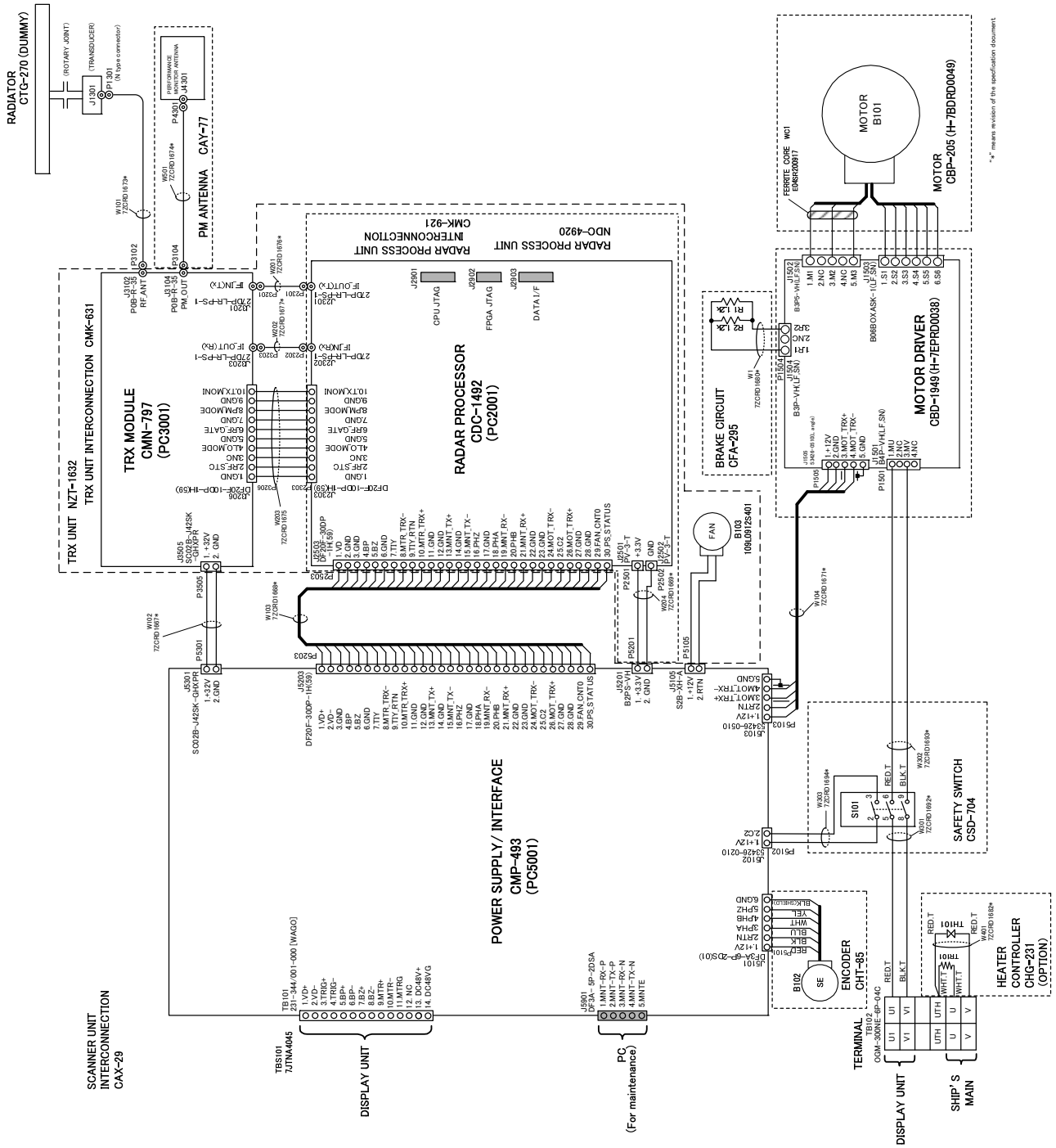
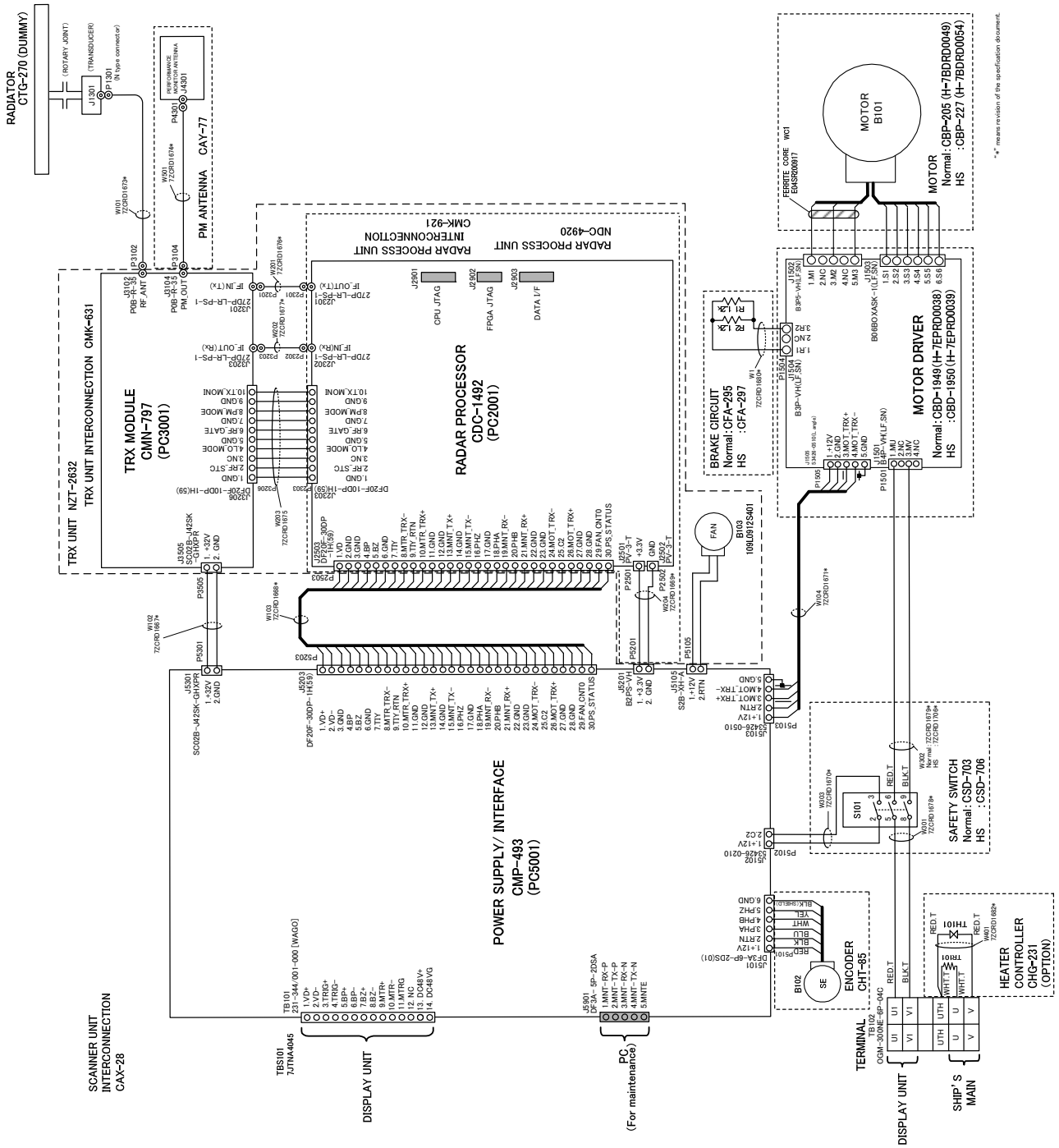
6.6.13 NKE-1632



NKE-1632 INTERCONNECTION

6.6.14 NKE-2632/2632-H



NKE-2632/2632-H INTERCONNECTION

6.7 External input/output sentence format

Note: Use external input/output sentence data after NMEA version 2.1

6.7.1 Receivable signals

6.7.1.1 Ship Heading

$--THS,x.x,a*hh<CR><LF>

1 2 3 4

1.THS	Header
2.x.x	Heading, degrees true
3.a	Mode indicator: A = Autonomous, E = Estimated (dead reckoning) M = Manual input, S = Simulator mode ,V = Data not valid (including standby)
4.hh	Checksum

$--HDT, x.x, T*hh<CR><LF>

1 2 3 4

1.HDT	Header
2.x.x	Heading
3.T	Degrees true

6.7.1.2 Course

$ --GGA,hhmmss.ss,llll.ll,a,yyyyy.yy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1. GGA	Header
2. hhmmss.ss	UTC of position
3. llll.ll	Latitude
4. a	N/S
5. yyyyy.yy	Longitude
6. a	E/W
7. x	GPS Quality indicator
8. xx	Number of satellites in use, 00-12, may be different from the number in view
9. x.x	Horizontal dilution of precision
10. x.x	Antenna altitude from mean-sea-level (geoid) (m)
11. M	Antenna altitude unit; M=meters
12. x.x	Height difference from WGS-84 earth ellipsoid surface to mean-sea-level surface (m) = Geoidal separation
13. M	Unit for the height difference from WGS-84 earth ellipsoid surface to mean-sea-level; M=meters
14. x.x	Age of Differential GPS data (seconds)
15. xxxx	Differential GPS reference station ID (0000 – 1023)

16. hh Checksum

$ --RMC,hhmmss.ss,A,llll.ll,a,yyyyy.yy,a,x.x,x.x,xxxxxx,x.x,a,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. RMC Header
2. hhmmss.ss UTC of position fix
3. A Status; A = Data valid, V = Navigation receiver warning
4. llll.ll Latitude
5. a N/S
6. yyyyy.yy Longitude
7. a E/W
8. x.x Speed over ground (knots)
9. x.x Course Over Ground (degrees, true north)
10. xxxxxx Date (UTC): ddmmyy
11. x.x Magnetic variation (degrees)
12. a Magnetic variation direction E/W
13. a Mode Indicator; A = Autonomous mode, D = Differential mode, N = Data not valid, E = Estimated (dead reckoning) mode, M = Manual input mode, S = Simulator mode
14. hh Checksum

$--RMA, A, llll.ll, a, yyyyy.yy, a, x.x, x.x, x.x, x.x, x.x,a,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. RMA Heading
2. A Status : A = data valid, V = blink, cycle or SNR warning
3. llll.ll Latitude
4. a Degrees N/S
5. yyyyy.yy Longitude
6. a Degrees E/W
7. x.x Time difference A, μs
8. x.x Time difference B, μs
9. x.x Speed over ground, knots
10. x.x Course over ground, degrees true
11. x.x Magnetic variation, degrees E/W
12. a Degrees E/W
13. a Mode indicator: A = Autonomous mode; D = Differential mode; E = Estimated (dead reckoning) mode; M = Manual input mode; S = Simulator mode;N = Data not valid.
14. hh Checksum

$-- GNS, hhmmss.ss, llll.ll, a, yyyyy.yy, a, c--c,xx,x.x,x.x,x.x,x.x,x.x,a *hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

1.	GNS	Heading
2.	hhmmss.ss	UTC of position
3.	llll.ll	Latitude
4.	a	N/S
5.	yyyyy.yy	Longitude
6.	a	Degrees E/W
7.	c—c	Mode indicator
8.	xx	Total number of satellites in use, 00-99
9.	x.x	HDOP
10.	x.x	Antenna altitude, m
11.	x.x	Geoidal separation, m
12.	x.x	Age of differential data
13.	x.x	Differential reference station ID
14.	a	Navigational status indicator
15.	hh	Checksum

$ --GLL,llll.ll,a,yyyyy.yy,a,hhmmss.ss,A,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9

1.GLL	Header
2. llll.ll	Latitude
3. a	N/S
4. yyyyy.yy	Longitude
5. a	E/W
6. hhmmss.ss	UTC of position
7. A	Status; A = Data valid, V = Data not valid
8. a	Mode Indicator; A = Autonomous mode, D = Differential mode, N = Data not valid, E = Estimated (dead reckoning) mode, M = Manual input mode, S = Simulator mode
9. hh Checksum	

6.7.1.3 Geodetic positioning system

$ --DTM,ccc,a,x.x,a,x.x,a,x.x,ccc*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10

1. DTM	Header (Datum Reference)
2. ccc	Local (geodetic reference) datum code; W84 = WGS84, W72 = WGS72,S85 =SGS85, P90 = PE90, 999 = User defined, IHO datum code
3. a	Local datum subdivision code
4. x.x	Latitude offset (minutes)
5. a	N/S
6. x.x	Longitude offset (minutes)
7. a	E/W
8. x.x	Altitude offset (meters)
9. ccc	Reference datum code (Geodetic reference system to which being conformed);W84 = WGS84, W72 = WGS72, S85 = SGS85, P90 = PE90
10. hh	Checksum

6.7.1.4 Date information

$ --ZDA,hhmmss.ss,xx,xx,xxxx,xx,xx*hh<CR><LF>

1 2 3 4 5 6 7 8

1. ZDA	Header (Time & Date)
2. hhmmss.ss	UTC
3. xx	Day (UTC)
4. xx	Month (UTC)
5. xxxx	Year (UTC)
6. xx	Local zone hours, 00 to +13 hrs
7. xx	Local zone minutes, 00 to +59
8. hh	Checksum

6.7.1.5 COG/SOG

$ --RMC,hhmmss.ss,A,llll.ll,a,yyyyy.yy,a,x.x,x.x,xxxxxx,x.x,a,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. RMC	Header
2. hhmmss.ss	UTC of position fix
3. A	Status; A = Data valid, V = Navigation receiver warning
4. llll.ll	Latitude
5. a	N/S
6. yyyyy.yy	Longitude
7. a	E/W
8. x.x	Speed over ground (knots)
9. x.x	Course Over Ground (degrees, true north)
10. xxxxxx	Date (UTC): ddmmyy
11. x.x	Magnetic variation (degrees)
12. a	Magnetic variation direction E/W
13. a	Mode Indicator; A = Autonomous mode, D = Differential mode, N = Data not valid, E = Estimated (dead reckoning) mode, M = Manual input mode, S = Simulator mode
14. hh	Checksum

$--RMA, A, llll.ll, a, yyyyy.yy, a, x.x, x.x, x.x, x.x, x.x,a,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. RMA	Heading
2. A	Status : A = data valid, V = blink, cycle or SNR warning
3. llll.ll	Latitude
4. a	Degrees N/S
5. yyyyy.yy	Longitude
6. a	Degrees E/W
7. x.x	Time difference A, μs
8. x.x	Time difference B, μs
9. x.x	Speed over ground, knots
10. x.x	Course over ground, degrees true
11. x.x	Magnetic variation, degrees E/W
12. a	Degrees E/W
13. a	Mode indicator: D = Differential mode; E = Estimated (dead reckoning) mode; M = Manual input mode; S = Simulator mode;N = Data not valid.
14. hh	Checksum

$ --VTG,x.x,T,x.x,M,x.x,N,x.x,K,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11

1. VTG Header
2. x.x Course over ground based on true north (degrees)
3. T Unit of course over ground; T = True
4. x.x Course over ground based on magnetic north (degrees)
5. M Unit of course over ground; M = Magnetic
6. x.x Speed over ground (knots)
7. N Speed over ground unit; N = knots
8. x.x Speed over ground (km/h)
9. K Speed over ground unit; K = km/hr
10. a Mode Indicator; A = Autonomous mode, D = Differential mode, N = Data not valid, E = Estimated (dead reckoning) mode, M = Manual input mode, S = Simulator mode
11. hh Checksum

6.7.1.6 Ship speed through water

$ --VBW,x.x,x.x,A,x.x,x.x,A,x.x,A,x.x,A*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12

1. VBW Header
2. x.x Longitudinal water speed (knots)
3. x.x Transverse water speed (knots)
4. A Status of water speed; A = Data valid
5. x.x Longitudinal ground speed (knots)
6. x.x Transverse ground speed (knots)
7. A Status of ground speed; A = Data valid
8. x.x Stern transverse water speed (knots)
9. A Status of stern transverse water speed; A = Data valid
10. x.x Stern transverse ground speed (knots)
11. A Status of stern transverse ground speed; A = Data valid, V = Invalid
12. hh Checksum

6.7.1.7 Turning speed

$--ROT, x.x, A*hh<CR><LF>

1 2 3 4

1. ROT Header
2. x.x Rate of turn, °/min, "-" = bow turns to port
3. A Status: A = data valid, V = data invalid
4. hh Checksum

6.7.1.8 Water depth

$ --DPT,x.x,x.x,x.x*hh<CR><LF>

1 2 3 4 5

1. DPT Header
2. x.x Water depth relative to the transducer (meters)
3. x.x Offset from transducer (meters)
4. x.x Maximum range scale in use
5. hh Checksum

$ --DBS,x.x,f,x.x,M,x.x,F*hh<CR><LF>

1 2 3 4 5 6 7 8

1. SDDBS Header
2. x.x Water depth from ship's bottom (feet)
3. f Units (feet)
4. x.x Water depth from ship's bottom (meters)
5. M Units (meters)
6. x.x Water depth from ship's bottom (fathoms)
7. F Units (fathoms)
8. hh Checksum

$ --DBT,x.x,f,x.x,M,x.x,F*hh<CR><LF>

1 2 3 4 5 6 7 8

1. DBT Header
2. x.x Water depth from ship's bottom (feet)
3. f Units (feet)
4. x.x Water depth from ship's bottom (meters)
5. M Units (meters)
6. x.x Water depth from ship's bottom (fathoms)
7. F Units (fathoms)
8. hh Checksum

$ --DBK,x.x,f,x.x,M,x.x,F*hh<CR><LF>

1 2 3 4 5 6 7 8

1. DBK Header
2. x.x Water depth from ship's bottom (feet)
3. f Units (feet)
4. x.x Water depth from ship's bottom (meters)
5. M Units (meters)
6. x.x Water depth from ship's bottom (fathoms)
7. F Units (fathoms)
8. hh Checksum

6.7.1.9 Wind direction/wind speed

$--MWV, x.x, a, x.x, a, A *hh<CR><LF>

1 2 3 4 5 6 7

1.MWV	Heading
2.x.x	Wind angle, 0° to 359°
3.a	Reference, R = relative, T=true
4.x.x	Wind speed
5.a	Wind speed units, K = km/h, M = m/s, N = knots
6.A	Status, A = data valid V= data invalid
7.hh	Checksum

$--MWD, x.x,T,x.x,M,x.x,N,x.x,M*hh<CR><LF>

1 2 3 4 5 6

1.MWD	Heading
2.x.x,T	Wind direction, 0° to 359° true
3.x.x,M	Wind direction, 0° to 359° magnetic
4.x.x,N	Wind speed, knots
5.x.x.M	Wind speed, m/s

6.7.1.10 Air temperature

$--XDR, a, x.x, a, c--c,..... a, x.x, a, c--c*hh<CR><LF>

1 2 3 4 5 6 7 8

1.XDR	Heading
2.a	Transducer type, transducer No. 1
3.x.x	Measurement data, transducer No. 1
4.a	Units of measure, transducer No. 1
5. c--c	Transducer No. 1 ID
6.	a Data, variable number of transducers
7. a, x.x, a, c--c	Transducer "n"
8.hh	Checksum

$--MTA,x.x,C*hh<CR><LF>

1 2 3

1.--MTA	Header
2. x.x,C	Temperature, degrees C
3.hh	Checksum

$--MDA,x.x,I,x.x,B,x.x,C,x.x,C,x.x,x.x,x.x,C,x.x,T,x.x,M,x.x,N,x.x,M*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13

1.--MDA	Header
2. x.x,I	Barometric pressure, inches of mercury
3. x.x,B	Barometric pressure, bars
4. x.x,C	Air temperature, degrees C
5. x.x,C	Water temperature, degrees C
6. x.x	Relative humidity, percent
7. x.x	Absolute humidity, percent
8. x.x.C	Dew point, degrees C
9.x.x.T	Wind direction, degrees True
10. x.x.M	Wind direction, degrees Magnetic
11. x.x.N	Wind speed, knots
12. x.x.M	Wind speed, meters/second
13. hh	Checksum

6.7.1.11 Water temperature

$-- MTW, x.x, C*hh<CR><LF>

1 2 3

1.MTW	Heading
2.x.x, C	Temperature, degrees C
3.hh	Checksum

$--MDA,x.x,I,x.x,B,x.x,C,x.x,C,x.x,x.x,x.x,C,x.x,T,x.x,M,x.x,N,x.x,M*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13

1.MDA	Header
2. x.x,I	Barometric pressure, inches of mercury
3. x.x,B	Barometric pressure, bars
4. x.x,C	Air temperature, degrees C
5. x.x,C	Water temperature, degrees C
6. x.x	Relative humidity, percent
7. x.x	Absolute humidity, percent
8. x.x.C	Dew point, degrees C
9.x.x.T	Wind direction, degrees True
10. x.x.M	Wind direction, degrees Magnetic
11. x.x.N	Wind speed, knots
12. x.x.M	Wind speed, meters/second
13. hh	Checksum

6.7.1.12 Atmospheric pressure

$--XDR, a, x.x, a, c--c,..... a, x.x, a, c--c*hh<CR><LF>

1 2 3 4 5 6 7 8

1.XDR	Heading
2.a	Transducer type, transducer No. 1
3.x.x	Measurement data, transducer No. 1
4.a	Units of measure, transducer No. 1
5. c--c	Transducer No. 1 ID
6.	a Data, variable number of transducers
7. a, x.x, a, c--c	Transducer "n"
8.hh	Checksum

$--MMB,x.x,I,x.x,B*hh<CR><LF>

1 2 3 4

1.MMB	Header
2. x.x,I	Barometric pressure, bars
3. x.x,B	Barometric pressure, inches of mercury
4.hh	Checksum

$--MDA,x.x,I,x.x,B,x.x,C,x.x,C,x.x,x.x,x.x,C,x.x,T,x.x,M,x.x,N,x.x,M*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13

1.MDA	Header
2. x.x,I	Barometric pressure, inches of mercury
3. x.x,B	Barometric pressure, bars
4. x.x,C	Air temperature, degrees C
5. x.x,C	Water temperature, degrees C
6. x.x	Relative humidity, percent
7. x.x	Absolute humidity, percent
8. x.x.C	Dew point, degrees C
9.x.x.T	Wind direction, degrees True
10. x.x.M	Wind direction, degrees Magnetic
11. x.x.N	Wind speed, knots
12. x.x.M	Wind speed, meters/second
13. hh	Checksum

6.7.1.13 Humidity

$--XDR, a, x.x, a, c--c,..... a, x.x, a, c--c*hh<CR><LF>

1 2 3 4 5 6 7 8

1.XDR	Heading
2.a	Transducer type, transducer No. 1
3.x.x	Measurement data, transducer No. 1
4.a	Units of measure, transducer No. 1
5. c--c	Transducer No. 1 ID
6.	a Data, variable number of transducers
7. a, x.x, a, c--c	Transducer "n"
8.hh	Checksum

$--MHU,x.x,x.x,x.x,C*hh<CR><LF>

1 2 3 4 5

1.MHU	Header
2.x.x	Relative humidity, percent
3.x.x	Absolute humidity, percent
4.x.x,C	Dew point, degrees C
5.hh	Checksum

$--MDA,x.x,I,x.x,B,x.x,C,x.x,C,x.x,x.x,x.x,C,x.x,T,x.x,M,x.x,N,x.x,M*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13

1.MDA	Header
2. x.x,I	Barometric pressure, inches of mercury
3. x.x,B	Barometric pressure, bars
4. x.x,C	Air temperature, degrees C
5. x.x,C	Water temperature, degrees C
6. x.x	Relative humidity, percent
7. x.x	Absolute humidity, percent
8. x.x.C	Dew point, degrees C
9.x.x.T	Wind direction, degrees True
10. x.x.M	Wind direction, degrees Magnetic
11. x.x.N	Wind speed, knots
12. x.x.M	Wind speed, meters/second
13. hh	Checksum

6.7.1.14 AIS

!--VDM,x,x,x,a,s—s,x*hh<CR><LF>

1 2 3 4 5 6 7 8

1.VDM	Header
2.x	Total number of sentences needed to transfer the message,1 to 9
3.x	Sentence number, 1 to 9
4.x	Sequential message identifier, 0 to 9
5.a	AIS channel
6.s—s	Encapsulated ITU-R M.1371 radio message
7. x	Number of fill-bits, 0 to 5
8.hh	Checksum

!--VDO,x,x,x,a,s—s,x*hh<CR><LF>

1 2 3 4 5 6 7 8

1.VDO	Header
2.x	Total number of sentences needed to transfer the message, 1 to 9
3.x	Sentence number, 1 to 9
4.x	Sequential message identifier, 0 to 9
5.a	AIS Channel
6.s—s	Encapsulated ITU-R M.1371 radio message
7.x	Number of fill-bits, 0 to 5
8.hh	Checksum

6.7.1.15 Alert

$--ACK,xxx*hh<CR><LF>

1 2 3

1.ACK	Header
2.xxx	Unique alarm number (identifier) at alarm source
3.hh	Checksum

$--ALR,hhmmss.ss,xxx,A, A,c--c*hh<CR><LF>

1 2 3 4 5 6 7

1.ALR	Header
2. hhmmss.ss	Time of alarm condition change, UTC
3. xxx	Unique alarm number (identifier) at alarm source
4.A	Alarm condition (A = threshold exceeded, V = not exceeded)
5.A	Alarm's acknowledge state, A = acknowledged,V = unacknowledged
6. c—c	Alarm's description text
7.hh	Checksum

6.7.2 Transmittable signals

6.7.2.1 RADAR system data

$--RSD, x.x, x.x,x.x, x.x,x.x, x.x,x.x, x.x,x.x, x.x, x.x, a, a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

1. RSD Header
2. x.x Origin 1 range (see Note 2), from own ship
3. x.x Origin 1 bearing (see Note 2) degrees from 0°
4. x.x Variable range marker 1 (VRM1), range
5. x.x Bearing line 1 (EBL1), degrees from 0°
6. x.x Origin 2 range (see Note 2)
7. x.x Origin 2 bearing (see Note 2)
8. x.x VRM 2, range
9. x.x EBL 2, degrees
10. x.x Cursor range, from own ship
11. x.x Cursor bearing, degrees clockwise from 0°
12. x.x Range scale in use
13. x.x Range units, K = km,N = nautical miles, S = statute miles
14. a,a Display rotation
15. hh Checksum

6.7.2.2 Own ship data

$--OSD, x.x,A,x.x, a,x.x,a,x.x,x.x,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11

1. OSD Header
2. x.x Heading, degrees true
3. A Heading status: A = data valid, V = data invalid
4. x.x Vessel course, degrees true
5. a Course reference,
   B = bottom tracking log, M = manually entered, W = water referenced,
   R = radar tracking (of fixed target), P = positioning system ground reference.
6. x.x Vessel speed
7. x.x Speed reference,
   B = bottom tracking log, M = manually entered, W = water referenced,
   R = radar tracking (of fixed target), P = positioning system ground reference.
8. x.x Vessel set, degrees true
9. x.x Vessel drift (speed)
10. x.x Speed units, K = km/h; N = knots; S = statute miles/h
11. hh Checksum

6.7.2.3 Watch timer reset

$--EVE,hhmmss.ss,c--c,c--c*hh<CR><LF>

1 2 3 4 5

1.EVE	Header
2.hhmmss.ss	Event time
3.c—c	Tag code used for identification of source of event
4.c—c	Event description
5.hh	Checksum

6.7.2.4 TT data, AIS target data

$--TTM,xx,x.x,x.x,a,x.x,x.x,a,x.x,x.x,a,c--c,a,a,hhmmss.ss,a*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 1617 18

1. TTM	Header (Track Target Message)
2. xx	Target number (00-99)
3. x.x	Target distance from own ship
4. x.x	Target bearing from own ship (degrees)
5. a	Reference of target bearing from own ship; T = True, R = Relative
6. x.x	Target speed
7. x.x	Target course (degrees)
8. a	Reference of target course; T = True, R = Relative
9. x.x	Distance of closest-point-of-approach
10. x.x	Time to CPA (minutes), “-“ = increasing
11. a	Speed/distance units (K/N/S)
12. c—c	Target name
13. a	Target status; L = Lost (tracked target has been lost), Q = Query (target in the process of acquisition), T = Tracking
14. a	Reference target; R = Reference (target is a reference used to determined own-ship position or velocity), null = other than reference
15. hhmmss.ss	UTC of data
16. a	Type of acquisition; A = Auto, M = Manual, R = Reported
17. hh	Checksum

$--TLL, xx, llll.ll, a, yyyyy.yy, a, c--c, hhmmss.ss, a, a*hh<CR><LF>

1 2 3 4 5 6 7 8 9

1.TLL	Header
2.xx	Target number 00 – 99
3. llll.ll, NS	Target latitude, N/S
4. yyyyy.yy,a	Target longitude, E/W
5. c—c	Target name
6. hhmmss.ss	UTC of data
7. a	Target status
8. a	Reference target = R, null otherwise
9.hh	Checksum

!--TTD,hh,hh,x,s—s,x*hh<CR><LF>

1 2 3 4 5 6 7

1.TTD	Header
2.hh	Total hex number of sentences needed to transfer the message, 01 to FF
3.hh	Hex sentence number, 01 to FF
4.x	Sequential message identifier, 0 to 9
5.s--s	Encapsulated tracked target data
6.x	Number of fill-bits, 0 to 5
7.hh	Checksum

$--TLB,x.x,c--c,x.x,c--c,...x.x,c--c*hh<CR><LF>

1 2 3 4 4 5

1.TLB	Header
2.x.x	Target number ‘n’ reported by the device.
3.c—c	Label assigned to target ‘n’
4.x.x,c—c	Additional label pairs
5.hh	Checksum

6.7.2.5 AIS remote control data

$--VSD,x.x,x.x,x.x,c—c,hhmmss.ss,xx,xx,x.x,x.x*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11

1.VSD	Header
2.x.x	Type of ship and cargo category, 0 to 255
3.x.x	Maximum present static draught, 0 to 25,5 m
4.x.x	Persons on-board, 0 to 8 191
5.c—c	Destination, 1-20 characters
6. hhmmss.ss	Estimated UTC of arrival at destination
7.xx	Estimated day of arrival at destination, 00 to 31 (UTC)
8.xx	Estimated month of arrival at destination, 00 to 12 (UTC)
9.x.x	Navigational status, 0 to 15
10.x.x	Regional application flags
11.hh	Checksum

$--AIR,xxxxxxxxx,x.x,x,x.x,x,xxxxxxxxx,x.x,x,a,x.x,x.x,x.x*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1.AIR	Header
2. xxxxxxxxx	MMSI of interrogated station-1
3.x.x	First message number requested from station-1
4.x	Message sub-section
5.x.x	Second message number requested from station-1
6.x	Message sub-section
7. xxxxxxxxx	MMSI of interrogated station-2
8.x.x	Message Number requested from station-2
9.x	Message sub-section
10.a	Channel of interrogation
11.x.x	Message ID1.1, station-1 reply slot
12.x.x	Message ID1.2, station-1 reply slot
13.x.x	Message ID2.1, station-2 reply slot
14.hh	Checksum

$--AIQ,xxx.*hh<CR><LF>

1 2 3

1—AIQ	Header
2.xxx	request of static information (VSD, ACA, etc.)
3.hh	Checksum

!--ABM,x,x,x,xxxxxxxxx,x,xx,s—s,x*hh<CR><LF>

1 2 3 4 5 6 7 8 9 10

1.AMB	Header
2. x	Total number of sentences needed to transfer the message,1 to 9
3. x	Sentence number, 1 to 9
4. x	Sequential message identifier
5. xxxxxxxxx	The MMSI of the destination AIS unit for the ITU-R M.1371 Message 6 or 12
6. x	AIS channel for broadcast of the radio message
7. xx	ITU-R M.1371 Message ID
8. s—s	Encapsulated data
9. x	Number of fill-bits, 0 to 5
10. hh	Checksum

!--BBM,x,x,x,x,xx,s—s,x*hh<CR><LF>

1 2 3 4 5 6 7 8 9

1.--BBM	Header
2.x	Total number of sentences needed to transfer the message,1 to 9
3.x	Sentence number, 1 to 9
4.x	Sequential message identifier, 0 to 9
5.x	AIS channel for broadcast of the radio message
6.xx	ITU-R M.1371 Message ID
7.s—s	Encapsulated data
8.x	Number of fill-bits, 0 to 5
9.hh	Checksum

6.7.2.6 Remote control data

JRC format

$PJRC,s—s*hh<CR><LF>

1 2 3

1.PJRC	Header
2.s—s	Data field
3.hh	Checksum

6.7.2.7 Alert

$--ACK,xxx*hh<CR><LF>

1 2 3

1.ACK	Header
2.xxx	Unique alarm number (identifier) at alarm source
3.hh	Checksum

$--ALR,hhmmss.ss,xxx,A, A,c--c*hh<CR><LF>

1 2 3 4 5 6 7

1.ALR	Header
2. hhmmss.ss	Time of alarm condition change, UTC
3. xxx	Unique alarm number (identifier) at alarm source
4.A	Alarm condition (A = threshold exceeded, V = not exceeded)
5.A	Alarm's acknowledge state, A = acknowledged, V =unacknowledged
6. c—c	Alarm's description text
7.hh	Checksum

6.8 Setting for the route transfer by LAN connection with the GPS

6.8.1 How to set the IP address of GPS

1. Refer to "4.20 Equipment Configuration" and display the equipment configuration menu.

2. Press 9 HOME "IP".

(1) IP ADDRESS Configuration

3. Press 1 MARK "IP ADDR".

4. Press ▲ ▼ to select "INPUT", and press ENT.

5. Enter the IP address with the numeric keypad, and press ENT.

To return the value to the default value, select "DEFAULT" and press ENT.

(2) SUBNET MASK Configuration

6. Press 2 EVENT "SUBNET MASK".

7. Press ▲ ▼ to select "INPUT", and press ENT.

8. Enter the subnet mask with the numeric keypad, and press ENT.

To return the value to the default value, select "DEFAULT" and press ENT.

(3) DEFAULT GATEWAY Configuration

9. Press 3 ⟷ "DEFAULT GATEWAY".

10. Press ▲ ▼ to select "INPUT", and press ENT.

11. Enter the default gateway with the numeric keypad, and press ENT.

To return the value to the default value, select "DEFAULT" and press ENT.

6.8.2 Setting of the LAN for GPS

· LAN configuration can be performed for active route sharing, data route sharing, data output, mutual monitoring, and remote maintenance output.

· In data output, the output NMEA sentence can be selected.

· To share active or data routes, sharing route configuration must be performed.

Set the route sharing setting to "SHARE" for data routes.

When set to "SHARE", data route reception will occur automatically.

For active routes, set the route sharing setting to "SHARE 1", "SHARE 2", "SHARE 3", "SHARE 4" or "SHARE 5".

(1) SHARE1: If the active route is switched on the unit, the route will automatically be sent out to connected equipment.
When a shared route is received, the route is automatically switched.

(2) SHARE2: If the active route is switched on the unit, a request is made to the user of the unit before the route is sent. Transmission of the route to the connected equipment is dependant on the permission of the user.
If the user has not authorized sending, the active route will only be executed on the local unit.
When a shared route is received, the route is automatically switched.

(3) SHARE3: If the active route is switched on the unit, the route will automatically be sent out to connected equipment.
When a shared route is received, the user is asked whether or not they want to switch routes.
If the user does not authorize route switching, the route will not be switched.

(4) SHARE4: If the active route is switched on the unit, a request is made to the user of the unit before the route is sent. Transmission of the route to the connected equipment is dependant on the permission of the user.
If the user has not authorized sending, the active route will only be executed on the local unit.
When a shared route is received, the user is asked whether or not they want to switch routes.
If the user does not authorize route switching, the route will not be switched.

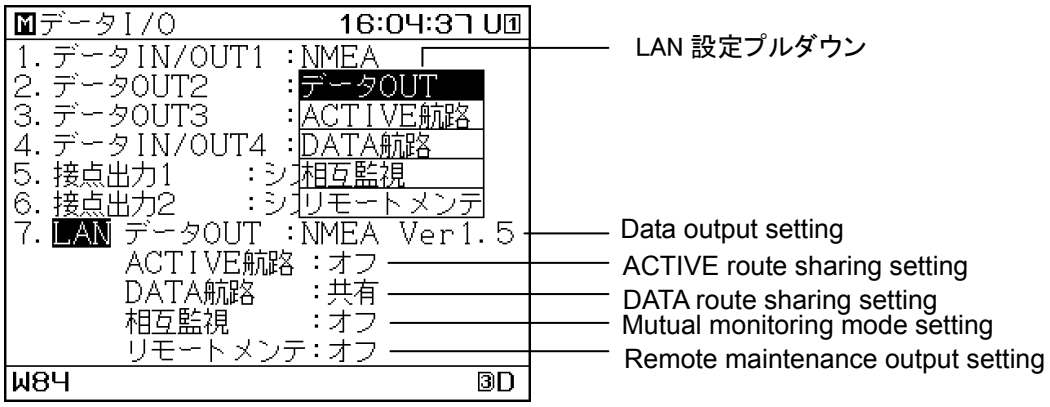
(5) SHARE5: The active route cannot be sent
When a shared route is received, the route is automatically switched.
The following icon is displayed when active routes are shared.

SHARE1 Icon:  SHARE2 Icon: SHARE3 Icon: SHARE4 Icon:
SHARE5 Icon:

· To perform mutual monitoring, mutual monitoring mode must be configured. With mutual monitoring mode, when GPS positioning is not being performed, the GPS positioning information from other units can be displayed.

· Remote maintenance output configuration can be used to regularly output data for use in remote maintenance

.



LAN Selection Screen

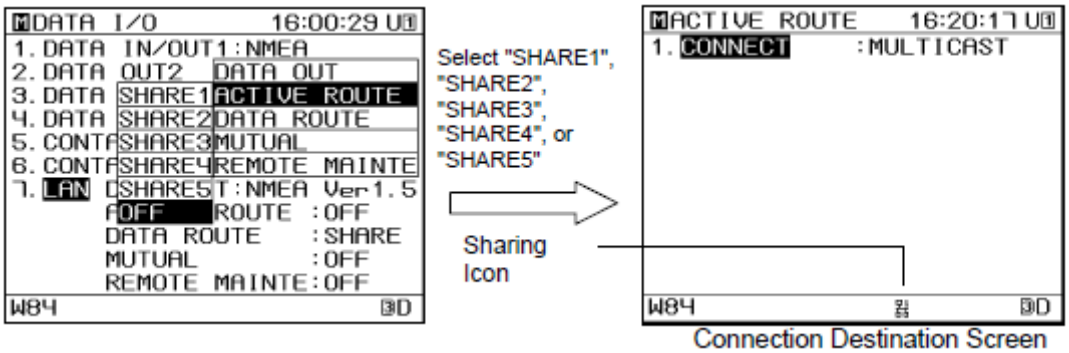
1. Refer to "4.20 Equipment Configuration" and display the equipment configuration menu.

2. Press 7 CURS, then 7 CURS, and select "LAN".

3. Press ▲ ▼ to select "ACTIVE ROUTE", and press ENT.

4. Press ▲ ▼ to select "SHARE1", "SHARE2", "SHARE3", "SHARE4", or "SHARE5", and press ENT to display the connection destination screen.

Select "OFF" to disable sharing.



Connection Destination Screen

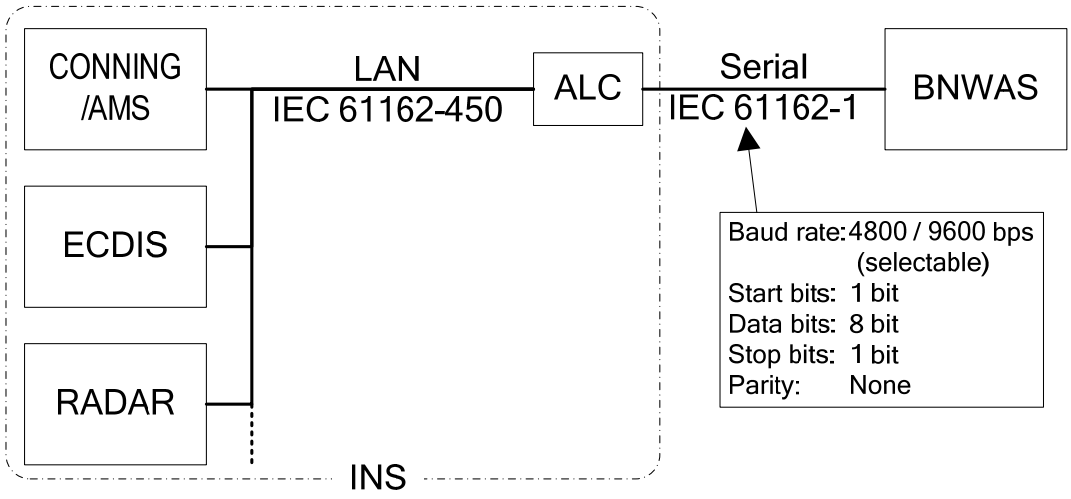
5. Press 1 MARK "CONNECT", select the destination, and press ENT.
   Normally, "MULTICAST" should be selected for the destination.
   To send to a specific unit, select "UNICAST".

6. When "UNICAST" is selected, press 2 EVENT and 3 ⟷ to select the destination IP "2.TO IP" and "3.PORT No.".

6.9 Specification of alert communication with BNWAS

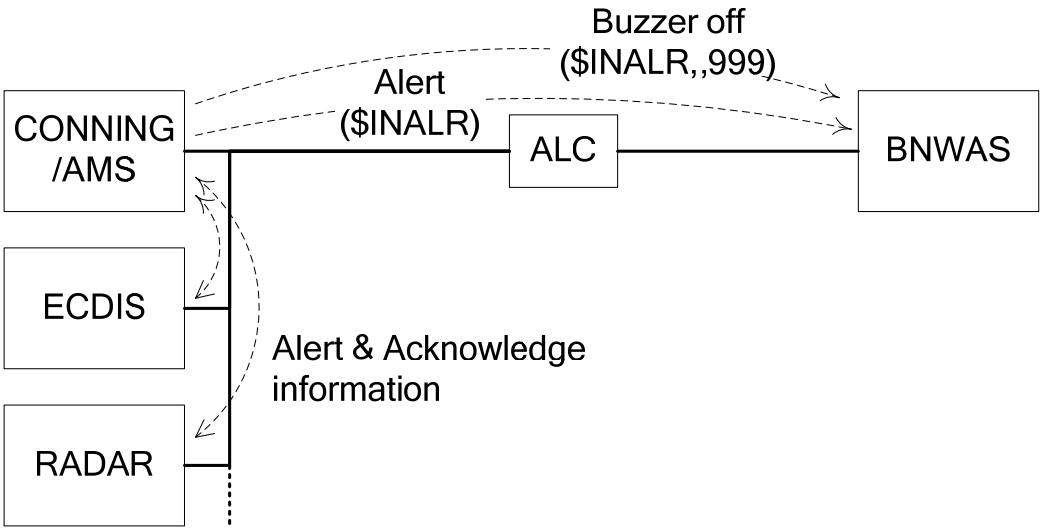
6.9.1 System Block Diagram

6.9.1.1 Connection Diagram

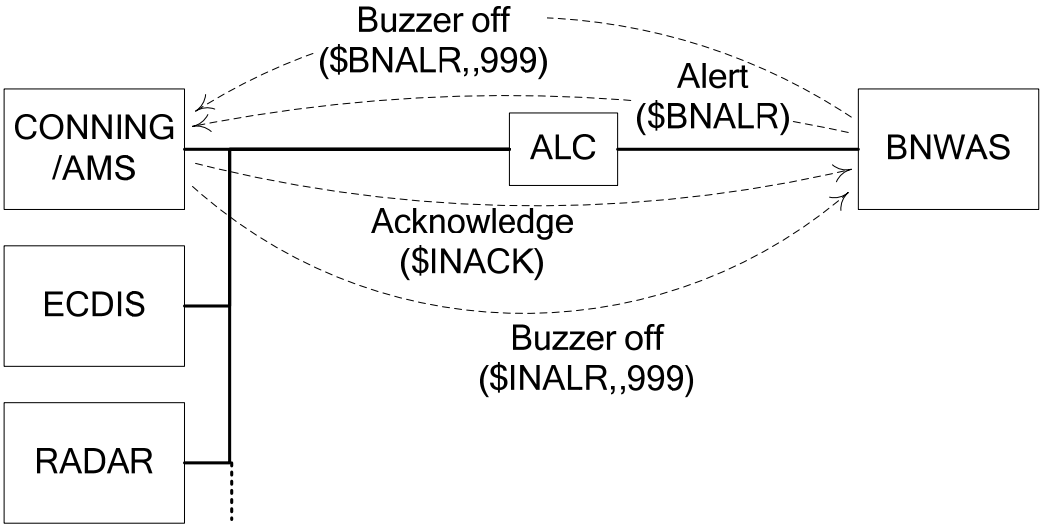


6.9.1.2 Function Diagram

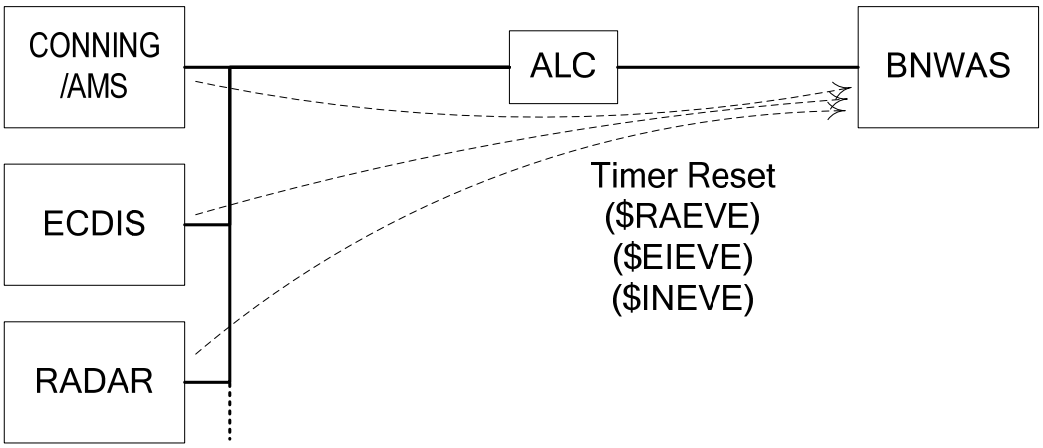
(1). INS Alert and Back-up navigator call



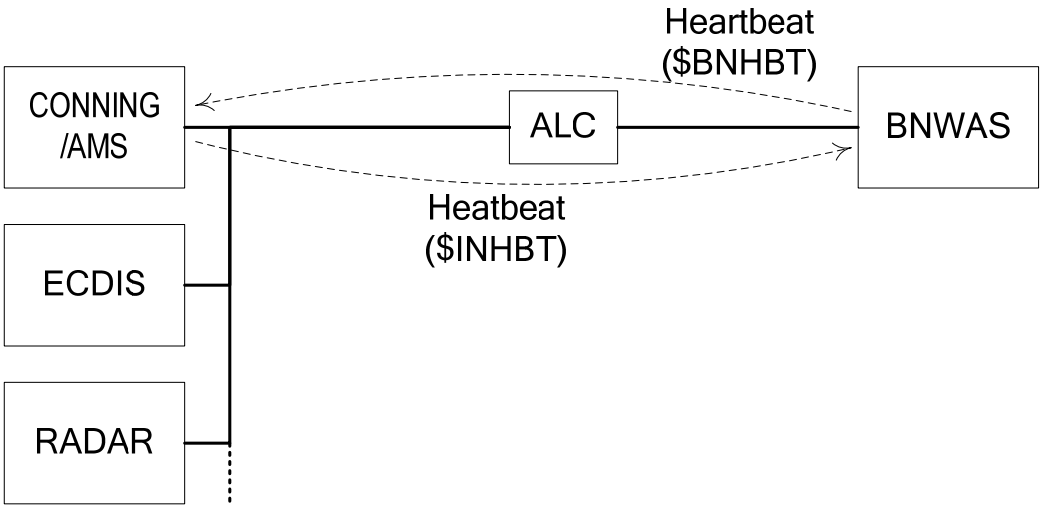
(2). BNWAS alert



(3). Watch Timer Reset

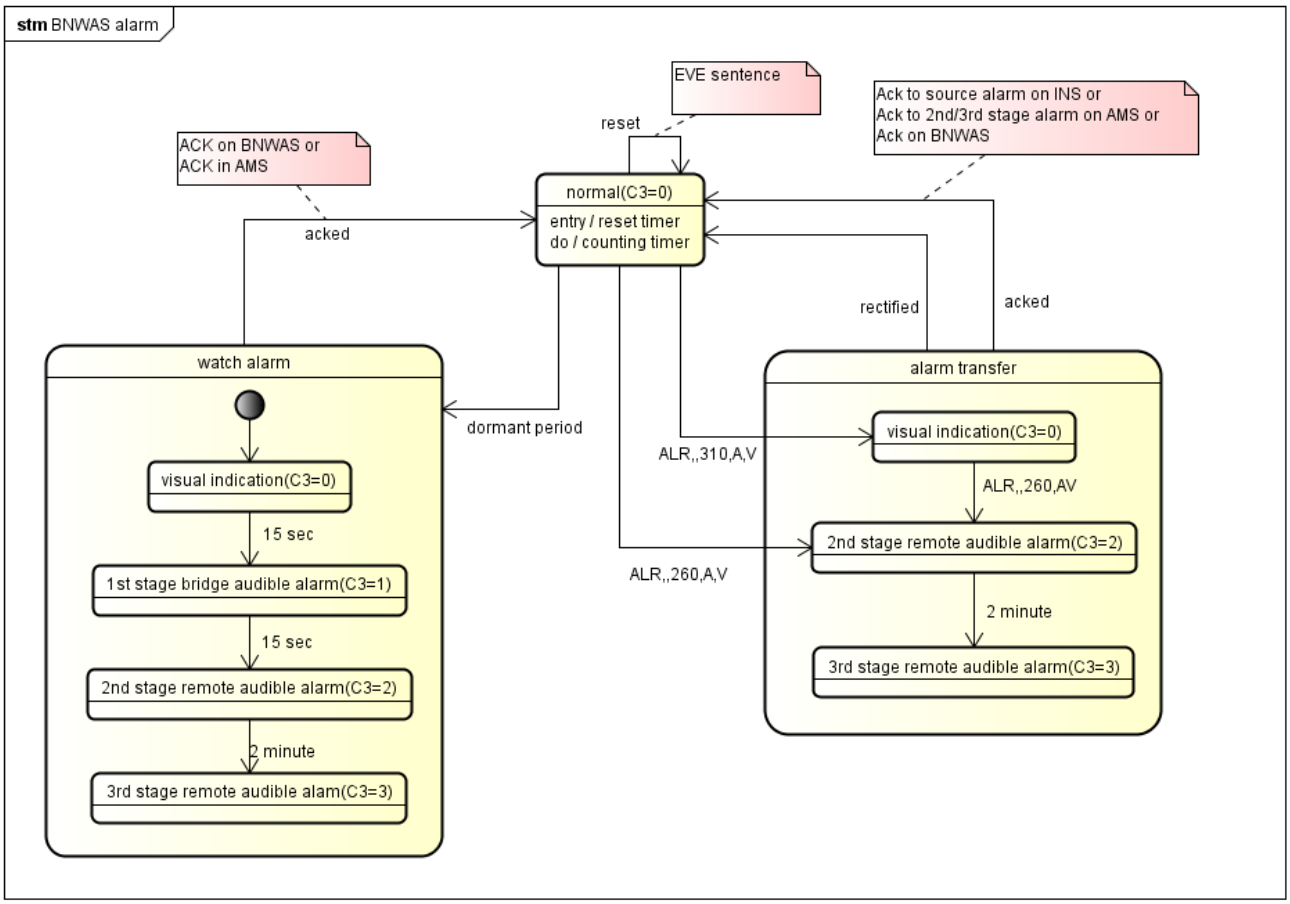


(4). Connection supervision

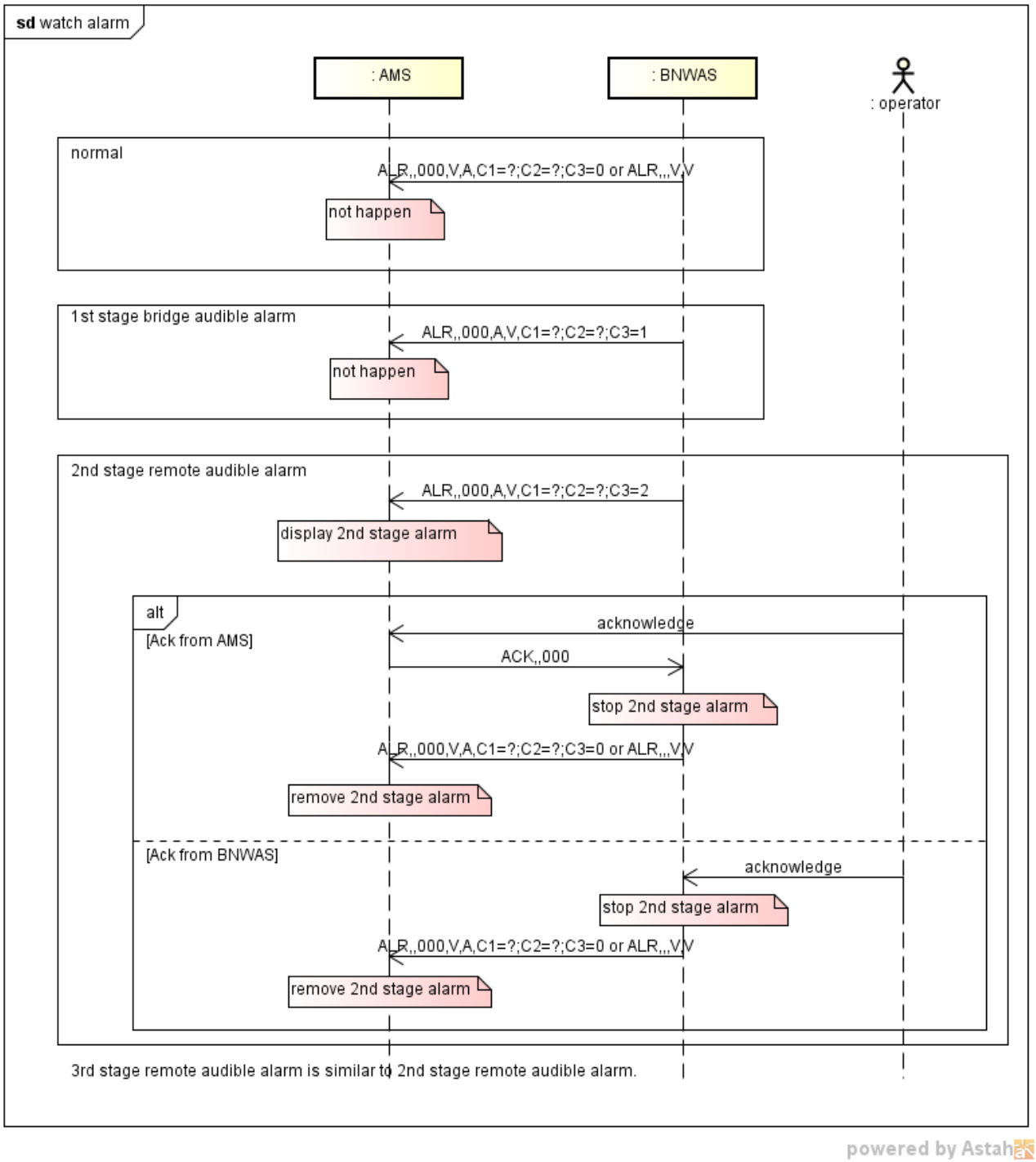


6.9.2 Mechanism

6.9.2.1 BNWAS status

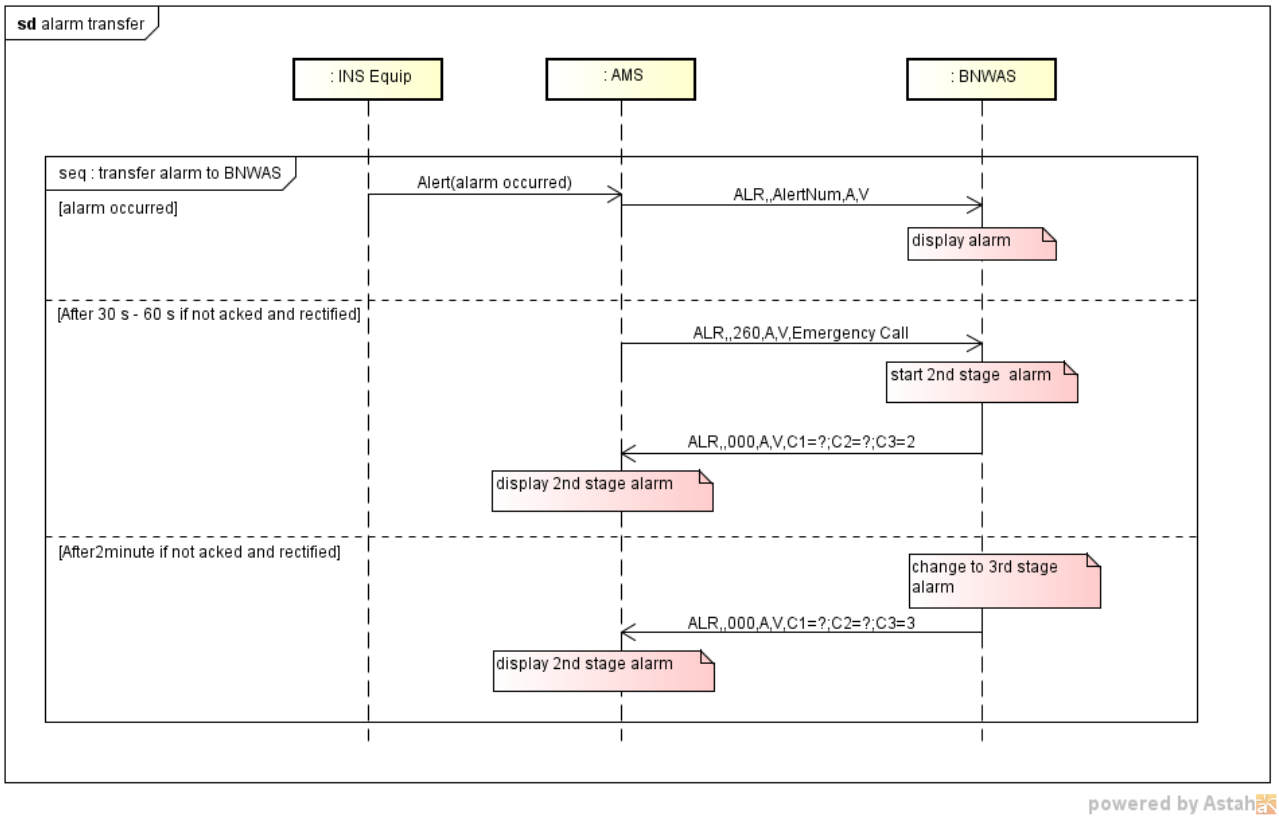


6.9.2.2 Watch alarm

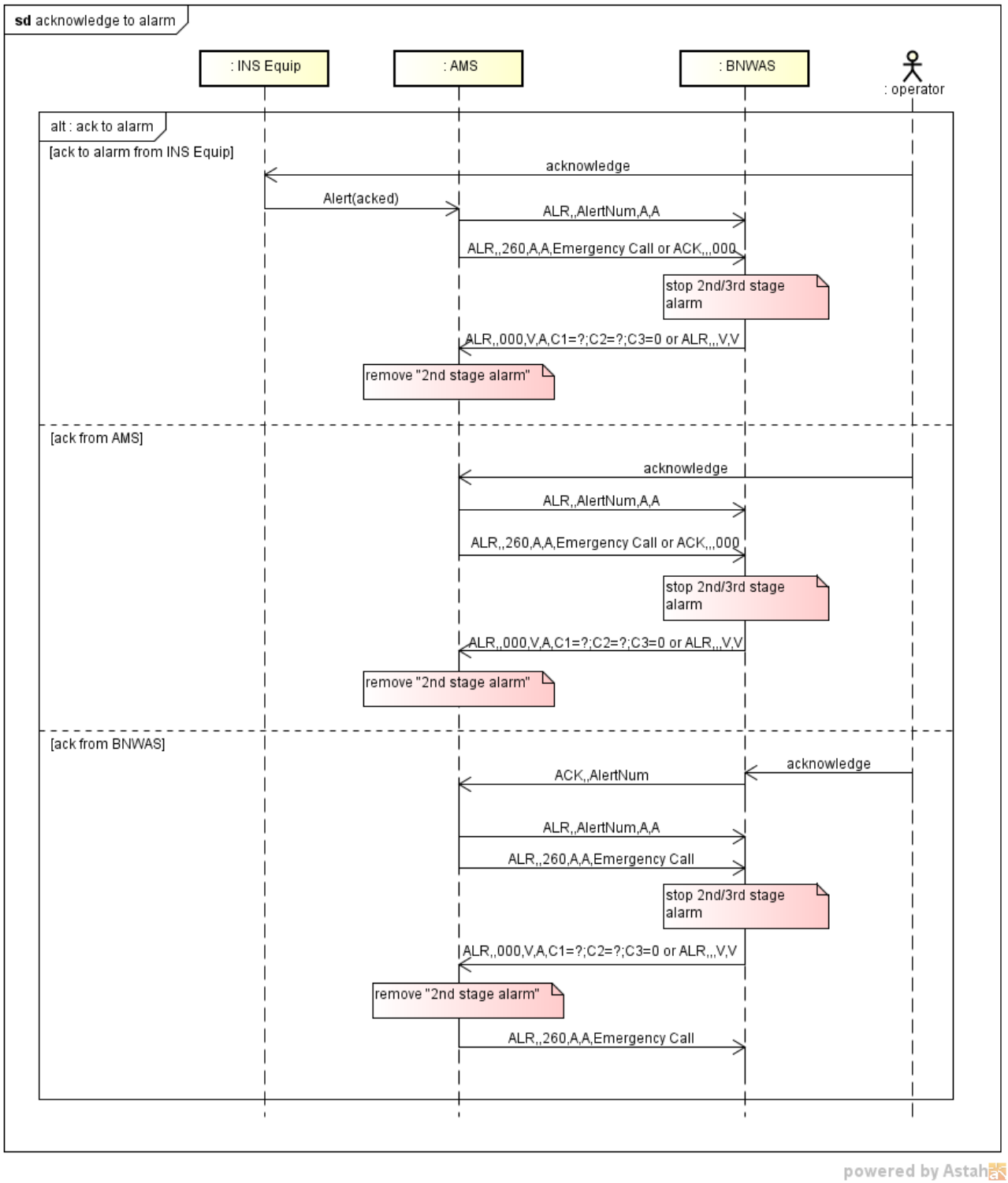


6.9.2.3 Alarm transfer

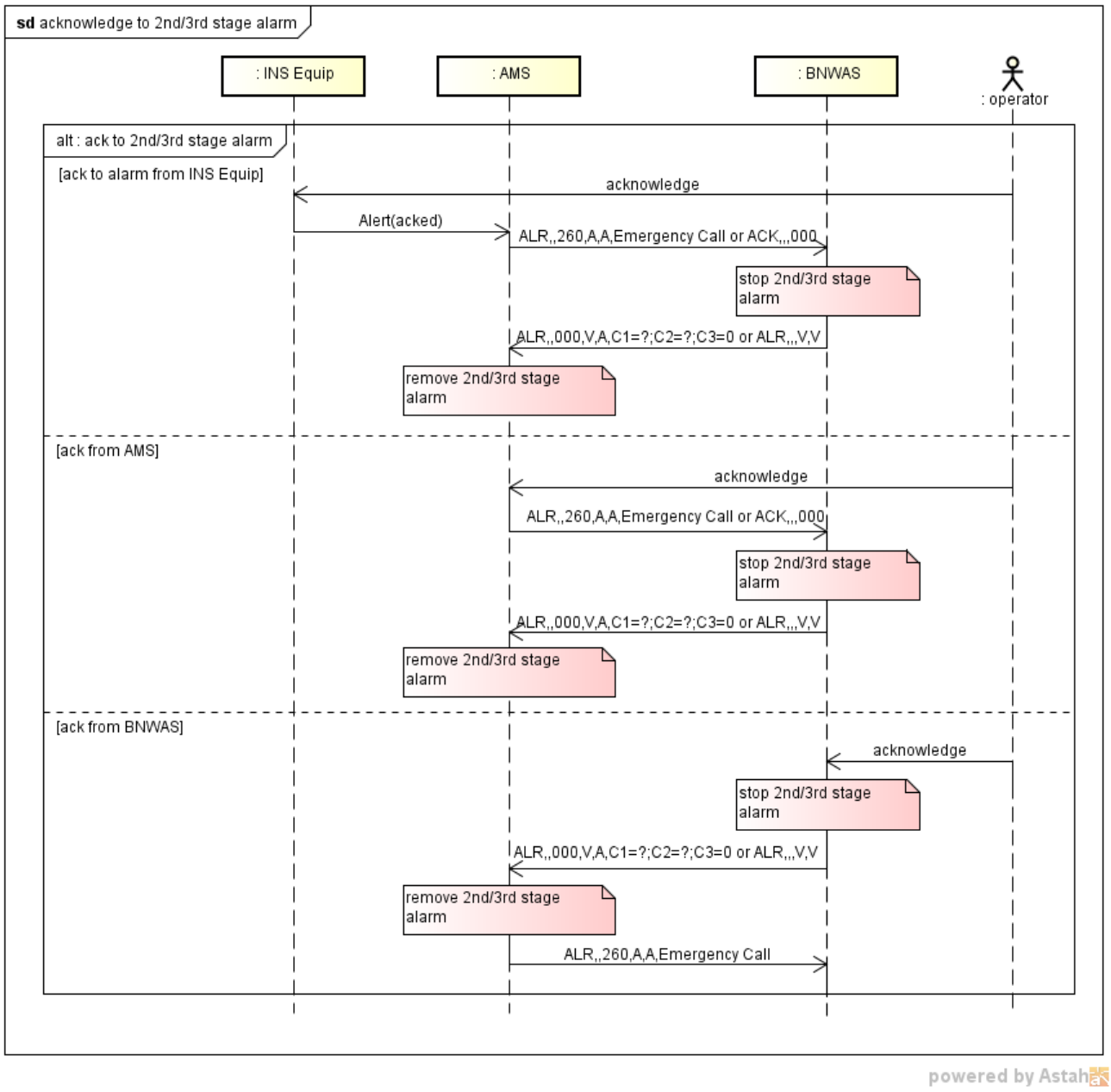
(1). Alarm transfer



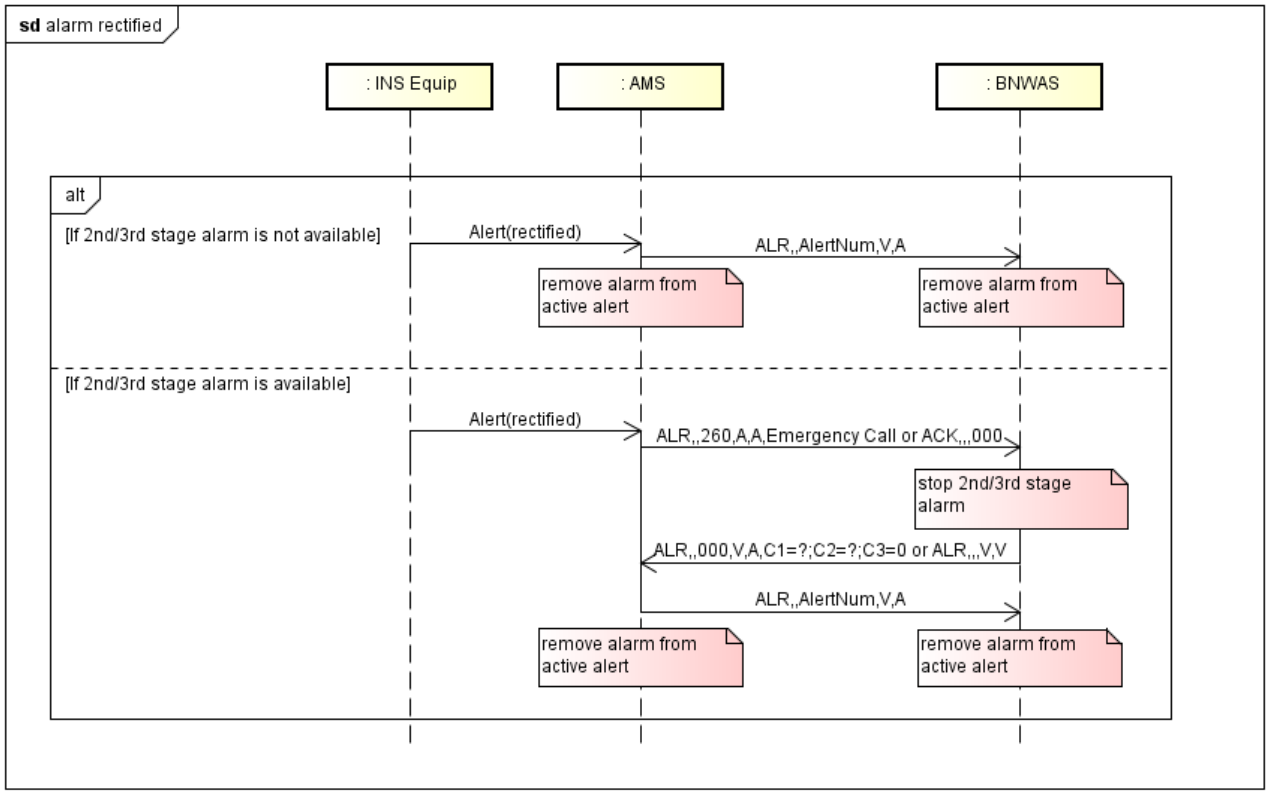
(2). Acknowledge to alert



(3). Acknowledge to 2nd/3rd stage remote audible alert



(4). Rectified


sd alarm rectified
: INS Equip
: AMS
: BNWAS
alt
[If 2nd/3rd stage alarm is not available]
Alert(rectified)
ALR,,AlertNum,V,A
remove alarm from active alert
remove alarm from active alert
[If 2nd/3rd stage alarm is available]
Alert(rectified)
ALR,,260,A,A,Emergency Call or ACK,,,000
stop 2nd/3rd stage alarm
ALR,,000,V,A,C1=?;C2=?;C3=0 or ALR,,,V,V
ALR,,AlertNum,V,A
remove alarm from active alert
remove alarm from active alert
powered by Astah

6.9.3 Sentences

No	mnemonic	Meaning	Remarks
1	ACK	Acknowledge alert	This sentence is used to acknowledge an Category-B alert condition reported by a device.
2	ALR	Set alert state	This sentence is used to report an alert condition on a device and its current state of acknowledgement.
3	EVE	Watch Timer reset	JRC-INS to BNWAS for timer-reset. (IEC 62616/7.4.6)
4	HBT	Heartbeat supervision sentence	This sentence is intended to be used to indicate that equipment is operating normally, or for supervision of a connection between JRC-INS and BNWAS.

6.9.3.1 Talker ID

No.	Source	Talker ID	Remark
1	BNWAS	BN	IEC 61162/Table 4
2	RADAR	RA	IEC 61162/Table 4
3	ECDIS	EI	IEC 61162/Table 4
4	INS/ CONNING/ AMS	IN	IEC 61162/Table 4

6.9.3.2 ACK sentence

$INALR,xxx*hh<CR><LF> (INS -> BMWAS)

$BNALR,xxx*hh<CR><LF> (BNWAS -> INS)

Alert number
See. Alert number table(Described later)

ACK – Acknowledge alarm

Acknowledge device alarm. This sentence is used to acknowledge an alarm condition reported by a device.

$--ACK,xxx*hh<CR><LF>

Unique alarm number (identifier) at alarm source

6.9.3.3 ALR sentence

Transmit : interval from 1sec to 15sec for BNWAS, from 1 sec to 3 sec for AMS.

$INALR,hhmmss.ss,xxx,A,A,c--c*hh<CR><LF> (INS -> BMWAS)

$BNALR,hhmmss.ss,xxx,A,A,c--c*hh<CR><LF> (BNWAS -> INS)

Alert's description text
If unnecessary, null is OK.

Alert's acknowledge state	
A	Acknowledged
V	Unacknowledged

Alert condition	
A	Threshold exceeded
V	Not exceeded

Alert number
See Alert number table(Described later)

Time of alert condition change. UTC
UTC or if time cannot be inserted, null is OK.

ALR – Set alarm state

Local alarm condition and status. This sentence is used to report an alarm condition on a device and its current state of acknowledgement.

$--ALR,hhmmss.ss,xxx,A, A,c--c*hh<CR><LF>

- Alarm's description text
- Alarm's acknowledge state, A = acknowledged, V = unacknowledged
- Alarm condition (A = threshold exceeded, V = not exceeded)
- Unique alarm number (identifier) at alarm source
- Time of alarm condition change, UTC

Alert number (sample)

alert number	source	mean	remark
(none)	JRC-INS, BNWAS	no-alerts message	IEC 61924-2/L.1.3
000	BNWAS	Dormant period report	Category-B IEC 62616 Ed1.0/6.2
001	BNWAS	System fail	Category-B
002	BNWAS	Power fail	Category-B
260	AMS	Emergency call (Back-up Navigator Call)	IEC 61924-2/J.2
300	No.1 RADAR	ARPA(CPA/TCPA) alert	Category-A
301	No.1 RADAR	Power & System fail	Category-B
302	No.2 RADAR	ARPA(CPA/TCPA) alert	Category-A
303	No.2 RADAR	Power & System fail	Category-B
304	No.3 RADAR	ARPA(CPA/TCPA) alert	Category-A
305	No.3 RADAR	Power & System fail	Category-B
310	ECDIS	Cross-Track (Off-Track)	Category-A
311	ECDIS	Course Difference (Off course)	Category-A
312	ECDIS	Wheel Over Line (ACCA)	Category-A
313	ECDIS	End Of Track	Category-A
314	ECDIS	Depth below keel	Category-A
315	ECDIS	Power & System fail	Category-B
320	Backup-ECDIS	Cross-Track (Off-Track)	Category-A
321	Backup-ECDIS	Course Difference (Off course)	Category-A
322	Backup-ECDIS	Wheel Over Line (ACCA)	Category-A
323	Backup-ECDIS	End Of Track	Category-A
324	Backup-ECDIS	Depth below keel	Category-A
325	Backup-ECDIS	Power & System fail	Category-B
350	CONNING	Power & System fail	Category-B
360	No.1 DGPS	Power & System fail	Category-B/Warning
361	No.2 DGPS	Power & System fail	Category-B/Warning
362	No.1 Gyro Compass	Power & System fail	Category-B/Warning
363	No.2 Gyro Compass	Power & System fail	Category-B/Warning
364	No.1 Speed Log	Power & System fail	Category-B/Warning
365	No.2 Speed Log	Power & System fail	Category-B/Warning
366	Echo Sounder	Power & System fail	Category-B/Warning
367	AIS	Power & System fail	Category-B/Warning
368	Auto Pilot	Power & System fail	Category-B/Warning
369	NAVTEX	Power & System fail	Category-B/Warning
370	VDR	Power & System fail	Category-B/Warning
371	Clock	Power & System fail	Category-B/Warning

372	GMDSS	Power & System fail	Category-B/Warning
373	No.1 Main SLC	Power & System fail	Category-B/Warning
374	No.2 Main SLC	Power & System fail	Category-B/Warning
375	No.3 Main SLC	Power & System fail	Category-B/Warning
376	No.1 Sub SLC	Power & System fail	Category-B/Warning
377	No.2 Sub SLC	Power & System fail	Category-B/Warning
378	No.3 Sub SLC	Power & System fail	Category-B/Warning
379	No.1 ALC	Power & System fail	Category-B/Warning
380	No.2 ALC	Power & System fail	Category-B/Warning
381	No.3 ALC	Power & System fail	Category-B/Warning
999	JRC-INS, BNWAS	Buzzer off request	original

6.9.3.4 No-alert message

When there is no alarm, this message will be sent from BNWAS or INS to the another.

$INALR,,,V,V,*hh<CR><LF> (INS -> BNWAS)

$BNALR,,,V,V,*hh<CR><LF> (BNWAS -> INS)

Note) see IEC 61924-2/L1.3

6.9.3.5 Back-up navigator call

For Back-up navigator call, emergency message sentence will be sent from AMS to BNWAS:

$INALR,,260,A,V,Emergency Call*hh<CR><LF>

For removing Back up navigator call:

$INALR,,260,A,A,Emergency Call*hh<CR><LF>

Note) see IEC 61924-2/J.2

6.9.3.6 Buzzer off request

For request buzzer off, this message will be used.

Transmit : 1 time

$INALR,,999,A,A,BZ off*hh<CR><LF> (INS -> BNWAS)

$BNALR,,999,A,A,BZ off*hh<CR><LF> (BNWAS -> INS)

6.9.3.7 Dormant period report

The ALR sentence is used for dormant period report from BNWAS to AMS.

$BNALR, hhmmss.ss, 000, A, A, c1;c2;c3*hh<CR><LF>

- Alarm stage
  - 1,2 or 3
- Dormant period in min
  - 03 - 12
- AUT or MAN or OFF
- Alarm's acknowledge state
  - A = Acknowledged
  - V = Unacknowledged
- Dormant period condition
  - A = Threshold exceeded
  - V = Not exceeded
- Alert number = 000
- Time of alert condition change.
  - UTC or if time cannot be inserted, null is OK.

Example:

$BNALR,,000,A,V,C1=AUT;C2=03;C3=1*hh<CR><LF>

The alarm message shall be sent with any change of the BNWAS settings for mode or dormant period, and with any activated and reset alarm.

2nd and 3rd alarm should be acknowledged by "$INACK,,000*hh<CR>LF>" from AMS.

Note) see IEC 62616 Ed1.0/6.2

6.9.3.8 EVE sentence

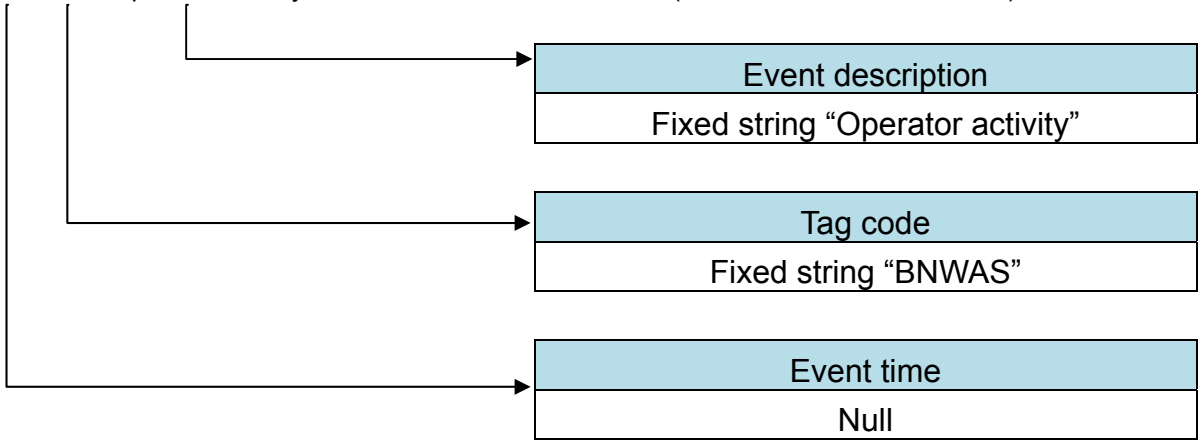
For reset of the Watch Timer, EVE sentence will be sent from individual equipment in INS except ALC to BNWAS.

Transmit : minimum interval is 1 sec per equipment.

$EIEVE,,BNWAS,Operator activity*hh<CR><LF> (ECDIS -> BNWAS)

$RAEVE,,BNWAS,Operator activity*hh<CR><LF> (RADAR -> BNWAS)

$INEVE,,BNWAS,Operator activity*hh<CR><LF> (CONNING/AMS -> BNWAS)



EVE – General event message

This sentence is used to transmit events (e.g. actions by the crew on the bridge) with a time stamp.

$--EVE,hhmmss.ss,c--c,c--c*hh<CR><LF>

- Event description
- Tag code used for identification of source of event (see Note)
- Event time (see Note)

NOTE This may be a null field.

see IEC 62616/7.4.6.

NOTE The sentence EVE (General event message) is designed to transmit actions by the crew on the bridge. The tag code field should be set as “BNWAS” and the event description field should be set as “Operator activity”.

Example $RAEVE,,BNWAS,Operator activity*hh<CR><LF>

6.9.3.9 HBT sentence

This sentence is intended to be used for supervision of a connection between AMS and BNWAS.

Transmit : interval from 1 sec to 3 sec.

$INHBT,x.x,A,x*hh<CR><LF> (INS -> BNWAS)

$BNHBT,x.x,A,x*hh<CR><LF> (BNWAS -> INS)

Sequential sentence identifier
Changing sentence counter. Number from 0 to 9.

Equipment status	
A	Fix

Configured repeat interval	
1.0	Fix

The sentence is transmitted at regular intervals specified in the corresponding equipment standard. The repeat interval may be used by the receiving unit to set the time-out value for the connection supervision.

$--HBT,x.x,A,x*hh<cr><lf>

- Sequential sentence identifier (see Note 3)
- Equipment status (see Note 2)
- Configured repeat interval (see Note 1)

NOTE 1 Configured autonomous repeat interval in seconds. This field should be set to NULL in response to a query if this feature is supported.

NOTE 2 Equipment in normal operation A = yes, V = no

This field can be used can be used to indicate the current equipment status. This could be the result of an built-in integrity testing function.

NOTE 3 The sequential sentence identifier provides a message identification number from 0 to 9 that is sequentially assigned and is incremented for each new sentence. The count resets to 0 after 9 is used.

6.10 Troubleshooting

When this equipment does not operate correctly, check the following points before asking for repairs.
Consult with your nearest subsidiary company, branch office, or sales office if the problem does not get solved even after checking and correcting these points, or if there are any abnormally locations other than the following items.

Symptom	Cause	Action
The power is not supplied. Alternatively, the equipment does not start even if the Power button of the operation unit is pressed.	The AC or DC power supply is not connected.	Connect the AC or DC power supply.
	The circuit breaker at the front of the PSU (NBD-913) is not set to ON.	Set the breaker to ON by pushing up the lever of the breaker.
	The AC or DC power supply is not input within the specified voltage range.	Connect the AC or DC power supply within the specified voltage range.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The PSU (NBD-913) is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
	The CCU (NCE-5605) is faulty.	Make a request to the distributor for repair.
The power is not supplied to the monitor.	The display unit is not activated.	Activate the display unit.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The MNU (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
Although the power is supplied to the monitor, the screen is not displayed.	The brightness of the monitor is set to the minimum level.	Adjust the brightness of the monitor to the appropriate level.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The MNU (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
The brightness of the monitor cannot be adjusted.	The MNU (NWZ-208/NWZ-207) is faulty.	Make a request to the distributor for repair.
The trackball or the option keyboard cannot be operated.	The internal wiring is faulty.	Make a request to the distributor for repair.
	The display unit (NCE-5605/NCE5625) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The trackball does cannot be moved smoothly.	The trackball is dirty.	Clean the trackball.
Although the power is supplied and the screen is displayed, the display is frozen, disabling processing to advance up to display of the task menu.	The CCU (NDC-1590) is abnormal.	Make a request to the distributor for repair.
Some task menus cannot be selected.	The device license has not been installed.	Install the license of the device to be used.
The cursor is not displayed correctly.	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
Characters/symbols are not displayed correctly.	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
Position information (GPS) is not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the GPS unit is not turned on.	Turn on the power supply for the GPS unit.
	The GPS unit does not perform positioning.	Check the state of the GPS unit.
	The connection with the GPS unit is abnormal.	Check the connection with the GPS unit. If a GPS unit is connected to the SLC, check that the LED of the corresponding port is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on. (Case where the GPS unit is connected to the SLC)	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. (Case where the GPS unit is connected to the SLC)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
AIS information is not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the AIS unit is not turned on.	Turn on the power supply for the AIS unit.
	The AIS unit does not perform receiving.	Check the state of the AIS unit.
	The connection with the AIS unit is abnormal.	Check the connection with the AIS unit. If an AIS unit is connected to the SLC, check that the LED of the corresponding port is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on. (Case where the AIS unit is connected to the SLC)	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. (Case where the AIS unit is connected to the SLC)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The azimuth of the Gyro compass is not displayed. Alternatively, the azimuth rotation direction is not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the gyro compass is not turned on.	Turn on the power supply for the gyro compass.
	The connection with the gyro compass is abnormal.	Check the connection with the gyro compass. If the gyro compass is connected to the SLC or GIF, check that the corresponding LED is lit during signal reception.
	The power supply for the SLC (CMH-2370) is not turned on. （Case where the gyro compass is connected to the SLC）	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. （Case where the gyro compass is connected to the SLC）	Make a request to the distributor for repair.
	The GIF (CMJ-554） is not set correctly （Case where the gyro compass is connected to the GIF）	Set the GIF correctly according to the gyro compass.
	The fuse of the GIF (CMJ-554) has blown. （Case where the gyro compass is connected to the GIF)	Replace the fuse of the GIF.
	The GIF (CMJ-554）is faulty. （Case where the gyro compass is connected to the GIF)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Vessel speed is not displayed or the values are not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the speed log is not turned on.	Turn on the power supply for the speed log.
	The connection with the speed log is abnormal.	Check the connection with the speed log. If the speed log is connected to the SLC or GIF, check that the corresponding LED is lit during signal reception.
	The power supply for the SLC (CMH-2370) is not turned on. (Case where the speed log is connected to the SLC).	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. (Case where the speed log is connected to the SLC).	Make a request to the distributor for repair.
	The GIF (CMJ-554) is not set correctly. (Case where the speed log is connected to the GIF).	Set the GIF correctly according to the speed log.
	The GIF (CMJ-554) is faulty. (Case where the speed log is connected to the GIF).	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Rudder angles are not displayed. Alternatively, the values are not displayed correctly.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the rudder angle indicator is not turned on.	Turn on the power supply for the rudder angle indicator.
	The connection with the rudder angle indicator is abnormal.	Check the connection with the rudder angle indicator. If the rudder angle indicator is connected to the SLC, check that the LED of the corresponding port is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on. (Case where the rudder angle indicator is connected to the SLC or the rudder angle indicator is connected to the AOC)	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. (Case where the rudder angle indicator is connected to the SLC or the rudder angle indicator is connected to the AOC)	Make a request to the distributor for repair.
	The AOC (CMJ-560) is not set correctly. (Case where the rudder angle indicator is connected to the AOC)	Set the AOC correctly according to the rudder angle indicator.
	The AOC (CMJ-560) is faulty. (Case where the rudder angle indicator is connected to the AOC)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The digital anemometer values (wind direction and speed) are not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the anemometer is not turned on.	Turn on the power supply for the anemometer.
	The connection with the anemometer is abnormal	Check the connection with the anemometer. Check that the LED of the corresponding port in the SLC is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on.	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
Water depth values are not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the echo sounder is not turned on.	Turn on the power supply for the echo sounder.
	The connection with the echo sounder is abnormal.	Check the connection with the echo sounder. Check that the LED of the corresponding port in the SLC is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on.	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Sensor signals are not displayed.	The communication is not set correctly.	Set the communication correctly.
	The power supply for the sensor equipment is not turned on.	Turn on the power supply for the sensor equipment.
	The connection with the sensor equipment is abnormal.	Check the connection with the sensor equipment. Check that the LED of the corresponding port in the SLC is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on.	Turn on the power supply for the SLC.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The display unit such as the SLC (CMH-2370), AOC (CMJ-560), and CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
Auto sailing is disabled.	The communication is not set correctly.	Set the communication correctly.
	The Auto sailing function is not operated correctly.	Operate Auto sailing correctly.
	The power supply for the Auto sailing unit is not turned on.	Turn on the power supply for the Auto sailing unit.
	The connection with the Auto sailing unit is faulty.	Check the connection with the Auto sailing unit. Check that the LED of the corresponding port in the SLC is lit during data reception.
	The power supply for the SLC (CMH-2370) is not turned on.	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Contact signals are not output.	The power supply for the SLC (CMH-2370) is not turned on. (Case where contact signal output is acquired from the SLC)	Turn on the power supply for the SLC.
	The SLC (CMH-2370) is faulty. (Case where contact signal output is acquired from the SLC)	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
The scanner unit is not recognized	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	Power is not supplied from the PSU to the scanner unit.	Check the power supply wiring between the PSU and the RIF. Check the power supply connection inside of the scanner unit. [Note] For checking wiring inside of the scanner unit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	Only AC power is supplied to the PSU. (NKE-2254 or NKE-2103 is connected as the scanner unit)	To connect the NKE-2254 or NKE-2103 scanner unit, the DC power supply must be connected to the PSU.
	The RIF (CQD-2273) is not set correctly.	Set the RIF correctly.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The scanner unit is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
The power is not supplied to the scanner unit.	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	The connection with the scanner unit is abnormal and overcurrent protection is functioning in the PSU.	Check the connection with the scanner unit and remove the cause of short-circuit.
	DC power is not supplied to the PSU. (NKE-2254 or NKE-2103 is connected as the scanner unit)	To connect the NKE-2254 or NKE-2103 scanner unit, DC power supply must be connected to the PSU.
	The DC24V output fuse is blown out. (NKE-2254 or NKE-2103 is connected as the scanner unit.)	After removing the cause of fuse blow-out, replace the fuse. The fuse is the 15A blade fuse at the front of the PSU (NBD-913).
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The PSU (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
The preheat count down of the scanner unit is not displayed.	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	The safety switch of the scanner unit is set to OFF.	Set the safety switch of the scanner unit to ON. [Note] For operating the safety switch of the scanner unit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	A solid-state scanner unit is connected.	Preheat count-down is not displayed for a solid-state scanner unit.
	The scanner unit is faulty.	Make a request to the distributor for repair.
	The RIF (CQD-2273) is not set correctly.	Set the RIF correctly.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
The scanner unit does not rotate even if the [Transmit] button is pressed.	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	The safety switch of the scanner unit is set to OFF.	Set the safety switch of the scanner unit to ON. [Note] For operating the safety switch of the scanner unit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	Power is not supplied from the PSU to the scanner unit.	Check the power supply wiring between the PSU and the RIF. Check the power supply connection inside of the scanner unit. [Note] For checking the wiring inside of the scanner unit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	The motor driver circuit inside of the scanner unit is not set correctly. (NKE-1632, NKE-2632, or NKE-2632-H is connected as the scanner unit.)	Set the motor driver circuit correctly. [Note] For setting the motor driver circuit, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	The rotating part of the scanner unit is frozen.	De-freeze the frozen section by using the neck heater option.

Symptom	Cause	Action
	Strong wind of relative wind velocity exceeding 100 kt (about 51.5 m/s) is blowing.	When strong wind of relative wind velocity exceeding 100 kt is blowing, the scanner unit does not rotate due to the protection function.
	The scanner unit is faulty.	Make a request to the distributor for repair.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The PSU (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
No radar image is displayed.	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	The GAIN value is set to the minimum.	Set a proper value for GAIN.
	The SEA/RAIN value is set to the maximum.	Set a proper value for SEA/RAIN.
	The magnetron is deteriorated significantly. （Case where an scanner unit that uses a magnetron is connected）	Replace the magnetron. [Note] For magnetron replacement, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit.　Otherwise, an unexpected accident may occur.
	The scanner unit is faulty.	Make a request to the distributor for repair.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The PSU (NBD-913) is abnormal.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Radar images cannot be tuned	The magnetron is deteriorated significantly. （Case where a scanner unit that uses a magnetron is connected）	Replace the magnetron. [Note] For magnetron replacement, always request the work to the specialized service person. Before starting the work, turn off the power supply of the display unit. Otherwise, an unexpected accident may occur.
	A solid-state scanner unit is connected.	Tuning bar is not displayed for a solid-state scanner unit.
The azimuth of the radar image is not displayed correctly.	The azimuth is not set correctly.	Set the azimuth correctly.
	CCRP is not set correctly.	Set CCRP correctly.
	The GPS antenna position is not set correctly.	Set the GPS antenna position correctly.
The range of the radar image is not displayed correctly.	The range is not set correctly.	Set the range correctly.
	CCRP is not set correctly.	Set CCRP correctly.
	The GPS antenna position is not set correctly.	Set the GPS antenna position correctly.
Interswitch Unit does not function.	Power for the Interswitch Unit is not turned on.	Turn on the power for the Interswitch Unit.
	The connection with the Interswitch Unit is abnormal.	Check the connection with the Interswitch Unit.
	The Interswitch Unit is faulty.	Make a request to the distributor for repair.
	The RIF (CQD-2273) is not set correctly.	Set the RIF correctly.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
If the power supply is turned off, the trail data is cleared without being stored.	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.

Symptom	Cause	Action
Radar images cannot be overlaid.	There is no optional license for radar overlay.	Implement an optional license for radar overlay.
	The connection with the scanner unit is abnormal.	Check the connection with the scanner unit.
	The connection with the radar display unit is abnormal.	Check the connection with the radar display unit.
	The RIF (CQD-2273) is faulty.	Make a request to the distributor for repair.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	The PSU (NBD-913) is faulty.	Make a request to the distributor for repair.
	The CCU (NDC-1590) is faulty.	Make a request to the distributor for repair.
UPS does not function.	The connection with UPS is faulty.	Check the connection with UPS.
	UPS is not set correctly.	Set UPS correctly.
	The UPS battery is extremely depleted.	Replace the battery. [Note] At the battery replacement, make a request for the work to the specialized service staff. During the replacement, turn off the corresponding power supply breaker in the ship. Otherwise, an unexpected accident may occur.
	The internal wiring is faulty.	Make a request to the distributor for repair.
	UPS is faulty.	Make a request to the distributor for repair.

アスベストは使用しておりません
Not use the asbestos

CODE No.7ZPNA4466A

For further information,contact:

JRC Japan Radio Co., Ltd.
Since 1915

URL http://www.jrc.co.jp
Marine Service Department
Telephone : +81-3-3492-1305
Facsimile : +81-3-3779-1420
e-mail : tmsc@jrc.co.jp
SEATTLE Branch
Telephone : +1-206-654-5644
Facsimile : +1-206-654-7030
e-mail : marineservice@jrcamerica.com

ALPHATRON
Alphatron Marine BV

URL http://www.alphatronmarine.com
Rotterdam (Head office)
Alphatron Marine B.V.
Telephone : +31 (0)10- 453 4000
Facsimile : +31 (0)10- 452 9214
e-mail : service@alphatronmarine.com
Singapore Branch
Alphatron Marine Systems Pte Ltd
Telephone : +65 6863 0335
Facsimile : +65 6863 3305
e-mail : service@alphatronmarinesystems.com

01ETM ISO 9001, ISO 14001 Certified