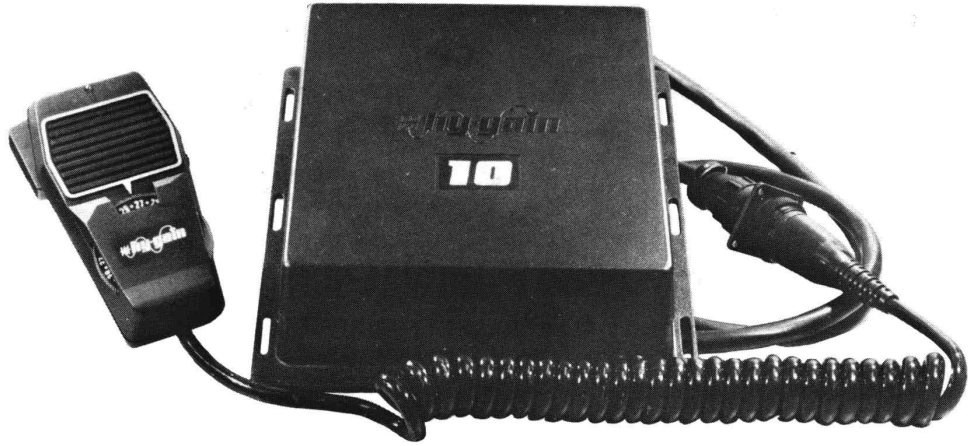


hy-gain 10
by **hy-gain**

MODEL 2710
CITIZENS TWO-WAY RADIO
40 channel mobile

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

Introduction

This service manual contains all the information needed to service and repair the Hy-Gain 10 transceiver (Model 2710). It includes an explanation of the theory of operation and alignment procedures. Revision, addendum, and errata sheets will be published as needed. Insert them as required in the manual.

The Hy-Gain unit is a full 40-channel transceiver designed, receiver certified, and type accepted for Class D Citizens Radio Service, as designated by the Federal Communications Commission (FCC).

It is a compact mobile unit which operates by remote control. All the operator controls are built into one unit, the microphone, allowing the transceiver to be mounted out of sight in the vehicle.

The transceiver is completely solid-state and highly reliable with low power consumption. Its PLL (Phase Locked Loop) synthesizer provides immediate operation on all 40 channels. A built-in automatic noise limiter (ANL) is included to help reduce atmospheric noise. Use the unit with 12 VDC (nominal), either negative or positive ground.

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 your problem. Address your 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 difficult problems.

How to Ship Returns

To return a unit, get a return authorization first. This is important. The handling of the unit will only be delayed if shipped without it. If you must ship immediately, telephone or telex the National Service Manager for expeditious service.

When you request return authorization, notification of completion of repairs may also be requested. The notification will include a copy of the bill. Paying the bill before the unit is returned 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. a 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 a 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 in full is received. 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

Specifications

General

Channels	all 40 channels in the Citizens Band (26.965 MHz-27.405 MHz)
Antenna Impedance	50 ohms, nominal
Power Requirements.....	11.5 VDC - 14.5 VDC, negative or positive ground
Compliance	type accepted under FCC rules, Part 95

Receiver Section

Circuitry	dual conversion superheterodyne with rf amplifier stage and 455 kHz ceramic filter
Sensitivity	0.7 uV to 10 dB (S+N)/N ratio
Intermediate Frequencies	1st IF - 10.695 MHz 2nd IF - 455 kHz
Audio Output	3 watts, maximum
Current Drain, Receive	about 500 mA, standby (no signal)

Transmitter Section

RF Power Output	4 watts
Emission	AM, type 6A3
Spurious Response Rejection	all harmonic and spurious suppression better than FCC requirements
Modulation	AM, 90% typical
Current Drain, Transmit	about 1.3A @ 13.8 VDC unmodulated

CHAPTER 2—THEORY OF OPERATION

General

The theory of operation of the radio is divided into four sections: the Phase Locked Loop Frequency Synthesizer, the Receiver, the Transmitter, and the Logic Functions. This material covers the functioning of the transceiver with a minimum of technical involvement. We have not attempted to explain the engineering techniques and approaches that arrived at these circuit designs.

Refer to the block diagram, Figure 2-2, for visual reference to the theory of operation.

Phase Locked Loop Frequency Synthesizer

The Phase Locked Loop (PLL) frequency synthesizer generates frequencies for use in both the transmitter and receiver sections. Its output determines the channel on which the transceiver is operating. The PLL circuitry incorporates three crystal oscillators to perform its frequency generating function.

The 11.8066 MHz Oscillator, Q105, has its output tripled and serves as a prescaler for the output of the Voltage Controlled Oscillator (VCO), Q101. The Offset Oscillator, Q109, operates at a frequency of 10.695 MHz, which mixes with the VCO output to provide the transmit frequency. The 10.24 MHz Oscillator, Q117, provides a reference for the PLL and an injection frequency for the Second Receiver Mixer.

The PLL circuit generates the operating frequencies needed for the transceiver in accordance with the binary code fed to the programmable divider, in IC101, from the channel selector switch.

Table A shows the following for each channel: the channel frequency, VCO frequency, binary code and the division ratio of the programmable divider.

For example, assume that channel 1 has been selected. The channel frequency is 26.965 MHz, the VCO frequency is 37.660 MHz, and the binary code ("N" code) is 224. The channel select logic board programs the programmable divider for a division ratio of 224. The 10.24 MHz reference frequency is fed to the Integrated Circuit PLL Chip, IC101. It is divided by 1024 within the chip, producing a 10 kHz reference signal. The output of the VCO is mixed in the PLL Mixer, Q102, with the tripled output of Q105, producing a 2.24 MHz signal. The signal is fed to the programmable divider, which divides it by 224 to produce 10 kHz.

The two 10 kHz signals are phase compared in the phase detector within IC102 producing a DC voltage. This DC voltage controls the varactor diode, D102, and holds the VCO frequency at 37.660 MHz.

Assume that the channel is changed to channel 40. The channel select logic board now provides a code that will produce a division ratio of 268. At this instant the VCO frequency is at 37.660 MHz, which is mixed with the tripled output of Q105. Again, the PLL Mixer, Q102, produces an output of 2.24 MHz. The 2.24 MHz signal is divided by 268 to produce a frequency of 8.358 kHz.

The 8.358 kHz output, along with the 10 kHz obtained from the reference oscillator, is fed to the phase detector. The comparison of the two frequencies in the phase detector produces an error output which is a combined AC-DC voltage. The low pass filter removes the AC component and allows only the DC voltage to be fed to the VCO. The VCO frequency changes until the output of the programmable divider is again 10 kHz. When the two frequencies are matched at 10 kHz, the error voltage output of the phase detector is zero.

There is now a new DC voltage set up to tune the VCO frequency to 38.100 MHz. When this occurs the loop is considered locked. With the channel selector at 40, the following outputs of the PLL circuitry are produced: the 38.100 MHz VCO output is fed to the First Receiver Mixer and, in the transmit mode, is mixed with the 10.695 MHz output of Q109 to produce a transmit frequency of 27.405 MHz.

Receiver

The receiver is a dual-conversion superheterodyne, receiving AM signals from 26.965 MHz to 27.405 MHz. The operating channel is determined by the PLL frequency synthesizer, which provides the local oscillator frequency to the First Mixer. A variable squelch circuit is included to quiet the receiver between transmissions.

In the receive mode, 13.8 VDC is supplied to IC102, Q114, Q115, Q118, Q119, and to Q106 (the AVR). The AVR supplies regulated voltage to the synthesizer stages and to the Reference Oscillator, Q117. A bias voltage is also applied to the base of the Transmit Switch, Q107. This bias holds the Transmit Switch open so that the transceiver circuits remain in receive.

Radio signals are received by the antenna and enter the radio at the antenna jack. The filter formed by L109, L110, C153 and C1 matches the antenna impedance to the RF Amplifier. Signals in the 26.695 MHz to 27.555 MHz range are filtered out and amplified by the RF Amplifier, Q114, and its tuned circuit, C154/T104 and T105. D107 is a signal overload protector.

The output of the RF Amplifier and buffered VCO signal (which in this case could be called the "first local oscillator frequency") are applied to the First Receiver Mixer, Q115. These two signals are mixed in the First Receiver Mixer and produce an output of 10.695 MHz, which is the first IF.

The first IF passes through tuned circuits L112 and T106. It is then applied to the Second Receiver Mixer, Q116, along with 10.240 MHz from the Reference Oscillator, Q117. The two signals are mixed in the Second Receiver Mixer and produce an output of 455 kHz, which is the second IF.

The second IF passes through the Ceramic Filter, CF101, and is amplified by Q118 and Q119. The amplified signal is then fed to the Detector, D110. The Detector establishes an automatic gain control (AGC) voltage and recovers the audio from the modulated signal. The AGC voltage maintains the output volume of the receiver constant under variations in the input signal strength and also controls the Squelch Switch, Q120.

The squelch functions in the following manner: in the receive mode, a bias voltage from Q106 is applied to the base of Q120, as determined by RV101. In the absence of a signal, the base of Q120 is positively biased and is on. This biases the squelch transistor inside IC102, which turns off the Audio Amplifier and squelches the receiver. When a signal is received, the AGC voltage developed by D110 biases Q120 off. This biases the squelch transistor inside IC102 such that the audio amplifier is turned on and the signal is heard.

The recovered audio from the Detector passes through a series Automatic Noise Limiter (ANL), D108, to the Electronic Attenuator, U304. The Electronic Attenuator functions as a volume control. Its output is amplified by IC102 and is fed through transformer T110 to the external speaker jack and the microphone speaker.

Transmitter

Switching to the transmit mode is accomplished in the following manner: when the PTT switch is closed, the base of the DC Switch, Q107, is grounded. This establishes forward bias which causes Q107 to conduct. Regulated voltage from the Automatic Voltage Regulator (AVR), Q106, is then supplied through Q107 to Q109 and Q110.

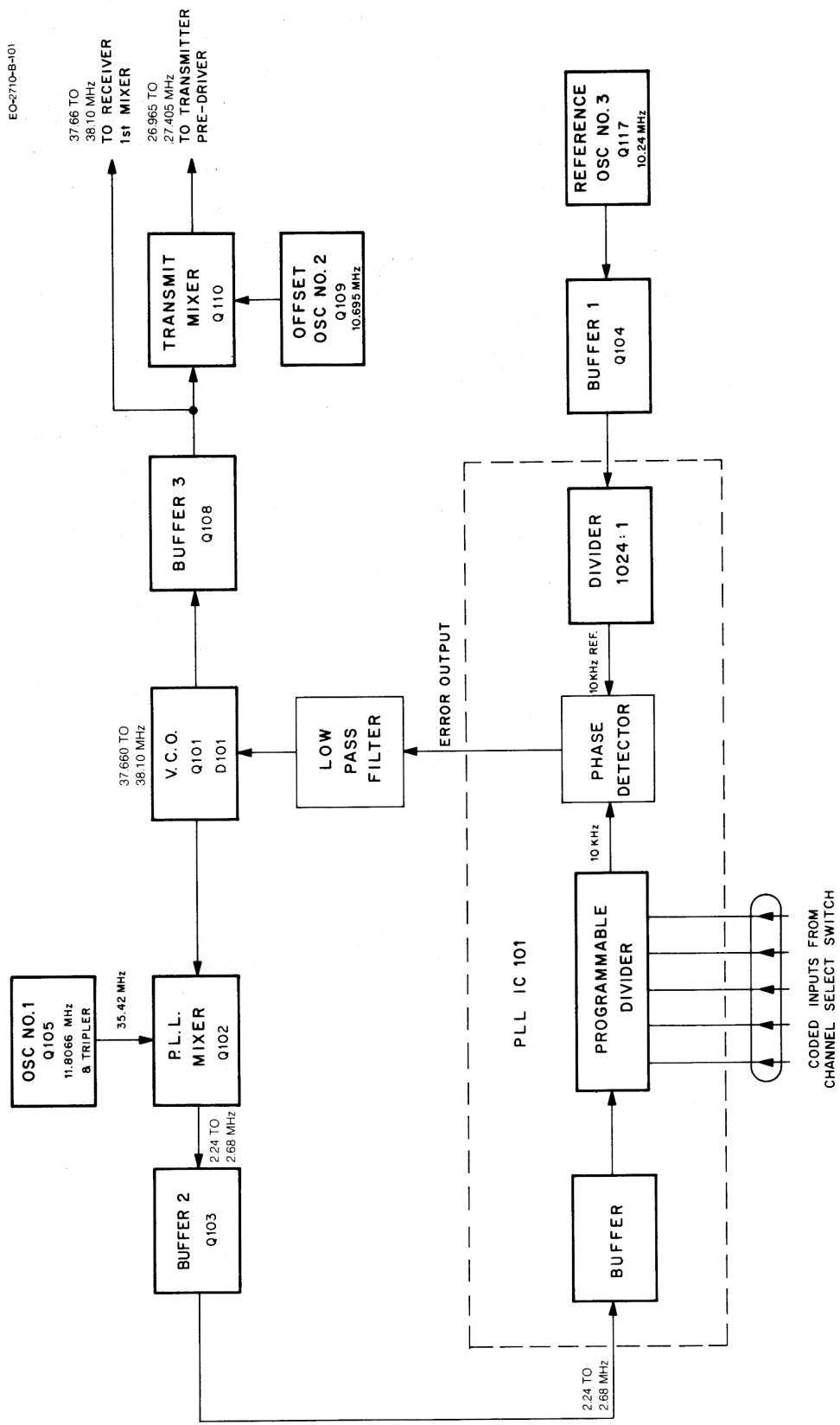


Figure 2-1. PLL Circuitry, Model 2710

“N” Code-Frequency Correlation Chart

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

Table A

The operating channel is determined by the PLL frequency synthesizer. The buffered VCO frequency is mixed in Q110 with the 10.965 MHz Offset Oscillator, Q109, output to yield the transmit frequency. The transmit frequency from Q110 passes through the filter circuit of L103, L104, and T102 and is applied to the Pre-driver, Q111. The filter circuit partially removes spurious signals from the transmit frequency.

The Pre-driver, Q111, and the Driver, Q112, form two stages of amplification leading to the final stage. The filter circuit of T103 follows Q111, and L106 follows Q112. These two circuits filter out the remaining spurious signals from the transmit frequency.

From the Driver the signal is applied to the final stage, the RF Power Amplifier, Q113. This is a current amplifier that raises the transmit signal to an output of four watts. Its output is applied to a filter, consisting of L109, C152, L110 and C1, and then to the antenna jack.

The transmit signal is modulated in the following manner: Microphone output is applied through the mic transformer, to the Audio Amplifier, IC102. The output of IC102 is applied to the collectors of Q112 and Q113 through the audio output transformer, T110. Control voltages for the transmit audio (ALC), Q122, and the Range Boost, Q121, come from detector diode D111. The transmit audio (ALC) boosts, or lowers, the amplifier gain in response to line voltage fluctuations. This ensures full modulation of the carrier despite any changes in line voltage. The Range Boost reduces AF peaks so that higher average AF level is supplied to the Audio Amplifier. This gives the desired high average modulation without overmodulation on peaks.

Control and Logic Functions

All operator controls, on/off switch, volume, push-to-talk switch, and channel selector switch, are located in the microphone unit. The microphone also includes a speaker for receiver audio (which doubles as the microphone element) and LED radiants which indicate the channel selected and whether the transceiver is transmitting.

Channel selection is accomplished with the channel selector switch located in the microphone control unit. The switch selects the proper binary code and feeds it to the programmable divider of the PLL, IC101.

Squelch Override Function

The squelch override function operates when an AM/FM stereo receiver (Hy-Gain Model 4601 or 4701) and the transceiver are operating. Set the squelch on the transceiver to eliminate background static. This allows the AM/FM stereo receiver to play. When the collector of the CB Transceiver Squelch Switch, Q120, is biased properly it enables Q12, in the Hy-Gain Model 4601 or 4701 stereo receiver, to kill the audio amplifiers IC2 and IC3 in the 4601 or IC4 and IC5 in the 4701. This allows a transceiver CB signal to be received. This function will work best when the transceiver's squelch knob is set in approximately the middle position.

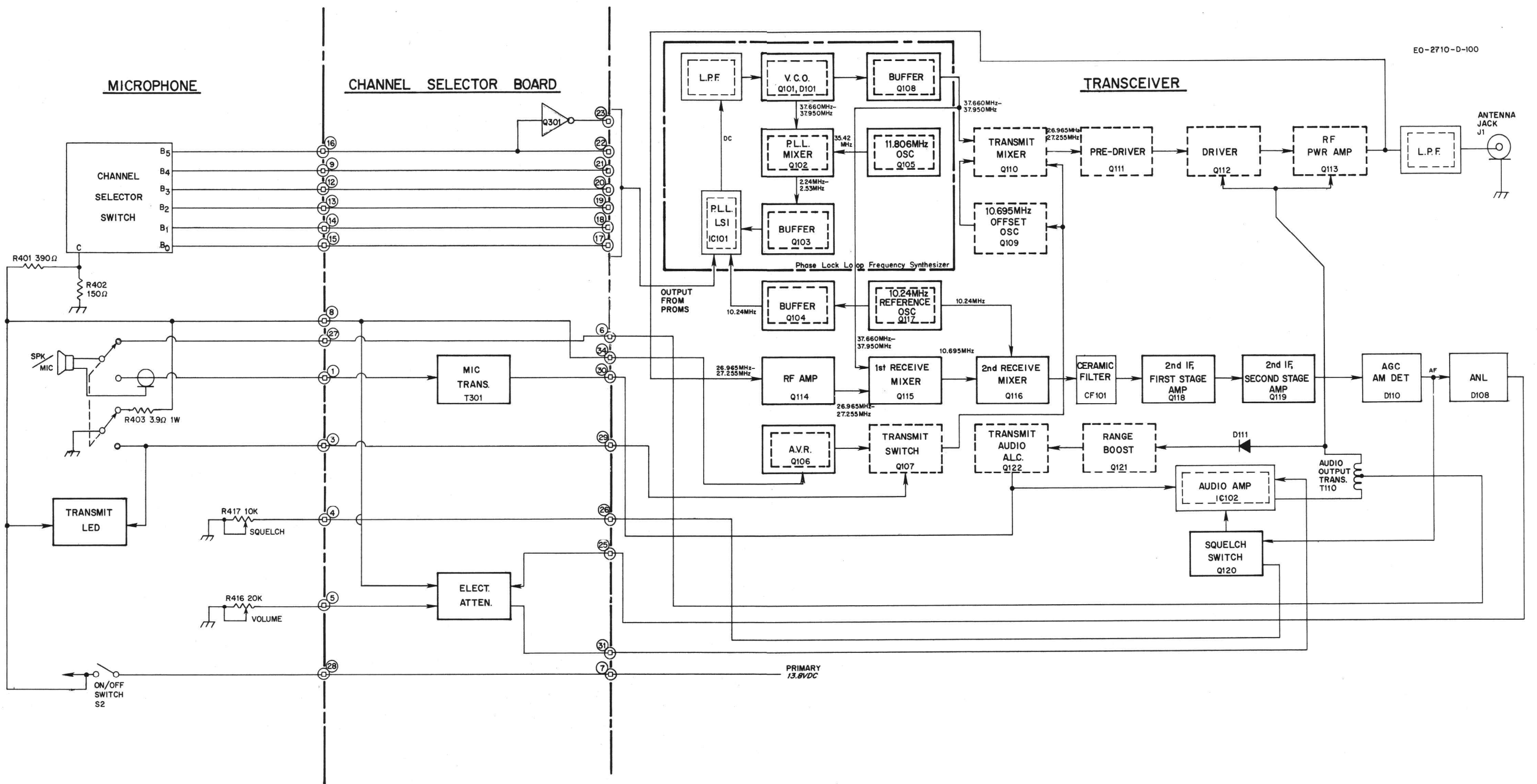


Figure 2-2. Block Diagram Model 2710

CHAPTER 3—ALIGNMENT

General

These procedures must be followed to align the 2710 transceiver. 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. 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 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 20k ohm/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 3-4 for the location of components to be adjusted for transmitter alignment.

Connect test equipment as shown in Figure 3-1.

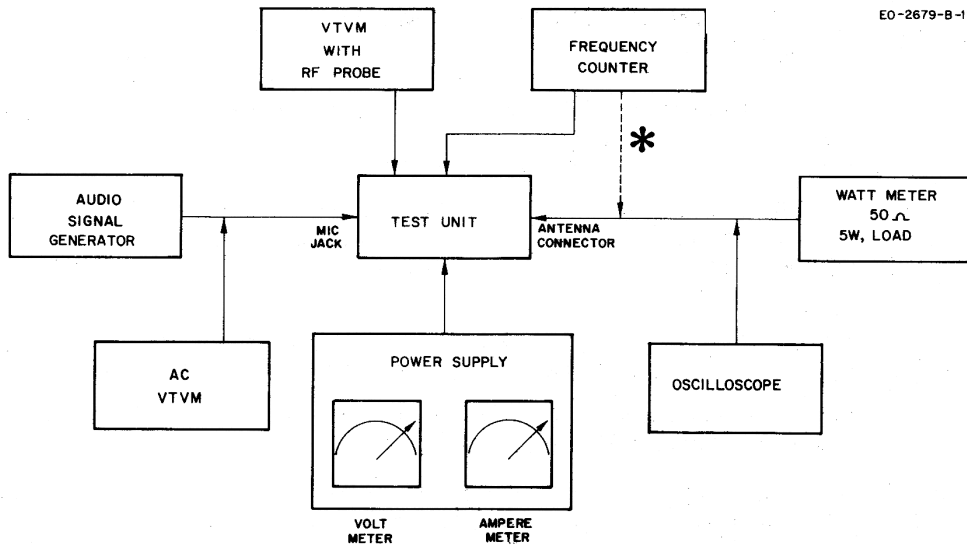


Figure 3-1. Equipment Set-up, Transmitter Alignment

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

Pre-Alignment Frequency Check

Before alignment, use a 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 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 Ch 1, check to read 37.66 MHz.

VCO Alignment

1. Connect VOM (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 VOM between ground and R114 (PT-8 side).
4. Adjust T101 to obtain $1.5V \pm 0.1V$.

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, and T102 for a maximum reading on the VTVM.
 6. Connect the RF VTVM 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, 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 out.
 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 1.35A.

Transmitter Frequency Check

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

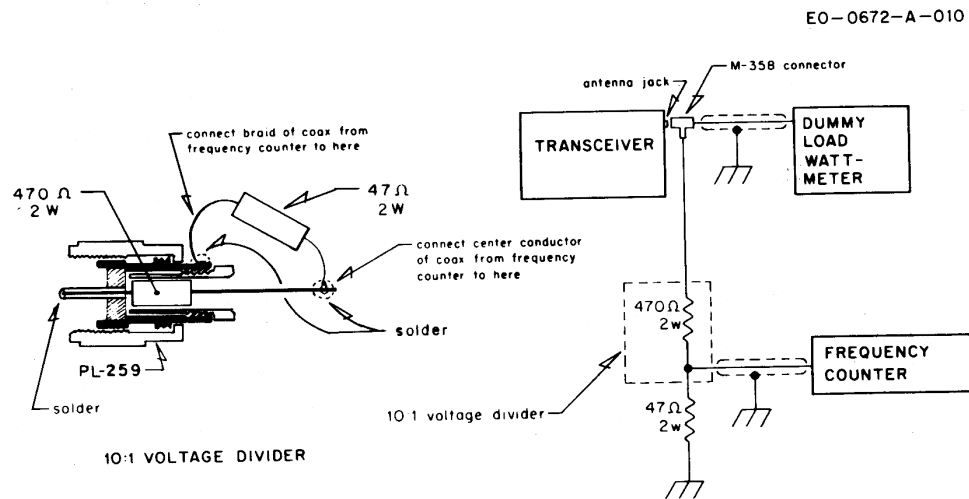


Figure 3-2. Connection of Frequency Counter and Dummy Load

4. Key the transmitter with the microphone PTT button.
5. Check the frequency of each channel with the following chart. Frequencies should be within ± 800 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

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

Equipment Set-up

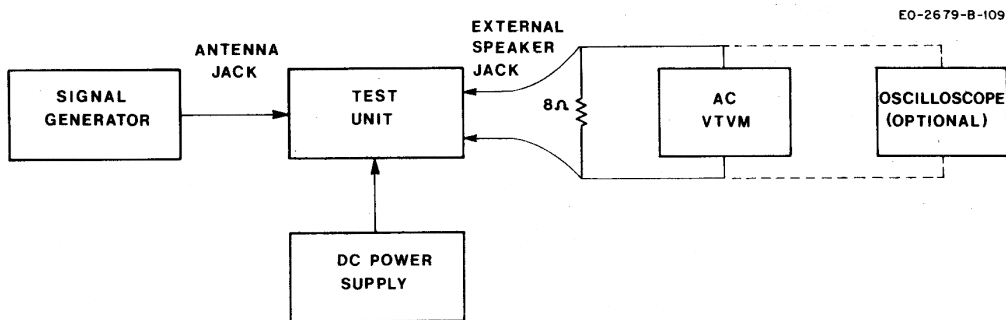


Figure 3-3. Equipment Set-up, Receiver Alignment

Receiver Alignment

1. Set the Signal Generator to 27.185 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.

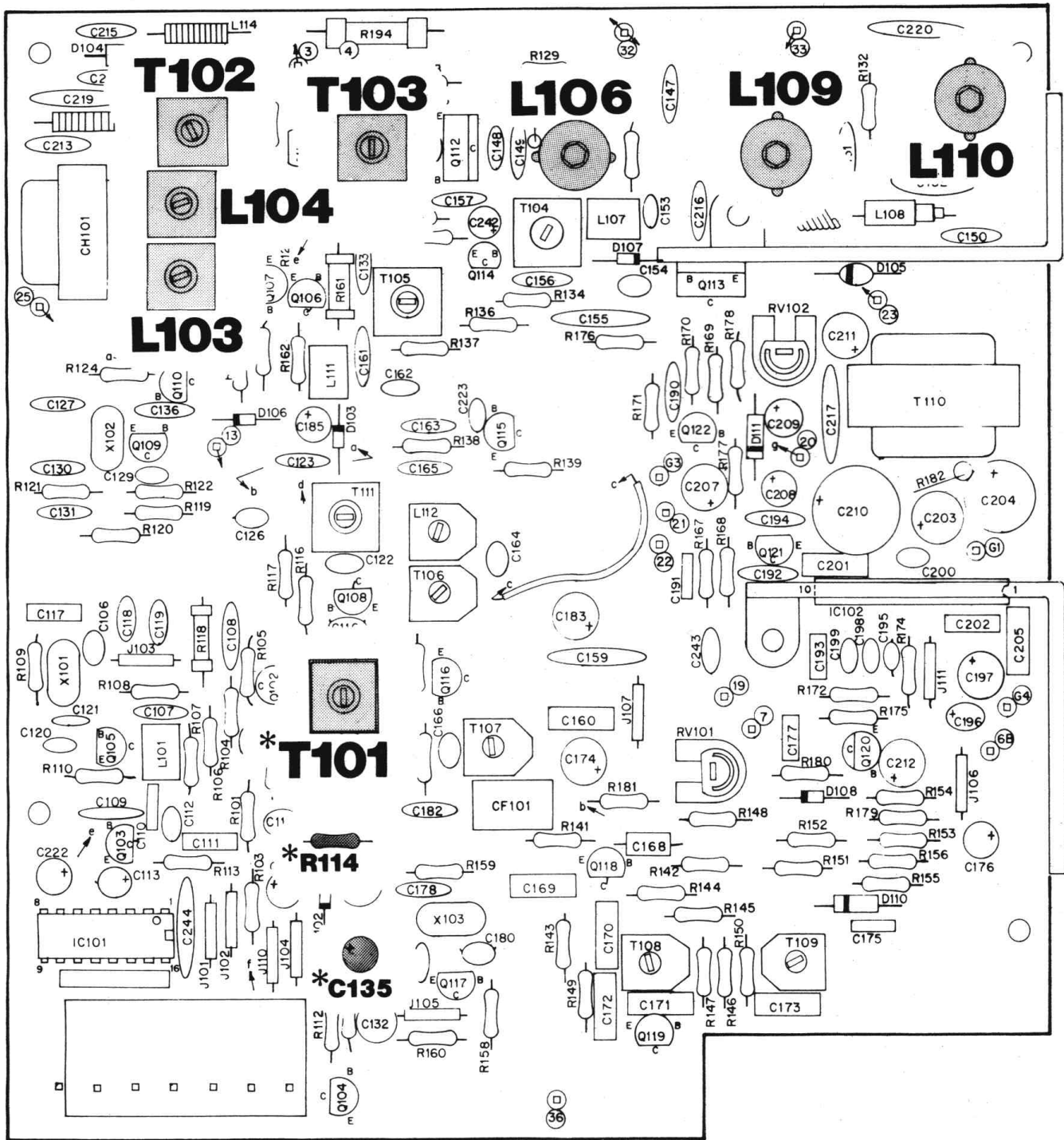
2. Adjust T104, T105, L112, T106, T107, T108 and T109 for maximum audio output as indicated on the AC VTVM (or oscilloscope if used).

Tight Squelch Adjustment

1. Set the Signal Generator to provide an RF input signal of 100 μ V, (1 kHz, 30% modulation).

2. Rotate the squelch control fully clockwise.

3. Adjust RV-101 so that the squelch just breaks with the 100 μ V signal input.

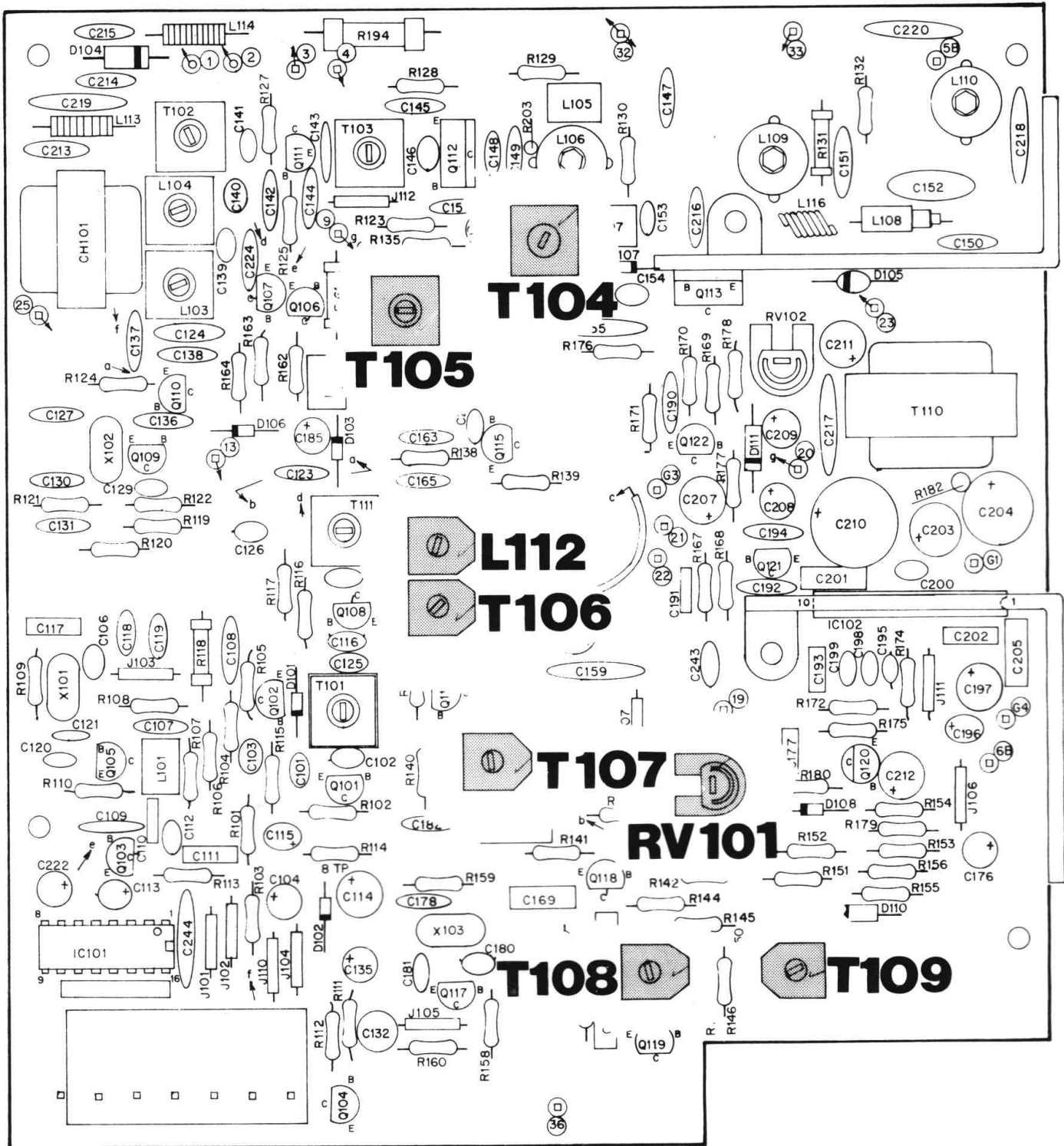


(FRONT PANEL)

NOTE:

* Adjusted for VCO alignment only.

Figure 3-4. Components Adjusted for Transmitter Alignment



(FRONT PANEL)

Figure 3-5. Components Adjusted for Receiver Alignment

CHAPTER 4 — CHARTS & DRAWINGS

Voltage Charts

VOLTAGE MEASUREMENT CHART

Reference Designator	Mode	E	B	C
Q101	RX	0	.08	1.60
Q102	RX	0	.03	1.71
Q103	RX	0	.08	1.32
Q104	RX	0	0	1.61
Q105	RX	1.12	.06	1.89
Q106	RX	8.64	6.71	12.54
Q107	RX	8.64	7.86	0.0
Q108	RX	0	.18	.41
Q109	RX	0	0	0
	TX	1.20	.09	1.73
Q110	TX	0	0	0
	TX	2.02	.84	8.49
Q111	RX	1.56	.46	13.70
	TX	1.00	.45	13.20
Q112	RX	0	0	12.93
	TX	0	-.13	9.75
Q113	RX	0	0	13.06
	TX	.01	-.05	10.75
Q114	Rx	1.47	.24	10.97
	TX	.50	.08	10.88
Q115	Rx	1.58	.23	7.93
	TX	7.76	.36	8.37
Q116	RX	0	.02	0
	TX	0	.01	0
Q117	Rx	.99	.06	1.85
	Tx	.99	.06	1.85
Q118	RX	1.53	.19	9.45
	TX	.01	.04	9.93
Q119	RX	.59	1.00	11.41
	TX	.01	.18	11.40
Q120	squelched	0	0.0	.02
	unsquelched	0	.23	.25
Q121	RX	0	.01	0
Q122	RX	.01	.07	.02

IC 102 (TA 7205P)

Pin No.	1	2	3	4	5	6	7	8	9	10
RX Voltage	6.79	.01	.12	.63	.18	.31	.68	5.19	11.85	12.88
TX Voltage	6.38	.01	.11	.59	.17	.29	.68	5.19	11.85	12.88

IC 101 (PLL 02A)

Pin No.	Voltage	Channels Selected
1	5.26	N/A
2	1.32	N/A
3	1.60	N/A
4	(not used)	
5	1.32-1.58	All channels
6	2.35	All channels
7	Low	Ch. 1-27
	High	Ch. 28-40
8		
9	Low	Ch. 28-40
10	High	Ch. 1-27
11	Low	Ch. 1-23, 28-40
	High	Ch. 14-27
12	Low	Ch. 1-7, 14-19, 28-35
	High	Ch. 8-13, 20-27, 36-40
13	Low	Ch. 1-3, 8-10, 14-16, 20-22, 24, 28-31, 36-39
	High	Ch. 4-7, 11-13, 17-19, 23, 25-27, 32-35, 40
14	Low	Ch. 1, 2, 4, 5, 8, 11, 14, 15, 17, 18, 20, 21, 23, 25, 28, 29, 32, 33, 36, 37, 40
	High	Ch. 3, 6, 7, 9, 10, 12, 13, 16, 19, 22, 24, 26, 27, 30, 31, 34, 35, 38, 39
15	Low	Ch. 1, 3, 4, 6, 9, 11, 12, 14, 17, 19, 20, 22, 25, 26, 28, 30, 32, 34, 36, 38, 40
	High	Ch. 2, 5, 7, 8, 10, 13, 15, 16, 18, 21, 23, 24, 27, 29, 31, 33, 35, 37, 39
16	Ground	

NOTE:

High = 2.30 volts to 2.80 volts
 Low = 0 volts

CHANNEL SELECTOR P.C. BOARD

Q301	E	GND	All ch.
	B	Low	Ch. 28-40
		High	Ch. 1-27
	C	Low	Ch. 1-27
		High	Ch. 28-40

NOTES:

1. Base Low = 0 volts
 High = 0.75 volts
2. Collector Low = 0.06 volts
 High = 2.98 volts

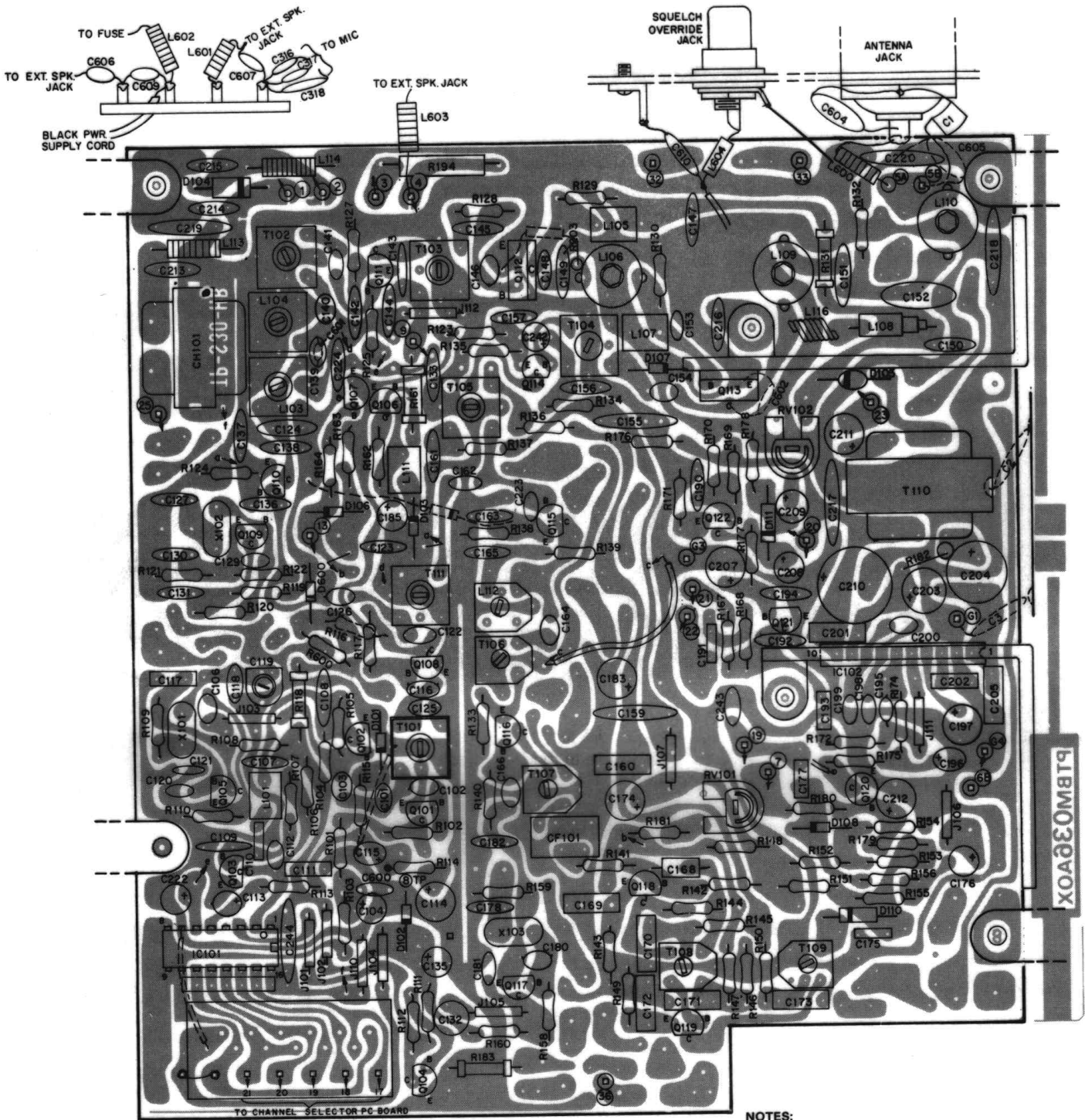
U 304 (MC 3340P)

Pin No.	Voltage	Channel Selected
1	0.08	All channels
2	0.81	All channels
3	GND	
4	(not used)	
5	(not used)	
6	3.51	All channels
7	5.26	All channels
8	11.65	All channels

MAIN P.C. BOARD

WIRING CHART

PIN NO.	WIRING CONNECTIONS
1	red wire to fuse holder
2	black wire (power cord)
3	blue wire to ext spk jack
4	orange wire to pin 27 on channel selector board
5	not used
6	not used
7	gray wire to pin 26 on channel selector board
8	not used
9	red wire to pin 20 on main p.c. board
10	not used
11	not used
12	not used
13	blue wire to pin 29 on channel selector board
14	not used
15	not used
16	not used
17	not used
18	not used
18	not used
19	green wire to pin 25 on channel selector board
20	orange wire to pin 9 on main p.c. board
	yellow wire to pin 39 on channel selector board
21	white wire to pin 31 on channel selector board
22	gray wire to pin 30 on channel selector board
23	yellow wire to L601
24	not used
25	red wire to pin 7 on channel selector board
26	not used
27	not used
28	not used
G1	not used
G2	not used
G3	not used
G4	black wire to pin 1 on channel selector board



- NOTES:
1. P.C. board shown as viewed from component side.
 2. Dashed outline components—mounted on foil side.

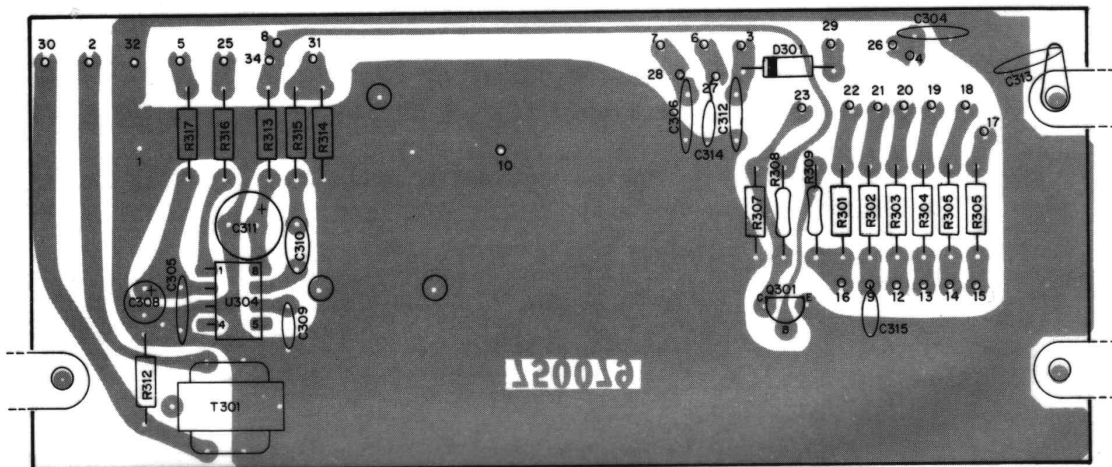
Figure 4-1. Component Outline, Main P.C. Board, Model 2710



**Component Outline
Channel Selector P.C. Board**

WIRING CHART
CHANNEL SELECTOR BOARD

PIN NO.	WIRING CONNECTIONS
1	black wire to pin G4 on main p.c. board
2	white shield wire to mic
3	white/green wire to mic
4	orange wire to mic
5	blue wire to mic
6	green wire to mic
7	red wire to pin 25 on main p.c. board
8	black heavy wire to mic
9	purple wire to mic
10	gray heavy wire to mic
11	not used
12	black/white wire to mic
13	brown/white wire to mic
14	red/white wire to mic
15	orange/white wire to mic
16	brown/wire to mic
17	blue wire to main p.c. board
18	orange wire to main p.c. board
19	red wire to main p.c. board
20	yellow wire to main p.c. board
21	white wire to main p.c. board
22	green wire to main p.c. board
23	white wire to main p.c. board
24	not used
25	green wire to pin 19 on main p.c. board
26	gray wire to pin 7 on main p.c. board
27	orange wire to pin 4 on main p.c. board
28	red heavy wire to mic
29	blue wire to pin 13 on main p.c. board
30	gray wire to pin 22 on main p.c. board
31	white wire to pin 21 on main p.c. board
32	shield wire to mic
33	not used
34	yellow wire to pin 20 on main p.c. board



NOTES:

1. P.C. board shown as viewed from component side.
2. Dashed outline components—mounted on foil side.

Figure 4-2. Component Outline Channel Selector P.C. Board, Model 2710

Parts List

Main P.C. Board

Reference Designator	Description	Part No.
	main p.c. board, complete	AP-TBM036JT
	main p.c. board, plated and drilled	PT-BN036AOX
C101	18pF, 50V, ceramic disc	CC-CB180KCM
C102	22pF, 50V, ceramic disc	CC-CB220KOM
C103	1pF, 50V, ceramic disc	CC-CB010CCM
C104	10uF, 16V, electrolytic	CE-ED100ALN
C105	(not used)	
C106	10pF, 50V, ceramic disc	CC-CB100DOM
C107	01uF, 50V, ceramic disc	CK-CB103PEM
C108	330pF, 50V, ceramic disc	CC-CB331KOM
C109	330pF, 50V, ceramic disc	CC-CB331KOM
C110	.001uF, 50V, mylar	CQ-MB102KCH
C111	.01uF, 50V, mylar	CQ-MB103KCH
C112	39pF, 50V, ceramic disc	CC-CB390KOM
C113	.22uF, 50V, electrolytic	CE-ECR22ZMN
C114	10uF, 16V, electrolytic	CE-ED100ZMN
C115	.1uF, 50V, electrolytic	CE-EGR10SMN
C116	15pF, 50V, ceramic disc	CC-CB150KOM
C117	.01uF, 50V, mylar	CQ-MB103KCH
C118	39pF, 50V, ceramic disc	CC-CB390KOM
C119	12pF, 50V, ceramic disc	CC-CB120KPM
C120	560pF, 50V, ceramic disc	CK-CB561KBM
C121	100pF, 50V, ceramic disc	CC-CB101KPM
C122	22pF, 50V, ceramic disc	CC-CB220KOM
C123	.01uF, 50V, ceramic disc	CK-CB103PEM
C124	100pF, 500V, mica	CM-SD101KCS
C125	33pF, 50V, ceramic disc	CC-CB330KOM
C126	12pF, 50V, ceramic disc	CC-CB120KPM
C127	56pF, 50V, ceramic disc	CC-CXB560KPM
C128	(not used)	
C129	.001uF, 50V, ceramic disc	722849
C130	82pF, 50V, ceramic disc	CC-CB820KPM
C131	.01uF, 50V, ceramic disc	CK-CB103PRM
C132	560pF, 50V, mylar	CQ-MB561LCH
C133	.01uF, 50V, ceramic disc	CK-CB103PEM
C134	(not used)	
C135	10uF, 16V, electrolytic	CE-ED100ALN
C136	220pF, 50V, ceramic disc	CC-CB221KOM
C137	.01uF, 50V, ceramic disc	CK-CB103PEM
C138	.01uF, 50V, ceramic disc	CK-CB103PEM
C139	2pF, 50V, ceramic disc	CC-CB020COM
C140	2pF, 50V, ceramic disc	CC-CB020COM
C141	68pF, 50V, ceramic disc	CC-CB680KOM
C142	.01uF, 50V, ceramic disc	CK-CB103PEM
C143	100pF, 50V, ceramic disc	CC-CB101KPM
C144	.01uF, 50V, ceramic disc	CK-CB103PEM
C145	.01uF, 50V, ceramic disc	CK-CB103PEM
C146	470pF, 50V, ceramic disc	CK-CB471KBM
C147	.01uF, 50V, ceramic disc	CK-CB103PEM
C148	120pF, 50V, ceramic disc	CC-CB121KOM
C149	220pF, 50V, ceramic disc	CC-CB221KOM
C150	.01uF, 50V, ceramic disc	CK-CB103PEM
C151	100pF, 500V, mica	CM-SD101KCS
C152	270pF, 500V, mica	CM-SD271KCS
C153	82pF, 50V, ceramic disc	CC-CB820KOM
C154	27pF, 50V, ceramic disc	CC-CB270KOM
C155	.047uF, 50V, ceramic disc	CK-CB473ZFM
C156	.01uF, 50V, ceramic disc	CK-CB103PEM
C157	.01uF, 50V, ceramic disc	CK-CB103PEM
C158	(not used)	
C159	.047uF, 50V, ceramic disc	CK-CB473KFM
C160	.047uF, 50V, mylar	CQ-MB473KCH

Reference Designator	Description	Part No.
C161	.01uF, 50V, ceramic disc	CK-CB103PEM
C162	120pF, 50V, ceramic disc	722413
C163	.01uF, 50V, ceramic disc	CK-CB103PEM
C164	2pF, 50V, ceramic disc	CC-CB020COM
C165	.01uF, 50V, ceramic disc	CK-CB103PEM
C166	10pF, 50V, ceramic disc	CC-CB100DOM
C167	(not used)	
C168	2.2pF, 500V, ceramic disc	CG-2H2R1KNN
C169	.047uF, 50V, mylar	CQ-MB473KCH
C170	.047uF, 50V, mylar	CQ-MB473KCH
C171	.047uF, 50V, mylar	CQ-MB473KCH
C172	.047uF, 50V, mylar	CQ-MB473KCH
C173	.047uF, 50V, mylar	CQ-MB473KCH
C174	3.3uF, 25V, electrolytic	CE-EE3R3ALN
C175	.0047uF, 50V, mylar	CQ-MB472KCH
C176	1uF, 50V, electrolytic	CE-EG010ALN
C177	.033uF, 50V, mylar	CQ-MB333KCH
C178	56pF, 50V, ceramic disc	CC-CB560KPM
C179	(not used)	
C180	560pF, 50V, ceramic disc	CK-CB561KBM
C181	100pF, 50V, ceramic disc	CC-CB101KOM
C182	68pF, 50V, ceramic disc	CC-CB680KPM
C183	10uF, 16V, electrolytic	CE-ED100ALN
C184	(not used)	
C185	47uF, 10V, electrolytic	CE-EC470ALN
C186 through	(not used)	
C189	.01uF, 50V, ceramic disc	CK-CB103PEM
C191	.022uF, 50V, mylar	CQ-MB223KCH
C192	150pF, 50V, ceramic disc	CC-CB151KOM
C193	.01uF, 50V, mylar	CQ-MB103KCH
C194	.01uF, 50V, ceramic disc	CK-CB103PEM
C195	390pF, 50V, ceramic disc	CK-CB391KBM
C196	5.6uF, 25V, tantalum	CS-SE5R6MDN
C197	33uF, 6.3V, electrolytic	CE-EB330ALN
C198	68pF, 50V, ceramic disc	CC-CB680KOM
C199	68pF, 50V, ceramic disc	CC-CB690KOM
C200	390pF, 50V, ceramic disc	CK-CB392KBM
C201	.068uF, 50V, mylar	CQ-MB683KCH
C202	.02uF, 50V, mylar	CQ-MB203KCH
C203	47uF, 16V, electrolytic	CE-ED470ALN
C204	220uF, 16V, electrolytic	CE-AD221ZLS
C205	.068uF, 50V, mylar	CQ-MB683KCH
C206	(not used)	
C207	33uF, 6.3V, electrolytic	CE-EB330ALN
C208	10uF, 16V, electrolytic	CE-ED100ALN
C209	1uF, 50V, electrolytic	CE-EG010ALN
C210	1000uF, 16V, electrolytic	CE-ED102ZUN
C211	47uF, 25V, electrolytic	CE-AE470ZLS
C212	33uF, 6.3V, electrolytic	CE-EB330ALN
C213	.01uF, 50V, ceramic disc	CK-CB103PEM
C214	.01uF, 50V, ceramic disc	CK-CB103PEM
C215	.01uF, 50V, ceramic disc	CK-CB103PEM
C216	.01uF, 50V, ceramic disc	CK-CB103PEM
C217	.047uF, 50V, ceramic disc	CK-CB473ZFM
C218	.047uF, 50V, ceramic disc	CK-CB473ZFM
C219	.047uF, 50V, ceramic disc	CK-CB473ZFM
C220	.047uF, 50V, ceramic disc	CK-CB473ZFM
C221	(not used)	
C222	4.7uF, 25V, electrolytic	CE-EE4R7SMN
C223	39pF, 50V, ceramic disc	CC-CB390KOM
C224	.01uF, 50V, ceramic disc	CK-CB103PEM
C225 through	(not used)	
C241	(not used)	
C242	1uF, 50V, electrolytic	CE-EG010ALN
C243	82pF, 50V, ceramic disc	CC-CB820KOM

Reference Designator	Description	Part No.
C244	.047uF, 50V, ceramic disc	CK-CB473ZFM
C600	.001uF, 50V, ceramic disc	722849
C601	1pF, 50V, ceramic disc	722447
C602	82pF, 50V, ceramic disc	722410
CF101	filter, ceramic	FB-R455A08M
CH101	choke coil	LF-119H001Y
D101	1TT410, silicon	QD-CTT410KQ
D102	MZ205, silicon, zener	QD-ZMZ205KE
D103	RD9.1E, silicon, zener	QD-ZRD9EXAA
D104	1S1885, silicon, zener	QD-SS1885XT
D105	V06C, silicon	QD-SV06CXXB
D106	1S1555, silicon	QD-SS1555XT
D107	1S1555, silicon	QD-SS1555XT
D108	1S1555, silicon	QD-SS1555XT
D109	(not used)	
D110	1N60, germanium	QD-G1N60XXT
D111	1N60, germanium	QD-G1N60XXT
D112	(not used)	
D600	1N4148 diode	760037
IC101	PLL02A	QQ-OPLL02AO
IC102	BA521	QQ-MBA521AX
L101	rf coil	LF-220KD01N
L102	(not used)	
L103	rf coil	TR-10CD004S
L104	rf coil	TR-10CD005S
L105	rf coil	LF-2R2KD01N
L106	rf coil	TR-A5CZ001M
L107	rf coil	LF-680KD01N
L108	rf coil	LD-ADX3825M
L109	rf coil	TR-A5CZ002M
L110	rf coil	TR-A5CZ003M
L111	rf coil	LF-680KD01N
L112	rf coil	TR-07MB008N
L113	rf coil	LD-ADB4024B
L114	rf coil	LD-ADB4024B
L115	(not used)	
L116	rf coil	LA-1KE1011A
Q101	(MITSUBISHI) MPS3704	QT-C0710XBE
Q102	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q103	(NEC) 2SC829D	QT-C0829XDN
Q104	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q105	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q106	(MITSUBISHI) 2SC1318Q	QT-C1318XAN
Q107	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q108	2SC1359B	QT-C1359XAN
Q109	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q110	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q111	2SC1687	QT-C1687XAN
Q112	(SONY) 2SC1760-3	QT-C1760XAS
Q113	(NEC) 2SC1306	QT-C1306XZA
Q114	2SC1047B	QT-C1047SAN
Q115	2SC1359B	QT-C1359XAN
Q116	(NEC) 2SC829C	QT-C0829XBN
Q117	(MITSUBISHI) 2SC710D	QT-C0710XBE
Q118	(NEC) 2SC829C	QT-C0829XBN
Q119	(NEC) 2SC829C	QT-C0829XBN
Q120	2SC372Y	QT-C0372XAT

Reference Designator	Description	Part No.
Q121	2SC828P.Q	QT-C0828XDN
Q122	2SC828P	QT-C0828XAN
		722552
R101	330, 5%, 1/4w, carbon film	RD-25RJ104D
R102	100k, 5%, 1/4w, carbon film	RD-25RJ1052D
R103	1.5k, 5%, 1/4w, carbon film	RD-25RJ152D
R104	1.5k, 5%, 1/4w, carbon film	RD-25RJ224D
R105	220k, 5%, 1/4w, carbon film	RD-25RJ152D
R106	1.5k, 5%, 1/4w, carbon film	RD-25RJ104D
R107	100k, 5%, 1/4w, carbon film	RD-25RJ152D
R108	1.5k, 5%, 1/4w, carbon film	RD-25RJ104D
R109	100k, 5%, 1/4w, carbon film	RD-25RJ102D
R110	1k, 5%, 1/4w, carbon film	RD-25RJ102D
R111	1k, 5%, 1/4w, carbon film	RD-25RJ104D
R112	100k, 5%, 1/4w, carbon film	RD-25RJ332D
R113	3.3k, 5%, 1/4w, carbon film	RD-25RJ471D
R114	470, 5%, 1/4w, carbon film	RD-25RJ223D
R115	22k, 5%, 1/4w, carbon film	RD-25RJ471D
R116	470, 5%, 1/4w, carbon film	RD-25RJ333D
R117	33k, 5%, 1/4w, carbon film	RG-HAPJ101B
R118	100, 5%, 1/2w, metal oxide	722576
R119	3.3k, 5%, 1/4w, carbon film	RD-25RJ104D
R120	100k, 5%, 1/4w, carbon film	722572
R121	2.2k, 5%, 1/4w, carbon film	RD-25RJ102D
R122	1k, 5%, 1/4w, carbon film	RD-25RJ823D
R123	82k, 5%, 1/4w, carbon film	RD-25RJ271D
R124	270, 5%, 1/4w, carbon film	RD-25RJ103D
R125	10k, 5%, 1/4w, carbon film	
R126	(not used)	RD-25RJ380D
R127	68, 5%, 1/4w, carbon film	RD-25RJ101D
R128	100, 5%, 1/4w, carbon film	RD-25RJ221D
R129	220, 5%, 1/4w, carbon film	RD-25RJ470D
R130	47, 5%, 1/4w, carbon film	RD-25RJ473D
R131	10, 5%, 1/2w, metal oxide	RD-25RJ102D
R132	47k, 5%, 1/4w, carbon film	RD-25RJ681D
R133	1k, 5%, 1/4w, carbon film	RD-25RJ152D
R134	680, 5%, 1/4w, carbon film	RD-25RJ101D
R135	1.5k, 5%, 1/4w, carbon film	RD-25RJ182D
R136	100, 5%, 1/4w, carbon film	RD-25RJ102D
R137	1.8k, 5%, 1/4w, carbon film	RD-25RJ471D
R138	1k, 5%, 1/4w, carbon film	RD-25RJ100K
R139	470, 5%, 1/4w, carbon film	RD-25RJ102D
R140	100k, 5%, 1/4w, carbon film	RD-25RJ472D
R141	1k, 5%, 1/4w, carbon film	RD-25RJ471D
R142	4.7k, 5%, 1/4w, carbon film	RD-25RJ473D
R143	470, 5%, 1/4w, carbon film	RD-25RJ221D
R144	4.7k, 5%, 1/4w, carbon film	RD-25RJ331D
R145	220, 5%, 1/4w, carbon film	RD-25RJ152D
R146	330, 5%, 1/4w, carbon film	RD-25RJ273D
R147	1.5k, 5%, 1/4w, carbon film	RD-25RJ221D
R148	27k, 5%, 1/4w, carbon film	RD-25RJ470D
R149	220, 5%, 1/4w, carbon film	RD-25RJ223D
R150	47, 5%, 1/4w, carbon film	RD-25RJ274D
R151	22k, 5%, 1/4w, carbon film	RD-25RJ473D
R152	270k, 5%, 1/4w, carbon film	RD-25RJ683D
R153	47k, 5%, 1/4w, carbon film	RD-25RJ333D
R154	68k, 5%, 1/4w, carbon film	RD-25RJ473D
R155	33k, 5%, 1/4w, carbon film	RD-25RJ473D
R156	47k, 5%, 1/4w, carbon film	
R157	(not used)	RD-25RJ104D
R158	100k, 5%, 1/4w, carbon film	RD-25RJ152D
R159	1.5k, 5%, 1/4w, carbon film	RD-25RJ152D
R160	1.5k, 5%, 1/4w, carbon film	RG-HAPJ220B
R161	22, 5%, 1/2w, metal oxide	RD-25RJ102D
R162	1k, 5%, 1/4w, carbon film	

Reference Designator	Description	Part No.
R163	390, 5%, 1/4w, carbon film	RD-25RJ391D
R164	10k, 5%, 1/4w, carbon film	RD-25RJ103D
R165	820, 5%, 1/4w, carbon film	RD-25RJ821D
R166	470, 5%, 1/4w, carbon film	RD-25RJ471D
R167	27k, 5%, 1/4w, carbon film	RD-25RJ273D
R168	3.3k, 5%, 1/4w, carbon film	RD-25RJ332D
R169	220k, 5%, 1/4w, carbon film	RD-25RJ224D
R170	22k, 5%, 1/4w, carbon film	RD-25RJ223D
R171	150, 5%, 1/4w, carbon film	RD-25RJ151D
R172	2.2k, 5%, 1/4w, carbon film	RD-25RJ222D
R173	(not used)	
R174	10, 5%, 1/4w, carbon film	RD-25RJ100D
R175	10k, 5%, 1/4w, carbon film	RD-25RJ103D
R176	82, 5%, 1/4w, carbon film	RD-25RJ820D
R177	270, 5%, 1/4w, carbon film	RD-25RJ271D
R178	680, 5%, 1/4w, carbon film	RD-25RJ681D
R179	22k, 5%, 1/4w, carbon film	RD-25RJ223D
R180	1.8k, 5%, 1/4w, carbon film	RD-25RJ182D
R181	18k, 5%, 1/4w, carbon film	RD-25RJ183D
R182	100, 5%, 1/4w, carbon film	RD-25RJ101D
R183 through R193	(not used)	
R194		
R195 through R203	(not used)	
R600	18, 5%, 1/4w, carbon film	722594
R601	5.6k, 5%, 1/4w, carbon film	RD14WJ562N
RV101	10k, potentiometer	RP-GNB10301
RV102	2k, potentiometer	RP-GNB20201
T101	rf transformer	TR-10DA002T
T102	rf transformer	TR-10CB001S
T103	rf transformer	TR-10CP005S
T104	rf transformer	TR-10MP003T
T105	rf transformer	TR-10CA005S
T106	rf transformer	TR-07MB008N
T108	rf transformer	TR-07LA005N
T109	rf transformer	TR-07LA023N
T110	rf transformer	TR-G25B001W
T111	rf transformer	TR-10MB003T
X101	11.8066 MHz, crystal	XA-S1B4001N
X102	10.695 MHz crystal	XA-S1B3002N
X103	10.240 MHz crystal	XA-S1B3001N
	heat sink - for IC102	ML-454AD002
	heat sink - for IC102	MS-327AD005
	heat sink - for Q113	ML-463AD001
	resistor array, 10k, (x6)	RA-B103K06D

Channel Selector P.C. Board

Reference Designator	Description	Part No.
	channel selector p.c. board, complete	878928
	channel selector p.c. board, plated and drilled	750070
C301 through		
C302	(not used)	
C304	.01uF, 50V, ceramic disc	720106
C305	.001uF, 25V, ceramic disc	722849
C306	.01uF, 25V, ceramic disc	720106
C307	.01uF, 25V, ceramic disc	720106
C308	10uF, 16V, ceramic disc	720144
C309	.0022uF, 50V, ceramic disc	720147
C310	.1uF, 25V, ceramic disc	720146
C311	47uF, 16V, electrolytic	722347
C312	.01uF, 25V, ceramic disc	720106
C313	.01uF, 25V, ceramic disc	722440
C314	(not used)	
C315	.001uF, 50V, ceramic disc	722849
D301	1N4148	760037
Q301	MPS5172	760238
R301	470, 10%, 1/4w, carbon	722556
R302	470, 10%, 1/4w, carbon	722556
R303	470, 10%, 1/4w, carbon	722556
R304	470, 10%, 1/4w, carbon	722556
R305	470, 10%, 1/4w, carbon	722556
R306	470, 10%, 1/4w, carbon	722556
R307	470, 10%, 1/4w, carbon	722556
R308	1.2k, 10%, 1/4w, carbon	722566
R310 and		
R311	(not used)	
R312	330, 10%, 1/4w, carbon	720086
R313	100, 10%, 1/4w, carbon	720130
R314	3.3k, 10%, 1/4w, carbon	720109
R315	22k, 10%, 1/4w, carbon	720129
R316	22k, 10%, 1/4w, carbon	720129
R317	3.3k, 10%, 1/4w, carbon	720109
T301	transformer, microphone	730036
U301 through		
U303	(not used)	
U304	MC3340P attenuator	760105

Microphone Components

Reference Designator	Description	Part No.
CR401	MV5274C, led, green	760310
CR402	TIL 220, Led, red	760118
R401	390, 5%, 1/2w, carbon	721301
R402	150, 10%, 1/2w, carbon	721314
R403	3.9, 10%, 1/2w, carbon	721346
R404	820, 5%, 1/2w, carbon	721334
R405	470, 5%, 1/2w, carbon	722733
R406 through R415	(not used)	
R416	20k, 1/4w, potentiometer (part of on/off switch)	722340
R417	10k, 1/4w, potentiometer (squelch control)	722339
S401	switch, 40 position rotary	700048
S402	switch, (on/off)	722340
S403	switch, mic ptt.	700326
S	speaker, 8 ohm	730035

Chassis Mounted Components

Reference Designator	Description	Part No.
C1	330pF, 50V, mica	721681
C2	.01uF, 25V, ceramic disc	721665
C3	.01uF, 25V, ceramic disc	721665
C316	.001uF, 50V, ceramic disc	722849
C317	.01uF, 50V, ceramic disc	722440
C318	.0047uh, 50V, ceramic disc	722853
C604	330pF, 50V, mica	721681
C605	220pF, 50V, ceramic disc	CC-CB221KOM
C606	.001uF, 50V, ceramic disc	722849
C607	.001uF, 50V, ceramic disc	722849
C608	(not used)	
C609	.001uF, 50V, ceramic disc	722849
C610	.001uF, 50V, ceramic disc	722849
L600	18uh, coil	722871
L601	6.8uh, rf choke	722857
L602	1.5uh, (full leads)	722488
L603	6.8uh, rf choke	722857
L604	6.8uh, rf choke	722857
J1	jack, antenna	650065
J2	jack, external speaker	650076
J3	jack, squelch override	650102
	washer, flat fiber	560040
	washer, extruded fiber	560039
	fuse, 3 amp	710027
	holder, fuse	710027

**Mechanical Parts
Transceiver**

Part No.	Description	Qty
870874	chassis, main frame	1
460092	case, upper	1
460093	case, lower	1
450308	strain relief, power cord	1
6220076	cord, power, 2 lead	1
450308	strain relief, transceiver cable	1
650080	plug, amphenol 16 pin	1

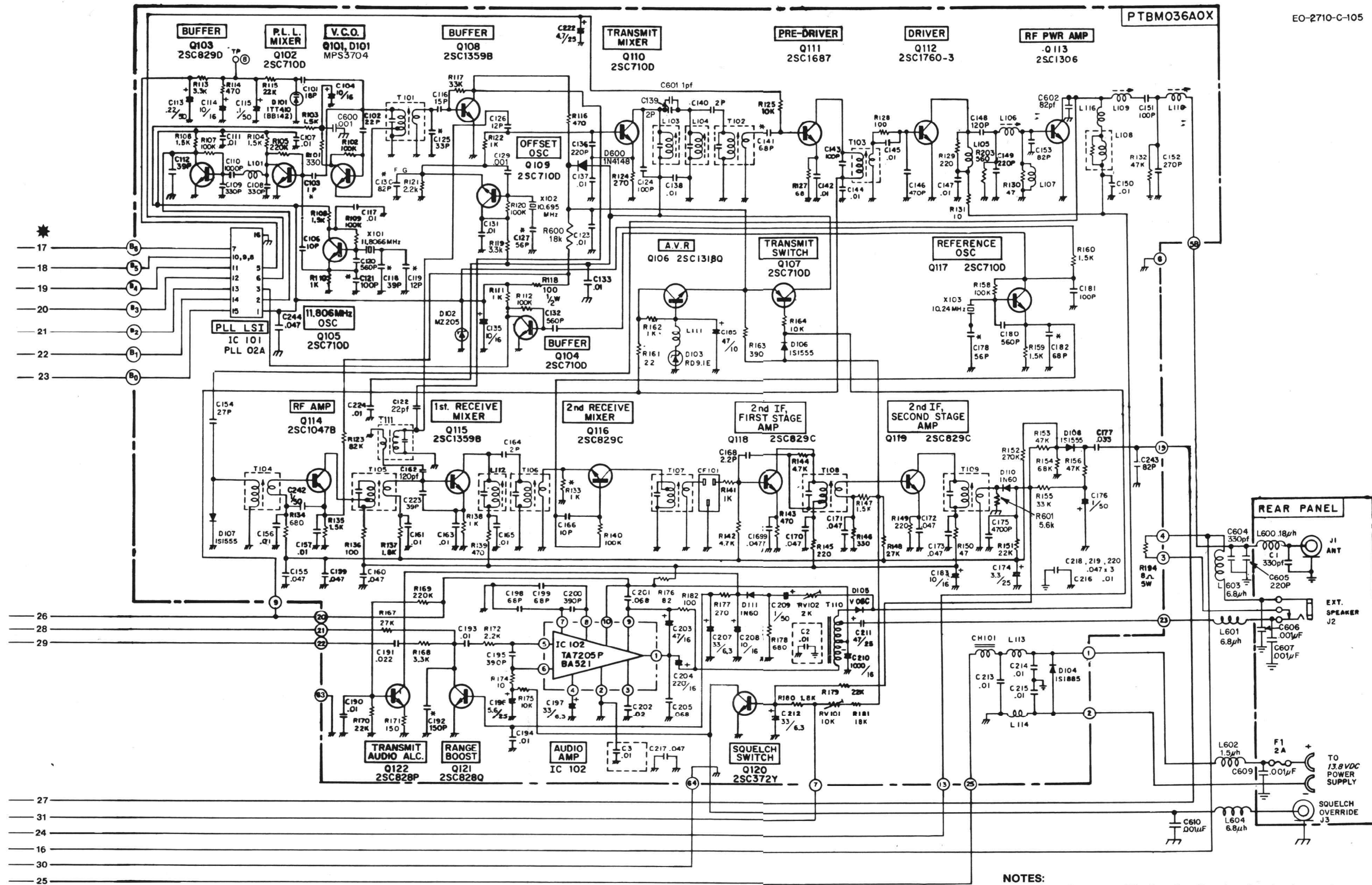
Microphone

460116	case, plastic (front)	1
460117	case, plastic (rear),	1
460118	cover, plastic (front),	1
620073	cord, microphone coil	1
460098	knob, volume control	1
460098	knob, squelch control	1
460153	button, push-to-talk	1
460175	button, microphone hanger	1
450295	filter, channel display	1
450321	plate, 40 channel dial	1

Accessory Parts

Part No.	Description	Qty
350629	holder, microphone	1
380279	bracket, connector mounting	1

Schematic Diagram

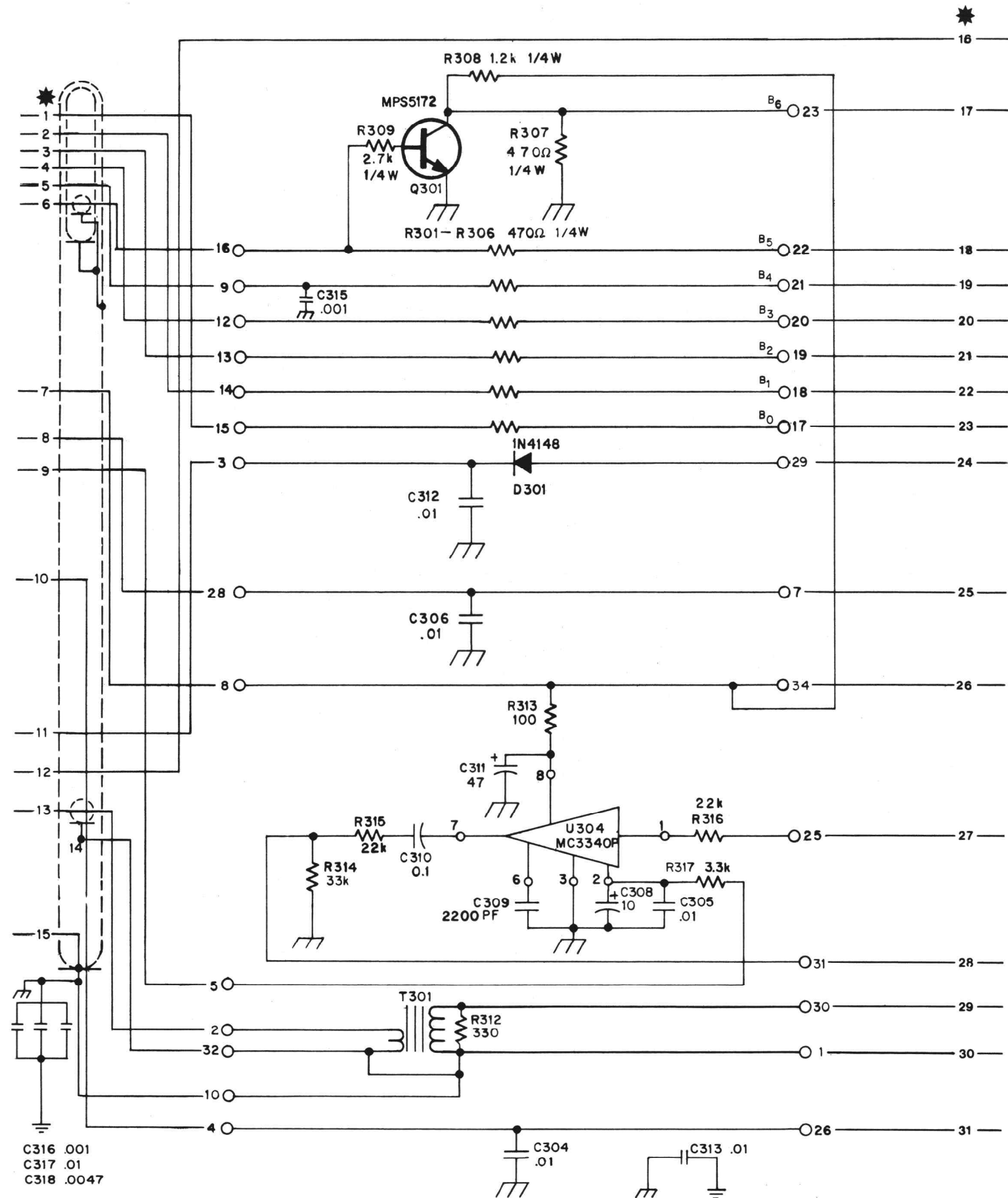


NOTES:

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)
2SA719	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC828	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC829	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC830	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC839	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC849	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC851	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC859	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC877	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1215	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC710	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC784	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC372	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1687	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1688	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1306	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1678	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1780	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
2SC1957,7	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
TA7205P	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖
BA521	⊖ ⊖ ⊖ ⊖	⊖ ⊖ ⊖ ⊖

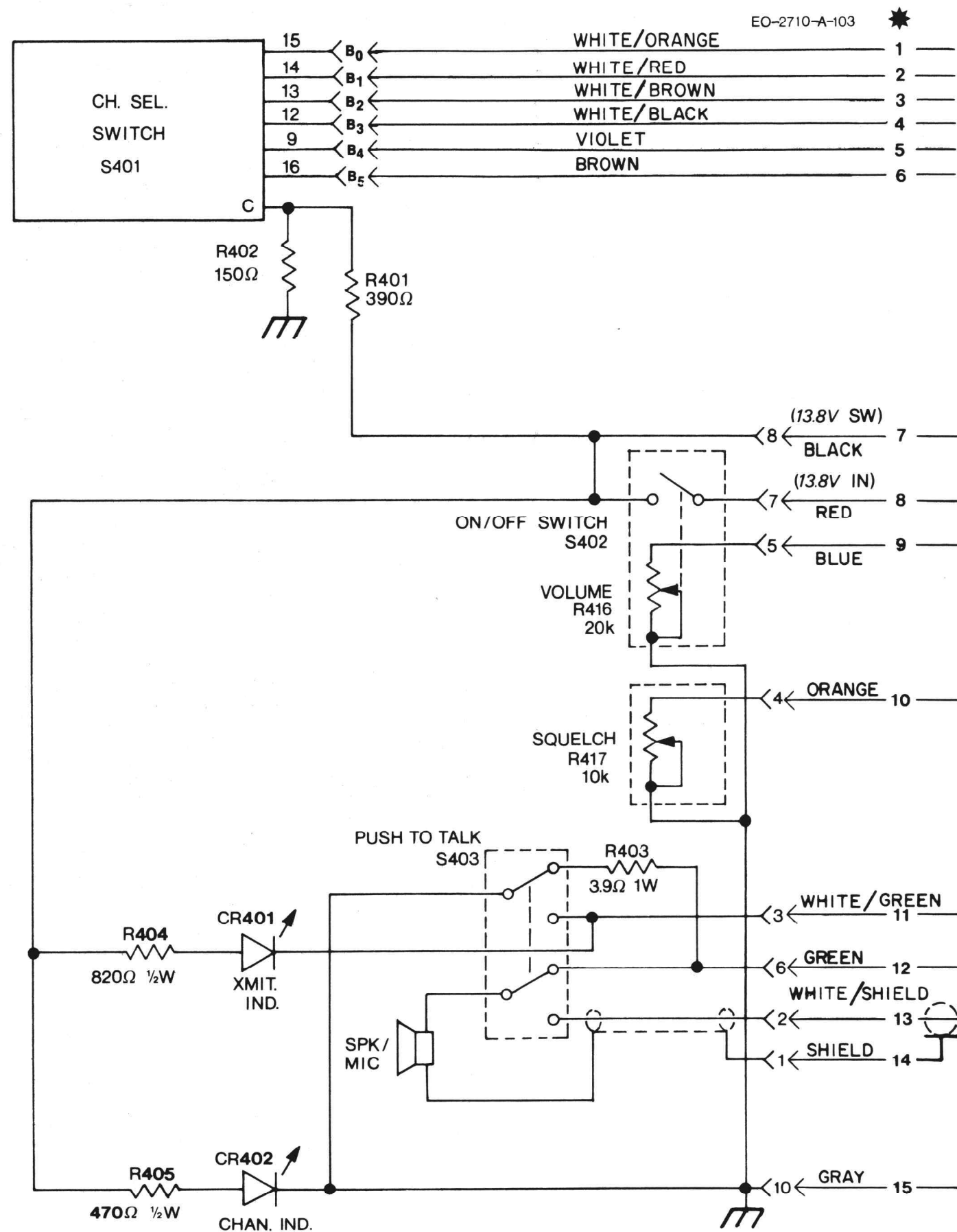
Figure 4-3. Schematic Diagram, Main P.C. Board, Model 2710



NOTES:

1. All resistors are 5%, ¼ 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 4-4. Schematic Diagram, Channel Selector P.C. BD, Model 2710



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 4-5. Schematic Diagram, Microphone, Model 2710

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