

**RTTY/CW TX TERMINAL for :
IC756 (all series), IC7400, IC746, IC7000
(PC not required)**

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IC-756, IC-7400, IC746 and IC-7000 have a built in RTTY decoder but RTTY transmission is very hard because Keyboard isn't supplied.

This interface can be used to add a standard PC Keyboard to some ICOM RTXs.

CW transmission can be performed also. For such use it can be used as CW keyboard with all commercial or home-made transceivers.

This solution is the "Ideal" one for portable operation due to the fact a PC is not required

F1-to-F10 can be user's programmable Keys for standardized messages.

Please see the following example:

The message: "cq cq de i0cg" is memorized with F1: while F2 load: "pse K → " (note that "→" is the cursor right Key that perform RX return)

To do an RTTY call :

press: F1, F1, F1, F2 consecutively

The RTX will go into TX and transmit the following text:

cq cq cq de i0cg

cq cq cq de i0cg

cq cq cq de i0cg

pse k →

The "→" key can be used inside a memory message or directly from the Keyboard to switch the RTX in RX mode.

Transmission is performed automatically when any keyboard Key will be pressed.

The F11 is a dedicated memory that allows an automatic counter for contest . Any time F11 is pressed the RTX will transmit three numbers (#) automatically incremented (Ie: 001, 002, 003). The # loaded into memory can be modified by the first # typed by the kdb and transmitted. This counter can be used in RTTY or CW too.

F11 will transmit the IOCG logo and SW version used. This can be transmitted if required.

The others functions F3-to-F10 keys can be programmed as desiderata with Name of QTH, Operator etcetera.

Programming a key message is very fast as it is only necessary press the ESC + function # Key to save a message (64 Chrs for any key).

To Save the memory write process two modes can be used:

- 1) with "return" Key, so a final return and line-feed is also transmitted

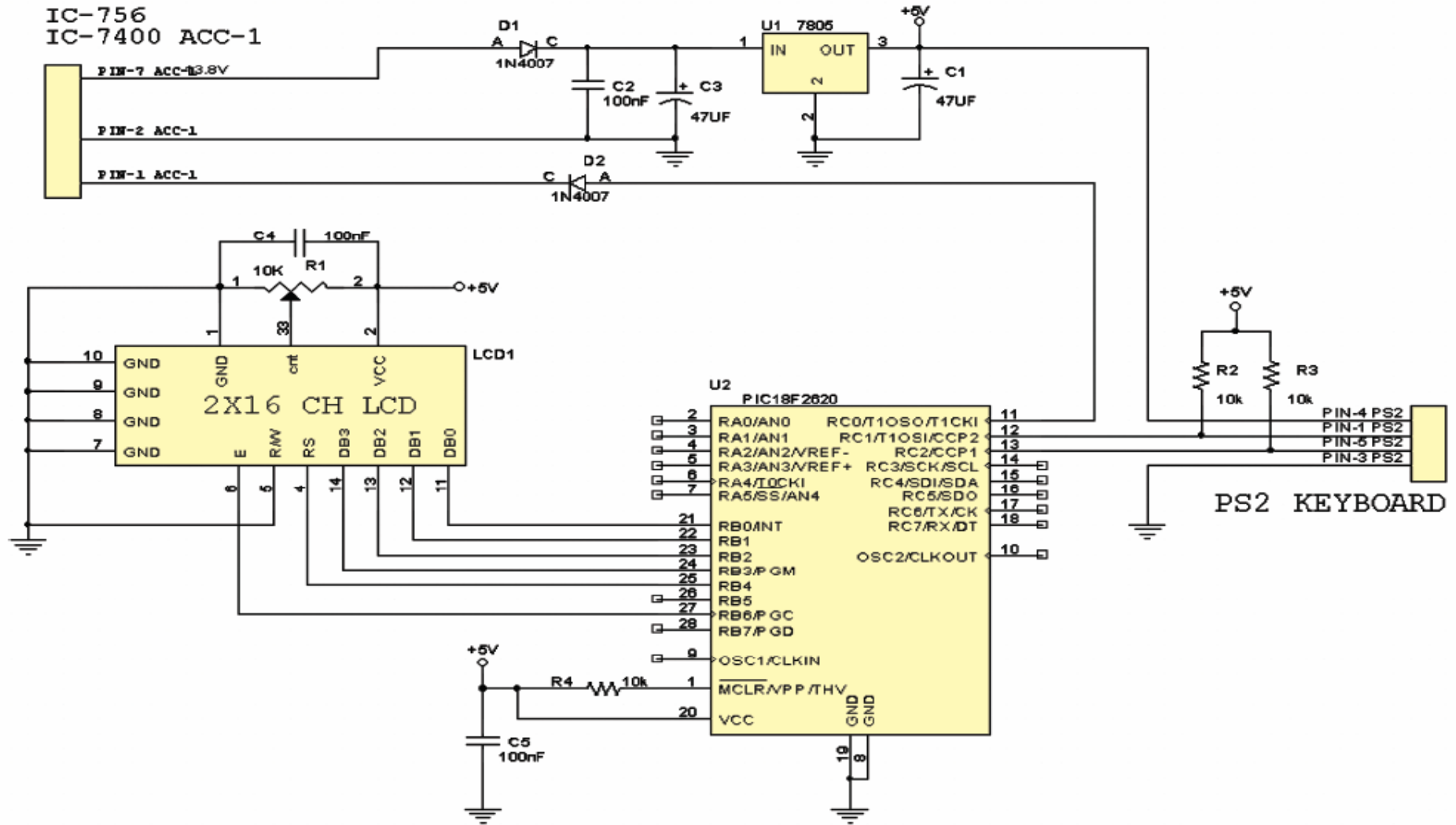
2) with "<" key, so no return is transmitted; useful if two memory must be transmitted on the same text line

Text is memorized on a non-volatile memory to avoid messages loss if keyboard is switched off.

CW USE NOTE:

- 1) If the Transceiver is in "FULL BREAK-IN", CW transmission of any KEY pressed is in automatic.
- 2) Side-tone of CW transmission can be listened on the interface front loudspeaker. This interface can be used for CW RX training also.
- 3) PAGE-UP and PAGE-Down keys will change CW speed.

Minimum schematic for RTTY If IOCG PCB is not used.



Attention: In the schematic diode D2 is wrongly positioned, it must be reversed.

What is available from IOCG:

1. .hex code is shareware and free. If ,after use, you like this program a voluntary donation on the PAYPAL account giulianori@virgilio.it is appreciated. Users that have donated a contribution will all updates at no charge.
2. Only programmed PIC (PIC18F2620)
3. PCB : code IOCG080108 (schematic is very simple so anyone can build interface on his own too) see the minimum schematic for RTTY
4. PIC board assembled and tested with LCD display, all connectors to connect the RTX, switches and PS2 or USB keyboard adapter (BOX and Keyboard are not supplied)

Future implementations:

- 1) Any valid user suggestion
- 2) SD memory stick to transport Contest log on PC
- 3) CW/RTTY demodulation

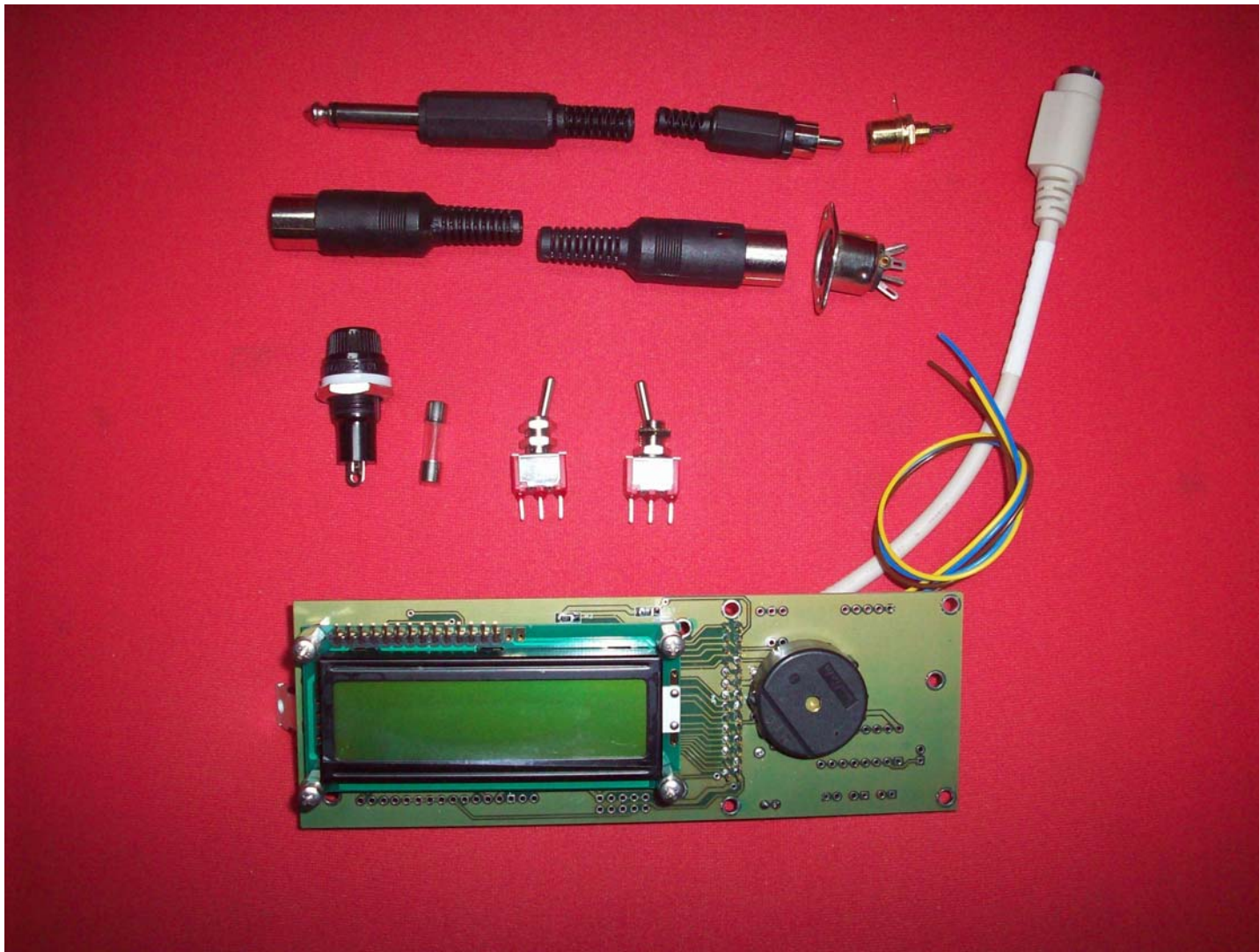
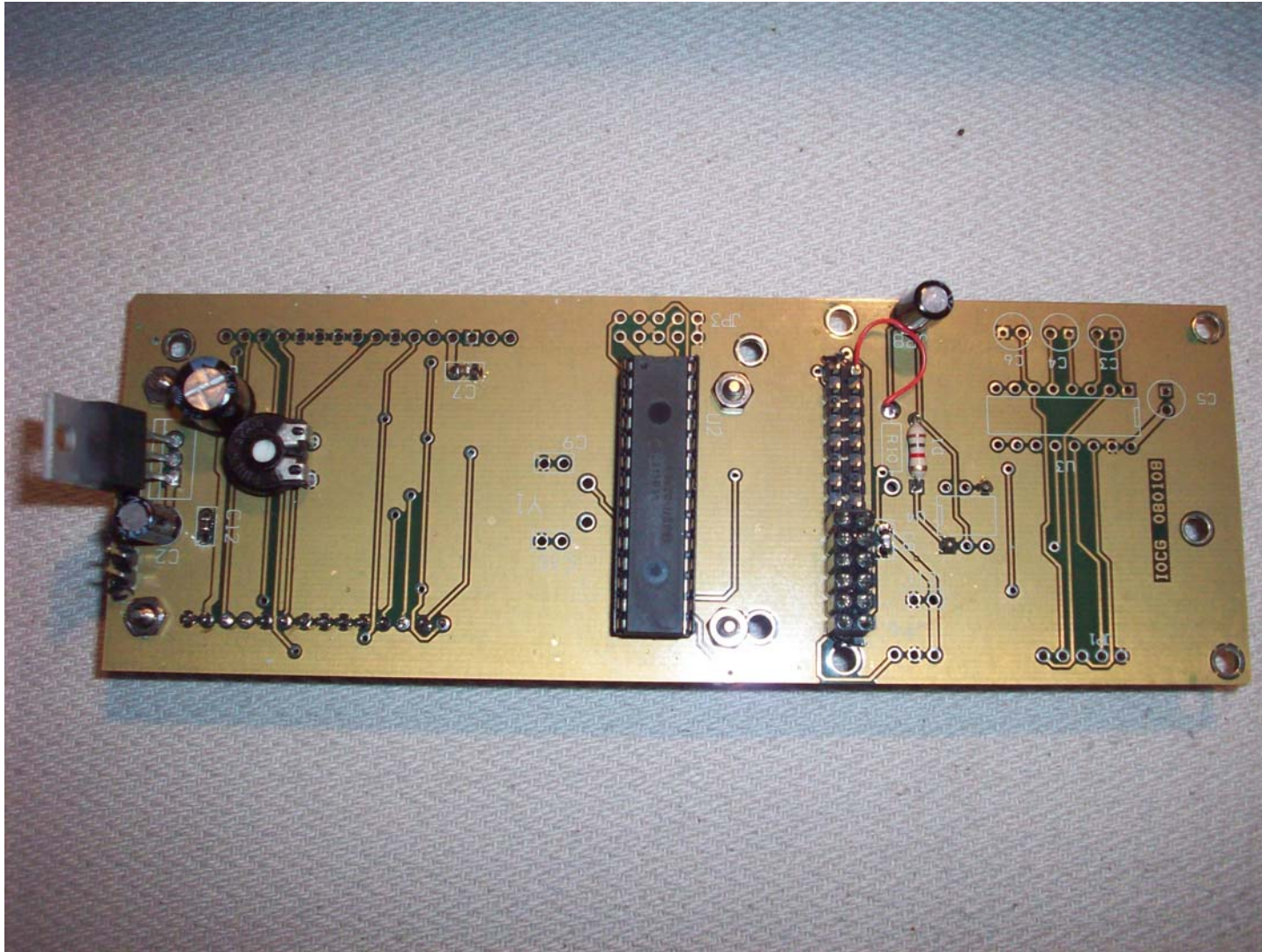
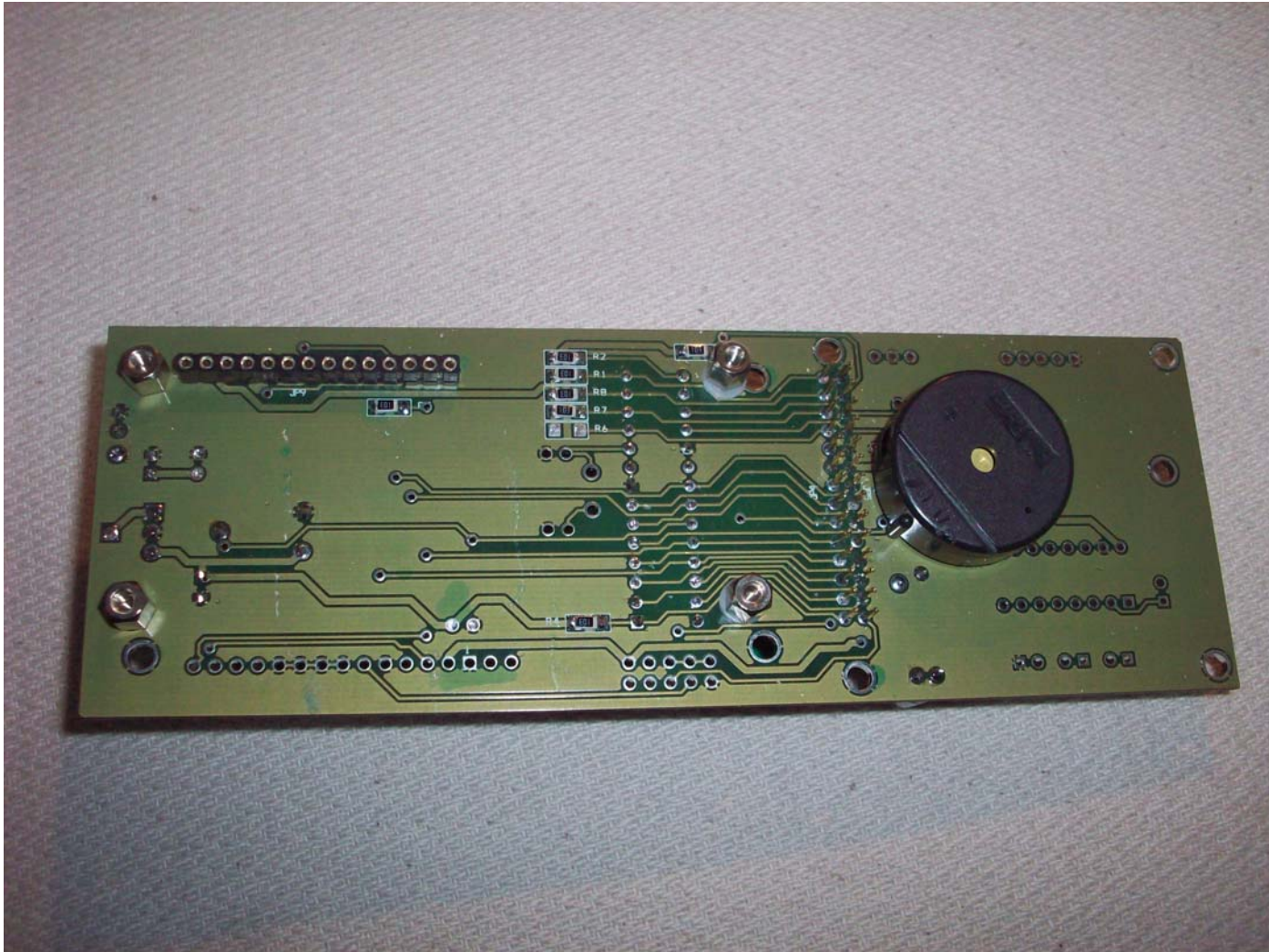


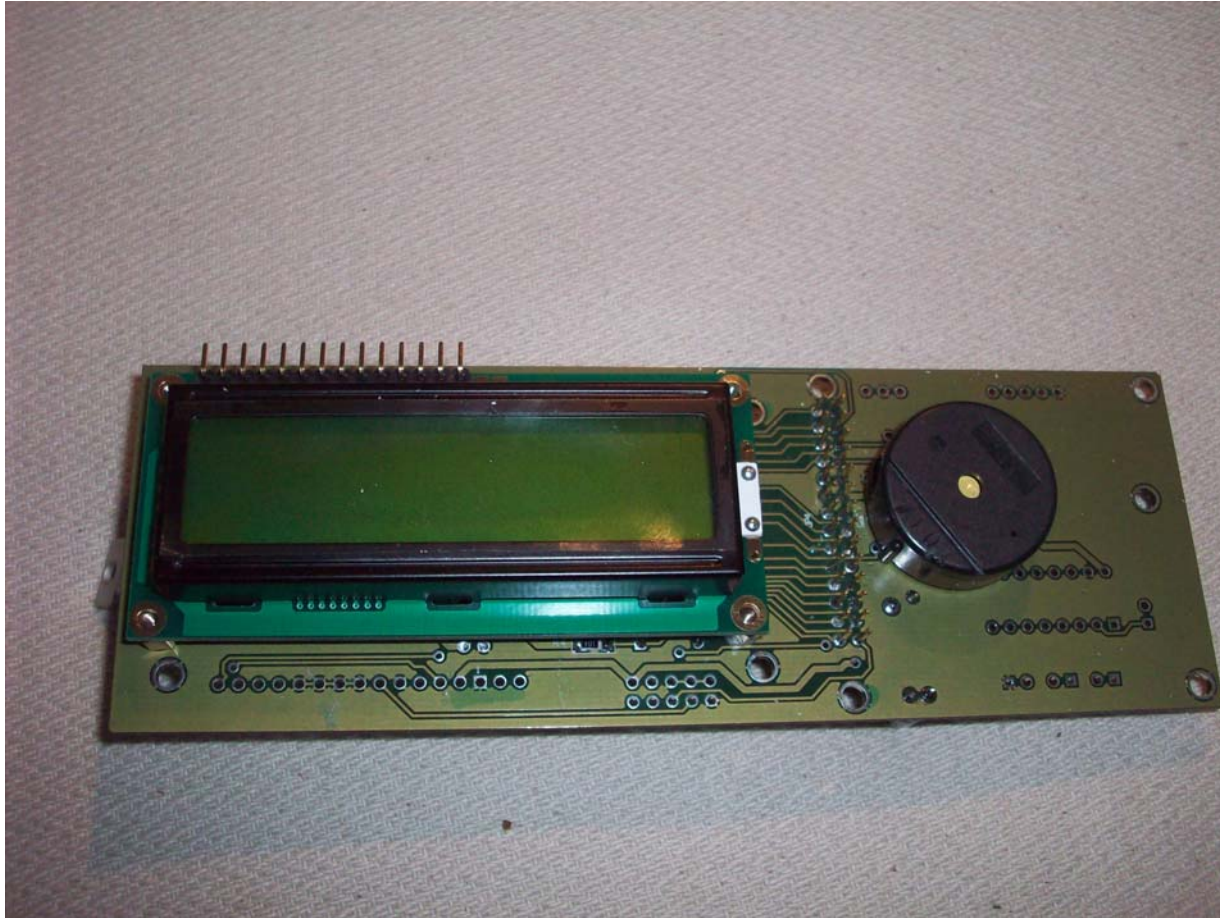
FIG 1 Fully Assembled Kit with PCB external components



PCB Back side (components side)



PCB Front side without LCD display (SMD resistors are preinstalled)

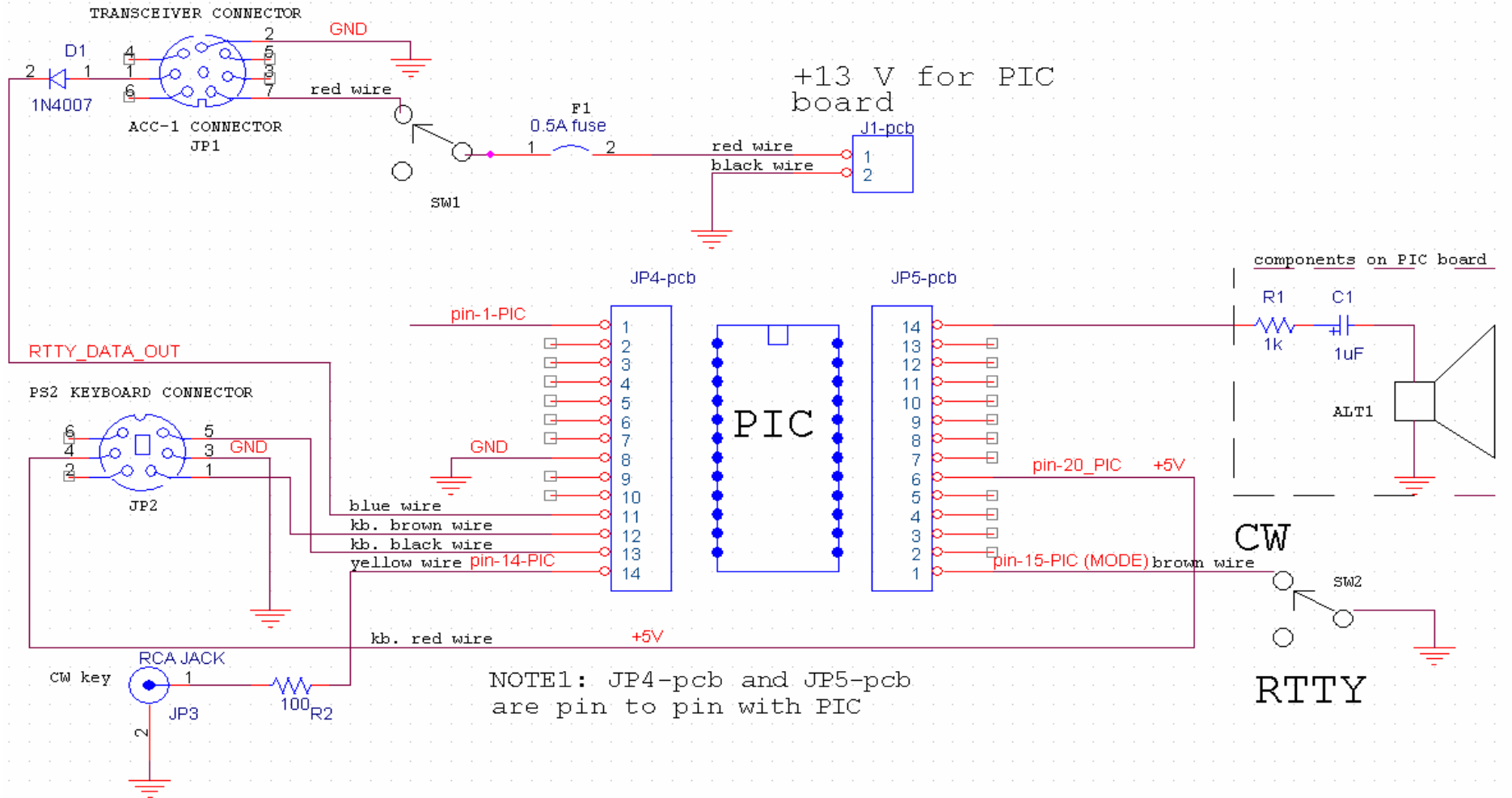


PCB Front side with LCD display



RTTY interface inside a prototype box in use with I0CG IC-756proIII

Box wiring with PIC controller (PCB code I0CG080108)

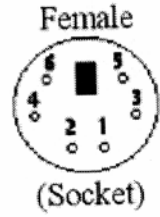
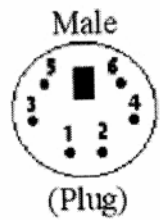


To perform automatic TX add a wire from JP1-3 to JP5-3 (PIC pin 17)

Bill of materials wired components inside Box

Reference	components	Use
Jp1	Connector 7 pin female	TRX connector for FSK and power supply
Jp2	PS2 adapter connector	Keyboard
Jp3	RCA Jack	CW key
Sw1	Power supply switch	
Sw2	Mode switch	Switch RTTY to CW mode
F1	Fuse	0.5 A

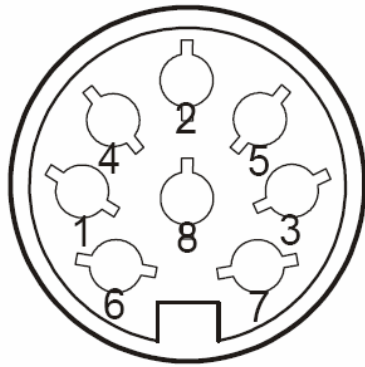
Connector for PS2 keyboard



6-pin Mini-DIN (PS/2):

- 1 - Data
- 2 - Not Implemented
- 3 - Ground
- 4 - Vcc (+5V)
- 5 - Clock
- 6 - Not Implemented

ACC-1 CONNECTOR for ICOM transceiver IC-756, IC-7400, IC746



frontal view

PIN 1 = FSK

PIN 2= GND

PIN 7= 13.8 V

PIN 3 =PTT (Optional, for automatic TX switch)

IC-7000 ACC Connector

ACC SOCKET

ACC	PIN #	NAME	DESCRIPTION	SPECIFICATIONS	COLOR
	1	8 V	Regulated 8 V output.	Output voltage : 8 V \pm 0.3 V Output current : Less than 10 mA	brown
	2	GND	Connects to ground.	—————	red
	3	HSEND	Input/output pin (HF/50 MHz). Goes to ground when transmitting. When grounded, transmits (connected to 8V line thru 2.2 k Ω resistance/144 MHz operation)	Ground level : -0.5 V to 0.8 V Input current : Less than 20 mA (HF/50 MHz bands)	orange
	4	BDT	Data line for the optional AT-180.	—————	yellow
	5	BAND	Band voltage output. (Varies with amateur band)	Output voltage : 0 to 8.0 V	green
	6	ALC	ALC voltage input.	Control voltage : -4 to 0 V Input impedance : More than 10 k Ω	blue
	7	VSEND	Input/output pin (144/430 MHz) Goes to ground when transmitting When grounded, transmits (connected to 8V line thru 2.2 k Ω resistance/HF*50 MHz operation).	Ground level : -0.5 V to 0.8 V Input current : Less than 20 mA (144 MHz band)	purple
	8	13.8 V	13.8 V output when power is ON.	Output current : Max. 1 A	gray
	9	TKEY	Key line for the AT-180	—————	white
	10	FSKK	RTTY keying input. Connected in parallel to the [RTTY] jack.	Ground level : -0.5 to 0.8 V Input current : Less than 10 mA	black
	11	MOD	Modulator input.	Input impedance : 10 k Ω Input level : Approx. 100 mV rms	pink
	12	AF	AF detector output. Fixed, regardless of [AF] position.	Output impedance : 4.7 k Ω Output level : 100 to 350 mV rms	light blue
	13	SQLS	Squelch output. Goes to ground when squelch opens	SQL open : Less than 0.3 V/5 mA SQL closed : More than 6.0 V/100 μ A	light green



Rear panel view

Cable for connections to IC-756 or IC-7400 / IC-746

Materials:

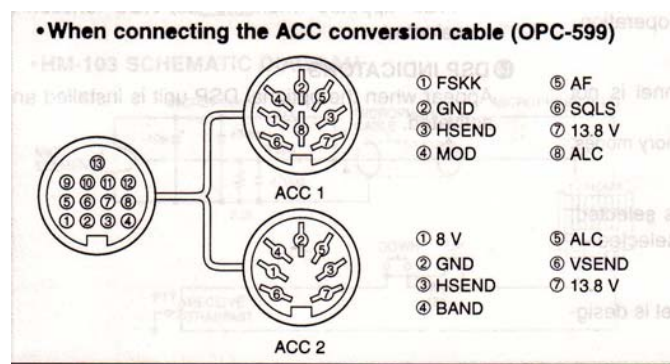
2 connectors 7 pin or 8 Pin for AUX-1 (only three pins used)

0.5 m four wire cable

Interface side	Transceiver side	signal
1	1	FSK
2	2	GND
7	7	13.8V
3	3	PTT (Optional, to automatic TX switch)

Cable for connection to IC-7000

If conversion cable type OPC-599 is used, cable is the same for IC-756 or IC-7400 / IC-746.



OP5-599 CONVERSION CABLE

Cable with 13 pins ACC connector supplied with IC-7000

Materials:

connector 7 pins

#1 connector 13 pins supplied with IC-7000

0.5 m cable with four wire

Interface side	Transceiver side (13 pin connector)	Wire color	signal
1	10	black	FSK
2	2	red	GND
7	8	gray	13.8V
3	13	Lite-green	PTT (Optional, to automatic TX switch)

Cable for CW for IC-756, IC-7400, IC-746, IC-7000

Materials:

#1 RCA male connector

#1 Jack mono 6 mm

0.5 m shield cable

cable connected as pin-to-pin

Some pictures of I0CG prototype:

