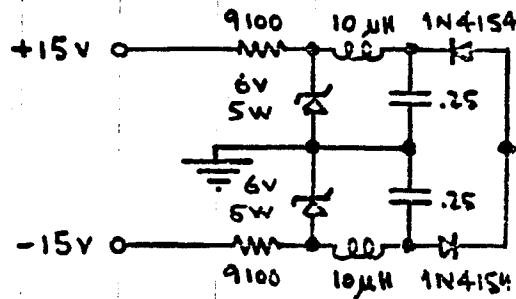


CX7a MODIFICATIONS

Done

1. PROTECTION CKT - FRONT END BD.

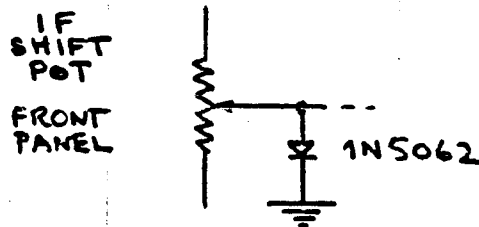


WILL CLIP INPUT
RF TO Q1 AT
± 6V.

check to see if
it's done?

done

2. SWITCHING TRANSIENT TO BFO



PREVENTS EXCESSIVE ⊕
TRANSIENT DURING 'STOP'
SWITCHING.

Done

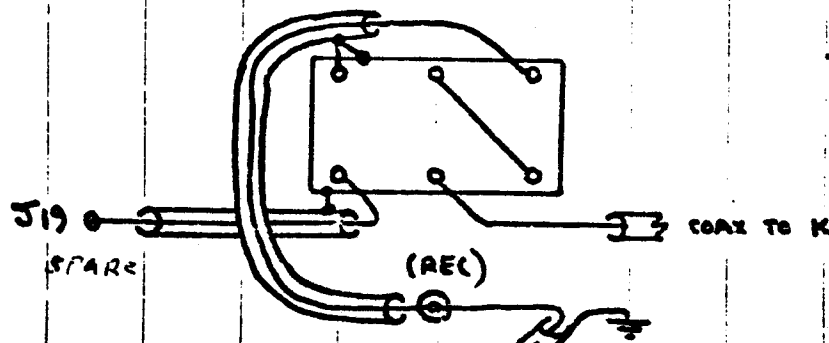
3. NOISE BLANKER - IF BOARD (A8)

- a) DISCONNECT PIN 7 IC2 FROM GND
- b) CONNECT PIN 7 IC2 TO R/T KEYLINE (44A)

done

4. RECEIVER INPUT SWITCH MOD FOR EXTERNAL ATTENUATOR

- a) REMOVE S9; REPLACE WITH SIMILAR DPDT SWITCH
- b) FROM INSIDE RF COMPARTMENT WIRE AS FOLLOWS:

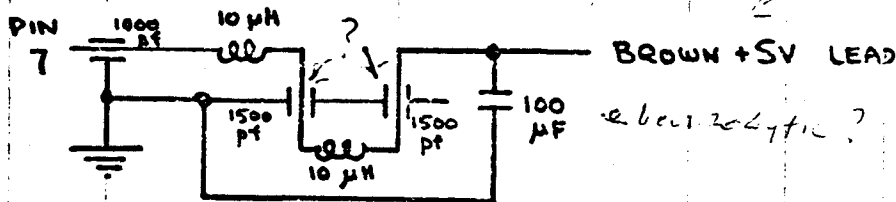


THIS GIVES ~70dB
ATTEN AT 3.8MHz

DONE

5. WARBLE OR BIRDIE REDUCTIONS - COUNTER BD. (A7)

- a) PUT 100Ω 1/4 W SERIES RESISTORS INSIDE OF COUNTER SHIELD ON LEADS 4, 8, 13, 14, 15, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1
- b) PUT 5V FILTER INSIDE OF CAN



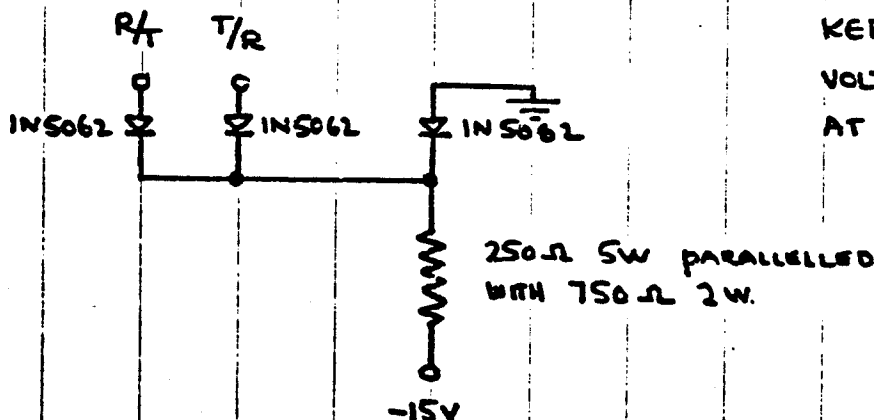
- c) INSTALL DRILLED AND TAPPED 1/2" AL ANGLE AT BACK OF COUNTER SHIELD TO MAKE GOOD ELEC. CONNECTION ALONG TOP BACK TO SHIELD TOP.
- d) DRESS PRESELECTOR CAPACITOR LEAD TO LIE FLAT AGAINST CHASSIS. *where? (see cap itself)*

6. RF DRIVE

- a) RF DRIVE BD. (A5, 2)
REMOVE C28
SHORT OUT L4
- b) POWER AMP BD. (A10)
REPLACE R1 BY 1000μH CHOKE
- c) PUT 1mh. FROM DRIVE CABLE TO AMPL. GRID.

DONE ✓

7. VOLTAGE CONTROL ON R/T AND T/R LINES (POWER SUPPLY BD (A3))

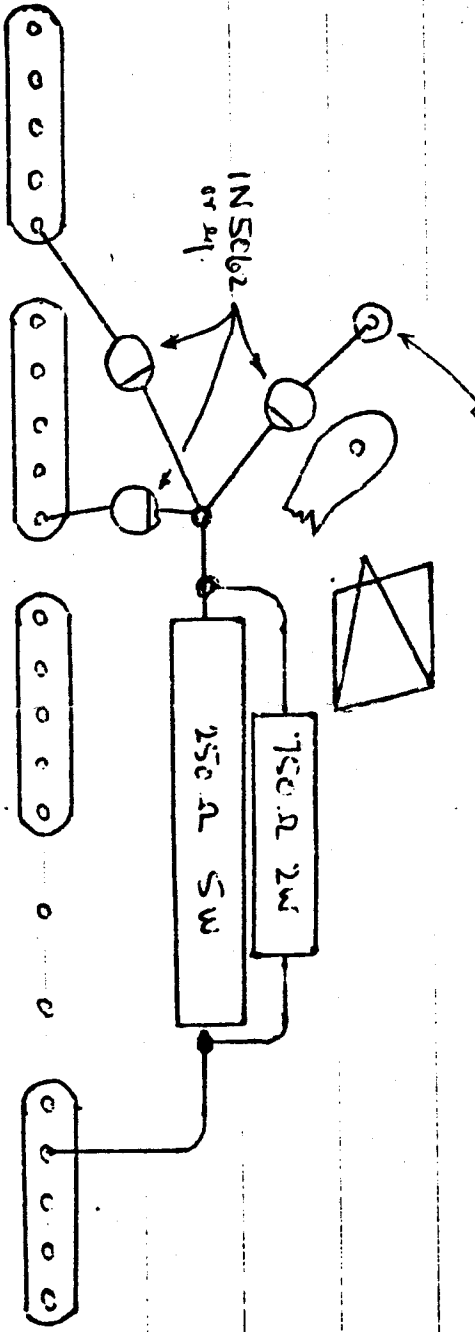


KEEPS R + T VOLTAGE MAXIMA AT GROUND.

Done

VOLTAGE CONTROL WIRING

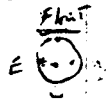
GRAY GREEN RED (15V) WH WH BLUE (-15V)



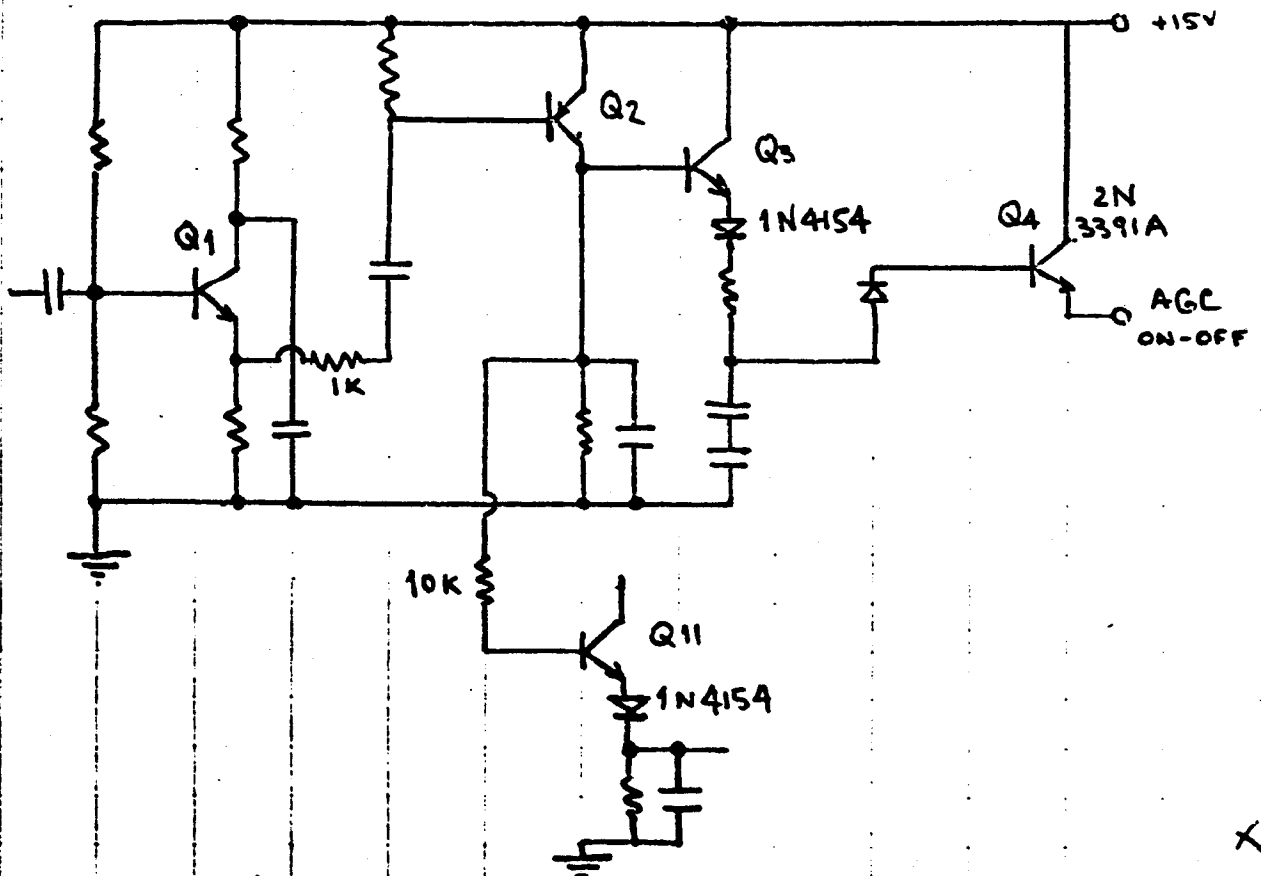
THIS GROUND DIRECTLY UNDER END LEAD OF CR10

Bottom of Power Supply A3

DONE 8. AGC BOARD MODS. (A9)



- ✓ a) REPLACE Q4 by 2N3391A. (HIGH β PREVENTS DRAIN OF HIGH-Z BASE TIME CONSTANT)
- ✓ b) PUT 1N4154 IN SERIES WITH Q3 EMITTER (PREVENTS B-E FAULT AT HIGH DRIVE LEVELS)
- ✓ c) PUT 1K IN SERIES WITH COUPLING CAPACITOR Q1c TO Q2b (IMPROVES INPUT LOADING OF Q1 - REDUCED DISTORTION AT PRODUCT DETECTOR)
- ✓ ~~10K~~ d) PUT 10K IN SERIES WITH Q11b (MAKES Q2, Q11 BEHAVE WITH STRONG SIGNALS)
- ✓ e) PUT 1N4154 IN SERIES WITH Q11e (PREVENTS EXCESSIVE e-b VOLTAGE AT HIGH DRIVE LEVELS)
- ✓ f) REPLACE R19 by 150 Ω , R18 by 1800 Ω (IMPROVES AUDIO DISTORTION)



9. A/TO FREQUENCY SHIFT

CAUSED BY A CHANGE IN IC2-A4 POWER SUPPLY FROM -15 V TO T/R VOLTAGE. THIS CHANGES THE LOAD ON THE 43 MHE OSCILLATOR ENOUGH TO PULL ITS FREQUENCY SLIGHTLY.

CURE IS AS FOLLOWS (ALL ON P3 BOARD)

a) TOP WIRING

- 1) BREAK LEAD FROM TERM. 7 TO PIN 13 - A/TO SWITCH
- 2) JUMPER TERM. 7 TO TERM. 1 NEAR TERMINAL STRIP

b) BOTTOM WIRING

- 1) BREAK LEADS ON BOTH SIDES OF PIN 13 - A/TO SWITCH
- 2) JUMPER PIN 4 TO PIN 10 - A/TO SWITCH
- 3) INSTALL SELECTED RESISTOR (ABOUT 300 Ω) PIN 13 TO PIN 4 - A/TO SWITCH. BEST VALUE SELECTED BY ZERO TONE CHANGE (CW SIGNAL) SWITCHING FROM A TO A/TO.

ABOVE WIRING - REFER TO NEXT TWO LAYOUT SHEETS

10.

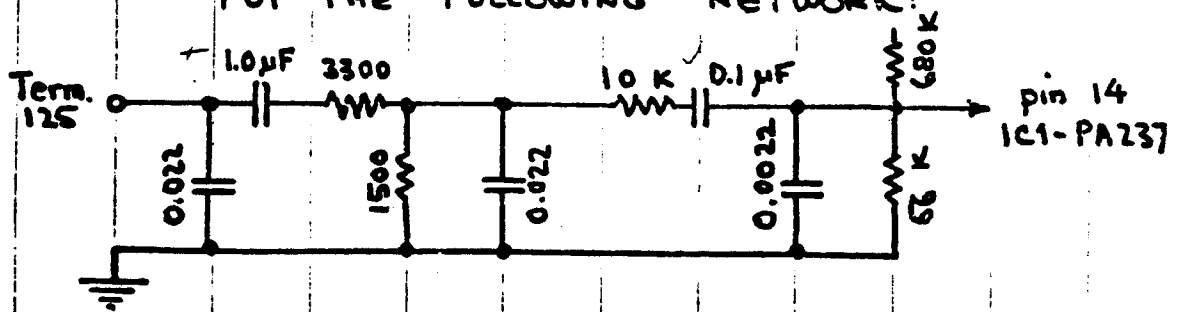
Done

AUDIO MODIFICATIONS (PROBLEMS - DISTORTION, FREQUENCY RESPONSE AND HUM AND HISS)

a) POWER SUPPLY BD.

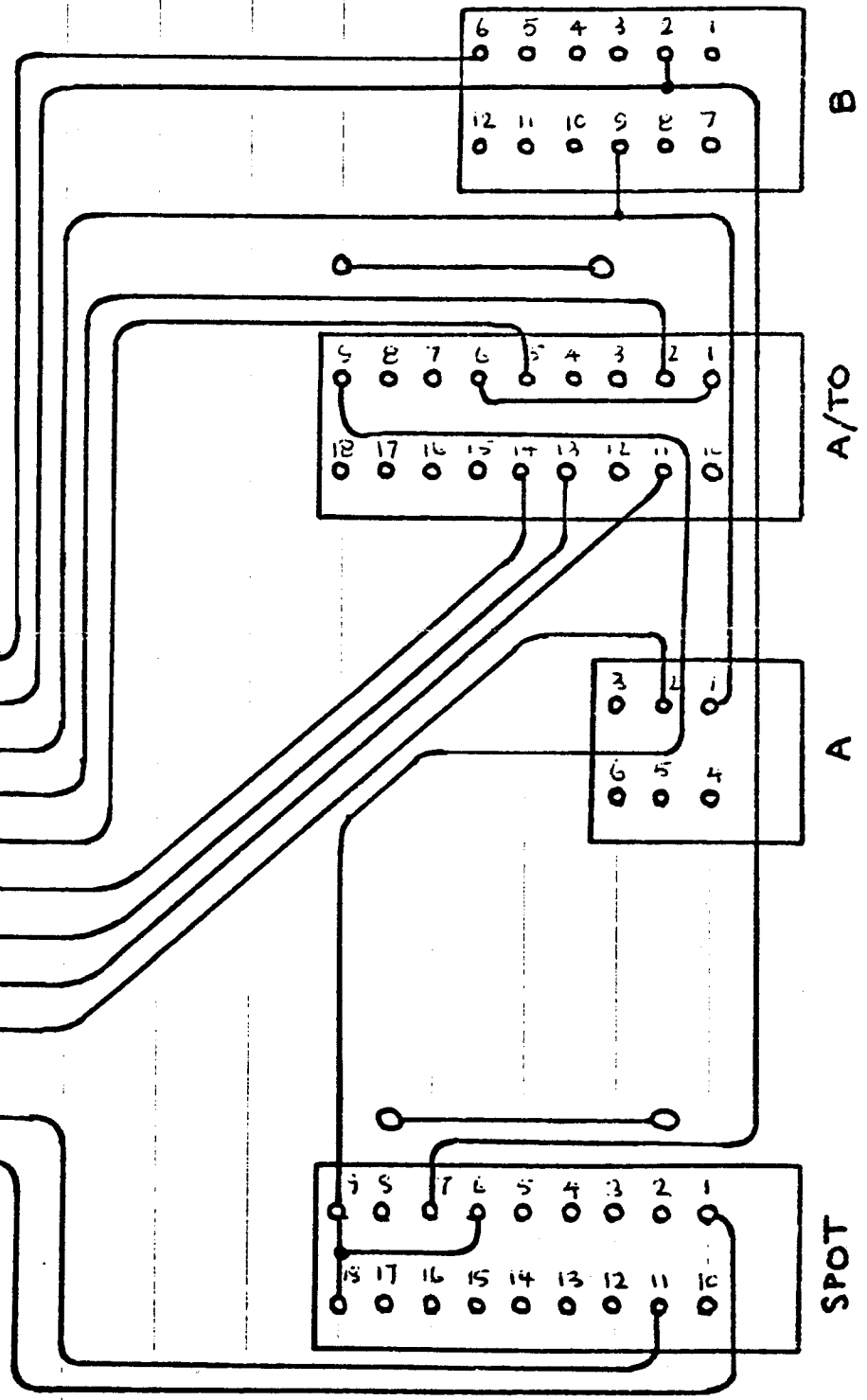
- 1) REMOVE C14, C20, C21, R42
- 2) BETWEEN TERM. 125 AND PIN 14 - IC1 (PA237)

PUT THE FOLLOWING NETWORK:



9. CONT

	TO	VIA	
			1
A8-419	172	2	2
S5-B1	268	3	3
A8-412	167	4	4
A8-411	166	5	5
A4-206	104	6	6
A8-402	165	7	7
TB1-10	280	8	8
A4-205	103	9	9
A8-417	170	10	10
S5-A1	265	11	11
C43	153	12	12
TB1-14	278		

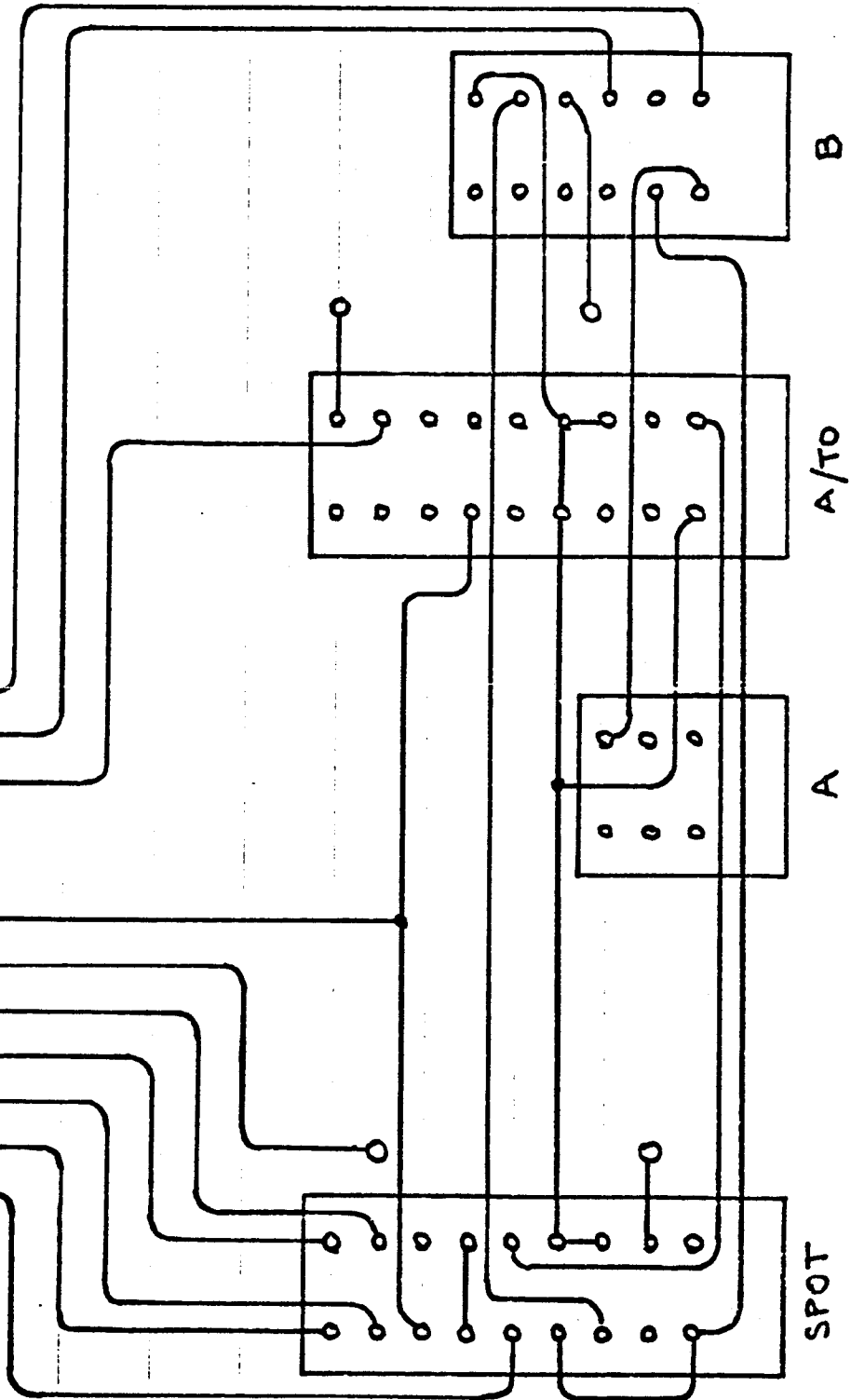


TOP WIRING P3 (TOP VIEW)

9 CONT

TO	VIA
SS-B6	253
SS-A6	261
C 47	159
TB1-15	286
A4-221	117
A1-84	13
TB1-6	284
A4-219	115
J5-21	220

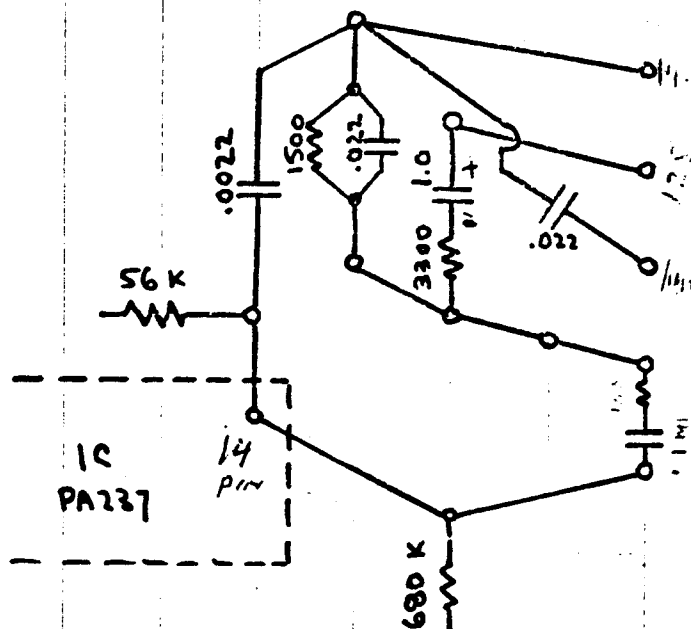
A C
 B O
 C O
 D O
 E O
 F O
 H O
 J O
 K O
 L O
 M O
 N O



BOTTOM WIRING P3 (TOP VIEW)

10. cont.
done

3) PHYSICAL PLACEMENT ABOUT AS FOLLOWS:
(UNDERSIDE OF BOARD)



b) AGC BD.

- 1) REPLACE R19 WITH 150 Ω (SEE 8g)
- 2) REPLACE R18 WITH 1800 Ω (SEE 8g)

c) AUDIO BD. A6

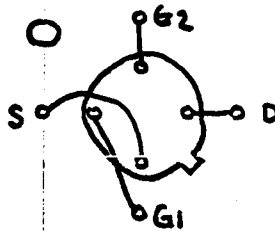
- 1) REMOVE 0.01 FROM G Q9 TO GROUND NOISE TRAZZ.

d) HUM REDUCTION

- 1) REMOVE S1C (TRANSMIT) SWITCH; DISCONNECT S1C-2 (BOTH WIRES), TAPE THEM UP. CONNECT (NEW) COAXIAL CENTER CONDUCTOR TO S1C-2 AND REASSEMBLE (SHIELD NOT CONNECTED)
- 2) THE OTHER END OF THIS COAX GOES TO S8C-6 (OLD WIRE REMOVED AND TAPED). SHIELD CONNECTED TO NEW COAX SHIELD IN d)3).
- 3) NEW COAX FROM S8C-6 TO PTT (J2-3) (OLD WIRE REMOVED AND TAPED). SHIELD GROUNDED AT J2-2, CONNECTED TO SHIELD OF COAX IN d)2).

11. PTO - BOTH A AND B

- a) REMOVE HARMONIC FILTER CAREFULLY FOR REASSEMBLY
OUTSIDE BOX: $R_{12}, R_{13}, C_{17}, C_{18}, L_3$
- b) REMOVE: $R_{10}, R_4, R_8, R_7, R_9, R_5, R_3, C_9, C_7, C_{11}, Q_2$
- c) PTO A ONLY, REMOVE CR1, WHITE LEAD BD. TERM 6 TO BOX TERM 1
- d) REPLACE: 1K IN R_{10} , 56K IN R_4 , 150 IN R_8 , JUMPERS IN R_7, C_9, C_{11}
- e) REMOVE LEADS BD. TERMS. 1, 2, 4, 5 PAGE 411
- f) RESEAT Q_3 LOWER (TOP $< 3/8$ " FROM BD.)
- g) DRILL + TAP 4-40 HOLE IN BACK PLATE IN LINE $1/4$ " FROM TERM 1
- h) UNDERSIDE OF BD. ISOLATE OLD CASE PIN ON Q_2
- i) INSTALL 40603 IN Q_2 , LEADS AS FOLLOWS:



NOTE REVERSED
G1 AND S LEADS

- j) UNDERSIDE: FROM G2- Q_2 PUT 10K TO -15V, 2K TO GROUND, 0.01 TO GROUND.
- k) REPLACE C_7 : TWISTED INSULATED WIRE CAP, APT $1\frac{1}{2}$ " LONG
- l) PUT 1K FROM FSK BD LEAD TO BOX TERM 1 (PTO B)
- m) PUT 150 Ω BD. TERM 1 TO BOX TERM 2 (-15V)
- n) PUT 47 Ω BD. TERM 2 TO BOX TERM 3
- o) PUT INTERNAL FLAT AL SHIELD ($3/8$ " METAL STANDOFFS) OVER ENTIRE AREA OF Q_3 (APT. $2" \times 7\frac{1}{2}"$)
- p) PUT 10K BD. TERM 4 TO BOX TERM 4
- q) PUT 100 μ H BD. TERM 5 TO BOX TERM 5
- r) REASSEMBLE HARMONIC FILTER OUTSIDE OF BOX BACK PLATE USING TAPPED HOLE FOR GROUND LUG. INPUT TO BOX TERM 3, OUTPUT TO BOX TERM 7
- s) CONNECT 150 Ω TO BOX TERM 3 FOR PTO TO COUNTER
- t) ADJUST C_7 BY CLIPPING LENGTH TO GET $1.0 \pm 10\%$ VOLTS P-P ON TERM. 7.

done

12. FRONT END CIRCUIT MODS.

a) INPUT TRANSFORMERS ALL CHANGED:

T1: REMOVE AND REWIRE PRIMARY FROM 2 TO 3 TURNS (FINAL 3t/58t). REPLACE C2 BY 150 pf.

T2: REMOVE AND REWIRE TO 4t/36t. ROUTE 7 MHz FEED LEAD S7F TO TAP POINT. ROUTE 7 MHz HOT LEAD TO HOT TRANSFORMER END

T3, T4: REMOVE T3, C5, C6, T4, C9, C10, C12, C13 AND LEADS FROM S7E, S7F. MAKE NEW COIL #16 WIRE ON 3/8" MANDREL TAP 1 IS 1 3/4t TO INPUT (ALL 14, 21, 28, 29 CONTACTS ON S7F. TAP 2 IS 8 1/4t (TOTAL) TO OUTPUT (ALL 14, 21, 28, 29 CONTACTS ON S7E). TOP END OF COIL IS 8 1/4t GOING TO ALL 14, 21, 28, 29 CONTACTS ON S7D (PRESELECTOR)

b) REWIRE S7G FOR SEPARATE LOADS ON 14, 21, 28 AND 29. THEY SHOULD BE:

14: 10 μH IN PARALLEL 1200 Ω

21: 4.7 " 1600 Ω

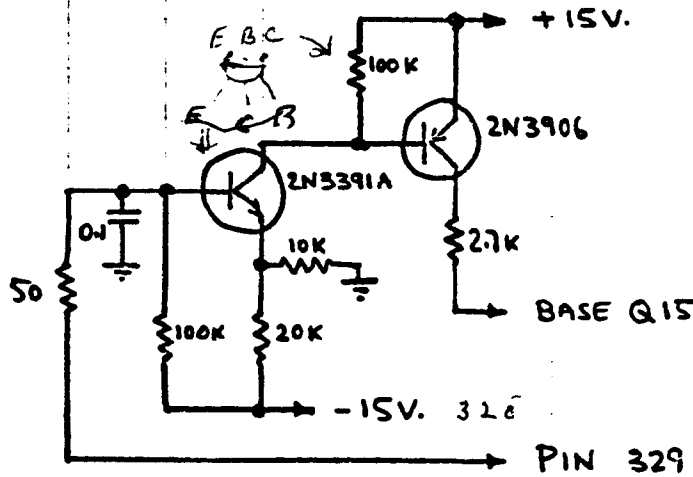
28, 29: 2.2 " 2200 Ω (2 ON S7B, 1 ON S7D)

Done

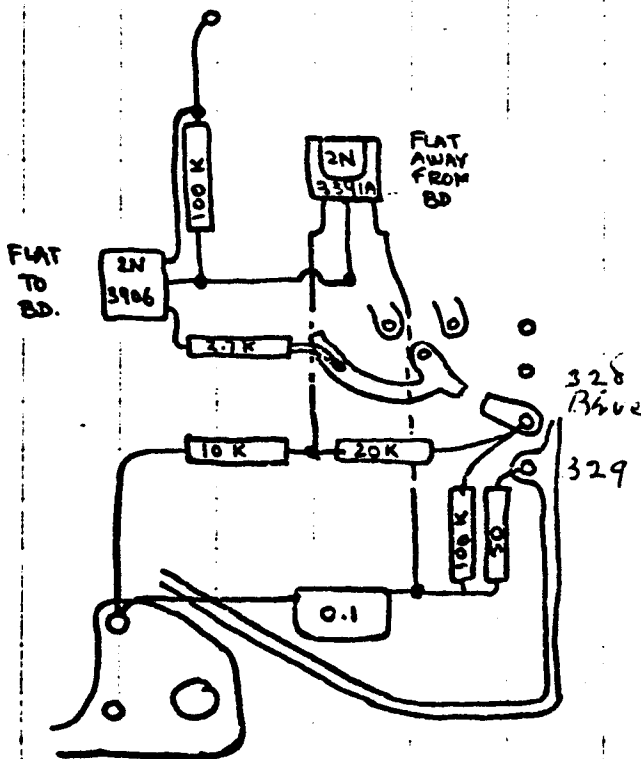
B. CW KEYING MODS.

✓ a) AUDIO BOARD : ADD THE FOLLOWING (UNDER BOARD)

- 1) OPEN CKT FROM BASE Q15 TO PIN 329
- 2) ADD:



APPROX. LAYOUT:



WITH THIS ARRANGEMENT

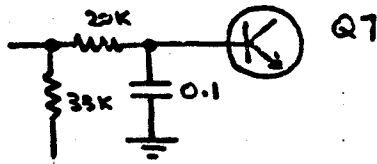
KEY PULSE = FRONT + BACK

RELAY = F + 1 1/2 ms.
B + 9 ms.

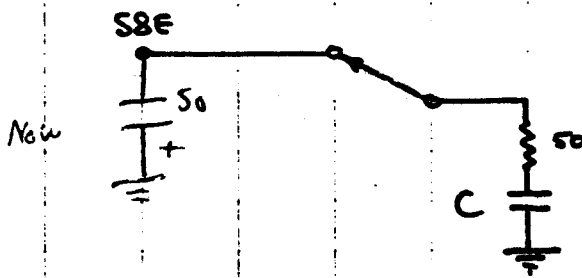
RF = F + 6 1/2 ms. (START)
F + 10 ms. (80% of TOP)
B + 1 1/2 ms. (START DOWN)
B + 3 1/2 ms. (OFF)

Conv 13. (cont)

- ✓ b) ON RF DRIVER BD:
NEAR Q7 REPLACE C44 WITH 1.0μF
BETWEEN BASE Q7 AND FEEDPOINT INSTALL:



- ✓ c) REMOVE C17 (50μF) FROM SWITCH S8E
- ✓ d) RUN AWIRE FROM SAME S8E SWITCHPOINT TO A SWITCH ON BACK PANEL (INSTALL NEXT TO SIDETONE)



? why switch?

IN UP POSITION gives VOX
Keying to use linear with
Foot Switch

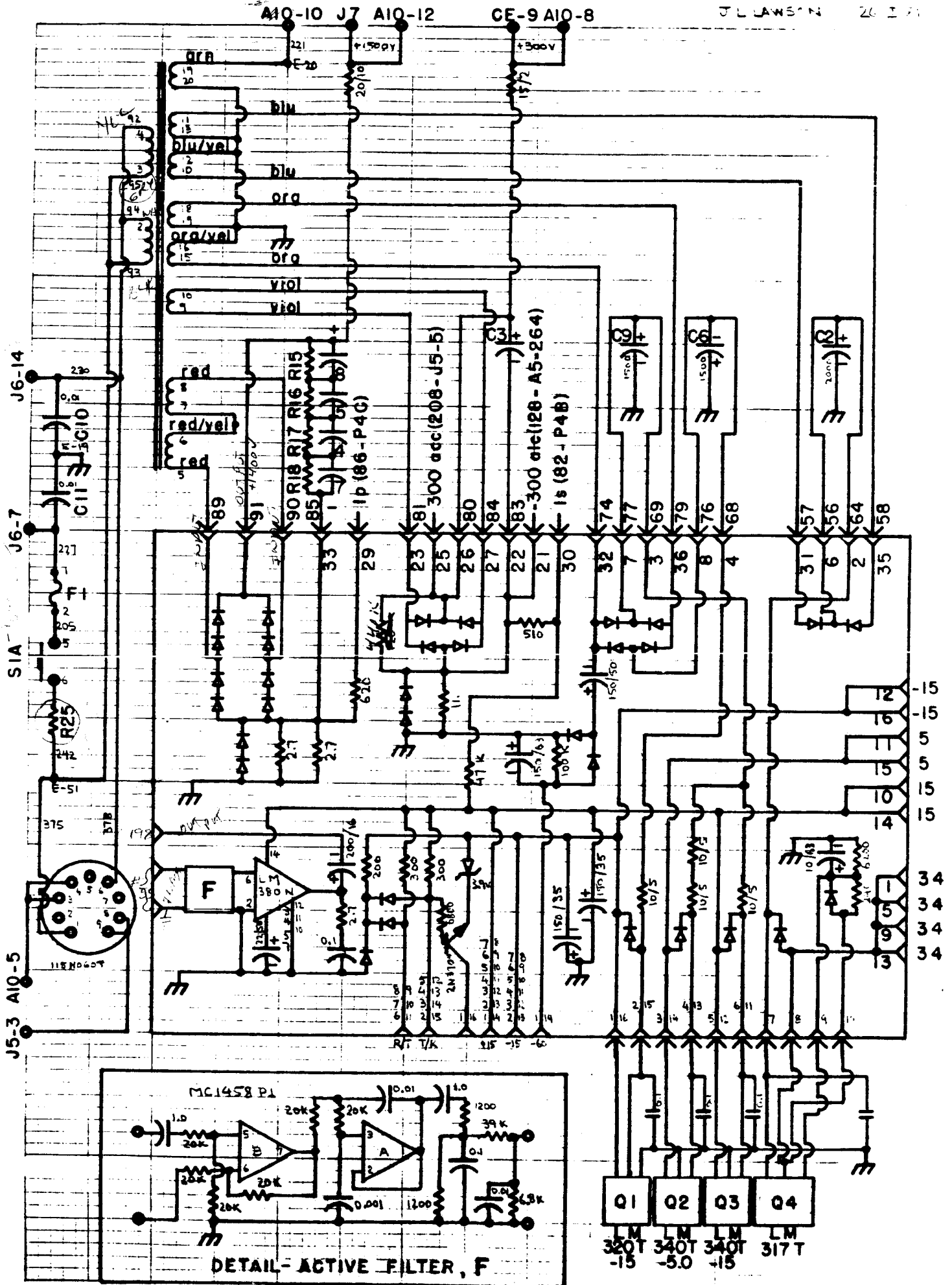
ELCARS? & + To 1/2? FOOT SWITCH
GROUNDING LUG DOWN POSITION
IS FULL BREAK IN

- ✓ C SHOULD BE ABOUT 10μF FOR SLOW "VOX"
KEYING (LAST 1/2 SEC DELAY)

" ON/AY
ALPHAS Ha.
Full Break in Rel

Conv 14

Changed MIL-06B socket (3/16") to
1/8" 3 cond jack for Mic. (J2) MHR
5/28/89



DETAIL - ACTIVE FILTER, F

Q1 LM 320T -15
 Q2 LM 340T -5.0
 Q3 LM 340T +15
 Q4 LM 317T

TRANSFORMER T1 (POWER)

TERMINAL	VOLTAGE	COLOR	WIRE #	A3 (OLD) TO	A3A (NEW) TO
1 •	110	BLK	93	A3-164	# 95, 249, 375
2		WH	94	A3-165	# 92, 230, 378
3 •	110	GRY	95	A3-166	
4		YEL	92	A3-163	
5 •	550	RED	89	A3-160	A3
6		RED/YEL	87	A3-159	CAPPED
7 •	550	RED/YEL	88	A3-159	CAPPED
8		RED	90	A3-161	A3
9	230	VIOL	81	A3-153	A3
10		VIOL	84	A3-156	A3
11	37	BLU	57	A3-128	A3
12	}	BLU/YEL	368	GND-E2	SAME
13					
14	37	BLU	58	A3-129	A3
15	21	ORG	74	A3-146	A3
16	}	ORG/YEL	370	GND-E2	SAME
17					
18	21	ORG	79	A3-151	A3
19		GRN	228	E20, #446 → J6-8	E20, 221 → A10
20		GRN	371	GND-E2	SAME

NOTE: # 230 → E19 → J6-14 (HOT AC PWR)
249 → E51 (COLD AC PWR)

TRANSFORMER T2 (AUDIO) - (ORIGINAL)

TERMINAL	COLOR	WIRE #	TO	
1	BRN	59	A3-130	AUDIO IN (HOT) NOTE: # 190
2	BLU	54	A3-124	AUDIO IN (COLD) FROM J2-1
3	ORG		J13-2	(GND) AUDIO OUT (COLD) TO J1-2
4	VIOL	SPLICE 198	J1-1	AUDIO OUT (HOT)
5	YEL	SPLICE WH	J6-4	ALT. AUDIO (COLD)
6	GRN	CAPPED		
7	BLK	SPLICE WH	J6-5	ALT. AUDIO (HOT)

DC SUPPLIES
A3

1. +34V

CAPACITOR

IN #56 → C2-1

OUT #64 → C2-1

DC REAR

#61 → J6-12

#207 → J5-4 → J5-5 → A5-251

#380 → A10-3

#483 → A9-507

2. +15V

CAPACITOR

IN #77 → C9-1

OUT #69 → C9-1

DC REAR

#209 → J5-6

FRONT (8)

3. +5V

DC REAR

#157 → C36

#211 → J5-8

4. -15V

CAPACITOR

IN #68 → C6-2

OUT #76 → C6-2

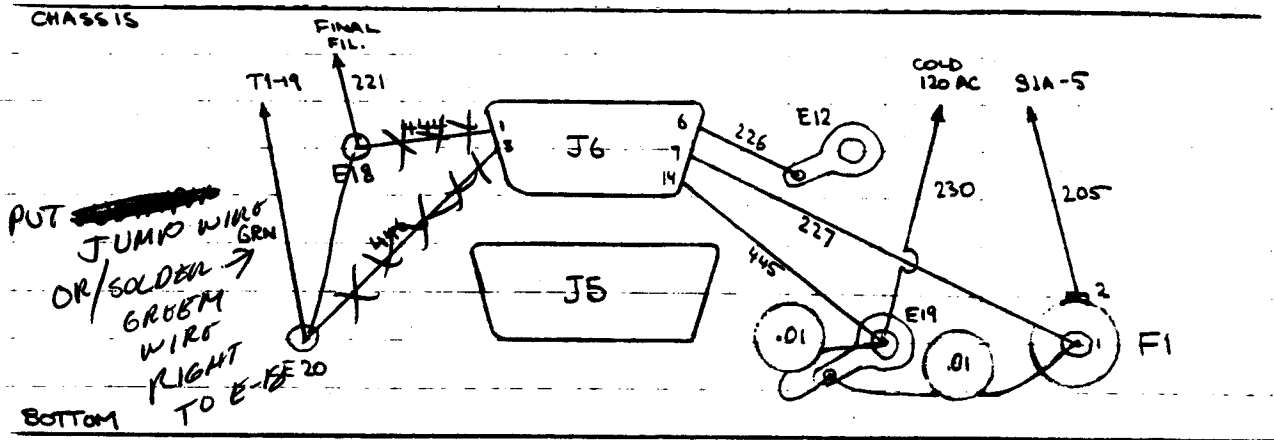
DC REAR

#210 → J5-7

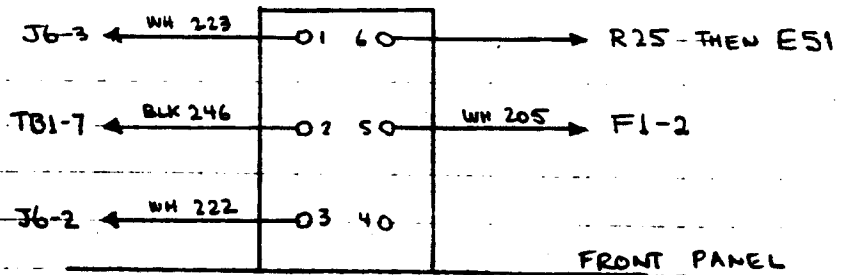
FRONT (10)

5. -60V

DC FRONT #42 → A5-261



VIEW OF INSIDE CONNECTIONS TO J6



TOP VIEW OF SIA POWER SWITCH

NEW
POWER SUPPLY A3A.

1. REMOVE OLD A3 BOARD

TOP
BOTTOM OF BOARD

VOX ADJ.

2. REMOVE T2

OR PREVIOUS

POWER

PLUG FOR BRCT

PIN 5
225

PIN 4
(224)

- a. 2 LEADS TO J6 (REMOVE FROM J6) # 225/224 FROM J6
- b. 2 SPICED LEADS TO J1-1, J13-2 (NEW AUDIO OUT) (YEL/BLK)
- c. 2 LEADS TO A3 - 124/130 (REMOVE) - ONLY T2 LEADS! #59, #54

3. SEPARATE ALL T1 WIRES

4. REROUTE COAX LEADS TO J8, 9, 10, 11 - TIE TO J7 TO ALLOW NEW HEAT SINK.

5. REMOVE WIRES

- a. 62 } TO Q4
- 63 } 374 WAS C2-1 → Q 64 WAS A3 138 - C21 (STILL THERE)
- 374 }
- b. 72 } TO Q1
- 73 } 78 }
- c. 70 } TO Q2
- 71 } 75 }
- a. 65 } TO Q3 (LABELED 56!)
- 66 }
- 67 }

18
47

6. PREPARE J6 (SEE INSTRUCTIONS)

7. TRIM ALL APPLICABLE WIRES AND CONNECT TO NEW PLUGS WITH NEW A3A BOARD IN PLACE

8. SPLICED / CAP POWER INPUT AND TD RELAY WIRES. CAP SPLICED RED/YEL T1 - 6 AND 7

9. INSTALL PROTECTIVE RESISTORS IN OUTPUT OF 1400 AND 300 V SUPPLIES ALREADY INSTALLED

10. INSTALL AND WIRE NEW REGULATOR HEATSINK

11. IF POSSIBLE INSTALL NEW J-6 AND POWER CABLE, (A NEW J-6 COULD HAVE BETTER POWER CONTACTS!) DOBS ~~IS~~ NOT MATTER

NOTE: ✓ A VOX R11 : #53 - GROUND #198
#60 TO JCT AUDIO FROM A3A
AND J1-1
NEW WIRE J1-1 TO ABOVE JCT.

A3A BOARD CONNECTIONS

AUDIO

✓ # 55	COAX INPUT	2
✓ # 54 (198)	OUTPUT	1

REGULATORS

10 (USES 16 W. FLAT CABLE)

MOLEX (36 PIN)

34C	# 56	→ C2-1
34C	# 64	→ C2-1
15C	# 77	→ C9-1
15C	# 69	→ C9-1
-15C	# 68	→ C6-2
-15C	# 76	→ C6-2
+34	# 120	→ A5-251
	# 207	→ J5-4
	# 380	→ A10-3
	# 483	→ A9-507
+15	# 209	→ J5-6
+5	# 157	→ C36
	# 211	→ J5-8
-15	# 210	→ J5-7
	# 14	→ A2-52
+300	# 208	→ J5-5
	# 80	→ C3-1
-300	# 128	→ A5-264
	# 83	→ C3-2
I _s	# 82	→ P4-B
I _p	# 86	→ P4-C
-1400C	# 85	→ C7-2