

Parts List/Tune Up Information

MARINE RADAR RA40C

- 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
V1	Magnetron	M1489	Transmitting tube

1.2 Semiconductor in the chassis of the scanner unit

Symbol No.	Description	Type	Function
U2	Limiter diode	NJS6931	Receiver protector at X-band
U3	Front end with X-band amplifier	NJT1959	RF amplifier, local oscillator and mixer

1.3 Semiconductor on SCAN_RDM PCB

Symbol No.	Description	Type	Function
D1	IC	74LS00F	Quadruple 2 input NAND
D2	IC	AC235AFP	Scanner controller
N1	IC	78L18F	Voltage regulator
N2	IC	7805FM	Voltage regulator
N3	IC	TC35095AF	8ch A/D converter
N4	IC	uPC451G2	Dual Op-amp
N5	IC	uPC803G2	Dual Op-amp
N6	IC	uPD74HC4066 G	Analog switch
N7	IC	AA231AFP	Logarithmic amplifier
V1, V3	Transistor	2SC3735	Pulse amplifier
V2	Transistor	2SC1462	Pulse amplifier
V4	Transistor	2SC2712	Switching high voltage

V5	Transistor	2SA1154	Switching high voltage
Symbol No.	Description	Type	Function
V6	FET	2SJ132-Z	FET for the switching high voltage
V7	FET	2SK738-Z-E1	FET for the switching high voltage
V8	FET	2SK1450	Switching high voltage
V9	Diode	FMU-16S	Damping diode
V10,V12	Zener diode	RD5.1MB	Rectifier for magnetron current
V11	Zener diode	RD6.2MB	Rectifier for magnetron current
V13	Diode	1SS184	Rectifier for magnetron current
V15	Zener diode	RD6.2MB	Hold off diode
V16	Transistor	2SA1182	Amplifier
V19	Diode	1SS184	Switching of Tuning
V20	Zener diode	RD3.3MB	Limiter
V21	Transistor	2SD1005	Output buffer for video
V22	Transistor	2SA1213	Amplifier
V23	Transistor	2SC3753	Buffer amplifier
V24	Diode	1SS123	Output buffer for video
V26	Diode	1SV222	Temperature compensator
V28	Transistor	2SC3356	Pre-amplifier
V30	IC	uPA2003GR	Septuple transistor array
V31	IC	uPA2003C	Septuple transistor array
V32	Zener diode	RD4.7MB	Limiter of trigger
V33	Diode	1SS123	Temperature compensator
V34	Diode	1SS184	Switching of band width
V35, V36	Zener diode	RD5.1MB	Limiter

1.4 Semiconductor in the chassis of the display unit

Symbol No.	Description	Type	Function
H1	LCD module	NL6448BC33-31	Color LCD display module
U1	Encoder	RECW20D-50-201-1D	Encoder

1.5 Semiconductor of MAIN PCB

Symbol No.	Description	Type	Function
D1-D2, D24, D26	IC	74HC541F	Octal 3-state buffer
D3	IC	AC233DFP	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	EPR0M256kX16-12C	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 Multivibrators

D34	IC	TC35095AF	8ch A/D converter
Symbol No.	Description	Type	Function
D35	IC	AC232DFP	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
V15-V16	Transistor	2SD1000	CFL amplifier

V20-V21	Transistor	2SC2712	Buffer amplifier
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Symbol No.	Description	Type	Function
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

1.6 Semiconductor of POWER PCB

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-4061	Rectifier
V4-V5	Diode	D1FL20U-4063	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
V23-V24	FET	2SK2010	Switch

V27	Transistor	2SA1162	Switch
V29	Transistor	2SB1097	Voltage regulator
V30-V31	Transistor	2SC2712	Voltage regulator
Symbol No.	Description	Type	Function
V32,V42	Zener diode	RD5.1MB2	Voltage regulator
V33	Transistor	UN221L	Buffer amplifier
V34-V36	Diode	DF10LC20U-4062	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.

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.