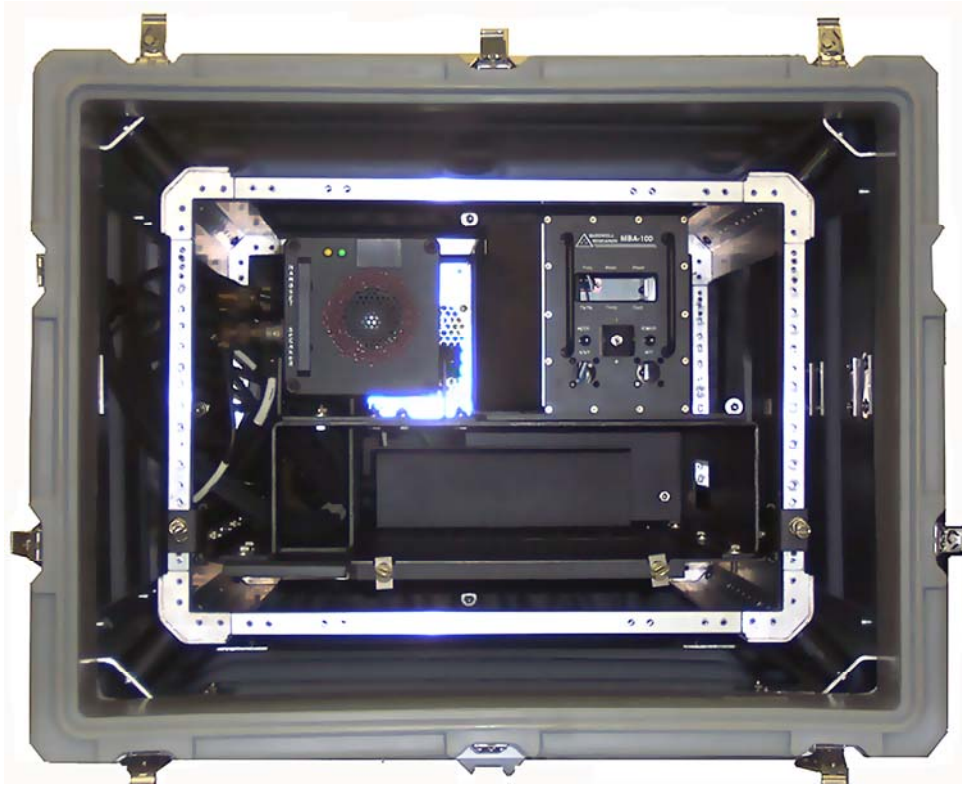


# MRC-105

## On-The-Move-Communications (OTMC)



### *Operational Manual*

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## **Chapter 1 - General Information**

### **1.1 Scope**

This manual has been prepared by McDowell Research, an Ultralife Company for the purpose of providing the user information necessary to understand, operate and maintain the On-The-Move-Communications (OTMC) Transit Case System.

- **Chapter 1 – General Information**

- This chapter provides safety and important information about the OTMC.

- **Chapter 2 – Set-Up**

- This chapter provides information necessary for setting up the OTMC.

- **Chapter 3 – Maintenance and Warranty Information**

- This chapter provides information regarding OTMC preventive care and corrective maintenance procedures.

- **Chapter 4 – System Diagram**

- This chapter provides a system diagram for ease of assembly.

### **1.2 Introduction**

- The OTMC Transit Case System is a self contained SATCOM On-The-Move-System (OTMC) which consists of the following equipment.
  - HWS1500-24 – AC to DC Converter
  - MRC-99 – Interoperable Power Adapter and Charger
  - MRC-67A – Amplified Speaker
  - MBA-100 – 100 Watt Multi-band Amplifier
  - OTMC Power Distribution Box

### 1.3 Important Safety Instructions

- A. This manual contains important safety and operating instructions for the OTMC Transit Case System.
- B. Before using the OTMC, read all instructions and cautionary markings on the MBA-100 Power Amplifier.
- C. Use of ancillary equipment not recommended or sold by McDowell Research may result in risk of fire, electric shock, or personal injury.
- D. Make sure cords are positioned so that they will not be stepped on, pinched, tripped over, or otherwise subjected to damage or stress; particularly when pushing or pulling the shelf in or out the case.
- E. Do not operate the system with damaged cables or connectors - replace them immediately.
- F. The OTMC requires a “two-man” lift.

### 1.4 Serviceable Parts and Repair

The OTMC has **NO** user serviceable parts. Units requiring repair should be sent to a qualified service depot for repair or follow instructions in the maintenance chapter of this manual.

### 1.5 Physical Description

#### 1.5.1 Characteristics

- **Length:** 22.5 inches
- **Width:** 14.75 inches
- **Height:** 26.5 inches
- **Weight:** 130 lbs. without transceiver

### 1.6 Equipment Provided

Equipment	Quantity
OTMC Operational Manual	1
OTMC Transit Case System	1
MBA-100 Operation Manual	1

## 1.7 Technical Specifications

AC Input Range	95-265 VAC, 47 to 440 Hz
DC Input Range	18-36 VDC
Operating Temperature	-30° C to 55° C (-22°F to 131°F)
Storage Temperature	-50° C to 65° C (-58°F to 149°F)
Operating Altitude	27,000 Feet
Storage Altitude	55,000 Feet
Humidity	95% Relative

## Chapter 2 – Quick Set Up and Operation

### 2.0 Quick Set-Up – Follow these steps before applying power to the system.

- 2.0.1 Ensure that the manual reset lever on the 100 Amp DC breaker is in the OFF position by pressing the RED button on top of the breaker.



Figure 1 – Circuit Breaker in OFF position

- 2.0.2 The sliding tray may be pulled out for easy access to interconnecting cables.

#### **CAUTION**

Ensure that the cables are out of the way of any moving metal parts to prevent damage to the cables as the tray is pulled in and out of the case.

#### **CAUTION**

The weight of the tray may tip the case over if it is pulled out all the way. Ensure that the case is properly secured, on the floor or on a flat surface with enough space to prevent injury to personnel or equipment damage.

## 2.1 AN/PRC-117F Radio Installation:

2.1.1 Remove the MRC-99 power supply from the storage pouch.

2.1.2 Ensure that the MIK-1016G-036 cable is routed under the MBA-100 mounting tray through the back end of the shelf.

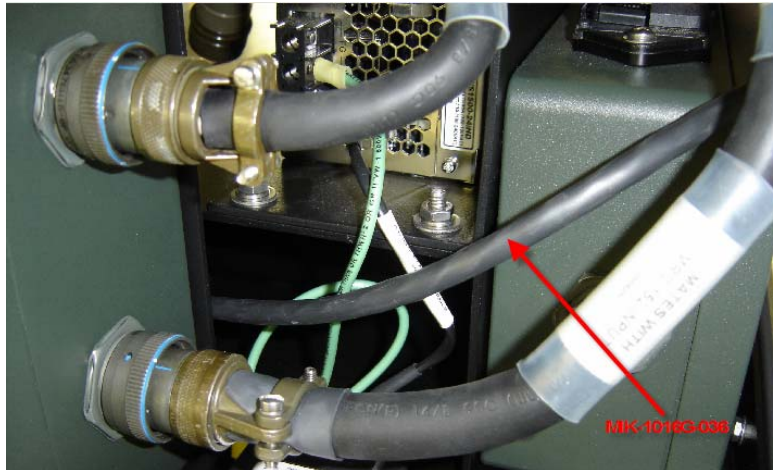


Figure 2 – MRC-99 DC power cable routing

2.1.3 Connect the MIK-1016G-036 cable to the AC input jack on the MRC-99 power supply.

2.1.4 Attach the AN/PRC-117F radio to the MRC-99 power supply.

2.1.5 Push the radio and power supply all the way to the back support plate and ensure that the radio is properly lined up with the front pawls (see Figure 3).



Figure 3 – Radio Mount pawls

2.1.6 Finger tighten the two pawls and ensure that the radio is secure.

## 2.0 Internal AC Power Supply Operation Setup:

- 2.2.1 Select the appropriate AC power input cable (PCP269-00-01 for international or PCP281-00-01 for North America) and ensure that the ring terminal ends of the cable are connected to the input side of the MC1230 Noise Filter (BLACK to terminal #1, WHITE to terminal #2 and GREEN to ground screw for PCP281-00-01 or BLUE to terminal #1, BROWN to terminal #2 and GREEN to ground screw for PCP269-00-01). Connect the other end to a 20 Amp (minimum) AC power outlet.



Figure 4 – AC power filter input connections

- 2.2.2 Connect the PCP270-00-01 cable. The circular plug end connects to J3 of the PDU and the RED (positive) and BLACK (negative) ring lugs to the positive and negative output terminals of the HWS1500-24 AC/DC Power Supply.

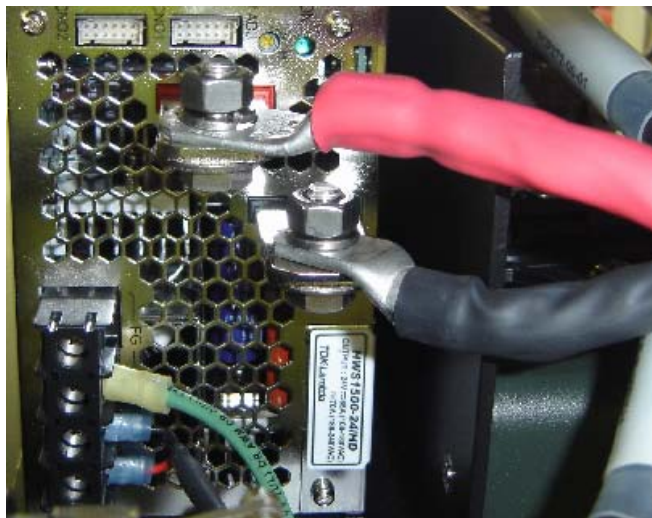


Figure 5 – PCP270-00-01 Cable connections

## 2.0 External DC Power Operation Setup:

2.3.1 Disconnect the PCP270-00-01 cable from the PDU input jack J3.

2.3.2 Connect PCP276-00-01 cable. The circular plug end connects to the input jack J3 of the PDU and the RED (positive) and BLACK (negative) ring lugs to the positive and negative output terminals of the external DC power source.



Figure 6 – PCP276-00-01 Connected to J3 on PDU

2.3.3 Connect the MIK-024A-360 cable to J1 on the AN/PRC-117F radio and the audio jack on the MRC-67A Amplified Speaker.

2.3.4 An optional method of connecting audio cables is to first connect the MRC67A-02 Dual Speaker Adapter to J1 on the AN/PRC-117F radio, then connect the MIK-024A-360 Cable to the speaker using one of the two audio connections on the dual speaker adapter. This allows for a second speaker or handset to be used.

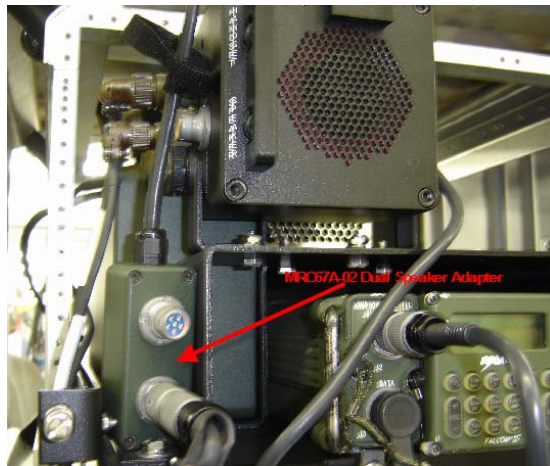


Figure 7 - MRC67A-02 Dual Speaker Adapter

- 2.3.5 Connect a radio handset or headset to the handset jack on the MRC-67A Amplified Speaker.
- 2.3.6 Ensure the MIK-023D-360 cable is connected to PDU output J5 and the DC power input jack on the MRC-67A Amplified Speaker.
- 2.3.7 Connect the BNC connector end of the MIK-1033D-048 RF cable to J9 on the AN/PRC-117F radio and the N connector end to the input of the MBA-100 Power Amplifier.
- 2.3.8 Connect one end of the MIK-1034D-240 to the output of the MBA-100 Power Amplifier and the other end to the SATCOM antenna.

**2.4 Operation:**

2.4.1 The MRC-67A speaker may be removed from the case by removing the two side thumb screws that secure the speaker to the mounting bracket. This allows remote operations of the OTMC system to up to 30 feet away from the case.

2.4.2 Move the manual reset lever on the 100 Amp breaker to the ON position.



Figure 8 – Circuit Breaker in ON position

- 2.4.3 Turn the function switch on the AN/PRC-117F to the desired mode of operation. Refer to the AN/PRC-117F Operators Manual for more detail operating instructions.
- 2.4.4 Turn the MBA-100 PA power switch to the ON position and select the desired mode of operation and power level. Refer to the MBA-100 Operational and Maintenance Manual for more detailed operating instructions.
- 2.4.5 Turn the Speaker power switch to the ON position and ensure that the GREEN LED illuminates.

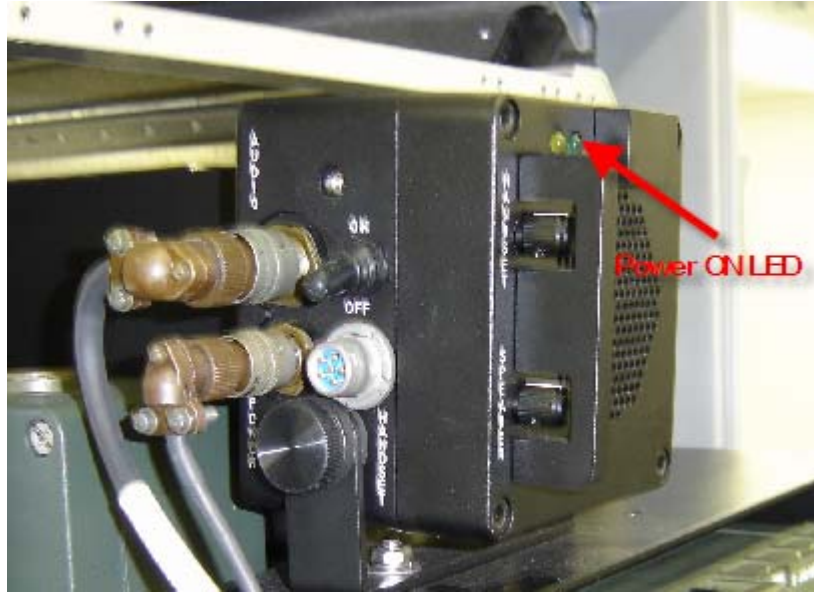


Figure 9 – Power ON LED

## **Chapter 3 – Maintenance and Warranty Information**

### **3.1 Preventive Maintenance**

All maintenance procedures should be in the subsequent sections.

### **3.2 Dirt and Dust**

All external components to the OTMC can be cleaned with a water dampened non-abrasive cloth and allowed to air dry or wipe dry with a clean dry non-abrasive cloth.

### **3.3 Oils and Grease**

All external components of the OTMC can be cleaned with a mild soap/water solution dampened non-abrasive cloth. Rinse with water dampened non-abrasive cloth and allowed to air dry or wipe dry with a clean dry non-abrasive cloth.

### **3.4 Corrective Maintenance**

The OTMC has **NO** user serviceable parts. Units requiring corrective maintenance should be sent to McDowell Research for repair. Contact information is provided below in section 3.6.

### 3.5 WARRANTY MAINTENANCE

#### Warranty Statement

**4 years for equipment shipped after May 1, 2004**  
**3 years for equipment shipped prior to May 1, 2004**

McDowell Research warrants to its customers that the products it manufactures and sells will be free from defects in materials and workmanship for a period of four (4) years for equipment shipped after May 1, 2004.

This warranty shall not apply to any defect, failure or damage caused by improper use or inadequate maintenance and care. McDowell shall not be obligated to provide service under this warranty to repair, service, or modify these products.

In order to obtain service under this warranty, customers must return a failed unit to McDowell with a description of the failure, contact information (in case questions arise and to speed up processing of guarantee claims) and finally a return shipping address. McDowell will return any failed unit at McDowell's cost.

**NOTE: THIS WARRANTY DOES NOT APPLY TO BATTERIES SUPPLIED BY MCDOWELL RESEARCH. ALL BATTERIES SUPPLIED BY MCDOWELL RESEARCH ARE WARRANTIED FOR 90 DAYS FROM SHIPMENT.**

### 3.2 Contact Information:

Please call (254) 752-1411 to obtain an RMA number then you may return any failed unit(s) to:

McDowell Research, an Ultralife Company  
300 South 8<sup>th</sup> Street  
Waco, Texas 76701  
Phone: (254) 752-1411  
Fax: (254) 752-1812

Online RMA requests can be located and submitted at:  
<http://www.mcdowellresearch.com/shop/RMArequest.asp> or  
[service@mcdowellresearch.com](mailto:service@mcdowellresearch.com)



## Appendix A

### OTMC Parts List

PART NUMBER	DESCRIPTION	CONTENTS		
		QUANTITY	PART NUMBER	DESCRIPTION
MRC105-10-01	BRACKET, MACHINED, ASSEMBLED	12	3035-01-0019	HW PEM, NUT, SF, FLSH, 1/4-20, .125-.155
		2	3035-01-0017	HW PEM,NUT,10-32,FLUSH, .091-UP
MRC105-10-02	MBA-100 BASE PLATE	-	-	-
MRC-105-10-05	SLIDING SHELF, MACHINED, ASSEMBLED	2	3035-01-0018	HW PEM, NUT, 6-32, FLUSH, .091-UP
		13	3035-01-0016	HW PEM, NUT, 6-32, FLUSH, .091-UP
		4	3035-01-0017	HW PEM, NUT, 10-32, FLUSH, .091-UP
		2	3035-01-0019	HW PEM, NUT, SF, FLSH, 1/4-20, .125-.155
MRC105-10-06	AC-DC PWR SUPPLY BRACKET	2	3035-01-0017	HW PEM, NUT, 10-32, FLUSH, .091-UP
MRC105-10-07	ENCL, BTM, MACHINED, POWDERCOAT	1	3200-02-0039	ENCL, BTM, 14.17 X 6.3X2.80, ALUM, RAW
		8	3035-02-0028	HW PEM, STUD, 10-32X1, SS
MRC105-18-02	MBA-100 BASE PLATE ASSEMBLY	4	3000-04-0044	SCREW, FLT HD, 1/4-28X.50, 100D, SS
		1	MRC105-10-02	MBA-100 BASE PLATE
		1	MBA100-00-00	MBA-100 TOP LEVEL ASSEMBLY
MRC105-18-03	SLIDING SHELF ASSEMBLY	7	3000-04-0009	SCREW, FLT HD, 4-40 X 5/8, 100CS, SS, BKOX
		1	RMT2-18-02	FRONT TIE DOWN BAR ASSEMBLY
		6	3000-04-0004	SCREW, FLT HD, 6-32 X 3/8, 100CS,SS, BKOX
		4	3000-04-0031	SCREW, FLT HD, 10-32 X 3/8, 100CS, SS
		1	MRC195-10-03	REAR SUPPORT
		1	MRC105-10-04	MRC-152 BRACKET
		1	MRC105-10-05	SLIDING SHELF, MACHINED, ASSEMBLED
MRC105-18-04	MAIN SHELF, BRACKET ASSEMBLY	1	MRC105-18-03	SLIDING SHELF ASSEMBLY
		5	3010-02-0025	WASHER, FLAT, SMALL, OD, 1/4", SS
		5	3010-04-0004	WASHER, LOCKING SPLIT, 1/4",SS
		5	3000-09-0006	BOLT, HEX, 1/4"-20 X 5/8", SS
		3	3000-04-0051	SCREW, FLT HD, 1/4 X 20 X 3/8, SS, 100D
		1	MRC105-10-01	BRACKET, MACHINED, ASSEMBLED
MRC105-18-06	AC/DC PWR SUPPLY BRACKET ASSEMBLY	2	3010-04-0006	WASHER, LOCKING, MED SPLIT, 5/16, SS
		2	3000-06-0005	NUT, HEX, FULL, 5/16-18, SS
		4	3000-04-0063	SCREW, FLT HD, M4 X 0.7 X 8MM, 90 DEG
		1	1155-01-004	POWER SUPPLY, AC-DC, HWS1500-24
		2	3000-09-0015	BOLT, HEX, 5/16-18 X .075"
		4	3010-02-0014	WASHER, FLAT, 5/16", SS
		1	MRC105-10-06	AC-DC POWER SUPPLY BRACKET
MRC105-18-07	PDU ASSEMBLY	2	MRC105-20-01	MRC-105 PDU JUMPER
		1	MS 3474W18-8P	CONN, GEN DUTY, JAM NUT, 8P, SIZE 18
		1	1120-19-0002	CIRCUIT BREAKER, SERIES 185, HI-AMP
		6	3000-01-0005	SCREW, PN HD, PH, 10-32 X 1", SS
		1	MS3474W18-8S	CONN, GEN DUTY, JAM NUT, 8S, SIZE 18
		3	M55181/4-01	CONN, POWER & AUDIO, JAM NUT, 4 PIN, F
		2	1100-12-0008	TERMINAL BLOCK, 10P, DBL ROW, 75A

## OTMC Parts List cont'd

		10	3000-06-0001	NUT, HEX, SS, 10-32
		10	3010-04-0007	WASHER, LOCKING, SPLIT, SS, #10
		12	3010-02-0006	WASHER, FLAT, SS, #10, .438 OD
		1	MRC105-10-07	ENCL, BTM, MACHINED, POWDERCOAT
MRC105-18-08	MAIN ASSEMBLY	1	MRC105-18-09	PDU WIRING ASSEMBLY
		1	MRC105-18-06	AC-DC PWR SUPPLY, BRACKET ASSEMBLY
		4	3010-02-0025	WASHER, FLT, SMALL OD, 1/4, SS
		4	3010-04-0004	WASHER, LOCKING, SPLIT, 1/4, SS
		4	3000-01-0037	SCREW, PN HD, 1/4-20 1/2", SS
		1	1112-02-0007	NOISE FILTER, MC1230
		2	3000-01-0030	SCREW, PN HD, PH, 8-32 X 1/2, SS, BLK OXD
		2	3010-04-0014	WASHER, LOCKING, SPLIT, SS, #8, BLK OXD
		1	3000-01-0041	SCREW, PN HD, PH, 6/32 X 5/16, SS
		1	3010-04-0003	WASHER, LOCKING, INT TOOTH, #6
		1	3010-02-0002	WASHER, FLAT, SS, #6, .306 OD, .025 THK
		8	3010-02-0006	WASHER, FLAT, SS, #10, .438 OD
		8	3000-01-0008	SCREW, PH HD, PH, 10-32 X 1, SS
		1	MRC105-18-04	MAIN SHELF, BRACKET ASSEMBLY
MRC105-18-09	PDU WIRING ASSEMBLY	20	1100-02-0022	TERM, RING, 8 AWG, #10 STUD, UNINS
		2	1100-02-0021	E HDWR, RING LUG, 1&2 GA, 1/2" STUD
		72"	1080-14-0000	WIRE, 14 AWG, BLK
		108"	1080-14-0002	WIRE, 14 AWG, RED
		1	MRC105-18-07	PDU ASSEMBLY
MRC105-20-01	MRC-105 PDU JUMPER			
MRC105-21-01	LABEL, SERIAL NUMBER	1	2500-02-0002	LABEL, LASER, GREY, 2" X 1.437"
MRC105-00-00	TOP LEVEL ASSEMBLY	1	MRC67A-002	DUAL SPEAKER ADAPTER
		1	MIK-1033D-048	RF CABLE TRANSMITTER TO AMPLIFIER W4
		1	PCP276-00-01	DC POWER CABLE
		1	PCP275-00-01	MC1230 NOISE FILTER GROUND
		1	PCP274-00-01	AC/DC POWER SUPPLY GROUND WIRE
		1	PCP273-00-01	AC/DC POWER CABLE
		1	MIK-1017H-026	AMP POWER CABLE, MBA-100.
		1	PCP270-00-01	PDU POWER CABLE
		1	PCP269-00-01	INT AC POWER CABLE
		1	MIK-023D-360	DC SPEAKER POWER CABLE
		1	MIK-024D-360	AUDIO CABLE, 360", W7
		1	MIK-1016G-036	POWER CABLE W6
		1	MIK-1034D-240	RF CABLE AMPLIFIER TO ANTENNA, 240", W5
		1	MRC99-1-00-01	TOP LEVEL ASSY, SPLIT TOP
		1	MRC105-18-08	MAIN ASSEMBLY
		1	MRC67A-00-00	MRC67A SPEAKER TOP LEVEL, ASSY, BLACK
		1	MRC105-18-02	MBA-100 BASE PLATE ASSEMBLY
		8	3010-02-0025	WASHER, FLAT, SMALL OD, 1/4", SS
		8	3010-04-0004	WASHER, LOCKING, SPLIT, 1/4", SS
		8	3000-01-0037	SCREW, PN HD, PH, 1/4-20 X 1/2", SS