

NISSEI
SERVICE MANUAL

DG-503



RANGE : 1.6 - 525 MHz

Max. Power : 200W

SERVICE MANUAL

TABLE OF CONTENT

MODEL : DG-503 SWR & POWER METER 1.6-525 MHz

SECTION SUBJECT:

1. INTRODUCTION

1.1 Main features.....	2
1.2 Specification.....	2

2. ALIGNMENT

2.1 Test equipment.....	3
2.2 Forward power (125-525Mhz).....	3
2.3 SWR alignment (125-525Mhz).....	4
2.4 Forward power (1,6-60Mhz).....	4
2.5 SWR alignment (1.6-60Mhz).....	4
2.6 Final alignment.....	4
2.7 Alignment spots photo.....	5

3. SCHEMATICS & COMPONENT PLACEMENT

3.1 Main board schematic	6
3.2 Main board component placement	7

4. EXPLODED DRAWING & PARTS LIST

4-1 EXPLODED DRAWING	8
4-2 PARTS LIST.....	8

1. INTRODUCTION

This digital SWR & Watt meter is highly accurate for measuring Forward Power, Reflected Power, & VSWR.

1.1 Main Features:

- A. Large LCD (3.5") display for easy of reading.
- B. Forward / Reflected power / VSWR ratio in one push button.
- C. LCD backlight display
- D. Convenient control layout for easy operation
- E. Packing gift box and DC 12V wire.

1.2 SPECIFICATIONS

MODEL	DG-503
Frequency Range	1.6-60 MHz / 125-525 MHz
Caibration point	14MHz / 50MHz / 145MHz / 435MHz
Power Range	0 - 200W
Accuracy	(+/- 5%)
Minimum Power for SWR	1W
Input/Output Connector	SO239 (N-female option)
Weight (Net)	750 g
Insertion Loss	Less than 0.1 dB
Testing Function	Fwd/Ref Power & VSWR ratio
Input/Output Impedance	50 Ohm
Dimension (W/H/D) mm	140 x 84 x 122
Accessories	Operation Manual, 12V DC Wire

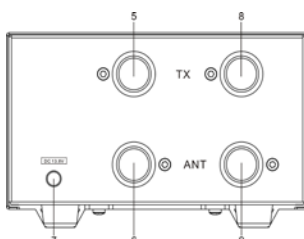
<FRONT PANEL>



<FRONT & REAR PANEL>

1. LCD Display : Indicates FWD/REF and VSWR
2. HF & V/UHF band switch.
3. Power switch

<REAR PANEL>



<REAR PANEL>

5. TX connector : Coax connector to transmitter RF output
6. ANT connector : Coax connector to antenna system
7. Power source : 13.8V DC wire

[Black line is negative (-), black/white line is positive (+)]

2. Alignment

2.1 Test Equipment

- A. HF transceiver
- B. VUHF dual band transceiver
- C. VHF Power amplifier (VHF), Input 5-20W, Output 200W
- D. UHF power amplifier (UHF), Input 5-20W, Output 200W
- E. Power Supply 13.8, 50A
- F. Dual Band Antenna (MAX. 200W)
- G. HF Antenna (MAX, 200W)
- H. Power meter BIRD 4421 or BIRD 43
- I. Dummy Load 50 OHM, MAX. 200W X1, 25 OHM, MAX, 200W x 1
- J. Ceramic adjusting driver

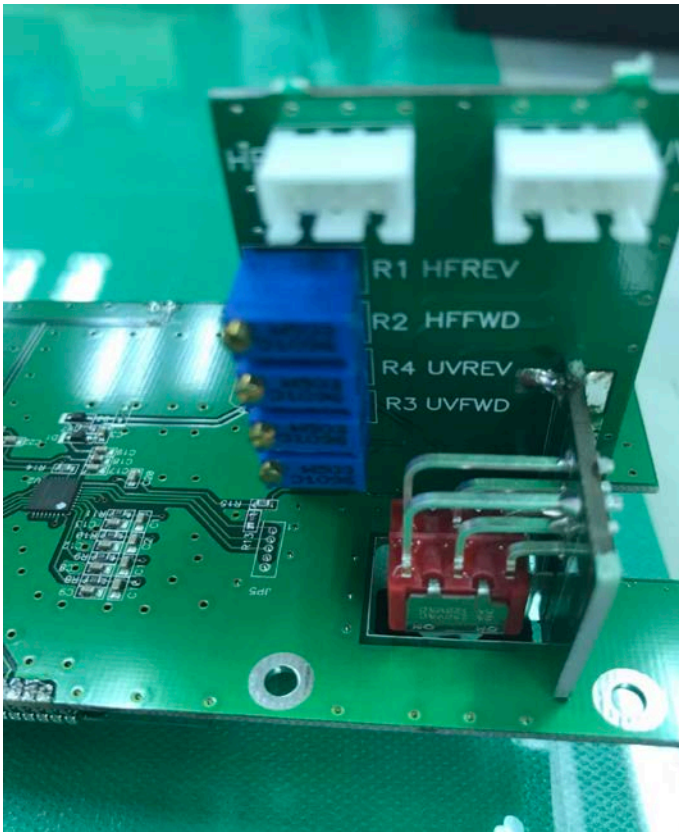
2.2 Forward Power alignment (125-525 MHz coupler & PCB adjustment)

Preset : Turn DG-503 switch to "VUHF", connect coupler plug to JP2 on C board

- A. Turn dual band transceiver to VHF 145.130 MHz position "M"
Connect BIRD 4421 + dummy load. Record forward power and SWR from BIRD 4421
- B. Turn dual band transceiver to UHF at 435.130 MHz ; position " M"
Connect BIRD 4421 + dummy load. Record forward power and SWR from BIRD 4421
- C. Turn DG-503 to VUHF (DG-503 replace BIRD 4421)
- D. Press PTT, adjust CV1 on coupler until the reading of forward power is same as record from point B.
- E. Turn transceiver to VHF at 145.130 MHz, position "M"
- F. Press PTT, adjust R3 UVFWD on PCB board, get the same readings recorded from point A
- G. As CV1 and R3 UVFWD might interfere each other, repeat step D & F until correct readings for V and U range are gotten.
- H. When adjustments made in step D and/or F, re-alignment A-G is essential to meet 5% tolerance

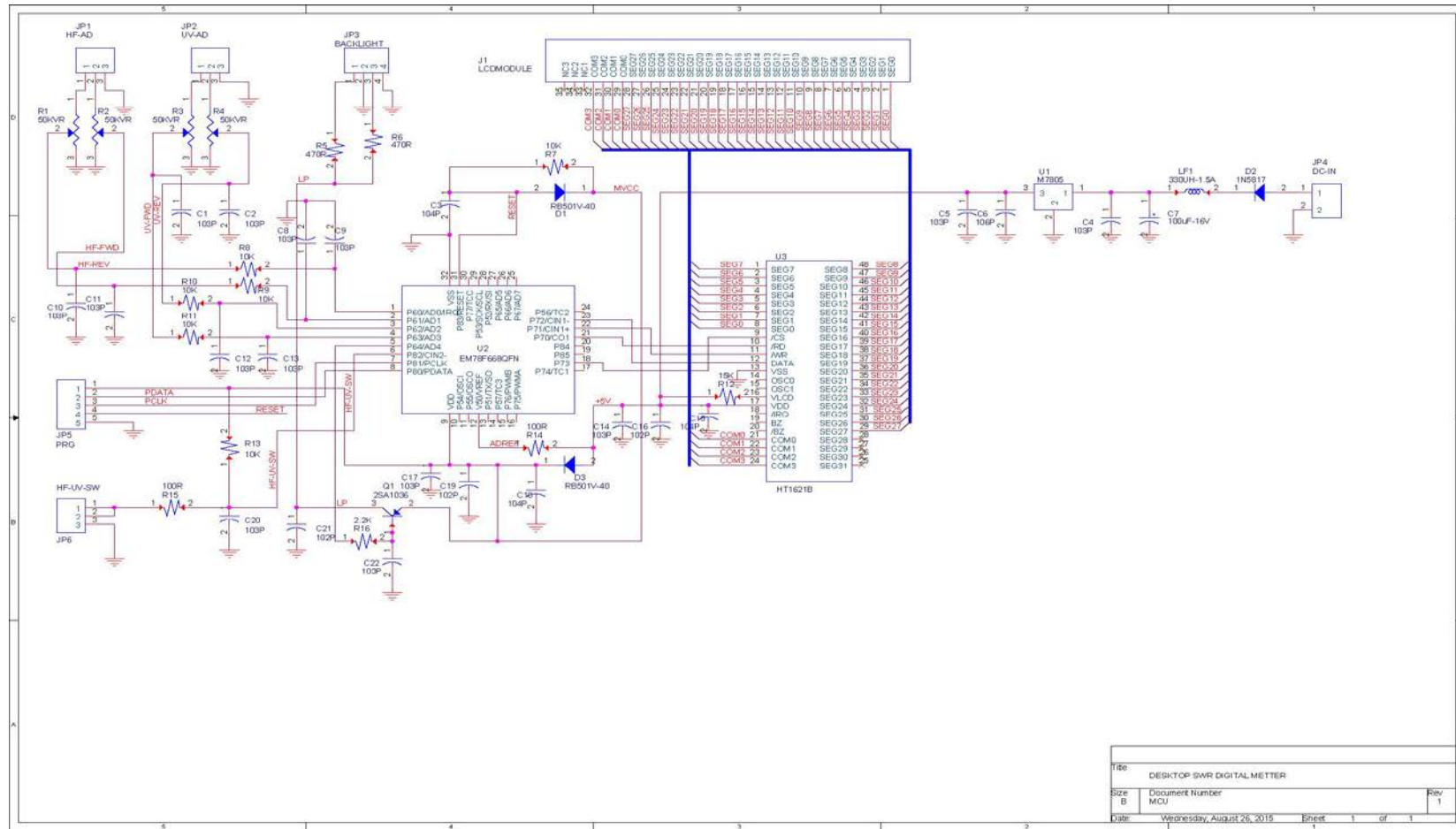
- 2.3 SWR alignment (125-525 MHz)
- A. Connect transceiver TX to DG-503 TX ; antenna to DG-503 ANT
 - B. Turn transceiver to UHF 435.130 MHZ, position "M"
 - C. Refer to 2.1 step B SWR value ; adjust CV2 in coupler to get same SWR reading from DG-503
 - D. Turn transceiver to VHF 145.139 MHZ, position "M"
 - E. Refer to 2.1 step A SWR value ; adjust R4 UVREV on the PCB to get same SWR reading from DG-503
 - F. As CV2 and R4 UVREV might interfere with each other, repeat step C and E until a correct reading for V and U range are gotten.
 - G. When adjustments made in step C and/or E, re-alignment A-G is essential to meet 5% tolerance
- 2.4 Forward power alignment (1.6-60 MHz)
- A. Turn HF transceiver to 28.5 MHz, connect BIRD 4421 + DG-503 + 50 Ohm dummy load.
 - B. Turn DG-503 switch to "HF", connect coupler plug into JP1 on PCB
 - C. Push PTT, tune transceiver power to get "100W" shown on BIRD 4421
 - D. Use ceramic driver to adjust R2 HFFWD on the PCB until DG-503 reading 100W is shown
- 2-5 SWR alignment (1.6-60 MHz)
- A. Turn HF transceiver to 28.5 MHz, connect BIRD 4421 + DG-503 + 25 Ohm dummy load.
 - B. Set DG-503 to HF range
 - C. Push PTT, record SWR value which is shown on BIRD 4421
 - D. Use ceramic driver to adjust R1 HFREV on PCB until same SWR reading shown on DG-503.
- 2.6 Final alignment
- PCBs (board A, B, &C) were aligned separately before assembly. After DG-503 completed assembly, it is a must for the calibrator to do a final check on every calibration point mentioned above to assure DG-503 accuracy

2.7 Alignment spots photo (PCB-C driver board)

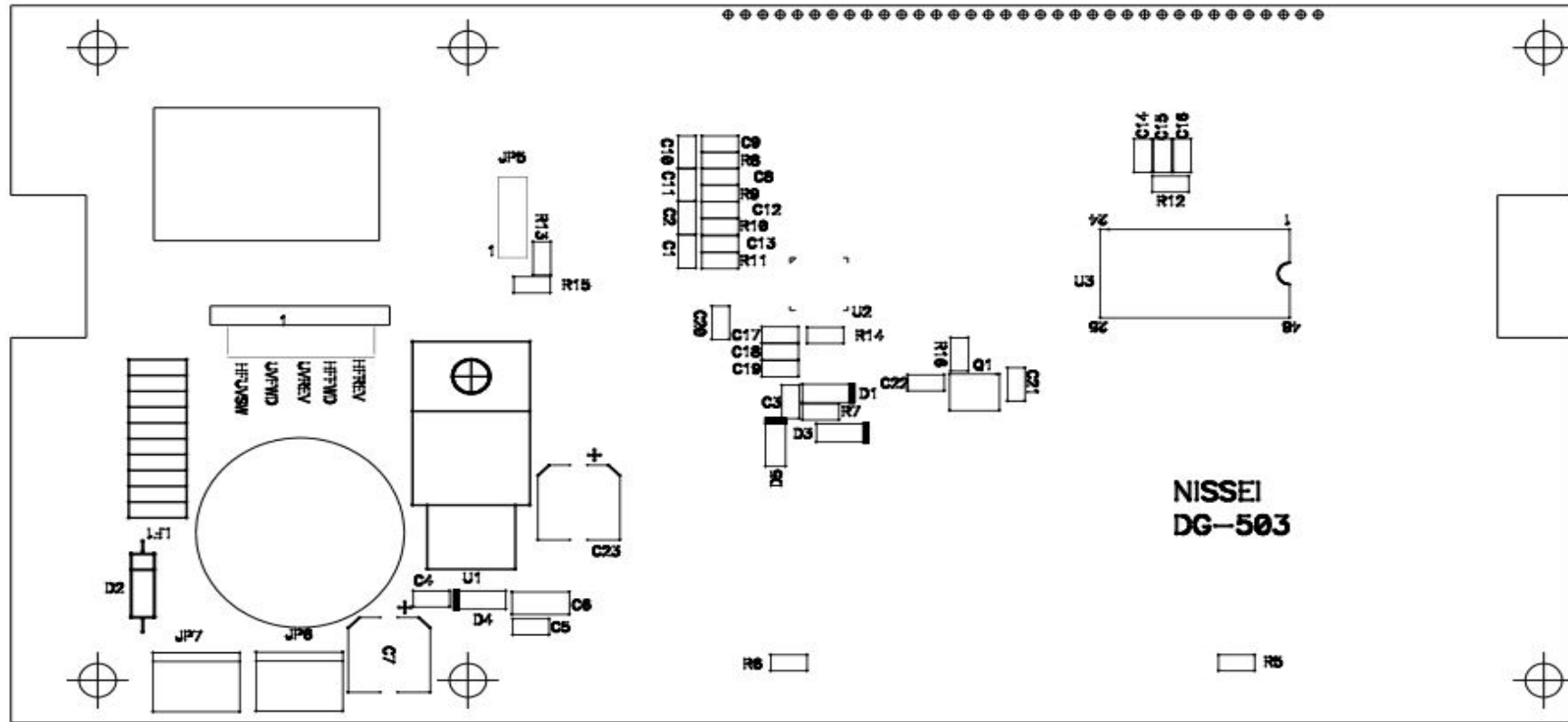


3. SCHEMATIC

3.1 Main board schematic

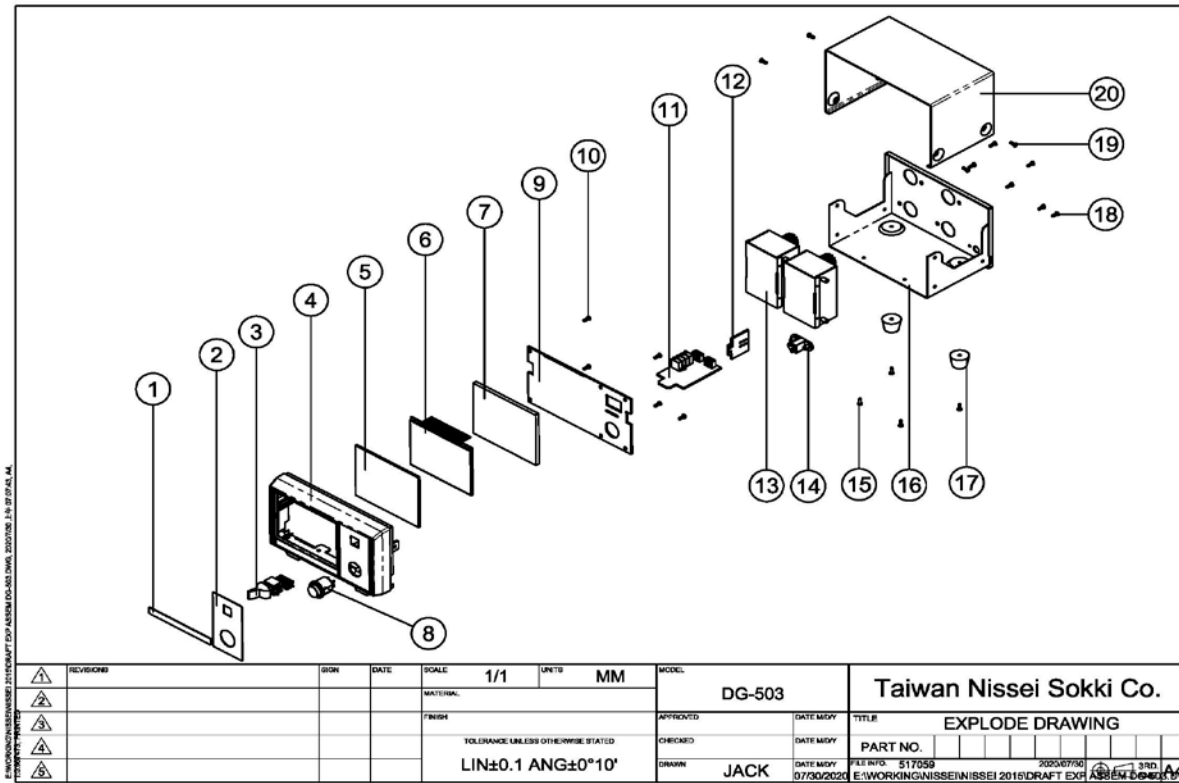


3.2 Main board component placement



4. EXPLODED DRAWING & PARTS LIST

4-1 EXPLODED DRAWING



4-2 PARTS LIST

No	Name	Description	QTY
1	Plate	Name plate	1
2	Plate	Function plate	1
3	Switch	Slide	1
4	Panel	Plastic front panel	1
5	Lens	PMMA	1
6	Display	LCD display	1
7	Backlight	LED backlight sheet	1
8	Button	Push button	1
9	PCB	PCB_B_Main Board	1
10	Screw		6
11	PCB	PCB_C_Driver Board	1
12	PCB	PCB for slide SW	1
13	Sensor	x2, HF and V/U HF	2
14	Socket	13.8V	1
15	Screw		6
16	Chassis	Base cabinet	1
17	Stand	Rubber stand	4
18	Screw		4
19	Screw		4
20	Chassis	Top cabinet	1

Brand: Nissei

Type: DG503

Complaint: Bad read out or 000 read out

If the display shows 000, pls refer to the photo and apply fully soldering at the said 5 points.

