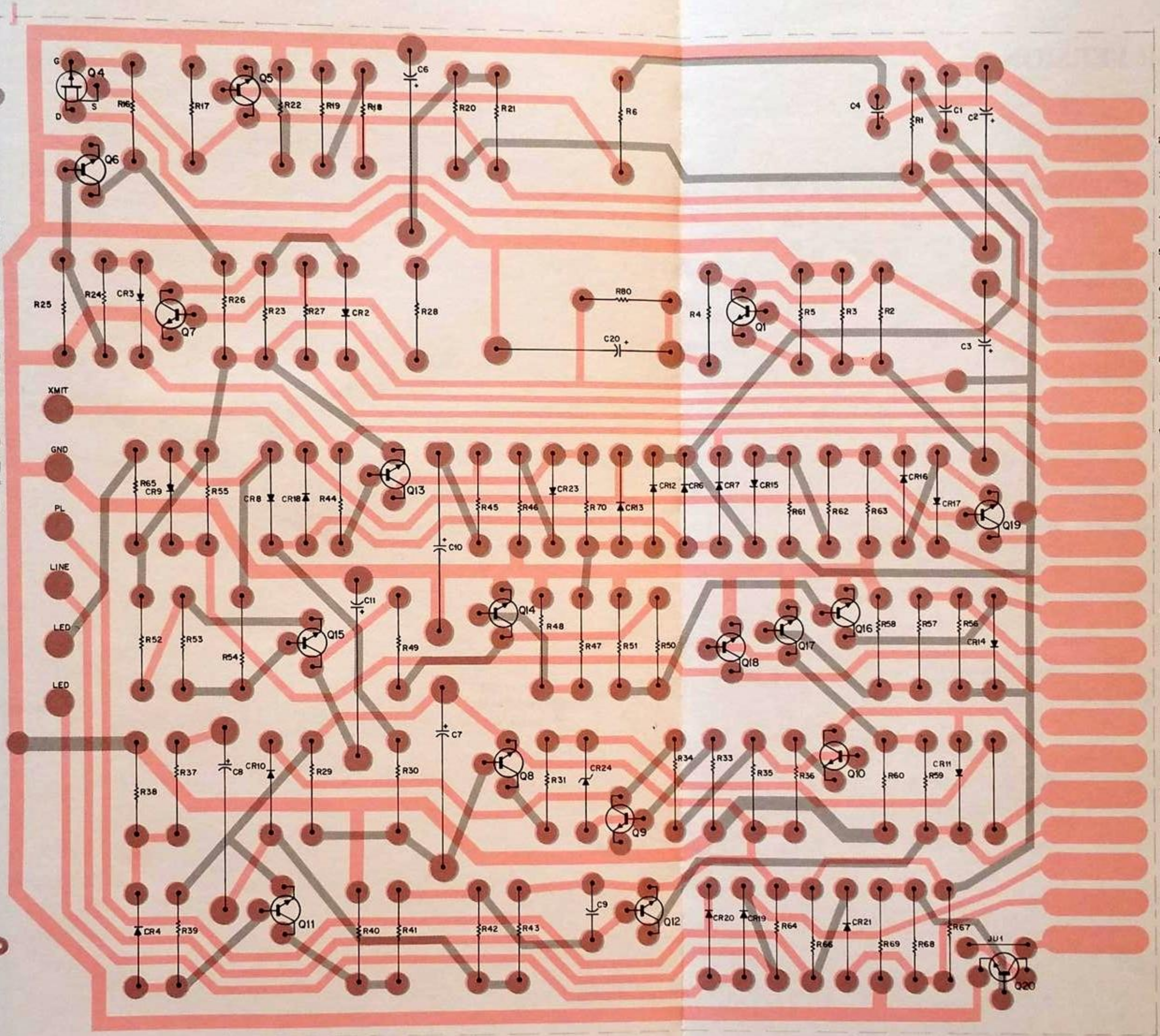
LATER VERSION

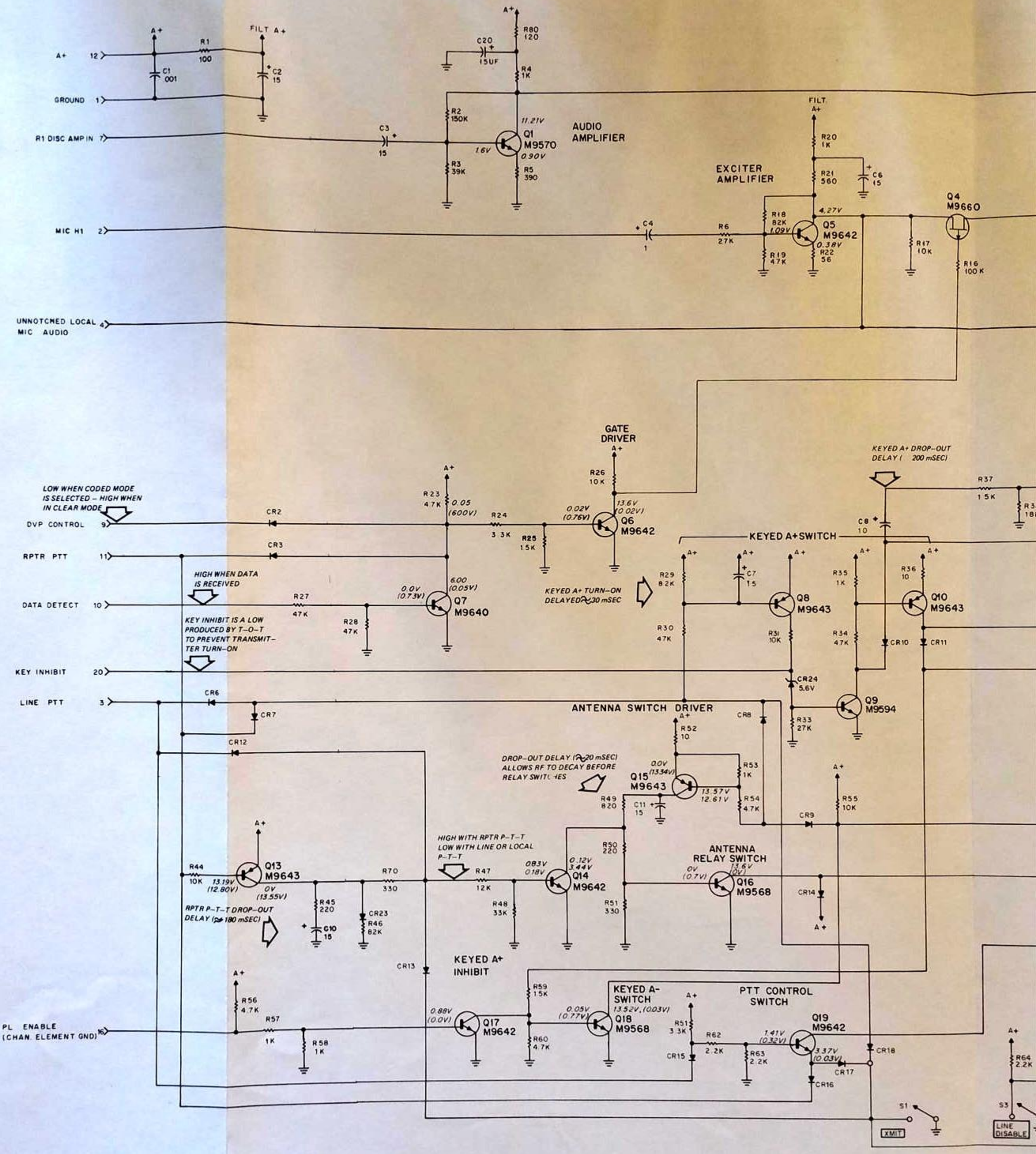
EARLIER VERSION SHOWN ON BACK

84D84800L01 AB



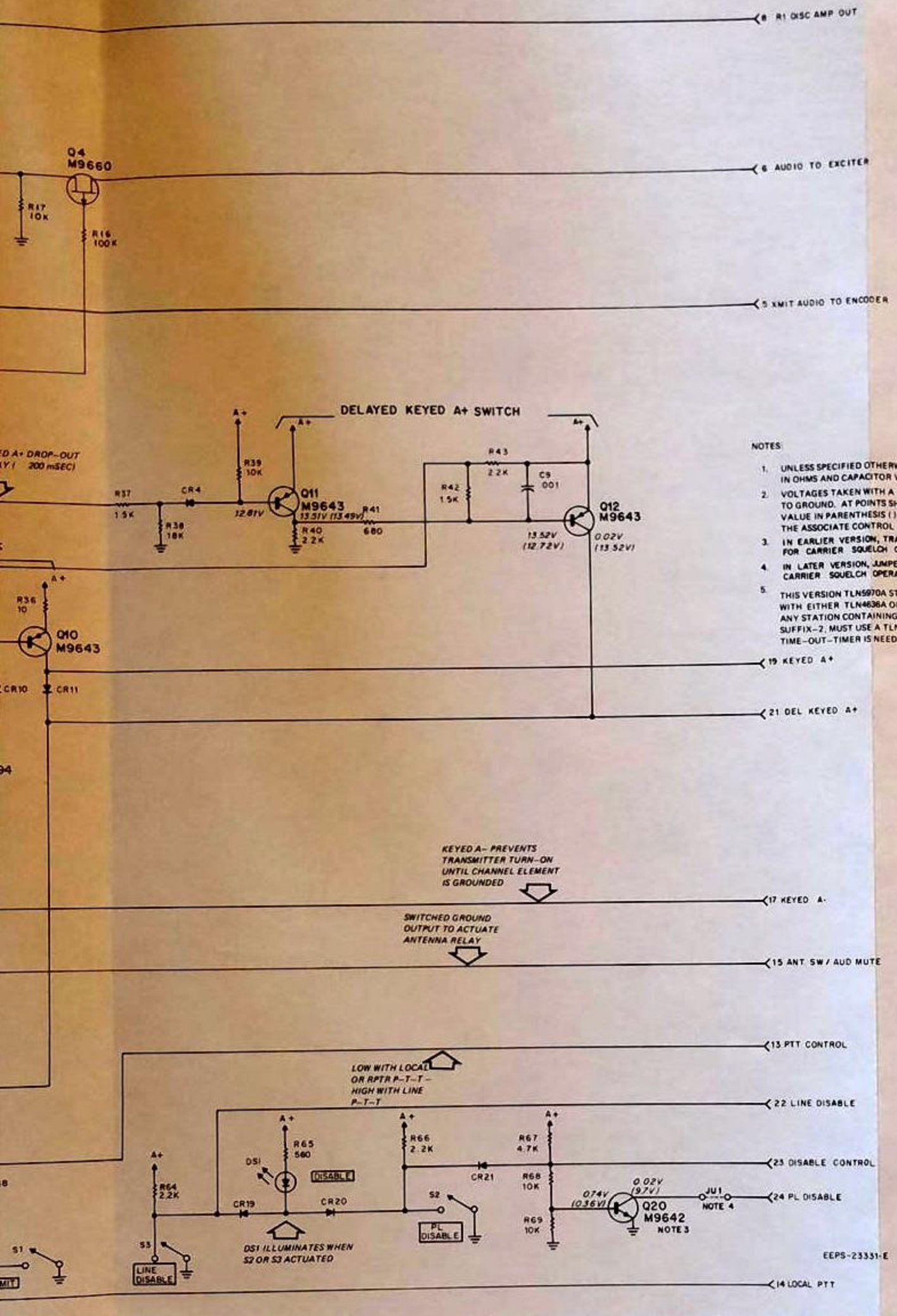
SHOWN FROM COMPONENT SIDE

COMPONENT SIDE — BD-DEPS-25492-A
SOLDER SIDE — BD-DEPS-25493-A
OL-DEPS-25494-B


A+
FILT A+
R1
100
C1
001
C2
15
12
GROUND 1
R1 DISC AMP IN 7
C3
15
R2
150K
R3
39K
R80
120
C20
15UF
R4
1K
R5
390
11.21V
Q1
M9570
0.90V
1.6V
AUDIO
AMPLIFIER
MIC H1 2
C4
1
R6
27K
EXCITER
AMPLIFIER
R20
1K
R21
560
C6
15
R18
82K
1.09V
Q5
M9642
0.38V
R22
56
R19
47K
4.27V
Q4
M9660
R17
10K
R16
100K
UNNOTCHED LOCAL
MIC AUDIO 4
LOW WHEN CODED MODE
IS SELECTED – HIGH WHEN
IN CLEAR MODE
DVP CONTROL 9
RPTR PTT 11
DATA DETECT 10
KEY INHIBIT 20
LINE PTT 3
CR2
CR3
CR6
CR7
CR12
HIGH WHEN DATA
IS RECEIVED
KEY INHIBIT IS A LOW
PRODUCED BY T–O–T
TO PREVENT TRANSMIT–
TER TURN–ON
R23
47K
0.05
(600V)
R24
3.3K
R25
15K
R27
47K
R28
47K
0.0V
(0.73V)
6.00
(0.05V)
Q7
M9640
GATE
DRIVER
R26
10K
0.02V
(0.76V)
13.6V
(0.02V)
Q6
M9642
KEYED A+ TURN–ON
DELAYED ≈30 mSEC
KEYED A+ DROP–OUT
DELAY (200 mSEC)
R37
1.5K
C8
10
KEYED A+SWITCH
R29
82K
C7
15
Q8
M9643
R30
47K
R31
10K
R35
1K
R36
10
Q10
M9643
R34
47K
CR10
CR11
CR24
5.6V
R33
27K
Q9
M9594
ANTENNA SWITCH DRIVER
CR8
R52
10
DROP–OUT DELAY (≈20 mSEC)
ALLOWS RF TO DECAY BEFORE
RELAY SWITCHES
Q15
M9643
0.0V
(1.334V)
13.57V
12.61V
R53
1K
R54
4.7K
R49
820
C11
15
R55
10K
CR9
R50
220
R51
330
ANTENNA
RELAY SWITCH
Q16
M9568
0V
(0.7V)
13.6V
(0V)
CR14
R44
10K
13.19V
(12.80V)
0V
(13.55V)
Q13
M9643
R70
330
R45
220
C10
15
CR23
R46
82K
RPTR P–T–T DROP–OUT
DELAY (≈180 mSEC)
HIGH WITH RPTR P–T–T
LOW WITH LINE OR LOCAL
P–T–T
R47
12K
R48
33K
0.83V
0.18V
0.12V
3.44V
Q14
M9642
KEYED A+
INHIBIT
CR13
R56
4.7K
R57
1K
R58
1K
PL ENABLE
(CHAN. ELEMENT GND) 16
0.88V
(0.0V)
Q17
M9642
R59
1.5K
R60
4.7K
KEYED A–
SWITCH
13.52V, (0.03V)
Q18
M9568
0.05V
(0.77V)
PTT CONTROL
SWITCH
R51
3.3K
R62
2.2K
CR15
R63
2.2K
1.41V
(0.32V)
Q19
M9642
3.37V
(0.03V)
CR16
CR17
CR18
R64
2.2K
S1
XMIT
S3
LINE
DISABLE

STATION CONTROL MODULE

MODEL TLN5970A



NOTES:

1. UNLESS SPECIFIED OTHERWISE, RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES ARE IN MICROFARADS.
2. VOLTAGES TAKEN WITH A DC VOLTMETER REFERENCED TO GROUND. AT POINTS SHOWING TWO VOLTAGES, THE VALUE IN PARENTHESIS ( ) RESULTS FROM ACTIVATING THE ASSOCIATE CONTROL FUNCTION.
3. IN EARLIER VERSION, TRANSISTOR Q20 IS REMOVED FOR CARRIER SQUELCH OPERATION.
4. IN LATER VERSION, JUMPER JU1 IS REMOVED FOR CARRIER SQUELCH OPERATION.
5. THIS VERSION TLN5970A STATION CONTROL MODULE PROVIDES COMPATIBILITY WITH EITHER TLN4636A OF TRN8684B TIME-OUT-TIMER MODULE OPERATION. ANY STATION CONTAINING A TLN5970A CONTROL STATION CONTROL MODULE EARLIER THAN SUFFIX-2, MUST USE A TLN4636A TIME-OUT-TIMER IF A NEW OR REPLACEMENT TIME-OUT-TIMER IS NEEDED.

FUNCTION

--Integrates control functions from other modules to key the station transmitter.

--Amplifies receiver discriminator signals which are used externally.

--Sets audio paths as dictated by the mode selected

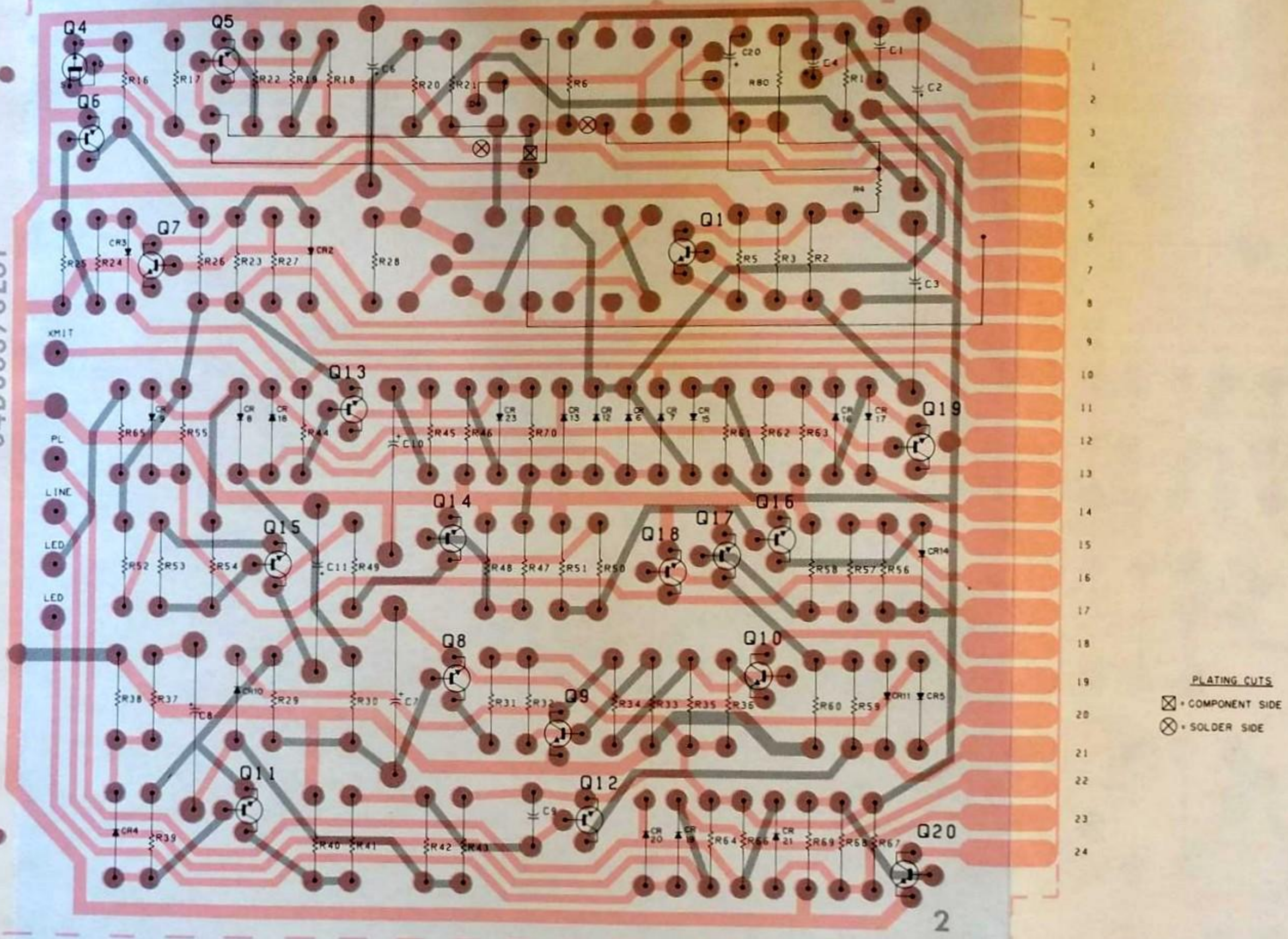
--Provides front panel controls for local operation or maintenance purposes.

PARTS LIST SHOWN ON BACK

68P81035E58-C

5/30/85- **UP**

EARLIER VERSION



SHOWN FROM COMPONENT SIDE

COMPONENT SIDE BD-DEPS-23258-0
SOLDER SIDE BD-DEPS-23259-0
OL-DEPS-23309-B

FUNCTIONAL DESCRIPTION

The station control module provides the switching interface between the tone control modules and the transmitter-receiver units. Clear local and line transmit audio signals are gated to the exciter via this module also.

To activate the transmitter, the following sequences of events must occur. A PTT input (line, local, or repeater) initializes three separate switching circuits. One circuit is used to derive keyed A+, delayed keyed A+, and keyed A-. The first stage turned on by any of the three PTT's is Q8 which provides a high to turn on Q9. If however, pin 20 (key inhibit) is low, Q9 is prevented from conducting which in turn shuts down the transmitter. Key inhibit is produced by the time-out-timer (if used) to prevent the transmitter from remaining on the air in case of a continuous PTT. Once Q9 has been turned on, Q10 and Q12 simultaneously switch to provide keyed A+ (pin 19) and delayed keyed A+ (pin 21). These two outputs are used to turn on Q18 (keyed A- switch) unless prevented by the lack of channel element ground (pin 16). If no channel element ground is present, Q17 is turned on and prevents Q18 from turning on. Keyed A- is available on pin 17 of the module.

Another circuit, activated by line or local PTT, is used to drive antenna relay switch Q16. The PTT function turns on Q15 and Q16 which provides a switch ground on pin 15 to activate the antenna relay. If however, a repeater PTT is present, Q13 and 14 are turned on providing a low to Q16 which inhibits the antenna switch.

The third circuit, activated by local or repeater PTT, is used to derive PTT control (pin 13). Local or repeater PTT provides a switched ground to the emitter of PTT control switch Q19. This turns Q19 on which provides a switched ground at pin 13. Line PTT prevents Q19 from turning on which prevents PTT control.

Upon the release of any of the three PTT's, a delay network (C8, R37, R38, and Q11) allows delayed keyed A+ to remain for an additional 150 msec. This supplies drive to Q18 which keeps keyed A- on for the additional 150 msec. In addition, Q15 is held on to provide drive to Q16 which keeps antenna switch active for the additional 150 msec. The purpose of this delay is to provide time for EOM or reverse PL burst to be sent at the end of every transmission.

Another delay network (C10, R47, R48) is used to prevent the occurrence of antenna switching following repeater PTT. Q14 is enabled for approximately 200 msec following repeater PTT to prevent Q16 from turning on during the delayed keyed A+ period.

Line transmit audio enters the module on pin 2, is applied by Q5 and exists the module either via pin 5 (audio to be encoded) or through audio gate Q4 to pin 6 (audio to be transmitter clear). When either a data detect (pin 10), *DVP* control (pin 9), or RPTR PTT (pin 11) is active, Q4 turns off, preventing audio from reaching pin 6.

Local mic audio enters the module on pin 4 and either exists directly on pin 5 or is gated through Q4 to pin 6 in the same manner as line audio.

R1 discriminator audio enters the module on pin 7, is amplified, and then set out on pin 8 where it is routed to the squelch gate module for the squelch detector.

The line disable switch prevents line PTT from occurring in the guard tone decoder. The PL disable switch provides a low on pin 23 and a high on pin 24. Note that on carrier squelch stations Q20 must be removed. PL disable allows the user to monitor the receive channel.

PARTS LIST

TLN5970A Station Control Module — PL-5437-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITORS, fixed:
C1,9	21-83596E01	.001 uF ±10%; 500 V
C2,3	23-82783B13	15 uF ±5%; 25 V
C4,12	23-84538G14	1.0 uF ±10%; 35 V
C6,7	23-82783B13	15 uF ±5%; 25 V
C8	23-82783B27	10 uF ±10%; 25 V
C9	21-83596E01	.001 uF ±10%; 500 V
C10,11	23-82783B13	15 uF ±15%; 25 V
C20	23-82783B13	15 uF ±10%; 25 V
		DIODES: (SEE NOTE)
CR2 thru 4 6 thru 21, 23	48-83654H01	silicon
CR22	48-88245C08	LED, red
CR24	48-82256C12	silicon
		TRANSISTOR: (SEE NOTE)
Q1	48-869570	NPN; type M9570
Q4	48-869660	FET; type M9660
Q5,6,7	48-869642	NPN; type M9642
Q8	48-869643	PNP; type M9643
Q9	48-869594	NPN; type M9594
Q10 thru 13	48-869643	PNP; type M9643
Q14	48-869642	NPN; type M9642
Q15	48-869643	PNP; type M9643
Q16,18	48-869568	NPN; type M9568
Q17	48-869642	NPN; type M9642
Q19,20	48-869642	NPN; type M9642
		RESISTORS, fixed ±10%; 1/4 W; unless otherwise stated
R1	6-124C25	100
R2	6-124D02	150k
R3	6-124C87	39k
R4	6-124C49	1k
R5	6-124C39	390
R6	6-124A83	27k ±5%
R9	6-124C61	3.3k
R16	6-124C97	100k
R17	6-124C73	10k
R18	6-124A95	82k ±5%
R19	6-124A89	47k ±5%
R20	6-124C49	1k
R21	6-124C43	560
R22	6-124A19	56 ±5%
R23	6-124C65	47k
R24	6-124C61	3.3k
R25	6-124C53	1.5k
R26	6-124C73	10k
R27,28	6-124C89	47k
R29	6-124C71	8.2k
R30	6-124C89	47k
R31	6-124A73	10k ±5%
R33	6-124A83	27k ±5%
R34	6-124C65	4.7k
R35	6-124C49	1k
R36	6-124C01	10
R37	6-124C53	1.5k
R38	6-124C79	18k
R39	6-124C73	10k
R40	6-124C57	2.2k
R41	6-124C45	680
R42	6-124C53	1.5k
R43	6-124C57	2.2k
R44	6-124C73	10k
R45	6-124A33	220 ±5%
R46	6-124A95	82k ±5%
R47	6-124A75	12k ±5%
R48	6-124C61	3.3k
R49	6-124C47	820
R50	6-124C33	220
R51	6-124C37	330
R52	6-124C01	10
R53	6-124C49	1k
R54	6-124C65	4.7k
R55	6-124C73	10k
R56	6-124C65	4.7k
R57,58	6-124C49	1k
R59	6-124C53	1.5k
R60	6-124C65	4.7k
R61	6-124A61	3.3k ±5%
R62,63,64	6-124C57	2.2k
R65	6-124C43	560
R66	6-124C57	2.2k
R67	6-124C65	4.7k
R68,69	6-124C73	10k
R70	6-124A37	330 ±5%
R80	6-124A27	120 ±5%
		SWITCHES, slide
S1	40-83468E01	spdt
S2, 3	40-83204B01	dpdt
		VOLTAGE REGULATOR:
VR1	48-82256C12	ZENER, 5.6 V
		MECHANICAL PARTS
	1-80795B14	PANEL ASSEMBLY, includes:
		ref. items S1, 2, 3
	64-83364L01	PANEL
	1-80795B15	CIRCUIT BOARD ASSEMBLY, includes:
	9-83011H11	RECEPTACLE, board mounting; 24 used
	43-865080	BUSHING, threads; 2 used
	3-8022	SCREW, machine; 4-40 x 1/4"; 2 used
	4-7683	WASHER, lock #4 int.; 2 used

NOTE: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

revisions

BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
TLN5970A-2	CR5	DELETED AND REPLACED WITH WIRE JUMPER	KEYED A + SWITCH CIRCUIT
	Q9	FROM 48-869642, M9642 TO: 48-869594, M9594	
	R33	FROM 6-124C57, 2.2k TO: 6-124A83; 27k	
	R31	FROM 6-124A71, 82.k TO: 6-124A73; 10k	
	R32	DELETED	
	VR1	ADDED	