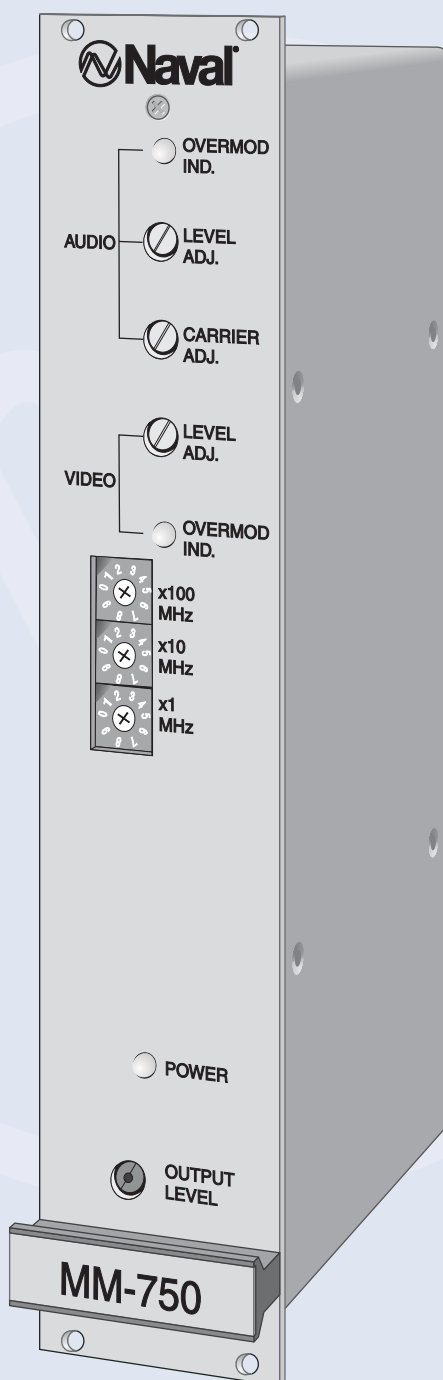


MM-750 VHF/UHF TV Modulator

Technical manual PAL B/G and I



0504

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1.0 Description

The MM-750 SSB modulator features low spurious levels for adjacent channel operation, due to modern PLL/digital synthesizer technique and adjustable high output level. The modulators can be supplied for either NTSC and PAL, please specify.

2.0 Controls front panel

AUDIO

Overmod ind: Indicates overmodulation

Level adj: Adjusts the audio input level

Carrier adj: Adjusts the audio subcarrier level

VIDEO

Level adj: Adjusts the video input level

Overmod ind: Indicates overmodulation

The output frequency is adjusted with the three switches x100 representing 100 MHz steps, x10 representing 10 MHz steps and x1 representing 1 MHz steps. Eg. for setting the frequency to channel 12 (205,25 MHz) the switches should be set as follows:

x100 2 (2x100 MHz)

x10 0 (0x10 MHz)

x1 5 (5x1 MHz)

or

channel 54 (711,25 MHz)

x100 7 (7x100 MHz)

x10 1 (1x10 MHz)

x1 1 (1x1 MHz)

POWER

Green LED indicator

Output level: Adjusts the RF output level.

3.0 Installation

The modulator unit can be installed in a 19"-rack. The supply voltage is fed from the power supply to the unit by loop-connecting the supply cable from module to module. The audio and video signals are fed into the MM-750 via RCA-connectors on the rear of the unit. The video and audio modulation is adjustable. The RF output is connected via a F-connector.

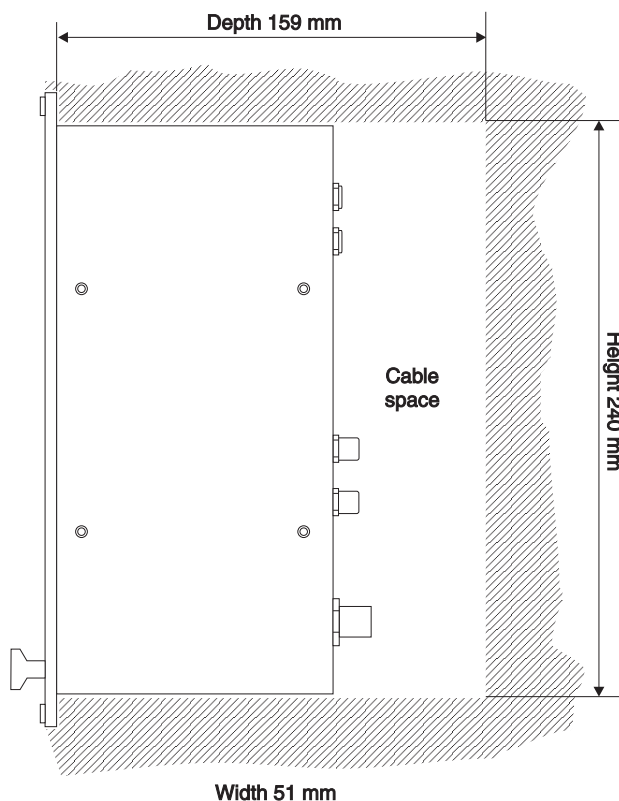
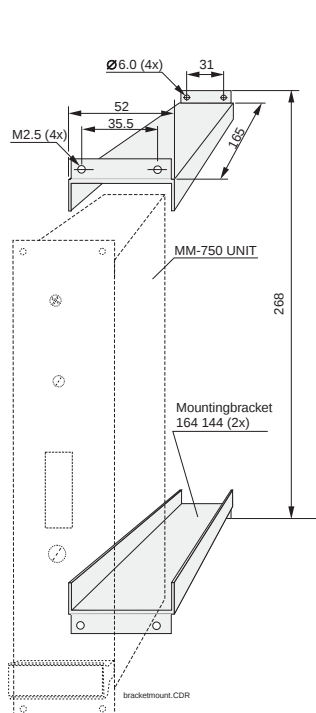
When combining the signal to a CAS 3000 system special precaution needs to be taken to avoid interference with terrestrial signals. Please consult your distributor or Naval Electronics AB for advice.

4.0 Ordering information

Description: Order no:

MM-750 NTSC	250.141	Weight: 1.4 kg
		Volume: 2.0 dm ³
Mounting bracket	164.144 (2 pcs. required)	

5.0 Dimensions



6.0 Technical data

RF Output Section

Output frequency range
Return loss

40 - 750 MHz
12 dB min @ <450 MHz
8 dB min @ <750 MHz

Output level

92 dB μ V

Tuning increment

1/ 10/ 100 MHz

Output level adjustable

0~ -18 dB

Aural/visual carrier ratio

-12~ -20 dB

Visual carrier freq. tolerance

± 10 kHz

Aural/visual carrier spacing (BG)

5.5 MHz ± 6 kHz

Aural/visual carrier spacing (I)

6 MHz ± 6 kHz

Spurious output

<-52 dB

C/N ratio in channel

> 65 dB

Output impedance

75 ohm

Video Input Section

Input level (75 Ohm unbal.)

0.6~1.5 Vpp

Frequency response

± 1 dB

P-P video to RMS hum ratio

48 dB

Video S/N ratio, weighted

58 dB

Differential gain

<4 %

Differential phase

<4°

C/L delay inequality

<20 ns

Over modulation indicator

87.5 ± 2.5 %

Input impedance

75 ohm

Audio Input Section

Frequency range	50 Hz to 15 kHz
Pre-emphasis-mono	50 μ s
Audio S/N	60 dB
Total harmonic distortion	< 1 %
Over modulation indicator	52 $\pm$ 2 KHz
Input impedance	10 kohm, unbalanced

General

Input voltage	15 VDC
Power consumption	500 mA
Dimension (HxWxD)	262 x 51 x 147 mm
Temperature range	0~+50°C

Connectors (RCA, female)	Video, Audio in
Connectors (DC, power jack)	15 VDC in, out
Connector (F, female)	RF out

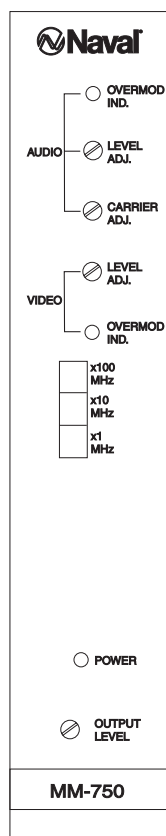
Indicators (Front panel)

Power on	LED, green
Video over modulation	LED, red
Audio over modulation	LED, red

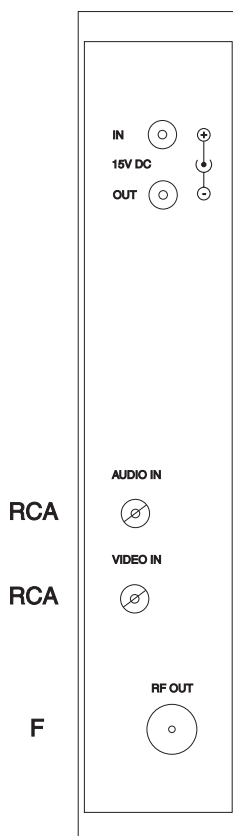
7.0 Front and rear view of modulator

MM-750

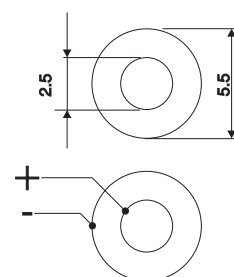
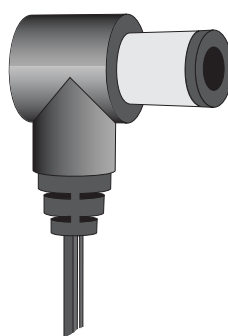
Front view



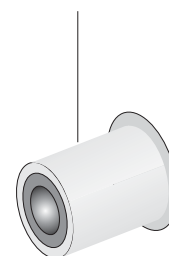
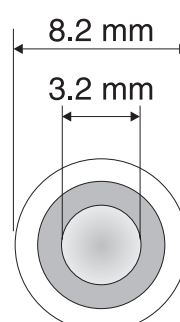
Rear view



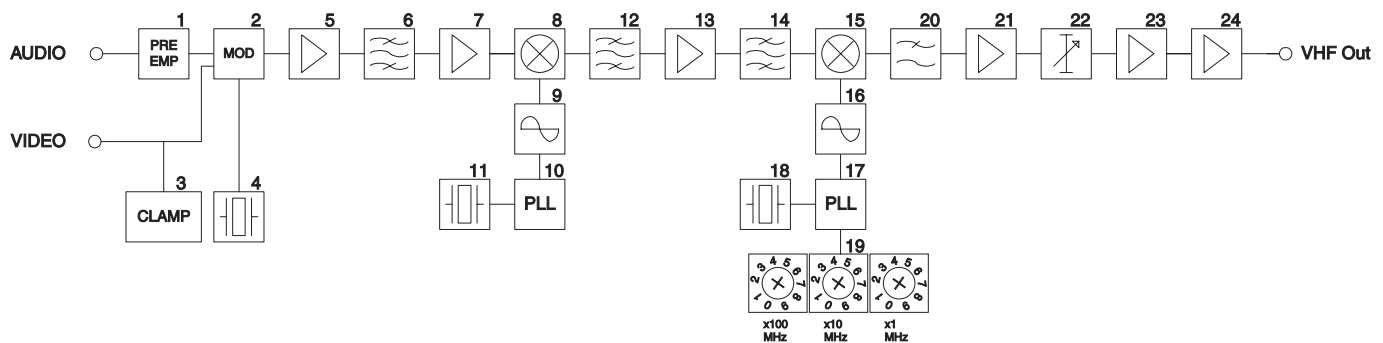
DC connector



RCA connector



8.0 Block diagram

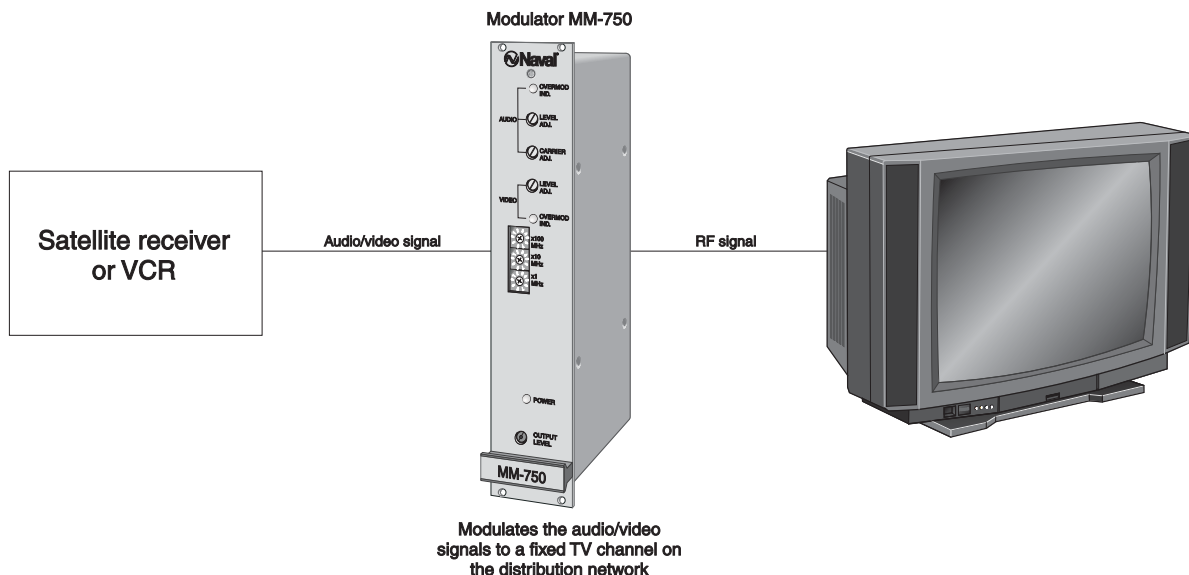


Descriptions of block diagram

- | | |
|--------------------------------|--------------------------------|
| 1. Pre-emphasis + Amplifier | 13. Amplifier |
| 2. Audio/video modulator | 14. Bandpass filter (1000 MHz) |
| 3. Video clamping | 15. Mixer |
| 4. Crystal (I.F.) | 16. Oscillator |
| 5. Amplifier | 17. Synthesizer |
| 6. Saw filter | 18. Crystal |
| 7. Amplifier | 19. Rotary switches |
| 8. Mixer | 20. Lowpass filter |
| 9. Oscillator | 21. Amplifier |
| 10. Synthesizer | 22. 0 ~ -18 dB attenuator |
| 11. Crystal | 23. Amplifier |
| 12. Bandpass filter (1000 MHz) | 24. Main power amplifier |

9.0 Configuration example

The picture shows a typical configuration using MM-750 in a distribution network. Several MM-750 can be combined into the same output by using SP2F/SP4F splitter/combiner.



10.0 Channel table

PAL B/G

E2	48,25	E21	471,25
E3	55,25	E22	479,25
E4	62,25	E23	487,25
E5	175,25	E24	495,25
E6	182,25	E25	503,25
E7	189,25	E26	511,25
E8	196,25	E27	519,25
E9	203,25	E28	527,25
E10	210,25	E29	535,25
E11	217,25	E30	543,25
E12	224,25	E31	651,25
S1	105,25	E32	559,25
S2	112,25	E33	567,25
S3	119,25	E34	575,25
S4	126,25	E35	583,25
S5	133,25	E36	591,25
S6	140,25	E37	599,25
S7	147,25	E38	607,25
S8	154,25	E39	615,25
S9	161,25	E40	623,25
S10	168,25	E41	631,25
S11	231,25	E42	639,25
S12	238,25	E43	647,25
S13	245,25	E44	655,25
S14	252,25	E45	663,25
S16	259,25	E46	671,25
S16	266,25	E47	679,25
S17	273,25	E48	687,25
S18	280,25	E49	695,25
S19	287,25	E50	703,25
S20	294,25	E51	711,25
S21	303,25	E52	719,25
S22	311,25	E53	727,25
S23	319,25	E54	735,25
S24	327,25	E55	743,25
S25	336,25	E56	751,25
S26	343,25	E57	759,25
S27	351,25	E58	767,25
S28	369,25	E59	775,25
S29	367,25	E60	783,25
S30	375,25	E61	791,25
S31	383,25	E62	799,25
S32	391,25	E63	807,25
S33	399,25	E64	815,25
S34	407,25	E65	823,25
S35	415,25	E66	831,25
S3B	423,25	E67	830,25
S37	431,45	E68	847,25
S38	439,25	E69	855,25
S39	447,25		
S40	455,25		
S41	463,25		

11.0 Troubleshooting

Problem	Cause / Solution
No power Indication	1.Check the AC cord coming from the power supply.
No picture / sound after installing the system	1.Check that the modulator's channel is correctly selected. 2.Video/Audio cable is not connected to modulator. 3.Check incoming cable for bad connections. 4.Modulator output level is too high/low, decrease/increase output level.
Picture O.K. no sound	1.Volume of control monitor too low. 2.Bad connection between audio cable from receiver to modulator. 3.Audio level of receiver / modulator is too low.
Sound O.K. no picture	1.Bad connection of video cable. 2.Video level of receiver / modulator is too low.
Picture full of sparkles	1.Video frequency on receiver is not correctly tuned. 2.Modulator channel not correctly selected. 3.Poor cable connection, check cables.
Audio is noisy	1.Modulator channel not correctly selected. 2.Poor cable connection, check cables.
<i>If you still have any questions, please contact your dealer.</i>	



Since 1971, the objective of Naval Electronics has been to offer the best possible products for TV and Radio reception at sea. Naval began with omnidirectional antennas and is the world leader in this field of technology today. Now, with an expanded product range, the name Naval means much more than antennas. Naval operates in more than 40 countries and has installations on thousands of vessels all over the world.

All specifications stated are subject to change without notice.