COLOR LCD FISH FINDER
FF50

SERVICE MANUAL

Document No.   7ZPBS4104

JRC *Japan Radio Co., Ltd.*

General Information

This service manual describes the maintenance and inspection procedures for the FF50.   Prior to the installation, users are requested to read this manual well and familiarize with its contents so that an optimum function may be derived from the FF50.

Note that the grounding work is indispensable to prevent electric shock hazards as well as to ensure the intended function of the set.   Don't try to ignore the grounding work.

For the operation of the set, refer to the Instruction Manual.

Before You Begin

Symbols Used In This Manual

Related Symbols Marks

In this manual, and on the equipment, we use several warning signs to call your attention to important to items that, if not handled correctly, could present danger to yourself or property.

These warning note classifications are as described below.

Please be fully aware of the importance of these items before using this manual.

| ⚠ **WARNING** | Indicates warning items that, if ignored, may result in serious personal injury or even death. |
| ⚠ **CAUTION** | Indicated cautionary items that, if ignored, may result in personal injury or physical damage. |

Examples of Related Symbol Marks Used in this Manual and on the Unit

Hot Surface	Each ⚠ mark is intended to alert the user to the presence of precautions including danger and warning items. The picture in each ⚠ mark alerts you to operations that should be carefully performed.
Prohibition / Prohibitions disassembly	Each ⃠ marks is intended to alert the user to the presence of prohibited activity. The picture/word in/beside each ⃠ mark alerts you to operations that are prohibited.
Instruction	Each ! mark is intended to alert the user to the presence of necessary instructions. The picture in each ! mark alerts you to operations that must be performed.

Warning Label

You can see the warning label on the top of the unit.

Do you attempt to remove the warning label from the unit or impair or modify it.

Usage Hints

⚠ WARNING

⏚	When installing this set, be sure to connect the grounding wire to the grounding terminal of the set. Otherwise, an electric shock can result when a failure or leakage occurred on the set.
🚫	Do not damage, break or modify the power cord. Placing a heavy load, heating, pulling or forcibly bending the cord can damage it resulting in a fire or an electric shock.
🚫	Do not use this set at a voltage other than the supply voltage stated on the set. Otherwise, a fire, an electric shock or system failure can result.
🚫	Do not touch inside the set with wet hands. When your hands are wet, don't try to connect or disconnect the power cord or touch the switches. Otherwise, an electric shock can result.
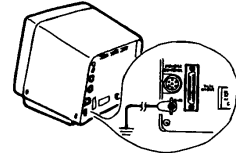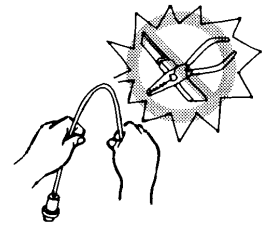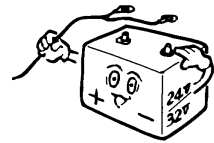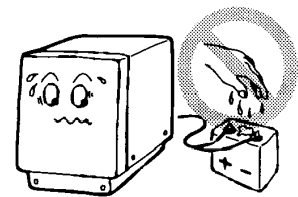
⚠ CAUTION

When removing the power cord, be sure to remove the power cord terminal correctly. Pulling the power cord can damage it resulting in a fire or an electric shock.

No
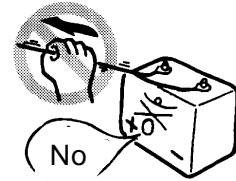
Do not bring the set in a cooled state suddenly into a warm room.
A high voltage may leak due to dew condensation resulting in a failure.   In this case, use the set after leaving it alone for 30 minutes.
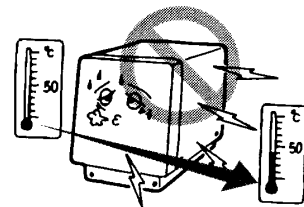
When cleaning the surface, do not use any organic solvent such as thinner or benzene. Otherwise, the painting on the surface may be damaged.
For cleaning the surface, remove the dust, then wipe with clean dry cloth.

Index

1. Specifications

Display	6.5 inch Color LCD (TFT)
Resolution	234× 320 dots (Screen Size 133 mm× 97 mm)
Presentation	8 or 16 Color Gradation with 2 Patterns
Brightness Control	10 steps
Contrast Control	10 steps
Range	Auto or Manual
	5 to 1,500 m
	10 to 5,000 ft
	3 to 1,000 fm
Shift	Auto or Manual
	0 to 1,000m
	0 to 3,000ft
	0 to 600fm
Frequency	200 kHz/50 kHz (Dual Frequency)
Power Output	600 W RMS (4,800W P-P)
Gain (Sensitivity)	100 steps
Depth Unit	Meter, Feet, Fathom, SP (0.3000 to 1.9999 m)
Speed Unit	Knots, Mile/h, Km/h
Noise Suppression	Selectable (0 to 15 level)
Interference Rejection	Selectable (OFF, IR1, IR2)
STC	Selectable (Short, Mid, Long)
Water Temperature	32.0 degree Fahrenheit to 100.0 degree Fahrenheit (0.0 degree Centigrade to 40.0 degree Centigrade)
Boat Speed	0 to 70 Knots
Trip Log	(Only at the STD/ 0 to 999 NM Navigation type 1 or 2)
Display Modes	1) STD (LF or HF)
	2) STD (LF)/STD (HF)
	3) STD/A-Scope (LF or HF)
	4) STD/A-Scope (LF)/STD/A-Scope (HF)
	5) STD/Zoom (LF or HF)
	6) STD/Auto Zoom (LF or HF)
	7) STD/Bottom Lock (LF or HF)
	8) STD/Bottom Discrimination (LF or HF)
	9) STD/Dual Frequency Mixed
	10) STD/Navigation type1 (LF or HF)
	11) STD/Navigation type2 (LF or HF)
Simulator	Built-In

Audible-visual alarms	Fish, Shallow, Deep, Temp Upper, Temp Lower, Temp Rate, Arrival, Anchor, Off Course, DGPS
Waypoints	Max. 400 points.
Route plans	10 plans, 40 waypoints per route.
Memory Backup	Includes Battery
Option NAVAID Input	GPS100/DGPS200 sensor NMEA0183 format
Input Voltage	12 to 24 VDC
Power Consumption	Approx. 25 W
Mass (Display Unit)	8.8 lbs (4 kg)
Water Resistance	IPx5
Environmental Conditions	-10 to +50

2. Component

When unpacking your FF50, you should find the following standard equipment
in the carton. If any items are missing, please notify your JRC dealer immediately.

Standard Equipment

No	Description	Model No.	Qty.	Remarks
1	Fish Finder	JFC-500	1	
2	Transducer	Depends on the	1	See below Type the item
3	Spares	5ZFAD00362	1	Fuse (3.15A)
4	Power Cable	CFQ-6382	1	length 1.5m
5	Ferrite Core	5MBBB00002	1	NF-130
6	Sun Cover	MTV302704	1	
7	Console Mounting Kit	MPTG30716	1	
8	Instruction Manual	7ZPBS2106B	1	
9	Warranty Card		1	

Transducers

Model No.	Frequency	Remarks
CFT-2501TFA	200 kHz/50 kHz	Transom type dual frequency with speed and temp. sensor
CFT-2501HFA	200 kHz/50 kHz	Through hull type dual frequency with speed and temp. sensor

3. Outline Drawing
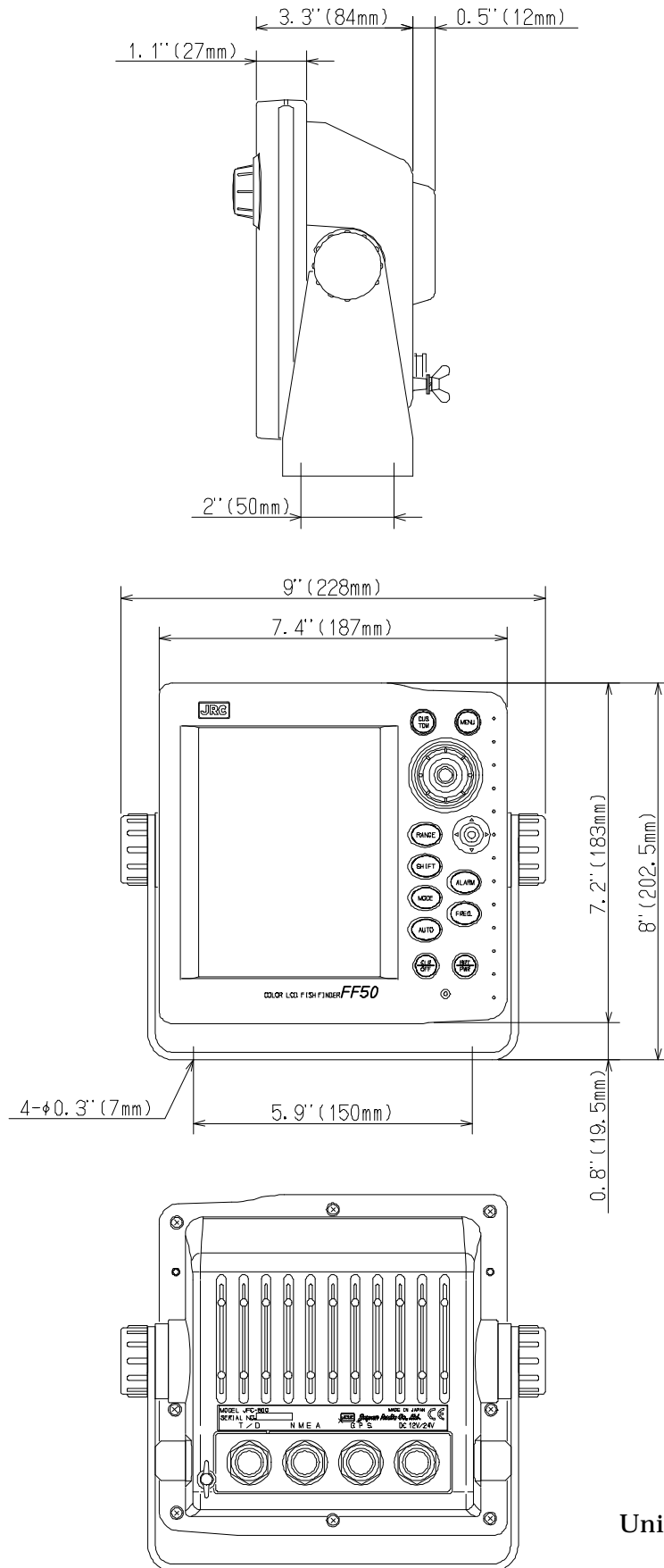
Unit :inch(mm)

4. Installing the display unit

Connecting The Power Supply and Transducer cables

(1) Connecting the Power Cables
    1,   Use CFQ-6382 for the power cable.
    2,   Connect the Power cables as indicated below.

Cable	Connector pin NO.	Polarity
Black	1	-
Red	2	+

    3.   At powering on,2.5A current is conduced to the FF50 for one second.
       Current capacity of circuit breaker, if any , must be suitable for the current.

(2) Power Cable Connecting Procedure For AC specification
    1.   Connect DC power supply ,then connect the power cable to DC power supply.
    2.   Don't use the DC power supply of switching form power supply.
       If you use the switching power supply , RX signal is interfered by power supply.
(3) Power Cable and transducer Wiring Procedure
    1. Don't try to bundle the radio equipment coaxial cable and the audio speaker cable with the Fish finder power cable.
       Such practice can generate noise on the radio and audio equipment.

5. Circuit Block Diagram
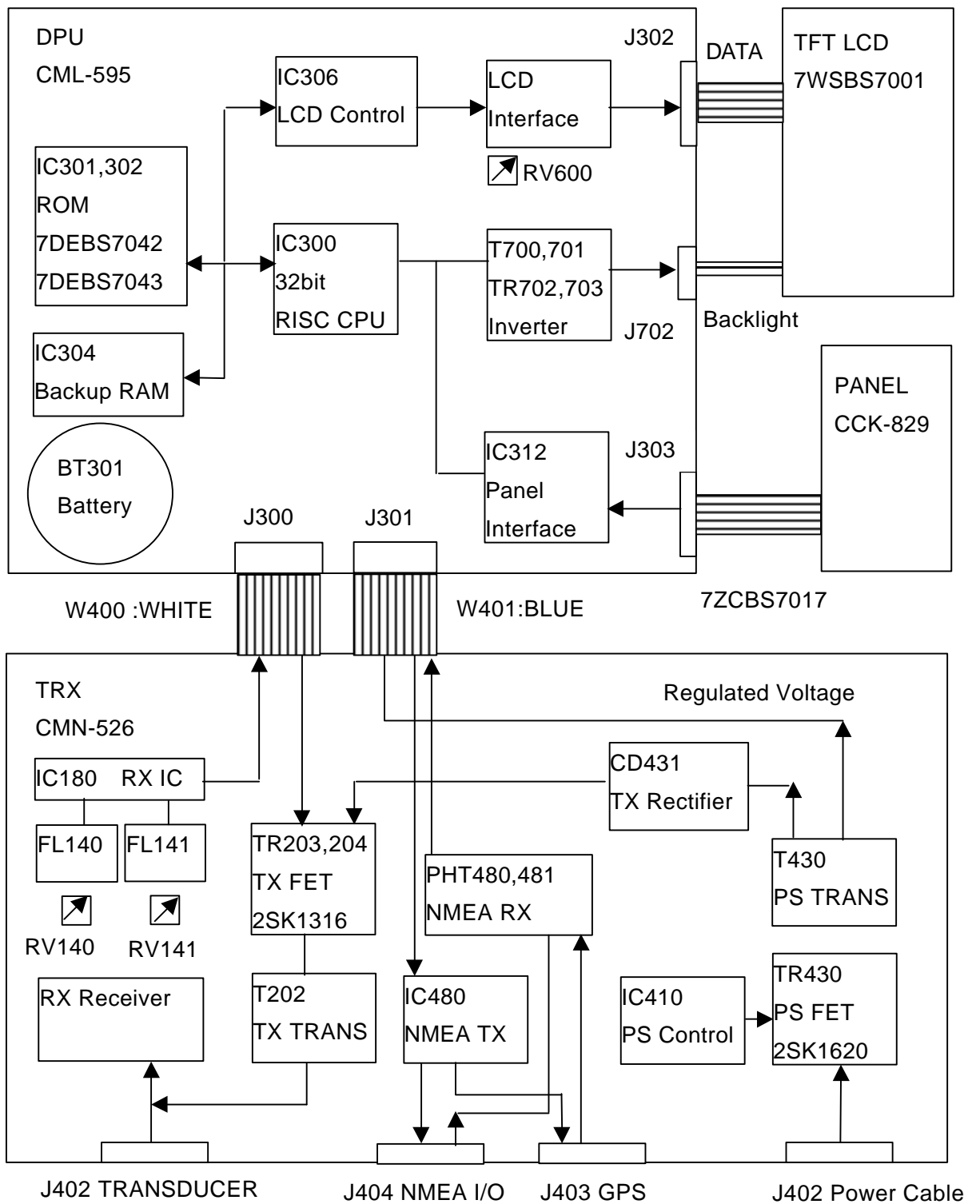
These VR is adjusted in manufacture.
Don't Remove VR adjustment.

RV600   LCD Flicker Adjustment
RV140, RV141   RX GAIN Adjustment

6.5 INCH COLOR LCD

A901
H-7WSBS7001
(EDTCA14QCF)

DATA CABLE   CCFL CABLE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24   1 2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24   1 2

J302   J702

W902
H-7ZCBS7017

J303   J501

**DPU UNIT
CML-595**

**PANEL UNIT
CCK-829**

J300   J301

W400   W401

**TRX UNIT
CMN-526**

POWER CABLE
H-7ZCBS7018
(CFQ-6382)

TRANSDUCER   NMEA I/O   GPS IN   DC IN

J402   J404   J403   J405   W900

EARTH

FUSE
3A

BLACK –   RED +

POWER SOURCE
11-32VDC

J402	J404	J403
1 SIGNAL (SPEED)	1 NC	1 GPS +12V
2 +VOLTAGE (SPEED)	2 DATA –OUTPUT	2 GPS GROUND
3 POSITIVE (DEPTH)	3 DATA COMMON	3 GPS COMMON
4 NC	4 DATA INPUT	4 GPS INPUT
5 NEGATIVE (DEPTH)	5 DATA +OUTPUT	5 GPS +OUTPUT
6 GROUND		
(SPEED DEPTH TEMP)		
7 THERMISTOR (TEMP)		

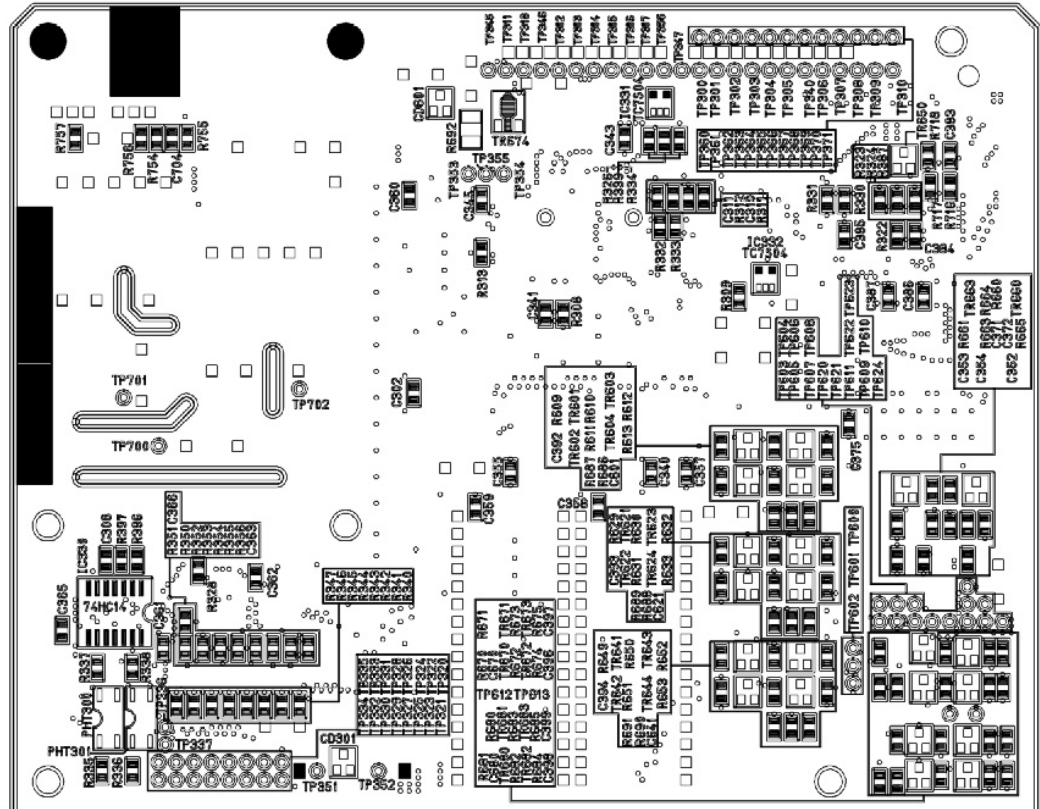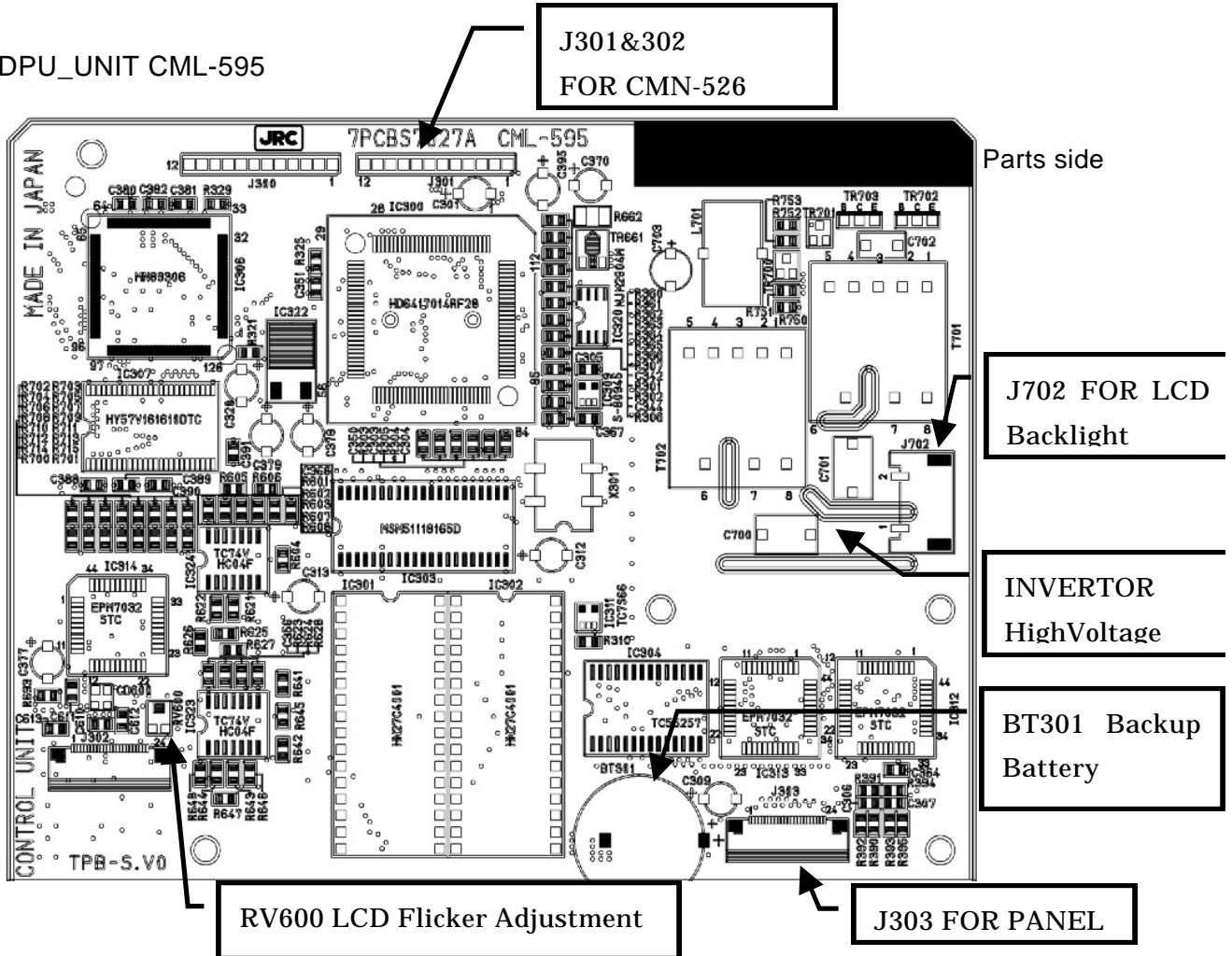**Figure Appendices-1**

6. Parts Layout

DPU_UNIT CML-595

J301&302
FOR CMN-526

Parts side

J702 FOR LCD
Backlight

INVERTOR
HighVoltage

BT301 Backup
Battery

RV600 LCD Flicker Adjustment

J303 FOR PANEL

Solder side

PS/TRX_UNIT CMN-526

W400&401 For CML-595
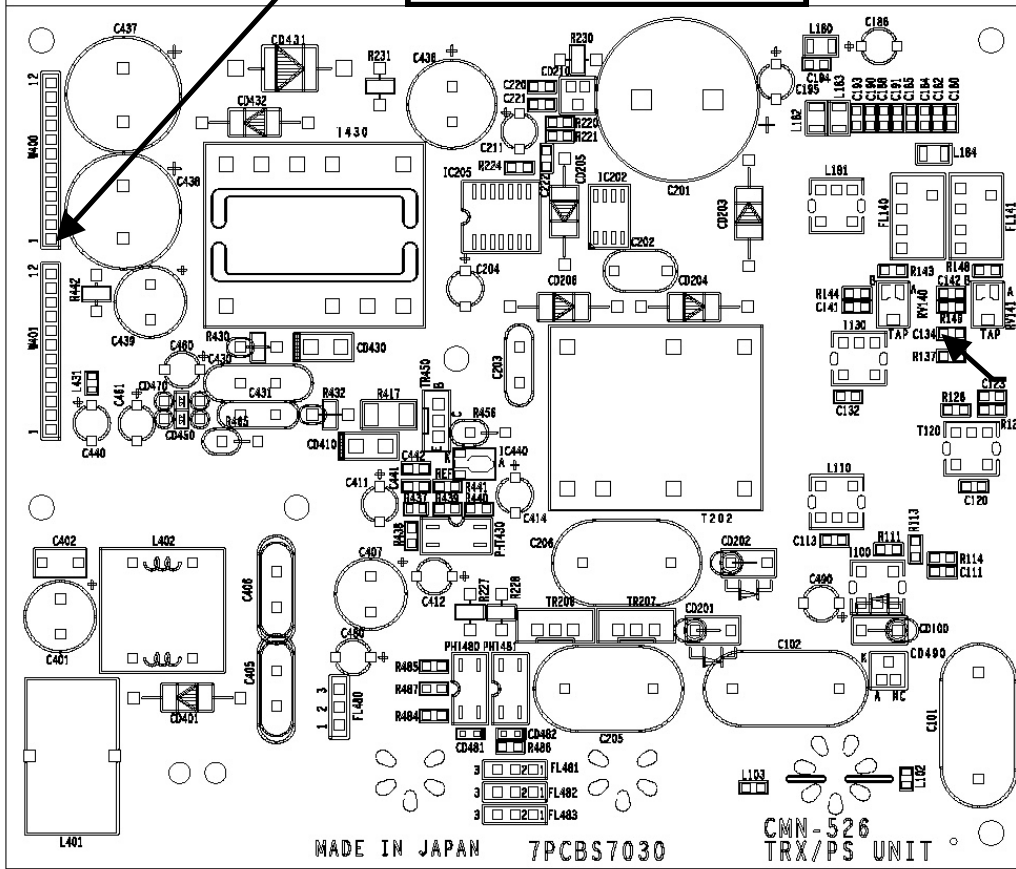
Parts side

RV140&141
RX Gain
Adjustment

Don't Remove

MADE IN JAPAN 7PCBS7030

CMN-526
TRX/PS UNIT
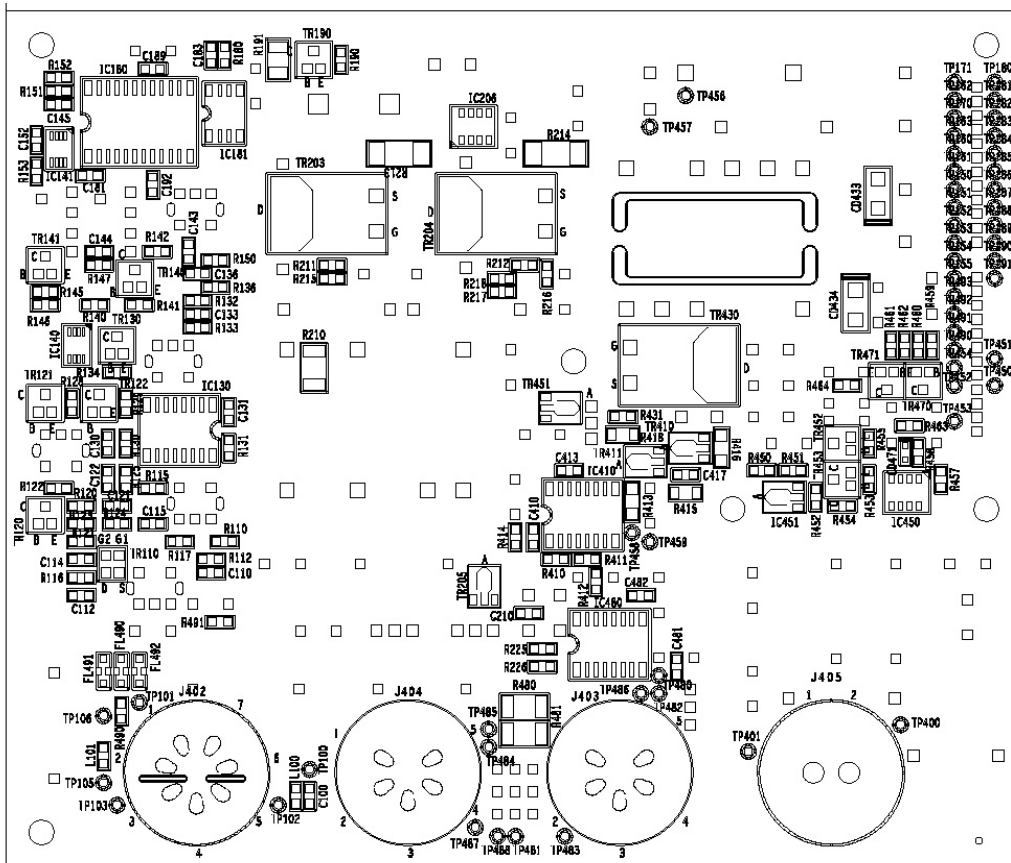
Solder side

PANEL_UNIT
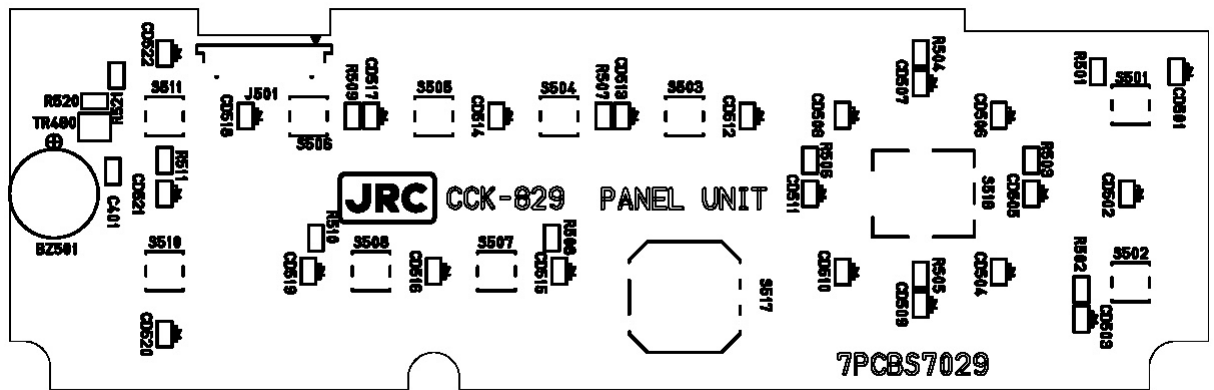
Parts side

7. Mechanical Parts List

Parts List				Page 1/1
(Model Number) FF50(JFC-500)			(Title) COLOR LCD FISH FINDER	
Item	PART NAME	Qty	PART NUMBER	DESCRIPTION
1	Front Panel Ass'y	1	MPBC34289	
2	Gasket	1	MTV302538	
3	Contact Rubber	1	MTV302660	
4	Light Guide	1	MTV302664	
5	Seald Case	1	MTB347026	
6	28 Knob	1	MPHD30171	
7	Cap	1	MPPK30372	
8	LCD Unit	1	-	H-7WSBS7001
9	DPU Unit	1	-	CMM-595
10	Plate	1	MTB344485	
11	Radiation Case	1	MTB349940	
12	Rubbber Packing	1	MTT305900	
13	Radiation Seet	1	MTT306641	
14	Bush	1	BRNG00206	
15	Main Unit	1	-	CMN-526
16	Panel Unit	1	-	CCK-829
17	Radiation Seet	1	MTT306524	
18	Label	1	MPNN37019	
19	Label (Warning)	1	MPNN35234A	High voltage
20	Label (Warning)	1	MPNN35688	Hot surface
21	Rear Cabinet Ass'y		MPBX36626	
-1	Rear Cover	1	MTC300800	
-2	Sponge Rubber	2	MTV302756	
-3	Rubber Spaser	2	MTT305975	
-4	Seet	1	BRPK05061	
22	Bracket	1	MTB344486	
23	Knob	2	MPTG30053	
24	Sun Cover	1	MTV302704	
25	Tapping Screw	8	BRTG04818	3x16 SUS Ptype
26	Tapping Screw	13	BRTG03437	3x12 Fe ZMC Ptype
27	Tapping Screw	4	BRTG04241	2.6x6 Fe Ptype
28	Tapping Screw	7	BRTG03095	3x8 Fe ZMC Btype
29	Screw	8	BSNA03006S	M3x6 Fe ZMC
30	Screw	1	BSBB04010B	BB4x10 Bs
31	Screw	1	MPTG30149	For Setting
32	Rubber Washer	8	MTT301458A	
33	Washer	11	BSLW03000B	LW3Bs
34	Washer	2	BSFW04000B	W4Bs
35	Washer	1	BSSW04000S	SW4
36	Mount Kit	1	MPTG30716	
37				
38				
39				
40				

8. Master Reset and Language Select

A MASTER Reset can be performed by either the SOFT
Reset or HARD Reset.

The SOFT Reset restores all set values except the
WAYPOINT data and ROUTE PLAN data to the original
factory set-up values.

The HARD Reset restores all set values to the original
factory- set values and deletes the WAYPOINT and ROUTE
PLAN data.

When you want to keep the WAYPOINT and ROUTE PLAN
data, execute the SOFT reset. When the MASTER reset is
executed, the CUSTOM DEFAULT is initialized to the
factory-set default settings.

When you push to BRT/PWR turn the power on while
pushing CUSTOM and MENU at the same time, the
LANGUAGE SELECT display appears.

Press the JOYSTICK up or down to select a language
and push it in to open the MASTER RESET type select
display.

Press the JOYSTICK up or down to select HARD or SOFT
and push it in to select OK or CANCEL for the selected
language and the reset type.

Press the JOYSTICK to the left or right to select OK and
push it in to execute the MASTER reset.

Select CANCEL and push the in to return to the language
select display.

After the MASTER reset is executed, the FF50 is rebooted
automatically.

To abort the MASTER reset, turn the power off and then
turn the power on again.

Note:

When a backup error occurs, the FF50 enters the MASTER
Reset

mode automatically, and the language select menu opens.
In this case , you cannot abort the MASTER reset. Be sure
not to turn the power off during the MASTER reset.

MASTER RESET TABLE

	Item	Default Settings	
Selected Language		English, Italian	Other
	BackLight	10	
	Contrast	5	
	Range	200	60
	ZoomRange	x2	
	Shift	0	
	Gain	HF=3.5, LF=3.5	
	DisplayMode	STD DUAL	
	AoutMode	MANUAL	
	FishAlarm	OFF	
	ShallowAlarm	OFF, 32	OFF, 10
	DeepAlarm	OFF, 164	OFF, 50
	TempUpperAlarm	OFF, 60.0	OFF, 15.6
	TempLowerAlarm	OFF, 50.0	OFF, 10.0
	TempRateAlarm	OFF, 0.5	OFF, 0.2
	ArrivalAlarm	OFF, 0.01NM	
	AnchorAlarm	OFF, 0.01NM	
	OffCourseAlarm	OFF, 0.01NM	
	DGPSAlarm	OFF	
	Buzzer	ON	
Menu	ChartSpeed	9	
	Noise	0	
	Interference	OFF	
	STC	Short	
	Symbols	OFF	
	SampleBar	ON	
	Colors	M	
	Graph	OFF	
	UserColor	see table1	
Navigation	Waypoint	see note1	
	Route	see note1	
	SequenceMode	Auto	
	FollowRoute	Route1	
	CDIrange	0.1	
	MonitorMode	OFF	
Installation	Simulator	OFF	
	TempIn	Int	
	SpeedIn	Int	
	PositionIn	Ant	
		HF=C, LF=C	
	ExpandRangeMode	Ratio	
Graph Scale	DepthGraphScale	center=98 range=196	center=30, range=60
	TempGraphScale	center=60 range=40	center=15, range=22
Unit	DepthUnit	FT	MT
	YourDepth	1.0000	
	TempUnit	F	C
	SpeedUnit	KTS	
Calibration	Calib.Temp	0.0	
	Calib.Speed	0.0	
	Draft	0.0	
	KeelHeight	0.0	
	GainOffset	HF=0, LF=0	
	ResetLog		
	MagneticCorr.	0.0	
GPS Setting	Position	N00 00.000 W000 00.000	
	TimeDiffrence	00.00	
	AnntenaHeight	1	
	GeodeticDatum	WGS-	
	FixMode	AUTO	
	HDOPlevel	10	
	Average	10S	
	ExcludeSatellite	none	
DGPS Setting	BeaconReceiveMode	AUTO	
	BeaconFrequency	288.0KHZ	
	BaudRate	100bps	
BottomJudgeLevel		HF=0.0, LF=0.0	

DEFOULT USER COLOR TABLE

sig.level	16-Step Gradation						8-Step Gradation					
	M1			M2			M3			M4		
	R	G	B	R	G	B	R	G	B	R	G	B
0	0	0	10	0	0	6	0	0	10	0	0	6
1	0	4	8	0	4	8	0	7	9	0	7	9
2	0	7	11	0	7	11	0	7	9	0	7	9
3	0	9	10	0	9	10	0	10	8	0	10	8
4	0	11	8	0	11	8	0	10	8	0	10	8
5	0	10	6	0	10	6	0	13	0	0	13	0
6	5	15	2	5	15	2	0	13	0	0	13	0
7	9	15	0	9	15	0	15	15	0	15	15	0
8	15	15	0	15	15	0	15	15	0	15	15	0
9	15	9	0	15	9	0	15	7	0	15	7	0
10	15	8	0	15	8	0	15	7	0	15	7	0
11	15	6	0	15	6	0	15	0	0	15	0	0
12	15	0	0	15	0	0	15	0	0	15	0	0
13	10	0	0	10	0	0	9	0	0	9	0	0
14	9	0	0	9	0	0	9	0	0	9	0	0
15	8	0	0	8	0	0	9	0	0	9	0	0

If you select SOFT RESET for MATER RESET, the data of Waypoint and Route created by users is not deleted. If you select HARD RESET, all the data of Waypoint and Route settings is deleted.

After HARD RESET, the Waypoint data: WPT1-7 is preset in the Waypoint list and Route No.1 list as the reference of simulation. You can change the data according to your use condition.

9. NMEA0183 INPUT/OUTPUT SENTENCES

Input sentences

$xxAPA Heading/Track Controller (Autopilot) Sentence "A".

$xxAPB Heading/Track Controller (Autopilot) Sentence "B".

$xxBWC Bearing & Distance to Waypoint

$xxBWR Bearing & Distance to Waypoint - Rhumb Line

$xxGGA Global Positioning System Fix Data

$xxHDG Heading, Deviation & Variation

$xxHDT Heading - True

$xxMTW Water Temperature

$xxRMC Recommended Minimum Specific GPS data

$xxVTG Course Over Ground and Ground Speed

$xxVHW Water Speed and Heading

Output sentences

$SDDBT Depth Below Transducer

$SDDPT Depth

$SDMTW Water Temperature

$SDAPB Heading/Track Controller (Autopilot) Sentence "B"

    Necessary to connect the GPS100 or DGPS200

$SDBWC Bearing & Distance to Waypoint

    Necessary to connect the GPS100 or DGPS200

$GPGGA Global Positioning System Fix Data

    Necessary to connect the GPS100 or DGPS200

$GPRMC Recommended Minimum Specific GPS data

    Necessary to connect the GPS100 or DGPS200

10. SELF TEST

The FF50 has a built-in self test function with which you can check the operating status of the FF50 automatically. Moreover, a function of monitoring input NMEA0183 formatted sentences is attached to the self test function, and you can easily check various data input from external equipment.
The self test function has the following four functions.

Internal checking function:

>Checks DPU and shows OK or NG as the result.
>Input data monitoring function:
>Displays various input data including GPS/DGPS sensor and
>NMEA0183 sentences on the screen.
>Panel checking function:
>Displays the status of the panel key that has been pushed.
>Display checking function:
>Displays test patterns such as crosshatch or color pattern.

When you push BRT/PWR to turn the power on while pushing AUTO and FREQ at the same time, the FF50 enters the SELFTEST mode and the SELFTEST display appears.

Then ROM and RAM are checked automatically and various data as well as the
result (OK or NG) appear.
Push any panel key to change the corresponding indicator from red to blue on the screen. When all indicators change to blue, the panel check is completed.
After the panel check is completed, push CLR/OFF to pause the input data display temporarily.
Push CLR/OFF again to resume the display.
When you want to check the NMEA0183 input sentences, stop the display with this procedure to make checking easier.
Push MENU to switch the display to test pattern. Each time you push MENU, the
test pattern changes as long as the power is on.
Turn the power off to end the self test.

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