



## Technical Info Doc: PIC16F876A LCD Satellite Tracker & Rotor Controller

### ST2 Intro:

ST2 is an advanced Satellite Antenna Tracking Interface for Yaesu (Or similar) Rotor Controllers. Project uses PIC16F976A, 28PIN DIP. Firmware uses full A/D and EPROM capability of 876A and makes setup a smooth process.

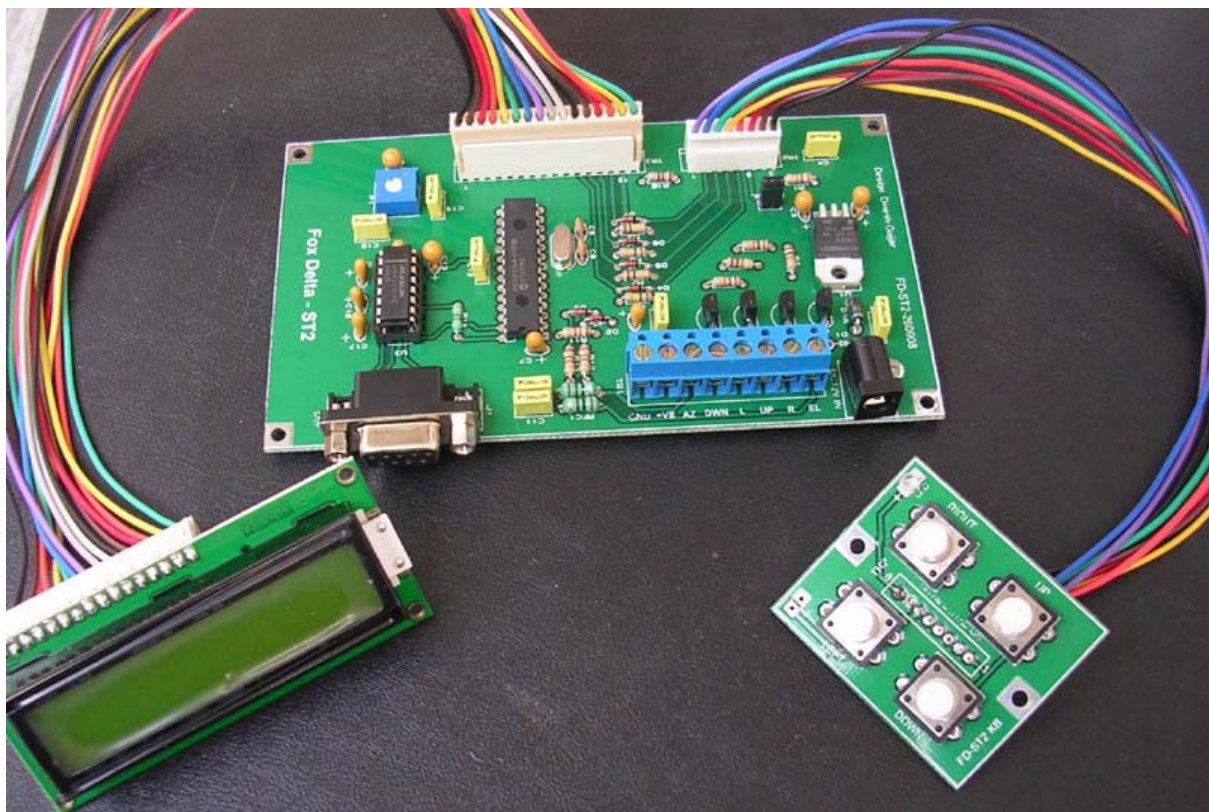
ST2 measures 14x8cm and is designed on a double sided PTH board.

Screw Terminals are used for Rotor Connections to simplify installation.

ST2 has Bi-Directional data flow, from PC to ST2 & St2 to PC. A Max232 level converter is used to obtain full RS232 compatibility.

ST2 supports GS232, Extended GS232 and Easycomm commands, making it a suitable interface to use with NOVA, SatPC32 any many more, having above interface servers.

ST2 may work without an LCD Display. However, Kits are supplied with LCD and 4 Push Button Keyboard, keeping in mind Operation at Radio Amateur Stations.

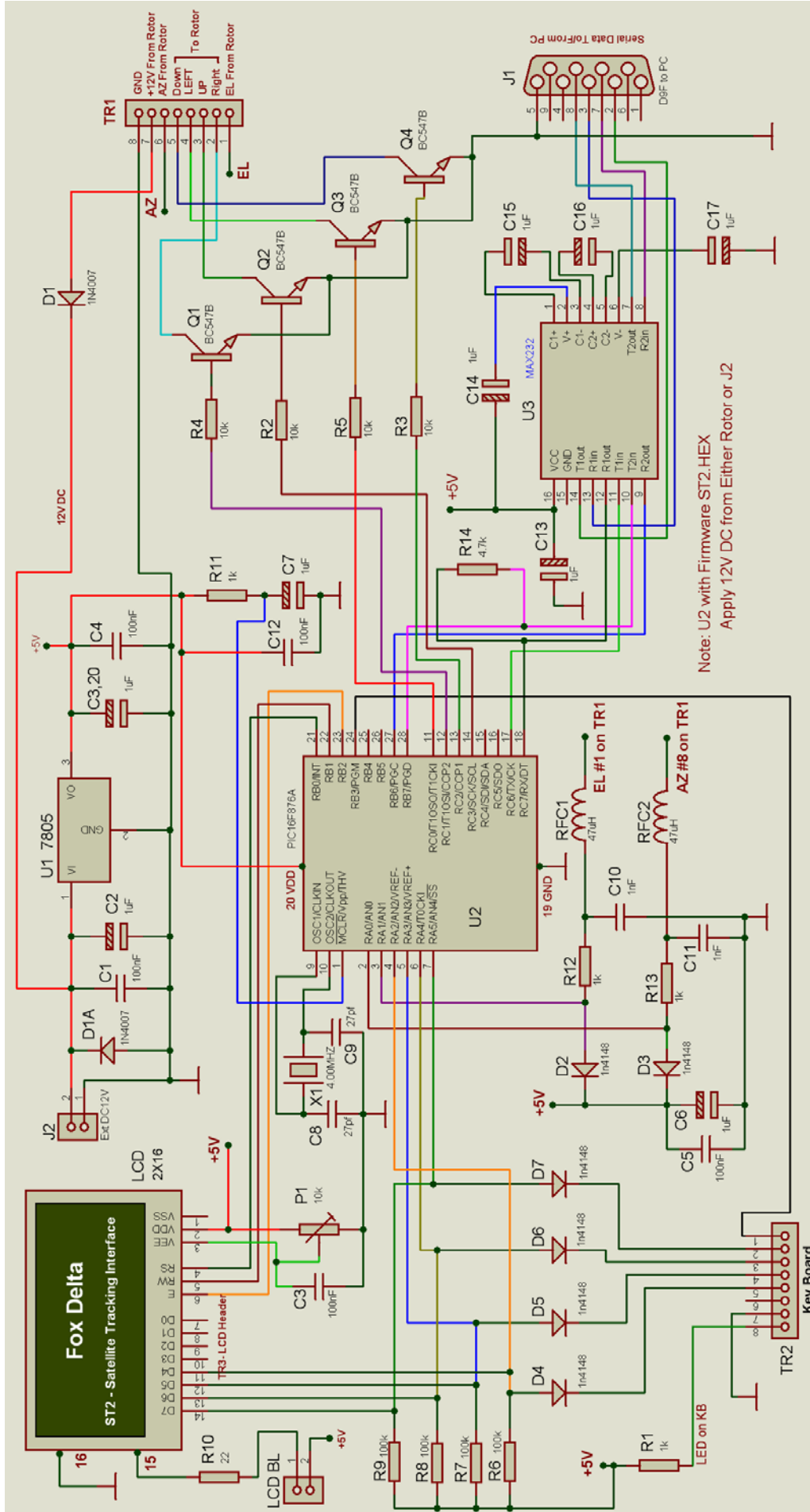


## ST2 Parts List:

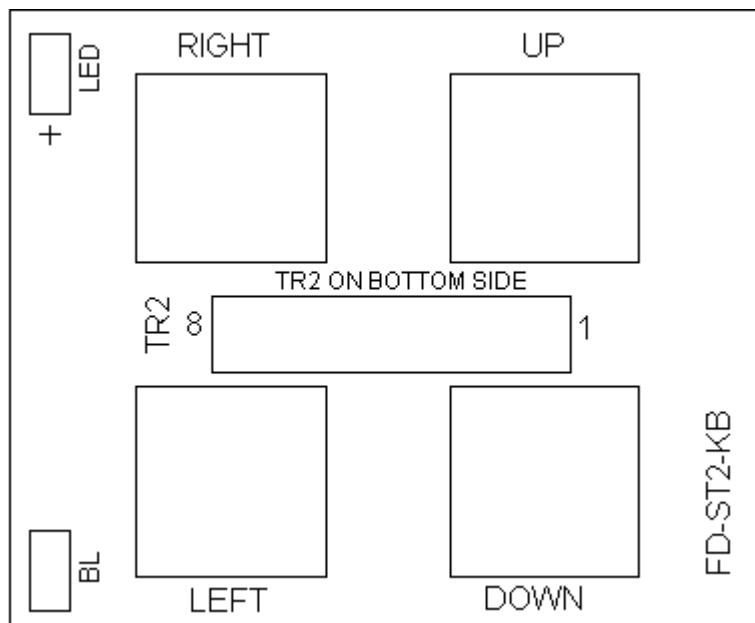
Part	Quantity	Details
U2: PIC16F876A	1	Processor Pre-Soldered.
Q1- 4: BC547B	4	NPN Transistors
16x2 LCD	1	LCD Display
X1: Crystal	1	4MHZ HC49U
ST2 PCB	1	Double Sided PTH PCB
U3: MAX232	1	RS232 Driver
TR3: SIL16 Male	2	LCD & PCB connector
SIL 16 Ribbon	1	Ribbon for interconnect
TR2: SIL8 Male	2	PCB mounted for KB
SIL 8 Ribbon	1	Key Board connection
U1: 7805	1	5V Positive Regulator
DIP 16	1	IC Socket for MAX232
47uh RFC	2	RFC1, 2
J2: DC Socket	1	+12V External
TR1: Terminal 8	1	8 Terminal block (2x4)
P1: 10K Preset	1	LCD Contrast
J1: D9F	1	PCB R/A D9 Female Connector
2 PIN Header	1	LCD BL
Push Buttons	4	12MM
KB PCB	1	Keyboard PCB
DIN8 Plug	1	For Yaesu Rotor Controller Connection

Part	Quantity	Details
1uf Tantalum	10	C2, 3, 6, 7, 13, 14, 15, 16, 17, 20
0.1uf Ploy	6	C1, 4, 5, 12, 18, 19
0.001uf Poly	2	C10, 11
27pf Ceramic	2	C8, 9,
1N4007	2	D1 , D1A
1N4148	6	D2, 3, 4, 5, 6, 7,
1K	4	R1 (LED), R11, 12, 13
100K	4	R6, 7, 8, 9
10K	4	R2, 3, 4, 5
4.7K	1	R14
22 Ohms	1	R10 (LCD BL)

# Schematic of ST2:



## Silk View of Key Board:

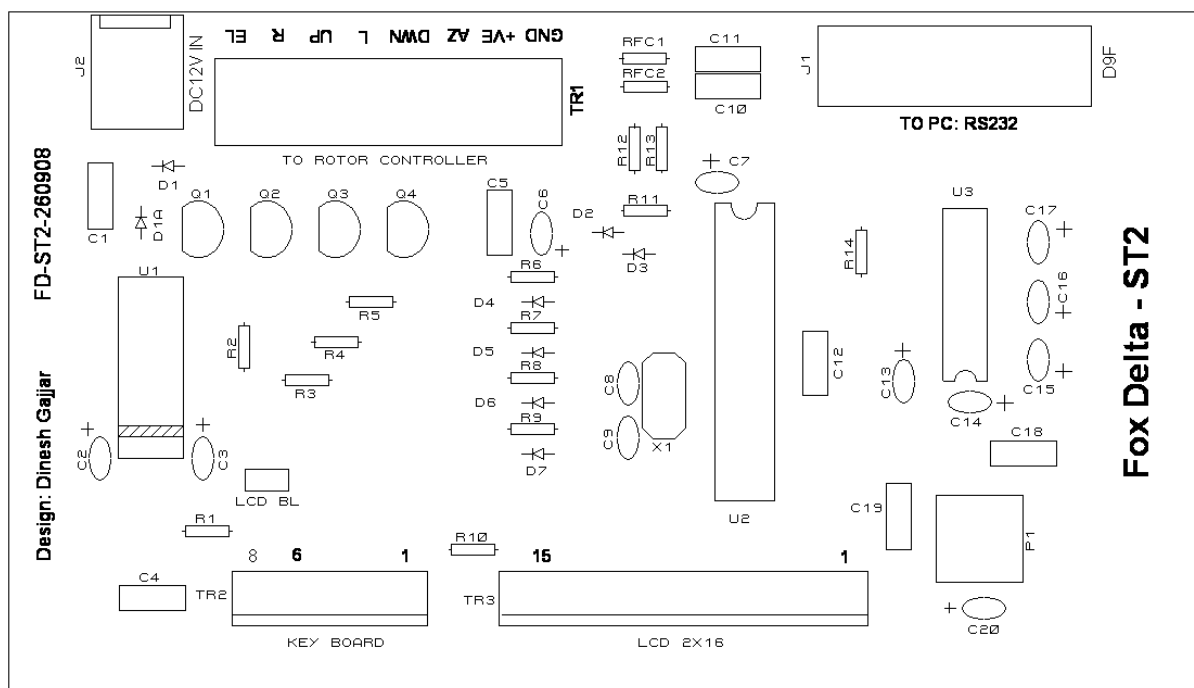


TR2 is an 8 Pin SIL socket and installed on the bottom side of the Key Board.

Key Board also has connection to install an LED and a BL on/off switch on User Front Panel.

However, these parts are not supplied with kit.

## ST2 Silk:

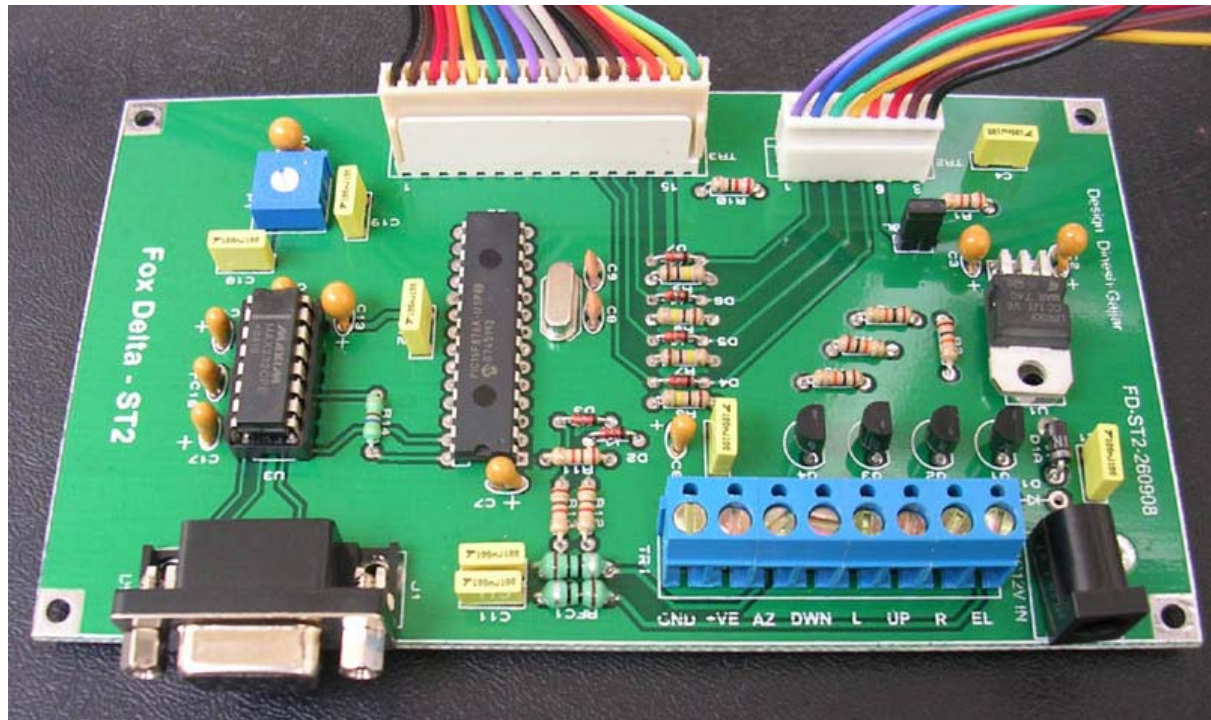


ST2 may be powered by applying DC12V at J2 or may receive DC12-15V from Yaesu Rotor Controller.

Install Diode D1 if you wish to power ST2 from Yaesu Controller.

For DC 12V at J2, remove D1. D1A is a polarity protection diode.

## Completed ST2:



### Setup with Yaesu Rotor Controller:

Prior to connecting this interface with Rotor Controller, Please refer to the Controller Schematic.

User is required to make a cable from ST2 to Yaesu Rotor Controller. This may be achieved by using an 8 Core cable and solder a DIN8 Plug at the other end.

Normal connections of the Yaesu G5400/5500 rotor controller is as follows:

### DIN 8 Plug Connections: ( Goes to TR1 on ST2)

1. EL: 2 to 4.5V out to ST2 or ST3 Interface
2. Right
3. UP
4. LEFT
5. DOWN
6. AZ: 2 to 4.5V out to ST2 or ST3 Interface
7. DC 12V to ST2 or ST3
8. GND

73s/Dinesh Gajjar / 22<sup>nd</sup> Nov 08

For more details, please visit Project Page: <http://www.foxdelta.com>