

## Parts List/Tune Up Info

### MARINE RADAR RA41C

Technical description that is not described on FCC Form 731 and an attached instruction book for Type RA41C.

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          |
|------------|-------------|----------|-------------------|
| V1         | Magnetron   | MSF1421B | Transmitting tube |

#### 1.2 Semiconductor in the chassis of the scanner unit

| Symbol No. | Description                     | Type    | Function                                 |
|------------|---------------------------------|---------|------------------------------------------|
| U101       | Front end with X-band amplifier | NJT1959 | RF amplifier, local oscillator and mixer |
| U1         | Limiter diode                   | NJS6930 | Receiver protector at X-band             |

#### 1.3 Semiconductor on SCAN\_RDM PCB

| Symbol No. | Description   | Type         | Function               |
|------------|---------------|--------------|------------------------|
| D1, D3     | IC            | 74HC00F      | Quadruple 2 input NAND |
| D2         | IC            | AC235AFP     | Scanner controller     |
| K1, K2     | Photo coupler | TLP181BL     | Isolator               |
| N1         | IC            | TC35095AF    | 8ch A/D converter      |
| N2         | IC            | 78L18F       | Voltage regulator      |
| N3         | IC            | 7805FM       | Voltage regulator      |
| N4         | IC            | 7809FM       | Voltage regulator      |
| N5         | IC            | uPD74HC4066G | Analog switch          |
| N6         | IC            | uPC803G2     | Dual Op-amp            |
| N8         | IC            | uPC451G2     | Dual Op-amp            |

| N11         | IC          | AA231BFP      | Logarithmic amplifier           |
|-------------|-------------|---------------|---------------------------------|
| Symbol No.  | Description | Type          | Function                        |
| N14         | IC          | 78L15F        | Voltage regulator               |
| V1          | IC          | uPA2003GR     | Transistor array                |
| V2,V21,V32  | Transistor  | 2SC3735       | Buffer amplifier                |
| V3,V31      | Transistor  | 2SA1462       | Pulse amplifier                 |
| V4          | Transistor  | 2SD1005       | Switching high voltage          |
| V5          | Transistor  | 2SA1213       | Switching high voltage          |
| V6          | FET         | 2SK738-Z-E1   | Switching high voltage          |
| V7          | FET         | 2SJ132-Z      | Switching high voltage          |
| V8          | FET         | 2SK1450       | Switching high voltage          |
| V9,V23      | Zener diode | RD6.2MB2      | Rectifier current for magnetron |
| V10-V11,V15 | Zener diode | RD5.1MB2      | Rectifier current for magnetron |
| V12,V27     | Diode       | A1S2838       | Rectifier current for magnetron |
| V13         | Diode       | FMU-16S       | Damping diode                   |
| V14         | Diode       | A1S2838       | Switching diode                 |
| V16,V37     | Zener diode | RD5.1MB2      | Limiter                         |
| V17         | FET         | 2SK2158       | Pulse Amplifier                 |
| V18         | Diode       | V03G          | Rectifier current for magnetron |
| V19         | Transistor  | 2SD1005       | Output buffer for video         |
| V20         | Transistor  | 2SA1213       | Output buffer for video         |
| V22         | Transistor  | 2SA1182       | Amplifier                       |
| V24         | Transistor  | 2SC3356       | Pre-amplifier                   |
| V25         | Zener diode | HZU3ALL-TR,TL | Limiter                         |
| V26         | Diode       | MA360         | Temperature compensator         |
| V29         | Diode       | A1S2838       | Switching of band width         |
| V34         | Transistor  | 2SB1097       | Voltage regulator               |

|         |            |         |                        |
|---------|------------|---------|------------------------|
| V35-V36 | Transistor | 2SC2712 | Differential amplifier |
| V38     | Diode      | A1S2838 | Switching diode        |

#### 1.4 Semiconductor in the chassis of the display unit

| Symbol No. | Description | Type              | Function          |
|------------|-------------|-------------------|-------------------|
| H1         | LCD module  | NL6448BC33-31     | Color LCD display |
| 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          | 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          | 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            | AC232CFP          | Video signal processor  |
| D36                             | IC            | HM62832HJP<br>-25 | 32kX8 SRAM              |
| D37                             | IC            | MC14046BF         | Phase locked loop       |
| D38                             | IC            | uPD485505G<br>-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-<br>V40,V43           | Diode         | 1SS123            | Switching diode         |
| V8,V10-<br>V11,V17-<br>V18,V25  | Diode         | 1SS184            | Switching diode         |
| V9,V34                          | Transistor    | uPA2003GR         | Transistor array        |
| V12                             | Zener diode   | RD5.1MB2          | Voltage regulator       |
| V13,V19,V22<br>,V26,V38,V4<br>2 | Transistor    | UN221L            | Buffer amplifier        |
| V14                             | Transistor    | 2SA1213           | CFL amplifier           |
| V15-V16                         | Transistor    | 2SD1000           | CFL amplifier           |

|         |            |         |                  |
|---------|------------|---------|------------------|
| V20-V21 | Transistor | 2SC2712 | Buffer amplifier |
|---------|------------|---------|------------------|

| 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<br>,V22 | Transistor    | 2SA1213      | Buffer amplifier       |
| V13,V15,V18<br>,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.    |