

TECHNICAL MANUAL

**UNIT AND INTERMEDIATE DIRECT SUPPORT (DS)
MAINTENANCE MANUAL (INCLUDING REPAIR PARTS
AND SPECIAL TOOLS LIST)**

FOR

**PARACHUTE, CARGO TYPE: 64-FOOT
DIAMETER, MODEL G-12D,
NSN 1670-00-893-2371
AND MODEL G-12E,
NSN 1670-01-065-3755**

This copy is a reprint which includes current pages from Changes 1 through 4.

Approved for public release; distribution is unlimited.

*** The following manuals, TM 10-1670-275-23&P, TM 10-1670-276-23&P, TM 10-1670-277-23&P, TM 10-1670-278-23&P, TM 10-1670-279-23&P, TM 10-1670-280-23&P, TM 10-1670-281-23&P, TM 10-1670-282-23&P, in their entirety, supersede TM 10-1670-215-23, dated 7 December 1973, including all changes.**

**HEADQUARTERS, DEPARTMENTS OF THE ARMY,
AIR FORCE AND NAVY
1 OCTOBER 1990**

TECHNICAL MANUAL

NO. 10-1670-281-23&P

HEADQUARTERS, DEPARTMENTS OF
THE ARMY, AIR FORCE, AND NAVY
WASHINGTON, D.C., 1 October 1990

Unit and Intermediate Direct Support (DS) Maintenance Manual
(Including Repair Parts and Special Tads List)

for

PARACHUTE, CARGO TYPE: 64-FOOT DIAMETER
MODEL G-12D, NSN 1670-00-893-2371
AND MODEL G-12E, NSN 1670-01-065-3755
Current as of 26 June 1990

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

ARMY

You can help improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St Louis, MO 63120-1798. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil>. A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding hard copy 2028.

AIR FORCE

For Air Force, submit AFTO Form 22 (Technical order System Publication Improvement Report and Reply) and forward to the address prescribed above for the Army. An information copy of the prepared AFTO Form 22 shall be furnished to SA-ALC/TILDP, Kelly AFB, TX 78241-6421.

NAVY

For Navy, mail comments to Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC, 20363-5100.

In either case a reply will be furnished direct to you.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

		Page
CHAPTER 1	INTRODUCTION	1-1
	OVERVIEW	1-1
Section I	General	1-1
Section II	Equipment Description and Data	1-5
CHAPTER 2	UNIT AND INTERMEDIATE DIRECT SUPPORT (DS) MAINTENANCE	
	INSTRUCTIONS	2-1
	OVERVIEW	2-1
Section I	Repair Pans, Special Tools, Test, Measurement and Diagnostic Equipment (TMDE) and Support Equipment	2-1
Section II	Service Upon Receipt	2-2
Section III	Assembly	2-8
Section IV	Preventive Maintenance Checks and Services (PMCS)	2-8
Section V	Unit and Intermediate Direct Support (DS) Maintenance Procedures	2-11
Section VI	Repair	2-105
Section VII	Preparation for Storage or Shipment	2-215

* The following manuals, TM 10-1670-275-23&P, TM 10-1670-276-23&P, TM 10-1670-277-23&P, TM 10-1670-278-23&P, TM 10-1670-279-23&P, TM 10-1670-280-23&P, TM 10-1670-281-23&P, TM 10-1670-282-23&P, in their entirety, supersede TM 101670-215-23, dated 7 December 1973, including all changes.

TABLE OF CONTENTS (cont)

	Page	Illust/ Figure
APPENDIX A REFERENCES	A-1	
APPENDIX B MAINTENANCE ALLOCATION CHART	B-1	
APPENDIX C REPAIR PARTS AND SPECIAL TOOLS LIST	C-1	
Section I Introduction	C-1	
Section II Repair Parts List		
Group 00 Parachute, Cargo, 64-Foot Diameter.	C-11	C-1
Group 01 Canopy, Cargo, 64-Foot.	C-15	C-2
Group 02 Deployment Bag	C-17	C-3
Group 03 Deployment Line (111 Inch)	C-19	C-4
Group 04 Pilot Chute	C-21	C-5
Group 05 Static Line, Cargo	C-23	C-6
Group 06 Centerline	C-25	C-7
Group 99 Bulk Materials..	C-26	
Section III Special Tools List (Not Applicable)		
Section IV Cross-Reference Indexes	C-27	
APPENDIX D EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	D-1	
APPENDIX E ILLUSTRATED LIST OF MANUFACTURED ITEMS	E-1	
INDEX	Index 1	

LIST OF ILLUSTRATIONS

Figure Number	Title	Page
1-1	64-Foot Diameter Cargo Parachute Assembly, Model G-12D, NSN 1670-00-893-2371	1-2
1-2	64-Foot Diameter Cargo Parachute Assembly, Model G-12E, NSN 1670-01-065-3755	1-3
1-3	Parachute Canopy Assembly	1-6
1-4	Suspension Line and Gore Panel Arrangement and Numbering	1-7
1-5	Deployment Bag	1-8
1-6	111-Inch Long Deployment Line.....	1-9
1-7	68-Inch Diameter Pilot Parachute	1-9
1-8	68-Inch Diameter Pilot Parachute Static Line	1-10
1-9	57-Foot Centerline (Model G-12E only).....	1-10
2-1	Installing Attachment Tie on Parachute Log Record	2-4
2-2	Inside Front Cover of Parachute Log Record	2-5
2-3	Inside Back Cover of Parachute Log Record	2-5
2-4	Log Record Entries for the Modification Work Order Compliance Record Page	2-6
2-5	Log Record Entries for Unit and Intermediate Repair and Inspection Data Page	2-7
2-6	Data Entries for a Log Record Note Page	2-7
2-7	Shakeout	2-13
2-8	Rigger's Orientation	2-25
2-9	Canopy Positioned on Packing Surface.....	2-27
2-10	Removing Canopy Inversion	2-28
2-11	Removing Turns from Suspension Lines.....	2-28
2-12	Removing Tangles from Suspension Lines	2-29
2-13	Removing Twists from Suspension Lines	2-29
2-14	Risers, Connector Links and Suspension Clevis In Proper Layout	2-30
2-15	Canopy Vent Lines Wrapped and Secured	2-31
2-16	Canopy Vent Ties Completed	2-32
2-17	Line Separator Positioned Between Suspension Line Groups.....	2-33
2-18	Preparing to Throw Right Group of Gores and Suspension Lines	2-33
2-19	Folding the Right Group of Gores	2-34
2-20	Right Gore Group Folded	2-35
2-21	Preparing to Throw Left Group of Gores and Suspension Lines	2-35
2-22	Folding the Left Gore Group	2-36
2-23	Gore Folding Completed	2-37
2-24	Canopy Ties Completed	2-39
2-25	Suspension Line Ties Completed	2-40
2-26	Risers and Connector Link Assemblies in Proper Arrangement	2-41
2-27	Connector Link Assemblies Tied	2-41
2-28	Installing Canopy Breakcord Tie.....	2-42
2-29	Canopy Breakcord Tie Completed	2-43
2-30	Stowing the Canopy in Deployment Bag	2-44
2-31	Canopy Stowing Completed.....	2-44
2-32	Locking Stow Loops Inserted through Locking Slots.....	2-45
2-33	Making the First Locking Stow	2-46
2-34	Locking Stows Completed.....	2-46
2-35	Suspension Line Ties Positioned on Suspension Line Retaining Strap Loops.....	2-47

LIST OF ILLUSTRATIONS (cont)

Figure Number	Title	Page
2-36	First Suspension Line Stow Completed	2-48
2-37	Second Suspension Line Stow Completed	2-48
2-38	Suspension Line and Riser Stowage Completed	2-49
2-39	Suspension Line Stowage Panel Rolled and Inserted into Bag Open End	2-50
2-40	Making Primary Bag Closing Tie	2-51
2-41	Securing the Right Secondary Bag Closing Loops.....	2-52
2-42	Securing the Left Secondary Bag Closing Loops and Suspension Clevis	2-52
2-43	Packing Completed, G12D Parachute.....	2-53
2-44	Parachute Bag and Static Line Attached and Gore Folding Completed	2-55
2-45	Canopy Stowed in Bag.....	2-56
2-46	Suspension Lines Folded and Secured	2-57
2-47	Bag Closing Completed	2-57
2-48	Riser Clevis Attached to Breakaway Static Line	2-58
2-49	Riser Clevis Attached to Non-Breakaway Static Line.....	2-59
2-50	Packing Completed.....	2-60
2-51	Rigger's Orientation	2-62
2-52	Canopy Positioned on Packing Surface.....	2-64
2-53	Removing Canopy Inversion	2-65
2-54	Removing Turns from Suspension Lines	2-65
2-55	Removing Tangles from Suspension Lines	2-66
2-56	Removing Twists from Suspension Lines.....	2-66
2-57	Risers, Connector Links and Suspension Clevis in Proper Layout	2-67
2-58	Serving Canopy Vent.	2-69
2-59	Attaching Center Line	2-70
2-60	Placing the Center Line.....	2-71
2-61	Preparing to Throw Right Group of Gores and Suspension Lines	2-71
2-62	Folding the Right Group of Gores	2-72
2-63	Preparing to Throw Left Group of Gores and Suspension Lines	2-73
2-64	Folding the Left Gore Group	2-73
2-65	Gore Folding Completed.....	2-75
2-66	Positioning the Center Line	2-76
2-67	Pulling Down Canopy Vent	2-76
2-68	Canopy Vent Lines Alined with Canopy Skirt.....	2-77
2-69	Center Line Attached to Clevis	2-78
2-70	Tieing the Canopy Lines	2-79
2-71	Tieing the Suspension Line Groups.....	2-80
2-72	Tieing Both Groups of Suspension Lines.....	2-80
2-73	Risers and Connector Link Assemblies in Proper Layout	2-81
2-74	Preparing to Thread Tie Through Connector Links.	2-82
2-75	Center Line S-Folded Between Connector Link Stacks.....	2-82
2-76	Connector Links Tied and Secured	2-83
2-77	Deleted	
2-78	Deleted	
2-79	Stowing the Canopy into the Deployment Bag.....	2-86

LIST OF ILLUSTRATIONS (cont)

Figure Number	Title	Page
2-80	Grasping Suspension Lines.....	2-87
2-81	S-Folding Suspension Lines on Top of Stowed Canopy.....	2-87
2-82	Locking Stow Loops Inserted Through Locking Slots.....	2-88
2-83	Making the First Locking Stow	2-89
2-84	Locking Stows Completed.....	2-89
2-85	Suspension Line Stow Ties Installed on Retraining Strap Loops.....	2-90
2-86	Forming the First Suspension Line Stow	2-91
2-87	Forming the Second Line Stow	2-92
2-88	Suspension Line, Center Line and Riser Stowage Completed	2-93
2-89	Rolling the Suspension Line Stowage Rap	2-94
2-90	Folding Deployment Bag Closing Flaps.....	2-94
2-91	Routing Tie and Tightening Bag Closing Loops	2-95
2-92	Securing Risers and Center Line Over Bag Closure Flaps	2-96
2-93	Securing Right Secondary Bag Closing Loops	2-97
2-94	Securing Left Secondary Bag Closing Loops.....	2-98
2-95	Packing Completed, G-12E Parachute	2-98
2-95.1	Bag Closing, G-12E	2-98.1
2-95.2	Locking Stows Completed, G-12E.....	2-98.2
2-95.3	Securing Tie Completed, G-12E	2-98.3
2-95.4	Suspension Lines Wrapped, G-12E	2-98.4
2-95.5	First and Second Suspension Line Stowed, G-12E	2-98.5
2-95.6	Suspension Line, Centerline, and Riser Stowage Completed, G-1 2E	2-98.6
2-95.7	Lacing Deployment Bag, G-12E.....	2-98.7
2-95.8	Lacing Completed, G-12E.....	2-98.8
2-96	Parachute Bag and Static Line Attached and Gore Folding Completed	2-100
2-97	Canopy Stowed in Bag.....	2-101
2-98	Suspension Lines Folded and Secured	2-102
2-99	Bag Closing Completed	2-102
2-100	Riser Clevis Attached to Breakaway Static Line	2-103
2-101	Riser Clevis Attached to Non-Breakaway Static Line.....	2-104
2-102	Packing Completed.....	2-104
2-103	Darning Method Using a Darning Sewing Machine.....	2-110
2-104	Repair Method Using Zig-Zag Sewing Machine.....	2-111
2-105	Canopy Bridle Loop Replacement Details	2-116
2-106	Vent Reinforcement Splicing Details.....	2-118
2-107	Basic Patch Application	2-122
2-108	Basic Patching Details Using Parachute Mending Cloth	2-123
2-109	Common Miscellaneous Patches (4 sheets)	2-126
2-110	Normal Gore Section Replacement Details.....	2-130
2-111	Modified Gore Section Replacement Details	2-131
2-112	Lapped Seams Completed foe Multiple Gore Section Replacement	2-133
2-113	Making a Line Splice with Type IV Coreless Nylon Cord	2-136
2-114	Suspension Line Replacement Details	2-137
2-115	Securing Damaged Line to New Line for Line Replacement	2-138

LIST OF ILLUSTRATIONS (cont)

Figure Number	Title	Page
2-116	Securing Radial Line and Vent Line to Canopy	2-141
2-117	Securing Radial Line and Suppression Line to Canopy	2-143
2-118	Canopy Line Replacement Details.	2-146
2-119	Radial Seam Patching	2-148
2-120	Radial Seam Reinforcement Tape Replacement Details	2-150
2-121	Pocket Band Replacement Details	2-152
2-122	Skirt Reinforcement (Lower Lateral Band) Splice Details	2-154
2-123	V-Tab Replacement Details	2-157
2-124	Suspension Line Reinforcement (V-Tab) Construction Details.....	2-158
2-125	Connector Link Assembly.....	2-160
2-126	Clevis Attaching Loop Buffer Replacement Details	2-162
2-127	Bridle Breakcord Attaching Loop Buffer Replacement Details	2-167
2-128	Bag Closing Loop Replacement Details	2-169
2-129	Deployment Bag Edge Binding Splicing Details	2-172
2-130	Bridle Strap Splicing Details.....	2-174
2-131	Horizontal Strap Splicing Details.....	2-176
2-132	Patching Deployment Bag Panels, Rap and Cover.....	2-178
2-133	Locking Stow Loop Replacement Details	2-180
2-133.1	Enlarging Locking Stow Loops, G-12E Deployment Bag	2-180.1
2-133.2	Marking Modified G-12E Deployment Bag	2-180.2
2-134	Suspension Line Retaining Strap Loop Replacement Details	2-183
2-135	Suspension-Line Retaining Strap Replacement Details.....	2-184
2-136	Suspension Line Retaining Strap Replacement Splicing Details.....	2-186
2-137	Cluster Tie Webbing Replacement Details.....	2-188
2-138	Riser Extension Tie Strap Replacement Details	2-190
2-139	Basic Patch Application	2-196
2-140	Typical Canopy Panel Patches.....	2-196
2-141	Crown Inside Reinforcement Tape Replacement Details.....	2-197
2-142	Canopy Crown Attaching Loop Replacement Details.....	2-199
2-143	Skirt Reinforcement Webbing Splice Details.....	2-200
2-144	Suspension Line Reinforcement Tape Replacement Details	2-201
2-145	Splicing a Type III Nylon Cord Suspension Line	2-202
2-146	Making a Line Splice with Type II Coreless Nylon Cord.....	2-204
2-147	Method of Attaching a Type III Nylon Cord Suspension Line to a Connector Link	2-205
2-148	Method of Attaching a Type II Coreless Nylon Cord Suspension Line to a Connector Link .	2-207
2-149	Bridle Bag Edge Binding Splicing Details	2-209
2-150	Replacing Clevis Pin Retaining Cord.....	2-210
2-151	Forming Riser Clevis Safety Pin	2-211
2-152	Bridle Line Construction Details	2-212
2-153	Bridle Line Attachment Details	2-213
2-154	Pilot Parachute Bag Tiedown Loop Replacement Details	2-214

LIST OF TABLES

Table Number	Title	Page
2-1	Unit and intermediate Direct Support (DS) Preventive Maintenance Checks and Services (PMCS).....	2-10
2-2	Sewing Machine Code Symbols.....	2-107
2-3	Stitching and Restitching Specifications.....	2-108
2-4	Mending Cloth Patching Specifications for Cargo Parachutes	2-124

CHAPTER 1

INTRODUCTION

	Page
Section I. General	1-1
Section II. Equipment Description and Data	1-5

OVERVIEW

This chapter includes the general information common to all parachute manuals and specific information pertinent to the parachute described in this manual.

SECTION I. GENERAL

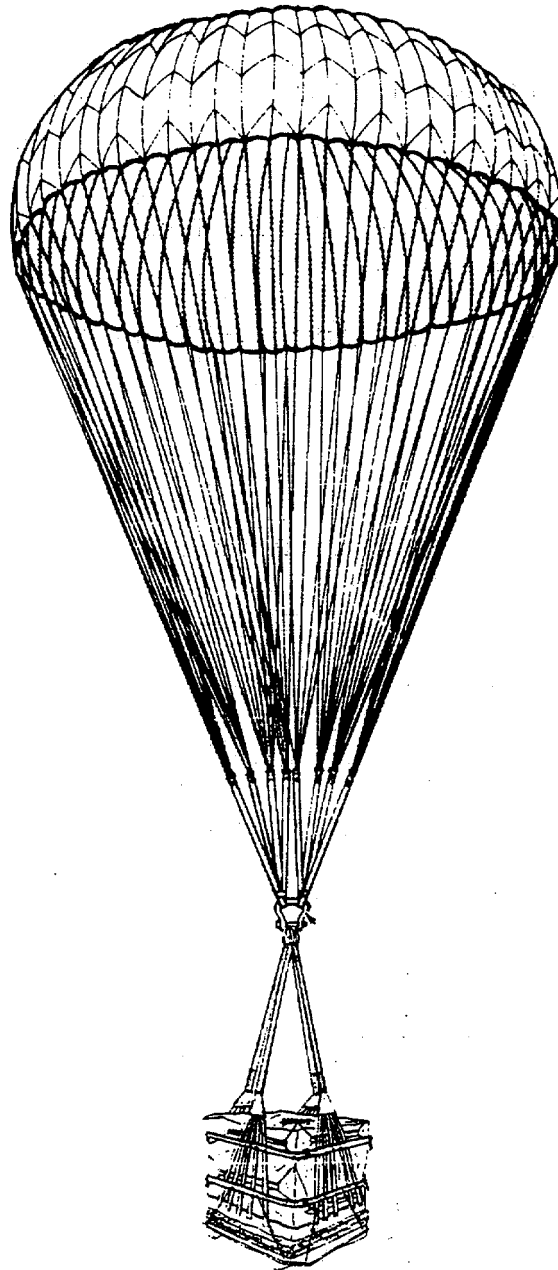
Paragraph	Page
1-1 Scope	1-1
1-2 Maintenance Forms and Records	1-4
1-3 Destruction of Army Materiel to Prevent Enemy Use	1-4
1-4 Preparation for Storage or Shipment	1-5
1-5 Reporting of Equipment Improvement Recommendations (EIR)	1-5

1-1. Scope. The scope of this manual is described in the following subparagraphs.

a. Type of Manual. This manual provides unit and intermediate direct support (DS) maintenance instructions for parachutes NSN 1670-00-893-2371 and NSN 1670-01-065-3755, shown in figures 1-1 and 1-2. This manual also provides a Repair Parts and Special Tools List located at Appendix C.

b. Equipment Name. 64-Foot Diameter Cargo Parachute, Model G-12D and Model G-12E, hereinafter called 64-Foot Cargo Parachute.

c. Purpose of Equipment. The parachute is designed for medium capacity use with the A-22 Air Delivery Cargo Bag and with variations of platform rigged loads.



4839-001

Figure 1-1. 64-Foot Diameter Cargo Parachute Assembly, Model G-12D, NSN 1670-00-893-2371.