



**A and X 40 CHANNEL
ADDENDUM
TO
23 CHANNEL SERVICE MANUALS**

**Manufactured and Distributed by
Hy-Gain de Puerto Rico, Inc.
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CHAPTER 1 — GENERAL INFORMATION

Application

This service bulletin contains alignment procedures, adjustment drawings, schematics and a parts list. The alignment procedures are valid for the following models:

Chapter 2.....Models 2680A, 2680X, 2682X, 2682B, 2683A, 2701X, 2683X, 3084X, 3084B, 3087A and 3087X

Chapter 3.....Models 2679A, 2679X and 2710X

Chapter 4.....Models 681A, 681X, 682A and 682X

For operating procedures and theory of operation, see the applicable service manual.

WARNING: This manual is for use in alignment ONLY! Any attempt to use this manual for conversion of 23 channel models is unlawful.

Warranty Service Department

For help with technical problems, for parts information, and information on local and factory repair facilities, contact the National Service Manager. When you write, please include all pertinent information that may be helpful in solving the problem. Address the letter to:

Hy-Gain Warranty Service Department
4900 Superior Street
Lincoln, Nebraska 68504
ATTN: National Service Manager

The Warranty Service Department can repair any unit. Before shipping the unit contact the National Service Manager. Often a problem is field solvable with a little extra help. This can save lost time and shipping costs. Limit factory returns to the difficult problems.

How to Ship Returns

To return a unit, get a return authorization. This is important. Handling of the unit may be delayed if shipped without it. If the unit must be shipped immediately, telephone or telex the National Service Manager for expeditious service.

When you request authorization, notification of completion of repairs may also be requested. The notification will include a copy of the bill. Paying the bill before the return of the unit can save the cost of a COD fee.

For warranty repair, prepare a letter in duplicate containing the following information (for out-of-warranty repair delete items 2 and 3):

1. your name and address
2. purchaser's name and address
3. proof of purchase
4. serial number
5. complete description of the problem
6. the return authorization

Check the unit to see that all parts and screws are in place and attach an envelope containing a copy of the letter directly to it so this information is not overlooked. Wrap the unit and the envelope in heavy paper or put it in a plastic bag. If the original carton is not available, place the unit in a strong carton at least *six* inches larger in all three dimensions than the unit. Fill the carton equally around the unit with resilient packing material (shredded paper, excelsior, bubble pack, etc.). Seal the box with gummed paper tape, tie it with strong cord, and ship it by prepaid express, United Parcel Service, or insured parcel post to the address given previously. Mail the original of the letter in a second envelope to that same address.

It is important that the shipment be well packed and fully insured. Damage claims can delay repair and return of the unit. All claims must be settled between you and the carrier.

All shipments must be sent PREPAID. We *do not* accept collect shipments. After the unit has been repaired we will send it back COD unless the bill has been prepaid. Unclaimed or refused COD shipments will not be reshipped until payment is received in full. These items become the property of Hy-Gain 60 days after refusal or return and will be sold for payment of charges due.

Units with unauthorized field modifications cannot be accepted for repair.

**Purchase of
Parts**

Parts can be purchased from any Hy-Gain Service Center or from the factory Warranty Service Department. When ordering, please supply the following information:

1. unit model number
2. unit serial number
3. part description
4. part number

CHAPTER 2 — REALIGNMENT PROCEDURES FOLLOWING MODIFICATION OF MOST MOBILE MODELS

General

These procedures must be followed to align the transceivers with the exception of models 2679A, 2679X, 2710X, 681A, 681X, 682A and 682X. Alignment should not be undertaken unless the technician has adequate test equipment and a full understanding of the circuitry of the transceivers.

IMPORTANT: Tuning adjustment of these transceivers "shall be made by or under the immediate supervision and responsibility of a person holding a first or second-class commercial radio operator license," as stipulated in Part 95.97(b) of the FCC Rules and Regulations.

The procedures are divided into two main sections: Transmitter Alignment and Receiver Alignment. See *Equipment* below for a complete list of recommended equipment.

These procedures assume that proper voltages are present at all points in the unit. If not, troubleshoot before continuing.

NOTE: The ferrite cores in the tuning coils are easily chipped or broken. Always use care when inserting an alignment tool in the coil; insert it straight into the core.

Recommended Equipment

The following equipment is recommended for use in aligning the transceivers.

Audio Signal Generator, 1 kHz

AC VTVM, 1 mV measurable

DC Ampere Meter, 2A

Variable Regulated Power Supply, DC 8-15V, 2A or higher

Frequency Counter, 0 to 40 MHz, high input impedance type

VTVM with RF probe

Oscilloscope, 30 MHz, high input impedance

RF wattmeter and 50 ohm, 5W dummy load

Standard RF signal generator, 27 MHz CB band

Speaker dummy resistor, 8 ohm, 5W

VOM 20 kohm/V

All test equipment should be properly calibrated.

NOTE: Test voltage is 13.8 VDC unless otherwise specified.

Transmitter Alignment Procedure

Equipment Set-Up

Refer to figure 2-4 for location of components to be adjusted for transmitter alignment.

Connect test equipment as shown in figure 2-1

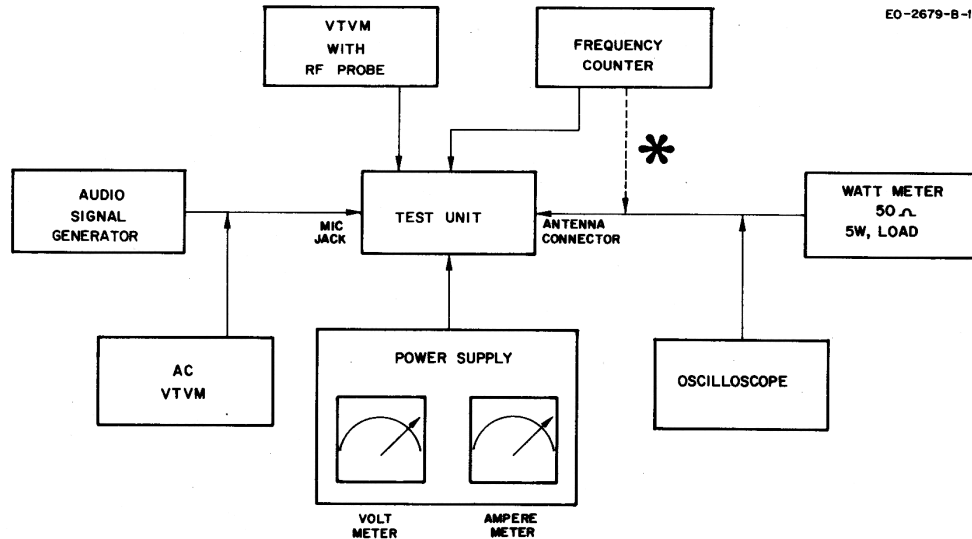


Figure 2-1. Equipment Set-Up, Transmitter Alignment

***NOTE:** See figure 2-2 for connection of the frequency counter and dummy load.

Pre-Alignment Frequency Check

Before alignment, use a high input impedance frequency counter through a 100 pF capacitor connected in series with the counter input probe to check the operating frequencies at the following points:

1. Pin 3 of IC101, reference input, check to read 10.24 MHz.
2. Disconnect C103 from the base of Q102. Check to read 11.8066 MHz at the base of Q102. If necessary, adjust C119 to obtain this frequency. Reconnect C103.
3. Q108 base, transceiver on channel 1, check to read 37.66 MHz.

VCO Alignment

1. Connect VOM (DC 10V range) across C135 and check to read 5.0V - 5.5V.
2. Place the Channel Selector in the channel 1 position.
3. Connect the VOM between ground and R114 (TP-8 side).
4. Adjust T101 to obtain $1.5V \pm .1V$.
5. Place the Channel Selector in the channel 40 position.
6. The VOM should now read $4.5V \pm .4V$.
7. Readjust T101 if needed, and recheck the channel 1 level.

RF Output Adjustment

1. Adjust the power supply voltage to 8.0 volts.
2. Connect the VTVM RF probe between the base of Q111 and ground.
3. Set the Transceiver Channel Selector to channel 19. Perform the following procedures on channel 19:

4. Key the transmitter
5. Adjust the slugs of L103, L104, T102 and T111 for a maximum reading on the VTVM.
6. Connect the VTVM RF probe between the base of Q112 and ground.
7. Adjust the slug of T103 for a maximum reading on the VTVM or wattmeter.
8. Adjust L106, L109 and L110 for maximum RF power output as indicated on the wattmeter.
9. Raise the power supply voltage to 13.8V.
10. Repeat steps 2 through 8.
11. Back off L109 (clockwise) for a reading of 4.0 watts RF power output.
12. Readjust L110 for maximum power output.
13. Repeat steps 11 and 12 until the maximum power output is 4.0 watts with L110 peaked for maximum output. Total transceiver current at this setting should not exceed 1.2A.
14. Check power output on channels 1 and 40. Power should not be less than 3.6 watts. If less, repeat alignment procedures.

Transmitter Frequency Check

1. Turn the transceiver off.
2. Connect the dummy load and frequency counter to the antenna.

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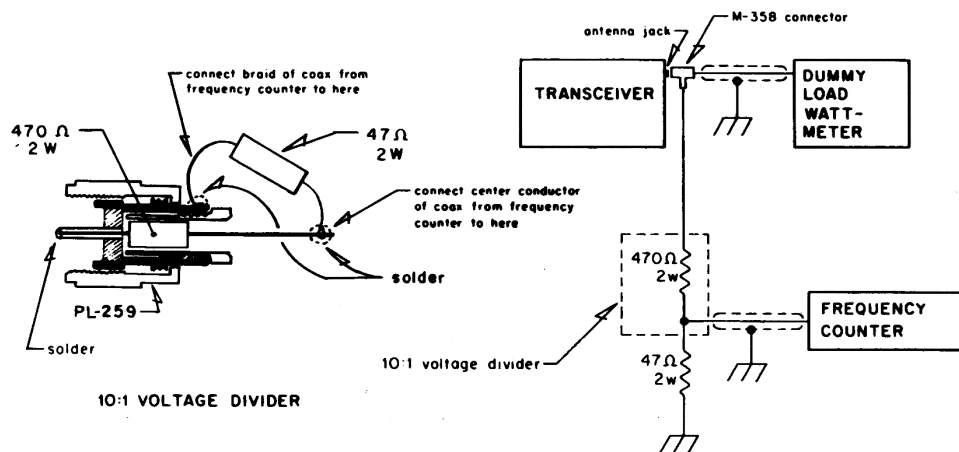


Figure 2-2. Connection of Frequency Counter and Dummy Load

3. Turn transceiver on.
4. Key the transceiver with the microphone PTT button.
5. Check the frequency of each channel with the following chart. Frequencies should be within $\pm 800\text{Hz}$ at 25°C .

CHANNEL FREQUENCY

Channel	MHz	Channel	MHz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Modulation Sensitivity Adjustment

1. Place the unit in the transmit mode and apply a 20 mV, 1 kHz signal to wire wrap pin 22 on the radio PC board.
2. Adjust RV-102 to obtain 90% modulation as observed on the oscilloscope.
3. Decrease the signal input to 6 mV. Modulation should not fall below 80%.

Receiver Alignment Procedure

Equipment Set-Up

Refer to figure 2-5 for the location of components to be adjusted for receiver alignment.

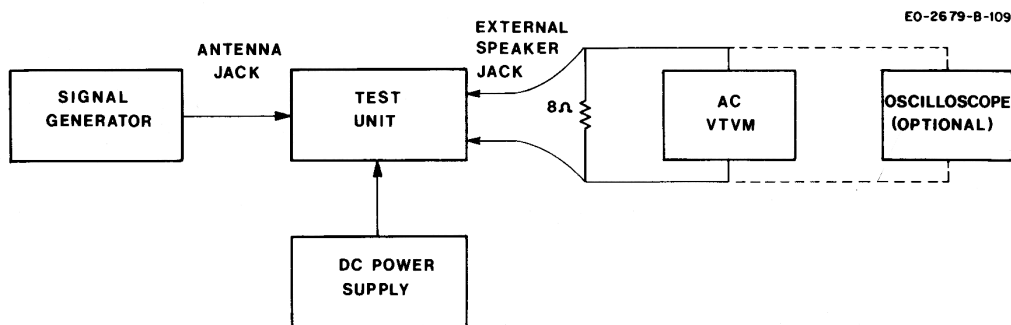


Figure 2-3. Equipment Set-Up, Receiver Alignment

Receiver Alignment

1. Set the signal generator to 27.115 MHz, 1 kHz, 30% modulation and set the transceiver to channel 19.

NOTE: This alignment should be performed with an extremely small signal input from the signal generator to avoid inaccurate alignment due to AGC action.

2. Adjust T104, T105, L112, T106, T108 and T109 for maximum audio output as indicated on the AC VTVM (or oscilloscope if used).

Tight Squelch Adjustment

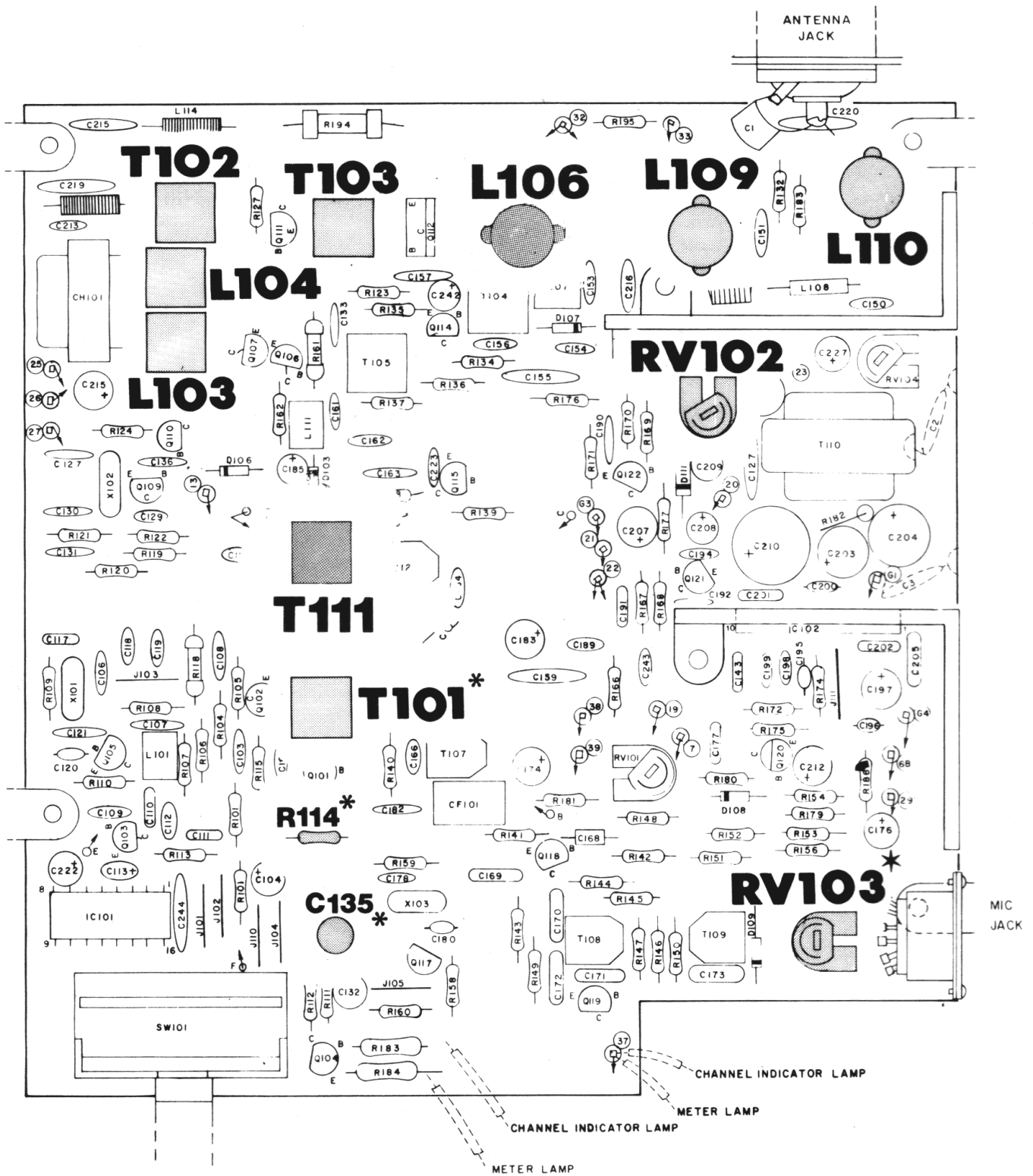
1. Set the signal generator to provide an RF input signal of 50 uV (1 kHz, 30% modulation).

2. Rotate the squelch control fully clockwise.

3. Adjust RV101 so that the squelch just breaks with the 50 uV signal input.

N — CODE FREQUENCY CORRELATION CHART

CHANNEL NO.	CHANNEL FREQ. (MHz)	"N" DIGITAL CODES	VCO FREQ.	PLL INPUT CODE									
				(256) B8	(128) B7	(64) B6	(32) B5	(16) B4	(8) B3	(4) B2	(2) B1	(1) B0	
1	26.965	224	37.660	0	1	1	1	0	0	0	0	0	0
2	26.975	225	37.670	0	1	1	1	0	0	0	0	0	1
3	26.985	226	37.680	0	1	1	1	0	0	0	1	0	0
4	27.005	228	37.700	0	1	1	1	0	0	1	0	0	0
5	27.015	229	37.710	0	1	1	1	0	0	1	0	1	1
6	27.025	230	37.720	0	1	1	1	0	0	1	1	1	0
7	27.035	231	37.730	0	1	1	1	0	0	1	1	1	1
8	27.055	233	37.750	0	1	1	1	0	1	0	0	0	1
9	27.065	234	37.760	0	1	1	1	0	1	0	1	1	0
10	27.075	235	37.770	0	1	1	1	0	1	0	1	1	1
11	27.085	236	37.780	0	1	1	1	0	1	1	1	0	0
12	27.105	238	37.800	0	1	1	1	0	1	1	1	1	0
13	27.115	239	37.810	0	1	1	1	0	1	1	1	1	1
14	27.125	240	37.820	0	1	1	1	1	0	0	0	0	0
15	27.135	241	37.830	0	1	1	1	1	0	0	0	0	1
16	27.155	243	37.850	0	1	1	1	1	0	0	1	1	1
17	27.165	244	37.860	0	1	1	1	1	0	1	0	0	0
18	27.175	245	37.870	0	1	1	1	1	0	1	0	1	1
19	27.185	246	37.880	0	1	1	1	1	0	1	1	1	0
20	27.205	248	37.900	0	1	1	1	1	1	0	0	0	0
21	27.215	249	37.910	0	1	1	1	1	1	0	0	0	1
22	27.225	250	37.920	0	1	1	1	1	1	0	1	0	0
23	27.255	253	37.950	0	1	1	1	1	1	1	0	1	1
24	27.235	251	37.930	0	1	1	1	1	1	0	1	1	1
25	27.245	252	37.940	0	1	1	1	1	1	1	0	0	0
26	27.265	254	37.960	0	1	1	1	1	1	1	1	1	0
27	27.275	255	37.970	0	1	1	1	1	1	1	1	1	1
28	27.285	256	37.980	1	0	0	0	0	0	0	0	0	0
29	27.295	257	37.990	1	0	0	0	0	0	0	0	0	1
30	27.305	258	38.000	1	0	0	0	0	0	0	1	0	0
31	27.315	259	38.010	1	0	0	0	0	0	0	1	1	1
32	27.325	260	38.020	1	0	0	0	0	0	1	0	0	0
33	27.335	261	38.030	1	0	0	0	0	0	1	0	1	1
34	27.345	262	38.040	1	0	0	0	0	0	1	1	1	0
35	27.355	263	38.050	1	0	0	0	0	0	1	1	1	1
36	27.365	264	38.060	1	0	0	0	0	1	0	0	0	0
37	27.375	265	38.070	1	0	0	0	0	1	0	0	1	1
38	27.385	266	38.080	1	0	0	0	0	1	0	1	1	0
39	27.395	267	38.090	1	0	0	0	0	1	0	1	1	1
40	27.405	268	38.100	1	0	0	0	0	1	1	0	0	0



NOTES:

- ‡ T101 adjusted in VCO Alignment only.
- *R114 and C135 are connection points for VCO Alignment.
- RV103 not adjusted in these models.

Figure 2-4. Components Adjusted for Transmitter Alignment

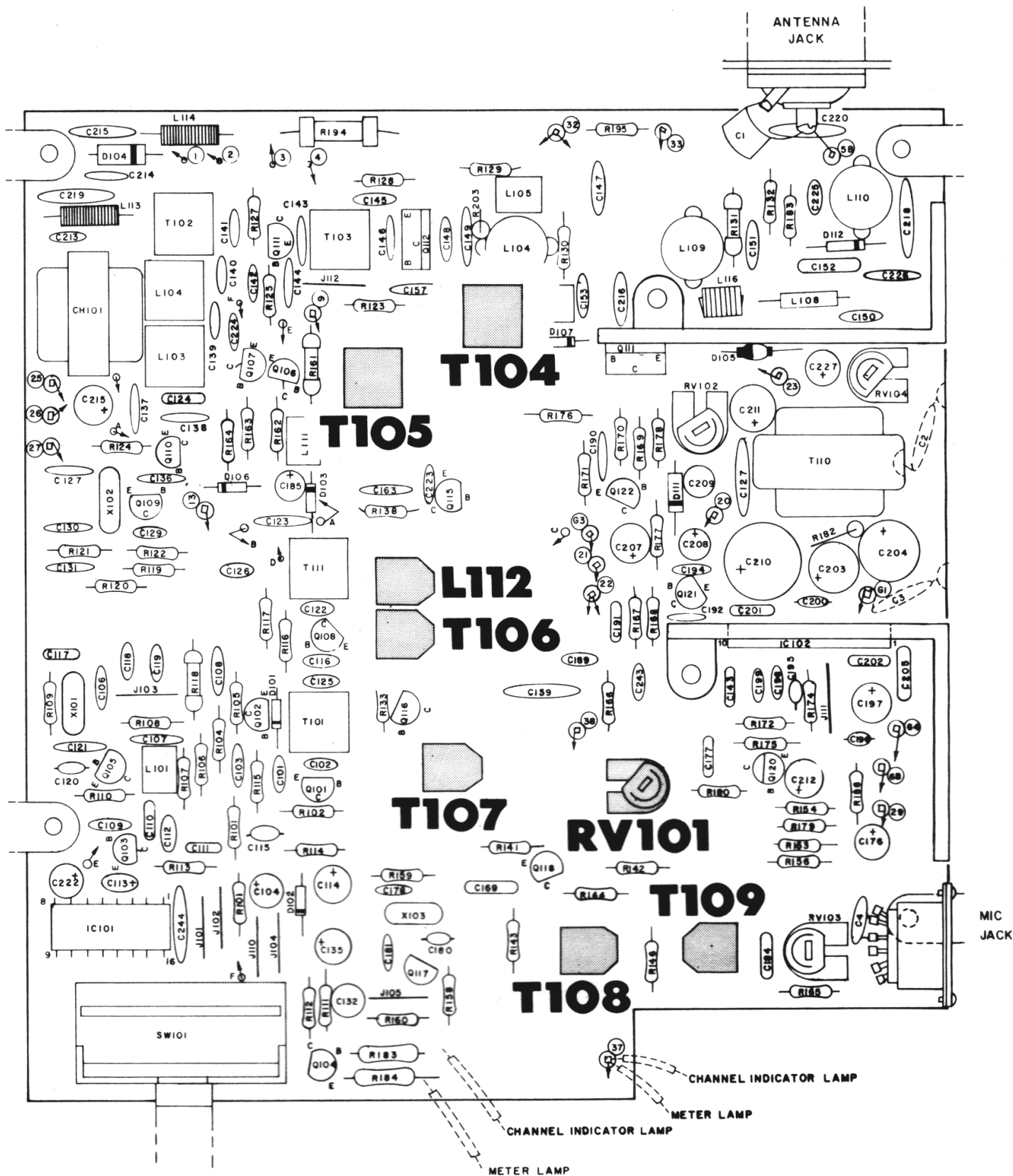
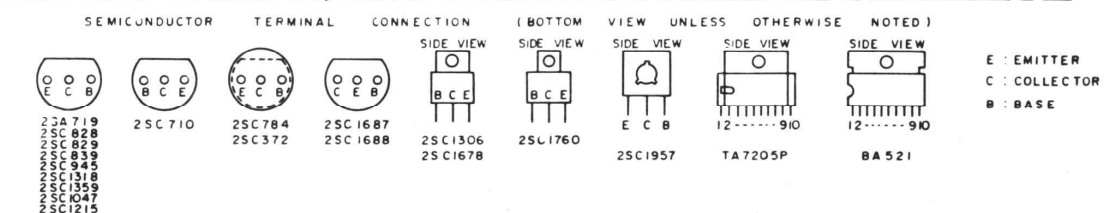
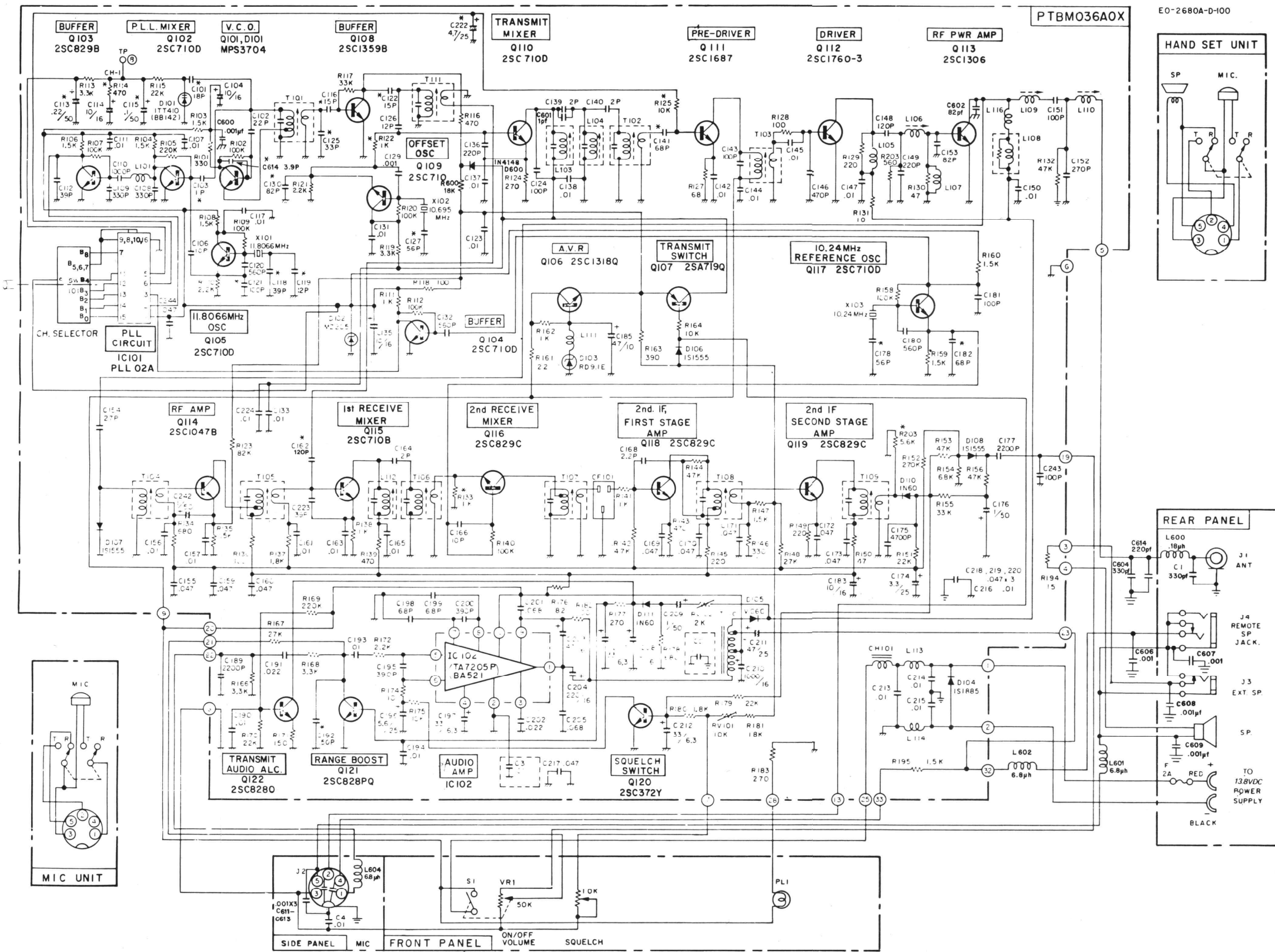


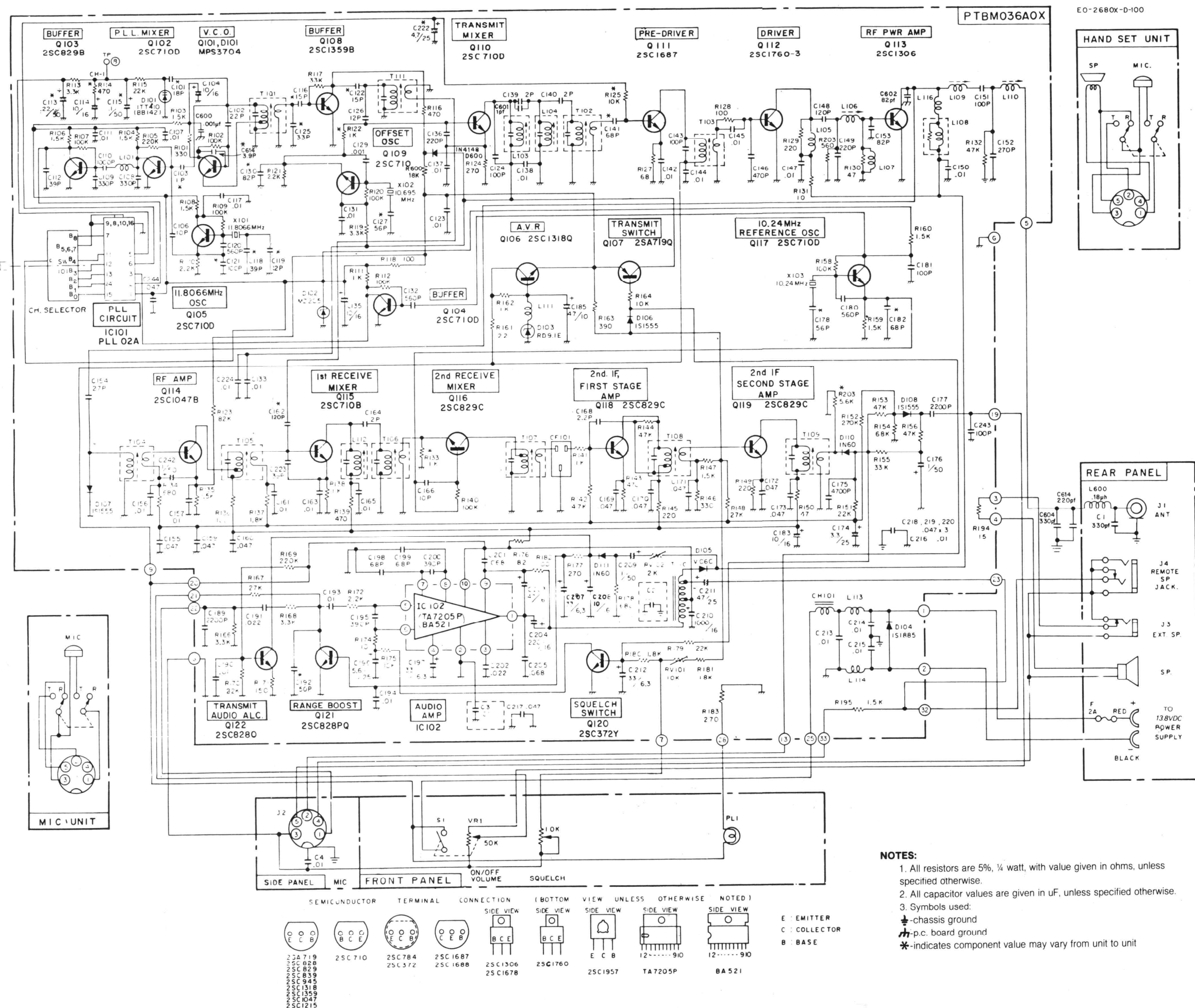
Figure 2-5. Components Adjusted for Receiver Alignment



NOTES:

- All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
- All capacitor values are given in uF, unless specified otherwise.
- Symbols used:
 ⊥ - chassis ground
 ⏏ - p.c. board ground
 * - indicates component value may vary from unit to unit

Figure 2-6. Schematic Diagram, Model 2680A



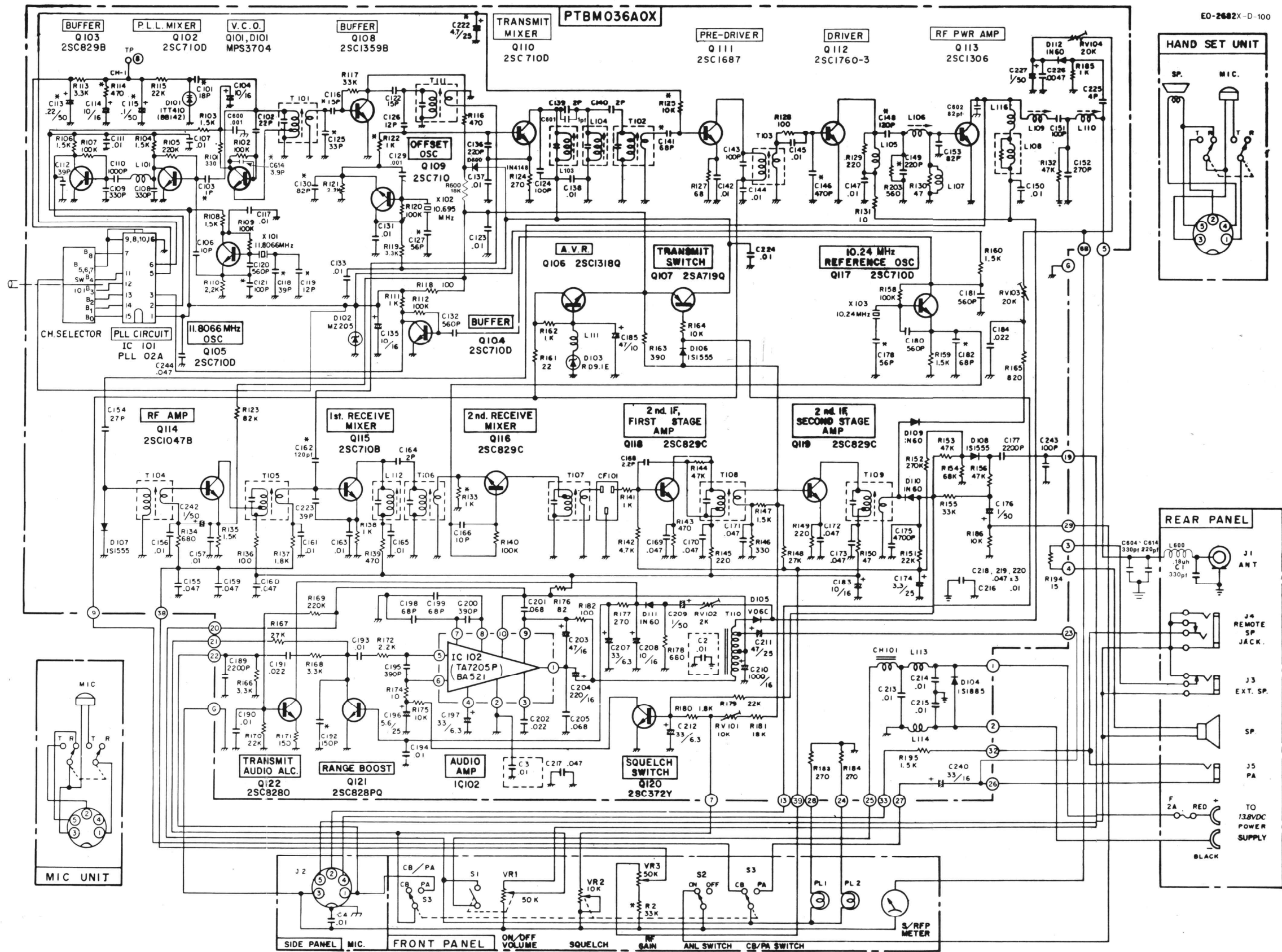
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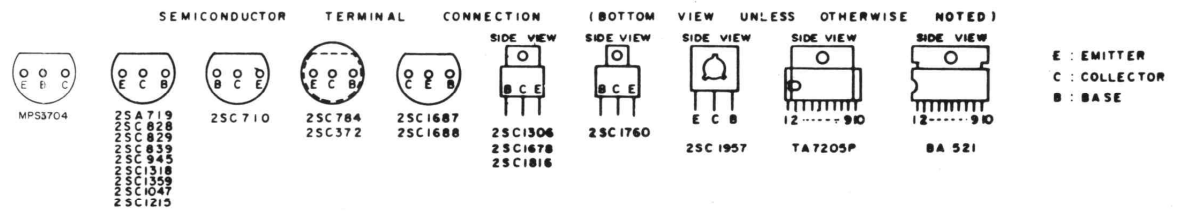
- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 ⏏ - chassis ground
 ⏏ - p.c. board ground
 * - indicates component value may vary from unit to unit

SEMICONDUCTOR	TERMINAL CONNECTION	(BOTTOM VIEW UNLESS OTHERWISE NOTED)	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC719	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC828	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC829	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC839	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC945	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1318	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1359	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1047	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1215	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC710	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC784	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1687	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1688	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1306	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1760	ECB	ECB	ECB	ECB	ECB	ECB	ECB
2SC1957	ECB	ECB	ECB	ECB	ECB	ECB	ECB
TA7205P	ECB	ECB	ECB	ECB	ECB	ECB	ECB
BA521	ECB	ECB	ECB	ECB	ECB	ECB	ECB

Figure 2-7. Schematic Diagram, Model 2680X

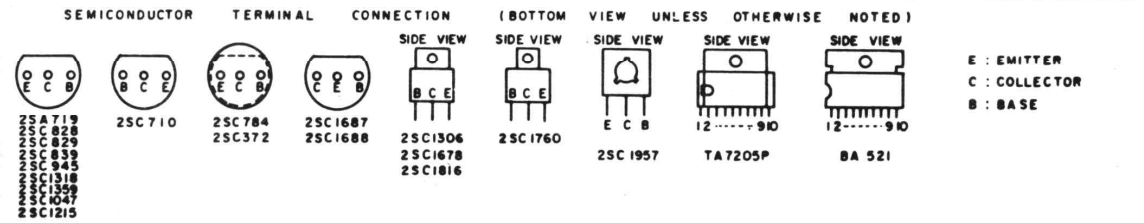
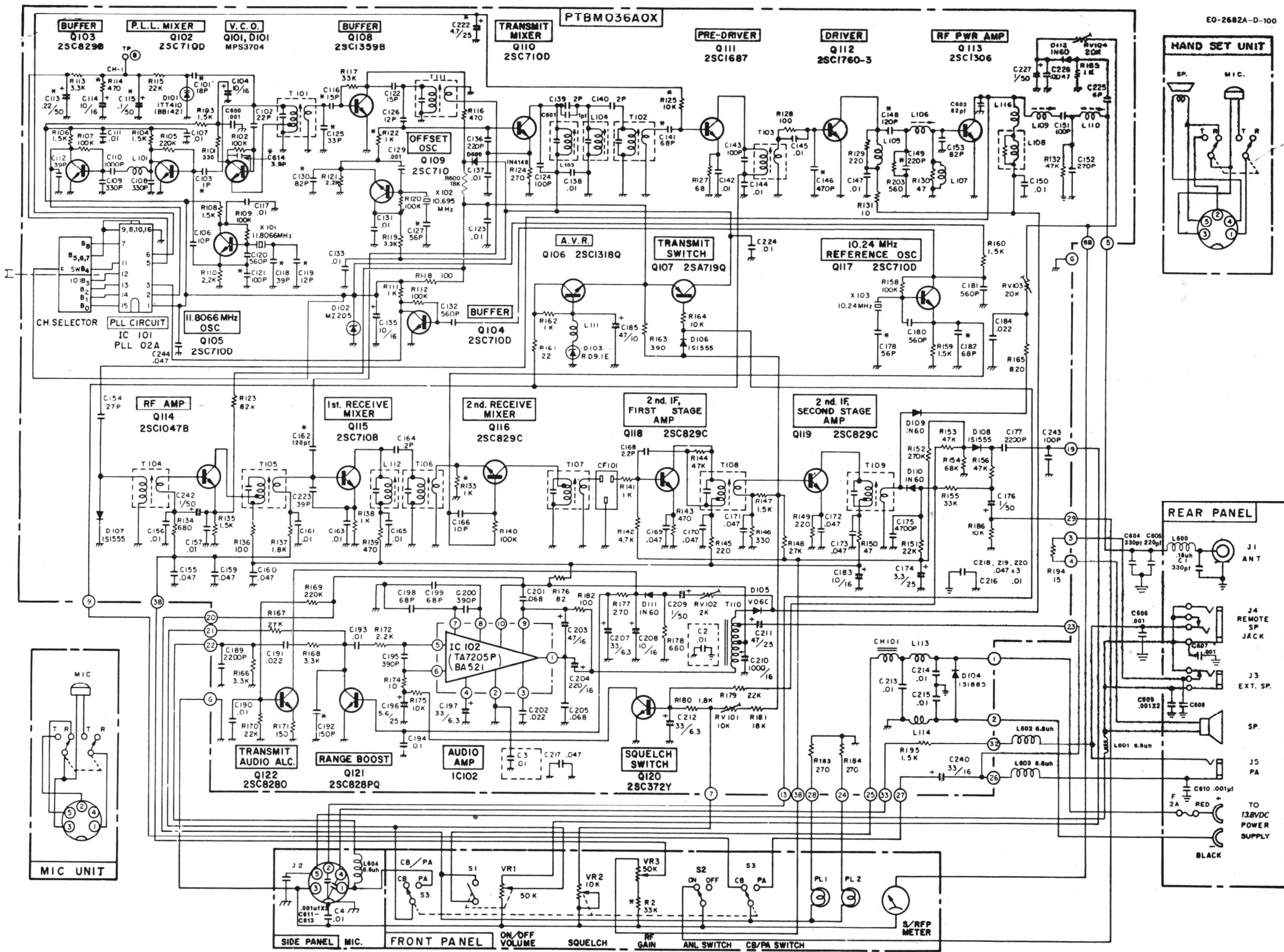


EO-2682X-D-100



- NOTES:
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 -chassis ground
 -p.c. board ground
 * -indicates component value may vary from unit to unit

Figure 2-8. Schematic Diagram, Model 2682X



NOTES:

- All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
- All capacitor values are given in uF, unless specified otherwise.
- Symbols used:
 - ⊖ - chassis ground
 - ⊕ - indicates component value may vary from unit to unit
 - * - indicates component value may vary from unit to unit

Figure 2-9. Schematic Diagram, Model 2682B

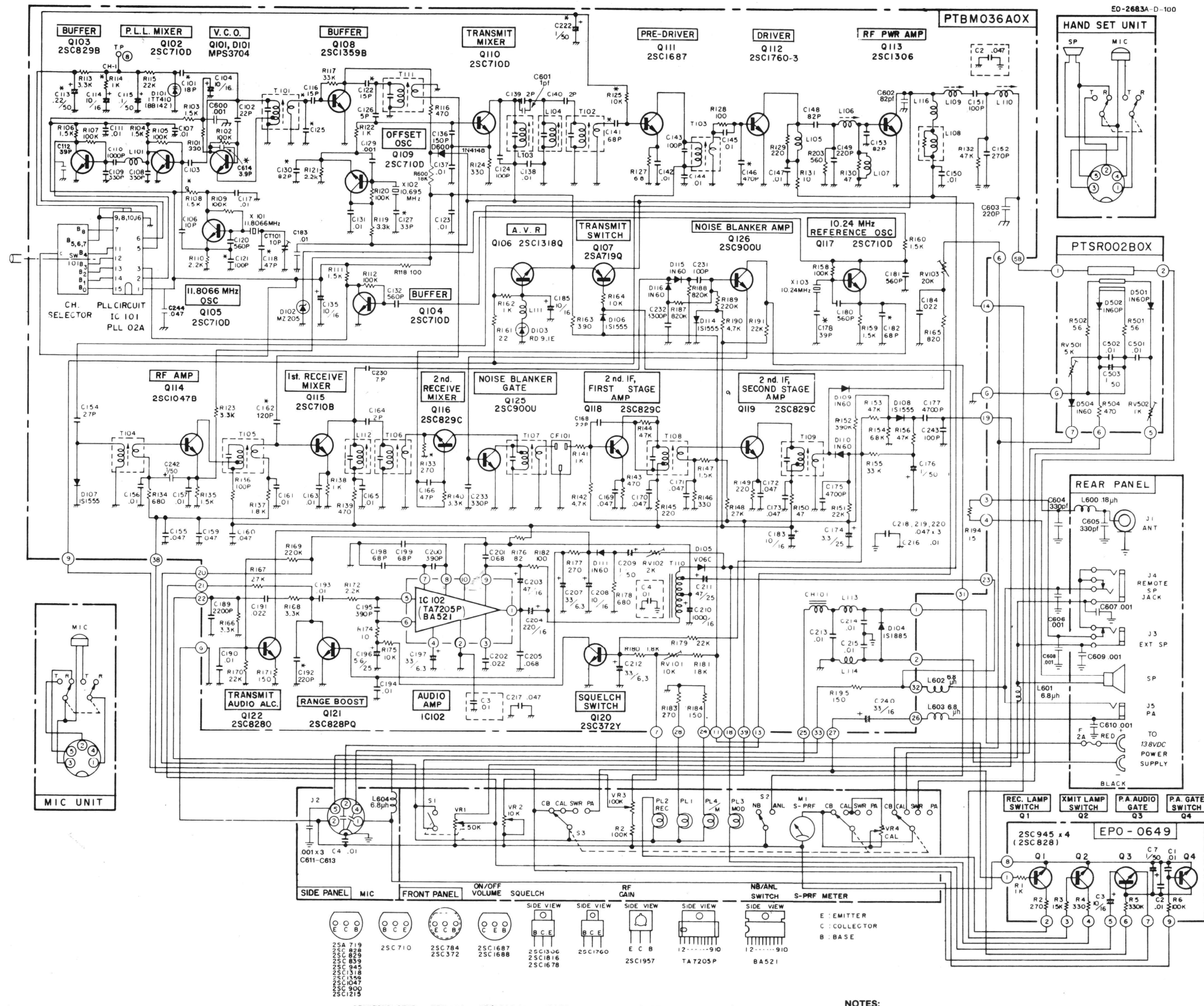


Figure 2-10. Schematic Diagram, Model 2683A

NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 - chassis ground
 - p.c. board ground
 * - indicates component value may vary from unit to unit

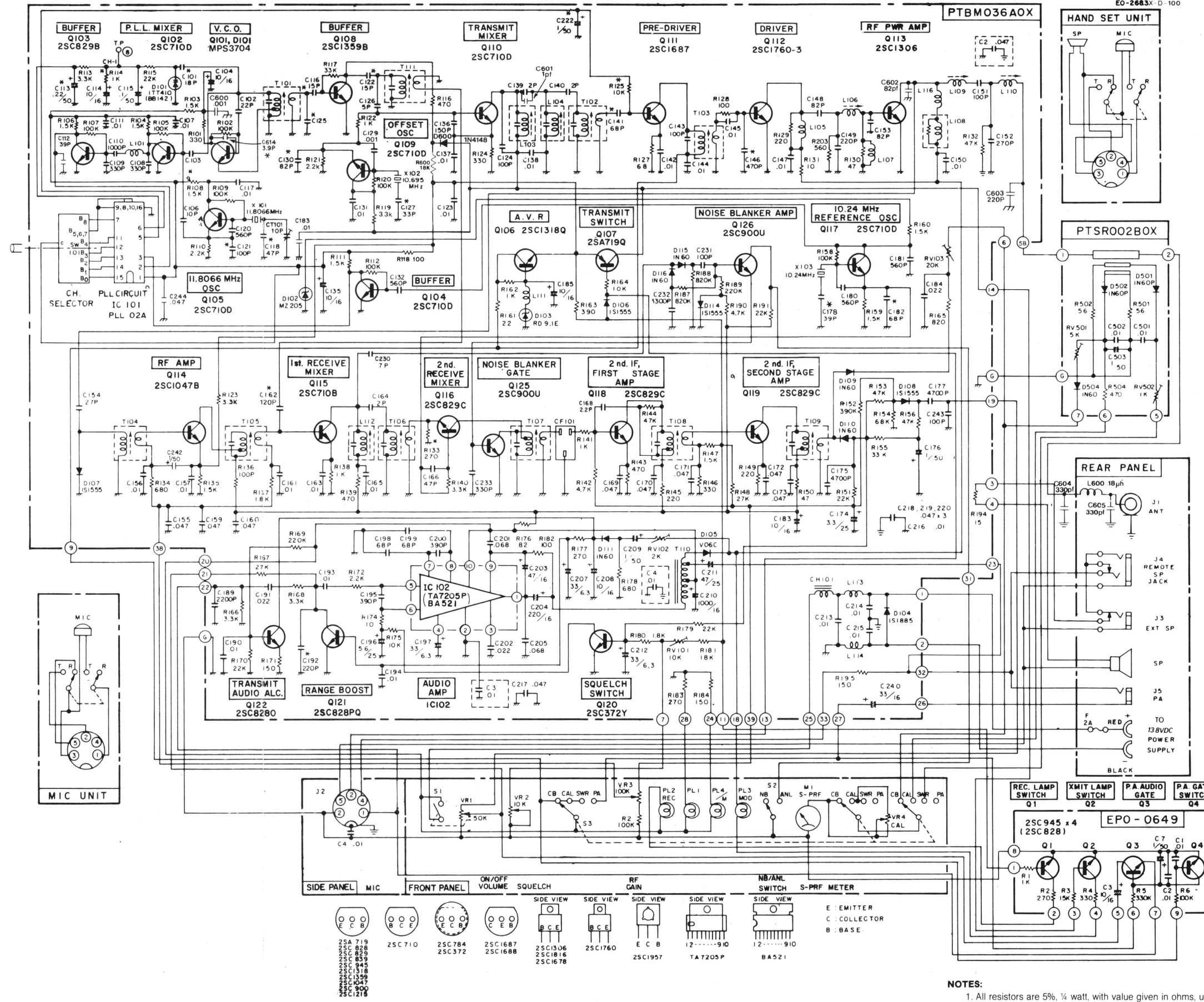
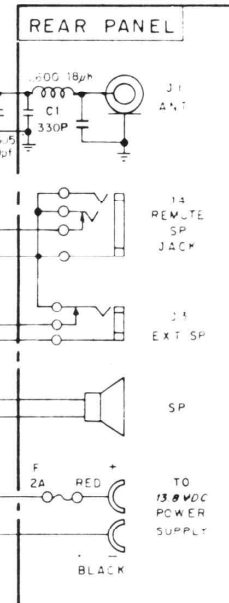
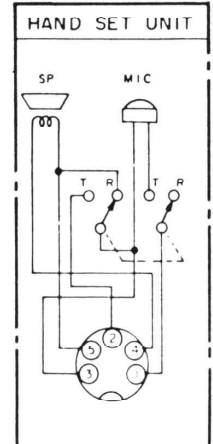
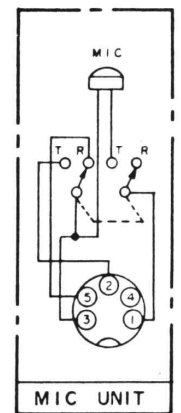
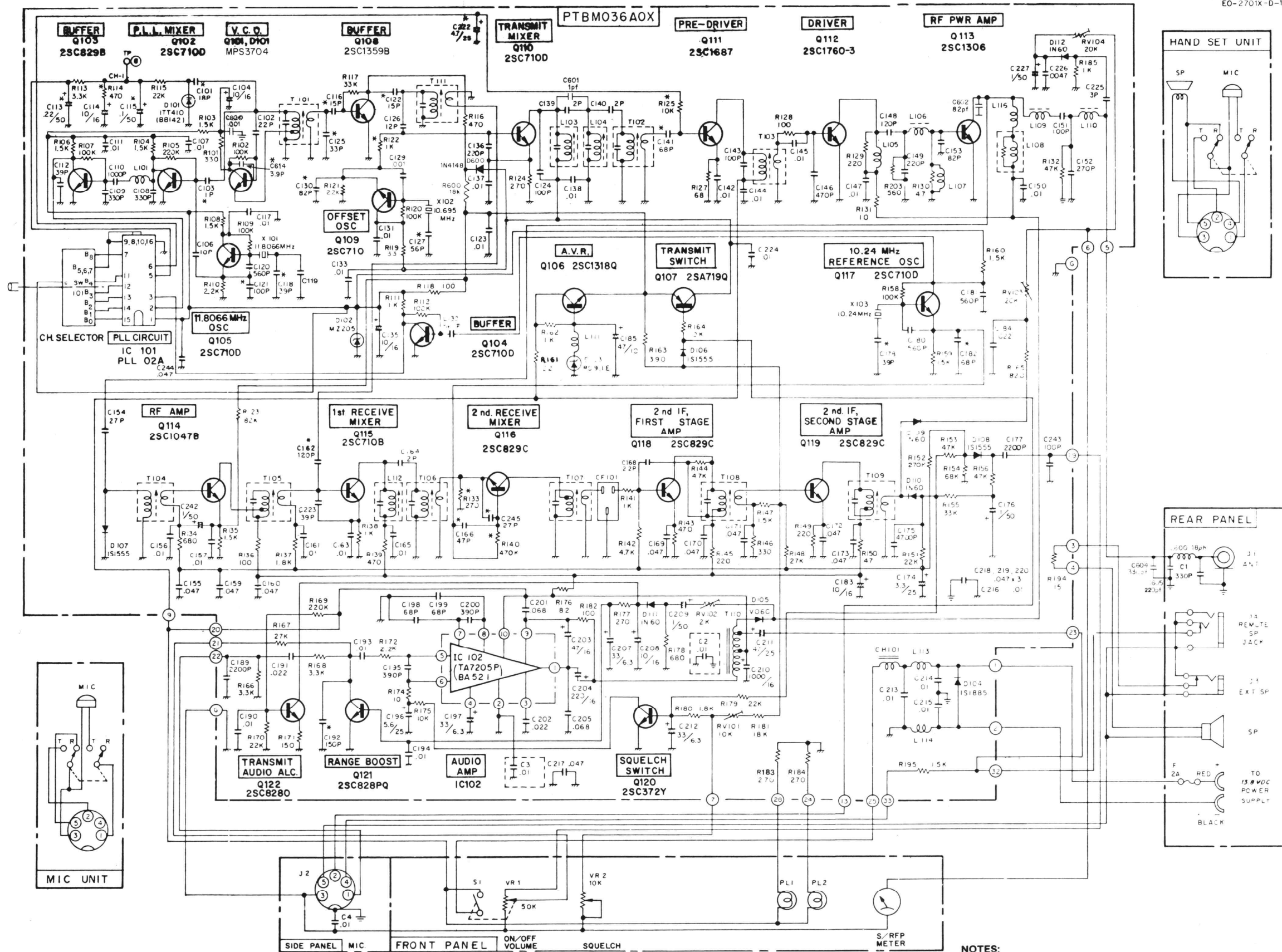


Figure 2-11. Schematic Diagram, Model 2683X

- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 = chassis ground
 = p.c. board ground
 * - indicates component value may vary from unit to unit



SEMICONDUCTOR	TERMINAL CONNECTION	VIEW	TERMINAL CONNECTION	VIEW	TERMINAL CONNECTION	VIEW		
25A 719	ECB	TOP VIEW	25C 710	BCE	TOP VIEW	25C 784	ECB	TOP VIEW
25C 828	BCE	TOP VIEW	25C 1687	BCE	TOP VIEW	25C 1306	BCE	TOP VIEW
25C 829	BCE	TOP VIEW	25C 1688	BCE	TOP VIEW	25C 1678	BCE	TOP VIEW
25C 829	BCE	TOP VIEW	25C 1816	BCE	TOP VIEW	25C 1957	ECB	TOP VIEW
25C 945	BCE	TOP VIEW				TA 7205P	ECB	TOP VIEW
25C 945	BCE	TOP VIEW				BA 521	ECB	TOP VIEW
25C 1318	BCE	TOP VIEW						
25C 1318	BCE	TOP VIEW						
25C 1047	BCE	TOP VIEW						
25C 1215	BCE	TOP VIEW						

NOTES:
 1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 - chassis ground
 - p.c. board ground
 * - indicates component value may vary from unit to unit

Figure 2-12. Schematic Diagram, Model 2701X

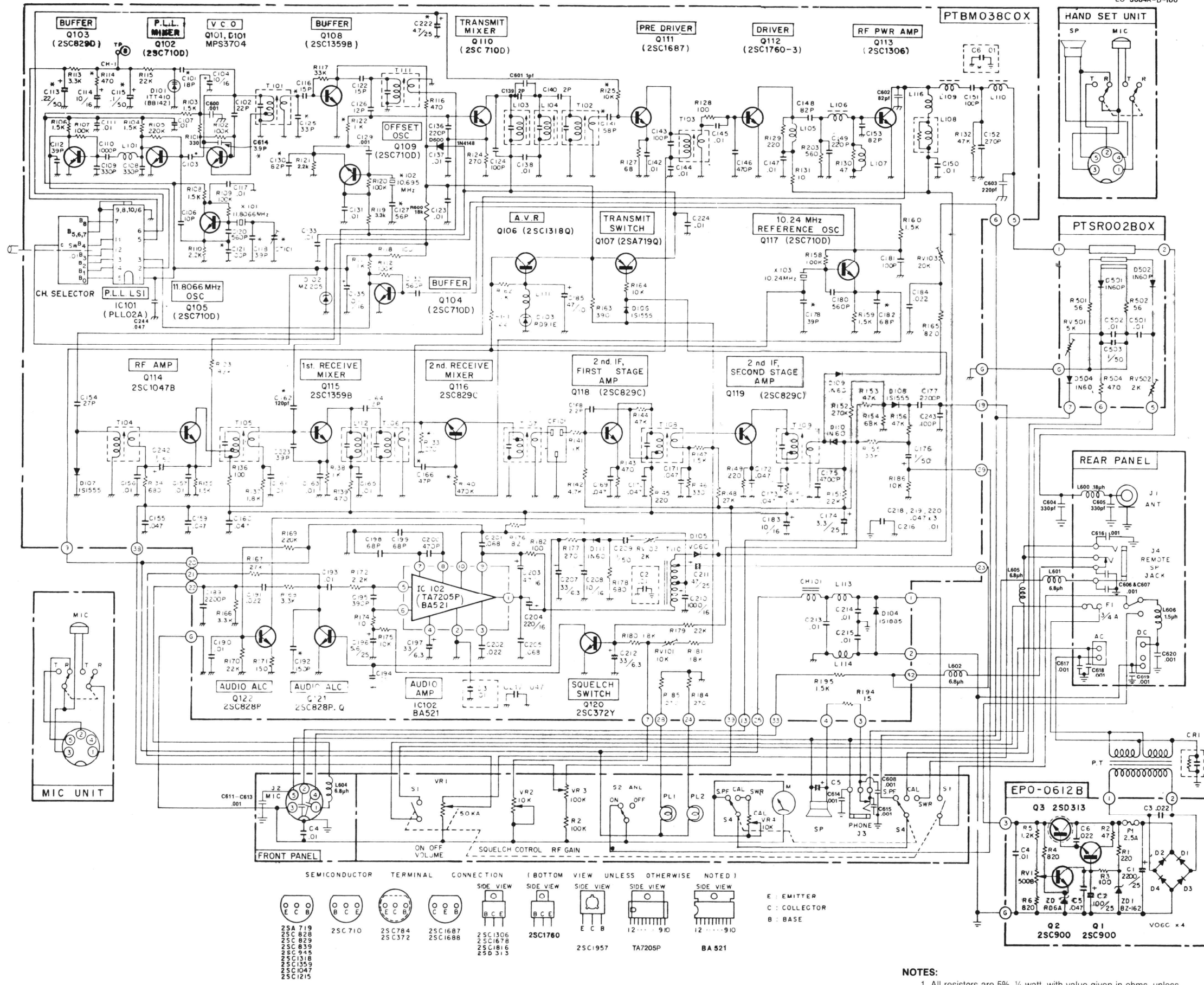
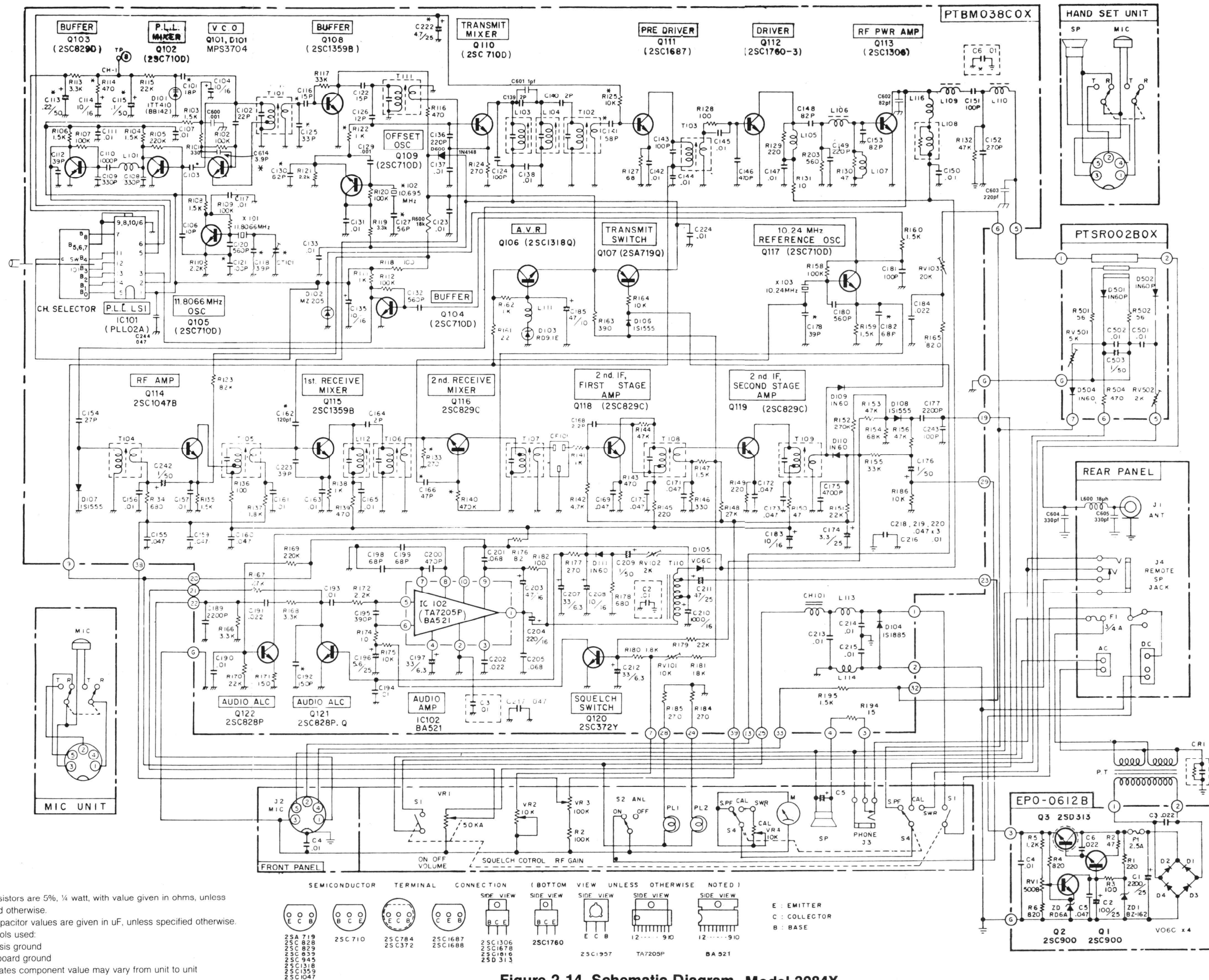


Figure 2-13. Schematic Diagram, Model 3084B



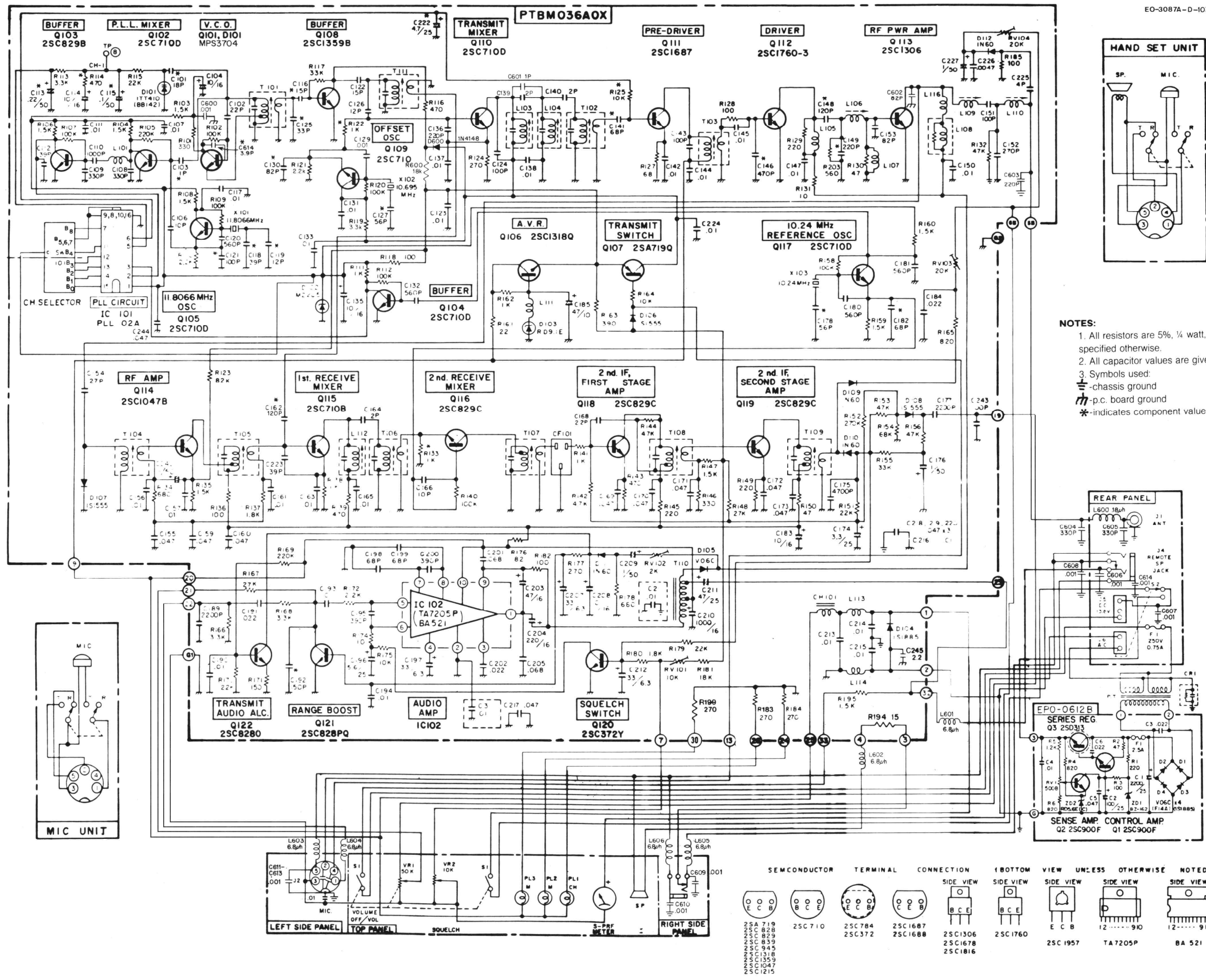
NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 ⏏ - chassis ground
 ⏏ - p.c. board ground
 * - indicates component value may vary from unit to unit

SEMICONDUCTOR	TERMINAL CONNECTION	(BOTTOM VIEW UNLESS OTHERWISE NOTED)
2SA 719	1 2 3	TOP VIEW
2SC 828	1 2 3	TOP VIEW
2SC 829	1 2 3	TOP VIEW
2SC 839	1 2 3	TOP VIEW
2SC 845	1 2 3	TOP VIEW
2SC 8318	1 2 3	TOP VIEW
2SC 1359	1 2 3	TOP VIEW
2SC 1047	1 2 3	TOP VIEW
2SC 1215	1 2 3	TOP VIEW
2SC 710	1 2 3	TOP VIEW
2SC 784	1 2 3	TOP VIEW
2SC 372	1 2 3	TOP VIEW
2SC 1687	1 2 3	TOP VIEW
2SC 1688	1 2 3	TOP VIEW
2SC 1306	1 2 3	TOP VIEW
2SC 1678	1 2 3	TOP VIEW
2SC 1816	1 2 3	TOP VIEW
2SD 313	1 2 3	TOP VIEW
2SC 1760	1 2 3	TOP VIEW
2SC 1957	1 2 3	TOP VIEW
TA7205P	1 2 3	TOP VIEW
BA 521	1 2 3	TOP VIEW

E : EMITTER
 C : COLLECTOR
 B : BASE

Figure 2-14. Schematic Diagram, Model 3084X



- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 -chassis ground
 -p.c. board ground
 -indicates component value may vary from unit to unit

SEMICONDUCTOR	TERMINAL CONNECTION	VIEW	VIEW	VIEW	VIEW	VIEW
2SA 719	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 828	BCE	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 829	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 839	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 945	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1318	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1359	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1047	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1215	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1687	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1688	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1306	BCE	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1678	BCE	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1760	BCE	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
2SC 1957	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
TA 7205P	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW
BA 521	ECB	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW	SIDE VIEW

Figure 2-15. Schematic Diagram, Model 3087A

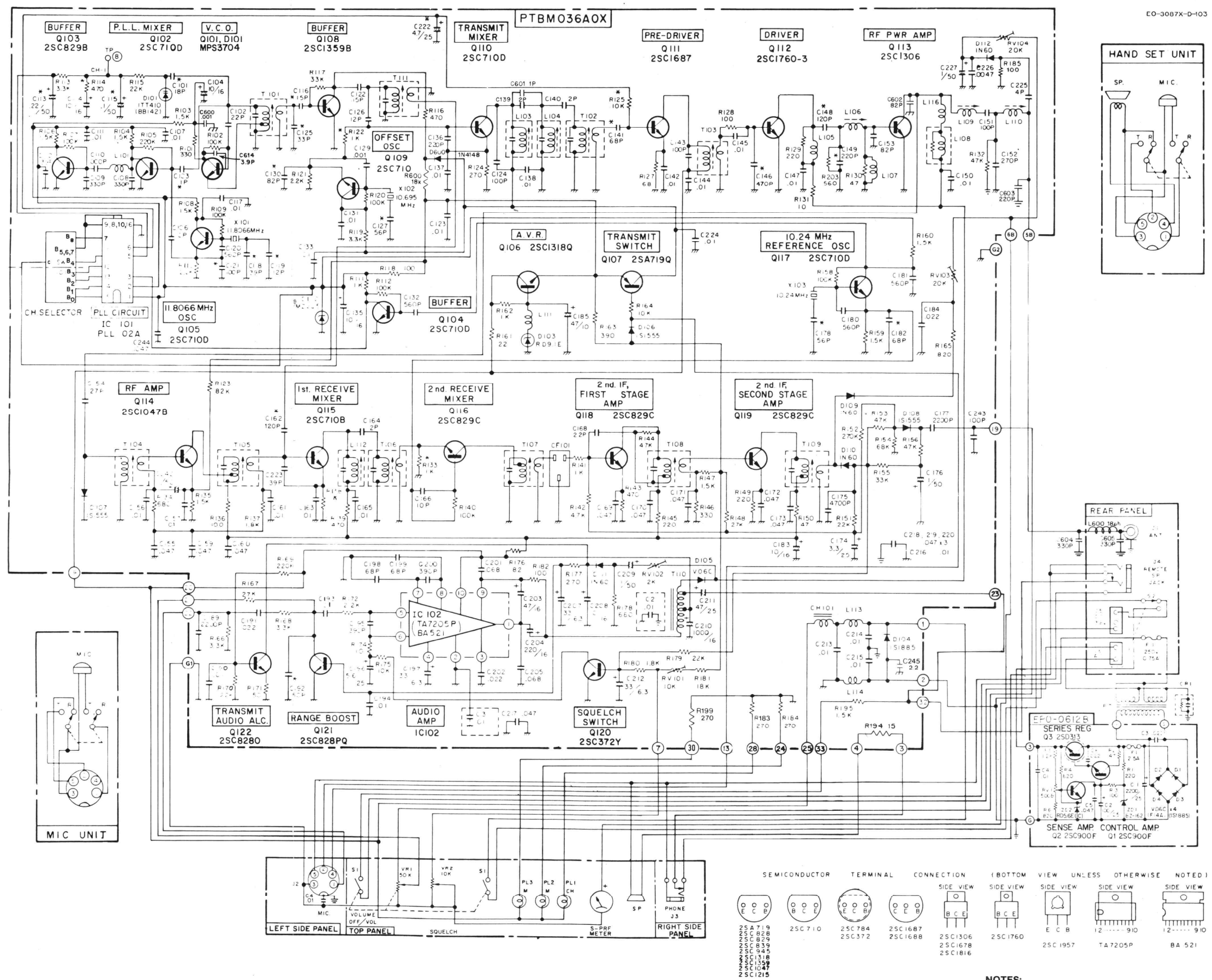


Figure 2-16. Schematic Diagram, Model 3087X

SEMICONDUCTOR	TERMINAL CONNECTION	(BOTTOM VIEW UNLESS OTHERWISE NOTED)
2SA719	1 2 3	TOP VIEW
2SC829	1 2 3	TOP VIEW
2SC839	1 2 3	TOP VIEW
2SC945	1 2 3	TOP VIEW
2SC1318	1 2 3	TOP VIEW
2SC1359	1 2 3	TOP VIEW
2SC1047	1 2 3	TOP VIEW
2SC1215	1 2 3	TOP VIEW
2SC784	1 2 3	TOP VIEW
2SC372	1 2 3	TOP VIEW
2SC1687	1 2 3	TOP VIEW
2SC1688	1 2 3	TOP VIEW
2SC1306	1 2 3	TOP VIEW
2SC1760	1 2 3	TOP VIEW
2SC1957	1 2 3	TOP VIEW
TA7205P	1 2 3	TOP VIEW
BA521	1 2 3	TOP VIEW

- NOTES:
- All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 - All capacitor values are given in uF, unless specified otherwise.
 - Symbols used:
 = chassis ground
 = p.c. board ground
 * - indicates component value may vary from unit to unit

CHAPTER 3 — REALIGNMENT PROCEDURES FOR MODELS 2679A, 2679X, and 2710X FOLLOWING MODIFICATION

General

These procedures must be followed to align the transceivers. Alignment should not be undertaken unless the technician has adequate test equipment and a full understanding of the circuitry of the transceiver.

IMPORTANT: Tuning adjustment of this transceiver "shall be made by or under the immediate supervision and responsibility of a person holding a first or second-class commercial radio operator license," as stipulated in Part 95.97(b) of the FCC Rules and Regulations.

The procedures are divided into two main sections: Transmitter Alignment and Receiver Alignment. See *Equipment* below for a complete list of recommended equipment.

These procedures assume that proper voltages are present at all points in the unit, if not, troubleshoot before continuing.

NOTE: The ferrite cores in the tuning coils are easily chipped or broken. Always use care when inserting an alignment tool in the coil; insert it straight into the core.

Recommended Equipment

The following equipment is recommended for use in aligning the transceiver.

Audio Signal Generator, 1 kHz

AC VTVM, 1 mV measureable

DC Ampere Meter, 2A

Variable Regulated Power Supply, 8-15 VDC, 2A or higher

Frequency Counter, 0 to 40 MHz, high input impedance type

VTVM with RF probe

Oscilloscope, 30 MHz, high input impedance with a 10:1 attenuator probe

RF wattmeter and 50 ohm, 5W dummy load

Standard RF signal generator, 27 MHz CB band

Speaker dummy resistor, 8 ohm, 5W

All test equipment should be properly calibrated.

NOTE: Test voltage is 13.8 VDC unless otherwise specified.

Transmitter Alignment Procedure

Equipment Set-Up

Refer to figure 3-4 for the location of components to be adjusted for transmitter alignment.

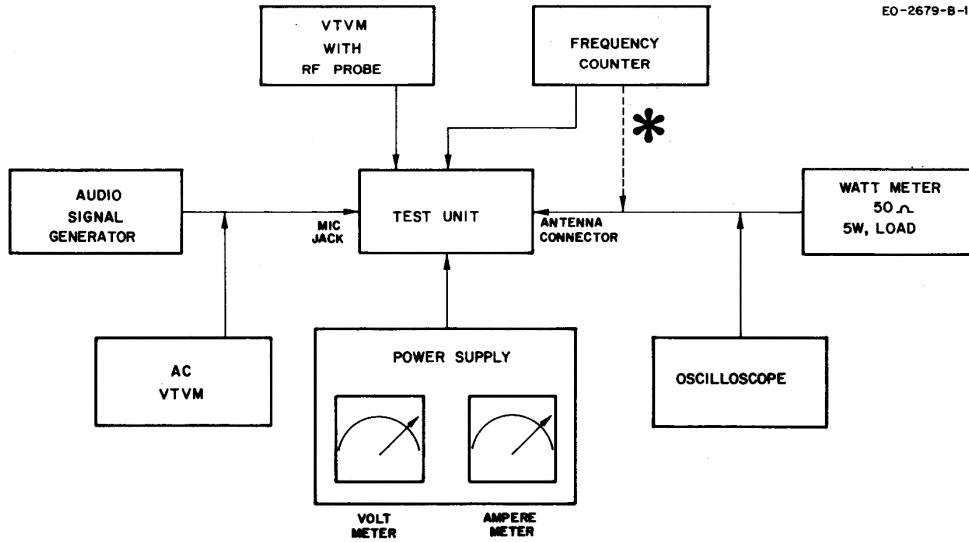


Figure 3-1. Equipment Set-Up, Transmitter Alignment

***NOTE:** See figure 3-2 for connection of the frequency counter and the dummy load.

Pre-Alignment Frequency Check

Before alignment, use a 10:1 attenuator oscilloscope probe connected to the counter input probe to check the operating frequencies at the following points:

1. Pin 3 of IC101, reference input, check to read 10.24 MHz.
2. On the emitter end of R110, check to read 11.8066 MHz.

VCO Alignment

1. Connect a VTVM (DC 10V ranged) across C135 and check to read 5.0V - 5.5V.
2. Place the Channel Selector in the channel 1 position.
3. Connect the VTVM between ground and R114 (TP-8 side).
4. Adjust T101 to obtain $1.5V \pm 0.1V$.
5. Connect the frequency counter with a 10:1 probe to the collector of Q108 and check for a reading of 37.66 MHz.

RF Output Adjustment

1. Adjust the power supply voltage to 8.0 volts.
2. Connect the VTVM RF probe between the base of Q111 and ground.
3. Set the Transceiver Channel Selector to channel 20. Perform the following procedures on channel 20.
4. Key the transmitter.
5. Adjust the slugs of L103, L104, T102 and T111 for a maximum reading on the VTVM.
6. Connect the VTVM RF probe between the base of Q112 and ground.

7. Adjust the slug of T103 for a maximum reading on the VTVM.
8. Adjust L106 for maximum RF output as indicated on the wattmeter.
9. Adjust L109 and L110 for maximum RF power output as indicated on the wattmeter.
10. Raise the power supply voltage to 13.8V.
11. Repeat steps 2 through 7 only.
12. Back off L110 (counterclockwise) for a reading of 4.0 watts RF power output.
13. Readjust L109 for maximum power output.
14. Repeat steps 12 and 13 until the maximum power output is 4.0 watts with L109 peaked for maximum output.

Total transceiver current at this setting should not exceed 1.2A.

Transmitter Frequency Check

1. Turn the transceiver off.
2. Connect the dummy load and frequency counter to the antenna jacks as shown in figure 3-2.

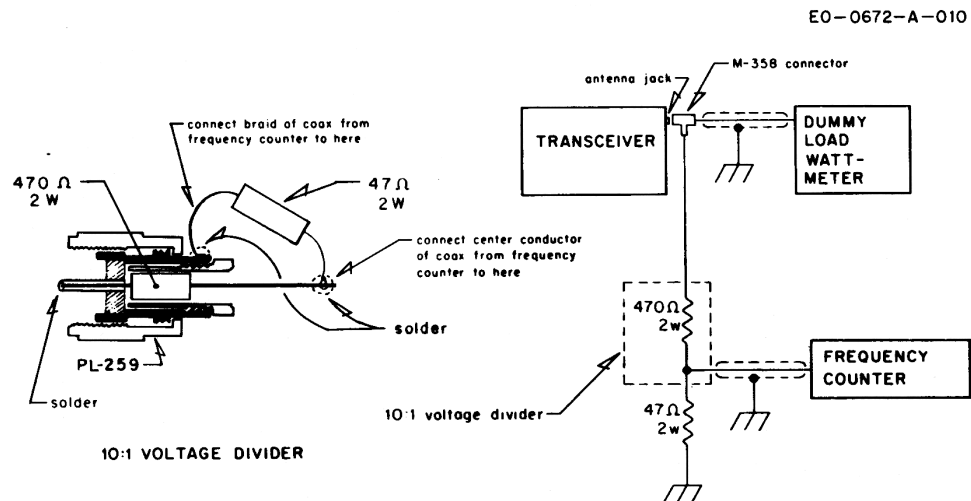


Figure 3-2. Connection of the Frequency Counter and Dummy Load

3. Key the transmitter with the microphone PTT button.
4. Check the frequency of each channel with the following chart. Frequencies should be within $\pm 800\text{Hz}$ at 25°C (room temperature).

CHANNEL FREQUENCY

Channel	MHz	Channel	MHz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Modulation Sensitivity Adjustment

1. Place the unit in the transmit mode and apply a 20 mV, 1 kHz signal to wire wrap pin 22 on the radio PC board.
2. Adjust RV-102 to obtain 90% modulation as observed on the oscilloscope.
3. Decrease the signal input to 6 mV Modulation should not fall below 80%.

Receiver Alignment Procedure

Equipment Set-Up

Refer to figure 3-5 for the location of components to be adjusted for receiver alignment.

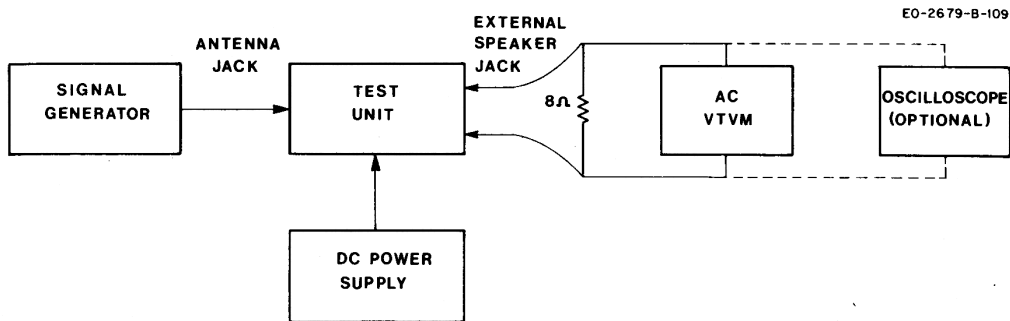


Figure 3-3. Equipment Set-Up, Receiver Alignment

Receiver Alignment

1. Set the signal generator to 27.115 MHz, 1 kHz, 30% modulation and set the transceiver to channel 13.

NOTE: This alignment should be performed with an extremely small signal input from the signal generator to avoid inaccurate alignment due to AGC action.

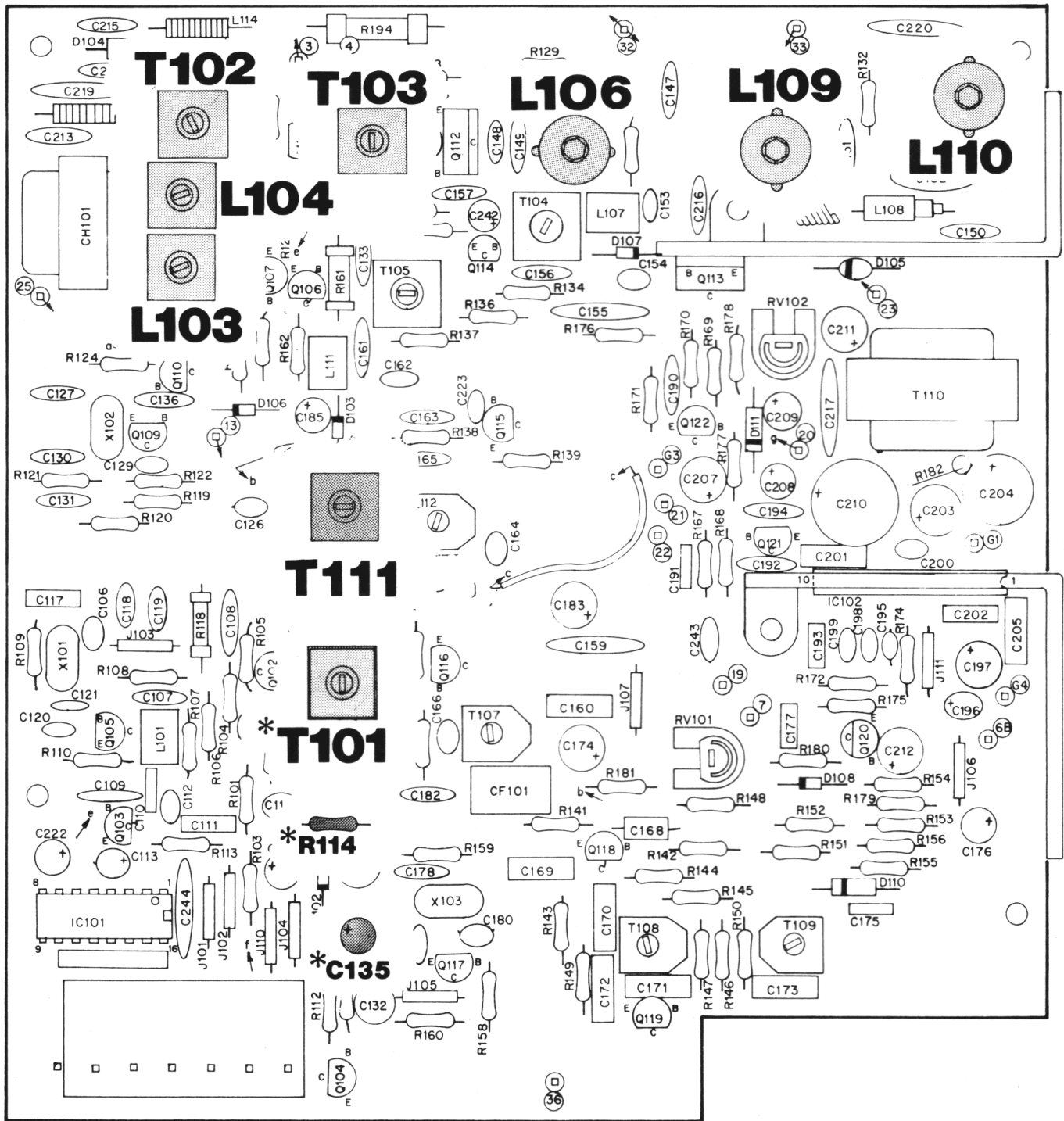
2. Adjust T104, T105, L112, T106, T107, T108 and T109 for maximum audio output as indicated on the AC VTVM (or oscilloscope if used).

Tight Squelch Adjustment

1. Set the signal generator to provide an RF input signal of 100 uV (1 kHz, 30% modulation).
2. Rotate the squelch control fully clockwise.
3. Adjust RV-101 so that the squelch just breaks with the 100 uV signal input.

N-Code Frequency Correlation Chart

CHANNEL NO.	CHANNEL FREQ. (MHz)	"N" DIGITAL CODES	VCO FREQ.	(256) B8	(128) B7	(64) B6	(32) B5	(16) B4	(8) B3	(4) B2	(2) B1	(1) B0
1	26.965	224	37.660	0	1	1	1	0	0	0	0	0
2	26.975	225	37.670	0	1	1	1	0	0	0	0	1
3	26.985	226	37.680	0	1	1	1	0	0	0	1	0
4	27.005	228	37.700	0	1	1	1	0	0	1	0	0
5	27.015	229	37.710	0	1	1	1	0	0	1	0	1
6	27.025	230	37.720	0	1	1	1	0	0	1	1	0
7	27.035	231	37.730	0	1	1	1	0	0	1	1	1
8	27.055	233	37.750	0	1	1	1	0	1	0	0	1
9	27.065	234	37.760	0	1	1	1	0	1	0	1	0
10	27.075	235	37.770	0	1	1	1	0	1	0	1	1
11	27.085	236	37.780	0	1	1	1	0	1	1	0	0
12	27.105	238	37.800	0	1	1	1	0	1	1	1	0
13	27.115	239	37.810	0	1	1	1	0	1	1	1	1
14	27.125	240	37.820	0	1	1	1	1	0	0	0	0
15	27.135	241	37.830	0	1	1	1	1	0	0	0	1
16	27.155	243	37.850	0	1	1	1	1	0	0	1	1
17	27.165	244	37.860	0	1	1	1	1	0	1	0	0
18	27.175	245	37.870	0	1	1	1	1	0	1	0	1
19	27.185	246	37.880	0	1	1	1	1	0	1	1	0
20	27.205	248	37.900	0	1	1	1	1	1	0	0	0
21	27.215	249	37.910	0	1	1	1	1	1	0	0	1
22	27.225	250	37.920	0	1	1	1	1	1	0	1	0
23	27.255	253	37.950	0	1	1	1	1	1	1	0	1
24	27.235	251	37.930	0	1	1	1	1	1	0	1	1
25	27.245	252	37.940	0	1	1	1	1	1	1	0	0
26	27.265	254	37.960	0	1	1	1	1	1	1	1	0
27	27.275	255	37.970	0	1	1	1	1	1	1	1	1
28	27.285	256	37.980	1	0	0	0	0	0	0	0	0
29	27.295	257	37.990	1	0	0	0	0	0	0	0	1
30	27.305	258	38.000	1	0	0	0	0	0	0	1	0
31	27.315	259	38.010	1	0	0	0	0	0	0	1	1
32	27.325	260	38.020	1	0	0	0	0	0	1	0	0
33	27.335	261	38.030	1	0	0	0	0	0	1	0	1
34	27.345	262	38.040	1	0	0	0	0	0	1	1	0
35	27.355	263	38.050	1	0	0	0	0	0	1	1	1
36	27.365	264	38.060	1	0	0	0	0	1	0	0	0
37	27.375	265	38.070	1	0	0	0	0	1	0	0	1
38	27.385	266	38.080	1	0	0	0	0	1	0	1	0
39	27.395	267	38.090	1	0	0	0	0	1	0	1	1
40	27.405	268	38.100	1	0	0	0	0	1	1	0	0



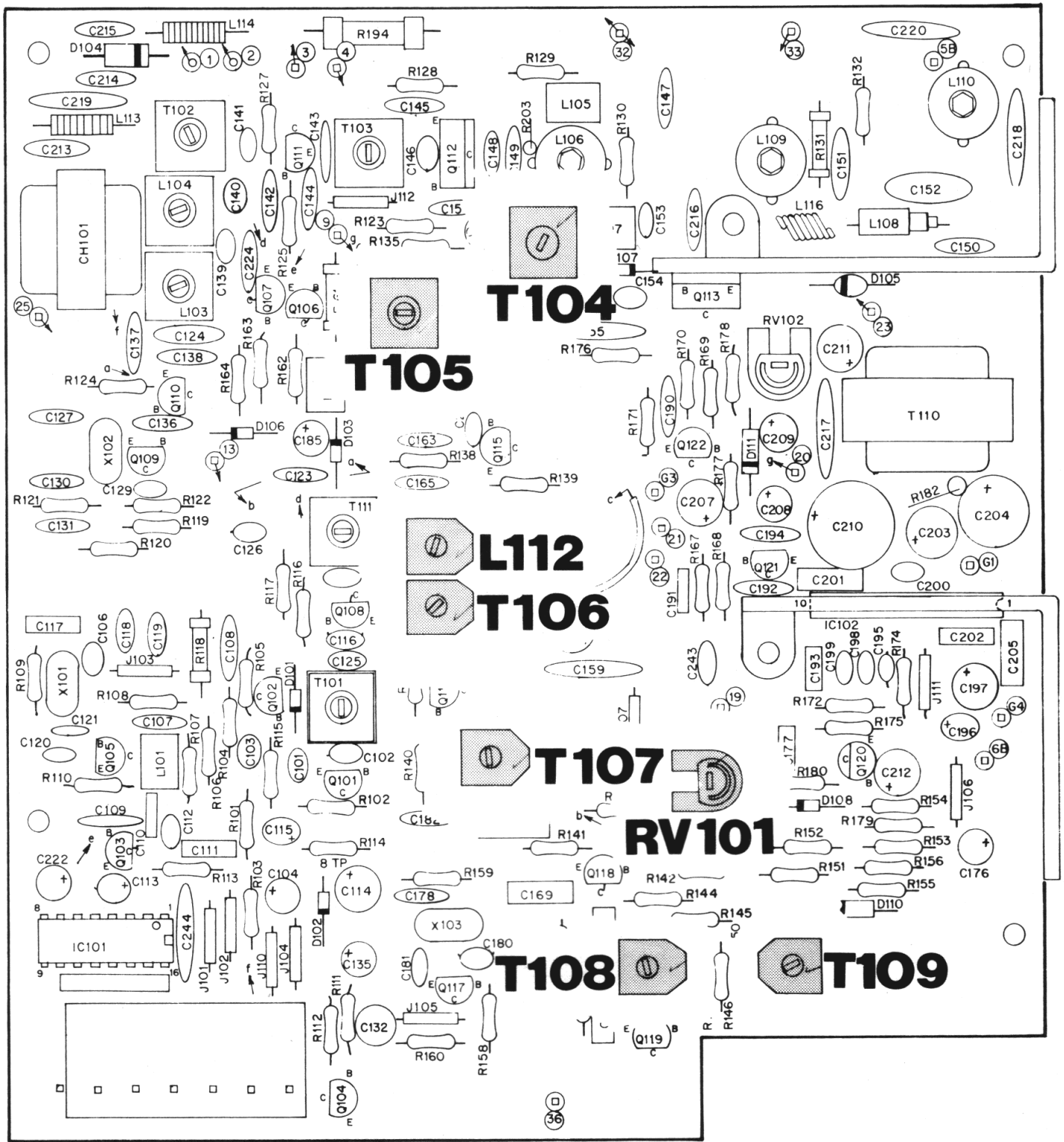
(FRONT PANEL)

NOTES:

- *T101 adjusted in VCO Alignment only.
- *R114 and C135 are connection points for VCO Alignment.

Figure 3-4.

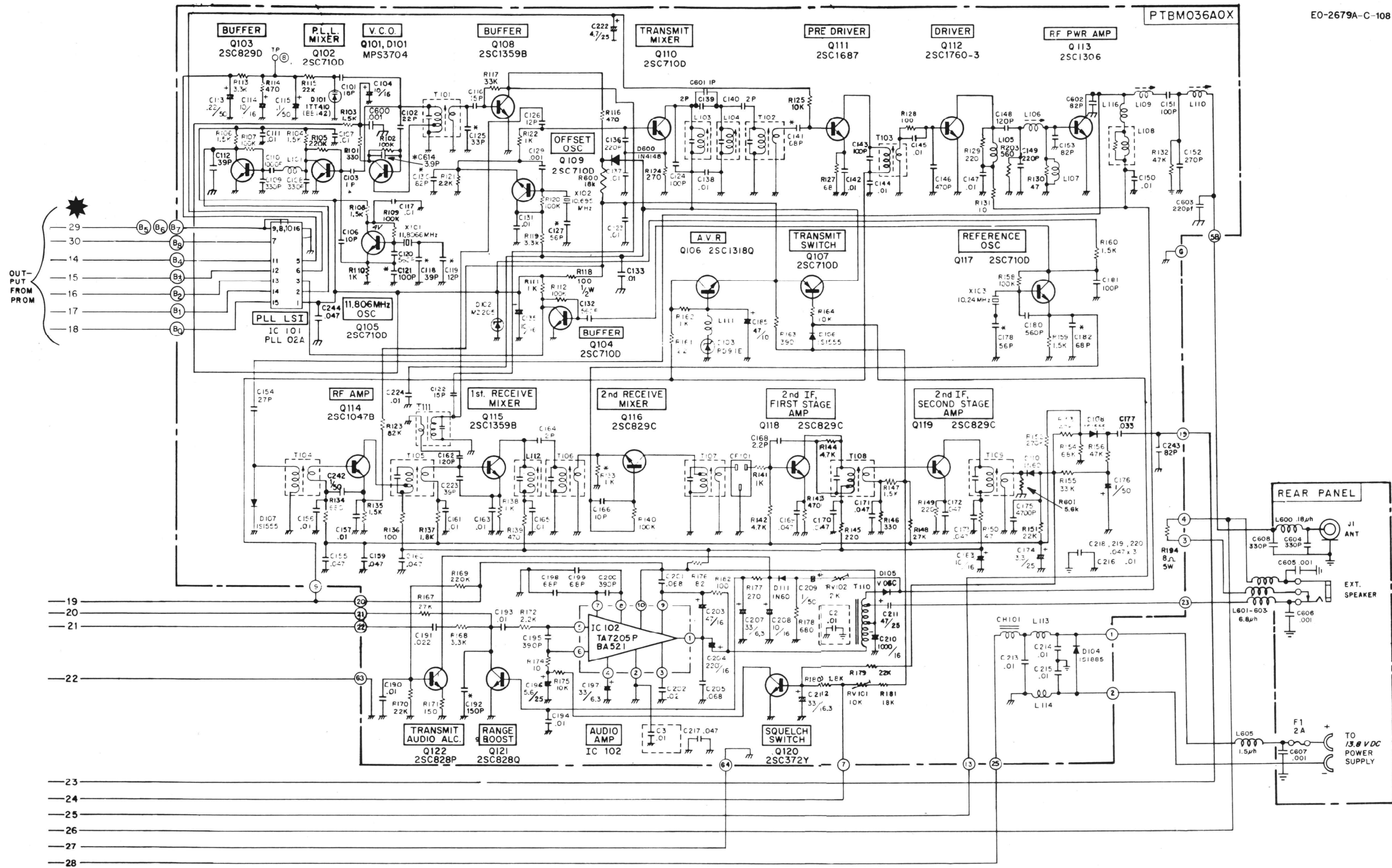
Components Adjusted for Transmitter Alignment



(FRONT PANEL)

Figure 3-5.

Components Adjusted for Receiver Alignment



- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 ⊕ - chassis ground
 ⊕ - p.c. board ground
 * - indicates component value may vary from unit to unit
 * - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

SEMICONDUCTOR	TERMINAL CONNECTION	(BOTTOM VIEW UNLESS OTHERWISE NOTED)
2SC829D	FCB	FCB
2SC710D	BCE	BCE
2SC710D	FCB	FCB
2SC1687	FCB	FCB
2SC1688	FCB	FCB
2SC1306	BCE	BCE
2SC1678	BCE	BCE
2SC1760	BCE	BCE
2SC1957	ECB	ECB
TA7205P	12-90	12-90
BA521	12-90	12-90

Figure 3-6. Schematic Diagram, Main P.C. Board, Model 2679A

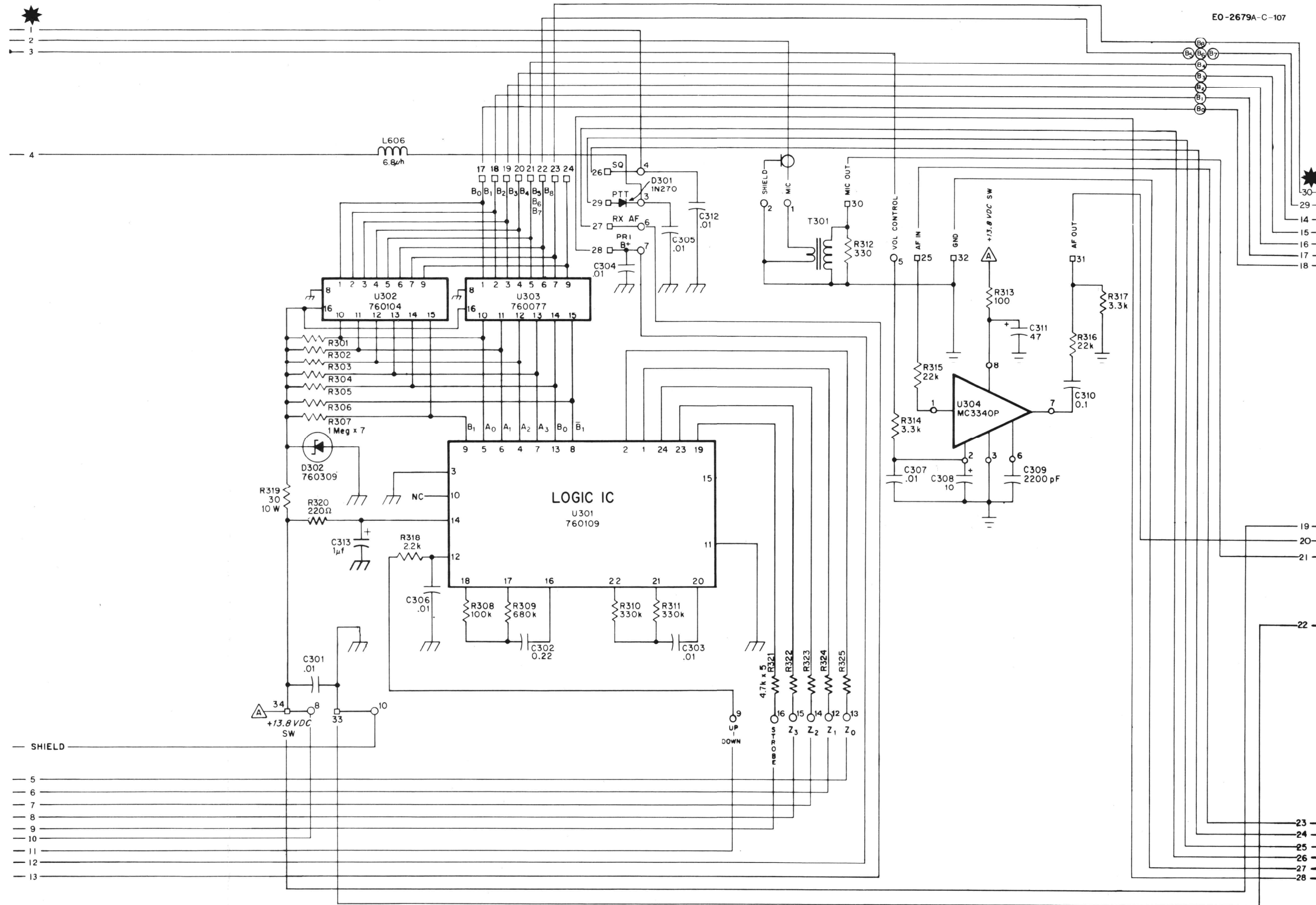
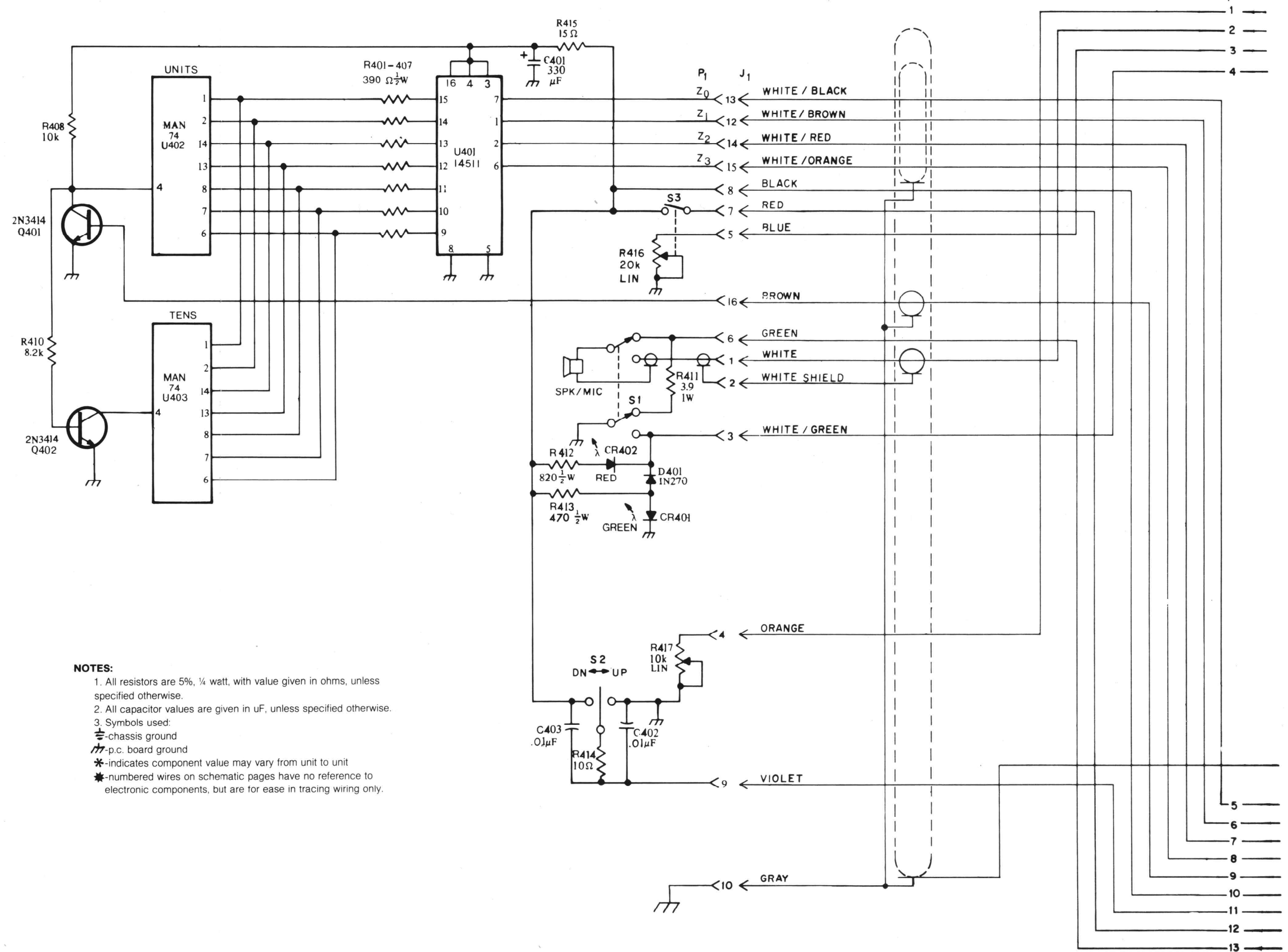


Figure 3-7. Schematic Diagram, Channel Selector P.C. Board, Model 2679A

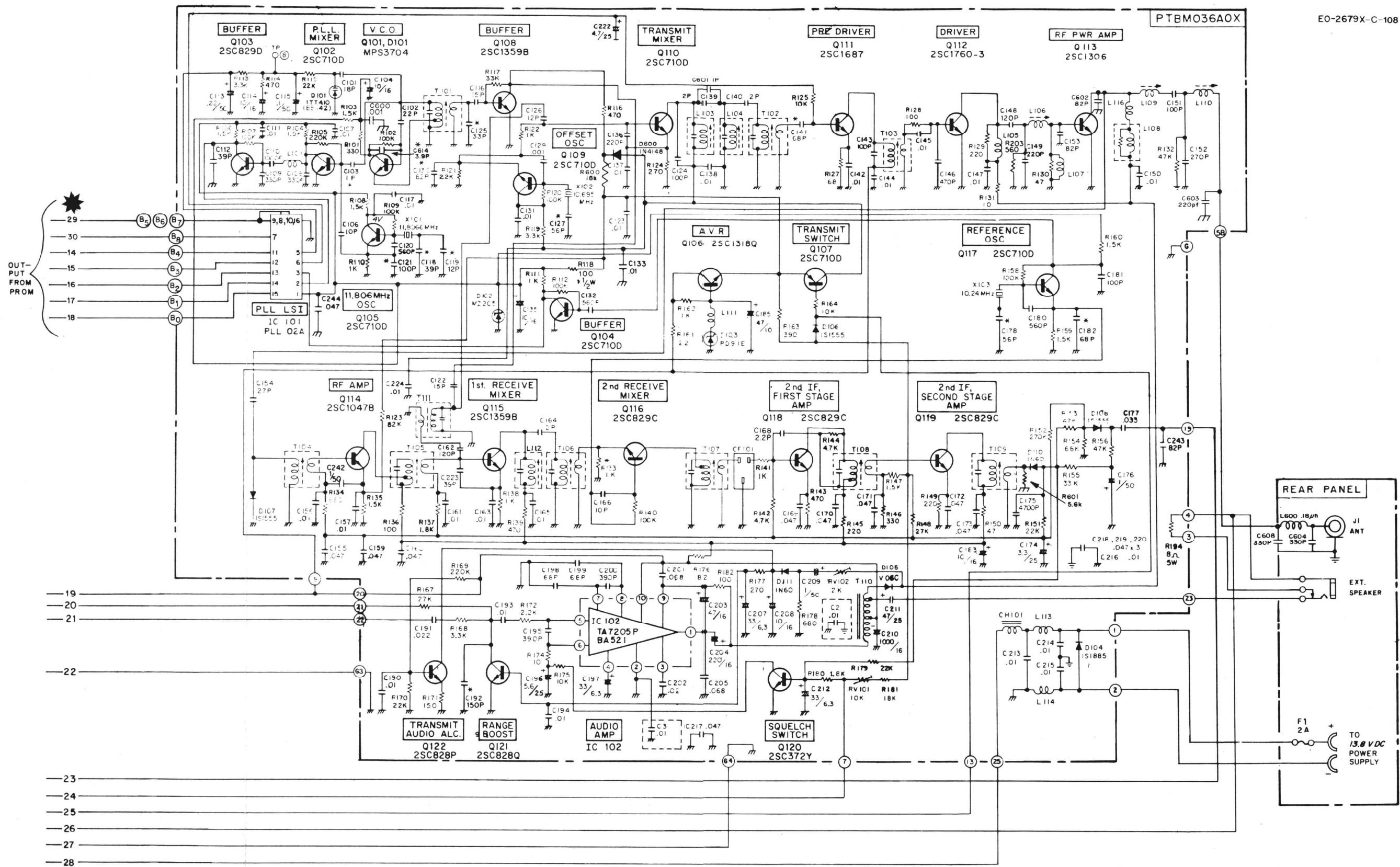
NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 - ⊥ - chassis ground
 - ⏏ - p.c. board ground
 - * - indicates component value may vary from unit to unit
 - * - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.



- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 - chassis ground
 - p.c. board ground
 - *-indicates component value may vary from unit to unit
 - *-numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

Figure 3-8. Schematic Diagram, Microphone P.C. Board, Model 2679A



NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 - chassis ground
 - p.c. board ground
 - * indicates component value may vary from unit to unit
 - *-numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

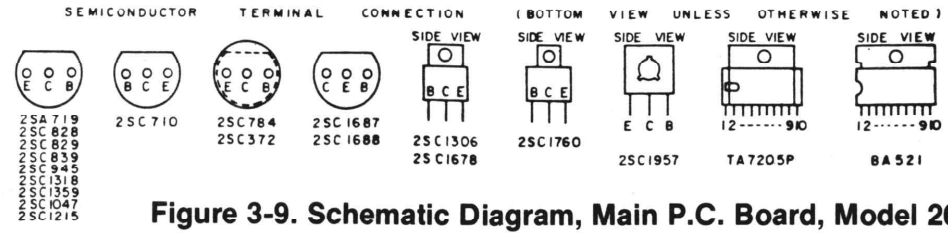


Figure 3-9. Schematic Diagram, Main P.C. Board, Model 2679X

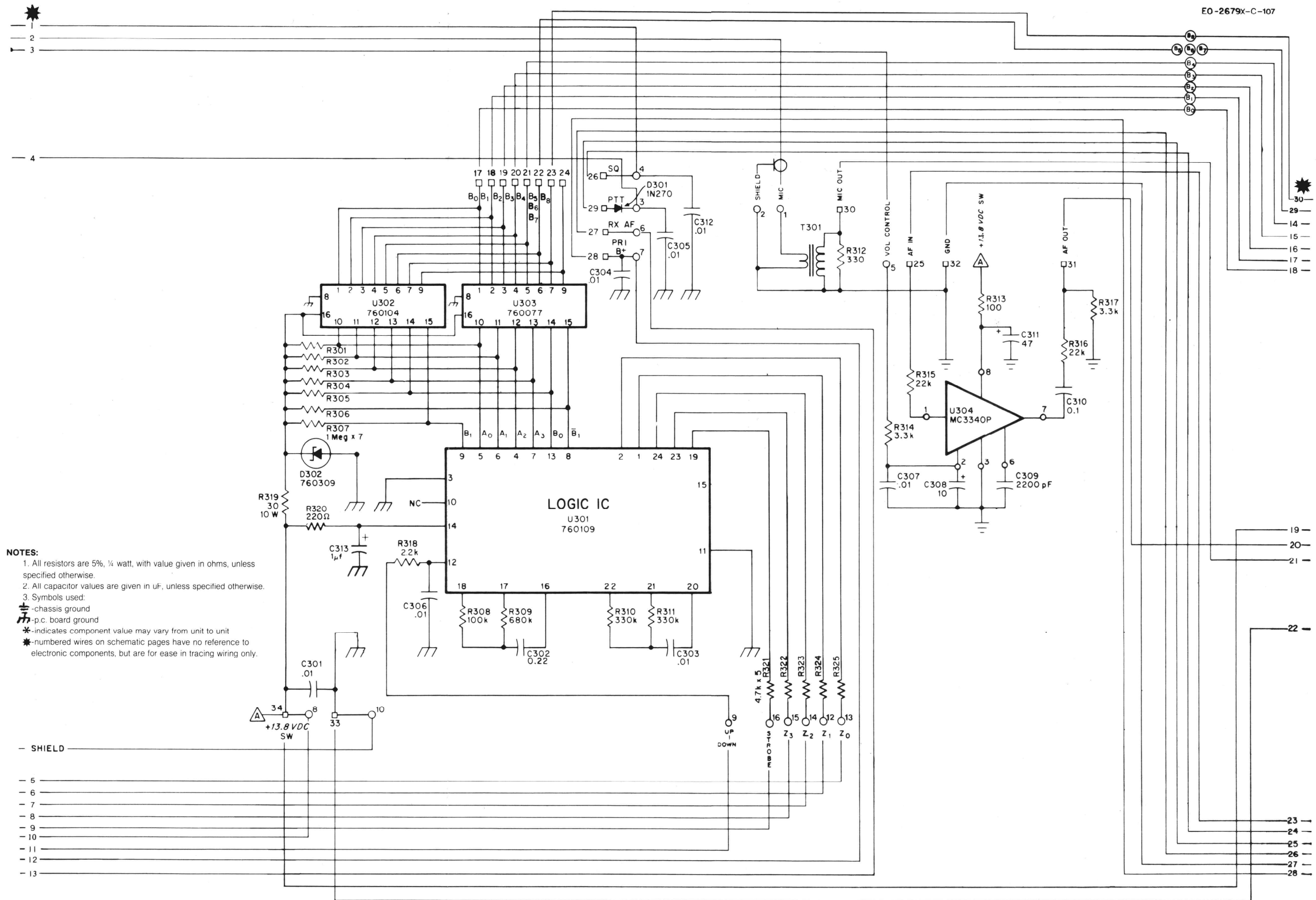
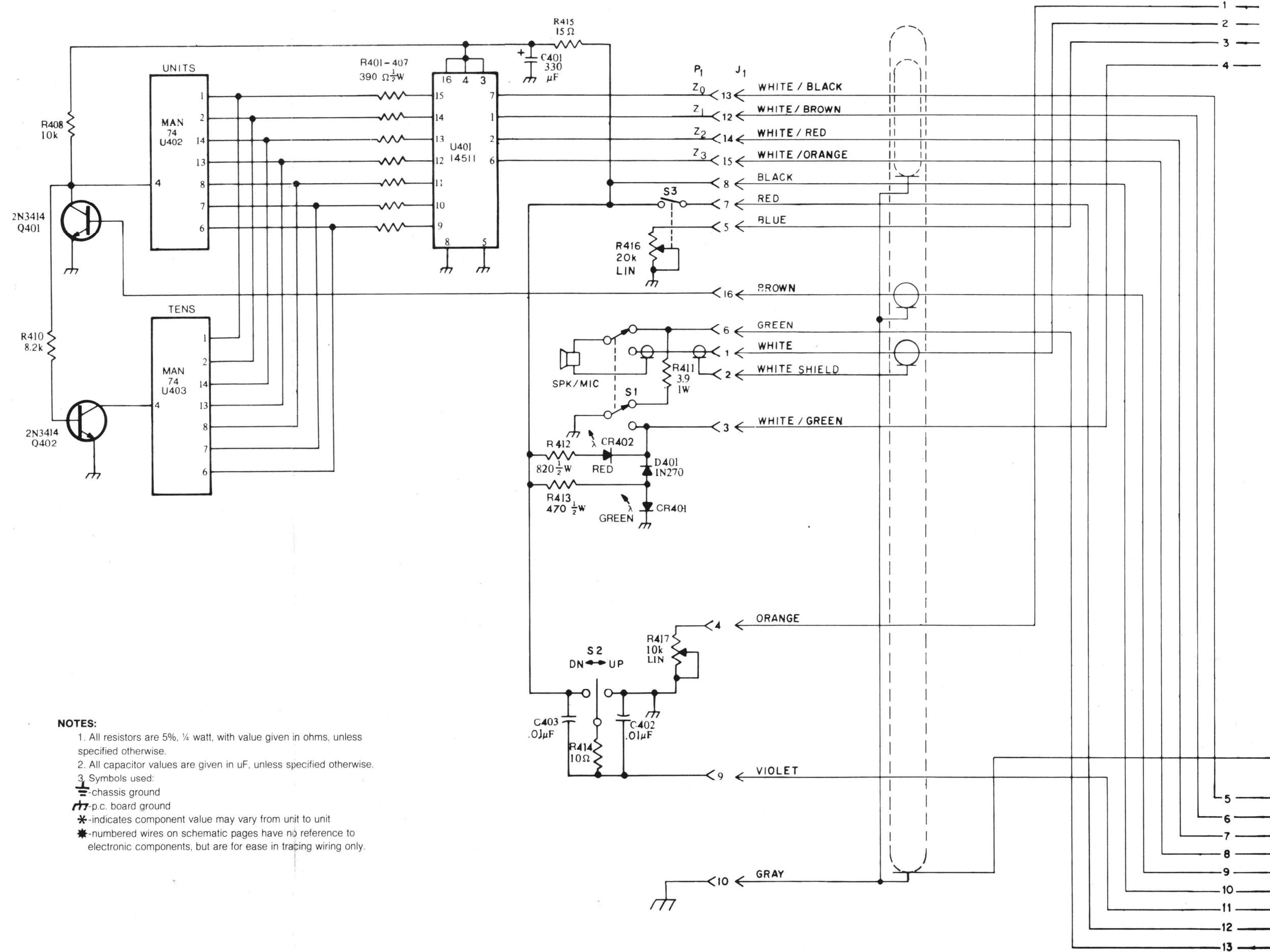


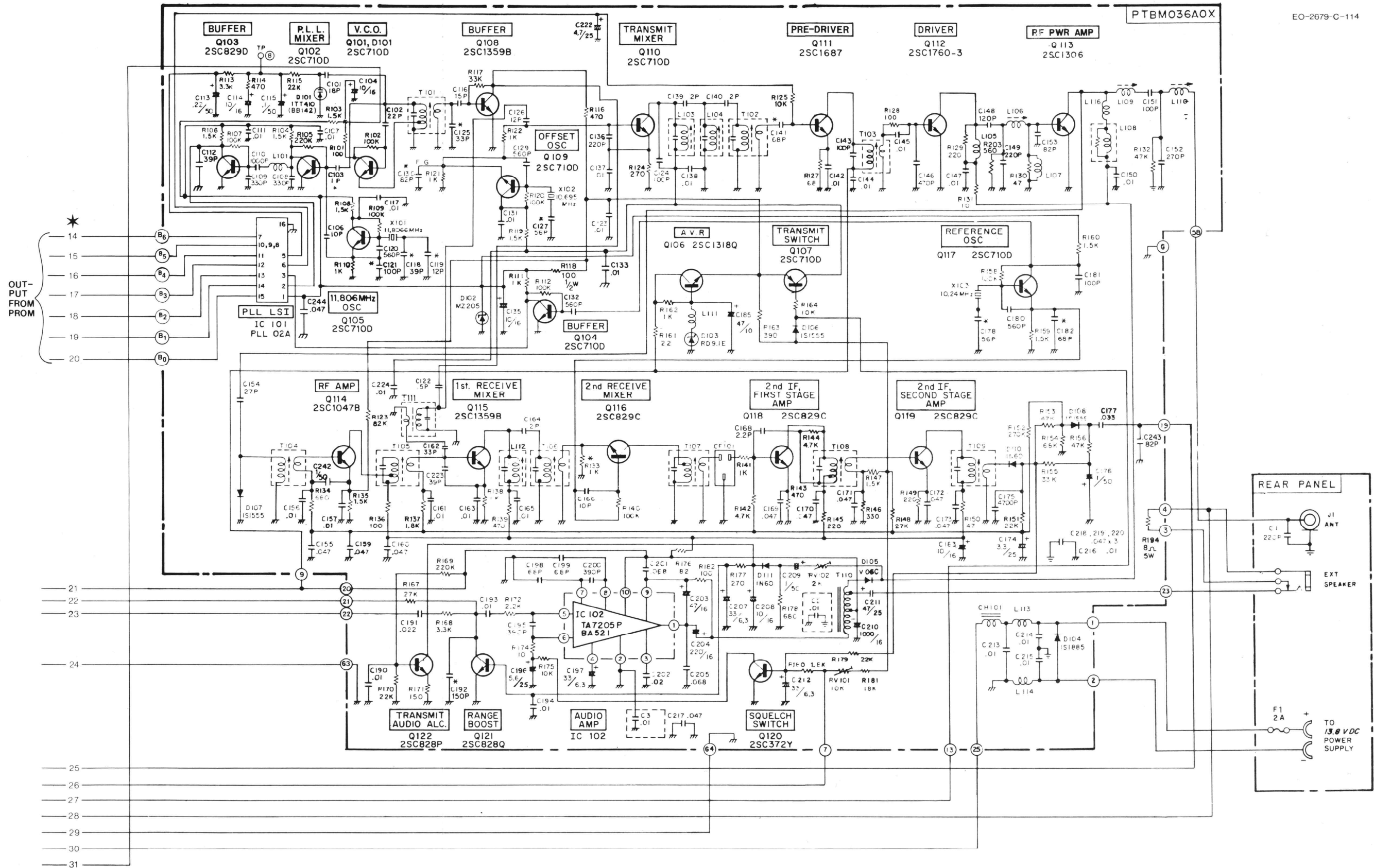
Figure 3-10. Schematic Diagram, Channel Selector P.C. Board, Model 2679X



NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 - chassis ground
 - p.c. board ground
 - * - indicates component value may vary from unit to unit
 - * - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

Figure 3-11. Schematic Diagram, Microphone P.C. Board, Model 2679X

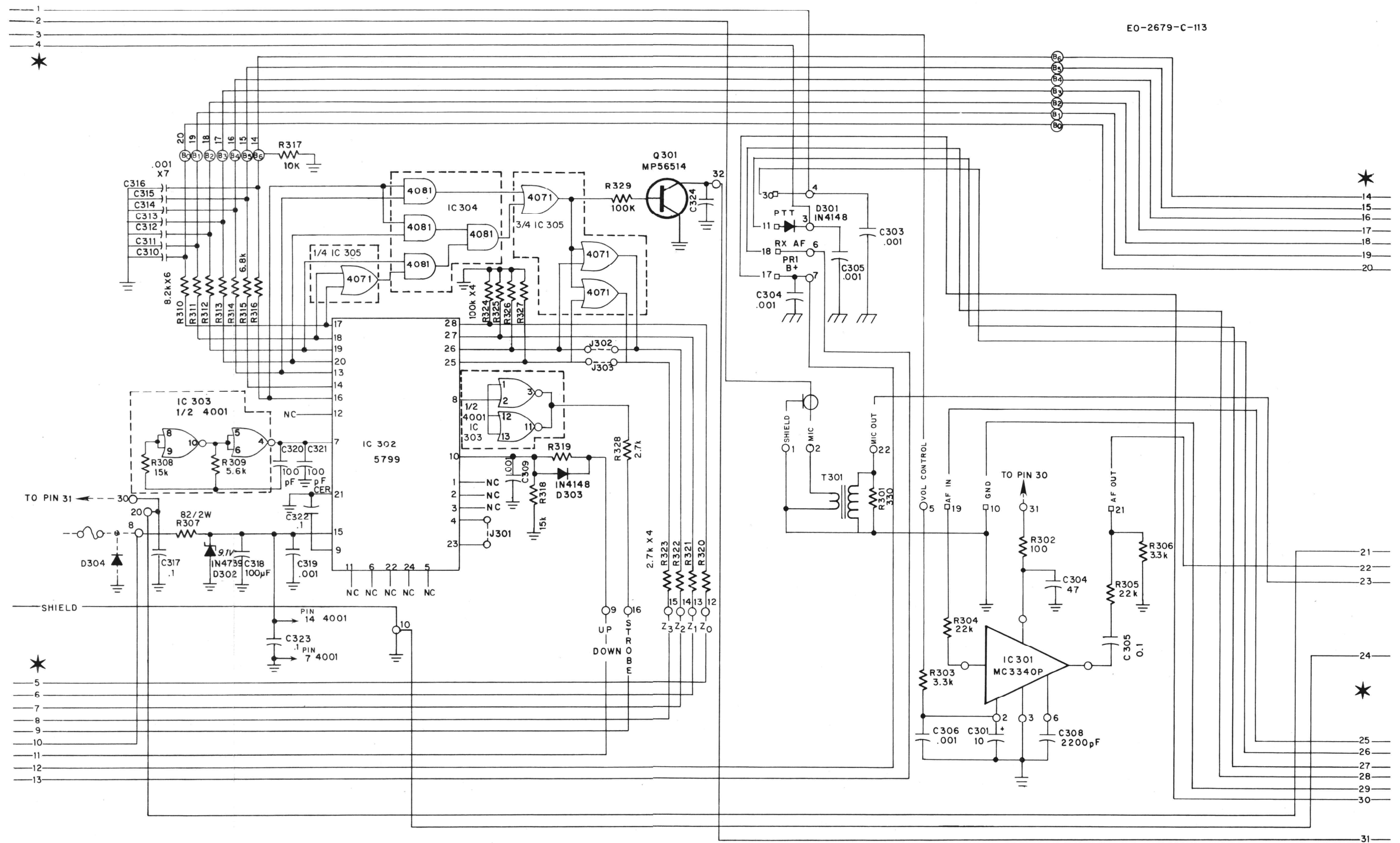


(REVISION A)

SEMICONDUCTOR	TERMINAL CONNECTION	(BOTTOM VIEW UNLESS OTHERWISE NOTED)
2SA719	○ ○ ○ ○	○ ○ ○ ○
2SC829	○ ○ ○ ○	○ ○ ○ ○
2SC829B	○ ○ ○ ○	○ ○ ○ ○
2SC839	○ ○ ○ ○	○ ○ ○ ○
2SC839B	○ ○ ○ ○	○ ○ ○ ○
2SC1318	○ ○ ○ ○	○ ○ ○ ○
2SC1318B	○ ○ ○ ○	○ ○ ○ ○
2SC1359	○ ○ ○ ○	○ ○ ○ ○
2SC1359B	○ ○ ○ ○	○ ○ ○ ○
2SC1215	○ ○ ○ ○	○ ○ ○ ○
2SC710	○ ○ ○ ○	○ ○ ○ ○
2SC784	○ ○ ○ ○	○ ○ ○ ○
2SC372	○ ○ ○ ○	○ ○ ○ ○
2SC1687	○ ○ ○ ○	○ ○ ○ ○
2SC1688	○ ○ ○ ○	○ ○ ○ ○
2SC1306	○ ○ ○ ○	○ ○ ○ ○
2SC1678	○ ○ ○ ○	○ ○ ○ ○
2SC1760	○ ○ ○ ○	○ ○ ○ ○
2SC1957	○ ○ ○ ○	○ ○ ○ ○
TA7205P	○ ○ ○ ○	○ ○ ○ ○
BA521	○ ○ ○ ○	○ ○ ○ ○

- NOTES:**
- All resistors are 10%, 1/4 watt, with value given in ohms, unless specified otherwise.
 - All capacitor values are given in uF, unless specified otherwise.
 - Symbols used:
 - ⊖ - chassis ground
 - ⊕ - p.c. board ground
 - * - indicates component value may vary from unit to unit
 - ★ - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only

Figure 3-12. Schematic Diagram, Main P.C. Board, Model 2679A-X



(REVISION A)

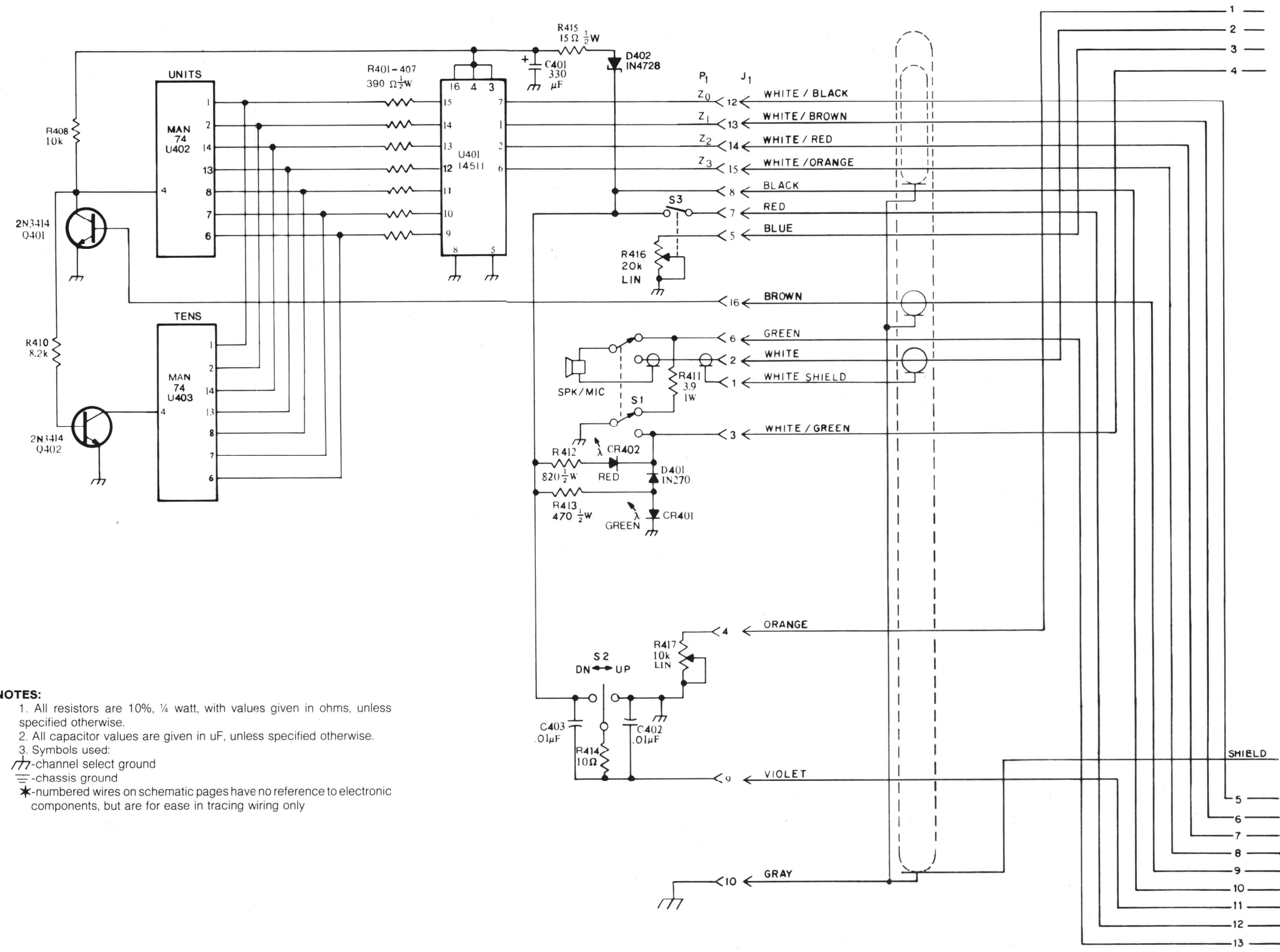
Figure 3-13. Schematic Diagram, Logic P.C. Board with 5799 IC, Model 2679A-X

NOTES:

1. All resistors are 10%, 1/4 watt, with values given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. D302, U301, U302, and U303 are Hy-Gain custom components, type numbered with Hy-Gain part numbers.
4. Symbols used:

-channel select ground
 -audio ground

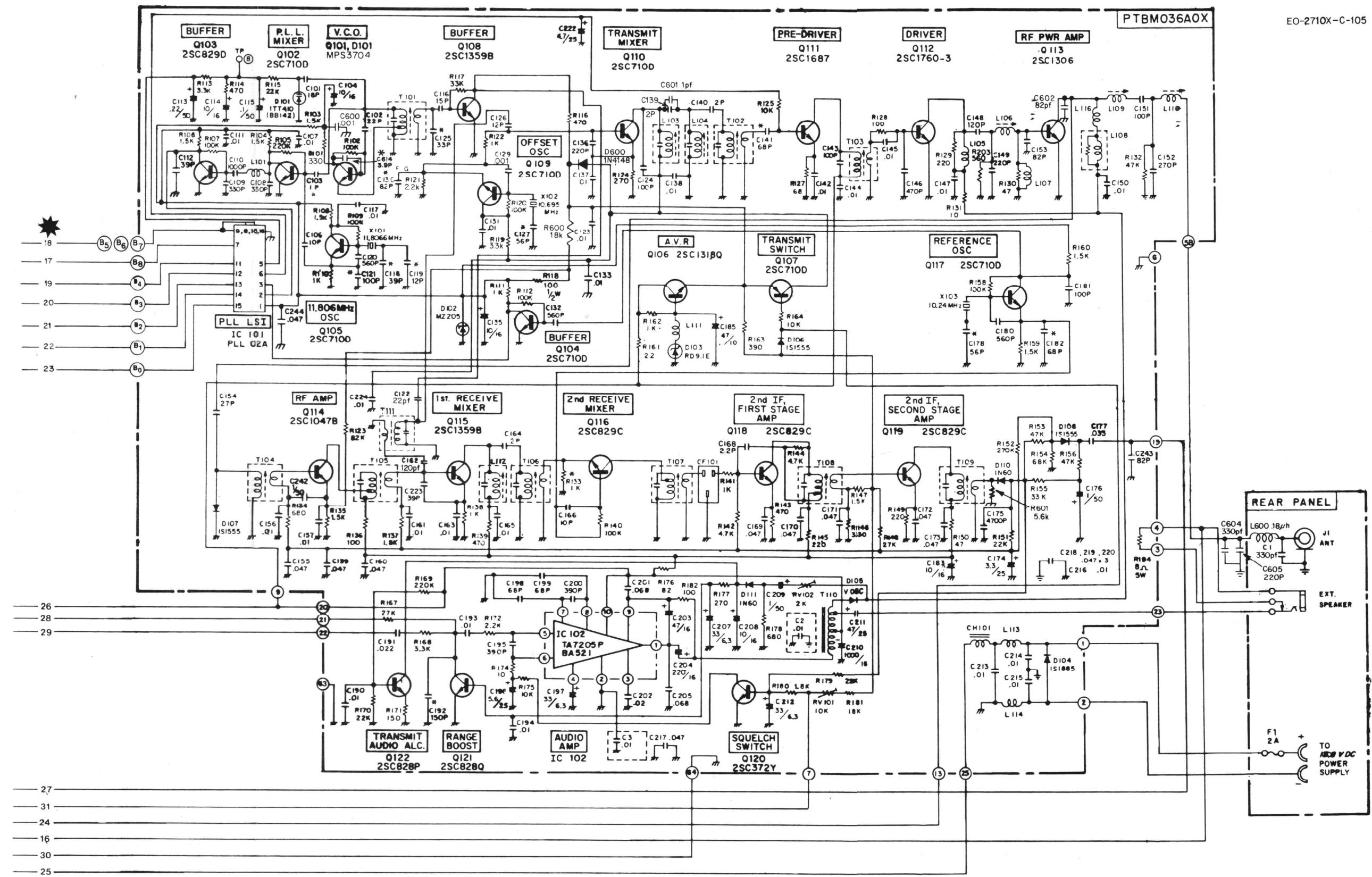
-numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only



NOTES:

1. All resistors are 10%, 1/4 watt, with values given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 // -channel select ground
 ≡ -chassis ground
 ★ -numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only

Figure 3-14. Schematic Diagram, Microphone P.C. Board, Model 2679A-X



- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 ⊥ - chassis ground
 // - p.c. board ground
 * - indicates component value may vary from unit to unit
 # - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

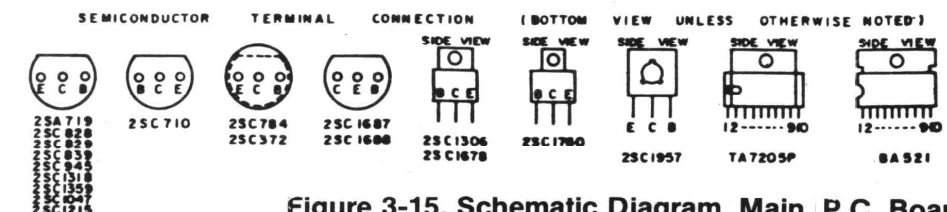
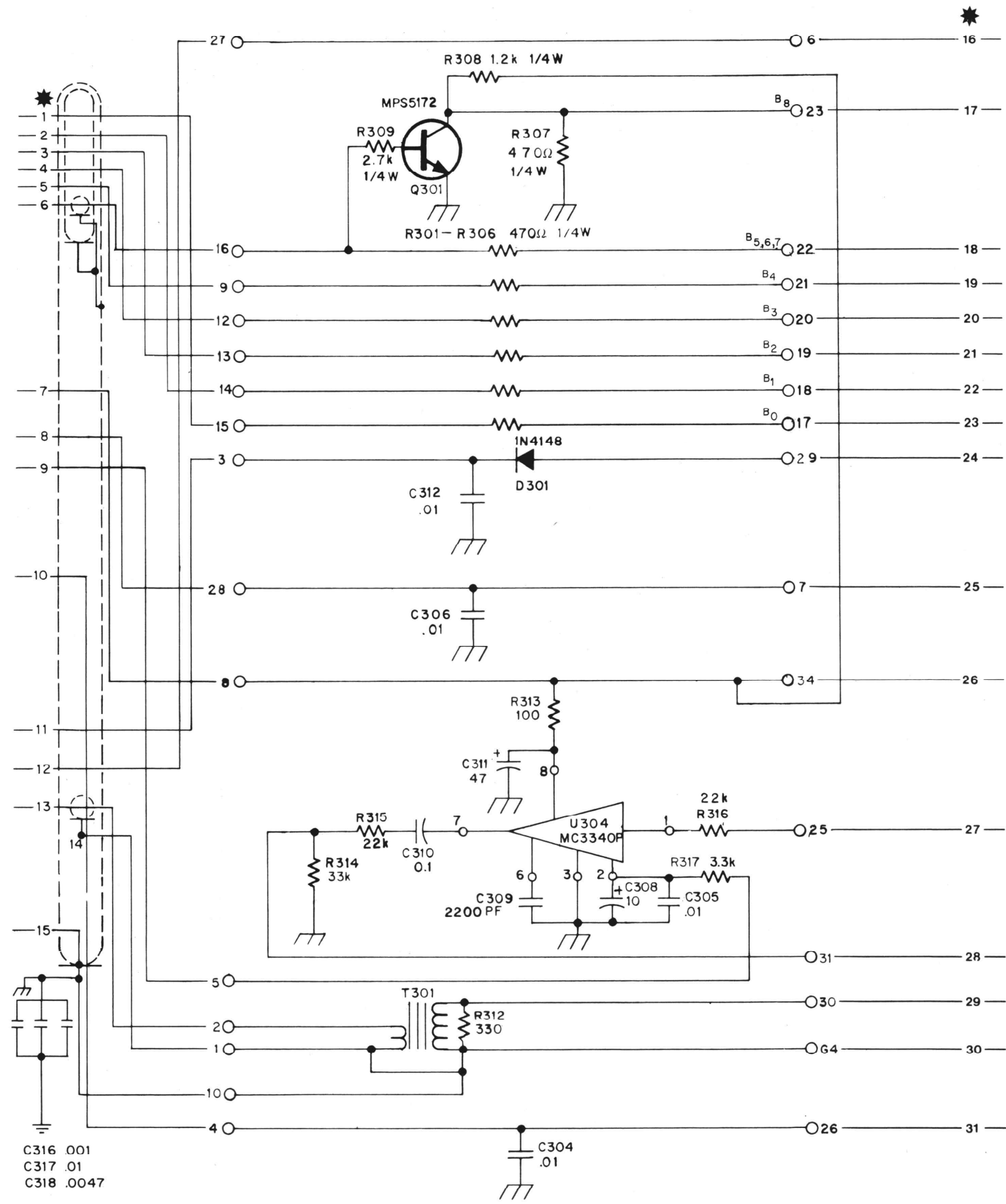


Figure 3-15. Schematic Diagram, Main P.C. Board, Model 2710X

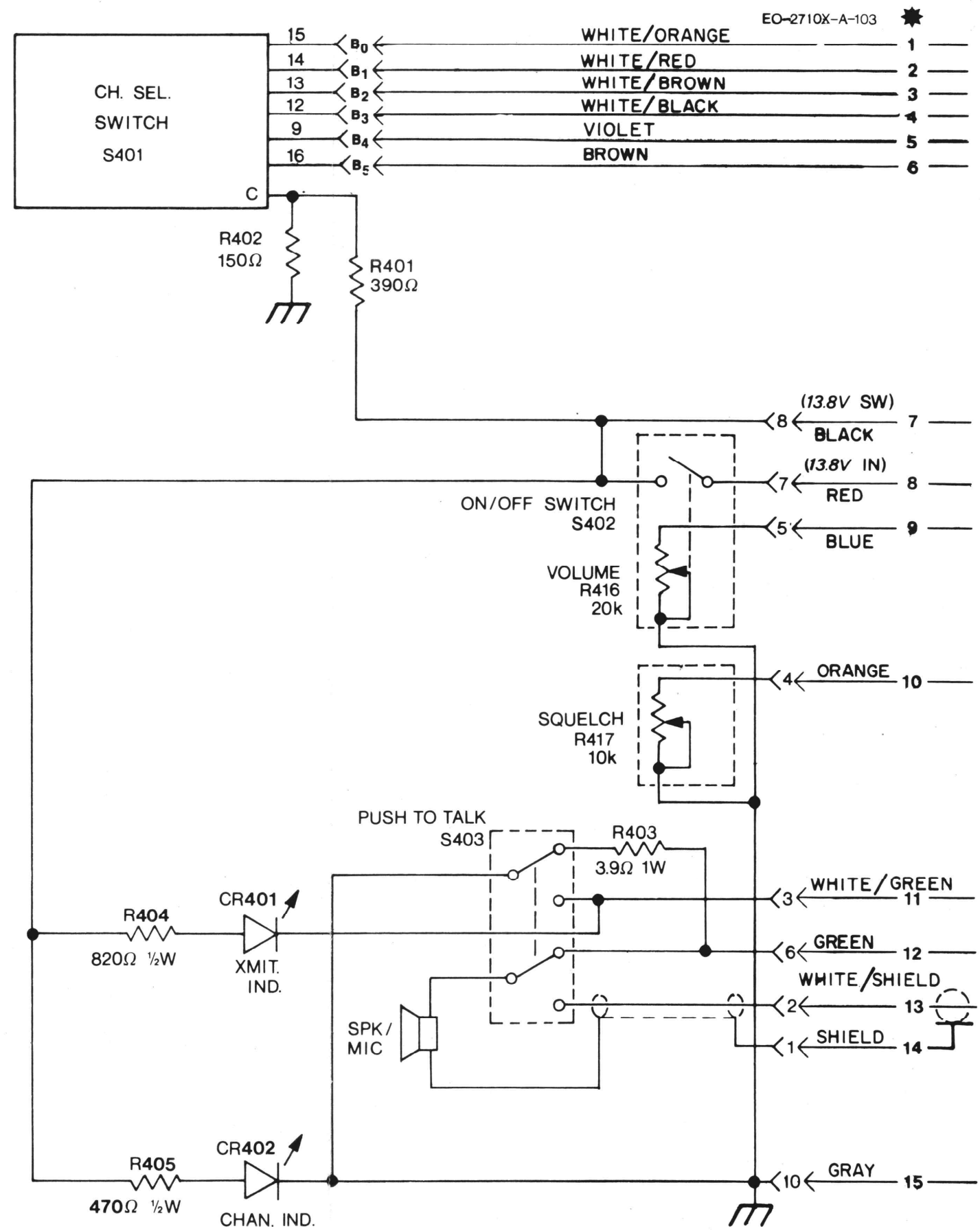


NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 * - chassis ground
 // - p.c. board ground
 * - indicates component value may vary from unit to unit
 * - numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

C316 .001
 C317 .01
 C318 .0047

Figure 3-16. Schematic Diagram, Channel Selector P.C. Board, Model 2710X



NOTES:

1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
2. All capacitor values are given in uF, unless specified otherwise.
3. Symbols used:
 - ⏏ chassis ground
 - ⏏ p.c. board ground
 - * indicates component value may vary from unit to unit
 - *-numbered wires on schematic pages have no reference to electronic components, but are for ease in tracing wiring only.

Figure 3-17. Schematic Diagram, Microphone P.C. BD, Model 2710X

CHAPTER 4 — REALIGNMENT PROCEDURES FOR MODELS 681A, 681X, 682A, and 682X FOLLOWING MODIFICATION

General

These procedures must be followed to properly align the Hy-Gain Ia and IIa transceivers (Models 681A, 681X, 682A, and 682X). Alignment should not be undertaken unless the technician has adequate test equipment and a full understanding of the circuitry of the transceiver.

IMPORTANT: Tuning adjustment of this transceiver "shall be made by or under the immediate supervision and responsibility of a person holding a first or second-class commercial radiotelephone operators license," as stipulated in Part 95.97 (b) of the FCC Rules and Regulations.

The procedures are divided into two main sections: Receiver Alignment and Transmitter Alignment. See *Equipment* below for a complete list of recommended equipment. These procedures assume that voltages are present at all points of the unit. If not, troubleshoot before continuing.

NOTE: The ferrite cores in the tuning coils are easily chipped or broken. Always use care when inserting an alignment tool in the tuning coil: insert it straight into the core.

Recommended Equipment

The following tools and equipment are recommended for use in aligning the models noted above.

Audio Signal Generator, 1 kHz

AC VTVM, 1 mV measurable

DC Ampere Meter, 2A

Variable Regulated Power Supply, DC 8-15V, 2A or higher

Frequency Counter, 0 to 40 MHz, high input impedance type

VTVM with RF probe

Oscilloscope, 30 MHz, high input impedance

RF wattmeter and 50 ohm, 5W dummy load

Standard RF signal generator, 27 MHz CB band

Speaker dummy resistor, 8 ohm, 5W

VOM 20 kohm V

All test equipment should be properly calibrated.

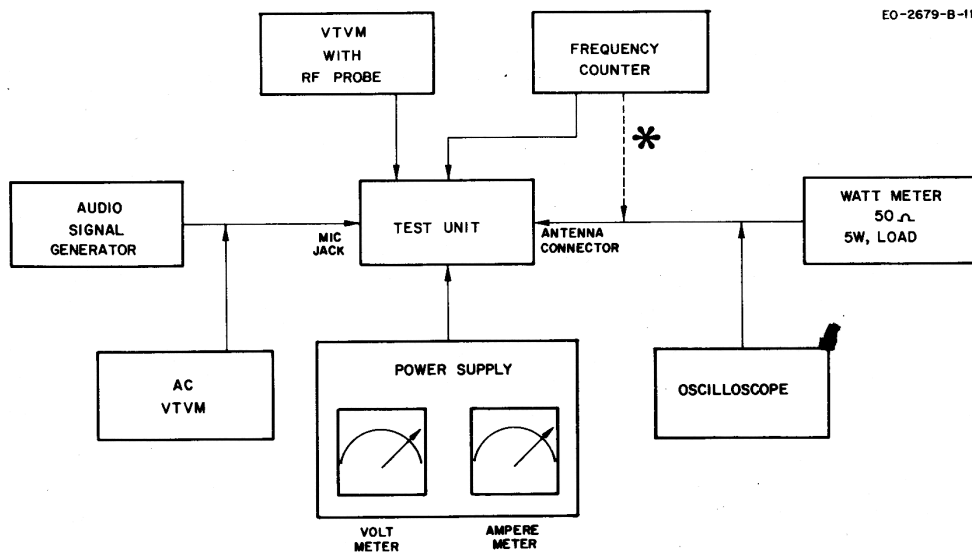
NOTE: Test voltage is 13.8 VDC unless otherwise specified.

Transmitter Alignment Procedures

Equipment Set-Up

Refer to figure 4-4 for the location of components to be adjusted for transmitter alignment.

Connect all test equipment as shown below.



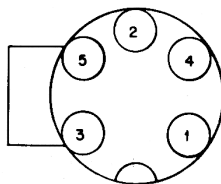
EO-2679-B-111

Figure 4-1. Equipment Set-Up, Transmitter Alignment

***NOTE:** See figure 4-2 for connection of the frequency counter and dummy load.

To set the transceiver to the transmit mode without the microphone, insert a 5-pin plug wired as shown below into the MIC jack on the transceiver. When applying an audio modulation signal to the microphone input circuit, use the same plug.

EO-0681-A-017



Pre-Alignment Frequency Check

Before alignment, using the frequency counter through a 1000 pF coupling capacitor connected in series with the counter input probe, check the operating frequencies at the following points.

Buffer, Q104, collector frequency should be 6400.5 MHz.

Buffer, Q108, base frequency should be 21.0195 MHz in the channel 2 position.

Offset Oscillator, Q109, emitter frequency should be 5945.300 MHz.

VCO Alignment

1. Place the Channel Selector in the channel 1 position.
2. Connect the VOM (DC 3V range) between ground and R114 (TP-8 side).
3. Adjust the T101 core clockwise to obtain $1.5V \pm 0.1V$ on the meter.

4. Place the Channel Selector in the open channel position. A voltage reading of 5.1V to 5.4V is obtained.

5. Place the Channel Selector in the channel 40 position and read the value on the meter. It should be $4.0V \pm .06V$.

RF Output Adjustment

1. Adjust the power supply voltage to 13.8 VDC.
2. Connect a wattmeter and 5W dummy load across the antenna jack.
3. If power output is greater than 2 watts, detune L106 by turning the core clockwise to obtain 2 watts.
4. Tune L111, L103, L104, T102 and T103 to obtain maximum output on channel 19.
5. While tuning these parts, detune L106 even further to maintain a reading between 2 - 2.7W.
6. When no further increase can be obtained by adjusting L111, L103, L104, T102 and T103 while on channel 19, tune L106, L109 and L110 for maximum output power.
7. If power exceeds 4W turn the core of L109 clockwise to decrease power to 4W.
8. Output power on channel 1 and channel 40 may decrease slightly but must never be greater than 4.0W.

Total transceiver current at this setting should not exceed 1.2A.

Transmitter Frequency Check

1. Turn the transceiver off.
2. Connect the dummy load and frequency counter of the antenna jack as shown below.

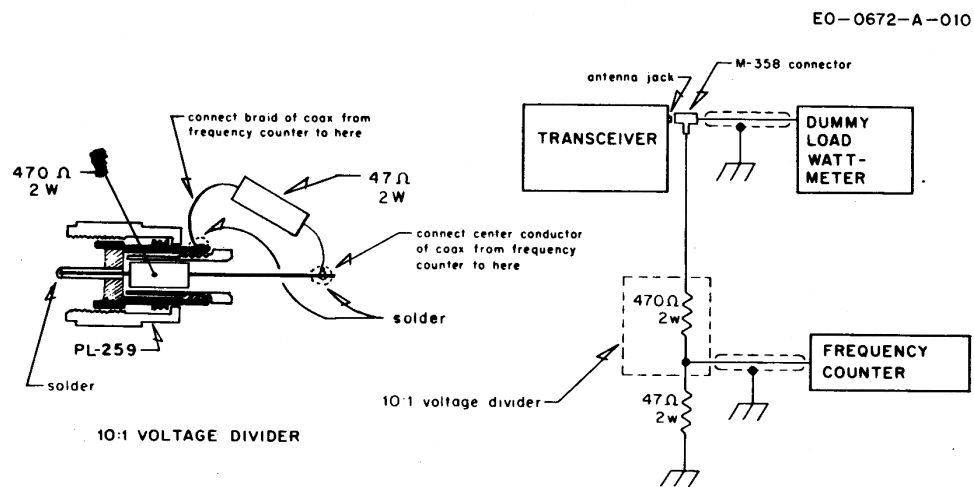


Figure 4-2. Connection of the Frequency Counter and Dummy Load

3. Key the transmitter with the microphone PTT button.
4. Check the frequency of each channel with the chart below.

CHANNEL FREQUENCY

Channel	MHz	Channel	MHz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Modulation Sensitivity Alignment

1. Set the unit in the transmit mode and apply a 20 mV, 1 kHz signal to the microphone input circuit.
2. RV102 should be adjusted to obtain 90% modulation in this condition.
3. Decrease the signal input to 6 mV and ensure that the modulation ratio is keeping a value higher than 80%.

RF Meter Alignment

Adjust RV104 so that the meter pointer indicates the same wattage as the reading obtained on the wattmeter; or so that the meter pointer coincides with the center of the red zone on the meter scale.

NOTE: Refer to the RF output adjustment procedure to set the reference power level, 3.8W on the wattmeter.

Refer to figure 4-5 for the location of components to be adjusted for receiver alignment.

Receiver Alignment Procedure

Equipment Set-Up

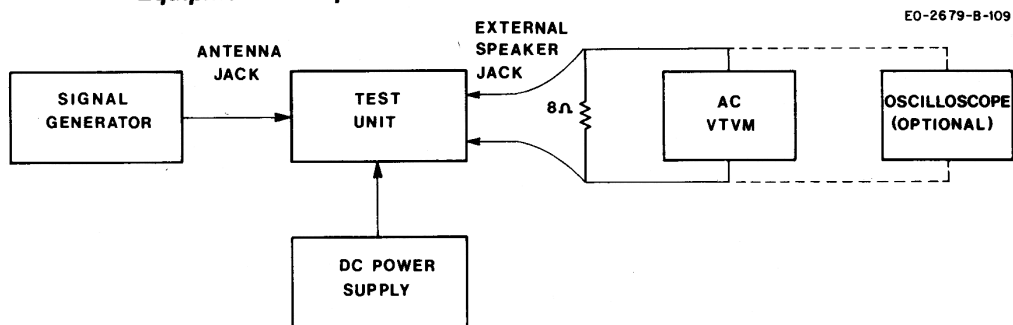
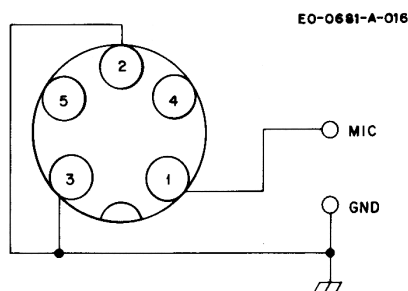


Figure 4-3. Equipment Set-Up, Receiver Alignment

NOTE: Place the ANL switch in the ON position (682A and 682X only). To put the transceiver in the receive mode, insert a 5-pin plug wired as shown below into the microphone jack on the front panel.



Receiver Alignment

1. Set the signal generator to 27.115 MHz, 1 kHz, 30% modulation and set the transceiver to the channel 13 position.

NOTE: This alignment should be performed with an extremely small signal input from the signal generator to avoid inaccurate alignment due to AGC action.

2. Adjust L115, T104, T105, L112, T106, T107, T108 and T109 for maximum audio output on the oscilloscope, or use the S-meter on the unit.

Tight Squelch Adjustment

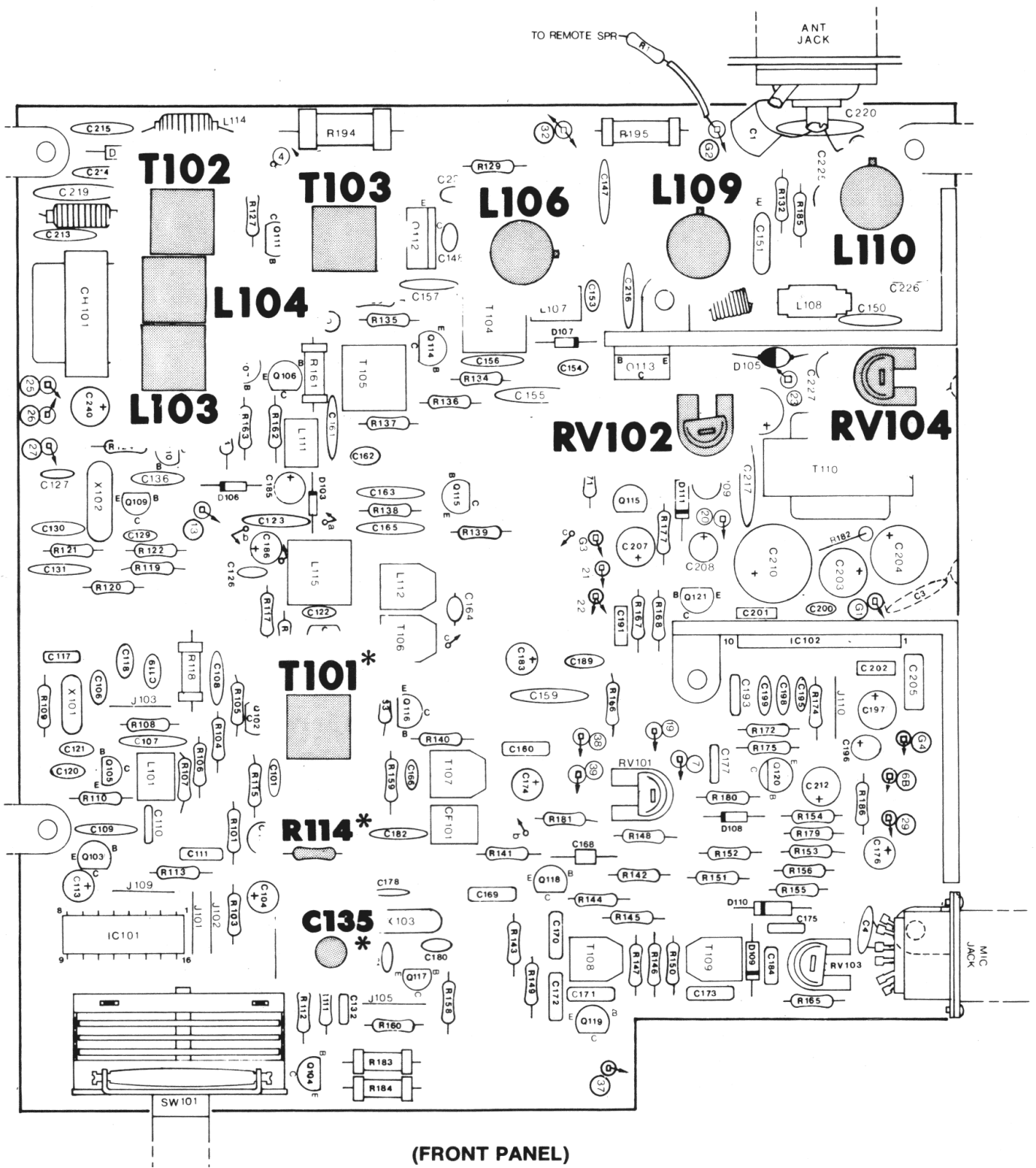
1. Set the signal generator to provide an RF input of 50 μ V (1 kHz, 30% modulation).
2. Rotate the squelch control fully clockwise.
3. Adjust RV101 so that tight squelch just breaks with the 50 μ V input.

S-Meter Adjustment

1. Set the signal generator to provide a 10 μ V signal input.
2. Adjust RV103 so the S-meter pointer indicates 7 on the meter on the front panel.

N CODE — FREQUENCY CORRELATION CHART

CHANNEL	RF FREQ.	VCO FREQ	PROGRAM CODE	40	20	10	8	4	2	1
1	26.965	21.020	00	0	0	0	0	0	0	0
2	26.975	21.030	01	0	0	0	0	0	0	1
3	26.985	21.040	02	0	0	0	0	0	1	0
4	27.005	21.060	04	0	0	0	0	1	0	0
5	27.015	21.070	05	0	0	0	0	1	0	1
6	27.025	21.080	06	0	0	0	0	1	1	0
7	27.035	21.090	07	0	0	0	0	1	1	1
8	27.055	21.110	09	0	0	0	1	0	0	1
9	27.065	21.120	10	0	0	1	0	0	0	0
10	27.075	21.130	11	0	0	1	0	0	0	1
11	27.085	21.140	12	0	0	1	0	0	1	0
12	27.105	21.160	14	0	0	1	0	1	0	0
13	27.115	21.170	15	0	0	1	0	1	0	1
14	27.125	21.180	16	0	0	1	0	1	1	0
15	27.135	21.190	17	0	0	1	0	1	1	1
16	27.155	21.210	19	0	0	1	1	0	0	1
17	27.165	21.220	20	0	1	0	0	0	0	0
18	27.175	21.230	21	0	1	0	0	0	0	1
19	27.185	21.240	22	0	1	0	0	0	1	0
20	27.205	21.260	24	0	1	0	0	1	0	0
21	27.215	21.270	25	0	1	0	0	1	0	1
22	27.225	21.280	26	0	1	0	0	1	1	0
23	27.255	21.310	29	0	1	0	1	0	0	1
24	27.235	21.290	27	0	1	0	0	1	1	1
25	27.245	21.300	28	0	1	0	1	0	0	0
26	27.265	21.320	30	0	1	1	0	0	0	0
27	27.275	21.330	31	0	1	1	0	0	0	1
28	27.285	21.340	32	0	1	1	0	0	1	0
29	27.295	21.350	33	0	1	1	0	0	1	1
30	27.305	21.360	34	0	1	1	0	1	0	0
31	27.315	21.370	35	0	1	1	0	1	0	1
32	27.325	21.380	36	0	1	1	0	1	1	0
33	27.335	21.390	37	0	1	1	0	1	1	1
34	27.345	21.400	38	0	1	1	1	0	0	0
35	27.355	21.410	39	0	1	1	1	0	0	1
36	27.365	21.420	40	1	0	0	0	0	0	0
37	27.375	21.430	41	1	0	0	0	0	0	1
38	27.385	21.440	42	1	0	0	0	0	1	0
39	27.395	21.450	43	1	0	0	0	0	1	1
40	27.405	21.460	44	1	0	0	0	1	0	0

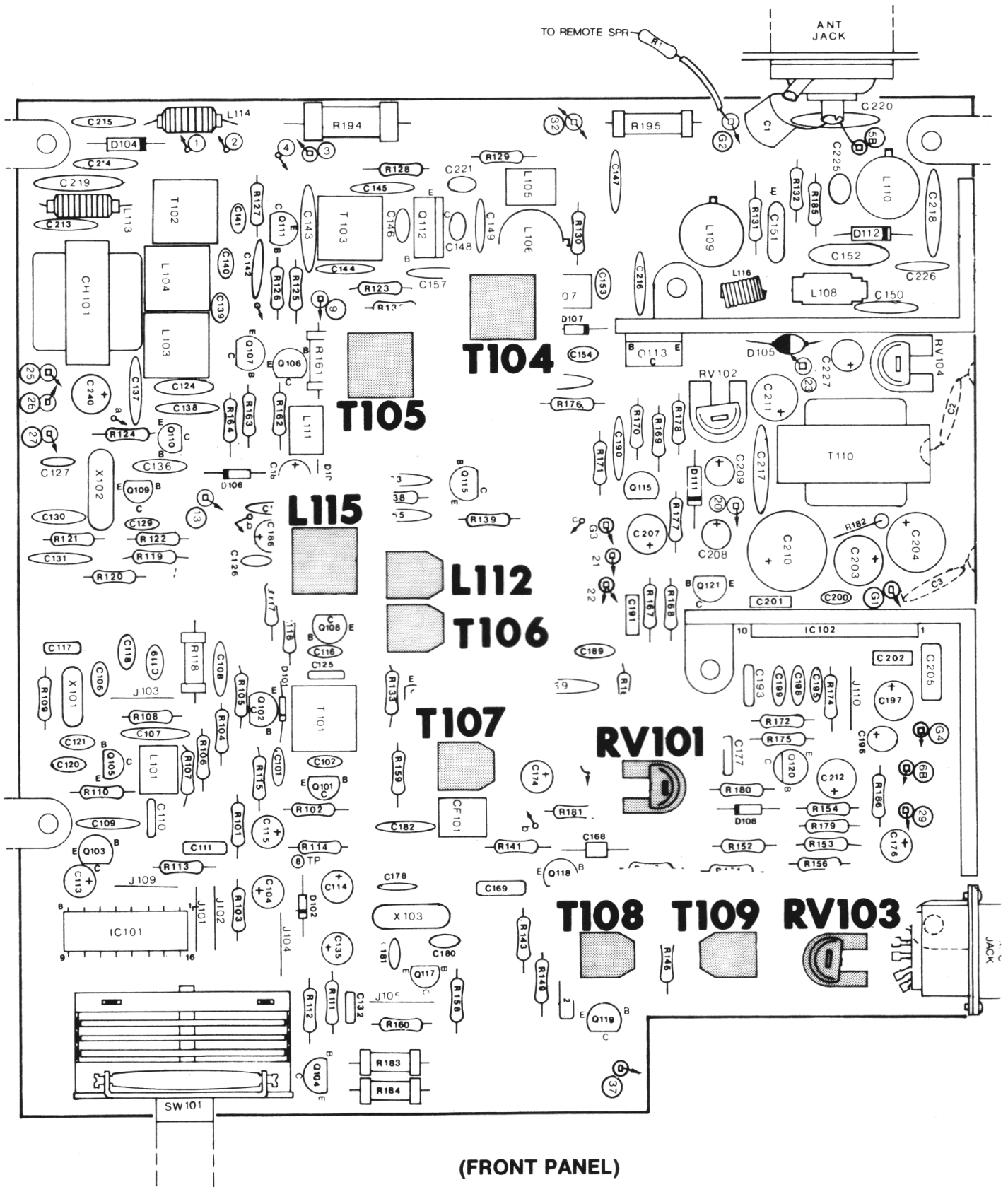


NOTES:

- *T101 adjusted in VCO Alignment only.
- *R114 and C135 are connection points for VCO Alignment.

Figure 4-4

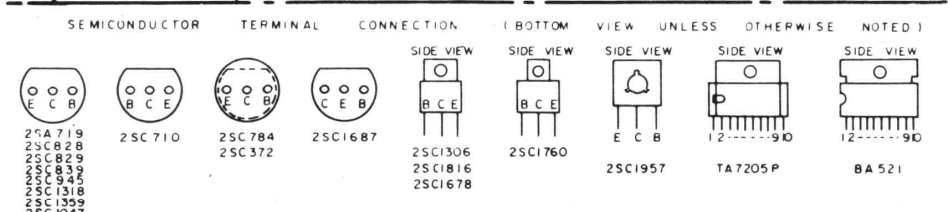
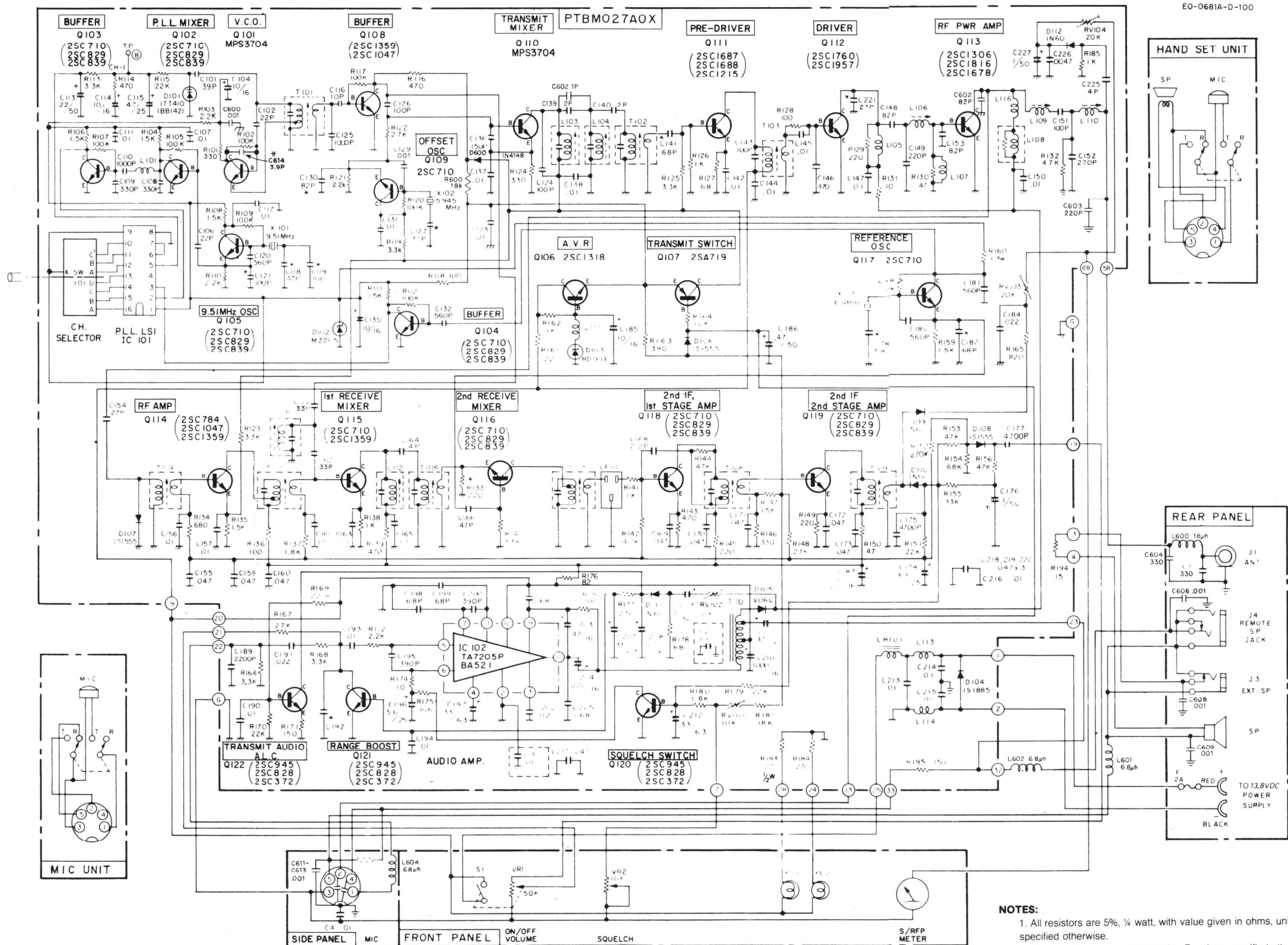
Components Adjusted for Transmitter Alignment.



(FRONT PANEL)

Figure 4-5

Components Adjusted for Receiver Alignment



- NOTES:**
1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 - E: EMITTER
 - C: COLLECTOR
 - B: BASE
 - chassis ground
 - p.c. board ground
 - *-indicates component value may vary from unit to unit

Figure 4-6. Schematic Diagram, Model 681A

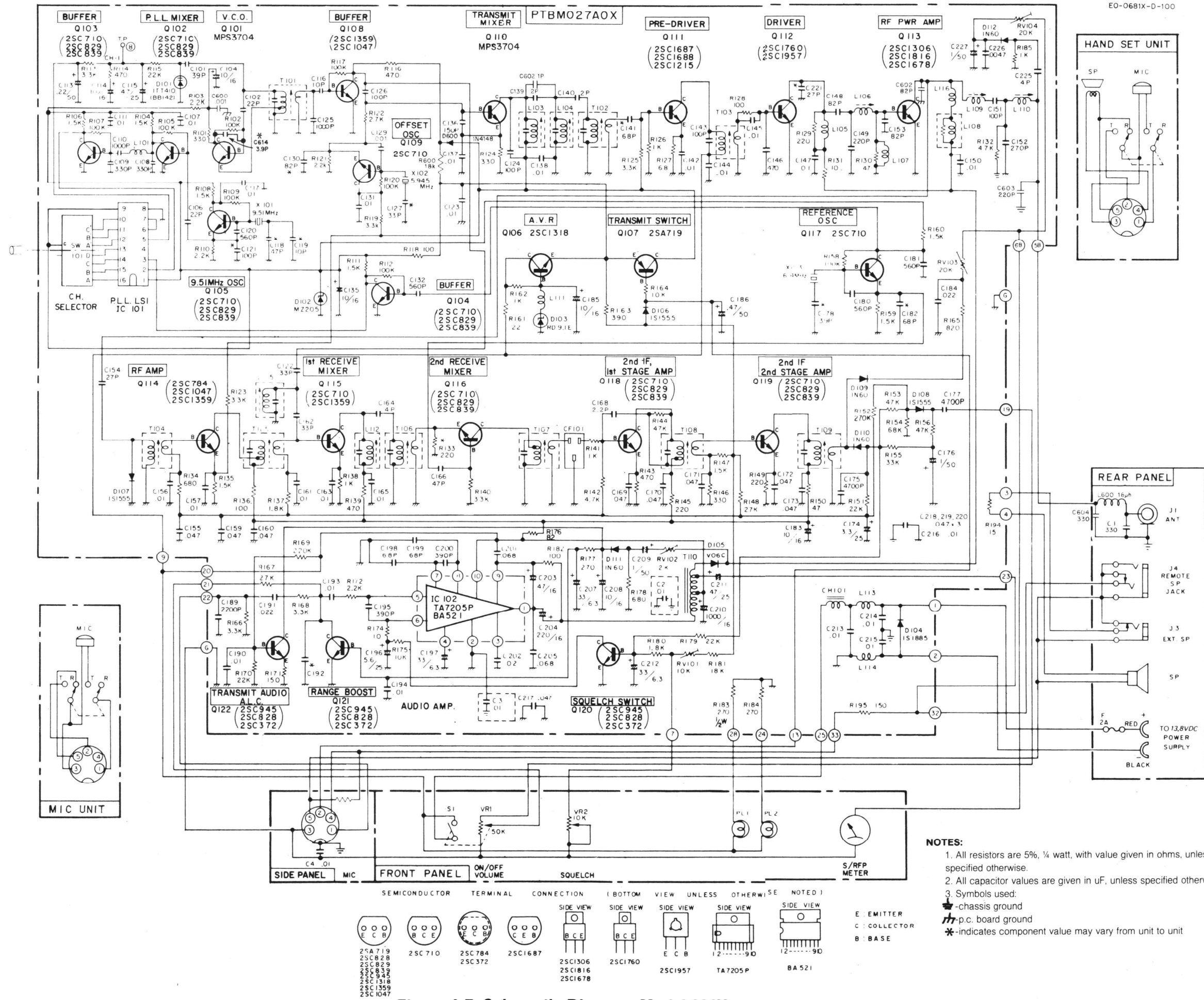
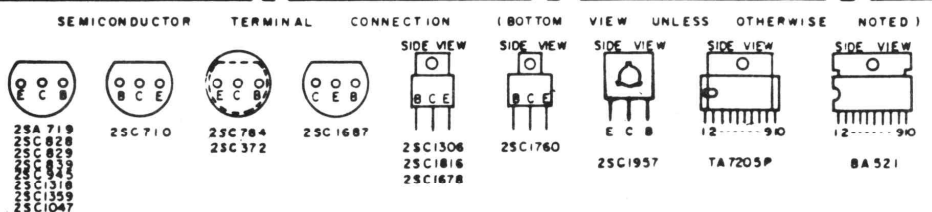
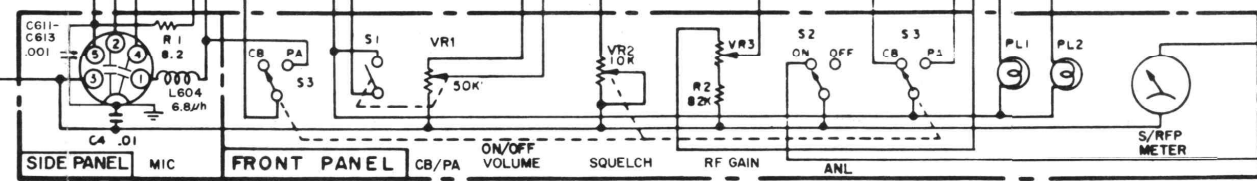
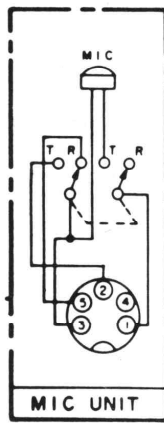
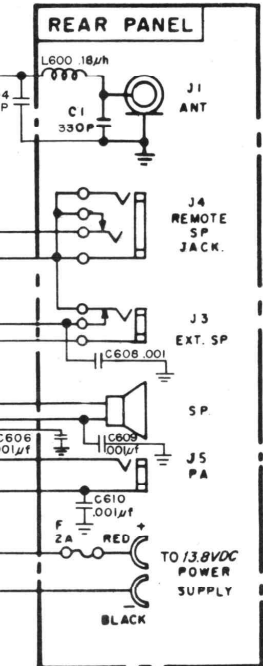
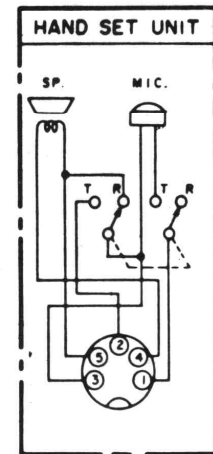
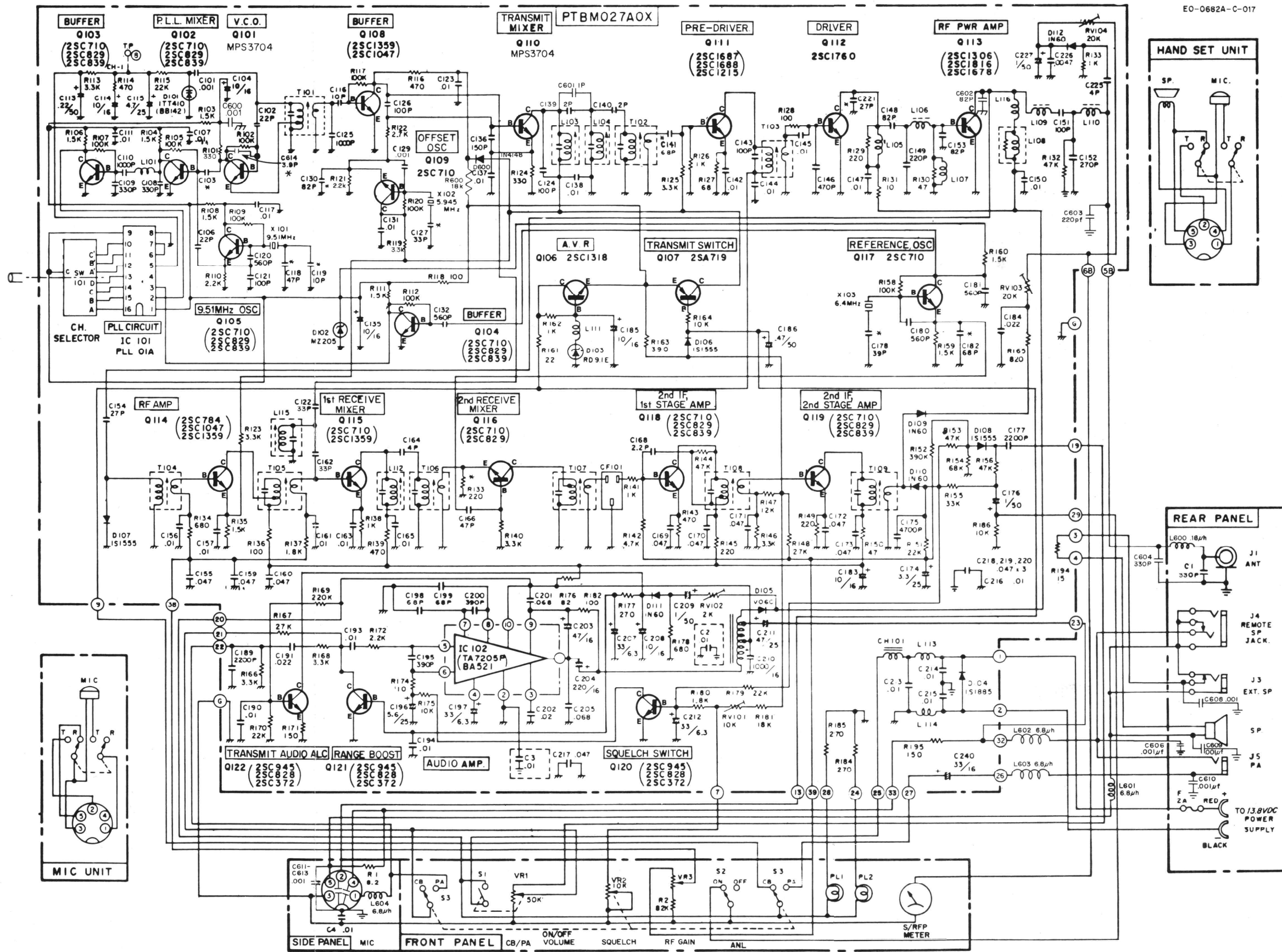
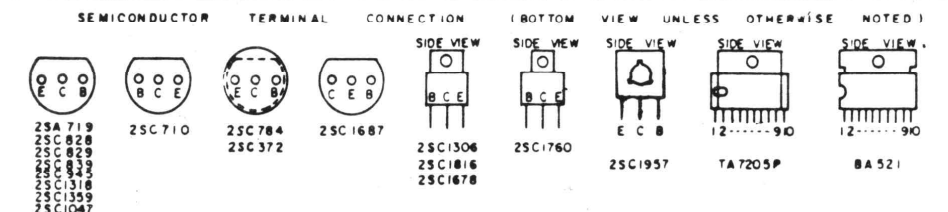
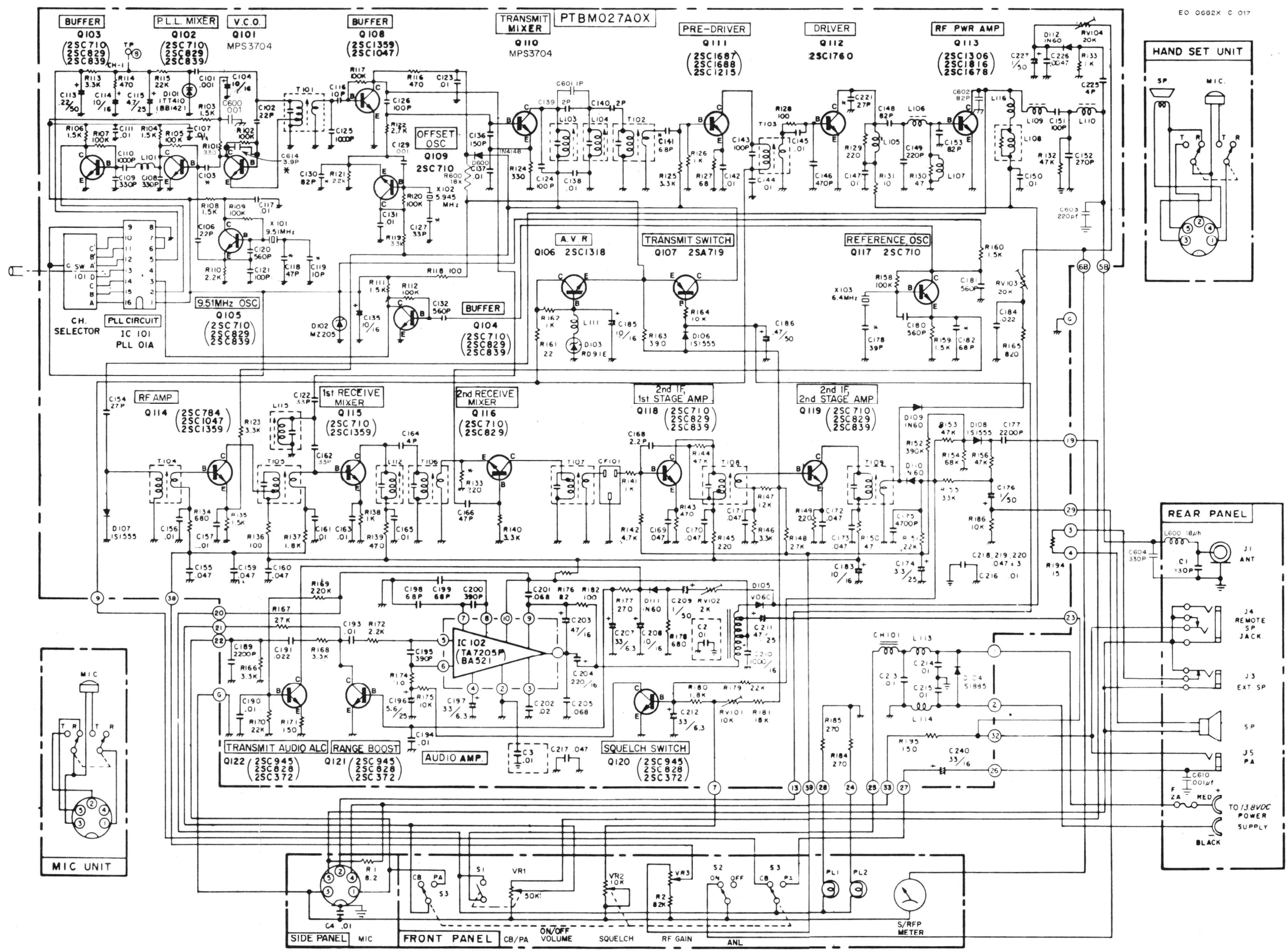


Figure 4-7. Schematic Diagram, Model 681X



NOTES:
 1. All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
 2. All capacitor values are given in uF, unless specified otherwise.
 3. Symbols used:
 - chassis ground
 - p.c. board ground
 * - indicates component value may vary from unit to unit

Figure 4-8. Schematic Diagram, Model 682A



NOTES:

- All resistors are 5%, 1/4 watt, with value given in ohms, unless specified otherwise.
- All capacitor values are given in uF, unless specified otherwise.
- Symbols used:
 - ⊥ - chassis ground
 - ⊥ - p.c. board ground
 - * - indicates component value may vary from unit to unit

Figure 4-9. Schematic Diagram, Model 682X

CHAPTER 5 — PARTS LIST

Application

The following parts lists contain only those parts which have been added or deleted as a result of modification. Consult the applicable service manual for a complete parts listing and use it in conjunction with the following lists for modified radios.

681A

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	330 pF, 500V, mica	721681
	■ 220 pF, 500V, mica	FM11ZC221KS
C122	33 pF, 50V, ceramic disc	722406
	■ 8 pF, 50V, ceramic disc	CC-CB080DOM
C129	.001 uF, 50V, ceramic disc	722849
	■ 560 pF, 50V, ceramic disc	CK-CB561KBM
C162	33 pF, 50V, ceramic disc	722406
	■ 10 pF, 50V, ceramic disc	CC-CB100DOM
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, 50V, ceramic disc	722447
C602	82 pF, 50V, ceramic disc	722410
C603	220 pF, 50V, ceramic disc	721665
C604	330 pF, 50V, mica	721681
C605	(not used)	
C606	.001 uF, 50V, ceramic disc	722489
C607	(not used)	
C608	.001 uF, 50V, ceramic disc	722849
C609	.001 uF, 50V, ceramic disc	722849
C610	(not used)	
C611 thru C613	.001 uF, 50V, ceramic	722849
D600	1N4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324
L600	.18 uH RF coil	722871
L601	6.8 uH RF choke	722857
L602	6.8 uH RF choke	722857
L603	(not used)	
L604	6.8 uH RF choke	722857
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
Q110	MPS3704	670142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼w, 10% carbon film	722522
	■ 100, ¼w, 10%, carbon film	RD25RJ101D
R119	3.3k, ¼w, 10%, carbon film	722576
	■ 1.5k, ¼W, 10%, carbon film	RD25RJ152D
R121	2.2k, ¼w, 10%, carbon film	722572
	■ 1k, ¼w, 10%, carbon film	RD25RJ102D
R600	18k, ¼W, 10%, carbon film	722594
SW101	Switch	700057
	■ Switch, Rotary Wafer	SR-0724301H

681X

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	330 pF, 500V, mica	721681
	■ 220 pF, 500V, mica	FM11ZC221KS
C122	22 pF, 50V, ceramic disc	722406
	■ 8 pF, 50V, ceramic disc	CC-CB080DOM
C129	.001 uF, 50V, ceramic disc	722849
	■ 560 pF, 50V, ceramic disc	CK-CB561KBM
C162	33 pF, 50V, ceramic disc	722406
	■ 10 pF, 50V ceramic disc	CC-CB100DOM
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82 pF, Y5F 50V ceramic disc	722410
C603	220 pF, 50V, ceramic disc	721665
C604	330 pF, 50V, mica	721681
D600	1N4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
Dial Skirt	■ Dial Skirt, (23 channel)	450324
L600	.18 uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-CO710XBE
Q110	MPS3704	670142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, 1/4W, 10%, carbon film	722522
	■ 100, 1/4W, 10%, carbon film	RD25RJ101D
R119	3.3k, 1/4W, 10%, carbon film	722576
	■ 1.5k, 1/4W, 10%, carbon film	RD25RJ152D
R121	2.2k, 1/4W, 10%, carbon film	722572
	■ 1k, 1/4W, 10%, carbon film	RD2.5RJ102D
R600	18k, 1/4W, 10%, carbon film	722594
SW101	Switch	700057
	■ Switch, Rotary Wafer	SR-0724301H

682A

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
	■ 220pF, 50V, mica	FM11ZC221KS
C122	33pF, 50V, ceramic disc	722406
	■ 8pF, 50V, ceramic disc	CC-CB080DOM
C129	.001uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	33pF, 50V, ceramic disc	722406
	■ 10pF, 50V, ceramic disc	CC-CB100DOM

Reference Designator	Description	Part No.
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82 pF, Y5F 50V, ceramic disc	722410
C603	220 pF, 50V, ceramic disc	721665
C604	330 pF, 50V, mica	721681
C605	(not used)	
C606	.001 uF, 50V, ceramic disc	722849
C607	(not used)	
C608 thru C613	.001 uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324
L600	.18 uH RF coil	722871
L601 thru L604	6.8 uH RF choke	722857
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0170XBE
Q110	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, 1/4W, 5%, carbon film	722522
	■ 100, 1/4W, 5%, carbon film	RD25RJ101D
R119	3.3k, 1/4W, 5%, carbon film	722576
	■ 1.5k, 1/4W, 5%, carbon film	RD25RJ152D
R121	2.2k, 1/4W, 5%, carbon film	722572
	■ 1k, 1/4W, 5%, carbon film	RD25RJ102D
R600	18k, 1/4W, 5%, carbon film	722594
SW101	Switch	700057
	■ Switch, Rotary Wafer	SR-0724301H

682X

- Deleted Components
- All other components are added

Reference Designator	Description	Part No.
C1	330 pF, 500V, mica	721681
	■ 220 pF, 500V, mica	FM11ZC221KS
C122	33 pF, 50V, ceramic disc	722406
	■ 8 pF, 50V, ceramic disc	CC-CB080DOM
C129	.001 uF, 50V, ceramic disc	722849
	■ 560 pF, 50V, ceramic disc	CK-CB561KBM
C162	33 pF, 50V, ceramic disc	722406
	■ 10 pF, 50V ceramic disc	CC-CB100DOM
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82 pF, Y5F 50V ceramic disc	722410
C603	220 pF, 50V, ceramic disc	721665
C604	330 pF, 50V, mica	721681
C605	(not used)	
C606	(not used)	
C607	(not used)	
C608	(not used)	
C609	(not used)	
C610	.001 uF, 50V, ceramic Disc	722849

Reference Designator	Description	Part No.
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt (40 channel)	450317
	■Dial Skirt (23 channel)	450324
L600	.18uH RF coil	722871
Q101	MPS3704	760142
Q110	■2SC710D (Mitsubishi)	QT-C0170XBE
	MPS3704	760142
R101	330, ¼W, carbon film	722522
	■100, ¼W, carbon film	RD25RJ101D
R119	3.3k, ¼W, carbon film	722576
R121	■1.5k, ¼w, carbon film	RD25RJ152D
	2.2k, ¼W, carbon film	722572
R600	■1k, ¼W, carbon film	RD25RJ102D
	18k, ¼W, carbon film	722594
SW101	Switch	700057
	■Swith, Rotary Wafer	SR-0724301H

2680A

- Deleted Components
- All other components are added

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
	■220pF, 500V, mica	FM11ZC221KS
C129	.001 uF, 50V, ceramic disc	722849
	■560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■10pF, 50V, ceramic disc	CC-CB100D0M
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	(not used)	
C604	330pF, 50V, mica	721681
C605	(not used)	
C606 thru C609	.001 uF, 50V, ceramic disc	722849
C610	(not used)	
C611 thru C613	.001 uF, 50V, ceramic disc	722849
C614	220pF, 50V, mica	721665
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■Dial Skirt, (23 channel)	450324
L600	.18uH RF coil	722871
L601 thru L602	6.8uH RF choke	722857
L603	(not used)	
L604	6.8uH RF choke	722857
Q101	MPS3704	760142
	■2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576

Reference Designator	Description	Part No.
R121	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
	2.2k, ¼W, 5%, carbon film	722572
R600	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■ Switch, Rotary Wafer	SR-0724102W
	Interconnecting p.c. board	750092

2680X

■ Deleted Components
 All other components are added

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
C129	■ 220pF, 500V, mica	FM11ZC221KS
	.001 uF, 50V, ceramic disc	122849
C162	■ 560pF, 50V, ceramic disc	CK-CB561KBM
	120pF, 50V, ceramic disc	722413
C600	■ 10pF, 50V, ceramic disc	CC-CB100DOM
	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	(not used)	
C604	330pF, 50V, mica	721681
C605 thru C613	(not used)	
C614	220pF, 500V, mica	721665
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324
L600	.18uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
R121	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
	2.2k, ¼W, 5%, carbon film	722572
R600	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700057
	■ Switch, Rotary Wafer	SR-0724102W
	Interconnecting p.c. board	750092

2682X

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
	■ 220pF, 500V, mica	FM11ZC221KS
C129	.001 uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 10pF, 50V, ceramic disc	CC-CB100DOM
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604	330pF, 50V, mica	721681
C605 thru C609	(not used)	
C610	.001 uF, 50V, ceramic disc	722849
D600	1N4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	Dial Skirt, (23 channel)	450324
L600	.18 uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■ Switch, Rotary Wafer	SR-0724102W
	Interconnecting p.c. board	750092

2682B

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
	■ 220pF, 500V, mica	FM11ZC221KS
C129	.001 uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 10pF, 50V, ceramic disc	CC-CB100DOM
C600	.001 uF, 50V, ceramic disc	722849
C601	1 pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	(not used)	
C604	330pF, 500V, mica	721681
C605	220pF, 50V, ceramic disc	721665
C606	.001 uF, 50V, ceramic disc	722849
C607	(not used)	
C608 thru C613	.001 uF, 50V, ceramic disc	722849

Reference Designator	Description	Part No.
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324
L600	.18uH RF coil	722871
C601 thru C604	6.8uH RF choke	722857
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■ Switch, Rotary Wafer	SR-0724102W
	Interconnecting p.c. board	750092

2710X

- Delete from the 2710 parts list.

Reference Designator	Description	Part No.
C313	■ .01uF, 50V, ceramic disc	722488
C314 thru C315	■ .001uF, 50V, ceramic disc	722849
C606 thru C609	■ .001uF, 50V, ceramic disc	722849
L601	■ 6.8uH, RF choke	722857
L602	■ 1.5uH, RF choke	722440
L603	■ 6.8uH, RF choke	722857

3084X

- Deleted Components
- All other components are added

Reference Designator	Description	Part No.
C129	.001uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB103KPM
C600	.001uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604	330pF, 50V, mica	721681
C605 thru C615	(not used)	
C616	.001uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037

Reference Designator	Description	Part No.
Dial Skirt	Dial Skirt, (40 channel)	450346
	■ Dial Skirt, (23 channel)	450347
L600	.18uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■ Switch, Rotary Wafer	SR-0724102W
	Interconnection p.c. board	750092

3084B

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C129	.001uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604	330pF, 50V, mica	721681
C605	330pF, 50V, mica	721681
C606 thru C608	.001uF, 50V, ceramic disc	722849
C609 thru C610	(not used)	
C611 thru C620	.001uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450346
	■ Dial Skirt, (23 channel)	450347
L600	18.uH RF coil	722871
L601 thru L602	6.8uH RF choke	722857
L603	(not used)	
L604 thru L605	6.8uH RF choke	722857
L606	1.5uH RF coil	722488
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D

Reference Designator	Description	Part No.
R121	2.2k, ¼W, 5%, carbon film	722572
	■1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■Switch, Rotary Wafer	APTSW013AA
	Interconnecting p.c. board	750092

3087A

■ Deleted Components
 All other components are added

Reference Designator	Description	Part No.
C129	.001 uF, 50V, ceramic disc	722849
	■560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■33pF, 50V, ceramic disc	CC-CB103KPM
C600	.001 uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	(not used)	
C604 thru C605	330pF, 50V, mica	721681
C606 thr C614	.001 uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■Dial Skirt, (23 channel)	450324
L600	.18uH RF coil	722871
L601 thru L606	6.8uH RF coil	722857
Q101	MPS3704	760142
	■2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■Switch, Rotary Wafer	SR-0742102W

3087X

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C129	.001 uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001 uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	(not used)	
C604 thru C605	330pF, 50V, mica	721681
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324
L600	.18uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■ 100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■ 1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■ 1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■ Switch, Rotary Wafer	SR-0724102W

2683A

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	180pF, 500V, ceramic disc	EM-SD181KCS
C129	.001 uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001 uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604 thru C605	330pF, 50V, mica	721681
C606	.001 uF, 50V, ceramic disc	722849
C607	(not used)	
C608 thru C613	.001 uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■ Dial Skirt, (23 channel)	450324

Reference Designator	Description	Part No.
L600	.18uH RF coil	722871
L601 thru L604	6.8uH RF choke	722857
Q101	MPS3704	760142
	■2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, ¼W, 5%, carbon film	722522
	■100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■Switch, Rotary Wafer	SR-0724102W

2683X

■Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	180pF, 500V, ceramic disc	FM11ZC221K5
C129	.001 uF, 50V, ceramic disc	722849
	■560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001 uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604 thru C605	330pF, 50V, mica	721681
D600	IN4148, germanium	760037
Dial Skirt	Dial Skirt, (40 channel)	450317
	■Dial Skirt, (23 channel)	450324
Q101	MPS3704	760142
	■2SC710D (Mitsubishi)	QT-C0710XBE
R101	330pF, ¼W, 5%, carbon film	722522
	■100, ¼W, 5%, carbon film	RD25RJ101D
R119	3.3k, ¼W, 5%, carbon film	722576
	■1.5k, ¼W, 5%, carbon film	RD25RJ152D
R121	2.2k, ¼W, 5%, carbon film	722572
	■1k, ¼W, 5%, carbon film	RD25RJ102D
R600	18k, ¼W, 5%, carbon film	722594
SW101	Switch	700047
	■Switch, Rotary Wafer	SR-0724102W

2679A

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C122	15pF, 50V, ceramic disc	722401
	■ 5pF, 50V, ceramic disc	CC-CB150KOM
C129	.001uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604	330pF, 50V, mica	721681
C605 thru C607	.001uF, 50V, ceramic disc	722849
C608	330pF, 50V, ceramic disc	721681
C609	.0047uF, 50V, ceramic disc	722853
C610	(not used)	
C611	.01uF, 50V, ceramic disc	722440
D600	IN4148, germanium	760037
L600	.18uH RF coil	722871
C601 thru C604	6.8uH RF choke	722857
L605	1.5uF RF choke	722488
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, 1/4W, 5%, carbon film	722522
	■ 100, 1/4W, 5%, carbon film	RD25RJ101D
R119	3.3k, 1/4W, 5%, carbon film	722576
	■ 1.5k, 1/4W, 5%, carbon film	RD25RJ152D
R121	2.2k, 1/4W, 5%, carbon film	722572
	■ 1k, 1/4W, 5%, carbon film	RD25RJ102D
R600	18k, 1/4W, 5%, carbon film	722594
R601	5.6k, 1/4W, 5%, carbon film	722582

2679 Logic (Channel Selector P.C. Board)

L606	6.8uH RF choke	722857
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2679 Microphone P.C. Board

■ Deleted Components
All other components are added

D401	IN4148, germanium	760037
	■ IN270, germanium	765722

2679X

■ Deleted Components
All other components are added

Reference Designator	Description	Part No.
C1	330pF, 500V, mica	721681
	■ 220pF, 500V, mica	FM11ZC221KS
C122	15pF, 50V, ceramic disc	722401
	■ .5pF, 50V, ceramic disc	CC-CB150KOM
C129	.001uF, 50V, ceramic disc	722849
	■ 560pF, 50V, ceramic disc	CK-CB561KBM
C162	120pF, 50V, ceramic disc	722413
	■ 33pF, 50V, ceramic disc	CC-CB330KPM
C600	.001uF, 50V, ceramic disc	722849
C601	1pF, NPO 50V, ceramic disc	722447
C602	82pF, Y5F 50V, ceramic disc	722410
C603	220pF, 50V, ceramic disc	721665
C604	330pF, 50V, mica	721681
C605 thru C607	(not used)	
C608	330pF, 50V, ceramic disc	721681
C609	.001uF, 50V, ceramic disc	722849
D600	IN4148, germanium	760037
L600	.18uH RF coil	722871
Q101	MPS3704	760142
	■ 2SC710D (Mitsubishi)	QT-C0710XBE
R101	330, 1/4W, 5%, carbon film	722522
	■ 100, 1/4W, 5%, carbon film	RD25RJ101D
R119	3.3k, 1/4W, 5%, carbon film	722576
	■ 1.5k, 1/4W, 5%, carbon film	RD25RJ152D
R121	2.2k, 1/4W, 5%, carbon film	722572
	■ 1k, 1/4W, 5%, carbon film	RD25RJ102D
R600	18k, 1/4W, 5%, carbon film	722594
R601	5.6k, 1/4W, 5%, carbon film	722582

Microphone P.C. Board

■ Deleted Components
All others components are added

D401	IN4148, germanium	760037
	■ IN270, germanium	765722

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