

10

INSTRUCTION

MANUAL

FTR-2410

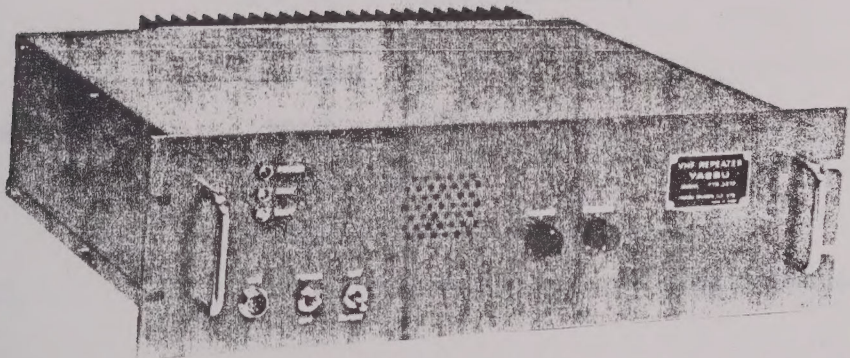
YAESU MUSEN CO , LTD.

TOKYO JAPAN.

OPERATION

MANUAL FOR

FTR-2410



YAESU MUSEN CO., LTD.
C.P.O. BOX 1500,
TOKYO, JAPAN

The FTR-2410 is a highly reliable FM repeater, providing 10 watts of output on the VHF bands. Designed for installation in any standard 19 inch mounting rack, the FTR-2410 has a built-in time-out timer and delay timer, "musts" for any repeater system. Options such as the CTCSS decoder/encoder for tone squelch operation, tone burst decoder, phone patch unit, etc., can help you meet most special requirements. Cavity duplexers are also available, with separation of either 4.5 MHz or 600 kHz.

SPECIFICATIONS:

GENERAL

Frequency range : 148 MHz - 174 MHz
Type A : 148 MHz - 160 MHz
Type B : 160 MHz - 174 MHz

Type of Emission : 16F3

Number of Channels : 1 channel, crystal control

Repeater System : Carrier operation system

Power Requirements : AC 100/110/117/200/220/234V
DC 12V (Negative ground)

Input Power : AC 100VA
DC 48W

Temperature Range : -30°C - +60°C

Duty Cycle : Continuous

Case Size : 133(H) x 483(W) x 356(D) mm

Weight : 12 kg. (w/o duplexer); 13.4 kg (w/duplexer)

TRANSMITTER

RF Power Output : 10 watts

Frequency Stability : ± 5 ppm

Frequency Multiplication : 6 times

Modulation : Phase modulation (FM)

Maximum Deviation : ± 5 kHz

Audio Response : +1, -3 dB/octave pre-emphasis characteristic from 300 Hz to 3000 Hz

Audio Distortion : Better than 10% (60% deviation at 1 kHz)

FM Noise Ratio : Better than 45 dB

Spurious Emissions : At least 60 dB below carrier.

RECEIVER

Sensitivity :	Better than 0.5 uV for 12dB SINAD Better than 1.0 uV for 20dB QS
Frequency Stability :	± 5 ppm
Adjacent Selectivity :	Better than 80dB (± 25 kHz)
Intermodulation :	Better than 65dB (± 25 kHz, ± 50 kHz)
Spurious Response :	Better than 80dB
Squelch Sensitivity :	0.2 uV
Audio Output :	2 watts at 8 ohms (10% THD)
AF Response :	+1, -3dB/octave de-emphasis characteristic from 300 Hz to 3000 Hz

DUPLEXER (Within)

Frequency Range :	148 MHz to 174 MHz
Frequency Separation :	4.5 MHz (min.)
Insertion Loss	1.2dB
TX Noise Suppression :	80dB
RX Isolation at TX :	80dB
Maximum VSWR :	1.5 : 1
Frequency Stability :	2.5 ppm/°F

INSTALLATION AND OPERATION

1. Connect the antenna to the SO-239 connector on the rear apron. Be sure your antenna impedance is 50 ohms.
2. Insert the AC plug to the wall outlet after making sure the voltage of your local power line matches that of your FTR-2410. If the voltage is different, the power voltage and the wire connection at the power transformer of your FTR-2410 should be changed.
3. Set the REPEAT/MIC switch to MIC, and the POWER switch to ON. The POWER LED will become illuminated.
4. Preset the SQUELCH control fully counterclockwise, and adjust the VOLUME control for an adequate audio level from the speaker.
5. Set the SQUELCH control to the point where the level of background noise is reduced. After 2 seconds, the background noise will completely disappear.

TRANSCEIVER OPERATION

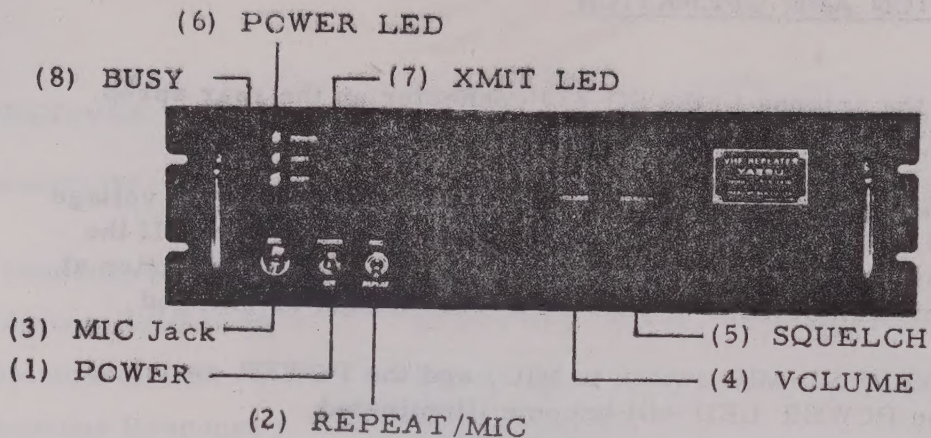
1. Connect a microphone to the MIC jack on the front panel and close the PTT switch of the microphone to transmit through the repeater, causing the XMIT LED to light up.
2. Release the PTT switch to return to the receive condition.
3. When a signal is present at the repeater, the BUSY LED will light up.

REPEATER OPERATION

1. Turn the REPEAT/MIC switch to the REPEAT position to activate the repeater function. When a signal strong enough to break the squelch is present, the transmitter turns on to send a signal.
2. When the monitoring of incoming signals is not necessary, turn the VOLUME control fully counterclockwise to reduce the audio output from the speaker.

BACK-UP BATTERY OPERATION AND CONNECTIONS

The FTR-2410 can be operated from an external battery during power shortages. To activate this function, a rechargeable battery should be connected to the BATTERY connector on the rear panel. The automatic power control circuit will automatically change to battery operation. While the power switch is on, the FTR-2410 will charge the battery continuously.



FRONT PANEL CONTROLS AND SWITCHES

(1) POWER

This is the main power switch of the FTR-2410.

(2) REPEAT/MIC

This switch changes the operating function of the FTR-2410 from repeater to transceiver, or vice versa. When this switch is in the REPEAT position, the FTR-2410 acts as a repeater, and while in the MIC position, you can speak into the microphone to use it as a transceiver.

(3) MIC Jack

This six-pin connector accepts the microphone input, and provides a standby control line.

(4) VOLUME

The volume control sets the receiver volume level.

(5) SQUELCH

The squelch control silences the receiver noise until a signal is received.

(6) POWER LED

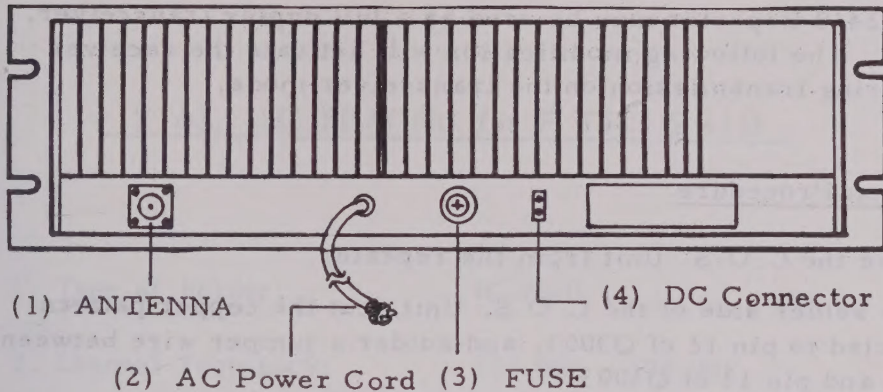
This indicator lamp will glow green during standby with AC power applied.

(7) XMIT LED

This red indicator will light up when the transmitter is activated.

(8) BUSY

This indicator will light up when a signal is received (a signal strong enough to break the receiver squelch).



REAR APRON CONNECTIONS

(1) ANTENNA CONNECTIONS

This UHF connector accommodates an antenna connection. The antenna impedance should be 50 ohms.

(2) AC Power Cord

Connect this AC power lead to the wall outlet. The power voltage of your local line should match the required voltage of your FTR-2410.

(3) FUSE

Only a properly rated fuse must be installed into this fuse holder. The proper fuse ratings per voltage are as follows:

100V - 117V	2 amps
200V - 234V	1 amp

(4) DC Connector

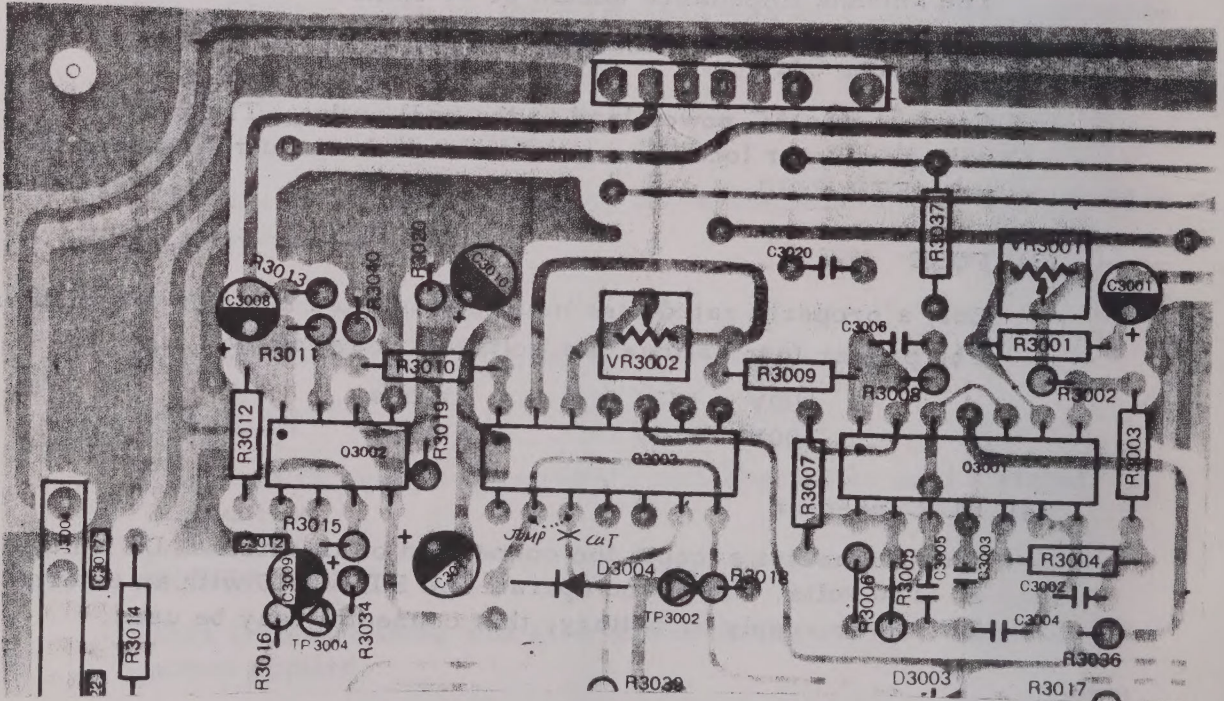
This connector accepts the connection of an external DC voltage of 12.0 volts. When you operate the FTR-2410 with an external DC power supply or battery, this connector may be used.

FULL DUPLEX MODIFICATION

The FTR-2410 Repeater may be used as a full duplex transceiver, if desired. The following modification will activate the receiver section during transmission on the transceiver mode.

Modification Procedure

1. Remove the C. O. S. Unit from the repeater.
2. On the solder side of the C. O. S. Unit, cut the copper pattern connected to pin 12 of Q3003, and solder a jumper wire between pin 12 and pin 13 of Q3003.
3. Now install the C. O. S. Unit in the correct position, as it was previously installed.



XTAL SPECIFICATIONS for FTR-2410

1. Type of Holder: HC-25/U
2. Channel Frequency: 134 MHz - 175 MHz
3. Oscillation Frequency: TX: CH/6
RX: (CH-21.4)/3
4. Load Capacity: 45 pF
5. Drive Level: TS-683/TSM 2mW
6. Shunt Capacity: TX: 134-175MHz 5.5pF+0.5
RX: 134-175MHz 4.0pF+0.5
7. Frequency Tolerance: +10ppm at 25°C
8. Frequency Stability: +10ppm -10°C to +50°C
9. Equivalent Resistance: Series 17 ohm max.
10. Operation mode: 3rd Overtone

ALIGNMENT STEPS

I. RECEIVER

- 1-1) Second IF
- 1-2) Second local
- 1-3) First IF
- 1-4) First local
- 1-5) RF section
- 1-6) Sensitivity peaking
- 1-7) Squelch sensitivity

II. TRANSMITTER

- 2-1) Oscillator
- 2-2) Multiplier stages
- 2-3) Bandpass filter
- 2-4) Spurious reduction
- 2-5) Deviation setting
- 2-6) RF power output

III. C.O.S. UNIT

- 3-1) RX AF level alignment
- 3-2) Repeat level alignment
- 3-3) Timer delay and repeat noise alignment
- 3-4) Time-out timer alignment

IV. DUPLEXER UNIT

ALIGNMENT :] RECEIVER

1-1) Second IF

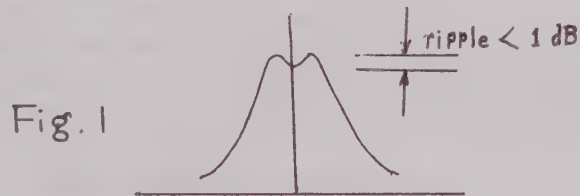
Connect a 455 kHz sweep generator to the base of Q1008, and connect an XY scope (vertical amp. input) to pin 1 of J1001. Adjust T1007 for maximum p-p indication on the scope.

1-2) Second Local

Connect a precision frequency counter to TP1002. Adjust TC1002 for a reading of exactly 20.945 MHz on the counter.

1-3) First IF

Connect a 21.4 MHz sweep generator to gate 2 of Q1002. Connect an XY scope (vertical amp. input) through a diode detector, to the secondary of T1006. Now adjust T1005 and T1006 so that the pattern shown in Figure 1 is obtained, with less than 1 dB of ripple.



1-4) First Local

Connect the RF probe of a VTVM to the base of Q1005 (TP1001). Adjust T1003 and T1004 for maximum indication on the VTVM.

Connect the RF probe of a VTVM to gate 2 of Q1002. Adjust L1008, L1009 for maximum indication on the VTVM.

Connect a precision frequency counter to the base of Q1005 (through an 0.01 uF capacitor). Preset the core of T1002 to be flush with the top of the shield can. Now adjust TC1001 and T1001 for the following frequency :

$$f_{\text{test}} = \frac{f(\text{RX channel}) - 21.4 \text{ MHz}}{3}$$

1-5) RF Section

Connect a precision VHF signal generator to the antenna jack, and connect an AF millivoltmeter to the speaker (use 8 ohm termination).

Inject a signal on the channel frequency at a level providing about 10 dB of noise quieting. Now adjust L1001, L1002, L1005, L1006 and L1007 for maximum noise quieting as shown on the meter. Adjust the signal generator level, and meter scale, as needed to provide a meaningful display.

1-6) SINAD Sensitivity

Connect a signal generator set to the channel frequency, with 1 kHz mod. @ ± 3 kHz deviation to the ANT jack. Connect an audio distortion meter to the speaker, using an 8 ohm termination. Inject a signal from the generator so that the distortion meter indicates 25% distortion. Adjust T1005 and T1006 for minimum distortion. Now reset the signal generator level for 25% distortion, and again adjust T1005 and T1006 for minimum distortion. Repeat several times.

1-7) Squelch Sensitivity

Connect a signal generator to the antenna jack, and set the SQL control fully clockwise. Apply a 1 uV signal from the generator, and adjust VR1001 so that the squelch just opens.

ALIGNMENT : TRANSMITTER

2-1) Oscillator Circuit

Connect a dummy load/VHF wattmeter to the antenna jack. Connect the RF probe of a VTVM to the base of Q2003. Close the PTT switch, and adjust T2003 for maximum deflection on the VTVM. Now connect a frequency counter to the base of Q2003 and adjust T2001/T2002 (coarse tuning) and TC2001 for exactly the following frequency :

$$f_{\text{test}} = \frac{f(\text{Transmit channel})}{6} \text{ MHz}$$

2-2) Multiplier Stages

Leave the dummy load/wattmeter connected to the antenna jack. Turn VR2002 fully clockwise. Now connect a DC voltmeter between TP 2002 (negative) and TP2007 (positive). Adjust T2005 and T2006 for maximum indication on the voltmeter. Now connect the meter to TP2003 (negative) and adjust T2007 and T2008 for maximum indication on the meter. Connect the wattmeter to the antenna jack, and adjust T2008, T2009, TC2002, TC2003 and TC2006 for maximum indication on the wattmeter.

2-3) Bandpass filter adjustment

Assemble the test equipment as shown in Figure 2. Adjust T2006 - T2009 and TC2002 - TC2006 so that the display shown in Figure 3 is obtained. Several passes through the alignment procedure may be necessary to achieve the proper bandpass.

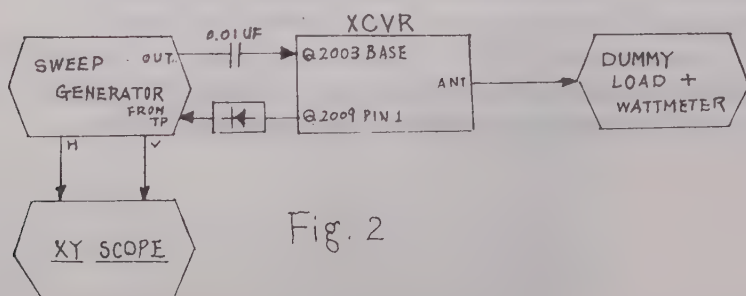
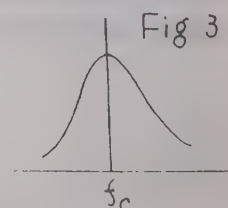


Fig. 2



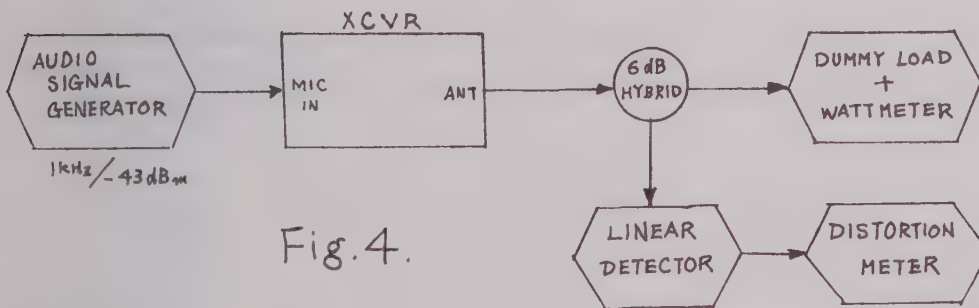
2-4) Spurious reduction

Connect a 6 dB hybrid combiner to the antenna jack. Connect a dummy load/wattmeter and a spectrum analyzer to the hybrid. Adjust TC2003 for minimum spurious emission over the range $1/2 f_t$ to $3/2 f_t$ ($f_t = \text{TX frequency}$). Now adjust TC2006 for minimum spurious signals over the range $5/6 f_t$ to $7/6 f_t$.

Recheck the bandpass filter tuning after adjustment of TC2006.

2-5) Deviation setting

Assemble the test equipment as shown in Figure 4. Inject a 1 kHz signal at -43 dBm at the mic jack. Adjust VR2001 for a deviation of ± 4.9 kHz. Now reduce the AF generator level, so that the deviation reaches ± 3 kHz. Adjust T2003 and T2004 for minimum distortion. If the deviation changes during this alignment, adjust it again. Several passes may be necessary.



2-6) RF power adjustment

With the dummy load/wattmeter connected to the antenna jack, adjust VR2002 for 10 watts RF output.

ALIGNMENT : I.C.O.S. UNIT

3-1) RX AF Level Alignment

Apply a 1 mV signal with 1 kHz mod., ± 3 kHz deviation to the ANT jack, and connect an AF voltmeter to pin 7 of Q3001. Adjust VR3001 so that +4 dBm is obtained on the voltmeter.

3-2) Repeat Level Alignment

While applying a 1 mV signal with 1 kHz mod., ± 3 kHz deviation, connect an AF voltmeter to TP3003. Adjust VR3003 for a deflection of -55 dBm (600 ohms) on the voltmeter.

3-3) Timer Delay and Repeat Noise Level Alignments

Apply a 1 mV signal from the signal generator to the ANT jack, and connect an oscilloscope to TP3002. Set the Squelch control to the center position, and adjust VR3004 so that the DC level on the scope decreases three seconds after the RF signal is turned off.

Connect an AF voltmeter to TP3004 and adjust VR3002 to the point where the noise level is reduced 20 dB, while the timer is activated.

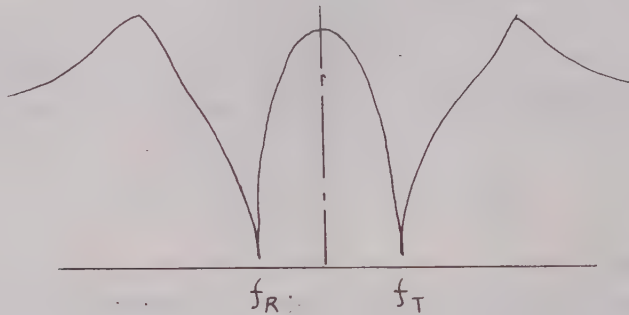
3-4) Time-out Timer Alignment

Connect an oscilloscope to TP3001 and apply a signal from a signal generator. This will produce a pulse wave on the scope. Adjust VR3005 so that a pulse width of 21.4 μ S is obtained on the scope (for three minutes).

ALIGNMENT : DUPLEXER

Connect a dummy load to the ANT jack of the duplexer, the output of a spectrum analyzer/tracking generator to the TRANS jack and the input to the REC jack.

Adjust the tuning screws of the duplexer until maximum attenuations are obtained on both receive and transmit frequencies on the analyzer, as shown below.



MAIN CHASSIS						FUSE
Symbol	Part No.	Description				
		TRANSISTOR			Q0000003	2A (100-117V AC)
					Q0000002	1A (200-234V AC)
Q1	G3407450R	2SD745R				
Q2	G3407450R	2SD745R				
		DIODE				TERMINAL POST
					Q5000022	STK-A6
D1	G2090046	S15VB10				
D2	G2090203	SDB205BGD				AC POWER CORD
D3	G2090204	SDB205BRD			T7600001	2 wire
D4	G2090205	SDB205BAD			P0090110	2 prong Rubber plug 1070
					T9000482	3 wire, 3 prong UL plug
		RESISTOR				
R1	J30406029	Cement	10W	0.2Ω	T9000680	3 wire, 3 prong Australian plug
R2	J30406029	"	"	0.2Ω		
					T9000684	3 wire, 2 prong EU plug
		TERMINAL BOARD			S3000009	Nylon cramp NP-4N
	Q6000030	1L4P 2-0-2				
		POTENTIOMETER				
VR1	J60800084	VM10A10KΩB				
VR2	J60800084	" 10KΩB				
		CAPACITOR				
C1	K43160002	Electrolytic	35WV	10000μF (35L10000)		
C2	K12329002	Ceramic Disc	1.5KV	0.0047μF (ECKDAL472PE)		
C3	K12329002	"	"	" 0.0047μF (ECKDAL472PE)		
		SPEAKER				
SP1	M4090049	SM-77KY-2				
		POWER TRANSFORMER				
PT1	L3030093					
		SWITCH				
S1	N2090028	8B2011				
S2	N2090028	"				
		RECEPTACLE				
J1	P0090012	FM146S				
J2	P1090192	S0-239				
		TERMINAL				
	Q5000044	T-1 (Red)				
	Q5000045	T-1 (Black)				
		FUSE HOLDER				
F1	P2000012	SN2059				

RECEIVER UNIT			R1004	J02245271	Carbon film	1/4W SJ	270Ω
Symbol No.	Part No.	Description	R1005	J02245273	" "	" "	27kΩ
PB-2306	F0002306	Printed Circuit Board	R1006	J02245224	" "	" "	220kΩ
	C0023060	P.C.B. with components	R1007	J02245473	" "	" "	47kΩ
PB-2309	F0002309	Printed Circuit Board (Connector board)	R1008	J02245470	" "	" "	47Ω
			R1009	J02245471	" "	" "	470Ω
			R1010	J02245101	" "	" "	100Ω
			R1011	J02245561	" "	" "	560Ω
		IC, FET, TRANSISTOR	R1012	J02245103	" "	" "	10kΩ
Q1001	G4800600	3SK60 (FET)	R1013	J02245472	" "	" "	4.7kΩ
Q1002	G4800600	3SK60 (FET)	R1014	J02245471	" "	" "	470Ω
Q1003	G3305350B	2SC535B (TR)	R1015	J02245222	" "	" "	2.2kΩ
Q1004	G3319060	2SC1906 (TR)	R1016	J02245223	" "	" "	22kΩ
Q1005	G3319060	2SC1906 (TR)	R1017	J02245471	" "	" "	470Ω
Q1006	G3305350B	2SC535B (TR)	R1018	J02245222	" "	" "	2.2kΩ
Q1007	G3305350B	2SC535B (TR)	R1019	J02245223	" "	" "	22kΩ
Q1008	G3305350B	2SC535B (TR)	R1020	J02245101	" "	" "	100Ω
Q1009	G3304600B	2SC460B (TR)	R1021	J10246102	Carbon composition		
Q1010	G3304600B	2SC460B (TR)			1/4W GK 1kΩ		
Q1011	G1090072	μPC577H (IC)	R1022	J02245472	Carbon film	1/4W SJ	4.7kΩ
Q1012	G1090218	AN315 (IC)	R1023	J02245223	" "	" "	22kΩ
Q1013	G3304600B	2SC460B (TR)	R1024	J02245102	" "	" "	1kΩ
Q1014	G3304600B	2SC460B (TR)	R1025	J02245102	" "	" "	1kΩ
Q1015	G3304600B	2SC460B (TR)	R1026	J02245223	" "	" "	22kΩ
Q1016	G3304600B	2SC460B (TR)	R1027	J02245333	" "	" "	33kΩ
Q1017	G3304600B	2SC460B (TR)	R1028	J02245102	" "	" "	1kΩ
Q1018	G1090222	MB3756 (IC)	R1029	J02245101	" "	" "	100Ω
			R1030	J02245472	" "	" "	4.7kΩ
			R1031	J02245223	" "	" "	22kΩ
		DIODE	R1032	J02245102	" "	" "	1kΩ
D1001	G2015550	Si 1S1555	R1033	J02245102	" "	" "	1kΩ
D1002	G2015550	" 1S1555	R1034	J02245101	" "	" "	100Ω
D1003	G2015550	" 1S1555	R1035	J02245222	" "	" "	2.2kΩ
D1004	G2015550	" 1S1555	R1036	J02245102	" "	" "	1kΩ
D1005	G2015550	" 1S1555	R1037	J02245154	" "	" "	150kΩ
D1006	G2015550	" 1S1555	R1038	J02245222	" "	" "	2.2kΩ
			R1039	J02245154	" "	" "	150kΩ
			R1040	J02245222	" "	" "	2.2kΩ
		CRYSTAL	R1041	J02245222	" "	" "	2.2kΩ
X1001	H0102029	HC-25/U (fr-21.4)/3MHz	R1042	J02245473	" "	" "	47kΩ
X1002	H0102050	HC-18/U 20.945MHz	R1043	J02245102	" "	" "	1kΩ
			R1044	J02245103	" "	" "	10kΩ
			R1045	J02245103	" "	" "	10kΩ
		CRYSTAL FILTER	R1046	J02245332	" "	" "	3.3kΩ
XF1001	H1101990	21J2B2(1/2)	R1048	J02245333	" "	" "	33kΩ
XF1002	H1101990	21J2B2(1/2) PAIR	R1049	J02245820	" "	" "	82Ω
			R1050	J02245103	" "	" "	10kΩ
			R1051	J02245473	" "	" "	47kΩ
		CERAMIC FILTER	R1052	J02245562	" "	" "	5.6kΩ
CF1001	H3900030	LF-B15	R1053	J02245332	" "	" "	3.3kΩ
CF1002	H3900030	LF-B15	R1054	J02245102	" "	" "	1kΩ
			R1055	J02245333	" "	" "	33kΩ
			R1056	J02245104	" "	" "	100kΩ
		CERAMIC DISCRIMINATOR	R1057	J02245682	" "	" "	6.8kΩ
CD1001	H7900010	455D	R1058	J02245224	" "	" "	220kΩ
			R1059	J02245472	" "	" "	4.7kΩ
			R1060	J02245820	" "	" "	82Ω
		POSISTOR	R1062	J02245332	" "	" "	3.3kΩ
PTH1001	G9090019	PTH-2928	R1063	J02245332	" "	" "	3.3kΩ
			R1064	J02245472	" "	" "	4.7kΩ
			R1065	J02245391	" "	" "	390Ω
		RESISTOR	R1066	J02245473	" "	" "	47kΩ
R1001	J02245683	Carbon film 1/4W SJ 68kΩ					
R1002	J02245273	" " " " 27kΩ					
R1003	J02245124	" " " " 120kΩ					

		POTENTIOMETER	C1040	K05179005	Ceramic Disc 50WV RH 8pF (2222-636-39808)
VR1001	J51723103	SR19R 10KΩB			
			C1041	K10179015	" " " 0.01μF (CK45B1H103MY)
		CAPACITOR	C1042	K10179014	" " " 0.001μF (CK45B1H102MY)
C1003	K08179001	Ceramic Disc 50WV AH 0.5pF (2222-636-03507)	C1043	K08179002	" " " AH 1pF (2222-636-03108)
C1006	K10179014	" " " 0.001μF (CK45B1H102MY)	C1044	K05179008	" " " RH 12pF (2222-636-40129)
C1007	K10179014	" " " 0.001μF (")	C1045	K05179013	" " " " 33pF (2222-637-40339)
C1008	K10179014	" " " 0.001μF (")	C1046	K10179014	" " " 0.001μF (CK45B1H102MY)
C1009	K10179014	" " " 0.001μF (")	C1048	K10179014	" " " 0.001μF (")
C1012	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)	C1049	K02179038	" " " CH 7pF (2222-636-09708)
C1013	K05179005	" " " RH 8pF (2222-636-39808)	C1050	K10179015	" " " 0.01μF (CK45B1H103MY)
C1014	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)	C1051	K10179015	" " " 0.01μF (")
C1017	K10179015	" " " 0.01μF (CK45B1H103MY)	C1052	K10179014	" " " 0.001μF (CK45B1H102MY)
C1018	K05179002	" " " RH 5pF (2222-636-39508)	C1053	K06179021	" " " UJ 33pF (2222-636-58339)
C1019	K05179013	" " " " 33pF (2222-637-40339)	C1054	K06179022	" " " " 220pF (2222-637-58221)
C1020	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)	C1055	K06179041	" " " " 100pF (2222-637-58101)
C1021	K05179023	" " " RH 15pF (2222-638-40159)	C1056	K02179028	" " " CH 10pF (2222-636-10109)
C1022	K05179015	" " " " 47pF (2222-637-40479)	C1057	K10179015	" " " 0.01μF (CK45B1H103MY)
C1023	K10179014	" " " 0.001μF (CK45B1H102MY)	C1058	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C1024	K10179014	" " " 0.001μF (")	C1059	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C1025	K10179014	" " " 0.001μF (")	C1060	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)
C1026	K10179015	" " " 0.01μF (CK45B1H103MY)	C1061	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C1027	K10179015	" " " 0.01μF (")	C1062	K10179014	" " " 0.001μF (")
C1028	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)	C1063	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)
C1029	K06179048	" " " UJ 15pF (2222-638-58159)	C1064	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1030	K10179014	" " " 0.001μF (CK45B1H102MY)	C1065	K10179015	" " " 0.01μF (")
C1031	K06179040	" " " UJ 82pF (2222-637-58829)	C1066	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C1032	K06179023	" " " " 56pF (2222-637-58569)	C1067	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1033	K10179015	" " " 0.01μF (CK45B1H103MY)	C1068	K10179014	" " " 0.001μF (CK45B1H102MY)
C1034	K10179015	" " " 0.01μF (")	C1069	K10179014	" " " 0.001μF (")
C1035	K10179014	" " " 0.001μF (CK45B1H102MY)	C1070	K10179014	" " " 0.001μF (")
C1037	K10179014	" " " 0.001μF (")	C1071	K50177222	Mylar " 0.0022μF (50F2U222M)
C1038	K10179014	" " " 0.001μF (")	C1072	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C1039	K10179015	" " " 0.01μF (CK45B1H103MY)			

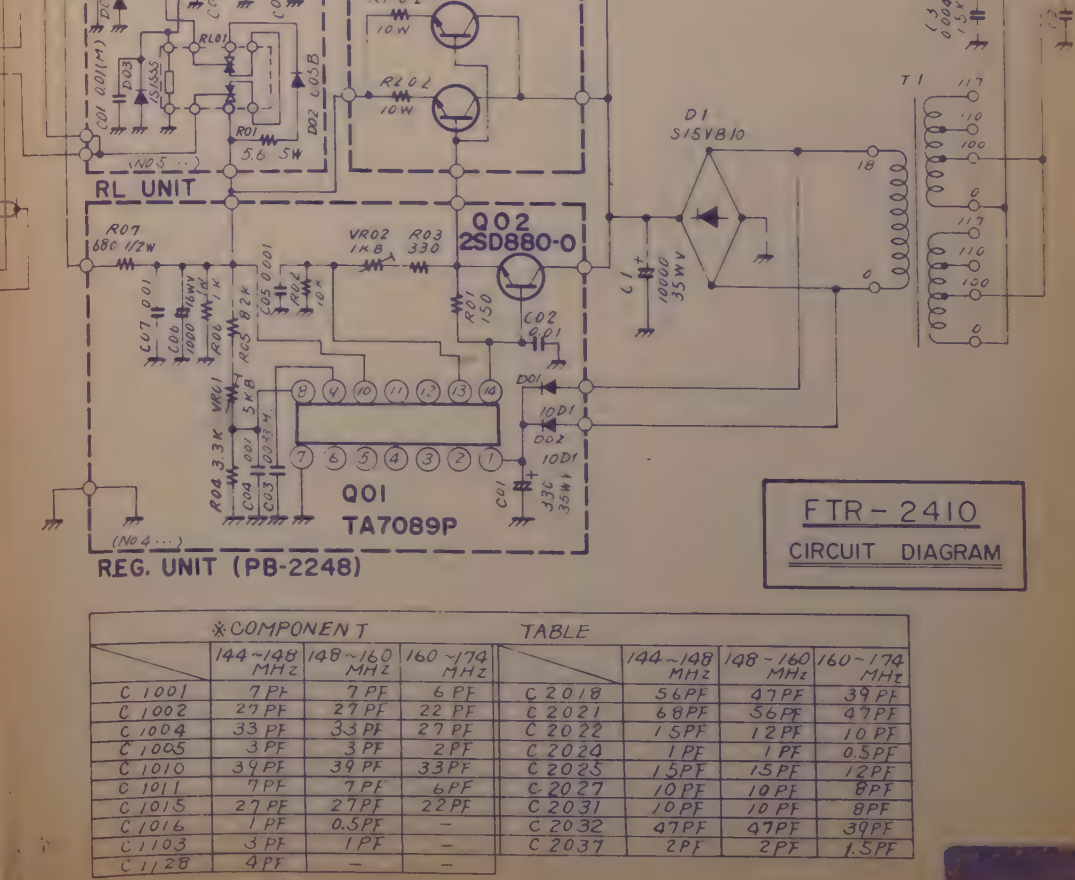
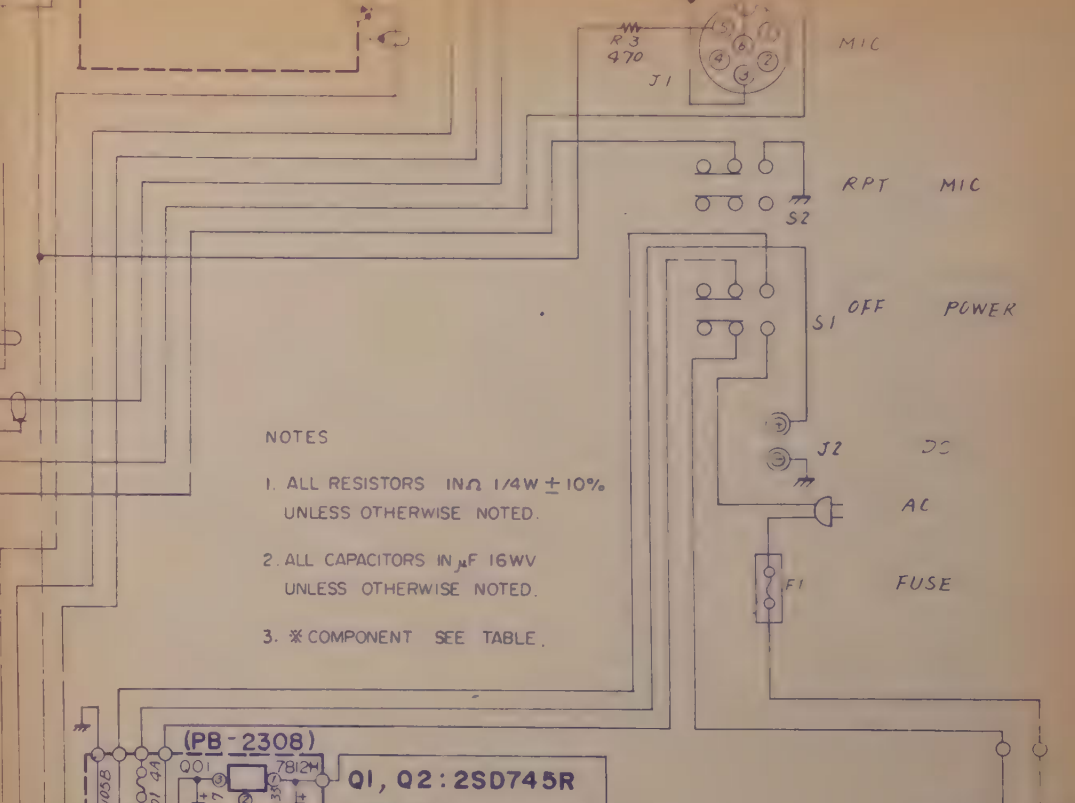
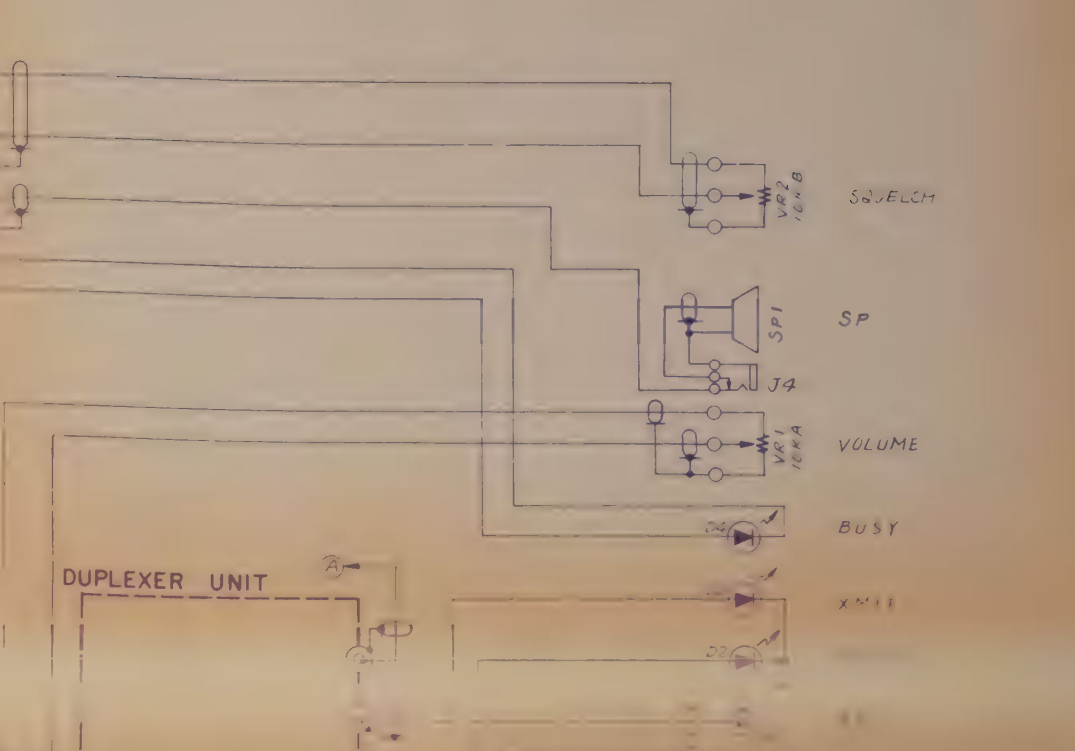
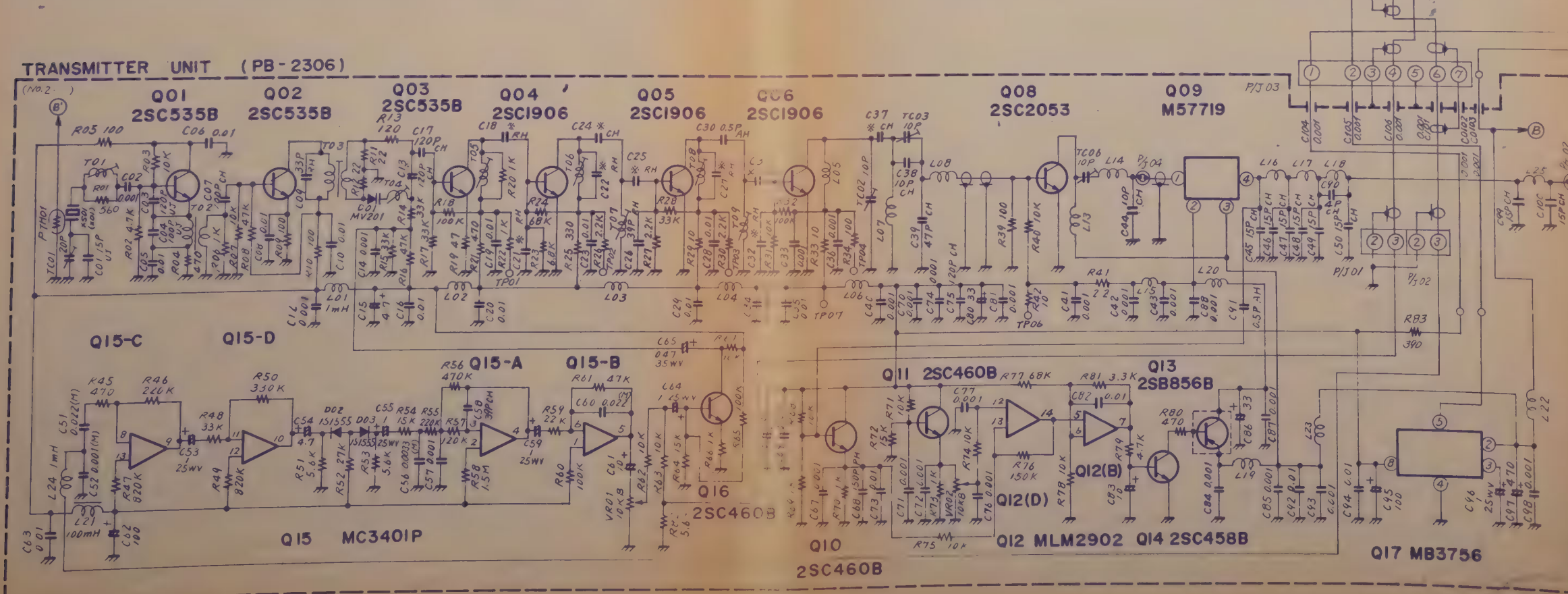
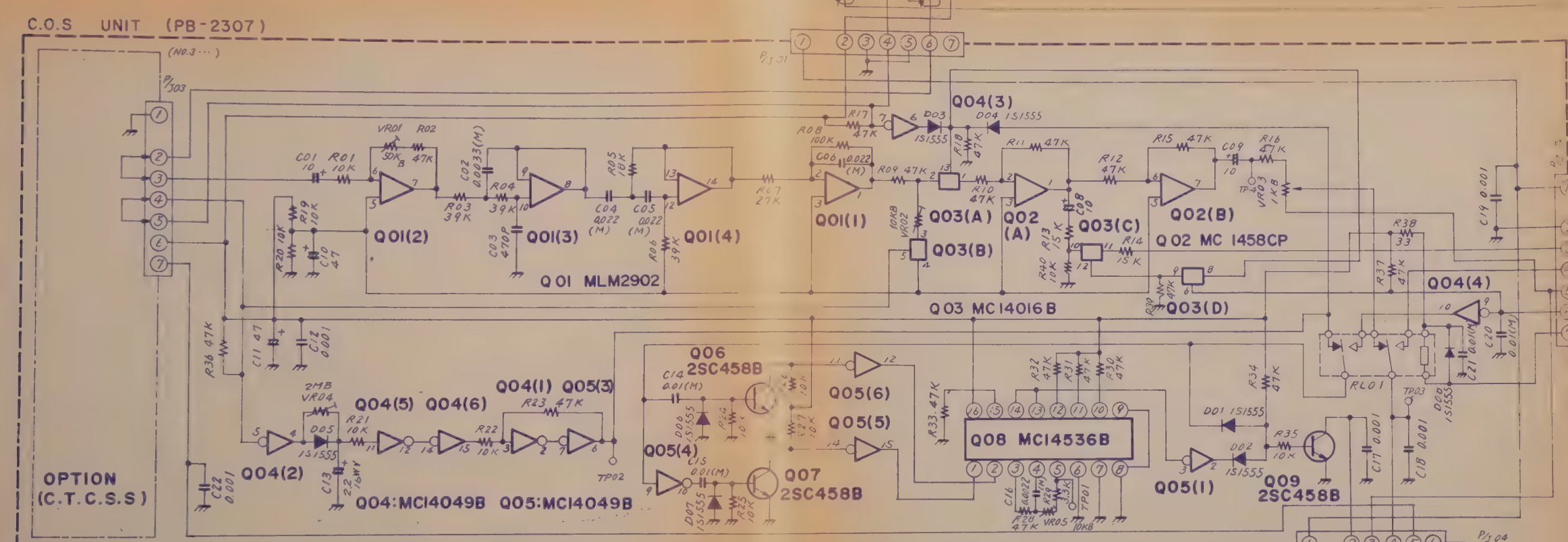
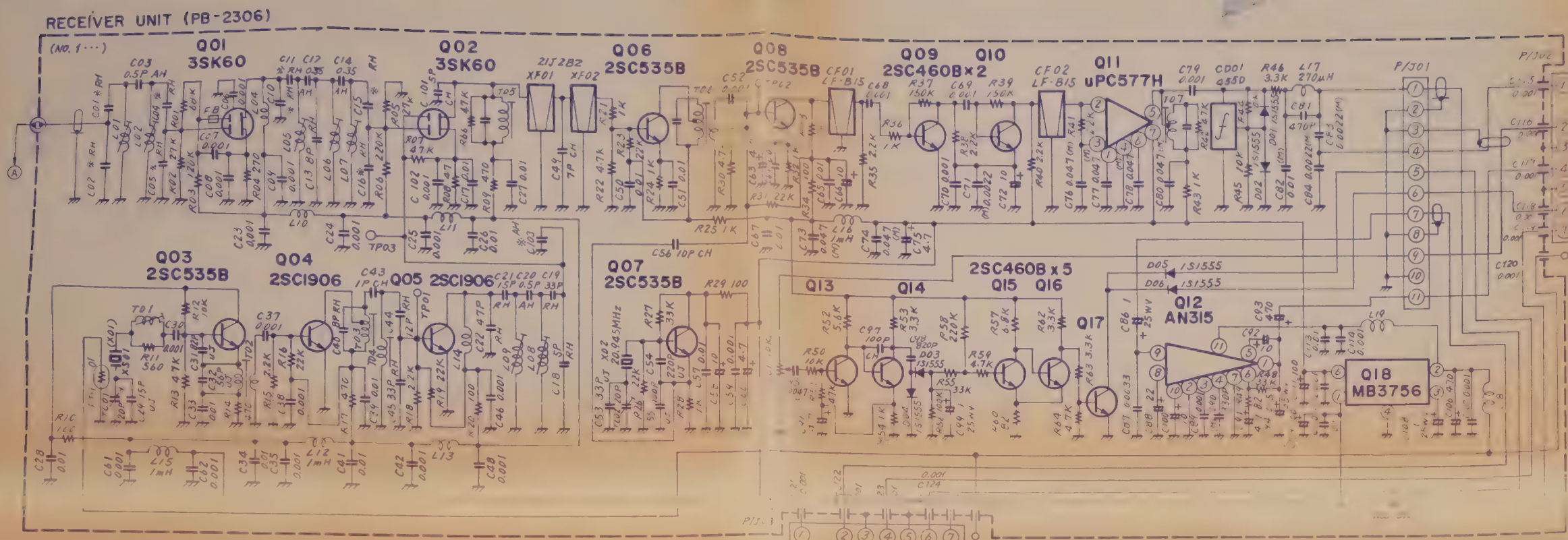
C1073	K50176473	Mylar 50WV 0.047 μ F (MRS-473K)	C1109	K40129007	Electrolytic 16WV 100 μ F (16RE100)
C1074	K50176473	" " 0.047 μ F (")	C1110	K10179015	Ceramic Disc 50WV 0.01 μ F (CK45B1H103MY)
C1075	K70127475	Tantalum- 16WV 4.7 μ F (CS15E1C4R7M)	C1111	K40129007	Electrolytic 16WV 100 μ F (16RE100)
C1076	K50176473	Mylar 50WV 0.047 μ F (MRS-473K)	C1112	K10179015	Ceramic Disc 50WV 0.01 μ F (CK45B1H103MY)
C1077	K50176473	" " 0.047 μ F (")	C1113	K10179015	" " " 0.01 μ F (")
C1078	K50176473	" " 0.047 μ F (")	C1114	K10179014	" " " 0.001 μ F (CK45B1H102MY)
C1079	K10179015	Ceramic " 0.01 μ F (CK45B1H103MY)	C1115	K21170002	Feed through " 0.001 μ F (ECKY1H-102WE)
C1080	K50176473	Mylar " 0.047 μ F (MRS-473K)	C1116	K21170002	" " " 0.001 μ F (")
C1081	K10179011	Ceramic Disc " 470pF (2222-660-02471)	C1117	K21170002	" " " 0.001 μ F (")
C1082	K50177103	Mylar " 0.01 μ F (50F2U103M)	C1118	K21170002	" " " 0.001 μ F (")
C1083	K50177222	" " 0.0022 μ F (50F2U222M)	C1119	K21170002	" " " 0.001 μ F (")
C1084	K50177222	" " 0.0022 μ F (")	C1120	K21170002	" " " 0.001 μ F (")
C1086	K70147105	Tantalum 25WV 1 μ F (CS15E1E010M)	C1121	K21170002	" " " 0.001 μ F (")
C1087	K50177332	Mylar 50WV 0.0033 μ F (50F2U332M)	C1122	K21170002	" " " 0.001 μ F (")
C1088	K70127226	Tantalum 16WV 22 μ F (CS15E1C220M)	C1123	K21170002	" " " 0.001 μ F (")
C1089	K50177102	Mylar 50WV 0.001 μ F (50F2U102M)	C1124	K21170002	" " " 0.001 μ F (")
C1090	K10179012	Ceramic Disc " 330pF (2222-660-02331)	C1125	K21170002	" " " 0.001 μ F (")
C1091	K70127475	Tantalum 16WV 4.7 μ F (CS15E1C4R7M)	C1126	K21170002	" " " 0.001 μ F (")
C1092	K70127106	" " 10 μ F (CS15E1C100K1S)	C1127	K50177103	Mylar " 0.01 μ F (50F2U103M)
C1093	K40129006	Electrolytic " 470 μ F (16RE470)			
C1094	K70167154	Tantalum 35WV 0.15 μ F (CS15E1VR15M)			TRIMMER CAPACITOR
C1095	K50177472	Mylar 50WV 0.0047 μ F (50F2U472M)	TC1001	K91000029	ECV-1ZW 20x53 20pF
C1096	K70127475	Tantalum 16WV 4.7 μ F (CS15E1C4R7M)	TC1002	K91000029	" " 20pF
C1097	K02179049	Ceramic Disc 50WV CH 100pF (2222-637-10101)			TRANSFORMER
C1098	K10179013	" " " 820pF (2222-630-02821)	T1001	L0020346	113CN-3393Y
C1099	K70147105	Tantalum 25WV 1 μ F (CS15E1E010M)	T1002	L0190013	1Г3KN-6409X
C1100	K70127106	" 16WV 10 μ F (CS15E1C100M)	T1003	L0020343	113SN-3392Y
C1101	K02179052	Ceramic Disc 50WV CH 5pF (222-636-09508)	T1004	L0020343	"
C1102	K10179014	" " " 0.001 μ F (CK45B1H102MY)	T1005	L0020717	199CC-1125BWN
C1106	K40129006	Electrolytic 16WV 470 μ F (16RE470)	T1006	L0020647	199CC-11114N
C1107	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)	T1007	L0020649	7MC-5896T
C1108	K70147105	Tantalum 25WV 1 μ F (CS15E1E010M)			INDUCTOR
			L1001	L0020706	
			L1002	L0020706	
			L1004	L1020081A	
			L1005	L0020706	
			L1006	L0020706	
			L1007	L0020706	
			L1008	L0020706	
			L1009	L0020706	
			L1010	L1020082A	

R2056	J02245474	Carbon film	1/4W SJ	470kΩ	C2016	K10179015	Ceramic Disc	50WV	0.01μF
R2057	J02245124	" "	" "	120kΩ			(CK45B1H103MY)		
R2058	J02245155	" "	" "	1.5MΩ	C2017	K02179032	" "	CH	120pF
R2059	J02245223	" "	" "	22kΩ			(2222-637-10121)		
R2060	J02245104	" "	" "	100kΩ	C2019	K10179015	" "	" "	0.01μF
R2061	J02245473	" "	" "	47kΩ			(CK45B1H103MY)		
R2062	J02245103	" "	" "	10kΩ	C2020	K10179015	" "	" "	0.01μF
R2063	J02245103	" "	" "	10kΩ			(")		
R2064	J02245153	" "	" "	15kΩ	C2023	K10179015	" "	" "	0.01μF
R2065	J02245104	" "	" "	100kΩ			(")		
R2066	J02245102	" "	" "	1kΩ	C2026	K05179014	" "	RH	39pF
R2067	J02245103	" "	" "	10kΩ			(2222-637-40399)		
R2068	J02245103	" "	" "	10kΩ	C2028	K10179015	" "	" "	0.01μF
R2069	J02245102	" "	" "	1kΩ			(CK45B1H103MY)		
R2070	J02245102	" "	" "	1kΩ	C2029	K10179015	" "	" "	0.01μF
R2071	J02245103	" "	" "	10kΩ			(")		
R2072	J02245153	" "	" "	15kΩ	C2030	K08179001	" "	AH	0.5pF
R2073	J02245102	" "	" "	1kΩ			(2222-636-03507)		
R2074	J02245103	" "	" "	10kΩ	C2033	K10179014	" "	" "	0.001μF
R2075	J10246103	" composition					(CK45B1H102MY)		
			1/4W GK	10kΩ	C2034	K10179014	" "	" "	0.001μF
R2076	J02245154	" film	" SJ	150kΩ			(")		
R2077	J02245683	" "	" "	68kΩ	C2035	K10179015	" "	" "	0.01μF
R2078	J02245103	" "	" "	10kΩ			(CK45B1H103MY)		
R2079	J02245472	" "	" "	4.7kΩ	C2036	K10179014	" "	" "	0.001μF
R2080	J02245471	" "	" "	470Ω			(CK45B1H102MY)		
R2081	J02245332	" "	" "	3.3kΩ	C2038	K02179028	" "	CH	10pF
R2082	J02245562	" "	" "	5.6kΩ			(2222-636-10109)		
R2083	J02245391	" "	" "	390Ω	C2039	K02179036	" "	" "	47pF
							(2222-637-10479)		
					C2040	K10179014	" "	" "	0.001μF
							(CK45B1H102MY)		
		POTENTIOMETER							
VR2001	J51723103	SR19R-10KB		10kΩB	C2041	K10179014	" "	" "	0.001μF
VR2002	J51724103	PN822H103H		10kΩB			(")		
					C2042	K10179014	" "	" "	0.001μF
							(")		
		CAPACITOR			C2043	K10179014	" "	" "	0.001μF
C2001	K06179048	Ceramic Disc	50WV UJ	15pF			(")		
		(2222-638-58159)			C2044	K02179028	" "	CH	10pF
C2002	K10179014	" "	" "	0.001μF			(2222-636-10109)		
		(CK45B1H102MY)			C2045	K02175150	" "	" "	15pF
C2003	K06179042	" "	UJ	120pF			(DD104CH150J50V02)		
		(2222-637-58121)			C2046	K02175150	" "	" "	15pF
C2004	K06179041	" "	" "	100pF			(")		
		(2222-637-58101)			C2047	K02175150	" "	" "	15pF
C2005	K10179015	" "	" "	0.01μF			(")		
		(CK45B1H103MY)			C2048	K02175150	" "	" "	15pF
C2006	K10179015	" "	" "	0.01μF			(")		
		(")			C2049	K02175150	" "	" "	15pF
C2007	K02179049	" "	CH	100pF			(")		
		(2222-637-10101)			C2050	K02175150	" "	" "	15pF
C2008	K10179015	" "	" "	0.01μF			(")		
		(CK45B1H103MY)			C2051	K50177223	Mylar	"	0.022μF
C2009	K05179013	" "	RH	33pF			(50F2U223M)		
		(2222-637-40339)			C2052	K50177102	" "	" "	0.001μF
C2010	K10179015	" "	" "	0.01μF			(50F2U102M)		
		(CK45B1H103MY)			C2053	K70147105	Tantalum	25WV	1μF
C2012	K10179014	" "	" "	0.001μF			(CS15E1E010M)		
		(CK45B1H102MY)			C2054	K70127475	" "	16WV	4.7μF
C2013	K02179032	" "	CH	120pF			(CS15E1C4R7M)		
		(2222-637-10121)			C2055	K70147105	" "	25WV	1μF
C2014	K10179014	" "	" "	0.001μF			(CS15E1E010M)		
		(CK45B1H102MY)			C2056	K50177332	Mylar	50WV	0.0033μF
C2015	K70127475	Tantalum	16WV	4.7μF			(50F2U332M)		
		(CS15E1C4R7M)							

C2057	K50177102	Mylar 50WV 0.001 μ F (50F2U102M)	C2093	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)
C2058	K02179050	Ceramic Disc " CH 39pF (2222-637-10399)	C2094	K10179015	" " " 0.001 μ F (CK45B1H103MY)
C2059	K70147105	Tantalum 25WV 1 μ F (CS15E1E010M)	C2095	K40129007	Electrolytic 16WV 100 μ F (16RE100)
C2060	K50177223	Mylar 50WV 0.022 μ F (50F2U223M)	C2096	K70147105	Tantalum 25WV 1 μ F (CS15E1V010M)
C2061	K70127106	Tantalum 16WV 10 μ F (CS15E1C100M)	C2097	K40129006	Electrolytic 16WV 470 μ F (16RE470)
C2062	K40129007	Electrolytic " 100 μ F (16RE100)	C2098	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)
C2063	K10179015	Ceramic Disc 50WV 0.01 μ F (CK45B1H103MY)	C2099	K02175150	" " " CH 15pF (DD104CH150J50V02)
C2064	K70147105	Tantalum 25WV 1 μ F (CS15E1E010M)	C2100	K02175150	" " " " 15pF (" " ")
C2065	K70167474	" 35WV 0.47 μ F (CS15E1VR47)	C2101	K21170002	Feed through " 0.001 μ F (ECKY1H-102WE)
C2066	K70127106	" 16WV 10 μ F (CS15E1C100M)	C2102	K21170002	" " " 0.001 μ F (" ")
C2067	K10179014	" 50WV 0.001 μ F (CK45B1H102MY)	C2103	K21170002	" " " 0.001 μ F (" ")
C2068	K07179021	Ceramic Disc " PH 150pF (2222-637-34151)	C2104	K21170002	" " " 0.001 μ F (" ")
C2069	K10179015	" " " 0.01 μ F (CK45B1H103MY)	C2105	K21170002	" " " 0.001 μ F (" ")
C2070	K10179014	" " " 0.001 μ F (CK45B1H102MY)	C2106	K21170002	" " " 0.001 μ F (" ")
C2071	K10179014	" " " 0.001 μ F (CK45B1H102MY)			
C2072	K10179014	" " " 0.001 μ F (" ")			TRIMMER CAPACITOR
C2073	K10179015	" " " 0.01 μ F (CK45B1H103MY)	TC2001	K91000029	ECV-1ZW-20x53 20pF
C2074	K10179014	" " " 0.001 μ F (CK45B1H102MY)	TC2002	K91000028	" -10x53 10pF
C2075	K02179032	" " " CH 120pF (2222-637-10121)	TC2003	K91000028	" -10x53 10pF
C2076	K10179014	" " " " 0.001 μ F (CK45B1H102MY)	TC2006	K91000028	" -10x53 10pF
C2077	K10179014	" " " " 0.001 μ F (" ")			TRANSFORMER
C2080	K70127336	Tantalum 16WV 33 μ F (CS15E1C330M)	T2001	L0020666	113CN-6391Z
C2081	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)	T2002	L0190011	113CN-6394N
C2082	K50177103	Mylar " 0.01 μ F (50F2U103M)	T2003	L0190011	113CN-6394N
C2083	K70127106	Tantalum 16WV 10 μ F (CS15E1C100M)	T2004	L0020652	113CN-6396Z
C2084	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)	T2005	L0020346	113CN-3393Y
C2085	K10179014	" " " 0.001 μ F (" ")	T2006	L0020653	113SN-6397Y
C2086	K70127336	Tantalum 16WV 33 μ F (CS15E1C330M)	T2007	L0020653	113SN-6397Y
C2087	K10179014	Ceramic Disc 50WV 0.001 μ F (CK45B1H102MY)	T2008	L0020429	113SN-4530Y
C2088	K10179014	" " " 0.001 μ F (" ")	T2009	L0020429	113SN-4530Y
C2091	K08179001	" " " AH 0.5pF (2222-636-03507)			INDUCTOR
C2092	K10179015	" " " 0.01 μ F (CK45B1H103MY)	L2001	L1190017	FL5H-102K 1mH
			L2002	L1020081A	
			L2003	L1020081A	
			L2004	L1020081A	
			L2005	L0020679	
			L2006	L1020081A	
			L2007	L0020679	
			L2008	L0020852	
			L2013	L0020678	
			L2014	L0020679	
			L2015	L1020079A	
			L2016	L0020679	
			L2017	L0020679	
			L2018	L0020679	
			L2019	L1020080A	

L2020	L1020080A					RESISTOR
L2021	L1190041	181LY-104K	100mH	R3001	J10246103	Carbon composition
L2022	L2030060					1/4W GK 10k Ω
L2023	L1020080A			R3002	J02245473	" film " SJ 47k Ω
L2024	L1190017	FL5H-102K	1mH	R3003	J10246393	" composition
L2025	L0020334					1/4W GK 39k Ω
				R3004	J10246393	" " " " 39k Ω
				R3005	J02245183	" film " SJ 18k Ω
		CRYSTAL SOCKET		R3006	J02245393	" " " " 39k Ω
XS2001	P3090002	S2-101P-00		R3007	J10246273	" composition
						1/4W GK 27k Ω
				R3008	J02245104	" film " SJ 100k Ω
		CONNECTOR		R3009	J10246473	" composition
J2001	P0090092	3022-08A				1/4W GK 47k Ω
J2002	P1090254	BNC-LR		R3010	J10246473	" " " " 47k Ω
J2003	P0090091	5049-07A		R3011	J02245473	" film " SJ 47k Ω
J2004	P1090016	SQ3056		R3012	J10246473	" Composition GK 47k Ω
				R3013	J02245153	" film " SJ 15k Ω
				R3014	J10246153	" composition
		TP TERMINAL				1/4W GK 15k Ω
TP2001	Q5000037	TP-H		R3015	J02245473	" film " SJ 47k Ω
TP2002	Q5000037			R3016	J02245473	" " " " 47k Ω
TP2003	Q5000037			R3017	J02245473	" " " " 47k Ω
TP2004	Q5000037			R3018	J02245473	" " " " 47k Ω
TP2006	Q5000037			R3019	J02245103	" " " " 10k Ω
TP2007	Q5000037			R3020	J02245103	" " " " 10k Ω
				R3021	J02245103	" " " " 10k Ω
				R3022	J02245103	" " " " 10k Ω
		PIN PLUG		R3023	J02245473	" " " " 47k Ω
P2004	P0090009	SQ4152		R3024	J02245103	" " " " 10k Ω
				R3025	J02245103	" " " " 10k Ω
				R3026	J10246103	" composition
						1/4W GK 10k Ω
				R3027	J10246103	" " " " 10k Ω
				R3028	J02245473	" film " SJ 47k Ω
				R3029	J02245332	" " " " 3.3k Ω
		C.O.S UNIT		R3030	J02245473	" " " " 47k Ω
Symbol No.	Part No.	Description		R3031	J02245473	" " " " 47k Ω
PB-2307	F0002307	Printed Circuit Board		R3032	J02245473	" " " " 47k Ω
	C0023070	P.C.B. with components		R3033	J10246473	" composition
						1/4W GK 47k Ω
		IC, TRANSISTOR		R3034	J02245473	" film " SJ 47k Ω
Q3001	G1090220	MLM2902	(IC)	R3035	J02245103	" " " " 10k Ω
Q3002	G1090374	MC1458CP	(IC)	R3036	J02245473	" " " " 47k Ω
Q3003	G1090124	MC14016B	(IC)	R3037	J10246473	" composition
Q3004	G1090052	MC14049B	(IC)			1/4W GK 47k Ω
Q3005	G1090052	"	(IC)	R3038	J02245330	" film " SJ 33 Ω
Q3006	G3304580B	2SC458B	(TR)	R3039	J02245473	" " " " 47k Ω
Q3007	G3304580B	"	(TR)	R3040	J02245103	" " " " 10k Ω
Q3008	G1090375	MC14536B	(IC)			
Q3009	G3304580B	2SC458B	(TR)			
						POTENTIOMETER
				VR3001	J51724503	PN822H503 50k Ω B
		DIODE		VR3002	J51724103	" 103 10k Ω B
D3001	G2015550	Si	1S1555	VR3003	J51724102	" 102 1k Ω B
D3002	G2015550	"	"	VR3004	J51739205	EVM-G0GA01B26 2M Ω B
D3003	G2015550	"	"	VR3005	J51724103	PN822H103 10k Ω B
D3004	G2015550	"	"			
D3005	G2015550	"	"			
D3006	G2015550	"	"			
D3007	G2015550	"	"	C3001	K70127106	Tantalum 16WV 10 μ F
D3008	G2015550	"	"			(CS15E1C100M)
				C3002	K50177332	Mylar 50WV 0.0033 μ F
						(S0F2U332M)

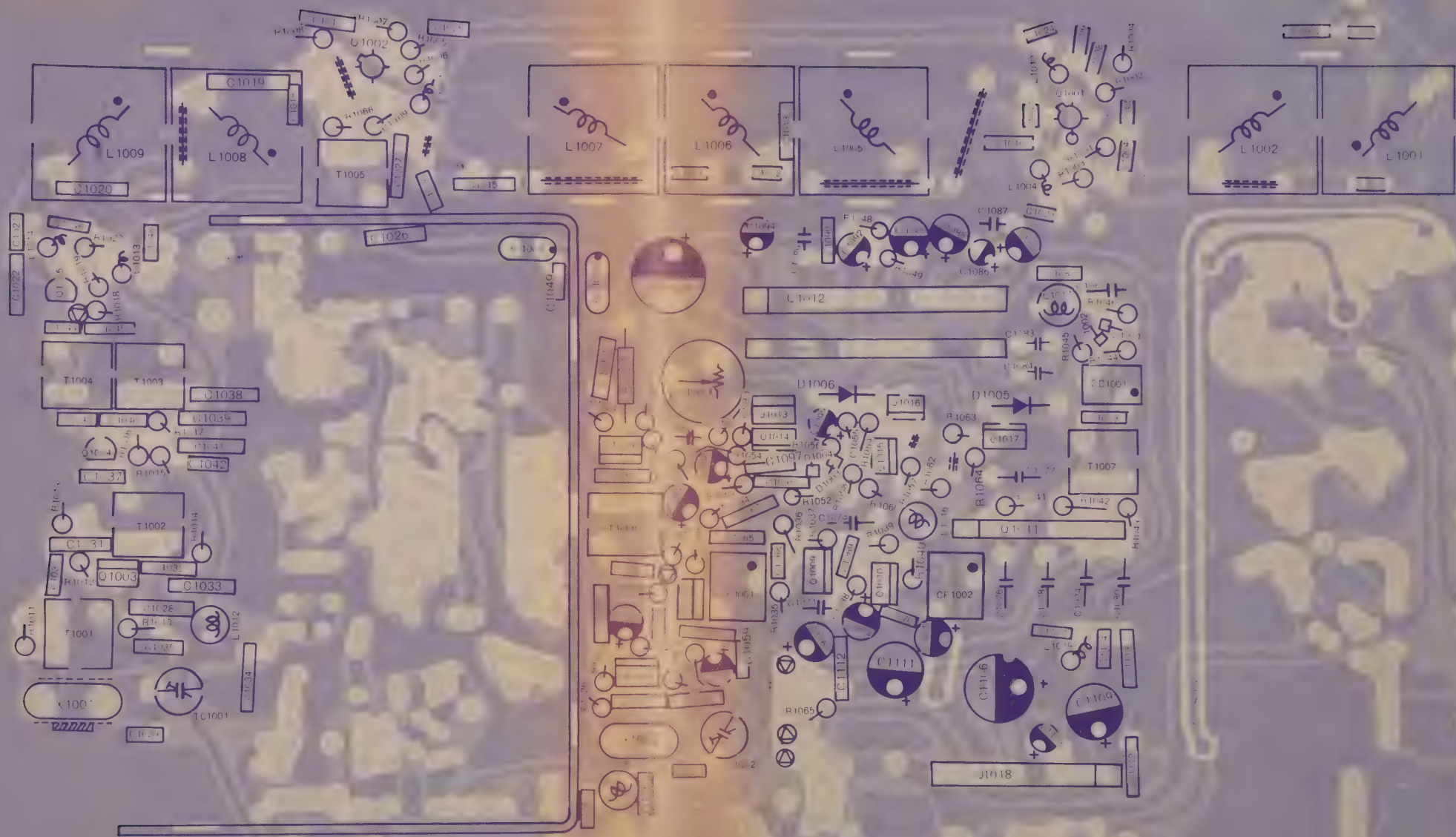
		RESISTOR						
R5001	J30376569	Cement	5W	5.6Ω	C2027	K05179007	Ceramic disc 50WV RH 10pF (2222-636-40109)	
					C2031	K05179007	" " " RH 10pF (2222-636-40109)	
		CAPACITOR			C2032	K05179015	" " " RH 47pF (2222-637-40479)	
C5001	K50177103	Mylar	50WV	0.01μF (50F2U103M)	C2037	K02179045	" " " CH 2pF (2222-636-10109)	
C5002	K70167334	Tantalum	35WV	0.33μF (CS15E1VR33M)				
C5003	K70127475	"	16WV	4.7μF (CS15E1C4R7M)	160MHz-174MHz BAND			
					C1001	K05179003	Ceramic disc 50WV RH 6pF (2222-632-39608)	
		RELAY			C1002	K05179011	" " " RH 22pF (2222-638-40229)	
RL5001	M1090019	HC-2-DC-12V			C1004	K05179012	" " " RH 27pF (2222-638-40279)	
RLS5001	M1390010	HC-2			C1005	K05179026	" " " RH 2pF (2222-632-39208)	
		DC FUSE			C1010	K05179013	" " " RH 33pF (2222-638-40339)	
F5001	Q0000006	4A			C1011	K05179003	" " " RH 6pF (2222-632-39608)	
		DC FUSE HOLDER			C1015	K05179011	" " " RH 22pF (2222-638-40229)	
	P2000003	F3265			C1016	-	Not used	
		TP TERMINAL			C1103	-	Not used	
	Q5000037	TP-H			C2018	K05179014	" " " RH 39pF (2222-638-40399)	
					C2021	K05179015	" " " RH 47pF (2222-638-40479)	
					C2022	K05179007	" " " RH 10pF (2222-632-40109)	
		TUNING CAPACITOR			C2024	K08179001	" " " AH 0.5pF (2222-632-03507)	
Symbol No.	Part No.	Description			C2025	K05179008	" " " RH 12pF (2222-632-40129)	
148MHz-160MHz BAND					C2027	K05179005	" " " RH 8pF (2222-632-39808)	
C1001	K05179004	Ceramic disc	50WV RH	7pF (2222-636-39708)	C2031	K05179005	" " " RH 8pF (2222-632-39808)	
C1002	K05179012	" " "	RH	27pF (2222-637-40279)	C2032	K05179014	" " " RH 39pF (2222-638-40399)	
C1004	K05179024	" " "	RH	33pF (2222-632-40339)	C2037	K02182159	" " " 63WV CH 1.5pF (DR870CH1R563V)	
C1005	K02179055	" " "	CH	3pF (2222-636-09308)				
C1010	K05179014	" " "	RH	39pF (2222-637-40399)				
C1011	K05179004	" " "	RH	7pF (2222-636-39708)				
C1015	K05179012	" " "	RH	27pF (2222-637-40279)				
C1016	K08179001	" " "	AH	0.5pF (2222-636-03507)				
C1103	K08179002	" " "	AH	1pF (2222-636-03108)				
C2018	K05179015	" " "	RH	47pF (2222-637-40479)				
C2021	K05179016	" " "	RH	56pF (2222-637-40569)				
C2022	K05179008	" " "	RH	12pF (2222-636-40129)				
C2024	K08179004	" " "	AH	1pF (2222-638-03108)				
C2025	K05179023	" " "	RH	15pF (2222-638-40159)				



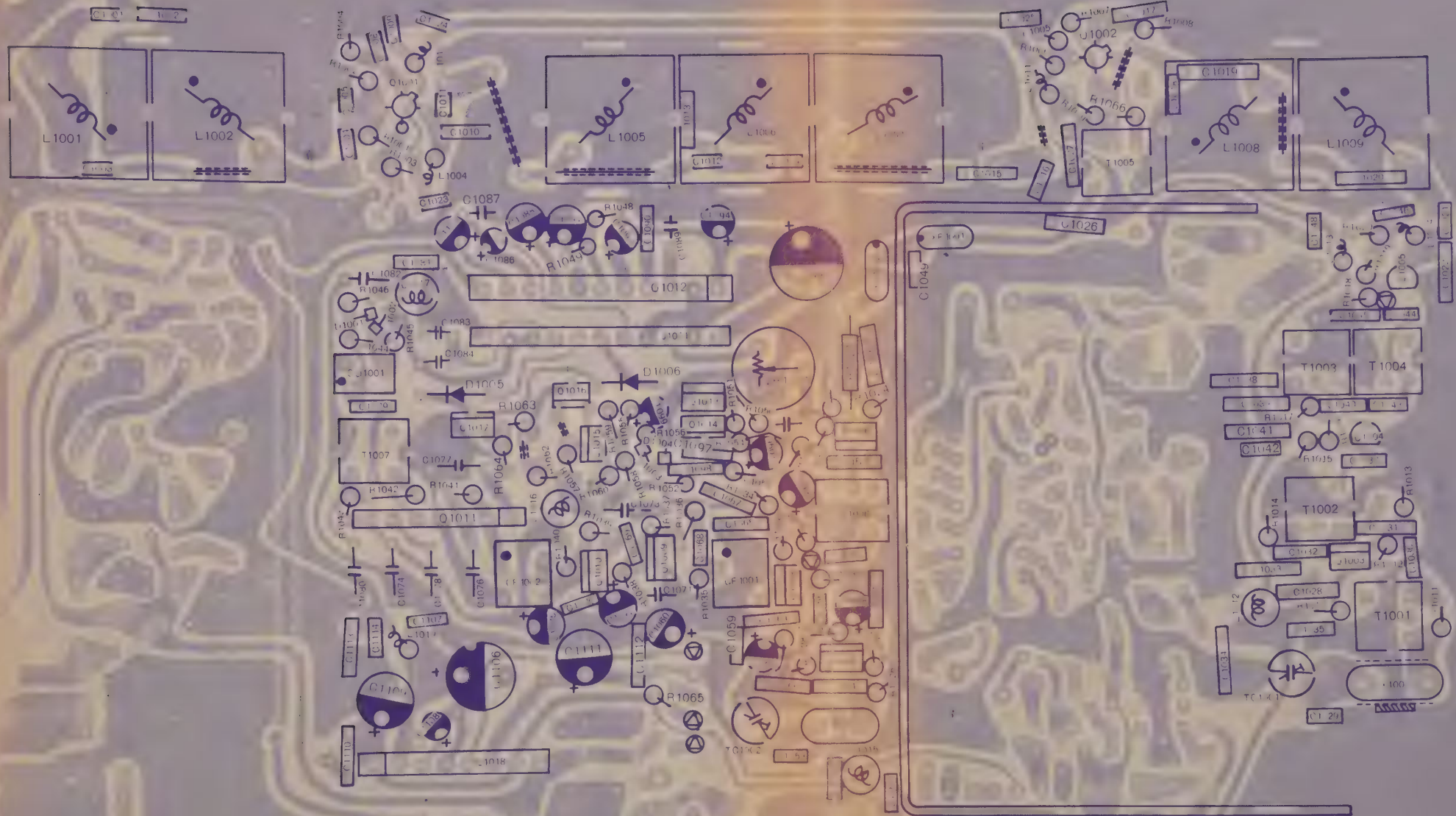
- NOTES
1. ALL RESISTORS IN Ω 1/4W \pm 10% UNLESS OTHERWISE NOTED.
 2. ALL CAPACITORS IN μ F 16WV UNLESS OTHERWISE NOTED.
 3. * COMPONENT SEE TABLE.

* COMPONENT TABLE	
C 1001	7 PF
C 1002	27 PF
C 1004	33 PF
C 1005	3 PF
C 1010	34 PF
C 1011	7 PF
C 1015	27 PF
C 1016	1 PF
C 1103	3 PF
C 1128	4 PF
C 2018	5.6 PF
C 2021	6.8 PF
C 2022	1.5 PF
C 2024	1 PF
C 2025	1.5 PF
C 2027	10 PF
C 2031	10 PF
C 2032	47 PF
C 2037	2 PF
144-148 MHz	7 PF
148-160 MHz	27 PF
160-174 MHz	6 PF
144-148 MHz	5.6 PF
148-160 MHz	6.8 PF
160-174 MHz	1.5 PF
144-148 MHz	1 PF
148-160 MHz	1.5 PF
160-174 MHz	10 PF
144-148 MHz	10 PF
148-160 MHz	47 PF
160-174 MHz	39 PF

FTR-2410
CIRCUIT DIAGRAM

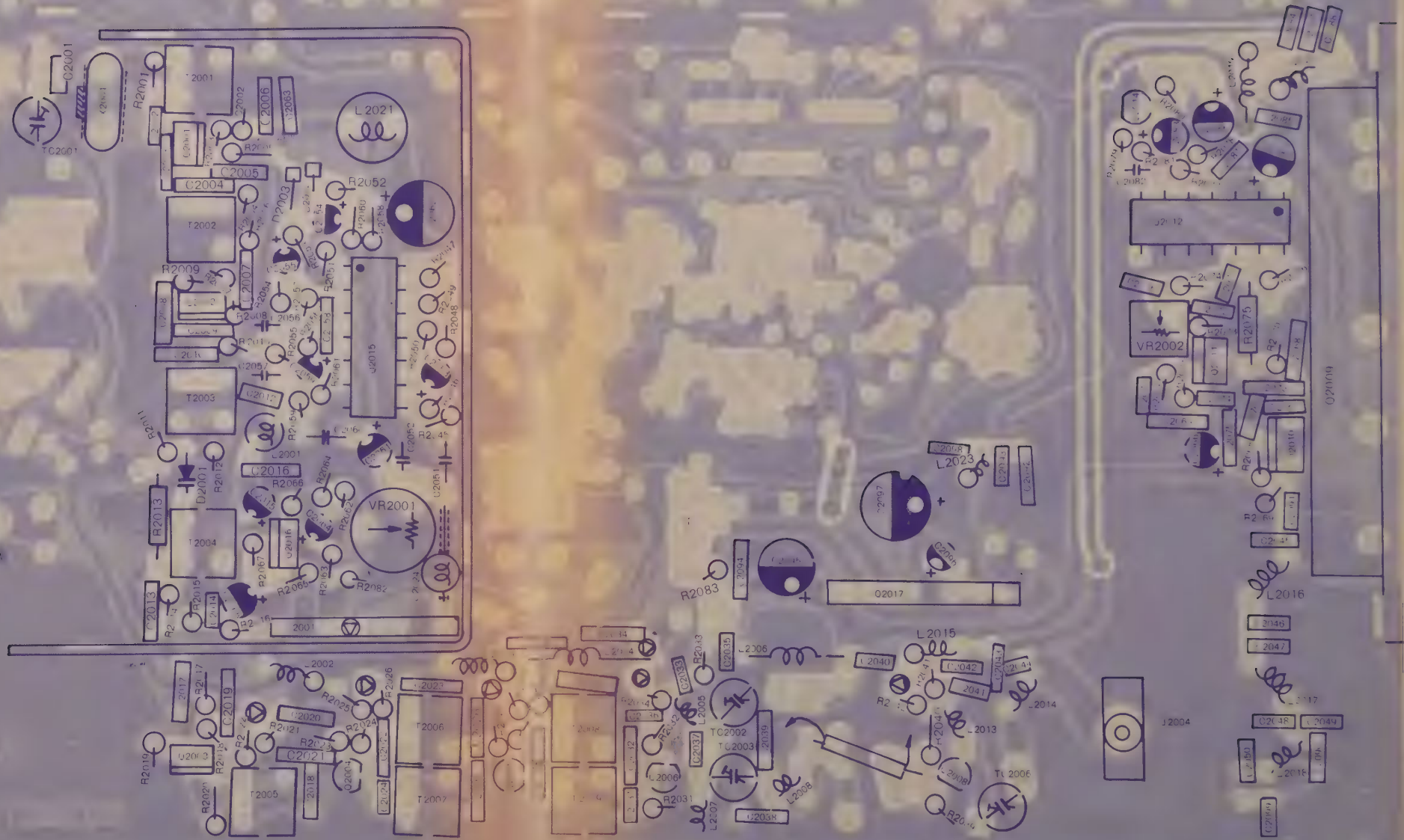


VIEDED FROM COMPONENT SIDE



VIEWED FROM SOLDER SIDE

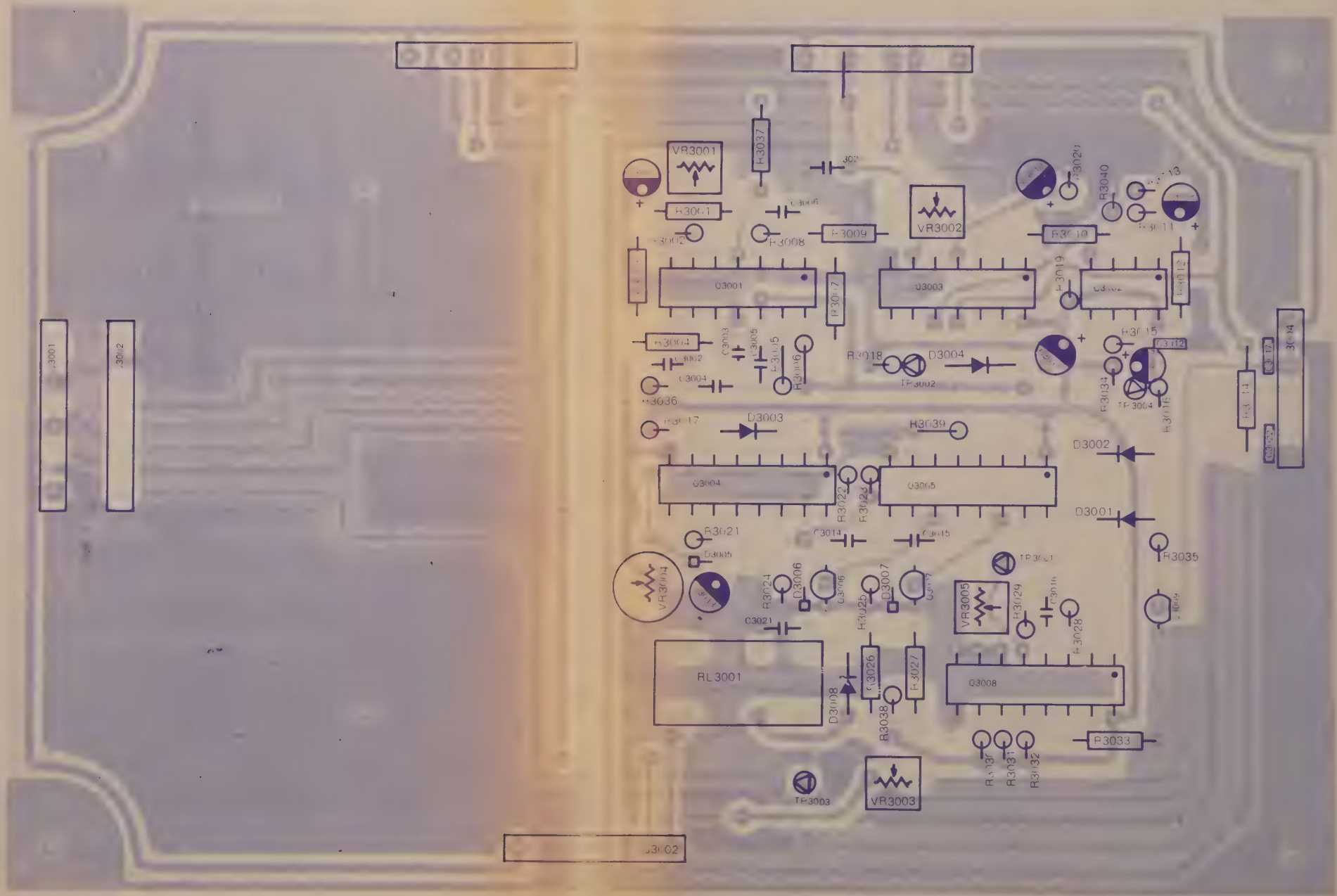
RX UNIT
PB-2306



VIEWED FROM COMPONENT SIDE

TX UNIT

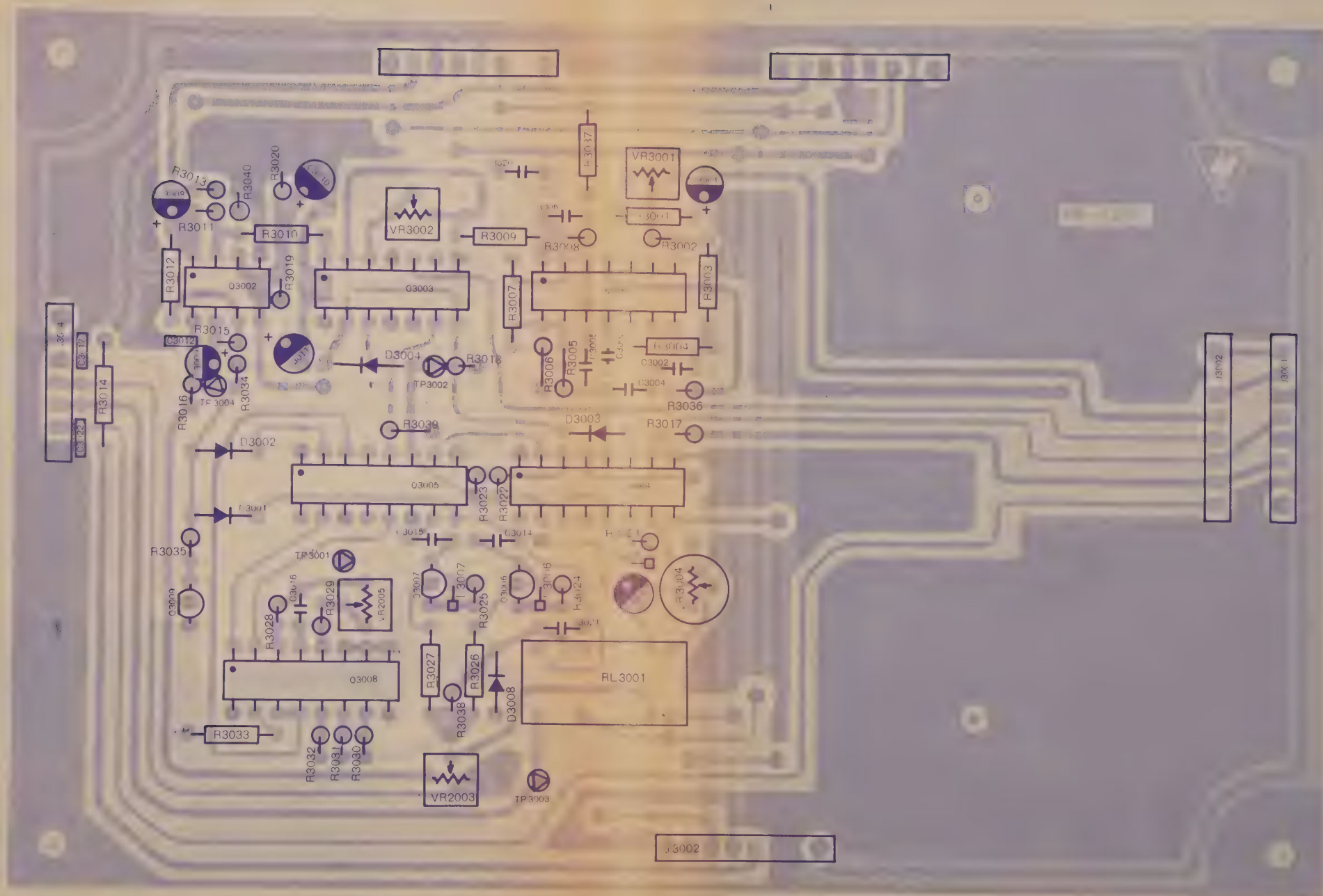
PB-2306



VIEWED FROM COMPONENT SIDE

C.O.S. UNIT

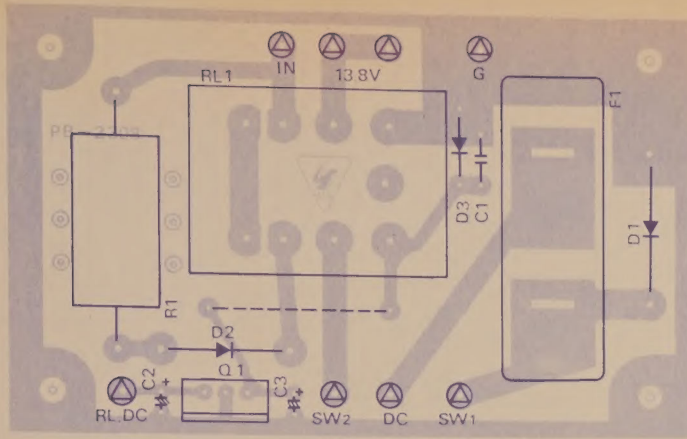
PB-2307



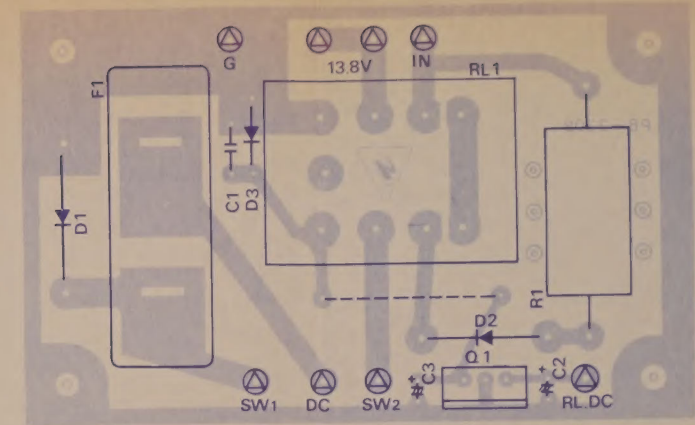
VIEWED FROM SOLDER SIDE

C.O.S. UNIT

PB-2307

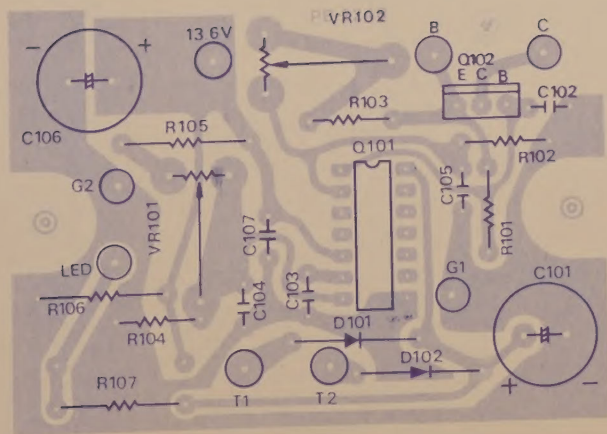


VIEWED FROM SOLDER SIDE

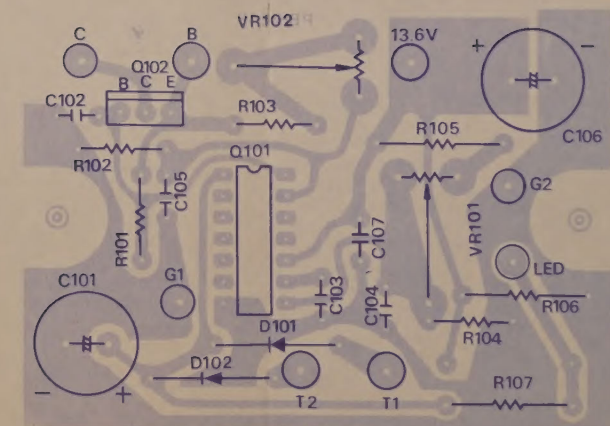


VIEWED FROM COMPONENT SIDE

RL UNIT
PB-2308



VIEWED FROM SOLDER SIDE



VIEWED FROM COMPONENT SIDE REG. UNIT
PB-2248

