

FIG. 5-4 TRANSMITTER ALIGNMENT PROCEDURE

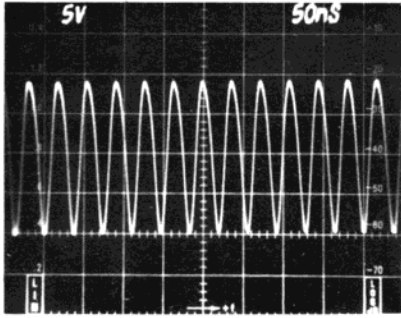
INITIAL SET-UP
Connect the transceiver to a 12.5 VDC supply. Connect an audio oscillator to the MIC input, a wattmeter and dummy load to the antenna jack, an oscilloscope to the dummy load, and set the channel selector to channel nearest center of band.
<u>STEP 1</u> With no modulation, key the transmitter and adjust T5 for maximum wattmeter indication.
<u>STEP 2</u> Adjust L5 and L6 for maximum wattmeter indication not to exceed 0.8 watts (SBE-24CB) or 1.7 watts (SBE-25CB).
<u>STEP 3</u> Set the audio oscillator to 1 KHz. Adjust output level for about 80% modulation. While observing scope, adjust L5 and L6 for best modulation symmetry.
<u>STEP 4</u> Remove dummy load and wattmeter. Fully extend antenna. Set scope probe or relative field strength meter next to antenna. Adjust L1 for maximum indication.

FIG. 5-5 RECEIVER ALIGNMENT PROCEDURE

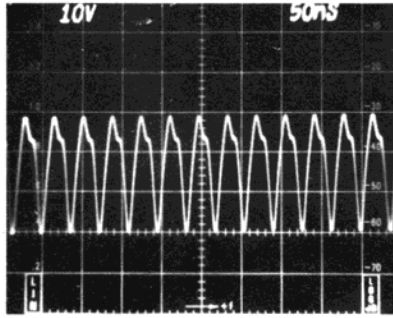
INITIAL SET-UP
Connect the transceiver to a 12.5 VDC supply. Set the channel selector to channel nearest center of band. Connect RF signal generator to the antenna jack and set to channel frequency 30% – 1 KHz modulation. Turn the volume control full clockwise and the squelch control full counterclockwise. Connect 8Ω load to external speaker jack, EXT SP, and connect AC voltmeter to 8Ω load. (See Figure 5-3.)
<u>STEP 1</u> Adjust T1, T2, T3 & T4 for maximum indication on the AC voltmeter.

FIG. 5-6 TRANSMITTER ALIGNMENT WAVEFORMS

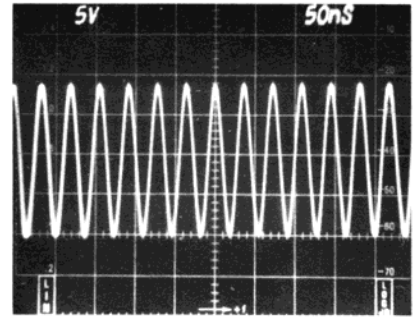
SBE-24CB SHASTA III



(a) TX OSCILLATOR Q6 COLLECTOR 3

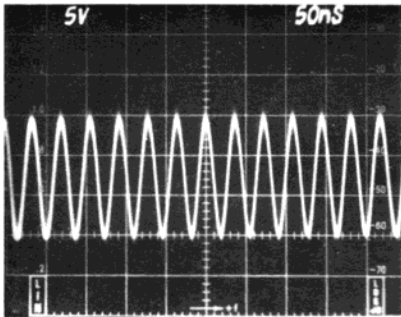


(b) TX FINAL Q7 EMITTER

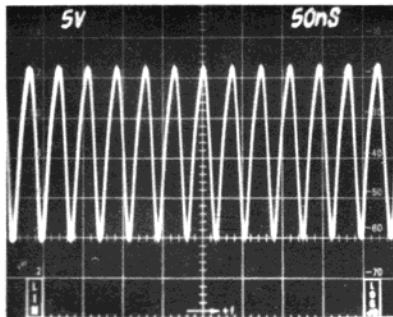


(c) OUTPUT DUMMY LOAD 4

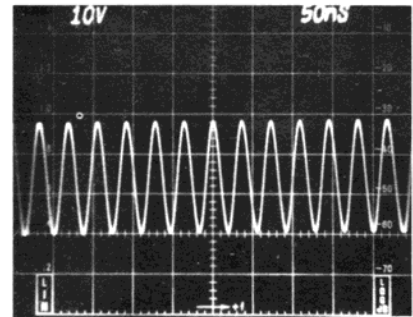
SBE-25CB SHASTA II



(d) TX OSCILLATOR Q6 COLLECTOR 5

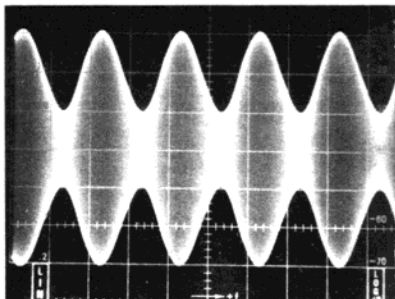


(e) TX FINAL Q7 EMITTER 6

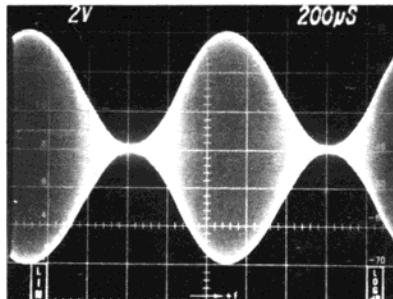


(f) OUTPUT DUMMY LOAD

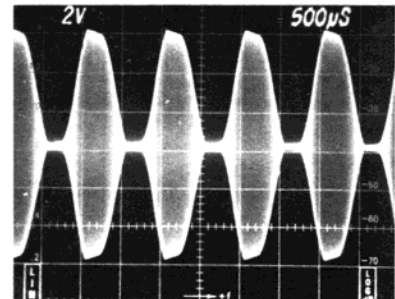
FIG. 5-7 MODULATION WAVEFORMS



50% MODULATION



100% MODULATION



OVERMODULATION

FIG. 5-8 ALIGNMENT LAYOUT

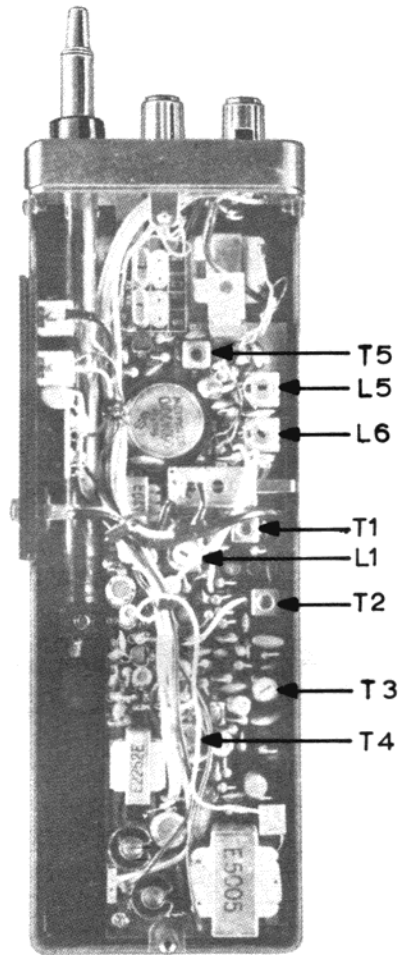


TABLE 5-9 RECEIVER INJECTION VOLTAGES

All injection voltages are at 30% – 1 KHz modulation at the specified frequency fed through a .01 MFD capacitor, and should produce at least 2 VAC audio output measured across the speaker or across an 8Ω load connected at EXT SP J2. Typical audio output voltages were taken with squelch control turned full counterclockwise and the volume control full clockwise.

INJECTION POINT	INJECTION LEVEL	FREQUENCY	AUDIO OUTPUT
Antenna	1μV	27.085 MHz	3 VAC
Q3 Base (TP-1)	20μV	455 KHz	2.4 VAC
Q4 Base	200μV	455 KHz	2.5 VAC
Q5 Base	2000μV	455 KHz	2.0 VAC

TABLE 5-10 TRANSCEIVER CRYSTALS

CH.	CH. FREQ.	TX OSC. XTAL FREQ.	RX OSC. XTAL FREQ.
1	26.965	26.965	26.510
2	26.975	26.975	26.520
3	26.985	26.985	26.530
4	27.005	27.005	26.550
5	27.015	27.015	26.560
6	27.025	27.025	26.570
7	27.035	27.035	26.580
8	27.055	27.055	26.600
9	27.065	27.065	26.610
10	27.075	27.075	26.620
11	27.085	27.085	26.630
12	27.105	27.105	26.650
13	27.115	27.115	26.660
14	27.125	27.125	26.670
15	27.135	27.135	26.680
16	27.155	27.155	26.700
17	27.165	27.165	26.710
18	27.175	27.175	26.720
19	27.185	27.185	26.730
20	27.205	27.205	26.750
21	27.215	27.215	26.760
22	27.225	27.225	26.770
23	27.255	27.255	26.800

RECEIVE: (CH. FREQ.) – (RX OSC.) = 455 KHz IF

TRANSMIT: (TX OSC.) = CH. FREQ.

TABLE 5-11 AGC VOLTAGES versus RF INPUT LEVEL

INPUT LEVEL (1)	AGC VOLTAGES (2)
1 μ V	1.14
10 μ V	0.85
100 μ V	0.64
1000 μ V	0.54
10,000 μ V	0.48

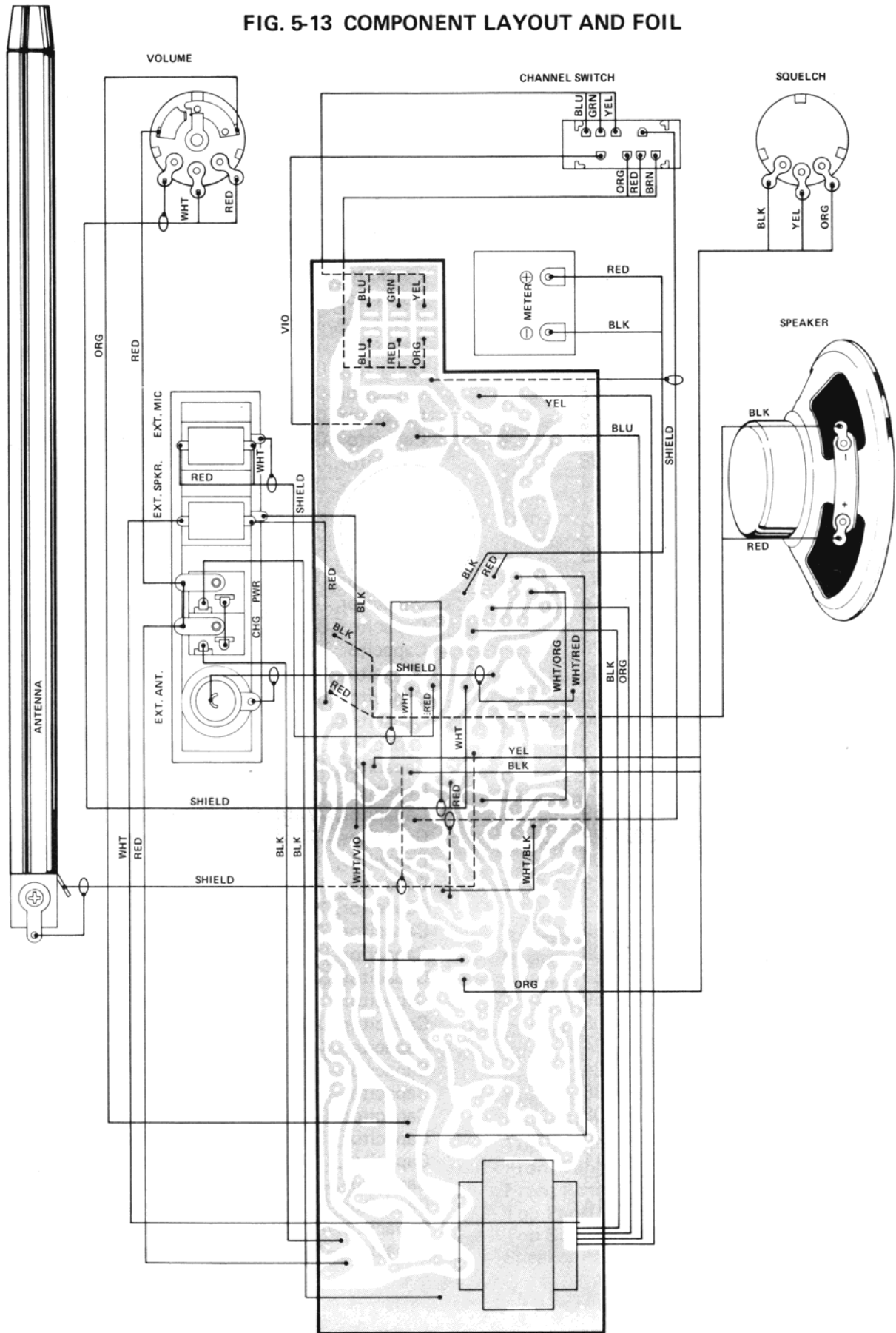
(1) Channel Frequency at Antenna Jack.

(2) Measured at TP2 with 10M Ω input.

FIG. 5-12 RECOMMENDED TEST INSTRUMENTS

<u>TEST INSTRUMENT</u>	<u>REQUIRED SPECIFICATIONS</u>	<u>USE</u>	<u>RECOMMENDED INSTRUMENT TYPE</u>
R.F. Signal Generator	Output frequency: 26.965 to 27.255 MHz. Output level calibrated from .1 microvolts to 500,000 microvolts. Internal modulation capability of 30% minimum at 1 KHz. (Calibrated)	Receiver service and alignment.	Hewlett-Packard Model 606A or B. Wavetek Model 3000.
Oscilloscope	Vertical bandwidth of 25 MHz or greater at 3db point. Triggered sweep capability.	Transmitter and receiver test and alignment.	Tektronics Model T932. Tektronics Model 465. Hewlett-Packard Model 180. Phillips Model PM3260E.
Frequency Counter	Frequency range DC to 30 MHz. Sensitivity: 10mv R.M.S. at 30 MHz. Overall timebase accuracy $\pm .002\%$, 6 digit resolution.	Transmitter frequency check and synthesizer troubleshooting.	Heath-Schlumberger Model SM128A
Wattmeter	25 watts full scale into 50 ohm load $\pm 5\%$ accuracy.	Measure power output and S.W.R.	Bird Model 43 with type 25A element. (May be terminated with antenna load)
AC VTVM	-40 to +20db range.	Measure audio output.	Heath Model IM-21.
Audio Oscillator	400 Hz to 4000 Hz output: Adjustable level, 0-1 volt output impedance 600 ohm.	Audio and modulator tests.	Hewlett-Packard Model 204C. Heath Model SG18A.
DC Power Supply	13.8 volt DC $\pm 10\%$ at 4 amperes.	Voltage for servicing.	Heath Model SP2720 (SBE Model SBE-4AC may be used if available.)

FIG. 5-13 COMPONENT LAYOUT AND FOIL



SECTION 6

PARTS LISTS

6.1 SBE-24CB Shasta III

<u>SYMBOL #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
C1	8000-00003-008	Capacitor, 100pfd, 50V Ceramic
C2	8000-00043-002	Capacitor, 56pfd, 50V, Ceramic
C3	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C4	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C5	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C6	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C7	8000-00028-277	Capacitor, 15pfd, 50V, Ceramic
C8	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C9	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C10	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C11	8000-00028-005	Capacitor, 0.01mfd, 50V, Mylar
C12	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C13	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C14	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C15	8000-00004-003	Capacitor, 0.04mfd, 50V, Mylar
C16	8000-00005-089	Capacitor, 300pfd, 50V, Ceramic
C17	8000-00012-007	Capacitor, 0.02mfd, 50V, Mylar
C18	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C19	8000-00011-003	Capacitor, 33mfd, 16V, Electrolytic
C20	8000-00028-026	Capacitor, 10mfd, 16V, Electrolytic
C21	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C22	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C23	8000-00024-030	Capacitor, 3.3mfd, 25V, Electrolytic
C24	8000-00024-030	Capacitor, 3.3mfd, 25V, Electrolytic
C25	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C26	8000-00043-001	Capacitor, 22pfd, 50V, Ceramic
C27	8000-00028-169	Capacitor, 27pfd, 50V, Ceramic
C28	8000-00003-029	Capacitor, 120pfd, 50V, Ceramic
C29	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C30	8000-00003-029	Capacitor, 120pfd, 50V, Ceramic
C31	8000-00003-029	Capacitor, 120pfd, 50V, Ceramic
C32	8000-00005-065	Capacitor, 70pfd, 50V, Ceramic
C33	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C34	8000-00005-089	Capacitor, 300pfd, 50V, Ceramic
C35	8000-00028-159	Capacitor, 150pfd, 50V, Ceramic
C36	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C37	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C38	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C39	8000-00028-198	Capacitor, 1mfd, 25V, Ceramic
C40	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C41	8000-00028-026	Capacitor, 10mfd, 16V, Electrolytic
C42	8000-00004-011	Capacitor, 0.001mfd, 50V, Ceramic
C43	8000-00028-023	Capacitor, 47mfd, 16V, Electrolytic
C44	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C45	8000-00028-027	Capacitor, 100mfd, 16V, Electrolytic
C46	8000-00012-007	Capacitor, 0.02mfd, 50V, Mylar

<u>SYMBOL #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
C47	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C48	8000-00028-277	Capacitor, 15pfd, 50V, Ceramic
D1	8000-00043-021	Diode, EQA-0109S
D2	8000-00006-007	Diode, 1N60
D3	8000-00006-007	Diode, 1N60
L1	8000-00043-006	Coil, 10PNP-26
L2	8000-00028-143	Coil, LF4-2R2K
L3	8000-00043-007	Coil, EL0610-202K
L4	8000-00043-008	Coil, 4LNC-027
L5	8000-00043-009	Coil, 8SNF-057
L6	8000-00043-010	Coil, 10PNP-028
Q1	8000-00028-206	Transistor, 2SC372 (O)
Q2	8000-00043-019	Transistor, 2SC784 (R)
Q3	8000-00028-206	Transistor, 2SC372 (O)
Q4	8000-00032-025	Transistor, 2SC372 (Y)
Q5	8000-00032-025	Transistor, 2SC372 (Y)
Q6	8000-00006-280	Transistor, 2SC1364
Q7	8000-00003-042	Transistor, 2SC1018
Q8	8000-00009-089	Transistor, 2SC373
Q9	8000-00009-089	Transistor, 2SC373
Q10	8000-00043-020	Transistor, 2SB324 (H)
Q11	8000-00043-020	Transistor, 2SB324 (H)
T1	8000-00043-011	Coil, 2440B
T2	8000-00043-012	Coil, 1624B
T3	8000-00043-013	Coil, 7MC352203N9
T4	8000-00043-014	Coil, 4202
T5	8000-00043-015	Coil, 2229
T6	8000-00043-016	Transformer, E-2252D
T7	8000-00043-018	Transformer, E-5005
T8	8000-00043-017	Transformer, E-0490B
TH1	8000-00043-022	Thermistor, M-270
VR1	8000-00043-005	Resistor, Semifixed, 22K
VR2	8000-00043-003	Resistor, Variable, 15A-50K
VR3	8000-00043-004	Resistor, Variable, 15C-50K
	8000-00028-100	Crystal Socket
	8000-00043-023	Filter, Ceramic, LF-B4
	8000-00043-024	Front Case
	8000-00043-025	Rear Case
	8000-00043-026	Front Bezel
	8000-00043-027	Top Bezel
	8000-00043-028	Front Panel (A)
	8000-00043-029	Front Panel (B)
	8000-00043-030	Top Panel
	8000-00043-031	Top Side Panel
	8000-00043-032	Speaker Panel

<u>SYMBOL #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
	8000-00043-033	Volume/Squelch Knob
	8000-00043-034	Talk Knob
	8000-00043-035	Talk Knob Holder
	8000-00043-036	Talk Knob Shaft
	8000-00043-037	Battery Insulator
	8000-00043-038	Antenna Grommet
	8000-00043-040	Antenna Bracket
	8000-00043-041	Meter Holder
	8000-00043-042	Carrying Case
	8000-00043-043	Jack Board
	8000-00043-044	Talk Switch
	8000-00043-045	Slide Switch
	8000-00043-046	Antenna
	8000-00043-047	Speaker, 8Ω 1.2W
	8000-00043-048	Meter
	8000-00043-049	Heat Sink
	8000-00043-050	Heat Sink
	8000-00043-052	Dummy Battery
	8000-00043-053	Battery Case, 310-2
	8000-00043-056	Display Box
	8000-00043-057	Battery Socket
	8000-00043-058	Battery Pin
	8000-00043-099	Model Label

6.2 SBE-25CB Shasta II

<u>SYMBOL #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
C1	8000-00043-002	Capacitor, 56pfd, 50V, Ceramic
C2	8000-00043-002	Capacitor, 56pfd, 50V, Ceramic
C3	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C4	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C5	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C6	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C7	8000-00028-277	Capacitor, 15pfd, 50V, Ceramic
C8	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C9	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C10	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C11	8000-00028-005	Capacitor, 0.01mfd, 50V, Mylar
C12	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C13	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C14	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C15	8000-00004-003	Capacitor, 0.04mfd, 50V, Mylar
C16	8000-00005-089	Capacitor, 300pfd, 50V, Ceramic
C17	8000-00012-007	Capacitor, 0.02mfd, 50V, Mylar
C18	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C19	8000-00011-003	Capacitor, 33mfd, 16V, Electrolytic
C20	8000-00028-026	Capacitor, 10mfd, 16V, Electrolytic
C21	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C22	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C23	8000-00024-030	Capacitor, 3.3mfd, 25V, Electrolytic
C24	8000-00024-030	Capacitor, 3.3mfd, 25V, Electrolytic
C25	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C26	8000-00043-001	Capacitor, 22pfd, 50V, Ceramic
C27	8000-00028-169	Capacitor, 27pfd, 50V, Ceramic
C28	8000-00003-029	Capacitor, 120pfd, 50V, Ceramic
C29	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C30	8000-00043-059	Capacitor, 180pfd, 50V, Ceramic
C31	8000-00043-002	Capacitor, 56pfd, 50V, Ceramic
C32	8000-00005-065	Capacitor, 70pfd, 50V, Ceramic
C33	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C34	8000-00005-089	Capacitor, 300pfd, 50V, Ceramic
C35	8000-00028-159	Capacitor, 150pfd, 50V, Ceramic
C36	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C37	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C38	8000-00028-024	Capacitor, 1mfd, 50V, Electrolytic
C39	8000-00028-198	Capacitor, 0.1mfd, 25V, Ceramic
C40	8000-00028-008	Capacitor, 0.01mfd, 25V, Ceramic
C41	8000-00028-026	Capacitor, 10mfd, 16V, Electrolytic
C42	8000-00004-011	Capacitor, 0.001mfd, 50V, Ceramic
C43	8000-00028-023	Capacitor, 47mfd, 16V, Electrolytic
C44	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
C45	8000-00028-027	Capacitor, 100mfd, 16V, Electrolytic
C46	8000-00012-007	Capacitor, 0.02mfd, 50V, Mylar
C47	8000-00028-014	Capacitor, 0.04mfd, 25V, Ceramic
D1	8000-00043-021	Diode, EQA-0109S
D2	8000-00006-007	Diode, 1N60

<u>SYMBOL #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
D3	8000-00006-007	Diode, 1N60
L1	8000-00043-006	Coil, 10PNP-26
L2	8000-00028-143	Coil, LF4-2R2K
L3	8000-00043-007	Coil, ELO610-202K
L4	8000-00043-008	Coil, 4LNC-027
L5	8000-00043-009	Coil, 8SNF-057
L6	8000-00043-010	Coil, 10PNP-028
Q1	8000-00028-206	Transistor, 2SC372 (O)
Q2	8000-00043-019	Transistor, 2SC784 (R)
Q3	8000-00028-206	Transistor, 2SC372 (O)
Q4	8000-00032-025	Transistor, 2SC372 (Y)
Q5	8000-00032-025	Transistor, 2SC372 (Y)
Q6	8000-00006-280	Transistor, 2SC1364
Q7	8000-00003-042	Transistor, 2SC1018
Q8	8000-00009-089	Transistor, 2SC373
Q9	8000-00009-089	Transistor, 2SC373
Q10	8000-00043-020	Transistor, 2SB324 (H)
Q11	8000-00043-020	Transistor, 2SB324 (H)
T1	8000-00043-011	Coil, 2440B
T2	8000-00043-012	Coil, 1624B
T3	8000-00043-013	Coil, 7MC352203N9
T4	8000-00043-014	Coil, 4202
T5	8000-00043-015	Coil, 2229
T6	8000-00043-016	Transformer, E-2252D
T7	8000-00043-018	Transformer, E-5005
T8	8000-00043-017	Transformer, E-0490B
TH1	8000-00043-022	Thermistor, M-270
VR1	8000-00043-005	Resistor, Semifixed, 22K
VR2	8000-00043-003	Resistor, Var., 15A-50K
VR3	8000-00043-004	Resistor, Var., 15C-50K
	8000-00028-100	Crystal Socket
	8000-00043-023	Filter, Ceramic, LF-B4
	8000-00043-024	Front Case
	8000-00043-025	Rear Case
	8000-00043-026	Front Bezel
	8000-00043-027	Top Bezel
	8000-00043-028	Front Panel (A)
	8000-00043-060	Front Panel (B)
	8000-00043-061	Top Panel
	8000-00043-031	Top Side Panel
	8000-00043-032	Speaker Panel
	8000-00043-033	Volume/Squelch Knob
	8000-00043-034	Talk Knob
	8000-00043-035	Talk Knob Holder
	8000-00043-036	Talk Knob Shaft
	8000-00043-037	Battery Insulator

SYMBOL #PART #DESCRIPTION

8000-00043-038	Antenna Grommet
8000-00043-039	Styrofoam Box
8000-00043-040	Antenna Bracket
8000-00043-041	Meter Holder
8000-00043-042	Carrying Case
8000-00043-043	Jack Board
8000-00043-044	Talk Switch
8000-00043-062	Slide Switch
8000-00043-046	Antenna
8000-00043-047	Speaker, 8 Ω , 1.2W
8000-00043-048	Meter
8000-00043-049	Heat Sink
8000-00043-050	Heat Sink
8000-00043-052	Dummy Battery
8000-00043-053	Battery Case
8000-00043-057	Battery Socket
8000-00043-058	Battery Pin
8000-00043-063	Display Box
8000-00043-100	Model Label

