Q5 SIGNAL 5-BAND VHF/UHF TRANSVERTER

Part Number 5BVUXHP SN _____

Transverter Configuration		
Power Output:	50W (25W on 1296)	
RX Gain @ Noise Figure:	>20dB Conversion Gain @ 1.0dB NF Typical	
DC Power Requirement:	11.5 - 15.5 VDC @ ☐ 15 Amp Max. ☐ Other_____	
IF Option:	☐ Common	☐ Separate TX and RX (Split)
RF Option:	☐ Common	☐ Separate TX and RX (Split)
IF Drive Level:		
Keying Option:	☐ PTT-L (To Ground)	☐ PTT-H (Positive Voltage)

☐ Additional Specified Options:

Operational Overview: The 5BVUXHP is a complete 5-Band High-Power Transverter for the 144, 222, 432, 902, and 1296 Amateur Radio Bands. It measures only 10” x 10” x 5” and weighs just 7.5 lbs. and offers the following standard features:

28MHz IF
50W Output (25W on 1296)
20dB Receive Conversion Gain Minimum
1.0dB Noise Figure Typical
High Level Mixer
Front End PIN Diode Protection
2-Stage SAW Filter Design
RF Output Level Meter
PLL Synthesized LO
Internal 0.28ppm TCXO Reference
Connection for Optional External 10MHz Reference
Front Panel Band Selector and Indicator
Accepts 4-Bit or 5-Bit Band Data
Sequenced PTT Output for Each Band
Dual Independent Cooling Fans
Optional PTT on IF Coax
IF Drive from -20dB to 10W
Common or Split IF Connection
Common or Split RF Connection for Each Band

The 5BVUXHP contains a separate optimized RF section for each band sharing a common IF section, mixer, and synthesized LO all managed by a microcontroller. The 5BVUXHP offers 5 bands in a compact space with less cabling and less expense than five individual transverters all without compromising performance.

The 5BVUXHP may be configured with Common or Split IF at any drive level between -20dBm to 10 Watts. All IF connections are made through standard BNC connectors. Common or Split RF configurations are available. The Common RF (Antenna) connector is Type-N. For Split RF, the TX port is Type-N and the RX port is SMA. The 5BVUXHP is keyed through its PTT line – a RCA Phono connector or through Pin 15 of the AUX connector. Both PTT polarities are available – PTT-L (Ground to Transmit) or PTT-H (Voltage to Transmit). The AUX connector also contains the Band Data connections for remote control of band selection. Also contained in the AUX connector is the sequenced PTT outputs that can be used for keying external amplifiers.

Configuration Overview: The 5BVUXHP is designed to interface to all modern amateur radio transceivers but has been specifically configured to your transceiver's specifications. As indicated on the front page, some user options and configurations need to be selected before delivery. Please review your configuration to verify that your interface will be easy and trouble free. Please refer to the front page chart for the following:

RF Output : This is the maximum linear output power level of the 5BVUXHP that should not be exceeded if linear operation is expected. In most cases, the transverter is capable of higher output power but is not recommended because of excessive "on the air" distortion products.

RX Gain and Noise Figure: The Receive Conversion Gain and Noise Figure listed are the typical specifications for each band. Utilizing the latest E-PHEMT and SAW filter technology, the receiver chain has been designed for gain management, IMD performance, and noise figure to eliminate overload and out of band interference maintaining a stable, quiet, sensitive receiver. Please note that the noise figure of the 5BVUXHP is always better through a separate RX connector and not through the Common Antenna connection.

DC Power Requirement: The DC power requirement listed should be used as a guideline. Please include some headroom in your power supply to eliminate voltage drop. Always choose the correct level of fusing for protection.

IF Option: The IF option has two choices – a Common IF connector in which both TX and RX IF signals are conducted through a single connector, or Split IF connections with a separate connector for the receive and transmit connections to your transceiver.

RF Option: The RF option has two choices for each band – a Common RF connector in which both TX and RX RF signals are conducted through a single connector (Antenna), or Split RF connections with a separate connector for the receive and transmit RF connections.

IF Drive Level: The IF Drive Level is adjustable over a 15-20dB range using the TXIF Gain Pot accessible through a hole in the transverter's bottom cover. Proper adjustment of this level will allow the 5BVUXHP to operate at its maximum linear output power.

Keying Option: The Keying Options are either PTT-L or PTT-H. PTT-L is the most common configuration and requires a connection to ground to transmit. PTT-H requires a voltage of at least 1.7VDC to transmit. This option can also be placed on the IF Coax if desired.

Additional Specified Options: All other customer specified options will be listed and identified along with special instructions required for proper operation.

Installation

Theory of Operation: The basic principle of a transverter is to convert a chosen band of operation to your transceiver of choice. Following the recommendations of the transceiver's operation manual for transverter use is the most important aspect of correct transverter operation. If configured correctly, the transverter will convert both transmit and receive signals to a new band of operation and be "invisible" to your transceiver's operation. In simple terms, the transverter will not improve the performance of your transceiver but if configured correctly, will not cause any degradation of performance in any way and will appear as if it was meant to be on that "new" band all the time.

Interfacing and Operation: The interfacing starts with a complete understanding of your transceiver and manual. Your transceiver's manual should cover the setup for transverter operation if it has transverter ports and depict the connections to be made. Some transceivers do not have ports but may still be interfaced with some instruction. Some transceivers are simple and some are complex. Some transceivers may have more than one correct way of interfacing. Hopefully, you have decided how this transverter is to be interfaced at the time of order so we were able to configure the transverter to fit your requirements.

Start with good quality 50 ohm cables for the IF (28MHz) and REF (10 MHz) connections. These connections are low level (10W or less) and are BNC connectors on the 5BVUXHP. We find that simple RG-58 type BNC cables work fine with or without adapters to your transceiver.

The 5BVUXHP requires a PTT Line to enable its Transmit mode. The PTT input to the 5BVUXHP is the RCA Phono connector or Pin 15 of the AUX connector. Many transceivers have RCA connectors for PTT outputs. But be sure to have whatever cable that is required ready to go.

The DC Power Cable is supplied with the 5BVUXHP and needs to be prepped and fuse-protected on the power supply end.

Connecting Your Transceiver to the 5BVUXHP: Interfacing the 5BVUXHP to your transceiver is easy. After reviewing the front-page configuration and verifying that it is configured correctly for your purpose, begin cabling. **An Important Note:** It is recommended that during the initial setup of the 5BVUXHP to not connect it to your complete system (HPA or LNA). All aspects of the transverter's performance should be tested before a complete installation is made to an existing system. Drive levels need to be established and proper switching needs to be verified before complete integration for protection of your existing system.

Connect the DC Power Cable to your power supply remembering to install the proper fuse for protection. Connect the twist-lock DC Power Plug to the 5BVUXHP. 13.8VDC is optimum but it will operate normally from 11 to 15VDC. Toggle the transverter's power switch. Its "ON" LED turns Green. Leave the 5BVUXHP powered on.

Connect an optional 10MHz Reference to the transverter's "REF" connector. The optimum level is between 0dBm and +13dBm. The transverter's "LOCK" LED turns Green. When not using an external reference, always terminate the "REF" port with a short or load.

Use the Band Select Knob on the front panel of the 5BVUXHP to choose the Amateur Radio Band of interest. Note how the Band Indicator LEDs change as the Band Select Knob is rotated to the left and right.

Connect the IF cable(s). The 5BVUXHP may be configured with a Common IF port labeled "COM" or two separate ports, "TX IF" and "RX IF", for the IF connections. The IF Cable is either connected to a transverter port connector or the main antenna connection of your transceiver. Refer to your manual.

If separate TX and RX RF ports were ordered, they are labeled "RX" and "ANT/TX" for the appropriate bands. If you have requested a Common RF (Antenna) connection, the "ANT/TX" port has both TX and RX functions. Connect your antenna system or dummy load with optional power meter to the appropriate RF connector on the 5BVUXHP.

With your transceiver powered off, connect its "PTT" line to the transverter's RCA connector labeled PTT on the 5BVUXHP. Refer to the configuration sheet for the type of keying required.

On the bottom of the 5BVUXHP, verify the TXIF and RXIF gain controls. Turn the RXIF control fully clockwise and the TXIF control counter-clockwise. This is maximum attenuation on Transmit and minimum attenuation on Receive.

Power-on your transceiver. If your transceiver cycles during power up, it may briefly key the 5BVUXHP. This is indicated by the Red "XMIT" light and the sound of relays cycling. Verify that the transceiver is in "receive" and that the red XMIT light is off on the 5BVUXHP. If not, shut off your transceiver and check the PTT connection with the IF cables disconnected from the transverter. If both transceiver and 5BVUXHP are in their receive modes, tune the transceiver to a frequency between 28.100 and 28.250MHz.

Observe the noise level in the transceiver on the "S" meter and by ear. If it is too high, adjust the RXIF gain control in the 5BVUXHP until a slight noise increase is heard in the transceiver or just a slight movement in the "S" meter is detected. It may help to power the 5BVUXHP on and off to verify the change. The RXIF gain may be increased beyond this point, but it will start to degrade the dynamic range of your transceiver.

It is now recommended to test the transverter's transmit section in the CW mode because most transceivers have carrier level or power level controls in this mode only. Do not use full or semi break-in if possible. Do not use FM, SSB, or AM because it may not be possible to obtain maximum output power with a transceiver in these modes. Set the carrier/output power control to minimum or "0" output power (if you can). Place the transceiver into transmit. If the PTT circuit is connected correctly, the red "XMIT" light on the 5BVUXHP will turn on. While observing the transverter's built-in RF Power meter or an inline RF power meter, slowly increase the carrier control (with key down) or increase the power output control to the maximum desirable IF drive level obtainable by your transceiver. If this level is not what is indicated on the front page of this document, do not exceed that level. Contact Q5 SIGNAL if you find that the 5BVUXHP is not configured for your transceiver's range.

If minimal power is detected on the power meter with the transceiver's drive level at maximum specified for the transverter, then slowly adjust the TXIF Pot in the 5BVUXHP in a clockwise direction while observing the power meter. Set it to any desired level between 0 and the maximum specified output power. The relative power meter is set to show 9 LEDs for the specified maximum linear output power. This may vary with a high VSWR but will be true into a 50 ohm dummy load. Switch the transceiver to USB and make a transmission. The power output and current drain should correlate to your speech pattern.

Basically, the 5BVUXHP is ready to use and may be integrated into your system.

General Operation: If everything is adjusted correctly, the operation of the 5BVUXHP should be transparent to the transceiver and the user. Except for the frequency read out (if your transceiver doesn't allow its display to be adjusted for transverter operation), it will be like operating with your transceiver on any other band. All of the functions of the transceiver (filtering, DSP, split band operation, dual VFO) will be transposed to one of the frequency bands of the 5BVUXHP.

Some precautions should be taken when operating CW or VOX. Operating the 5BVUXHP in a "Full Break-In" mode is not recommended. Because of the mechanical relays and the sequencer in the transverter, there will be too much delay to operate "Full Break-In" effectively. And the relays would be abused if "Full Break-In" was enabled. It is best to operate in "semi break-in" and adjust the delay of the PTT on your transceiver to match your comfortable CW operating speed in a way that the delay will hold the PTT until your transmission is complete. This delay will actually need to be a little longer to allow all components within the system (HPA, LNA, Relays, etc.) to complete their transition if utilized.

Common or Split IF Option: The IF configuration may be changed at any time according to the type of transceiver you are utilizing. The component designators are silk screened on the printed circuit board. K6 is the Common IF relay. To split the IF lines into separate RXIF and TXIF, remove the IF coax from its position on the board (junction of K6 and C136) and re-attach the center conductor between C135 and K6. The shield may be now soldered to the ground pad marked RXIF. The TXIF cable can be prepped and soldered to the pad between K6 and C128. The shield can be soldered to the ground pad labeled TXIF. Install a BNC connector in the rear panel (TXIF) and attach the TXIF coax. Reverse the procedure if you want to change to (or back to) Common IF.

TXIF Drive Level Range: The TXIF drive level range can be changed at anytime to conform to your transceiver type. Basically, there are three configurations. For high IF drive levels (250mW-10W), the 50 Ohm load (R31) will be installed with a low value capacitor in the C129 position (3pF typical). Mid level drives between 1mW and 250mW will not have the load installed and will have a 1000pF capacitor installed for C129. For low drive levels (-20dBm to 0dBm), U26 will be installed. If you desire to change the drive level for whatever reason, just duplicate the info above. To install U26, remove the printed bypass jumper before installing. For -10 to -6dBm inputs, use a MAR-3 for U26. For -20dBm, use a MAR-6. Other MMIC's may be used, but the bias resistor R35 may need to be changed. Adjust R33 to obtain the desired level in all cases. **An Important Note:** Do not assume that low transverter output power is due to inadequate IF drive. Please consult Q5 SIGNAL if you have problems obtaining full output power with your specified drive level.

AUX Connector: The AUX Connector is a 15-Pin D-Sub High Density Female Connector containing the connections for Band Data Inputs, Sequenced PTT Outputs, Alternate PTT Input, and Ground. Refer to the table below for the pin-out:

PIN	DESCRIPTION
1	BAND DATA 0
2	BAND DATA 1
3	BAND DATA 2
4	BAND DATA 3
5	BAND DATA 4
6	PTT 144
7	PTT 222
8	PTT 432
9	PTT 902
10	PTT 1296
11	GND
12	GND
13	GND
14	GND
15	PTT

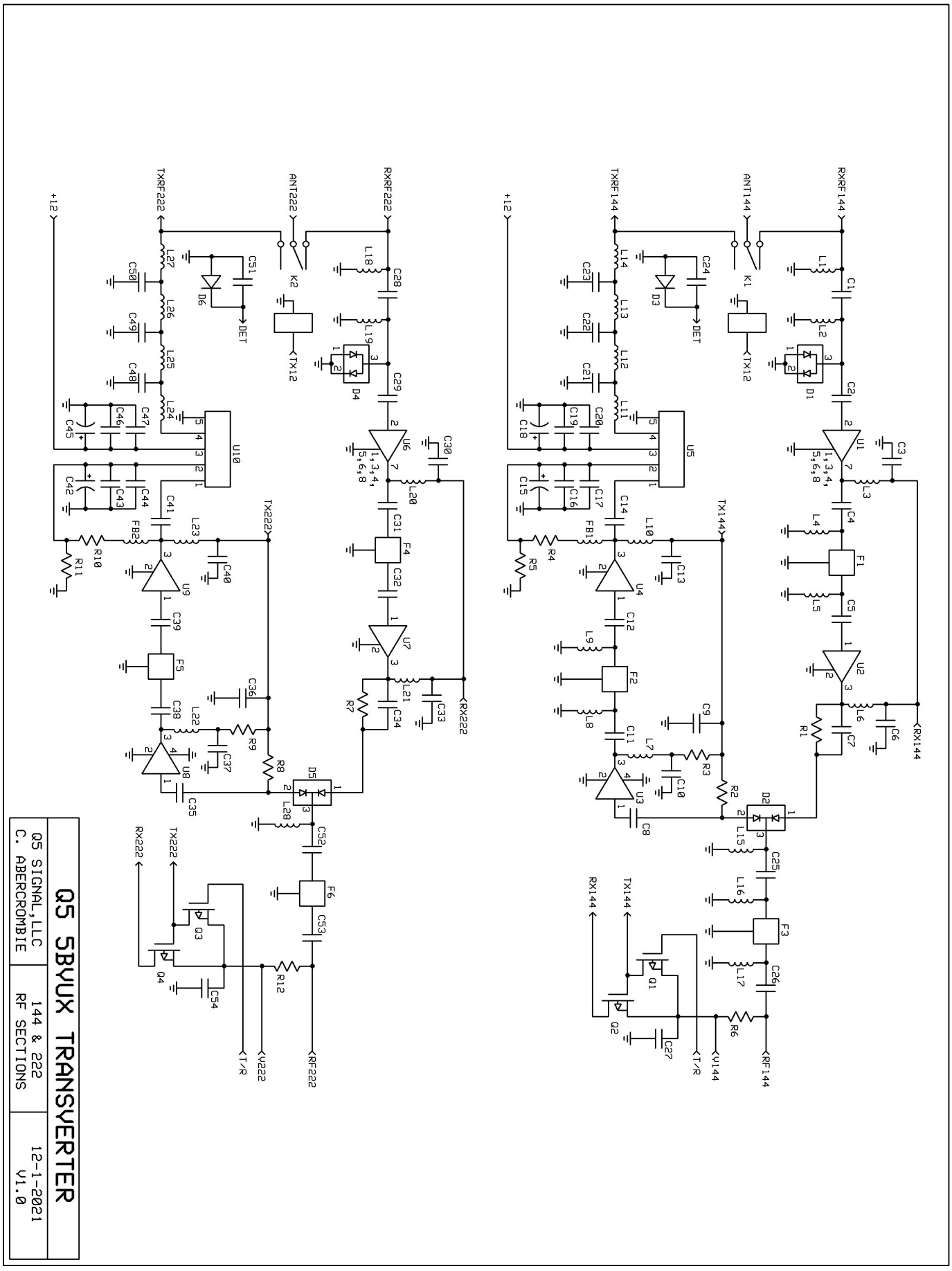
Band Data Inputs: The Band Data Inputs are active-low inputs (sink 5mA) providing an alternate method for band selection. When valid band data is present on these pins, the front-panel Band Select Knob is ignored. Custom Band Data configurations may be available. For the standard Band Data configuration, refer to the truth table below:

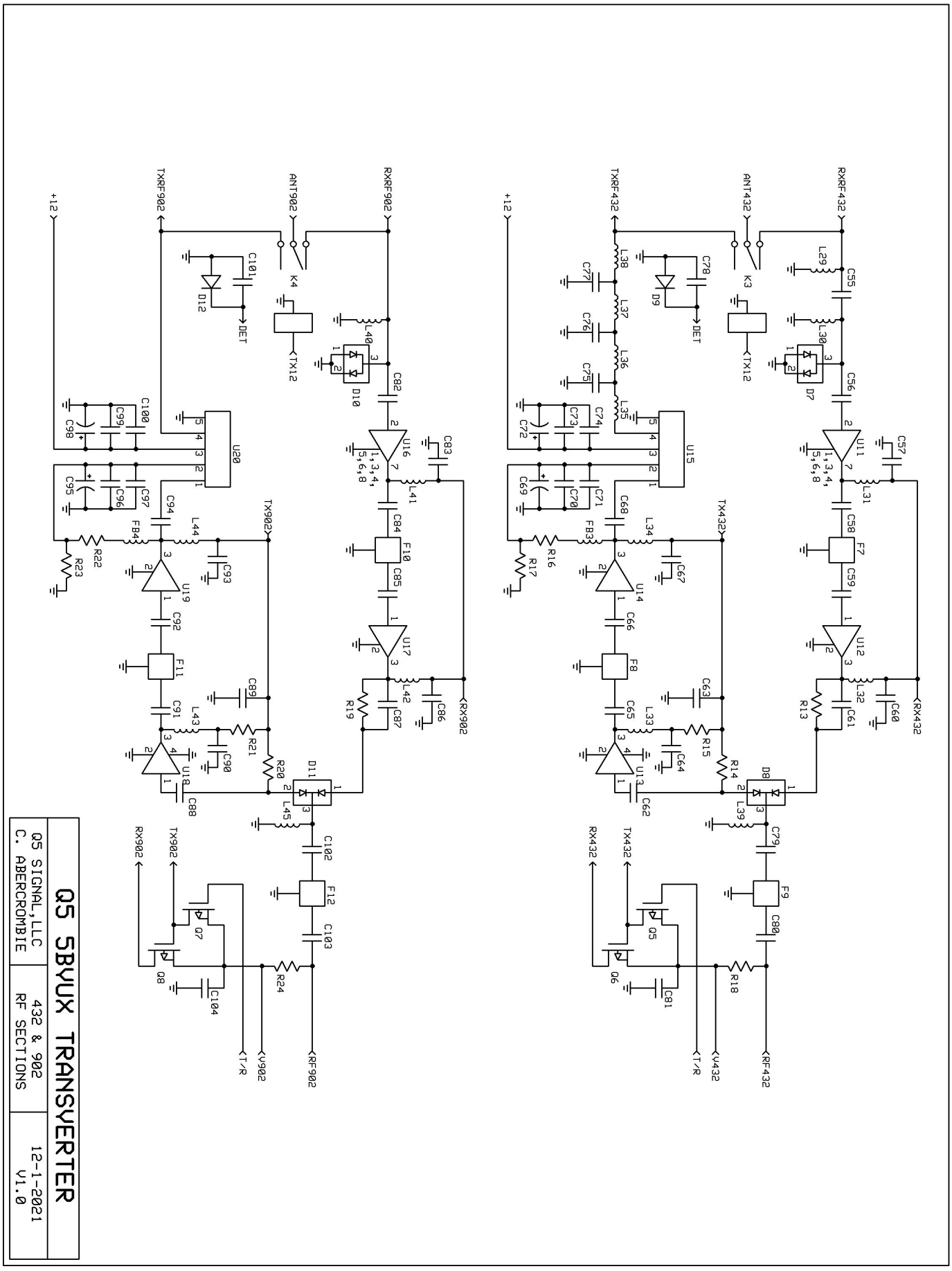
BAND	BAND DATA				
	4	3	2	1	0
144	1	0	0	1	0
222	1	0	0	1	1
432	1	0	1	0	0
902	1	0	1	0	1
1296	1	0	1	1	0

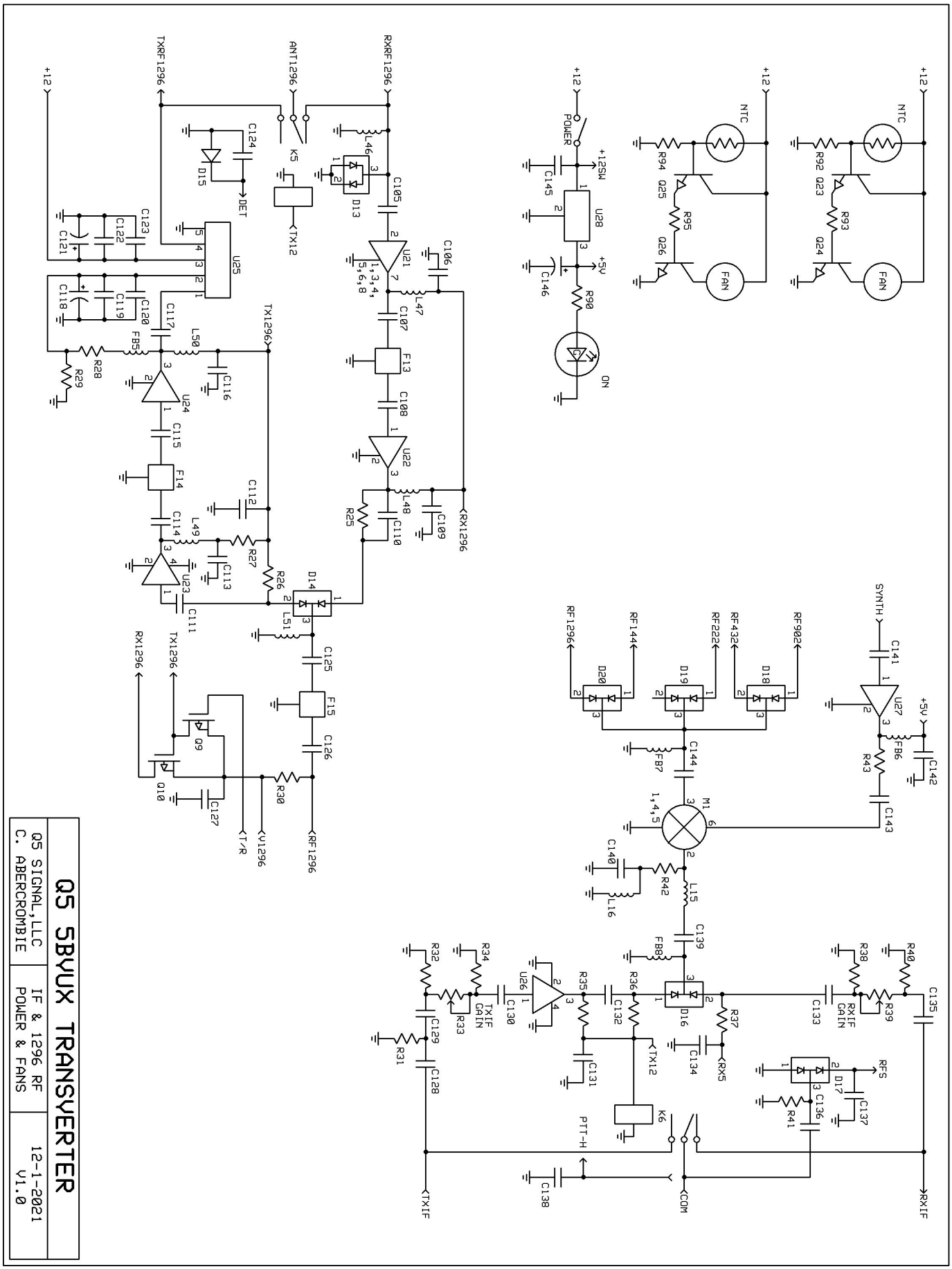
Sequenced PTT Outputs: A Sequenced PTT Output is provided for each band to facilitate the connection of add-on equipment such as a power amplifier. Each PTT Output is open-collector rated for 30V @ 100mA and switches to ground 100ms before the 5BVUXHP produces RF output.

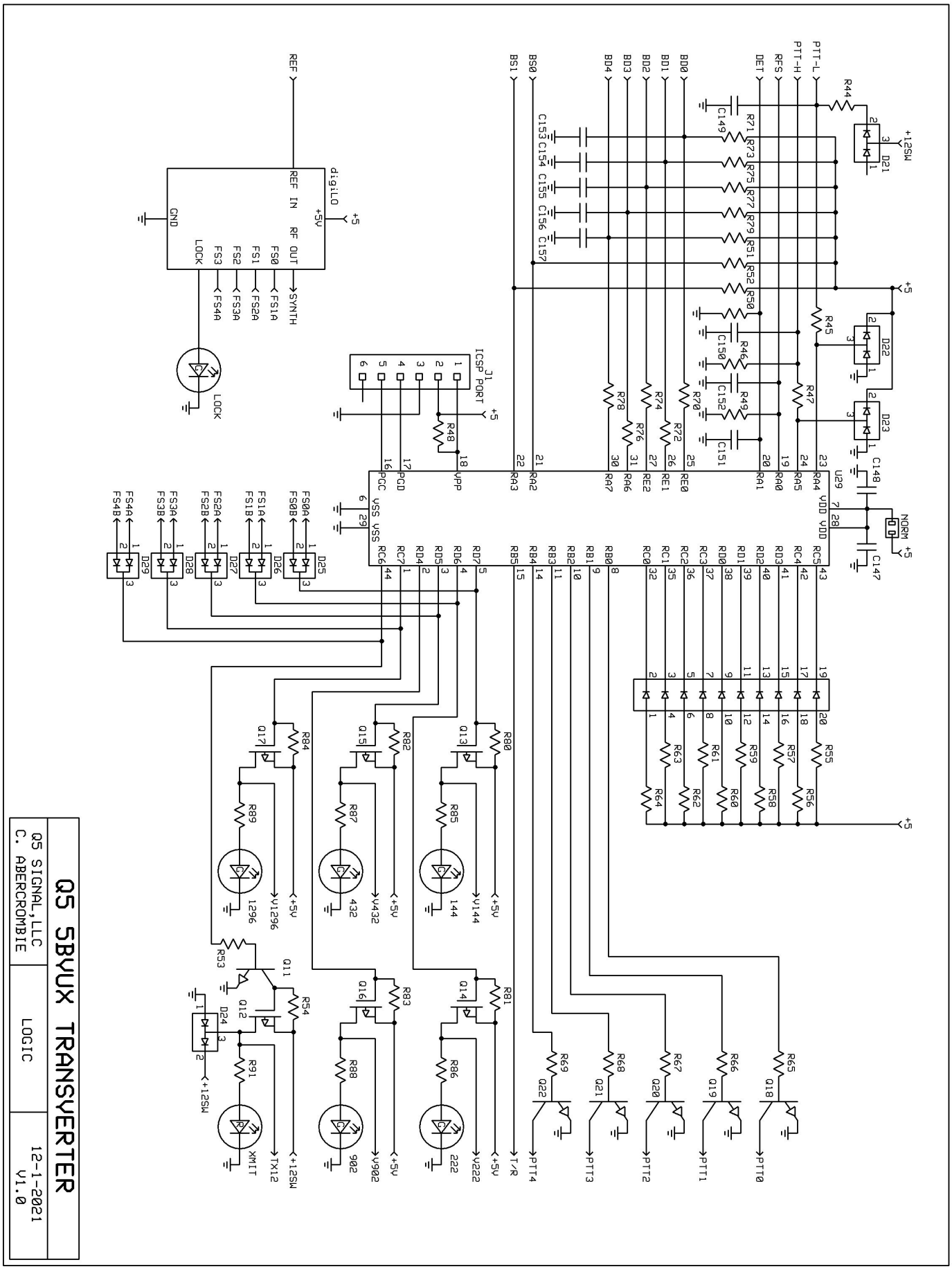
C1	18pF 0805	C61	1nF 0805	C121	22uF TANT	D23	BAT54S
C2	1nF 0805	C62	1nF 0805	C122	100nF 0805	D24	BAT54S
C3	1nF 0805	C63	1nF 0805	C123	100pF 0805	D25	BAT54C
C4	12pF 0805	C64	1nF 0805	C124	100pF 0805	D26	BAT54C
C5	12pF 0805	C65	1nF 0805	C125	100pF 0805	D27	BAT54C
C6	1nF 0805	C66	1nF 0805	C126	100pF 0805	D28	BAT54C
C7	1nF 0805	C67	1nF 0805	C127	1nF 0805	D29	BAT54C
C8	1nF 0805	C68	1nF 0805	C128	1nF 0805		
C9	1nF 0805	C69	22uF TANT	C129	1nF 0805	F1	TA147FD
C10	1nF 0805	C70	100nF 0805	C130	1nF 0805	F2	TA147FD
C11	12pF 0805	C71	1nF 0805	C131	1nF 0805	F3	TA147FD
C12	12pF 0805	C72	22uF TANT	C132	1nF 0805	F4	TA0576B
C13	1nF 0805	C73	100nF 0805	C133	1nF 0805	F5	TA0576B
C14	1nF 0805	C74	1nF 0805	C134	1nF 0805	F6	TA0576B
C15	22uF TANT	C75	6.8pF 1111	C135	1nF 0805	F7	TA1808A
C16	100nF 0805	C76	8.2pF 1111	C136	1pF 0805	F8	TA1808A
C17	1nF 0805	C77	6.8pF 1111	C137	1nF 0805	F9	TA1808A
C18	22uF TANT	C78	1nF 0805	C138	1nF 0805	F10	TA1042A
C19	100nF 0805	C79	1nF 0805	C139	100pF 0805	F11	TA1042A
C20	1nF 0805	C80	1nF 0805	C140	100pF 0805	F12	TA1042A
C21	27pF 1111	C81	1nF 0805	C141	1nF 0805	F13	TA0536A
C22	33pF 1111	C82	100pF 0805	C142	1nF 0805	F14	TA0536A
C23	27pF 1111	C83	1nF 0805	C143	1nF 0805	F15	TA0536A
C24	1nF 0805	C84	100pF 0805	C144	1nF 0805		
C25	12pF 0805	C85	100pF 0805	C145	100nF 0805	FB1	BLM18HE102SN1D
C26	12pF 0805	C86	1nF 0805	C146	4.7uF TANT	FB2	BLM18HE102SN1D
C27	1nF 0805	C87	100pF 0805	C147	100nF 0805	FB3	BLM18HE102SN1D
C28	12pF 0805	C88	100pF 0805	C148	100nF 0805	FB4	BLM18HE102SN1D
C29	1nF 0805	C89	1nF 0805	C149	1nF 0805	FB5	BLM18HE102SN1D
C30	1nF 0805	C90	1nF 0805	C150	1nF 0805	FB6	BLM18HE102SN1D
C31	1nF 0805	C91	100pF 0805	C151	1nF 0805	FB7	BLM18HE102SN1D
C32	1nF 0805	C92	100pF 0805	C152	1nF 0805	FB8	BLM21AG102SN1D
C33	1nF 0805	C93	1nF 0805	C153	1nF 0805		
C34	1nF 0805	C94	100pF 0805	C154	1nF 0805	K1	HF352S
C35	1nF 0805	C95	22uF TANT	C155	1nF 0805	K2	HF352S
C36	1nF 0805	C96	100nF 0805	C156	1nF 0805	K3	HF352S
C37	1nF 0805	C97	100pF 0805	C157	1nF 0805	K4	HF352S
C38	1nF 0805	C98	22uF TANT			K5	HF352S
C39	1nF 0805	C99	100nF 0805	D1	BAR66	K6	G5Y-12V
C40	1nF 0805	C100	100pF 0805	D2	BAR64-05		
C41	1nF 0805	C101	100pF 0805	D3	1N5711	L1	LQW2BASR33J
C42	22uF TANT	C102	100pF 0805	D4	BAR66	L2	LQW2BAS82NJ
C43	100nF 0805	C103	100pF 0805	D5	BAR64-05	L3	LQW2BASR33J
C44	1nF 0805	C104	1nF 0805	D6	1N5711	L4	LQW2BAS56NJ
C45	22uF TANT	C105	100pF 0805	D7	BAR66	L5	LQW2BAS56NJ
C46	100nF 0805	C106	1nF 0805	D8	BAR64-05	L6	LQW2BASR33J
C47	1nF 0805	C107	100pF 0805	D9	1N5711	L7	LQW2BASR33J
C48	15pF 1111	C108	100pF 0805	D10	BAR66	L8	LQW2BAS56NJ
C49	18pF 1111	C109	1nF 0805	D11	BAR64-05	L9	LQW2BAS56NJ
C50	15pF 1111	C110	100pF 0805	D12	1N5711	L10	LQW2BASR33J
C51	1nF 0805	C111	100pF 0805	D13	BAR66	L11	3T #20 3/16" ID
C52	1nF 0805	C112	1nF 0805	D14	BAR64-05	L12	5T #20 3/16" ID
C53	1nF 0805	C113	1nF 0805	D15	1N5711	L13	5T #20 3/16" ID
C54	1nF 0805	C114	100pF 0805	D16	BAR64-05	L14	3T #20 3/16" ID
C55	8.2pF 0805	C115	100pF 0805	D17	BAS70-04	L15	LQW2BASR33J
C56	1nF 0805	C116	1nF 0805	D18	BAR64-05	L16	LQW2BAS56NJ
C57	1nF 0805	C117	100pF 0805	D19	BAR64-05	L17	LQW2BAS56NJ
C58	1nF 0805	C118	22uF TANT	D20	BAR64-05	L18	LQW2BASR33J
C59	1nF 0805	C119	100nF 0805	D21	BAT54S	L19	LQW2BAS56NJ
C60	1nF 0805	C120	100pF 0805	D22	BAT54S	L20	LQW2BASR33J

L21	LQW2BASR33J	Q25	PMBT2222A	R58	330R 0805	U22	TQP3M9009
L22	LQW2BASR33J	Q26	MJD31C	R59	330R 0805	U23	ERA-2SM+
L23	LQW2BASR33J			R60	330R 0805	U24	GVA-60+
L24	3T #20 3/16" ID	R1	470R 0805	R61	330R 0805	U25	RA18H1213G
L25	4T #20 3/16" ID	R2	470R 0805	R62	330R 0805	U26	MAR-6SM+
L26	4T #20 3/16" ID	R3	0R00 0805	R63	330R 0805	U27	GVA-60+
L27	3T #20 3/16" ID	R4	51R0 0805	R64	330R 0805	U28	MC7805
L28	LQW2BASR33J	R5	470R 0805	R65	330R 0805	U29	PIC18F44K22-I/PT
L29	LQW2BASR33J	R6	470R 0805	R66	330R 0805		
L30	LQW2BAS22NJ	R7	470R 0805	R67	330R 0805		
L31	LQW2BASR33J	R8	470R 0805	R68	330R 0805		
L32	LQW2BASR33J	R9	0R00 0805	R69	330R 0805		
L33	LQW2BASR33J	R10	51R0 0805	R70	10K0 0805		
L34	LQW2BASR33J	R11	470R 0805	R71	3K30 0805		
L35	1T #20 3/16" ID	R12	470R 0805	R72	10K0 0805		
L36	2T #20 3/16" ID	R13	470R 0805	R73	3K30 0805		
L37	2T #20 3/16" ID	R14	470R 0805	R74	10K0 0805		
L38	1T #20 3/16" ID	R15	0R00 0805	R75	3K30 0805		
L39	LQW2BASR33J	R16	51R0 0805	R76	10K0 0805		
L40	LQW2BAS22NJ	R17	470R 0805	R77	3K30 0805		
L41	LQW2BAS82NJ	R18	470R 0805	R78	10K0 0805		
L42	LQW2BAS82NJ	R19	470R 0805	R79	3K30 0805		
L43	LQW2BAS82NJ	R20	470R 0805	R80	10K0 0805		
L44	LQW2BAS82NJ	R21	0R00 0805	R81	10K0 0805		
L45	LQW2BAS82NJ	R22	51R0 0805	R82	10K0 0805		
L46	LQW2BAS8N2J	R23	470R 0805	R83	10K0 0805		
L47	LQW2BAS82NJ	R24	470R 0805	R84	10K0 0805		
L48	LQW2BAS82NJ	R25	470R 0805	R85	330R 0805		
L49	LQW2BAS82NJ	R26	470R 0805	R86	330R 0805		
L50	LQW2BAS82NJ	R27	39R0 0805	R87	330R 0805		
L51	LQW2BAS82NJ	R28	51R0 0805	R88	330R 0805		
L52	LQW2BASR22J	R29	470R 0805	R89	330R 0805		
L53	LQW2BASR22J	R30	470R 0805	R90	330R 0805		
		R31	50 OHM LOAD	R91	1K00 0805		
M1	SYM-30DHW+	R32	220R 0805	R92	220R 0805		
		R33	1K POT	R93	470R 0805		
Q1	DMP3098L	R34	220R 0805	R94	220R 0805		
Q2	DMP3098L	R35	470R 0805	R95	470R 0805		
Q3	DMP3098L	R36	470R 0805				
Q4	DMP3098L	R37	470R 0805	U1	TQP3M9036		
Q5	DMP3098L	R38	220R 0805	U2	PHA-1+		
Q6	DMP3098L	R39	1K POT	U3	MAR-3SM+		
Q7	DMP3098L	R40	220R 0805	U4	TQP3M9009		
Q8	DMP3098L	R41	100K 0805	U5	RA80H1415M1		
Q9	DMP3098L	R42	51R0 0805	U6	TQP3M9036		
Q10	DMP3098L	R43	51R0 0805	U7	PHA-1+		
Q11	PMBT2222A	R44	3K30 0805	U8	MAR-3SM+		
Q12	DMP3098L	R45	10K0 0805	U9	PHA-1+		
Q13	DMP3098L	R46	10K0 0805	U10	CUSTOM		
Q14	DMP3098L	R47	10K0 0805	U11	TQP3M9036		
Q15	DMP3098L	R48	10K0 0805	U12	PHA-1+		
Q16	DMP3098L	R49	100K 0805	U13	MAR-3SM+		
Q17	DMP3098L	R50	220R 0805	U14	PHA-1+		
Q18	PMBT2222A	R51	1K00 0805	U15	RA60H3847M1		
Q19	PMBT2222A	R52	1K00 0805	U16	TQP3M9037		
Q20	PMBT2222A	R53	330R 0805	U17	TQP3M9009		
Q21	PMBT2222A	R54	10K0 0805	U18	MAR-3SM+		
Q22	PMBT2222A	R55	330R 0805	U19	PHA-1+		
Q23	PMBT2222A	R56	330R 0805	U20	RA50H8994M1		
Q24	MJD31C	R57	330R 0805	U21	TQP3M9037		


Q5 SBVUX TRANSVERTER
Q5 SIGNAL,LLC
C. ABERCROMBIE
144 & 222
RF SECTIONS
12-1-2021
V1.0
RXRF144
ANT144
TXRF144
+12
RXRF222
ANT222
TXRF222
TX144
TX222
RX144
RX222
RF144
RF222
V144
V222
T/R
TX12
DET
K1
K2


Q5 5BVUX TRANSVERTER
Q5 SIGNAL,LLC
C. ABERCROMBIE
432 & 902
RF SECTIONS
12-1-2021
V1.0
RXRF432
ANT432
TXRF432
+12
RXRF902
ANT902
TXRF902
RX432
TX432
RF432
V432
T/R
RX902
TX902
RF902
V902


Q5 5BVUX TRANSVERTER
Q5 SIGNAL,LLC
C. ABERCROMBIE
IF & 1296 RF
POWER & FANS
12-1-2021
V1.0
+12
NTC
R92
Q23
R93
Q24
FAN
R94
Q25
R95
Q26
POWER
+12SW
C145
U28
+5V
C146
R90
ON
SYNTH
C141
U27
FB6
R43
C142
C143
M1
1,4,5
C140
L16
R42
L15
C139
FB8
C144
FB7
RF1296
RF144
RF222
RF432
RF902
D20
D19
D18
R38
R40
R39
RXIF GAIN
C133
C135
RXIF
R32
R34
TXIF GAIN
R33
C130
U26
R35
R36
C132
D16
R37
C134
RX5
C131
TX12
K6
PTT-H
C138
COM
TXIF
R31
C129
C128
RFS
D17
C136
C137
R41
ANT1296
RXRF1296
TXRF1296
K5
TX12
D15
C124
DET
D13
L46
C105
C106
U21
L47
C107
F13
C108
U22
L48
C110
R25
C109
RX1296
C123
C122
C121
U25
C118
C119
C120
C117
L50
FB5
R28
R29
U24
C116
C115
F14
C112
C114
L49
R27
C113
U23
R26
D14
C111
L51
C125
F15
C126
R30
C127
Q9
Q10
TX1296
RX1296
T/R
V1296
RF1296


Q5 5BVUX TRANSVERTER
Q5 SIGNAL,LLC
C. ABERCROMBIE
LOGIC
12-1-2021
V1.0
PTT-L
PTT-H
RFS
DET
BD0
BD1
BD2
BD3
BD4
BS0
BS1
+12SW
+5
NORM
REF
LOCK
digiLO
ICSP PORT
PTT0
PTT1
PTT2
PTT3
PTT4
T/R
XMIT
TX12
LOCK
1296
V1296
144
V144
432
V432
222
V222
902
V902