

PRC132DBB

DUAL BATTERY BOX

TECHNICAL MANUAL

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LORAL
TerraCom

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TECHNICAL MANUAL

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1.0 GENERAL INFORMATION

This manual is the technical manual for the PRC132DBB Dual Battery Box. It includes information on the operation, installation and maintenance of the PRC132DBB. Information contained in this manual is organized in five sections: Section I General Information, Section II Installation, Section III Operation, Section IV Technical Description and Section V Maintenance.

1.1 GENERAL DESCRIPTION

The PRC132DBB is a dual long life battery box used with the RT-1648/PRC-132, the RT-1648(A) and the RT-1648(B) Transceivers of the AN/PRC-132 System. The PRC132DBB attaches to the back of the transceiver and supplies power for operation of the transceiver. The PRC132DBB holds two batteries, a semi-permanent BB-490 Lead Acid battery and a replaceable BA-5590 Lithium battery. The PRC132DBB operates the transceiver from the BB-490 Lead Acid battery while the BA-5590 Lithium battery is used to maintain the charge of the BB-490 battery. As 12 VDC batteries, the BB-490 has 3.6 Amp-hours of energy while the BA-5590 has 14.4 Amp-hours of energy. Not only does the BA-5590 have four times the energy, it only weighs approximately 1/2 as much as the BB-490, giving an overall energy to weight ratio advantage of approximately 7:1.

The advantage of the BB-490 battery is that it can provide the high peak currents required of the transceiver while transmitting, whereas the lithium battery is internally fused and can only provide a limited amount of current. By using the two batteries together, maximum transceiver performance is obtained while taking advantage of the high energy and low weight of the BA-5590 Lithium battery.

The PRC132DBB has a window with two indicators that show the state of charge of the BA-5590 Lithium battery.

The PRC132DBB also has an external charging connector for connection to external 12 or 24 VDC charging devices while it is attached to and operating the transceiver.

1.2 TECHNICAL CHARACTERISTICS

The technical characteristics of the PRC132DBB are listed in Table 1.2-1.

TABLE 1.2-1 TECHNICAL CHARACTERISTICS

GENERAL

Output Voltage to transceiver:	14.35 VDC nominal.
Input voltage for 24 VDC charging:	20 to 60 VDC.
Input current for 24 VDC charging:	1 amp typical, 3 amps maximum.
Input voltage for 12 VDC charging:	Per BB-490 specification.
Input current for 12 VDC charging:	Per BB-490 specification.

MECHANICAL

Size:	6.0 x 5.0 x 7.0 inches (15.25 x 12.7 x 17.8 cm).
Weight (without batteries):	3.9 pounds (1.74 kg).
Weight BB-490 battery:	4 pounds (1.82 kg) max.
Weight BA-5590 battery:	2.2 pounds (1.0 kg) max.

ENVIRONMENTAL

Low Temperature:	-30°C operating, -40°C storage per MIL-STD-810D, Method 502.2, Procedures I and II.
High Temperature:	+65°C operating, +85°C storage per MIL-STD-810D, Method 501.2, Procedures I and II.
Humidity:	MIL-STD-810D, Method 507.2, Procedures II and III.
Altitude:	MIL-STD-810D, Method 500.2, Procedure II and rapid descent.
Dust and Sand:	MIL-STD-810D, Method 510.2, Procedures I and II.
Salt Fog:	MIL-STD-810D, Method 509.2, Procedure I.
Fungus:	MIL-STD-810D, Method 508.3.
Immersion:	MIL-STD-810D, Method 512.2, Procedure I to 3 feet. 100 feet when attached to transceiver.
Vibration:	MIL-STD-810D, Method 514.3, Procedure II, Loose Cargo Bounce.
Shock (Drop):	MIL-STD-810D, Method 516.3, Procedure IV.
Shock (Bench Handling):	MIL-STD-810D, Method 516.3, Procedure VI.

1.3 STANDARD EQUIPMENT

PRC132DBB Dual Battery Box 457-0022-001
 Technical Manual 003-0535-001

1.4 STANDARD ACCESSORIES

A list of the standard charging accessories is given in Table 1.4-1.

**TABLE 1.4-1
 STANDARD CHARGING ACCESSORIES**

LORAL PART NUMBER	LORAL MODEL NUMBER	U.S. MILITARY NOMENCLATURE	DESCRIPTION
		BB-490/U	Lead Acid Battery
		BA-5590/U	Lithium Battery
993931-10	SC824B		AC Battery Charger, 12 VDC
131-0027-001	SC826		12/24 VDC Solar Power Unit
430-0058-001	SC792A		12 VDC Charging Adapter, Solar Power Unit
992136-00	SC806A	G-74/U	12/24 VDC Hand Crank Generator
430-0070-001	SC654		Tree Brace for G-74/U Hand Crank Generator
437-0049-001	SC790A		12 VDC Charging Adapter, Hand Crank Generator
		G-76A/G	24 VDC Hand Crank Generator
430-0046-001	SC792S		24 VDC Charging Adapter

2.0 INSTALLATION

This section of the manual contains information on the setup and use of the PRC132DBB.

2.1 TRANSCEIVER CONNECTION

Refer to Figure 2.1-1. The battery box provides power to the transceiver via a power connector that mates with an external connector located at the back of the transceiver. Connection is made automatically when the battery box is attached to the transceiver. The battery box is held onto the rear of the transceiver with latches attached to the transceiver housing.

To preserve battery life, the battery box is disconnected from the transceiver when not in use.

2.2 BATTERY INSTALLATION

The PRC132DBB holds one BB-490 Lead Acid battery and one BA-5590 Lithium battery. The batteries are installed by removing the top cover from the battery box housing. The top cover is held in place with two hand operated latches. Each battery must be installed in the correct location. A label is provided on the inside wall of the battery box indicating the correct position of the batteries. The battery connectors all also keyed to prevent incorrect installation. The connector for the BB-490 battery has four key way slots and the connector for the BA-5590 battery has five key way slots. The BB-490 may be physically installed in either location without damage but will not operate the transceiver if it is installed in the BA-5590 Lithium battery location. The BA-5590 will not physically fit nor will electrical connection be made to the BB-490 connector.

2.3 BATTERY CHARGING

Although the BB-490 Lead Acid battery is normally charged from the BA-5590 Lithium battery, several other battery charging accessories are available for connection to the PRC132DBB external charging connector.

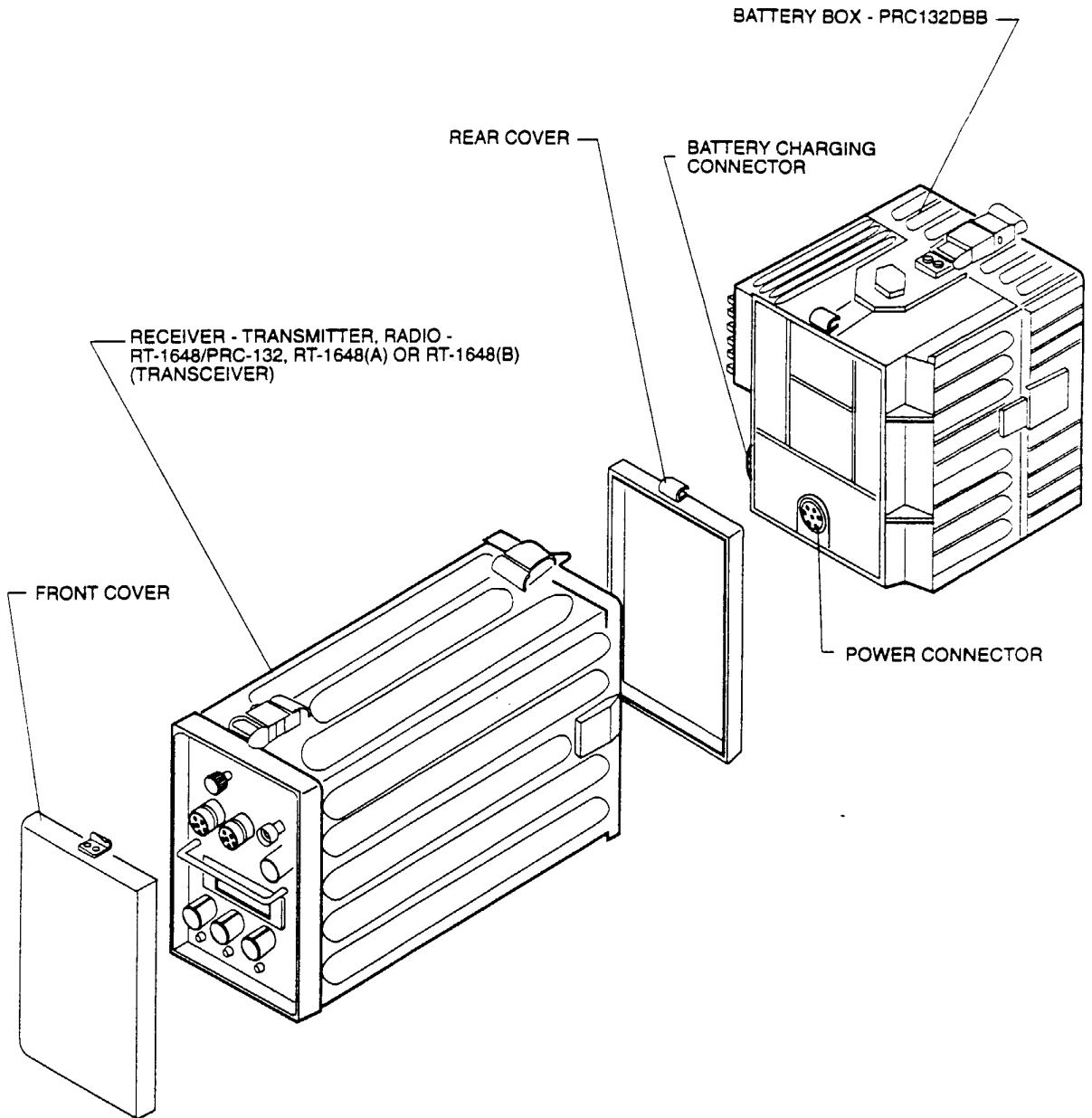


FIGURE 2.1-1. TRANSCEIVER/BATTERY BOX CONNECTION

2.3.1 SC824B AC BATTERY CHARGER

The SC824B AC Battery Charger operates from 110/220 VAC, 50/60 Hz and provides 12 VDC nominal for charging. A switch is provided behind a front panel door to select the proper AC voltage. The SC824B has four (4) cables for connection to the external charging connector on the PRC132DBB and can charge up to four (4) lead acid batteries simultaneously.

Battery boxes may be charged while attached to the radio. Lead acid batteries will reach full charge in approximately 20 hours. They may be left on the charger indefinitely without damage. It is recommended that lead acid batteries not in use be left on the charger to prevent self-discharge of the batteries.

Follow the steps below to charge from the SC824B AC Battery Charger.

1. Use the switch behind the door on the SC824B front panel to select the proper AC operating voltage (110 or 220 VAC)
2. Plug the SC824B AC power cord into the AC outlet.
3. Set the SC824B Battery Select Switch to the LEAD ACID position.

* WARNING *

To avoid damage to the battery being charged, it is necessary that the Battery Select Switch be set in the Lead Acid position.

4. Connect up to four (4) of the SC824B charging cables to the external charging connector on the PRC132DBB battery boxes.
5. Turn on the SC824B AC power switch.
6. Charge lead acid batteries for approximately 20 hours for full charge.
8. Continue to trickle charge until the battery is needed.

2.3.2 SC826 SOLAR POWER UNIT

The SC826 is a small, lightweight 12 VDC solar power unit capable of up to .68 Amp at 12 VDC in bright sunlight. The SC826 consists of five interconnected modules that fold together for easy carrying in a canvas pouch. It can be operated on a flat surface, and has stiffener rods to provide rigidity for self-supported stand-up operation. It may also be suspended from a backpack for operation during movement. The SC826 consists of 70 silicon solar cells connected in a series/parallel arrangement to provide adequate voltage for charging 12 VDC battery boxes. Four color-coded terminal wires permit easy connection to the SC792A Cable Adaptor. The SC792A Cable Adaptor is required for connection to the PRC132DBB external charging connector.

Follow the steps below to charge from the SC826 Solar Power Unit.

1. Remove the SC826 stiffener rods from the pouch pocket. Unfold the SC826 and use the rods to hold it in an open position.
2. Connect the SC826 for 12 VDC operation by tying the red and yellow leads together, and the blue and black leads together.

* **WARNING** *

The SC826 can be connected for either 12 VDC or 24 VDC operation. To avoid possible damage to the BB-490 Lead Acid battery under charge, it is important the SC826 be connected for 12 VDC operation only.

3. Connect the red and yellow leads to the red binding post of the SC792A.
4. Connect the blue and black leads to the black binding post of the SC792A.
5. Connect the SC792A connector to the PRC132DBB external charging connector.
6. Position the SC826 at a right angle to the sun.

7. Occasionally adjust the position of the SC826 as the sun moves across the sky. Charge time will vary with conditions, but should be less than 6 hours in bright sunlight.

2.3.3 SC806A HAND CRANK GENERATOR

The SC806A is a small, lightweight 12 VDC hand crank generator capable of 10 Watts at normal cranking speeds. The SC806A incorporates an alternator and full-wave silicon diode rectifier in a sealed, ruggedized aluminum case. It has two binding posts for wire connection and is supplied with approximately 30 feet of two-conductor wire. It can provide enough power to operate the radio in receive mode and charge batteries at the same time. Operation in low power transmit may also be possible depending upon the cranking speed. The SC790A Adapter Regulator is required for attachment to the PRC132DBB battery box. The SC806A is supplied with hardware to mount it to a stable surface suitable to support it during cranking operation.

 * WARNING *

The SC806A generates high unregulated voltages which can cause damage to the battery box or transceiver. Under normal charging conditions, the BB-490 battery being charged acts to regulate the SC806A output voltage to a level compatible with the transceiver input voltage. In order to fully protect the transceiver from damage under abnormal conditions the SC790A contains a regulator to prevent the potentially high SC806A output voltage from damaging a transceiver when the battery box is attached to the transceiver and the battery is missing or faulty. No other cable adapter should be substituted for the SC790A.

The SC654 Tree Brace Assembly is used for the temporary attachment of the SC806A Hand Crank Generator to a structure such as a tree, pole or mast. The SC654 provides a firm foundation for the SC806A during cranking and makes cranking easier for the operator. The SC654 consists of a rigid plate, a foldout brace, and an adjustable belt assembly with buckle. This combination allows the SC806A to be attached to objects with irregular shapes and up to 3 feet (1 m) in diameter.

Follow the steps below to charge from the SC806A Hand Crank Generator.

1. Use the wires provided with the SC806A to connect the binding posts on the SC806A to the binding posts on the SC790A (red-to-red and black-to-black).
2. Connect the SC790A connector to the PRC132DBB external charging connector.
3. Using the hardware supplied, mount the SC806A to a stable surface suitable to support it during cranking operation. Use the SC654 to temporarily attach the SC806A to a tree, pole or other object.
4. Turn the hand crank on the SC806A to charge the battery. The SC806A will supply a minimum of 8.0 watts at 12 VDC when the crank is turned at no more than 80 RPM. At this rate the charge time should be less than 6 hours. Charge time can be decreased by turning the crank faster.

2.3.4 G-76A/G HAND CRANK GENERATOR

The G-76A/G is a 24 VDC hand crank generator designed for operation with the PRC132DBB Battery Box. In its folded position, the generator can be transported in its own carrying bag by one person. Unfolded, the G-76A/G includes a tripod with three legs, an operator's seat and a mounting platform for the generator. The generator includes a built in voltage regulator and interface cable to the external charging connector of the battery box. The G-76A/G is capable of providing enough power to operate a radio in receive mode and charge batteries at the same time. Operation in low power transmit is also possible depending upon cranking speed.

Follow the steps below to charge from the G-76A/G Hand Crank Generator.

1. Unfold the G-76A/G Hand Crank Generator and stabilize it on a suitable surface.
2. Connect the G-76A/G charging cable between the G-76A/G and the PRC132DBB external charging connector.
3. Crank the G-76A/G handles at a relatively low speed for battery charging. The G-76A/G has two lights to indicate output voltage and current. The 24V light should be ON and the 2A light should be ON.

4. Charging time should be less than 6 hours. Due to the internal charge control circuitry in the battery box, charging time is relatively constant even at higher cranking speeds.

2.3.5 CHARGING ADAPTERS AND ADAPTOR/REGULATOR

Several charging adapters and an adaptor regulator are available for interface between charging accessories and the PRC132DBB. Charging adapters serve to adapt the output of the solar power units, hand crank generators, or other charging accessories to the charging input of the associated battery box. The adaptor/regulator serves this same purpose, and includes a voltage regulator to protect radio equipment from the unregulated output of hand crank generators.

The SC792A Adaptor Cable is used to interface the SC826 Solar Power Unit to the PRC132DBB Battery Box. The SC790A Adaptor/Regulator is used to interface the SC806A to PRC132DBB Battery Box.

In addition to the above, the SC792S is used to interface 24 VDC charging accessories to the external charging connector of the PRC132DBB. The SC792S includes color-coded binding posts (red-positive, black-negative) for connecting to a two-wire cable from the charging accessory. It also includes a connector that mates to the external charging connector on the battery box.

3.0 OPERATION

This section describes the operation of the PRC132DBB.

3.1 PREPARATION FOR USE

The PRC132DBB can be used with the transceiver with either a single BB-490 Lead Acid battery installed or with both the BB-490 and the BA-5590 Lithium battery installed.

The PRC132DBB cannot be used with only the BA-5590 Lithium battery installed.

The BB-490 should be fully charged prior to a mission. If a discharged BB-490 is installed in the PRC132DBB with a charged BA-5590 Lithium battery some time will be required before the BB-490 battery is capable of operating the transceiver in the high power transmit modes.

3.2 BATTERY CONDITION INDICATORS

The PRC132DBB includes indicators to indicate the status of the BA-5590 Lithium battery. Refer to Figure 3.2-1. Two indicators are included inside the PRC132DBB which can be viewed through the window in the side of the housing. One indicator is a green LED and the other is a meter. The LED is used for nighttime viewing and the meter is used for daytime viewing. The LED is illuminated and the meter face is all white whenever the BA-5590 Lithium battery has charge remaining.

When the BA-5590 is discharged the LED is OFF and the meter face is half white and half red. At this point the BA-5590 should be replaced with a new BA-5590.

In addition to these indicators, the RT-1648(B) Transceiver LCD can be used to read the battery voltage directly. The battery voltage read on the LCD indicates the state of charge of both the BA-5590 and the BB-490 batteries. When the BA-5590 is charging the BB-490, the battery voltage will read approximately 14.35 VDC. When the BA-5590 becomes discharged, the battery voltage indicated on the LCD will be the BB-490 battery voltage. The BB-490 voltage will start at 14.35 VDC and decrease down to 10 VDC as the battery becomes discharged.

NOTE

The battery voltage indication is available on the RT-1648(B) Transceiver only. The RT-1648/PRC-132 and the RT-1648(A) Transceivers do not have provisions for reading battery voltage.

When the indicators first show that the BA-5590 battery needs to be replaced, there will be enough energy in the BB-490 battery to continue to operate the transceiver for a reasonable period of time. The remaining operating time will depend on the how often the transceiver is used to transmit and the transmit power level but under normal use, or when operating in receive only, there should be several hours of operating time left.

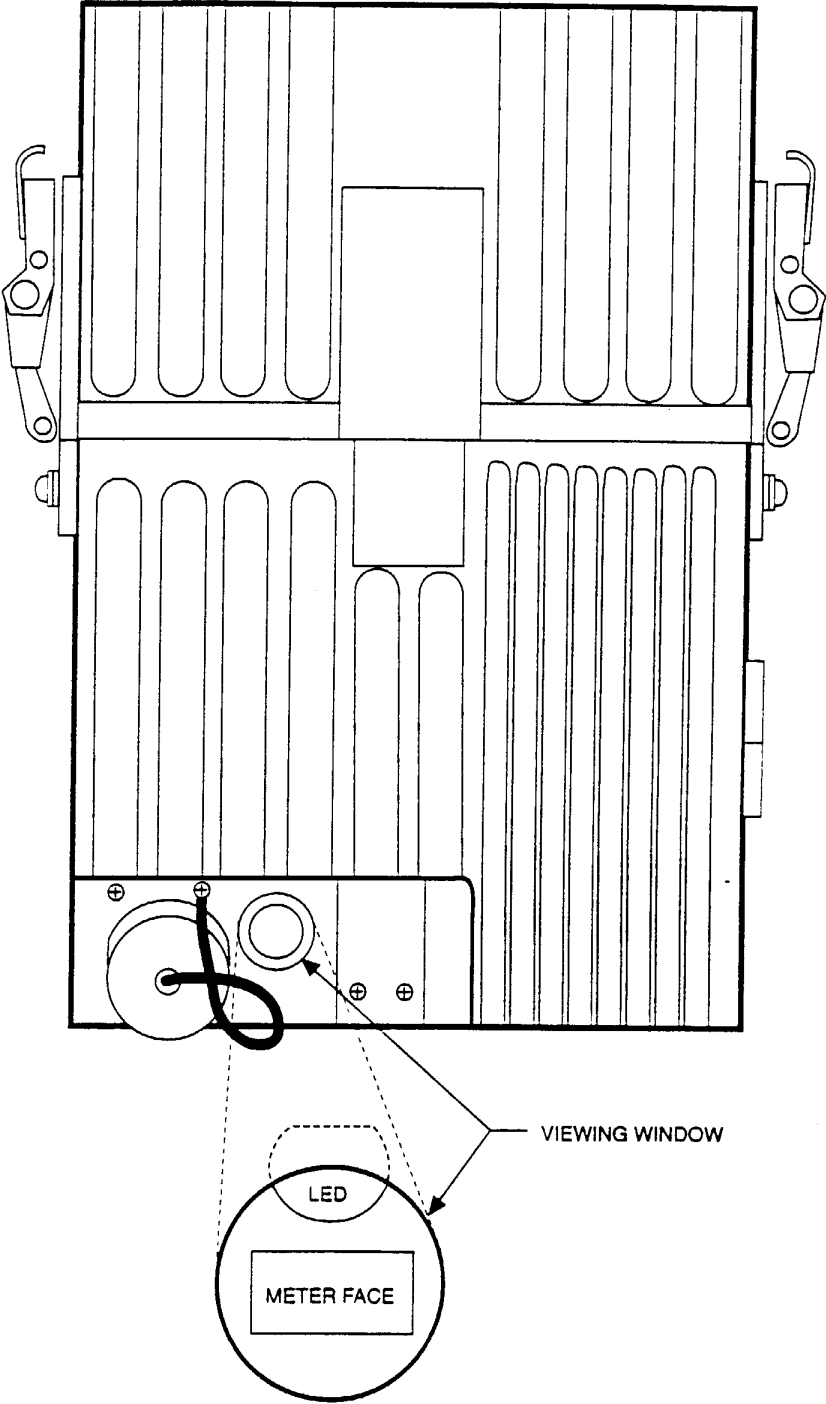


FIGURE 3.2-1. BATTERY CONDITION INDICATORS

4.0 TECHNICAL DESCRIPTION

4.1 INTRODUCTION

This section contains a description of the theory of operation for the PRC132DBB.

4.2 CIRCUIT DESCRIPTION

Refer to the schematic diagram. The BB-490 Lead Acid battery is connected to the battery box circuitry at the P1 connector. The BA-5590 Lithium battery is connected to the circuitry at the P2 connector. Both the BB-490 and the BA-5590 batteries consist of two 12 VDC batteries that can be connected in parallel for 12 VDC operation or in series for 24 VDC operation. When used in the PRC132DBB, the BB-490 battery is connected in parallel for 12 VDC operation and the BA-5590 battery is connected in series for 24 VDC operation in the PRC132DBB.

The connection from the battery box to the transceiver is at the J2 Radio connector. The BB-490 battery is used to provide power to the transceiver and is connected directly to this connector.

The BB-490 battery accepts charging current from one of three sources, 12 VDC charging accessories connected to the J1 Charging connector at pin E, 24 VDC charging accessories connected to the J1 Charging connector at pin D or the BA-5590 Lithium battery installed in the battery box.

12 VDC charging accessories are connected directly to the BB-490 through diode CR5. CR5 is used for reverse voltage protection.

24 VDC charging accessories are connected through reverse voltage protection diode CR1 to a voltage regulator consisting of A1A2U1 and its associated circuitry. A1A2U1 regulates the 24 VDC charging accessory input to a nominal 14.35 VDC (13.7 to 15.0 VDC) for input voltages from 20 to 60 VDC. A1A2U1 is an adjustable switching mode voltage regulator. The input of A1A2U1 is filtered by capacitor C1. The output of A1A2U1 is a rectangular waveform that is applied to the network consisting of inductor L1, diode CR3 and capacitor C2. This network along with the BB-490 battery filters the rectangular wave output of A1A2U1 to provide the regulated DC output for charging the BB-490. Feedback from the regulated DC output through voltage divider R2 and R1 provides the reference voltage for A1A2U1. Diode CR2 is the "catch" diode of the "buck" regulator and provides the current path through the load when the negative field of L1 collapses. The efficiency of the regulator circuitry exceeds 89%.

The BA-5590 Lithium battery also charges the BB-490 through A1A2U1 and its associated circuitry. The 24 VDC nominal output from the BA-5590 is routed through diode CR6 to the input of A1A2U1. CR6 prevents attempted charging of the BA-5590 from the external 20 to 60 VDC input.

The remaining circuitry is used to turn the charge indicators, M1 and DS1, and the A1A2U1 switching regulator on or off. The indicators are turned off when the BA-5590 voltage drops below approximately 16 VDC. The regulator is turned off if the BA-5590 voltage and the voltage at pin D of the J1 external charging connector drop below approximately 16 VDC. The indicators are turned on when the BA-5590 voltage increases above approximately 19 VDC. The regulator are controlled by the output of comparator U2A.

The remaining circuitry is used to control the state of charge indicators, M1 and DS1, and the A1A2U1 switching regulator. With a charged BA-5590 battery, the state of charge indicators are normally on with the current path through R9 and CR7. The state of charge indicators are turned off by turning off CR7, thereby opening the current path through M1 and DS1. CR7 is an adjustable shunt regulator that acts as a precision zener diode. CR7 is turned on whenever its reference voltage at the junction of CR7, R3 and R7 exceeds approximately 2.5 VDC. CR7 is turned off when the reference drops below approximately 2.5 VDC.

CR7 is also turned off whenever Q3 is turned on, thereby pulling the reference low. The state of Q3 is controlled by the output of comparator U2A at pin 1 through transistor inverter Q1. When the output of U2A is high, transistor Q1 is on, pulling the base of Q3 low, and thereby turning Q3 off. When the output of U2A goes low, Q1 is turned off and Q3 is turned on through R6 and R8, thereby turning CR7 off. The U2A comparator output will remain high, keeping the indicators and A1A2U1 switching regulator on, as long as the (+) input at pin 3 is higher than the (-) input at pin 2. The negative input at pin 2 is a regulated 10 VDC. The regulated 10 VDC is derived from either the voltage from external charging accessories connected at pin D of the J1 Charging connector or from the BA-5590 battery. The voltage first enters a series voltage regulator consisting of transistor Q2 and zener diode CR4. CR4 is a 36 VDC zener diode that prevents the voltage at the base of Q2 from exceeding approximately 36 VDC. The voltage at the emitter of Q2 is approximately 0.7 VDC lower than the base voltage and is regulated to 10 VDC by series regulator U1. The output of comparator U2A goes low when the (+) input falls below the 10 VDC reference. The (+) input is also derived from either the voltage from the external charging input at pin D of the J1 charging connector or the BA-5590 battery. This voltage is divided by resistors R4 and R5 so that approximately 19 VDC from either source equals 10 VDC at the (+) input.

The A1A2U1 switching regulator is controlled by the input at pin 5. This input is pulled low through Q1 and the regulator is on when the comparator output is high. When the comparator output goes low, Q1 is turned off and pin 5 of the regulator is pulled high through R6, thereby shutting the regulator off.

5.0 MAINTENANCE

This section contains maintenance information for the PRC132DBB Dual Battery Box.

5.1 SCHEDULED AND PREVENTIVE MAINTENANCE

There is no scheduled maintenance for the PRC132DBB. The only preventive maintenance is cleaning exterior surfaces and connectors and visual inspection to ensure that all visible seals and gaskets are not damaged.

5.2 CORRECTIVE MAINTENANCE

Disassembly and assembly information is provided for the PRC132DBB. The unit should only be disassembled to the extent necessary to accomplish the necessary repair. No special tools are required for disassembly.

5.3 DISASSEMBLY

All PRC132DBB circuitry is located on a PWB frame assembly. Refer to the appropriate assembly drawing and the steps below for access to this circuitry.

1. Remove the battery box cover.
2. Remove batteries if installed.
3. Remove 6 screws and washers from the PWB frame assembly.
4. Grasp the P1 or P2 battery connector and carefully lift the PWB frame assembly from the battery box and rotate it 90 degrees to gain access to the circuitry.

5.4 ASSEMBLY

Assemble the battery box in the reverse order of disassembly.

5.5 DOCUMENTATION

The following pages include parts lists, assembly drawings and schematic for the PRC132DBB.

6.0 DOCUMENTATION

Parts lists and drawings are provided to reflect the applicable module/PCB configuration purchased. Non-applicable drawing sheets are not provided.

<u>DRAWING #</u>	<u>DESCRIPTION</u>
457-0022-001 Sht. 1	PRC132DBB - LB Dual Battery Box Extended Life, BB-490
430-0079-001 Sht. 1, 2	AN/PRC132 Dual Battery Box Housing Assy
452-0049-001 Sht. 1, 2	CCA, Charge Control

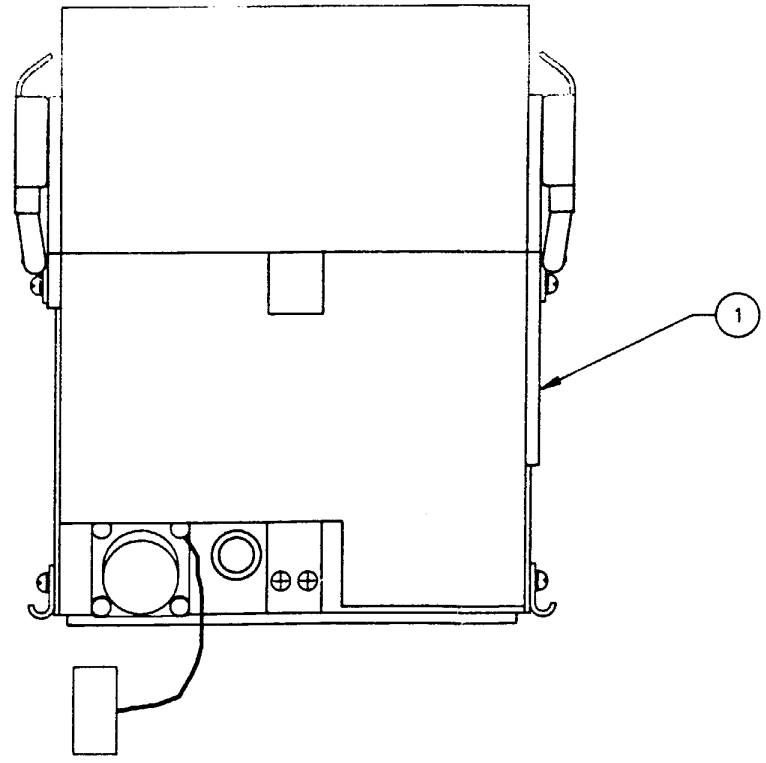
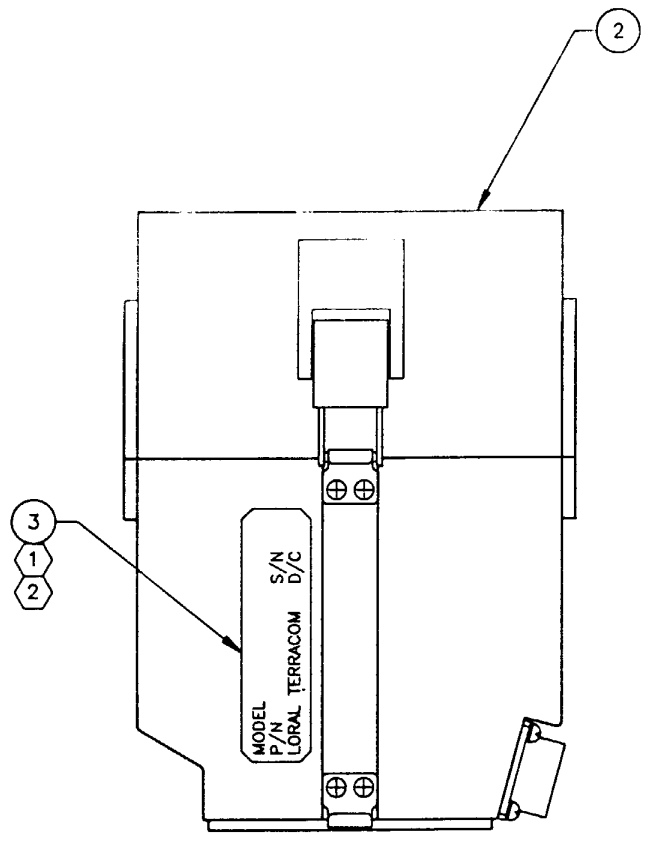
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8 7 6 5 4 3 2 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS					
ZONE/REV	DESCRIPTION	DFTR	CHK	DATE	APPROVED
A	INITIAL RELEASE PER DCN 32516	MOYER	WJC	2/6/94	[Signature]

- ① IDENTIFY PER SPEC NO. 16000932 WITH STOCK NO., SERIAL NO., AND LATEST REV LTR, USING LABEL (ITEM 3).
- ② CLEAN SURFACE THOROUGHLY PRIOR TO INSTALLING LABEL (ITEM 3) TO ENSURE PROPER ADHESION.



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USED ON	NEXT ASSY
	457-0022-001

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
TOLERANCES	
LINEAR	ANGULAR
XX = .01	= 0° 30'
XXX = .008	
ALL MACHINED SURFACES ✓	
MATERIAL	

CONTRACT NUMBER		 <small>TerraCom 1070 Babcock Ave San Diego CA 92123</small>
DRAWN BY	R. MOYER 1/94	
CHECK BY	CASTLEMAN 2/94	PRC132DBB-LB, DUAL BATTERY BOX, EXTENDED LIFE, BB-490
DESIGNER	R. MOYER 1/94	
MECH ENG		
ELECT ENG	D. FRIESTER 2/94	
PROJECT RELEASE		SIZE
DESIGN ACTIVITY APPROVAL		CAGE CODE
DESIGN APPROVAL		DRAWING NUMBER
		REV
		SCALE 1/1
		SHEET 1 OF 1

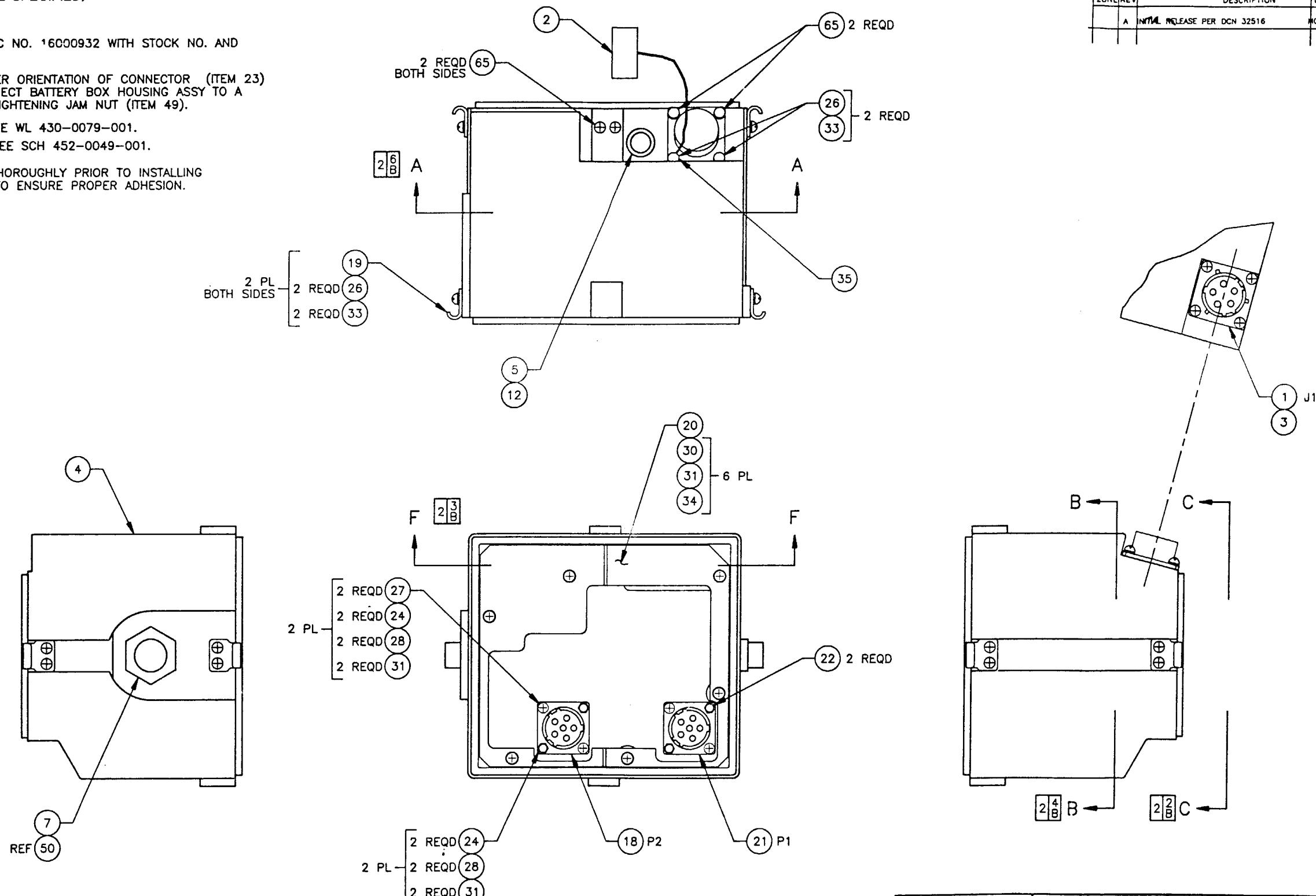
457-0022-001 A

8 7 6 5 4 3 2 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. IDENTIFY PER SPEC NO. 16000932 WITH STOCK NO. AND LATEST REV LTR.
2. TO ENSURE PROPER ORIENTATION OF CONNECTOR (ITEM 23) IN HOUSING, CONNECT BATTERY BOX HOUSING ASSY TO A RADIO PRIOR TO TIGHTENING JAM NUT (ITEM 49).
3. FOR WIRE LIST, SEE WL 430-0079-001.
4. FOR SCHEMATIC, SEE SCH 452-0049-001.
5. CLEAN SURFACE THOROUGHLY PRIOR TO INSTALLING LABEL (ITEM 64) TO ENSURE PROPER ADHESION.

REVISIONS					
ZONE/REV	DESCRIPTION	DFTR	CHK	DATE	APPROVED
A	INITIAL RELEASE PER DCN 32516	MOYER	62	2/1-4	ML



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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NUMBER		 LORAL 1020 Barona Ave San Diego CA 92123	
TOLERANCES		DRAWN BY B. MOYER 1/84			
LINEAR XX ± .01 XXX ± .005	ANGULAR = 0° 30'	CHECK BY	DESIGNER B. MOYER 1/84	AN/PRC132 DUAL BATTERY BOX HOUSING ASSY	
ALL MACHINED SURFACES ✓		ELECT ENG D. FRESTON 2/84		SIZE CAGE CODE DRAWING NUMBER REV D 54296 430-0079-001 A	
MATERIAL		DESIGN ACTIVITY APPROVAL		SCALE 1/1 SHEET 1 OF 2	
USED ON		DESIGN APPROVAL		LMC098	
NEXT ASSY					

430-0079-001 A

8

7

6

5

4

3

2

1

D

C

B

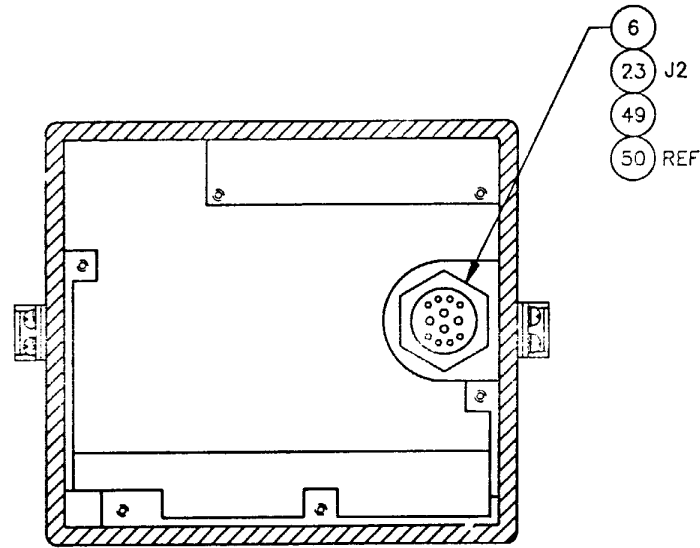
A

D

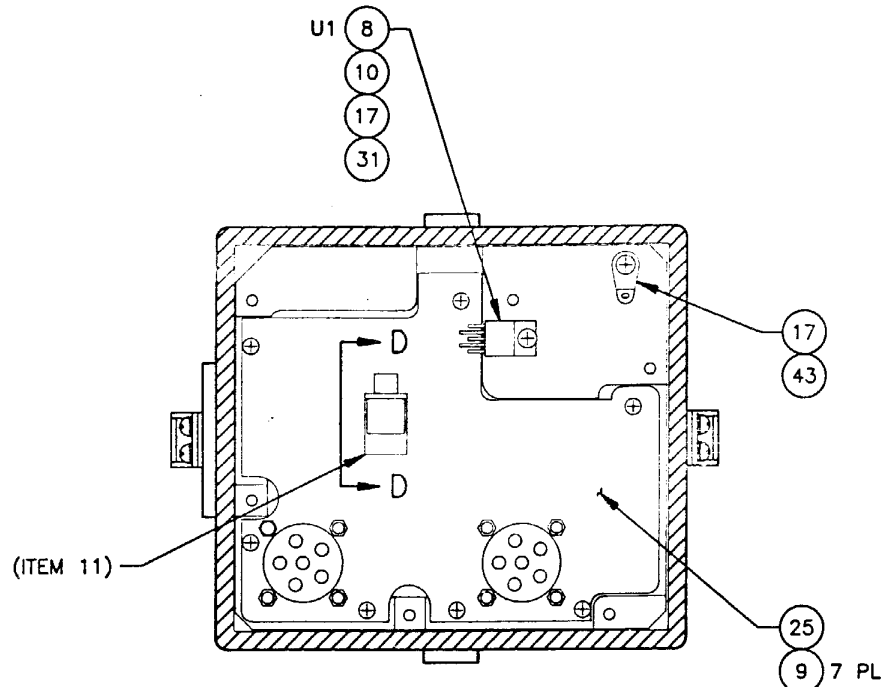
C

B

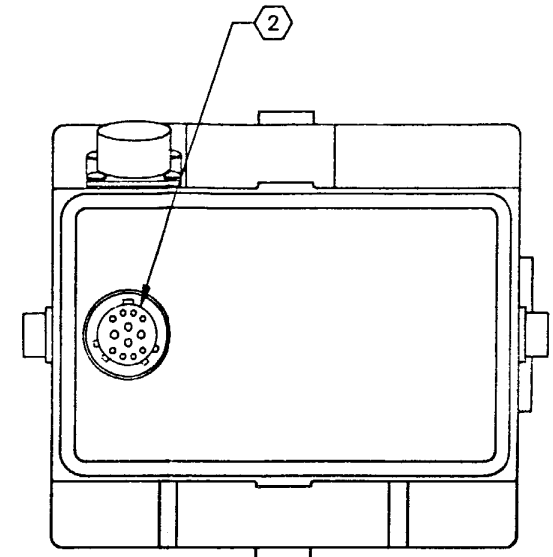
A



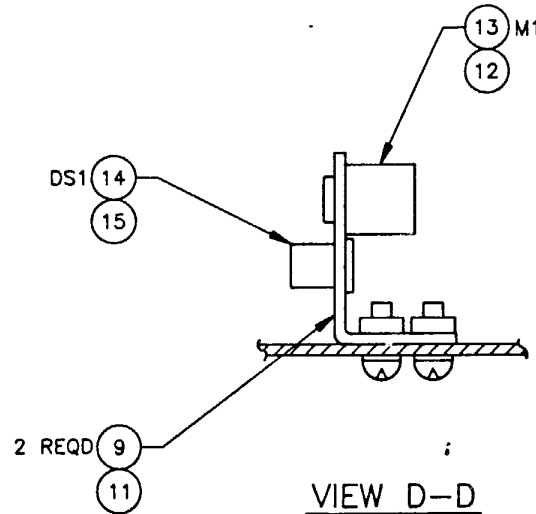
SECTION A-A 1/8



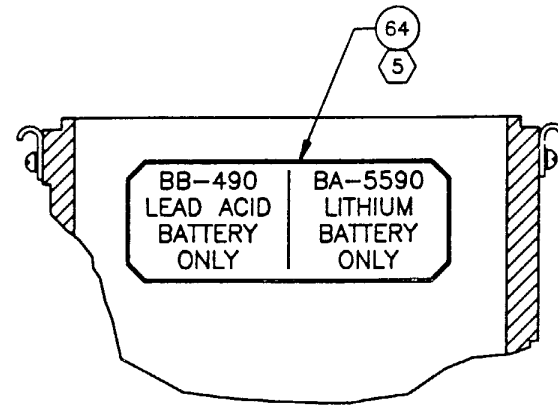
SECTION B-B 1/8



SECTION C-C 1/8



VIEW D-D
SCALE: 2/1



VIEW F-F 1/5

430-0079-001 A

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SCALE 1/1						SHEET 2 OF 2	

8

7

6

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1

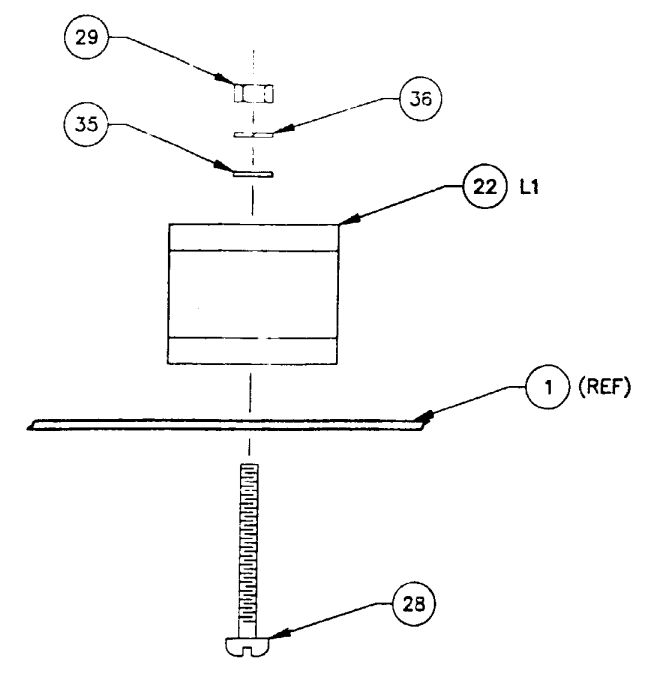
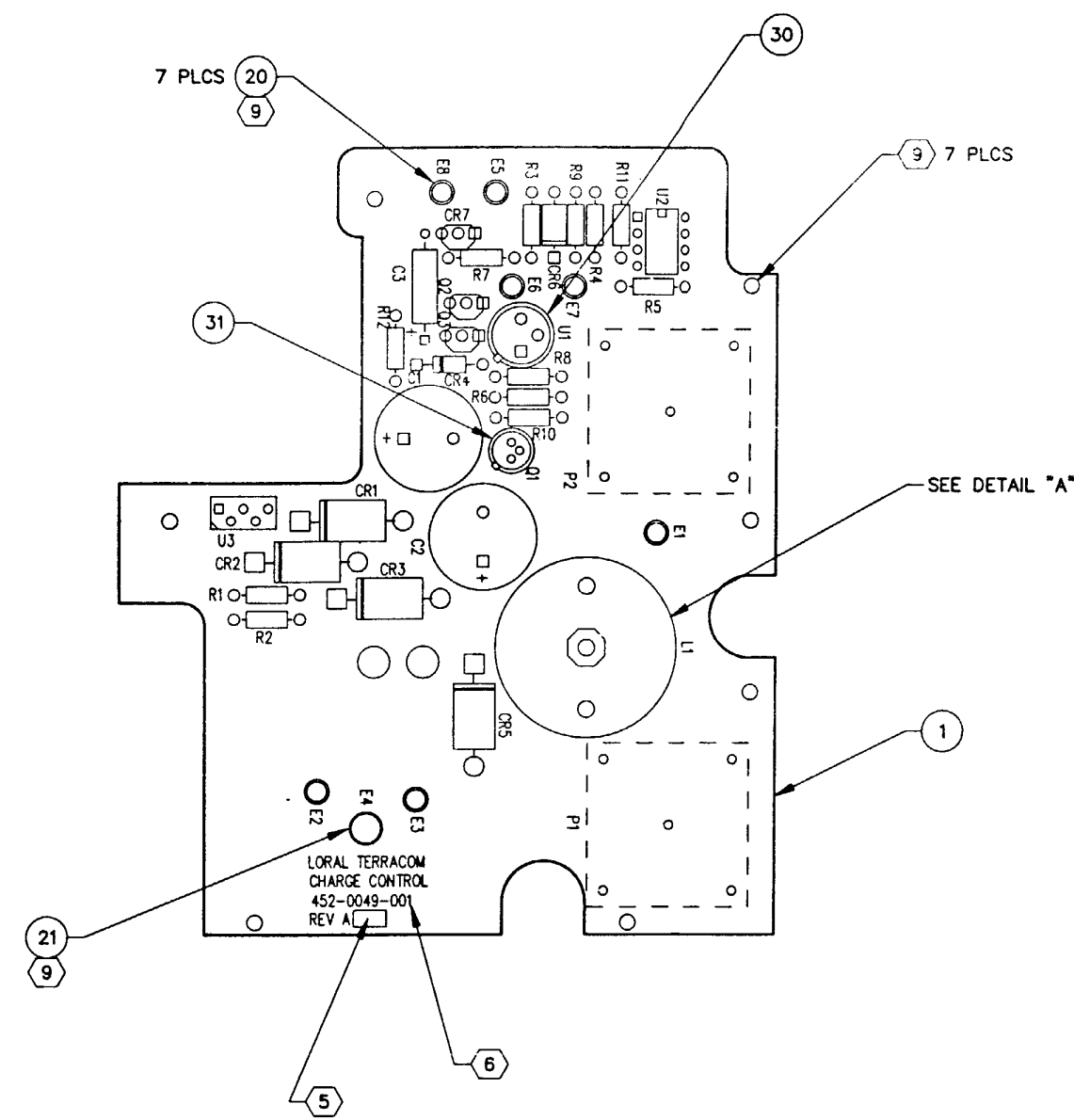
LMC08B

8 7 6 5 4 3 2 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. RESISTOR VALUES ARE SPECIFIED IN OHMS AND ARE IN 1/BW, +/- 2%
2. CAPACITOR VALUES ARE SPECIFIED IN PICOFARADS WHEN REPRESENTED BY WHOLE NUMBERS, AND IN MICROFARADS WHEN REPRESENTED BY DECIMALS.
3. INDUCTOR VALUES ARE SPECIFIED IN MICROHENRIES.
4. SQUARE PADS INDICATE PIN 1 OF INTEGRATED CIRCUITS, RESISTOR NETWORKS AND CONNECTORS, CATHODES OF DIODES, POSITIVE SIDE OF POLARIZED CAPACITORS AND EMITTERS OF TRANSISTORS.
5. IDENTIFY WITH LATEST REVISION.
6. IDENTIFY WITH OPTION NUMBER.
7. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LORAL TERRACOM STANDARD WORKMANSHIP MANUAL.
8. TRIM LEADS ON CIRCUIT SIDE OF BOARD SUCH THAT THE MAXIMUM PROTRUSION OF LEADS, AS MEASURED FROM THE SURFACE OF THE CIRCUIT SIDE OF THE BOARD, DOES NOT EXCEED .050 INCHES.
9. CONFORMAL COAT USING ITEM 32. DO NOT COAT TERMINALS E1-8 AND MOUNTING PADS.

REVISIONS						
ZONE	REV	DESCRIPTION	DFTR	CHK	DATE	APPROVED
A		ENG. REL FER DCN 31995	SRM	DL	9-2-73	[Signature]



DETAIL "A"
NOT TO SCALE

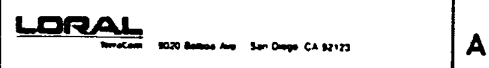
#HIGHEST REF. DES. USED			REF. DES. NOT USED		
CJ	L1	S-			
CR7	P2	U2			
E8	Q3	Y-			
J-	R12				

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PRC-132	
USED ON	NEXT ASSY

UNLESS OTHERWISE SPECIFIED		CONTRACT NUMBER	
DIMENSIONS ARE IN INCHES			
TOLERANCES			
LINEAR	ANGULAR	DRAWN BY	S.MOYES 9/93
XX = .01	= 0° 30'	CHECK BY	D.COSTELLO 9/93
XXX = .008		DESIGNER	JOHN A. 9/93
ALL MACHINED SURFACES		MECH ENG	
SURFACES		ELECT ENG	D.FENSTER 10/93
MATERIAL		PROJECT RELEASE	
		DESIGN ACTIVITY APPROVAL	
		DESIGN APPROVAL	

DISK DATA ON FILE
SEE SEPARATE PARTS LIST(S)

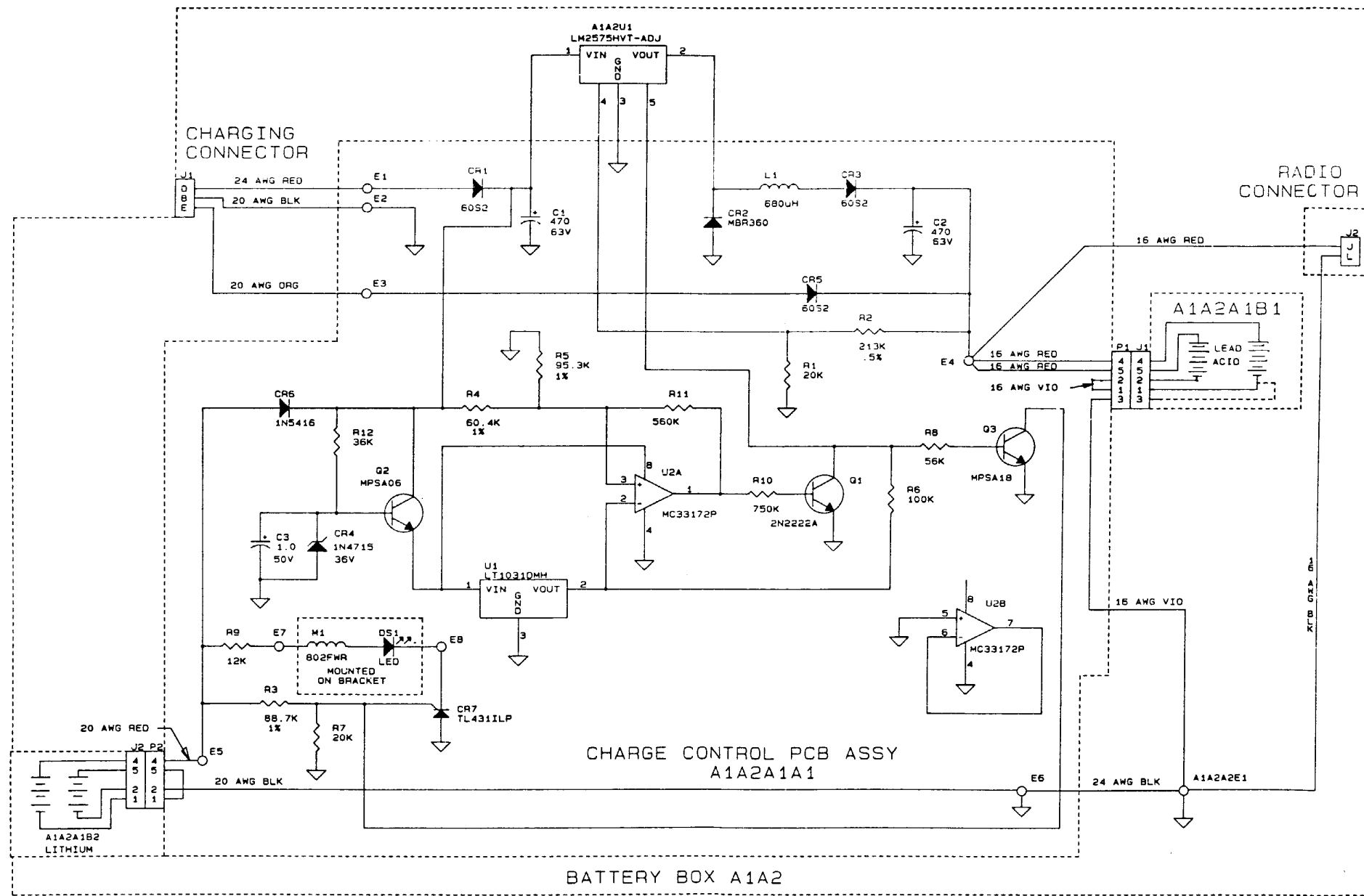


CIRCUIT CARD ASSEMBLY- CHARGE CONTROL			
SIZE	CAGE CODE	DRAWING NUMBER	REV
D	54296	452-0049-001	A
SCALE 2/1	SHEET 1 OF 2		LSC048

8 7 6 5 4 3 2 1

D
C
B
A
452-0049-001 A

8 7 6 5 4 3 2 1



CHARGE CONTROL

D
C
B
A

452-0049-001

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SIZE	CAGE CODE	DRAWING NUMBER	REV
D	54296	452-0049-001	A
SCALE	NONE	SHEET 2 OF 2	

8 7 6 5 4 3 2 1

PARTS LIST

FORM NO: K006/81/PPL
 DATE : 17 FEB 1994
 PAGE 1 OF 1 PAGE(S)

EQUIPMENT : PRC132DBB-LB, DUAL BATT BOX, EXTENDED LIFE, BB-490 RECHARGE
 PART NO. : 457-0022-001 REV NO.: A
 MANUFACTURER : LORAL TERRACOM, INC.

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	PRC132DBB-LB, DUAL BATT BOX, EXTENDED LIFE, BB-490 RECHARGE **** CONSISTS OF: ****			457-0022-001
	AN/PRC132DBB, HOUSING ASSY	(1)	1	430-0079-001
	AN/PRC-132 BATTERY BOX COVER ASSY (A3155282)	(2)	1	994530-10
	LABEL, GENERAL, MODEL, S/N, P/N	(3)	1	403-0038-001
	MANUAL, PRC132DBB DUAL BATTERY BOX	(4)	1	003-0535-001

PARTS LIST

EQUIPMENT : AN/PRC-132 BATTERY BOX COVER ASSY (A3155282)
 PART NO. : 994530-10 REV NO.: 06
 MANUFACTURER : LORAL TERRACOM, INC.

FORM NO: K006/81/PPL
 DATE : 17 FEB 1994
 PAGE 1 OF 1 PAGE(S)

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	AN/PRC-132 BATTERY BOX COVER ASSY (A3155282)			994530-10
	**** CONSISTS OF: ****			
	COVER, BATTERY, MACHINING	(1)	1	426-0011-001
	LATCH SOHFRAD	(3)	2	821997-01
	PACKING, PREFORMED, O-RING, ID 5.987 (MS29513C)	(4)	1	158-0103-001
	SCREW, MACHINE, PAN HEAD, CRES, BLACK, PHILLIPS, 4-40 X 5/16 UNC-2A, MS51957	(5)	4	117-0336-114
	PAD, RUBBER	(6)	4	119-1029-001
	WASHER, SPLIT/LOCK, #4, CRES, BLACK, MS35338	(7)	4	116-0110-008
	SILICON COMPOUND, NATO CODE NO. S-736, MIL-S-8660	(8)	REF	004-0105-001
	ADHES.CYANOACRYLATE, RAPID ROOM-TEMP CURING,SOLVENTLESS, MIL-A-46050	(9)	REF	004-0106-001

PARTS LIST

FORM NO: K006/81/PPL

DATE : 17 FEB 1994

PAGE 1 OF 2 PAGE(S)

EQUIPMENT : AN/PRC132DBB, HOUSING ASSY
 PART NO. : 430-0079-001 REV NO.: A
 MANUFACTURER : LORAL TERRACOM, INC.

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	AN/PRC132DBB, HOUSING ASSY			430-0079-001
	**** CONSISTS OF: ****			
	LED, GREEN, HIGH PERFORMANCE	DS1	1	132-0100-001
	CONNECTOR, RECPT, SERIES 1, FLANGE,	J1	1	121-0583-001
	BAYONET, SOLDER CONTACT, MS3112G			
	CONNECTOR, PT05A-14-12S	J2	1	121-0552-001
	INDICATOR, ELECTRO-MECHANICAL	M1	1	131-0348-001
	CONNECTOR, PLUG FOR BB-590	P1	1	121-0757-001
	CONNECTOR, BATTERY SM-D-687888	P2	1	121-0582-001
	IC, SWITCHING REGULATOR, 1A, 60V,	U1	1	102-0851-001
	BUCK CONFIGURATION, T0-220			
	COVER, PROTECTIVE, RECEPTACLE,	(2)	1	126-0189-001
	BAYONET COUPLING, MS3181F			
	GASKET, RUBBER	(3)	1	158-0079
	BOX, MACHINED, BATTERY, PRC132DBB	(4)	1	445-0070-001
	LENS, INDICATOR, PRC132DBB	(5)	1	119-1325-001
	PACKING, PREFORMED, O-RING ID .801	(6)	1	158-0102-001
	(MS29513C)			
	VALVE, PRESSURE RELIEF (100 FT)	(7)	1	119-1012-001
	SCREW, SEMS 2-56X3/16 CRES	(9)	9	810228-00
	WASHER, STEEL #6 RECTANGULAR	(10)	1	812063-00
	BRACKET INDICATOR PRC132DBB	(11)	1	445-0068-001
	ADHESIVE, STRUCTURAL TUBE KIT	(12)	REF	004-0040
5980-25-138-2709	LED, LENS ADPTR-RND, T-1 3/4, GRN	(15)	1	132-0066-002
	WIRE, MIL-W-22759/16, 24 AWG,	(16)	0.56	137-1061-007
	WHT/RED			
	SCREW, PH PHL 4-40 X3/8 CRES	(17)	2	810525-00
	STRIKE, BATT BOX	(19)	4	821998-01
	FRAME, PWB, PRC132DBB	(20)	1	445-0069-001
	GUIDE PIN FOR HERMETIC RECEPTACLE	(22)	2	119-1331-001
	NUT, SMALL HEX, MACH SCREW, CRES	(24)	8	118-0099-002
	NO 4			
	CIRCUIT CARD ASSY, BATTERY BOX,	(25)	1	452-0049-001
	PRC132DBB			
	SCREW, MACHINE, PAN HEAD, CRES,	(26)	10	117-0336-114
	BLACK, PHILLIPS, 4-40 X 5/16			
	UNC-2A, MS51957			
	SCREW MACH 4-40 X 5/16 P-SS-PL	(27)	4	117-0035
	WASHER, FLAT-REDUCED OUTSIDE	(28)	8	116-0111-008
	DIAMETER, #4, NAS620C			
	WASHER, FLAT-REDUCED OUTSIDE	(30)	6	116-0111-002
	DIAMETER, NO. 4 (NAS620)			
	WASHER, SPLIT/LOCK, #4, CRES	(31)	15	116-0110-002
	MS35338H			
	WASHER, SPLIT/LOCK, #4, CRES,	(33)	10	116-0110-008
	BLACK, MS35338			

PARTS LIST

FORM NO: K006/81/PPL

DATE : 17 FEB 1994

PAGE 2 OF 2 PAGE(S)

EQUIPMENT : AN/PRC132DBB, HOUSING ASSY
 PART NO. : 430-0079-001 REV NO.: A
 MANUFACTURER : LORAL TERRACOM, INC.

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	SCREW, MACHINE-PAN HEAD, CROSS RECESSED , CRES, UNC-2A, 4-40 X 5/8	(34)	6	117-0336-018
	WASHER, FLAT, REDUCED OUTSIDE DIAMETER, #4 BLACK OXIDE	(35)	1	116-0111-009
	LUG, SOLDER, #4 STUD , 2 HOLE, MIL-T-15659	(43)	1	119-1049-001
	WIRE, MIL-W-22759/16 , 24 AWG, BLACK	(44)	0.5	137-1061-001
	WIRE, MIL-W-22759/16 , 24 AWG, RED	(45)	0.6	137-1061-002
	WIRE, QPL, #20 AWG (19 X 32), BLK, MIL-W-22759/16	(48)	1.29	137-1039-001
	NUT, CONNECTOR, JAM	(49)	1	119-0995-001
	LUBRICANT, SUPER-O- LUBE, 4 OZ TUBE	(50)	REF	004-0097-001
	WIRE, QPL, #20 AWG (19 X 32), RED, MIL-W-22759/16	(51)	0.35	137-1039-003
	WIRE, QPL, #20 AWG (19 X 32), ORN, MIL-W-22759/16	(52)	0.67	137-1039-004
	WIRE, QPL, #16 AWG (19 X 29), RED, MIL-W-22759/16	(54)	1.33	137-1038-003
	WIRE, QPL, #16 AWG (19 X 29), BLK, MIL-W-22759/16	(55)	0.83	137-1038-001
	WIRE, MIL-W-22759/16 , 16 AWG, VIOLET	(56)	0.79	137-1060-001
	INSULATION SLEEVING, ELECTRICAL, HEAT SHRINKABLE, 1/16 IN.	(59)	0.5	138-0095-001
	INSULATION SLEEVING, ELECTRICAL, HEAT SHRINKABLE, 3/32 IN.	(60)	0.3	138-0096-001
	INSULATION SLEEVING, ELECTRICAL, HEAT SHRINKABLE, 1/8 IN.	(61)	1	138-0097-001
	STRAP, TIE DOWN, SELF CLINCHING, PLASTIC, TYPE 1, CL 1 PER MIL-S-23190	(63)	7	119-1104-001
	LABEL, BATTERY LOCATION	(64)	1	003-0536-001
	SCR, PH PHL 4-40 X 1/4, BLK SEALING	(65)	6	810544-00

PARTS LIST

FORM NO: K006/81/PPL
 DATE : 17 FEB 1994
 PAGE 1 OF 2 PAGE(S)

EQUIPMENT : CIRCUIT CARD ASSY, BATTERY BOX, PRC132DBB
 PART NO. : 452-0049-001 REV NO.: C
 MANUFACTURER : LORAL TERRACOM, INC.

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	CIRCUIT CARD ASSY, BATTERY BOX, PRC132DBB			452-0049-001
	**** CONSISTS OF: ****			
	CAPACITOR, 470uF, 63V, LOW ESR	C1,2	2	104-0149-001
	CAPACITOR, QPL, ELECTROLYTIC, 1.0 UF, 50V, MIL-C-39003/1	C3	1	104-0141-001
	DIODE, 6A, 200V, AXIAL- LEAD SILICON RECTIFIER	CR1,3,5	3	420032-00
	DIODE, SCHOTTKY, 3A, 60V	CR2	1	100-0232-001
	DIODE, ZENER, 36V, 250mW	CR4	1	100-0231-001
	DIODE, POWER RECTIFIER, FAST RECOVERY, MIL-S-19500/411D	CR6	1	100-0207-001
	ADJUSTABLE PRECISION SHUNT REGULATOR	CR7	1	102-0881-001
	INDUCTOR, 680uH	L1	1	106-0571-001
	TRANSISTOR, SILICON 2N2222A	Q1	1	440052-00
	TRANSISTOR, NPN SILICON	Q2	1	440041-00
	TRANSISTOR, NPN	Q3	1	440071-00
	RES, MF-20K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R1,7	2	111-1001-038
	RESISTOR, METAL FILM, 750K OHM, +/- 2%, 1/8W, MIL-R-39017/5J	R10	1	111-1001-011
	RES, MF-560K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R11	1	111-1001-049
	RES, MF-36K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R12	1	111-1000-363
	RESISTOR, MF - 213K, 1/20W, +/- .5%, MIL-R-55182/7	R2	1	114-0307-023
	RES, MF-88.7K OHM +/- 1%, 1/8W, MIL-R-39017/5J	R3	1	111-1001-056
	RES, MF-60.4K OHM +/- 1%, 1/8W, MIL-R-39017/5J	R4	1	111-1001-055
	RES, MF-95.3K OHM +/- 1%, 1/8W, MIL-R-39017/5J	R5	1	111-1001-026
	RES, MF-100K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R6	1	111-1000-104
	RES, MF-56K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R8	1	111-1000-563
	RES, MF-12K OHM +/- 2%, 1/8W, MIL-R-39017/5J	R9	1	111-1000-123
	TERMINAL, TURRET MIL-T-55155/30A	REF E1-3,5-8	7	119-1019-001
	TERMINAL, STUD (NONINSULATED), STYLE SE12	REF E4	1	119-1092-001
	IC, PRECISION 10 VOLT REFERENCE	U1	1	102-0828-001
	IC, DUAL OP-AMP, LOW POWER, SINGLE SUPPLY, MC33172P	U2	1	102-0824-001

PARTS LIST

EQUIPMENT : CIRCUIT CARD ASSY, BATTERY BOX, PRC132DBB
 PART NO. : 452-0049-001 REV NO.: C
 MANUFACTURER : LORAL TERRACOM, INC.

FORM NO: K006/81/PPL
 DATE : 17 FEB 1994
 PAGE 2 OF 2 PAGE(S)

EQUIPMENT CODE:

NSN	DESCRIPTION	SCHEMATIC REF.	QTY	TERRACOM PART-NO.
	PWB, BATTERY BOX, PRC132DBB	(1)	1	453-0049-000
	SCREW, MACHINE - PAN HEAD, CROSS-RECESSED BRASS, UNC-2A, 4-40 X 1 1/8	(28)	1	117-0382-001
	NUT, PLAIN-HEXAGON, MACHINE SCREW, UNC-2B, 4-40 BRASS	(29)	1	118-0119-001
	MOUNTING PAD,ELECT.- ELECTRONIC COMPONENT , MULTIPLE APPLICATIONS	(30)	1	119-1053-001
	MOUNTING PAD,ELECT.- ELECTRONIC COMPONENT , .100 DIAMETER PIN CENTER	(31)	1	119-1052-001
	CONFORMAL COATING	(32)	REF	070048-00
	WASHER, FLAT, #4 BRASS	(35)	1	812168-00
	WASHER, SPLIT, LOCK, #4 BRASS	(36)	1	812169-00