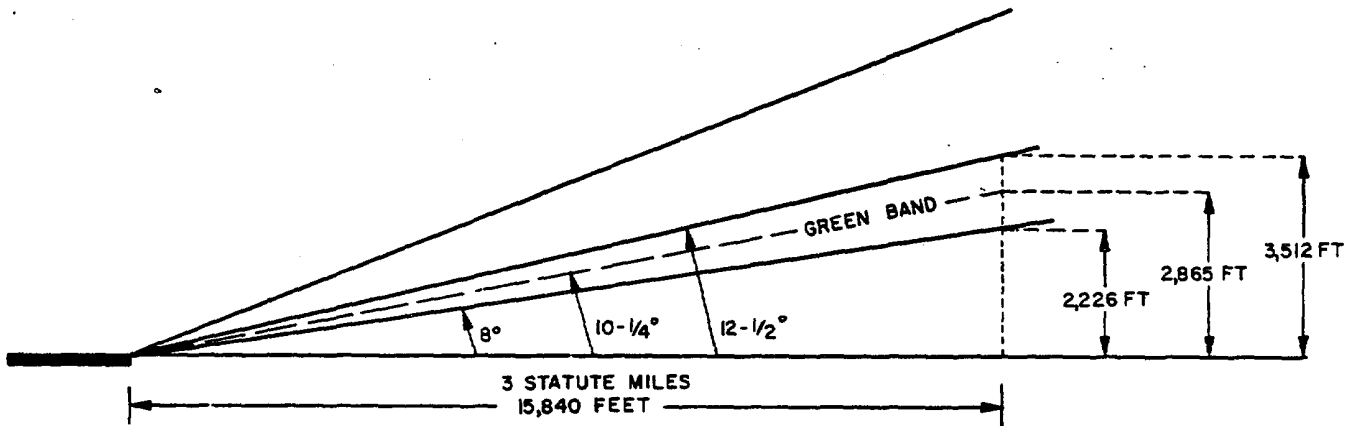


DERIVATION: RATE OF DESCENT IN FEET PER MINUTE =  

$$\frac{(\text{SINE OF GLIDE SLOPE ANGLE})(\text{AIRSPEED})(5,280)}{60} = \frac{(0.1736)(80)(5,280)}{60} = 1,223 \text{ FT./MIN}$$

NOTE: SEE TABLE 2-2 TABULATED RATES OF DESCENT (\*)

RATE OF DESCENT DERIVATION



DERIVATION: INTERCEPT ALTITUDE IN FEET =  

$$(\text{TANGENT OF SLOPE ANGLE})(\text{DISTANCE}) = (0.1405)(15,840) = 2,226 \text{ FT}$$

NOTE: SEE TABLE 2-2 TABULATED INTERCEPT ALTITUDES (\*\*)

INTERCEPT ALTITUDE DERIVATION

EL5825-248-15-TM-8

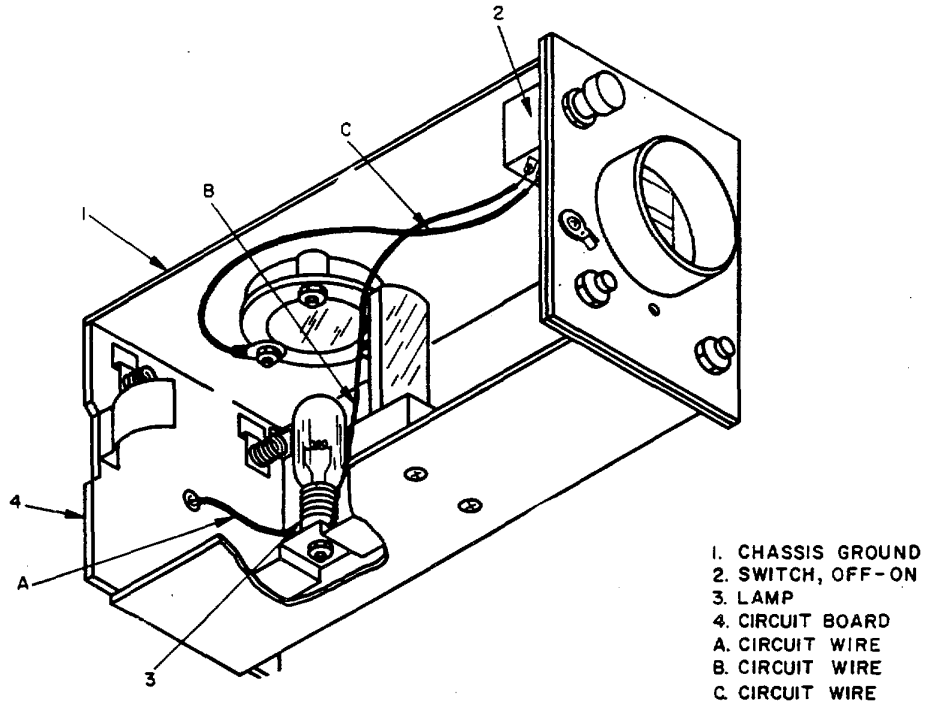
Figure 2-7. Rate of descent and intercept altitude derivations.

Table 2-2. Green Band Centerline Vertical Descent Speeds (feet per minute)

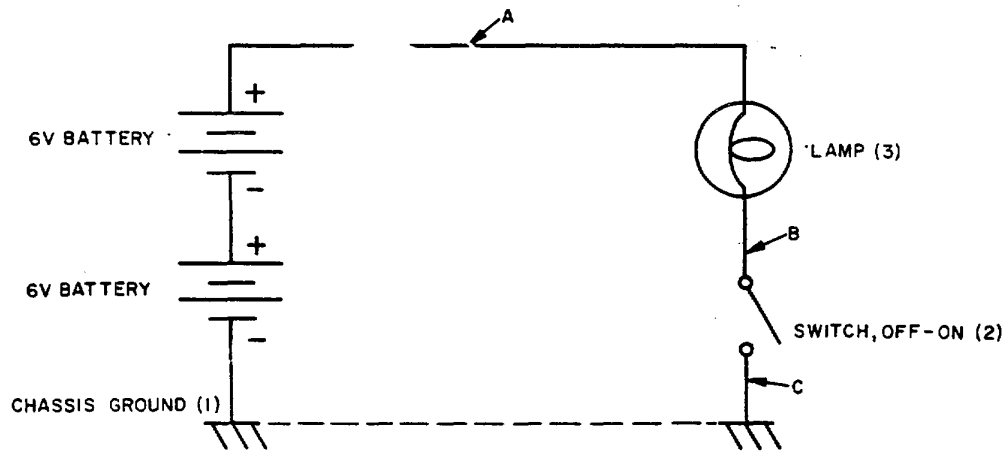
Slope angle of green band centerline		4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
Forward air speed		Vertical Descent Speed in Feet per Minute															
Feet/Min	MPH																
2,640	30	184	230	276	322	367	413	459	504	549	594	639	683	728	772	816	860
3,080	35	215	269	322	375	429	482	535	588	640	693	745	797	849	901	952	1,003
3,520	40	246	307	368	429	490	551	611	672	732	792	851	911	970	1,029	1,088	1,146
3,960	45	276	345	414	483	551	619	688	756	823	891	958	1,025	1,091	1,158	1,224	1,289
4,400	50	307	384	460	536	612	688	764	840	915	990	1,064	1,138	1,213	1,287	1,360	1,433
4,840	55	338	422	506	590	674	757	841	923	1,006	1,089	1,171	1,253	1,334	1,415	1,496	1,576
5,280	60	369	460	552	644	735	826	917	1,007	1,098	1,188	1,277	1,366	1,455	1,544	1,632	1,719
5,720	65	399	499	598	697	796	895	994	1,091	1,189	1,287	1,384	1,480	1,576	1,673	1,767	1,862
6,160	70	430	537	644	751	857	963	1,070	1,175	1,281	1,386	1,490	1,594	1,698	1,801	1,903	2,006
6,600	75	461	576	690	805	919	1,032	1,146	1,259	1,372	1,485	1,597	1,708	1,819	1,930	2,039	2,149
* 7,040	80	491	614	736	858	980	1,101	1,223	1,343	1,464	1,584	1,703	1,822	1,940	2,058	2,175	2,292
7,480	85	522	652	782	912	1,041	1,170	1,299	1,427	1,555	1,683	1,809	1,936	2,061	2,187	2,311	2,436
7,920	90	553	691	828	965	1,102	1,239	1,376	1,511	1,647	1,782	1,916	2,050	2,183	2,316	2,447	2,580
8,360	95	584	729	874	1,019	1,164	1,308	1,452	1,595	1,738	1,881	2,022	2,164	2,304	2,444	2,583	2,723
8,800	100	614	767	920	1,073	1,225	1,376	1,529	1,679	1,830	1,980	2,129	2,277	2,425	2,573	2,719	2,865
9,240	105	645	806	966	1,126	1,286	1,445	1,605	1,763	1,921	2,079	2,235	2,391	2,547	2,702	2,855	3,009
9,680	110	676	844	1,012	1,180	1,347	1,514	1,681	1,847	2,012	2,178	2,342	2,505	2,668	2,830	2,991	3,152
10,120	115	706	882	1,058	1,234	1,409	1,583	1,758	1,931	2,104	2,277	2,448	2,619	2,789	2,959	3,127	3,295
10,560	120	737	921	1,104	1,287	1,470	1,652	1,834	2,015	2,195	2,376	2,554	2,733	2,910	3,088	3,263	3,438
11,000	125	768	959	1,150	1,340	1,532	1,714	1,910	2,099	2,287	2,475	2,660	2,847	3,031	3,217	3,399	3,581
11,440	130	799	997	1,196	1,394	1,594	1,782	1,986	2,183	2,378	2,574	2,766	2,961	3,152	3,346	3,535	3,724
11,880	135	829	1,035	1,242	1,440	1,656	1,850	2,062	2,267	2,469	2,673	2,873	3,075	3,273	3,475	3,671	3,867
12,320	140	860	1,074	1,288	1,494	1,718	1,918	2,138	2,351	2,561	2,772	2,979	3,188	3,395	3,604	3,807	4,011
12,760	145	890	1,112	1,334	1,558	1,780	1,986	2,214	2,435	2,652	2,871	3,085	3,302	3,516	3,733	3,943	4,154
13,200	150	921	1,150	1,380	1,612	1,842	2,054	2,290	2,519	2,743	2,970	3,192	3,416	3,637	3,862	4,079	4,297

Table 2-3. Three-Mile Green Band Intercept Altitudes (feet above ground level)

Slope angle of green band centerline	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
Green band top edge	1,735	2,085	2,367	2,651	2,936	3,223	3,512	3,803	4,097	4,393	4,693	4,993	5,299	5,610	5,923	6,239
Green band centerline	1,177	1,456	1,735	2,016	2,299	2,580	2,865	3,151	3,440	3,730	4,025	4,318	4,617	4,920	5,225	5,534
* Green band bottom edge	553	830	1,107	1,386	1,667	1,945	2,226	2,509	2,793	3,079	3,368	3,657	3,949	4,245	4,543	4,842



INNER CHASSIS WIRING DIAGRAM



ELECTRICAL CIRCUIT SCHEMATIC

EL5825-248-15-TM-9

Figure 2-8. Visual Approach Path Indicator MX-7301/TVN, schematic diagram.

## 2-8. Operation Under Unusual Conditions

a. MX-7301/TVN operation is limited to the environmental restrictions and limitations for the batteries. Voltage and current outputs from the batteries diminish at extremely cold temperature (Zero degrees Fahrenheit and below) in direct relation to the change in temperature. The colder the temperature, the less power is furnished by the batteries. The less power furnished, the dimmer the three-color light beacon becomes. The upper temperature limit is that temperature at which the batteries cease to function (approximately 130 degrees Fahrenheit).

b. Night operation of the MX-7301/TVN as a primary landing aid during Instrument Flight Rule (IFR) conditions is not recommended, because landing aircraft must fly the visible green band to achieve a safe glideslope approach for landing. If visibility is restricted to less than 3 statute miles, the MX-7301/TVN can be operated only as a secondary landing aid with Ground Control Approach (GCA) radar or other suitable electronic means serving as the primary landing aid.

## 2-9. Removal

To stop the MX-7301/TVN from operating and to remove the equipment from its installed location, perform the following steps.

a. Press the off-on switch to the off position.

- b. Place the lens cap assembly over the lens holder.
- c. Release the two snap latches mounted on the top and bottom of the MX-7301/TVN.
- d. Slide the inner chassis out of the housing by pulling on the two snap latch flanges.
- e. Swing the two adjustable leg assemblies inward and upward from their extended position.
- f. Turn the leg assemblies clockwise until the legs fit into their stowed area inside of the inner chassis.
- g. If the MX-7301/TVN is to be placed in storage or is to be out of use for 48 hours or more, remove the two 6-volt dry cell batteries from the housing.
- h. Slide the inner chassis into the housing.
- i. Engage the two snap latches.
- j. Turn the aft leveling plate adjustment knob counterclockwise to loosen the aft leveling plate.
- k. Slide the aft leveling plate upward until the bottom flange butts against the housing.
- l. Turn the aft leveling plate adjustment knob clockwise to tighten the aft leveling plate to the housing.
- m. Place the MX-7301/TVN into the canvas carrying case and secure the snap catch. The MX-7301/TVN is ready for transport.

## CHAPTER 3

## MAINTENANCE INSTRUCTIONS

## Section I. OPERATOR AND ORGANIZATIONAL MAINTENANCE

**3-1. Preventive Maintenance**

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent occurrence of trouble, to reduce repair time, and to insure equipment serviceability. The MX-7301/TVN is an electrical device which requires a minimum of maintenance. Under normal operating conditions, replacement of parts within the MX-7301/TVN is not expected with the exception of periodic replacement of the light source lamp and the batteries.

**3-2. Periodic Preventive Maintenance Checks and Services**

Before and after each operating period and prior to storage, visually inspect the MX-7301/TVN as follows:

- a. Insure that all parts and components are secure.
- b. Insure that the three-color filter lens and the clear collimation lens are clean and unbroken.
- c. Insure that the electrical wires and solder connections are not broken.
- d. Insure that the battery compartment, the printed circuit boards, and the electrical contacts are not corroded.
- e. Insure that the battery terminal springs are properly aligned and are not bent or loose.
- f. Insure that the light source lamp and the two spare lamps are operative.

**3-3. Cleaning**

a. Remove dust or loose dirt from the MX-7301/TVN external housing surfaces and from the internal chassis and housing surfaces by wiping with a soft, lint-free cloth, Federal Specification DDD-R-30; a soft bristle nonmetallic brush, Military Specification MIL-B-5612; or equivalent.

b. Remove finger smudges, dust, or dirt from the lenses using a soft, lint-free cloth dampened (not wet) with nonabrasive glass cleaner such as a solution of water and soap, Federal Specification P-S-600, (FSN 5120-992-3229); a solution of water and detergent, Military Specification MIL-D-26937; plastic polish cleaner, Military Specification MIL-C-18767, Type I, (FSN 7930-634-5340); aliphatic naphtha, Federal Specification TT-N-95, Type 2, (FSN 6810-265-0664); or equivalent.

**WARNING**

Prolonged breathing of cleaning compound is dangerous; provide adequate ventilation; cleaning compound is flammable; do not use near flame.

c. Remove dirt, fungus, and corrosion from electrical contacts using trichloroethane cleaning compound, Federal Specification O-T-620, Type I, applied with a soft, lint-free cloth. Remove extensive corrosion using 400-grit (very fine grain, No. 000) aluminum oxide abrasive cloth. Military Specification MIL-A-9962, (FSN 5350-967-5089).

## Section II. DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

**3-4. Repair**

Repair Kit (FSN 5825-670-6407) provides instructions, replacement parts, and components necessary for most repair actions. This kit is itemized in figure 3-1. Repair of the equipment is accomplished with standard handtools. Special tools, devices, or equipment are not required for MX-7301/TVN repair.

**3-5. Lubrication**

Lubrication of the MX-730i TVN is not required.

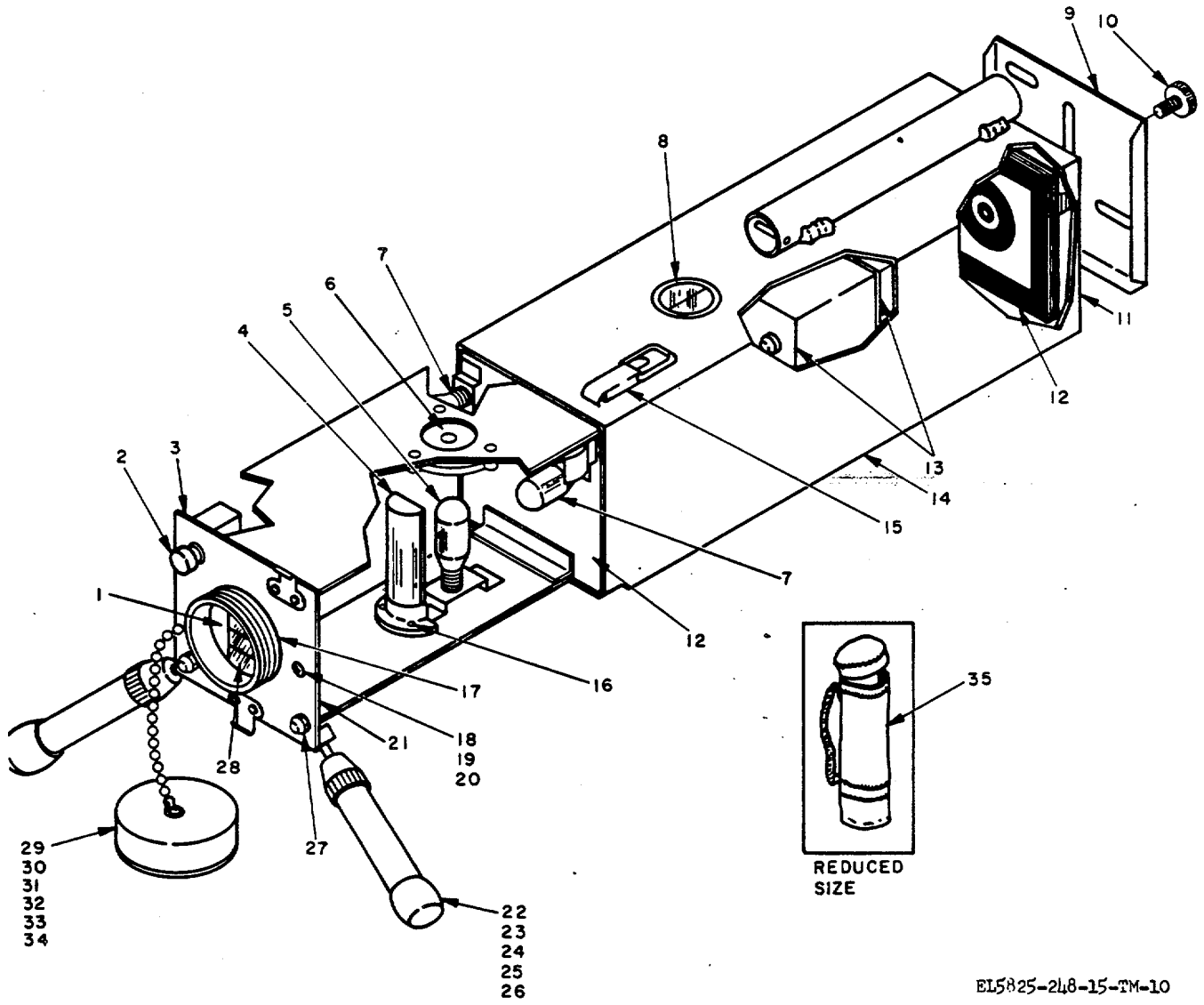
**3-6. Troubleshooting**

Troubleshooting information and instructions are contained in the following chart.

<i>Index No.</i>	<i>Nomenclature</i>	<i>Part No.</i>	<i>Quantity</i>
1	Window, Three-color Lens	193-027	1
2 *	Switch, Off-On, Push Button	1156	1
3	Plate, End, Front Panel	193-008	1
4 *	Lead, Collimation	193-007-1	1
5 *	Lamp	965GE	1
6 *	Level Assembly, -Bubble	193-103	1
7 *	Lamp, Spare	965GE	2
8 *	Window, Bubble Level	193-010	1
9 *	Plate, Aft Leveling	193-005-1	1
10 *	Knob, Leveling Plate Adjustment	193-025	1
11 *	Plate, Indicator	193-009	1
12	Board, Printed Circuit	193-017-3	2
13	Battery, 6-Volt Dry Cell	BA-200/U	2
14	Housing, VAPI, Aluminum	193-003	1
15	Latch, Snap, Corbin Pull	15797	2
16	Screw, Mounting, Flat Head'	MS35241-22	2
17 *	Holder, Lens, Three-color	193-004	1
18	Screw, Round Head, Phillips	AN515-4R8	2
19	Nut.	AN340-B4	2
20	Clip	193-016-5	2
21 *	Gasket Set	193-101	1
22	Leg Assembly	193-034-101	2
23 *	Bolt, Eye	AN42B-3A	2
24 *	Pin, Clevis	MS203922C11	2
25 *	Pin, Cotter	MS24665-132	2
26 *	Turnbuckle, Clevis End	MS21252-3RS	2
27 *	Nut	22K1-02	2
28 *	Lens, Filter, Three-color	193-006-1	1
29 *	Cap Assembly, Lens Cover	193-104-1	1
30 *	Screw, Round Head, Phillips	AN515-4R8	1
31 *	Nut	S21043-04	1
32 *	Coupling, Chain End, MCM No. 10 Bead	MCM Cat 29, P260	1
33 *	Chain, MCM No. 10 Bead, 5 inches long	MCM Cat 29, P260	1
34 *	Cap, Plastic	NAS813-28	1
35	Case, Canvas Carrying	193-028	1

**NOTE**

Items designated with an asterisk (\*) are contained in VAPI Repair. Kit FSN 5825-670-6407.



EL5825-248-15-TM-10

Figure 3-1. Visual Approach Path Indicator MX-7301/TVN, parts list and repair kit.



<i>Item No.</i>	<i>Symptom</i>	<i>Probable cause</i>	<i>Corrective action</i>
1	Lamp does not light.	<ul style="list-style-type: none"> <li>a. Battery voltage is too low.</li> <li>b. Lamp is burned out.</li> <li>c. Electrical contacts are corroded.</li> <li>d. Battery terminal springs are out of alinement.</li> <li>e. Off-On switch is inoperative.</li> <li>f. Electrical wire or solder connections are broken.</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace batteries with new batteries.</li> <li>b. Replace lamp with operative lamp.</li> <li>c. Clean electrical contacts with 400-grit (very fine grain, No. 000) aluminum oxide abrasive cloth or with designated cleaning compound. (Refer to paragraph 3-3c.)</li> <li>d. Realign battery terminal springs or replace battery.</li> <li>e. Replace Off-On switch.</li> <li>f. Replace wire or resolder broken connections.</li> </ul>
2	Light beacon is one color (white).	Three-color filter lens is broken.	Replace three-color filter lens.
3	Three-color light beacon will not collimate.	Collimation lens is broken.	Replace collimation lens.
4	Bubble level does not function.	Bubble level is broken allowing internal fluid to escape.	Replace bubble level

### Section III. DEPOT OVERHAUL STANDARDS

#### 3-7. Applicability of Depot Overhaul Standards

Visual Approach Path Indicator MX-7301/TVN must be tested thoroughly after rebuild or repair to insure that it meets adequate performance standards when returned to stock for reissue. Use the test described in this section to measure the performance of the repaired equipment. It is mandatory that repaired equipment to be reissued, or returned to stock for reissue, meet all of the performance standards given in this section.

#### 3-8. Applicable References

a. Repair Standards. Applicable procedures of the Army depot performing this test, and its general standards for repaired electronic equipment, form a part of the requirements for testing this equipment.

b. Technical Publications. TM 11-5825-248-15 is the only technical publication applicable to this equipment.

c. Modification Work Orders. Perform all modification work orders applicable to this equipment before making the test specified. DA Pam 310-7 lists all available MWO's..

#### 3-9. Test Facilities Required

No special test facilities are required for performing this test.

#### 3-10. General Test Requirements

To check the performance capability of Visual Approach Path Indicator MX-7301/TVN, perform the procedures contained in paragraph 2-4.

**CHAPTER 4**  
**SHIPMENT AND LIMITED STORAGE AND DEMOLITION**  
**TO PREVENT ENEMY USE**

---

**Section I. SHIPMENT**

**4-1. Disassembly**

Disassembly of the MX-7301/TVN is not required for shipment.

**4-2. Repacking**

**CAUTION**

Do not package the MX-7301/TVN with batteries installed. Battery deterioration will corrode the printed circuit boards

and other interior components of the equipment, causing damage to the equipment.

Repacking of the equipment for shipment or limited storage normally will be performed at a packaging facility or by a repackaging team. Should emergency packaging be required, select the materials from those listed in SB 38-100. Package the equipment in accordance with the original packaging, so far as possible, with the available materials.

**Section II. DEMOLITION OF EQUIPMENT TO PREVENT ENEMY USE**

**4-3. Authority for Demolition**

Demolition of the equipment will be accomplished only upon the order of the commander. Use the destruction procedures outlined in paragraph 4-4 to prevent further use of the equipment.

**4-4. Methods of Destruction**

Any or all of the methods of destruction given below may be used. The time available will be the major determining factor for the methods to be used when destruction of the equipment is undertaken. The tactical situation also will determine in what manner the destruction order will be carried out.

*a. Smash.* Smash the lenses, bubble level, lamps, switch, sighting tube, front panel, inner chassis, printed circuit boards, housing, batteries, and carrying case; use sledges, axes, handaxes, pickaxes, hammers, crowbars, or heavy tools.

*b. Cut.* Cut electrical cords and wiring; use axes, handaxes, or machetes.

**WARNING**

Be extremely careful with explosive and incendiary devices. Use these items only when the need is urgent.

*c. Explode.* If explosives are necessary, use firearms, grenades, or TNT.

*d. Burn.* Burn cords, wiring, and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

**4-5. Report of Destruction**

The destruction of the MX-7301/TVN shall be reported through command channels. The report shall contain the data required by the controlling procedure and shall be reported on the designated forms.

**APPENDIX A****REFERENCES**

---

The following publications contain information applicable to the operation and maintenance of Visual Approach Path Indicator MX-7301/TVN.

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	.U.S. Army Equipment Index of Modification Work Orders.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
TB 746-10	First Instructions for Painting and Preserving Electronics Command Equipment.
TM 9-213	Painting Instructions for Field Use.
TM 11-6625-203-12	Operator and Organizational Maintenance: Multimeter AN/URM-105, Including Multimeter ME-77/U.
TM 38-750	Army Equipment Record Procedures.

## APPENDIX C

## MAINTENANCE ALLOCATION

## Section I. INTRODUCTION

**C-1. General**

This appendix provides a summary of the maintenance operations covered in the equipment literature for the MX-7301/TVN. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

**C-2. Maintenance Functions**

Maintenance functions will be limited to and defined as follows:

*a. Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

*b. Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

*c. Service.* To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

*d. Adjust.* To rectify to the extent necessary to bring into proper operating range.

*e. Align.* To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized.

This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.

*f. Calibrate.* To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

*g. Install.* To set up for use in an operational

environment such as an encampment, site, or vehicle.

*h. Replace.* To replace unserviceable items with serviceable like items.

*i. Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

*j. Overhaul.* Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

*k. Rebuild.* The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

*l. Symbols.* The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

**C-3. Explanation of Format**

*a. Column 1, Group Number.* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. *Column 2, Component Assembly Nomenclature.* Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. *Column 3, Maintenance Functions.* Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

<i>Code</i>	<i>Maintenance category</i>
C.....	Operator/crew
O.....	Organizational maintenance
F.....	Direct support maintenance
H.....	General support maintenance
D.....	Depot maintenance

d. *Column 4, Tools and Test Equipment.* Column 4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in section III.

e. *Column 5, Remarks.* Self-explanatory.

**C-4. Explanation of Format of Section III, Tool and Test Equipment Requirements**

The columns in Section III, Tool and Test Equipment Requirements, are as follows:

a. *Tools and Equipment.* The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

b. *Maintenance Category.* The codes in this column indicate the maintenance category normally allocated the facility.

c. *Nomenclature.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. *Federal Stock Number.* This column lists the Federal stock number of the specific tool or test equipment.

e. *Tool Number.* Not used.

SECTION II. MAINTENANCE ALLOCATION CHART																
(1) GROUP NUMBER	(2) FUNCTIONAL GROUP COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS		
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD				
1	VISUAL APPROACH PATH INDICATOR MX-7301/TVN	O	O	O	O	O		O	O						2 3 1	Visual Operational and Subassemblies
1.BT	BATTERY BA-200/U	O	O					C	C			D	D			Visual Operational in unit Two required for each unit
1.MP	HOUSING, VAPI	O	O	F				O	O			F	D	D		Repaint Subassemblies into Metalwork
1.A1	LAMP HEAD	O	O	O				O				C				Visual Operational Clean
															1,2	Replace lamps(with running spares) Replace lens, filter, switch, level assy, etc. as required

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND TEST EQUIPMENT REQUIREMENTS				
TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
1	O,F	MX-7301/TVN (continued) TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5180-610-8177	
2	O,F	MULTIMETER AN/URM-105	6625-581-2036	
3	O	FIELD COMPASS	6605-846-7618	

**APPENDIX D****ORGANIZATIONAL, DIRECT SUPPORT,  
(GENERAL SUPPORT, AND DEPOT MAIN-  
TENANCE REPAIR PARTS LIST****Section I. INTRODUCTION****1. Scope.**

This manual lists repair parts required for the performance of organizational, direct support, general support, and depot maintenance of the Visual Approach Path Indicator, MX-7301/TVN.

**2. General.**

This Repair Parts List is divided into the following sections:

- a. Prescribed Load Allowance (PLA) - Section II. A composite listing of the repair parts having quantitative allowances for initial stockage at the organizational level.
- b. Repair Parts - Section III. A list of repair parts authorized for the performance of maintenance at the organizational level in figure item number sequence.
- c. Section IV. A list of repair parts authorized for the performance of maintenance at the direct support, general support, and depot level in figure and item number sequence.
- d. Special Tools, Test and Support Equipment - Section V. Not Applicable.
- e. Federal Stock Number and Reference Number Index - Section VI. A list of Federal stock numbers in ascending numerical sequence followed by a list of reference numbers in ascending alpha-numeric sequence, cross-referenced to the illustration figure number and item number.



**3. Explanation of Columns.**

The following provides an explanation of columns in the tabular lists in Sections II, III, and IV:

a. Source, Maintenance, and Recoverability Codes (SMR), Column 1.

(1) Source code, indicates the selection status and source for the listed item. Source codes used are:

Code	Explanation
P	Repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.
P2	Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.

Code	Explanation
P9	Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 380-41.
P10	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380-41, and which are stocked and supplied by the Army COMSEC logistic system.
M	Repair parts which are not procured or stocked, but are to be manufactured in indicated maintenance levels.

Code	Explanation
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories. Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
XI	Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.

Code	Explanation
X2	<p>Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain same through cannibalization. Where such repair parts are not obtainable through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.</p>
C	<p>Repair parts authorized for local procurement. Where such repair parts are not obtainable from local procurement, requirements will be requisitioned through normal supply channels accompanied by a supporting statement of nonavailability from local procurement.</p>

Code	Explanation
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) Maintenance code, indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are:

Code	Explanation
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(3) Recoverability code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	Explanation
R	Repair parts and assemblies which are economically reparable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

Code	Explanation
S	Repair parts and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units

Code	Explanation
	because of precious metal content, critical materials, or high dollar value reusable casings or castings.

b. Federal Stock Number, Column 2. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description, Column 3. This column indicates the Federal item name and any additional description of the item required. The abbreviation "w/e" when used as a part of the nomenclature, indicates the Federal stock number includes all armament, equipment, accessories, and repair parts issued with the item. A part number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses. Material required for manufacture or fabrication is identified.

d. Unit of Measure (U/M), Column 4. A 2 character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column 5. This column indicates the quantity of the item used in the assembly group. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated (e.g., shims, spacers, etc.).

f. 15-Day Organizational Maintenance Allowance, Column 3 of Section II and column 6 of Section III.

Code

Explanation

(1) The allowance columns are divided into four subcolumns. Indicated in each subcolumn opposite the first appearance of each item is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

(2) The quantitative allowances for organizational level of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the density column applicable to the number of items supported to obtain the total quantity of repair parts authorized.

(3) Organizational units providing maintenance for more than 100 of these equipments shall determine the total quantity of parts required by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example, authorized allowance for 51-100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.



(4) Subsequent changes to allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendation should be forwarded to the U.S. Army Electronics Command, Fort Monmouth, New Jersey. Revisions of the range of items authorized will be made by the U.S. Army Electronics Command, Fort Monmouth, New Jersey based upon engineering experience, demand data, or TAERS information.

g. 30-Day DS/GS Maintenance Allowances, Columns 6, and 7. NOTE: Allowances in GS column are for GS maintenance only.

(1) The allowance columns are divided into three subcolumns. Indicated in each subcolumn, opposite, the first appearance of each item, is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the applicable allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

(2) The quantitative allowances for DS/GS levels of maintenance will represent initial stockage for a 30-day period for the number of equipments supported.

(3) Determination of the total quantity of parts required for maintenance of more than 100 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column.

Example, authorized allowance for 51-100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.

h. 1-Year Allowances Per 100 Equipments/Contingency Planning Purposes, Column 8. This column indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

i. Depot Maintenance Allowance Per 100 Equipments, Column 9. This column indicates opposite the first appearance of each item, the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

j. Illustration, Column 10. This column is divided as follows:

(1) Figure Number, Column 10a. Indicates the figure number of the illustration in which the item is shown.

(2) Item Number, Column 10b. Indicates the callout number used to reference the item in the illustration.

**4. Special Information.**

- a. Repair parts mortality has been based on 500 hours of operation.
- b. Parts which require manufacture or assembly at a category higher than that authorized for installation will indicate in the source column the higher category.
- c. For end items authorized mandatory stockage of repair parts by the Department of the Army, on a case by case basis, the mandatory stockage items are indicated by a plus "+" sign as the first character in the end item density columns of both the Repair Parts List and the Prescribed Load Allowance for each such authorized allowance quantity.

**5. How to Locate Repair Parts.**

- a. When Federal stock number or reference number is unknown:
  - (1) First. Using the table of contents, determine the assembly group within which the repair part belongs. This is necessary since illustrations are prepared for assembly groups, and listings are divided into the same groups.
  - (2) Second. Find the illustration covering the assembly group to which the repair part belongs.
  - (3) Third. Identify the repair part on the illustration and note the illustration figure and item number of the repair part.
  - (4) Fourth. Using the Repair Parts Listing, find the assembly group to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. When Federal stock number or reference number is known:

(1) First. Using the Index of Federal Stock Numbers and Reference Numbers find the pertinent Federal stock number or reference number. This index is in ascending FSN sequence followed by a list of reference numbers in ascending alpha-numeric sequence, cross-referenced to the illustration figure number and item number.

(2) Second. Using the Repair Part Listing, find the (insert as applicable - functional group, functional subgroup, or assembly group) of the repair part and the illustration figure number and item number referenced in the Index of Federal Stock Numbers and Reference Numbers.

**6. Abbreviations.**

Abbreviations	Explanation
cd-or	cadmium-or
zn-pltd	zinc -plated
MOD	MODEL
opn	opening
rd-hd	round head

**7. Federal Supply Codes for Manufacturers.**

Code	Manufacturer
00715	Specialties Mfg. Co. 8821 Fenkel Detroit, Michigan, 48238

Code	Manufacturer
01666	PPG Industries Inc. Adhesive Products Division 225 Belleville Ave. Bloomfield, N.J. 07003
14608	Corbin Cabinet Lock Division of Emhart Corp. 102 Washington St. New Britain, Conn. 06050
24455	General Electric Co. Lamp Division of Consumer Products Group Nela Park Cleveland, Ohio
39428	Mc Master-Carr Supply Co. P.O. Box 4355 Chicago, Ill. 60680
72653	G.C. Electronics Co. Division of Hydrometals Inc. 400 S. Wyman St. Rockford, Ill. 61101

Code	Manufacturer
72962	Elastic Stop Nut Div. of Amerace ESNA Corp. 2330 Vauxhall Road Union, N.J. 07083
75037	Minnesota Mining & Mfg. Co. Electro Products Division 3M Center St. Paul, Minn. 55101
75543	Lavelle Rubber Co. 424 N. Wood Chicago, Ill. 60622
80205	National Aerospace Standards Committee Aerospace Industries Association of America Inc. 1725 De Sales N.W. Washington, D.C: 20036
84631	Hollander Metal Products Corp. 1380 Barum Ave. P.O. Box 701 Bridgeport, Conn. 06601
88044	Aeronautical Standards Group Dept. of Navy and Air Force

Code	Manufacturer
94961	Minnesota Mining & Mfg. Co. Reflective Products Division 3M Center St. Paul, Minn. 55101
96906	Military Standards Promulgated By Standardization Div. Directorate of Logistic Services DSA
98897	Lockheed-Georgia Co. 86 South Cobb Dr. Marietta, Ga. 30061

SECTION II. PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION  USABLE ON CODE	(3) 15-DAY ORG. MAINT. ALLOWANCE			
		(a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100
5310-873-3292	NUT-SELF-LOCKING HEXAGON MS21043-04 (96906)	*	*	*	2
	KEEPER WITH SLIDE NO NUMBER (84631)	*	*	*	2
	LAMP, INCANDESCENT GE965 (24455)	*	2	2	2



SECTION III REPAIR PARTS LIST

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW				(7) ILLUSTRATION	
					(a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(a) FIGURE NO.	(B) ITEM NO.
					PO		BRACKET, DOUBLE ANGLE 193-005-101 (98897)	EA	1	
PO		THUMBSCREW 193-025-101 (98897)	EA	1	*	*	*	*	D-1	2
PO		CONTAINER, STORAGE 193-028-101 (98897)	EA	1	*	*	*	*	D-1	3
PO		KEEPER WITH SLIDE NO NUMBER (84631)	EA	2	*	*	*	*	D-1	8
PO		HOUSING ASSEMBLY 193-054-101 (98897)	EA	1	*	*	*	*	D-1	9
PO		SCREW, WD, PAN HD BRS NO. 6X 0.5	EA	1	*	*	*	*	D-1	21
PO	5305-207-7466	SCREW, MACHINE MS35214-13 (96906)	EA	1	*	*	*	*		60
PO	5310-167-0815	WASHER, FLAT AN960-4 (88044)	EA	1	*	*	*	*		61
PO	5310-873-3292	NUT, SELF-LOCKING HEXAGON MS21043-04 (96906)	EA	1	*	*	*	2		62
PO		LAMP, INCANDESCENT GE965 (24455)	EA	3	*	2	2	2		65

SECTION IV REPAIR PARTS LIST

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	(4) USABLE ON CODE	(5) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION		
						(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)	
						1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.	
GOR	5825-918-3738	Visual Approach Path Indicator 193-040-1 98897)														
PO		Bracket, Double Angle 193-005-101 (98897)		EA	1	*	*	*				5	4	D-1	1	
PO		Thumbscrew 193-025-101 (98897)		EA	1	*	*	2	*	*	2	10	8	D-1	2	
PO		Container, Storage 193-028-101 (98897)		EA	1	*	*	*	*	*	*	5		D-1	3	
		Eyelet, Snap Fastener AN227-9B (88044)		EA	1									D-1	4	
	5325-276-4934	Stud, Snap Fastener AN227-8B (88044)		EA	1									D-1	5	
	5325-285-6256	Socket, Snap Fastener AN227-7B (88044)		EA	1									D-1	6	
	5325-359-6844	Button, Snap Fastener AN227-6B (88044)		EA	1									D-1	7	
PO		Keeper with Slide No Number (84631)		EA	2	*	2	2	*	2	2	16		D-1	8	
PO		Housing Assembly 193-054-101 (98897)		EA	1	*	*	*	*	*	*	5		D-1	9	
X1		Housing, Assembly of 193-054-102 (98897)		EA	1									D-1	10	
X1		Spacer, Plate 193-041-101 (98897)		EA	1									D-1	11	
PF		Printed Wiring Board 193-052-101 (98897)		EA	1	*	*	2	*	*	2	8		D-1	12	
PF	5340-950-8676	Catch, Clamping 15797 (14608)		EA	2	*	*	2	*	*	2	16	8	D-1	13	
PF		Plate, Contact 193-042-101 (98897)		EA	1	*	*	*	*	*	*	8		D-1	14	

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	(4) USABLE ON CODE	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION	
					(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)
					1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.
PF		Wire, 22 Gage Plastic Coated Commercial	AR											
PF PF	5320-117-3738	Rivet, Solid MS20426AD4-8 (96906)	EA	4	*	2	2	*	2	2	16		D-1 15	
PF	5310-622 1733	Nut, Self-Locking Plate NAS686A3 (80205)	EA	1	*	2	2	*	2	2	12	8	D-1 16	
X1		Rivet, Solid MS20426A3-18 (96906)	EA	3									D-1 17	
	5320-584 6672	Rivet, Solid MS20426A3-6 (96906)	EA	2									D-1 18	
X1		Plate, Identification 317-100-102 (98897)	EA	1									D-1 19	
X1		Bracket, Angle 193-043-101 (98897)	EA	1									D-1 20	
PO		Screw, WD, Pan HD BRS No. 6 x 0.5	EA	1	*	*	2	*	*	2	10	8	D-1 21	
PH		Epoxy M773 (01666)	AR											
X1		Solder, 18 SWG	AR											
X1		Plate, Designation 193-009-1 (98897)	EA	1	*	*	2	*	*	2	10		D-1 22	
PF		Window, Observation 193-010-1 (98897)	EA	1	*	*	2	*	*	2	10	4S	D-1 23	
PFR		Cell Assembly, Optical 193-050-101 (98897)	EA	1	*	*	*	*	*	*	5		D-1 24	
PF	5340-950-8676	Cell, Optical Element 193-050-101 (98897)	EA	1	*	*	*	*	*	*	5		D-1 25	
PF		Lens Assembly, Indica- tor Light 193-006-1(98897)	EA	1	*	*	2	*	*	2	12		D-1 26	

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION	
						(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)
						1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.
PF		Lens Assembly, Optical 193-007-1 (98897)		EA	1	*	*	2	*	*	2	12	8	D-1	27
PF		Spacer, Sleeve 193-013-1 (98897)		EA	3	*	2	2	*	2	2	18	9	D-1	28
PF		Clip, Spring Tension 193-053-101 (98897)		EA	2	*	*	2	*	*	2	12	14	D-1	29
X1		Housing, Optical Instru- ment 193-044-101 (98897)		EA	1									D-1	30
PF		End Plate Assembly, Optical Housing 193-008-1 (98897)		EA	1	*	*	*	*	*	*	8		D-1	31
X1		Plate, End 193-008-3 (98897)		EA	1									D-1	32
PF		Gasket 193-008-5 (98897)		EA	1	*	*	2	*	*	2	10	18	D-1	33
X1	5330-664- 1508	Catch, Clamping 15794 (14608)		EA	2									D-1	34
X1	5320-584- 6672 8040-682- 6690	Rivet, Solid MS20426AD3-6 (96906) Pliobond Cement 43-2 (72653)		EA	2									D-1	35
X1		Printed Wiring Board 193-051-101 (98897)		EA	1									D-1	36
X1		Top Plate, HSG Optical Instrument 193-039-101 (98897)		EA	1									D-1	37
X1		Plate, Base 193-012-1 (98897)		EA	1									D-1	38
X1		Bracket, Angle 193-048-101 (98897)		EA	1									D-1	39
X1		Bracket, Angle 193-047-101 (98897)		EA	1									D-1	40

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	(4) USABLE ON CODE	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION	
					(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)
					1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.
X1		Bracket, Angle 193-046-101 (98897)	EA	1									D-1	41
X1		Bracket, Angle 193-049-101 (98897)	EA	1									D-1	42
X1		Clip, Electrical 193-045-101 (98897)	EA	1									D-1	43
X1		Lampholder 193-014-1 (98897)	EA	2									D-1	44
X1	5320-584- 6672	Rivet, Solid MS20426AD3-6 (96906)	EA	14									D-1	45
X1	5320-117- 6939	Rivet, Solid MS20426AD3-5 (96906)	EA	8									D-1	46
PF		Window, Observation 193-027-1 (98897)	EA	1	*	*	2	*	*	2	10	45	D-1	47
X1		Epoxy M733 (01666)	AR											
PF		Level Assembly, Circular Vial 193-024-1 (98897)	EA	1	*	*	2	*	*	2	8		D-1	48
PF		Leg, Electrical Equip- ment 193-032-1 (98897)	EA	2	*	2	2	*	2	2	13		D-1	49
PF		Leg, Assembly, Elec- trical 193-034-101 (98897)	EA	2	*	2	2	*	2	2	13		D-1	50
PF		Pin, Straight, Headless 193-034-102 (98897)	EA	1	*	2	2	*	2	2	16	3	D-1	51
X1		Pipe, Aluminum Alloy 193-034-103 (98897)	EA	1									D-1	52
X1		Bushing, Rubber 193-034-104 (98897)	EA	1									D-1	53
X1		Cap, Brass Flared 193-034-105 (98897)	EA	1									D-1	54

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	(4) USABLE ON CODE	(5) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION	
						(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)
						1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.
X1	5305-722-4781	Tip, Rubber T37 (75543)	EA	1										D-1	55
		Screw, Drive AN535-10-6 (88044)	EA	1											D-1
AFR		Cap Assembly 193-104-1 (98897)	EA	1										D-1	57
PF	5935-828-0596	Cap, Prot, Dust, Moisture Seal NAS813-28 (80205)	EA	1	*	*	2	*	*	2	5			D-1	58
PF	7510-889-6147	Chain Assembly, Single Leg 10 (39428)	EA	1	*	*	2	*	*	2	5			D-1	59
		Tape, Pressure Sensitive Adhesive 22 (94961)	AR												
PO	5305-207-7466	Screw, Machine MS35214-13 (96906)	EA	1	*	*	2	*	*	2	5	8		D-1	60
PO	5310-167-0815	Washer, Flat AN960-4 (88044)	EA	1	*	*	2	*	*	2	5	13		D-1	61
PO	5310-873-3292	Nut, Self-Locking, Hexagon MS21043-04 (96906)	EA	1	*	2	2	*	2	2	12	9		D-1	62
PF		Switch, Push 1156 (00715)	EA	1	*	*	2	*	*	2	8	15		D-1	63
PF		Lampholder 5-87	EA	1	*	*	2	*	*	2	5	10		D-1	64
PO		Lamp, Incandescent GE965 (24455)	EA	3	2	3	6	2	2	2	65	225		D-1	65
PF	5310-222-4246	Nut, Plain, Octagon 22K1-02 (72962)	EA	2	*	2	2	*	2	2	19	18		D-1	66
PF	5340-068-0527	Turnbuckle MS21252-3RS (96906)	EA	2	*	*	2	*	*	2	10			D-1	67
PF	5306-292-5517	Bolt, Eye AN42B3A (88044)	EA	2	*	2	2	*	2	2	13	10		D-1	68

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION  REF. NUMBER & MFR CODE	(4) USABLE ON CODE	(5) QTY INC IN UNIT	(6) 30 DAY DS MAINT ALLOWANCE			(7) 30 DAY DS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUS- TRATION	
					(A)	(B)	(C)	(A)	(B)	(C)			(A)	(B)
					1-20	21-50	51-100	1-20	21-50	51-100			FIG. NO.	ITEM NO.
PF	5315-812-3759	Pin, Straight, Headless MS20392-2C11 (96906)	EA	2	*	2	2	*	2	2	16	6	D-1	69
PF	5315-839-2325	Pin, Cotter' MS24665-132 (96906)	EA	2	*	2	2	*	2	2	16		D-1	70
PF	5310-934-9746 (96906)	Nut, Self-Locking Hexa- gon MS35649-245	EA	5	*	3	5	2	2	2	40	45	D-1	71
PF	5310-167-0657	Washer, Plain AN960-3 (88044)	EA	2	*	2	2	*	2	2	16	26	D-1	72
PF	5305-271-8104	Screw, Machine AN507B440R12 (88044)	EA	3	*	2	2	*	2	2	19	27	D-1	73
PF	5305-889-2999	Screw, Machine MS35206-217 (96906)	EA	2	*	*	2	*	*	2	16	18	D-1	74
PF	5305-835-4720	Screw, Machine MS21207-4-4 (96906)	EA	2	*	*	2	*	*	2	16	18	D-1	75
X1	5320-117-6939	Rivet, Solid MS20426AD3-5 (96906)	REE										D-1	76
PF		Wire, 22 Gage, Plastic Coated Commercial	REF											
PF		Terminal, Lug STSTP100-004A16 (9889T7)	EA	1	*	*	2	*	*	2	8	13	D-1	77
PH		Solder, 18 SWG 50150 Alloy Commercial	REF											
PF		Insulation, Sleeving Electrical 3025-020 (75037)	AR											

**Section VI. INDEX - FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS-REFERENCE TO FIGURE AND ITEM NUMBER**

<u>Stock Number</u>	<u>Figure Number</u>	<u>Item Number</u>
5305-207-7466	D-1	60
5305-271-8104	D-1	73
5305-722-4781	D-1	56
5305-835-4720	D-1	75
5305-889-2999	D-1	74
5306-292 -5517	D-1	68
5310-167-0657	D-1	72
5310-222-4246	D-1	66
5310-622-1733	D-1	16
5310-873-3292	D-1	62
5310-934-9746	D-1	71
5315-812-3759	D-1	69
5315-839-2325	D-1	70
5320-117-6953	D-1	15
5320-584-6672	D-1	45
5325-276-4934	D-1	5
5325-285-6256	D-1	6
5325-359-6844	D-1	7
5330-664-1508	D-1	34
5340-068-0527	D-1	67
5340-950-8676	D-1	13
5825-918-3738	D-1	
5935-828-0596	D-1	58
7510-889-6147	D-1	
8040-682 -6690	D-1	

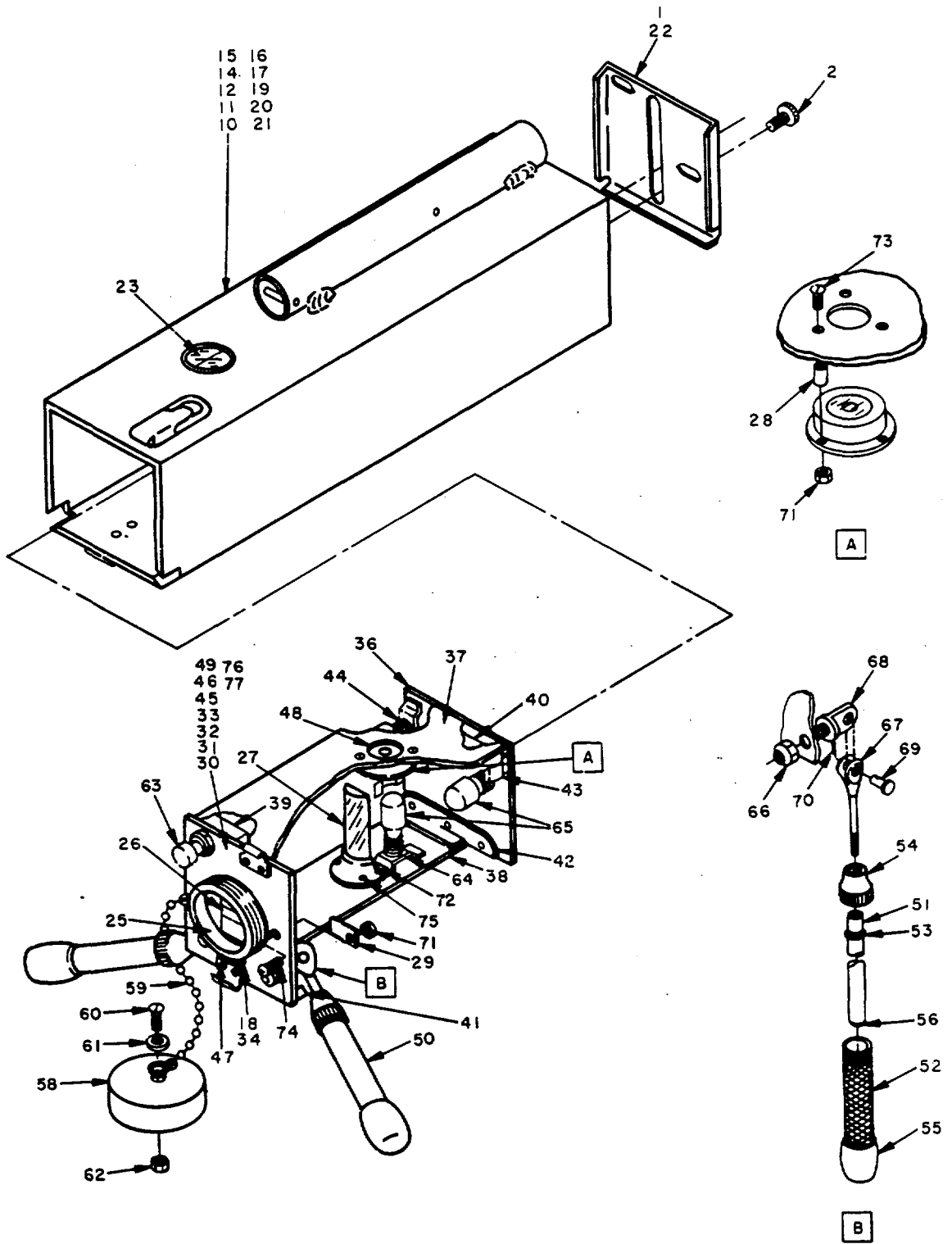


**Section VI. INDEX - FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS-REFERENCE TO FIGURE  
AND ITEM NUMBER (CONT.)**

<u>Reference Number</u>	<u>Mfg. Code</u>	<u>Figure Number</u>	<u>Item Number</u>
AN227-6B	88044	D-1	7
AN227-7B	88044	D-1	6
AN227-8B	88044	D-1	5
AN227-9B	88044	D-1	4
AN42B3A	88044	D-1	68
AN507B440R 12	88044	D-1	73
AN535-10-6	88044	D-1	56
AN960-3	88044	D-1	72
AN960-4	88044	D-1	61
GE965	24455	D-1	65
MS20392-2C11	96906	D-1	69
MS20426AD3-5	96906	D-1	46, 76
MS20426AD3-6	96906	D-1	18, 35, 45
MS20426AD4-8	96906	D-1	15
MS20426A3-18	96906	D-1	17
MS21043 -04	96906	D-1	62
MS21207-4-4	96906	D-1	75
MS21252-3RS	96906	D-1	67
MS24665-132	96906	D-1	70
MS3 5206-217	96906	D-1	74
MS35214-13	96906	D-1	60
MS35649-245	96906	D-1	71
NAS686A3	80205	D-1	16
NAS813 -2 8	80205	D-1	58
STSTP 100 -004A 16	98897	D-1	77
T37	75543	D-1	55
10	39428	D-1	59
1156	00715	D-1	63
15794	14608	D-1	34
15797	14608	D-1	13
193-004-1	98897	D-1	25
193-005-101	98897	D-1	1
193-006-1	98897	D-1	26
193-007-1	98897	D-1	27
193-008-1	98897	D-1	31
193-008-3	98897	D-1	32
193-008-5	98897	D-1	33
193-009-1	98897	D-1	22

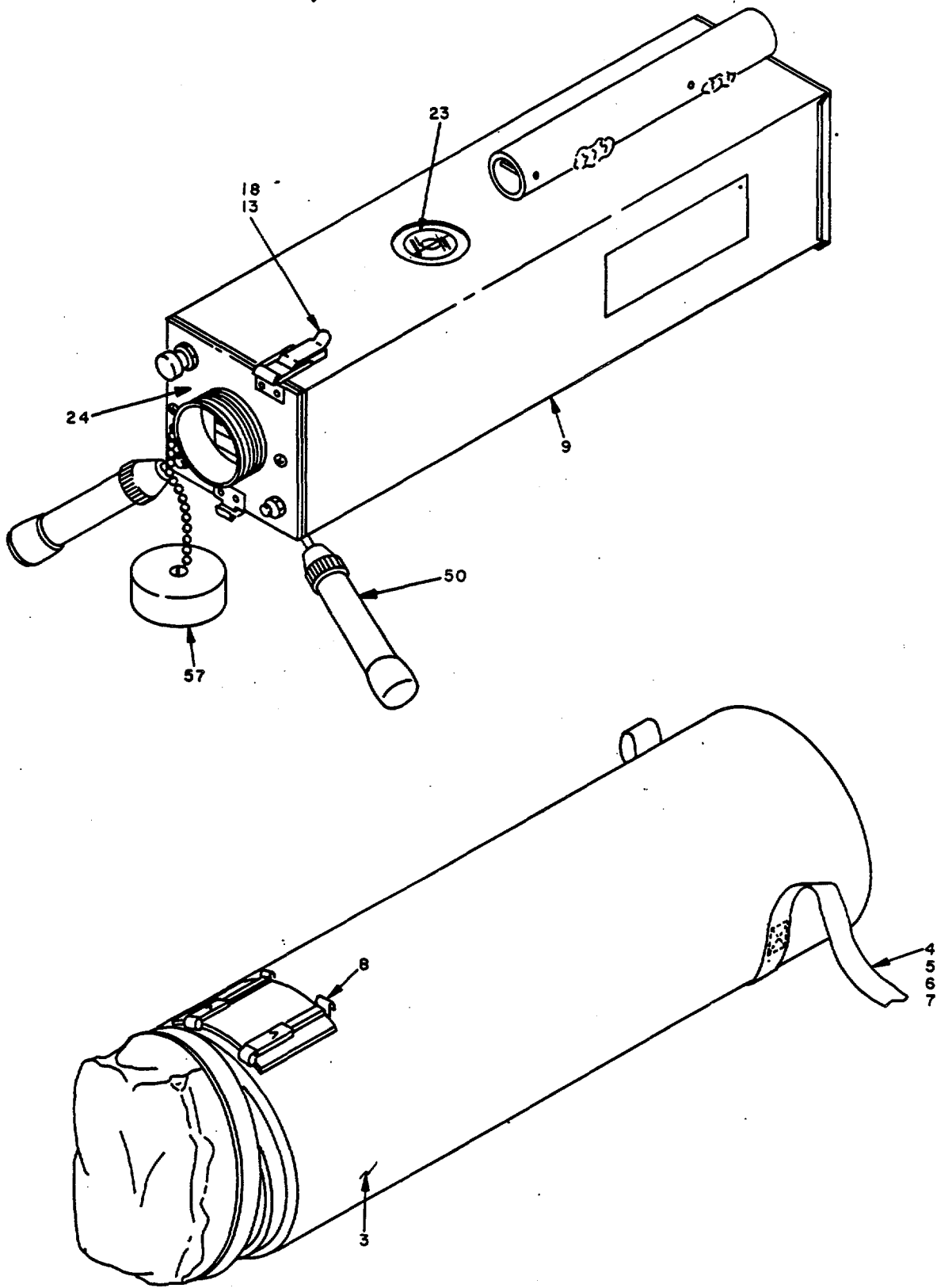
**Section VI. INDEX - FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS-REFERENCE TO FIGURE  
AND ITEM NUMBER (CONT.)**

<u>Reference Number</u>	<u>Mfg. Code</u>	<u>Figure Number</u>	<u>Item Number</u>
193-010-1	98897	D-1	23
193-012-1	98897	D-1	38
193-013-1	98897	D-1	28
193-014-101	98897	D-1	44
193-024-1	98897	D-1	48
193-025-101	98897	D-1	2
193-027-1	98897	D-1	47
193-028-101	98897	D-1	3
193-032-1	98897	D-1	49
193-034-101	98897	D-1	50
193-034-102	98897	D-1	51
193-034-103	98897	D-1	53
193-034-105	98897	D-1	54
193-039-101	98897	D-1	37
193-041-101	98897	D-1	11
193-042-101	98897	D-1	14
193-043-101	98897	D-1	20
193-044-101	98897	D-1	30
193-045-101	98897	D-1	43
193-046-101	98897	D-1	41
193-047-101	98897	D-1	40
193-048-101	98897	D-1	39
193-049-101	98897	D-1	42
193-050-101	98897	D-1	24
193-051-101	98897	D-1	36
193-052-101	98897	D-1	12
193-053-101	98897	D-1	29
193-054-101	98897	D-1	9
193-054-102	98897	D-1	10
193-104-1	98897	D-1	57
22K1-02	72962	D-1	66
317-100-102	98897	D-1	19
5-87			64



EL5825-248-15-T1-11①

Figure D-1(1). Visual Approach Path Indicator MX-7301/TVN (sheet 1 of 2).



EL5825-248-15-10-11 ②

Figure D-1(2). Visual Approach Path Indicator MX-7301/TVN (sheet 2 of 2).

By Order of the Secretary of the Army:

Official:

**KENNETH G. WICKHAM,**  
*Major General, United States Army,*  
*The Adjutant General.*

**W. C. WESTMORELAND,**  
*General, United States Army,*  
*Chief of Staff.*

Distribution :

To be distributed in accordance with DA Form 12-36 (qty rqr Block #371), Organizational maintenance requirements for All Rotor Wing aircraft.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983 0 - 381-302 (3396)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

**SOMETHING WRONG WITH THIS PUBLICATION?**

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT... PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
----------	------------	------------	-----------

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 2028-2  
1 JUL 79

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

**PIN: 028180-000**