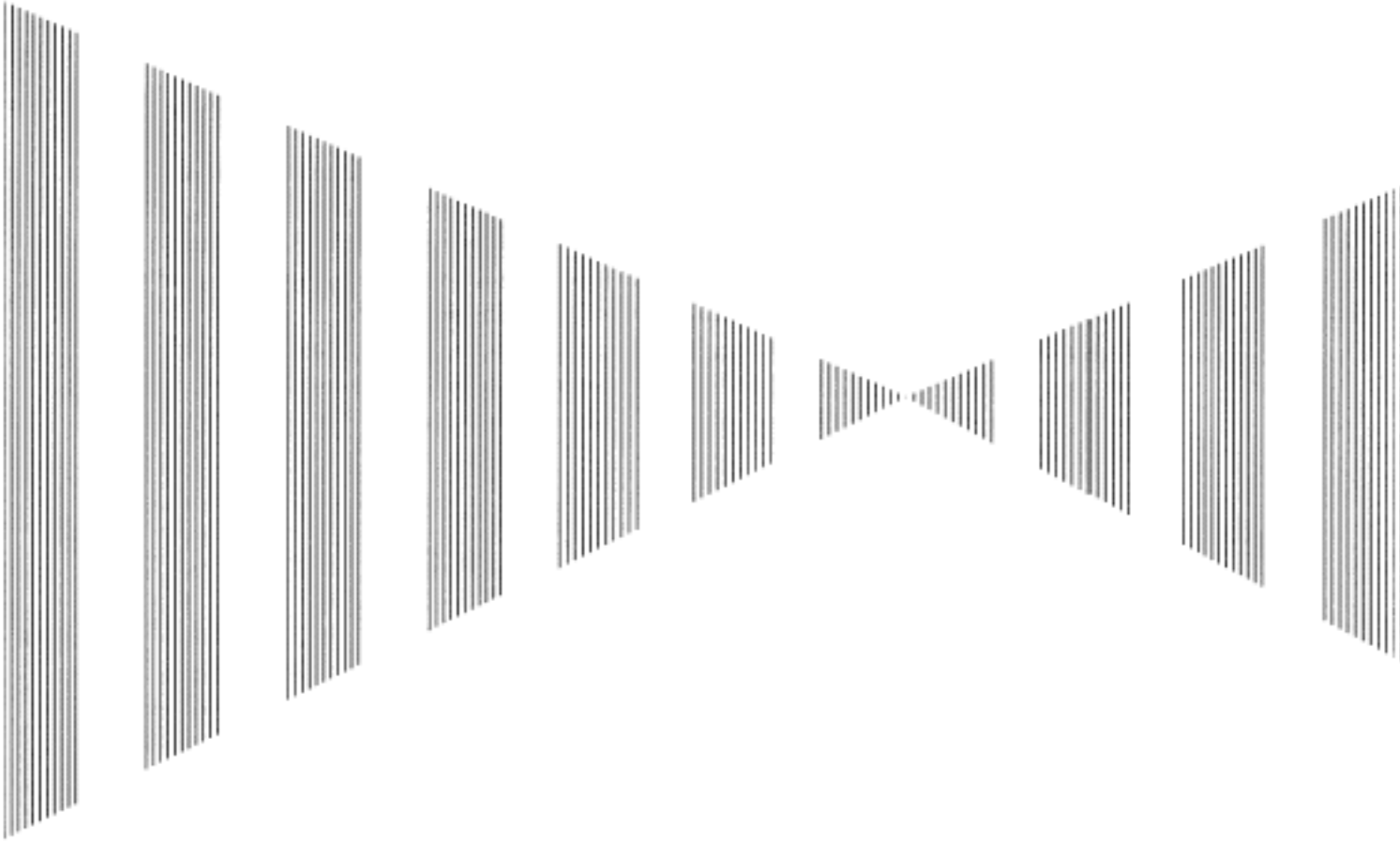


SECTION 9

AFTER-SALES SERVICE



..... When you Request for Repair

If you suppose the product may be out of order, read the description in Section 8 carefully and check the suspected point again.

If it is still out of order, you are recommended to stop operation of the equipment and consult with the dealer from whom you purchased the product, or our branch office in your country or district, the sales department in our main office in Tokyo.

- **Repair within the Warranty Period**

If any failure occurs in the product during its normal operation in accordance with the instruction manual, the dealer or JRC will repair free of charge. In case that any failure is caused due to misuse, faulty operation, negligence or force major such as natural disaster and fire, the product will be repaired with charges.

- **Repair after the Warranty Period**

If any defective function of the product is recoverable by repair, the repair of it will be made at your own charge upon your request.

- **Necessary Information for Repair**

- ☆ Product name, model, manufacturing date and serial number
- ☆ Trouble conditions (as detailed as possible. Refer to “Radar Failure Check List” in page 9-2.)
- ☆ Name of company/organization, address and telephone number

..... Recommended Maintenance

The performance of the product may deteriorate due to the secular change of the parts used in it, though such deterioration depends upon the conditions of operation.

So checkup and maintenance is recommendable for the product in addition to your daily care.

For maintenance, consult with the near-by dealer or our sales department.

Such maintenance will be made with charges.

For further details of after-sale service, contact the JRC Offices in the list at the end of this manual.



Radar Failure Check List

When placing an order for repair of the product, it is requested that you could confirm the check items and fill the results and sent the sheet to our contact.

If there is any unclear items, contact the ship on which the product is installed, and give the correct information on the product.

Ship name: _____ Phone: _____ Fax: _____

Radar general model name: JMA- _____ Serial No. : _____

(Write the full model name correctly)

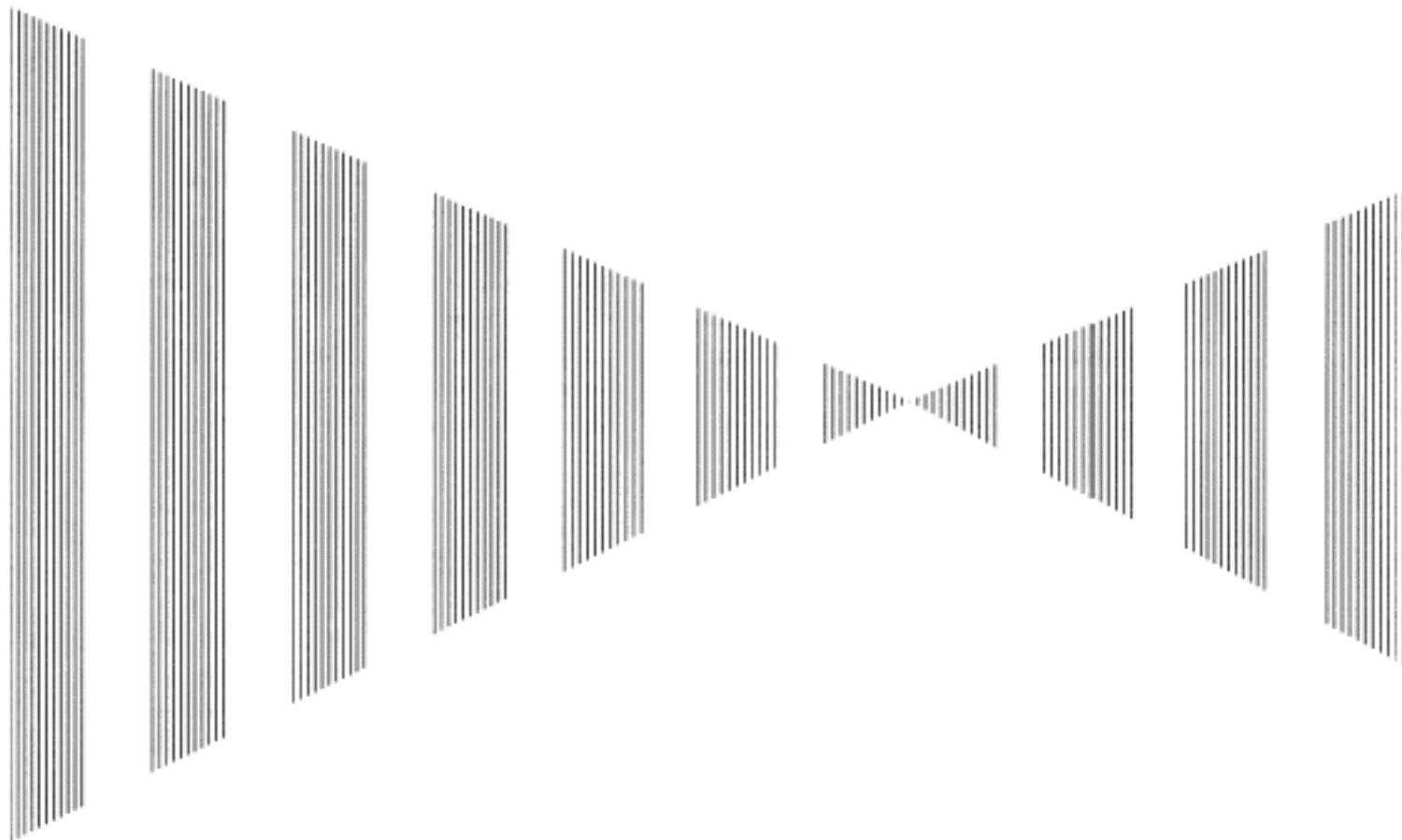
- (1) Check the following items in the order of the number, and circle the applicable answer between YES or NO. If the item cannot be determined as YES or NO, explain in detail in the item (18), others.
- (2) If any of the items (1) to (5) is marked as NO, check the fuse of the product (refer to Section 8.2 and 8.3).
- (3) Check the items (4) to (17) while the transmission (TX) is ON.

* Functions mentioned in the items (14), (15) and (17) may be optional, answer is not necessary.

No.	Check Item	Result	
(1)	Power can be turned on. (The lamp on the operation panel is lit)	YES	NO
(2)	A few minutes after powering-on, it will become standby status (TX Ready).	YES	NO
(3)	When powering-on (or TX ON), CRT displays something (CRT is lit).	YES	NO
(4)	The scanner rotates at the transmission (TX) ON. (Check the following items while transmission is ON)	YES	NO
(5)	Current is supplied to the magnetron. (Refer to the instruction manual)	YES	NO
(6)	Turning is enabled. (Check with the range of 6 NM or more)	YES	NO
(7)	Fixed marker is displayed.	YES	NO
(8)	VRM is displayed.	YES	NO
(9)	While noise is displayed while set at STC and FTC minimum, GAIN maximum, IR-OFF and range 48 NM.	YES	NO
(10)	Target reflection echo is displayed.	YES	NO
(11)	Sensitivity of reflection echo is normal.	YES	NO
(12)	EBL is displayed.	YES	NO
(13)	Cursor mark moves.	YES	NO
*(14)	GYRO course can be set and normally displayed.	YES	NO
*(15)	LOG speed can be normally displayed.	YES	NO
(16)	ARPA works normally.	YES	NO
*(17)	If equipped with an interswitch, when switching from the straight mode (II) to (X), the failures (items marked NO) in the above (1) to (16), are switched over to the other unit.	YES	NO

(18) Others (Error message, etc.) _____

SECTION 10 DISPOSAL



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DISPOSAL

10.1 DISPOSAL OF THE UNIT

When disposing of this unit, be sure to follow the local laws and regulations for the place of disposal.

10.2

DISPOSAL OF USED BATTERIES



WARNING



When disposing of used lithium batteries, be sure to insulate the batteries by taping the $\oplus$ and $\ominus$ terminals. Otherwise, heat generation, explosion or a fire may occur.

In this unit, Lithium batteries are used for the following parts:
Radar Processing circuit (CDC-1198): BT1 (Maxell: CR2450)

- Do not store used lithium batteries. Dispose of them in accordance with regulations of local government.
- When disposing of used lithium batteries be sure to insulate the batteries by taping the $\oplus$ and $\ominus$ terminals. For disposal of batteries, be sure to follow the local laws and regulations. For detail, consult with the dealer you purchased the product our business office, or local government.

10.3 DISPOSAL OF USED MAGNETRON

Magnetron is used in the Scanner (NKE—2102/2252/1075A)

- When the magnetron is replaced with a new one, return the used magnetron to our dealer or business office.
For detail, consult with our dealer or business office.

SECTION 11

SPECIFICATIONS

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11.1 JMA-5310-6 TYPE RADAR

(1) Type of Emission	P0N
(2) Display	Color Raster Scan
(3) Screen	18.1-inch Color LCD Effective diameter of radar display, more than 250 mm
(4) Range Scale	0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24, 48, 96nm
(5) Range Resolution	Less than 25m
(6) Minimum Detective Range	Less than 28m
(7) Range Accuracy	Less than 1% of the maximum distance of the range scale in use or less than 15m whichever is larger
(8) Bearing Accuracy	Less than 1°
(9) Bearing Indication	Relative Motion mode: Head-up/Course-up/North-up True Motion mode: Course-up/North-up
(10) Ambient Condition	According to IEC60945-4 Temperature Scanner: -25 to +55°C (Storage Temperature: -25 to +70°C) Other Unit except Scanner: -15 to +55°C Relative Humidity 93% at +40°C Vibration 2 to 13.2Hz, amplitude $\pm 1\text{mm}$ $\pm 10\%$ 13.2 to 100Hz, Gravity acceleration 0.7m/s^2 Velocity of the wind 51.5m/s(100kt)
(11) Power Supply Input	+24VDC (Display Unit) +24VDC (Scanner) * Display Unit and Scanner correspond to 100VAC/220VAC when use NBA-3308.
(12) Power Consumption	Approx. 300W (In maximum wind velocity)
(13) Power Supply Voltage Fluctuation	+24VDC $-10/+30\%$ (Display Unit) +24VDC $-10/+30\%$ (Scanner Unit)
(14) Pre-heating Time	Approx. Within 1min30sec

11.2 JMA-5320-7/9/6HS TYPE RADAR

(1) Type of Emission	P0N
(2) Display	Color Raster Scan
(3) Screen	18.1-inch Color LCD Effective diameter of radar display, more than 250 mm
(4) Range Scale	0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24, 48, 96nm
(5) Range Resolution	Less than 25m
(6) Minimum Detectable Range	Less than 28m
(7) Range Accuracy	Less than 1% of the maximum distance of the range scale in use or less than 15m whichever is larger
(8) Bearing Accuracy	Less than 1°
(9) Bearing Indication	Relative Motion mode: Head-up/Course-up/North-up True Motion mode: Course-up/North-up
(10) Ambient Condition	According to IEC60945-4 Temperature Scanner: -25 to +55°C (Storage Temperature: -25 to +70°C) Other Unit except Scanner: -15 to +55°C Relative Humidity 93% at +40°C Vibration 2 to 13.2Hz, amplitude $\pm 1\text{mm}$ $\pm 10\%$ 13.2 to 100Hz, Gravity acceleration 0.7m/s^2 Velocity of the wind 51.5m/s (100kt)
(11) Power Supply Input	+24VDC (Display Unit) +24VDC (Scanner) * Display Unit and Scanner correspond to 100VAC/220VAC when use NBA-3308.
(12) Power Consumption	Approx. 400W (In maximum wind velocity)
(13) Power Supply Voltage Fluctuation	+24VDC $-10/+30\%$ (Display Unit) +24VDC $-10/+30\%$ (Scanner Unit)
(14) Pre-heating Time	Approx. Within 3min

11.3 JMA-5330-12 TYPE RADAR

(1) Type of Emission	P0N
(2) Display	Color Raster Scan
(3) Screen	18.1-inch Color LCD Effective diameter of radar display, more than 250 mm
(4) Range Scale	0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24, 48, 96nm
(5) Range Resolution	Less than 25m
(6) Minimum Detectable Range	Less than 28m
(7) Range Accuracy	Less than 1% of the maximum distance of the range scale in use or less than 15m whichever is larger
(8) Bearing Accuracy	Less than 1°
(9) Bearing Indication	Relative Motion mode: Head-up/Course-up/North-up True Motion mode: Course-up/North-up
(10) Ambient Condition	According to IEC60945-4 Temperature Scanner: -25 to +55°C (Storage Temperature: -25 to +70°C) Other Unit except Scanner: -15 to +55°C Relative Humidity 93% at +40°C Vibration 2 to 13.2Hz, amplitude $\pm 1\text{mm}$ $\pm 10\%$ 13.2 to 100Hz, Gravity acceleration 0.7m/s^2 Velocity of the wind 51.5m/s(100kt)
(11) Power Supply Input	+24VDC (Display Unit) 230VAC, 1 Φ , 50/60Hz (Scanner) * Display Unit correspond to 100VAC/220VAC when use NBA-3308.
(12) Power Consumption	Approx. 100W(+600VA) (In maximum wind velocity)
(13) Power Supply Voltage Fluctuation	+24VDC $-10/+30\%$ (Display Unit) 220VAC $\pm 10\%$ (Scanner Unit)
(14) Pre-heating Time	Approx. Within 3min

11.4 SCANNER (NKE-2102)

(1) Dimensions	Height 440mm×Swing Circle 1910mm			
(2) Mass	Approx. 31kg			
(3) Polarization	Horizontal Polarization			
(4) Directional Characteristic	Horizontal Beam Width:	1.2° (-3dB width)		
	Vertical Beam Width:	20° (-3dB width)		
	Sidelobe Level:	Below −26dB (within ±10°)		
		Below −30dB (outside ±10°)		
(5) Revolution	Approx. 27rpm (Normal)			
(6) Peak Power	10kW			
(7) Transmitting Frequency	9410 ±30MHz			
(8) Transmitting Tube	Magnetron [MSF1425B]			
(9) Pulse width/Repetition Frequency	Short	Middle	Long	
	0.125nm	0.08μS/2250Hz		
	0.25nm	0.08μS/2250Hz		
	0.5nm	0.08μS/2250Hz		
	0.75nm	0.08μS/2250Hz	0.25μS/1700Hz	
	1.5nm	0.08μS/2250Hz	0.25μS/1700Hz	0.5μS/1200Hz
	3nm	0.25μS/1700Hz	0.5μS/1200Hz	0.8μS/750Hz
	6nm	0.5μS/1200Hz	0.8μS/750Hz	1.0μS/650Hz
	12nm	0.5μS/1200Hz	0.8μS/750Hz	1.0μS/650Hz
	24nm			1.0μS/650Hz
	48nm			1.0μS/650Hz
	96nm			1.0μS/520Hz
(10) Duplexer	Circulator + Diode Limiter			
(11) Mixer	MIC Front End			
(12) Intermediate Frequency Amplifier	Intermediate Frequency: 60MHz			
	Band Width:	20MHz(0.08μS)		
		6MHz(0.25μS)		
		3MHz(0.5μS, 0.8μS, 1μS)		
	Gain: More than 90dB			
	Amplifying Characteristics: Logarithmic Amplifier			
(13) Overall Noise Figure	6dB(Average)			

11.5 SCANNER (NKE-2252-7/9)

(1)	Dimensions	25kW-7ft: Height 440mm×Swing Circle 2270mm 25kW-9ft: Height 440mm×Swing Circle 2825mm		
(2)	Mass	25kW-7ft: Approx. 54 kg 25kW-9ft: Approx. 56 kg		
(3)	Polarization	Horizontal Polarization		
(4)	Directional Characteristics	Horizontal Beam Width:	1.0° (7ft, -3dB width) 0.8° (9ft, -3dB width) Vertical Beam Width 20° (7/9ft, -3dB width) Sidelobe Level: Below −26dB (7/9ft, within ±10°) Below −30dB (7/9ft, outside ±10°)	
(5)	Revolution	24rpm (7/9ft, Normal)		
(6)	Peak Power	25kW ±50%		
(7)	Transmitting Frequency	9410 ±30MHz		
(8)	Transmitting Tube	Magnetron [M1568B(J)]		
(9)	Pulse Width/Repetition Frequency	Short	Middle	Long
	0.125nm	0.07μS/2200Hz		
	0.25nm	0.07μS/2200Hz		
	0.5nm	0.07μS/2200Hz		
	0.75nm	0.07μS/2200Hz	0.2μS/2200Hz	
	1.5nm	0.07μS/2200Hz	0.2μS/2200Hz	0.4μS/1400Hz
	3nm	0.2μS/2200Hz	0.4μS/1400Hz	0.8μS/750Hz
	6nm	0.4μS/1400Hz	0.8μS/750Hz	1.0μS/650Hz
	12nm	0.4μS/1400Hz	0.8μS/750Hz	1.0μS/650Hz
	24nm			1.0μS/650Hz
	48nm			1.0μS/650Hz
	96nm			1.2μS/520Hz
(10)	Duplexer	Circulator + Diode Limiter		
(11)	Mixer	MIC Front End		
(12)	Intermediate Frequency Amplifier	Intermediate Frequency: 60MHz Band Width: 20MHz(0.08μS) 6MHz(0.2μS, 0.4μS) 3MHz(0.8μS, 1μS, 1.2μS) Gain: More than 90dB Amplifying Characteristics: Logarithmic Amplifier		
(13)	Overall Noise Figure	6dB(Average)		

11.6 SCANNER (NKE-1075A)

(1) Dimensions	Height 837mm×Swing Circle 3758mm			
(2) Mass	Approx. 163kg			
(3) Polarization	Horizontal Polarization			
(4) Directional Characteristics	Horizontal Beam Width	12ft: 1.9°		
	Vertical Beam Width	12ft: 30°		
	Sidelobe Level:	Below −26dB (within ±10°)		
		Below −30dB (outside ±10°)		
(5) Revolution	24/21rpm (60/50Hz)			
(6) Peak Power	30kW ±50%			
(7) Transmitting Frequency	3050 ±30MHz			
(8) Transmitting Tube	Magnetron [M1302]]			
(9) Pulse Width/Repetition Frequency		Short	Middle	Long
	0.125nm	0.07μS/1900Hz		
	0.25nm	0.0μS/1900Hz		
	0.5nm	0.0μS/1900Hz		
	0.75nm	0.07μS/1900Hz	0.2μS/1900Hz	
	1.5nm	0.07μS/1900Hz	0.2μS/1900Hz	0.3μS/1900Hz
	3nm	0.2μS/1900Hz	0.3μS/1900Hz	0.6μS/1100Hz
	6nm	0.3μS/1900Hz	0.6μS/1100Hz	1.2μS/570Hz
	12nm	0.3μS/1900Hz	0.6μS/1100Hz	1.2μS/570Hz
	24nm			1.2μS/570Hz
	48nm			1.2μS/570Hz
	96nm			1.2μS/570Hz
(10) Duplexer	Circulator + TRHPL			
(11) Mixer	MIC Front End			
(12) Intermediate Frequency Amplifier	Intermediate Frequency: 60MHz			
	Band Width: 20MHz(0.07uS)			
	6MHz(0.2μS, 0.3μS)			
	3MHz(0.6μS, 1.2μS)			
	Gain: More than 90dB			
	Amplifying Characteristics: Logarithmic Amplifier			
(13) Overall Noise Figure	5dB(Average)			

11.7 SCANNER (NKE-2252-6HS)

(1) Dimensions	25kW-6ft: Height 440mm×Swing Circle 1920mm			
(2) Mass	Approx. 52 kg			
(3) Polarization	Horizontal Polarization			
(4) Directional Characteristics	Horizontal Beam Width:	1.2°		
	Vertical Beam Width	20° (-3dB width)		
	Sidelobe Level:	Below −26dB (within ±10°)		
		Below −30dB (outside ±10°)		
(5) Revolution	48rpm (Normal)			
(6) Peak Power	25kW ±50%			
(7) Transmitting Frequency	9410 ±30MHz			
(8) Transmitting Tube	Magnetron [M1568B(J)]			
(9) Pulse Width/Repetition Frequency		Short	Middle	Long
	0.125nm	0.07μS/2200Hz		
	0.25nm	0.07μS/2200Hz		
	0.5nm	0.07μS/2200Hz		
	0.75nm	0.07μS/2200Hz	0.2μS/2200Hz	
	1.5nm	0.07μS/2200Hz	0.2μS/2200Hz	0.4μS/1400Hz
	3nm	0.2μS/2200Hz	0.4μS/1400Hz	0.8μS/750Hz
	6nm	0.4μS/1400Hz	0.8μS/750Hz	1.0μS/650Hz
	12nm	0.4μS/1400Hz	0.8μS/750Hz	1.0μS/650Hz
	24nm			1.0μS/650Hz
	48nm			1.0μS/650Hz
	96nm			1.2μS/520Hz
(10) Duplexer	Circulator + Diode Limiter			
(11) Mixer	MIC Front End			
(12) Intermediate Frequency Amplifier	Intermediate Frequency: 60MHz			
	Band Width: 20MHz(0.08μS)			
	6MHz(0.2μS, 0.4μS)			
	3MHz(0.8μS, 1μS, 1.2μS)			
	Gain: More than 90dB			
	Amplifying Characteristics: Logarithmic Amplifier			
(13) Overall Noise Figure	6dB(Average)			

11.8 DISPLAY UNIT(NCD-4510)

- | | |
|----------------------------|--|
| (1) Structure | Desk Top Type
(LCD Monitor Unit/Keyboard Unit/Processor Unit Separation Structure) |
| (2) Screen | 18.1-inch Color LCD 1280x1024 dot (SXGA) |
| (3) Display mode | Radar mode
Synthesis mode (Synthesis Radar echo and Coastline)
Plotter mode (Require Plotter Unit (option)) |
| (4) Range Scale | 0.125, 0.25, 0.5, 0.75, 1.5, 3, 6, 12, 24, 48, 96nm |
| (5) Range Marker | 0.025, 0.05, 0.1, 0.25, 0.25, 0.5, 1, 2, 4, 8, 16nm |
| (6) Bearing Indication | Rader mode/Synthesis mode
Relative motion: North-up, Course-up, Head-up
True motion: North-up, Course-up
True motion (Plotter mode (Option)): N-up, C-up |
| (7) Variable Range Maker | 2VRM (Digital Display)
VRM unit of Display: nm, km
VRM Range:0.000 to 295nm (0.000 to 547.0km) |
| (8) Electric Bearing lines | 2EBL(Digital Display)
Each EBL can be floating displayed.
EBL unit of Display: 0.1°
EBL Range: 0.000° to 359.9°
Bearing Indication: Relative bearing and True bearing can be switched. |
| (9) Cursor | Target Range, Bearing and Latitude presentation can be possible to move with trackball. |

11.9 PROCESSOR UNIT(NDC-1273)

- | | |
|-------------------------------------|--|
| (1) Structure | Desk Top Type (Horizontal putting and length putting using combinedly) |
| (2) Dimensions | Height 170mm×Width 300mm×Depth 320mm |
| (3) Mass | Approx. Below 10kg |
| (4) Tune Method | Auto(Bar-graph indicate)
* Manual operation can be adjusted in maintenance mode. |
| (5) STC (SEA) | AUTO/MANUAL |
| (6) FTC (RAIN) | AUTO/MANUAL |
| (7) Radar Interference Rejection | Built-in (The effect can be adjusted by three stages.) |
| (8) Scan Correlation | Function1/2/3, 2 Peak Hold Processing
Automatic change of processing method.
(Target range synchronize/Clutter synchronize)
Rθ scan correlation can be done by the addition high performance signal processing board. |
| (9) Bearing Marker | 360° in 1° digit.
Relative motion: Fixation
True motion: Rewrite at a position correct in every scan. |
| (10) Heading Line | Electronic (Stern Line can be displayed.) |
| (11) Guard Zone Alarm (Radar Alarm) | Invasion, Secession, OFF can be Selected.
With buzzer sound.(Possible to output to External buzzer.)
Zone-1: Ring.(0.1 to 32nm, Relative position)
Zone-2: Arbitrary polygon.(Limitation within range of display. Longitude and latitude are fixed.)
Number of zone: Can be memorized up to 16 and can be used simultaneously.
Structure of zone: 16 corner or less.
Automatically acquisition by ATA described in Section “ARPA”. |
| (12) Off Center | Within 66% of the radius of any range. (Except 96nm)
Can be operated in all mode in relative motion.
Trail is succeed at Off Center mode. |
| (13) True motion Unit | Built-in (Except 96nm) |
| (14) True motion reset position | 66% of radius of any range.
Possible to manual reset. |

(15) Twice zoom	The zoom center is 66% radius of any range. (Except 0.125nm)
(16) Radar trails indication	True motion: (Only true motion) Relative motion: True motion trails and relative motion trails can be selected. Trail time length: 15 sec/30 sec/1 min/3 min/6 min/10 min/15 min/30 min/60 min/Continuous/OFF Arbitrary trail time length can be displayed at any time. Possible to display time series trail and continuous trail by color classification. Built-in Trail thinning process. Trail function can be use at true motion reset. When range is changed, Trail function can be use. Trail function can be use at Off Center. (Relative motion) When motion indication and bearing indication changed, Trail function can be use.(Only true motion trails indication.)
(17) Variety of Pulse width	Long/Middle/Short (0.75, 1.5, 3,6,12 nm)
(18) Target enhance	3 stages can be changed.
(19) Correct position	When synthesis Radar and Coastline is displayed, position can be corrected by manually.
(20) Display color	Radar echo: 16 stages (Yellow, Green, Orange, Color) Radar trails: 16 stages (White, Light blue, Green) Fixed Maker: Monochrome (white) VRM1/VRM2/EBL1/EBL2: Monochrome (Cyan) Character/Bearing Marker: 2 stages (White, Green, Orange) Heading Line/Cursor: Monochrome (White) Own Ship's track/Another Ship's track: 7 stages Coastline/Isobaths: 16 stages

11.10 PLOTTER UNIT

(1) Plotter (Normal) (Synthesis mode)

Projection:	Mercator projection (Latitude 70 degree or less.)
Scale:	Radar synchronize range scale
Own ship trail:	Color of 1 stage. Interval of storage 10/30 sec, 1/3/5/10/30/60 min or every 1/3/5 nm and OFF
Cursor mark :	Storage Capacity 7,000 point
Coastline data :	Coastline ROM Card (Option) (ERC, JRC, C-Map NT+) One selected isobath can be displayed.
Painting out:	ON/OFF can be selected.

(2) Plotter (Option) (Synthesis mode)

Projection:	Mercator projection (Latitude 70 degree or less.)
Scale:	Synchronize range scale
Own ship trail:	Color of 7 stages. Interval of storage: 10/30 sec, 1/3/5/10/30/60 min or every 1/3/5 nm and OFF
Cursor mark:	Storage capacity of Own ship trail: 7,000 point Color of 7 stages Storage capacity of cursor mark: 20,000 point
Event mark:	Variety of cursor Mark: 19 Color of 7 stages Storage capacity of event mark: Include in cursor mark Variety of event mark: 3 kinds, (Two kinds can be switched. /8 form to selection.)
Line:	Variety of external event mark: One kind, Monochrome Color of 7 stage Storage capacity of line: Include in cursor mark Variety of line: Solid line, broken line, alternate long and short dash line
Coast line data:	Coast line ROM card (Option) (ERC, JRC, C-Map NT+) Selected one isoline can be displayed.
Painting out:	ON/OFF can be selected.
External memory:	Memory card (Option)
Destination and sea route:	Destination can be set up to 99 point. Information of destination: Azimuth, distance and the time to required destination. Setting of sea route: 10 sea routes. (10 destination for one sea route can be set.) Alarm of sea route: Destination, Secession, Invetion, Secession
Position compensation:	Radar display synchronize range scale coast line by manual.

(3) Plotter (Option) (Synthesis mode)

Projection:	Mercator projection (Latitude 85 degree or less.)
Scale:	1/1,000 to 1/10,000,000 are continuously selected. 10 stage can be changed (Preset can be used)
Own ship trail:	Color of 7 stages. Interval of storage: 3/5/10/30 sec, 1/3/5/10/30/60 min Every 1/3/5 nm and OFF Storage capacity of Own ship trail: 7,000 point
Cursor mark:	Color of 7 stages Storage capacity of cursor mark: 20,000 point Variety of cursor Mark: 19
Event mark:	Color of 7 stages Storage capacity of event mark: Include in cursor mark Variety of event mark: 3 kinds, (Two kinds can be switched. /8 form to selection.) Variety of external event mark: One kind, Monochrome
Line:	Color of 7 stage Storage capacity of line: Include in cursor mark Variety of line: Solid line, broken line, alternate long and short dash line
Coast line data:	Coast line ROM card (Option)(ERC, JRC, C-Map NT+) Selected one isoline can be displayed.
Painting out:	ON/OFF can be selected.
External memory:	Memory card (Option) Own ship trail, another ship trail, cursor mark, event mark, line, destination, sea route can be memorized.
Destination and sea route:	Destination can be set up to 99 point. Information of destination: Azimuth, distance and the time to required destination. Setting of sea route: 10 sea routes. (10 destination for one sea route can be set.) Alarm of sea route: Destination, Secession, Invetion, Secession

11.11

ARPA-1 (HIGH PERFORMANCE ARPA)

Radar mode, synthesis mode

Manual acquisition, Automatically acquisition(by two of guard ring)

Automatic tracking of 100 targets can be done.

Maximum tracking range: 32nm

Display of tracking data: 6 at the same time. (Can be scroll.)

Naming function: Possible to name by the alphabet up to 8 character to each target.

The range, azimuth, CPA, TCPA, true course, true speed, BCR, BCT of target can be displayed.

(When naming is displayed, BCR/BCT can't be displayed.)

Vector display: True/Relative

Past position: Exclusive display and another ship trail.

Alarm of danger ship: Depends on CPA/TCPA setting.

Synthesis mode

Another ship trail: 20 targets. 1000 point per one target can be displayed. (Own ship trail and marks are another.)

Display color: Color of 7 stages (The display color of each target can be set.)
(The display color of all targets can be set by the batch. In this case, the display color is one color.)

Interval of storage: 3/5/10/30 sec, 1/3/5/10/130/160 min, 1/3/5/10 nm Possible to storage in memory card(Optional).

11.12

ARPA-2 (NORMAL EDITION ATA)

Radar mode, synthesis mode

Manual acquisition, Automatically acquisition(by two of guard ring)

Automatic tracking of 30 targets can be done.

Maximum tracking range: 32nm

Display of tracking data: 6 at the same time. (Can be scroll.)

Naming function: Possible to name by the alphabet up to 8 character to each target.

The range, azimuth, CPA, TCPA, true course, true speed, BCR, BCT of target can be displayed.

(When naming is displayed, BCR/BCT can't be displayed.)

Vector display: True/Relative

Past position: Exclusive display and another ship trail.

Alarm of danger ship: Depends on CPA/TCPA setting.

Synthesis mode

Another ship trail: 20 target.s 1500 point per one target can be displayed. (Own ship trail and marks are another.)

Display color: Color of 7 stages (The display color of each target can be set.)

(The display color of all targets can be set by the batch. In this case, the display color is one color.)

Interval of storage: 3/5/10/30 sec, 1/3/5/10/60 min, 1/3/5/10 nm Possible to storage in memory card(Optional).

11.13

KEYBOARD UNIT(NCE-7699)

- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-------------------------------|---------------------------|------------------------------------|---------------------------|---|---------------------------------------|------------------------|-----------------------------|-------------|--|-------------|--|-------------|--|-------------|--|---------------------------------|-------------------------|---------------------------------|-------------------------|-------------------|------------------------|----------------------------|-------------------------------------|---------------------------------|--|--------------|--------------------------------|-------------|--------------------------------|--------------------------------|--------------------------|--------------------|---|--|---|----------------------------|--|------------------------------|---|---------------------------------|---|--|----------------------|-----------------------|------------------------------------|------------------------------|---|---|--|--|---|------------------|---------------------------------|---|-----------------------|-----------------|-----------------------|-----------------------|-------------|-----------------------|--|-------------------------|-----------|-------------|--|---------------------|--|
| (1) Structure | Structure of keyboard unit is separate from processor unit.
Desk-Top type
Correspond Flush mount | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Switch | Gain (Transmit pulse width can be changed by PUSH-SW.)
SEA (AUTO/MANU can be changed by PUSH-SW.)
RAIN (AUTO/MANU can be changed by PUSH-SW.)
MULTI (Adjustment item can be changed by PUSH-SW.)
EBL (Floating EBL ON/OFF can be changed by PUSH-SW.)
VRM
Trackball | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) Operation switch | <table border="0"> <tr> <td>STBY/OFF (Standby/Power off):</td> <td>Stop transmit, Power off.</td> </tr> <tr> <td>TX/OFF (Transmit start/Power off):</td> <td>Start transmit, Power off</td> </tr> <tr> <td>PANEL(Brightness of keyboard adjustment):</td> <td>Brightness of keyboard switch adjust.</td> </tr> <tr> <td>ALARM ACK(Stop Alarm):</td> <td>Acknowledge and stop alarm.</td> </tr> <tr> <td>EBL1(EBL1):</td> <td>Selection display and non-display of EBL1.</td> </tr> <tr> <td>EBL2(EBL2):</td> <td>Selection display and non-display of EBL2.</td> </tr> <tr> <td>VRM1(VRM1):</td> <td>Selection display and non-display of VRM1.</td> </tr> <tr> <td>VRM2(VRM2):</td> <td>Selection display and non-display of VRM2.</td> </tr> <tr> <td>RANGE+(Increase display range):</td> <td>Increase display range.</td> </tr> <tr> <td>RANGE-(decrease display range):</td> <td>decrease display range.</td> </tr> <tr> <td>ACQ(acquisition):</td> <td>ATA target acquisition</td> </tr> <tr> <td>TGT DATA(Numeric display):</td> <td>Numeric display of tracking target.</td> </tr> <tr> <td>TGT CNCL(Release of selection):</td> <td>Release of selection of tracking target.</td> </tr> <tr> <td>MOB(Marker):</td> <td>Turning on and release marker.</td> </tr> <tr> <td>ENT(Enter):</td> <td>Left side button of trackball.</td> </tr> <tr> <td>CLR/INFO(Release/Information):</td> <td>Right side of trackball.</td> </tr> <tr> <td>MAP(Display mode):</td> <td>Selection display and non-display of MAP(NAV LINE, etc...).</td> </tr> <tr> <td> </td> <td>Selection of Rader, Synthesis and Plotter mode.</td> </tr> <tr> <td>AZI MODE(Display azimuth):</td> <td>Selection of North-up, Course-Up, Head-Up.</td> </tr> <tr> <td>TM/RM(True/Relative Motion):</td> <td>Selection true motion, relative motion.</td> </tr> <tr> <td>RR/HL(Fixed ring/Heading Line):</td> <td>Selection display and non-display of fixed ring and heading line.</td> </tr> <tr> <td> </td> <td>Off center operation</td> </tr> <tr> <td>OFF CENT(Off Center):</td> <td>Setting and release of guard zone.</td> </tr> <tr> <td>GZ ALARM (Guard zone alarm):</td> <td>Selection of true motion and relative motion of vector.</td> </tr> <tr> <td>VECT T/R (True/Relative motion vector):</td> <td>Selection display and non-display of trails.</td> </tr> <tr> <td> </td> <td>Selection of screen arrangement of color.</td> </tr> <tr> <td>TRAILS (Trails):</td> <td>Selection of signal processing.</td> </tr> <tr> <td>Day/Night(Brightness of screen switch):</td> <td>User assignment key1.</td> </tr> <tr> <td>FUNC(Function):</td> <td>User assignment key2.</td> </tr> <tr> <td>USER KEY1(User key1):</td> <td>Rader menu.</td> </tr> <tr> <td>USER KEY2(User key2):</td> <td>Selection display and non-display of mark.</td> </tr> <tr> <td>RADAR MENU(Radar menu):</td> <td>ATA menu.</td> </tr> <tr> <td>MARK(MARK):</td> <td> </td> </tr> <tr> <td>ATA MENU(ATA menu):</td> <td> </td> </tr> </table> | STBY/OFF (Standby/Power off): | Stop transmit, Power off. | TX/OFF (Transmit start/Power off): | Start transmit, Power off | PANEL(Brightness of keyboard adjustment): | Brightness of keyboard switch adjust. | ALARM ACK(Stop Alarm): | Acknowledge and stop alarm. | EBL1(EBL1): | Selection display and non-display of EBL1. | EBL2(EBL2): | Selection display and non-display of EBL2. | VRM1(VRM1): | Selection display and non-display of VRM1. | VRM2(VRM2): | Selection display and non-display of VRM2. | RANGE+(Increase display range): | Increase display range. | RANGE-(decrease display range): | decrease display range. | ACQ(acquisition): | ATA target acquisition | TGT DATA(Numeric display): | Numeric display of tracking target. | TGT CNCL(Release of selection): | Release of selection of tracking target. | MOB(Marker): | Turning on and release marker. | ENT(Enter): | Left side button of trackball. | CLR/INFO(Release/Information): | Right side of trackball. | MAP(Display mode): | Selection display and non-display of MAP(NAV LINE, etc...). | | Selection of Rader, Synthesis and Plotter mode. | AZI MODE(Display azimuth): | Selection of North-up, Course-Up, Head-Up. | TM/RM(True/Relative Motion): | Selection true motion, relative motion. | RR/HL(Fixed ring/Heading Line): | Selection display and non-display of fixed ring and heading line. | | Off center operation | OFF CENT(Off Center): | Setting and release of guard zone. | GZ ALARM (Guard zone alarm): | Selection of true motion and relative motion of vector. | VECT T/R (True/Relative motion vector): | Selection display and non-display of trails. | | Selection of screen arrangement of color. | TRAILS (Trails): | Selection of signal processing. | Day/Night(Brightness of screen switch): | User assignment key1. | FUNC(Function): | User assignment key2. | USER KEY1(User key1): | Rader menu. | USER KEY2(User key2): | Selection display and non-display of mark. | RADAR MENU(Radar menu): | ATA menu. | MARK(MARK): | | ATA MENU(ATA menu): | |
| STBY/OFF (Standby/Power off): | Stop transmit, Power off. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TX/OFF (Transmit start/Power off): | Start transmit, Power off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PANEL(Brightness of keyboard adjustment): | Brightness of keyboard switch adjust. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALARM ACK(Stop Alarm): | Acknowledge and stop alarm. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EBL1(EBL1): | Selection display and non-display of EBL1. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EBL2(EBL2): | Selection display and non-display of EBL2. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VRM1(VRM1): | Selection display and non-display of VRM1. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VRM2(VRM2): | Selection display and non-display of VRM2. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RANGE+(Increase display range): | Increase display range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RANGE-(decrease display range): | decrease display range. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ACQ(acquisition): | ATA target acquisition | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TGT DATA(Numeric display): | Numeric display of tracking target. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TGT CNCL(Release of selection): | Release of selection of tracking target. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MOB(Marker): | Turning on and release marker. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ENT(Enter): | Left side button of trackball. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLR/INFO(Release/Information): | Right side of trackball. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAP(Display mode): | Selection display and non-display of MAP(NAV LINE, etc...). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Selection of Rader, Synthesis and Plotter mode. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AZI MODE(Display azimuth): | Selection of North-up, Course-Up, Head-Up. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TM/RM(True/Relative Motion): | Selection true motion, relative motion. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RR/HL(Fixed ring/Heading Line): | Selection display and non-display of fixed ring and heading line. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Off center operation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFF CENT(Off Center): | Setting and release of guard zone. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GZ ALARM (Guard zone alarm): | Selection of true motion and relative motion of vector. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VECT T/R (True/Relative motion vector): | Selection display and non-display of trails. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Selection of screen arrangement of color. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TRAILS (Trails): | Selection of signal processing. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Day/Night(Brightness of screen switch): | User assignment key1. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FUNC(Function): | User assignment key2. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USER KEY1(User key1): | Rader menu. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USER KEY2(User key2): | Selection display and non-display of mark. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RADAR MENU(Radar menu): | ATA menu. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MARK(MARK): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ATA MENU(ATA menu): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

11.14

INPUT ENABLE SIGNAL

- | | |
|--|--|
| (1) Navigation equipment: | NMEA0183
Receive capability sentence.
Longitude/Latitude: GGA>RMC>RMA>GNS/GLL
Waypoint: RMB>BWC(BWR)
COG/SOG: RMC>RMA>VTG
SPEED: VBW
Day/Time information: ZDA |
| (2) Bearing signal: | GYRO-SYNC: 360X, 180X, 90X, 30X. (Require optional NSK unit)
GYRO-STEP: 360X, 180X, 90X, 30X. (Require optional NSK unit)
JRC-NSK format (JLR-10)
IEC61162-2 38400bps: HDT
IEC61162-1: HDT>HDG>HDM>VHW
※Can't be use for ATA. |
| (3) Speed signal: | LOG-SYNC: 360X, 180X,90X, 30X. (Require optional NSK unit)
LOG-PULSE: 800, 400, 200, 100. (Require optional NSK unit) |
| (4) External event mark: | Contact input by way of terminal board. |
| (5) Radar buoy: | Negative input |
| (6) Depth: | DPT>DBK>DBT>DBS |
| (7) Water temperature: | MTW |
| (8) Tendency: | CUR, JRC format |
| (9) Direction of wind, velocity of wind: | MWV, MWD |

11.15

OUTPUT ENABLE SIGNAL

- | | | |
|-----|------------------------|---|
| (1) | Slave video | Radar video: TIY, VD, BP(2048p), BZ |
| (2) | Navigation information | NMEA0183
Radar system data: RSD
Own ship data: OSD
ARPA data: TTM
Target data latitude/longitude: TLL
Alarm: ALR |
| (3) | External alarm | Contact output by way of terminal board |
| (4) | External monitor | Multi scan monitor, Analog RGB, HD15pin Connector |

11.16

STANDARD CONFIGURATION

- | | | |
|-----|-------------------------|---|
| (1) | Scanner | 1 |
| (2) | Display unit | 1 (Processor unit, LCD unit, Keyboard unit) |
| (3) | Equipment cable | 10/25kW (Both end was connectors.)
Standard:20m, Option: 30m
30kW (The end of display unit is a connector.)
Display unit to Power supply unit Standard:20m, Option:30m
Power supply unit to scanner Standard:15m, Option:50m(Maximum) |
| (4) | Equipment reserve parts | 1 |
| (5) | Instruction manual | 1 (Japanese or English) |

11.17

EQUIPMENT DISTANCE BETWEEN OTHER INSTRUMENTS

	Maximum	Standard
(1) LCD monitor to processor unit	5m	5m
(2) Keyboard unit to processor unit	5m	5m
(3) Scanner to display unit (10/25kw)	30m	20m
(4) Scanner to power supply unit (30kW)	50m	20m
(5) Power supply unit to display unit(30kW)	30m	20m



11.18 OTHERS (OPTION)

- High performance ARPA unit (Built-in)
- Normal edition ATA unit (Built-in)
- NSK unit (Built-in)
- Plotter (Built-in)
- AIS interface (Built-in)
- Coast line ROM card
- Memory card
- Inter Switch

APPENDIX

INTER-SWITCH (Option)

NQE-3141

Instruction Manual

1.	Overview	A-1
1.1	Overview	A-1
1.2	Configuration	A-1
2.	Operation	A-2
2.1	Operation Flow	A-2
2.2	Inter Switch Menu	A-3
2.2.1	Switching an Inter-Switch Pattern	A-4
2.3	Reading Inter-switch Patterns	A-10
2.4	Saving Inter-switch patterns	A-11
2.5	Naming Indicators	A-12
2.6	Naming Scanners	A-13
3.	Reference	A-14

1. OVERVIEW

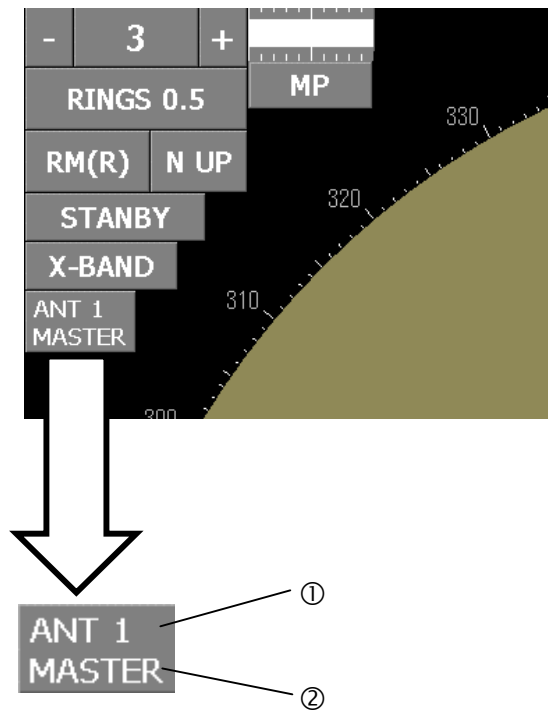
1.1 OVERVIEW

The inter-switch enables switching connections between multiple radar indicators that are installed on a bridge and multiple antennas of different characteristics.

The NQE-3141 switches connections between multiple indicators and multiple transceivers/scanners (referred to as MTR henceforth) on the JMA-5300 Series radar equipment.

1.2 CONFIGURATION

Connections can be switched easily using the button on the screen.



Button on the screen

① indicates the channel number that is connected.

② indicates MASTER or SLAVE.

When MASTER is displayed, the indicator can control the scanner.

When SLAVE is displayed, the indicator cannot control the scanner.

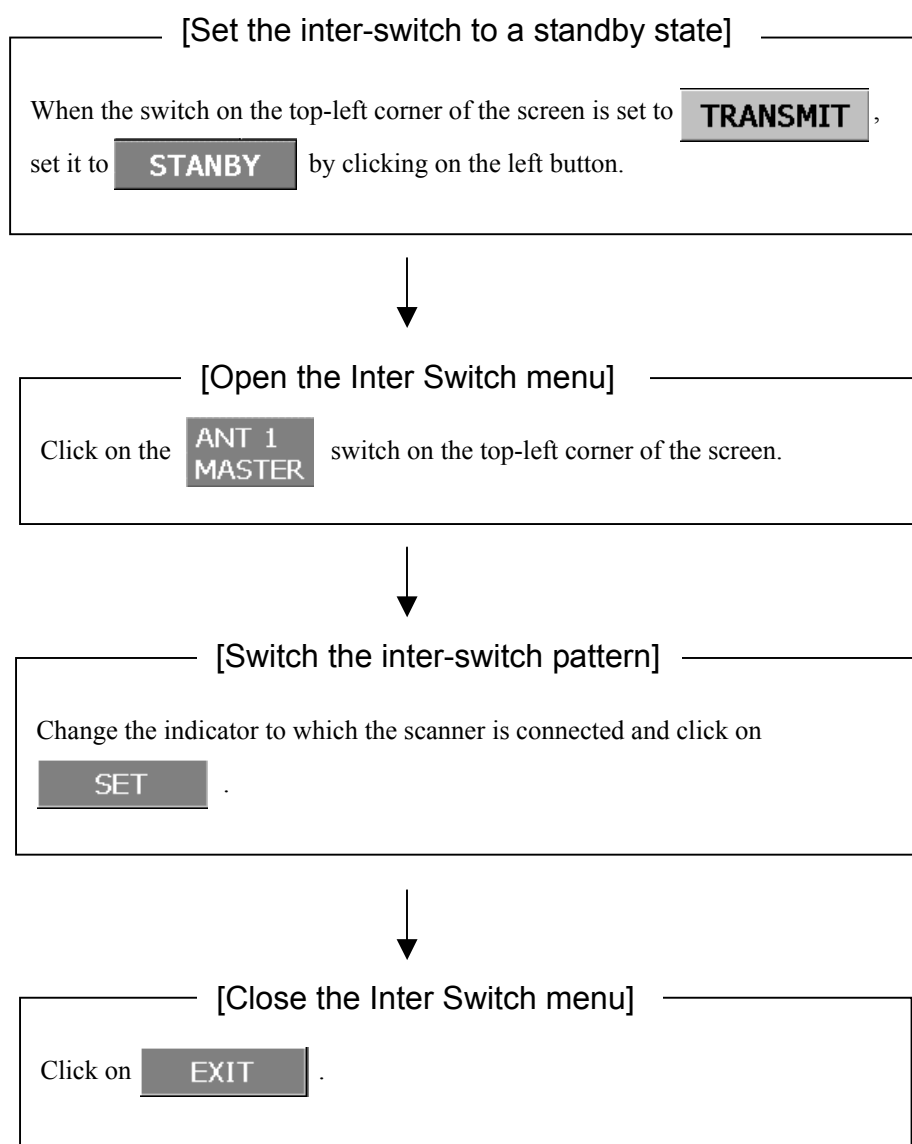
In SLAVE mode, transmission/stop and pulse width switching cannot be changed. The usage range is also restricted.

2. OPERATION

When switching an inter-switch pattern, set the inter-switch to STANDBY and operate the switches on the indicator panel according to the following flow.

2.1 OPERATION FLOW

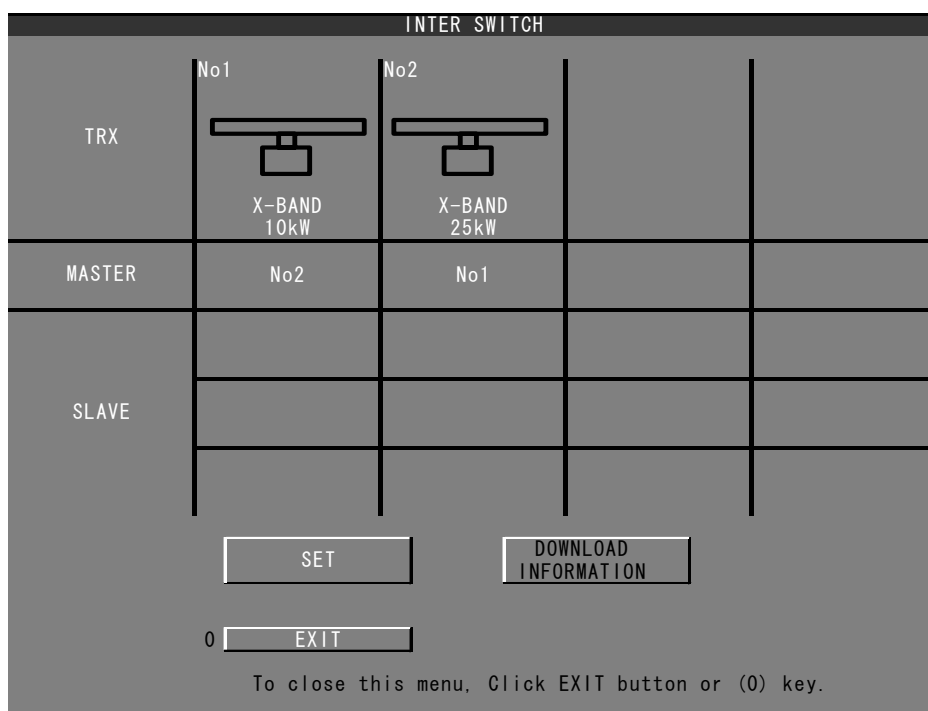
Flow from opening to the closing of the menu



2.2

INTER SWITCH MENU

The Inter Switch menu can be opened only when the radar is in a standby mode. The Inter Switch menu can be opened during transmission, however, in this case, transmission automatically stops and the radar is set to a standby mode.



When the button on the screen is clicked on, the Inter Switch menu is displayed as shown above.

- ① indicates the scanner format.
- ② Indicates the master indicator and ③ indicates the slave indicator.

Functions of the three switches that are provided at the bottom of the Inter Switch menu are described below.

- **DOWNLOAD INFORMATION** button (A)
Updates information.
- **SET** button (B)
Sets a pattern at switching of an inter-switch pattern. See Section 2.2.1, “Switching an Inter-Switch Pattern” for details.
- **EXIT** button (C)
Closes the Inter Switch menu.

2.2.1 Switching an Inter-Switch Pattern.....

This section uses an example that controls two indicators and two scanners.

[1] Switching two indicators (cross connection)

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

The Inter Switch Setting menu is opened.

Press the **[1]** key.

The Change Pattern screen is displayed.

* Indicators can also be switched by using the 2-9P radar screen ⑧ button.

Inter Switch Setting	
1. Change Pattern	
2. Load Pattern	>
3. Save Pattern	>
4. Input IND. Name	>
5. Input TRX Name	>
0. EXIT	

2. Set the cursor to the panel of the indicator to be switched and press the **[ENT]** key.

Select the panel in which the indicator name is displayed within the bold frame as shown above. Panels of the indicators that are not displayed cannot be selected.

Example: Set the cursor to panel ① and press the **[ENT]** key.

The panel of the selected indicator is displayed in reverse video.

INTER SWITCH				
TRX	No1	No2		
	 X-BAND 10kW	 X-BAND 25kW		
MASTER	No1	No2		
SLAVE				

- Set the cursor to the panel of another indicator and press the **[ENT]** key.

Example: Set the cursor to panel ② and press the **[ENT]** key.

Indicator ② and indicator ① are switched.

INTER SWITCH				
TRX	No1	No2		
	 X-BAND 10kW	 X-BAND 25kW		
MASTER	No2	No1		
SLAVE				

The names of indicators ① and ② are switched as follows.

- Click on SET at the bottom of the Inter Switch menu.

The inter-switch pattern switching is set.

- Click on EXIT at the bottom of the Inter Switch menu.

The Inter Switch menu is closed.

[II] Setting one indicator as a slave of another indicator (slave connection)

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

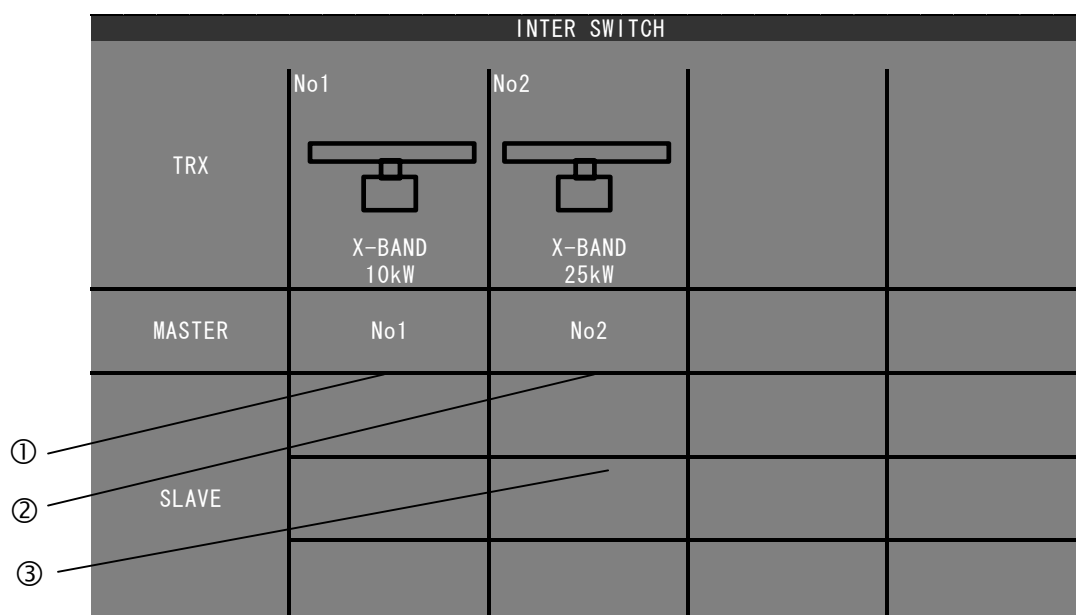
The Inter Switch Setting menu is opened.

Press the **[1]** key.

The Change Pattern screen is displayed.

- * Indicators can also be switched by using the 2-9P radar screen ⑧ button.

Inter Switch Setting	
1. Change Pattern	
2. Load Pattern	>
3. Save Pattern	>
4. Input IND. Name	>
5. Input TRX Name	>
0. EXIT	



- Set the cursor to the panel of the indicator to be set as a slave and press the **[ENT]** key.

Select the panel in which the indicator name is displayed within the bold frame as shown above. Panels of the indicators that are not displayed cannot be selected.

Example: Set the cursor to panel ① and press the **[ENT]** key.

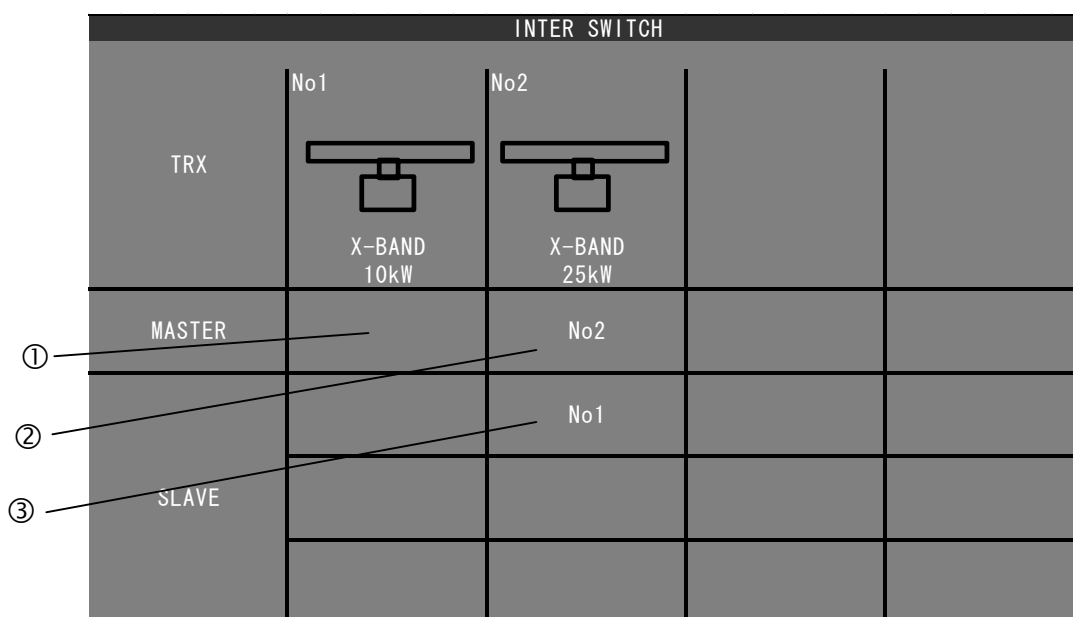
The panel of the selected indicator is displayed in reverse video.

3. Set the cursor to the panel under the indicator that is to be set as a master and press the **[ENT]** key.

Example: Set the cursor to panel ③ and press the **[ENT]** key.

Indicator ① moves to position ③.

Indicator ① is set to a slave of indicator ② as shown below.



4. Click on **SET** at the bottom of the Inter Switch menu.

The inter-switch pattern switching is set.

5. Click on **EXIT** at the bottom of the Inter Switch menu.

The Inter Switch menu is closed.

2.3

READING INTER-SWITCH PATTERNS

Inter-switch patterns that have been saved can be read.

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

The Inter Switch Setting menu is opened.

Press the **[2]** key.

The Load Pattern screen is displayed.

2. Select the number of the file to which the pattern is to be loaded using any of the numeric keys **[1]** to **[5]**.

The loaded inter-switch pattern is reflected.

Load Pattern	
1.	
2.	
3.	
4.	
5.	
9. NEXT	>
0. EXIT	

2.4

SAVING INTER-SWITCH PATTERNS

Inter-switch patterns can be saved.

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

The Inter Switch Setting menu is opened.

Press the **[3]** key.

The Save Pattern screen is displayed.

2. Select the number of the file in which the pattern is to be saved using any of numeric keys **[1]** to **[5]**.

An alphanumeric key screen is displayed.

3. Enter a name using alphanumeric keys and press the ENT button.

The data is saved under the file name that was entered.

Save Pattern

1.

2.

3.

4.

5.

9. NEXT >

0. EXIT

Save Pattern

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	SP	<	>	
DEL						BS		ENT	

EXIT

2.5

NAMING INDICATORS

Names can be assigned to indicators.

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

The Inter Switch Setting menu is opened.

Press the **[3]** key.

The Input IND. Name screen is displayed.

2. Select the number of the indicator to be named using any of numeric keys **[1]** to **[4]**.

An alphanumeric key screen is displayed.

3. Enter a name using alphanumeric keys and press the ENT button.

The name that was entered is reflected in the indicator.

* Up to four indicators can be named.

Input IND. Name	
1. No.1	IND.1
2. No.2	IND.2
3. No.3	IND.3
4. No.4	IND.4
0. EXIT	

No.1											
0	1	2	3	4	5	6	7	8	9		
A	B	C	D	E	F	G	H	I	J		
K	L	M	N	O	P	Q	R	S	T		
U	V	W	X	Y	Z	SP	<	>			
DEL								BS		ENT	
EXIT											

2.6

NAMING SCANNERS

Names can be assigned to scanners.

Procedure

1. Press the **[RADAR MENU]** key twice.

Press the **[6]** key.

The Inter Switch Setting menu is opened.

Press the **[4]** key.

The Input TRX Name screen is displayed.

2. Select the number of the scanner to be named using any of numeric keys **[1]** to **[4]**.

An alphanumeric key screen is displayed.

3. Enter a name using alphanumeric keys and press the ENT button.

The name that was entered is reflected in the scanner.

* Up to four scanners can be named.

Input TRX Name

1. No.1

TRX1

2. No.2

TRX2

3. No.3

TRX3

4. No.4

TRX4

0. EXIT

No.1

0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z	SP	<	>	
DEL						BS		ENT	

EXIT

3. REFERENCE

Preheating time required after pattern switching

A preheating time is required in some cases as indicated below after completion of an inter-switch pattern switching since the preheating time varies according to the connection state between the scanner (MTR) and the indicator before switching.

This delay is to protect the electron tube that delivers radiowaves.

- (a) Connection was not changed to a new connection state: No preheating required
- (b) Connection was changed to a new connection state and a scanner has been used before the change: No preheating required
- (c) Connection was changed to a new connection state and a scanner has not been used before the change: Preheating required

Notes on pattern switching

Pattern switching may not be enabled immediately after completion of the previous pattern switching.

This is because it takes some time to prepare for the next switching after completion of the previous pattern switching. Wait for several seconds before starting the next pattern switching.

Notes on master/slave connection mode

Master/slave connection refers to the connection where the indicator that is connected to a scanner is defined as a master and the indicator that is connected to the master indicator is defined as a slave indicator.

A slave indicator cannot be set to a transmission mode unless the master indicator is in a transmission mode. When the mode of a master indicator is changed from a transmission mode to a standby mode, “MTR ST-BY” is displayed in the message area and an alarm sound is emitted.

A slave indicator is not capable of tuning control. Tuning is controlled by a master indicator. “SLAVE” is displayed on the tuning display at the top-left corner of the screen.

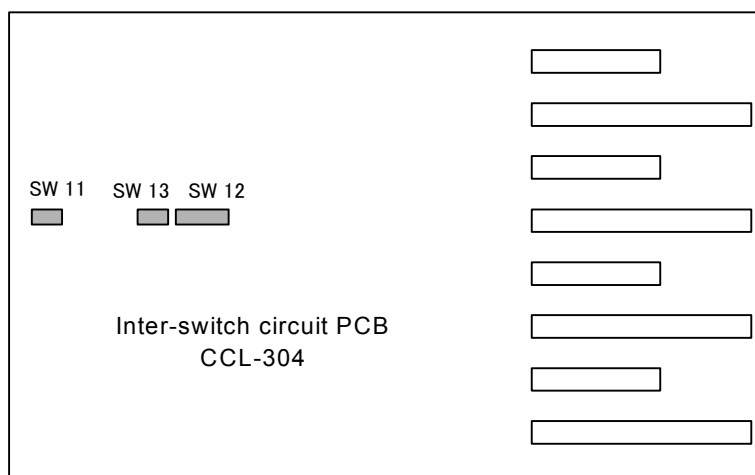
The range change of a slave indicator is restricted by the range of the master indicator. In principle, the range of a slave indicator cannot exceed the range of the master indicator. However, some range may be greater than the range of the master indicator if it is within the same transmission pulse width/transmission pulse rate.

Setting at installation

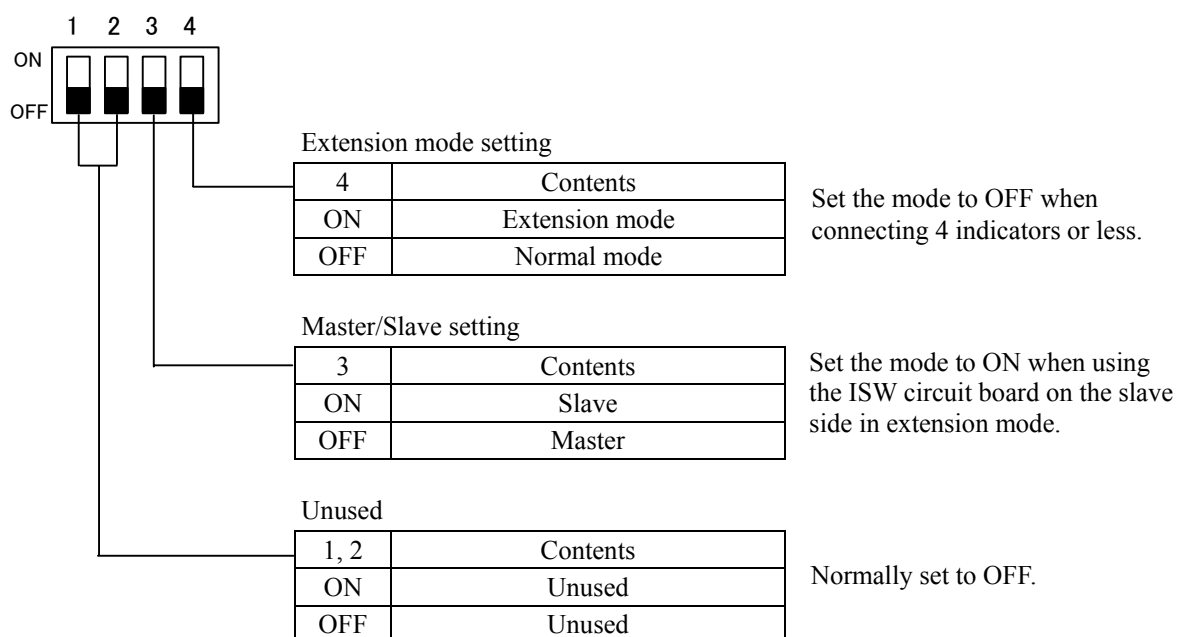
The inter-switch must be installed according to the installation guide that is provided separately. The setting tables are provided below.

• Setting the inter-switch circuit (CCL-304)

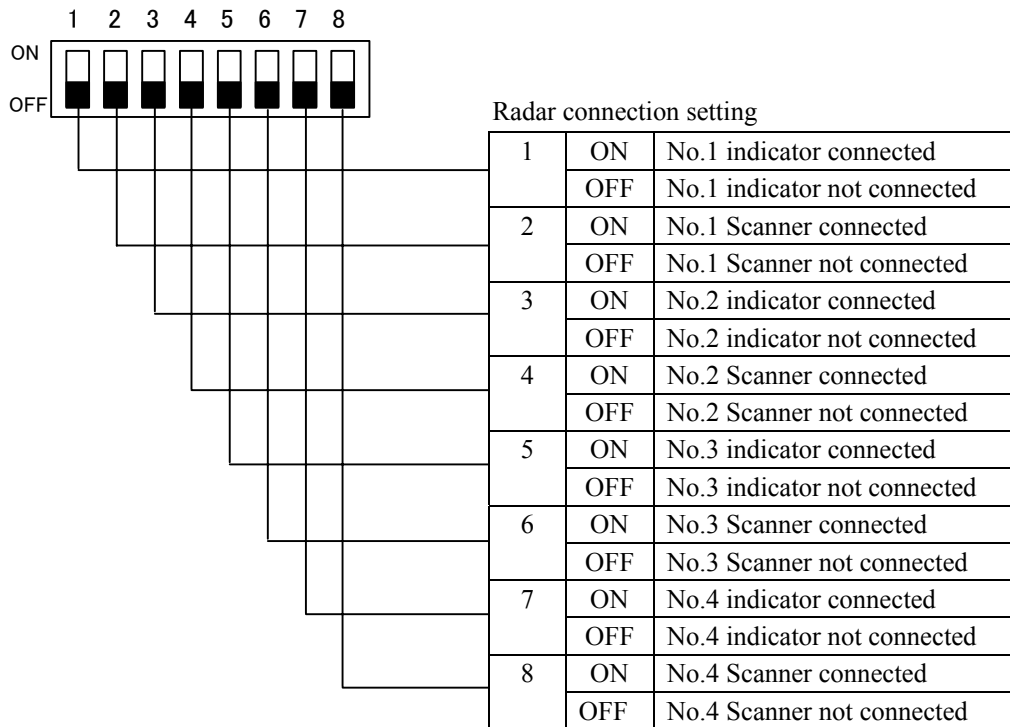
The contents of DIP switches SW11, SW12, and SW13 are shown below.



(1) Setting SW11 (extension mode, master/slave setting)



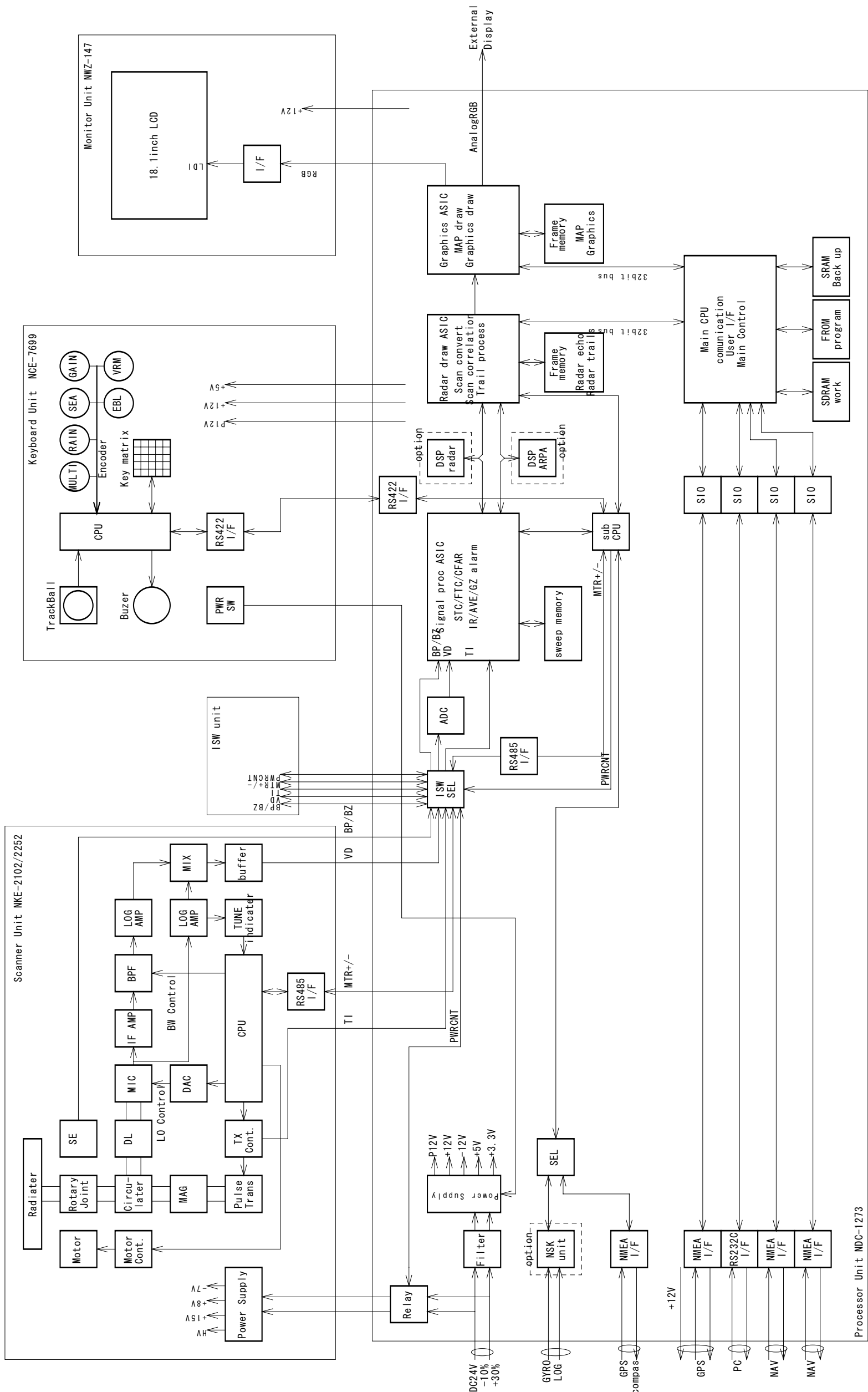
(2) Setting SW12 (radar connection setting)



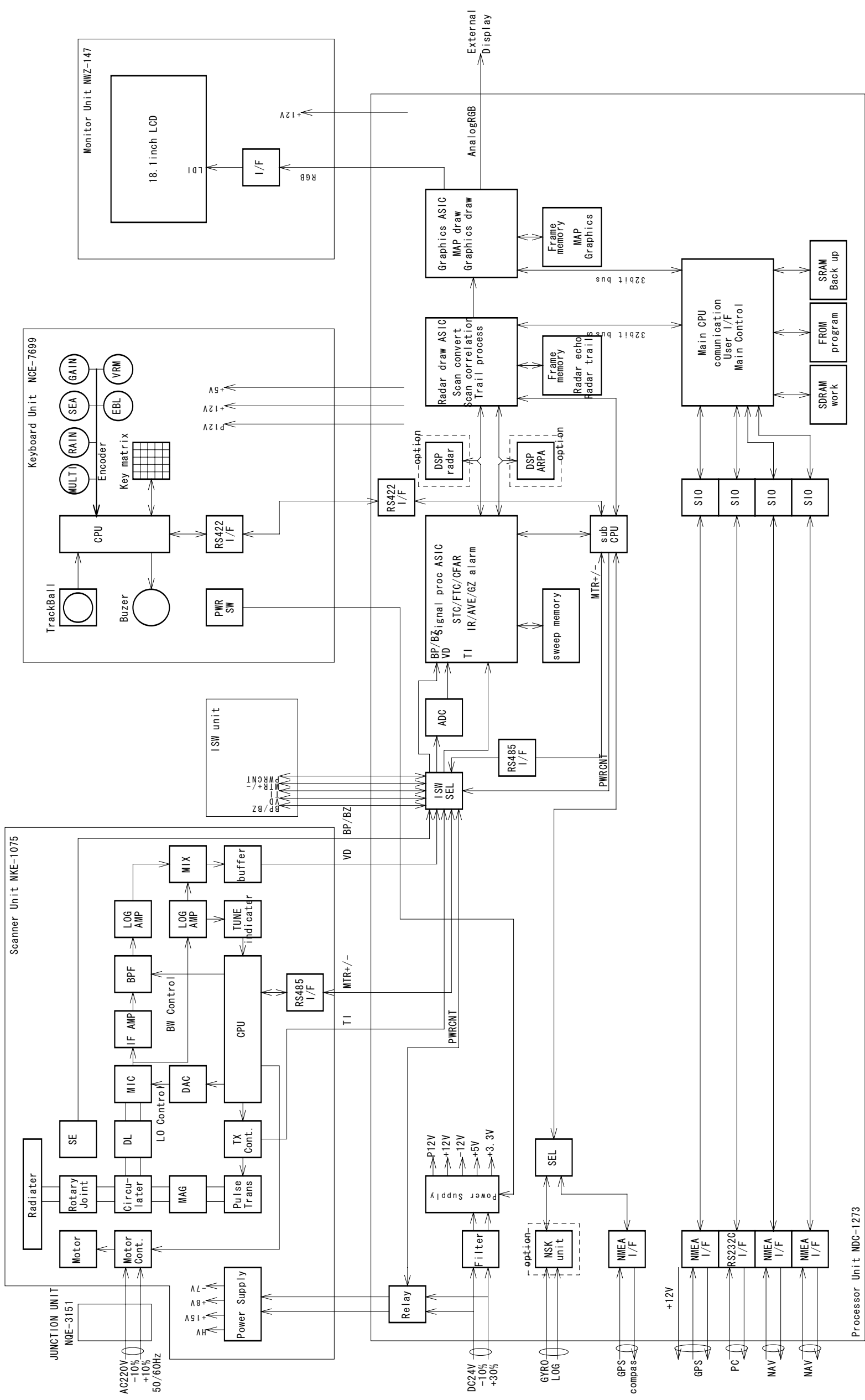
(3) SW13 (Unused)



Note Before setting the DIP switches of the ISW circuit, ensure that safety procedures are followed by referencing the Installation Guide.



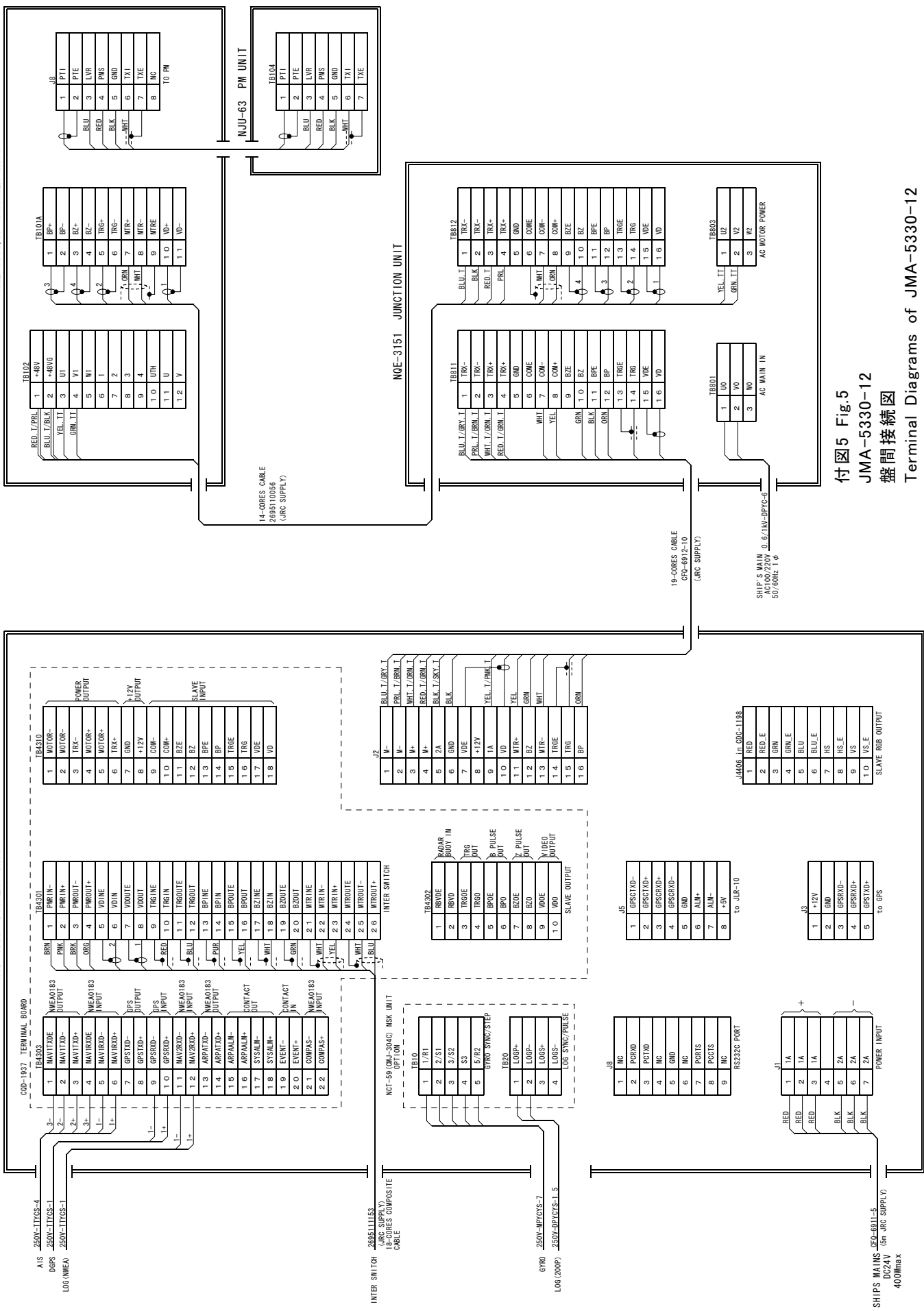
付図 1 Fig.1
 JMA-5310-6/5320-7/9
 レーダー装置回路動作説明図
 Block Diagrams of RADAR JMA-5310-6/5320-7/9

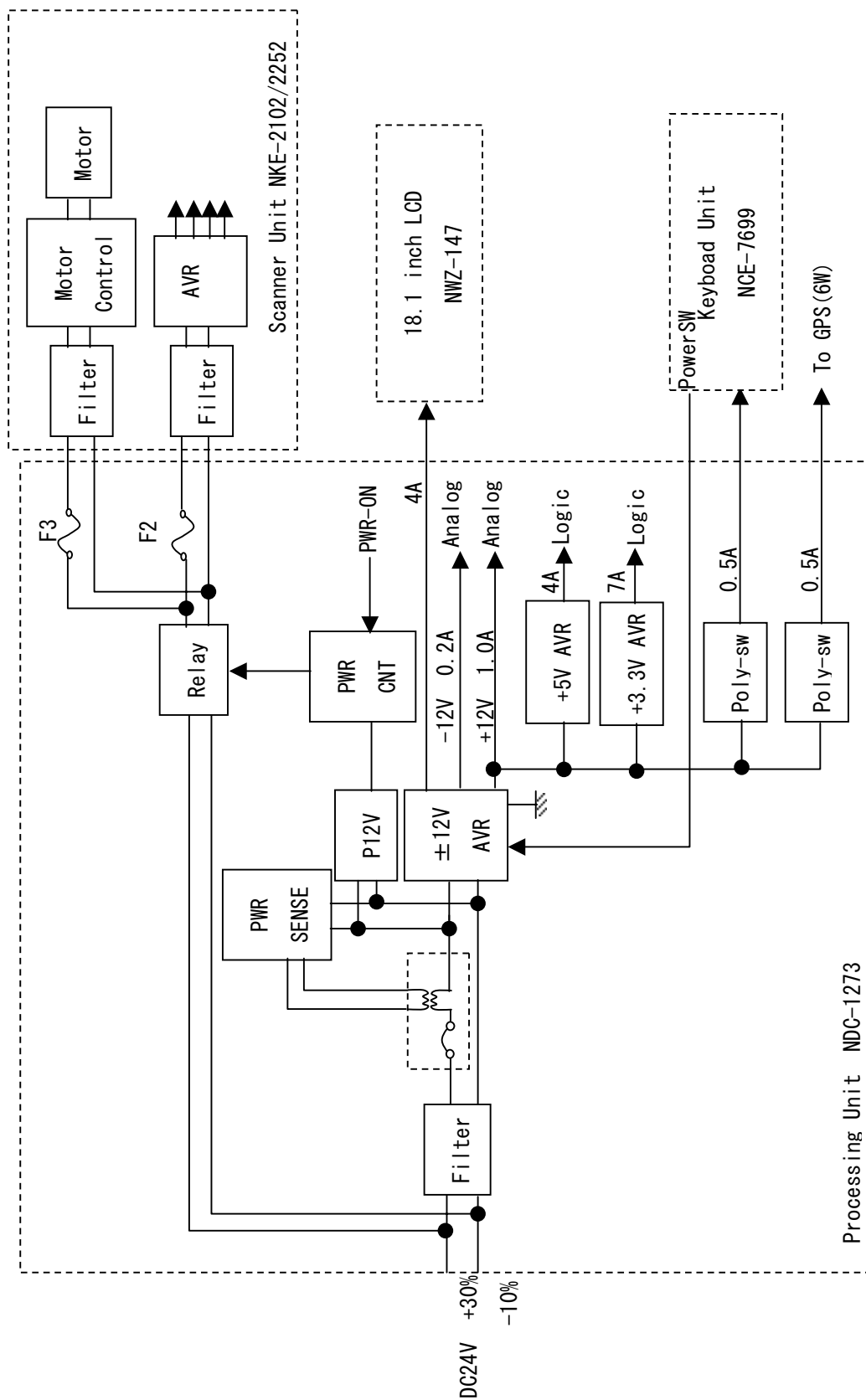


付図 2 Fig.2
JMA-5330-12
レーダー装置回路動作説明図
Block Diagrams of RADAR JMA-5330-12

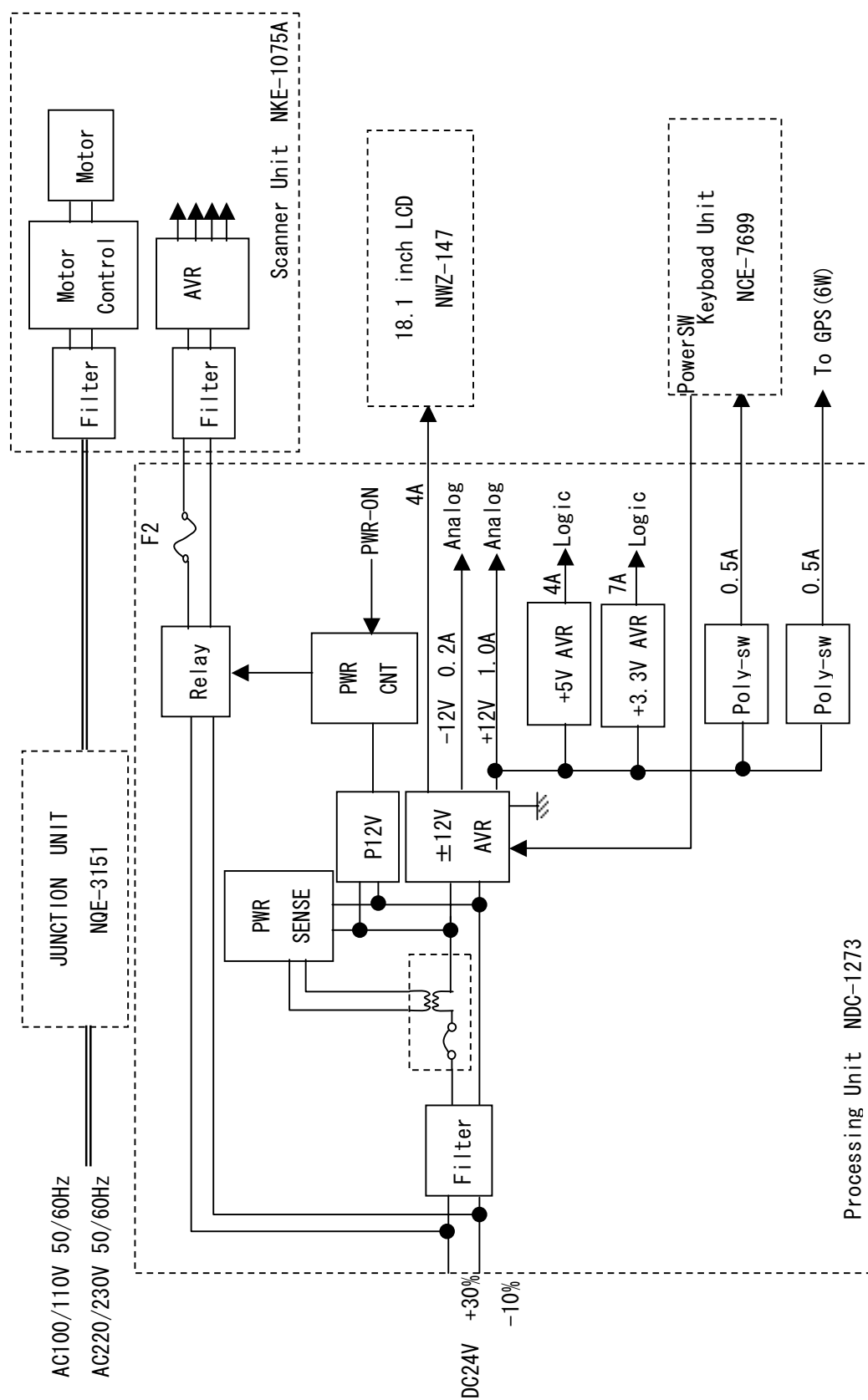
NCD-4510 DISPLAY UNIT

NKE-1075/A SCANNER UNIT

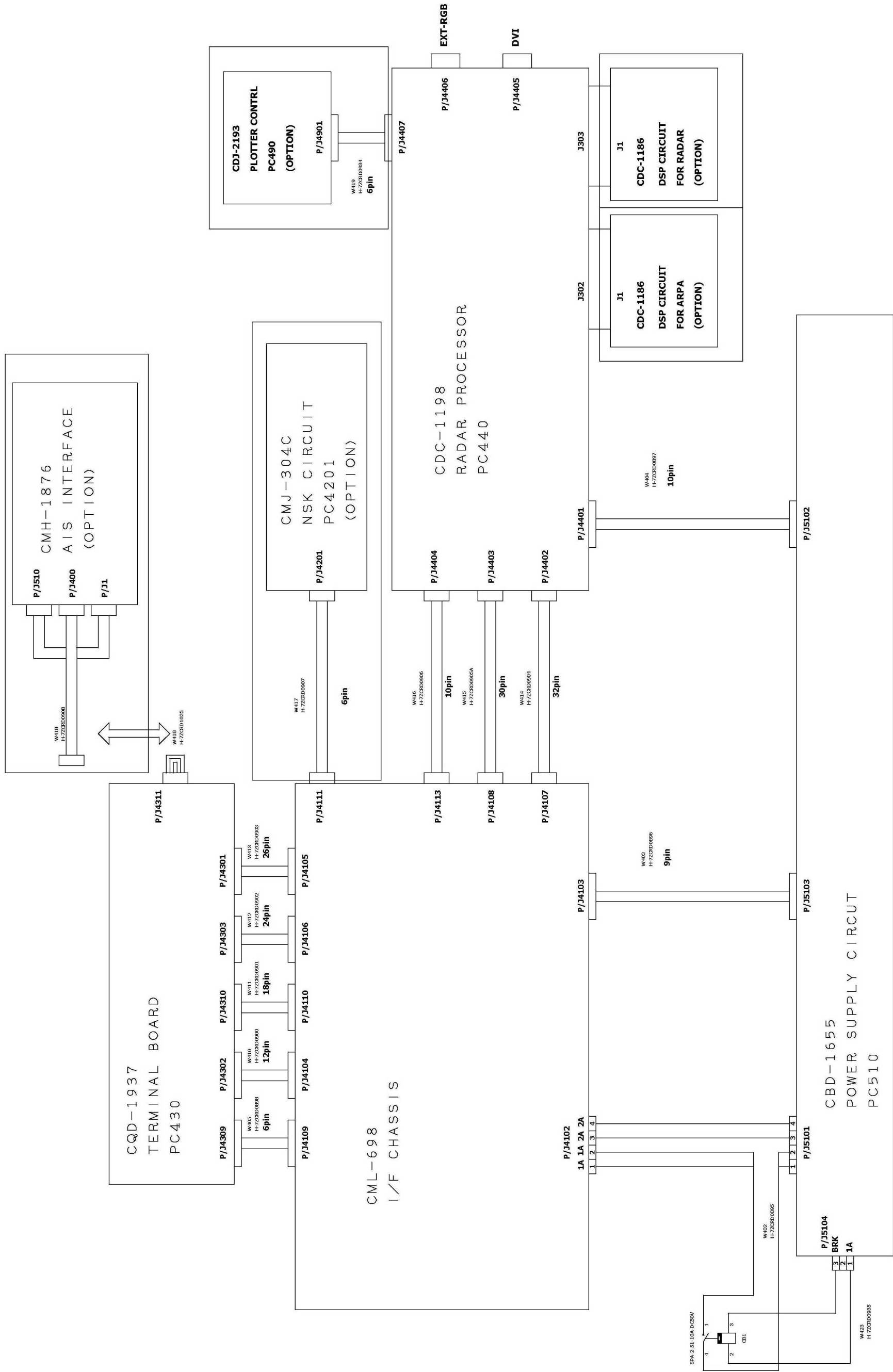




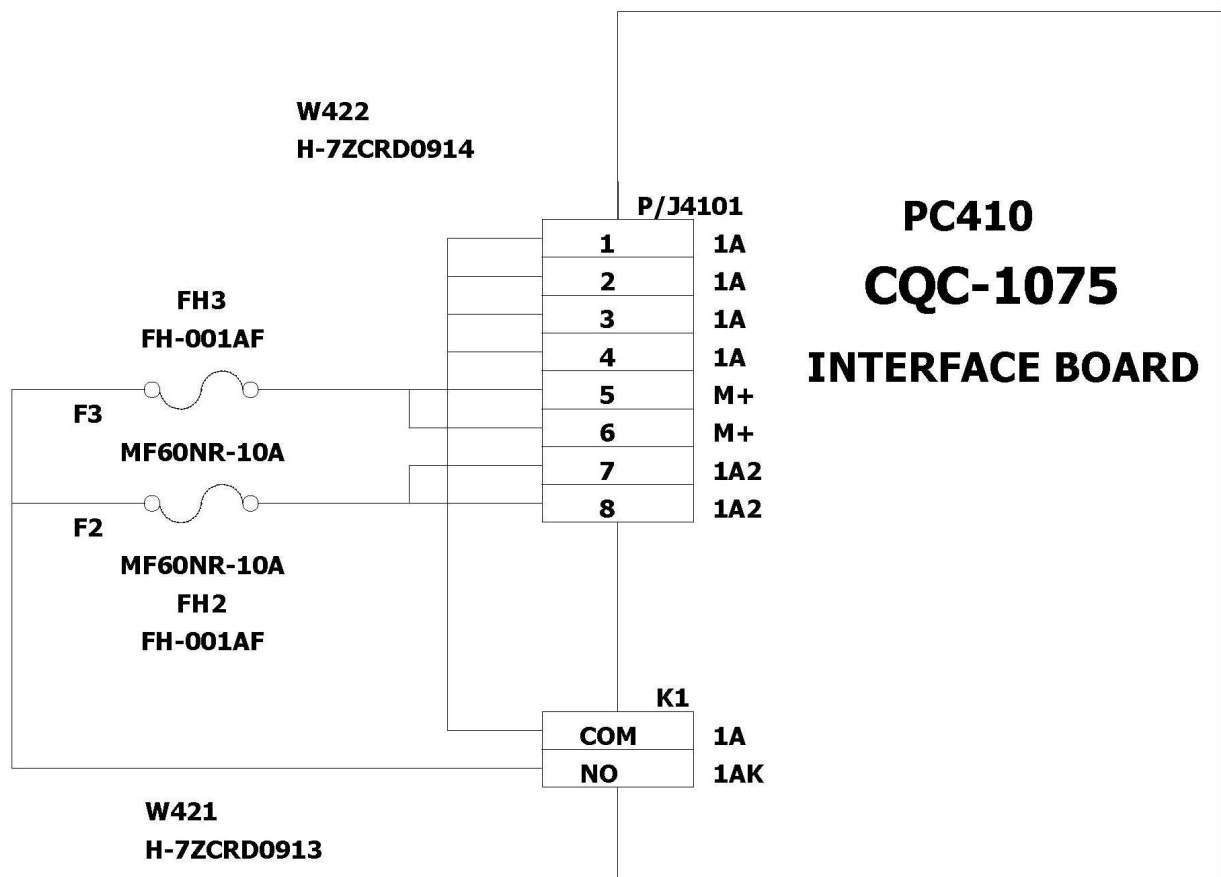
付図 6 Fig.6
JMA-5310-6/5320-7/9
電源系統図
Primary power supply block of RADAR JMA-5310-6/5320-7/9



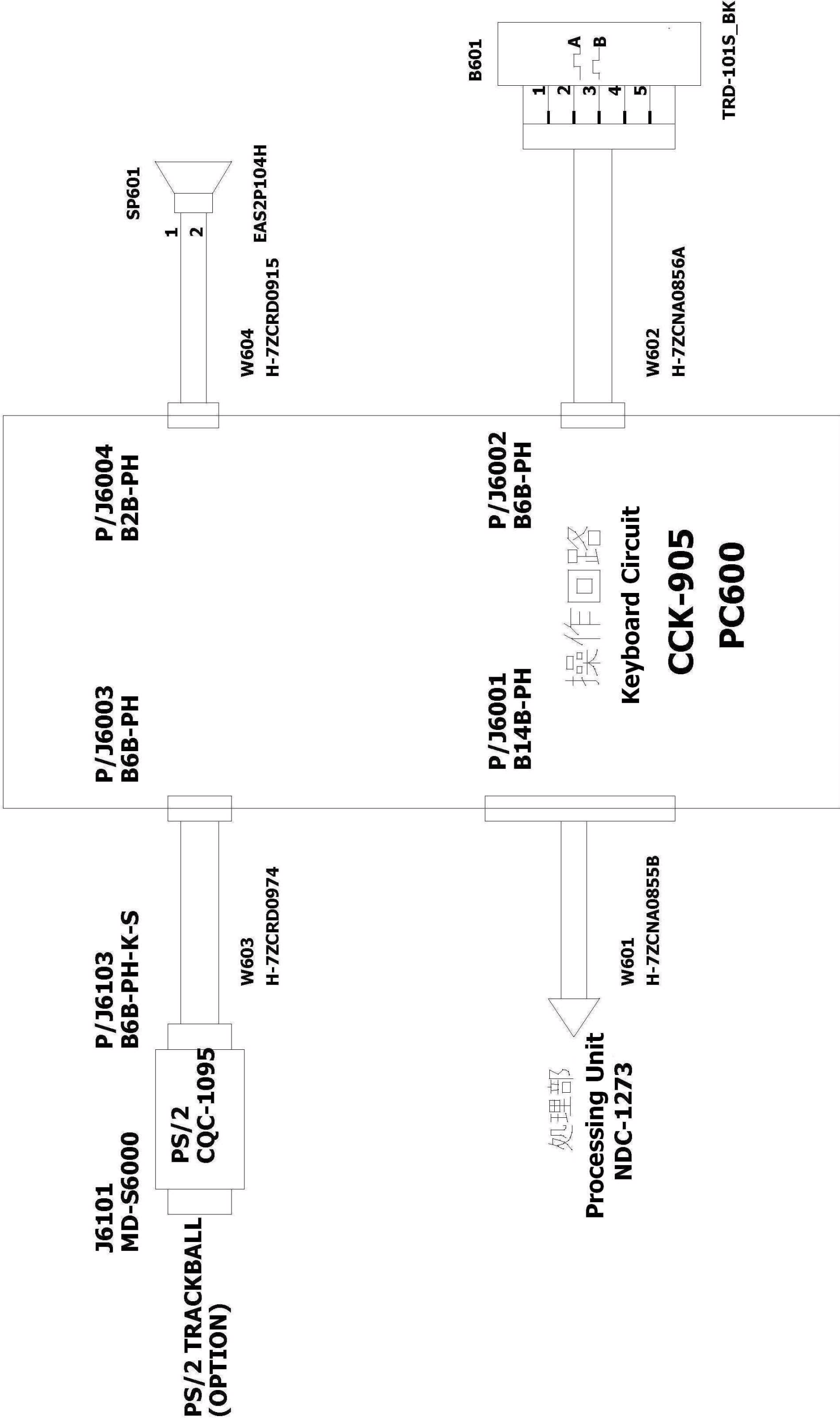
付図 7 Fig.7
JMA-5330-12
電源系統図
Primary power supply block of RADAR JMA-5330-12



付図8 Fig.8
NDC-1273
処理部機内接続図
Inter connection Diagrams of Processing Unit



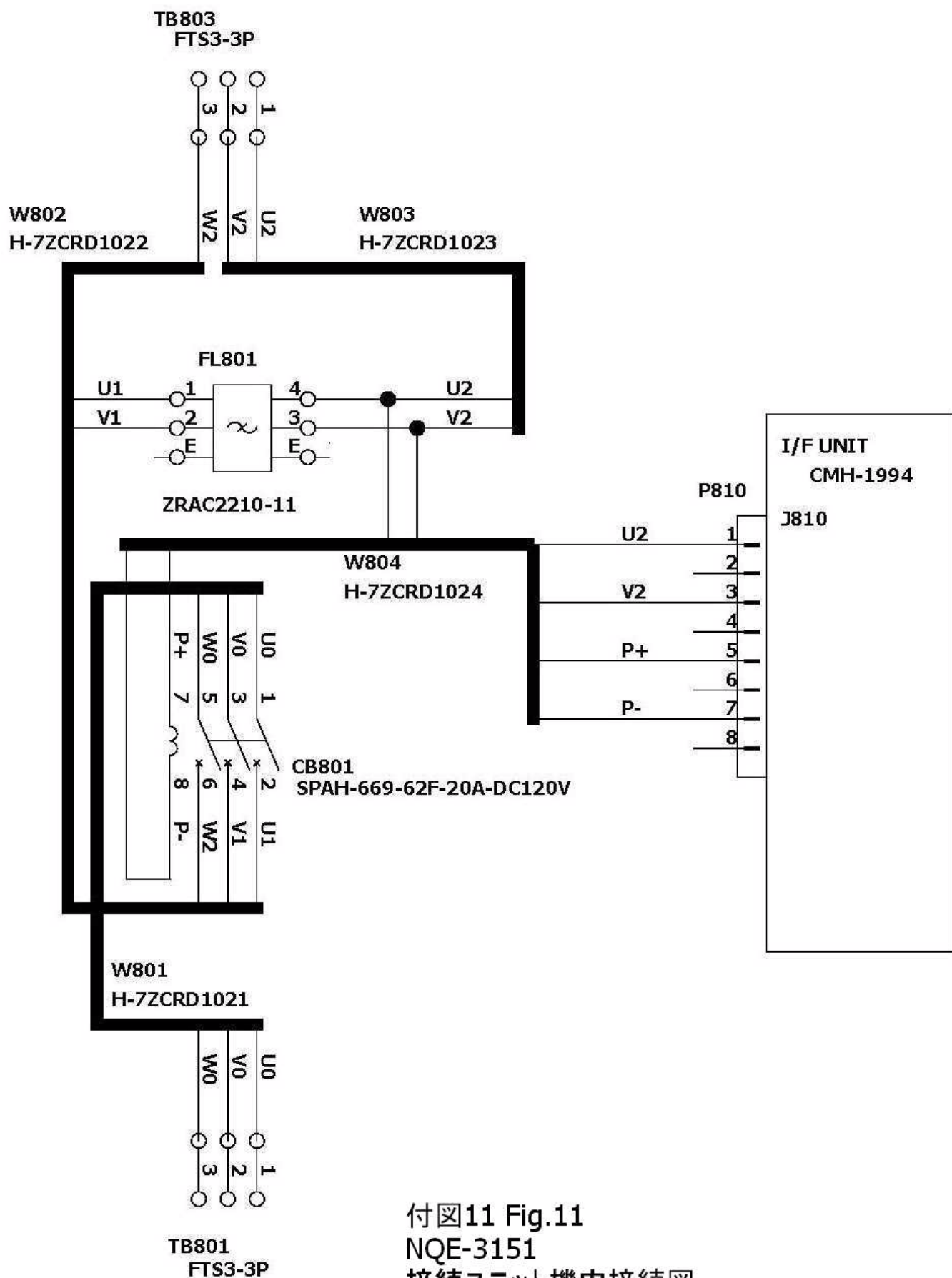
付図9 Fig.9
NDC-1273
入出力部機内接続図
Inter connection Diagrams of Interface Board



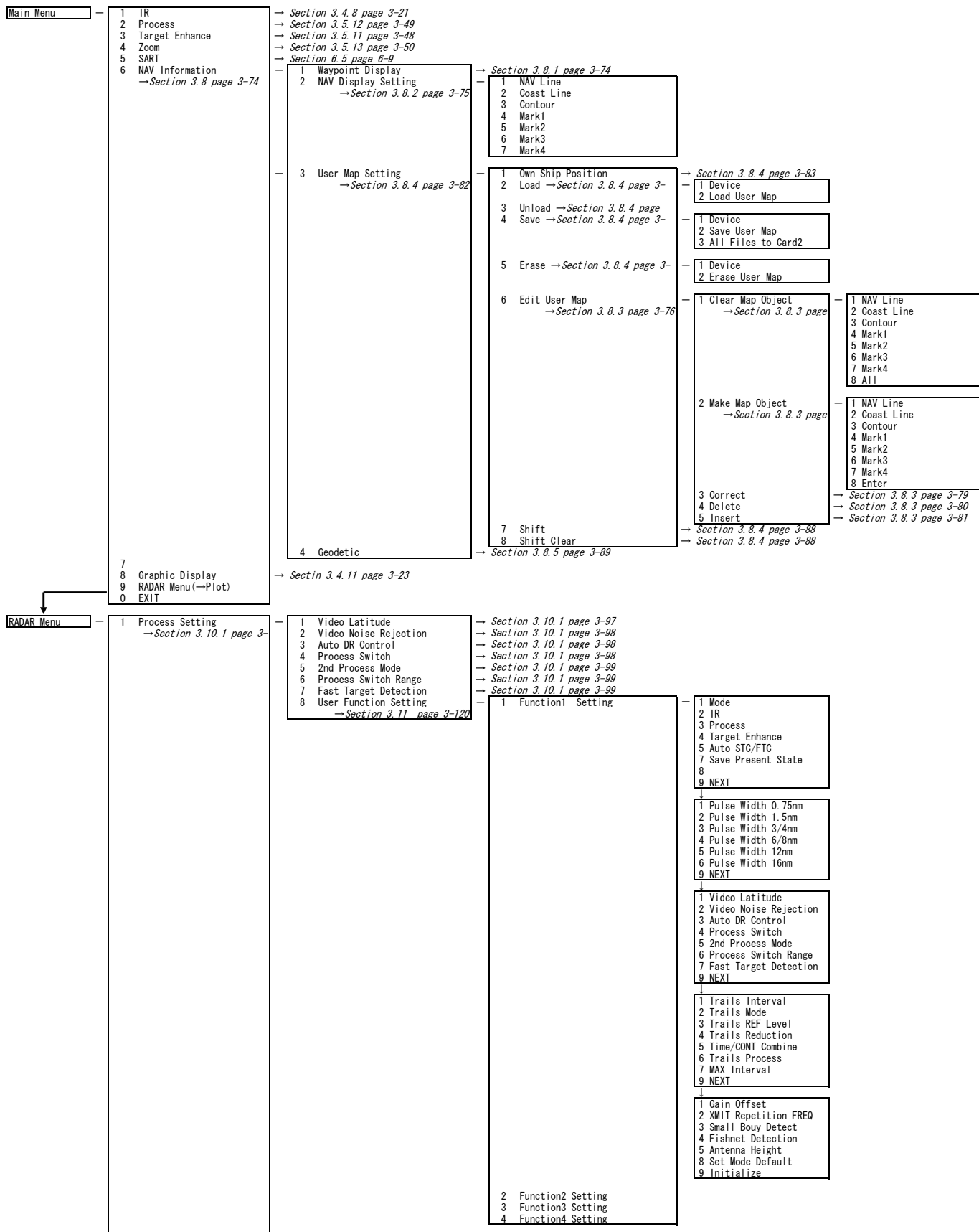
付図10 Fig.10

NCE-7699
操作部機内接続図

Inter connection Diagrams of keyboard Unit



付図11 Fig.11
 NQE-3151
 接続ユニット機内接続図
 Inter connection Diagrams of Junction Unit



2	RADAR Trails Setting →Section 3.10.2 page 3-	1 Trails Interval	→ Section 3.5.9 page 3-44
		2 Trails Mode	→ Section 3.5.9 page 3-46
3	Marker Setting	3 Trails REF Level	→ Section 3.10.2 page 3-100
		4 Trails Reduction	→ Section 3.10.2 page 3-100
		5 Time/CONT Combine	→ Section 3.10.2 page 3-101
		6 Trails Process	→ Section 3.10.2 page 3-101
		7 MAX Interval	→ Section 3.10.2 page 3-101
4	Screen Setting	1 EBL1 Setting →Section 3.5.3 page 3-27	1 EBL1 Bearing → Section 3.5.3 page 3-27
		2 EBL2 Setting →Section 3.5.3 page 3-27	2 EBL1 Floating → Section 3.5.3 page 3-28
		3 VRM1 Range Unit	3 EBL1 Bearing Fix → Section 3.5.3 page 3-29
		4 VRM2 Range Unit	1 EBL2 Bearing → Section 3.5.3 page 3-27
		5 Parallel Index Line →Section 3.5.5 page 3-33	2 EBL2 Floating → Section 3.5.3 page 3-28
		6 Cursor Setting →Section 3.10.3 page 3-102	3 EBL2 Bearing Fix → Section 3.5.3 page 3-29
		7 EBL Maneuver Setting →3.5.16章 page 3-55P	1 Display → Section 3.5.4 page 3-31
			2 Range Link → Section 3.5.4 page 3-32
			3 PI Bearing REF → Section 3.5.5 page 3-35
			4 PI Floating → Section 3.5.5 page 3-36
5	TRX Setting		5 PI Bearing Fix → Section 3.5.5 page 3-37
			6 PI Individual → Section 3.5.5 page 3-39
			→Section 3.5.5 page 3-40
			1 Line 1
			2 Line 2
			3 Line 3
			4 Line 4
			5 Line 5
			6 Line 6
			7 Line 7
6	Inter Switch Setting →Refer to the Operation Manual of Inter Switch In Appendix	1 EBL/VRM Control Cursor	→ Section 3.10.3 page 3-102
		2 Cursor Length	→ Section 3.10.3 page 3-102
		1 EBL Maneuver	
		2 Reach	
		3 Turn Mode	
		4 Turn Set	
		1 Day/Night	→ Section 3.3.8 page 3-12
		2 Color Scheme	→ Section 3.3.8 page 3-13
		3 Outer PPI	→ Section 3.3.8 page 3-14
		4 Inner PPI	→ Section 3.3.8 page 3-14
7	Inter Switch Setting →Refer to the Operation Manual of Inter Switch In Appendix	5 Character	→ Section 3.3.8 page 3-14
		6 RADAR Echo	→ Section 3.3.8 page 3-14
		7 RADAR Trails (Time)	→ Section 3.3.8 page 3-14
		8 RADAR Trails (CONT)	→ Section 3.3.8 page 3-14
		1 RADAR Video	
		2 RADAR Trails	
		3 ATA/AIS	
		4 Fix Marker	
		5 EBL/VRM	
		6 Character	
8	Inter Switch Setting →Refer to the Operation Manual of Inter Switch In Appendix	7 Panel	
		→ Section 3.10.4 page 3-103	
		1 Depth Graph Display	→ Section 3.10.4 page 3-105
		2 Depth Range	→ Section 3.10.4 page 3-106
		3 Time Range	→ Section 3.10.4 page 3-106
		→ Section 3.10.4 page 3-104	
		→ Section 3.10.4 page 3-104	
		1 PRF Fine Tuning	→ Section 3.10.5 page 3-107
		2 Jamming	→ Section 3.10.5 page 3-107
		4 XMIT Repetition FREQ	→ Section 3.10.5 page 3-107
9	Inter Switch Setting →Refer to the Operation Manual of Inter Switch In Appendix	6 Band Select	→ Section 3.10.5 page 3-108
		1 Change Pattern	
		2 Load Pattern	
		3 Save Pattern	
		4 Input IND. Name	
		5 Input TRX Name	
		1 No. 1	
		2 No. 2	
		3 No. 3	
		4 No. 4	

7 NAV Equipment Setting

- 1 Set GYRO
- 3 Speed Equipment
- 4 Manual Speed
- 5 MAG Compass Setting
→Section 8.6 page 8-65
- 6 Set/Drift Setting
→Section 8.6 page 8-66
- 7 GPS Setting

→ Section 8.6 page 8-62
→ Section 8.6 page 8-63
→ Section 8.6 page 8-64

- 1 Heading Correction
- 2 Correct Value

→ Section 8.6 page 8-65
→ Section 8.6 page 8-65

- 1 Correction
- 2 Set
- 3 Drift

→ Section 8.6 page 8-66
→ Section 8.6 page 8-66
→ Section 8.6 page 8-66

- 1 GPS Process Setting
→Section 8.6 page 8-68

- 1 Position
- 2 Exclusion
- 3 Geodetic
- 4 Antenna Height
- 5 Fix Mode
- 6 DOP Level
- 7 Position Average
- 8 Master Reset
- 9 Send Date

→ Section 8.6 page 8-68
→ Section 8.6 page 8-69
→ Section 8.6 page 8-70
→ Section 8.6 page 8-72
→ Section 8.6 page 8-73
→ Section 8.6 page 8-74
→ Section 8.6 page 8-75
→ Section 8.6 page 8-76

- 2 DGPS Setting
→Section 8.6 page 8-77

- 1 Mode
- 2 Frequency
- 3 Baud Rate (BPS)
- 4 DGPS Mode
- 5 Send Data

→ Section 8.6 page 8-77
→ Section 8.6 page 8-78
→ Section 8.6 page 8-79
→ Section 8.6 page 8-80

- 3 WAAS Setting
→Section 8.6 page 8-81

- 1 Mode
- 2 Ranging
- 3 NG WAAS
- 4 WAAS Select Mode
- 5 WAAS No.
- 6 Send Data

→ Section 8.6 page 8-81
→ Section 8.6 page 8-82
→ Section 8.6 page 8-83
→ Section 8.6 page 8-84
→ Section 8.6 page 8-85

- 4 GPS Status

→ Section 8.6 page 8-86

8 RADAR Sub Menu

- 1 PIN Setting
→Section 3.11.5 page 3-126
- 2 Multj Dial Setting
→Section 3.5.17 page 3-56
- 3 User Key Setting
→Section 3.5.18 page 3-58
- 4 Date/Time Setting
→Section 8.6 page 8-89
- 5 Buzzer Volume
- 9 Test Menu
→Section 8.1 page 8-2

- 1 Load PIN Data
- 2 Save PIN Data
- 3 Delete PIN Data

→ Section 3.11.5 page 3-126
→ Section 3.11.5 page 3-127
→ Section 3.11.5 page 3-128

- 1 Vector Length
- 2 Trails Length
- 3 ATA TGT Display No.
- 4 C-UP Angle

→ ection 3.5.17 page 3-56
→ ection 3.5.17 page 3-56
→ ection 3.5.17 page 3-56
→ ection 3.5.17 page 3-56

- 1 User Key1
- 2 User Key2

- 1 UTC/Local
- 2 Local Date
- 3 Local Time
- 4 Time Zone

→ Section 8.6 page 8-89
→ Section 8.6 page 8-89
→ Section 8.6 page 8-90
→ Section 8.6 page 8-90

→ Section 3.3.6 page 3-11

- 1 Self Test
→Section 8.1 page 8-3

- 1 Memory Test
- 2 Sensor Test
- 3 Line Test

→ Section 8.1 page 8-4
→ Section 8.1 page 8-5
→ Section 8.1 page 8-6

- 2 Monitor Test
→Section 8.1 page 8-7

- 1 Pattern 1
- 2 Pattern 2
- 3 Pattern 3
- 4 Pattern 4
- 5 Pattern 5
- 6 Pattern 6

→ Section 8.1 page 8-7
→ Section 8.1 page 8-7
→ Section 8.1 page 8-7
→ Section 8.1 page 8-7
→ Section 8.1 page 8-7
→ Section 8.1 page 8-7

- 3 Panel Test
→Section 8.1 page 8-8

- 1 Key Test
- 2 Buzzer Test
- 3 Light

→ Section 8.1 page 8-9
→ Section 8.1 page 8-10
→ Section 8.1 page 8-11

- 4 PM Display
- 5 Error Logging
- 6 System INFO

→ Section 3.9.1 page 3-91, Section 8.1 page 8-12
→ Section 8.1 page 8-13
→ Section 8.1 page 8-17

- 9 Plot Menu
- 0 EXIT

Plot Menu			
1 Own Track Setting	1 Own Track Interval → Section 3.6.2 page 3-68 2 Display Own Track → Section 3.6.1 page 3-67 3 Clear Own Track → Section 3.6.3 page 3-69 4 Own Track Memory → Section 3.6.4 page 3-70		
5 Map Setting	1 Fill Land Area → Section 3.7.3 page 3-73 2 C-MAP Setting → Section 3.10.6 page 3-113 1 Grid Display → Section 3.10.6 page 3-113 2 Sounding Display → Section 3.10.6 page 3-113 3 Soundings Unit → Section 3.10.6 page 3-114 4 Light Sectors Display → Section 3.10.6 page 3-114 5 Light Sectors Level → Section 3.10.6 page 3-114 3 JRC/ERC Card Setting → Section 3.10.6 page 3-109 1 Day/Night → Section 3.10.6 page 3-109 2 Color of Land → Section 3.10.6 page 3-109 3 BRT of Land → Section 3.10.6 page 3-109 4 Color of Sea → Section 3.10.6 page 3-110 5 BRT of Sea → Section 3.10.6 page 3-110 6 Color of Name → Section 3.10.6 page 3-110 7 BRT of Name → Section 3.10.6 page 3-110 9 NEXT 1 LAT/LON Line → Section 3.10.6 page 3-110 2 Color of L/L Line → Section 3.10.6 page 3-110 3 BRT of L/L Line → Section 3.10.6 page 3-111 4 ERC Display Request → Section 3.10.6 page 3-111 5 ERC Mark → Section 3.10.6 page 3-111 6 JRC Card Display 1 Lighthouse → Section 3.10.6 page 3-111 2 Bouy → Section 3.10.6 page 3-111 3 Rough Line → Section 3.10.6 page 3-111 4 Other Line → Section 3.10.6 page 3-111 4 Contour Setting → Section 3.10.6 page 3-112 1 10m 2 20m 3 30m 4 40m 5 50m 6 60m 7 70m 8 80m 9 Other 5 Map Display Setting → Section 3.10.6 page 3-115 1 Shift Coast Line 1 → Section 3.10.6 page 3-115 2 Shift Coast Line 2 → Section 3.10.6 page 3-116 3 LAT/LON Correction → Section 3.10.6 page 3-117 4 Map Center Position → Section 3.10.6 page 3-118 5 Loran C Correction 1 Chain 2 TD1 3 TD2 4 TD1 Correction 5 TD2 Correction		
6 MEM CAPA/Copy → Section 3.12.1 page 3-	1 Copy Internal → Card2 → Section 3.12.1 page 3-131 2 Copy Card2 → Internal → Section 3.12.1 page 3-131 3 Copy Card1 → Card2 → Section 3.12.1 page 3-131 4 Clear File → Section 3.12.1 page 3-132 7 Show Card1 → Section 3.12.1 page 3-132 8 Show Card2 → Section 3.12.1 page 3-132		
7 CLR MEM/INIT Card → Section 3.12.2 page 3-	1 CLR Mark/Line Data → Section 3.12.2 page 3-133 3 Format Card2 → Section 3.12.2 page 3-133		
0 EXIT			

ATA Menu	1 ATA Setting	1 Vector Time 2 Past Position 3 CPA Limit 4 TCPA Limit 5 CPA Ring 6 Trial →Section 5.3.7 page 5-37 9 Target Number Display	→ Section 5.1.4 page 5-10 → Section 5.3.4 page 5-21 → Section 5.1.3 page 5-9 → Section 5.1.3 page 5-9 → Section 5.1.5 page 5-11 → Section 5.3.3 page 5-21	1 Trial 2 Course 3 Speed
		1 EPA Setting (ATAなし時)	1 Vector Time 2 Plot Number 3 CPA Limit 4 TCPA Limit 5 CPA Ring 6 Audible Warning	→ Section 5.1.4 page 5-10 → Section 5.2.4 page 5-15 → Section 5.1.3 page 5-9 → Section 5.1.3 page 5-9 → Section 5.1.5 page 5-11 → Section 5.2.5 page 5-17
	2 AIS Setting	1 AIS Function 2 AIS Symbol Display 3 ATA Symbol Display 4 CPA Limit 5 TCPA Limit 6 AIS Filter Setting 7 Identical Distance	→ Section 5.4.2 page 5-54 → Section 5.4.5 page 5-57 → Section 5.4.7 page 5-60 → Section 5.4.1 page 5-52 → Section 5.4.1 page 5-52 → Section 5.4.9 page 5-64	1 Filter Type 2 Make AIS Filter 3 Filter Display 4 ENT → Section 5.4.8 page 5-61 → Section 5.4.8 page 5-62 → Section 5.4.8 page 5-63
		3 ATA Track Setting	1 Track Function 2 Track Color →Section 5.3.9 page 5-45 3 Track Display →Section 5.3.9 page 5-46 4 Track Memory Interval 5 Clear Track Color 6 Clear Track Number 7 CARD2 Track Display	→ Section 5.3.9 page 5-44 1 All 2 ATA Track No. 1 3 ATA Track No. 2 4 ATA Track No. 3 5 ATA Track No. 4 6 ATA Track No. 5 7 ATA Track No. 6 8 ATA Track No. 7 9 NEXT 1 ATA Track No. 8 2 ATA Track No. 9 3 ATA Track No. 10 4 Other 1 All 2 ATA Track No. 1 3 ATA Track No. 2 4 ATA Track No. 3 5 ATA Track No. 4 6 ATA Track No. 5 7 ATA Track No. 6 8 ATA Track No. 7 9 NEXT 1 ATA Track No. 8 2 ATA Track No. 9 3 ATA Track No. 10 4 Other → Section 5.3.9 page 5-47 → Section 5.3.9 page 5-48 → Section 5.3.9 page 5-49 → Section 5.3.9 page 5-50
	4 Guard Zone Setting	1 ATA Guard Zone 2 RADAR Alarm →Section 3.5.20 page 3-63 3 Set GZ Alarm Key	1 Guard Zone 1 2 Guard Zone 2 3 Make Guard Zone 1 4 Make Guard Zone 2 5 ENT 1 Sector RADAR Alarm →Section 3.5.20 page 3-66 3 Make Sector Alarm →Section 3.5.20 page 3-65 5 RADAR Alarm Mode 6 Sensitivity Level 1 Guard Zone →Section 5.1.6 page 5-12 2 Sector RADAR Alarm →Section 5.1.6 page 5-12	→ Section 3.5.19 page 3-60 → Section 3.5.19 page 3-60 → Section 3.5.19 page 3-60 → Section 3.5.19 page 3-60 1 Sector Alarm1 2 Sector Alarm2 1 Sector Alarm1 2 Sector Alarm2 3 ENT → 3.5.20章 page 3-65P → 3.5.20章 page 3-66P 1 Guard Zone 1 2 Guard Zone 2 1 Sector Alarm1 2 Sector Alarm2
		5 Test Menu →Section 5.3.8 page 5-	1 Test Video 2 ATA Simulator 3 Status 4 Gate Display	→ Section 5.3.8 page 5-39 → Section 5.3.8 page 5-40 → Section 5.3.8 page 5-42 → Section 5.3.8 page 5-43

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	1 Equipment Setup	1 Bearing Adjustment 2 Range Adjustment 3 Tune Adjustment 4 TRX Setting	→ Section 8.5 page 8-33 → Section 8.5 page 8-34 → Section 8.5 page 8-32	
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