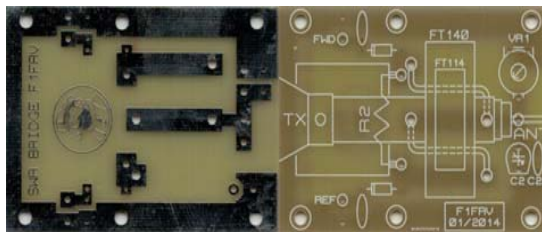


## SCHEMATIC DIAGRAM AUTOMATIC SWR & PEAK POWER METERS

DOC N°: AMATEUR RADIO  
BY: f1frv@sfr.fr WEB: <http://f1frv.free.fr>  
DATE: 05/2022 REV: 7c PAGE: 1/2

Rev 7c: Added 100  $\mu$ A meters & protection  
Rev 7c: Replaced 2N7000 by BS170 , Added D3 & J9, J10  
Rev 7c: Replaced D1 Zener 5.1 V by BAT42 to improve sensitivity



[http://f1frv.free.fr/main3h\\_SWR\\_Bridges.html](http://f1frv.free.fr/main3h_SWR_Bridges.html)

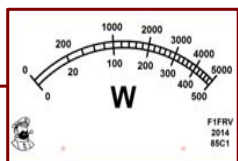
TRANSCEIVER  
OR  
AMPLIFIER

SWR BRIDGE

ANTENNA



ALTERNATIVES  
POWER SCALE  
HIGH / LOW



QUADRATIC SCALE



LOGARITHMIC SCALE

AUTOMATIC SWR METER  
& PEAK POWER METERS

SIMPLE SEMI AUTOMATIC  
ANTENNA TUNER  
TUNE FOR MIN SWR

MOTOR

MOTOR  
DC  
SUPPLY

DC SUPPLY  
12 - 20 V  
100 mA

[http://f1frv.free.fr/Flea\\_Market.html](http://f1frv.free.fr/Flea_Market.html)

[http://f1frv.free.fr/main3i\\_Auto\\_SWR.html](http://f1frv.free.fr/main3i_Auto_SWR.html)

**DONT FORGET THAT POWER MEASUREMENTS  
ARE ONLY TRUE ON 50 OHMS & SWR 1/1 !!!**

AUTOMATIC SWR & PEAK POWER METERS  
WITH SIMPLE SEMI AUTO ANTENNA TUNER

DATE: 05/2022 REV: 7c PAGE: 2/2  
BY: f1frv@sfr.fr WEB: <http://f1frv.free.fr>  
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# -Bill Of Materials

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Design: AUTOMATIC SWR & PEAK POWER WATTMETER

Doc. no.: AMATEUR RADIO

Revision: 7 to 7c

Author: [flfrv@sfr.fr](mailto:flfrv@sfr.fr)

Modified: 05/2021

QTY	PART-REFS	VALUE	PACKAGE
---	-----	-----	-----
Resistors			
-----			
6	R1,R3,R6,R9,R10,R18	100k 1%	RES 0.25W
3	R2,R4,R11	1k 1%	RES 0.25W
2	R5,R7	3.3k 1%	RES 0.25W
1	R8	1M 1%	RES 0.25W
Capacitors			
-----			
3	C1-C3	22nF	PITCH 2.5
4	C6,C7,C9,C10	100nF	PITCH 2.5
2	C4,C5	2.2nF	PITCH 2.5
1	C8	22uF	PITCH 2.5
Integrated Circuits			
-----			
1	U1	LM224 or 324 + SOCKET	DIL14
1	U2	LM258 or 358 + SOCKET	DIL08
Transistors			
-----			
2	Q1,Q2	BS170	TO92
Diodes			
-----			
2	D1,D2	BAT42	DO35
1	D3	1N4007	DO41
Miscellaneous			
-----			
5	Jx	TERMINAL BLOCK 2 POLES	PITCH 5.08
OR 10	Jx	PRESS FIT PINS	DIA 1.32
1	J2	AVG / PEAK JUMPER	PITCH 2.54
1	RV1	1k 25 turns	3296W OR 3266W
1	RV2	100k 25 turns	3296W OR 3266W
1	RV3	100k 1 turn	PIHER PT10LV

NOTA. Meters & SCHUBERT box are not supplied

NOTA. 2 x 3.3k , 2 x BAT42 , 2 x 100nF added for 100µA meters protection



# AUTOMATIC SWR METER & PEAK WATTMETER TO BE USED DOWNSTREAM A SWR BRIDGE

DATE: 05/2022 REV: 7c  
BY: F1FRV@SFR.FR  
DOC N°: AMATEUR RADIO

REV 7c: Replaced 2N7000 by BS170 & single side PCB by dual side

REV 7c: New PCB dimensions to fit inside SCHUBERT box

REV 7c: Replaced D1 Zener 5.1V by BAT42 . Use of 100 uA meters is advised

## AUTOMATIC SWR METER ADJUSTEMENT PROCEDURE

CONNECT CIRCUIT TO DC SUPPLY (12 V TO MAXI 20 V)

WITH OTHERS TEST DC SUPPLIES, OR BATTERIES,

APPLY ANY DC VOLTAGE  $> \sim 0.4$  V & MAXI = DC SUPPLY - 2 V

EXAMPLE: 5V, ON J6 AND HIS EXACT HALF (2.5V) ON J5

ADJUST RV1 FOR METER AT MID SCALE (SWR = 3)

METER INDICATES RATIO OF FWD/REF VOLTAGES

TO HAVE SWR INDICATION, USE LOGARITHMIC METER SCALE

YOU CAN NOW CONNECT TO YOUR SWR BRIDGE AND ENJOY

ADJUST RV2 FOR POWER METER SCALE, BY COMPARISON WITH

AN ACCURATE POWER METER ON 50 OHMS DUMMY LOAD

TO HAVE PWR INDICATION, USE QUADRATIC METER SCALE

WITH 25% AT MID SCALE AND 100% FULL SCALE

TO DRAW YOUR OWN METER SCALE, YOU CAN USE F5BU's

FREWARE "GALVA" AT: <https://www.f5bu.fr/galva-about/>

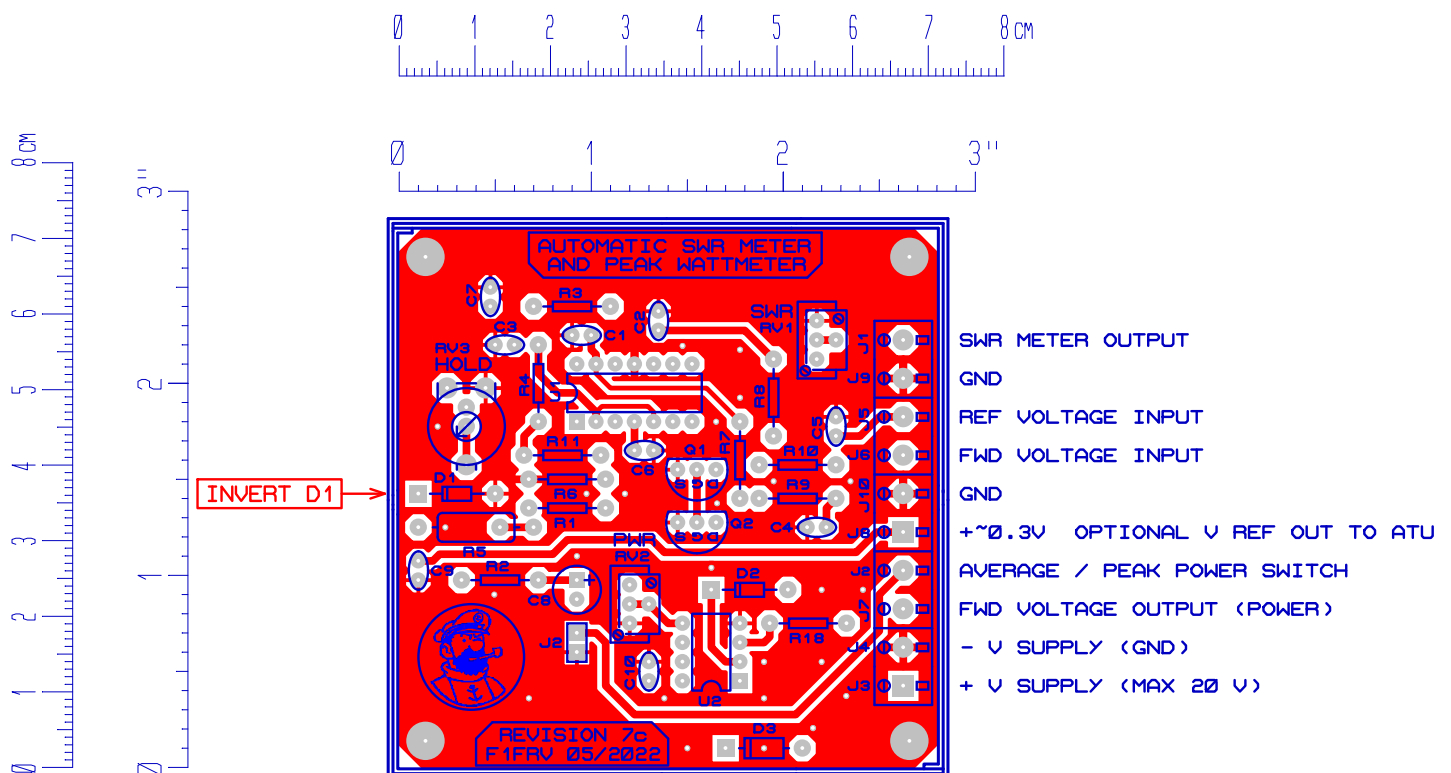
## THAT'S ALL FOLKS ! ! ! ! PEAK WATTMETER BY GROUNDING J2 TERMINAL

PCB DUAL SIDE WITH METALLISED THRU HOLES & SOLDER RESIST

DIMENSIONS: 71.12 x 71.12 mm (2.8" x 2.8")

FIXATION: 4 HOLES 3.2 mm DIA, AXIS 64 x 64 mm (2.52" x 2.52")

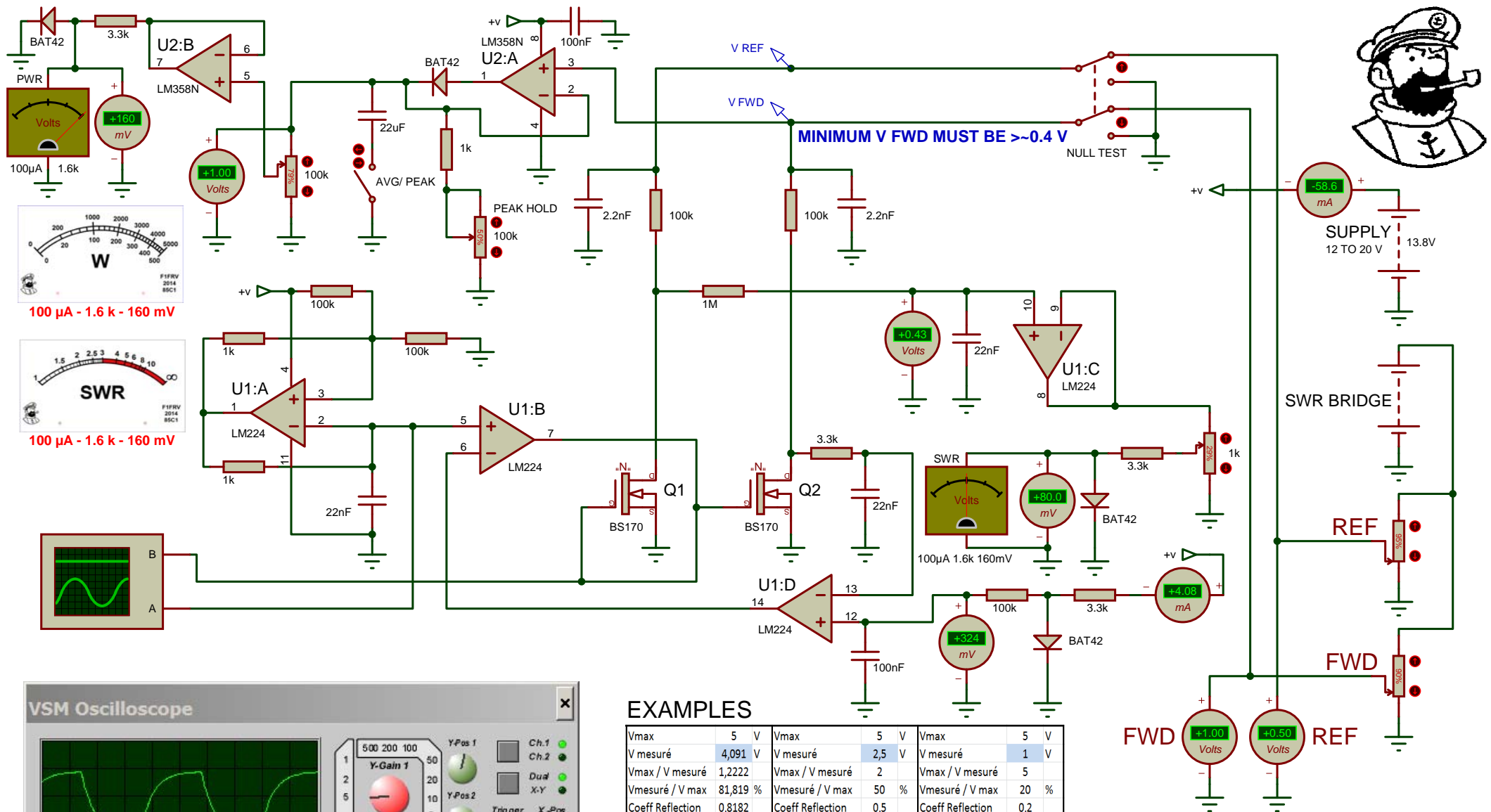
PCB CAN BE SOLDERED INSIDE A "SCHUBERT" TINY BOX 74 x 74 x 30 mm



FOR USE WITH SCHUBERT BOX 74 x 74, REPLACE SCREWED TERMINAL BLOCS  
BY PRESS FIT PINS "VERO" DIA 1.32 mm FOR WIRES SOLDERING  
OR USE SCHUBERT BOX 74 x 111



## AUTOMATIC SWR & PEAK POWER METERS SIMULATION



## EXAMPLES

Vmax	5 V	Vmax	5 V	Vmax	5 V
V mesuré	4,091 V	V mesuré	2,5 V	V mesuré	1 V
Vmax / V mesuré	1,2222	Vmax / V mesuré	2	Vmax / V mesuré	5
Vmesuré / V max	81,819 %	Vmesuré / V max	50 %	Vmesuré / V max	20 %
Coeff Reflection	0,8182	Coeff Reflection	0,5	Coeff Reflection	0,2
Reflected power	66,943 %	Reflected power	25 %	Reflected power	4 %
ROS en dB	1,7429 dB	ROS en dB	6,0206 dB	ROS en dB	13,979 dB
ROS	10 /1	ROS	3 /1	ROS	1,5 /1

**AUTOMATIC SWR & PEAK POWER METERS  
SIMULATION**

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