PALOMAR SSB 500

specifications

GENERAL

Channels	:	40 – AM/Single Sideband
Frequency Range	:	26.965 to 27.405 MHz
Frequency Control	:	Phaselock Synthesizer
Frequency Tolerance	:	±0.005%
Frequency Stability	:	±0.002%
Operating Temperature Range	:	–30°C to +50°C
Microphone	:	Plug-in type dynamic with volume control
Input Voltage	:	13.8V DC (Positive or Negative ground)
Current Drain	:	Receive 1.5A at maximum audio output 0.5A standby (no signal).
Size	:	10-6/10" L. X 8"W. X 2-1/2" H.
Weight	:	6 lbs.
Antenna Connector	:	Standard American type
Semiconductors	:	41 Transistors, 7 FETS,60 Diodes, 7 ICs
Meter	:	Illuminated, indicates relative power output and received signal strength
Power Bandswidth	:	10.5 to 16V

TRANSMITTER

Power	:	4 Watts - AM (max. allowed by FCC) 12 Watts PEP-SSB (max. allowed by FCC)
Modulation	:	High and low level Class B amplitude modulation (AM)
Modulation Capability	:	95% Typical (AM)
Harmonic Suppression and Spurious Emmissions	:	Better than FCC requirement

Frequency Response	:	400 Hz to 2.5 kHz – AM and SSB
Output Impedance	:	50 Ohms, unbalanced
Output Indicators	:	Meter shows relative RF output power, Tx red lamp indicates transmit mode.

RECEIVER

Sensitivity – AM	:	.7μV for 10 db S/N
Sensitivity – SSB	:	.25μV for 10 db S/N
Selectivity	:	6 db at 4.2 kHz 60 db at 7 kHz (AM and SSB)
Image Rejection	:	More than 50 db
Automatic Gain Control (AGC)	:	Change in audio output less than 10 db from 10μV to .5 volts
Squelch	:	Adjustable – threshold less than .5μV
Audio Frequency Response	:	400Hz to 2.5 kHz
Distortion	:	Less than 10% at 3.0 watts output
Adjacent Channel Rejection	:	AM: -60 db, SSB: -65db
Cross Modulation	:	More than 55 db
IF Frequency	:	AM and SSB, 7.8 MHz
Clarifier	:	±1kHz
Noise Blanker	:	RF type, effective on AM and SSB
Audio Output Power	:	More than 3 watts into 8 ohms
Built-in Speaker	:	8 ohms, dynamic
External Speaker (optional)	:	Disables internal speaker when connected

PUBLIC ADDRESS (PA) SYSTEM

Power Output	:	3 watts into external speaker
External Speaker for PA (optional)	:	When PA switch is in PA mode, the unit functions as a public address system.

PALOMAR SSB 500 instruction manual

introduction

The PALOMAR SSB-500 has been designed to provide a high level, trouble-free performance of both AM and SSB modes in the Citizens Band Service which is comprised of the following frequency assignments:

CHANNEL	CHANNEL FREQUENCY [MHZ]	CHANNEL	CHANNEL FREQUENCY [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 - Emergency	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

To insure that you obtain the maximum performance from your PALOMAR SSB-500, please read carefully the following control descriptions and operating instructions.

NOTE: This transceiver has been designed for use in Class D operation in the 27 MHz Citizens Band Radio Service. This transceiver is also designed to meet the Federal Communications Commission requirements applicable to equipment operating in Class D service, and is not to be used for any other purpose. Part 95 and Part 15, Sub-part C of the FCC Regulations define operation in this service. You are required to read and understand these Regulations prior to operating this equipment.

A copy of Part 95 of the FCC Rules and Regulations is furnished with your transceiver. (It is also available from the U.S. Government Printing Office, Washington DC., 20402.)

Complete FCC Forms 505 and 555-B which accompany this manual.

You are also required to submit a complete copy of FCC Form 505 prior to operating this transceiver on the air.

It is the user's responsibility to see that this unit is operated at all times in accordance with the FCC Citizens Radio Service regulations.
WARNING: Transmitter section adjustments must be performed only by a qualified technician holding a valid first or second class FCC Radiotelephone License.

section I

installation

Location

Plan the location of the transceiver and microphone bracket before starting the installation. Select a location that is convenient for operation and does not interfere with the driver or passengers in the vehicle. In automobiles, the transceiver is usually mounted to the underneath of the dash panel, with the microphone bracket beside it or directly on the unit.

Mounting and Connection

The PALOMAR SSB-500 is supplied with a universal mounting bracket. The transceiver is held in the bracket by four bolts permitting adjustment at the most convenient angle.

The bracket must be mounted with the machine screws supplied. The mounting must be mechanically strong and also provide a good electrical connection to the chassis of the vehicle. Proceed as follows to mount the SSB-500.

1. After you have determined the most convenient location in your vehicle, hold the PALOMAR SSB-500 with mounting bracket in the exact location desired. If nothing will interfere with mounting it in the desired position, remove the bracket and use it as a template to mark the location for the mounting bolts. Before drilling the holes, make sure nothing will interfere with the installation of the mounting bolts.

2. Connect the antenna cable plug to the standard receptacle on the rear panel. Most CB antennas are terminated with a type PL-259 plug and mate with the receptacle.

3. Connect the power cord plug to the DC power socket on the rear panel of the unit. If you are installing the transceiver in an automobile built in the U.S.A. after 1966, or if you are certain that your vehicle has a Negative Ground System, follow these instructions:

   A. Connect the DC power input wire with the fuse to +12V DC. In an automobile installation, +12V DC is usually obtained from the accessory contact on the ignition switch. This prevents the set being left on accidentally when the driver leaves the car and also permits operating the unit without

the engine running. Locate the accessory contact on most ignition switches by tracing the power wire from the AM broadcast receiver in the car.

B. Connect the black lead to – 12V DC. This is usually the chassis of the car. Any convenient location with good electrical contact (remove paint) may be used.

4. Follow the instructions below if you are certain that your vehicle has a Positive Ground System.

   A. Connect the positive (red) wire to a screw bolt on the metal frame supporting the instrument panel, or to any metal point that is part of the vehicle's metal structure. (Remove any paint or coating to ensure good electrical contact).

   B. Connect black negative lead to – 12V DC. Usually, – 12V is obtained from the accessory contact on the ignition switch or directly on the minus battery terminal.

5. Mount the microphone bracket on the right side of the transceiver or near the transceiver, using four screws supplied. When mounting in an automobile, place the bracket under the dash so the microphone is readily accessible.

Ignition Noise Interference

Use of a Mobile transceiver at low signal level is normally limited by the presence of noise. The primary source of noise in automobile installation is from the generator and ignition system in the vehicle. Under most operating conditions, when signal level is adequate, the background noise does not present a serious problem. Also, when extremely low level signals are being received, the transceiver may be operated with vehicle engine turned off. The unit requires very little current and therefore will not significantly discharge the vehicle battery.

Even though the PALOMAR SSB-500 has a selectable automatic noise limiter, in some installations ignition interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist and variations between vehicles requires different solutions to reduce the noise. Consult with your PALOMAR dealer or a CB Radio technician for help in locating and correcting the source of severe noise.

Antenna

Since the maximum allowable power output of the transceiver is limitted by the FCC, the antenna is one important factor affecting transmission distance. Only a properly matched antenna system will allow maximum power transfer

from the 50 ohms transmission line to the radiating element. In mobile installations (cars, trucks, boats, etc.), an antenna system that is non-directional should be used.

A vertically polarized quarter-wave length whip antenna provides the most reliable operation and greatest range. The shorter, loaded type whip antennas are more attractive, compact and adequate for applications where the maximum possible distance is not required. Also the loaded whips do not present the problems of height imposed by the full quarter wave length whip.

Mobile whip antennas utilize the metal body of the vehicle as a ground plane. When mounted at a corner of the vehicle they are slightly directional, in the direction of the body of the vehicle. For all practical purposes, however, the radiation pattern is non-directional. The slight directional characteristic will be observed only at extreme distances. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

If the transceiver is not mounted on a metal surface, it is necessary to run a separate ground wire from the unit to a good metal electrical ground in the vehicle. When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plane, unless the vessel has a steel hull.

Before installing the transceiver in a boat, consult your dealer for information regarding an adequate grounding system and prevention of electrolysis between fittings in the hull and water.

Remote Speaker

The external speaker jack (EXT. SP) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 3 Watts. When the external speaker is plugged in, the internal (built-in) speaker is disconnected.

Public Address

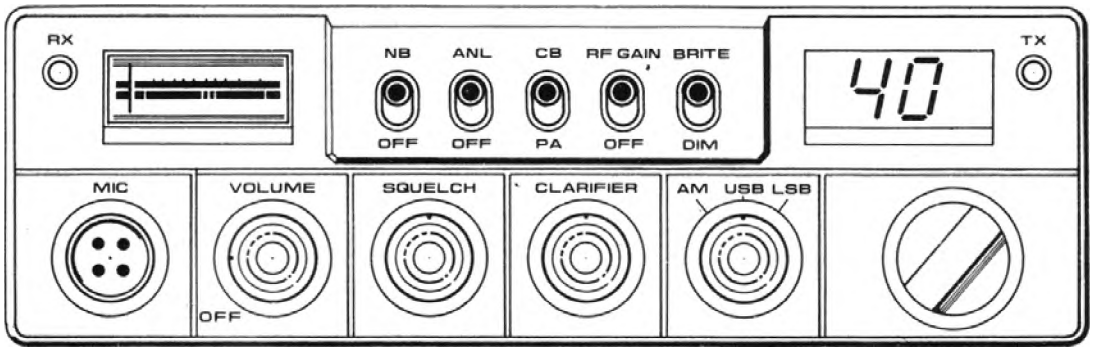
An external 8 ohms, 3 Watts speaker must be connected to the Public Address speaker jack (PA SP) on the rear panel when the transceiver is used as a Public Address system. The speaker should be directed away from the microphone to prevent acoustic feedback. Physical separation or isolation of the microphone and speaker is important when operating the PA at high output levels.

section II

operation

CONTROLS AND INDICATORS

There are ten controls and four indicators on the front panel of your PALOMAR SSB-500.



A. CONTROL FUNCTIONS

1. **OFF/ON VOLUME**: Turn clockwise to apply power to the unit and to set the desired listening level.

2. **SQUELCH**: This control is used to cut off or eliminate receiver background noise in the absence of an incoming signal. For maximum receiver sensitivity it is desired that the control be adjusted only to the point where the receiver background noise or ambient background noise is eliminated. Turn fully counterclockwise then slowly clockwise until the receiver noise disappears. Any signals to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

3. **CHANNEL SELECTOR**: This switch selects any one of the 40 channels designated as Citizens Band channels desired. The selected channel is indicated digitally in the Channel Indicator LED (Light Emitting Diode) read-out provided above the Channel Selector switch.

Channel 9 has been reserved by the FCC for emergency communications involving the immediate safety of life of individuals or immediate protection of property. Channel 9 may also be used to render assistance to a Mortarist.

4. **LSB-USB-AM MODE SWITCH**: Selects mode of operation – Lower Sideband, Upper Sideband or standard AM.

5. **NB-OFF SWITCH**: "NB" position selects special RF noise reduction circuit (Noise Blanker) to combat ignition noise.

6. **ANL-OFF SWITCH**: In the ANL position, the Automatic Noise Limiter circuit is activated.

7. **CB-PA SWITCH**: Selects the mode of operation. The PA function should not be used unless an external speaker is connected as described in Section I, Installation Section. In the CB position, the PA function is disabled and the unit will transmit and received on the selected frequency.

8. **RF GAIN-OFF SWITCH**: Place this switch in RF GAIN position when usual operation or receiving week station. Place this switch in OFF position for strong station.

9. **BRITE-DIM SWITCH**: Controls the brightness of the LED channel indicator for optimum intensity. In the BRITE position for day driving and in DIM position for night time driving.

10. **CLARIFIER**: This control permits slight adjustment of receiver tuning. Used for clarity on SSB reception and fine tuning of stations on AM reception.

B. INDICATOR FUNCTIONS

1. **SIGNAL STRENGTH/POWER OUTPUT METER**: Shows relative incoming signal strength when receiving and relative transmit power when transmitting.

2. **TX (TRANSMIT) LAMP**: This lamp will illuminate during transmit mode of operation.

3. **RX (RECEIVE) LAMP**: This lamp will illuminate during receive mode or PA mode of operation.

4. **CHANNEL INDICATOR**: This is an LED (Light Emitting Diode) which shows the channel selected by Channel Selector switch.

C. PUSH-TO-TALK MICROPHONE WITH REMOTE VOLUME GAIN

The receiver and transmitter are controlled by the Push-to-Talk switch on the microphone. Press the switch and the transmitter is activated; release switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. Rotate the remote volume – gain knob on microphone to increase or decrease your modulation level. The radio comes complete with the low impedance dynamic microphone (supplied).

D. OPERATING PROCEDURE TO RECEIVE:

1. Rotate the Squelch Control to the fully counter clockwise position initially.
2. Set the CB-PA Switch to the CB position.
3. Set the Clarifier Control to the center (12 o'clock) position.
4. Set the LSB-USB-AM Switch to either AM for standard AM reception or LSB or USB, depending on whether signal to be received is on the Upper or Lower sideband.
5. Set the NB-OFF switch in the OFF position initially.
6. Select desired channel (1 – 40) by rotating the Channel Selector switch to the desired position.
7. Rotate the Volume Control with Power Switch clockwise to apply power to the transceiver. Since the transceiver is fully transistorized, operation will be instantaneous. Continue rotating the Volume control clockwise to provide a comfortable listening level.
8. If necessary, adjust RF GAIN-OFF and ANL switches for clearer reception.

E. OPERATING PROCEDURE TO TRANSMIT ON AM AND SSB:

WARNING: NEVER ATTEMPT TO TRANSMIT WITHOUT AN ANTENNA OR DUMMY LOAD CONNECTED TO THE TRANSCEIVER.

Before operating the transceiver, the followings MUST be done:

1. Valid Class D Citizens Band equipment license shall be posted at the main control (fixed) station location.
   NOTE: Operation under a Temporary Permit, FCC Form 555-B, which is furnished with your SSB–500, is permissible while your regular license application is being processed by the FCC.

2. A properly filled out and signed identification card, FCC Form 452-C which is also furnished with SSB-500, must be affixed to all units.

3. Part 95 of the FCC Rules and Regulations, which is furnished with your SSB-500, must be read and understood.

Transmitting with this unit on any of the 40 CB channels requires no unusual procedures except that you must first select one of three modes of operation possible, AM, USB or LSB.

If you are attempting to communicate with a station having a similar transceiver to yours, SSB-500, you can make initial contact on AM and then arrange to conduct subsequent communications in one of the sideband modes, either USB or LSB. Of course, if the other station is only capable of AM reception, you will also have to transmit in the AM mode.

After you have selected the desired mode of operation by means of the LSB-USB-AM selector switch, simply press the Push-to-Talk Switch on the Microphone to transmit.

Hold the Microphone 3 to 4 inches from your mouth and slightly to one side so that the voice does not project directly into the Microphone (this provides best results). Speak at a normal level – there is no need to raise your voice or shout into the Microphone.

During periods of transmission, the receiver is silenced and reception is therefore impossible. In the same way, your signal cannot be heard by another station when he is transmitting – each must take turns. To receive again, simply release the Microphone Push-to-Talk Button.

section III

maintenance and adjustment

The transceiver is specifically designed for the environment encountered in Mobile installations. The use of all solid state circuitry and its light weight result in high reliability. Should a failure occur, however, replace parts only with identical parts. Do not substitute. Refer to the schematic diagram and parts list.

WARNING

Federal law requires that adjustment of the radio frequency section of this transceiver may not be made by a citizens band operator. Only a United States licensed first or second class commercial license holder may tune the transmitter section of this transceiver, FCC Part 95D, Section 95.97d.

ADJUSTMENT

The transceiver is factory aligned and should not require any adjustments when used with a 50 ohm antenna.

If an antenna other than 50 ohms impedance is used, adjustment of the transmitter output circuit may be made to obtain optimum power transfer to the antenna. This adjustment should be made only by a qualified personnel using a high quality in-line RF watt meter which will not produce standing waves when inserted in the antenna cable.

NOTE: If the performance described in the OPERATION and MAINTENANCE AND ADJUSTMENT sections is not obtained, review the operating instructions to insure that proper procedures were followed. If a problem still exists, refer to WARRANTY SERVICE INSTRUCTIONS on the last page of this instruction manual.

PARTS LIST

Symbol No	Description	Part No.
S-408	Rotary SW	1
S-402	Rotary SW	2
S-401	Slide SW	3
S-403	Slide SW	4
S-404	Slide SW	5
S-405	Slide SW	6
S-407	Slide SW	7
VR-405/ S-406	V. R. 10KA	8
VR-404	V. R. 100K B	10
VR-401	V. R. 20K B	11
J-401	ANT Connector	12
J-403	3P Jack	13
J-404	3P Jack	14
J-407	DC Jack	15
J-402	Mic Connector	16
SP-401	Speaker 8 Ω	17
M-401	Meter 200 μA	18
D-65	LED Red 5 φ	19
D-66	LED Green 5 φ	20
	Power Cord Ass'y	21
	Ass'y Wire Kit	22
	P. C. B. (MAIN)	23
	P. C. B (A)	24
	P. C. B (B)	25
Relay-1	Relay RL-023. 3P	26
F-401	Fuse 3A	27
	Frame Ass'y	28
	Front Panel	29
	Bracket	30
	Side Panel	31
	Rear Panel	32
	Shield	33
	Cover A	34
	Cover B	35
	Terminal	36
	Washer	37
	Ser. No. Plate	38
	CH Knob	39
	V.R Knob	40
	Microphone	41
	SW Felt	42
	Meter Cushion	43
	Jack Insulation Washer	44
	Speaker Felt	45
	Empire Tube	46
	Binding Wire	47
	Mic Hanger	48
	Styrol Foam	49
	LED Filter	50
	Heat Sink	51
	SW Bracket	52
	Test Terminal	53
	Pan HD Screw A	54
	Pan HD Screw B	55
	Pan HD Screw C	56
	Pan HD Screw D	57
	Pan HD Screw E	58
	Truss HD Screw	59
	Flat HD Screw	60

Symbol No.	Description	Part No.
	Mounting Screw	61
	Instruction Manual	62
	FCC Form 505	63
	FCC Form 555-B	64
	FCC Form 452-C	65
	FCC Form 76K	66
	FCC Rules Part 95	67
IC1	I C TA 7061 AP	68
IC2	IC MC 1496A	69
IC3	IC μPC 592Hz	70
IC4	IC μPC 1156H	71
IC5	IC TA 7310P	72
IC6	IC MC 78L05ACP	73
IC7	IC MC 145106P	74
TR1	2SC 710C	75
TR2	2SA 628D	76
TR3	2SC 710C	77
TR4	2SC 710C	78
TR5	2SC 1730L	79
TR6	2SC 710C	80
TR7	2SC 710C	81
TR8	2SC 710C	82
TR9	2SC 710D	83
TR10	2SC 710C	84
TR11	2SC 710C	85
TR12	2SC 710C	86
TR13	2SC 710C	87
TR14	2SC 710C	88
TR15	2SC 710E	89
TR16	2SC 710D	90
TR17	2SA 628D	91
TR18	2SC 710C	92
TR19	2SA 628D	93
TR20	2SC 710D	94
TR21	2SC 710C	95
TR22	2SC 710C	96
TR23	2SC 710C	97
TR24	2SC 1419C	98
TR25	2SC 1419C	99
TR26	2SC 710C	100
TR27	2SC 710C	101
TR28	2SC 710C	102
TR29	2SC 710C	103
TR30	2SC 710C	104
TR32	2SA 628D	105
TR33	2SC 710C	106
TR34	2SC 710C	107
TR38	2SC 710C	108
TR39	2SC 710C	109
TR40	2SC 710D	110
TR41	2SC 710C	111
TR42	2SC 710C	112
TR43	2SC 1945A	113
TR44	2SC 2166C	114
TR45	2SC 1973	115
FET1	3SK 45B	116
FET2	2SK 33F	117
FET3	2SK 34P	118
FET4	3SK 45B	119
FET5	2SK 34P	120
FET6	2SK 33F	121

Symbol No.	Description	Part No.
FET7	3SK 45B	122
D1	Diode IS 2473	123
D2	Diode IS 2473	124
D3	Diode IS 2473	125
D4	Diode IS 2473	126
D5	Diode IS 2473	127
D6	Diode IS 2473	128
D7	Diode IS 2473	129
D8	GE Diode IN 60	130
D9	GE Diode IN 60	131
D10	GE Diode IN 60P	132
D11	GE Diode IN 60	133
D12	Diode IS 2473	134
D13	Diode IS 2473	135
D14	Diode IS 2473	136
D15	Diode IS 2473	137
D16	Diode IS 2473	138
D17	Diode IS 2473	139
D18	Diode IS 2473	140
D19	Diode IS 2473	141
D20	Diode IS 2473	142
D21	Diode IS 2473	143
D22	Diode IS 2473	144
D23	Diode IS 2473	145
D24	Zener Diode Mz 409B	146
D25	Zener Diode MZ 408A	147
D26	Zener Diode WZ 050	148
D27	Rectifier Diode 10DI	149
D28	Zener Diode MZ 409B	150
D29	Diode IS 2473	151
D30	Diode IS 2473	152
D31	Zener Diode MZ 306B	153
D32	Zener Didoe MZ 306B	154
D33	Diode IS2473	155
D34	Diode IS2473	156
D35	Diode IS2473	157
D36	Diode IS2473	158
D37	Diode IS2473	169
D38	Diode IS2473	160
D39	Diode IS2473	161
D40	Diode IS2473	162
D41	Vari-Cap Diode MV201	163
D42	Vari-Cap Diode MV201	164
D43	Vori-Cap Diode MV201	165
D44	Zerer Diode MZ 409B	166
D45	Vari-Cap Diode MV-201	167
D46	Diode IS 2473	168
D47	Diode IS 2473	179
D50	GE Diode IN 60 (P.A)	170
D51	Varistor Diode KB 162W	171
D52	Varistor Diode KB 162W	172
D53	Diode IS 2473	173
D54	Rectifier Diode 10DI	174
D56	Diode IS 2473	175
D57	Diode IS 2473	176
D58	Diode IS 2473	177
D59	GE Diode IN 60 (P.A)	178
D60	Diode IS 2473	179

Symbol No.	Description	Part No.
D61	Diode IS 2473	180
D62	Diode IS 2473	181
D63	Diode IS 2473	182
L1	RFT 23MHz LA029	183
L2	RFT 23MHz LA155	184
L3	RFT 27MHz LA152	185
L4	RFT 27MHz LA156	186
L5	IFT 7.8MHz LA179	187
L7	IFT 7.8MHz LA038	188
L8	IFT 7.8MHz LA-096	189
L9	Micro Inductor 470μH	190
L10	Micro Inductor 56mH	191
L11	Micro Inductor 68mH	192
L12	Micro Inductor 470μH	193
L13	Micro Inductor 470μH	194
L14	Micro Inductor 470μH	195
L16	RFT 34MHz LA160	196
L17	RFT 34MHz LA191	197
L18	Micro Inductor 470μH	298
L19	Micro Inductor 100μH	299
L20	Micro Inductor 470μH	200
L21	Micro Inductor 470μH	201
L22	Micro Inductor 470μH	202
L23	Micro Inductor 470μH	203
L24	RFT 33MHz LA190	204
L25	Micro Inductor 470μH	205
L26	Micro Inductor 470μH	206
L27	TX Filter Coil	207
L28	TX Filter Coil	208
L29	TX Filter Coil	209
L30	TX TANK Coil	210
L31	Choke Coil	211
L32	TX Diver Coil	212
L33	Choke Coil	213
L34	Choke Coil	214
L35	TX Transformer	215
L36	TX Transformer	2.6
L37	TX Transformer	217
L38	TX Transformer	218
L39	IFT 7.8MHz LA-038	219
L40	Choke Coil	210
L43	Micro Inductor 1μH	211
L44	Micro Inductor 1μH	212
L45	Micro Inductor 470μH	213
L401	Choke Coil 4.7μH	224
L403	Choke Coil 4.7μH	225
L405	Choke Coil 4.7μH	226
L406	Choke Coil 4.7μH	227
L407	Choke Coil 4.7μH	228
L408	Choke Coil 4.7μH	229
L410	Choke Coil 4.7μH	220
L411	Choke Coil 4.7μH	231
L412	Choke Coil 4.7μH	232
T1	OPT TF106	233
X1	X-TAL 7.8025 MHz HC-25C/U	234
X2	X-TAL 7.7975MHz HC-25C/U	235
X3	X-TAL 11.2858MHz HC-25C/U	236

Symbol No.	Description	Part No.
X4	X-TAL 11.2842 MHz HC-25C/U	237
X5	X-TAL 10.240MHz HC-25C/U	238
X6	X-TAL 11.2850MHz HC-25C/U	239
FT1	X-TAL filter 7.8MHz	240
VR1	Semi Fixed R20KB	241
VR2	Semi Fixed R20KB	242
VR3	Semi Fixed R100KB	243
VR4	Semi Fixed 50KB	244
VR5	Semi Fixed 100KB	245
VR7	Semi Fixed 5KB	246
VR8	Semi Fixed 10KB	247
VR9	Semi Fixed 5KB	248
VR12	Semi Fixed 100KB	249
VR15	Semi Fixed 500B	250
VR16	Semi Fixed 500B	251
CT1	Ceramic Trimmer Cap. 20PF	252
CT2	Ceramic Trimmer Cap. 20PF	253
CT3	Ceramic Trimmer Cap. 20PF	254
CT4	Ceramic Trimmer Cap. 20PF	255
CT5	Ceramic Trimmer Cap. 20PF	256
CT6	Ceramic Trimmer Cap. 20PF	257
CT7	Ceramic Trimmer Cap. 20PF	258
CT8	Ceramic Trimmer Cap. 20PF	259
VR401	Semi Fixed R20KB	260
VR404	Semi Fixed R100KB	261
VR405	Semi Fixed R10KA	262
R1	Carbon R 220Ω	263
R2	Carbon R 10KΩ	264
R3	Carbon R 2.2MΩ	265
R4	Carbon R 5.6KΩ	266
R5	Carbon R 100KΩ	267
R6	Carbon R 22KΩ	268
R8	Carbon R 1KΩ	269
R9	Carbon R 4.7KΩ	270
R10	Carbon R 2.7KΩ	271
R11	Carbon R 5.6KΩ	272
R12	Carbon R 1KΩ	273
R13	Carbon R 1KΩ	274
R14	Carbon R 1KΩ	275
R15	Carbon R 220Ω	276
R16	Carbon R 2.2KΩ	277
R17	Carbon R 470Ω	278
R19	Carbon R 1.5KΩ	279
R20	Carbon R 1.5KΩ	280
R21	Carbon R 1.5KΩ	281
R22	Carbon R 100Ω	282
R23	Carbon R 1.5KΩ	283
R24	Carbon R 4.7KΩ	284

Symbol No.	Description	Part No.
R25	Carbon R 47Ω	285
R26	Carbon R 22KΩ	286
R27	Carbon R 5.6KΩ	287
R28	Carbon R 470Ω	288
R29	Carbon R 220Ω	289
R30	Carbon R 47KΩ	290
R31	Carbon R 3.3KΩ	291
R32	Carbon R 150Ω	292
R33	Carbon R 220Ω	293
R34	Carbon R 220KΩ	294
R35	Carbon R 100KΩ	295
R36	Carbon R 470Ω	296
R37	Carbon R 18KΩ	297
R38	Carbon R 820KΩ	298
R39	Carbon R 470KΩ	299
R40	Carbon R 220KΩ	300
R42	Carbon R 56KΩ	301
R43	Carbon R 680KΩ	302
R44	Carbon R 1.5KΩ	303
R45	Carbon R 5.6Ω	304
R46	Carbon R 330Ω	305
R47	Carbon R 4.7KΩ	306
R48	Carbon R 10KΩ	307
R49	Carbon R 10KΩ	308
R50	Carbon R 220KΩ	309
R51	Carbon R 3.3KΩ	310
R52	Carbon R 220Ω	311
R53	Carbon R 100KΩ	312
R54	Carbon R 10KΩ	313
R55	Carbon R 1KΩ	314
R56	Carbon R 100KΩ	315
R57	Carbon R 3.3KΩ	316
R58	Carbon R 100KΩ	317
R59	Carbon R 3.3KΩ	318
R60	Carbon R 220Ω	319
R61	Carbon R 12KΩ	320
R62	Carbon R 3.3KΩ	321
R63	Carbon R 56Ω	322
R64	Carbon R 10KΩ	323
R65	Carbon R 220Ω	324
R66	Carbon R 2.2KΩ	325
R67	Carbon R 220Ω	326
R68	Carbon R 820Ω	327
R69	Carbon R 1KΩ	328
R70	Carbon R 10KΩ	329
R71	Carbon R 220Ω	330
R72	Carbon R 470Ω	331
R73	Carbon R 220KΩ	332
R74	Carbon R 220Ω	333
R75	Carbon R 100KΩ	334
R76	Carbon R 10KΩ	335
R77	Carbon R 3.3KΩ	336
R78	Carbon R 15KΩ	337
R80	Carbon R 4.7KΩ	338
R81	Carbon R 10KΩ	339
R82	Carbon R 56KΩ	340
R160	Carbon R 2.7KΩ	341
R84	Carbon R 4.7KΩ	342
R86	Carbon R 1KΩ	343
R87	Carbon R 10KΩ	344
R88	Carbon R 270KΩ	345

Symbol No.	Description	Part No.
R89	Carbon R 10K Ω	346
R91	Carbon R 4.7K Ω	347
R92	Carbon R 3.3K Ω	348
R93	Carbon R 56K Ω	349
R94	Carbon R 220Ω	350
R95	Carbon R 330Ω	351
R96	Carbon R 3.3K Ω	350
R97	Carbon R 10Ω	353
R98	Carbon R 10K Ω	354
R99	Carbon R 33K Ω	355
R100	Carbon R 1K Ω	356
R101	Carbon R 4.7K Ω	357
R102	Carbon R 2.2K Ω	358
R103	Carbon R 2.2K Ω	359
R104	Carbon R 22K Ω	360
R105	Carbon R 68Ω	361
R106	Carbon R 56K Ω	362
R107	Cement R 10Ω/5W	363
R108	Carbon R 330 Ω	364
R110	Carbon R 470 Ω	365
R111	Carbon R 390 Ω	366
R112	Metal Oxide R 33 Ω/1W	367
R113	Metal Oxide R 150Ω/1W	368
R116	Carbon R 1KΩ	369
R117	Carbon R 2.2K Ω	370
R118	Carbon R 100 Ω	371
R119	Carbon R 100 Ω	372
R120	Carbon R 2.2K Ω	373
R121	Carbon R 5.6K Ω	374
R122	Carbon R 15K Ω	375
R123	Carbon R 1K Ω	376
R124	Carbon R 150K Ω	377
R125	Carbon R 2.7K Ω	378
R126	Carbon R 820Ω	379
R127	Carbon R 1.5K Ω	380
R128	Carbon R 1.5K Ω	381
R130	Carbon R 1.5K Ω	382
R131	Carbon R 220 Ω	383
R132	Carbon R 100 Ω	384
R133	Carbon R 1K Ω	385
R134	Carbon R 2.2K Ω	386
R135	Carbon R 3.3K Ω	387
R136	Carbon R 22K Ω	388
R137	Carbon R 1.5K Ω	389
R141	Carbon R 100 Ω	390
R142	Carbon R 220 Ω	391
R143	Carbon R 5.6K Ω	392
R144	Carbon R 10K Ω	393
R145	Carbon R 1K Ω	394
R146	Carbon R 470 Ω	395
R150	Carbon R 470 Ω	396
R151	Carbon R 22K Ω	397
R152	Carbon R 10 Ω	398
R153	Carbon R 1.5K Ω	399
R154	Carbon R 220Ω	400
R155	Carbon R 5.6K Ω	401
R156	Carbon R 10K Ω	402
R157	Carbon R 1K Ω	403
R161	Metal Oxide R 56 Ω/1W	404
R162	Carbon R 1.8K Ω	405
R163	Carbon R 5.6K Ω	406

Symbol No.	Description	Part No.
R164	Carbon R 10K Ω	407
R165	Carbon R 1K Ω	408
R166	Carbon R 100K Ω	409
R167	Carbon R 10K Ω	410
R168	Carbon R 100 Ω	411
R169	Carbon R 100 Ω	412
R170	Carbon R 56K Ω	413
R171	Carbon R 10K Ω	414
R172	Carbon R 22K Ω	415
R173	Carbon R 2.2K Ω	416
R174	Carbon R 560 Ω	417
R175	Carbon R 8.2K Ω	418
R179	Carbon R 15Ω	419
R180	Metal Oxide R 56Ω/1W	420
R181	Metal Oxide R 220 Ω/1W	421
R182	Carbon R 10 Ω	422
R183	Carbon R 330 Ω	423
R184	Carbon R 1K Ω	424
R185	Carbon R 1K Ω	425
R186	Carbon R 10 Ω	426
R187	Carbon R 3.3K Ω	427
R188	Carbon R 220 Ω	428
R189	Carbon R 470 Ω	429
R190	Carbon R 39KΩ	430
R191	Carbon R 100 Ω	431
R192	Carbon R 10K Ω	432
R193	Carbon R 10K Ω	433
R194	Carbon R 56K Ω	434
R195	Carbon R 56K Ω	435
R196	Carbon R 220 Ω	436
R199	Carbon R 15 Ω	437
R200	Carbon R 470 Ω	438
R201	Carbon R 10K Ω	439
R202	Carbon R 1K Ω	440
R204	Carbon R 47 Ω	441
R205	Carbon R 4.7 Ω	442
R206	Carbon R 5.6 Ω	443
R207	Carbon R 100K Ω	444
R208	Carbon R 8.2K Ω	445
R209	Carbon R 2.2K Ω	446
R211	Carbon R 1.5K Ω	447
R212	Carbon R 1.5K Ω	448
R213	Carbon R 1.5K Ω	449
R214	Carbon R 1.5K Ω	450
R215	Carbon R 1.5K Ω	451
R216	Carbon R 1.5K Ω	452
R217	Carbon R 1.5K Ω	453
R218	Carbon R 1.5K Ω	454
R219	Carbon R 1.5K Ω	455
R220	Carbon R 1.5K Ω	456
R221	Carbon R 1.5K Ω	457
R222	Carbon R 1.5K Ω	458
R223	Carbon R 1.5K Ω	459
R224	Carbon R 1.5K Ω	460
R225	Carbon R 820 Ω	461
R226	Carbon R 1.5K Ω	462
R227	Carbon R 470 Ω	463
R230	Carbon R 18 Ω/$\frac{1}{2}$ W	464
C1	Ceramic Condenser 33PF CH	465
C2	Ceramic Condenser 0.01μ	466

Symbol No.	Description	Part No.
C 4	Ceramic Condenser 0.01 μ	467
C 5	Ceramic Condenser 0.01	468
C 6	Ceramic Condenser 0.01	469
C 7	Ceramic Condenser 0.022	470
C 8	Ceramic Condenser 100P CH	471
C 9	Ceramic Condenser 0.01	472
C 10	Ceramic Condenser 0.0047	473
C 11	Ceramic Condenser 0.0047	474
C 12	Ceramic Condenser 0.0047	475
C 13	Ceramic Condenser 0.0047	476
C 14	Elyt Cap 33 μ/16V	477
C 15	Ceramic Cap 0.01 μ	478
C 16	Ceramic Cap 0.01 μ	479
C 17	Mylar Cap 0.01	480
C 18	Mylar Cap 0.039	481
C 19	Ceramic Cap 0.022	482
C 20	Ceramic Cap 0.022	483
C 21	Ceramic Cap 0.022	484
C 22	Ceramic Cap 0.022	485
C 23	Mylar Cap 0.022	486
C 24	Ceramic Cap 0.001	487
C 25	Mylar Cap 0.039	488
C 26	Mylar Cap 0.039	489
C 27	Mylar Cap 0.039	490
C 28	Ceramic Cap 0.022	491
C 29	Mylar Cap 0.039	492
C 30	Mylar Cap 0.039	493
C 31	Mylar Cap 0.039	494
C 32	Ceramic Cap 59P CH	495
C 33	Ceramic Cap 0.022	496
C 34	Ceramic Cap 0.022	497
C 35	Elyt Cap 1 μ/50 V	498
C 36	Ceramic Cap 59p CH	499
C 37	Ceramic Cap 10P CH	500
C 38	Ceramic Cap 330PSL	501
C 39	Aluminum Solid Elec. Cap 0.1/16V	502
C 40	Mylar Cap 0.039	503
C 41	Ceramic Cap 0.022	504
C 42	Elyt Cap 10 μ/16	505
C 43	Elyt Cap 4.7 μ/16	506
C 44	Elyt Cap 2.2 μ/25V	507
C 45	Ceramic Cap 47P CH	508
C 46	Ceramic Cap 0.01	509
C 47	Elyt Cap 47 μ/10V	510
C 48	Mylar Cap 0.01	511
C 49	Elyt Cap 47 μ/10V	512
C 50	Elyt Cap 47 μ/10V	513
C 51	Mylar Cap 0.022	514
C 52	AL Solid Elect Cap 0.1 μ/16V	515
C 53	Ceramic Cap 0.01	516
C 54	Ceramic Cap 33P CH	517
C 55	Elyt Cap 2.2 μ/2.5V	518
C 56	Mylar Cap 0.039	519
C 57	Ceramic Cap 0.022	520
C 58	Elpt Cap 1 μ/50V	521
C 59	Elpt Cap 47 μ/10V	522
C 60	AL Solid Elec. Cap 0.1/16V	523

Symbol No.	Description	Part No.
C 61	Mylar Cap 0.047	524
C 62	Mylar Cap 0.047	525
C 63	Elyt Cap 10 μ/16V	526
C 64	Mylar Cap 0.039	527
C 66	Elyt Cap 47 μ/10V	528
C 67	Elyt Cap 4.7 μ/16V	529
C 68	Elyt Cap 4.7 μ/16V	530
C 69	Elyt Cap 10 μ/16V	531
C 71	Mylar Cap 0.068	532
C 72	Mylar Cap 0.022	533
C 73	Mylar Cap 0.1 μ	534
C 74	Mylar Cap 0.022	535
C 75	Mylar Cap 0.1	536
C 76	Elyt Cap 47 μ/10V	537
C 77	Elyt Cap 0.47 μ/50V	538
C 78	Elyt Cap 0.47 μ/50V	539
C 79	Elyt Cap 0.47 μ/50V	540
C 80	Mylar Cap 0.01	541
C 81	Elyt Cap 220 μ/16V	542
C 82	Mylar Cap 0.047	543
C 83	Mylar Cap 0.01	544
C 84	Elyt Cap 1 μ/50V	545
C 85	Mylar Cap 0.039	546
C 86	Mylar Cap 0.022	547
C 87	Elyt Cap 10 μ/16V	548
C 88	Elyt Cap 4.7 μ/25V	549
C 89	Elyt Cap 33 μ/16V	550
C 90	Ceramic 20P CH	551
C 91	Mylar Cap 0.1	552
C 92	Elyt Cap 33 μ/16V	553
C 93	Ceramic Cap 68P CH	554
C 94	Elyt Cap 1000 μ/16V	555
C 95	Elyt Cap 470 μ/16V	556
C 96	Mylar Cap 0.1	557
C 97	Elyt Cap 4.7 μ/25V	558
C 98	Elyt Cap 1 μ/50V	559
C 99	Elyt Cap 10 μ/16V	560
C 100	Ceramic Cap 0.022	561
C 101	Elyt Cap 220 μ/16V	562
C 102	Elyt Cap 220 μ/16V	563
C 103	Elyt Cap 470 μ/10V	564
C 104	Elyt Cap 330 μ/10V	565
C 105	Ceramic Cap 0.022	566
C 106	Ceramic Cap 0.022	567
C 107	Elyt Cap 1000 μ/16V	568
C 109	Ceramic Cap 0.022	569
C 110	AL Solid Elec. Cap 0.1 μ/16V	570
C 111	Ceramic Cap 18P CH	571
C 112	Ceramic Cap 20P CH	572
C 113	Ceramic Cap 0.001	573
C 114	Ceramic Cap 0.001	574
C 115	Ceramic Cap 100P CH	575
C 116	Ceramic Cap 10P CH	576
C 117	Ceramic Cap 2P CH	577
C 118	Ceramic Cap 0.022	578
C 119	Ceramic Cap 0.022	579
C 120	Elyt Cap 10 μ/16V	580
C 121	Mylar Cap 0.039	581
C 122	Ceramic Cap 47P CH	582
C 123	Ceramic Cap 47P CH	583

Symbol No	Description	Part No.
C124	Ceramic Cap 0.01	584
C125	Ceramic Cap 0.01	585
C126	Ceramic Cap 220P SL	586
C127	Ceramic Cap 470P SL	587
C128	Ceramic Cap 220P SL	588
C129	Ceramic Cap 0.01	589
C130	Ceramic Cap 10P CH	590
C131	Ceramic Cap 47P CH	591
C132	Ceramic Cap 100P CH	592
C133	Mylar Cap 0.1	593
C134	Mylar Cap 0.1	594
C135	Elyt Cap 220μ/16V	595
C136	Ceramic Cap 470PSL	596
C137	Ceramic Cap 220PSL	597
C138	Ceramic Cap 0.01	598
C139	Ceramic Cap 10P CH	599
C140	Elyt Cap 1μ/50V	600
C141	Elyt Cap 10μ/16V	601
C142	Ceramic Cap 56P CH	602
C144	Ceramic Cap 0.022	603
C145	Ceramic Cap 0.022	604
C146	Ceramic Cap 0.022	605
C147	Ceramic Cap 470P SC	606
C148	Ceramic Cap 220P SC	607
C149	Ceramic Cap 0.01	608
C150	Ceramic Cap 10P CH	609
C151	Ceramic Cap 0.01	610
C152	Ceramic Cap 0.01	611
C153	Ceramic Cap 68P CH	612
C154	Mylar 0.047	613
C155	Ceramic Cap 2P CH	614
C156	Ceramic Cap 10P CH	615
C157	Mylar Cap 0.039	616
C158	Elyt Cap 1μ/50V	617
C159	Ceramic Cap 0.0047	618
C160	Ceramic Cap 0.0047	619
C161	Elyt Cap 4.7μ/25V	620
C162	Ceramic Cap 0.022	621
C163	Ceramic Cap 68P CH	622
C164	Ceramic Cap 150P CH	623
C165	Ceramic Cap 220P SL	624
C166	Ceramic Cap 0.0047	625
C167	Ceramic Cap 330P SL	626
C168	Ceramic Cap 1P CH	627
C169	Mylar Cap 0.039	628
C170	Ceramic Cap 47P SL	629
C171	Ceramic Cap 47P CH	630
C172	Ceramic Cap 0.0047	631
C173	Ceramic Cap 180P CH	632
C174	Ceramic Cap 56P CH	633
C175	Mylar Cap 0.1	634
C177	Ceramic Cap 0.0047	635
C178	Ceramic Cap 0.0047	636
C179	Elyt Cap 2.2μ/25V	637
C182	Mylar Cap 0.039	638
C183	Ceramic Cap 0.0047	639
C184	Ceramic Cap 120P CH	640
C185	Ceramic Cap 0.0047	641
C186	Ceramic Cap 0.0047	642
C187	Ceramic Cap 0.0047	643
C188	Mylar Cap 0.047	644

Symbol No	Description	Part No.
C189	Mylar Cap 0.047	645
C190	Ceramic Cap 0.1	646
C191	Ceramic Cap 33P CH	647
C192	Ceramic Cap 0.01	648
C193	Ceramic Cap 0.022	649
C194	Ceramic Cap 18P CH	650
C195	Ceramic Cap 0.01	651
C196	Ceramic Cap 0.022	652
C197	Ceramic Cap 0.022	653
C198	Mylar Cap 0.039	654
C199	Elyt Cap 1μ/50V	655
C200	Mylar Cap 0.01	656
C201	Mylar Cap 0.01	657
C204	Ceramic Cap 0.01	658
C205	Ceramic Cap 0.01	659
C206	Ceramic Cap 0.022	660
C207	Ceramic Cap 0.01	661
C208	Ceramic Cap 0.01	662
C209	Ceramic Cap 0.01	663
C210	Mylar Cap 0.01	664
C211	Elyt Cap 2.2μ/25V	665
C213	Ceramic Cap 0.1	666
C214	Ceramic Cap 0.01	667
C215	Ceramic Cap 0.022	668
C216	Ceramic Cap 0.022	669
C217	Ceramic Cap 0.022	670
C218	Elyt Cap 4.7μ/25V	671
C219	Ceramic Cap 0.022	672
C220	Ceramic Cap 0.022	673
C221	Ceramic Cap 0.022	674
C222	Ceramic Cap 0.022	675
C223	Ceramic Cap 0.022	676
C224	Ceramic Cap 0.022	677
C225	Ceramic Cap 0.022	678
C226	Ceramic Cap 0.022	679
C227	Ceramic Cap 0.022	680
C228	Ceramic Cap 0.022	681
C229	Ceramic Cap 0.01	682
C230	Ceramic Cap 0.022	683
C231	Ceramic Cap 0.022	684
C241	Mylar Cap 0.039	685
C242	Ceramic Cap 47P CH	686
C401	Mylar Cap 0.047	687
C405	Ceramic Cap 0.01	688
C406	Ceramic Cap 0.01	689
C408	Ceramic Cap 0.01	690
C410	Ceramic Cap 0.01	691
C415	Ceramic Cap 0.01	692
C416	Ceramic Cap 0.01	693
C417	Ceramic Cap 0.01	694
C421	Ceramic Cap 0.01	695
C422	Ceramic Cap 0.022	696
C423	Ceramic Cap 0.022	697

WARRANTY SERVICE INSTRUCTIONS

1. Refer to instruction manual for adjustments that may be applicable.

2. Check common electrical parts. Always check instruction manual for applicable adjustments after such replacement.

3. Defective parts removed from units which are within the warranty period should be sent to the factory prepaid with model and serial number of product from which removed and date of product purchase. These parts will be exchanged at no charge.

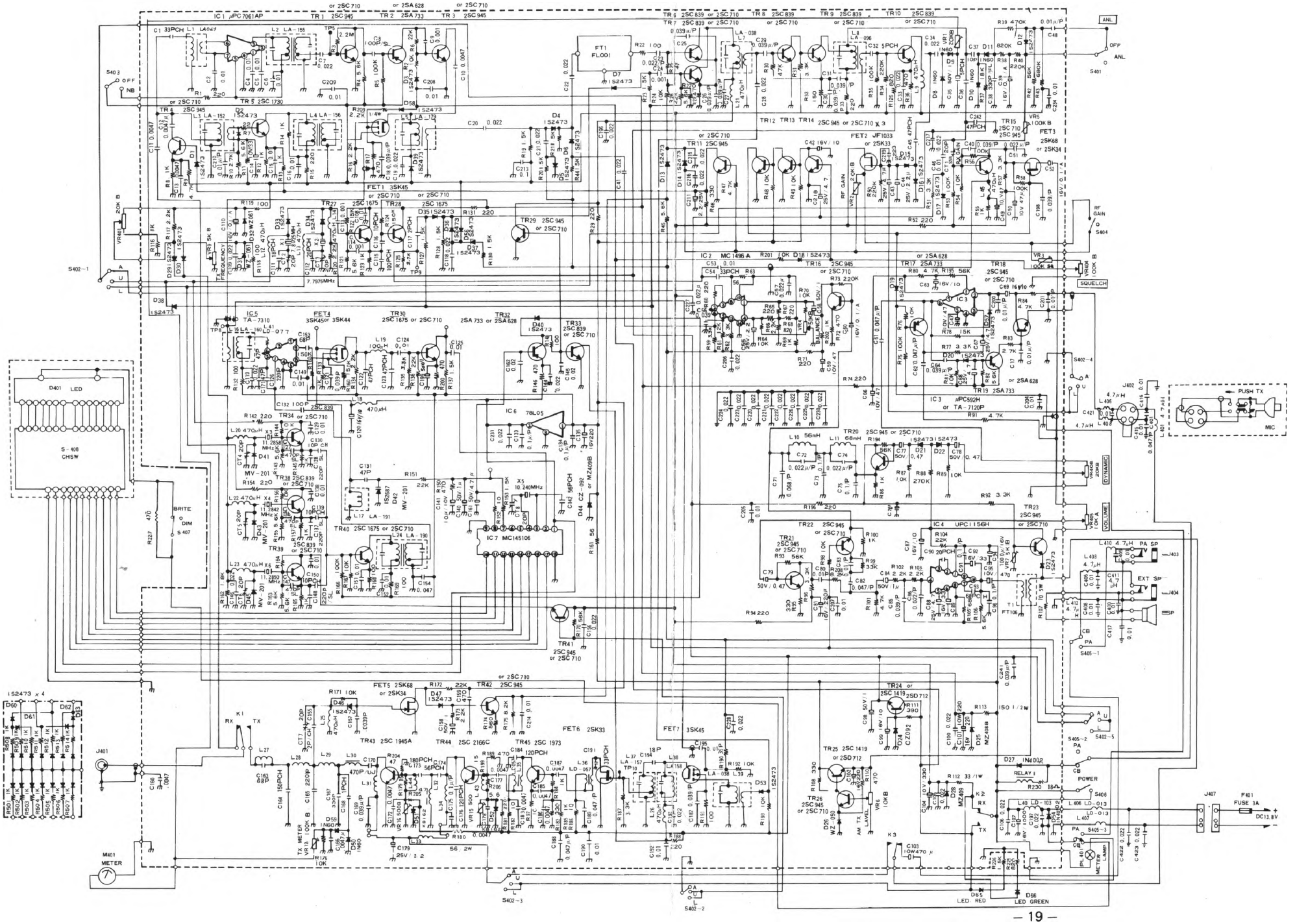
4. If the above mentioned procedures do not correct the difficulty, pack the product securely using the same packaging arrangement as supplied by the manufacture. A detailed list of troubles encountered must be enclosed as well as your name and address. Forward prepaid (United Parcel Service is preferred) to PALOMAR ELECTRONICS CORPORATION

SERVICE DEPARTMENT

PALOMAR ELECTRONICS CORPORATION

BOX 2903-665 OPPEN ST. ESCONDIDO, CA. 92025 U. S. A.

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM