

Specifications for Port Expander for the VK5DJ controller

- Provide 3 digital inputs (possible uses include burglar alarm, AC fail)
- Provide 2 analogue to digital converters (possible uses battery voltage, SWR)
- Provide outputs where possible uses include audio board control (record, playback, 2 for message number –callsign and message, plus outputs for siren on breakin, change antenna, switch fans.

PIC connections for 16F1827

Pin number	Function	Notes
1 RA2	TTL out (high when active)	via 4K7 possible drive a transistor for a fan
2 RA3	Digital input (active low)	Software connected to AC fail function in controller
3 RA4	Digital input (active low)	From door alarm but no software in controller yet
4 RA5	Digital input (active low)	From another input
5 Vss	Ground power	Ground
6 RB0	Detect end of play (RECLED)	Connect to ISD1820 RECLED output
7 RB1	USART input	RX RS232 – TTL (to pin 8 of PIC on main controller)
8 RB2	USART output	TX RS232 – TTL (to pin 7 of PIC on main controller)
9 RB3	Digital output	TTL drive to audio board –high to record
10 RB4	Digital output	Output (10msec pulse) to PLAYE initiate playback
11 RB5	Digital output	Message select 1 (if device has > 1 message)
12 RB6	Digital output	Message select 2 (if device has more than 1 message)
13 RB7	Digital output	TTL drive auxiliary (antenna switch?)
14 Vdd	+5V supply	+5V regulated and bypassed
15 Osc1	10 MHz crystal bypassed with 27pf to ground	10 MHz Crystal for comms stability (TTL RS232) across pins 15 and 16
16 Osc2	10 MHz crystal bypassed with 27pf to ground	
17 RA0	A/D conversion 0	Possible battery volts (tie low if not used)
18 RA1	A/D conversion 1	Possible SWR (tie low if not used)

It will be necessary to protect any long leads on the inputs of the digital leads. This would apply to the burglar alarm and possibly the AC Fail circuitry. I'll use a 0V on an input pin to indicate an active function. The best protection would be a simple transistor switch but this will invert the logic from the user side.

Outputs to audio board can be direct connections as this is all TTL. Any outputs to relays will need to be buffered by transistors, again active low on the pins of the PIC.

A/D input will need to scale the voltage to within a range 0-5V or part thereof (Voltage must not go below 0V).

Construction on VeroBoard.

Repeater controller – additional commands to suit voice expansion

Main command	Subcommand	Result	Notes
12 HEX	00	Uses CW ID	IDs still follow the permissions
	01	Uses Voice ID	Using message 0 in recorder
13 HEX	00	CW message from EEDATA	
	01	Uses Voice message	using msg1 in recorder
14 HEX	00	Record ID off	
	01	Record ID on	Wait for OK then rekey and talk
15 HEX	00	Record message off	
	01	Record ID on	Wait for OK then rekey and talk
16 HEX	00	Digital port 1 is off	
	01	Digital port 1 is on	Perhaps switch fan
17 HEX	00	Digital port 2 is off	
	01	Digital port 2 is on	Perhaps switch antenna
18 HEX	00	Request external inputs (off)	
	01	Request external inputs (on)	Returns value of three ext inputs
19 HEX	00	Read A/D 1 (off)	
	01	Read A/D 1 (on)	Get battery volts or other
1A HEX	00	Read A/D 2 (off)	
	01	Read A/D 2 (on)	Get SWR or other

Additional commands for the repeater controller using the 16F1827 (Version 9)

All but the two record functions are remembered in EEDATA.

The record functions works like this:

Send command 1401, drop carrier, listen for OK. The audio from the next opening of the COS to the next closure of the COS is recorded.

There are two safety precautions built in to avoid lock up through lost data.

In the controller the play back will be aborted if the playback exceeds 15 seconds and the transmitter(s) will drop out. In the extender board if either a playback or a record function exceed 32 seconds then the extender board will reset and switch off record and playback functions. Any external controls will be restored to the saved state.

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