Maintenance Manual

ORION™

29 - 50 MHz
SCAN AND SYSTEM MOBILE RADIO

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ERICSSON

NOTICE!

This manual covers Ericsson and General Electric products manufactured and sold by Ericsson Inc.

NOTICE!

Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

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SPECIFICATIONS*

Frequency Range:	29-42 MHz, 35-50 MHz
Battery Drain:	
Receive	
Squelched	1.1 Amperes at 13.8 Volts
Unsquelched	3.0 Amperes at 13.8 Volts (15 Watts Output)
Transmitter:	
60 Watts	16 Amperes at 13.2 Volts
110 Watts	28 Amperes at 13.6 Volts
Frequency Stability:	0.0005% depending on model
Temperature Range:	-30°C (-22°F) to +60°C (+140°F)
Duty Cycle:	100% Receive, 14% Transmit
Transmitter	
Transmit Output Power:	60/110 Watts
Conducted Spurious:	-85 dB
Modulation:	±5 kHz
Audio Sensitivity:	55 to 110 millivolts
Audio Frequency Characteristics:	Within +1 dB to -3 dB of a 6 dB/octave pre-emphasis 300 Hz and within +1 dB to -4.5 dB of a 6 dB/octave pre-emphasis 3000 Hz per EIA standards. Post-limiter filter per FCC and EIA.
Distortion:	Less than 2% (1000 Hz) Less than 5% (3000 Hz)
Deviation Symmetry:	0.3 kHz maximum

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SPECIFICATIONS*

Maximum Frequency Separation:	29-42 MHz, 35-50 MHz
Microphone Load Impedance:`	600 Ohms
Power Adjust Range:	100% to 50% of rated power (U.S.A. Models)
RF Output Impedance:	50 Ohms
FM Noise:	55 dB
Receiver	
Audio Output:	15 Watts with less than 3% distortion (To 4.0 ohm speaker)
Sensitivity:	0.35 µV (STD)/0.22 µV (PRE) 12 dB SINAD (IEIA method)
Selectivity:	-85 dB EIA Two-Signal Method (20 kHz Channels)
Spurious Response:	-100 dB
Intermodulation 20 kHz:	-85 dB
Maximum Frequency Separation:	29-42 MHz, 35-50 MHz
Frequency Response:	Within +1, -3 dB of 6 dB/octave de-emphasis from 300 to 3000 MHz (1000 Hz reference)
RF Input Impedance:	50 Ohms
Hum/Noise ratio:	
Unsquelched	-50 dB
Squelched	-70 dB
Channel Spacing:	20 kHz

* These specifications are typical values intended primarily for use of the service technician. Refer to the appropriate Specifications Sheet for the complete specifications.

DESCRIPTION

Ericsson Inc. synthesized **ORION** mobile radio combinations are completely solid-state, utilizing microcomputer technology and integrated circuits to provide high-quality, high-reliability radios. Standard low band combinations are equipped with:

- Microcomputer Controlled Frequency Synthesizer
- 0.0005% Frequency Stability
- Noise Blanker
- Other Structured Options

The basic radio consists of three printed wiring boards mounted in a cast aluminum frame. The three boards are:

1. The Control Logic/IF board
2. The Frequency Synthesizer/Receiver board
3. The Power Amplifier/Exciter board

The radio is of double-layer construction with tuning adjustments easily accessible.

The Control Logic/IF Board is located on the top of the radio, while the Power Amplifier/Exciter and the Synthesizer/Receiver boards are located on the bottom of the radio.

SYNTHESIZER

The synthesizer consists of a microcomputer, **E**lectrically **E**rasable **R**ead **O**nly **M**emory **(EEPROM)**, a frequency synthesizer IC, transmit and receive **V**oltage Controlled **O**scillator's **(VCO)** and associated circuitry. The frequency synthesizer under control of the microcomputer generates all transmit and receive **R**adio **F**requencies **(RF)**.

The EEPROM stores binary data for all radio frequencies, Channel Guard tones/digital codes and the timing function of the **C**arrier **C**ontrol **T**imer **(CCT)**. The microcomputer accesses the EEPROM and provides the correct WALSH bits to the Channel Guard circuitry to generate the correct Channel Guard tone or digital code on a per-channel basis.

PROGRAMMING

The EEPROM allows the radio to be programmed or reprogrammed as needed to adapt to changing system requirements. Radio Frequencies, Channel Guard tone and digital codes and the CCT function can be reprogrammed.

The EEPROM can be reprogrammed through the radio front connector using a personal computer. This programmer allows all information to be loaded simultaneously.

Programming instructions are provided in the respective Programmer Maintenance Manuals.

TRANSMITTER

The transmitter consists of the frequency synthesizer, transmitter VCO and a **P**ower **A**mplifier **(PA)** assembly. The PA assembly consists of a PA board mounted on a heat sink assembly. The PA board also contains the exciter, low-pass filter and antenna switching diode.

Audio and Channel Guard circuitry for the transmitter is located on the Control Logic/IF Board.

RECEIVER

The receiver consists of the frequency synthesizer, RX VCO, injection amplifiers, front end, IF, limiter detector and noise blanker circuitry. Audio, squelch and Channel Guard circuitry for the receiver is located on the Control Logic/IF Board.

SYSTEM CONTROL FUNCTION

A microprocessor on the Control Logic/IF board controls the frequency synthesizer, the TX ON/OFF, the decoding of CTCSS tones, the generation of CTCSS tones,. etc. The audio processor circuitry of the transmitter and the receiver are located on the Control Logic/IF board. Squelch circuitry and a connection to the digital **AEGIS** circuit is also located on the Control Logic/IF board.

OPERATION

Complete operating instructions for the **ORION** two-way radio are provided in Operator's Manual ***LBI-38888*** for the control unit used.

MAINTENANCE

The Service Section in maintenance manual ***LBI-39140*** contains the maintenance information to service this radio. The Service Section includes:

- Disassembly Procedures

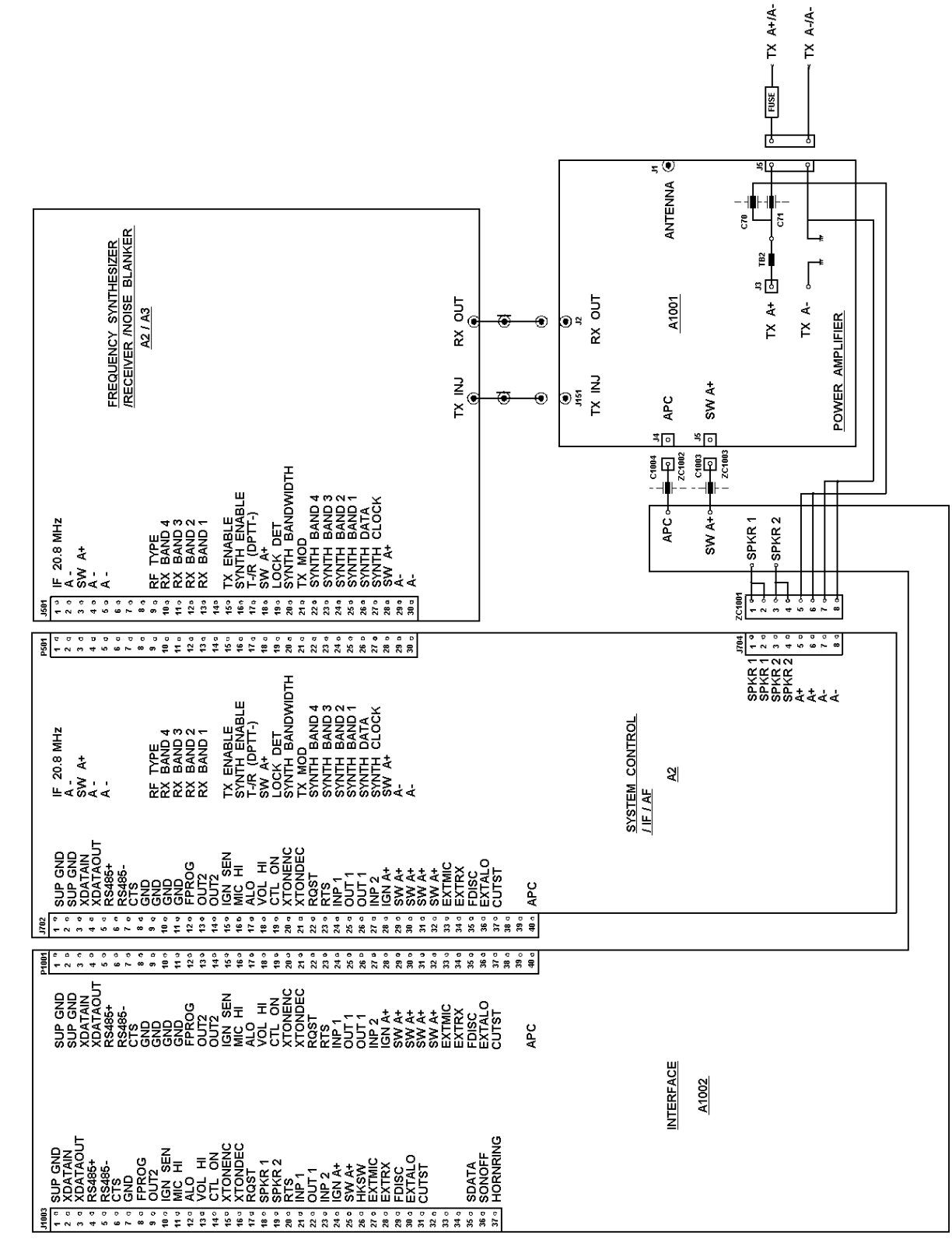
- Replacement of IC's, chip capacitors and resistors
- Alignment procedures for the transmitter and receiver
- Troubleshooting Procedures and wave forms
- A mechanical layout for the radio is found in **ORION** Assemblies Maintenance Manual ***LBI-38909***.

RADIO UNIT

344A4576P1/JHM-171S60A, 344A4576P2/JHM-171S60B 344A4576P3/JHM-171S110A, 344A4576P4/JHM-171S110B

Issue 1

SYMBOL	PART NUMBER	DESCRIPTION
A1	B19/CMF-132	Control Logic/IF Board (IF Section)
A1	B19/CMC-855	Control Logic/IF Board (Logic Section)
A2	B19/CMN-350A	Synthesizer/Receiver Board CMN-350A (Used In P1, P3)
A2	B19/CMN-350B	Synthesizer/Receiver Board CMN-350B (Used In P2, P4)
A3	B19/CFR-138	Noise Blanker
A1001	B19/CAH-505AL	PA Circuit CAH-505AL (Used In P1)
A1001	B19/CAH-505BL	PA Circuit CAH-505BL (Used In P2)
A1001	B19/CAH-505AH	PA Circuit CAH-505AH (Used In P3)
A1001	B19/CAH-505BH	PA Circuit CAH-505BH (Used In P4)
A1002	B19/CMH-1231LB	Interface



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