

# FX-50, FM-100C FM-250C EXCITERS N+1B OPTION Instruction Manual

597-1138  
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## **FX-50, FM-100C, FM-250C EXCITERS N+1 OPTION**

### **Instruction Manual**

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1) Inspected the containers for visible signs of damage and 2) Counted the containers and compared with the amount shown on the shipping papers. If a shortage or evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Claims for loss or damage will not be honored without proper notification of inspection by the carrier.

### RF PRODUCT TECHNICAL ASSISTANCE, REPAIR SERVICE, PARTS -

Technical assistance is available from Broadcast Electronics by letter, prepaid telephone or E-mail. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured, and well protected. If proper shipping materials are not available, contact the RF Technical Services Department for a shipping container. Do not mail the equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact the RF Technical Services Department for a Return Authorization.

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### RF TECHNICAL SERVICES -

Telephone: +1 (217) 224-9617

E-Mail: [rfservice@bdcast.com](mailto:rfservice@bdcast.com)

Fax: +1 (217) 224-6258

### FACILITY CONTACTS -

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Web Site: [www.bdcast.com](http://www.bdcast.com)

### PARTS -

Telephone: +1 (217) 224-9617

E-Mail: [parts@bdcast.com](mailto:parts@bdcast.com)



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Do not return any merchandise without our written approval and Return Authorization. We will provide special shipping instructions and a code number that will assure proper handling and prompt issuance of credit. Please furnish complete details as to circumstances and reasons when requesting return of merchandise. All returned merchandise must be sent freight prepaid and properly insured by the customer.

### **MODIFICATIONS -**

Broadcast Electronics, reserves the right to modify the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

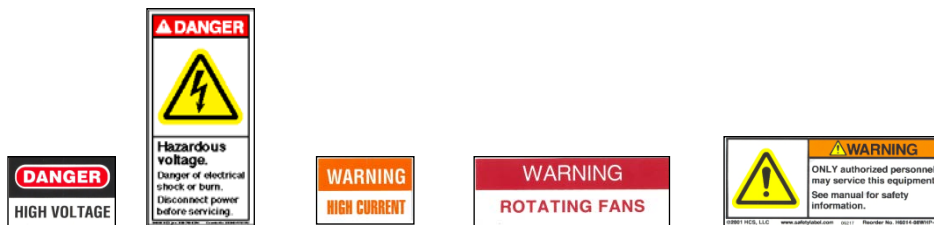




## SAFETY PRECAUTIONS

**PLEASE READ AND OBSERVE ALL SAFETY PRECAUTIONS//**

**ALL PERSONS WHO WORK WITH OR ARE EXPOSED TO POWER TUBES, POWER TRANSISTORS, OR EQUIPMENT WHICH UTILIZES SUCH DEVICES MUST TAKE PRECAUTIONS TO PROTECT THEMSELVES AGAINST POSSIBLE SERIOUS BODILY INJURY. EXERCISE EXTREME CARE AROUND SUCH PRODUCTS. UNINFORMED OR CARELESS OPERATION OF THESE DEVICES CAN RESULT IN POOR PERFORMANCE, DAMAGE TO THE DEVICE OR PROPERTY, SERIOUS BODILY INJURY, AND POSSIBLY DEATH.**



### **DANGEROUS HAZARDS EXIST IN THE OPERATION OF POWER TUBES AND POWER TRANSISTORS -**

The operation of power tubes and power transistors involves one or more of the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel.

- A. HIGH VOLTAGE** Normal operating voltages can be deadly. Additional information follows.
- B. RF RADIATION** Exposure to RF radiation may cause serious bodily injury possibly resulting in Blindness or death. Cardiac pacemakers may be affected. Additional information follows.
- C. HOT SURFACES** Surfaces of air-cooled radiators and other parts of tubes can reach temperatures of several hundred degrees centigrade and cause serious burns if touched. Additional information follows.
- D. RF BURNS** Circuit boards with RF power transistors contain high RF potentials. Do not operate an RF power module with the cover removed.

## HIGH VOLTAGE –

Many power circuits operate at voltages high enough to kill through electrocution. Personnel should always break the primary AC Power when accessing the inside of the IPA unit.

## RADIO FREQUENCY RADIATION

Exposure of personnel to RF radiation should be minimized, personnel should not be permitted in the vicinity of open energized RF generating circuits, or RF transmission systems (waveguides, cables, connectors, etc.), or energized antennas. It is generally accepted that exposure to “high levels” of radiation can result in severe bodily injury including blindness. Cardiac pacemakers may be affected.

The effect of prolonged exposure to “low level” RF radiation continues to be a subject of investigation and controversy. It is generally agreed that prolonged exposure of personnel to RF radiation should be limited to an absolute minimum. It is also generally agreed that exposure should be reduced in working areas where personnel heat load is above normal. A 10 mW/cm<sup>2</sup> per one tenth hour average level has been adopted by several U.S. Government agencies including the Occupational Safety and Health Administration (OSHA) as the standard protection guide for employee work environments. An even stricter standard is recommended by the American National Standards Institute which recommends a 1.0 mW/cm<sup>2</sup> per one tenth hour average level exposure between 30 Hz and 300 MHz as the standard employee protection guide (ANSI C95.1-1982).

RF energy must be contained properly by shielding and transmission lines. All input and output RF connections, such as cables, flanges and gaskets must be RF leak proof. Never operate a power tube without a properly matched RF energy absorbing load attached. Never look into or expose any part of the body to an antenna or open RF generating tube or circuit or RF transmission system while energized. Monitor the tube and RF system for RF radiation leakage at regular intervals and after servicing.

## HOT SURFACES –

The power components in the IPA unit are cooled by forced-air and natural convection. When handling any components of the IPA unit after it has been in operation, caution must always be taken to ensure that the component is cool enough to handle without injury.





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# 1 Overview

Information presented in this manual provides installation, operation, and maintenance information for the FX-50, FM-100C, and FM-250C exciter N+1B option.

## 1.1 EQUIPMENT DESCRIPTION.

The Broadcast Electronics N+1B option allows an FX-50/FM-50, FM-100C, or an FM-250C exciter/transmitter to be pre-programmed with up to 10 different frequencies. When installed in a Broadcast Electronics solid-state transmitter as an exciter or operated as a standalone transmitter, the unit will provide the ability to operate as a backup transmitter on any one of 10 frequencies in an N+1 system. The option consists of: 1) a modified AFC/PLL circuit board, 2) a frequency selection circuit board, and 3) an N+1B controller circuit board.

MODEL	PART NO.	DESCRIPTION
FX-50	909-1051-326	3-50 Watt FM exciter with N+1B option, 220V ac 50/60 Hz operation.
FM-100C	909-1101-305	10-100 Watt FM exciter/transmitter with N+1B option, 220V ac 50/60 Hz operation.
FM-250C	909-1251-305/306	25-250 Watt FM exciter/transmitter with N+1B option, 220V ac 50/60 Hz operation.

## 1.2 SPECIFICATIONS.

When the N+1B system is installed in an FM-250C exciter, the signal-to-noise specification will change. The following text presents the revised specification. All other specifications are identical to the specifications published in the FX-50, FM-100C, and FM-250C manuals.

PARAMETER	SPECIFICATION
FM SIGNAL-TO-NOISE RATIO: Mono/Composite	80 dB below $\pm 75$ kHz deviation @ 400 Hz measured in a 20 Hz to 30 kHz bandwidth with 75 microsecond deemphasis.

## 1.3 N+1B CIRCUIT BOARD INTERFACING.

The N+1B circuit board is located in the exciter of the N+1 transmitter. The exciter is equipped with rear-panel 25-pin D-Type connector J3 for cable interfacing. Table 1-1 presents the connector pin descriptions. Refer to Table 1-1 as required to interface the N+1B circuitry to the N+1 system controller.

Table 1-1. N+1B CIRCUIT BOARD INTERFACING.

J3 PIN	DESCRIPTION
1	Transmitter 5 Select. Momentary Contact To Ground Required To Select Transmitter 5 Operation.
2	Transmitter 1 Select. Momentary Contact To Ground Required To Select Transmitter 1 Operation.
3	Transmitter 7 Select. Momentary Contact To Ground Required To Select Transmitter 7 Operation.
4	Transmitter 5 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 5 is enabled. 100 mA maximum current.



5	Transmitter 4 Select. Momentary Contact To Ground Required To Select Transmitter 4 Operation.
6	Transmitter 9 Select. Momentary Contact To Ground Required To Select Transmitter 9 Operation.
7	Ground
8	Transmitter 2 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 2 is enabled. 100 mA maximum current.
9	Transmitter 6 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 6 is enabled. 100 mA maximum current.
10	Transmitter 8 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 8 is enabled. 100 mA maximum current.
11	Transmitter 10 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 10 is enabled. 100 mA maximum current.
12	Ground
13	Ground
14	Transmitter 3 Select. Momentary Contact To Ground Required To Select Transmitter 3 Operation.
15	Transmitter 6 Select. Momentary Contact To Ground Required To Select Transmitter 6 Operation.
16	Transmitter 8 Select. Momentary Contact To Ground Required To Select Transmitter 8 Operation.
17	Transmitter 4 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 4 is enabled. 100 mA maximum current.
18	Transmitter 2 Select. Momentary Contact To Ground Required To Select Transmitter 2 Operation.
19	Transmitter 10 Select. Momentary Contact To Ground Required To Select Transmitter 10 Operation.
20	Transmitter 3 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 3 is enabled. 100 mA maximum current.
21	Transmitter 1 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 1 operation is enabled. 100 mA maximum current.
22	Transmitter 7 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 7 is enabled. 100 mA maximum current.
23	Transmitter 9 Status Indication. The circuit will output a LOW (0 volts DC) when transmitter 9 is enabled. 100 mA maximum current.
24	Ground
25	Ground



## 1.4 N+1B CIRCUIT BOARD PROGRAMMING.

The N+1B circuit board is located in the exciter of the N+1 transmitter. The circuit board contains frequency programming switches for up to 10 transmitters. Figure 1 presents the switch locations for the transmitters.

The N+1B circuit board is programmed by configuring the switches for the desired operating frequencies. Figure 2 presents the frequency programming information. The figure presents the switch programming for transmitter 1. The switch programming for transmitters 2 through 10 is identical to transmitter 1. Use Table 2, Figure 1, and Figure 2 when programming the frequencies for transmitters 2 through 10.

Each transmitter circuit on the N+1B controller assembly is equipped with a modulation pre-correction control. The controls are adjusted at the factory and will not require calibration in the field. However, if in the future the controls are required to be calibrated, refer to MODULATION CORRECTION (R63) in the AFC/PLL section of exciter manual and perform the procedure to calibrate each pre-correction control on the N+1B controller circuit board.

Table 1-2. SWITCH PROGRAMMING

TRANS	SWITCH	CORRESPONDING SWITCH PROGRAMMING IN FIGURE 2
1	S1	-----
	S2	-----
	S3	-----
2	S4	S1
	S5	S2
	S6	S3
3	S7	S1
	S8	S2
	S9	S3
4	S10	S1
	S11	S2
	S12	S3
5	S13	S1
	S14	S2
	S15	S3
6	S16	S1
	S17	S2
	S18	S3
7	S19	S1
	S20	S2
	S21	S3
8	S22	S1
	S23	S2
	S24	S3
9	S25	S1
	S26	S2
	S27	S3

10	S28	S1
	S29	S2
	S30	S3

## 2 BE Part Numbers

This section provides parts lists for the N+1B option. The parts lists provide descriptions and part numbers of electrical components, assemblies, and selected mechanical parts required for maintenance. Each parts list entry in this section is indexed by reference designators appearing on the applicable schematic diagrams.

This bill of material uses an indented structure to show relationships of parts into sub assemblies. Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

### 2.1 N+1B option

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	959-1138-001	N+1 OPTION		
..1	417-0129	CONN, 25PIN FEM. HDF	1	
..1	417-0131	CONN,16 PIN 609-1630 ANSLEY	4	
..1	418-2600	CONN,26-PIN,RIBBON	1	
..1	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	1	
..1	420-6104	SCREW,6-32X.250,S.S. PH	7	
..1	420-6112	SCREW,6-32X.750,S.S. PH	4	
..1	421-6001	6-32 S.S. HEX THIN NUT	3	
..1	423-6002	#6 LOCK SPLIT	18	
..1	441-2114	STOFF,ALUM 1/4HEX X 1 6-32	4	
..1	441-8254	STOFF,BRASS MALE-FEM1/4X1,6-32	4	
..1	600-0016	CBL,FLAT,16-COND,28GA	2	
..1	600-0026	CBL,FLAT,26-COND,28GA	1.5	
..1	919-0104-002	ASSY PCB,AFC/PLL FOR N+1B OPTION	1	
....2	000-3302	CAP,CER,DISC,3.3PF,1000V	1	C59
....2	001-5004	CAP,CER,DISC,5PF,500V,NPO	2	C15, C16



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	003-1054	CAP,CER,MNLY, .1uF,50V,20%	18	C1, C3, C5, C6, C7, C8, C10, C12, C13, C21, C24, C27, C32, C33, C39, C41, C43, C60
....2	020-4793	CAP,LYTIC,4700UF,16V,LOW LEAK	1	C35
....2	023-1076	CAP,LYTIC,10uF,50V,STDUP	5	C42, C68, C70, C72, C73
....2	023-1084	CAP,LYTIC,100MFD,35V,STDUP,RAD	7	C4, C22, C23, C25, C69, C71, C14
....2	024-1064	CAP,LYTIC,1UF,50V,RAD	1	C29
....2	024-3364	CAP,LYTIC,3.3UF,50V,NP	1	C30
....2	024-3374	CAP,LYTIC,33UF,35V,STDUP	1	C37
....2	024-4764	CAP,LYTIC,4.7UF,50V,20%,STDUP	1	C28
....2	030-1053	CAP,MYLAR FILM,.1uF,100V,RAD	1	C31
....2	030-2253	CAP,MYLAR FILM,.22UF,100V,RAD	2	C34, C38
....2	031-1043	CAP,MYLAR FILM,.01UF,100V,RAD	3	C9, C11, C40
....2	031-2243	CAP,MYLAR FILM,.022UF,200V,RAD	1	C26
....2	038-4753	CAP,PYST,.47UF,100V	1	C44
....2	042-3922	CAP,MICA,390PF,100V,5%	6	C2, C17, C18, C19, C20, C36
....2	100-1031	RES,100 OHM,1/4W,1%,METAL	1	R22
....2	100-1041	RES,1K OHM,1/4W,1%	7	R10, R42, R40, R44, R23, R84, R85
....2	100-1051	RES,10K OHM,1/4W,1%	11	R6, R13, R37, R15, R16, R24, R46, R48, R47, R95, R50
....2	100-1111	RES,118 OHM,1/4W,1%	1	R32
....2	100-1231	RES,121 OHM,1/4W,1%	3	R21, R97, R99
....2	100-1551	RES,15K OHM,1/4W,1%	4	R25, R26, R27, R51
....2	100-2723	RES,27 OHM,1/4W,5%	1	R34
....2	100-3951	RES,39.2K OHM,1/4W,1%	1	R9

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	100-4773	RES,4.7MEG OHM,1/4W,5%	1	R43
....2	100-5041	RES,4.99K OHM,1/4W,1%	2	R29, R30
....2	100-5663	RES,560K OHM,1/4W,5%	1	R19
....2	103-1021	RES,10 OHM,1/4W,1%,METAL	1	R1
....2	103-1062	RES,100K OHM,1/4W,1%,METAL	2	R17, R18
....2	103-1215	RES,12.1K OHM,1/4W,1%,METAL	1	R11
....2	103-1331	RES,1.33K OHM,1/4W,1%,METAL	2	R98, R100
....2	103-1375	RES,13.7K OHM,1/4W,1%,METAL	1	R101
....2	103-1504	RES,1.5K OHM,1/4W,1%,METAL	1	R28
....2	103-1745	RES,17.4K OHM,1/4W,1%,METAL	1	R82
....2	103-2213	RES,221 OHM,1/4W,1%,METAL	1	R33
....2	103-2673	RES,267 OHM,1/4W,1%,METAL	5	R7, R14, R38, R93, R94
....2	103-3014	RES,3.01K OHM,1/4W,1%,METAL	1	R83
....2	103-3323	RES,332 OHM,1/4W,1%,METAL	2	R2, R8
....2	103-3324	RES,3.32K OHM,1/4W,1%,METAL	2	R4, R5
....2	103-3631	RES,365 OHM,1/4W,1%,METAL	1	R20
....2	103-3836	RES,383K OHM,,1/4W,1%,METAL	1	R39
....2	103-4753	RES,475 OHM,1/4W,1%,METAL	1	R45
....2	103-4755	RES,47.5K OHM,1/4W,1%,METAL	1	R31
....2	103-4951	RES,49.9K OHM,1/4W,1%,METAL	2	R36, R12
....2	103-5112	RES,51.1 OHM,1/4W,1%,METAL	1	R3
....2	103-5113	RES,511 OHM,1/4W,1%,METAL	1	R49
....2	103-5624	RES,5.62K OHM,1/4W,1%,METAL	1	R41
....2	103-7541	RES,7.50K OHM,1/4W,1%,METAL	1	R68
....2	103-8255	RES,82.5K OHM,1/4W,1%,METAL	1	R35
....2	177-5044	RES,TRMR,5K,VERT ADJ	1	R69
....2	177-5054	RES,TRMR,50K,VERT ADJ	1	R52





BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	200-0009	DIODE,ZENER,1N 4739A	2	D17, D19
....2	203-4005	DIODE,1N4005	2	D16, D18
....2	203-4148	DIODE,1N4148	3	D1, D2, D3
....2	211-3904	TSTR,2N3904	4	Q1, Q2, Q3, Q4
....2	220-0317	VR,LM317LZ TO92	1	U6
....2	220-4040	IC,MC14040B 12-BIT BINARY	1	U2
....2	220-5151	IC,MC145151 SYNTHESIZER	1	U9
....2	220-8658	IC,SP8658 PRESCALER,DIVIDE/20	1	U8
....2	221-0072	AMP,OP,BIFET TLO72CP	1	U11
....2	221-0358	AMP,DUAL OP,LM358	1	U13
....2	221-5532-001	IC,NE-5532AN	1	U10
....2	227-0317	VR,LM317T,LM317KC	1	U17
....2	227-0337	VOLTAGE REGULATOR,3 TERM, NEG	1	U18
....2	228-0290	IC, 74LS90N (N)	1	U1
....2	228-4013	IC,MC14013B	1	U4
....2	228-4073	IC,MC14073B	1	U3
....2	228-4538	IC,MC14538B NATL SEMICONDUCTOR	2	U5, U12
....2	323-7345	LDR,LED TYPE,VACTEC VTL 5C2	3	LDR1, LDR2, LDR3
....2	323-9224	IND,LED,GRN,521-9270	5	DS1, DS2, DS3, DS4, DS5
....2	340-0004	SW,JUMPER PROGRAMMABLE	2	P3, P10
....2	360-2200	CHOKE,RF 2.2UH 550MA	2	L1, L2
....2	364-0047	COIL, MOLDED .47UH	1	L3
....2	370-0002	XMFR,RF,MCL,T4-1 (NOTE)	1	T1
....2	390-0001	OSC,XTAL PC MT TCXO 10MHZ	1	Y1
....2	402-0000	TY-RAP	2	
....2	407-0074	SPR,LED .25 ODX.147 1D X.22L	5	
....2	413-1597	TERM,TURRET,2 SHLDR, .219,GOLD FLASH	3	TP2, TP3, TP4

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-0003	CONN,HEADER 3 PIN	2	J3, J10
....2	417-0004	JACK,TEST,RIGHT ANGLE PC MT	1	TP1
....2	417-0804	SOCKET,8-PIN DIP,BURNDY	3	XU10, XU11, XU13
....2	417-1404	SOCKET,14-PIN DIP	3	XU1, XU3, XU4
....2	417-1604	SKT,16-PIN,DIP	3	XU2, XU5, XU12
....2	417-2804	SOCKET,IC 28-PIN,DIP,HI RELIABILITY	1	XU9
....2	417-5010	SPACER,BOARD	1	J1, J2, J8, S1, S2, S3
....2	420-6104	SCREW,6-32X.250,S.S. PH	2	
....2	423-6002	#6 LOCK SPLIT	2	
....2	426-6000	PEM NUT,#6-32 KFS2-632	6	
....2	519-0104	PCB,BLANK,AFC/PLL (scan)	1	
....2	601-0022	WIRE,AWG22,BUSS	0.1	
....2	700-0148	TAPE,JOINING 3/4	0.001	
..1	919-0138-001	ASSY,PCB,N+1 FREQUENCY SELECTION	1	
....2	003-1054	CAP,CER,MNLY,.1uF,50V,20%	6	C51, C52, C53, C54, C55, C56
....2	220-4244	IC,74HC244 OCTAL TRISTATE	16	U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34
....2	226-1060	RES NET,100K,10-PIN SIP	14	R70, R71, R72, R74, R75, R76, R77, R78, R79, R80, R82, R83, R84, R85
....2	226-1061	RES NET,100K,8-PIN SIP	2	R73, R81
....2	340-0002	SW,4 POS,SPST,8-PIN DIP	30	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18, S19, S20, S21, S22, S23, S24, S25, S26, S27, S28, S29, S30
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	2	J11, J12



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-2004	SOCKET,20-PIN,DIP,HIGH RELIABILITY	16	XU19, XU20, XU21, XU22, XU23, XU24, XU25, XU26, XU27, XU28, XU29, XU30, XU31, XU32, XU33, XU34
....2	519-0138-001	PCB,N+1 FREQUENCY SELECTION	1	
..1	919-0138-002	ASSY,PCB,N+1B CONTROLLER	1	
....2	000-3302	CAP,CER,DISC,3.3PF,1000V	1	C39
....2	001-5004	CAP,CER,DISC,5PF,500V,NPO	2	C31, C32
....2	003-1054	CAP,CER,MNLY,.1uF,50V,20%	19	C8, C9, C10, C11, C13, C14, C16, C17, C29, C30, C35, C36, C40, C41, C42, C49, C50, C69, C70
....2	013-1095	CAP,LYTIC,1000UF,25V-10+50%	1	C19
....2	023-1076	CAP,LYTIC,10uF,50V,STDUP	7	C1, C15, C18, C43, C44, C46, C47
....2	023-1084	CAP,LYTIC,100MFD,35V,STDUP,RAD	6	C23, C24, C26, C27, C45, C48
....2	024-1064	CAP,LYTIC,1UF,50V,RAD	1	C12
....2	030-2253	CAP,MYLAR FILM,.22UF,100V,RAD	2	C25, C28
....2	031-1043	CAP,MYLAR FILM,.01UF,100V,RAD	20	C3, C4, C5, C6, C7, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C71, C72, C73, C74, C75
....2	040-2422	CAP,MICA,240PF	3	C20, C21, C22
....2	042-2531	CAP,MICA,2500PF,500V,1%	1	C33
....2	042-3312	CAP,MICA,33PF,500V,5%	2	C37, C38
....2	042-5031	CAP,MICA,5000PF,500V,1%	1	C34
....2	100-1041	RES,1K OHM,1/4W,1%	10	R2, R3, R4, R5, R6, R91, R92, R93, R94, R95
....2	100-1051	RES,10K OHM,1/4W,1%	5	R16, R20, R23, R24, R79



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	100-1231	RES,121 OHM,1/4W,1%	2	R65, R67
....2	100-1731	RES,174 OHM,1/4W,1%	1	R62
....2	100-3031	RES,301 OHM,1/4W,1%	1	R61
....2	100-3951	RES,39.2K OHM,1/4W,1%	1	R53
....2	100-5041	RES,4.99K OHM,1/4W,1%	2	R33, R34
....2	100-6031	RES,604 OHM,1/4W,1%	1	R32
....2	103-1007	RES,1 MEG OHM,1/4W,1%,METAL	9	R10, R21, R22, R25, R26, R27, R31, R35, R69
....2	103-1062	RES,100K OHM,1/4W,1%,METAL	5	R11, R12, R13, R14, R15
....2	103-1331	RES,1.33K OHM,1/4W,1%,METAL	2	R66, R68
....2	103-1745	RES,17.4K OHM,1/4W,1%,METAL	1	R39
....2	103-1825	RES,18.2K OHM,1/4W,1%,METAL	1	R37
....2	103-2211	RES,22.1K OHM,1/4W,1%,METAL	1	R54
....2	103-3014	RES,3.01K OHM,1/4W,1%,METAL	1	R40
....2	103-3163	RES,316 OHM,1/4W,1%,METAL	10	R86, R87, R88, R89, R90, R101, R103, R105, R107, R109
....2	103-4361	RES,432K OHM,1/4W,1%,METAL	1	R55
....2	103-4753	RES,475 OHM,1/4W,1%,METAL	1	R63
....2	103-5112	RES,51.1 OHM,1/4W,1%,METAL	11	R19, R80, R81, R82, R83, R84, R96, R97, R98, R99, R100
....2	103-5115	RES,51.1K OHM,1/4W,1%,METAL	1	r9
....2	103-6193	RES,619 OHM,1/4W,1%,METAL	10	R41, R42, R43, R44, R45, R102, R104, R106, R108, R110
....2	103-6194	RES,6.19K OHM,1/4W,1%,METAL	2	R59, R64
....2	103-6346	RES,634K OHM,1/4W,1%,METAL	1	R58
....2	103-7326	RES,732K OHM,1/4W,1%,METAL	1	R57
....2	103-7503	RES,750 OHM,1/4W,1%,METAL	1	R60



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	103-7541	RES,7.50K OHM,1/4W,1%,METAL	2	R17, R29
....2	103-8256	RES,825K OHM,1/4W,1%,METAL	1	R56
....2	175-1034	RES,TRMR,1K,VERT ADJ	10	R47, R48, R49, R50, R51, R111, R112, R113, R114, R115
....2	177-5044	RES,TRMR,5K,VERT ADJ	3	R18, R30, R38
....2	200-4733	DIODE,ZENER,1N4733A, 5%	1	D21
....2	201-2800	DIODE,HOT CARRIER	3	D2, D3, D4
....2	203-4005	DIODE,1N4005	2	D19, D20
....2	203-4148	DIODE,1N4148	7	D1, D5, D6, D15, D16, D17, D18
....2	210-7000	TSTR,2N7000,MOSFET	10	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10
....2	220-4093	IC,MC14093B SCHMITT NAND	1	U7
....2	220-4240	IC,74C24ON,INVERTING TRI STATE	2	U1, U17
....2	221-5532-001	IC,NE-5532AN	4	U8, U9, U10, U11
....2	225-0005	IC,CD4071BE,RCA	1	U15
....2	226-0392	RES NETWORK, 10K	2	R28, R36
....2	226-1061	RES NET,100K,8-PIN SIP	4	R1, R8, R46, R52
....2	226-2004	MC1416,ULN2004 7-DRLNGTNS DP16	2	U12, U16
....2	227-0317	VR,LM317T,LM317KC	1	U13
....2	227-0337	VOLTAGE REGULATOR,3 TERM, NEG	1	U14
....2	228-4028	IC,MC14028B	1	U5
....2	228-4076	IC,MC14076 QUAD REGISTER	1	U3
....2	228-4532	IC,MC14532B 8-BIT PRIOR ENCOD	2	U2, U18
....2	228-4538	IC,MC14538B NATL SEMICONDUCTOR	1	U4
....2	228-4584	IC,MC14584 14-PIN SCHMITT TRIG	2	U6, U19
....2	270-0056	REL,REED 12V D51A12(D) 1 AMP	10	K1, K2, K3, K4, K5, K6, K7, K8, K9, K10

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	323-9224	IND,LED,GRN,521-9270	10	DS1, DS2, DS3, DS4, DS5, DS6, DS7, DS8, DS9, DS10
....2	340-0004	SW,JUMPER PROGRAMMABLE	3	P4, P5A, P5B
....2	407-0074	SPR,LED .25 ODX.147 1D X.22L	10	
....2	413-1597	TERM,TURRET,2 SHLDR,,219,GOLD FLASH	4	E1, E2, TP1, TP2
....2	417-0044	CONN,10 PIN SINGLE ROW HEADER	2	J2, J8
....2	417-0200	CONN,HEADER 20 PIN	1	J1, J5
....2	417-0804	SOCKET,8-PIN DIP,BURNDY	4	XU8, XU9, XU10, XU11
....2	417-1404	SOCKET,14-PIN DIP	4	XU6, XU7, XU15, XU19
....2	417-1604	SKT,16-PIN,DIP	9	XR28, XR36, XU2, XU3, XU4, XU5, XU12, XU16, XU18
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	2	J10, J11
....2	417-2004	SOCKET,20-PIN,DIP,HIGH RELIABILITY	2	XU1, XU17
....2	417-4004	CONN,HEADER,2 PIN	1	J4
....2	417-6304	CONN,ELEVATED SOCKET,4-PIN,SIP,.635	3	P6, P7, P9
....2	417-6305	CONN,ELEVATED SOCKET,5-PIN,SIP,.635	1	P8
....2	417-6310	CONN,ELEVATED SOCKET,10-PIN,SIP.635	1	P2
....2	417-6316	CONN,ELEVATED SOCKET,16-PIN,SIP.635	1	P1
....2	418-2602	CONN,PCB MALE HEADER,26 POS	1	J3
....2	420-6105	SCREW,6-32X.312,S.S. PH	2	
....2	423-6002	#6 LOCK SPLIT	2	
....2	426-6000	PEM NUT,#6-32 KFS2-632	2	
....2	519-0138-002	PCB,BLANK,N+1B CONTROLLER	1	
..1	979-9981	KIT,BIND+MAN,N+1B OPTION	1	
....2	597-1138	INSTRUCTION MANUAL, FX 50/FM 100C/FM 250C (N+1) EXCITER	1	
.....3	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	598-0010-001	BINDER,1 IN, BLUE,W CD POCKET	1	

### 3 RF Technical Services Contact Information

RF Technical Services -

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### 4 Drawings

The following pages present the N+1B option drawings.

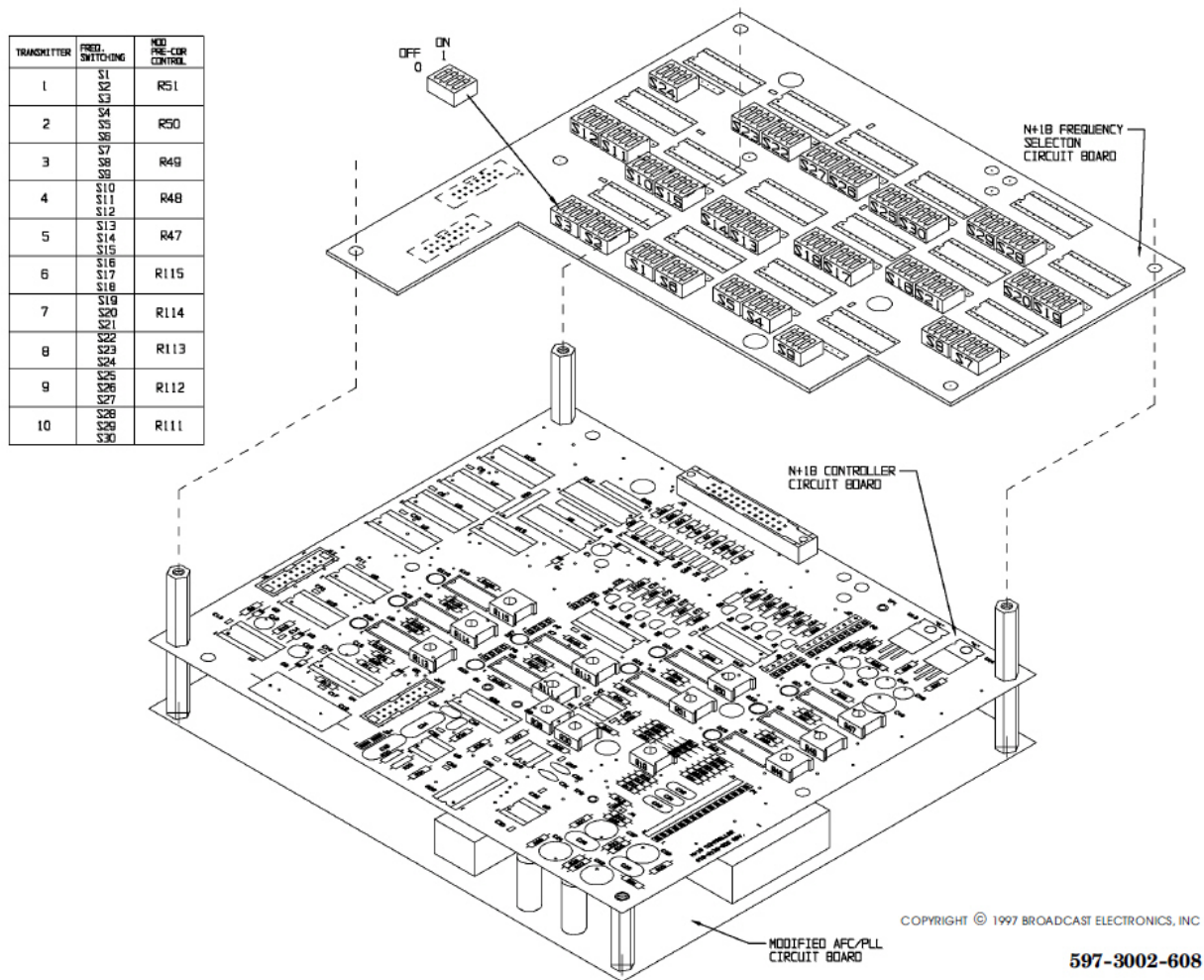


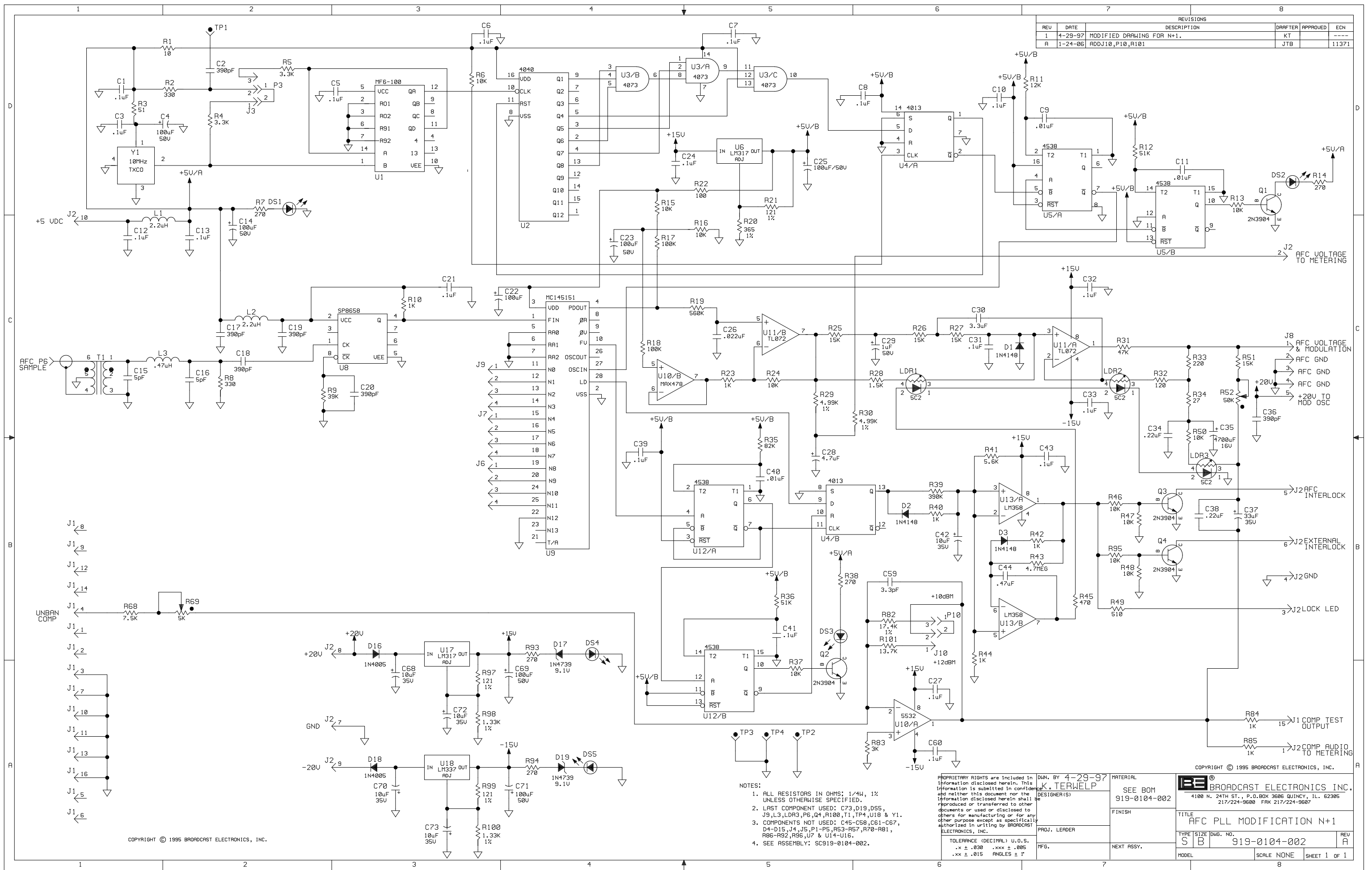
Figure 4-1. N+1B CIRCUIT SWITCH LOCATIONS



DOMESTIC												EUROPEAN											
FREQUENCY IN MHZ	SWITCH S1	SWITCH S2	SWITCH S3	FREQUENCY IN MHZ	SWITCH S1	SWITCH S2	SWITCH S3	FREQUENCY IN MHZ	SWITCH S1	SWITCH S2	SWITCH S3	FREQUENCY IN MHZ	SWITCH S1	SWITCH S2	SWITCH S3	FREQUENCY IN MHZ	SWITCH S1	SWITCH S2	SWITCH S3				
87.1	0	1	1	98.1	1	0	1	87.2	1	0	1	98.2	1	0	1								
87.2	0	1	1	98.2	1	0	1	87.4	1	0	1	98.4	1	0	1								
87.3	0	1	1	98.3	1	0	1	87.5	1	0	1	98.5	1	0	1								
87.4	0	1	1	98.4	1	0	1	87.6	1	0	1	98.6	1	0	1								
87.5	0	1	1	98.5	1	0	1	87.7	1	0	1	98.7	1	0	1								
87.6	0	1	1	98.6	1	0	1	87.8	1	0	1	98.8	1	0	1								
87.7	0	1	1	98.7	1	0	1	87.9	1	0	1	98.9	1	0	1								
87.8	0	1	1	98.8	1	0	1	88.0	1	0	1	99.0	1	0	1								
87.9	0	1	1	98.9	1	0	1	88.1	1	0	1	99.1	1	0	1								
88.0	0	1	1	98.9	1	0	1	88.2	1	0	1	99.2	1	0	1								
88.1	0	1	1	99.0	1	0	1	88.3	1	0	1	99.3	1	0	1								
88.2	0	1	1	99.1	1	0	1	88.4	1	0	1	99.4	1	0	1								
88.3	0	1	1	99.2	1	0	1	88.5	1	0	1	99.5	1	0	1								
88.4	0	1	1	99.3	1	0	1	88.6	1	0	1	99.6	1	0	1								
88.5	0	1	1	99.4	1	0	1	88.7	1	0	1	99.7	1	0	1								
88.6	0	1	1	99.5	1	0	1	88.8	1	0	1	99.8	1	0	1								
88.7	0	1	1	99.6	1	0	1	88.9	1	0	1	99.9	1	0	1								
88.8	0	1	1	99.7	1	0	1	89.0	1	0	1	100.0	1	0	1								
88.9	0	1	1	99.8	1	0	1	89.1	1	0	1	100.1	1	0	1								
89.0	0	1	1	99.9	1	0	1	89.2	1	0	1	100.2	1	0	1								
89.1	0	1	1	100.0	1	0	1	89.3	1	0	1	100.3	1	0	1								
89.2	0	1	1	100.1	1	0	1	89.4	1	0	1	100.4	1	0	1								
89.3	0	1	1	100.2	1	0	1	89.5	1	0	1	100.5	1	0	1								
89.4	0	1	1	100.3	1	0	1	89.6	1	0	1	100.6	1	0	1								
89.5	0	1	1	100.4	1	0	1	89.7	1	0	1	100.7	1	0	1								
89.6	0	1	1	100.5	1	0	1	89.8	1	0	1	100.8	1	0	1								
89.7	0	1	1	100.6	1	0	1	89.9	1	0	1	100.9	1	0	1								
89.8	0	1	1	100.7	1	0	1	90.0	1	0	1	101.0	1	0	1								
89.9	0	1	1	100.8	1	0	1	90.1	1	0	1	101.1	1	0	1								
90.0	0	1	1	100.9	1	0	1	90.2	1	0	1	101.2	1	0	1								
90.1	0	1	1	101.0	1	0	1	90.3	1	0	1	101.3	1	0	1								
90.2	0	1	1	101.1	1	0	1	90.4	1	0	1	101.4	1	0	1								
90.3	0	1	1	101.2	1	0	1	90.5	1	0	1	101.5	1	0	1								
90.4	0	1	1	101.3	1	0	1	90.6	1	0	1	101.6	1	0	1								
90.5	0	1	1	101.4	1	0	1	90.7	1	0	1	101.7	1	0	1								
90.6	0	1	1	101.5	1	0	1	90.8	1	0	1	101.8	1	0	1								
90.7	0	1	1	101.6	1	0	1	90.9	1	0	1	101.9	1	0	1								
90.8	0	1	1	101.7	1	0	1	91.0	1	0	1	102.0	1	0	1								
90.9	0	1	1	101.8	1	0	1	91.1	1	0	1	102.1	1	0	1								
91.0	0	1	1	101.9	1	0	1	91.2	1	0	1	102.2	1	0	1								
91.1	0	1	1	102.0	1	0	1	91.3	1	0	1	102.3	1	0	1								
91.2	0	1	1	102.1	1	0	1	91.4	1	0	1	102.4	1	0	1								
91.3	0	1	1	102.2	1	0	1	91.5	1	0	1	102.5	1	0	1								
91.4	0	1	1	102.3	1	0	1	91.6	1	0	1	102.6	1	0	1								
91.5	0	1	1	102.4	1	0	1	91.7	1	0	1	102.7	1	0	1								
91.6	0	1	1	102.5	1	0	1	91.8	1	0	1	102.8	1	0	1								
91.7	0	1	1	102.6	1	0	1	91.9	1	0	1	102.9	1	0	1								
91.8	0	1	1	102.7	1	0	1	92.0	1	0	1	103.0	1	0	1								
91.9	0	1	1	102.8	1	0	1	92.1	1	0	1	103.1	1	0	1								
92.0	0	1	1	102.9	1	0	1	92.2	1	0	1	103.2	1	0	1								
92.1	0	1	1	103.0	1	0	1	92.3	1	0	1	103.3	1	0	1								
92.2	0	1	1	103.1	1	0	1	92.4	1	0	1	103.4	1	0	1								
92.3	0	1	1	103.2	1	0	1	92.5	1	0	1	103.5	1	0	1								
92.4	0	1	1	103.3	1	0	1	92.6	1	0	1	103.6	1	0	1								
92.5	0	1	1	103.4	1	0	1	92.7	1	0	1	103.7	1	0	1								
92.6	0	1	1	103.5	1	0	1	92.8	1	0	1	103.8	1	0	1								
92.7	0	1	1	103.6	1	0	1	92.9	1	0	1	103.9	1	0	1								
92.8	0	1	1	103.7	1	0	1	93.0	1	0	1	104.0	1	0	1								
92.9	0	1	1	103.8	1	0	1	93.1	1	0	1	104.1	1	0	1								
93.0	0	1	1	103.9	1	0	1	93.2	1	0	1	104.2	1	0	1								
93.1	0	1	1	104.0	1	0	1	93.3	1	0	1	104.3	1	0	1								
93.2	0	1	1	104.1	1	0	1	93.4	1	0	1	104.4	1	0	1								
93.3	0	1	1	104.2	1	0	1	93.5	1	0	1	104.5	1	0	1								
93.4	0	1	1	104.3	1	0	1	93.6	1	0	1	104.6	1	0	1								
93.5	0	1	1	104.4	1	0	1	93.7	1	0	1	104.7	1	0	1								
93.6	0	1	1	104.5	1	0	1	93.8	1	0	1	104.8	1	0	1								
93.7	0	1	1	104.6	1	0	1	93.9	1	0	1	104.9	1	0	1								
93.8	0	1	1	104.7	1	0	1	94.0	1	0	1	105.0	1	0	1								
93.9	0	1	1	104.8	1	0	1	94.1	1	0	1	105.1	1	0	1								
94.0	0	1	1	104.9	1	0	1	94.2	1	0	1	105.2	1	0	1								
94.1	0	1	1	105.0	1	0	1	94.3	1	0	1	105.3	1	0	1								
94.2	0	1	1	105.1	1	0	1	94.4	1	0	1	105.4	1	0	1								
94.3	0	1	1	105.2	1	0	1	94.5	1	0	1	105.5	1	0	1								
94.4	0	1	1	105.3	1	0	1	94.6	1	0	1	105.6	1	0	1								
94.5	0	1	1	105.4	1	0	1	94.7	1	0	1	105.7	1	0	1								
94.6	0	1	1	105.5	1	0	1	94.8	1	0	1	105.8	1	0	1								
94.7	0	1	1	105.6	1	0	1	94.9	1	0	1	105.9	1	0	1								
94.8	0	1	1	105.7	1	0	1	95.0	1	0	1	106.0	1	0	1								
94.9	0	1	1	105.8	1	0	1	95.1	1	0	1	106.1	1	0	1								
95.0	0	1	1	105.9	1	0	1	95.2	1	0	1	106.2	1	0	1								
95.1	0	1	1	106.0	1	0	1	95.3	1	0	1	106.3	1	0	1								
95.2	0	1	1	106.1	1	0	1	95.4	1	0	1	106.4	1	0	1								
95.3	0	1	1	106.2	1	0	1	95.5	1	0	1	106.5	1	0	1								
95.4	0	1	1	106.3	1	0	1	95.6	1	0	1	106.6	1	0	1								
95.5	0	1	1	106.4	1	0	1	95.7	1	0	1	106.7	1	0	1								
95.6	0	1	1	106.5	1	0	1	95.8	1	0	1	106.8	1	0	1								
95.7	0	1	1	106.6	1	0	1	95.9	1	0	1	106.9	1	0	1								
95.8	0	1	1	106.7	1	0	1	96.0	1	0	1	107.0	1	0	1								
95.9	0	1	1	106.8	1	0	1	96.1	1	0	1	107.1	1	0	1								
96.0	0	1	1	106.9	1	0	1	96.2	1	0	1	107.2	1	0	1								
96.1	0	1	1	107.0	1	0	1	96.3	1	0	1	107.3	1	0	1								
96.2	0	1	1	107.1	1	0	1	96.4	1	0	1	107.4	1	0	1								
96.3	0	1	1	107.2	1	0	1	96.5	1	0	1	107.5	1	0	1								
96.4	0	1	1	107.3	1	0	1	96.6	1	0	1	107.6	1	0	1								
96.5	0	1	1	107.4	1	0	1	96.7	1	0	1	107.7	1	0	1								
96.6	0	1	1	107.5	1	0	1	96.8	1	0	1	107.8	1	0	1								
96.7	0	1	1	107.6	1	0	1	96.9	1	0	1	107.9	1	0	1								
96.8	0	1	1	107.7	1	0	1	97.0	1	0	1	108.0	1	0	1								
96.9	0	1	1	107.8	1	0	1	97.1	1	0	1	108.1	1	0	1								
97.0	0	1	1	107.9	1	0	1	97.2	1	0	1	108.2	1	0	1								
97.1	0	1	1	108.0	1	0	1	97.3	1	0	1	108.3	1	0	1								
97.2	0	1	1	108.1	1	0	1	97.4	1	0	1	108.4	1	0	1								
97.3	0	1	1	108.2	1	0	1	97.5	1	0	1	108.5	1	0	1								
97.4	0	1	1	108.3	1	0	1	97.6	1	0	1	108.6	1	0	1								
97.5	0	1	1	108.4	1	0	1	97.7	1	0	1	108.7	1	0	1								
97.6	0</																						



REVISIONS				
REV	DATE	DESCRIPTION	DRAWER	APPROVED
1	4-29-97	MODIFIED DRAWING FOR N+1.	KT	
A	1-24-06	ADD J10, P10, R101	JTB	

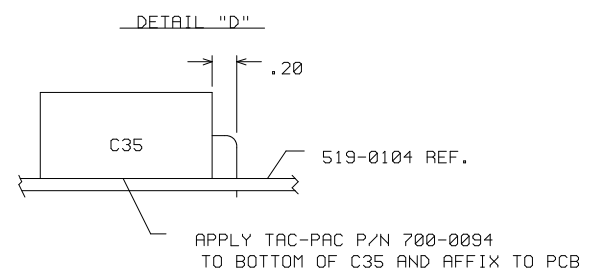
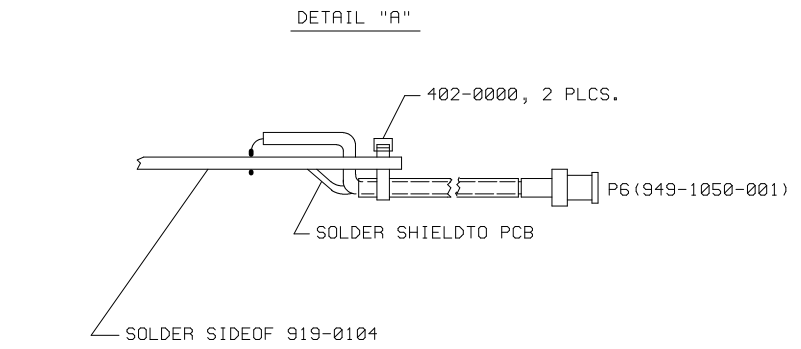
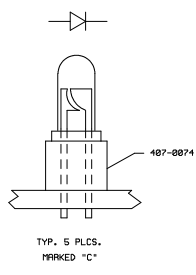
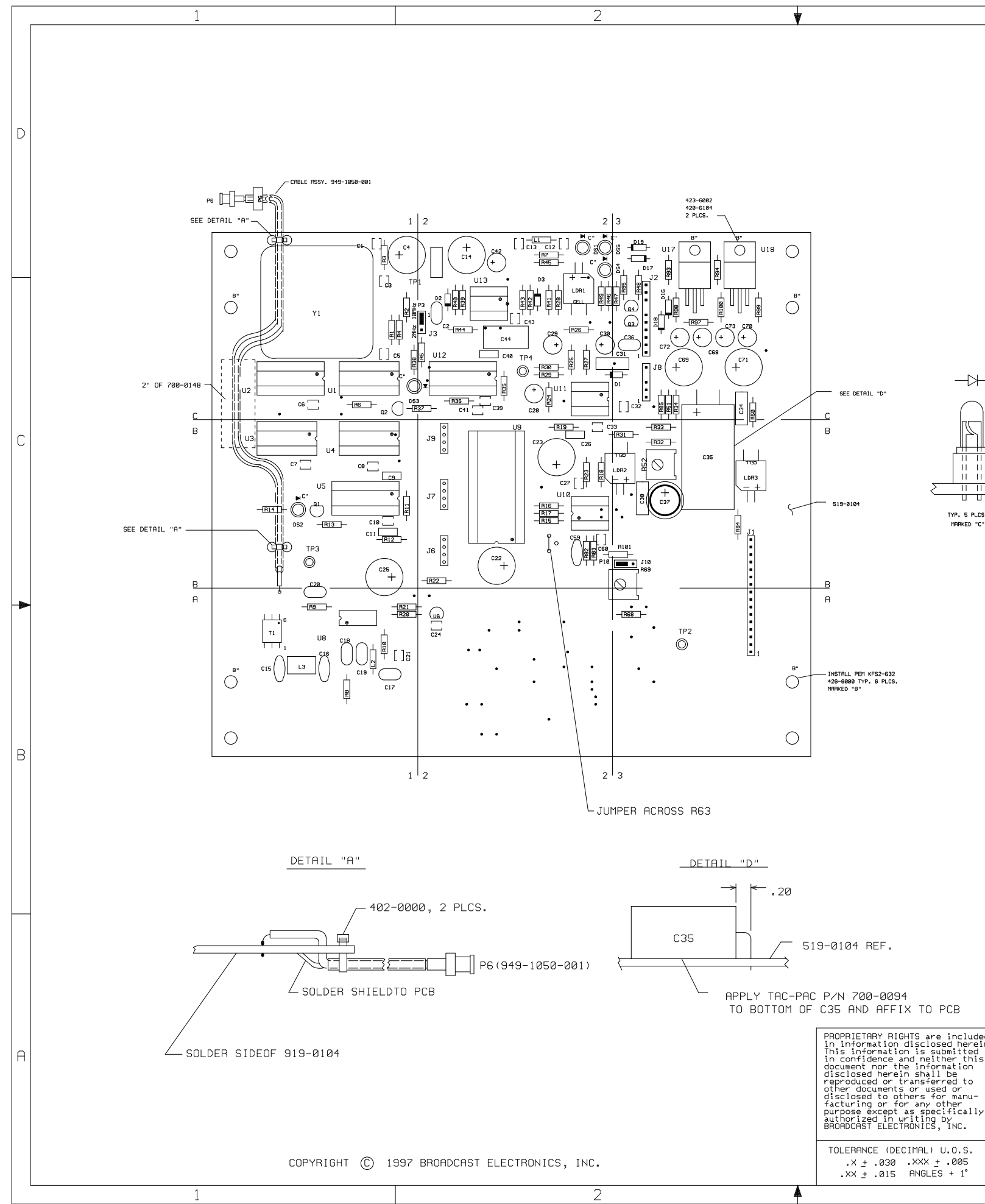


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- NOTES:
1. ALL RESISTORS IN OHMS; 1/4W, 1% UNLESS OTHERWISE SPECIFIED.
  2. LAST COMPONENT USED: C73, D19, DS5, J9, L3, LDR3, P6, Q4, R100, T1, TP4, U18 & Y1.
  3. COMPONENTS NOT USED: C45-C58, C61-C67, D4-D15, J4, J5, P1-P5, R53-R57, R70-R81, R86-R92, R96, U7 & U14-U16.
  4. SEE ASSEMBLY: SC919-0104-002.

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FINISH		TITLE		TYPE		REV	
		AFC PLL MODIFICATION N+1		S B		919-0104-002	
PROJ. LEADER		MODEL		SCALE		SHEET 1 OF 1	
NFG.				NONE			

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	4-30-97	MODIFIED DRAWING FOR N+1.	KT	DDL	----
A	12-12-97	ENGINEERING RELEASE	KT	DDL	----
B	6-2-98	UPDATE DWG TO MATCH BOM	MSE	DDL	9987
C	2-3-99	ADDED 2" OF 700-0148; MOVED CORX OUTSIDE OF IC'S.	KT	DDL	10084
D	10-3-00	CHANGED DETAIL "A" TO CALL OUT 949-1050-001.	KT	DDL	10362
E	1-25-06	ADD J10,P10,R101	JTB	DDL	11371



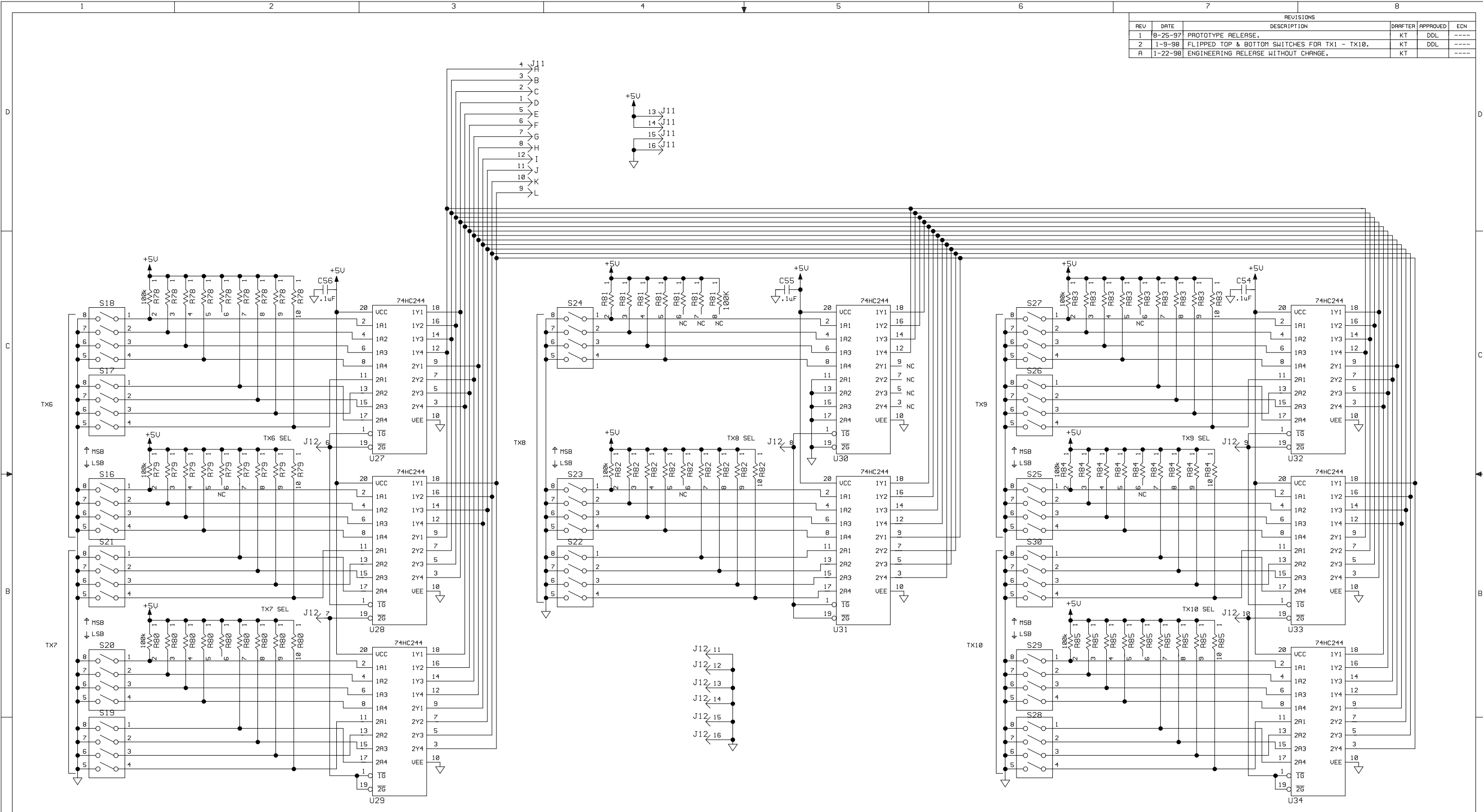
- NOTES:
1. LAST COMPONENT USED: C73,D19,DS5,J10,L3, LDR3,P10,Q4,R101,T1,TP4,U18 & Y1.
  2. COMPONENTS NOT USED: C45-C58,C61-C67,D4-D15, J4,J5,P1-P5,R53-R67,R70-R81,R86-R92,R96,U7 & U14-U16.
  3. SEE SCHEMATIC SB919-0104-002.

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	K. TERWELP	SEE BOM 919-0104-002		
	DESIGNER(S)	FINISH	TITLE	AFC PLL MODIFICATION N+1
	PROJ. LEADER	MFG.	TYPE	A B
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°		NEXT ASSY.	DWG No. 919-0104-002	REV E
			SCALE 1/1	SHEET 1 OF 1

REVISIONS			DATE	DESCRIPTION	DRAWN	APPROVED	ECN
1	8-25-97	PROTOTYPE RELEASE.	KT	DDL	----		
2	1-9-98	FLIPPED TOP & BOTTOM SWITCHES FOR TX1 - TX10.	KT	DDL	----		
A	1-22-98	ENGINEERING RELEASE WITHOUT CHANGE.	KT		----		



- NOTES:
- ALL RESISTORS IN OHMS: 1/4W, 1% UNLESS OTHERWISE SPECIFIED.
  - LAST COMPONENT USED: C56, J12, R85, S30 & U34.
  - COMPONENTS NOT USED: C1-C50, J1-J10, R1-R69 & U1-U18.
  - SEE ASSEMBLY: AC919-0138-001.

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DESIGNED BY: 8-25-97 K. TERWELP  
 DESIGNER(S)  
 PROJ. LEADER  
 MFG.

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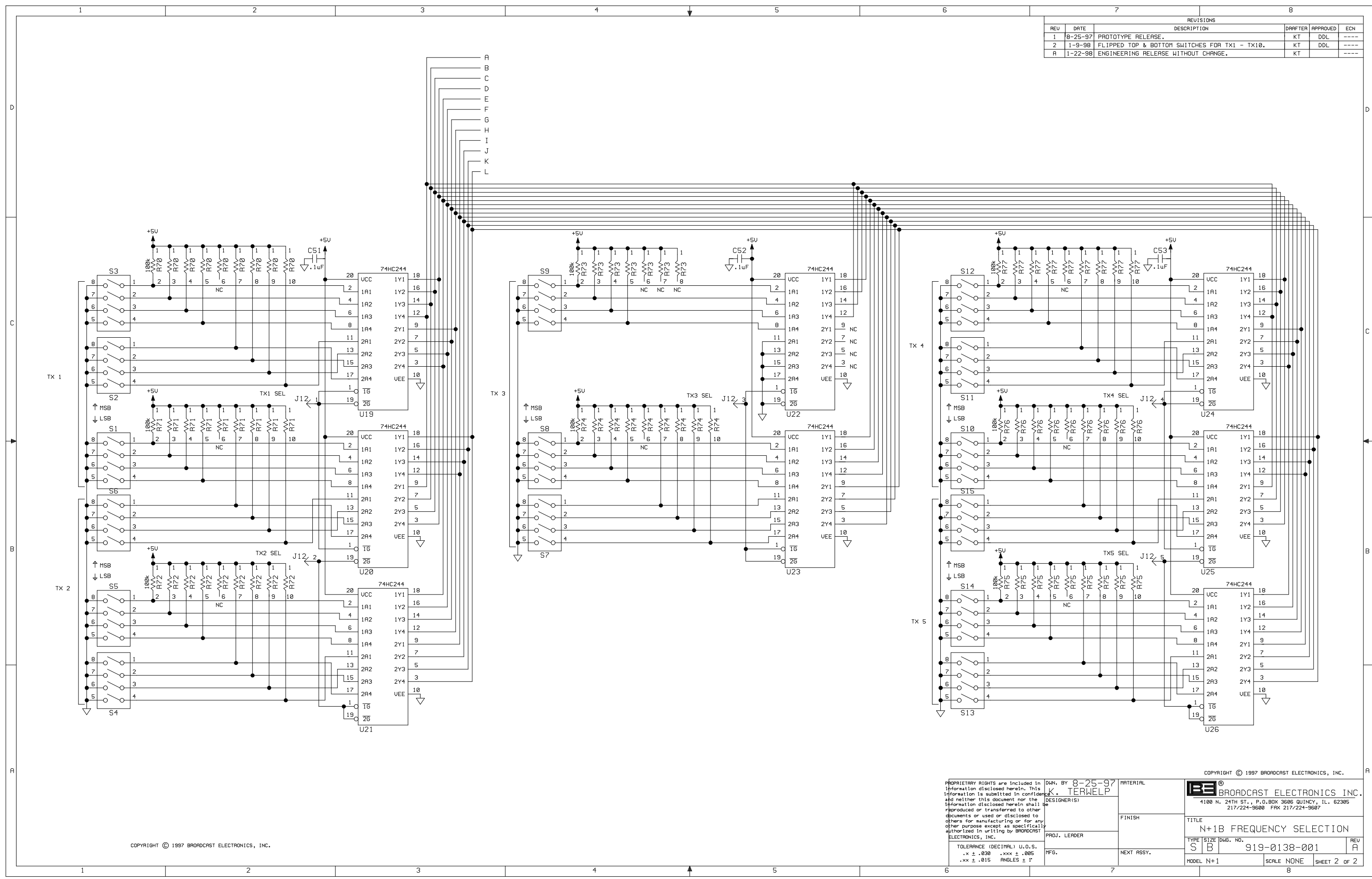
**B** BROADCAST ELECTRONICS INC.  
 4100 N. 24TH ST., P.O. BOX 3686 QUINCY, IL. 62305  
 217/224-9680 FAX 217/224-9687

TITLE: N+1B FREQUENCY SELECTION

TYPE	SIZE	DWG. NO.	REV
S	B	919-0138-001	A

MODEL N+1 SCALE NONE SHEET 1 OF 2

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	8-25-97	PROTOTYPE RELEASE.	KT	DDL	----
2	1-9-98	FLIPPED TOP & BOTTOM SWITCHES FOR TX1 - TX10.	KT	DDL	----
A	1-22-98	ENGINEERING RELEASE WITHOUT CHANGE.	KT		----

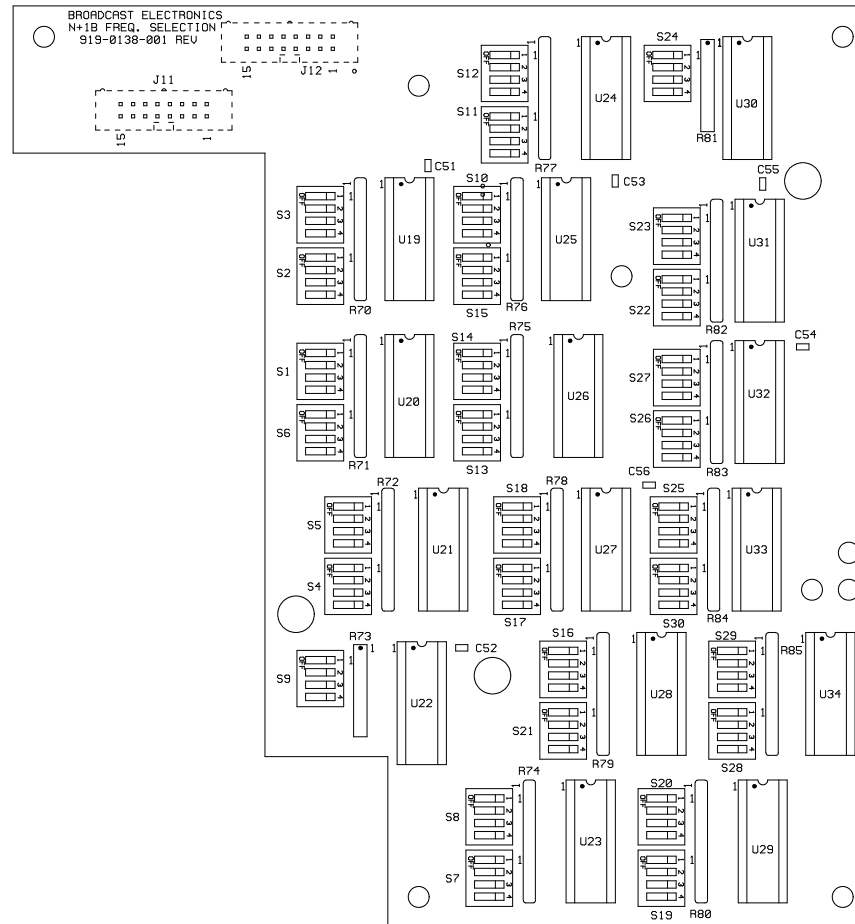


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TITLE N+1B FREQUENCY SELECTION				
TYPE SIZE DWG. NO. S B 919-0138-001		MODEL N+1 SCALE NONE SHEET 2 OF 2		

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	9-11-97	PROTOTYPE RELEASE.	KT	DDL	----
2	1-9-98	FLIPPED SWITCHES AROUND.	KT	DDL	----
A	1-22-98	CORRECTED OUTLINE OF J11 & J12; ENGINEERING RELEASE	KT	DDL	----
B	1-23-06	CHG'D PIN 1 TO SQUARE ON J11,12	JTB	DDL	11332



NOTES:  
1. SEE SCHEMATIC SB919-0138-001.

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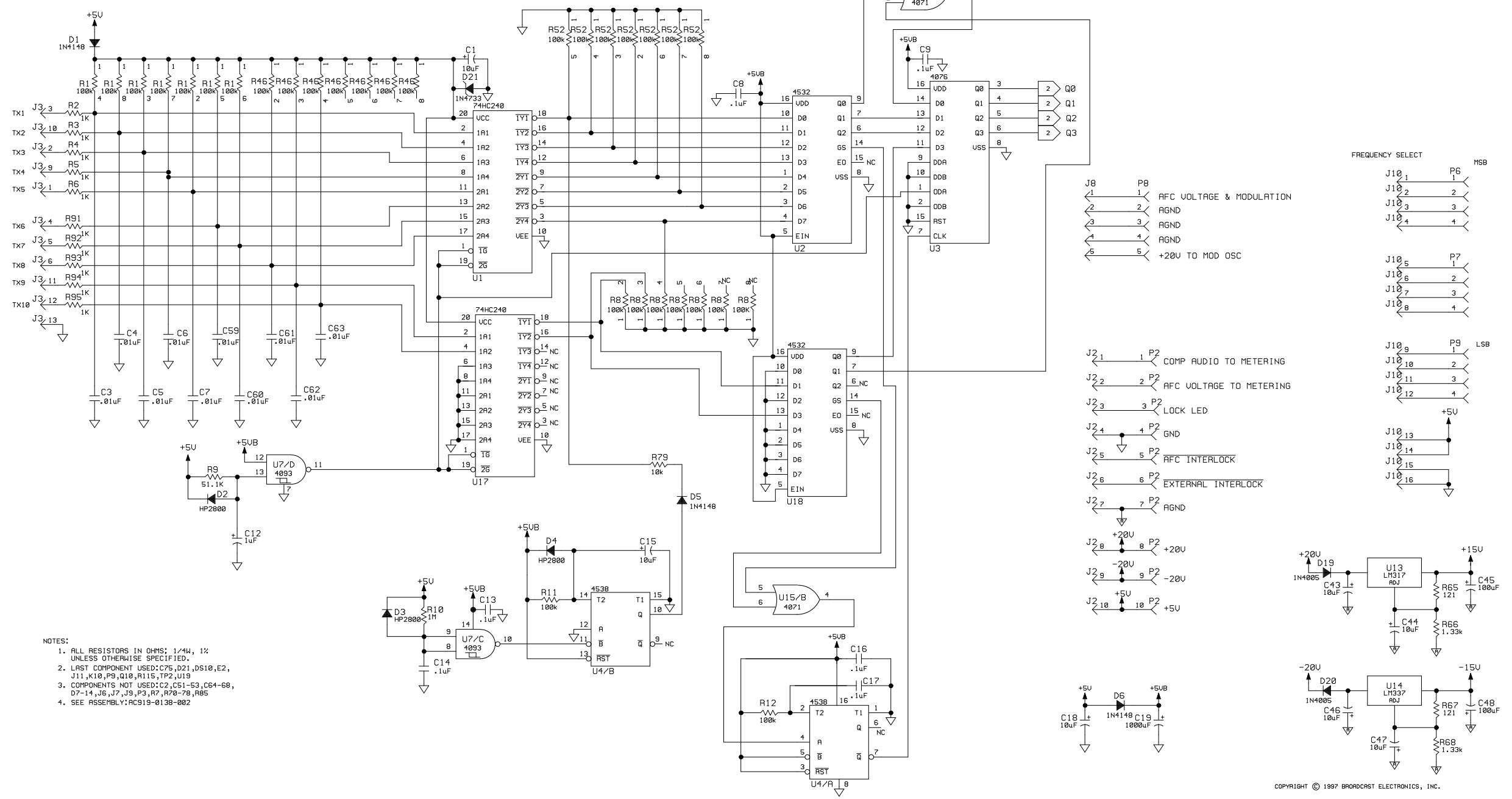
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	K. TERWELP	SEE BOM 919-0138-001		
	DESIGNER(S)	FINISH	TITLE	PCB ASSEMBLY N+1B FREQUENCY SELECTION
	PROJ. LEADER	PROJ. LEADER	TYPE	A
MFG.	MFG.	SIZE	C	
		DWG No.	919-0138-001	
		REU	B	
		MODEL	NNNN	
		SCALE	1/1	
		SHEET	1 OF 1	

TOLERANCE (DECIMAL) U.O.S.  
 .X ± .030 .XXX ± .005  
 .XX ± .015 ANGLES + 1°

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REVISIONS						
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN	
1	8-8-97	PROTOTYPE RELEASE	KT	DL	----	
2	11-20-97	SEE SHEET 3.	MH	DL	----	
A	1-22-98	ENGINEERING RELEASE WITHOUT CHANGE.	MH	DL	----	
B	2-20-04	CHGD R9 FROM 100K TO 51.1K	KT			11107

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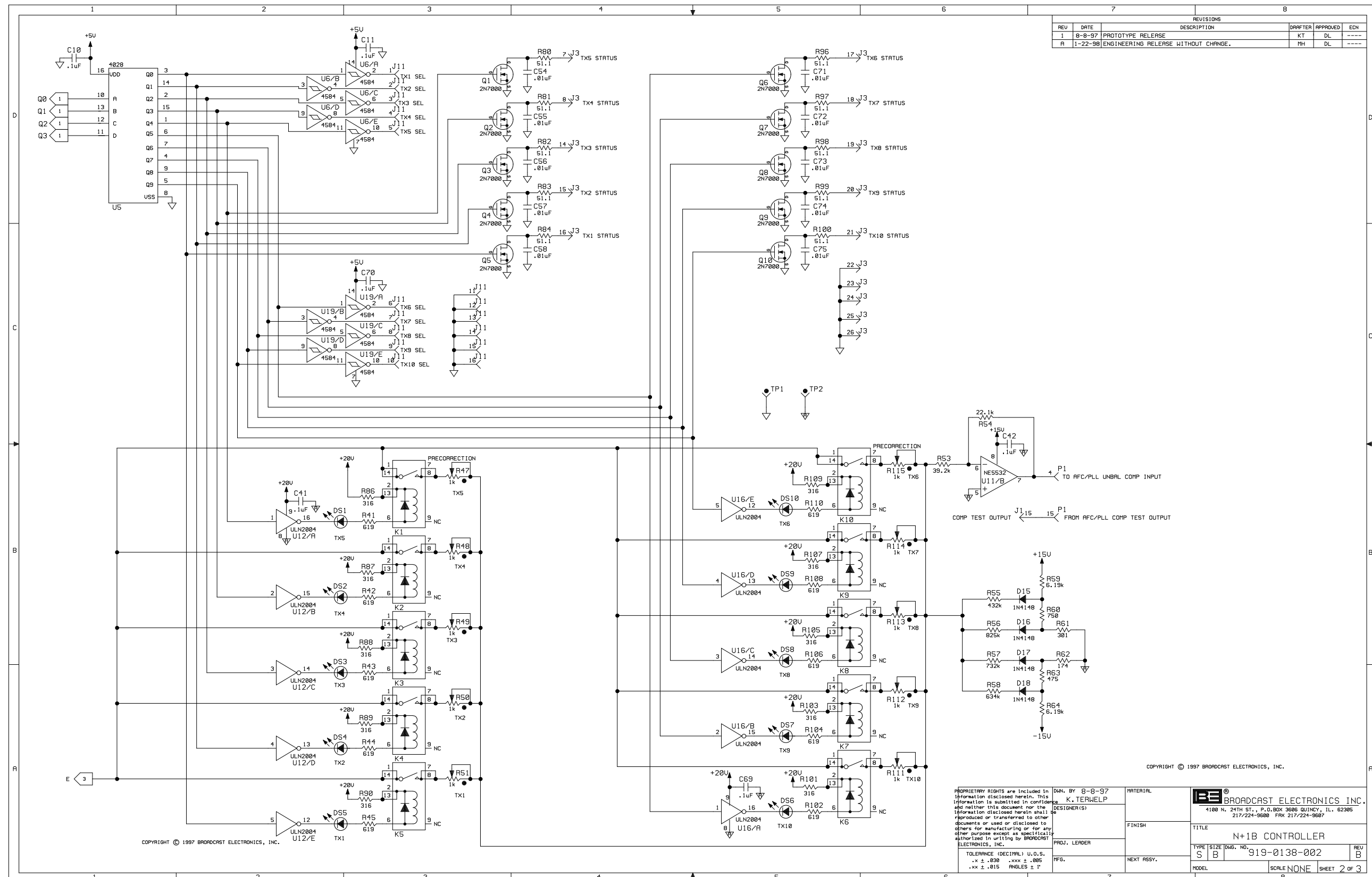


- NOTES:
1. ALL RESISTORS IN OHMS: 1/4W, 1% UNLESS OTHERWISE SPECIFIED.
  2. LAST COMPONENT USED: C75, D21, DS10, E2, J11, K10, P9, Q10, R115, TP2, U19
  3. COMPONENTS NOT USED: C2, C51-53, C64-68, D7-14, J6, J7, J9, P3, R7, R70-78, R85
  4. SEE ASSEMBLY: RC919-0138-002

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TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°	PROJ. LEADER	FINISH NEXT ASSY.	
TITLE N+1B CONTROLLER			REV B
MODEL			SCALE NONE SHEET 1 OF 3



REVISIONS			DRAFTER	APPROVED	ECH
1	8-8-97	PROTOTYPE RELEASE	KT	DL	----
2	1-22-98	ENGINEERING RELEASE WITHOUT CHANGE.	MH	DL	----

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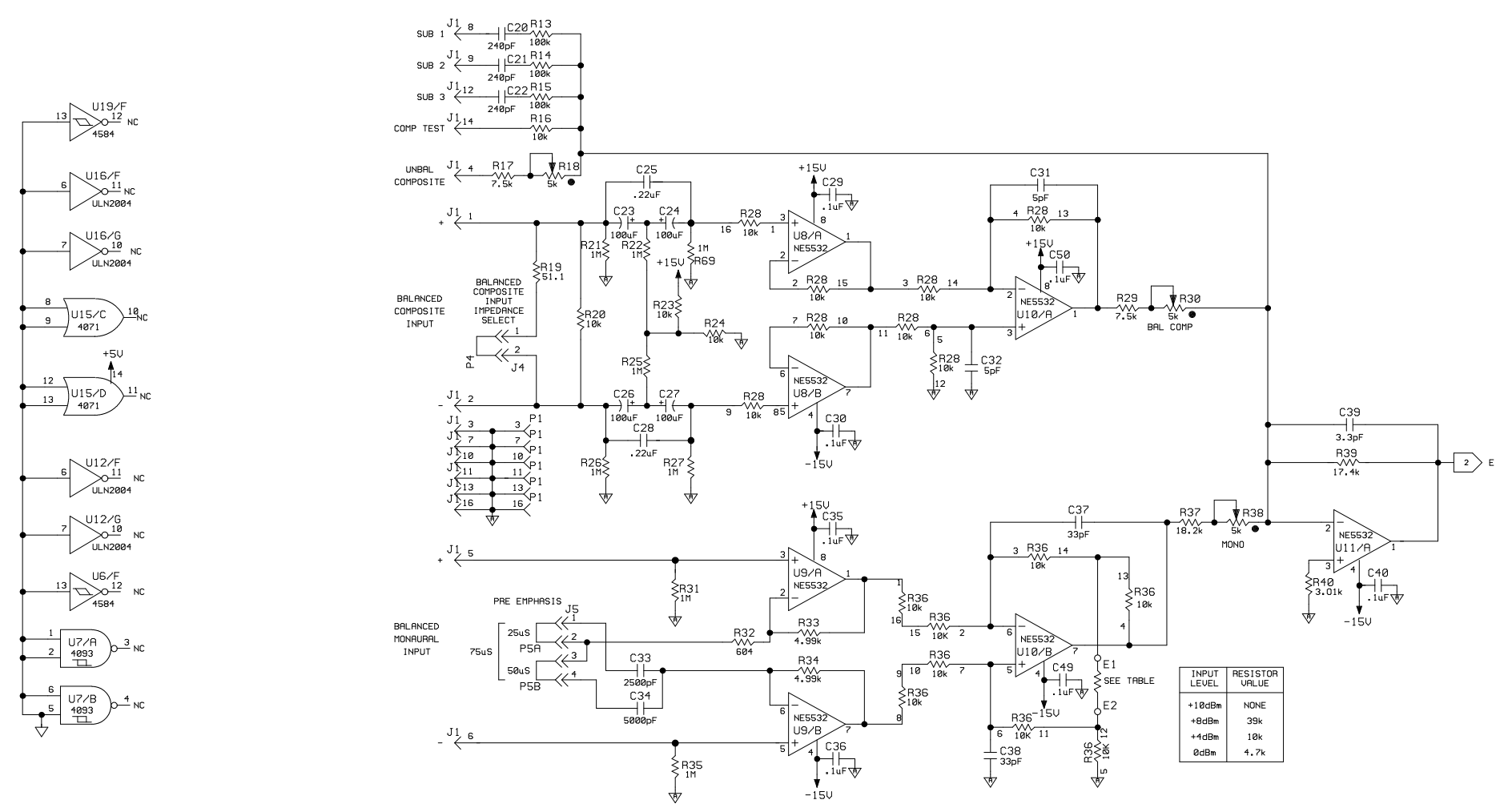
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DESIGNED BY: 8-8-97 K. TERWELP  
DESIGNER(S):

TOLERANCE (DECIMAL) U.O.S.  
 .x ± .038 .xxx ± .005  
 .xx ± .015 ANGLES ± 1°

MATERIAL	BROADCAST ELECTRONICS INC. 4180 N. 24TH ST., P.O. BOX 3686 QUINCY, IL. 62305 217/224-9600 FAX 217/224-9607	
FINISH	TITLE N+1B CONTROLLER	
PROJ. LEADER	TYPE SIZE DWG. NO.	REV
ENG.	S B 919-0138-002	B
NEXT ASSY.	MODEL	SCALE NONE SHEET 2 OF 3

REVISIONS					
REV	DATE	DESCRIPTION	DRAWN	APPROVED	ECN
1	8-8-97	PROTOTYPE RELEASE	KT	DL	----
2	11-20-97	DELETED CONNECTION BETWEEN U9 PINS 5 & 6.	MH	DL	----
A	1-22-98	ENGINEERING RELEASE WITHOUT CHANGE.	MH	DL	----



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DWN. BY 8-8-97  
K. TERWELP  
DESIGNER(S)  
PROJ. LEADER  
MFG.

**BROADCAST ELECTRONICS INC.**  
4100 N. 24TH ST., P.O. BOX 3606 QUINCY, IL. 62305  
217/224-9600 FAX 217/224-9607

TITLE: **N+1B CONTROLLER**

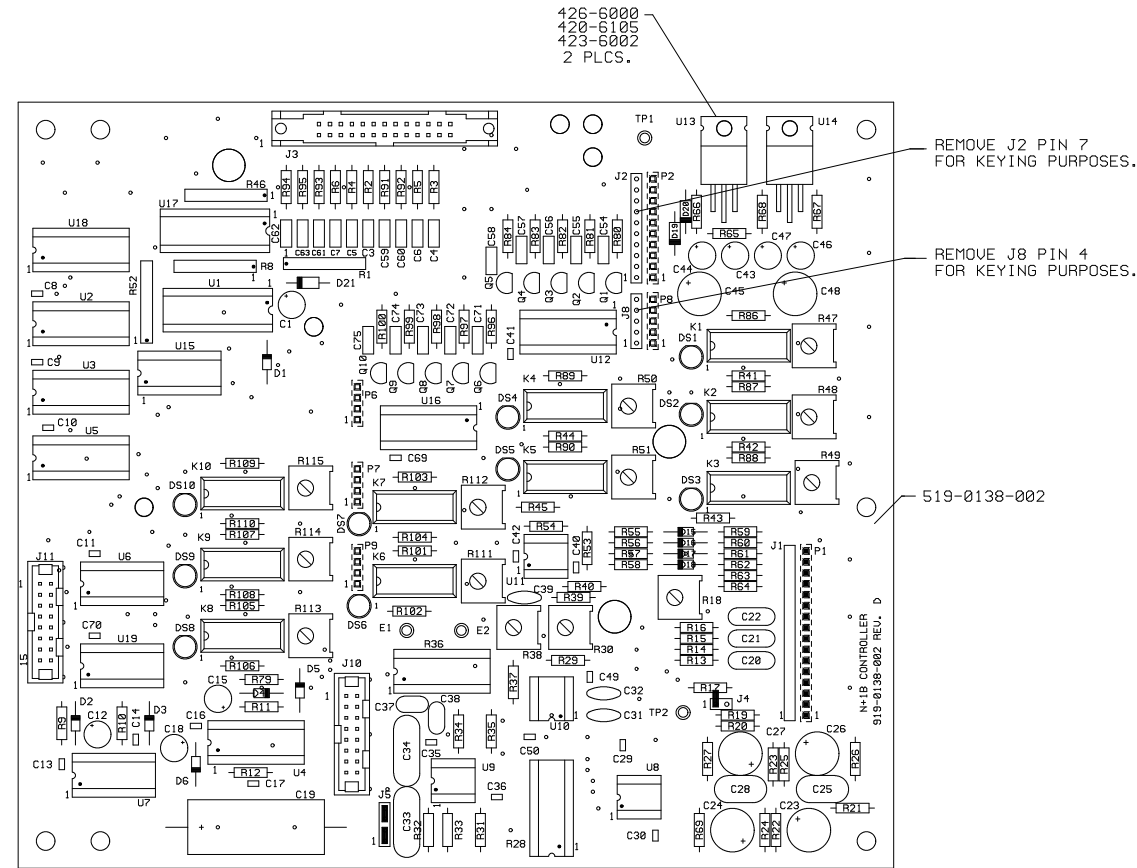
TYPE SIZE DWG. NO. **S B 919-0138-002**

MODEL SCALE NONE SHEET 3 OF 3



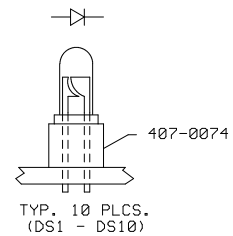
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REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	8-25-97	PROTOTYPE REVISIONS	MERK	DL	----
A	1-22-98	CHGD HDWARE FOR U13 & U14; ENGINEERING RELEASE.	MH	DL	----
B	12-1-99	CHGD HDWARE FOR U13 & U14.	KT	DL	10218
C	3-28-00	CHGD MOUNTING HARDWARE ON BOM.	KT	DL	10286
D	2-20-04	CHGD R9 FROM 103-1062 TO 103-5115	KT		11107



NOTES:

1. LAST COMPONENT USED: C75, D21, DS10, E2, J11, K10, P9, Q10, R115, TP2 & U19.
2. COMPONENTS NOT USED: C2, C51-53, C64-68, D7-14, J6, J7, J9, P3, R7, R70-78, R85.
3. SEE SCHEMATIC SB919-0138-002



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	DESIGNER(S)	FINISH		TITLE PCB ASSY. N+1 CONTROLLER
	PROJ. LEADER	NEXT ASSY. AD919-0138-002	TYPE SIZE DWG No. A C 919-0138-002	REV D
	TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°	MFG.	MODEL FX-50	SCALE 1/1 SHEET 1 OF 1