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Legend:

TBC – To Be Confirmed (When pre-production modules are available / diagrams released for issue).

NYC – Not Yet Completed – Awaiting Resources.

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Not yet produced

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None Issued

1 INTRODUCTION TO THE AXIS FIXED VHF RADIO TELEPHONE

The Axis fixed VHF range is robustly constructed using a pressure die cast aluminium case for effective heat dissipation ensuring maximum transmission performance even after many hours of constant use. The radio is designed to meet or exceed stringent International regulations including ETS300-162 and EN301-025.

AXIS RT62 - Has full international channel capability; 16 pre-programmed private channels; features Dual and Tri Watch, Channel Inhibit and Revert, Scan and full memory operation; back-lit LCD display featuring large, 14 segment numerals to indicate working channel above smaller legends providing operational and status information; available with either fist-mic or telephone handset.

AXIS RT63 - The RT63 is similar to the RT62 but includes features only required in the USA. Items referred to in the DSC receiver block diagram are omitted. DSC received audio is shared with the voice receiver. When the voice channel is inactive, the radio scans channel 70. DSC AF and AF pins of the handset connector are joined for this purpose. Note all references to the RT62 apply to this version.

AXIS RT64 – Offers the same facilities as the RT62 Model with an additional watch-keeping receiver allowing it to use the Digital Selective Calling (DSC) system for routine and distress calling on VHF Channel 70. To access this feature the RT64 must be linked to a Simrad Class D DSC control unit DSC1400.

AXIS RD68 – Offers the same facilities as the RT64 with a built in Class D DSC Controller to facilitate routine and distress calling on VHF Channel 70. Digitally Selected Calls are quicker and simpler to make than traditional voice calls using Channel 16 and should a distress situation occur, an alert can quickly be raised indicating identity, position and nature of the emergency and automatically establish communication on the emergency voice channel

The main components of the Simrad Fixed VHF range are:

1.1 Electronics PCBs

a.	Receiver / Transmitter PCB	Drawing No. E03921
b.	Control PCB RT62 / RT64	Drawing No. E03924
c.	Control PCB RD68	Drawing No. E03658
d.	Fist Mic FTM5 (RD68)	
e.	Fist Mic FTM6 (RT62/64)	Drawing No. E03950
f.	Telephone Handset THS4	
f.	Telephone Handset THS5	Drawing No. E03953

1.2 Mechanical Components

a.	RT62 / RT64 Chassis	Drawing No. E04086
b.	RD68 Chassis	Drawing No. E04093

c.	RT62 / RT64 Front Panel	Drawing No. E04088
d.	RD68 Front Panel	Drawing No. E04099
f.	FTM6 General Assembly	Drawing No. E04084
g.	THS5 General Assembly	Drawing No. E03162

2 OPERATING SIMRAD VHF RADIOs

This Service Manual only contains operating instructions for those features of Simrad Radio that are not normally available to the end user. For details of normal operation please refer to the appropriate Simrad Instruction Manual.

LCD Test Mode. The LCD test mode may be entered by holding Soft Keys 2 and 4 on power up. Depressing each key in turn will then fill the display with the appropriate characters. The radio must be turned off to exit test mode.

3 ASSEMBLY INSTRUCTIONS

3.1 RT62 / RT64 Chassis Pre-Assembly

Refer to Chassis Assembly Drawing number E04086 and General Assembly Drawing numbers E04091 (RT62) and E04092 (RT64)

Ensure that the “Coolpads” Part numbers E04067 and E04068 are fitted to the AF Amplifier and PA Module Platforms. Fit an appropriate PCB, E03921 for RT62 or E04089 for RT64, into the chassis carefully locating the extension loudspeaker socket, antenna connector and UHF Grounding Washer. Locate the 2 insulators E03998 one to each of the securing screw apertures at each side of the PA Module and fit the 6 screws 200294 as indicated. Ensure that the screw securing the AF Amplifier IC is fitted with an M3 Insulating Washer 200081. Solder the 2 cables from the power connector E03323 onto the PCB and withdraw any slack in the cables.

Solder the tinned copper wire from the Antenna socket onto the antenna pad and angle the tags of the UHF Grounding Washer away from the antenna connector and solder each to the earth plane. Locate and fit the 3 PCB Compression Rubbers E03999 into the front of the casing.

3.2 RT62 / RT64 Front Panel Pre-Assembly

Refer to Front Panel PCB Assembly Drawing Number E04088.

Ensure that the front case printing on the window and keypad is correct for the product under assembly and that the window and the LCD face are clean and free from dust. Offer the PCB, E03924, up to the case front ensuring that the shanks of the 3 rotary controls fit through the appropriate aperture and that the pins of the handset / fistmic socket engage through the PCB. Fit an “O” Ring, 190044, to each of the 3 Control Knobs, 2 x E03103:BK and 1 x E03102:BK. Apply a smear of Multi Purpose Grease PFG-210, Part Number 260002, to each of the “O” Rings and fit the knobs to the rotary controls pressing firmly home. Solder the fist Mic connector pins to the PCB and make the connections between the PCB and the Speaker using prepared lead E04073. Fit a socket cover E03845 to the fist Mic socket.

3.3 RT62 / RT64 Final Assembly

Refer to RT62 General Assembly Drawing Number E04091 and RT64 Drawing Number E04092.

Fit the Front Panel Seal E03982 to the Front Panel Assembly E04088 ensuring that the seal fits securely into the recess and the screw aperture seals fit squarely over the aperture bosses. Offer up the front panel to the chassis ensuring that the 20 way Pin Header 170203 on the front panel

PCB mates with the 20 way Female Header 170202 on the main PCBC, NB. The headers are offset from centre and will only engage in the correct orientation. Secure the front panel using 4 x No 6 Pan Poz screws 200236 taking care that the seal remains seated and that the screws are not over-tightened. Fit the Cover Seal E03117 to the Lid Moulding E03983 ensuring that the seal seats comfortably into the recess. Offer up the lid to the chassis and secure using the 4 x M3 Pan Poz screws ensuring that the seal remains seated and that the screws are not overtightened.

3.4 RD68 Chassis Pre-Assembly (TBC)

Refer to Chassis Assembly Drawing Number E04093 and General Assembly Drawing Number E04095

Ensure that the “Coolpads” Part numbers E04067 and E04068 are fitted to the AF Amplifier and PA Module Platforms. Fit a PCB E04090 into the chassis carefully locating the extension loudspeaker socket, antenna connector and UHF Grounding Washer. Locate the 2 insulators E03998 one to each of the securing screw apertures at each side of the PA Module and fit the 6 screws 200294 as indicated. Ensure that the screw securing the AF Amplifier IC is fitted with an M3 Insulating Washer 200081. Solder the 2 cables from the Cable Assembly Power Socket E03323 and the 2 connectors from the Cable Assembly NMEA Socket E03582 onto the PCB and withdraw any slack in the cables. Secure the cables between the Ferrite Bead 240041 and the Grommet E03129 using a Cable Tie 200026.

Solder the tinned copper wire from the Antenna socket onto the antenna pad and angle the tags of the UHF Grounding Washer away from the antenna connector and solder each to the earth plane. Locate and fit the 3 PCB Compression Rubbers E03999 into the front of the casing.

3.5 RD68 Front Panel Pre-Assembly (TBC)

Refer to Front Panel PCB Assembly Drawing Number E04098.

Ensure that the front case printing on the window and keypad is correct for the product under assembly and that the window and the LCD face are clean and free from dust. Offer the PCB, E03658, up to the case front ensuring that the shanks of the 2 rotary controls fit through the appropriate aperture and that the pins of the handset / fistmic socket engage through the PCB. Fit an “O” Ring, 190044, to each of the 2 Control Knobs, 2 x E03103:BK. Apply a smear of Multi Purpose Grease PFG-210, Part Number 260002, to each of the “O” Rings and fit the knobs to the rotary controls pressing firmly home. Solder the fist Mic connector pins to the PCB and make the connections between the PCB and the Speaker using prepared lead E04073. Fit a socket cover E03845 to the fist Mic socket.

3.6 RD68 Final Assembly (TBC)

Refer to General Assembly Drawing Number E04095.

Fit the Front Panel Seal E03982 to the Front Panel Assembly E04098 ensuring that the seal fits securely into the recess and the screw aperture seals fit squarely over the aperture bosses. Offer up the front panel to the chassis ensuring that the 20 way Pin Header 170203 on the front panel PCB mates with the 20 way Female Header 170202 on the main PCBC, NB. The headers are offset from centre and will only engage in the correct orientation. Secure the front panel using 4 x No 6 Pan Poz screws 200269 taking care that the seal remains seated and that the screws are not over-tightened. Fit the Cover Seal E03117 to the Lid Moulding E03983 ensuring that the seal seats comfortably into the recess. Offer up the lid to the chassis and secure using the 4 x M3 Pan Poz screws ensuring that the seal remains seated and that the screws are not over-tightened.

3.3 FTM5 Fist Mic Assembly (RD68 Only)

Refer to Drawing No. E03161 and fit the PTT Grommet E03143 into the web in the front case ensuring that it is correctly seated. From the end of the Cable Assembly E03175 strip and remove the outer insulation for 15mm. Cut off the Blue, Green, Orange and Black wires, (not used), flush with the end of the outer insulation. Strip 5mm of insulation from the ends of the Red and White wires, twist and sleeve the screen and tin the ends. Pass the end of the cable up through the bottom hole in the front case; apply a small quantity of Hellerman Sleeving Oil to the cable and slide on Cable Grommet E03141. Pull the cable and grommet through together, until the grommet is fully home, ensuring that the flat on the head of the grommet lays against the inside of the case, then pull cable back through grommet by approximately 100mm. Wipe off any excess sleeving oil from the cable. Solder the cable connections to the PCB and position the PCB assembly onto the 2 mounting pillars. Route the cable into the case, pulling out any excess wire, until the PCB and cable lay neatly into the case. Ensure the PTT Key hits the push switch before fixing the PCB assembly into the case using 2 screws (200036).

Into the groove around the outside of the Rear Case E03133 fit a Case Seal E03136 ensuring it is pushed fully home. Fit the PTT Key E03134 so that the spring leg in the centre of the key with a guide either side, faces out, and the peg on the other side of the key faces into the case front. Fit the rear case onto the front using washer (200257) and screw (200023) and tighten firmly.

3.4 FTM6 Fist Mic Assembly (RT62 / RT64 Only) (Not Yet Produced)

3.5 THS4 Telephone Handset Assembly (RD68 Only)

Refer to Drawing No. E03162 and fit the PTT Grommet E03143 into the sidewall of the front case ensuring that it is correctly seated. From the end of the Cable Assembly E03175 strip and remove the outer insulation for 35mm. Cut off the Blue wire flush with the outer insulation, (not used). Cut back the Red wire to 20 mm long from the end of the outer insulation, the Orange and Black wire to 30 mm and the Green and White wire to 35 mm. Strip and tin the ends. Pass the end of the cable up through the hole in the bottom of the front case; apply a small quantity of Hellerman Sleeving Oil to the cable and slide on Cable Grommet E03141. Pull the cable and grommet through together, until the grommet is fully home into the case, ensuring that the flat on the head of the grommet is facing out, not towards the wall of the case. Then pull cable back through grommet by approximately 30mm. Wipe off any excess sleeving oil from the cable. Secure with Cable Tie 200026. Fit the handset weight E03311 and hold in place by fitting 3 Grommets 190024 onto the pillars. Solder the five wires and screen from the coiled cable and the two wires from the speaker to the PCB E03309. Position the PCB into the case on top of the three pillars retaining the weight and using 3 Screws 200082, fix the PCB into the case. Fully tighten the 3 screws. Fit PTT Key and check that the key operates the switch. Into the groove around the outside of the Rear Case E03140 fit Case Seal E03142 ensuring it is pushed fully home. Fit the rear case onto the front, ensuring the seal remains in place, using 6 Screws 200055 with washers and tighten screws firmly to secure front and rear case halves together.

3.6 THS5 Telephone Handset Assembly (RT62 / RT64 Only) (Not Yet Produced)

4 MECHANICAL ASSEMBLY DRAWINGS

Not yet released for issue by R&D

5 CIRCUIT DESCRIPTIONS (TBC)

Introduction

The SIMRAD RT62 and RT64 comprise of 2 generic Printed Circuit Board (PCB) assemblies. Applying different components to the common PCBs creates the different versions and options. The main Receiver / Transmitter PCB assembly, Part No. E03920 contains all the transmitter and receiver circuitry including the synthesiser, modulator and audio power amplifiers. Provision for an optional second, watch keeping, receiver dedicated to the Digital Selective Calling (DSC) Channel 70 is also made. The control PCB assembly, Part No. E03923 houses the microcontroller, user controls and interfaces and display module. It also houses ATIS detection and mute circuitry where appropriate.

The Simrad RD68 utilises the same transmitter receiver board with a different front panel which incorporates all the features of the RT64 but also includes a full Class D DSC controller, incorporated through a V.23 modem.

5.1 Receiver / Transmitter PCB Assembly

Refer to drawing number E03919.

Receiver. The Radio Frequency (RF) signal from the Antenna socket passes through the low pass Power Amplifier (PA) filter Inductors L207, L208, L209 and L210, and associated components and a bandpass filter formed by L212 and L213 and associated capacitors. During transmissions, Diodes D201and D216 are enabled to protect the receiver. The signal is amplified by Transistor TR203, filtered by L214 and L215 and a portion of the signal is then routed to the second receiver via the power splitter formed by C258, C259, C261 and Resistor R232. Then follows an isolation amplifier, TR226 and associated components, to block the main receiver Local Oscillator (LO) signal from feeding back to the second receiver. The RF signal is fed to TR204 Source and the LO to Gate 1. Low side injection is used, i.e. the LO output, from TR210 buffered by TR208 and TR209, is 21.4 MHz below the receive frequency. L216 provides the drain load before matching through C268, C269 and R239 into the 4 pole Crystal Filter XTAL204 and XTAL205 which provides isolation from adjacent channels. The output of the filter is matched to the integrated Intermediate Frequency (IF) amplifier / demodulator IC204 by L217 and associated capacitors. A second LO, TR221, XTAL206 and associated components, running at 21.85MHz produces the second IF of 450KHz. CF205 is a ceramic filter, providing further adjacent channel isolation and completing the necessary bandwidth definition. Demodulation is achieved through the built-in demodulator with quadrature coil L218.

Audio from pin 9 of IC204 is de-emphasised by the filter formed by R246, C289 and C290, buffered by TR205 and distributed to the various audio stages on the control PCB. The audio from pin 9 is also passed through a very high gain amplifier, within IC204, configured as a bandpass filter,

via R245 to detector D202 to provide a voltage proportional to the received signal strength. This level is fed to an Analogue to Digital (A-D) converter, housed in the microprocessor on the control PCB, where it is compared with the selected squelch level to provide squelch control. The Audio Frequency (AF) signal is returned from the control PCB, via the volume control to an audio amplifier formed by IC206 and associated components to drive the front panel speaker.

Transmitter. The output from the Voltage Controlled Oscillator (VCO) buffer, TR208 and TR209 is fed via pin diode D203 and C318 to the PA driver stage, controlled transistors TR206 and TR207. The gain of the driver stage is controlled by TR224 to provide approximately 250 mW drive, when 25 Watts output is selected, and minimum drive when 1Watt is selected by switching off TR224 via the 1 Watt signal and TR225. The output of the hybrid power module, IC207, is fed to the PA filter L207, L208, L209 and associated capacitors to suppress the emission of unwanted harmonics and pin diodes D201 and D216 are enabled to protect the receiver. Inductor L209 of the filter, together with diodes D213 and D214, form a simple forward and reverse power detector to provide power control and transmitter status indication to the front panel display. The power control signal is fed to differential amplifier IC210b, together with the reference power control voltage from VR200 and VR201, to set the high and low power levels. The output of this amplifier forms a regulated supply with TR217 and TR218 to supply the PA driver stage. The reference input voltage and supply for TR218 is fed from TR219 which is only turned on after the synthesiser is in lock. The VCO in lock signal is supplied from the synthesiser to TR220, which controls TR219.

Voltage Controlled Oscillator / Synthesiser. The main VCO consists of TR210 tuned by L232, varactor D200 and associated components. Band switching between receive and transmit is by PIN diode D210. The VCO operates at the fundamental frequency in transmit and is offset, low, by 21.4MHz on receive. The output of the oscillator is buffered by TR208 and TR209 switched between transmit and receive by D203 and D204 as appropriate. An output is also routed by C370 to the input of the synthesiser IC211. The reference frequency at 21.85MHz is generated by TR221 controlled by XTAL206. Main tuning of the VCO is achieved by a varactor diode D200 controlled from the synthesiser by the tuning voltage supplied from pin 12 of IC211, the output being filtered by C371, C372 and R319. The synthesiser is loaded from data provided from the front panel, via a 3 wire serial interface, to select appropriate divide ratios.

Modulator. Transmit audio from the front panel is amplified by IC212b, the gain being configured by R337, R340 and C388, to give the signal pre-emphasis. The output of the stage is peak detected by D215 and detector TR222 to provide a gain control signal to TR223 which enables limiting of high level input signals. Temperature compensation of the limiter is provided by thermistor R332 and IC212a forms a high pass filter to meet the 14dB / octave roll-off above 6kHz. The final output is fed to

the modulation varactor diode D207 via gain control VR202 which is set to a maximum of 5kHz deviation.

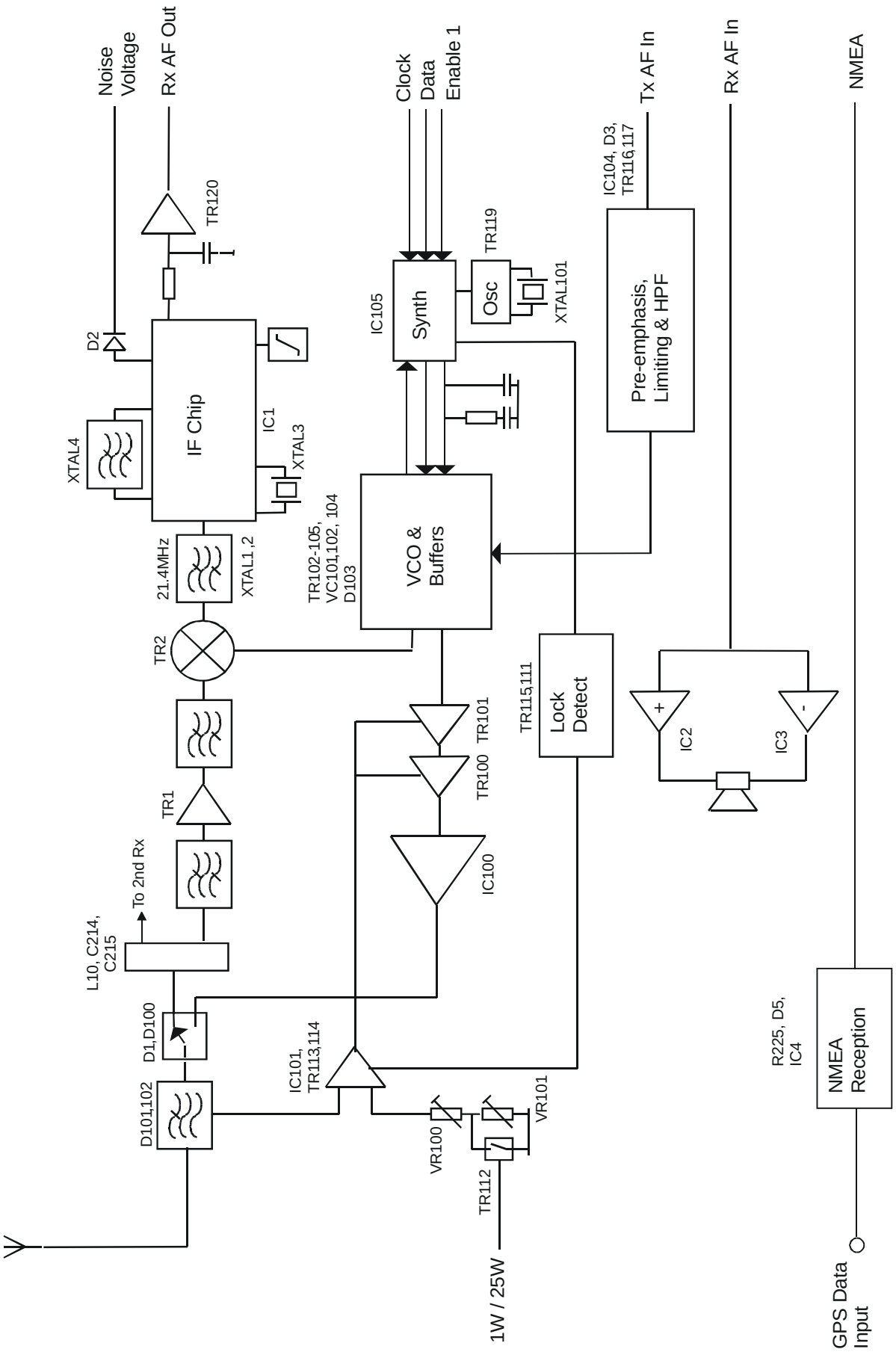
Power Regulation and Switching. The 12 volt supply is switched on the front panel and then feeds the audio amplifier IC206, the regulators IC208 and IC209 and the first stage of the RF power module IC207. The RF power module second stage takes power before the switch to minimise the effect of voltage drops. D211 and D212 provide reverse polarity protection. A regulated 8v supply is provided by IC208 and 5v by IC209. The supplies for receive and transmit circuits are switched by TR213 and TR211 controlled form the synthesiser via TR215, TR214 and TR212.

Second Receiver. (RT64 and RD68 only)

The second receiver is connected to the main receiver at the power splitter L214, C258, C259, C261 and R232. Inductors L202, L203 and associated components form an input bandpass filter prior to the RF amplifier TR201. The output of the amplifier is coupled into the mixer at the source of TR202 and low side injection from the LO, TR200, is fed into the gate. The output at 17.9MHz passes through the crystal filter XTAL201 and XTAL202 to the second IF stage, IC200. The IF stage has similar operation to the main receiver IF though the second local oscillator is provided by XTAL203 running at a frequency of 18.35MHz. Demodulated audio is buffered by IC202a and is then passed to the front panel.

The LO for this fixed frequency receiver is formed by TR200, XTAL200 and associated components running at a frequency of 138.625MHz. The output of the LO is coupled to the mixer via capacitors C427 and C429. Variable capacitor VC200 is used to optimise the LO drive level into the mixer.

NMEA Reception. (RD68 only) Position and time information, from a GPS unit, is received in the form of NMEA data. This is opto-coupled into the radio via R225, D200 and IC203. The data is then routed through to the control PCB via SKT1.


Noise Voltage
Rx AF Out
Clock
Data
Enable 1
Tx AF In
Rx AF In
NMEA
TR120
D2
IF Chip
IC1
XTAL4
XTAL3
IC105
Synth
Osc
TR119
XTAL101
IC104, D3, TR116,117
Pre-emphasis, Limiting & HPF
21.4MHz
XTAL1,2
TR102-105, VC101,102, 104 D103
VCO & Buffers
TR2
TR115,111
Lock Detect
TR101
TR100
IC100
TR1
To 2nd Rx
L10, C214, C215
D1,D100
D101,102
IC101, TR113,114
VR100
VR101
TR112
1W / 25W
IC2
IC3
+
-
R225, D5, IC4
NMEA Reception
GPS Data Input

5.2 Control PCB Assembly. (RT62 and RT64 Only)
Refer to drawing number E03922

All the functions of the radio are controlled from this assembly by the microprocessor IC102. The microprocessor has it own clock controlled by XTAL101 running at 4.096MHz. Reset generator IC104 ensures that the microprocessor starts up correctly and resets under low voltage conditions. The microprocessor has an integral data bus interface driving the front panel display module LCD101. External controls consist of 5 push buttons, S101 to S105, and rotary squelch, VR102, rotary channel change CS101 and rotary volume / on off control VR101. The level of illumination on the LCD and keypad is controlled by TR108 driving LED's 101 to 106.

Configuration data, MMSI and channel information is stored in the non-volatile memory IC103. This interfaces to IC102 via a 4 wire serial interface shared with the synthesiser data to the Rx / Tx PCB assembly. Separate enables ensure that the data is routed correctly.

Volume control VR101 controls the level of audio in the loudspeaker. Amplifier IC101a boosts the level delivered to the handset earpiece. Individual mutes of the handset and speaker audio are provided by TR105 and TR104 respectively, under control of the microprocessor. The voltage on the squelch control and noise input from the Rx / Tx PCB are read and the audio muted as appropriate. Additionally the state of the handset is detected from SKT101 to mute the speaker when the handset is off cradle (optional).

The handset interface is via connector SKT101. The microphone input is biased for use with Electret microphones and may be muted by TR101 during ATIS transmissions. A 500mA re-settable fuse F101 protects the 12V output. The cradle and PTT lines are also used for external data connections to PC or third party accessories.

Optional data interfaces are provided for external programming and remote control via TR102 and TR103 and ATIS generation IC101b and detection IC105, IC106 and TR106 and alarm generation is provided by IC102 and filtered by the RC network C127 and R128.

The ATIS signal is generated by the microprocessor, IC102, which produces a 2-bit (3-level) approximation of a sine wave at the correct frequency and baud rate. R112, R113 and R114 sum the two outputs before filtering by IC101b which forms a second order low pass filter. R108 and R106 then attenuate the output before summing into the microphone audio. Note that the microphone is muted by TR101 during transmission of the ATIS signal. The MMSI is held in the non-volatile memory IC103 together with a control flag to enable ATIS generation.

The inclusion of IC106 allows the ATIS signal to be muted during reception. IC105a filters the received audio and IC105b which feed a zero crossing detector formed by IC105c, IC105d, D101 and TR106. This signal is then fed to a second microprocessor, IC106, which

measures the period of each half cycle of the incoming signal. By counting the number of periods, which might be an ATIS signal, the microprocessor can decide that ATIS is being received. When this decision is made, after about 10ms, IC106 sets an output to inform IC102 to mute the audio for 300ms. IC106 derives its clock from the main microprocessor IC102 and the reset from IC104 via inverter TR107.

5.3 Control PCB Assembly. (RD68 only)

Refer to drawing number E03656.

All the functions of the radio are controlled from this assembly by the microprocessor IC4. The microprocessor has it own clock controlled by XTAL1 running at 7.15909MHz. Reset generator IC9 ensures that the microprocessor starts up correctly and resets under low voltage conditions. The microprocessor has a data bus interface driving the front panel display module. External controls consist of a 21 push button key matrix, rotary squelch and volume control VR1 and VR3 respectively. TR7 driving LED's 1 to 10 and the integral LED's on the LCD module control the level of illumination on the LCD and keypad.

Configuration data, MMSI and channel information is stored in the non-volatile memory IC5. This interfaces to IC4 via a 4 wire serial interface shared with the synthesiser data to the Rx / Tx PCB assembly. Separate enables ensure that the data is routed correctly.

Volume control VR3 controls the level of audio in the loudspeaker. Amplifier IC2a boosts the level delivered to the handset earpiece. Individual mutes of the handset and speaker audio are provided by TR3 and TR4 respectively, under control of the microprocessor. The voltage on the squelch control and noise input from the Rx/Tx PCB are read and the audio muted as appropriate. Additionally the state of the handset is detected from SKT1 to mute the speaker when the handset is off cradle (optional).

The handset interface is via connector SKT1. The microphone input is biased for use with Electret microphones and may be muted by IC1a. The 12V output is current protected by a 500mA fuse F1. The cradle and PTT lines are also used for external data connections to PC or third party accessories.

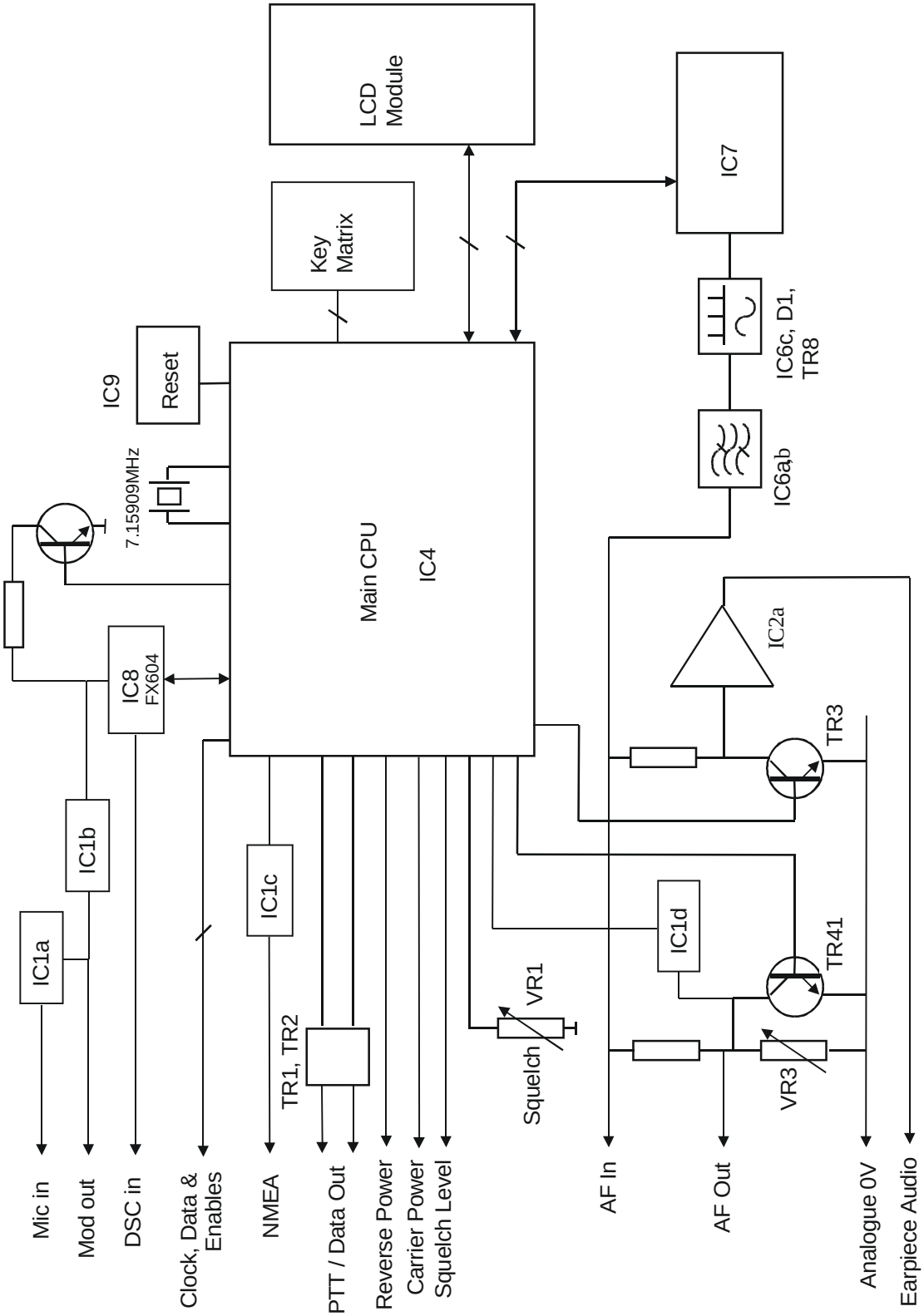
Data interfaces are provided for external programming via TR1 and TR2. NMEA data is received from the Rx/Tx PCB via PLG1 Pin 19 and passed onto the microprocessor, IC4, via IC1c.

Optional circuitry for ATIS detection consists of IC6, IC7, D1 and TR8. The inclusion of IC7 allows the ATIS signal to be muted during reception. IC6c filters the received audio and IC6d, which feed a zero crossing detector, formed by IC6a, IC6b, D1 and TR8. This signal is sent to a second microprocessor, IC7, which measures the period of each half cycle of the incoming signal. By counting the number of periods, which might be an ATIS signal, the micro can decide whether ATIS is being

received or not. When this decision is made, after about 10ms, IC7 sets an output to inform IC4 to mute the audio for 300ms. IC7 derives its clock and reset from the main microprocessor IC4.

The ATIS and DSC signals are generated and decoded by the modem, IC8 and surrounding components. TR9 switches the modulation index between that required for DSC and ATIS. The output signal is then passed onto the microphone audio via IC1b. Note that IC1a mutes the microphone during transmission of the ATIS or DSC signals.

IC1d controls the audio level required for alarms. For normal key ‘beeps’ the microprocessor, IC4, generates a square wave which is filtered and reduced in level by R15, R75, C14 and C105 and then fed into the audio amplifier via PLG1. For alarm generation IC1d short circuits R75 to increase the level of signal being fed to the audio amplifier.


LCD Module
Key Matrix
IC7
IC9
Reset
7.15909MHz
Main CPU
IC4
IC6c, D1, TR8
IC6a,b
IC2a
TR3
IC8 FX604
IC1b
IC1a
IC1c
IC1d
TR41
VR1
Squelch
VR3
TR1, TR2
Mic in
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AF Out
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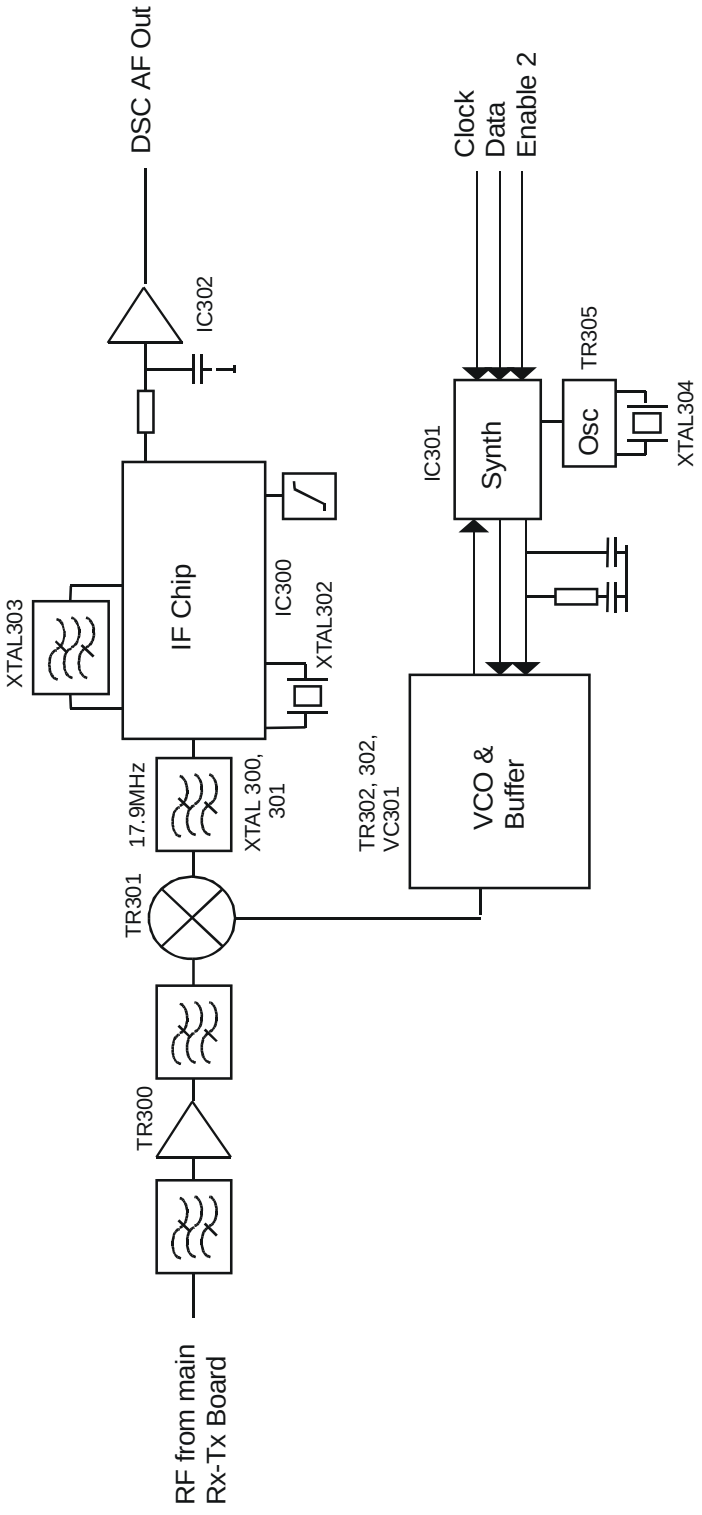
Earpiece Audio


DSC AF Out
IC302
Clock
Data
Enable 2
TR305
IC301
Synth
Osc
XTAL304
XTAL303
IF Chip
IC300
XTAL302
17.9MHz
XTAL 300,
301
TR302, 302,
VC301
VCO &
Buffer
TR301
TR300
RF from main
Rx-Tx Board

6 CIRCUIT DIAGRAMS

6.1 Circuit Schematics

Not Yet Released for Issue by R&D

Component Lists and Layouts

Not Yet Released for Issue by R&D

7 PROGRAMMING AND CONFIGURATION

Not Yet Produced

8 FAULT FINDING

8.1 Common User Faults

None Yet Identified.

8.2 Common Technical Faults

None Yet Identified

9 SPARE PARTS DETAIL

Not Yet Produced

10 TECHNICAL NOTES

None Yet Issued