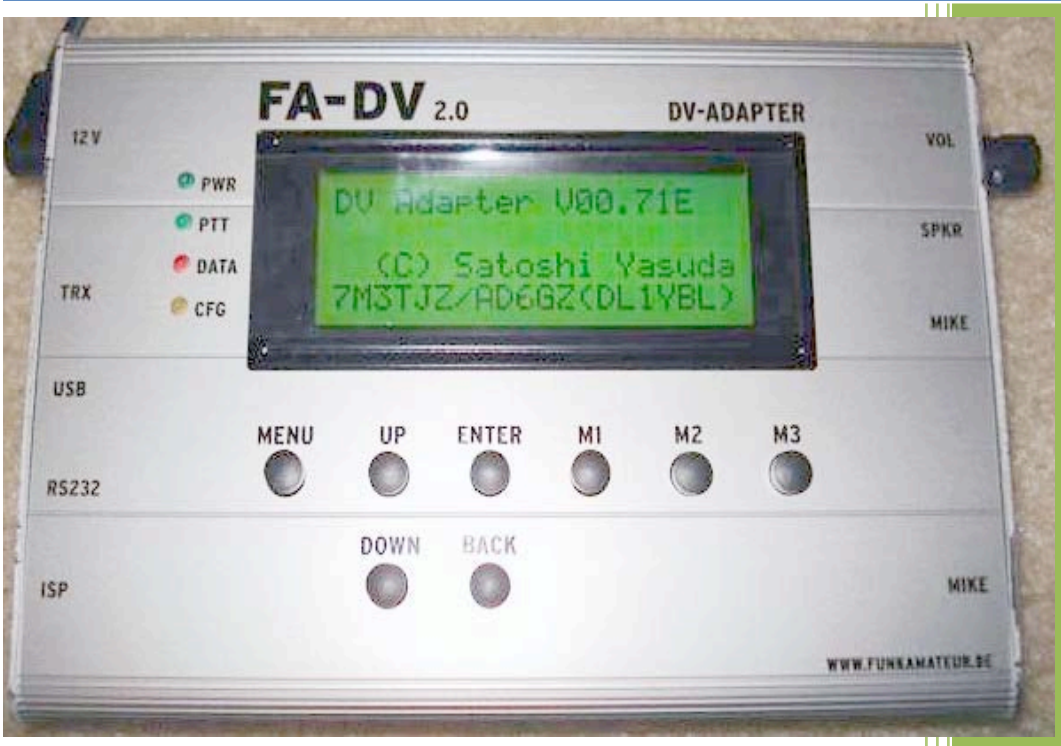
2010

DV-ADAPTER 2.0



Owner's Manual

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Owner manual for the D-Star DV Adapter USA Version

This manual will guide you step by step how to use the DV Adapter.

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Chapter 1



Getting Started

D-Star DV Adaptor Kit





Your kit includes:

1 D-STAR DV Adaptor

1 PS2 – 6MM MD6M/M Cable



Additional Parts Needed: ***(Not Included)***

1 Small Speaker

1 Power Supply: *(Requires 12Volt DC - 2Amp or greater)*

1 Microphone: *(either 2.5mm or RG45 connection)*

Connecting Components

1. Connect the 6pin cable (supplied) to the DV adapter and the other side to your 9.6k packet plug on your transceiver.





6pin plug to the TRX port

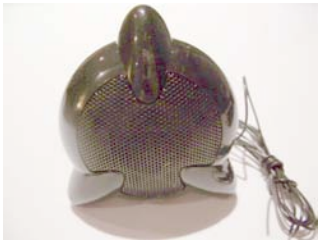
Note: *For Kenwood TS 2000, you will have to cut one end of cable and solder color wire to the 13th pin Kenwood plug provided your radio.*

2. Connect a 12 Volt DC, 2Amp or more power source to the adapter.





3. Connect a loudspeaker to the adapter.





4. Connect microphone to the adapter. You can use either a 2.5mm or RJ45 Microphone.







5. Set the microphone switch to the proper microphone port. Set the Data toggle switch to the setting required for your radio. (Normal or Reverse)

Note: The Icom 706MK2G needs only to be set one time, but a Kenwood TS 2000 need the toggle switch for proper operation between 23cm / 70 cm and 2m. This switch changes data inverse settings.

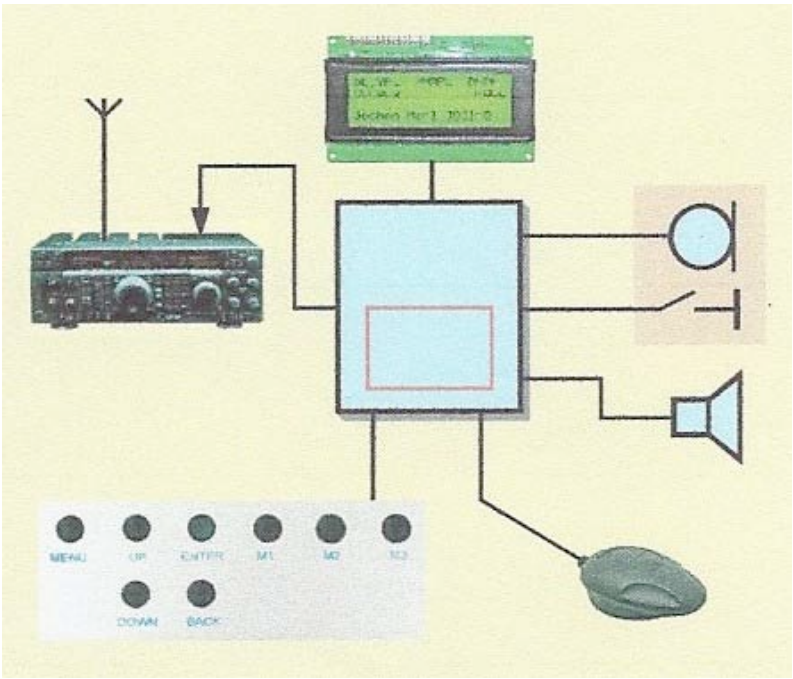


Figure 1: Principle of Operation DV adapter; requirement is a 9k6 - capable radio. Where this exists, There is no modification to the transceiver required!

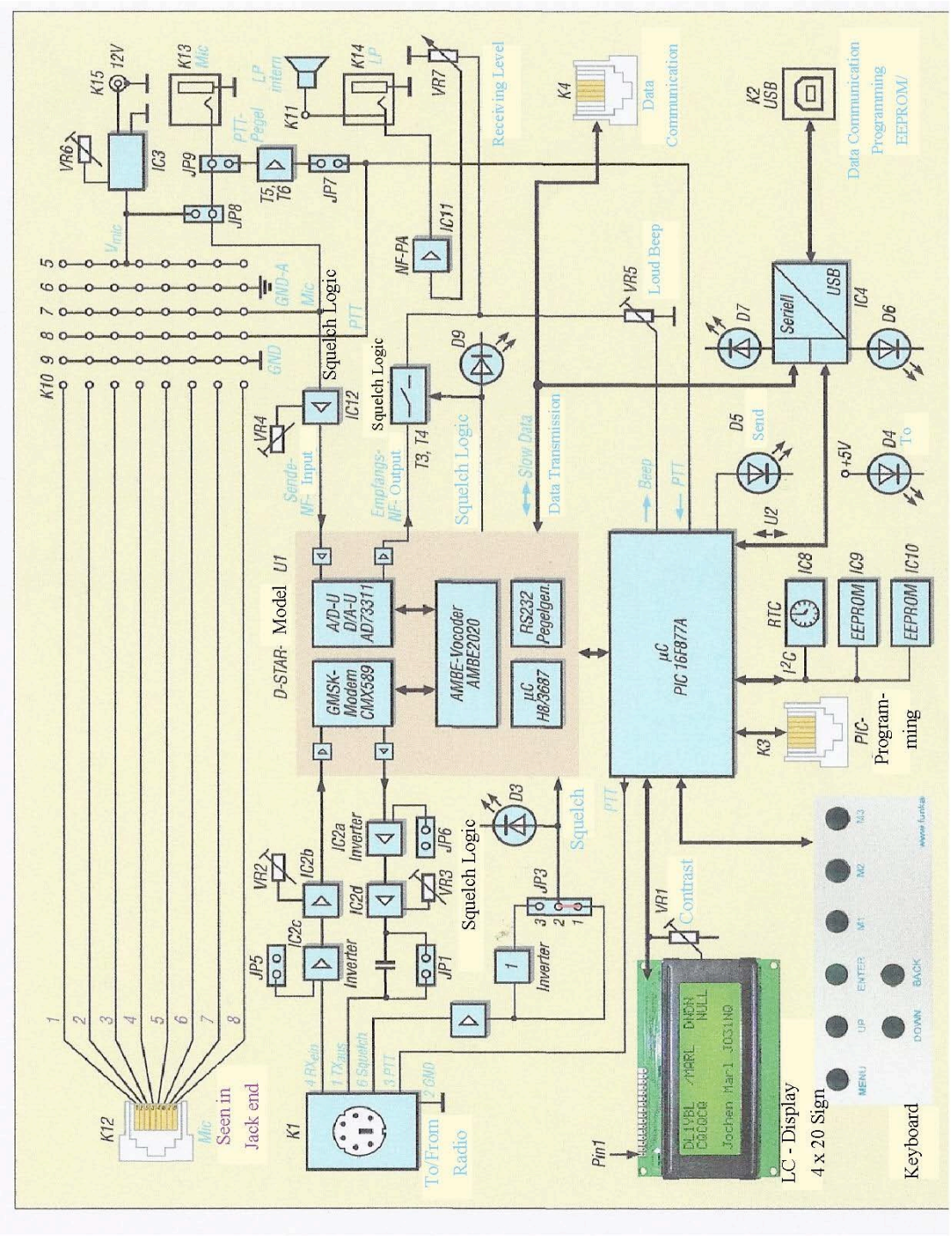
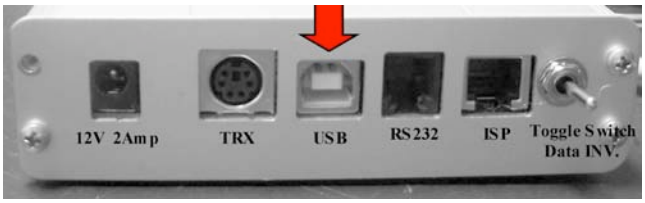


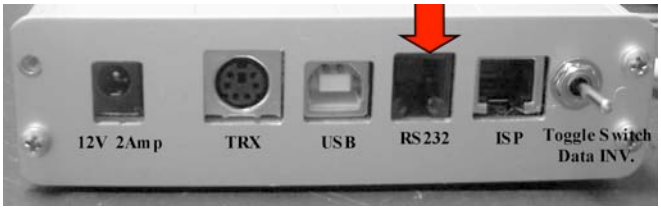
Figure 2: Block diagram of the DV adapter 2.0; significant changes compared to version 1.0 relate to the flexible microphone -- wiring, USB interface to PC, possible signal inversion RX / TX, real time clock RTC and PIC programming socket and more to follow in firmware updates.

Addition Components

1. **USB Date Port** – to connect a laptop/computer for memory programming and text messaging.



2. **TX/RX GPS / 5 Volt DC** – Plug a GPS receiver into the system.



3. **PIC Reprogramming** – connecting to computer with a RJ11 plug.



4. To toggle the TX/RX Date for the use of Kenwood TS-2000**.**



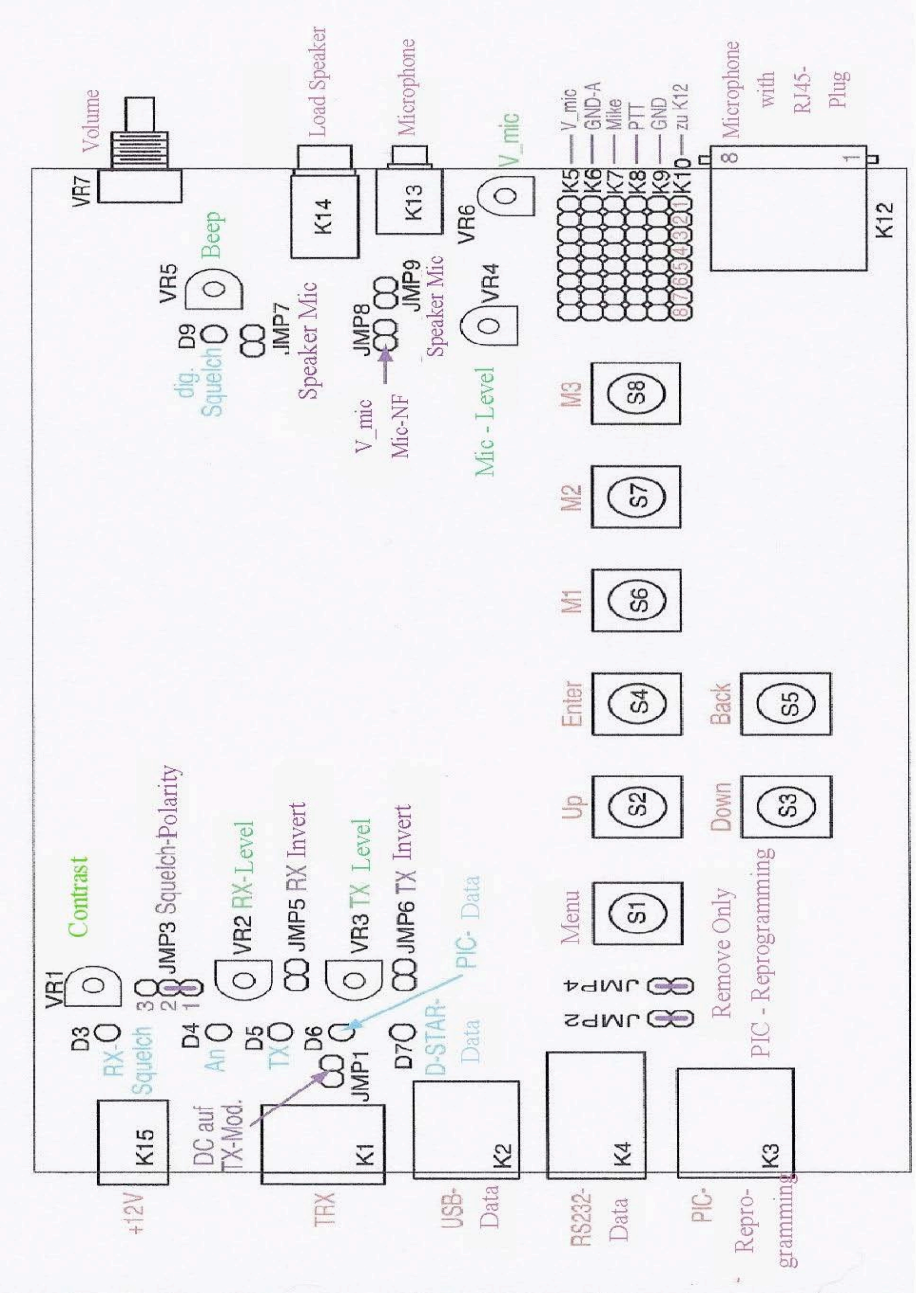


Figure 3: Connections and matching points on the board top, jacks and buttons labeled here in red, green, trimmer, Blue-violet light emitting diodes and jumpers, the jumpers are normally 2 a.m. to 4 p.m. to put more and maybe only for reprogramming To remove PIC! Furthermore Jumper 3 is connected to either 1-2 (below) or 2-3 (above).

Chapter 2



Operating Your DV Adaptor

Operating Your
D-STAR DV Adaptor

If you have provided me your Call sign and the local Repeater call sign these settings will be already programmed.

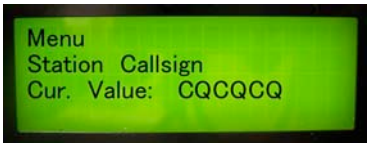
If not: Refer to Chapter 3, Page 20, *"How to program your D-STAR DV Adaptor"*.





1. Press the Menu Button and you see My call sign, if not, scroll with the up and down to the desired location in men. Press the Enter button and you see "new Value". A _ symbol is the place where you put the Letter or Number with the up and Down button. Then press Enter after every time till you hit the 8th position, then it is saved. Remember: you must hit Enter 8 times.





2. The next is the Station Call sign (Your call)
Hit Menu again and then one time up. You see station call sign, value CQCQCQ
Hit Enter and you see New Value. Here is the _ under the C from CQCQCQ now and with the up/down button you can change that to any call sign you like. Also REF001CL to link, or _ _ _ _ _ _ _ U to unlink, just like any other D-STAR Radio you know.

3. Auto RX Call Automatically stores the callers callsign received into "Your Call" for call sign routing. Normally would be turned "off". Use menu UP to select to desired value.





4. Auto Rx Repeater Automatically stores repeater call sign last heard. Normally would be set to "off".

5. Duplex Must always be "on"







6. The RPT 1 and 2 settings, press the Menu button, go with the up button as long as you see the "Value", hit "enter", use the up and or down button to enter required data. Always enter a total of "8" letters or spaces. The last indicator must be the "port" you are requiring to operate on or "G" for gateway in RPT 2. Use spaces or "underscore" to advance the space.

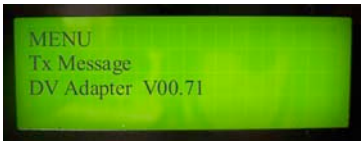
7. GPS Sentence default is "0". See Table for additional 26 data symbols available.





8. My Call sign Note Used for message after your callsign. (4) Positions available such as your name.

9. TX Message Used for sending text message after callsign. Sent as data. Default DV Adapter 1.07…

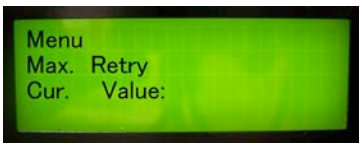




10. Message Transmission Text message sent or not.. Default "on".

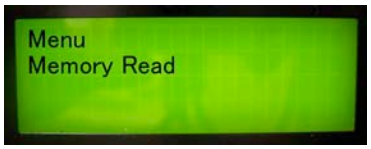
11. TX message Interval Beacon Interval for GPS





12. Maximum Retry How many times it retries sending GPS status or Text message until sent without errors. Default :"3"

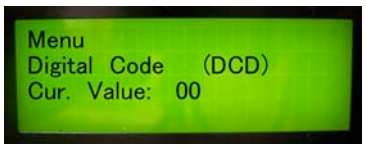
13. Slow Data Speed For programs like D-Rats or D-Chat. Default 9600.



14. Menu Memory Read Use this location to go into menu. Press "Enter" then select M1-M3 for programmed data. Select by pressing "enter" again.

15. TX Delay Time Should be around 200mSec. Delay from TX to pass Header.





16. Digital Code (DCD) Must be 00. This code allows Channel Guard for passing Receive data.

17. RESET Resets menu back to the beginning as if power removed. RX Position Allows receive of GPS data.

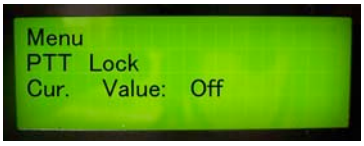






18. Auto Duplex Allows automatic offsets for some radios.

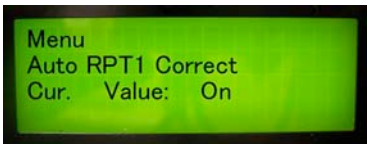
19. PTT Lock Disables PTT.





20. BEEP Repeater control tone Default "on"

21. Auto RPT1 Correct Works with RPT1 AUTO and allows Callsign to automatically update to any new repeater. Should be "ON" if RPT1 is "ON".





22. GPS Message GPS Extra Status Message

23. The value with be explain in the GPS Chapter later.



Additional Information



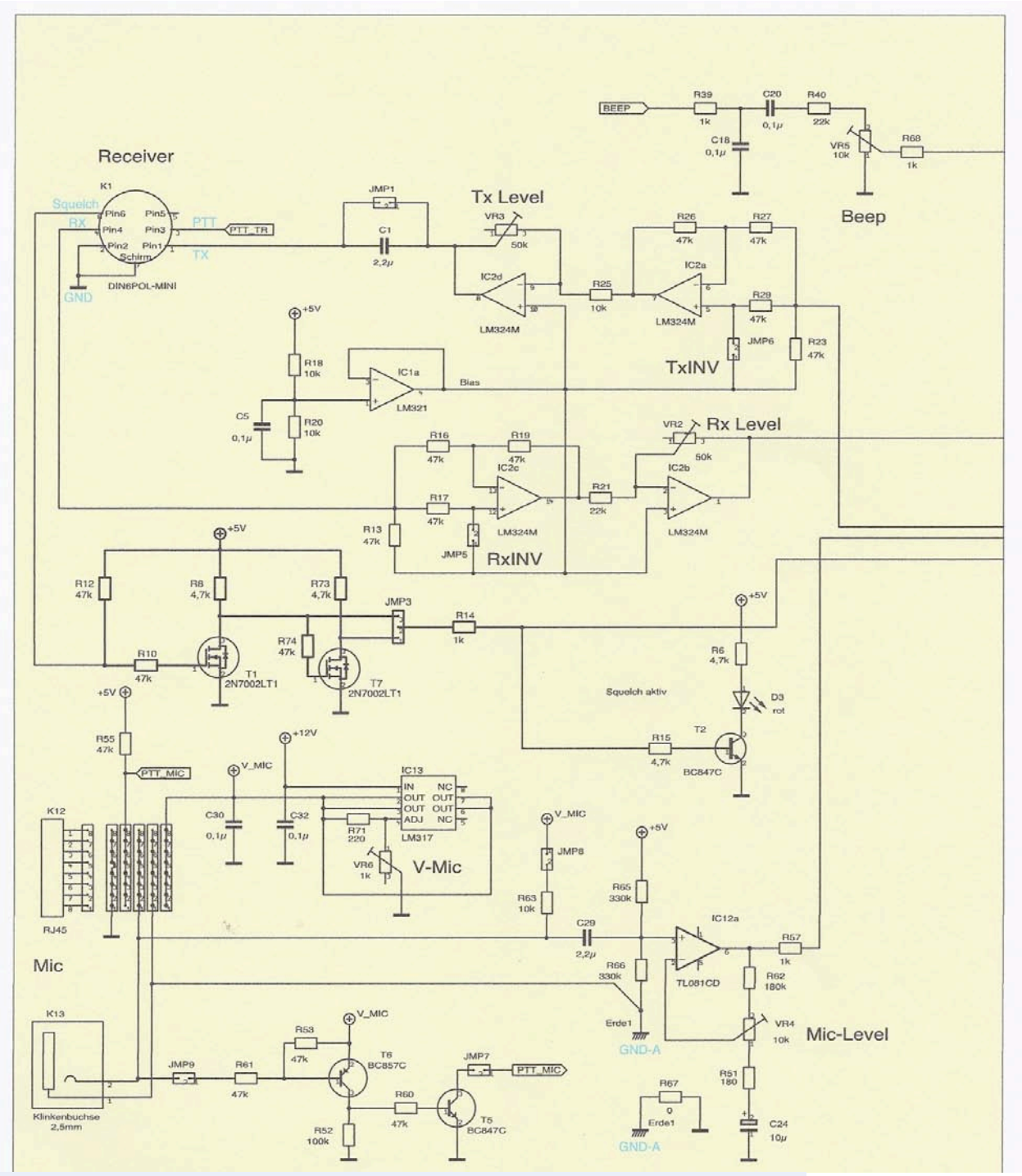


Figure 4: Schematic of the analog part of the DV adapter 2.0, left side

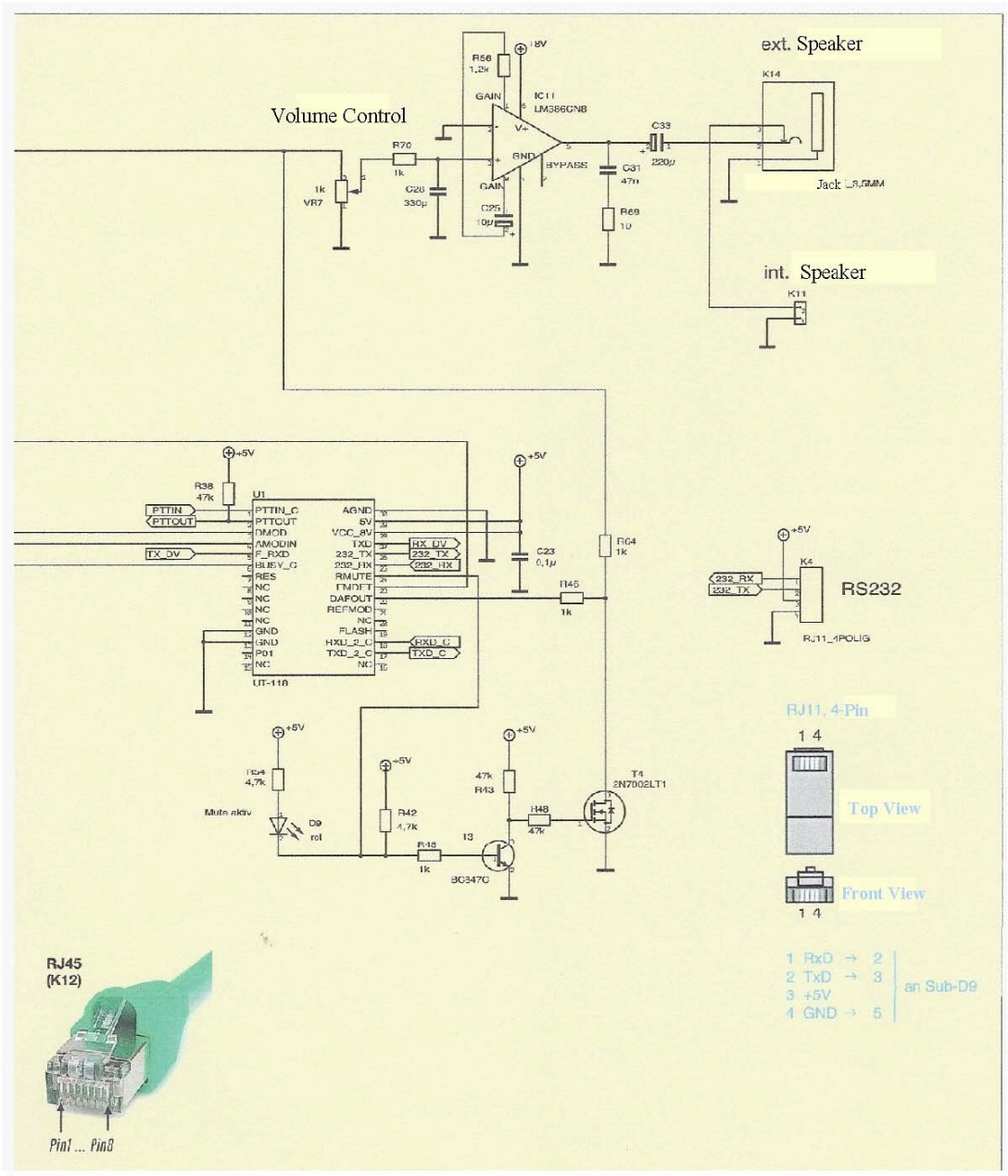


Figure 4: Schematic of the analog part of the DV adapter 2.0, right side

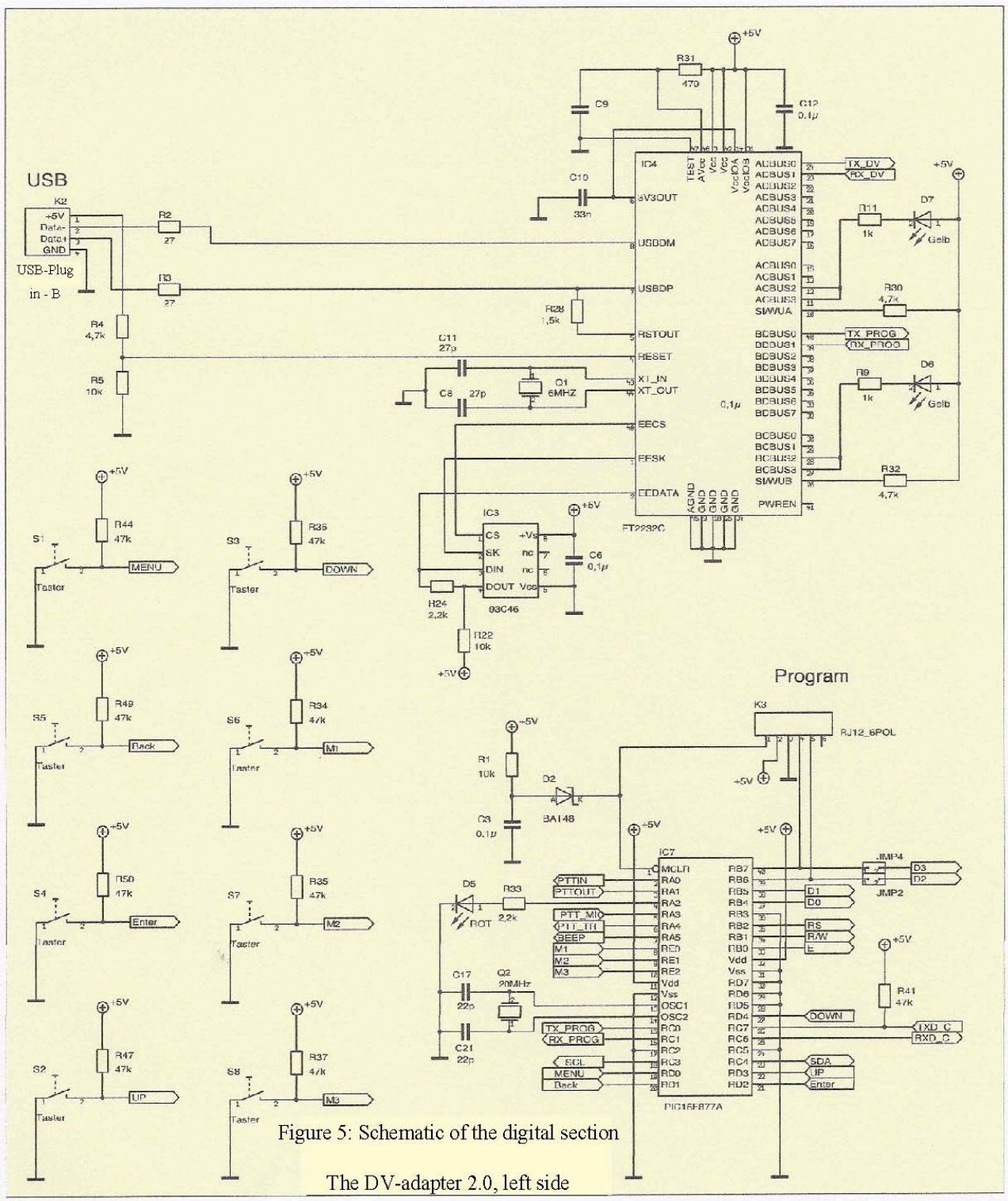


Figure 5: Schematic of the digital section

The DV-adapter 2.0, left side

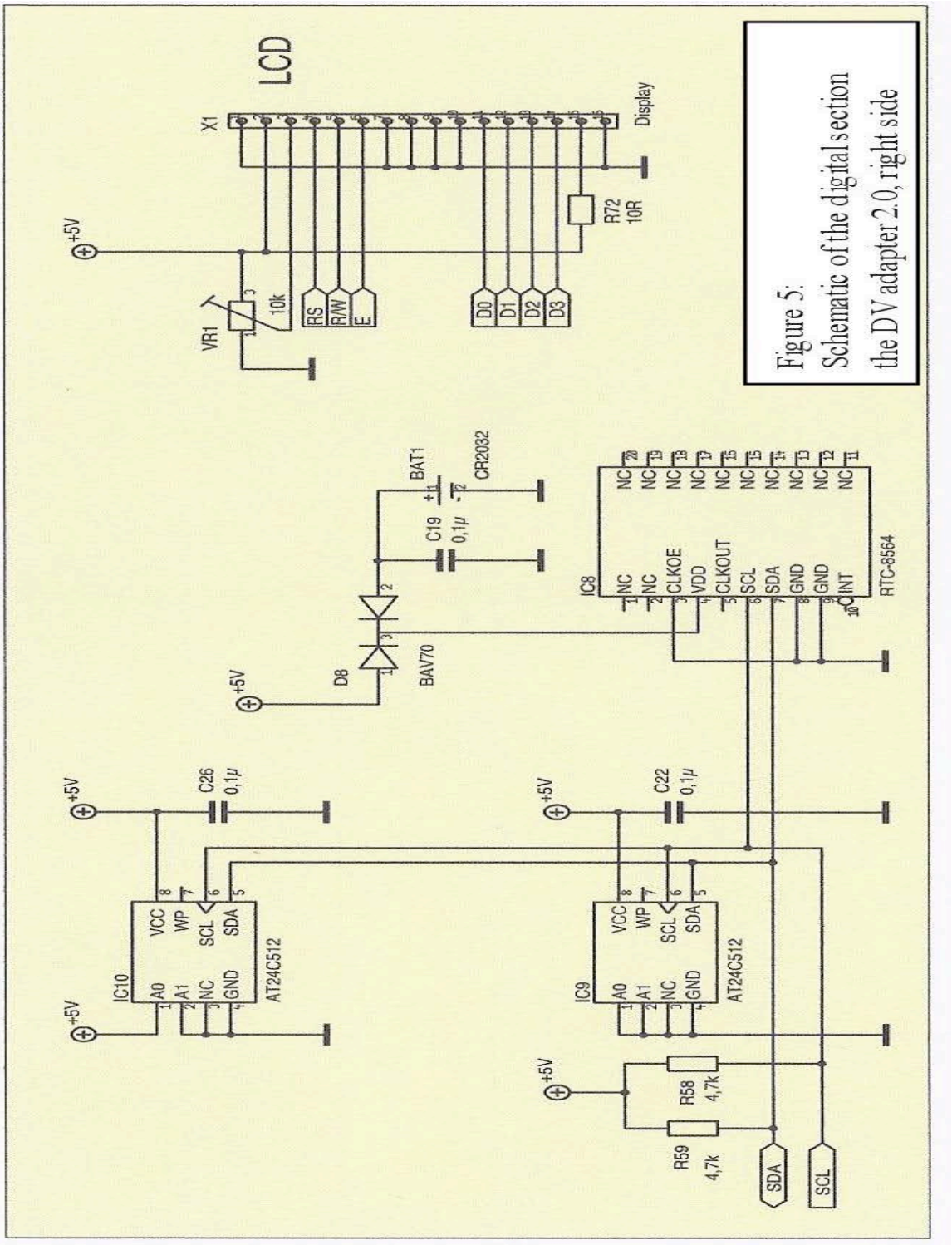


Figure 5:
Schematic of the digital section
the DV adapter 2.0, right side

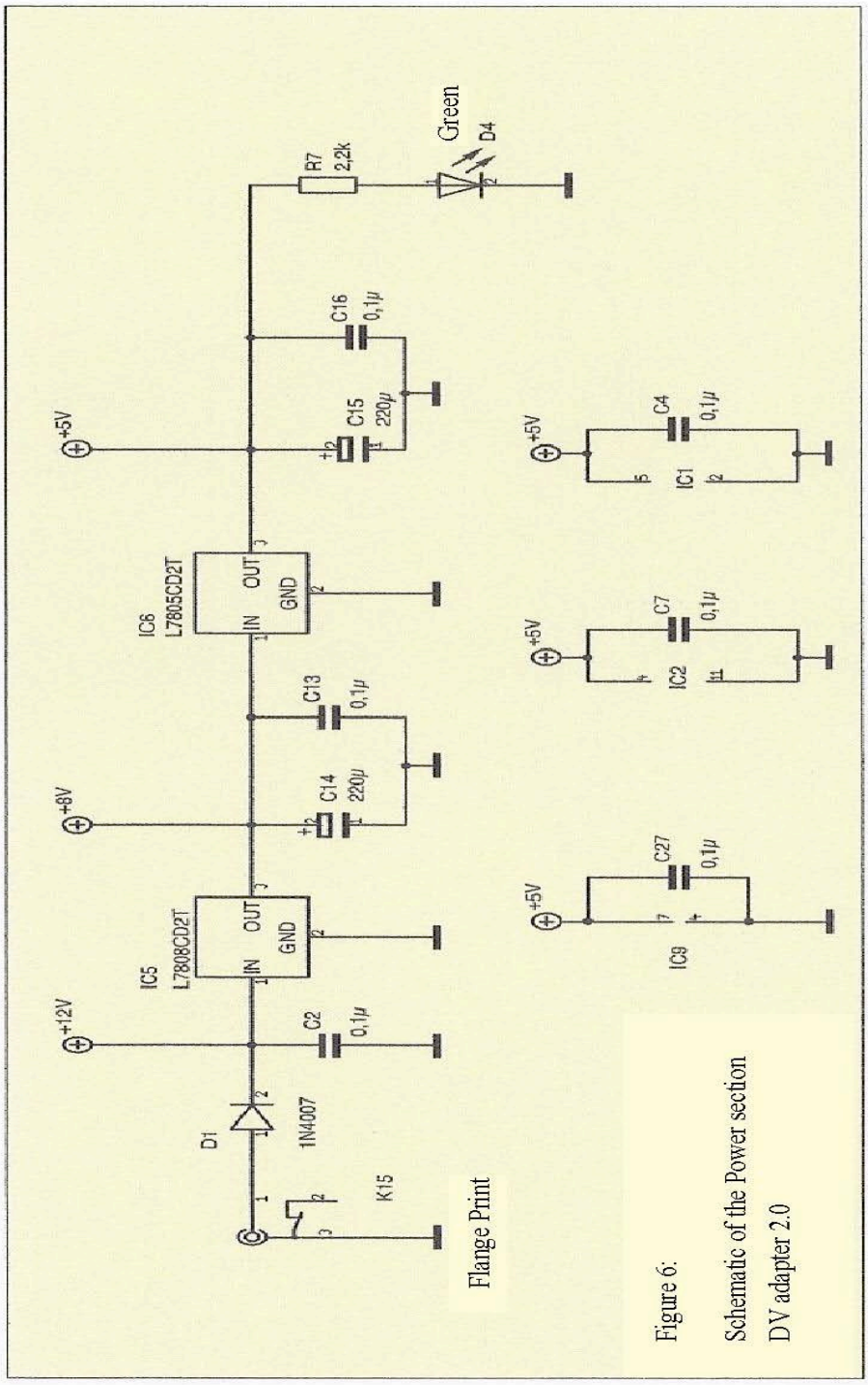


Figure 6:

Schematic of the Power section

DV adapter 2.0

Table 1: BOM of SMD components

Name	Value/Design	Type
R1, R5, R18, R20, R22, R25	10 kΩ	R-0805
R2, R3	27 Ω	R-0805
R4, R6, R8, R15, R30, R32, R42, R54, R58, R59, R73	4,7 kΩ	R-0805
R7, R24, R33	2,2 kΩ	R-0805
R10, R12, R13, R16, R17, R19, R23, R26, R27, R29, R34, R35, R36, R37, R38, R41, R43, R44, R47, R48, R49, R50, R53, R55, R60, R61, R74	47 kΩ	R-0805
R9, R11, R14, R39, R45, R46, R57, R64, R68, R70	1 kΩ	R-0805
R21, R40	22 kΩ	R-0805
R28	1,5 kΩ	R-0805
R31	470 Ω	R-0805
R51	180 Ω	R-0805
R52	100 kΩ	R-0805
R56	1,2 kΩ	R-0805
R62	180 kΩ	R-0805
R65, R66	330 kΩ	R-0805
R67	0	R-0805
R69	10 Ω	R-0805
R71	220 Ω	R-0805
C1, C29	2,2 µF	C-0805
C2, C3, C4, C5, C6, C7, C9, C12, C13, C16, C18, C19, C20, C22, C23, C26, C27, C30, C32	0,1 µF	C-0805
C8, C11	27 pF	C-0805
C10	33 nF	C-0805
C14, C15	220 µF	C-TAN-D
C17, C21	22 pF	C-0805
C28	330 pF	C-0805
C31	47 nF	C-0805
D2	BAT48	MINIMELF
D8	BAV70	SOT-23
T2, T3, T5	BC847C	SOT-23
T4	2N7002LT1	SOT-23
T6, T7	BC857C	SOT-23
IC1	LM321	SOT-23-5
IC2	LM324D	SO-14
IC3	93C46	SO-8
IC4	FT2232C	LQFP48
IC5	L7808CD2T	TO-263-2
IC6	L7805CD2T	TO-263-2
IC8	RTC-8564	SSOP-20
IC9	AT24C512	SO-8
IC12	TL081CD	SO-8
IC13	LM317	SO-8T1
U1	Narrow pitch connector (version for D-STAR module)	

Table 2: BOM of leaded components

Component	Value / Description	Housing	Remarks
BAT1	CR2032-Holder	KZH 20	
C24, C25	10 µF	ELKO2.5-5	
C33	220 µF	ELKO2.5-6	
D1	1N4007		
D3, D5, D9	Red	LED_3mm low Current	
D4	Green	LED_3mm low Current	
D6, D7	Yellow	LED_3mm low Current	
IC7	PIC16F877A	DIL40	Caption: 2FB2
IC10	AT24C512	DIL8	
IC11	LM386CN8	DIL8	Cutting out 36-pin. Strips
JMP1, JMP2, JMP4…JMP9	K1X2	1X02	Cutting out 36-pin. Strips
JMP3	K1X3	1X03	
K1	DIN6POL-MINI	DIN6POL-MINI	
K2	USB-B Connector	USB-B-PRINT	
K3	RJ12_6POL	RJ12, Unshielded Line	
K4	RJ11_4POLIG	RJ11, Unshielded Line	
K5, K6, K7, K8, K9, K10	K1X8	1X08	Cutting out 64-pin Strips
K11	K1X2	1X02	On the Platinum Base
K12	RJ45	RJ45, Unshielded Line Rounded	On the Platinum Base
K13	2.5 mm Jack	MJ-2508N	Low Profile
K14	3.5 mm Jack	MJ-3502N	
K15	Flange-Print	HEBW 21	
Q1	6 MHz	HC-18U	
Q2	20 MHz	HC-18U	
R63	10 kΩ / ¼ W	R _Stand	
R72	10 Ω/ ¼ W	Lying	
S1, S2, S3, S4, S5, S6, S7, S8	Taster	TASTER_3F	
S1, S2, S3, S4, S5, S6, S7, S8	Cap for Sensors		
VR1, VR4, VR5	10 kΩ	PT6L	
VR2, VR3	50 kΩ	PT6L	
VR6	1 kΩ	PT6L	
VR7	1 kΩ	3310	
X1	Display	LCD_4 · 20	

Miscellaneous			
U1	D-STAR Model		Below, in text
Button Cell	CR2032		In holder BAT1
Spacer sleeves, plastic, 8 mm for display	4 Each		
Jumper	9 Each		
Miniature speaker, 0,2 W			Not Included
Button for load speaker			Not Included
IC-Socket 8-pin			2x, IC10, IC11
IC-Socket 40-pin			1x, PIC IC7
3-mm screws + nuts for display	4 pieces		
Aluminum Housing	BX-199		Not Included
3-mm-screws for attaching the speakers	3 … 4 Pieces		Not Included
Pin Header	1 piece	1 x 16	For Display Connection

Table 3: Importance of the jumpers

JMP	Open	Closed
1	TX-Modulation normal, DC-free	TX-Modulation electrically +2,5 V
2*	PIC-Programming	normal
3	2-1: Squelch normal	2-3: Squelch normal
4*	PIC-Programming	normal
5	RX normal	RX inverting
6	TX normal	TX inverting
7**	RJ45-Mic	Speaker mic
8	Mic-NF DC component	Mic-NF On v_mic
9**	RJ45-Mic	Speaker Mic

* And **) 2 a.m. to 4 p.m. and 7 p.m. to 9 p.m. each jumper to evenly

Table 4: Connection to the Jumper field for some K5 ... K10 Handheld microphones

Yaesu MH31A8J: K10 ->	8	7	6	5	4	3	2	1*
***V_mic* K5**						•		
GND-A K6					•			
Mike-NF K7				•				
PTT K8			•					
GND K9		•						
JMP8	Set!							
***V_mic* (VR6)**	5 *V*							

Icom HM-103: K10 ->	8	7	6	5	4	3	2	1*
***V_mic* K5**								•
GND-A K6				•				
Mike-NF K7						•		
PTT K8					•			
GND K9		•						
JMP8	Open!							
V_mic	7.2 V (fully Clockwise VR6)							

Icom HM-133: K10 ->	8	7	6	5	4	3	2	1*
***V_mic* K5**								•
GND-A K6				•				
ke-NF K7			•					
PTT K8					•			
GND K9		•						
JMP8	Open!							
V_mic	7.2 V (fully Clockwise VR6)							

Speaker Mic Alinco, Icom, standard or Yaesu-type, e.g. WiMo MS-109::	
JMP7+ 9	Set!
JMP8	Set!
***V_mic* (VR6)**	
K5…K10	Irrelevant, not to K12 Mic

*) V. l. n. r. in position as in Figs 1, 9 or 10; Numbering here as in the network technology [12]; Warning: Reverse in Yaesu manuals!

Table 5: Suitability and settings for some radio sets (Status: August 25, 2009);
except at C5, C-5608 and FT-736 is needed after this experience no interference into the radio!

Manu-facturer	Devise	Function TX	Function RX	SQ-Polarity	Settings VR3 (TX-Hub)	JP1 DC	JP6 TX*	JP5 RX*	JP3 Sq.	Remarks
Kenwood	TH-F7E	?	?	Signal: 3,6 V	Carefully	Same	?	?	2 - 3	Still in Test
Kenwood	TM-255E	Yes	Yes	Signal: 5 V	Carefully	Same	Open	Open	2 – 3	
Kenwood	TM-455E	Yes	?	Signal: 5 V	Carefully	Same	Open	?	2 – 3	Still in Test
Kenwood	TM-833	Yes	Yes	?	?	?	Open	Open	?	According to info from 7M3TJZ
Kenwood	TM-D700E	Yes	?	Signal: 5 V	Carefully	Same	Open	?	2 – 3	Still in Test
Kenwood	TM-D710E	Yes	?	Signal: 5 V	Carefully	Same	Open	?	2 – 3	Still in Test
Kenwood	TM-V7E	Yes	?	Signal: 5,1 V	Carefully	Same	Open	?	2 – 3	Still in Test
Kenwood	TS-2000E/**2 M**	Yes	Yes*	No Signal: 2,9 V	Generous	Open	Open	Set	1 – 2	TX-Modulate (K1/Pin 1) and Pin 11 of ACC 2
	…/70 CM	Yes*	Yes	No Signal: 2,9 V	Generous	Open	Set	Open	1 – 2	TX-Modulate (K1/Pin 1) and Pin 11 of ACC 2
Icom	IC-706MK2G	Yes*	Yes	No Signal: 6 V	Generous	Same	Set	Open	1 – 2	
Icom	IC-910H	Yes	Yes	No Signal: 6 V	Carefully	Same	Open	Open	1 – 2	
Icom	IC-7000	Yes*	Yes*	No Signal: 6 V	Carefully	Same	Set	Set	1 – 2	
Icom	IC-7400	?	?	No Signal: 6 V	?	Same	?	?	1 – 2	Still in Test
Icom	IC-E208	Yes	Yes	Signal: 5 V	Generous		Open	Open	2 – 3	
Icom	IC-E2820	Yes	Yes	No Signal: 5 V	Generous		Open	Open	2 – 3	
Siemens	C5 [8] (Cell Phone)	Yes*	Yes+	No Signal: 5 V	Generous	Same	Set	Open	1 – 2	More Info see[8]
Standard	C-5608	Yes	Yes	Signal: 5 V	?	?	Open	Open	2 – 3	More Info at [9]
Yaesu	FT-736	Yes	Yes*+	Signal: 5 V	Carefully		Open	Set	2 – 3	With Symek-ZF-Model, Info possibility per E-Mail**
Yaesu	FT-817	Yes*	Yes		Carefully	Same	Set	Open	2 – 3	Mode Pkt. Menu 9600
Yaesu	FT-847	Yes*	Yes	Signal: 5 V	Carefully	Same	Set	Open	2 – 3	Mode Pkt. Menu 9600
Yaesu	FT-857	Yes	Yes	Signal: 3,6 V	Carefully	Same	Open	Open	2 – 3	Mode Pkt. Menu 9600
Yaesu	FT-897	Yes	Yes	Signal: 3,6 V	Carefully	Same	Open	Open	2 – 3	Mode Pkt. Menu 9600
Yaesu	FT-7800	Yes*	Yes	Signal: 5 V	Carefully	Same	Set	Open	?	According to info from 7M3TJZ
Yaesu	FT-8000	Yes	Yes	?	?	?	Open	Open	2 – 3	According to info from 7M3TJZ
Yaesu	FT-8800	Yes*	Yes	Signal: 5 V	Carefully	Same	Set	Open	2 – 3	Mode Pkt. Menu 9600
Yaesu	FT-8900	Yes*	Yes	Signal: 5 V	Carefully	Same	Set	Open	2 – 3	Mode Pkt. Menu 9600

* Inversion of the signal necessary to see JP 5 or JP6 in this table; 470 nF
\+ 1 microfarad in the RX-NF-line to pin 4 set to K1

The table will be updated in subsequent editions.

Table 6: GPS modes of the D-STAR module selectable via menu 8

Mode	NMEA-Record		
0			
1	GLL		
2	GGA		
3	RMC		
4	GSA		
5	VTG		
6	GLL	GGA	
7	GLL	RMC	
8	GLL	GSA	
9	GLL	VTG	
10	GGA	RMC	
11	GGA	GSA	
12	GGA	VTG	
13	RMC	GSA	
14	RMC	VTG	
15	GSA	VTG	
16	GLL	GGA	RMC
17	GLL	GGA	GSA
18	GLL	GGA	VTG
19	GLL	RMC	GSA
20	GLL	RMC	VTG
21	GLL	GSA	VTG
22	GGA	RMC	GSA
23	GGA	RMC	VTG
24	GGA	GSA	VTG
25	RMC	GSA	VTG

Chapter 3



Special Information :

Regards to DSC Squelch settings by pressing the "back" button, on the top right hand part of the display an indicator of the letter(s)…. c, C, d, D or nothing indicate different code squelch settings. Default is no letter indicating no Channel Guard or Private Line.

" " all receive
"c" provides callsign warning tone when your callsign is entered in another parties YourCall.
"C" same as "c" but passes receive audio without signal tone.
"d" Blocks all other callers except when other parties have put your particular call in their "Yourcall" and you put their callsign in "Yourcall". Gives signal warning Tone.
"D" same as "d" but without warning tone.

Programming preprogrammed settings. M1-M3
Will send to you later !