



DRM-R2

Manual

1st edition
December 5, 2003



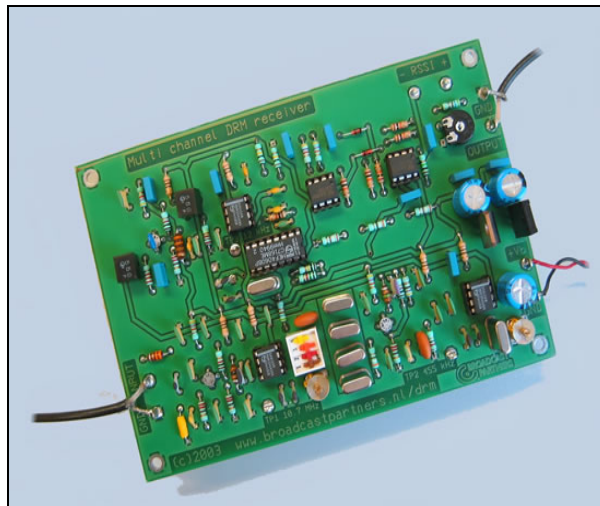
About DRM

DRM, short for Digital Radio Mondiale, is the world's only non-proprietary, digital system for AM with the ability to use existing frequencies and bandwidth across the globe.

With near-FM quality sound offering a dramatic improvement over analogue AM, DRM will revitalize the AM broadcasting bands below 30 MHz in markets worldwide.

Broadcast Partners is at the forefront of this exciting new technology, putting a lot of effort in research and development.

To let you experience the benefits of DRM programs broadcasted around the globe, Broadcast Partners has developed a low-cost receiver which can be attached to any PC with DRM decoding software.



Broadcast Partners DRM tuner

Broadcast Partners' new tuner is a low-cost solution for innovators in the world of radio who like to experience this new evolution of radio.

Modification of existing tuners (such as Kenwood and Yaesu), with the risk of losing your warranty, is no longer necessary.

This DRM kit delivers the hardware the way you want it.

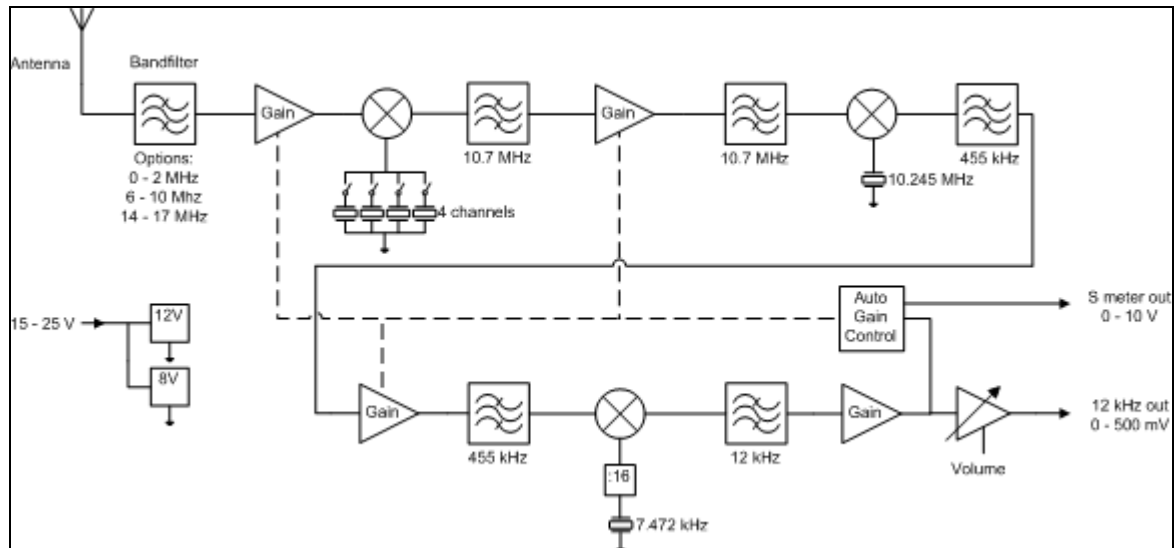
Specifications

- Listen to up to 4 DRM stations
- Superior Automatic Gain Control
- Operates with standard DRM software (www.drmrx.org)
- Excellent image rejection, sensitivity and selectivity
- Requires separate DRM software (available for approx. €60 at www.drmrx.org)

Contents of the kit

The kit consists of an assembled and tested Printed Circuit Board.

Schematic



Frequency selection is done by activating the DIP switch for one of the channel crystals.

Technical specifications

Parameter	Description	Min.	Typ.	Max.	Unit
General					
Receiving band input filter	Option A Option B Option C	0 5.4 13.7	- - -	2.0 11.8 17.6	MHz MHz MHz
Channels		-	4	-	
IF Frequencies	IF 1 IF 2 IF 3	- - -	10.7 455 12	- - -	MHz kHz kHz
Sensitivity		-	10	-	uV
Audio output					
Adjustable output level		0	-	500	mV
Output resistance		-	5	-	kOhm
Audio bandwidth		6	-	18	kHz
Power supply					
DC Supply voltage		15	-	35	V
Current consumption		-	100	-	mA
Dimensions of PCB					
Length		-	148	-	mm
Width		-	100	-	mm

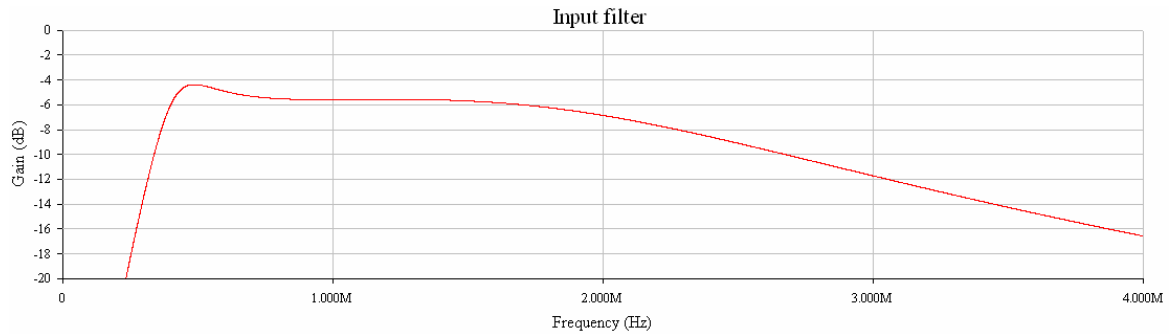


Figure 1: Input filter response Option A

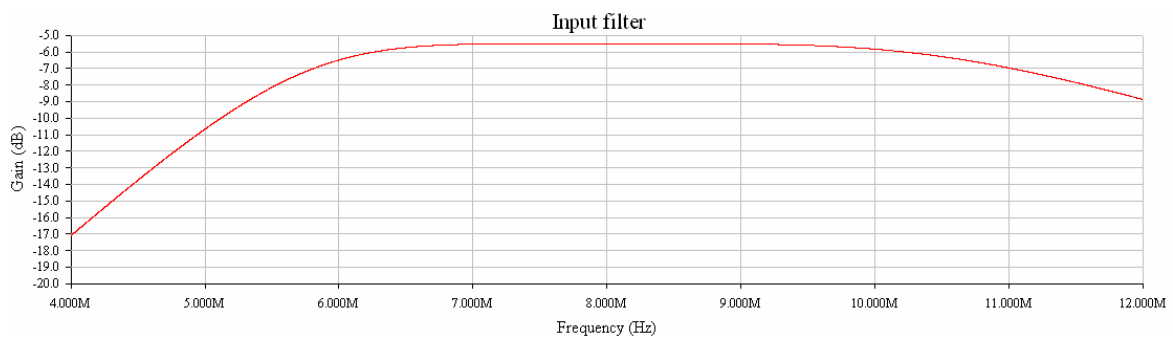


Figure 2: Input filter response Option B

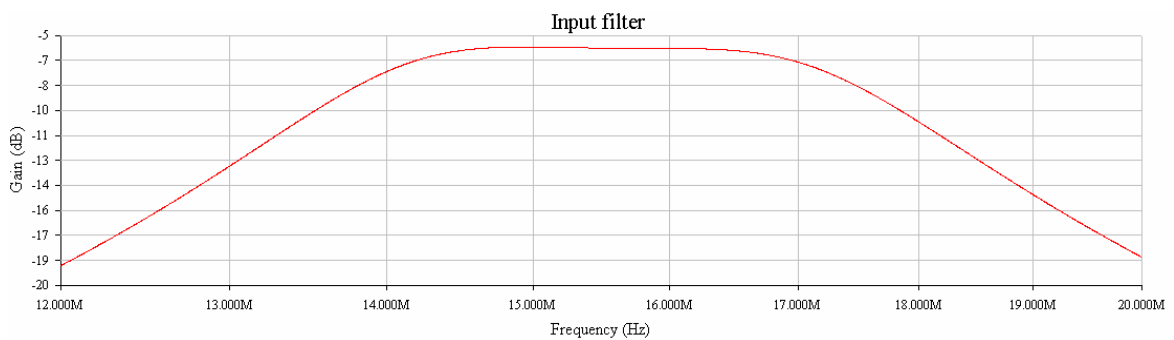


Figure 3: Input filter response Option C

Add extra channels

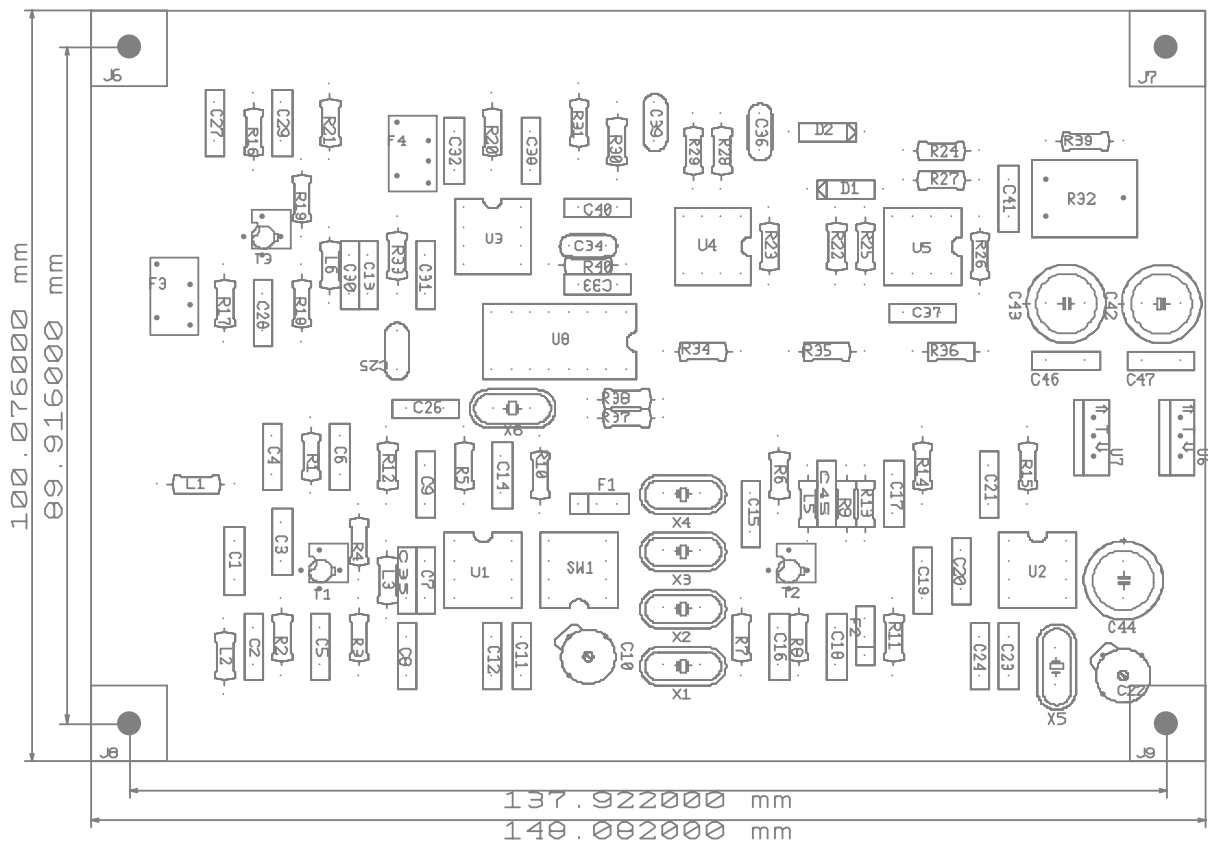
The DRM receiver is capable of receiving four DRM stations. To add a channel, simply add a crystal. The crystals (X1, X2, X3 and X4) are used in the first down conversion from the station frequency to the 10.7 MHz IF frequency. Therefore, the frequency of the crystal should be 10.7 MHz higher than the desired frequency.

Specification of the crystals used:

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency		-	Station frequency + 10.7 MHz	-	MHz
Load capacitance		-	30	-	pF
Resonance type	Parallel				

Example: Crystal for the DRM station of DW, Sines (UK) at 15.44 MHz = 15.44 + 10.7 = 26.14 MHz

Dimensions



More information

www.drm.org
www.drmx.org
www.broadcastpartners.nl, drm@broadcastpartners.nl

for background information on DRM
 for the DRM software project
 for more information on Broadcast Partners



Appendix A: Current DRM stations

UTC	Days	kHz	Beam	Target	Power	Programme	Language	Site
0000-0059	daily	6010	268	NE USA/Canada	70	BBCWS	English	Sackville
0000-2400	daily	531	ND	NE Germany	2	531 digital	German	Burg
0000-2400	daily	1485	ND	SW Germany	0,3	SWR Das Ding	German	Kaiserslautern
0000-2400	daily	15896	ND	Erlangen	0,1	biteXpress Campus Radio	German	Erlangen
0000-2400	daily	25765	ND	Rennes	0,1	TDF Radio O	French	Rennes
0000-2400	irregular	855	ND	Berlin	2,5	DLR	German	Berlin-Britz
0000-2400	daily	729	ND	NE Germany	1	DLF	German	Putbus
0000-2400	daily	26012	ND	Nuernberg	0,01	Campus Radio	German	Nuernberg
0000-2400	daily	1485	ND	Berlin	1	kaufradio	German	Berlin
0000-2400	Tests	1062	ND	Paris	5	TDF	French	Meudon
0000-2400	Tests	26000	ND	Neumarkt	0,01	Campus Radio	German	Dillberg
0100-0159	daily	6140	268	NE USA/Canada	70	Radio China	English	Sackville
0400-0459	daily	6010	285	W & C No. America	70	BBCWS	English	Sackville
0500-0600	Sat/Sun	15255	230	NZ + SE Australia	10	RNW	English	Bonaire
0600-1000	daily	21675	300	Europe	80	DW	English	Trincomalee
0600-2400	Tu-Su	6095	ND	Europe	35	RTL	various	Junglinster
0800-1400	daily	15440	40	W & C Europe	80	DW	English	Sines
0800-1500	Tests	774	ND	Czechia	2,5	Czech Radio	Czech	Hradec Králové- Stezery
0900-1100	Mon-Fri	17700	40	Europe	80	DW	English	Sines
0945-0959	daily	9850	ND	Europe	40	FEBA	English slow	Flevo
0959-1200	daily	9850	ND	Europe	40	RNW	English	Flevo
1000-1100	Mon	9760	110	W & C Europe	33	Christian V.	English	Rampisham
1000-1200	daily	6140	120	W & C Europe	40	DW	English	Juelich
1000-1500	daily	7320	62	NE & C Europe	33	BBCWS	English	Rampisham
1100-1155	Mon-Fri	17710	50	Europe	80	DW	English	Sines
1100-1200	Sat	9850	ND	Europe	40	TDP Radio	Music Mix	Flevo
1100-1300	daily	21780	50	SW Europe	10	RNW	English	Bonaire
1100-1300	Sat/Sun	9410	62	NE & C Europe	33	BBCWS	English	Rampisham
1200-1257	daily	9850	ND	Europe	40	RNW	Dutch	Flevo
1200-1300	daily	6140	120	W & C Europe	40	DW	German	Juelich
1200-1359	daily	9655	ND	Europe	150	DW	English	Wertachtal
1300-1330	daily	9815	ND	Europe	40	Radio Sweden	German	Flevo
1300-1500	Mon-Fri	9410	62	NE & C Europe	33	BBCWS	English	Rampisham
1305-1455	daily	5975	290	W Europe	40	T-Systems	German	Juelich
1330-1400	daily	9815	ND	Europe	40	Radio Sweden	English	Flevo
1330-1400	Sun	9785	95	Europe	33	var. from NASB	English	Rampisham



1400-1430	daily	9815	ND	Europe	40	RCI	English	Flevo
1400-1500	daily	15780	240	W & C Europe	35	VoR	Russian	Taldom
1400-1559	daily	6130	ND	Europe	150	DW	German	Wertachtal
1429-1500	daily	9815	ND	Europe	40	RNW	English	Flevo
1500-1514	daily	9815	ND	Europe	40	Vatican Radio	German	Flevo
1500-1600	daily	15780	240	W & C Europe	35	VoR	English	Taldom
1600-1700	daily	15780	240	W & C Europe	35	VoR	German	Taldom
1600-1729	daily	3995	ND	Europe	150	DW	German	Wertachtal
1600-1800	daily	6140	ND	Europe	40	DW	English	Juelich
1600-1915	daily	1296	96	Netherlands	70	BBCWS	English	Orfordness
1700-1800	daily	15780	240	W & C Europe	35	VoR	French	Taldom
1800-1900	daily	6140	ND	Europe	40	DW	German	Juelich
1900-2000	daily	11925	61	Russia	33	BBC	Russian	Rampisham
2055-2130	daily	9800	268	NE USA/Canada	70	Vatican Radio	English	Sackville
2100-2155	daily	11730	50	Europe	10	RNW	English	Bonaire
2115-2400	daily	1296	96	Netherlands	70	BBCWS	English	Orfordness
2130-2200	daily	9800	268	NE USA/Canada	70	RNW	English	Sackville
2200-2300	daily	15530	320	N America West	10	RNW	English	Bonaire
2200-2300	daily	9800	268	NE USA/Canada	70	RCI	English	Sackville
2300-2330	daily	9800	268	NE USA/Canada	70	Deutsche Welle	English	Sackville
2330-2359	daily	9800	268	NE USA/Canada	70	Radio Sweden	English	Sackville

As of December 5, 2003

See http://www.rnw.nl/realradio/html/drm_schedule.html