Rework Procedure for P3 (29-42 MHz 110 Watt) Low Band Orion Radio

Revision PA4: March 29, 1999

I INTRODUCTION

This manual provides instructions for upgrading an Orion Low Band Radio (High Split, High Power), Ericsson part number 344A4576P3, from revision "D" to revision "E".

II MATERIAL SUPPLIED

The following materials are included in the P3 field upgrade kit:

C8:	470pF	B19/5CAAD00975 (C2012COG1H471J-E-TP)
C17:	1200pF	B19/5CMAB00120 (DM15C122J1)
C20/C22:	330pF	B19/5CMAB01388 (UC342H3300J)
C23:	390pF	B19/5CMAB02044 (UC342H3900J)
C51:	0.01uF	B19/5CBAB03114 (DD111-63B103K50)
C84:	62pF	B19/5CAAA05117 (GRM42-2CH620J500-PT)
R10/R11:	2.2 ohms	B19/5REAG06612 (ERJ-1WYJ2R2U)
R49:	560 ohms	B19/5READ01507 (RR0510P-681-D)
R50:	1000 ohms	B19/5REAG06587 (EROS2CKF1001)
Spacer	0.75 mm	For C17

III EQUIPMENT REQUIRED

The following equipment is needed to complete this upgrade:

- Label to mark the product with new revision level
- Orion Maintenance Manual, Ericsson part number LBI-38905A
- T20 Torx driver
- Small soldering iron, suitable for soldering chip components
- Power supply capable of powering the Orion radio
- PC Compatible computer running ProGrammer radio programming software (TQ-3385 Release 5.0 or higher)
- TQ-3370 Programmer Interface Box (19D438367G2)
- TQ-3377 Orion Programming Cable (19B802554P15)
- Dow Corning Toray Silicone Company SE9185 Clear (1 part silicone sealant)

IV UPGRADE PROCEDURE

The upgrade procedure consists of 6 steps:

- Modifications to Matching Network of the Power Amplifier.
- Modifications to power control circuitry.
- Alignment of RV1 potentiometer.
- Verification of Tracking Data.
- Re-labeling of Product
- Test and Verification

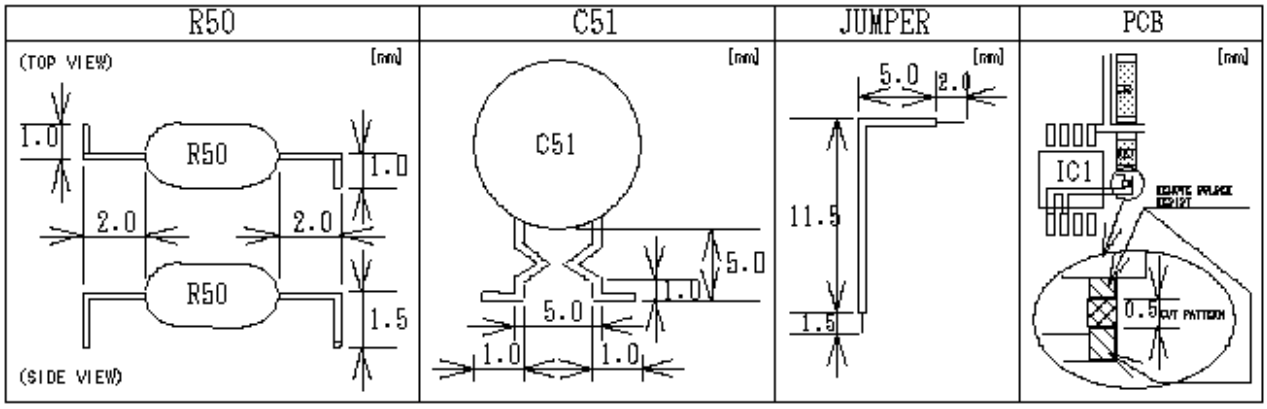

FIG.1

V Modifications to Matching Network of the Power Amplifier (P3)

1. Following the instructions in the maintenance manual, remove the external covers, and then remove the internal shield from the power amplifier module.
2. Remove and discard the metal shield located near C17 (in the vicinity of T4). (This shield would interfere with the future installation of C17).
3. Remove and discard C16 (note: C16 is not on the board, it is a 470 pF DM-15 located on top of the transformer T4).
4. Remove and discard C58 (chip capacitor is located under the T4 output).
5. Change C8 from 150pF to 470pF
6. Change R11 from 4.7 ohms to 2.2 ohms
7. Change R10 from 4.7 ohms to 2.2 ohms
8. Change C20 from 220pF to 330pF
9. Change C22 from 220pF to 330pF
10. Change C23 from 470pF to 390pF (chip capacitor atop large transformer T5)
11. Add C84 (62pF)
12. Install C17 (1200 pF), using the plastic spacers between the body of the capacitor and the board. (The spacers are approx. 0.75mm long). To perform this operation, it will first be necessary to remove the power amplifier board. This requires first removing the large shield near the antenna, then unsoldering the antenna (3 places), then removing approximately 19 bolts that hold the board down. (Take note of where the longer bolts go). Once C17 has installed, reverse this sequence to replace the board and the antenna area shield, taking special care to ensure that no bolts are inadvertently omitted.

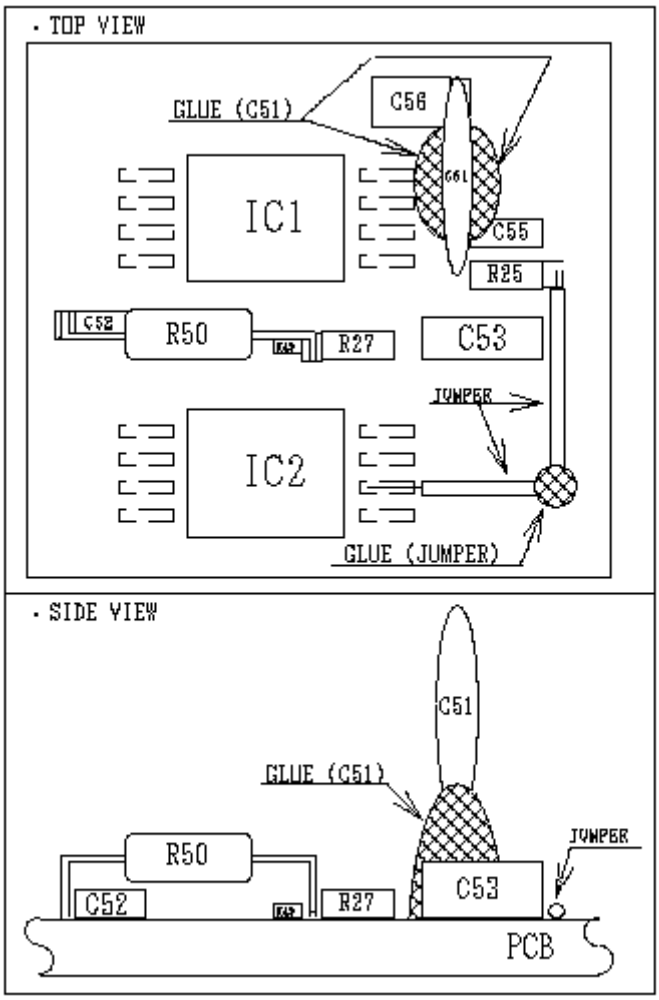

FIG.2

VI Modifications to power control circuitry (P3)

1. Remove and discard IC-2 (comparator)
2. Remove and discard C82
3. Remove and discard R21
4. Remove and discard R22
5. Remove and discard R23
6. Remove and discard R28
7. Cut trace on PWB near IC1 and R27 (in the exact location as shown in Figure 1)
8. Add R49 (560 ohms) between pin 1 and 2 of IC1, and R27 (as shown in Figure 2)
9. Form the leads of R50 (as shown in Figure 1), then add R50 (1K ohm) between R27 and the ground at C52 (as shown in Figure 2)
10. Install a jumper from the pin 6 pad for IC2, to R25 (as shown in Figure 2)
11. Using the silicone sealant, stake down the jumper wire (as shown in Figure 2)
12. Form the leads of C51 (as shown in Figure 1), then using the silicone sealant for mechanical stability, install one end of C51 (.01uF) to the C55 / IC1 pin 6 junction, and install the other end of C51 to the ground at C56 (as shown in Figure 2).

VII Alignment of RV1 potentiometer.

1. Using PC ProGrammer's maintenance facility, set the tracking data to "179" at frequency F3L (see "tracking data" section of LBI-39140).
2. Ensure that the antenna port is terminated with an antenna, or a 50 ohm load with adequate power handling capabilities.
3. Measuring at the APC line of J4, key up the transmitter and adjust RV1 until the measured voltage is 3.45V +/- 0.03 V.

VIII Verification of Tracking Data.

1. Referencing the service section (LBI-39140) which appears as the last section of the Orion maintenance manual (LBI-38905A), follow the "Setting Tracking Data" instructions to re-set the RF Power Tracking Data.
2. Although adjustment should not be necessary, if desired the squelch tracking data can be optionally checked and if necessary fine-tuned.

IX Re-labeling of product

1. Add a label to the outside of the product, indicating that it has been updated to Revision E per this procedure.

X Test and Verification

1. Ensure that the desired user personality has been programmed into the radio.
2. Verify the "initial measurements" per LBI-39140.

Rework Procedure for P4 (35-50 MHz 110 Watt) Low Band Orion Radio

Revision PA4: March 29, 1999

I INTRODUCTION

This manual provides instructions for upgrading an Orion Low Band Radio (High Split, High Power), Ericsson part number 344A4576P4, from revision "E" to revision "F".

II MATERIAL SUPPLIED

The following materials are included in the P4 field upgrade kit:

C8:	470pF	
C17:	1200pF	
C51:	0.01uF	
C84:	100pF	
R10/R11:	3.3 ohms	
R49:	560 ohms	
R50:	1000 ohms	
C84:	100pF	
Spacer	0.75 mm	For C17

III EQUIPMENT REQUIRED

The following equipment is needed to complete this upgrade:

- Label to mark the product with new revision level
- Orion Maintenance Manual, Ericsson part number LBI-38905A
- T20 Torx driver
- Small soldering iron, suitable for soldering chip components
- Power supply capable of powering the Orion radio
- PC Compatible computer running ProGrammer radio programming software (TQ-3385 Release 5.0 or higher)
- TQ-3370 Programmer Interface Box (19D438367G2)
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- Dow Corning Toray Silicone Company SE9185 Clear (1 part silicone sealant)

IV UPGRADE PROCEDURE

The upgrade procedure consists of 6 steps:

- Modifications to Matching Network of the Power Amplifier.
- Modifications to power control circuitry.
- Alignment of RV1 potentiometer.
- Verification of Tracking Data.
- Re-labeling of Product
- Test and Verification

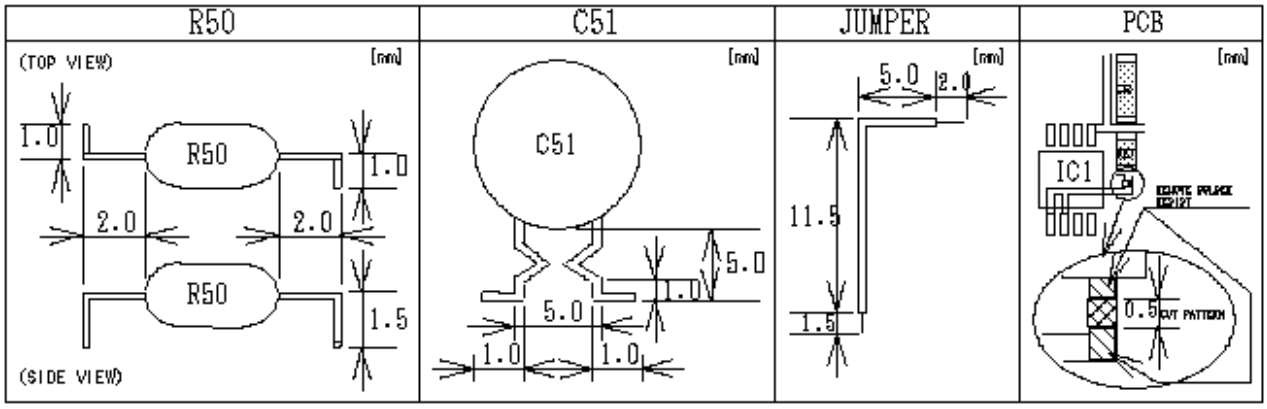

FIG.1

V Modifications to Matching Network of the Power Amplifier (P4)

1. Following the instructions in the maintenance manual, remove the external covers, and then remove the internal shield from the power amplifier module.
2. Remove and discard the metal shield located near C17 (in the vicinity of T4). (This shield would interfere with the future installation of C17).
3. Remove and discard C16 (note: C16 is not on the board, it is on top of the transformer T4).
4. Remove and discard C58 (chip capacitor is located under the T4 output).
5. Change C8 from 150pF to 470pF
6. Change R11 from 4.7 ohms to 3.3 ohms
7. Change R10 from 4.7 ohms to 3.3 ohms
8. Change C84 from 120pF to 100pF.
9. Install C17 (1200 pF), using the plastic spacers between the body of the capacitor and the board. (The spacers are approx. 0.75mm long). To perform this operation, it will first be necessary to remove the power amplifier board. This requires first removing the large shield near the antenna, then unsoldering the antenna (3 places), then removing approximately 19 bolts that hold the board down. (Take note of where the longer bolts go). Once C17 has installed, reverse this sequence to replace the board and the antenna area shield, taking special care to ensure that no bolts are inadvertently omitted.

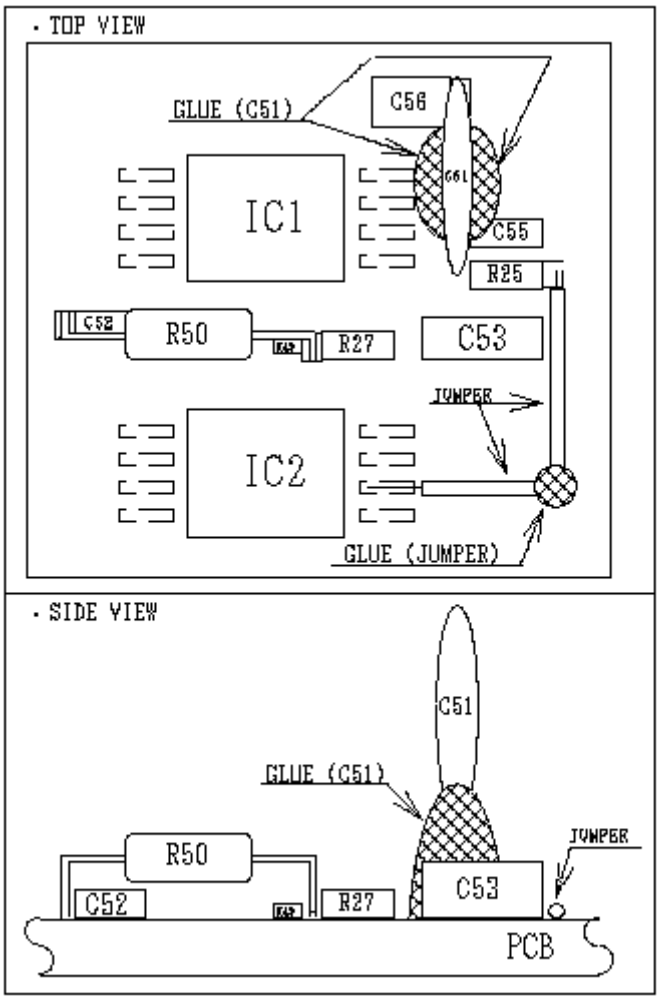

FIG.2

VI Modifications to power control circuitry (P4)

1. Remove and discard IC-2 (comparator)
2. Remove and discard C82
3. Remove and discard R21
4. Remove and discard R22
5. Remove and discard R23
6. Remove and discard R28
7. Cut trace on PWB near IC1 and R27 (in the exact location as shown in Figure 1)
8. Add R49 (560 ohms) between pin 1 and 2 of IC1, and R27 (as shown in Figure 2)
9. Form the leads of R50 (as shown in JRC Figure 1), then add R50 (1K ohm) between R27 and the ground at C52 (as shown in Figure 2)
10. Install a jumper from the pin 6 pad for IC2, to R25 (as shown in Figure 2)
11. Using the silicone sealant, stake down the jumper wire (as shown in Figure 2)
12. Form the leads of C51 (as shown in Figure 1), then using the silicone sealant for mechanical stability, install one end of C51 (.01uF) to the C55 / IC1 pin 6 junction, and install the other end of C51 to the ground at C56 (as shown in JRC Figure 2).

VII Alignment of RV1 potentiometer.

1. Using PC ProGrammer's maintenance facility, set the tracking data to "179" at frequency F3L (see "tracking data" section of LBI-39140).
2. Ensure that the antenna port is terminated with an antenna, or a 50 ohm load with adequate power handling capabilities.
3. Measuring at the APC line of J4, key up the transmitter and adjust RV1 until the measured voltage is 3.45V +/- 0.03 V.

VIII Verification of Tracking Data.

1. Referencing the service section (LBI-39140) which appears as the last section of the Orion maintenance manual (LBI-38905A), follow the "Setting Tracking Data" instructions to re-set the RF Power Tracking Data.
2. Although adjustment should not be necessary, if desired the squelch tracking data can be optionally checked and if necessary fine-tuned.

IX Re-labeling of product

1. Add a label to the outside of the product, indicating that it has been updated to Revision F per this procedure.

X Test and Verification

1. Ensure that the desired user personality has been programmed into the radio.
2. Verify the "initial measurements" per LBI-39140.