

Parts List/Tune Up Information

MARINE RADAR RA54

Technical description that is not described on FCC Form 731 and an attached instruction book for Type RA54.

1. Function of each electron tube, semiconductor or other active circuit device

Rule's No.2.983 (d) - (6)

1.1 Electron tubes

Symbol No.	Description	Type	Function
V101	Magnetron	MSF1425B	Transmitting tube

1.2 Semiconductor in the chassis of the scanner unit

Symbol No.	Description	Type	Function
U101	Front end with X-band amplifier	NJT1973	RF amplifier, local oscillator and mixer
U1	Limiter diode	NJS6930	Receiver protector at X-band

1.3 Semiconductor on E41-101*(Modulator)

Symbol No.	Description	Type	Function
CR1, CR3	Diode	1SS123-L	Rectifier
CR2, CR4, CR5, CR6, CR7, CR10, CR14	Zener Diode	HZM5.1NB2TL	Voltage limiter
CR8	Zener Diode	HZM9.1NB1TL	Voltage limiter
CR9	Zener Diode	HZM6.2NB2TL	Voltage limiter
CR11, CR15	Diode	SB90-05J	Voltage limiter
CR12	Diode	DCB010TA	Rectifier
CR13	Diode	V06G	Rectifier
Q1, Q6	Transistor	2SA1182-Y-TE 85L	Video/Trigger amplifier
Q2	Transistor	2SD1005-T1	Video amplifier

Symbol No.	Description	Type	Function
Q3	Transistor	2SA1213-TE12 L	Video amplifier
Q4, Q8	Transistor	2SA1462-T1BY 34	Trigger buffer amplifier
Q5, Q7, Q9	Transistor	2SC3735-T1BB 35	Pulse amplifier
Q10, Q28	Transistor	2SC3736-T10L	Pulse amplifier
Q11, Q29, Q31	Transistor	2SA1463-T1IL	Pulse amplifier
Q12, Q18	FET	2SK738-Z-E1	Pulse amplifier
Q13, Q19	FET	2SJ132-Z-T1	Pulse amplifier
Q14	Transistor	2SC3631-Z	Pulse amplifier
Q15, Q17, Q20, Q21, Q22, Q23, Q24	FET	2SK1450	Pulse switch
Q16	Transistor	2SA1413-Z-T2 K	Buffer amplifier
Q25, Q27	Transistor	2SC2712-YTE8 5L	Voltage regulator
Q26	Transistor	2SB596-0	Voltage regulator
Q30	FET	IRFP150N	Motor driver
U1	IC Regulator	LM350K	Magnetron heater driver
U2	IC	TC74HC14AF	Hex-inverter
U3	IC Regulator	HA17815V	Voltage regulator
U4	IC Regulator	HA17805V	Voltage regulator
U5	IC	TC74HC00AF-E L	Quad- 2input NAND gate
U6	IC	MC14046BCF	Azimuth PLL
U7	Transistor Array	TD62004F	Signal buffer
U8, U9	IC	TC74HC4040AF	12 bit binary counter
U10	IC Custom	AC235AFP	Transceiver controller
U11	IC	TC74HC11AF-T P2	Triple 3 input AND gate

Symbol No.	Description	Type	Function
U12, U13	A/D converter	TC35095AF	System check interface
U14	Ope-amplifier	UPC324G2-E2	Analog interface
U15, U16, U17, U19	Photo coupler	TLP181GB	Ground isolator
U18	IC	UPC494GS-E2	Motor Power supply controller

1.4 Semiconductor on E41-200*(IF amplifier)

Symbol No.	Description	Type	Function
CR1, CR2, CR5, CR7	Diode	1SS123-L	Switch, Bias control
CR3	Vari-capacitance diode	MA360-TX	Tuning frequency control
CR4	Zener diode	HZM5.1NB2TL	Voltage offset control
CR6	Diode	DCB010TA	Switch
Q1	Transistor	2SD1005	Video amplifier
Q2	Transistor	2SA1213	Video amplifier
Q3	Transistor	2SA1462	Video amplifier
Q4, Q5	Transistor	2SC3735	Video amplifier, switch
Q6	Transistor	2SC3356-T1B	IF pre-amplifier
U1	IC regulator	TA7808F-TE16L	Power supply
U2, U3, U4	IC custom	AA209ASP	Log-IF amplifier
U5	IC regulator	TA78L05F-TE12R	Front-end power supply
U6	IC	TC74HC4066AF	Analog switch
U7	IC Ope-amp.	UPC324G2-T2	Auto/Manual tuning control
U8	IC custom	AA231BFP	AFC control
U9	IC Ope-amp.	UPC803G2-E2	Auto/Manual tuning control
U10	IC regulator	HA17805V	IF amp. power supply

1.5 Semiconductor in the chassis of the display unit

Symbol No.	Description	Type	Function
H1	LCD module	LQ150V1DG12	Color LCD display
U1	Encoder	RECW20D-50-20 1-1D	Encoder

1.6 Semiconductor of E43-700*(Logic control)

Symbol No.	Description	Type	Function
D1-D2, D24, D26	IC	74HC541F	Octal 3-state buffer
D3	IC	AC233CFP	Graphic memory controller
D4	IC	uPD72020GC-8-3B6	Graphic controller
D5-D8, D13-D14	IC	VRAM2M70J	256kX8 VRAM
D9-D12	IC	74HC166F	8-bit shift register
D15	IC	SRAM32KX8-12CF	32kX8 SRAM
D16	IC	HD6413003TF16	16bit CPU
D17-D18	IC	74HC138F	Decoder
D19, D28	IC	74HC273F	Octal D-flip-flop
D20	IC	EPROM256kX16-12C	256kX16 EPROM
D21	IC	24LC04B/SN	512kX8FRAM
D22	IC	74HC74F	Dual D-flip-flop
D23, D39	IC	74HC14F	Schmitt-trigger inverter
D25, D33	IC	74HC245F	Octal bus transceivers
D27	IC	74HC05F	Hex. Inverter
D29-D30	IC	74HC595F	8-bit shift register
D31	IC	MB89251A-PF	Serial data transmitter/Receiver
D32	IC	74HC123F	Dual Multi vibrators

Symbol No.	Description	Type	Function
D34	IC	TC35095AF	8ch A/D converter
D35	IC	AC232CFP	Video signal processor
D36	IC	HM62832HJP-25	32kX8 SRAM
D37	IC	MC14046BF	Phase locked loop
D38	IC	uPD485505G-25	Line buffer
D40	IC	74HC74F	Dual D-flip-flop
K1-2,4-6	Photo coupler	TLP181BL	Isolator
K3	Photo coupler	PC356T	Isolator
N1	IC	TL7759CPS	Voltage detector
N2-5	IC	THS124	Hole IC
N6, N9	IC	uPC451G2	Quadruple Op-amp
N7	IC	78L05F	Voltage regulator
N8	IC	MB88346BPF	12ch 8bit D/A converter
N10	IC	AA239BFP	Video controller
V1	FET	2SK1419	Switch
V2	Thyristor	03P2J	Over current protector
V3	Zener diode	RD10MB2	Voltage regulator
V4	Diode	DF10LC20U	Voltage protector
V5, V36	Transistor	UN211F	Buffer amplifier
V6-V7, V39-V40, V43	Diode	1SS123	Switching diode
V8, V10-V11, V17-V18, V25	Diode	1SS184	Switching diode
V9, V34	Transistor	uPA2003GR	Transistor array
V12	Zener diode	RD5.1MB2	Voltage regulator
V13, V19, V22, V26, V38, V42	Transistor	UN221L	Buffer amplifier
V14	Transistor	2SA1213	CFL amplifier

Symbol No.	Description	Type	Function
V15-V16	Transistor	2SD1000	CFL amplifier
V20-V21	Transistor	2SC2712	Buffer amplifier
V23, V27-V33	LED	TLG260	Illuminator
V24	Transistor	2SA1213	Buffer amplifier
V35	Transistor	2SD1000	Trigger amplifier
V37	Transistor	2SB799	Output buffer for video
V41	FET	2SK2158	Switch

1.7 Semiconductor of E43-600*(Power Supply)

Symbol No.	Description	Type	Function
D1	IC	TC4011BF(N)	Quadruple 2 input NAND
K1	Photo coupler	TLP181BL	Isolator
K2	Photo coupler	PC356T	Isolator
N1-2	IC	uPC494G	Switching controller
N3	IC	uPC1093T	Voltage regulator
V1	Transistor	2SC2873	Voltage regulator
V2, V19-V20,	Transistor	2SC2712	Buffer amplifier
V3, V8	Diode	DE5SC6M-406 1	Rectifier
V4-V5	Diode	D1FL20U-406 3	Rectifier
V6-V7	Diode	RU4A	Rectifier
V9, V11	Zener diode	RD20MB2	Voltage protector
V10	Zener diode	RD10MB2	Voltage regulator
V12, V14, V17 , V22	Transistor	2SA1213	Buffer amplifier
V13, V15, V18 , V26	Diode	D1FS4-4063	Switching diode
V16, V25, V28	FET	2SK1419	Switch
V21	Transistor	2SC2873	Buffer amplifier

Symbol No.	Description	Type	Function
V23-V24	FET	2SK2010	Switch
V27	Transistor	2SA1162	Switch
V29	Transistor	2SB1097	Voltage regulator
V30-V31	Transistor	2SC2712	Voltage regulator
V32,V42	Zener diode	RD5.1MB2	Voltage regulator
V33	Transistor	UN221L	Buffer amplifier
V34-V36	Diode	DF10LC20U-4 062	Voltage protector
V37	Transistor	2SC3631-Z	Switch of H.T.
V38	Transistor	UN2113	Buffer amplifier
V39	Diode	A1SS123	Switching diode
V40	Transistor	2SA1413-Z	Switch of H.T.
V41	Transistor	2SA1213	Switch of H.T.

1.8 Semiconductor of E43-900*(Panel Key Control)

Symbol No.	Description	Type	Function
DS1, DS2, DS3, DS4, DS5, DS6, DS7, DS8	LED	TLG260	Light Emission Diode
Q1, Q2	Transistor	2SC2712	LED Driver
U1, U2, U3, U4	Hole IC	THS124	Magnetic Sensor for Cursor
U5	Ope-Amplifier	uPC324	Magnetic sensor buffer

2. Tune up procedure over the power range or at specific operating power levels.
Rule's No. 2.983(d)-(9)

2.1 Transmitter

Pulse radars employ a pulse-excited magnetron as the transmitter tube. The magnetron used in this radar has a fixed cavity resonator which determines the oscillating frequency. Accordingly, this radar transmitter has no more frequency-adjust circuitry.

2.2 Receiver

Pulse radars receive the reflected signal from targets, therefore receiving signal has the same frequency as the transmitter power output. Thus, the radar receiver is tuned to the transmitting frequency. This radar has a super heterodyne type receiver with a Front-End module. The Front-End module consists of a GaAs FET low noise amplifier, a double balanced mixer and a FET local oscillator. Tuning of the receiver is accomplished by controlling the local oscillator frequency. The local oscillator consists of a FET and a varactor diode. Its oscillating frequency is controlled by the voltage across the varactor diode. Tuning is made by an automatic tuning circuit controlling the voltage, so that the signal frequency from the mixer coincide with intermediate frequency of the receiver.