CONNECT SYSTEMS INCORPORATED

1802 Eastman Ave., Suite 116
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FLEX III SERIES UNIVERSAL CONTROLLER

Hardware Reference Manual

Made in U.S.A.

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TWELVE POSITION SCREW TYPE OF TERMINAL BLOCK (J3)

RX AUDIO For the products detecting CTCSS, DCS, or LTR, or products that use the internal squelch, the RX AUDIO must be connected to the discriminator of the radio. For all other products the RX AUDIO can be connected to the discriminator, high side of the volume control, or the speaker. For single ended audio as described here, JP-8 should be connected between B and C.

TX AUDIO Connect to the high side of the microphone. This line normally contains voice only. However, if this line contains CTCSS, DCS, or LTR, will need to connect directly to the modulator. For single ended audio as described here, JP-7 should be connected between B and C.

SUBCODE The SUBCODE output is used to inject signaling tones separately from voice audio and is normally only used if the system is generating CTCSS, DCS, or LTR. Connect the SUBCODE output past the instantaneous deviation control (IDC) circuit in the transmitter. Preferably directly to the modulator.

PTT The PTT normally hooks to the PTT of the transmitter. If you are using a Hand Held with the PTT sharing a common connection with the transmit audio, then attach a resistor with a value between 2.4K and 4.7K from the PTT to the TX Audio and attach the TX audio line to the center conductor of the microphone cable. In most product that use the PTT, the AUX relay can also be used as a PTT connection. This has the advantage of allowing positive keying or other situations where the normal open collector PTT does not work.

COS Connect to a point that has a good voltage swing when the squelch is opened/closed. The best point to connect is to the collector of the transistor that controls the busy light (if the receiver has one). Otherwise you may connect to the squelch control voltage. The minimum voltage for the COS is about 0 volts and the Maximum voltage is the supply voltage.

Some radios have that point coming out the back of the radio. It sometimes goes under the name of squelch detect, sq det, or COR. In some case a pull up or pull down resistor is necessary.

The polarity and other parameters associated with the COS is contained within the programming parameters described later. It should be noted that in most cases, the COS can be replaced with the internal squelch.

SENSE 1 This point is used as an auxiliary input for specialized purposes in certain products. As an example, this input may be used to detect the presence of a CTCSS/DCS signal in an LTR system. The minimum voltage for the sense input is about 0 volts and the Maximum voltage is the supply voltage.

The polarity and other parameters associated with the SENSE is contained within the programming parameters if used.

SENSE 2 This point is used as an auxiliary input for specialized purposes in certain products. The minimum voltage for the sense input is about 0 volts and the Maximum voltage is about 48 volts.

RX+
RX- If jumpers JP7 and JP-8 is connected between A and C, then the system is set for 600 ohms balanced audio input. If balanced audio input is used, then balanced audio output must be used.

TX+
TX- Used for balanced audio output. Because there is a transformer coupled to this line, CTCSS, DCS, or LTR cannot be outputted on this connection and the separate SUBCODE output must be used.

+12 VDC Connect to a source of 12 volts to 15 volts DC. The Flex Series Controllers are reverse polarity protected, so a polarity mistake will not damage the product. Connect the return lead to ground.

GND The two grounds in the system are internally connected to each other.

FRONT PANEL DB9 CONNECTOR (J2)

This connector is used for programming the system using a lap top computer or a desk top computer or as a serial output port for certain products such as the Communication decoder.

Programming will be via a Microsoft windows based program that will be available at no charge sometime next year.

Pin 1: -6 volts
Pin 2: transmit (data from flex to P.C.)
Pin 3: receive (data from P.C. to flex)
Pin 4: not used
Pin 5: ground
Pin 6: -6 volts
Pin 7: not used
Pin 8: -6 volts
Pin 9: not used

JTAG CONNECTOR (J1)

This connector is used for changing the FLASH program built into the microprocessor. It is used in conjunction with the EC-2 programming module (Our part number FLEX-M). Power for the module is obtained through this connector.

BACK PANEL PROGRAMMING JACK (J7)

This jack serves three purposes:

1. By plugging a telephone in the back, the user can program the various parameters as allowed by the system by means of the 12 position keypad on the telephone.
2. The mouth piece of the telephone can be used for storing voice prompts in the system.
3. Can be used for communications with other Flex Series Controllers via a RS485 Interface.

Pin 1: not used
Pin 2: RS485 Connection
Pin 3: Tip for telephone
Pin 4: Ring for telephone
Pin 5: RS485 Connection
Pin 6: not used

BACK PANEL TELEPHONE JACK (J6)

This jack connect to the telephone line and is used for the following purposes:

1. Remote programming via a telephone
2. Telephone to radio and radio to telephone connection as in a phone patch
3. Input device for a paging terminal to allow the remote telephone to initiate a page.

Pin 1: not used
Pin 2: not used
Pin 3: Tip for telephone
Pin 4: Ring for telephone
Pin 5: not used
Pin 6: not used

BACK PANEL E&M JACK (J8)

This jack connect to an audio source with a separate balanced RX and TX line. Has an AUX Relay that can be used for controlling an E&M configuration. If used in this mode, Sense 2 can be used for detecting the 48 volts.

Pin 1: Relay, Normally opened
Pin 2: Audio from remote device
Pin 3: Audio to remote device
Pin 4: Audio to remote device
Pin 5: Audio from remote device
Pin 6: Relay, Common

BACK PANEL BALANCED AUDIO JACK (J9)

This jack connect to an audio source with a separate balanced RX and TX line OR A common RX/TX line.

Pin 1: Not used
Pin 2: Audio from remote device
Pin 3: Audio to remote device or common RX/TX
Pin 4: Audio to remote device or common RX/TX
Pin 5: Audio from remote device
Pin 6: Not used

INTERNAL SIX POSITION CONNECTOR (J10)

This connector is used if all of the pins from the aux relay are needed. By hooking up to this connector, the user has access to a double pole, double throw relay. The connection is as follows:

Pin 1	Pole 1, Common
Pin 2	Pole 2, Common
Pin 3	Pole 2, Normally open
Pin 4	Pole 2, Normally closed
Pin 5	Pole 1, Normally open
Pin 6	Pole 1, Normally closed

INTERNAL FIVE POSITION CONNECTOR (J4)

This connector is used for four separate digital outputs. The output is from an MC14049B Integrated Circuit and caution should be had in tying those outputs to external devices. The connection is as follows:

Pin 1	Digital Out 1
Pin 2	Digital Out 2
Pin 3	Digital Out 3
Pin 4	Digital Out 4
Pin 5	Common Ground

ADJUSTMENTS

P1 HYB BAL The Hybrid Balance control is used to null out the mobile return audio in full duplex mode. The alignment must take place on one of the phone lines the Flex Series controller will be serving. (This alignment can not be done at the shop prior to delivery to the site.)

Have a mobile place a call through the Flex Series Controller. The party answering the called phone should leave the phone off hook during the alignment procedure.

Monitor the transmitter output with a service monitor or connect an oscilloscope to the "TX OUTPUT" terminal on the rear of the Flex Series Controller. Place all four Dip switches in the off position.

Have the mobile simultaneously press digits 3 and 6 on his touch tone keypad. This will result in the transmission of a single 1477 Hz tone.

Adjust the "HYB BAL" Potentiometer to produce the least audio output. Try all possible dip position combinations and null each time. The combination which gives the minimum output is the correct position to use.

Changes made within the telephone company or rerouting of telephone lines could occasionally require re-adjustment of the hybrid.

P2 HYB BAL The Hybrid Balance control is used to null out the audio path if the system uses balanced audio on the radio side and the RX and TX are common lines.

P3 TEL VOX Used for detection of call progress tones and sensitivity to voice in Vox operated applications. Turning the pot clockwise increases its sensitivity.

P4 PREAMP The preamp control is used to match the audio level from your receiver to the Flex Series controller. To adjust, a signal containing 100 Hz CTCSS with about 600 Hz deviation should be applied to the receiver. Adjust the preamp control until a level of 3 volts peak to peak is observed at test point 9. If an oscilloscope is not available, read 1 volt RMS using a VOM.

P5 RX VOX Used in VOX mode only. Sets RX audio triggering sensitivity. Should be fully clockwise in VOX simplex applications. Reduce setting when used through repeaters if land line cannot respond to mobile during hang time due to noise or tone on the repeater carrier.

P6 AUDIO OUT Adjust the maximum level going to the transmitter. When turned fully clockwise, an output voltage of about five volts peak to peak is obtained. In most case the output level can also be set in the programming mode.

P7 CONTRAST Sets the contrast of the LCD. Adjust to what is most pleasing to the individual.

P8 HYB BAL The Hybrid Balance control is used to null out the audio path if the system uses balanced audio on the secondary input (In parallel with telephone)

P9 SQUELCH Advance clockwise to a point just beyond where the front panel display "Rx" message disappears. Not all products will display the Rx message.

P10 CTCSS Sets the level for the CTCSS generation for output to the SUBCODE terminal.

P11 DCS/LTR Sets the level for the DCS/LTR generation for output to the SUBCODE terminal.

JUMPER STRAP OPTIONS

JP1-JP3 Does not exist

JP4 Product Specific. See product manual
JP5 Product Specific. See product manual
JP6 Product Specific. See product manual

JP7,JP8 With jumper installed between "C" and "A", the system has balanced audio on the receive audio. With jumper installed between "C" and "B", te system has single ended audio on the receive and transmit audio.

JP9 Selects the audio source for the voice recorder to be either from the telephone/programming jack or the radio. If jumper is between "C" and "A" the audio source is from the radio. If jumper is between "C" and "B" the audio source is from the telephone line.

JP10 The terminating resistor when used for RS485

JP11 This jumper is used to minimize the power through the 3.3 voltage regulator. This is only needed when the Ethernet controller is installed. With the jumper off, the internal diodes take up some of the dissipation from the voltage regulator.

JP12 **Line In Use Detector.** When inserted, enables line in use detection. That allows the system to detect if another phone in parallel with the controller is off hook. Will only work with a phone system where the nominal on hook voltage is about 48 volts.

JP13,JP14 **Preamp Gain.** With jumper 13 not installed and Jumper 14 not installed, gain is 100 with flat audio.

With jumper 13 not installed and Jumper 14 in "A" position, gain is 10 with flat audio.

With Jumper 13 not installed and Jumper 14 in "B" position, gain is 10 with a 3 db roll off starting at 300 Hz.

With jumper 13 installed and Jumper 14 not installed, gain is 100 with 3 db roll off starting at 300 Hz.

With jumper 13 installed and jumper 14 in "A" position, has a gain of 10 with 3 db roll off starting at 3 KHz.

With jumper 13 installed and jumper 14 in "B" position, has a gain of 10 with a 3 db roll off starting at 300 Hz.

JP15 With jumper connected between "C" and "A", the audio source is balanced audio. With jumper connected between "C" and "B", the audio source is single ended audio.

JP16-JP21 These jumpers determine if the transformers used for balanced audio to the radio is set up as separate TX/RX or common TX/RX.

If set for separate TX/RX, jumper the following: JP16 and JP17.

If set for common TX/RX, jumper the following: JP17,JP18,JP19,JP20 and JP21.

JP22-JP27 These jumpers determine if the transformers used for the secondary input (in parallel with the telephone line) is set up for separate TX/RX or common TX/RX.

If set for separate TX/RX, jumper the following: JP22 and JP23.

If set for common TX/RX, jumper the following: JP23,JP24,JP25,JP26 and JP27.

JP28 When inserted, allows the TX Audio output to be DC coupled.

JP29 When connected, gain of last stage is 2.7. When not connected gain is 10.

JP30 Does not exist

JP31 When connected between "A" and "C", the audio source for the tone decoder is from the radio. When connected between "B" and "C", the audio source for the tone decoder is from the telephone line or one or the audio sources in parallel with the telephone.

JP32	When connected, the notch filter is not used. Part U31 should not be installed if notch filter not used.

REVISION HISTORY

Version 1.00, June 20, 2004, First Release

CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 1 OF 10	REV A

DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
1	1		P.C.B., MODEL FLEX III	MODEL FLEX III
2	2		CAP, SMD 0805, 18 pF 08055A330JAT2A	C127,C128
3	1		CAP, SMD 0805, 22 pF 08055A330JAT2A	C130
4	4		CAP, SMD 0805, 33 pF 08055A330JAT2A	C7,C8,C87,C92
5	2		CAP, SMD 0805, 82 pF 08055A820JAT2A	C89,C118
6	5		CAP, SMD 0805, 120 pF 08055A121JAT2A	C75,C97,C112,
7				C113,C114
8	2		CAP, SMD 0805, 270 pF 08055A271JAT2A	C71,C138
9	8		CAP, SMD 0805, .001 uF 008055C102JAT2A	C15,C16,C17,C18,
10	6			C19,C139,c140,
11				c143
12	5		CAP, SMD 0805, .0022 uF 08055C222JAT2A	C51,C52,C53,C54,
13				C69
14	4		CAP, SMD 0805, .0047 uF 08055C472JAT2A	C32,C77,C119,
15				C121
16	12		CAP, SMD 0805, .01 uF 08055C103JAT2A	C34,C35,C55,C59,
17				C78.C79,C80,C81,
18				C82,C83,C99,C106
19				
20	1		CAP, SMD 0805, .015 uF 08055C153JAT2A	C33
21	3		CAP, SMD 0805, .022 uF 08055C223JAT2A	C60,C100,C107
22	7		CAP, SMD 0805, .047 uF 08055C473JAT2A	C31,C61,C76,
23				C101,C108,C120,
24				C122

CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 2 OF 10	REV A
DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
25	57		CAP, SMD 0805, .1 uF 08055C104KAT2A	C1,C2,C3,C4,C6,
26				C9,C10,C11,C12,
27				C13,C14,C20,C21,
28				C23,C24,C26,C27,
29				C29,C30,C40,C41,
30				C42,C43,C44,C45,
31				C47,C48,C49,C57,
32				C62,C65,C66,C67,
33				C68,C70,C84,C85,
34				C86,C88,C90,
35				C102,C109,C115,
36				C116,C117,C125,
37				C126,C129,C131,
38				C132,C133,C134,
39				C135,C136,C137,
40				C141,C142
41	1		CAP, SMD 0805, .22 uF 08053C224KAT2A	C96
42	1		CAP, .47 uF, 250V, EF2474-NO	C58
43	8		CAP, 1 uF, 50V, ELECT, 50TWSS1	C25,C28,C56,C63,
44				C72,C98,C105,
45				C111
46	2		CAP, 2.2 uF, 50V, ELECT, 50TWSS2R2	C73,C74
47	3		CAP, 4.7 uF, 50V, ELECT, 50TWSS4R7	C5,C36,C91
48				

CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 3 OF 10	REV A

DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
49	5		CAP, 10 uF, 50V, ELECT, 50TWSS10	C64,C103,C104,
50				C110,CXXX(NOTE1)
51	4		CAP, 33 uF, 25V, ELECT, 25TWSS33	C22,C39,C46,C50
52				
53				
54	1		CAP, 47 uF, 35V, ELECT, 35TWSS47	C93
55	6		CAP, 220 uF, 35V, ELECT, 35TWSS220	C37,C38,C94,C95,
56				C123,C124
57	4		CONNECTOR, RJ11, 6 POS, 66011-002	J6,J7,J8,J9
58	1		CONNECTOR, 12 POS MSTBA 2,5/12-G508	J3
59				
60	1		CONNECTOR, DP9S, RT ANG, DE9S318,104951	J2
61	1		CONNECTOR, 2 x 5,FAN-10SGS	J1
62				
63	1		HEADER, 14 PIN, 2X7, 10-88-1141	LCD1
64	22		CONNECTOR, 2 PIN HEADER, TD-2SG	JP4,JP5,JP6,
65				JP10,JP11,JP12,
66				JP13JP16,JP17,
67				JP18,JP19,JP20,
68				JP21,JP22,JP23,
69				JP24,JP25,JP26,
70				JP27,JP28,JP29,
71				JP32
72				

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DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
73	6		CONNECTOR, 3 PIN HEADER, TD-3SG	JP7,JP8,JP9,
74				JP14,JP15,JP31
75	1		CONNECTOR, 5 PIN HEADER	J4
76	1		CONNECTOR, 6 PIN HEADER	J10
77	28		CONNECTOR, SHORTING BLOCK, DM-2GM-0	
77				
78	3		DIODE, 1N5245B,ZENER, 15V, CMBZ5245B	D20,D21,D23
79	9		DIODE, 1N4004	D1,D4,D5,D6,D7,
80				D8,D9,D10,D19,
81				
82	18		DIODE, 1N4148, MMBD414	D11,D12,D13,D14,
83				D15,D16,D17,D18,
84				D22,D24,D25,D26,
85				D27,D28,D29,D30,
86				D31,D32
87				
88	1		LED ASSY, RED, LL64233R, LTL-523-11	D3
89	1		LED, RED, SMALL, 35BL504	D2
90				
91	2		FUSE, 255.250	F2,F3
92	1		FUSE, 2 AMP, 473.002	F1
93				
94				
95	3		I.C. H11AA4.S, OPTOISOLATOR	U9,U17,U18
96	2		I.C. 4N25.S-M, OPTOISOLATOR	U15,U16

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DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
97	7		I.C. LF347M, QUAD OP AMP	U10,U14,U20,U21,
98				U24,U25,U28
99	2		I.C. LM324M, QUAD OP AMP	U3,U11
100	2		I.C. M-88L70-01S, DTMF DECODER	U19,U23
101	1		I.C. uA78M33CKC, 3.3 V REGULATOR	U13
102	1		I.C. LM78L05ACM, 5.0 V REGULATOR	U12
103				
104	1		I.C. MAX3221CAE, RS232 INTERFACE	U2
105	1		I.C. 24LC256I/SN, 256K IIC EEPROM	U4
106	1		I.C. C8051F120, MICROPROCESSOR	U1
107	1		I.C. SP3485CN, RS485 TRANCEIVER	U8
108	1		I.C. DS1340, CLOCK CHIP	U6
109	1		I.C. ISD4002-120S, VOICE RECORDER	U5
110	3		I.C. MAX7413CUA, 5th ORDER BESSEL FLTR	U22,U26,U32
111	1		I.C. DS1077L-50, CLOCK GENERATOR	U7
112	1		I.C. MC14049B, HEX INVERTER	U27
113	1		I.C. MAX4751 QUAD SWITCH	U33
114				
115	1		I.C. CMX823 TONE DECODER	U30
116	1		I.C. MSHN1S NOTCH FILTER	U31
117				
118				
119				
120				

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DRAWN BY J. WANGER	APPROVED	DATE APPROVED

ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
121	3		POT, 2K, 3386P-1-202	P1,P2,P8
122	7		POT, 10K, 3386P-1-103	P3,P4,P5,P6,P7,
123				P10,P11
124	1		POT, 100K, 3386P-1-104	P9
125				
126	2		RELAY, G5V-2-DC12	RL1,RL2
127				
128				
129	1		RESISTOR, 1/2 W, 100, CARBON FILM	R62
130	3		RESISTOR, 1/2 W, 220, CARBON FILM	R61,R63,R74
131	2		RESISTOR, 1/2 W, 1K, CARBON FILM	R22,R60
132	1		RESISTOR, 1/2 W, 3.3K, CARBON FILM	R23
133	1		RESISTOR, 1/2 W, 22K, CARBON FILM	R59
134	1		RESISTOR, 1/2 W, 33K, CARBON FILM	R64
135	8		RESISTOR, 1/4 W, 620, CARBON FILM	R65,R66,R125,
136				R126,R127,R129,
137				R132,R168
138	2		RESISTOR, SMD 0805, 0	R13,R161
139	5		RESISTOR, SMD 0805, 100	R72,R123,R128,
140				R130,R133
141	4		RESISTOR, SMD 0805, 240	R71,R117,R124,
142				R131
143	2		RESISTOR, SMD 0805, 470	R34,R159
144	1		RESISTOR, SMD 0805, 620	R27

CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 7 OF 10	REV A
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ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
145	10		RESISTOR, SMD 0805, 1K	R6,R12,R16,R35,
146				R44,R81,R91,R94,
147				R105,R115
148				
149	2		RESISTOR, SMD 0805, 1.1K	R20,R39
150				
151	1		RESISTOR, SMD 0805, 2K	R58
152	14		RESISTOR, SMD 0805, 2.2K	R7,R8,R9,R38,
153				R46,R51,R55,R75,
154				R76,R77,R78,R85,
155				R116,R118
156	1		RESISTOR, SMD 0805, 3.3K	R48
157	4		RESISTOR, SMD 0805, 4.7K	R5,R17,R18,R107
158	12		RESISTOR, SMD 0805, 5.1K	R11,R15,R41,R45,
159				R52,R53,R57,R80,
160				R90,R104,R158,
161				R169
162				
163	3		RESISTOR, SMD 0805, 8.2K	R37,R50,R151
164	4		RESISTOR, SMD 0805, 10K	R95,R96,R113,
165				R148
166	1		RESISTOR, SMD 0805, 12K	R103
167	1		RESISTOR, SMD 0805, 13K	R49
168	2		RESISTOR, SMD 0805, 15K	R89,R122

CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 8 OF 10	REV A

DRAWN BY J. WANGER	APPROVED	DATE APPROVED

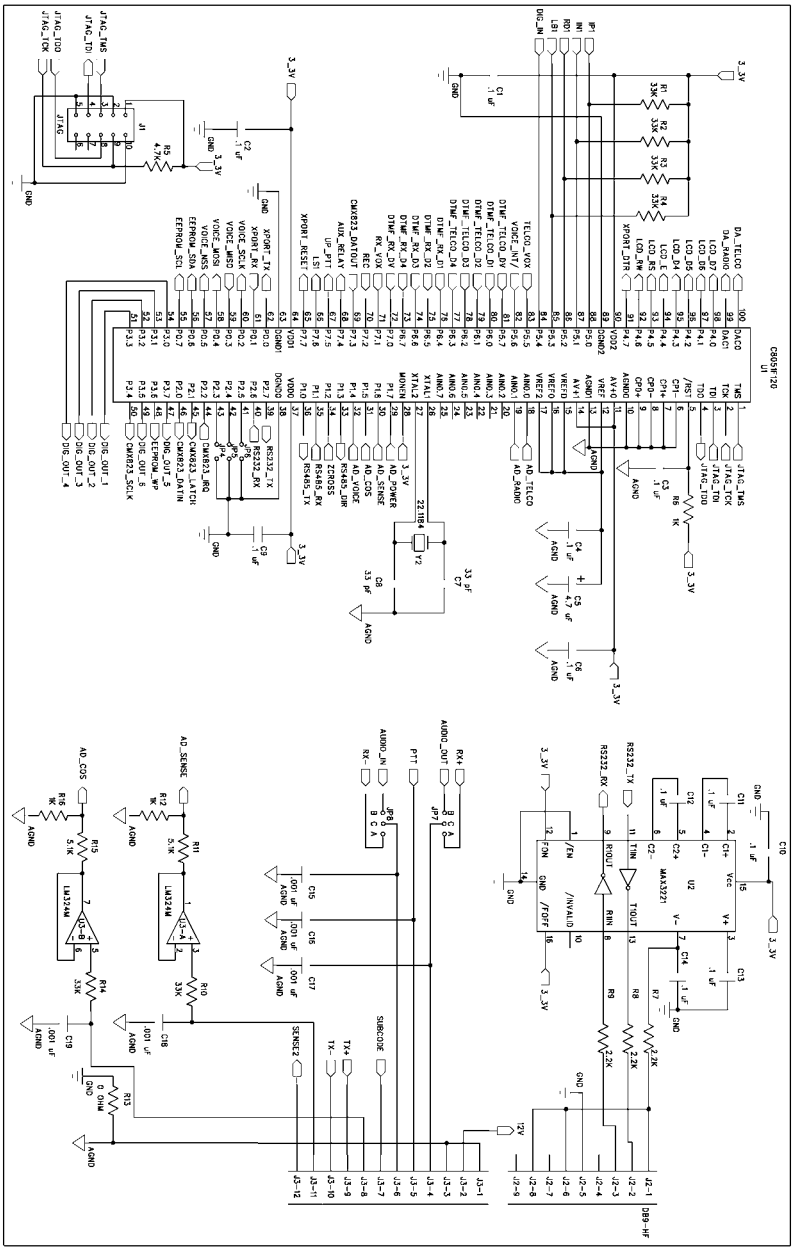
ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
169	3		RESISTOR, SMD 0805, 18K	R87,R120,R149
170	3		RESISTOR, SMD 0805, 22K	R19,R43,R79
171	1		RESISTOR, SMD 0805, 24K	R156
172	2		RESISTOR, SMD 0805, 27K	R88,R121
173	13		RESISTOR, SMD 0805, 33K	R1,R2,R3,R4,R10,
174				R14,R21,R25,R40,
175				R47,R56,R69,R101
176				
177	5		RESISTOR, SMD 0805, 47K	R26,R98,R99,
178				R166,R167
179	2		RESISTOR, SMD 0805, 51K	R28,R29
180	3		RESISTOR, SMD 0805, 62K	R30,R31,R100
181	1		RESISTOR, SMD 0805, 75K	R32
182	2		RESISTOR, SMD 0805, 82K	R146,R150
183				
184	20		RESISTOR, SMD 0805, 100K	R33,R42,R54,R82,
185				R84,R93,R97,
186				R106,R108,R110,
187				R135,R136,R137,
188				R139,R140,R141,
189				R143,R144,R145,
190				R153
191	1		RESISTOR, SMD 0805, 150K	R92
192	1		RESISTOR, SMD 0805, 180K	R102

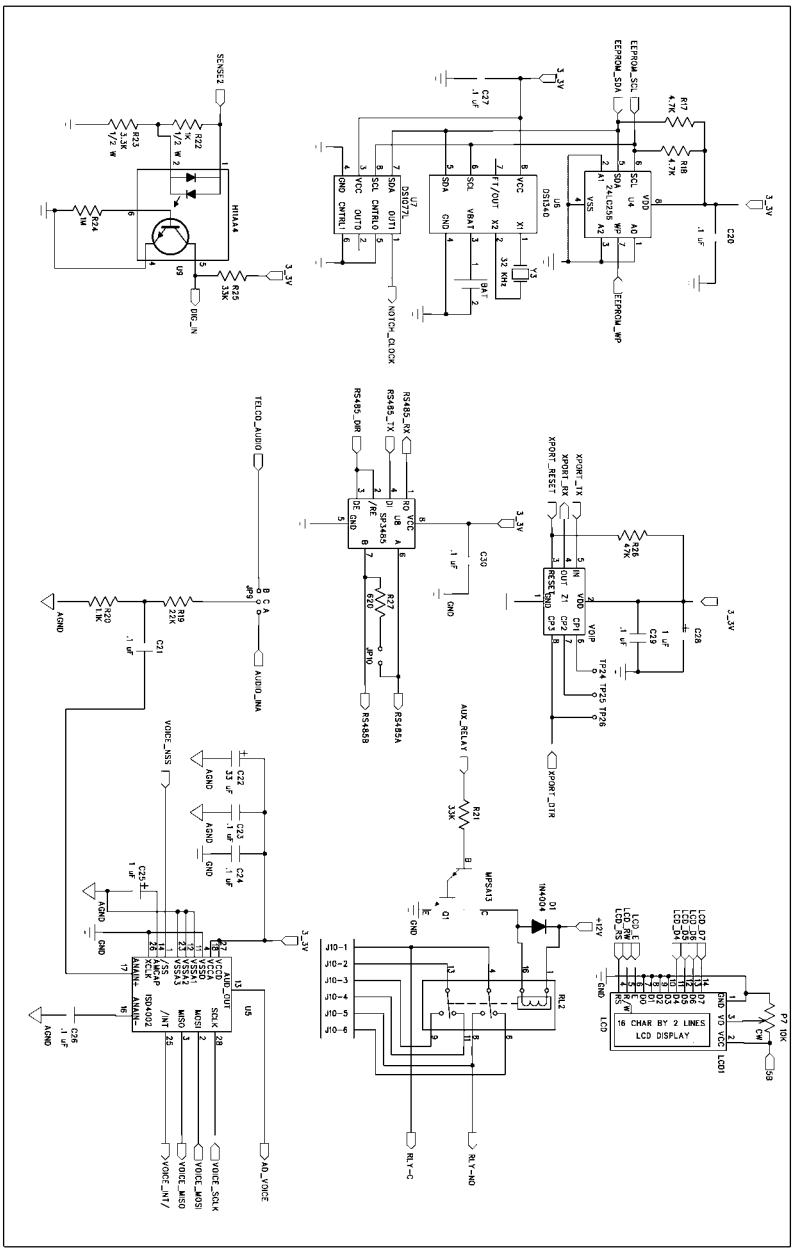
CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 9 OF 10	REV A
DRAWN BY J. WANGER	APPROVED	DATE APPROVED

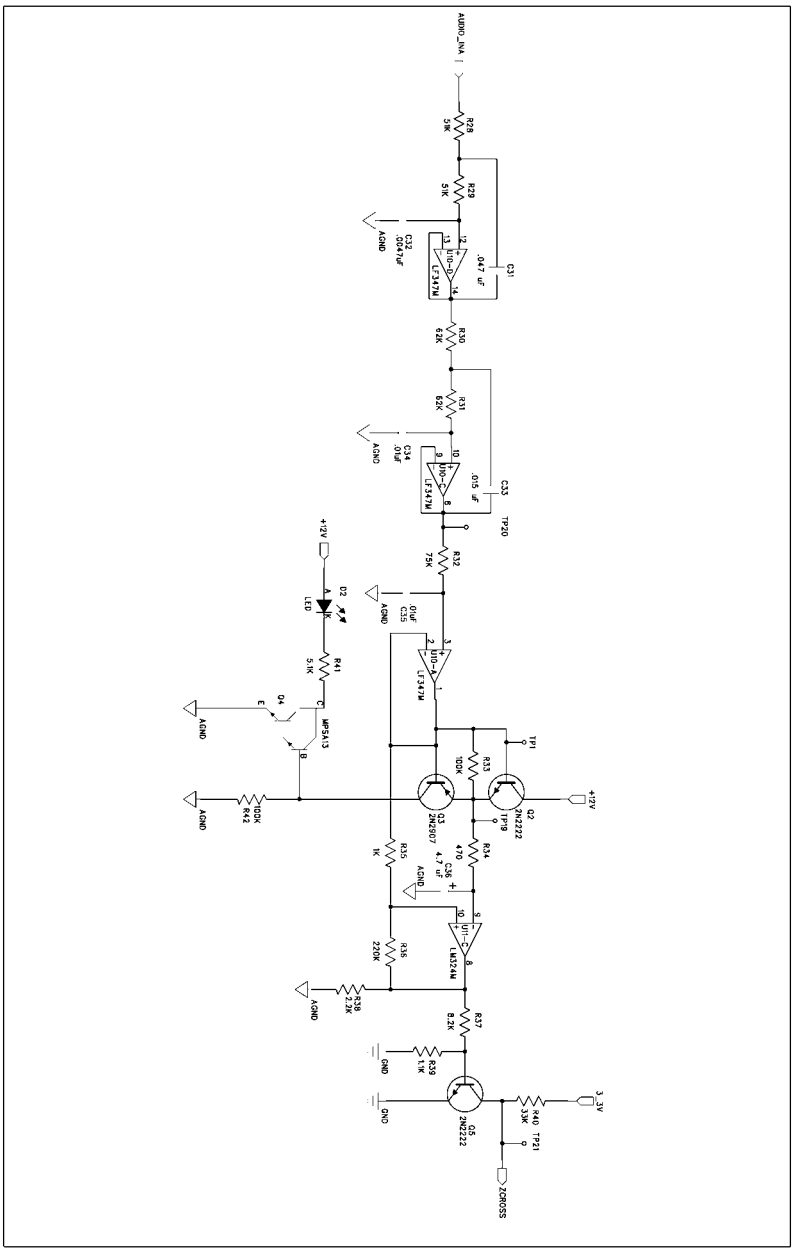
ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
193	4		RESISTOR, SMD 0805, 220K	R36,R114,R147,
194				R157
195	3		RESISTOR, SMD 0805, 270K	R152, R154, R170
196				
197	6		RESISTOR, SMD 0805, 300K	R83,R109,R112,
198				R134,R138,R142
199	2		RESISTOR, SMD 0805, 470K	R86,R111
200	9		RESISTOR, SMD 0805, 1M	R24,R67,R68,R70,
201				R73,R155,R163,
202				R164,R165,
203	1		RESISTOR, SMD 0805, 1.5M	R119
204	3		SWITCH, 4 POSITION DIP, CTS-206-4	S1,S2,S3
205	8		TRANSFORMER, 671-1898	T1,T2,T3,T4,T5,
206				T6,T7,T8
207				
208	3		TRANSISTOR, MMBT2907A/MMBT2907A-LT1	Q3,Q7,Q10
209	4		TRANSISTOR, MMBTA13/MMBTA13-LT1	Q1,Q4,Q6,Q8
210				
211	3		TRANSISTOR, MMBT2222A/PMBT2222A	Q2,Q5,Q9
212	2		VARISTOR, V250LA20, MOV, 250V	V1,V2
213				
214	1		INDUCTOR, FERRITE BEAD	L1
215				
216				

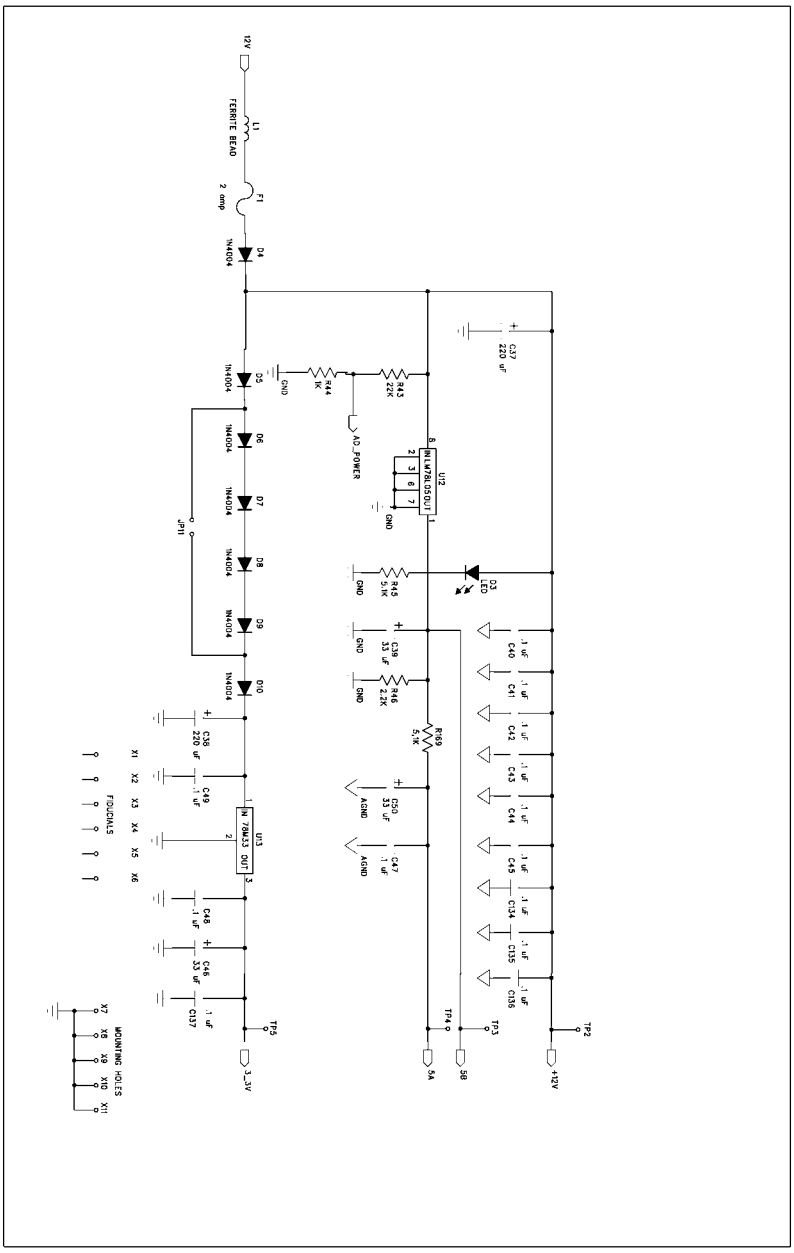
CONNECT SYSTEMS INC. 1802 EASTMAN AVE #116 VENTURA, CA. 93003	PARTS LIST PCBA, MODEL FLEX III SHEET 10 OF 10	REV A
DRAWN BY J. WANGER	APPROVED	DATE APPROVED

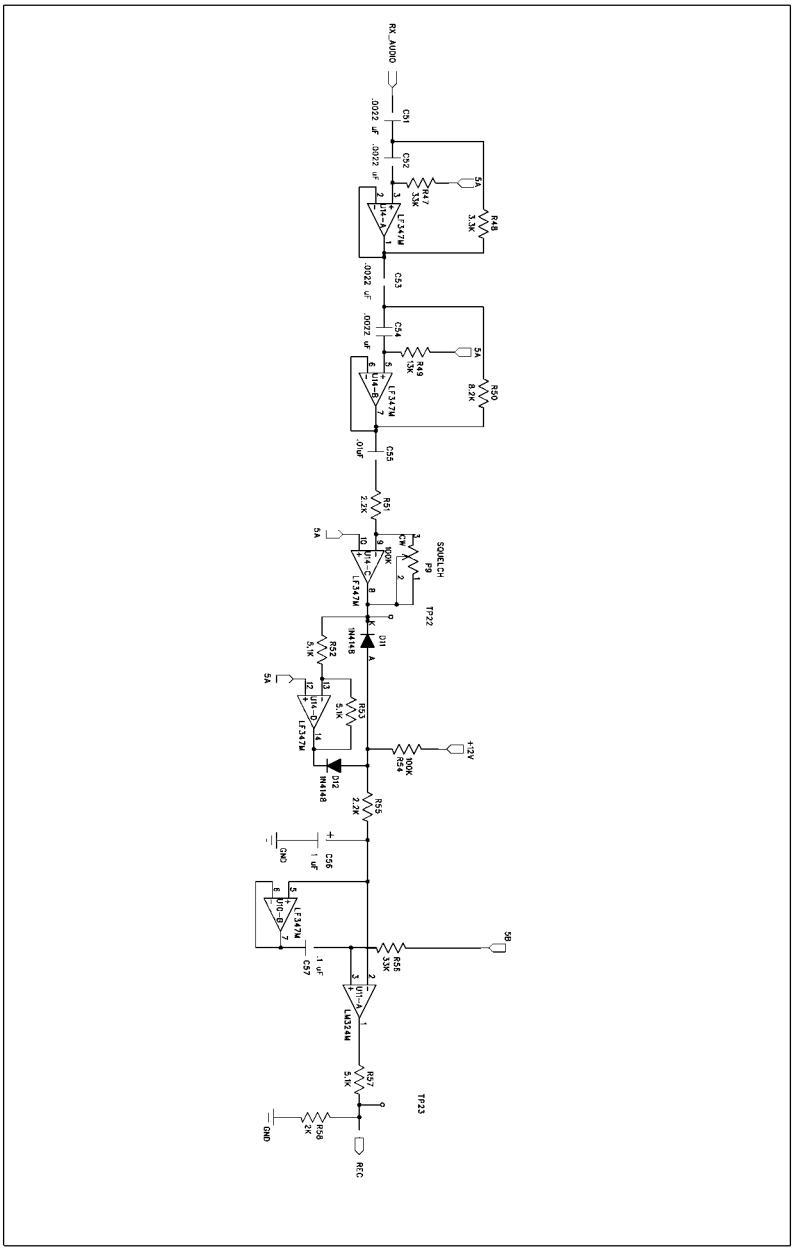
ITEM	QTY UNIT	QTY ISSUED	DESCRIPTION	REF DESIGNATION
217	2		XTAL, 3.58 MHz, KD0048FCB	Y1,Y4
218	1		XTAL, 22.1184 MHz, FOX 221	Y2
219	3		XTAL SPACERS, SPACER-I	Y1,Y2,Y4
220	1		XTAL, 32KHz	Y3
221				
222	1		BATTERY HOLDER	BAT
223	1		ETHERNET CONTROLLER	Z1
224				
225	1		HARDWARE, HEATSINK, 6230B-TT	U13
226	1		HARDWARE, 6-32 NUT	U13
227	1		HARDWARE, 6-32 X 1/4 SCREW	U13
228	1		HARDWARE, NO. 6 SS LOCKWASHER	U13
229				
230	1		LABOR, ASSEMBLY, FLEX III PCB	
231				
232				
233				
234				
235				
236				
237				
238				
239				
240				

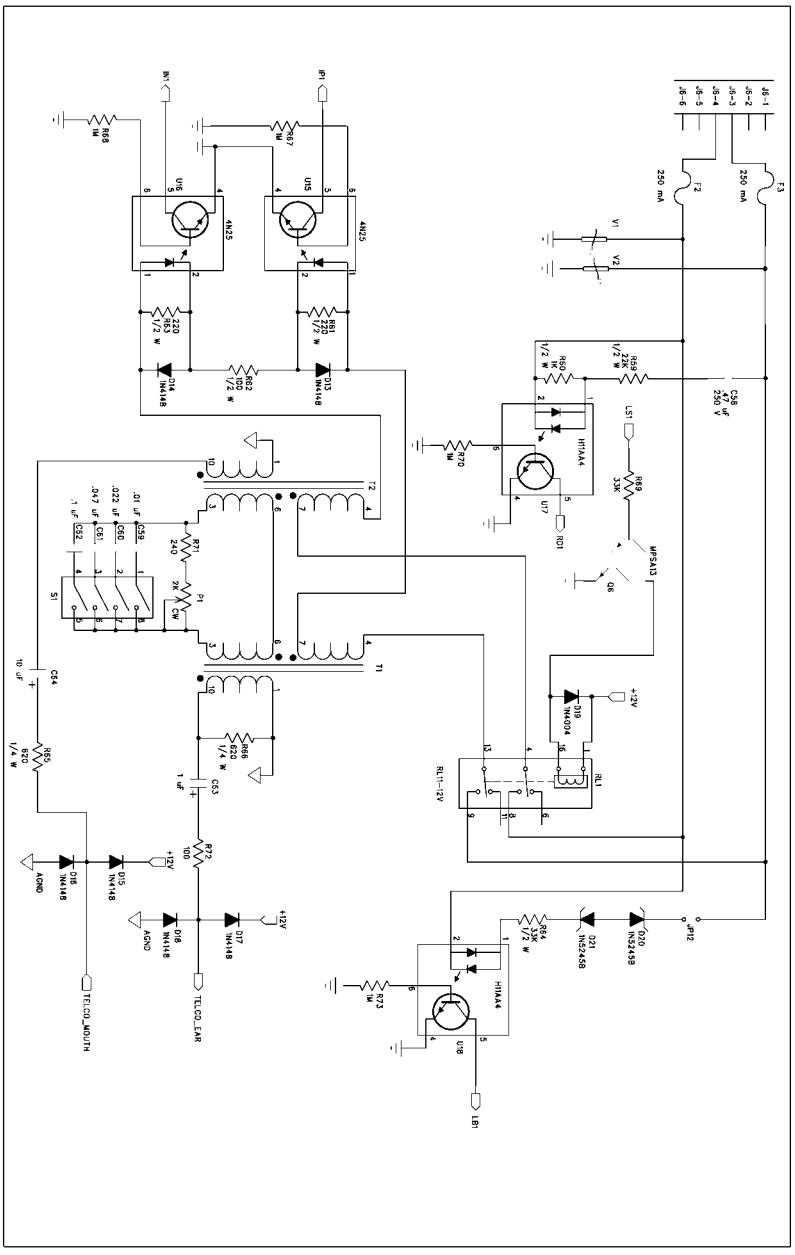


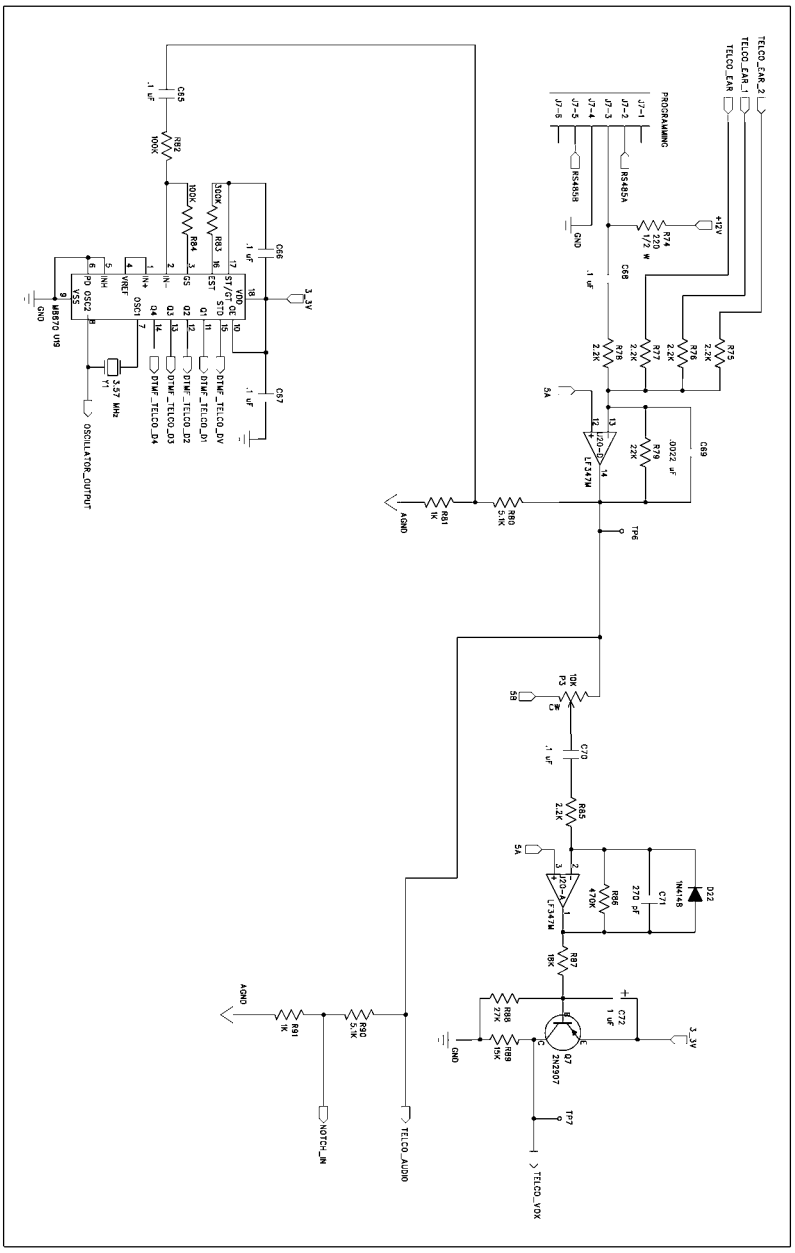


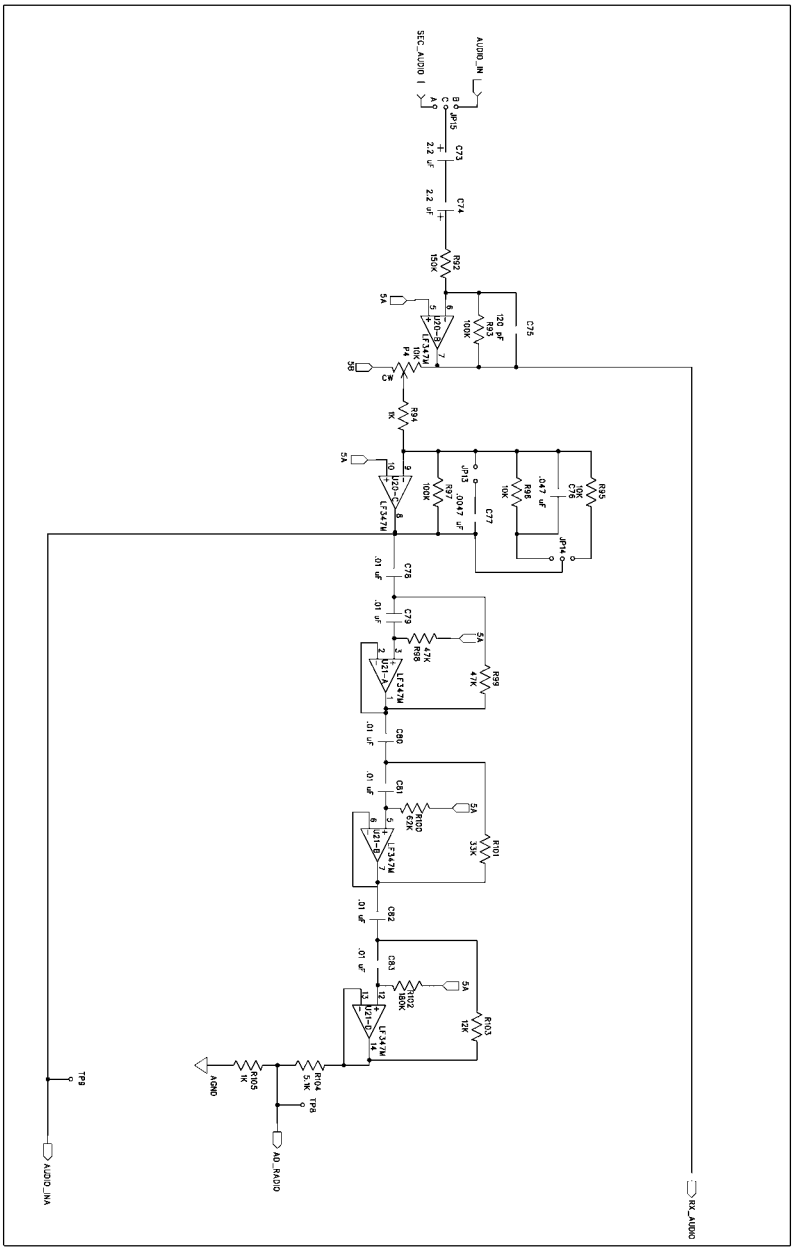

AGND_INA
R28
5.9K
R29
51K
C32
.0047uF
AGND
U10-C
LF347M
.047 uF
C31
R30
62K
R31
82K
C34
.01uF
AGND
U10-D
LF347M
.015 uF
C33
TP20
R32
75K
+12V
D2
LED
C35
.01uF
AGND
U10-A
LF347M
R41
5.1K
Q4
MPSA13
AGND
TP1
R33
100K
Q3
2N2907
Q2
2N2222
TP19
+12V
AGND
100K
R42
R35
1K
R34
470
C36
4.7 uF
AGND
U11-C
LM324M
R36
220K
R38
2.2K
AGND
R37
8.2K
R39
1.1K
GND
GND
Q5
2N2222
R40
33K
TP21
3_3V
ZCROSS

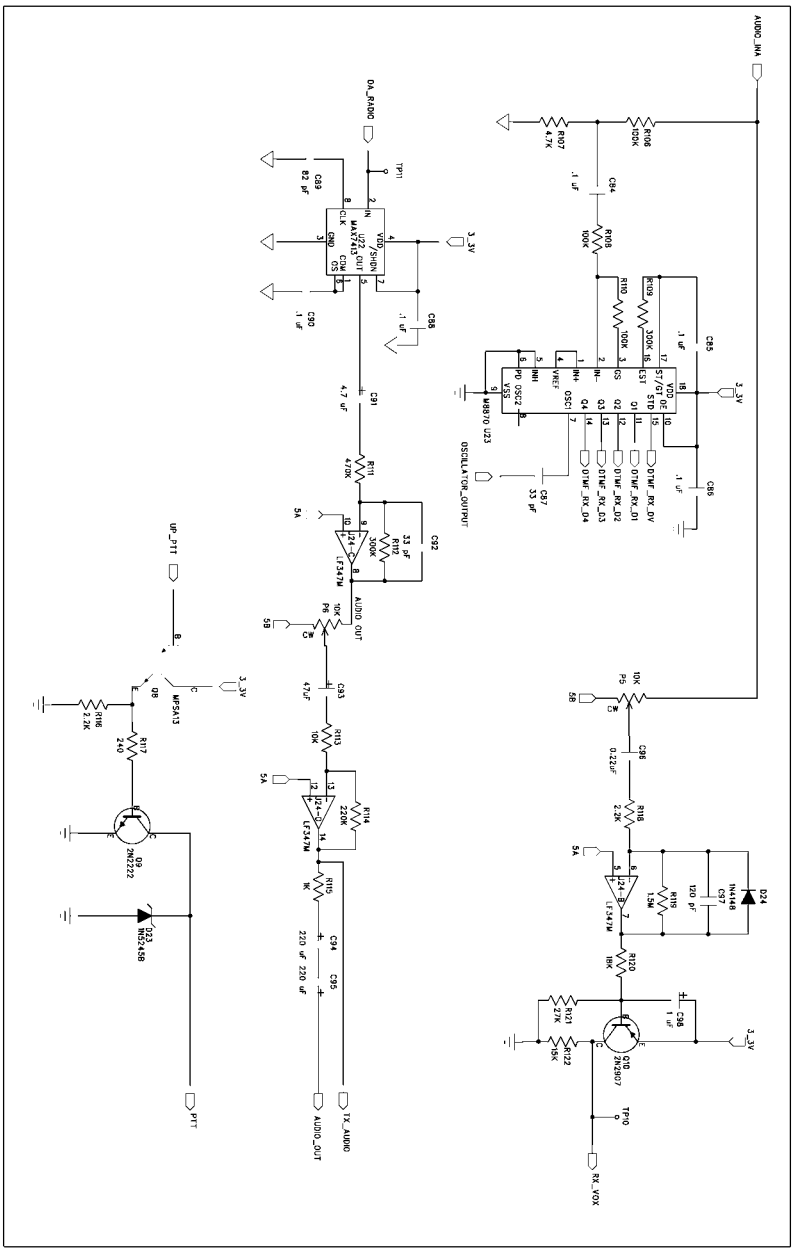

12V
L1
FERRITE BEAD
F1
2 amp
D4
1N4004
D5
1N4004
D6
1N4004
D7
1N4004
D8
1N4004
D9
1N4004
D10
1N4004
JP11
R44
1K
GND
R45
22K
ADJ_POWER
U12
MIL-M78L05CH/T
C37
220 uF
R43
5.1K
D3
LED
C38
33 uF
R46
2.2K
R169
5.1K
C39
33 uF
AGND
C47
.1 uF
C40
.1 uF
C41
.1 uF
C42
.1 uF
C43
.1 uF
C44
.1 uF
C45
.1 uF
C134
.1 uF
C135
.1 uF
C136
.1 uF
C36
220 uF
C49
.1 uF
U13
79MXX OUT
C48
.1 uF
C46
33 uF
C137
.1 uF
FIDUCIALS
X1
X2
X3
X4
X5
X6
MOUNTING HOLES
X7
X8
X9
X10
X11
TP5
3.3V
TP4
5A
5B
TP3
TP2
+12V

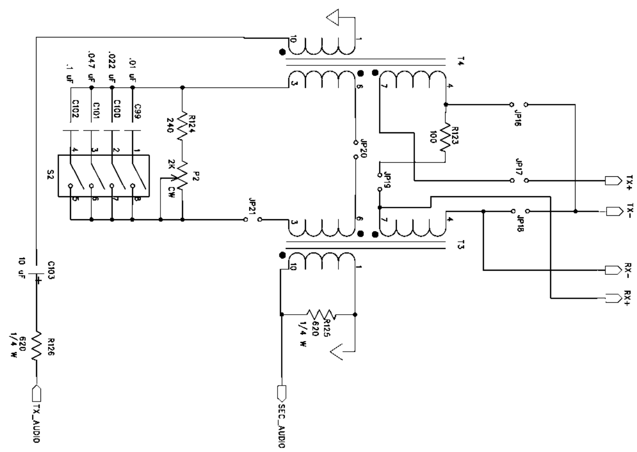

RX_AUDIO
C51
.0022 uF
C52
.0022 uF
R47
33K
5A
R48
3.3K
LF347M
C53
.0022 uF
C54
.0022 uF
R49
33K
5A
R50
8.2K
LF347M
.01uF
C55
R51
2.2K
5A
SQUELCH
R9
100K
LF347M
TP22
D11
1N4148
R52
5.1K
5A
R53
5.1K
LF347M
+12V
R54
100K
D12
1N4148
R55
2.2K
C56
1 uF
GND
LF347M
9V
R56
33K
.1 uF
C57
LM324M
R57
5.1K
TP23
R58
2K
GND
REC

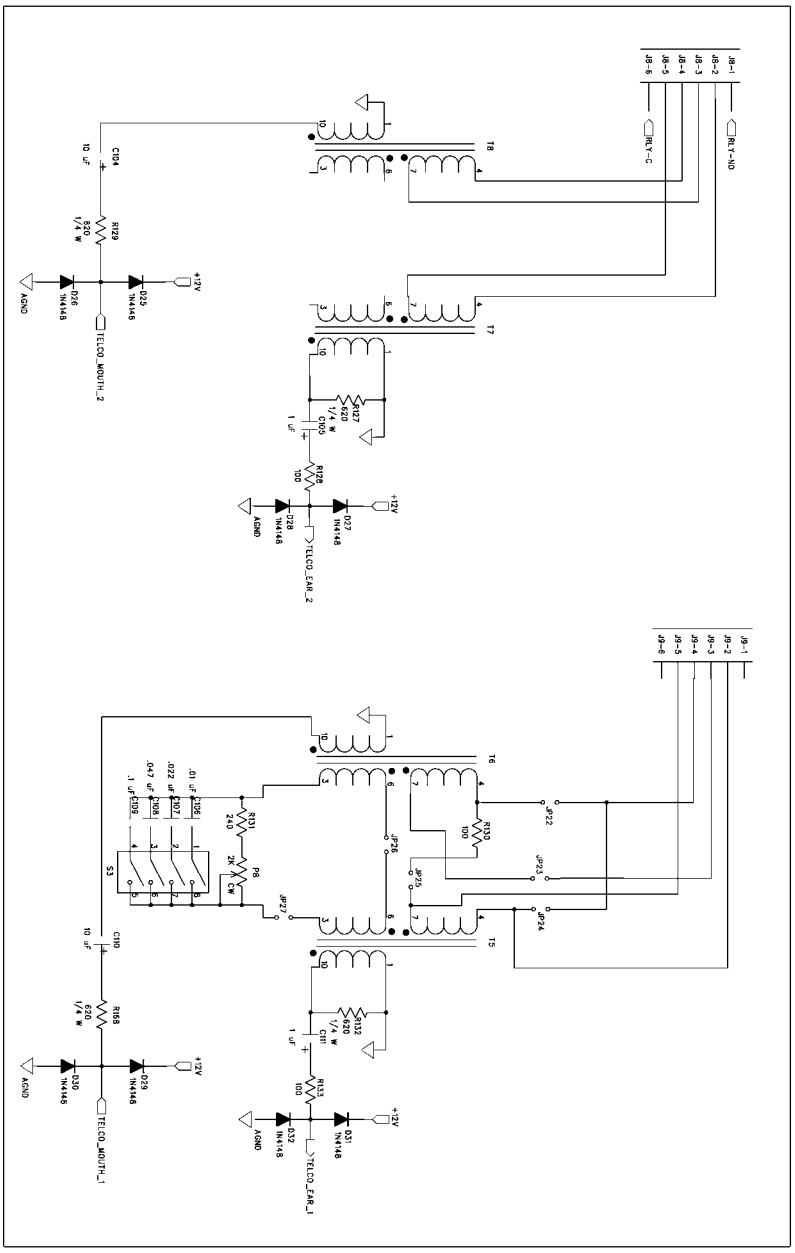


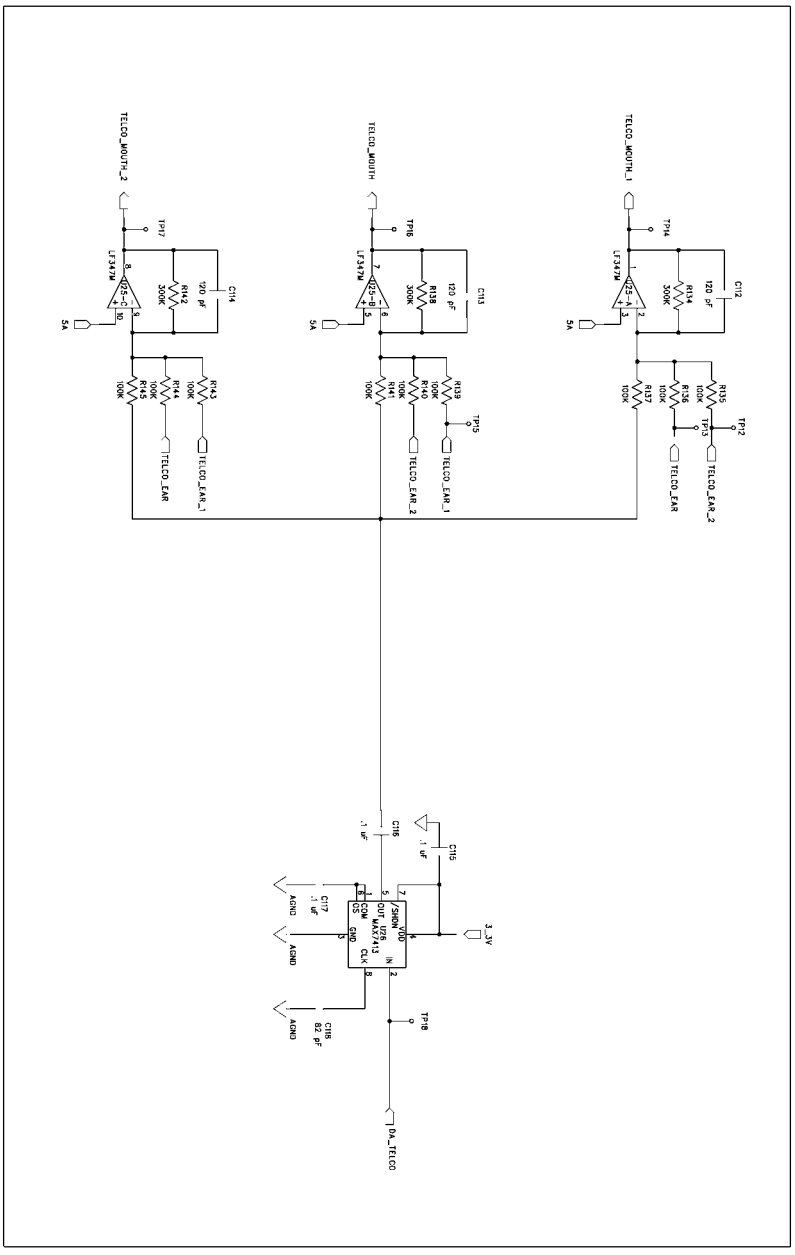

TELCO_EAR_2
TELCO_EAR_
TELCO_EAR
PROGRAMMING
J7-1
J7-2
J7-3
J7-4
J7-5
J7-6
RS485B
RS485A
GND
+12V
R74
220
1/2 W
C68
.1 uF
R78
2.2K
R77
2.2K
R76
2.2K
R75
2.2K
5A
U20-A
LF347M
R79
22K
.0022 uF
C69
R81
1K
R80
5.1K
AGND
TP6
C55
.1 uF
R82
100K
100K
R84
150K
R83
C66
.1 uF
ST/GT
EST
VDD
CK
OSC1
OSC2
VREF
INH
PD
VSS
MB87D 019
GND
3.57 MHz
OSCILLATOR_OUTPUT
Q4
Q3
Q2
Q1
DTMF_TELCO_D4
DTMF_TELCO_D3
DTMF_TELCO_D2
DTMF_TELCO_D1
DTMF_TELCO_DV
C67
.1 uF
3_3V
10K
P3
5B
C70
.1 uF
R85
2.2K
R86
470K
270 pF
C71
1N4148
D22
R87
10K
R88
27K
R89
15K
Q7
2N2907
C72
1 uF
TP7
TELCO_VOX
R91
1K
R90
5.1K
NOTCH_IN
TELCO_AUDIO

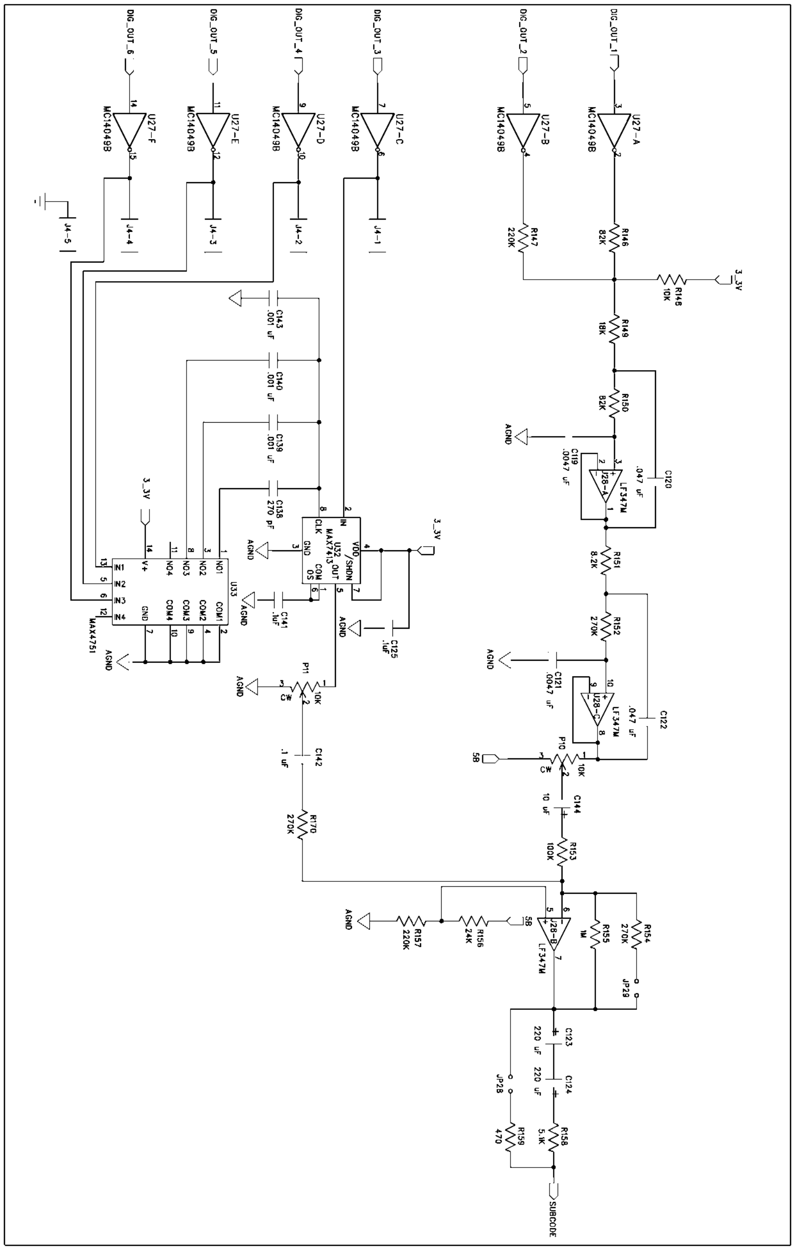

AUDIO_IN
SEC_AUDIO I
JP15
C73
2.2 uF
C74
2.2 uF
R92
150K
5A
R93
100K
120 pF
C75
P4
10K
5B
CW
R94
1K
5A
JP13
R97
100K
.0047 uF
C77
R96
10K
.047 uF
C76
R95
10K
JP14
C78
.01 uF
C79
.01 uF
5A
R88
4.7K
R99
47K
C80
.01 uF
C81
.01 uF
5A
R100
82K
R101
33K
C82
.01 uF
C83
.01 uF
5A
R102
180K
R103
12K
R105
1K
R104
5.1K
TP6
AGND
AD_RADIO
TP9
AUDIO_IMA
RX_AUDIO

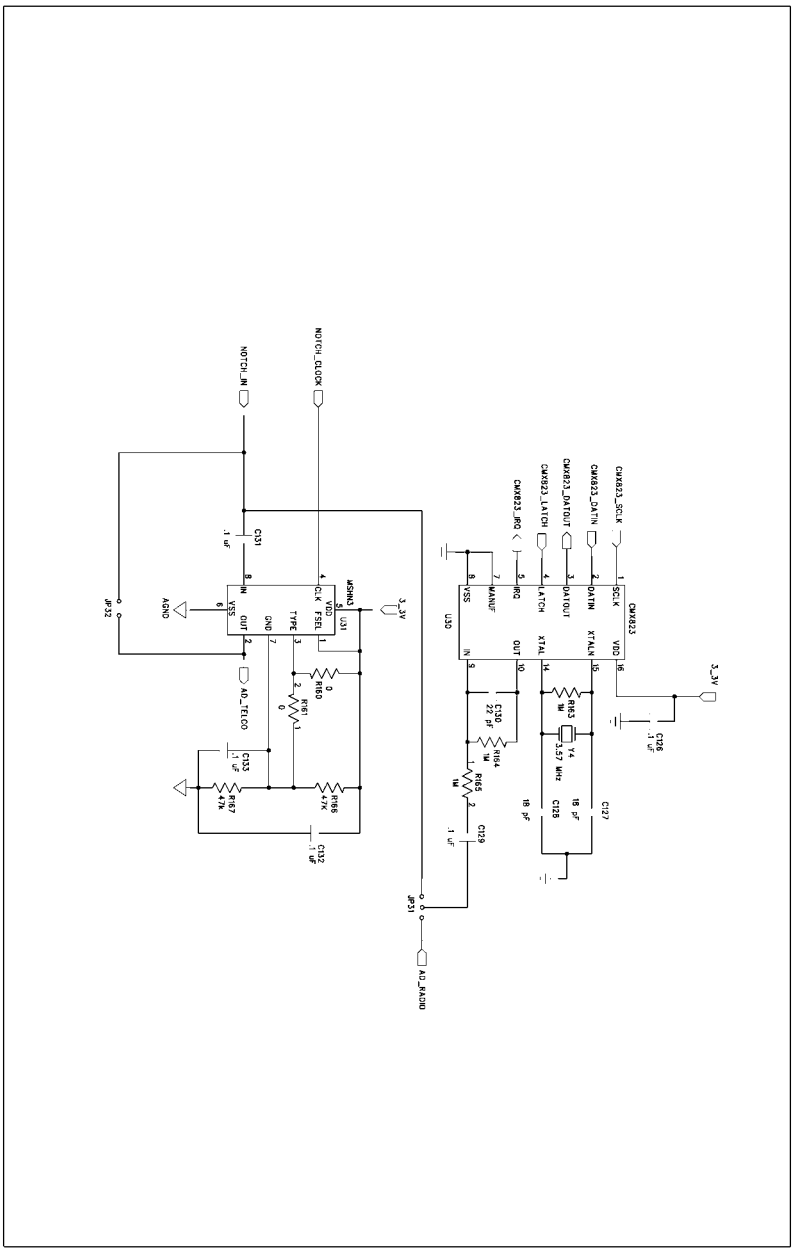

AUDIO_IMA
R107 4.7K
R106 82K
C84 .1 uF
R108 100K
R109 300K 1%
R110 100K
C85 .1 uF
3_3V
VDD
S1/G1
S2/G2
EST
GS
IN-
IN+
VREF
OSC1
OSC2
VSS
MX877D U23
D1/MF_RX_DV
D2/MF_RX_D1
D3/MF_RX_D2
D4/MF_RX_D3
Q4/MF_RX_D4
C86 .1 uF
C87 33 pF
OSCILLATOR_OUTPUT
R105 10K
C96 0.22uF
R116 2.2K
R115 1.3M
C97 120 pF
1N4148 D24
R120 10K
R121 27K
R122 15K
Q10 2N2907
C98 1 uF
TP10
RX_VOX
DA_RADIO
TP11
C89 82 pF
U22 MAX4743 CLK GND COM OUT NC1 NC2 VDD/SHDN
C90 .1 uF
C88 .1 uF
C91 4.7 uF
R111 470K
C92 33 pF
R112 300K
LF347M
AUDIO_OUT
R104 10K
C93 47uF
R113 10K
R114 220K
R115 1K
C94 220 uF
C95 220 uF
TX_AUDIO
AUDIO_OUT
UP_PTT
Q8 MPSA13
R116 2.2K
R117 24Q
Q9 2N2222
D23 BZX55C8
PTT


T4
T3
R123
100
R124
240
P2
2K
CW
R125
620
1/4 W
R126
620
1/4 W
C99
.01 uF
C100
.022 uF
C101
.047 uF
C102
.1 uF
C103
10 uF
S2
JP16
JP17
JP18
JP19
JP20
JP21
TX+
TX-
RX-
RX+
TX_AUDIO
SEC_AUDIO


J8-1
J8-2
J8-3
J8-4
J8-5
J8-6
RLY-C
RLY-NO
T8
T7
C104
10 uF
R129
620
1/4 W
D26
1N4446
D25
1N4446
+12V
AGND
TELCO_MOUTH-2
C105
1 uF
R127
620
1/4 W
R128
100
D28
1N4446
D27
1N4148
+12V
AGND
TELCO_EAR-2
J9-1
J9-2
J9-3
J9-4
J9-5
J9-6
T6
T5
JP22
JP23
JP24
JP25
JP26
JP27
R130
100
C106
.01 uF
C107
.022 uF
C108
.047 uF
C109
.1 uF
R131
249
R8
2K
1/4 W
S3
C110
10 uF
R168
620
1/4 W
D30
1N4446
D29
1N4446
+12V
AGND
TELCO_MOUTH-1
C111
1 uF
R132
620
1/4 W
R133
100
D32
1N4148
D31
1N4148
+12V
AGND
TELCO_EAR-1


TELCO_MOUTH_2
TELCO_MOUTH
TELCO_MOUTH_1
TP17
TP16
TP14
LF347M
R142
300K
R140
300K
R138
300K
R136
300K
C114
120 pF
C113
120 pF
C112
120 pF
5A
R143
100K
R144
100K
R141
100K
R139
100K
R137
100K
R135
100K
TP15
TP13
TP12
TELCO_EAR
TELCO_EAR_1
TELCO_EAR_2
C116
.1 uF
C115
.1 uF
C117
.1 uF
C118
82 pF
AGND
3.3V
MAX413
TP18
DA_TELCO


DIG_OUT_1
DIG_OUT_2
DIG_OUT_3
DIG_OUT_4
DIG_OUT_5
DIG_OUT_6
U27-A
U27-B
U27-C
U27-D
U27-E
U27-F
MC14049B
J4-1
J4-2
J4-3
J4-4
J4-5
R146
82K
R147
220K
R148
10K
3_3V
R149
18K
R150
82K
C119
.0047 uF
C120
.047 uF
U28-A
LF347M
AGND
R151
8.2K
R152
270K
C121
.0047 uF
U28-C
C122
.047 uF
P10
10K
CW
5B
C144
10 uF
R153
100K
C143
.001 uF
C140
.001 uF
C139
.001 uF
C138
270 pF
U32
MAX7413
CLK
IN
GND
COM
OS
VDD
SHDN
OUT
C141
.1uF
C125
.1uF
U33
MAX4751
IN1
IN2
IN3
IN4
V+
GND
NO1
NO2
NO3
NO4
COM1
COM2
COM3
COM4
P11
10K
C142
.1 uF
R170
270K
R157
220K
R156
24K
U28-B
LF347M
R155
1M
R154
270K
JP29
C123
220 uF
C124
220 uF
JP28
R158
5.1K
R159
470
SUBCODE


CMX823_SCLK
CMX823_DATIN
CMX823_DATOUT
CMX823_LATCH
CMX823_IRQ
SCLK
DATIN
DATOUT
LATCH
IRQ
MANUF
VSS
XTALI
XTALO
VDD
CMX823
U30
3_3V
C126
.1 uF
R163
1M
Y4
3.57 MHz
C127
15 pF
C125
15 pF
18 pF
C150
22 pF
R164
1M
R165
1M
C139
.1 uF
JP31
AD_AGND
NOTCH_CLOCK
NOTCH_IN
C131
.1 uF
MSMN3
U31
CLK
FSEL
VDD
TYPE
GND
OUT
VSS
IN
JP32
AGND
R160
0
R161
0
AD_TELCO
C133
.1 uF
R167
47K
R166
47K
C132
.1 uF

CHANGES TO MANUAL

Revision 1.00: Initial Release

Revision 1.01: Mistake in preamp description. Should be - "Adjust the preamp control until a level of 3 volts peak to peak is observed at test point 9."