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## SECTION III

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**TABLE I, TROUBLESHOOTING GUIDE**

TROUBLE	PROBABLE CAUSE
1. Transceiver will not operate.	<ul style="list-style-type: none"><li>a. On/Off Switch defective.</li><li>b. Fuse blown.</li><li>c. Defective power source.</li><li>d. Voltage regulator defective.</li><li>e. Polarity reversed. (DC operation only.)</li></ul>
2. Fuse blows after replacement.	<ul style="list-style-type: none"><li>a. Polarity of source voltage reversed. Shorted D-705. (DC operation only)</li><li>b. Q704, Q705, C718, C722, T704, C720 defective (shorted)</li></ul>
3. No audio output. (S meter indicates reception of signals)	<ul style="list-style-type: none"><li>a. Squelch control set wrong.</li><li>b. Speaker defective.</li><li>c. EXT SPK jack defective.</li><li>d. Volume control defective.</li></ul>
4. No audio output. (Transmitter is not modulated when speaking into microphone.)	<ul style="list-style-type: none"><li>a. All probable causes as in step 3 above.</li><li>b. Q702, Q703, C704, Q705, defective.</li><li>c. Microphone defective.</li><li>d. T701, T702 defective.</li><li>e. C952, C509, C510 defective.</li><li>f. D9 open, defective.</li></ul>

TABLE 1, TROUBLESHOOTING GUIDE (Continued)

TROUBLE	PROABLE CAUSE
5. Poor reception of signals and low RF power output.	<ul style="list-style-type: none"> <li>a. Low DC source voltage, less than 10 volts (DC operation only)</li> <li>b. Antenna connector or antenna defective.</li> <li>c. C101, C955, defective (open).</li> <li>d. D956, D102, C501 shorted.</li> </ul>
6. Poor sensitivity.	<ul style="list-style-type: none"> <li>a. Q101, Q102 defective.</li> <li>b. C955 open.</li> <li>c. Receiver section poorly aligned.</li> </ul>
7. Low background noise on all Channels.	<ul style="list-style-type: none"> <li>a. One of the receiver RF coils has open winding.</li> <li>b. Q101, Q102 or Q301 weak or defective.</li> </ul>
8. Squelch function inoperative, receiver does not silence.	<ul style="list-style-type: none"> <li>a. Q501 or Q502 shorted</li> <li>b. Squelch control R510 defective (open).</li> <li>c. C503 shorted.</li> </ul>
9. Squelch function inoperative, receiver will not awaken.	<ul style="list-style-type: none"> <li>a. Q501 or 502 defective</li> <li>b. Squelch control R510 defective (shorted)</li> <li>c. C502 shorted</li> </ul>
10. Transmitter does not operate, (Receiver operates normally).	<ul style="list-style-type: none"> <li>a. Microphone Transmit switch defective.</li> <li>b. TR18, TR19, or TR20 defective</li> <li>c. L10, L11, L12 or L13 defective (shorted or open).</li> <li>d. TR16 or 11.275 MHz crystal defective.</li> </ul>

After the repair or replacement of any critical frequency controlling part or circuit, the transmitter and receiver sections should be tested for operational compliance to the Federal Communications Commission (FCC) frequency and power requirements and the manufacturers specifications.

TABLE 2, SYNTHESIZER CRYSTAL COMBINATION

CHANNEL	A GROUP CRYSTALS	B GROUP CRYSTALS	(A + B)	(A + B) - (11.275 MHz)
1	23.290 MHz	14.950 MHz	38.240 MHz	26.965 MHz
2	"	14.960 "	38.250 "	26.975 "
3	"	14.970 "	38.260 "	26.985 "
4	"	14.990 "	38.280 "	27.005 "
5	23.340 MHz	14.950 "	38.290 "	27.015 "
6	"	14.960 "	38.300 "	27.025 "
7	"	14.970 "	38.310 "	27.035 "
8	"	14.990 "	38.330 "	27.055 "
9	23.390 MHz	14.950 "	38.340 "	27.065 "
10	"	14.960 "	38.350 "	27.075 "
11	"	14.970 "	38.360 "	27.085 "
12	"	14.990 "	38.380 "	27.105 "
13	23.440 MHz	14.950 "	38.390 "	27.115 "
14	"	14.960 "	38.400 "	27.125 "
15	"	14.970 "	38.410 "	27.135 "
16	"	14.990 "	38.430 "	27.155 "
17	23.490 MHz	14.950 "	38.440 "	27.165 "
18	"	14.960 "	38.450 "	27.175 "
19	"	14.970 "	38.460 "	27.185 "
20	"	14.990 "	38.480 "	27.205 "
21	23.540 MHz	14.950 "	38.490 "	27.215 "
22	"	14.960 "	38.500 "	27.225 "
23	"	14.990 "	38.530 "	27.255 "

1) Frequency of Transmitter:  $(A + B) - (11.275 \text{ MHz}) = \text{Channel Frequency}$

2) Frequency of Receiver:

$(A + B) - (\text{Received signal}) = 11.275 \text{ MHz}$  (1st IF Frequency). 11.730 MHz  
 $(2\text{nd Oscillator Frequency}) - 11.275 \text{ MHz} = 455 \text{ KHz}$  (2nd IF).

**TABLE 3,  
TRANSISTOR VOLTAGES**

Measure all voltage with a VTVM or 20K ohm/V voltmeter. Connect the negative meter lead to the circuit board common ground. Make measurements in the receiver section with the squelch control in the "unsquelched" position, and in the transmitter section without modulation.

	Type	RECEIVER (NO SIGNAL)			TRANSMITTER (WITHOUT MODULATION)			APPLICATION
		B	C	E	B	C	E	
Q101	2SC930/ 2SC839	1.47	5.73	1.48	0.45	0.09	0.29	RF AMP.
Q102	2SC930/ 2SC839	2.01	6.28	1.57	0.80	0.15	0.20	1ST MIX.
Q301	2SC930/ 2SC839	2.20	5.88	1.55	0.78	0.12	0.13	2ND MIX
Q302	2SC930/ 2SC839	2.25	4.76	1.55	1.23	0.49	0.48	IF AMP.
Q303	2SC930/ 2SC839	0.71	6.80	0	0.01	0.45	0	IF AMP.
Q501	2SC945/ 2SC372	0.06	0.73	0	0.02	0.05	0	SQUELCH AMP.
Q502	2SC945/ 2SC372	0.73	0.02	0	0.5	0.03	0	SQUELCH AMP.
Q507	2SA495	13.50	0	13.75	12.76	5.26	13.47	MODUL INDICATOR.
Q701	2SC945/ 2SC372	1.83	3.03	1.18	0.02	0.05	0.02	AF AMP.
Q702	2SC945/ 2SC372	1.49	11.53	7.05	1.41	7.12	0.76	AF AMP.
Q703	2SC945/ 2SC372	1.45	10.93	0.81	1.44	10.63	0.76	AF. DRIVER.
Q704	2SC1096	0.64	13.65	0.02	0.64	13.38	0.02	A. F. POWER AMP
Q705	2SC1096	0.64	13.65	0.02	0.64	13.38	0.02	A. F. POWER AMP
Q706	2SC1173	14.39	22.6	13.8	14.43	19.1	13.8	VOLT. REGULATOR
Q707	2SD234	13.8	22.6	13.8	13.8	19.1	13.15	VOLT. REGULATOR
Q708	2SC945/ 2SC372	7.36	14.39	6.69	7.27	14.43	6.67	VOLT. REGULATOR
Q901	2SC930	1.85	6.85	2.11	1.85	6.88	2.08	23 MHZ OSC.
Q902	2SC930/ 2SC839	1.47	6.95	1.21	1.47	6.85	1.19	SYNTHESIZER MIX- ER
Q903	2SC930/ 2SC839	1.92	6.44	1.35	0.02	0.05	0	2ND. OSC.
Q904	2SC930/ 2SC839	1.63	5.90	1.04	1.62	5.82	1.02	14 MHZ OSC.
Q905	2SC930/ 2SC839	3.19	6.97	7.06	3.06	6.87	2.62	TRANS 11 MHZ OSC.
Q906	2SC930/ 2SC839	0.80	6.97	7.06	0.67	6.83	0.44	TRANS 2ND MIX- ER
Q907	2SC1166	2.10	13.73	7.06	1.55	0	0.95	BUFFER AMP
Q908	2SC1166	2.10	13.45	0	0.04	11.80	0.33	RF DRIVER AMP
Q909	2SC799	0.03	13.46	0	0.67	12.15	0.01	FINAL RF POWER AMP

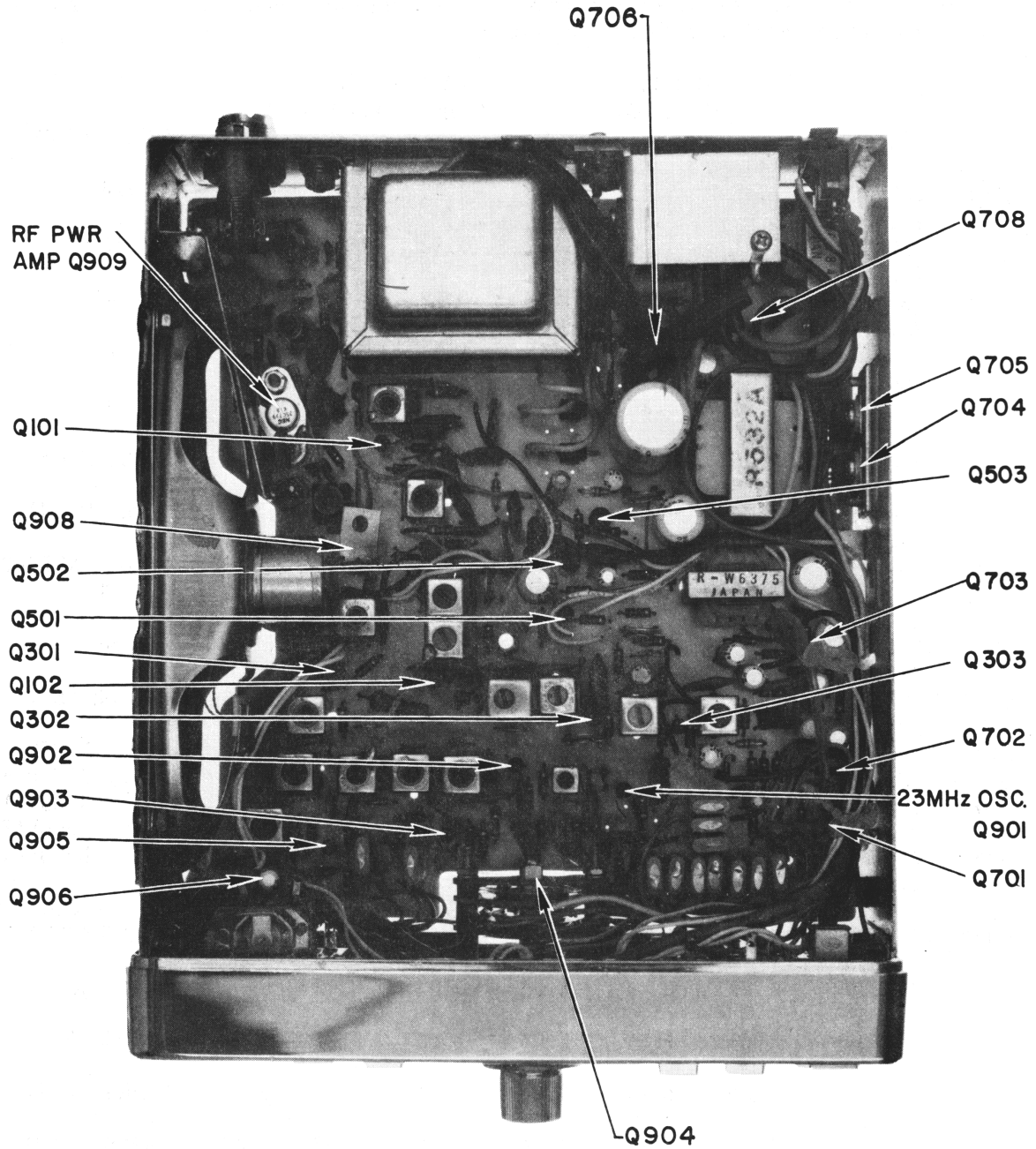


FIGURE 6, TRANSISTORS, LOCATION DIAGRAM

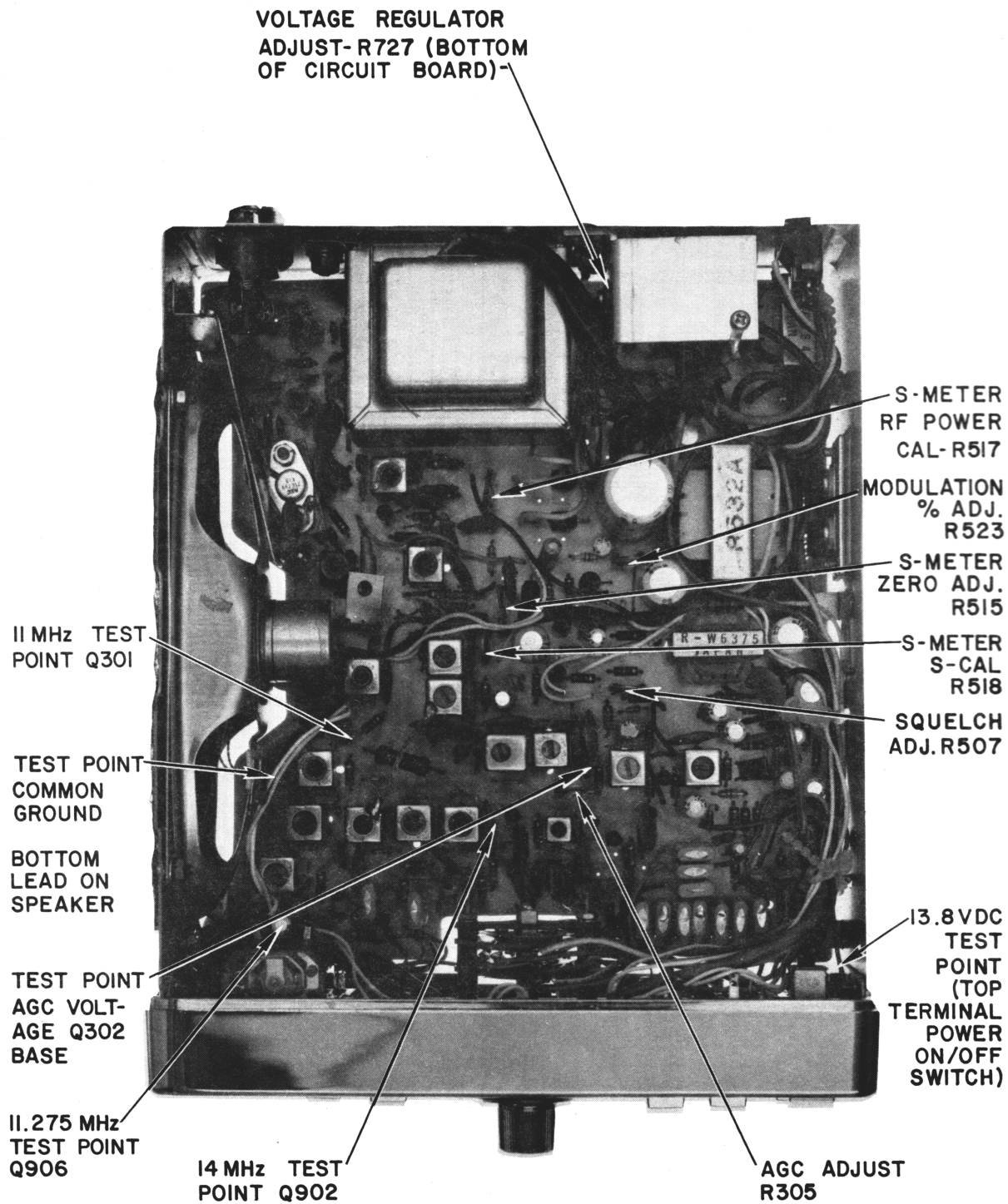


FIGURE 9, INTERNAL ADJUSTMENTS AND TEST POINTS, LOCATION DIAGRAM

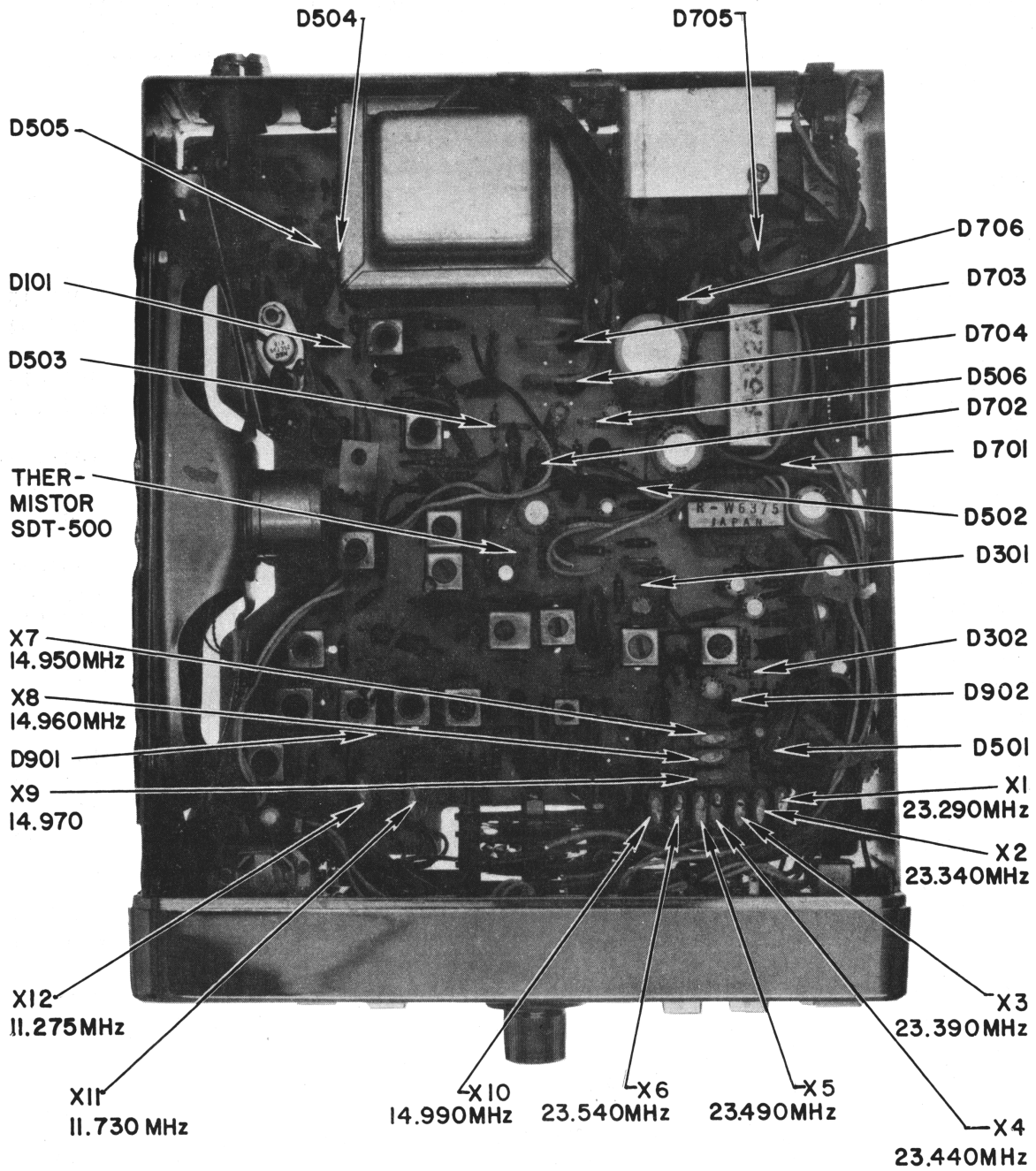


FIGURE 12, DIODES AND CRYSTALS, LOCATION DIAGRAM