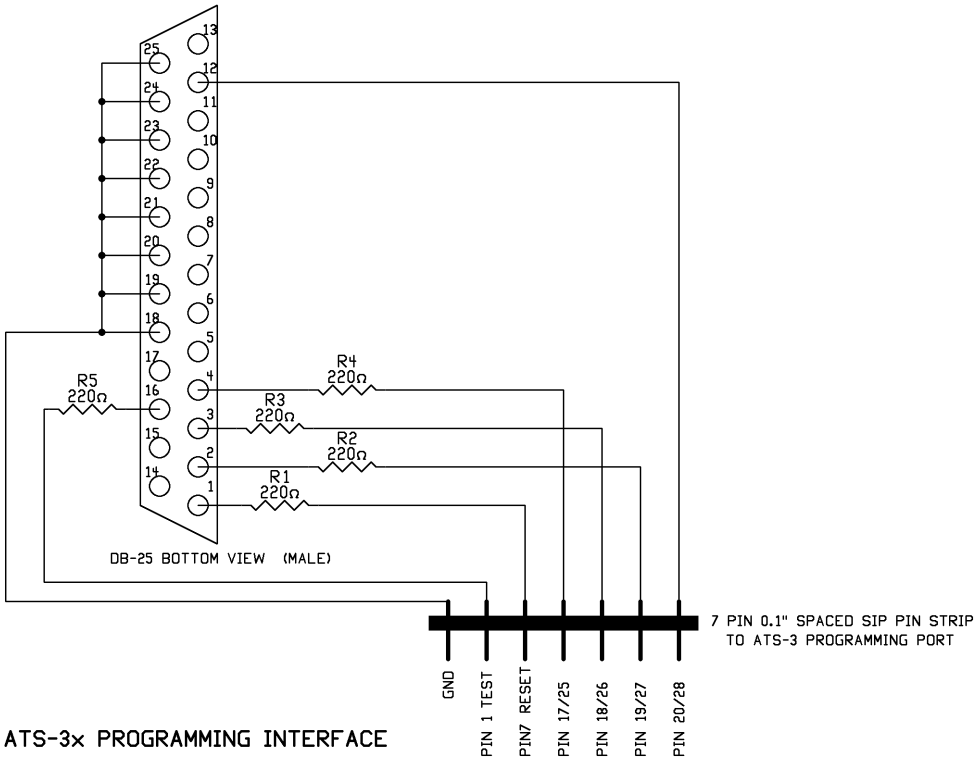
Reprogramming the MPU.

There is a row of pads above the MPU labeled “programmer”. These bring out the programming pins for the MPU, so that the firmware can be upgraded or changed. Several people have modified the firmware to provide additional or different features to the rig. To reprogram the MPU, a simple level shifting interface must be constructed to go between a PC with a parallel port and the programming pads on the main board. As shown below:



In addition to the interface, you will need to install the MPS430 IAR development program to your PC. This program can be found in the MPS file folder with the name “FET_R451.exe” Double clicking on this will start the installation program.

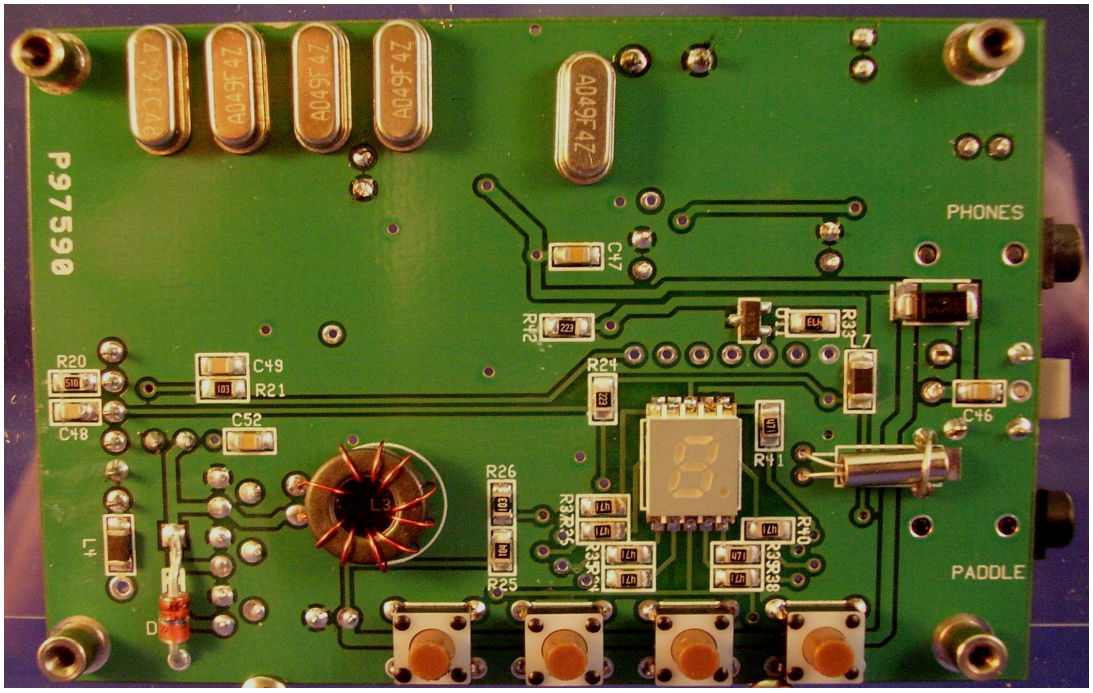
The file folder labeled “MSP” on the CD should be copied to your hard drive, either in the C root directory or “My Documents” folder. Open the IAR program and select “open existing project” from the dialog box and direct it to look in the MPS folder. The project “ATS3B_digi should show up and select that and click OK.

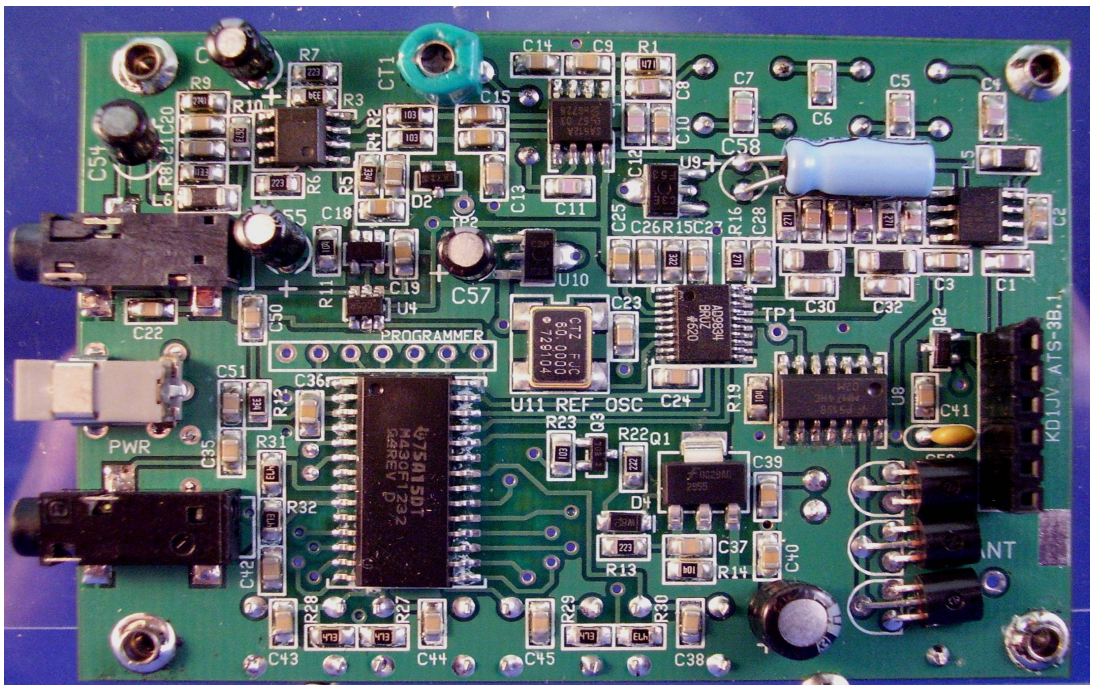
The source code file will now be displayed and can now be worked on if so desired. To reprogram the MPU with this file, connect the programming cable to the LPT1 parallel port of your PC, apply power to the ATS3B board and then plug the header pins from the interface cable into the board. The ground pin end goes into the pad hole to the left of the MPU, as seen with the MPU below the programming port pins. A SIP socket is not needed for the pins, the fit into the board is tight enough to the pins in the SIP plug to make reliable contact.

Now click on the C-Sky icon in the tool bar (looks like a magnifying glass) and the programming should start.

If you wish to program a different file into the MPU, add that file to the MPS folder and then add it to the list of files. Click on that file name to make it active and proceed as above.

Reference pictures of the front and back sides of completed board:

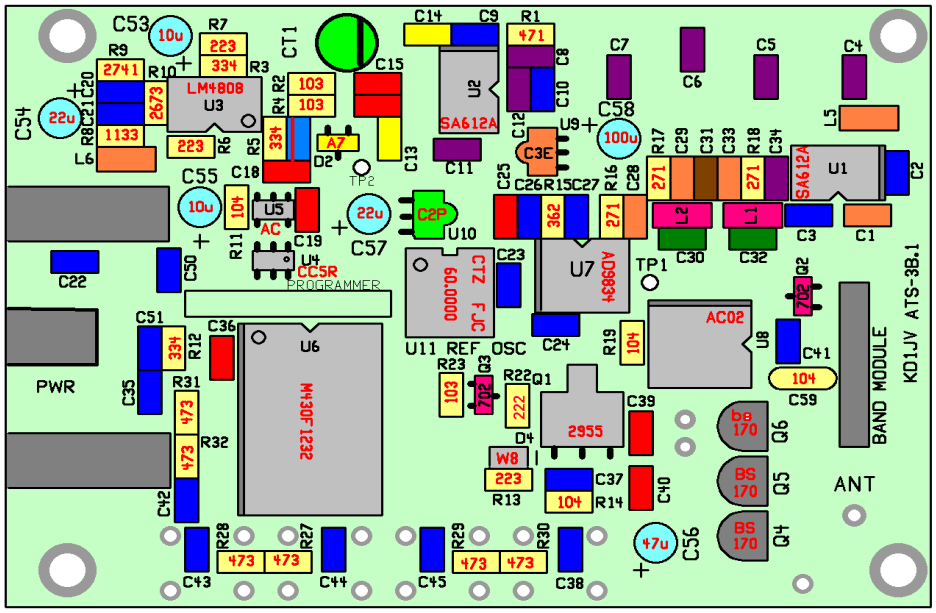




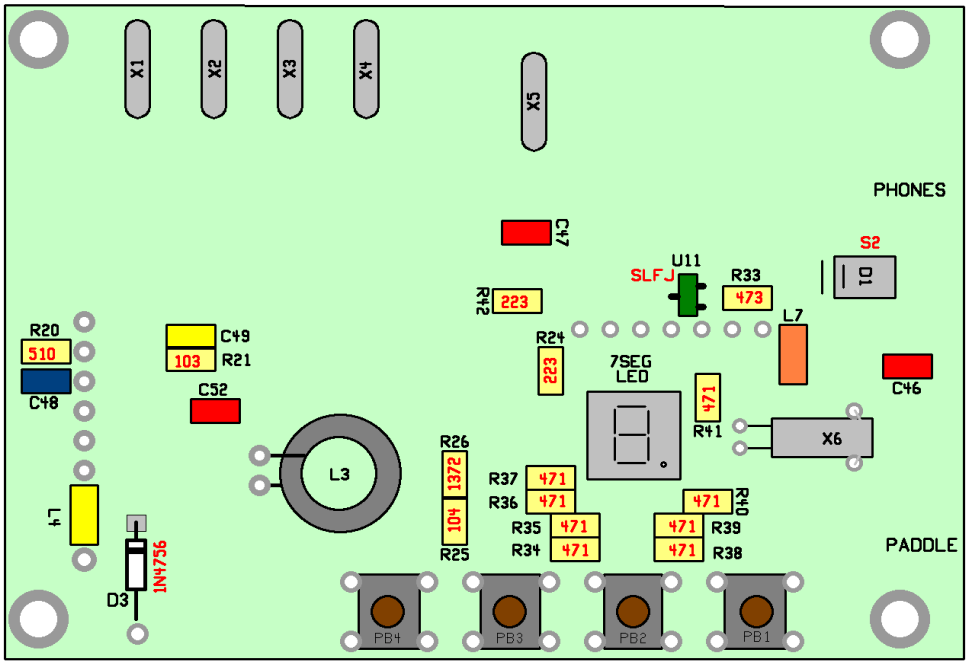
Overall placement diagrams.

The front and back parts placement guides below should be printed out for convenient reference while building. Color coded locations match the colors of the corresponding part carrier. Part outlines with numbers inside indicate resistors and the resistor value to be placed there. Also refer to the photos of the completed board.

Back side:



Front side:



Parts check list:

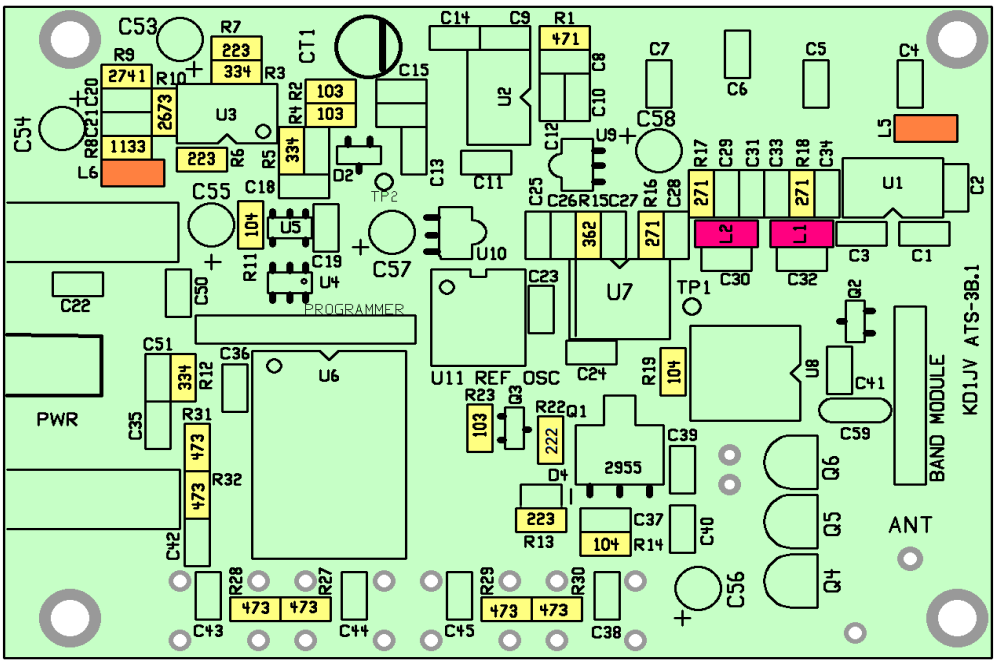
COLOR IS MARKER OR STICKER ON PART CARRIER PACKAGE

QTY	VALUE/ SIZE	MARKINGS OR COLOR		QTY	VALUE	MARKINGS OR COLOR
2	51 OHM 0805	510				
3	270 OHMS 0805	271		4	22 p	ORANGE
10	470 OHMS 0805	471		1	47p	BROWN
2	2.2 K 0805	222		8	100 p	PURPLE
1	3.6 K 0805	362		1	470 p	LIGHT BLUE/RED
5	10 K 0805	103		3	1000 p	YELLOW
6	22 K 0805	223		22	.01 u	BLUE
7	47 K 0805	473		11	.1 u	RED
5	100 K 0805	104		1	.1 u radial lead	Mono cap.
3	330 K 0805	334		2	10 u /16V	ALUM ELECTRO
1	2.74 K 1% 0805	2741		2	22 u /16V	ALUM
1	13.7 K 1% 0805	1372		1	47 u /16V	ALUM
1	113 K 1% 0805	1133		1	100 u /10V	ALUM
1	267 K 1% 0805	2673				
				1	30p GREEN	TRIMMER
2	SA612A	SO-8				
1	LM4808	SO-8		1	0.15 uH	YELLOW
1	MPS430F1231	SO-28L		2	3.9 uH	PINK
1	AD9834	TSSOP-28		3	10 uH	ORANGE
1	74AC02	SO-14				
1	60.000 MHz OSC	SILVER RECTANGLE				
1	74LVC1G3157	CC5R SOT-6		5	4.9152 MHz	HC-49US
1	AN6123MS	AC SOT-5		1	32.572 kHz	SMALL CYLINDER
1	MCP120T-3151	Green, SLFJ, SOT-3		1	0.2” LED SMT	7 SEG DISPLAY
1	NDT2955	SOT-233		1	FT43-37	BLACK CORE
2	2N7002	Pink, 12W or 702 SOT-3		2	3.5mm STEREO	SMT JACK
1	BAV99IN dual diode	Yellow, A7, SOT-3		1	0.7mm DC PWR	JACK
1	812C50	C3E ORANGE, SOT-89		1	0.7mm DC PWR	PLUG
1	812C35	CP2 GREEN, SOT-89		4	6mm TACT	SWITCHES
3	BS170	TO-92		1	6 pin SIP	socket
1	SS12	S2		4	0.187” #2	Flanged stand off
1	5.1V 500 mw	W8		4	#2 1/4” screws	
1	1N4756A	47V ZENER				

Resistors:

Resistor locations are highlighted in yellow. Number shown in outline is the same as marked on body of part. When all the resistors have been installed (front and back), you will find there are five extras. These will be used on the filter module boards. Put them aside someplace where they will not get lost! Four inductors are also installed at this time. These are larger than the resistors and usually come in a clear or black plastic part carrier.

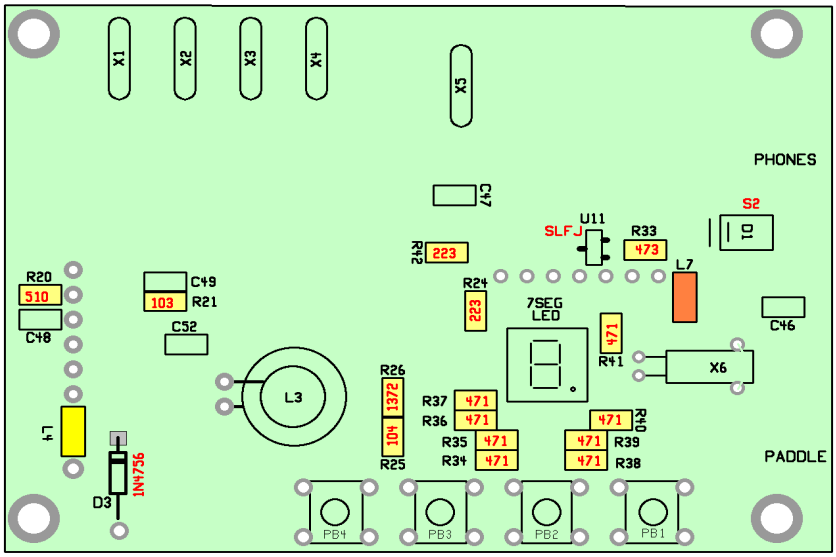
BACK SIDE:



Inductors: L1, L2: Pink sticker L5, L6: Orange sticker

LOC	VALUE	label	SIZE		LOC	value	label	size
R16	270	271	0805		R27	47 K	473	0603
R17	270	271	0805		R28	47K	473	0603
R18	270	271	0805		R29	47K	473	0603
R1	470	471	0805		R30	47 K	473	0603
R22	2.2 K	222	0805		R31	47K	473	0603
R9	2.74K 1%	2741	0805		R32	47K	473	0603
R15	3.6 K	362	0805		R11	100 K	104	0805
R2	10 K	103	0805		R14	100 K	104	0805
R4	10 K	103	0805		R19	100 K	104	0805
R23	10 K	103	0805		R8	113 K 1%	1133	0805
R6	22 K	223	0805		R10	267 K 1%	2673	0805
R7	22 K	223	0805		R3	330 K	334	0805
R13	22 K	223	0805		R5	330 K	334	0805
					R12	330 K	334	0805

Resistors Front side:



R20	51 ohms	510	0805	R21	10 K	103	0805
R34	470	471	0805	R26	13.7K 1%	1372	0805
R35	470	471	0805	R24	22K	223	
R36	470	471	0805	R42	22K	223	0805
R37	470	471	0805	R33	47 K	473	0805
R38	470	471	0805	R25	100 K	104	0805
R39	470	471	0805	L7	Orange	10 uH	1206
R40	470	471	0805	L4	Yellow	0.15uH	1206
R41	470	471	0805				

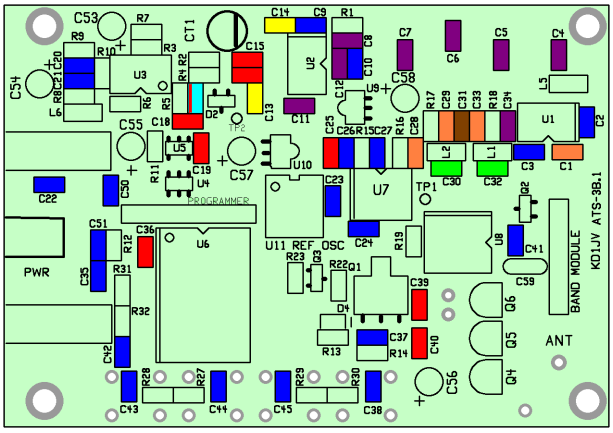
L7: Orange sticker L4: Yellow sticker

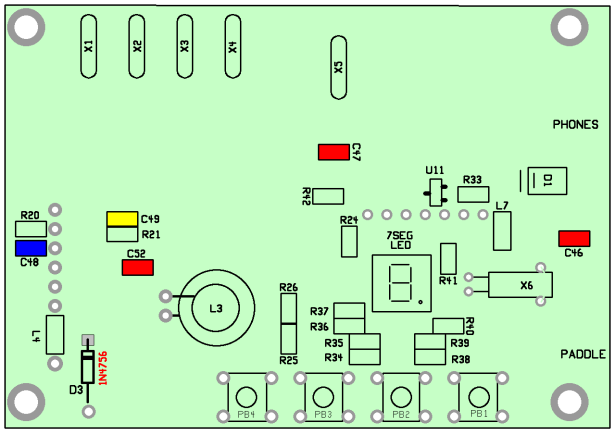
Capacitors:

Capacitors part carriers are color coded as the part its self has no markings to identify its value directly. Install all the capacitors of a given value (if required, both sides of the board) before starting to install another value. This will prevent mixing up values. All but one of the capacitors are coded with a solid color. The one exception is light blue with a red stripe along the top edge of the carrier. This is the one which goes to the right of R5

BACK SIDE

This side is a little “busy” so pay attention to where each value goes. Putting a cap is a wrong location can cause some parts of the circuits not to work properly and finding a miss-placed cap can be difficult.



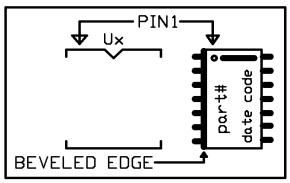


Color	Value	QTY	location
Green	0.0 pfd	2	C30, C32 (Not Used)
Orange	22 pfd	4	C1, C28, C29, C33
Brown	47 pfd	1	C31
Purple	100 pfd	8	C4, C5, C6, C7, C8, C11, C12, C34
Light Blue Red stripe	470 pfd	1	Not labeled on board, to right of R5.
Yellow	1000 pfd	2	C13, C14
Blue	0.01 ufd	21	C2, C3, C9, C10, C20, C21, C22, C23, C24, C26, C27, C35, C37, C38, C41, C42, C43, C44, C45, C50, C51
Red	0.1 ufd	8	C15, C16 (not labeled on board) C18, C19, C25, C36, C39, C40
Top Side			
Yellow	1000 pfd	1	C49
Blue	0.01 ufd	1	C48
Red	0.1 ufd	3	C46, C47, C52

Semiconductors:

Little details you will need to know:

Finding Pin 1.



Some of the ICs used in this kit have a dot or indentation at the Pin 1 corner of the chip. For others, the Pin 1 locations isn't as obvious. The manufactures logo is sometimes used (as is the case for U1 and U2) or sometimes there is a line along the Pin 1 end of the chip. In all cases, there is a beveled or rounded edge along the side of the IC package. When the chip is viewed so the package is orientated vertically, Pin 1 is always in the upper left corner.

Before placing an IC or transistor, tin one of the corner pads and then tack that lead of the part down first. Before soldering any other pins, make sure all the leads are lined up on the pads. This is especially important for U7, where these isn't much room for error. Then solder the lead on the opposite corner from the tacked lead to make sure the body doesn't move when you solder the rest of the leads.

U4 and U5 are very similar. The way to tell them apart is the fact U4 has 5 leads and U4 has 6. U4 has a faint dot which marks the pin 1 end, also the lettering “CC5R” will be upside down when installed correctly.

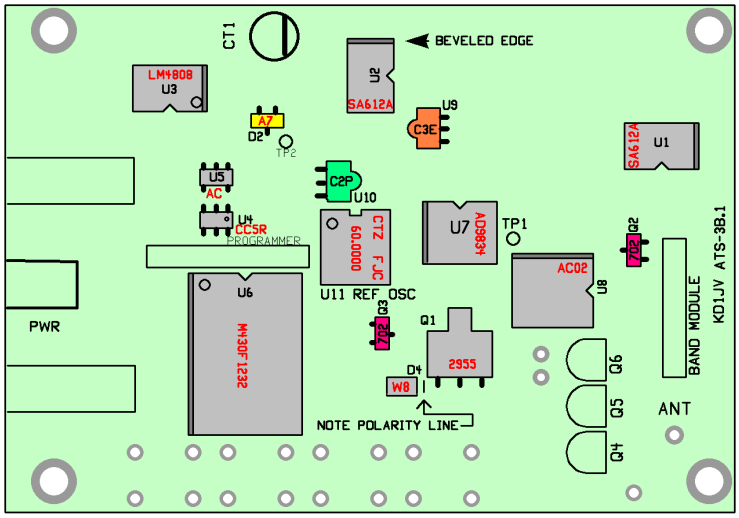
U11 is the rectangular box with the silver top. Be sure to get solder to flow into the little “U” shaped cups near each corner of the part. A number of builders have had trouble with this and not made solder connection to the pads under the part. A fine tipped iron is required here. Also, be careful of using too much solder and making a short to the metal top of the package.

D1 and D4 have very faint lines printed on them to indicate the cathode end. Look carefully for these line and face them towards the line printed on the board.

The two regulators and the TO-23 sized transistors and IC carriers have been color coded with a sticker and corresponds to the color on the layout diagram. Simply match colors like with the caps.

There maybe more numbers or letters on the semiconductor packages then indicated on the layout diagram. These are date or lot codes and can vary depending on when the parts are purchased. Therefore these are not used for part identification on the layout diagrams.

FRONT SIDE



U1, U2: SA612A

U3: LM4808

U4: CC5R Note dot showing orientation.

U5: AC

U6: M430F1232

U7: AD9834

U8: AC02

U9: Orange sticker, C3E

U10: Green sticker, C2P

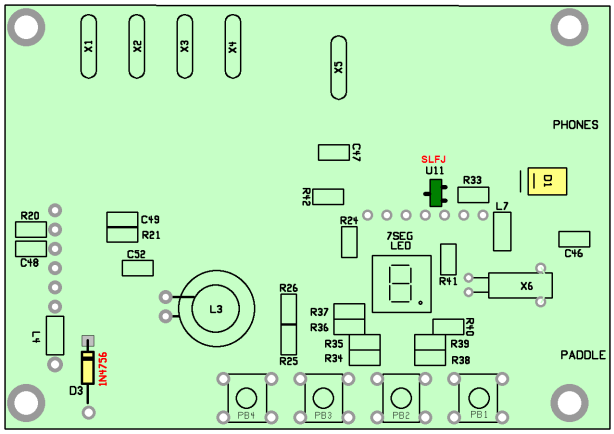
Q2,Q3: Pink sticker, 12W or 702

D4: W8, small black rectangle Note polarity!

U11: 60 MHz clock osc. This is the silver can. Getting solder to flow under the pad can be tricky, be sure to put the iron up to the little cup on the side of the pad. Be careful not to short to the metal top of the package.

(Note the U11 designation is duplicated on the front of the board for the uP rest chip)

BACK SIDE

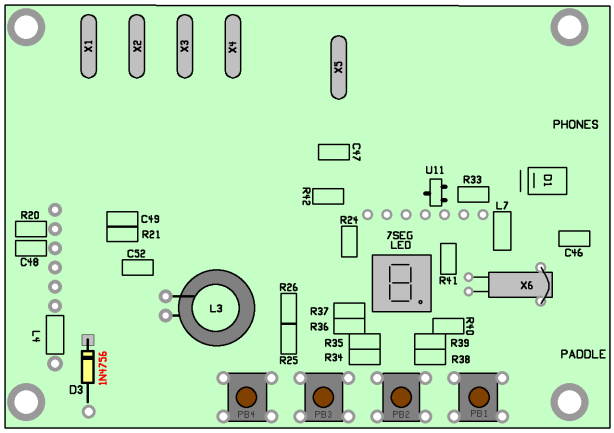


U11: Green sticker, SLFJ (last two characters maybe different on actual part)

D1: S2, larger black rectangle Note polarity! Faint line on one end of part faces line on board.

D3 not installed at this time.

Through hole parts



The SMT LED display should be soldered down first.

Carefully note the end of the display which has the decimal point. Make sure that it is in the lower right corner, towards the switches, before soldering! Use a small tipped iron and try to make the solder wick up into the little solder cups on the display.

Note: the display pads are not spaced quite right and are a little too close together. Therefore it is important to get the center pins of the display centered very well to prevent shorts between the outer pins and the pads.

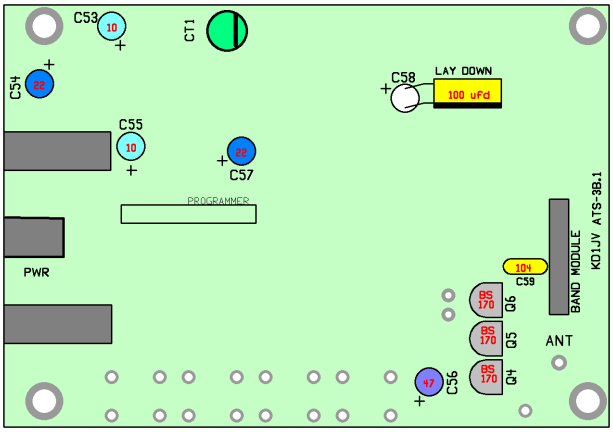
D3: The anode end of D3 goes into the hole in the board, while the cathode end gets soldered to the SMT pad. Put a little "L-kink" in the lead which goes to the SMT pad, so the body of the diode sits flush with the board.

X6: A small silver cylinder with two leads. Use a piece of electrolytic capacitor lead clipping to hold the end of the crystal down to the board, using the two holes on either side of the crystal, near its end.

X1-5, 4.9152 MHz crystals. Mount these snug to the board, don't worry, the pads under the can won't short to the can.

L3: 13 turns #30 wire (9") on black, FT37-43 core. You can wind this now and put it aside, as it should be mounted after initial board tests are done.

PB1-4: These can only fit one way. Snip the leads after you solder them in, as their sharp, pointy and stick out from the board a bit.



CT1: Green trimmer. The flat side of the trimmer goes towards the line in the outline.

C59: 0.1 ufd mono cap (104)

C58: 100 ufd aluminum electrolytic. Mount the cap on it's side, angeling the leads slightly so the body of the cap is above the row of chip parts below it. Long lead is +

Q7-9 BS170. These are mounted with the flat side of the package flush to the board. (See picture on page 12) Mounted this way, the board adds some measure of heat sinking. The easiest way to do this is to insert the leads into holes as you normally would, then bend the body over. You may have to push up on the leads a little from the other side of the board to create a sharper bend in the lead, so the body sits flat and square to the board.

C53 and C57, 10 ufd aluminum electrolytic. Long lead +

C54 and C57, 22 ufd aluminum electrolytic. Long lead +

C56, 47 ufd long lead +

Power jack

SMT phone jacks. Tin all three pads, then push lead down onto pad with iron, while adding a little solder.

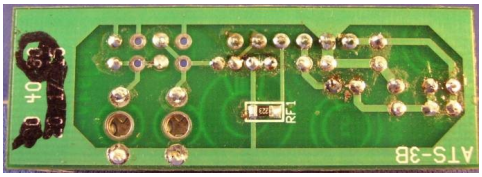
Band module SIP header jack: Make sure this is square to the board before soldering more than one lead.

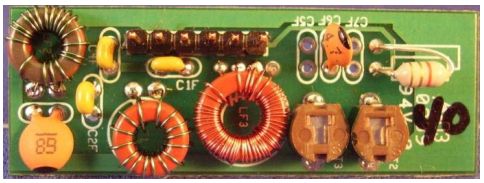
Board mounting spacers. These threaded spacers solder directly to the board in the four corner holes. It will take some heat to do this. The spacers mount on the front side of the board (side with switches on it) and solder on the back side of the board. Using this type of spacer eliminates the need for nuts on the mounting screws, which were a pain to do.

Filter boards:

First, separate the filter boards from the groups of three by snapping along the scored line. You should have five resistors (0805 size, each a different value) left over from the main board assembly. These will be used on the filter boards so that the processor can identify which module is for which band. The resistor can only go in one place, near the center of the bottom side of the board. All the other parts will go on the opposite, top side of the board. Once you have soldered one of these resistors to a board, use the table below to identify which band that board will be used on. Then cross out or scratch out all the band numbers but the one for which that board is for. See photo below, left. Using a indelible marker to indicate the band on the component (top) side of the board is also a good idea.

Band	80M	40M	30M	20m	17M	15M
Value	100 K (104)	22 K (223)	10 K (103)	2.2 K (222)	470 (471)	51 (51)



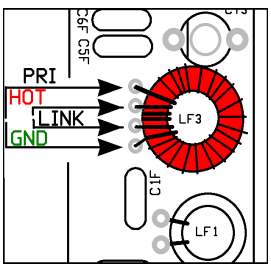


The table below lists the component values used for each band. (value marked on part) 1 turn on toroid = 1 pass through center of core. Wind wire on the core snugly, but not real tight. Wire lengths allow for ½" max starting pig tail. Note that #32 wire is used to wind the receiver input coils, this the smaller diameter (thinner) of the two wire sizes supplied.

Location	80 meters	40 meters	30 meters	20 meters	17 meters	15 meters
C1F	680 p (681)	330 p (331)	220p (221)	150p (151)	22p (22)	22p (22)
C2F	1500 p (152)	680 p (681)	560p (561)	330p (331)	220p (221)	220p (221)
C3F	100 p (101)	68 p (68)	47 p (47)	22 p (22)	15 p (15)	15 p (15)
C4F	680 p (681)	330 p (331)	220p (221)	150p (151)	100p (101)	100p (101)
C5F	100 p	NONE	NONE	NONE	NONE	NONE
C6F	15 p (15)	4.7 p (4.7)	4.7 p (4.7)	4.7 p (4.7)	2.2 p (2.2)	2.2 p (2.2)
C7F	22 p	NONE	NONE	NONE	NONE	NONE
CT2	brown	brown	green	green	green	green
CT3	brown	brown	green	green	green	green
LF1	T30-2 23T #30 (12")	T30-2 15T #30 (8")	T30-2 12T #30 (6")	T30-6 11T #30 (6)"	T30-6 11T #30 (6")	T30-6 11T #30 (6")
LF2	T30-2 26T #30 (13")	T30-2 19T #30 (10")	T30-2 14T #30 (7")	T30-6 15T #30 (7.5")	T30-6 15T #30 (7.5")	T30-6 12T #30 (6")
LF3	**T37-2** 55T # 32 (28") 6 T link	**T37-2** 45T #32 (26") 4 T link	**T37-7 (white)** 50T #32 (27") 4 T link	**T37-7(white)** 42T #32 (24") 4T link	T30-2 27T #32 (16") 3 T link	T30-2 27T #32 (16") 3 T link
LF4 RFC	BRN/GRY/ BLK (18)	GRY/RED/ GOLD (8.2)	GRY/RED/ GOLD (8.2)	GRN/BLU/ GOLD (5.6)	ORG/ORG/ GOLD (3.3)	ORG/ORG/ GOLD (3.3)

Trimmer caps: make sure flat side faces line on location outline, towards center of board.

T-37-2 = large red, T37-7 = large white, T-30-2 = small red, T30-6 = small yellow



Tin wire ends before attempting to solder wire to pads on board!

LF3: This coil requires a secondary link winding. The link is wound between the ends of the primary turns. The best way to do this is to make a small loop at the end of the primary turns, then continue to wind the required number of link turns. Snip the loop to separate the primary winding from the link and twist the link wires together so they don't get mixed up with the primary. The link wires go into the two middle holes and the primary the two outer holes, as shown to the left. If these are mixed up, the trimmer won't peak the coil and receiver sensitivity will be very bad.

6 pin SIP pins mounted last, be sure it is flush and square to the board. Clip excess pin length and trimmer capacitor leads after soldering or they may short to lid of tin.

IC Voltage tables: Receive mode

P1	1.4V	RFIN	P8	5.0V	V+
P2	1.4V	RFIN	P7	4.3V	OSC
P3	0V	GND	P6	4.9V	OSC
P4	3.9V	OUT	P5	3.9V	OUT

U1/U2 SA612 mixer oscillator

P1	2.5V	OUT	P8	5.0V	V+
P2	2.5V	-IN	P7	2.5V	OUT
P3	2.5V	+IN	P6	2.5V	-IN
P4	0V	GND	P5	2.5V	+IN

U3 LM4808 audio amp

P1	5.0V	V+	P5	0.96V	Audio out
----			P4	0V	gnd
P2	0.34V	Vagc	P3	1.2V	IN

U5 Audio AGC

P1	2.2V	Audio in	P6	3.5V	Control
P2	0V	GND	P5	5V	V+
P3	0V	ST in	P4	2.2V	Audio out

U4 Analog SPDT switch

P1	0V	TEST	P28	3.5V	MUTE
P2	3.5V	V+	P27	3.5V	DDS
P3	0V	ST out	P26	3.5V	DDS
P4	0V	GND	P25	0V	DDS
P5	2.7V	osc	P24	0V	Tx key
P6	1.7V	osc	P23	3.5V	SPLIT
P7	3.5V	reset	P22	3.5V	TUNE DN
P8	3.5V	Dash in	P21	3.5V	MENU
P9	3.5V	Dot in	P20	0/3.5V	Band volt
P10	3.5V	Tune up	P19	.5 to 1.2	Batt V
P11	3.5V	7seg	P18	3.5V	7seg
P12	3.5V	7seg	P17	3.5V	7seg
P13	3.5V	7seg	P16	3.5V	7seg
P14	3.5V	7seg	P15	3.5V	7seg

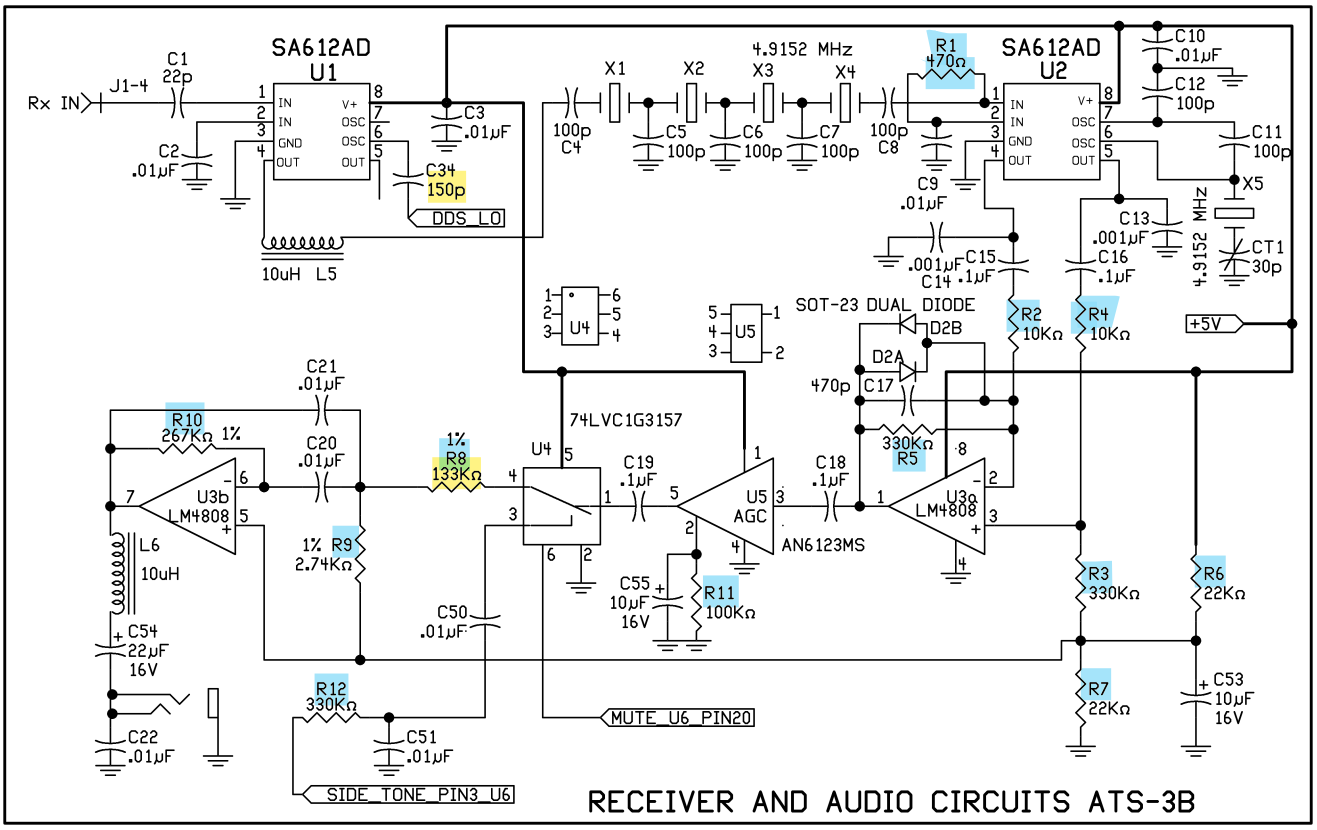
U6 MPS430 MPU

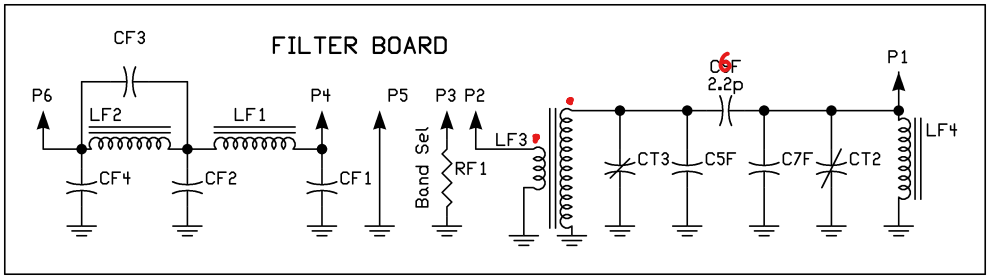
P1	1.13V	FS ADJ	P20	.75V	IOUTB
P2	1.17V	REF out	P19	.37V	IOUT
P3	3.54V	COMP	P18	0V	AGND
P4	5.0V	AVDD	P17	.37V	CMPin
P5	3.5V	DVDD	P16	3.75V	CMPout
P6	2.4V	CAP	P15	3.3V	FSYNC
P7	0V	DGND	P14	3.3V	SCLK
P8	1.7V	40 MHz	P13	0V	SDATA
P9	0V	Fsel	P12	0V	SLEEP
P10	0V	Psel	P11	0V	RESET

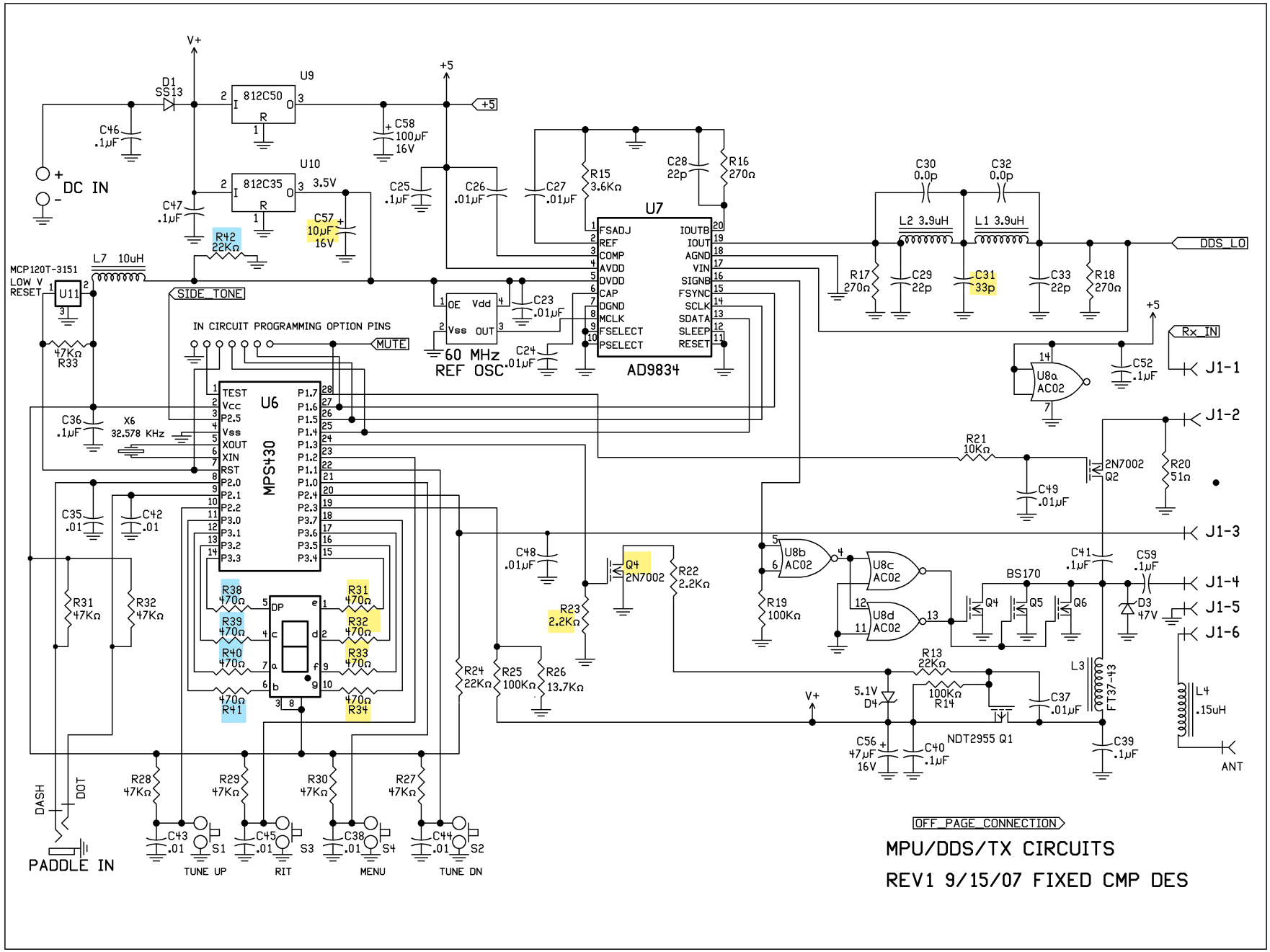
U7 AD9843 DDS

Schematics

Receiver section schematic;

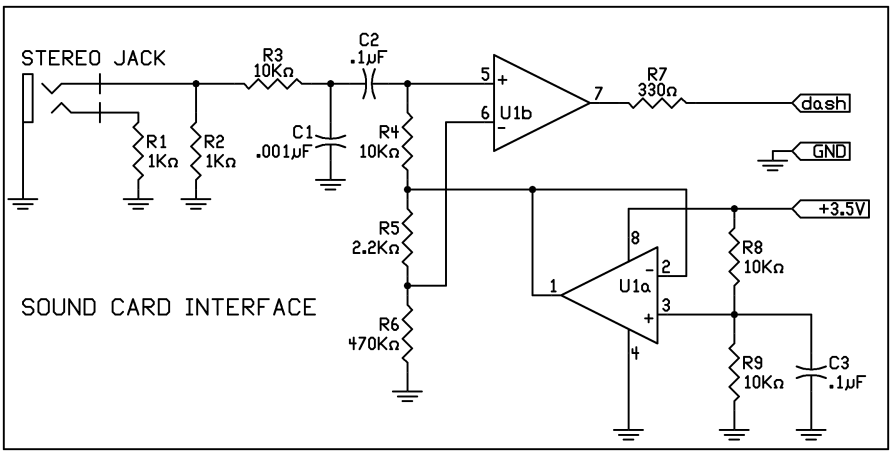





V+
D1
SS13
U9
812C50
+5
C46
.1µF
C58
100µF
16V
DC IN
U10
812C35
3.5V
C47
.1µF
C57
10µF
16V
R42
22KΩ
C25
.1µF
C26
.01µF
C27
.01µF
R15
3.6KΩ
C28
22p
R16
270Ω
U7
FSADJ
REF
COMP
AVDD
DVDD
CAP
DGND
MCLK
FSELECT
PSELECT
IOUTB
IOUT
AGND
VIN
SIGNB
FSYNC
SCLK
SDATA
SLEEP
RESET
AD9834
C30
0.0p
C32
0.0p
L2 3.9uH
L1 3.9uH
DDS_LO
R17
270Ω
C29
22p
C31
33p
C33
22p
R18
270Ω
MCP120T-3151
LOW V
RESET
U11
L7 10uH
SIDE_TONE
OE
Vdd
Vss
OUT
C23
.01µF
C24
.01µF
60 MHz
REF OSC
IN CIRCUIT PROGRAMMING OPTION PINS
MUTE
47KΩ
R33
U6
MPS430
TEST
Vcc
P2.5
Vss
XOUT
XIN
RST
P2.0
P2.1
P2.2
P3.0
P3.1
P3.2
P3.3
P1.7
P1.6
P1.5
P1.4
P1.3
P1.2
P1.1
P1.0
P2.4
P2.3
P3.7
P3.6
P3.5
P3.4
C36
.1µF
X6
32.578 KHz
C35
.01
C42
.01
R31
47KΩ
R32
47KΩ
R38
470Ω
R39
470Ω
R40
470Ω
470Ω
R41
R31
470Ω
R32
470Ω
R33
470Ω
470Ω
R34
DP
a
b
c
d
e
f
C48
.01µF
Q4
2N7002
R22
2.2KΩ
R23
2.2KΩ
R24
22KΩ
R25
100KΩ
R26
13.7KΩ
U8b
AC02
U8c
AC02
U8d
AC02
R19
100KΩ
R21
10KΩ
C49
.01µF
2N7002
Q2
R20
51Ω
U8a
AC02
C52
.1µF
Rx_IN
J1-1
J1-2
J1-3
J1-4
J1-5
J1-6
BS170
Q4
Q5
Q6
C41
.1µF
C59
.1µF
D3
47V
R13
22KΩ
100KΩ
R14
5.1V
D4
L3
FT37-43
C37
.01µF
C39
.1µF
L4
.15uH
ANT
C56
47µF
16V
C40
.1µF
NDT2955 Q1
R28
47KΩ
R29
47KΩ
R30
47KΩ
R27
47KΩ
C43
.01
S1
C45
.01
S3
C38
.01
S4
C44
.01
S2
TUNE UP
RIT
MENU
TUNE DN
DASH
DOT
PADDLE IN
OFF_PAGE_CONNECTION
MPU/DDS/TX CIRCUITS
REV1 9/15/07 FIXED CMP DES

Digital mode operation:

Before any digital mode can be used, you must build the digital interface shown below. The op amp must be a rail to rail output type which can operate at 3.5 volts, such as a ST microdevices TS-952. At the moment, kits are not available for this interface, but maybe at some time. If built with SMT parts, it can be made small enough to fit inside the Altoids tin along with the ATS-3B board, or it can be built into it's own separate tin, which is likely the best way to do it. Two “AAA” batteries would power it for a long time, provided it has an on/off switch!



R1 and R2 are required when the interface is used in conjunction with a Pocket PC. Without these loads, the Pocket PC will turn the internal microphone off. R3 and C1 form a low pass filter, which cleans up the audio from the sound card, which has a lot of high frequency noise on it. R8 and R9 form a voltage divider to provide a bias voltage of ½ the supply and is buffered by U1a to form a low impedance voltage source. R5 and R6 form another voltage divider so that the non-inverting (+) input to U1b is slightly more positive than the inverting input when there is no signal input. This ensures the output of U1b will be in a high state when not being used and will not interfere with normal paddle operation if it left connected to the dash input all the time. Like wise, R7 isolates the output of the U1b op amp from the dash input so it will not interfere with normal paddle operation. A sine wave audio input applied to the stereo jack will be converted to a square wave on the output of U1b. The input must be of sufficient amplitude to ensure switching occurs at or near the zero crossings so that a 50% duty cycle square wave output is obtained.

Entering ATS3-B into digital mode operation:

Click and hold the MENU switch until the letter “D” is sounded by the side tone and appears on the 7 segment display (as a lower case “d”).

Once in digital mode, only the quick Menu functions of frequency and battery voltage are available. The Frequency tune switches work as normal. A direct frequency entry is available in the Pocketdigi application. A click and hold of the Menu switch exits digital mode.

Running Pocketdigi:

The Pocketdigi program is located in a folder on the CD. There are two zipped folders. The one which the names ends with _X86 is for use with Windows operating systems in either a Desktop or Laptop PC. The one which name ends with _ARM has versions for use a PDA using Windows CE or Window mobile. The file named “Pocketdigi” is used in a PDA. The one named htx2000 is for hand held PC's, which are larger than a PDA. Unzip the files in the folder to one on your PC. A good place to put it would be in “My Documents” so it can be easily found. Pocketdigi runs as an executable file. It does not install as a program file. Simply click on the file name to run it. If the Windows firewall is active, you will be asked if you really want to run it. Of course you do, click yes.

A comprehensive operations manual for Pocketdigi has yet to be written. Vojtech in waiting for someone to volunteer. Most of the functions are self evident and intuitive, working in much the same way as programs you are probably familiar with.

The screen is divided into three sections. The top is the waterfall. The operating frequency is set by tapping or clicking on the waterfall above the scale showing the frequency, or on a signal trail. The center section is the received text screen and the

bottom section is the transmitted text screen. If your using a PDA, when you activate the on screen keyboard, these windows will shrink so the keyboard is not covering up anything.

Along the bottom of the screen are the menus. These are [Tools] [Channels] Macros] and [CAT] each has a pull up sub menu when selected. In the Desktop version, the menus are at the top of the screen.

Tools contains Tune, Replay, Setup, Waterfall, Tx Volume, About, Device info and Exit. It is best to use Exit when quiting the program, as this will shut it down.

Channels contains the mode selection sub menu, AFC control, Squelch and the like.

Macros contains the various macros which can be set and the edit macro function. More on this later.

CAT allows setting the frequency of the rig.

When you run the program for the first time, there are a few things you need to set up. First you might want to type in your station info. Next you need to tell it you want to use the ATS rig with it. Select Tools > Setup > TRX Control. When you select TRX Control, an error message saying it was unable to connect to Bluetooth system will appear. Simply click on the ok button and the TRX control setup screen will be shown. Select the “ATS3/Manchester” option.

Calibration:

NOTE: Since pocketdigi uses the sound card to communicate to the ATS3 rig, all program sounds, alarms, screen taps, etc must be turned off. These sounds can confuse the ATS3.

Connect the sound card interface to the ATS-3B rig, then connect the PC running Pocketdigi to the interface and set the ATS-3B into digital mode. Return to the TRX Control screen. There is a button labeled “TEST”. Clicking this button should make the side tone in the ATS-3B annunciate the Morse letters “PDGI”. If it does not, increase the speaker or Tx volume of the sound card until it does. The sound level should be set a little above the minimum needed to get the response from the rig. If you do not get the annunciation even with the volume turned all the way up, then there is likely a problem with the interface board.

Offset adjustment:

Below the ATS3/Manchester selection on the TXR Control screen, there is a field called “offset” and is set to 577 Hz. This offset number will have to be adjusted to exactly match the offset in the ATS-3B rig. There is likely to be some difference between the exact transmit and receive frequencies fall due to the setting of the BFO trimmer and tolerances in the capacitor values used in the audio filter.

In order to set the offset correctly, you need to set up a separate PSK31 station so that you can talk to yourself. Using dummy loads instead of antennas, of course. Since your not actually transmitting on the air, you can use the default power up frequency of the ATS on the band you happen to choose to use, though it is best to use one of the higher bands, as this will compensate for any DDS calibration errors which are more pronounced on the higher bands. If your using a Pocket PC (aka PDA) with the ATS-3B, receiver audio is coupled into the PDA using its built in microphone. Place an earbud from the phones jack of the ATS-3B over the microphone slots on the PDA. If your using the Desktop program, you can jumper the headphone output directly into the MIC jack on the PC.

1. Set the marker on the Pocketdigi water fall to exactly 600 Hz. (tap the screen just above the frequency ruler)
2. In the Channels sub menu, verify Pocketdigi is in BPSK31 mode and AFC is turned off
3. Set the ATS-3B to transmit by clicking on the lightning bolt to the right of CAT. Note that when transmitting, the side tone reproduces the modulation tones and can be heard in the headphones.
4. Find the ATS-3B signal with the other receiver and select the signal on the waterfall. Its AFC should also be turned off.
5. Return to receive mode on the Pocketdigi by clicking the lightning bolt again.
6. Transmit a signal with the other rig.
7. Check the frequency of where the other rig is transmitting at on the Pocketdigi water fall. Tune the transmit frequency until it is centered at 600 Hz and note how far the frequency had to be changed to align it to 600 Hz.
8. Add (if you had to tune down in frequency) or add (if you had to tune up in frequency) the difference between the initial transmit frequency and final frequency to the offset value in the Pocketdigi set up menu. Tap on the number and use the keyboard to change it. You will have to go through and exit the setup > Tx control menu each time you need to change and then check the offset value
9. Repeat steps 3 to 8 until both rigs are transmitting and receiving on the exact same frequency.

Now that the offset has been set, you can talk between your other rig and the ATS-3B. Try sending the macros and try different modulation modes.

Using the CAT function.

This function allows for setting the operating frequency of the rig.

Selecting CAT then [Frequency] will bring up a numeric keypad. Five digits must be entered but the first one is a “don't care” place holder digit. It can be any number other than zero. Do not use the decimal point. The remaining digits will be the 100 kHz, 10 kHz, 1 kHz and 100 Hz digits of the frequency you want to go to. Once you enter the frequency, tap on SET to transfer the information to the ATS-3B. It is possible to set the frequency of the rig outside of the normal tuning limits of the rig. Doing this is not recommend.

Using Macros:

Some of the Marcos are not complete and are missing the return to receive statement $rx, so this will have to be added or the rig will stay in transmit. Here is a list of the various macro commands which can be inserted into the text.

$$ - The letter '$'
${autocq:xx} - Start tx. After $rx macro, go to RX mode for xx seconds and then restart this macro again.
$tx - Push the TX button.
$rx - Switch to receive.
$mycall – Call sign as defined in preferences.
$myname - Name as defined in preferences.
$myqth - QTH as defined in preferences.
$myloc - Locater as defined in preferences.
$myemail - Email address as defined in preferences.
$time - Local time.
$utctime - Universal Coordinated Time.
$date - Local date.
$utcdate - UTC date.
$call - Other parties call sign taken from QSO data.
$band - Band taken from QSO data.
$rxrst - Received RST taken from QSO data.
$txrst - Transmitted RST taken from QSO data.
$name - Other parties name taken from QSO data.
$qth - Other parties QTH taken from QSO data.
$notes - Notes taken from QSO data.
$soft - Software version.

Making QSOs:

Because the bandwidth of the ATS-3B is so narrow, you have to tune stations in to get them into the pass band. Once in the pass band of the receiver and you have good copy on them, you can match their frequency by taping on the waterfall. This is very handy, as the 50 Hz tuning steps are a little too coarse to exactly match other stations frequencies. Even if they are using AFC, you have to be pretty close to begin with for them to know your trying to contact them.