

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED - FM Signal Generator
Oscilloscope
AC VTVM

The following chart shows the center frequency and frequency spread of each version of the TMR series radio. All multi channel radios should be aligned to the channel nearest the center of the range over which they will operate.

Single frequency units should be aligned to the channel installed.

There is no electrical difference in the low band units, except for the center frequency to which they are aligned.

MODEL	CENTER FREQUENCY	FREQUENCY SPREAD
TMR-1 LL	36 MHz	33-39 MHz
TMR-4 LL	"	"
TMR-8 LL	"	"
TMR-12 LL	"	"
TMR-1 LM	39.5 MHz	37-43 MHz
TMR-4 LM	"	"
TMR-8 LM	"	"
TMR-12 LM	"	"
TMR-1 LH	43.5 MHz	41-47 MHz
TMR-4 LH	"	"
TMR-8 LH	"	"
TMR-12 LH	"	"
TMR-1 H	157 MHz	153-161 MHz
TMR-4 H	"	"
TMR-8 H	"	"
TMR-12 H	"	"

During all steps of alignment, the squelch control should be in maximum clockwise position (minimum squelch action).

455 KHZ QUADRATURE DETECTOR ALIGNMENT

1. Connect the FM Signal generator to the antenna input jack. Accurately set frequency to the center of the channel being used for alignment. Modulate signal generator with 1000 Hz, 3KHz deviation.
2. Connect the oscilloscope to point A, (Junction of C122, C123, R116).
3. Adjust output of signal generator until all noise in scope pattern just disappears.
4. Adjust L103 for maximum peak to peak amplitude, while maintaining symmetry of the detected signal.

IF ALIGNMENT.

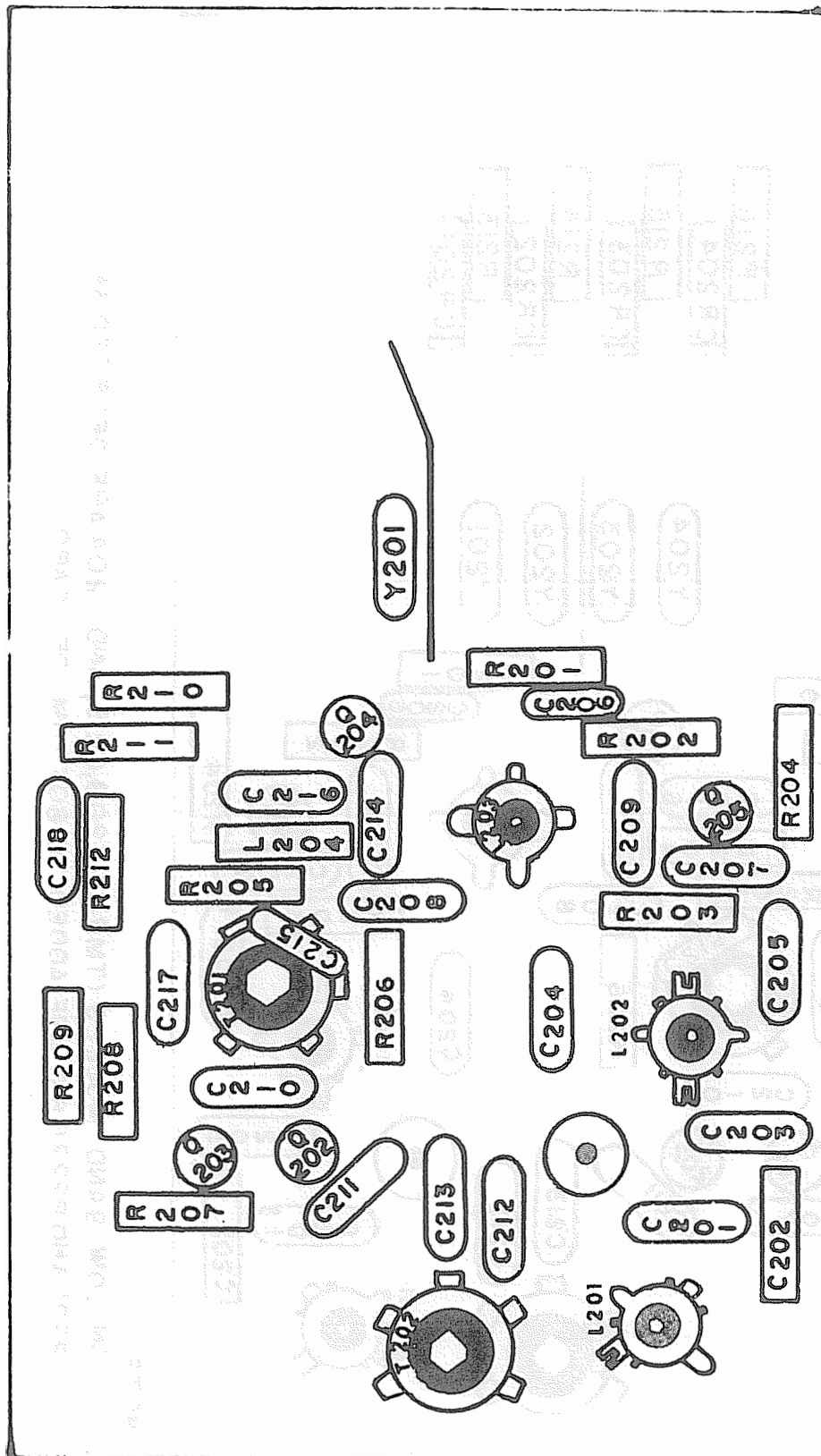
1. Disconnect RF signal generator from antenna input.
2. Connect AC voltmeter across speaker terminals.
3. Adjust volume control for .5 volt noise reading on AC voltmeter.
4. Peak cores of T101 (one core) and T202 (two cores) for maximum noise (maximum reading on AC voltmeter). If the circuits are not badly misaligned, the correct point should be within 2 turns of the slugs present position.
5. Connect the RF generator to the antenna input jack. Turn modulation off. Set the generator frequency to the secondary image frequency. This is 910 KHz below the channel frequency. Note, some receivers have the second oscillator at 11.155 MHz, in this case the image frequency is 910 KHz above the channel frequency. Check the frequency marked on top of the crystal.
6. Adjust the signal generator output until voltmeter reads .2 volts.
7. Adjust T101 for maximum quieting degradation, (Highest meter reading). Adjust signal generator output to maintain voltmeter reading between .1 and .2 volts. The correct position for the slug should be within two turns of the position in step 4.
8. Adjust both cores of T202 for maximum quieting degradation (highest meter reading). Adjust signal generator output to maintain voltmeter reading between .1 and .2 volts. The correct position of the slugs should be within two turns of the position in step 4.

RF ALIGNMENT.

1. Pre-set the slugs of L201, L202, L203 flush with the tops of the coil forms. Pre-set both slugs of T201 flush with the outer ends of the coil form.
2. Connect AC voltmeter across the speaker terminals.
3. With nothing connected to the antenna input, adjust the volume control until AC voltmeter reads 1 volt of noise.
4. Connect signal generator to antenna input jack. Set generator accurately to the center frequency of the channel being used for alignment. Turn modulation off.
5. Adjust output of signal generator until AC voltmeter reads .2 volts.
6. Adjust L201, L202 and L203, in that order, for maximum quieting (lowest meter reading). Adjust signal generator output to maintain voltmeter reading between .1 and .2 volts. Repeat adjustments until no further improvement can be made. If two peaks occur on any slug, use the peak with the slug nearest the top of the coil form.
7. Adjust the top core of T-201 for maximum quieting (lowest meter reading). Adjust signal generator to maintain reading on AC voltmeter between .1 and .2 volts. If two peaks occur, use the one with the slug nearest the top of the coil form.
8. Adjust the bottom core of T201 for maximum quieting. The proper adjustment point should occur within 2 turns of the bottom of the coil form, if no peak occurs, set the slug flush with the bottom of the coil form.

IC NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 101	.70V	0V	0V	.70V	7.5V	0V	4.2V	7.5V	3.32V	3.3V				
IC 102	4.0V	3.5V		1.3V	1.3V	1.3V						3.5V	7.6V	5.0V
IC 301, IC 302, IC 303	0V	.70V	0V	0V	.25V	0V	1.4V	3.6V			D E A C T I V A T E D			
	0V	.70V	0V	0V	1.4V	0V	.25V	3.6V			A C T I V A T E D			

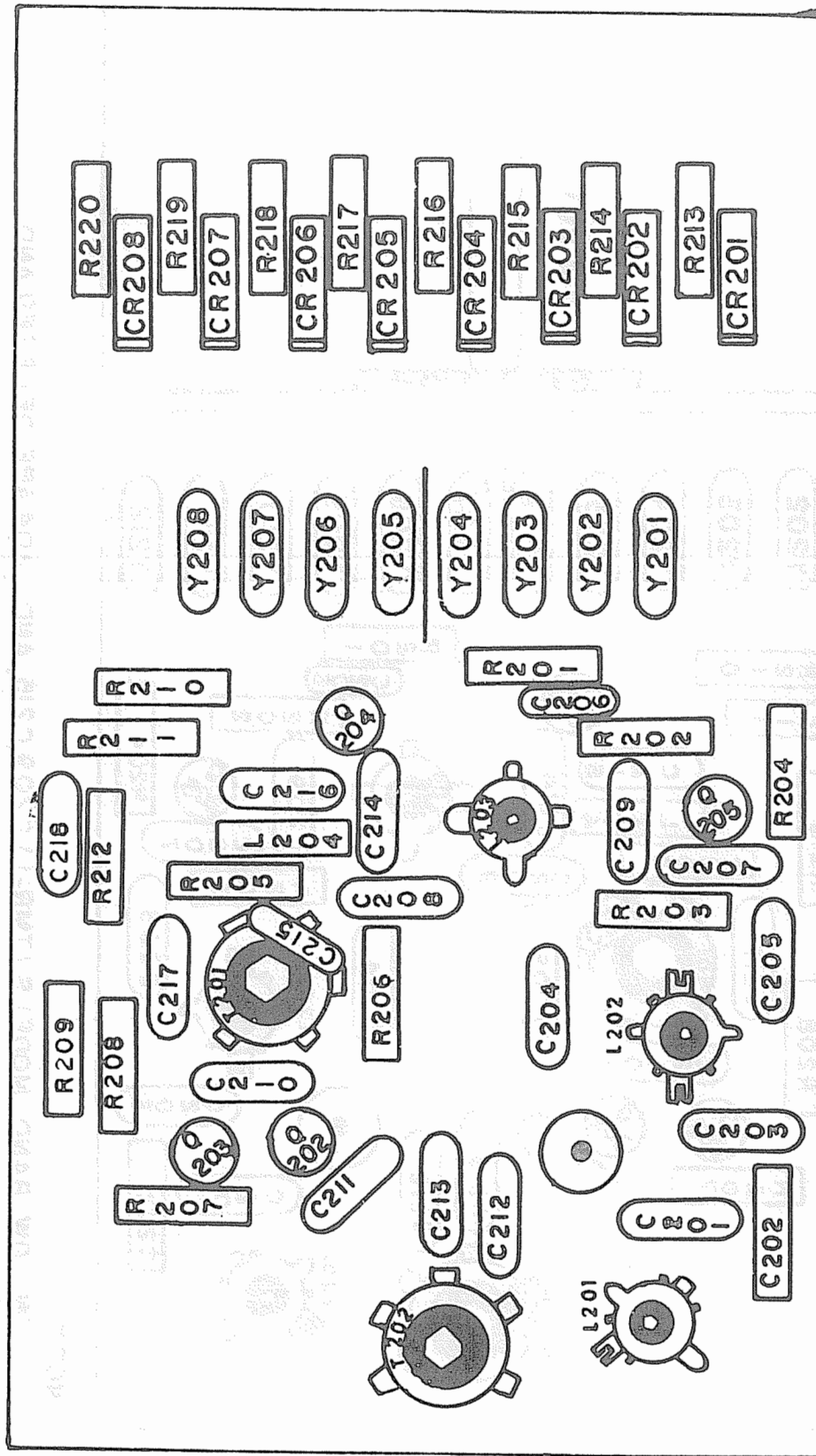
<u>TRANSISTOR</u>	<u>EMITTER</u>	<u>BASE</u>	<u>COLLECTOR</u>
Q201	3.5V	4.3V	6.8V
Q202	1.2V	1.8V	6.4V
Q203	1.2V	1.8V	6.4V
Q204	2.5V	3.2V	7.2V
Q101	3.0V	3.3V	7.5V
Q102	3.8V	4.4V	6.3V
Q103	8.5V 8.5V 8.5V	8.5V 8.5V 8.5V	0V Unsquelled .8V Squelched 1.5V Tight Squelch
Q104	0V 0V 0V	0V Unsquelled .8V Squelched 1.5V Tight Squelch	1.9V Unsquelled .10V Squelched-Scanning
Q105	1.6V Unsquelled 1.1V Squelched- Scanning	1.9V .10V	5.1V 8.3V
Q106	5.8V	6.6V	12.5V
Q107	13V DC Operation 14V AC Operation	12.5V	7.2V
Q108	6.5V	7.2V	.10V
Q109	6.5V 6.5V	7.2V 7.2V	13V DC Operation 14V AC Operation
Q110	0V	.10V	6.5V
Q301 thru 307	.70V Deactivated	.55V	.11V
Q308	.35V Activated	1.3V	.8V
Q309	0V	.55V Deactivated	.70V
Q310	0V	.85V Activated	.35V
Q311	0 0V	.55V Deactivated .10V Activated	.20V 6.2V
Q3 2	.60V Deactivated 3.7V Activated	.10V 3.6V	8.2V 6.3V
Q313	7.3V Deactivated 6.5V Activated	8.2V 6.3V	7.5V 7.5V



NOTE

ON LOW BAND MODELS (TMR-L) C209,C215, AND L204 ARE DELETED AND R221 AND R222(1.8K) ARE ADDED TO BOTTOM OF BOARD.

RF CIRCUIT BOARD, MODEL TMR-1

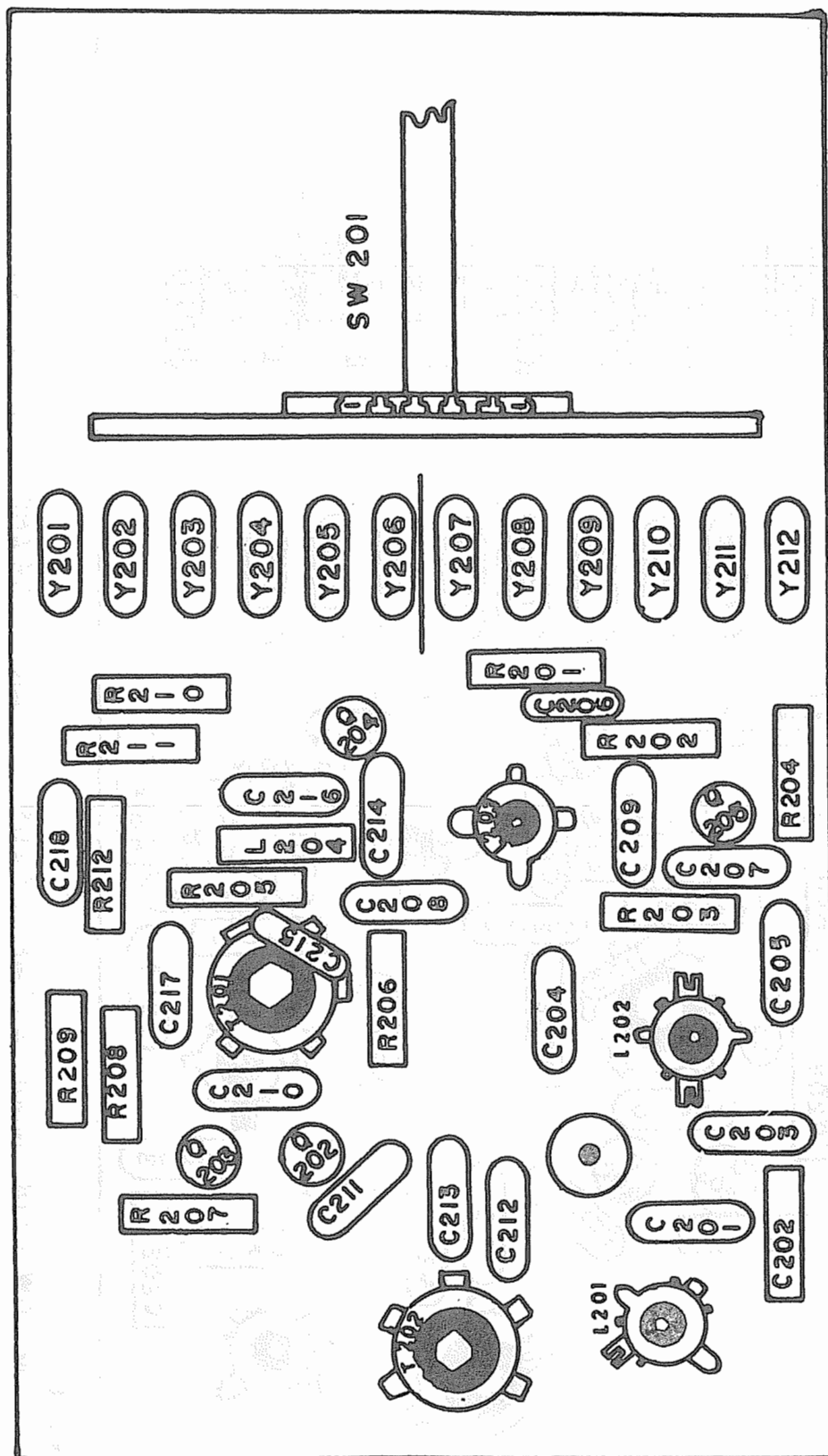


NOTE

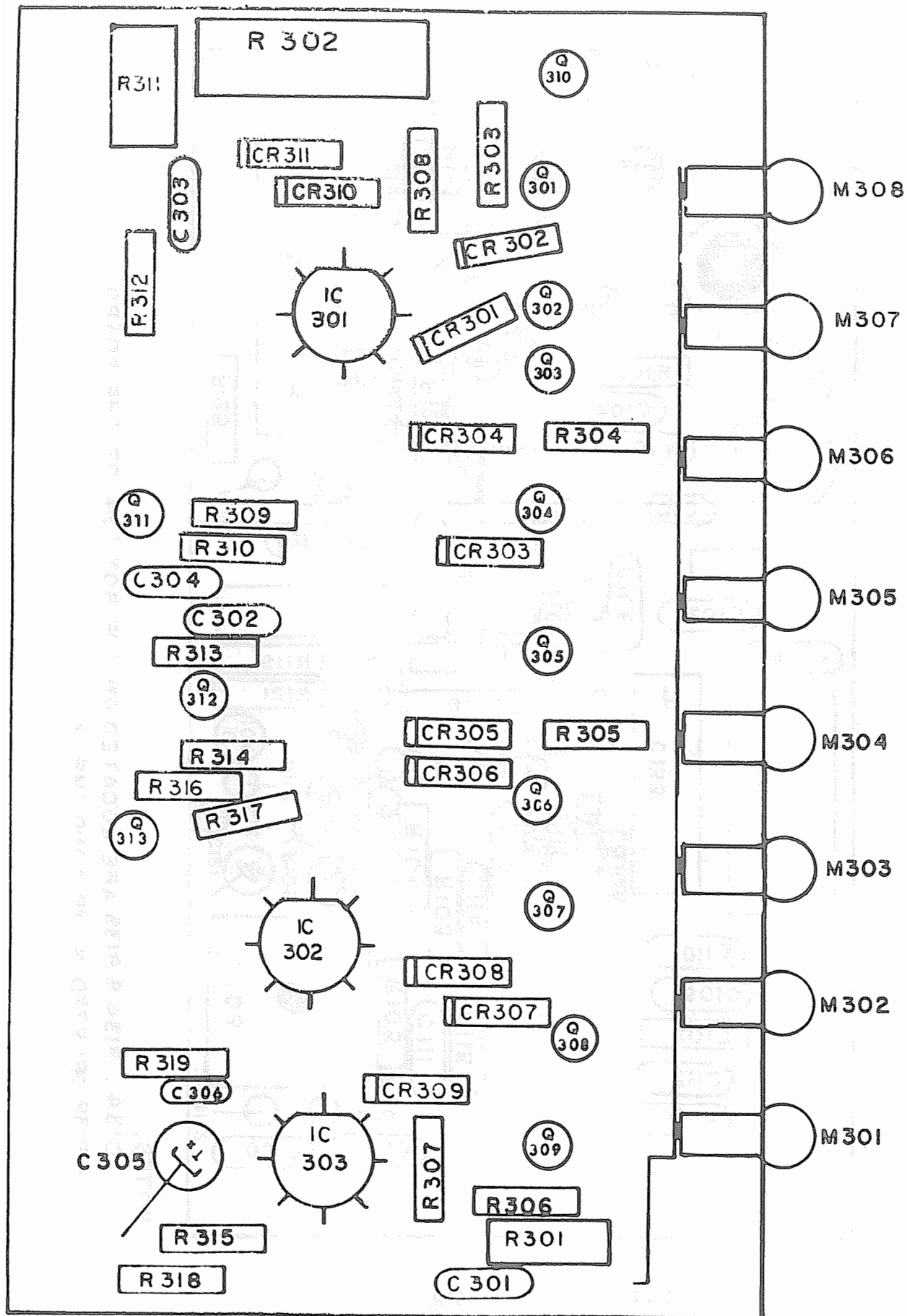
ON LOW BAND MODELS (TMR-L) C209, C215, AND L204 ARE DELETED AND R221 AND R222 (1.8K) ARE ADDED TO BOTTOM OF BOARD.

RF CIRCUIT BOARD, MODEL TMR-8

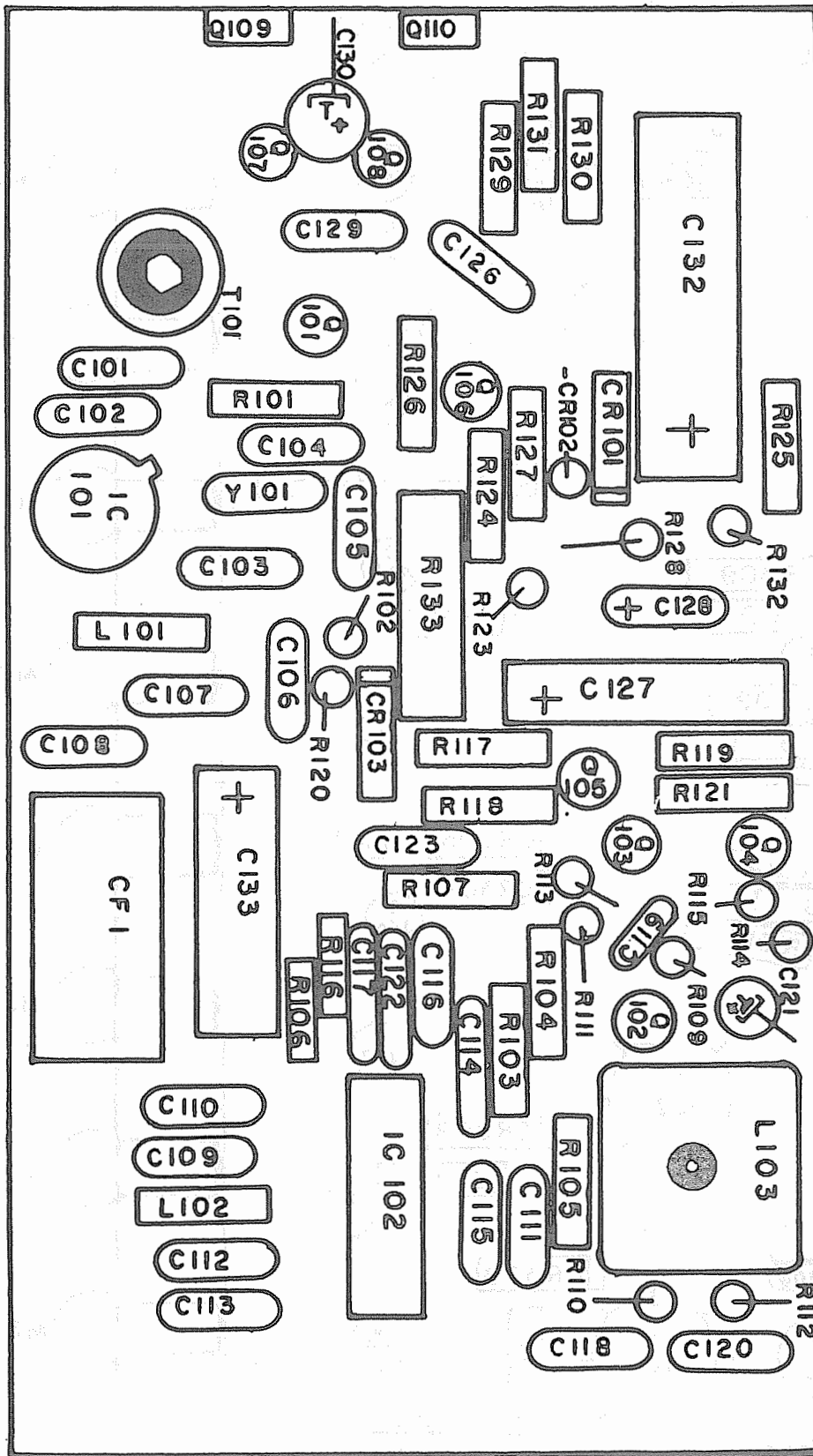
RF CIRCUIT BOARD, MODEL TMR-12



NOTE
ON LOW BAND MODELS (TMR-L) C209, C215, AND L204 ARE DELETED AND
R221 AND R222 (1.8K) ARE ADDED TO BOTTOM OF BOARD.

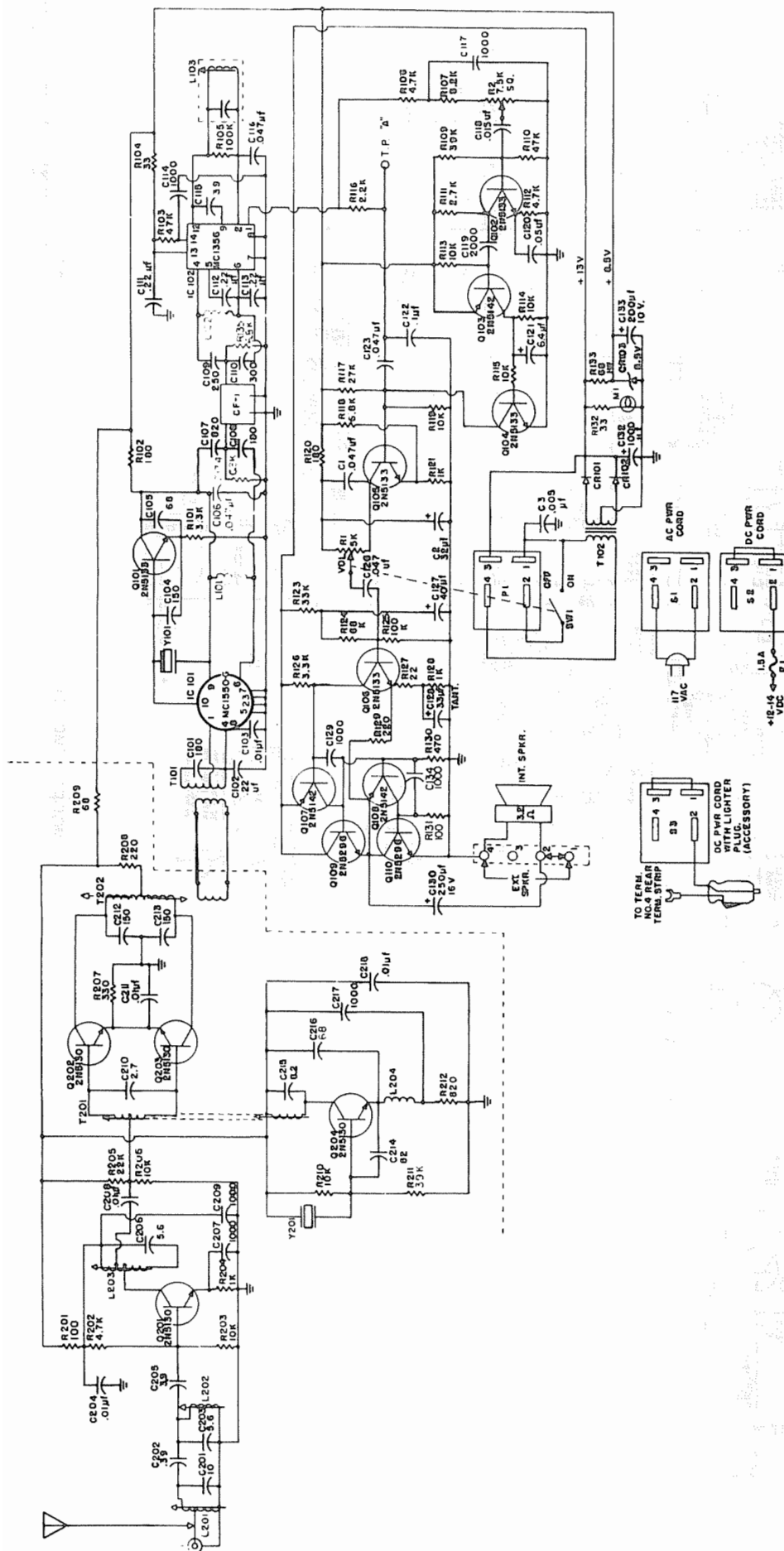


SCANNER CIRCUIT BOARD, MODEL TMR-8



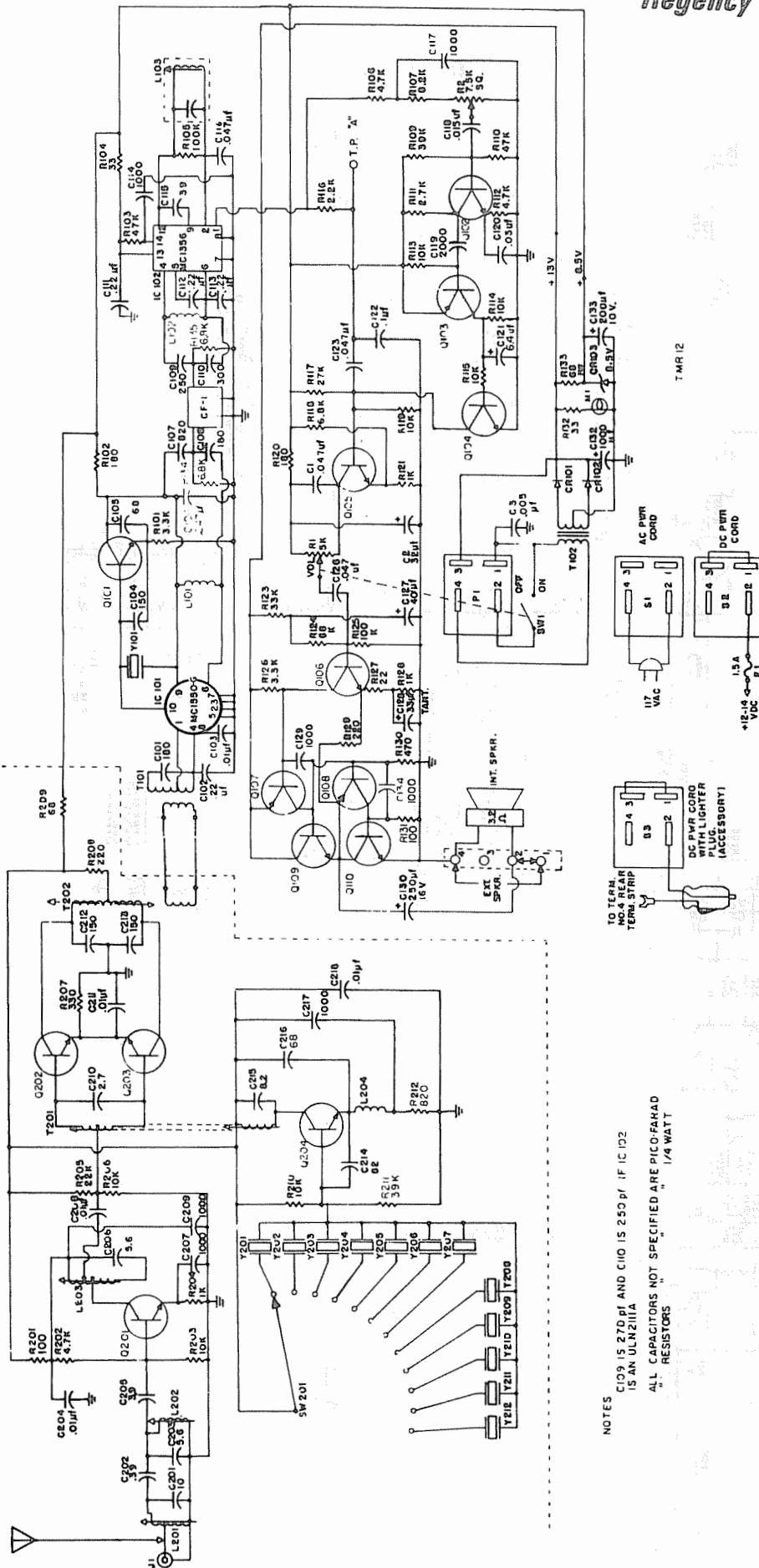
- NOTES:
1. C134 , R134 & R135 ARE LOCATED ON THE BOTTOM OF THE BOARD
 2. R132 DELETED IN TMR-4 AND TMR-12

IF-AUDIO CIRCUIT BOARD



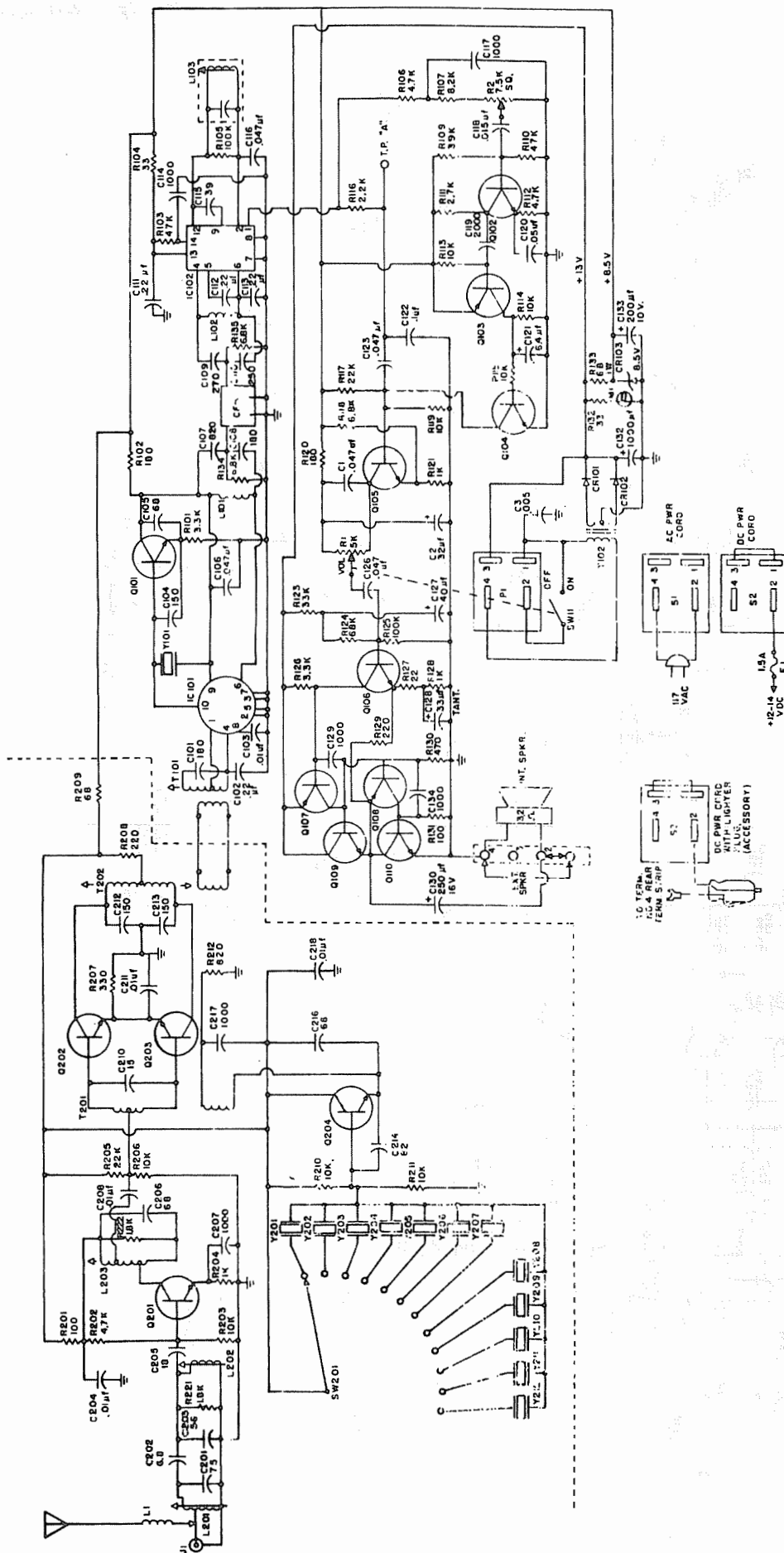
NOTE: C109 IS 270pf AND C110 IS 200pf IF IC102 IS AN ULN2131A
ALL CAPACITORS NOT SPECIFIED ARE PICO-FARAD
RESISTORS = 1/4 WATT

MODEL TMR-7H



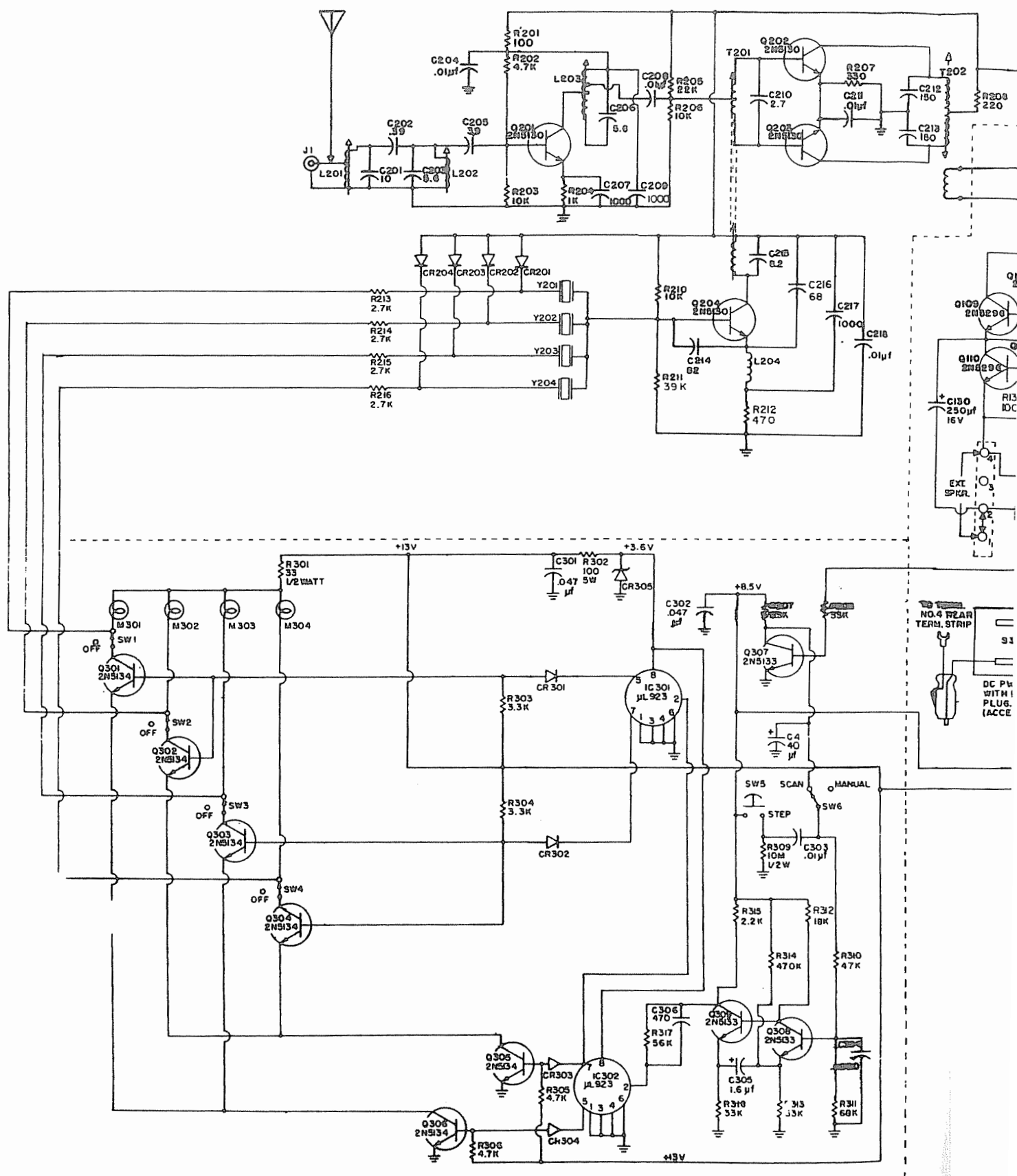
NOTES
C109 IS 270 pF AND C110 IS 250 pF IF IC 102
IS AN UN211A
ALL CAPACITORS NOT SPECIFIED ARE PICO-FARAD
RESISTORS " 1/4 WATT

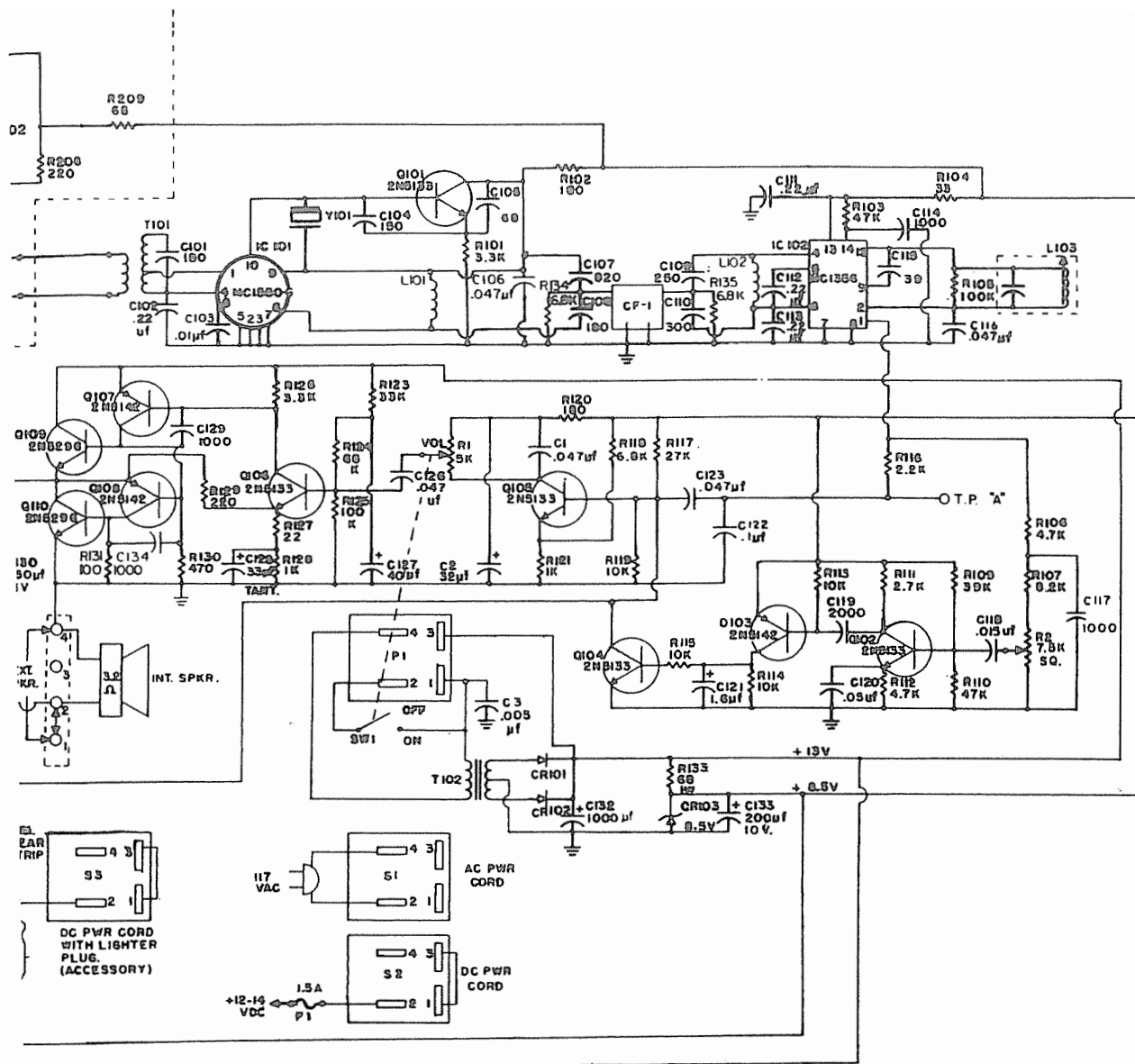
MODEL TMR-12H

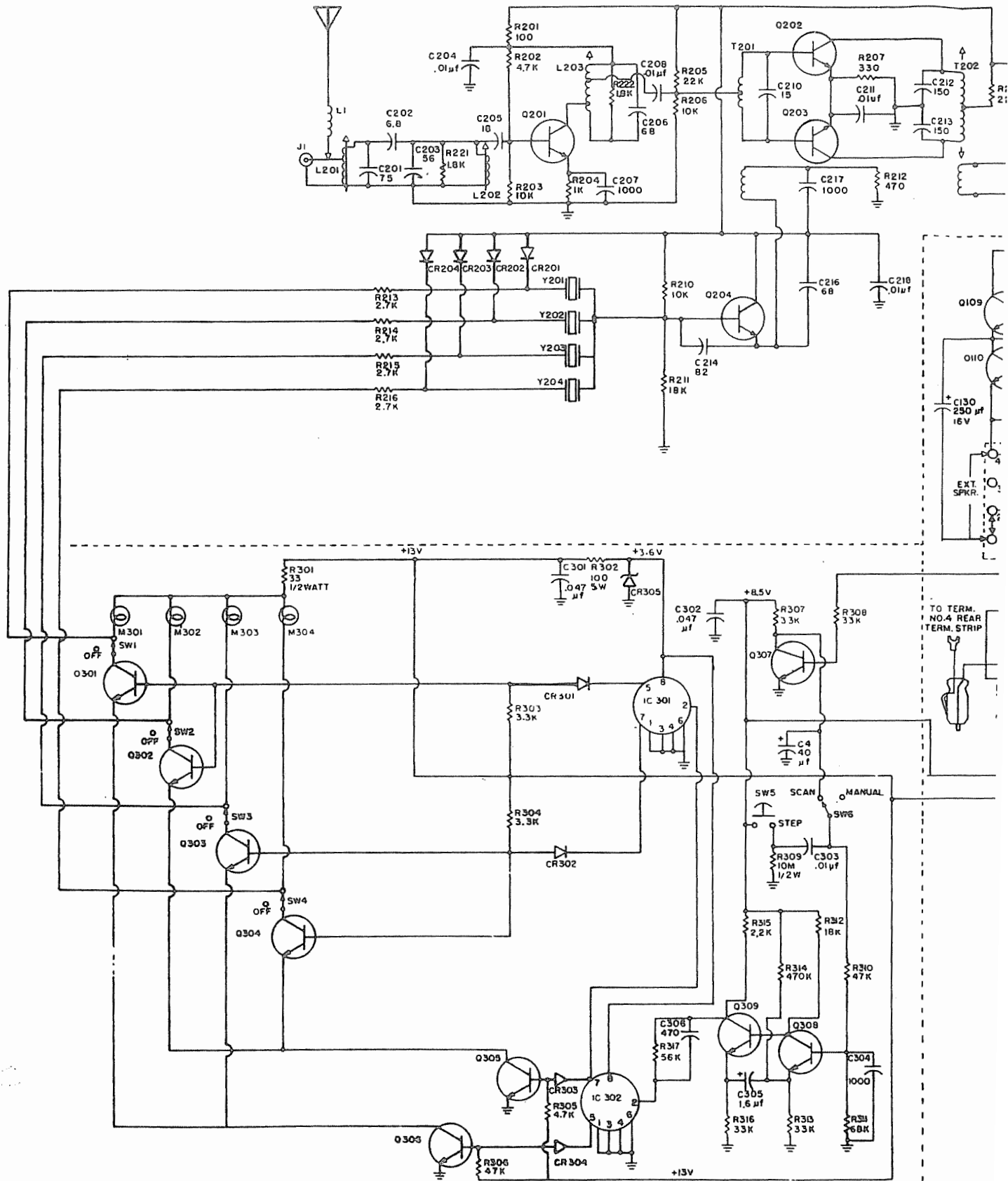


MODEL TMR-12L

NOTE: ALL CAPACITORS NOT SPECIFIED ARE PICO-FARAD
RESISTORS " 1/4 WATT







SEMICONDUCTORS

ITEM PART NO./TYPE

(RF, High Band)

CR201	102-339/1N198 (1)
CR202	102-339/1N198 (1)
CR203	102-339/1N198 (1)
CR204	102-339/1N198 (1)
CR205	102-339/1N198 (1)
CR206	102-339/1N198 (1)
CR207	102-339/1N198 (1)
CR208	102-339/1N198 (1)
Q201	2N5130
Q202	2N5130
Q203	2N5130
Q204	2N5130

(1) Used in TMR-4H/8H

(RF, Low Band)

CR201	102-339/1N198 (1)
CR202	102-339/1N198 (1)
CR203	102-339/1N198 (1)
CR204	102-339/1N198 (1)
CR205	102-339/1N198 (1)
CR206	102-339/1N198 (1)
CR207	102-339/1N198 (1)
CR208	102-339/1N198 (1)
Q201	2N5222
Q202	2N5222
Q203	2N5222
Q204	MPS-3563

(1) Used in TMR-4L/8L

(IF-Audio Board)

CR101	S1-1
CR102	S1-1
CR103	MB6356(Zener 8.5 V)
IC101	MC1550G
IC102	ULN-2111A (1)
	(MC-1356P)(1)
Q101	2N5133
Q102	2N5133
Q103	2N5142
Q104	2N5133
Q105	2N5133
Q106	2N5133
Q107	2N5142
Q108	2N5142
Q109	2N5296
Q110	2N5296

(1) Replace with original part.

(Scanner Board, TMR-8)

CR301	1N198
CR302	1N198
CR303	1N198
CR304	1N198
CR305	1N198

CR306	1N198
CR307	1N198
CR308	1N198
CR309	1N198
CR310	1N198
CR311	1N747B(Zener 3.6 V)
IC301	9923-U8A-992328X
IC302	9923-U8A-992328X
IC303	9923-U8A-992328X
Q301	2N5134
Q302	2N5134
Q303	2N5134
Q304	2N5134
Q305	2N5134
Q306	2N5134
Q307	2N5134
Q308	2N5134
Q309	2N5134
Q310	2N5134
Q311	2N5133
Q312	2N5133
Q313	2N5133

ELECTROLYTIC CAPS

ITEM PART NO. VALUE

(I-F-Audio Board)

C121	C426AR/F1.6	1.6 uF 25 V
	C426AR/G6.4	6.4 uF 40 V
C127	C426AR/E40	40 uF 16 V
C128	196D-336X00115FB	33 uF 15 V
C130	C437AR/E250	250 uF 16 V
C132	C437AR/E1000	1000 uF 16 V
C133	C426AR/D200	200 uF 10 V

(Scanner Board, TMR-8)

C305	C426AR/F1.6	1.6 uF 25 V
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(Chassis)

C2	C426AR/D32	32 uF 10 V
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CONTROLS

ITEM PART NO. DESCRIPTION

(Chassis, TMR-1)

R1	102-303-5	5000 ohms Volume/ Switch
R2	102-303-6	7.5 K Squelch

(Chassis, TMR-8)

R1	102-312-3	5000 ohms	Volume/ Switch
R2	102-312-2	7500 ohms	Squelch

(Chassis, TMR-12)

R1	102-303-5	5000 ohms	Volume/ Switch
R2	102-303-6	7500 ohms	Squelch

COILS/TRANSFORMERS

ITEM	PART NO.
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(RF, High Band)

L201	301-520-1
L202	301-520-2
L203	301-520-3
L204	102-369
T201	102-368
T202	102-367

(RF, Low Band)

L1	102-380-1
L201	301-520-4
L202	301-520-5
L203	301-520-6
T201	102-379
T202	102-367

(IF-Audio Board)

L101	ES-2228
L102	ES-2228
L103	301-517
T101	102-366

(Chassis)

T102	301-5
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MISCELLANEOUS

ITEM	NAME	PART NO
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(IF Board)

CF-1	Ceramic Filter, 455KC	CFP-455D
Y101	Crystal, 10.245 MHz	301-516-1

(RF, 12L/H)

Switch Assembly	500-753 & 301-422-2
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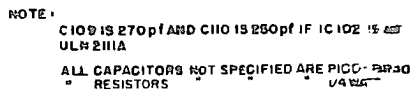
(Chassis)

SW1-8	Switch, Push-Push	5P08-312N-H000
SW9-10	Switch, 2 Stations	5S02-312N-H000
	Speaker	102-377
	Antenna Telescopic	P-6-125/102
	Crystal(Specify Freq.)	301-532 (High Band)
		301-542 (Low Band)

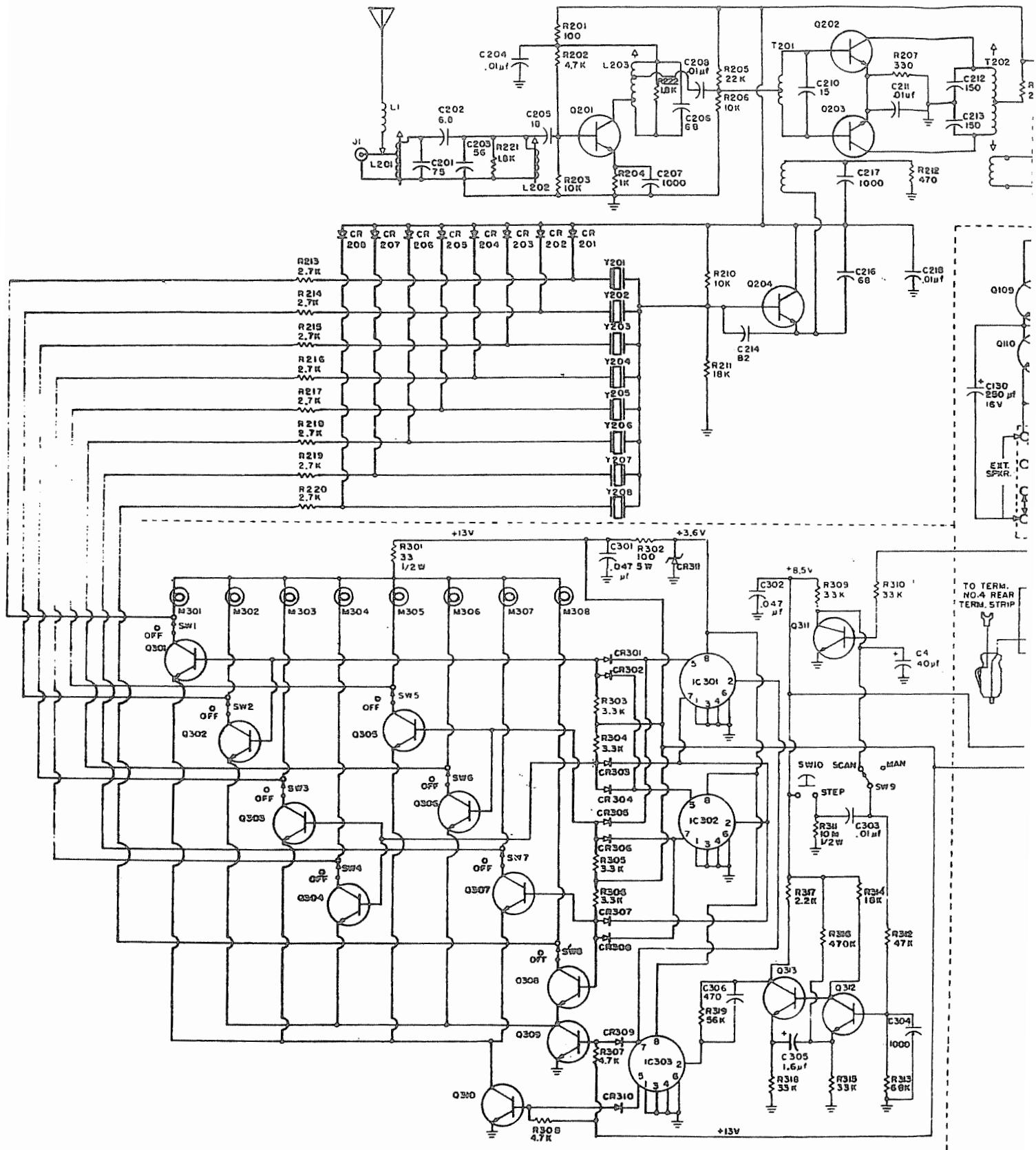
CABINET PARTS

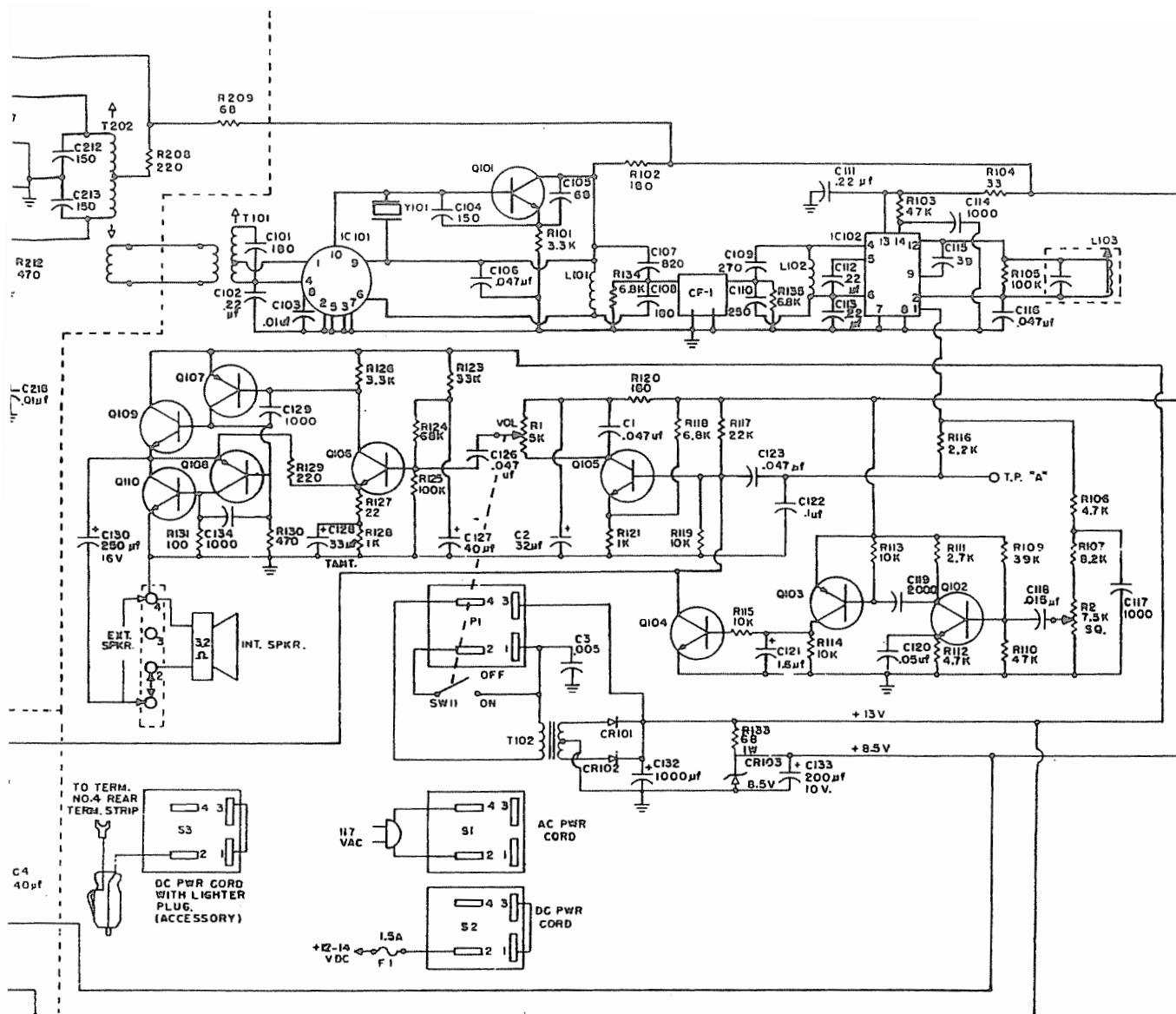
NAME	PART NO.
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Front Panel (TMR-1, TMR-12)	301-500-1
Knob, Volume/Squelch (TMR-1, TMR-12)	3-9
Knob, Volume/Squelch	27500
Knob, Push Button	UID-1B1
Knob, Channel Selector	6-13



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MODEL TMR-8L