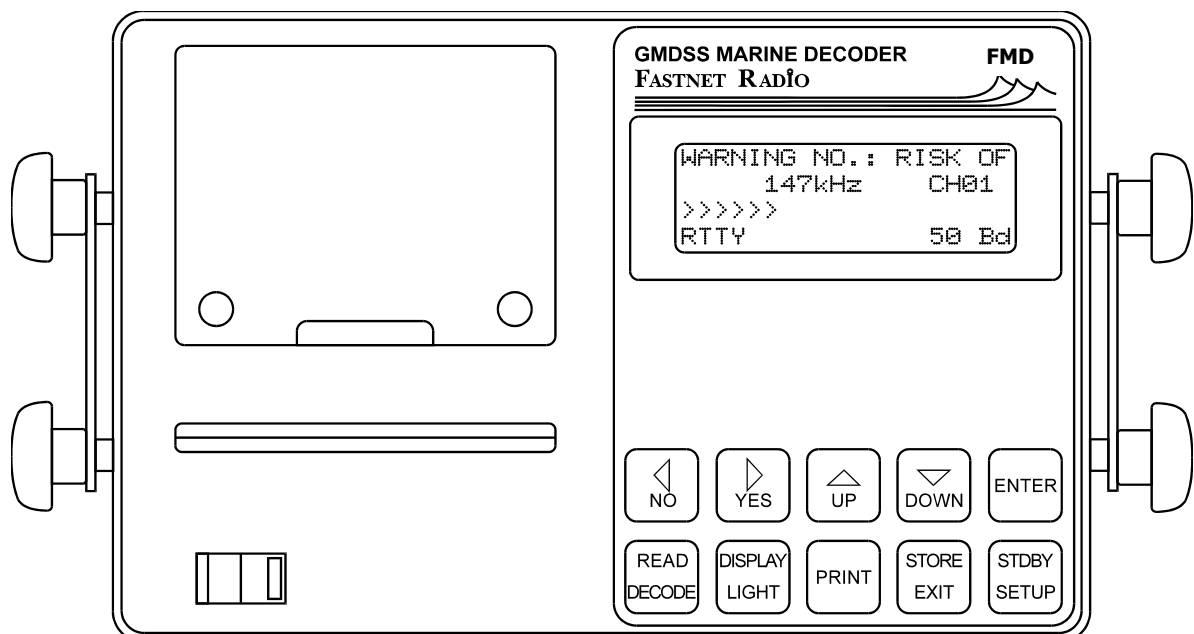


OPERATOR MANUAL

GMDSS Marine Radio Decoder

FMD15



ATTENTION

IMPORTANT INFORMATION

The FMD15 has two M5 threaded holes on either side for the supplied thumb screws, so that it can be fitted to the universal mounting bracket. The length of the thumb screws has been so determined, that, together with the bracket and the lock washers, they can only penetrate approx. 5mm into the thread.

Should you use alternative fitting methods or screws, please make sure that they do not penetrate the thread by more than 5mm.



By using longer screws, the integrated electronic could be damaged !!



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1.3. Keypad Functions


- > 'cursc  left
- > 'answ  >



- >  to the right
- >  r <YES>



- >  upwards
- >  ipwards
- > increase values



- >  downwards
- >  ase values


- >  n entry
- >  te cursor position

-  emory contents
coding

- >  / memory contents
- >  on back-lighting

- >  rinting
- >  (P) print and/or (W) write
- > print space

- >  to higher menu level
- >  ocess

-  standby mode
SET UP menu

1. Receiver

1.1. Operation

The receiver requires practically no operation.

The NAVTEX frequency (518.0 kHz) is pre-programmed

Further this model has one further pre-programmed frequency, according to a defined sailing region.

The frequencies of a transmitting station are normally set down internationally and are rarely changed. However, this pre-programmed frequency has been allotted the following parameters:

- > Morse
- > RTTY
- > SITOR-FEC

The message decoding mode has not been laid down, as it is expected, that, in the next few years, various stations will change their transmission from Morse or RTTY to SITOR-FEC. On the following pages you can find a list of the present codes used.

It is not necessary to adjust the mode in the receiver. This is done automatically, when selecting the decoding mode.

3. Decoding of Messages

The FMD15 can store and decipher NAVTEX, MORSE, RTTY and SITOR codes, which then can be read and/or printed out in plain language. In radio signal traffic there are many other kinds of keyed codes. As they are not for use by the general public, they cannot be decoded by the FMD15.

Weather and navigational warnings for shipping are transmitted in one of the above-mentioned codes, which can be decoded by the FMD15.

The signal tone (NF) received is fed to a PLL signal Decoder, which filters out the audio signals and transforms them into digital information. This in turn will be converted into legible symbols by the integrated microprocessor.

The type of code used by the individual station, can be found in the appropriate manuals for marine radio stations. The codes used vary:

- > for MORSE also : CW,A1,A1A, telegraphy
- > for RTTY also : F1B, telex
- > for SITOR also : FEC,F1B

3.1 Selecting Mode and Decoding

In various manuals, the type of code used by a station is shown mostly as A1A, F1B etc. The following list is an oversight of types of transmission generally used in marine radio transmission. The required adjustments to receiver and Decoder are also listed

Message Transmission Types

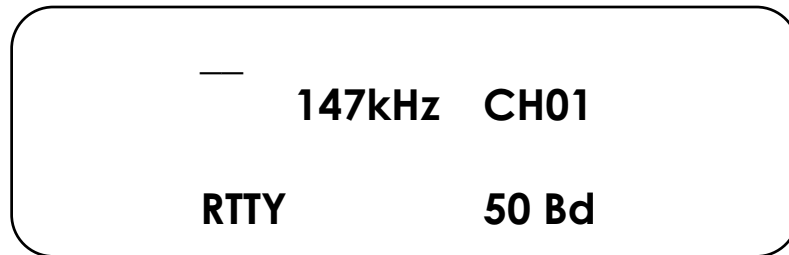
Transmission decoder Mode up	receiver set up	set
A1A – Morse-telegraphy with non-damped carrier e.g. Roma	CW	Morse
A2A - Morse – Telegraphy in double side band method	CW	Morse
A3A – audio radio in Double side band e.g. BBC, DLT etc.	*	*
F1B – FM telex signal From Pinneberg	FSK	RTTY
F1B – FM telex special Signal for NAVTEX	FSK	SITOR- NEC
F1B – FM telex (MSI Frequencies e.g. Portishead: 4211kHz(402)	FSK	SITOR- NEC
F1C – FM tele-facsimile From Bracknell Pinneberg Etc	FSK	*
F3E – VHF audio radio from 88kHz to 108kHz	*	*
H3E – AM radio, SSB with Carrier e.g. Murmansk	*	*
J3E – SSB radio	*	*
R3R – as H3E however with a Reduced carrier e.g. Niton	*	*

*** - not available with FMD 15**

3.3 Recalling Stored Channels

> to recall a channel press   twice

the following picture appears on the display:



This means that the receiver is receiving the pre-programmed frequency. The bottom line shows that the code being used is RTTY (Radio Tele Type) at a transmission rate of 50 Baud/m.

After a short phase for the decoder to synchronise, the decoded text will appear on the top line.

According to the selected mode in 3.2., the decoded text can only be read in the display or stored in the memory and printed out.

The selection can be altered by pressing key **<PRINT>**. The following functions for selection will appear on the bottom line:

- > · — — display only
- > · P — display and print simultaneously
- > · — S display and store simultaneously
- > · P S display, store and print simultaneously.

This will not influence the mode selection in 3.2.

3.4. Message Memory

The FMD15 possesses two separate independent memory stores. One for NAVTEX messages (see chap.5) and one for Morse, RTTY and SITOR messages.

The latter has a capacity of about 15000 characters. A message of maximum 3750 characters can be stored in a data record. Should a message be longer, further data records will be automatically opened. All in all, 100 data records can be filed with a total capacity of 15.000 characters. Should the memory store be full, a new message will be stored by replacing the oldest messages.

The most up-to-date messages will always be available.

It can happen that a new message of only a few characters replaces the oldest message containing 3750 characters. At this moment the store contents have been reduced to 11250 characters.

On completion of the message, every data record will be stored with a identification in form of date and time (TTMMhhmm).

Should the FMD15 be switched off during storage, whether deliberately or not (e.g. power interruption), the actual data record will not be stored because of lack of signal ending.

Because of strong disturbance (e.g. starting the motors with weak batteries), it can happen that the identification of data records may be partly or completely deleted. In this case, it may be possible to read messages only partly or not at all. On restarting the unit it can happen that all messages in the memory are deleted for safety reasons, because the unit cannot recognise the identifications.

Thereafter newly decoded messages will be stored correctly.

4. Automatic Reception and Decoding

The FMD15 has a timer function for the storage of 9 programmes. Each storage contains a starting time, stop time and the channel number of a stored frequency (similar to that in a video recorder). The transmission times of weather messages can be found in the usual manuals but to be on the safe side it is recommended to add some time before and after the start/stop times.

For reference the following transmission times can be used:

- > MORSE transmissions approx. 30 mins.
- > RTTY transmissions approx. 15 mins.
- > SITOR transmissions approx. 10 mins


The FMD15 will automatically switch to the required frequency at the selected start time and will decode according to the input parameters. The decoded message will be stored, according to the parameters, in the assigned channel if "**STORE**" was answered with **<YES>**. It will be directly printed out if "**PRINT**" was answered with **<YES>**.

On reaching the stop time, the FMD15 will switch back automatically into standby mode i.e. the basic mode for NAVTEX reception).

4.1. Programming the Timer Function

Starting from standby mode:

> press  key to call up menu 1

> use  key to select **TIMER**

> press 

4.1.1. Input of New Timer ON/OFF Times

> press  once more

On the display will appear:

INSERT ROW	
from	to
12:00	12:00

Use the cursor keys



to enter the required start and stop times and the channel number. The keys **<NO>** and **<YES>** move the cursor to the required position. The keys **<UP>** and **<DOWN>** change the figure value.

Keys **<UP>** and **<DOWN>** have an auto-repeat function, which means the selected value will increase or decrease in steps as long as the key is depressed. As long as you have not pressed **<ENTER>** you can change the value as often as required. Having checked that all values are correct press **<ENTER>**. By pressing **<ENTER>** once more you can enter further programme rows.

4.1.2. Deleting Timer ON/OFF Times

Call up **TIMER** menu as in 4.1.

> Press  key

On display will appear:

DELETE ROW NO. : 1__

Use the cursors **<UP>** and **<DOWN>** to select the number of the row to be deleted and activate by pressing **<ENTER>**. To leave the **TIMER** mode without a row deletion, press **<EXIT>**.

Press **<EXIT>** once more to return to the standby mode

The maximum length of time in the timer function is 60 minutes. However it is possible to put in the same start time as the previous stop time. In the case where to programmed times overlap, the newer start time is dominant

Should a timer function be interrupted by manual operation e.g. calling up another frequency, the unit will still return to standby mode on reaching the stop time

4.2. Interrupting and Restarting the Timer

An actual timer programme can be interrupted by pressing the **<STDBY>** key. The unit will switch back automatically to the standby mode at the respective stop time. It is possible to restart the unit during operation by switching it off for approx. 3 to 5 seconds. When switched on the unit returns to its programmed status.

4.3 Reading Stored Messages

Stored messages can be read on the display as often as desired. The complete data record store disposes of more than 20000 characters. Of this amount approx. 5500 are reserved for NAVTEX messages, the rest for Morse, RTTY and SITOR together. When the storage space is full, the oldest message will be automatically deleted. However this is done separately for NAVTEX and other messages. Meaning that the oldest NAVTEX message cannot be replaced by a new RTTY message, only by a new NAVTEX message and vice versa. Each message is identified by date and time in the following form: TT.MM.HH.MM (day, month, hour, minutes).


> Press  key to recall **READ MEMORY**

> use keys  and  to select the type of message to be read (**NAVTEX or CHANNEL**) and press **<ENTER>**.

> press key  once more

The display will now show, when in NAVTEX, the list of messages with NAVTEX identification (e.g. JA34), and when in **CHANNEL** the display will show the stored messages by date and stop time in number sequence DD.MM.HH.MM (Day, month, hour minutes).



Place cursor on selected message.

- > now press the key  and the selected message appears on the display
- > keys **<UP>** and **<DOWN>** enable you to "turn the pages". On reaching the end of the message or by pressing **<EXIT>**, the read out will end.
- > by pressing **<EXIT>** once more you will return to standby mode.

4.4 Printing Out Stored Messages

Stored messages can be printed out as often as required.

Select the message to be printed out as **READ MEMORY** (see 4.3.)

- > press key  to call up **READ MEMORY**
- > select message to be printed out
- > by pressing key  the message will be printed out from start to finish.

- > Printing can be stopped by pressing **<EXIT>**

It is possible to print only a part of the message e.g. only the sector applicable to your sailing region. This is done as follows:

- > press key **<DISPLAY>** and message appears on display.

- > "turn the pages" with the cursors **<UP>** and **<DOWN>**

- > by pressing **<PRINT>** the printer will commence from the displayed page

- > press **<EXIT>** when required or allow printing to continue until the message has ended

- > press **<EXIT>** twice to return to standby mode

5. NAVTEX, Reception and Decoding

When the unit is in standby mode, it is automatically operating as a NAVTEX receiver and therefore a manual activation is not necessary

ATTENTION:

During the reception of other stations, also when receiving a message programmed to be stored by the timer, NAVTEX cannot be received.

However, depending on your position, you should put in the necessary system parameters to enable the best possible NAVTEX information.

In put of the parameters is done as follows:

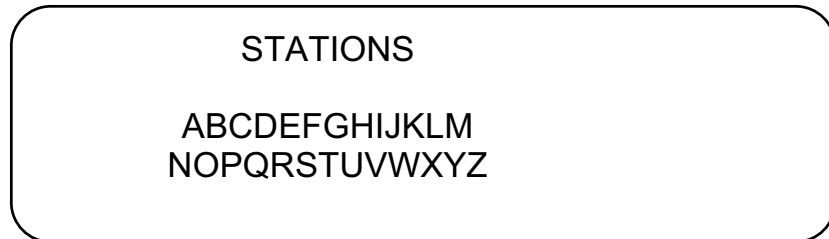
- > press key **<SET UP>** to call up set up menu
- > with cursor **<DOWN>** spring to position **4 - NAVTEX**
- > press **<ENTER>** to enter NAVTEX menu

Display will show



1 FREQU.	5 REPEAT
2 STATION	6 ALARM
3 MESSAGE	7 STATUS
4 PRINT	8 EXIT



5.1. Selection of Transmitting Stations

- > With cursor **<DOWN>** to position **2 – STATION**
- > press **<ENTER>** and the display will show:



NAVTEX stations are identified by the letters **-A-** to **-Z-**. Stations from which messages should be received are represented by capital letters, and stations from which messages should be suppressed with small letters.

- > use the cursors   to select an individual letter

- > use the cursors   to change the letters from capitals to small letters

An up-to-date list of NAVTEX transmission stations can be found at the end of this chapter.

- > having checked that all adjustments are correct return  to

to **NAVTEX** menu. The selected adjustment will be stored.

5.2. Selecting Type of Message

Cursor on position **-3- MESSAGE** and press

Similar to station selection, the messages are identified by letters and the selection of messages is analogue.

The international definition of the letters is

- A** = navigational warnings
- B** = meteorological warnings
- C** = ice reports
- D** = SAR information
- E** = meteorological prognosis
- F** = pilot service messages
- G** = DECCA messages
- H** = LORAN messages
- I** = OMEGA messages
- J** = SATNAV messages
- K** = messages about other electronic navigational assistance
- L** = additional navigational warnings
- V - Y** = special services, tests
- Z** = no message available

Messages of type **-A-**, **-B-** and **-D-** cannot be suppressed.

> by pressing key  selection will be stored and return to **NAVTEX** menu.

5.3. Printer Function

> In **NAVTEX <SET UP>** cursor on **PRINT** and press key **<ENTER>**

You can select now whether you wish the message to be printed out while being received or, stored, to be printed out on desire, by answering with keys **<YES>** and **<NO>**.

> by pressing key  the selection will be stored and the system returns to **NAVTEX** menu.

5.4. Suppressing Repeated Messages

Current **NAVTEX** messages are transmitted repeatedly usually every 4 or 6 hours. A repeat message, which has already been stored and printed out, can be suppressed.

As before cursor on position **5 – REPEAT** and enter.

Answer the question with **<YES>** or **<NO>** and

store with key 

5.5 Alarm for A, B and D messages

Should the FMD15 receive messages of the type A, B or D they can be alerted with an acoustic alarm.

> Cursor position **6 - ALARM** and enter.

If you wish alarm activated for A, B and D type messages press **<YES>**

press  to store and return to **NAVTEX** menu.

5.6 Print out of NAVTEX parameter status

For your own control you can print out the input of the parameters

> Cursor on position **7** and enter to print out **STATUS**

You will receive a simple and clear print out, making it easy to control, that all input parameters are correct.

5.7. Returning to standby mode



This can be done either by pressing the key twice or:

- › Cursor on position 8 <EXIT> and press <ENTER>.

The display will now show the standby mode.

5.8. Displaying and dealing with errors

The SITOR code used by NAVTEX can recognise errors. Every data field, to which a character has been assigned, will be repeated and have a relationship of 4:3 bit. Only when both data fields match and are valid does the corresponding character appear as a capital letter. Should it be recognised as valid only once, then it will appear as a small letter. If both assigned data field characters be non-valid, then it will appear as an * (asterisk). It is not common form of expression. We are of the opinion that a small letter holds more information than an asterisk *.

5.9. Termination by high error rate

When deciphering NAVTEX, the error rate of the decoded signal will be examined. Should the acceptance rate be exceeded, then the print out, if activated, will be interrupted and the message will be automatically deleted from the memory store.

5.10. Current list of NAVTEX transmission stations (02/98)

North Sea, Gulf of Bothnia, Finnish Gulf:

Bodoe R, NOR	LGP	B	0018, 0418, 0900, 1218, 1618, 2100
Cullercoats R, G,	GCC	G	0048, 0448, 0848, 1248, 1648, 2048
Oostende R, BEL	OST	T	0248, 0648, 1048, 1448, 1848, 2248
Oostende R, BEL	OSU	M	0200, 0600, 1000, 1400, 1800, 2200
Rogaland R, NOR	LGQ	L	0148, 0548, 0948, 1348, 1748, 2148
Stockholm Radio (64 28N, 2126E)	SDJ	H	0000, 0400, 0800, 1200, 1600, 2000
Stockholm Radio (55 29N, 14 19E)	SDJ	J	0330, 0730, 1130, 1530, 1930, 2330
Stockholm Radio (59 16N, 18 43E)	SDJ	U	0030, 0430, 0830, 1230, 1630, 2030
Vardoe R, NOR	LGV	V	0300, 0700, 1100, 1500, 1900, 2300

South Atlantic

Bahia Blanca R, ARG	L2N	D	0210, 0810, 1410, 2010
Buenos Aires R, ARG	L2B	F	0510, 1110, 1710, 2310
Comodoro Rivadavia R	L2W	C	0040, 0640, 1240, 1840
Rio Gallegos R, ARG	L3I	B	0410, 1010, 1610, 2210

West Pacific, Sea of Japan

Adak, USA	NOJ	X	0340, 0740, 1140, 1540, 1940, 2340
Antofagasta, CHL	CBA	A	0400, 1200, 2000
Astoria, USA	NMW	W	0130, 0530, 0930, 1330, 1730, 2130
Bangkok, THA		F	0050, 0450, 0850, 1250, 1650, 2050
Beringovskiy R, FE,CIS	UCT2	E	0040, 0440, 0840, 1240, 1640, 2040
Callao, Peru	OBC3	U	0320, 0720, 1120, 0520, 1920, 2320
Dalian, CHI	XSZ	R	0250, 0650, 1050, 1450, 2250
Gangzhou, CHI	XSQ	N	0210, 0610, 1010, 1410, 2210
Guam, USA	NRV	V	0100, 0500, 0900, 1300, 1700, 2100
Honolulu, USA	NMO	O	0040, 0440, 0840, 1240, 1640, 2040
Isle de Pascua		F	0450, 1250, 2050
Kholmsky R, FE, CIS	UFO	B	0010, 0410, 0810, 1210, 1610, 2010
Kushiro R, J	JNX	K	0140, 0540, 0940, 1340, 1740, 2140
Magadan R, FE, CIS	UVD	D	0030, 0430, 0830, 1230, 1630, 2030
Moji R, J	JNR	H	0110, 0510, 0910, 1310, 1710, 2120
Mollendo, Peru	OBF4	W	0340, 0740, 1140, 1540, 1940, 2340
Naha R, J	JNB	G	0100, 0500, 0900, 1300, 1700, 2100
Otaru R, J	JNL	J	0130, 0530, 0930, 1330, 1730, 2130
Paita, Peru	OBY	S	0300, 0700, 1100, 1500, 1900, 2300
Petropavlovsk-K R, FE	UBE4	C	0020, 0420, 0820, 1220, 1620, 2020

Prince Rupert, CAN	VAJ	D	0030, 0430, 0930, 1230, 1630, 2030
Provideniya R, FE, CIS	UPB	F	0050, 0450, 0850, 1250, 1650, 2050
Puerto Montt, CHL	CBP	D	0430, 1230, 2030
Punta Arenas, CHL	CBM	E	0440, 1240, 2040
San Francisco, USA	NMC	C	0400, 0800, 1200, 1600, 2000, 2400
Singapore, Jurong	9VG	C	0020, 0420, 0820, 1220, 1420, 2020
Shanghai, CHI	XSG	Q	0240, 0640, 1040, 1440, 2240
Talcahuano, CHL	CBT	C	0420, 1220, 2020
Tofino, CAN	VAE	H	0110, 0510, 0910, 1310, 1710, 2110
Vladivostok R, SE, CIS	UIK	A	0000, 0400, 0800, 1200, 1600, 2000
Yokohama R, J	JGC	I	0120, 0520, 0920, 1320, 1720, 2120
Kodiak, ALS, USA	NOJ	J	0300, 0700, 1100, 1500, 1900, 2300
Long Beach, Cambria	NMQ9	Q	0045, 0445, 0845, 1245, 1645, 2045
Valparaiso R, CHL	CBV	B	0410, 1210, 2010

Indian Ocean, Gulf of Arabia, Red Sea

Ambon, IN		B	0010, 0410, 0810, 1210, 1610, 2010
Bombay R, IND	VWB	G	0100, 0500, 0900, 1300, 1700, 2100
Damman R, ARS	HZG	G	0005, 0605, 1205, 1805
Hong Kong	VRX	L	0150, 0550, 0950, 1350, 1750, 2150
Jakarta, IN	PKX	E	0040, 0440, 0840, 1240, 1640, 2040
Jayapura, IN	PNK	A	0000, 0400, 0800, 1200, 1600, 2000
Madras R, IND	VWM	P	0230, 0630, 1030, 1430, 1830, 2230
Makkasar, IN		D	0030, 0430, 0830, 1230, 1630, 2030
Muscat, Oman	A4M	M	0200, 0600, 1000, 1400, 1800, 1905
Hamala R, BHR	A9M	B	0010, 0410, 1810, 1210, 1610, 2010
Serapeum R, EGY	SUZ	N	0750, 1150, 1550, 1950

Mediterranean Sea, Black Sea

Alexandria	SUH	N	0610, 1010, 1410, 1810
Antalya R, TUR	TAL	F	0050, 0450, 0850, 1250, 1650, 2050
Augusta	IQA	S	0300, 0700, 1100, 1500, 1900, 2300
Bari	IPB	U	0320, 0720, 1120, 1520, 1920, 2320
Cagliari	IDC	T	0310, 0710, 1110, 1510, 1910, 2310
Cape Town	ZSC	C	0020, 0420, 0820, 1220, 1620, 2020
Cross Corsen, F		A	0000, 0400, 0800, 1200, 1600, 2000
Cross La Garde (Toulon)		W	0340, 0740, 1140, 1540, 1940, 2340
Durban	ZSD	O	0220, 0620, 1020, 1420, 1820, 2220
Iraklion R, GRC	SVH	H	0110, 0510, 1910, 1310, 1710, 2110
Ismailia (Serapeum)		X	0750, 1150, 1550, 1950
Israel, Haifa		P	0230, 0630, 1030, 1430, 1830, 2230
Istanbul R, TUR	TAH	D	0030, 0430, 0830, 1230, 1630, 2030
Izmir R, TUR	TAN	I	0120, 0520, 0920, 1320, 1720, 2120
Kerkyra R, GRC	SVK	K	0140, 0540, 0940, 1340, 1740, 2140

Limnos R, GRC	SVL	L	0150, 0550, 0950, 1350, 1750, 2150
Malta,	9HD	O	0220, 0620, 1020, 1420, 1820, 2220
Mariupol R, UK, CIS	USU	B	0100, 0500, 0900, 1300, 1700, 2300
Odessa R, UK, CIS	UTW	C	0230, 0630, 1030, 1430, 1830, 2230
Port Elizabeth	ZSQ	I	0120, 0620, 1020, 1420, 1820, 2220
Roma, I,	IAR	R	0250, 0650, 1050, 1450, 1850, 2250
Samsun R, TUR	TAF	E	0040, 0440, 0840, 1240, 1640, 2040
Split R, CRT	9AS	Q	0250, 0650, 1050, 1450, 1850, 2250
Tarifa, ESP	EAC	G	0100, 0500, 0900, 1300, 1700, 2100
Troodos R, CYP	5BA	M	0200, 0600, 1000, 1400, 1800, 2200
Varna R, BUL	LZW	J	0130, 0530, 0930, 1330, 1730, 2130

Atlantic, Bering Sea, English Channel, Norwegian Sea

Arkhangelsk R, RU, CIS	UGE	F	0200, 0600, 1000, 1400, 1800, 2200
Bermuda	ZBM	B	0010, 0410, 0810, 1210, 1610, 2010
Boston, USA	NMF	F	0445, 0845, 1245, 1645, 2045, 0045
Horta, AZR	CTH	F	0050, 0450, 0850, 1250, 1650, 2050
Ijmuiden Coastguard, NLPBK		P	0348, 0748, 1148, 1548, 1948, 2348
Labrador, CAN	VOK	X	0350, 0750, 1150, 1550, 1950, 2350
La Coruna (NW Spain)	EAF	D	0030, 0430, 0830, 1230, 1630, 2030
Las Palmas (Canary I.)	EAL	I	0120, 0520, 0920, 1320, 1720, 2120
Lisbon, POR	CTV	R	0250, 0650, 1050, 1450, 1850, 2250
Miami, USA	NCF	A	0000, 0400, 0800, 1200, 1600, 2000
Montreal, CAN	VFN	X	0340, 0740, 1140, 1540, 1940, 2340
Murmansk R, RU, CIS	UMN	C	0120, 0520, 0920, 1220, 1720, 2120
New Orleans, USA	NMG	G	0300, 0700, 1100, 1500, 1900, 2300
Niton R, G	GNI	S	0018, 1418, 0818, 1218, 1618, 2018
Portpatrik R, G	GPK	O	0130, 0530, 0930, 1330, 1730, 2130
Portsmouth, USA	NMN	N	0130, 0530, 0930, 1330, 1730, 2130
Reykjavik R, ISL	TFA	R	0318, 0718, 1118, 1518, 1918, 2318
San Juan, Puerto Rico, USA	NMR	R	0200, 0600, 1000, 1400, 1800, 2200
Sept Isles, CAN	VCK	C	0020, 0420, 0820, 1220, 1620, 2020
St. Johns, CAN	VON	O	0220, 0620, 1020, 1420, 1820, 2220
Sydney, NS, CAN	VCO	Q	0240, 0640, 1040, 1440, 1840, 2240
Tarifa (Gibraltar)	EAC	G	0100, 0500, 0900, 1300, 1700, 2100
Thunder Bay, CAN	VBA	P	0230, 0630, 1030, 1430, 1830, 2230
Warton, CAN	VBC	H	0110, 0510, 0910, 1310, 1710, 2110
Yarmouth, CAN	VAU	U	0320, 0720, 1120, 1520, 1920, 2320

7. NMEA Printer and Navigation Log

7.1. Printing of NMEA Data

The FMD15 can be used as an NMEA printer. In this mode NMEA signals are fed via the NMEA 0183 interface **unaltered** to the integrated or external printer.

Please note, that only data, which are defined as NMEA data, can be processed.

The unit, which is destined to supply NMEA data (GPS, compass, log etc.), should be connected to the NMEA input of the FMD15.

Activating the NMEA print function:

- > press key **<SET UP>**
- > press key no. **3** to call up **NMEA**
- > press key no. **1** to call up **NMEA PRINT**

The FMD15 is now operating as an NMEA 0183 printer. When data comes from the connected device it will be printed out unaltered. Since NMEA data is transmitted in a one second rhythm, it is advisable not to leave the unit in this mode for a longer period, in order to save paper.

This function of the FMD15 is suitable for checking and documenting NMEA signals.

To leave this mode:

- > press key **<EXIT>** three times to return to standby mode.

ATTENTION:

During the function <NMEA PRINT> the FMD15 cannot operate other functions. This means that cannot receive NAVTEX messages nor do the timer functions operate!!

7.2. Activating Log

When connected via NMEA 0183 interface to an external GPS, it is possible with the FMD15 to receive, store and print out the NMEA data record "GPS transit specific \$ GPRMC", which is practically a complete record of the route.

The formula for this data record must read as follows:

```
$GPRMC,111111,A,2222.222,N,33333.333,W,44.555.,  
666666,77.,E*CS
```

All variants of this \$GPRMC data record with the different periods and commas will be recognised and processed. Other data records other than RMC type will not be recognised!!

The RMC data record has been defined however as the standard data record for GPS equipment, so that all well known models can be easily connected.

The contents of the data record are:

111111	-time in hhmmss
A	-identity if data valid (A) or invalid (V)
2222.222	-latitude in degrees, minutes, 1/1000mins
N	-direction - (N) north, (S) south
33333.333	-longitude in degrees, minutes, 1/1000mns
W	-direction - (W) west, (E) east
44.44	-speed over ground (SOG in Kns)
555	-heading over ground (degrees)
666666	-date as DDMMYY
77	-deviation value
E*	-check value

This data record will be memorised and stored by the FMD15. The storage can hold 50 data records. When the storage is full, the data will be automatically printed out.

To control the continual amount of data, two parameters can be selected to define the information according to your personal wish.

Parameter 1: time from 1 to 99 minutes

You can select, in which time intervals the position should be stored, even when there has been no movement (e.g. at anchor, in berth).

If **<00>** is entered as time parameter, there will be no time-defined entry. This saves data records being stored and printed out, when the vessel is stationary for a longer period of time.

Parameter 2: positional movement in minutes (1 to 9nm)

You can also select, independent from the time interval, a distance after which the position of your vessel should be documented. For easy calculation, the values north/south and east/west are separated.

To activate the log:

- > press **<SET UP>** key
- > press no. **2** to enter **GPS LOG**
- > to activate the log function press **<YES>**. (press **<NO>** to switch off)
- > use cursor **<DOWN>** to spring to position **TIME**
- > select the TIME interval with keys **<YES>/<NO>**
- > use cursor **<DOWN>** to spring to position **WAY**
- > select the WAY interval with keys **<YES>/<NO>**
- > press key **<EXIT>** 4 times to return to stand-by

The FMD15 navigation log function will work even when other functions e.g. reception, decoding are in process. Only when an incoming NAVTEX message or a longer decoding is taking place, will the position log be interrupted, however it will commence immediately at the end of the message. At any given time, 50 position data will be stored. After every 50th value, the storage will be printed out automatically. This does not take place during message decoding or when the FMD15 is being operated manually, but as soon as the FMD15 returns to the stand-by mode.

However, you can print out the actual stored data at any time. To do this:

⌘ call up the **GPS LOG**
⌘ press **<PRINT>**

When the print out has ended, the display will ask:

<DELETE ALL?>

Press **<YES>** to delete all position data in the storage or press **<NO>** to save the data. On receipt of new data, the oldest will be automatically deleted.

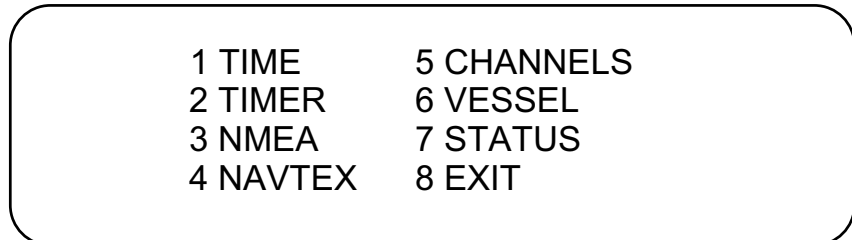
Using the above function, it is manually possible to print out the log daily. An automatic deletion after print out was deliberately waived to make it possible to repeat the print out, should there be a printer error.

8. System (SET UP)

8.1 Setting of Time and Date



⚡ Press key **<SET UP>** to enter the SETUP menu 1



⚡ The display will show:




The cursor is already on position **1 - TIME**

⚡ Press  to set the TIME

⚡ By using the cursors   you can select the hours, minutes etc. Positions

⚡ Using the cursors   you can alter the values as required.

⚡ Having checked that all values are correct, press  and return to the **<SET UP>** menu. The selected time has now been stored.

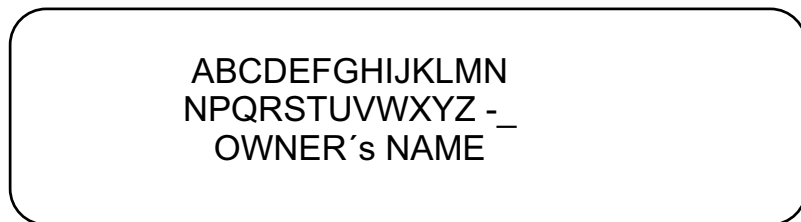
8.2. Setting of Owner's and Vessel's Names

The name of the owner and of the ship can be entered into the FMD15. They will then appear on the bottom line at the end of each print out.

⚡ use the cursor **<DOWN>** to spring to position **6 – VESSEL**

⚡ press **<ENTER>** to call up menu position **1 OWNER**.

The display will show:



Using the cursors **<YES>** and **<NO>** you can select the letters **A** to **Z**, **(-)** hyphens and **()** spaces. The selected letter is allotted by pressing **<DOWN>**. The letter can be deleted again by pressing **<UP>**. When the owner's name has been correctly selected, press **<ENTER>** to store.

The same procedure should be used for storing the vessel's name.

⚡ Use cursor **<DOWN>** to spring to menu position **<2> SHIP**

⚡ Press **<ENTER>** to call up above display.

8.3. Print Out of System Data

The following system data can be printed out:

- ⚡ Navigation log ON/OFF and (by ON) trigger parameters
- ⚡ programmed reception channels and their
- ⚡ mode
- ⚡ message storage
- ⚡ message direct print out
- ⚡ programmed timer status 1 to max. 9
- ⚡ unit type and version number
- ⚡ name of owner and ship if entered

To activate the print out:

- ⚡ press **<DOWN>** and spring to position **7 - <STATUS>**
- ⚡ press **<ENTER>** to commence printing

NAVTEX parameters can be printed out separately under menu position **3 - NAVTEX**.

Data storage:

All stored data, such as system parameters, receiver parameters, timer status, stored messages etc. remain stored for at least 3 months, and under optimal conditions up to 12 months. This is possible because of the integrated NiCd battery, which is continually charged when the unit is in operation.

It is recommended that in a case, where the unit should be out of operation for a longer period, that you print out the system data and the NAVTEX parameters and file them. Should there be a loss of data, you can re-enter the old data from the print out.

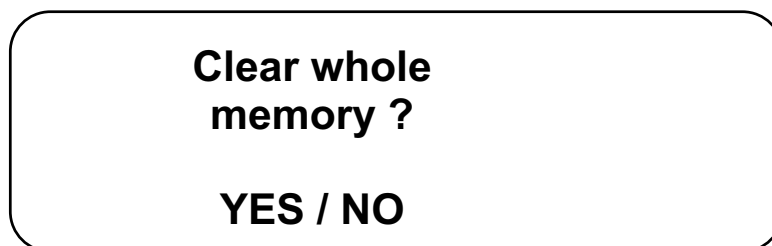
8.4. Memory Store, Deletion and Reset

All programmed system parameter data can be deleted i.e. can be reset to the standard parameters. Equally, all stored messages can be deleted. In this case the programmed timer status, navigation log status and NAVTEX parameters will also be deleted. It is therefore recommended, that you print out the system and NAVTEX status, before you commence this function (see chapters 8.3. and 5.7)

To activate the deletion function:

1. Switch off the unit - **<OFF>**
2. Hold key **<NO>** and
3. Switch on - **<ON>**
4. Release key **<NO>**

The display will show:



5. answer by pressing **<YES>** or **<NO>**
6. Switch the unit off for a few seconds and switch on again.

All data and news programmable, are deleted and can now be newly programmed.

9. Installation

9.1. Delivery contents

Please check, that the following contents, necessary for the installation of the FMD15 are supplied:

#	1 pc	pre-assembled power connection cable
#	2 pcs	universal mounting brackets
#	4 pcs	self holding spacers
#	4 pcs	lock washers M5
#	4 pcs	thumbscrews M5
#	1 pc	spare fuse 2A slow-blow 5 x 20mm
#	1 pc	fuse, 300mA slow-blow 5 x 20mm (active antenna)
#	1 pc	mounting hole template
#	1 pc	instruction manual

9.2. Installation of unit

The two universal mounting brackets allow:

- # desk top fitting
- # wall fitting

Additionally the FMD15 can be fitted at 4 different angles. Screw the brackets with the 4 screws to the wall or ceiling, using the adhesive template in order to bore the holes in the correct positions.

On each side of the FMD15, there are two M5 threaded holes for fitting at the required angle with the thumb screws. Beforehand, press the self-holding spacers into the selected holes. These keep the brackets at a defined distance from the casing and has been accounted for in the template.

Before boring the holes, we recommend you to attach the brackets, power supply and antenna cables, and select the final mounting position.

Using the template, bore the holes in the exact positions and screw on the brackets. Hold the FMD15 at the selected angle and attach with the thumb screws into the holes with the spacers.

ATTENTION

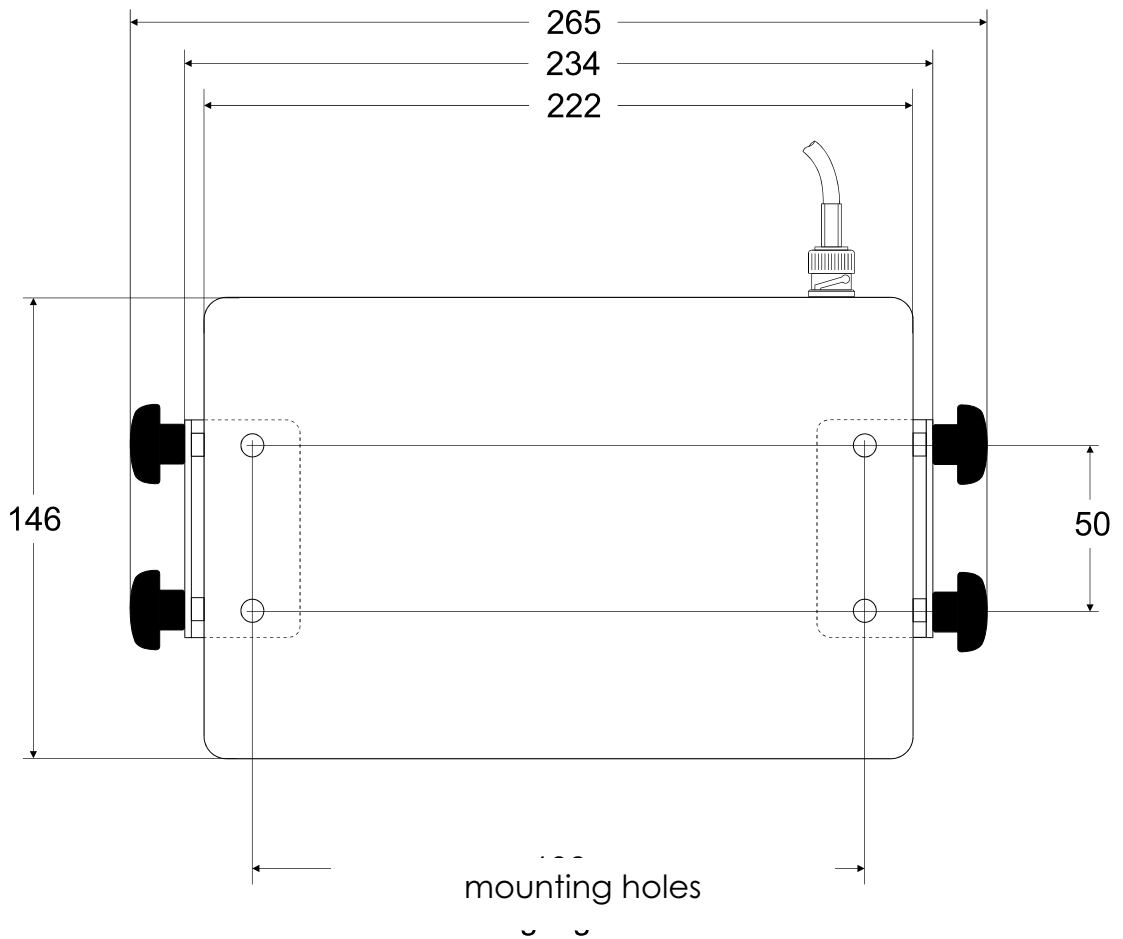
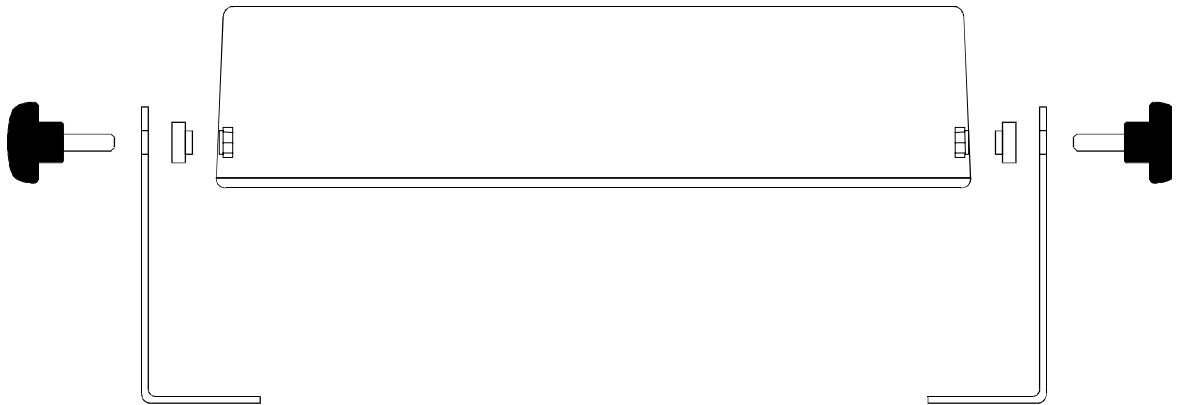
IMPORTANT INFORMATION

The FMD15 has two M5 threaded holes on either side for the supplied thumb screws, so that it can be fitted to the universal mounting bracket. The length of the thumb screws has been so determined, that, together with the bracket and the lock washers, they can only penetrate approx. 5mm into the thread.

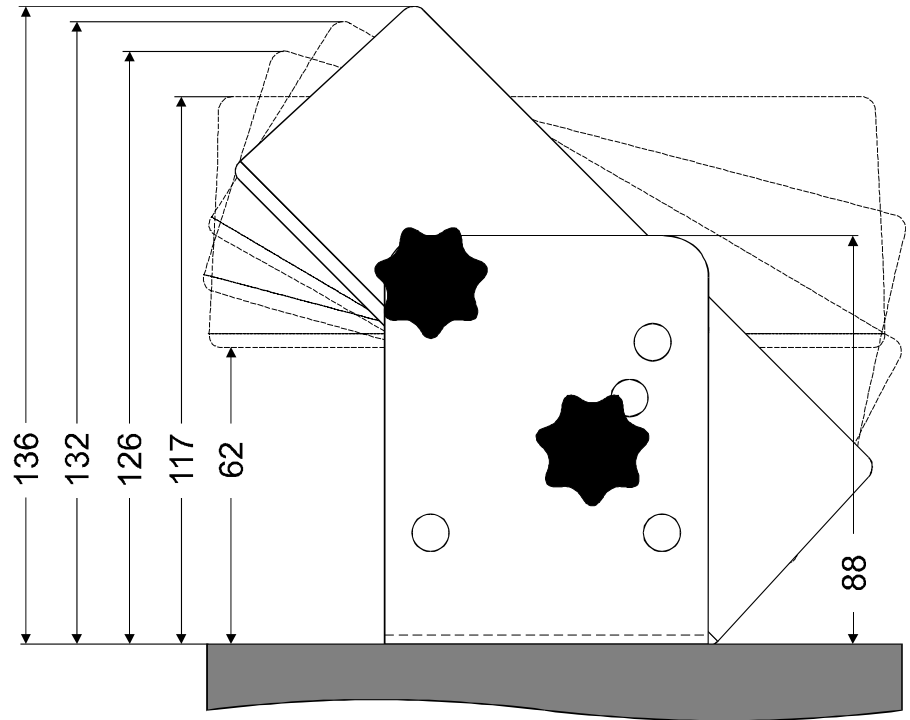
Should you use alternative fitting methods or screws, please make sure that they do not penetrate the thread by more than 5mm.

By using longer screws, the integrated electronic could be damaged !!

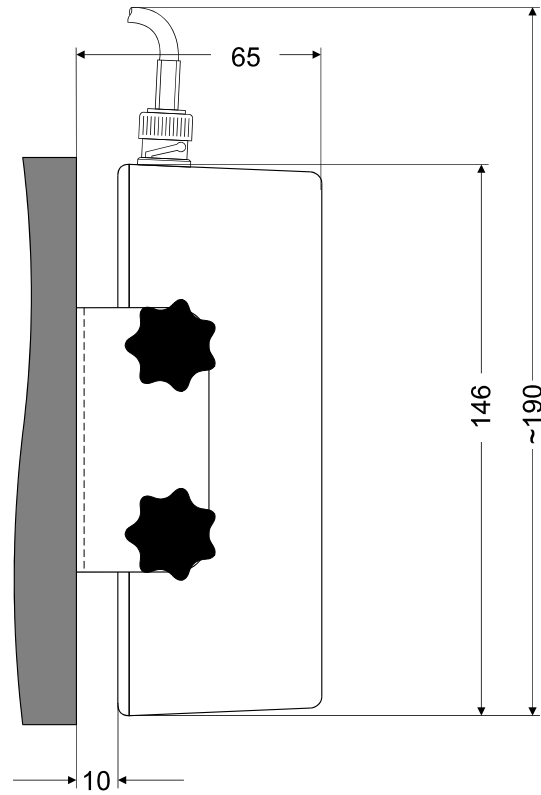
Dimensions:



Desk Top Mounting



Wall Mounting:

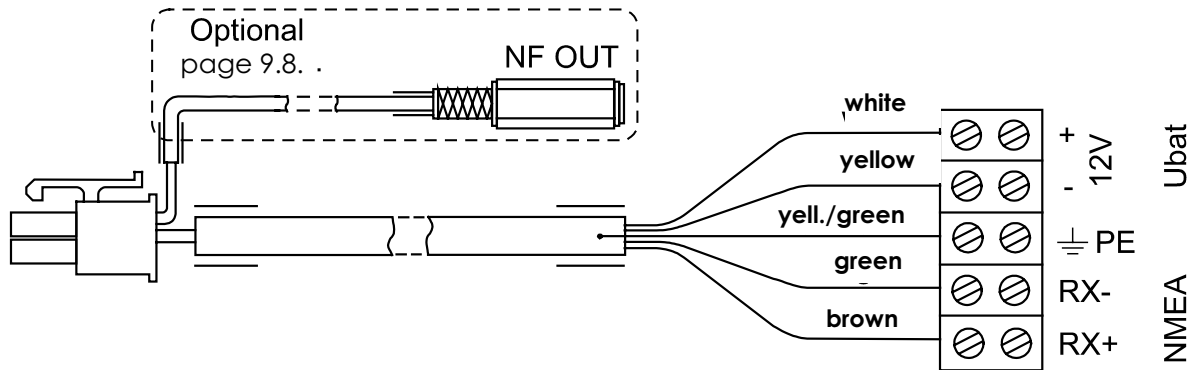


9.3. Power Supply Connection

Plug the pre-assembled cable supplied into the socket at the rear. The clip on connection is self-locking. To release, the lock clip must be pressed in the direction of the casing with a suitable tool.

The unit was manufactured to operate on a supply voltage of 11V to 15V DC (12V battery). The FMD15 has reverse battery and over voltage protection. Should an incorrect connection take place, check the fuse and if necessary, replace.

The power cable is shielded to suppress disturbances. The open end is ready for connection and is fitted with a terminal strip.



The connection should be as near as possible to the distribution panel or the battery. It is most important, that the current is completely free of interference. Should there be any doubt, we recommend, that you fit a suppression filter.

Before switching on, we recommend you to test the polarity and the voltage at the terminals on the unit.

9.4. NMEA Interface Connection

Using the FMD15 as navigation log or NMEA printer, the NMEA interface must be connected with an external NMEA device (e.g. GPS) The TX+ / TX- of the external unit must be connected to the RX+ / RX- of the FMD15.

9.5. Antenna and earth connection

The antenna socket is designed to be fitted to a coaxial cable connection with a BNC plug and impedance of 50Ω. No provision has been made for the connection of high impedance, unshielded antennæ.

The reception quality depends, to a high degree, on the quality of the antenna used. A good antenna guarantees good reception.

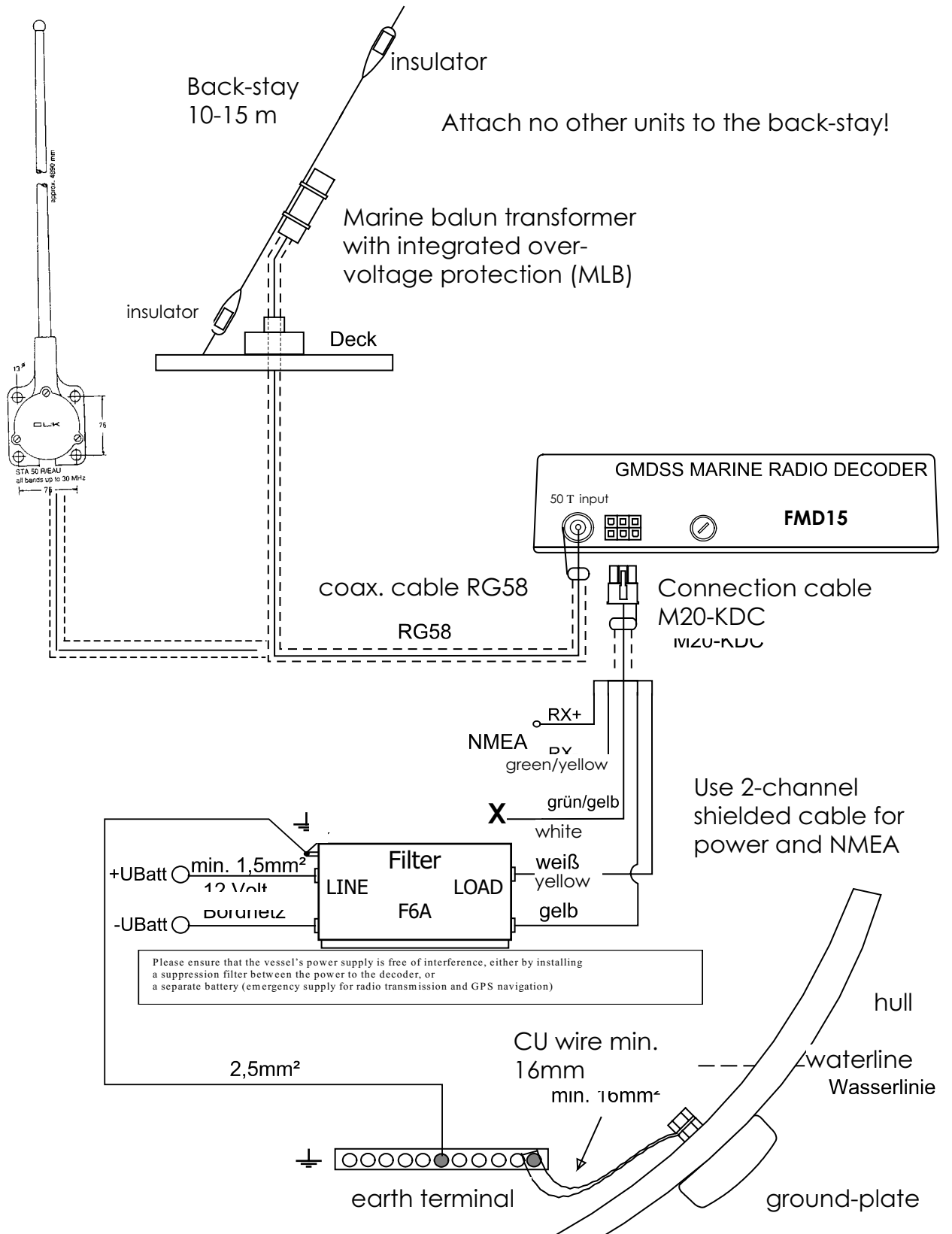
We recommend the use of a well tuned passive antenna or a high performance active antenna. Cheap active antenna do not provide the desired results due to bad cross-modulation characteristics.

Long wire antenna (e.g. on the back-stay) should be used in connection with an impedance matching balun transformer.

Important for good reception is of course good earthing of the ship's power supply and the FMD15. An adequately dimensioned grounding sponge and properly matched antenna will result in optimum performance.

For installation recommendations, see the following pages:

Antenna – MLB Long-wire for Sailing Yachts and – Whip for Motor Vessels

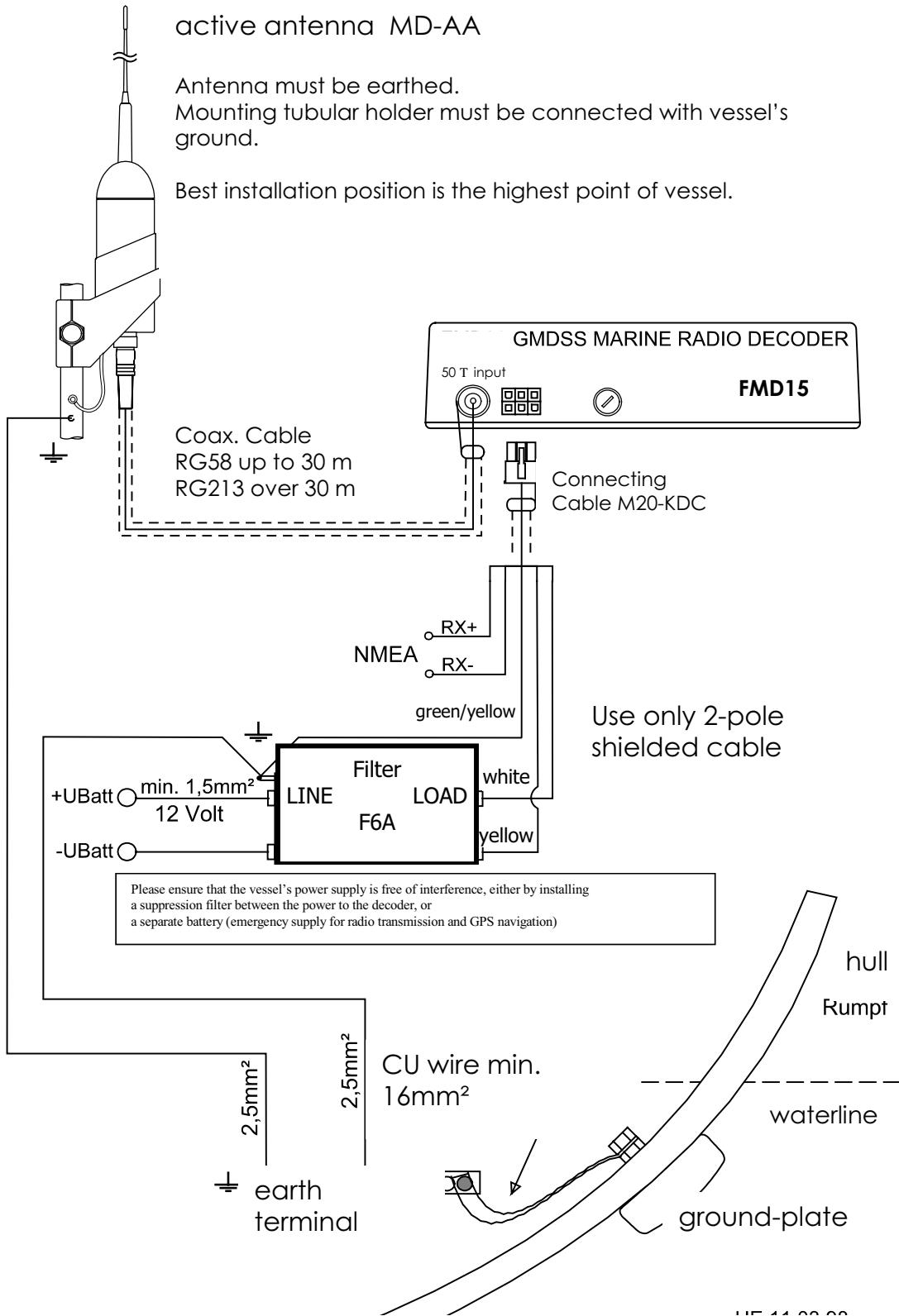


MD-AA Active Antenna

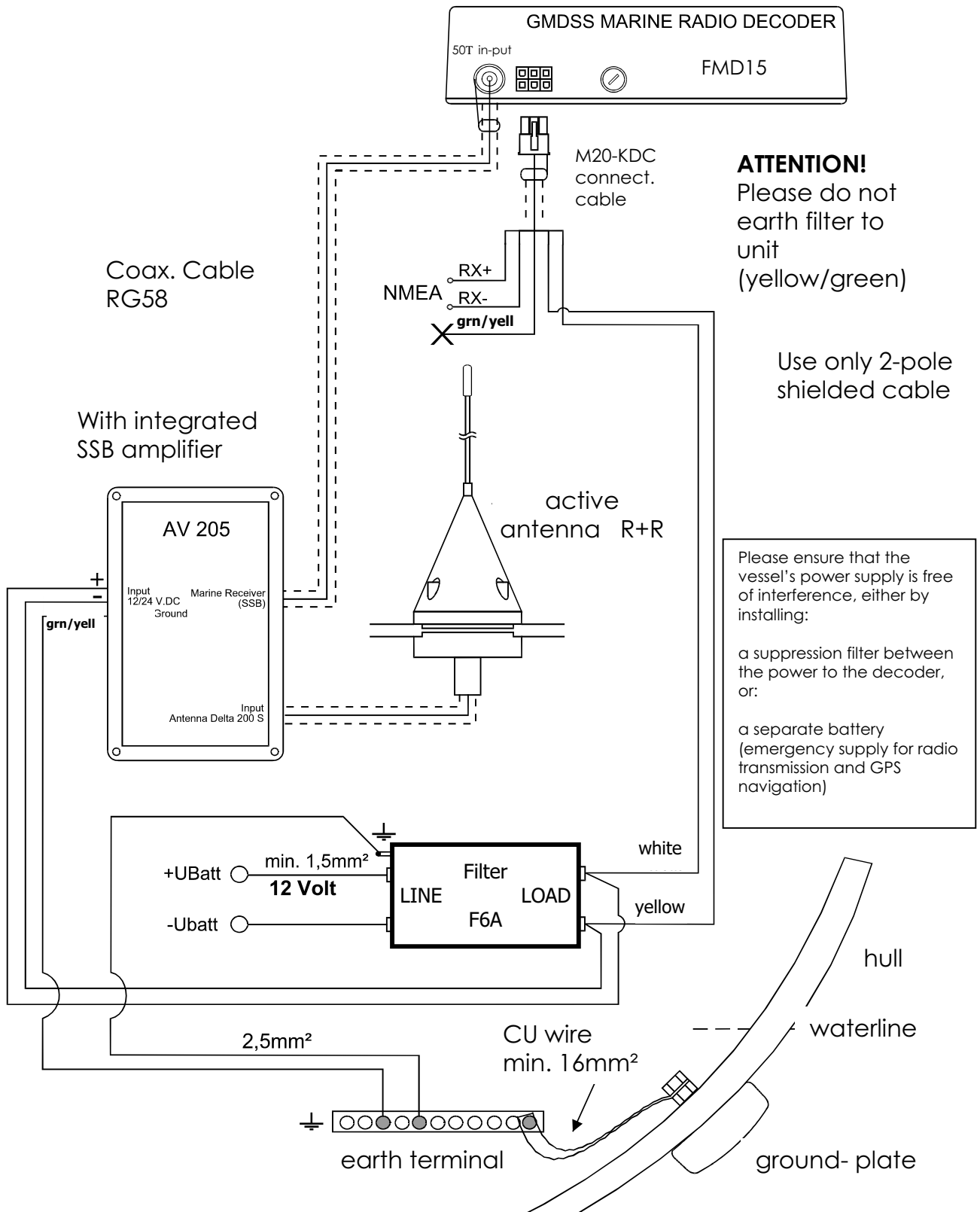
active antenna MD-AA

Antenna must be earthed.
Mounting tubular holder must be connected with vessel's ground.

Best installation position is the highest point of vessel.



R+R Active Antenna

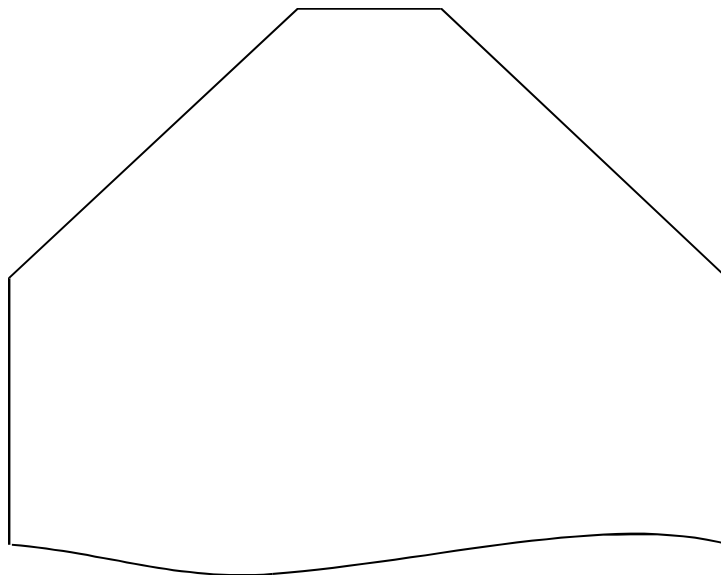


9.6, Printer Paper Change

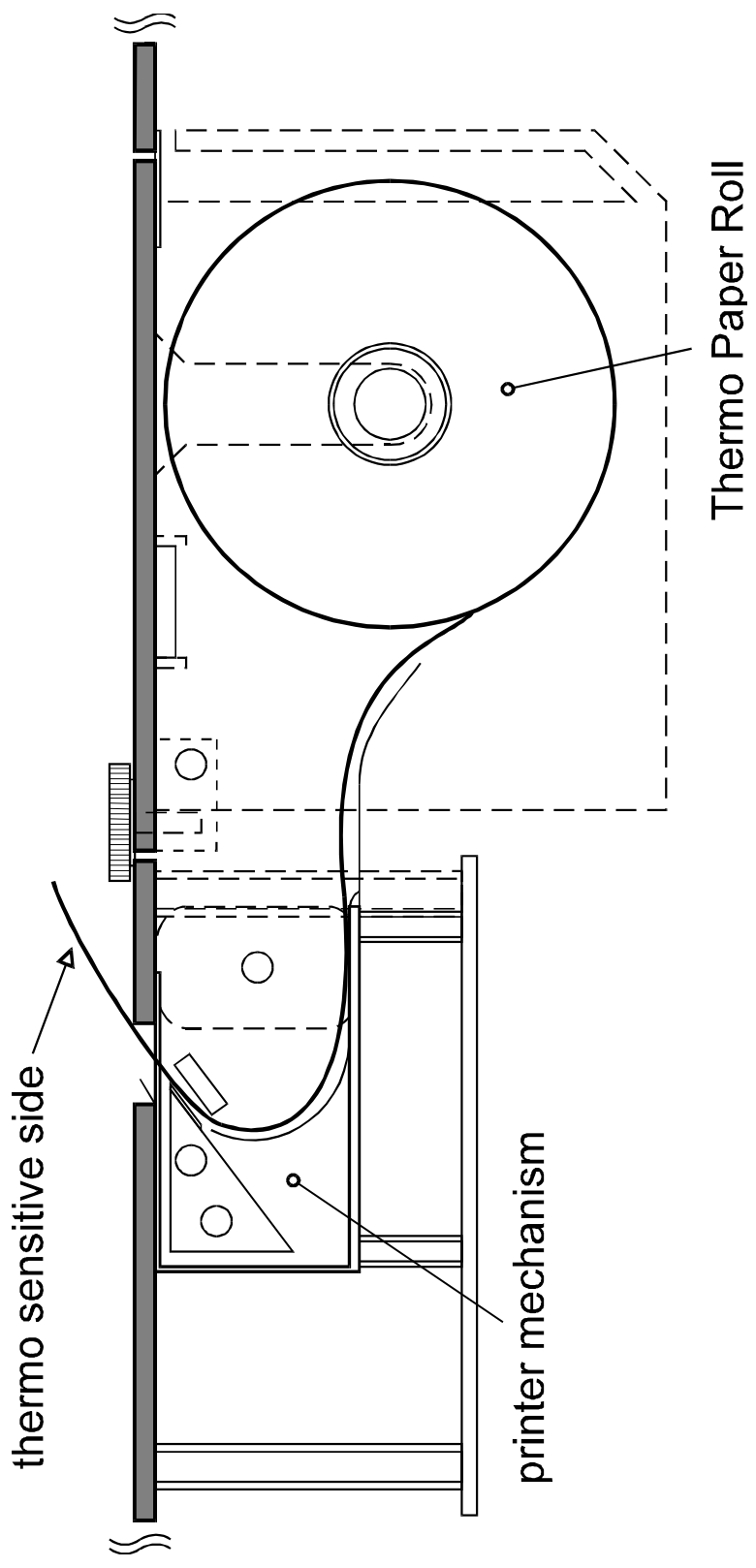
The FMD15 has a thermal printer, paper width: 80mm. The diameter of the paper roll must not exceed 45mm and the diameter of the core, no more than 12mm. The standard supplied roll has an approximate length of 25 metres and prior to reaching the end, a colour indication will appear, reminding you to change the roll.

Changing the roll:

1. Switch the unit off
2. Remove paper roll lid
3. Pull the old roll and core rod upwards to remove, making sure that there are no paper remains are left in the mechanism!
4. Stick the core rod through the new roll and replace in the holder.
5. Cut the end of the roll as in sketch



6. Feed the paper through the guide until the paper appears at the tear-off blade.
7. Straighten the paper by pulling parallel.
8. Replace the lid.
9. Switch on the unit
10. Print out one of the stored messages to test if the printer is working correctly.



thermo sensitive side

printer mechanism

Thermo Paper Roll

9.7. Active Antenna Power Supply

The FMD15 has an integrated feeder for a power supply of 12V and maximum current consumption of 250mA, for an active antenna, which means that any interconnected supply units in the antenna cable are superfluous.

This supply unit is **not activated** when leaving the factory, because when attaching a balun transformer (impedance matcher), there would be a short circuit burden and other types of antennæ would have a 12V burden on the coupling.

To activate the power supply for the active antenna:

remove the lid of the unit by unscrewing the six screws on the rear of the unit. Put in the 5 x 20mm / 500mA tubular glass fuse which is supplied into the fuse holder next to the main fuse.

ATTENTION:

SHOULD IT BE NECESSARY TO CHANGE THIS FUSE AT ANY TIME, NEVER USE STRONGER FUSES, AS THIS COULD LEAD TO DESTRUCTION OF POWER SUPPLY PARTS!!

9.8. Audio output

The FMD15 does not have a LF amplifier nor integrated speakers. This means one cannot hear or control acoustically. For every day use, this is unnecessary with the FMD15, as the signal strength is displayed. Maximum is twelve arrows but from seven arrows upwards, the signal is strong enough to be decoded. However the strength of the signal can be influenced by strong noise ratio or interfering signals.

Optionally, you can order a shielded cable of about 50cm and a 3.5mm jack, on which there is an LF signal sound of approximately 1 Vpp, which can be made audible over a suitable amplifier and speaker.

Fastnet Radio offer a loudspeaker with integrated 12V DC amplifier, which can be connected simply to the 3.5mm jack.

10. FMD15 Accessories

10.1. 24V DC/DC Converter

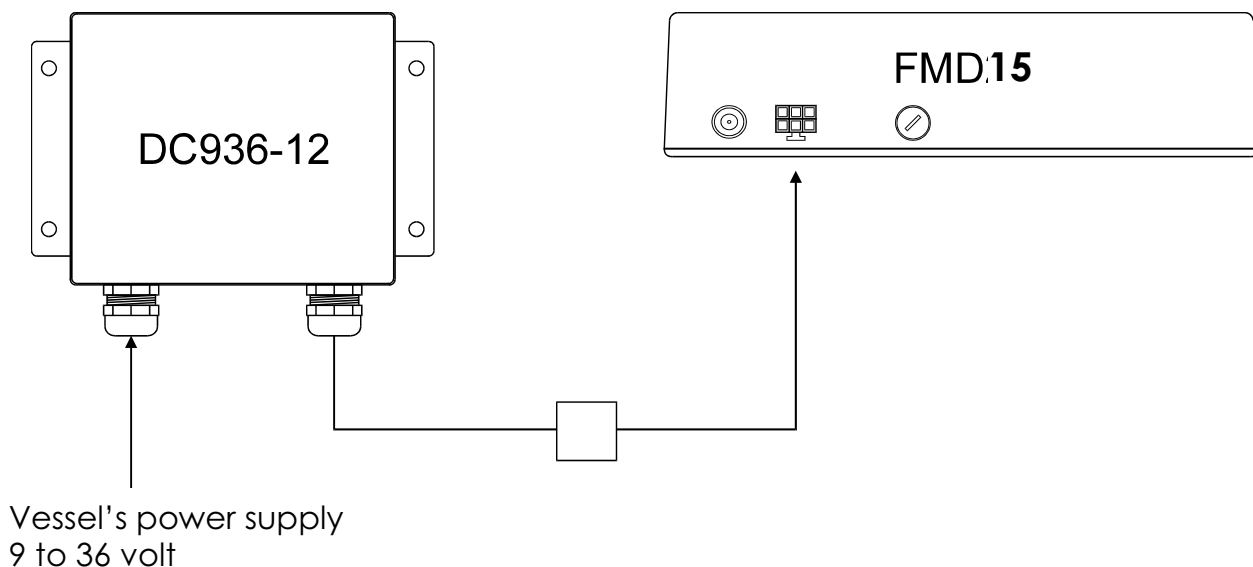
The FMD15 can be operated with a DC/DC converter. This offers the following advantages:

#input voltage range 9V to 36V

#constant output voltage 12.5V

This means that the FMD15 can be operated by 12V and 24V batteries. The DC/DC converter has an integrated filter, which suppresses interference from the ship's voltage supply and offers additionally, a galvanic separation between the power supply and the unit. (An advantage for aluminium hulls).

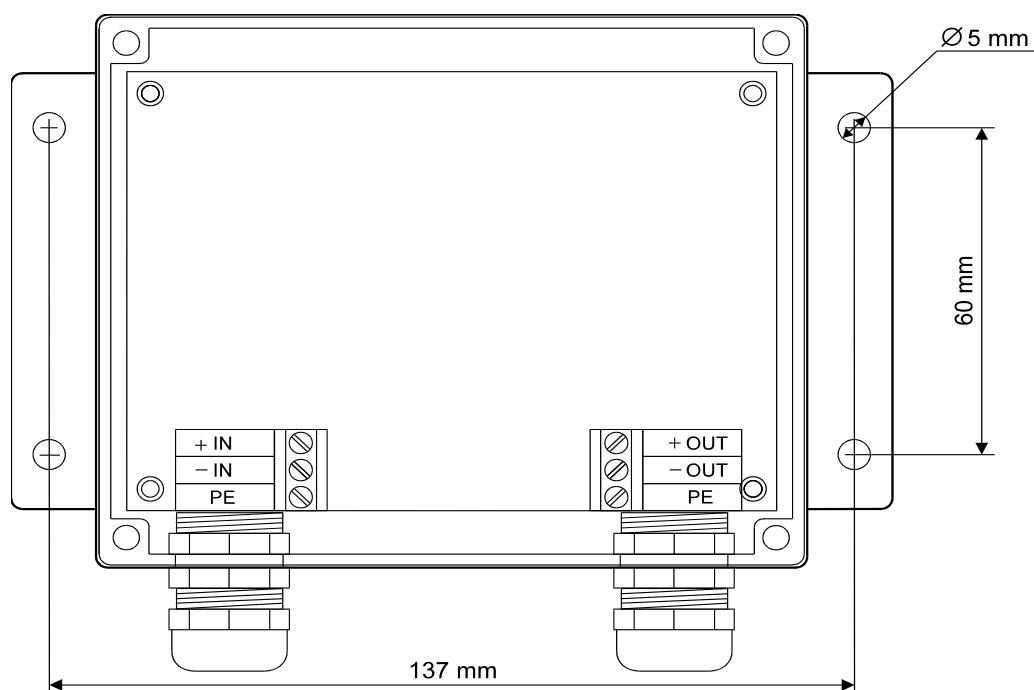
10.2. Converter Installation



10.3. DC936-12 DC/DC Converter from 9V-36V DC to 12V DC

With the DC/DC converter, DC936-12, it is possible to operate electronic 12V nominal voltage devices with a 24V on board network. Vice versa, with the 936-24, a 24V a unit can be operated with a 12V network. The maximum power consumption of the unit connected can be as high as 30 Watt.

By an input voltage from 9V to 36V, the output voltage will be constant. The input and output voltages are galvanically separated. The efficiency is between 75 and 82%, depending on the fluctuation of load. Special filters have been integrated at input and output, to suppress noise voltage and radiation interference and which guarantee interference free operation of connected devices and from the onboard network. We recommend that you use shielded cables for input and output. For this reason, an earth connection has been provided for at both terminals.



Technical Information:

Dimensions:	150 x 102 x 36 mm (l x b x h)
Connections:	PG11 terminal screws
Input voltage:	9 to 36 Volt DC
Type DC936-12:	12V output voltage max. output current 2.5A
Type DC936-24:	24V output voltage max. output current 1.25A

10.4. MD-AA Active Antenna for FMD15, 20, 50 and 55

Description:

The MD-AA active antenna has been specially developed and tuned for the Fastnet Radio GMDSS Marine Decoder series FMDxxx, but can also be used for any other receiver in the above range.

It was mainly designed for the reception of vertically polarised waves in the long, medium and short ranges. Extra value has been placed on a greater spacing interval between the signal and the interference level, rather than reaching a higher output potential. Carefully tuned for this purpose, the antenna electronics adapt themselves to a low noise level, vertical linear impedance transformer, which guarantees the highest possible signal interference immunity. By using the most modern shielded circuits, damage, caused by over-voltage, such as atmospheric or electrostatic lightning, will generally be ruled out.

The electronics are installed in a shockproof, UV and oil resistant casing, which optimally protects them against mechanical or atmospheric damage. The robust N-connection in the antenna is weathering resistant.

A fitting coaxial cable (RG214/RG58) serves simultaneously to branch off reception signals as well as to supply the distribution voltage.

A universally fitting mount for the installation on tubular or plain surfaces is standard supply.

The latest versions of FMDs have an integrated antenna -adapted power supply, which can be activated on desire.

In this case, only a suitable coaxial cable, connected to the decoder's antenna input, is required, making the additional installation of an antenna power supply unnecessary.

Technical data.

Frequency range: 100kHz to 30MHz
 Nom. impedance: 50T
 VSWR <2
 HF connection: N-socket
 Power supply: via HF connection
 Voltage: 12V DC (10 - 16V)
 Consumption: max. 65mA at 12V
 Distortion:

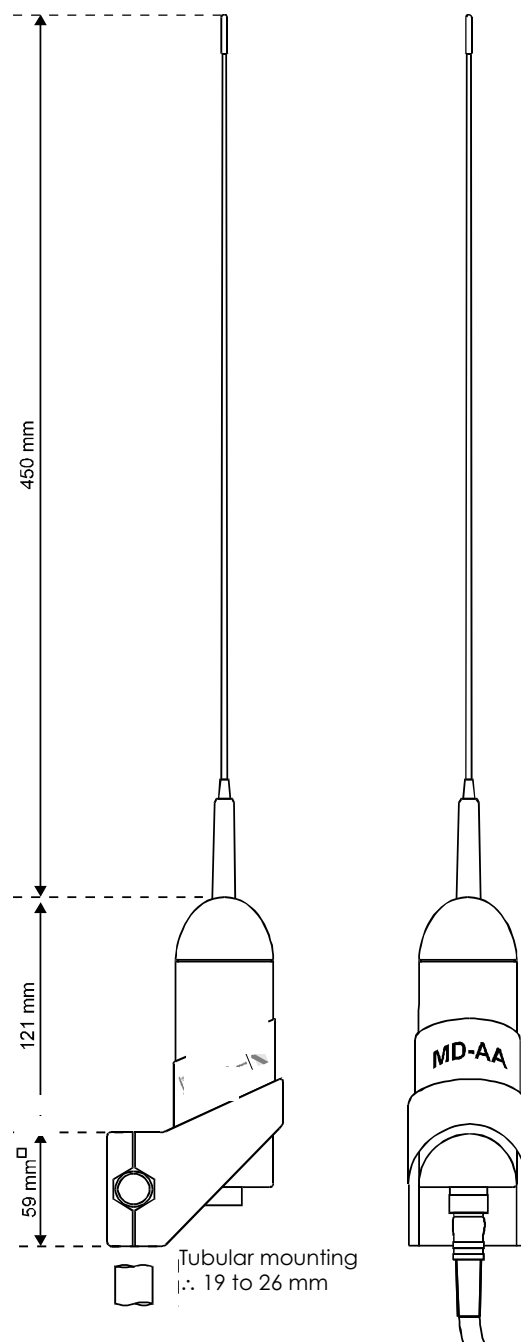
2.Level

E1=E2=0V/m type 75dB
 3. level E1=E2=0V/m type 95dB

Dimensions: see sketch

Weight: approx. 400 gr.

Temperature range: -25°C to +55°C



Ordering information:

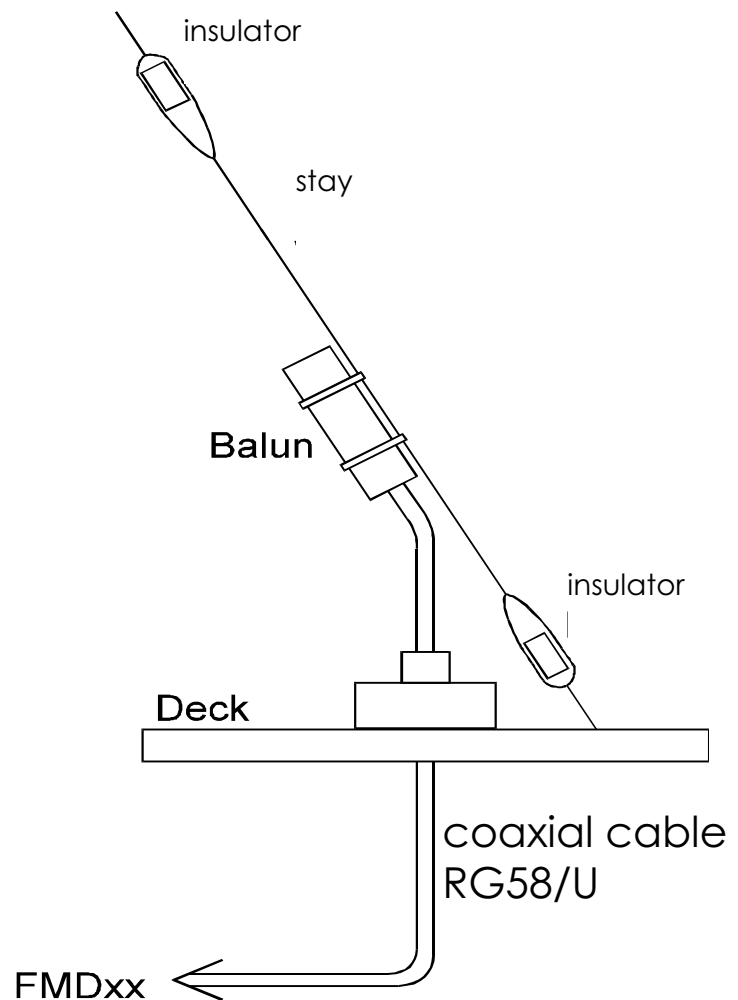
MD-AA Antenna incl. holder
 And N-plug for RG58/U
 Voltage feed
 AA-PS: (optional)

10.5. MLB Marine Long-Wire Balun Transformer for Back-Stay

The function of the MLB is to match impedance of the high Ohm long-wire stay antenna with the 50T antenna input. The balun is connected to the antenna input with a shielded 50T coaxial cable. This leads the antenna signal to the receiver input but not the noise voltage interference. This results in a vital improvement in the quality of reception.

With its special matching transformer, it enables you to use an insulated stay, with a length between 6 and 25 metres, as an antenna for a reception range from 100kHz to 30MHz.

An over-voltage protection against electrostatic charging during lightning storms has been built in.

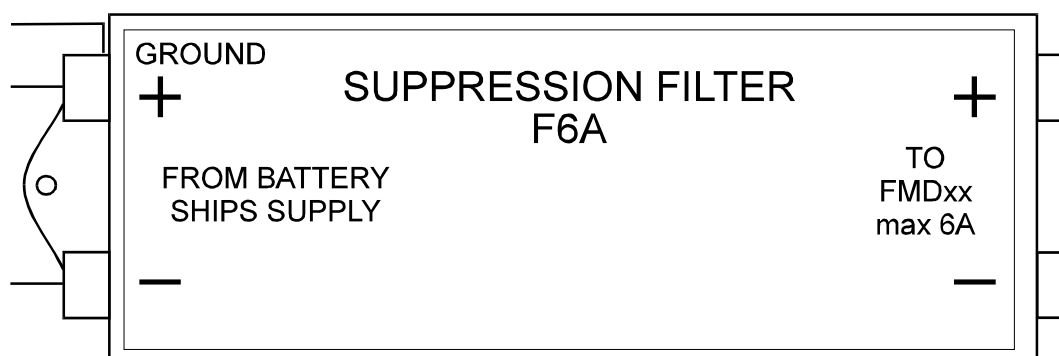
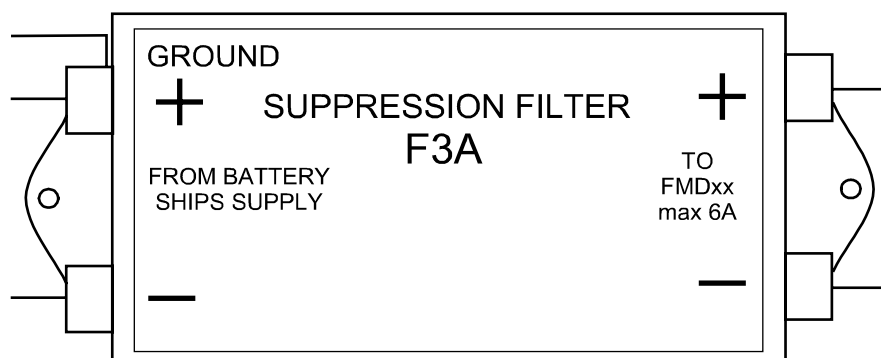


Order information: MLB marine long-wire balun transformer

10.6. F3A/F6A suppression filter

Practically every piece of electrical or electronic equipment on board, which is connected to the vessel's power supply, such as the generator, the battery charger, pumps, refrigerator etc., cause disturbances within the power supply. This could interfere with the function of sensitive electronic equipment, such as a receiver.

This filter suppresses a great deal of such disturbance, which may reach the decoder via the power supply. It can be simply fitted between the power supply and the unit.



Order Information: F3A (F6A) suppression filter 3A (6A)

10.7. M20-ALS - active loudspeaker for FMD15

The FMD15 has an integrated LF amplifier with a loudspeaker for the acoustic reproduction of the reception signal. For the everyday use of the FMD15 this is not necessary.

For testing the initial installation of the particular antenna, it is very useful for searching disturbing influences and for servicing and updating purposes, it is necessary to receive the reception signal acoustically.

The M20-ALS is an active speaker with an integrated amplifier. When fitted to the audio-output, it makes it possible to hear the reception signal.

The M20-ALS functions with 12 volt DC (10-15V).

Technical information:

Dimensions: 91 x 145 x100mm (WxHxT)

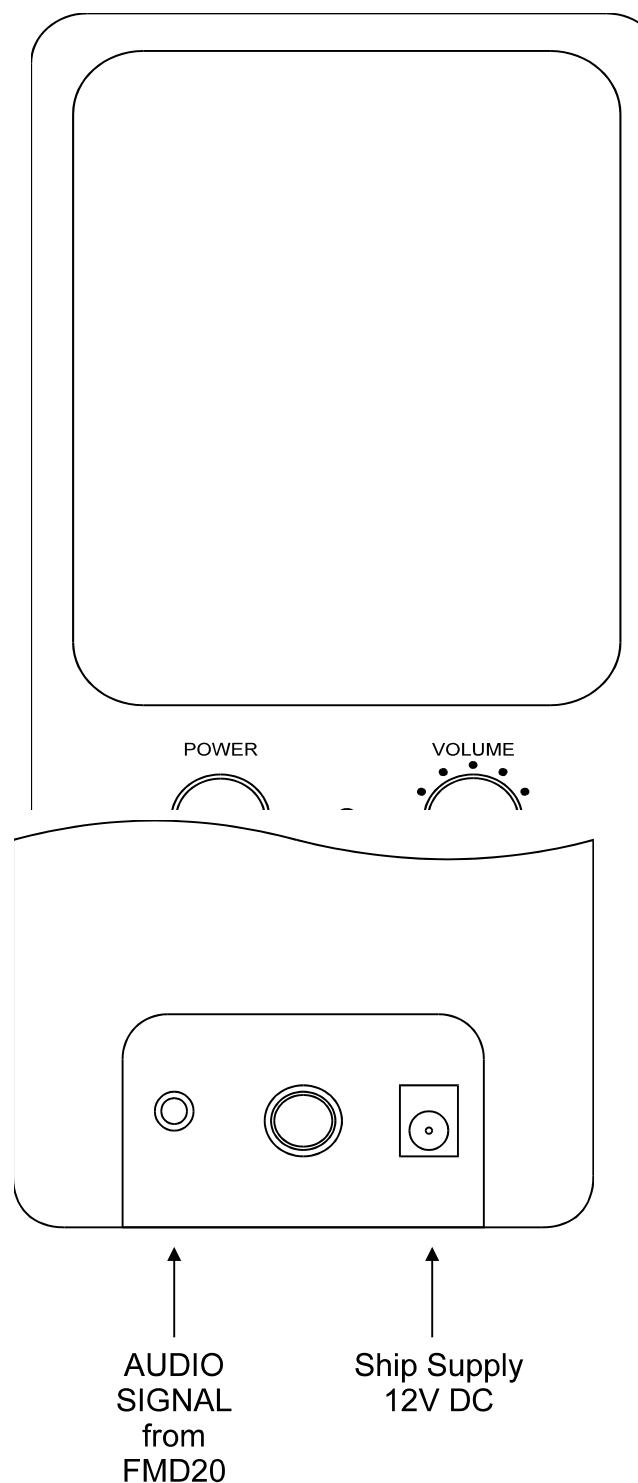
Supply: 12V DC (10-15V)

Input supply: 3 Vss max.

Output: 15 Watt peak max.

Delivery Contents:

- ALS
- Power cable
- LF connector cable
- Connector cable to FMD15 with LF output.



Order information: M20-ALS active loudspeaker for FMD15

11. Technical Data

11.1. General:

Dimensions	: Receiver 222 (W) x 146 (H) x 55 (D) mm incl. brackets 288 (W) x 170 (H) x 65 (D) mm
Weight	: approx. 1.5 kg
Power Supply	: 12 V nominal (11 to 15 V DC), : optional 10 to 36 V
Consumption	: 150 mA in Stand-by, : 250 ma decoding : 600 mA operating, 1,2 A printing
Fuse	: Spare Fuse, 2 A slow blow, 5x20mm

11.2 Receiver:

Frequency Range:	518,0 kHz (NAVTEX) and 1 channel between 100 kHz to 13 MHz
Modulation	: FSK, CW
Receiver System	: Double Superheterodyne Receiver with PLL Synthesiser tuning
Pre-selection	: selective band filter
IF	: 10.7 MHz
IF filter	: quartz 10.7 MHz
Audio Filter	: 900 - 1700 Hz
Display	: LCD panel display
Antenna Input	: 50 Ohm asym., BNC Connector
Audio Output	: internal to PLL signal converter external 3.5mm jack bush with approx. 1 V _{ss} signal level

11.3. Micro-Controller

System Processor	: SAB80C535 Siemens
Program Memory	: 64K x 8 EPROM
Data Memory	: 32K x 8 S-RAM
System Clock	: 15360 MHz

11.4 Signal-Converter - Decoder

Converter : NF PLL lock system
Decoding : Morse 40 tp 100 Bpm
RTTY 50 Baud
SITOR 100 Baud
NAVTEX
Timer : 9 - user programmable

11.5. LCD Display

Display module : L2014 Seiko or equivalent
Display area : 71 X 21 mm
Resolution : Text mode 4 lines 20 rows
Back-lighting : LED back-lit

11.6. Printer

Printer mechanism : MTP 401 Seiko
Printer head : Thermal head printer
Resolution : 5 x 7 dots per character
Printer speed : 0,6 characters per second
Paper width : 80 mm, print width 67 mm
Print lifetime : 500000 characters

11.7. ~~MA~~ Interface (receive only)

Interface : NMEA 0183
Baud rate : 4800 baud
Data String : \$GPRMC for log

11.8 Supply for Active Antenna

Supply : nom. 12 V
Power : max. 250 mA
Fuse : spare fuse, 500 mA slow blow, 5x20mm

11.9. Approvals

CE Conformity Explanation
Inspected by IEC 945 3rd edition
Basic Standard for GMDSS Equipment

12. Information Stations, Reception Conditions

12.1 Stations, Frequencies and Transmission Times

The most complete and exact listing is to be found in the

Admiralty List of Radio Signals Volume 3
Radio Weather Services and Navigational Warnings













An annually up-dated edition is issued by :

Hydrographer of the Navy
Admiralty List of Radio Signals
Taunton
Somerset TA1 2DN
United Kingdom
Tel: +44 1823 337900
Fax: +44 1823 334752

This book can be purchased by Fastnet Radio or in every qualified nautical bookshop.

Fastnet Radio prepare the latest information for the most important sailing regions in Europe and will gladly send this on request.

12.3. Beaufort Scale of Wind Force

Beaufort Scale	Description	Average Wind Force in m/s	Average Wind force in kn	Description in the Weather Chart
0	calm	<0.2	<1	
1	light air	0.3 – 1.5	1 – 3	
2	slight breeze	1.6 – 3.3	4 – 6	
3	gentle breeze	3.4 – 5.4	7 – 10	
4	moderate breeze	5.5 – 7.9	11 – 15	
5	fresh breeze	8.0 – 10.7	16 – 21	
6	strong breeze	10.8 – 13.8	22 – 27	
7	moderate gale	13.9 – 17.1	28 – 33	
8	fresh gale	17.2 – 20.7	34 – 40	
9	strong gale	20.8 – 24.4	41 – 47	
10	whole gale	24.5 – 28.4	48 – 55	
11	storm	28.5 – 32.6	56 – 63	
12	hurricane	>32.6	>63	

12.4. Sea Swell

See table on page 417 of the Admiralty List of Signals NP 283(1).

12.5. Antenna Reception On Board

Today radio receivers belong to standard equipment on board all sea-going vessels.

Too little attention is paid to the fact, that a receiver functions only as good as the quality of the antenna being used.

What should one take into account when choosing the antenna?

The frequency range of the antenna must have the same range as the receiver, at least have the same range that is going to be used.

The output impedance of the antenna must match the input impedance of the receiver. In other words, the antenna and the receiver must conform.

The antenna and the cables leading to the receiver should transmit the least possible interference to the receiver. This entails proper grounding of the receiver and the antenna.

Receivers used in the maritime sector are usually constructed to function within a range of 100kHz to 30MHz i.e. from the lowest LW range to the top of the SW range. This corresponds to a wavelength of 3000 metres to 10 metres, which is a vast range. Since the length of an antenna is in a fixed ratio to a wavelength, it is understandable that it only matches one frequency properly. When using a long-wire antenna e.g. insulated back-stay, a suitable matching transformer should be fitted between the antenna and the lead to the receiver. There are such adapters, e.g. a marine balun (MLB) (balanced/unbalanced), which match the antenna via a shielded cable to the receiver quite satisfactorily. The antenna should be installed as high as possible away from any disturbing factors. Practically every electric or electronic device send out interfering signals, which should not reach the receiver. Modern devices carrying a CE approval are more or less disturbance free. In the case of older devices, it is necessary to take steps to decrease the interference which they cause. The lead from the antenna to the receiver must be non-dissipative, well shielded coaxial cable with the same impedance as the receiver input. Usually it is laid parallel to other disturbing cables and electric

devices, A badly shielded cable will pick up local interference and pass it on to the receiver. The receiver itself should be connected to a grounding plate at the least possible distance.

A passive long-wire antenna installed in the best possible position with a matching impedance and a shielded lead cable, is usually sufficient to allow a satisfactory reception quality.

Alternatively you can install an active antenna. The input resistance of the amplifier of an active antenna is very high, so that only a very short whip is necessary. The output resistance of the amplifier is 50 Ω throughout the specified range, so that a corresponding coaxial cable of also 50 Ω is sufficient to carry an antenna signal without further loss of impedance to the receiver input. The difficulty in the realisation of a good active antenna is to make the integrated amplifier and the impedance converter linear and that it is not over-modulated by strong signals from nearby transmission stations which cause self generated interference signals to be passed on to the receiver. As a rule this is only possible with an efficient amplifier and the corresponding power consumption, it is a challenge therefore, for the developer to find the best solution between the highest linearity and the lowest consumption.

Because of the smaller dimensions, it is easier to find a suitable position for installation of an active antenna far away enough from disturbing influences. The lead to the receiver via the shielded coaxial cable is uncritical. Using a high quality active antenna will give an optimum reception.

12.6. MORSE Code Table

The FMD15 will recognise the following code and translate accordingly:

MORSE Code	Character	Remarks
• -	A	
• - • -	Ä	
• - - • -	Å,Á	displayed as „a“
- ••••	B	
- • - •	C	
- - - -	CH	
- ••	D	
•	E	
••• - •	F	
- - •	G	
•••••	H	
••	I	
• - - -	J	
- • -	K	
• - ••	L	
- -	M	
- •	N	
- - • - -	Ñ	displayed as „n“
- - -	O	
• - - •	P	
- - • -	Q	
• - •	R	
••••	S	
-	T	
••• -	U	
••• - -	Ü	
••••• -	V	
• - -	W	
- ••• -	X	
- • - -	Y	
- - ••	Z	

MORSE Code	Character	Remarks
• - - - -	1	
• • - - -	2	
• • • - -	3	
• • • • -	4	
• • • • •	5	
- • • • •	6	
- - • • •	7	
- - - • •	8	
- - - - •	9	
- - - - -	0	
- • - - • -)	Closing Parenthesis
- • - - •	(Opening Parenthesis
- • • - •	/	Slash
- • - • - •	+	Plus symbol
- - - • • •	:	Colon
• - • - • -	.	Period
- • • • -	=	Equal symbol / new line
• • - - • •	?	Question mark
- - • • - -	,	Comma
• - • • - •	„	Quote symbol
- • • • • -	_ - _	Minus Symbol, Hyphen
• - - - - •	'	Apostrophe, Accent
- • - • -	_ ! _	Exclamation mark
- • - • -	_ + _	End of message
• • • - • -	_ sk _	End of transmission
• • • • • • • •	_ err _	Error
• - • • •	- w -	Please wait
• - • • -	_ - _	Hyphen
• • • - - - • • •	_ sos _	Distress Call

Other national special signs or distorted characters are shown as an asterisk (*)

13. Examples

13.1. Status Print Out of Timer Parameters for Baltic and North Sea

```
STATUS INFORMATION
GPS-LOG:  TIME: 99 min Distance: 9nm
MODE      STORE      PRINT
RTTY      YES        NO
PROGRAMMED TIMER FUNCTIONS:
1.  from   5:30    to   5:40
2.  from   6:02    to   6:06
3.  from   10:10   to   10:20
4.  from   11:12   to   11:35
GMDSS MARINE RADIO DECODER FMD15 1.1*
SHIP                                     OWNER
```

ATTENTION.

For up-to-date transmission times, please see the latest Admiral List of Signals Volumes NP283(1) and (2), otherwise do not hesitate to contact us, Fastnet Radio in Hamburg and we will gladly send you the latest information of the most important stations.

13.2. Examples of NAVTEX Print Out

NAVTEX message - Station Wales, South Coast

WZ 899
WALES SOUTH COAST - BARRY
WELSH WATER BARRY WEST BUOY 51-22N
03-17W UNLIT
NNN
NAVTEX 518kHz SA33 12-03-94 0:53UTC

NAVTEX message - Station Split Radio

SPLIT RADIO NAV WNG 243/92

SINCE DEC 16TH 1992 N OF CLIFF MULD (43
31 06 N-15 55 30 E)

ANCHORED WAVEGRAPHIC STATION MARKED
WITH W-FLASHLIGHT.

500 MTRS BERTH REQUESTED.
NNN
NAVTEX 518 kHz QA08 11-03-94 22:58UTC

13.3 Example of Weather Report

TURKEY. LOW 1002 SOUTH OF SPAIN, MOVING NORTHEAST SLOWLY.

SECONDARY DEPRESSION 1019 SOUTH OF THE BALEARIC ISLANDS

MOVING NORTH. HIGH 1941 HEBRIDES WEAKENING A LITTLE, LITTLE MOVING WEST. RIDGE 1025 AZORES STATIONARY.

FORECASTS FOR FRIDAY, 00 UTC:
(D0) WIND FORCE BEAUFORT

GOLFE DU LION (42.2N 04.5E) SST: 18 C

FR 12Z: E	9	/	11	4 M	RAIN
FR 18Z: E	8-9	/	11	4 M	RAIN
SA 00Z: E	8-9	/	10	3 M	TS
SA 06Z: E	8	/	10	3 M	SH
SA 12Z: E	8	/	10	2 M	RAIN
SA 18Z: E	7-8	/	9-10	2 M	RAIN
SU 00Z: E	6-7	/	9	2 M	RAIN

BALEARIC ISLANDS (39.4N 03.7E) SST: 20 C

FR 12Z: S	6	/	8	2 M	//
FR 18Z: SE-S	5-6	/	7	2 M	SH
SA 00Z: S	4-5	/		1.5 M	RAIN
SA 06Z: SW	4-5	/		1.5 M	SH
SA 12Z: SW-W	5	/		2 M	RAIN
SA 18Z: W	5	/		2 M	SH
SU 00Z: SW-W	6	/	7	2 M	//

CH04 10100kHz RTTY 12-11-99	9:52UTC
GMDSS MARINE RADIO DECODER	FMD15 1.02
FASTNET RADIO AG	FASTNET LADY

13.4. Example of Navigation Log

Navigation Log, partial print out

NAVIGATIONS LOG : 060999

TIME	LAT	LONG	SPEED	COU	DATE	VAR
063743	5454.534 N	00946.945 E	01.0	198	060999	01 W
063945	5454.468 N	00947.084 E	00.6	113	060999	01 W
064044	5454.439 N	00947.325 E	01.7	037	060999	01 W
064544	5454.557 N	00946.951 E	00.3	051	060999	01 W
064646	5454.528 N	00947.110 E	00.4	161	060999	01 W
065243	5454.490 N	00947.107 E	00.6	183	060999	01 W
070247	5454.521 N	00947.096 E	01.3	284	060999	01 W
071238	5454.533 N	00946.976 E	00.5	346	060999	01 W
071442	5454.530 N	00947.018 E	00.5	348	060999	01 W
073118	5454.513 N	00947.082 E	00.4	290	060999	01 W
074324	5454.460 N	00946.900 E	01.0	336	060999	01 W

13.5. Example of NAVTEX Status Information

NAVTEX - STATUS - INFORMATION:

FREQUENCY: 518kHz
STATIONS: abcdefGhiJklmnOpqrSTuvwXyz
MESSAGES: ABcDEfghilkLmnopqrstuvwxy
DIRECT PRINT: YES
REPEAT: YES
ALARM: NO
STORED MESSAGES:
GB59 GA78 GL01 GA72 GA70 GL21 GL19 GA53
GA50 TA61 TA53 TA31 TA03 TA23 SA28 SA27
SL07 SA19 SA17 SA05 SA72 SA68 SA60 SA08
SA95 GA53 SB24 OB86 SB24 SA28 SL07 SA19
SA05 SA72 SA68
GMDSS MARINE RADIO DECODER FMD15 2.72E
SHIP OWNER

14. Appendix

14.1. Service and Maintenance

Your FMD15 has been designed to require only a minimum of maintenance. When changing paper rolls it is advisable to ascertain that dust that may have collected in the paper compartment is removed. There are no parts inside the case and service should be left to qualified personnel.

14.2. Service Organisations

This product has been designed and manufactured to the highest standards and has undergone rigorous testing in extreme environments. In the unlikely event that service may be required, the unit should be returned to the dealer from which it was purchased. If that presents a problem then service is available from any of the following organisations:

FASTNET RADIO AG

Deelböge 5-7

22297 Hamburg

Tel.: + 49 40 369898-0

Fax: + 49 40 369898-10

e-mail: info@fastnet.de

<http://www.fastnet.de>

Attention: Please return this unit to the dealer from whom it was purchased, for guarantee repairs. Whenever a unit is returned for servicing please include a complete fault description, a copy of your warranty card and / or proof of purchase.

14.3. Warranty

Fastnet Radio AG guarantees that the materials and the manufacturing of all products are delivered, according to the specifications, in a faultless condition.

The guarantee period on parts and labour is 24 months after the date of purchase. Parts, subject to wear and tear, such as lamps, fuses batteries, bearings etc. are not covered with this guarantee.

Guarantee servicing will be carried out by authorized service dealers or the national agency for Fastnet Radio AG products. Products returned, which were purchased by Fastnet Radio, will be repaired free of charge or replaced. Freight or custom's charges or other extra charges are the responsibility of the customer. In no way must the costs of guarantee repairs exceed the original purchasing price.

Service-deployment – The request for servicing must be given in writing to Fastnet-Radio AG in Hamburg. Fastnet-Radio will then arrange the deployment of servicing. Servicing on board can be carried out by the nearest authorized service-partner. The labour costs for the repair or rather the replacement of defective modules or parts will be carried out without charge as long as a guarantee is valid. Overtime, waiting time travel and board costs, insurance , custom's or other extra costs are the responsibility of the customer. Additional costs connected with the survey or replacement of components e.g. costs of docking slipping, divers and preventative measures are not covered by this Fastnet-Radio guarantee.

Validity: These guarantee regulations are only valid under presentation of a guarantee certificate or the receipt with serial number.

Additionally the installation and the operation must be in line with the user manual.

The guarantee commitments are not valid for damages caused by improper operation, accidents, damages, lack of servicing, water damages or damages caused by unauthorized personnel.

Fastnet-Radio AG will not accept responsibility for loss caused by coincidental damages out of other contracts, even when these have been caused by lack of servicing or in connection with the sale, the installation the operation or the repair of the product.

To clarify: coincidental damages include to a certain extent e.g. loss of value, material or personal damage claims and are not part of the contents of these guarantee commitments. These guarantee obligations have taken into consideration the national legal jurisdiction

14.4. Software Maintenance

A great number of features of this product are controlled by software which is secured in 2 EPROM firmware chips. Changes in particular requirements as well as general product improvements can therefore be updated by simply exchanging new EPROM chips against those installed. This can normally be done by a skilled technician and your dealer will gladly assist you. This manual contains a coupon for one free update. Further updates are chargeable and should be ordered through your dealer or directly from Fastnet Radio at the address mentioned above.

Up-date Enquiry :

should you have an enquiry, please fill out the attached form completely, and return it to Fastnet Radio

ENQUIRY

To
Fastnet Radio AG
Deelböge 5-7
22297 Hamburg

Subject: Software Up-date FMD15

Please send me information concerning a software up-date for the FMD15 to the following address:

Name : _____

Street : _____

Zip code/City : _____ / _____

Country : _____

Telephone : _____ / _____ / _____

Tele-fax : _____ / _____ / _____

FMD15: Serial Number : _____

Version Number : _____

Date of purchase : _____

A copy of the invoice is attached: YES/NO

City, date

Signature

14.5. Error Alarm

The FMD15 has an integrated control function . In case of an error, an acoustic alarm will sound. This is a combination of short and long beep tones.

14.5.1. „PRINTER-ERROR“ Alarm

Should there be a fault in the printer (e.g. paper jam or end of the paper roll), the display will show “PRINTER ERROR”, at the same time an alarm will sound in the form of two short beeps. This will occur every 15 minutes.

Should the fault occur during the decoding of a message, the message will be stored automatically and after the fault has been rectified, the message can be printed out.

14.5.2 Further Acoustic Error Alarms

Nr.	Sequence	Explanation	Function
01	•	LCD driver	err_wait_01
12	44••	LCD driver	err_wait_2
02	4•	LCD driver	err_wait_3
04	44•.	LCD driver	err_wait_016
03	••	printer Function	err_prn
19	••44•	time, date	err_RTC
20	44•4•	time, date	err_RTC_set
21	•4•4•		err_sence

These error alarms can happen sporadically, caused by external or internal influence such as power fluctuation, interference in the power supply, static discharge etc. They can generally be reset by pressing the <**EXIT**> key. If this does not work, switch the unit off for approx. 5 seconds.

Should this error alarm continue to occur, then most likely there is a fault in the unit and should be brought to one of the authorised service centres to be examined.