FIG. 5-1 RECOMMENDED TEST INSTRUMENTS

TEST INSTRUMENT	REQUIRED SPECIFICATIONS	USE	RECOMMENDED INSTRUMENT TYPE
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 ±.002%, 6 digit resolution.	Transmitter frequency check and synthesizer troubleshooting.	Heath-Schlumburger Model SM128A
Wattmeter	5 watts full scale into 50 ohm load ±5% accuracy.	Measure power output and S.W.R.	Bird Model 43 with type 5A 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 impedence 600 ohm.	Audio and modulator tests.	Hewlett-Packard Model 204C. Heath Model SG18A.
DC Power Supply	13.8 volt DC ±10% at 2 amperes.	Primary supply voltage for servicing.	Heath Model SP2720 (SBE Model SBE-1AC may be used if available.)

FIG. 5-2 PERFORMANCE VERIFICATION PROCEDURE

TRANSMITTER

INITIAL SET-UP
Connect the SBE-23CB to a 13.8 VDC supply. Connect a wattmeter, dummy load and oscilloscope to the antenna jack (See Figure 5-3.)
STEP 1 Key the transmitter and observe that the wattmeter indicates an output of at least 3 watts.
STEP 2 Whistle into microphone with transmitter keyed. Check for 90-100% modulation.
STEP 3 Connect counter to dummy load and check transmit frequencies.

RECEIVER

INITIAL SET-UP
Connect SBE-23CB to 13.8 VDC supply. Connect RF signal generator to the antenna jack and set to 27.085 MHz 30% – 1 KHz modulation. Set the unit to channel 13. 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 5-4.)
STEP 1 Adjust signal generator for 0.7μV output. Verify that at least 2 VAC appear across the 8Ω load.
STEP 2 Increase signal generator output to 200μV. Rotate squelch knob full clockwise. Receiver should squelch.

FIG. 5-3 TRANSMITTER TEST CONNECTION

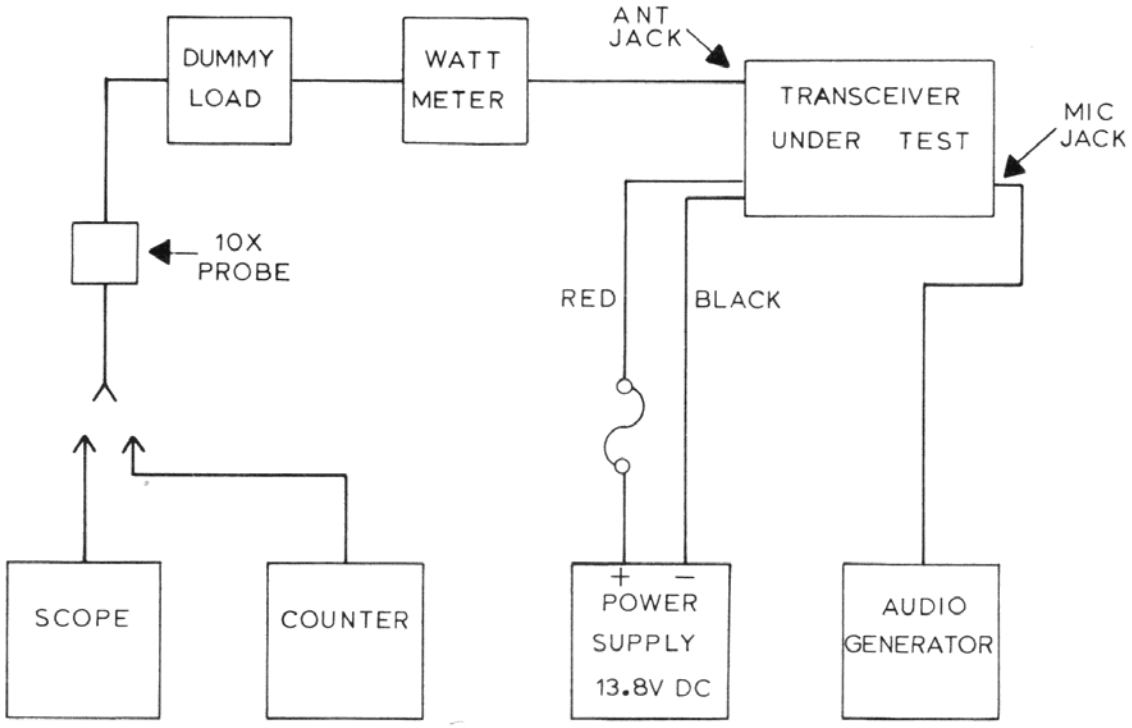


FIG. 5-4 RECEIVER TEST CONNECTION

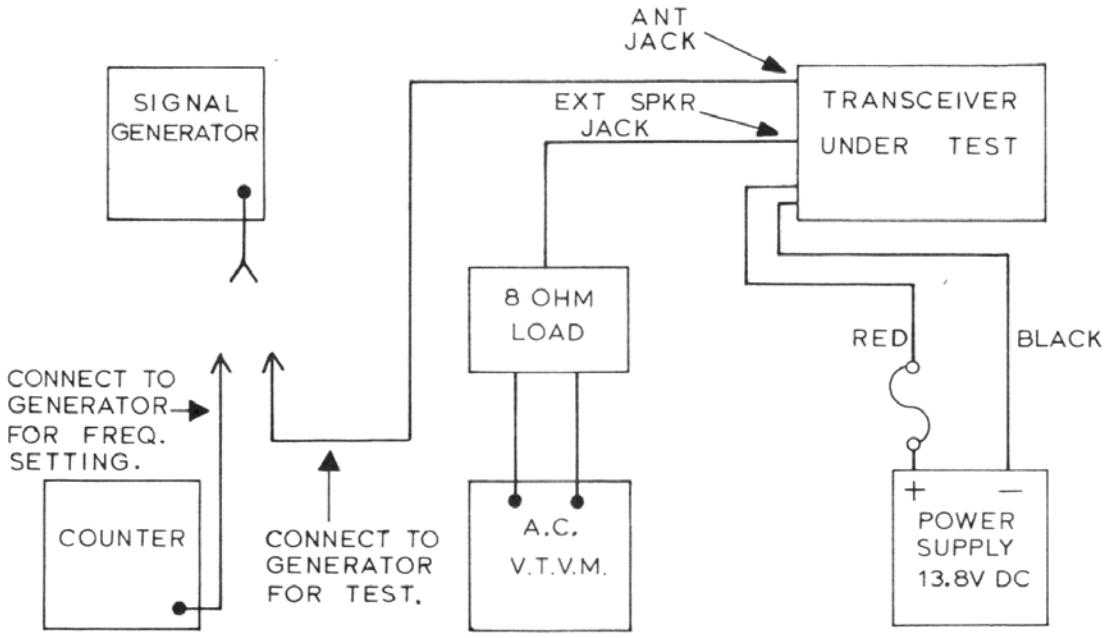


FIG. 5-5 RECEIVER ALIGNMENT PROCEDURE

INITIAL SET-UP

Connect an AC voltmeter across the speaker or 8Ω load plugged into J3 EXT SP. Connect the RF signal generator to the antenna jack, set to 27.085 MHz 30% – 1 KHz modulation. Set the Channel Select SW to channel 11. Turn the squelch control full counterclockwise and the volume control full clockwise.

STEP 1

Adjust the RF output level of the signal generator to a level sufficient to produce about 2 VAC on the AC voltmeter. Adjust L1, L2, L3, T1, T2, T3, T4, T5, and T6 for maximum indications on the AC voltmeter. If at any time during the alignment procedure the audio level increases to more than 4 VAC, reduce the generator output level. Repeat adjustment until 0.7μV RF signal produces about 2 VAC on the AC voltmeter.

STEP 2

Turn squelch control full clockwise. Increase the RF signal to 300μV. Squelch should break. If squelch fails to break, adjust VR2 to break squelch.

TABLE 5-6 AGC VOLTAGES versus RF INPUT LEVEL

INPUT LEVEL (1)	AGC VOLTAGES (2)	AGC VOLTAGES (3)
No connection	+2.95	+2.28
1μV	+2.37	+1.68
10μV	+1.72	+1.06
100μV	+1.43	+0.78
1000μV	+1.31	+0.66
10,000μV	+1.23	+0.59

(1) Channel Frequency at Antenna Jack.
(2) Measured with 10MΩ input at junction C19 and R15.
(3) Measured with 10MΩ input at junction R7 and R8.

FIG. 5-7 ALIGNMENT LAYOUT

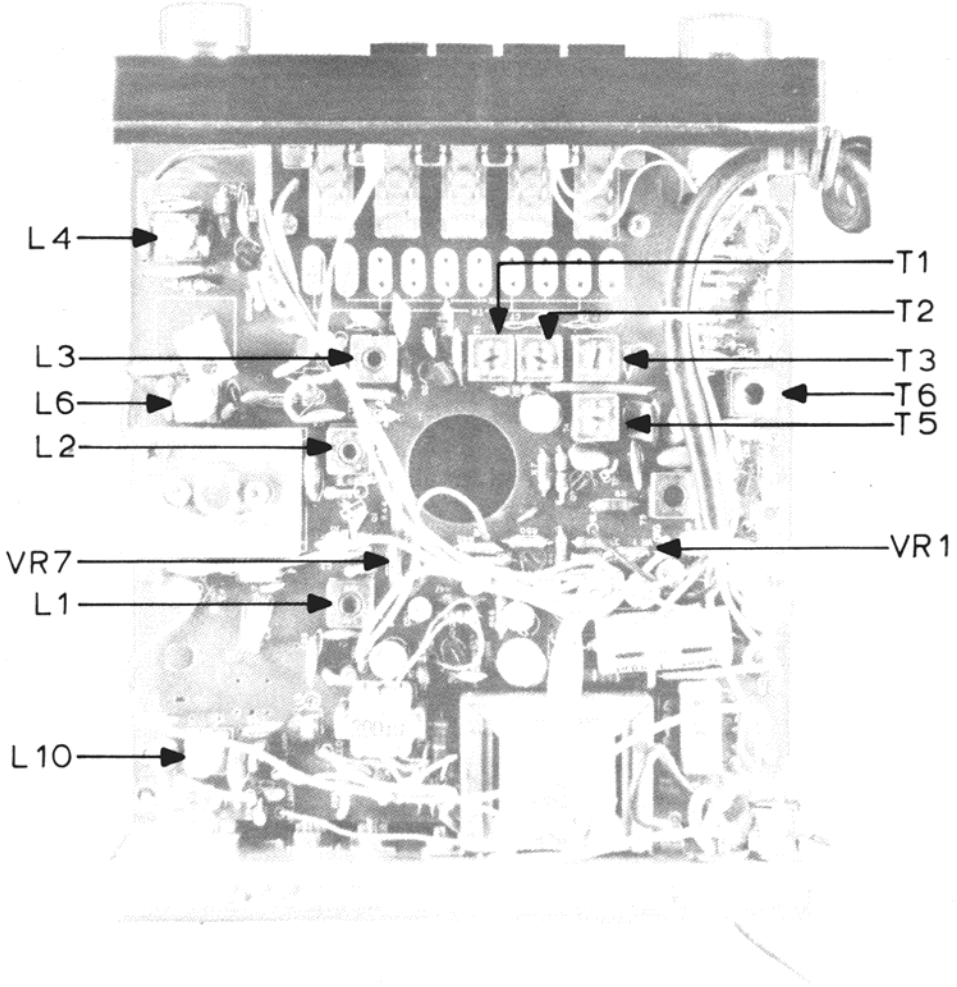


TABLE 5-8 RECEIVER INJECTION VOLTAGES

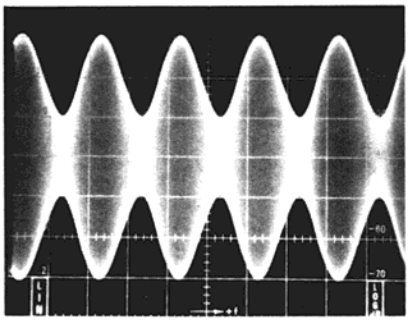
All injection voltages are at 30% — 1 KHz modulation at the spceified frequency fed through a .01 MFD capacitor, and should produce at least 2 VAC audio output measured across the speaker or across an 8Ω load connected at EXT SP J2. Volume control is turned full clockwise and squelch control is turned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

INJECTION POINT	INJECTION LEVEL	FREQUENCY	AUDIO OUTPUT
Antenna	1μV	27.085 MHz	5.0V
Q1 Base-TP1	10μV	27.085 MHz	5.5V
Q2 Base-TP2	10μV	27.085 MHz	5.2V
Q3 Base-TP3	30μV	455 KHz	3.2V
Q4 Base-TP4	3000μV	455 KHz	4.7V

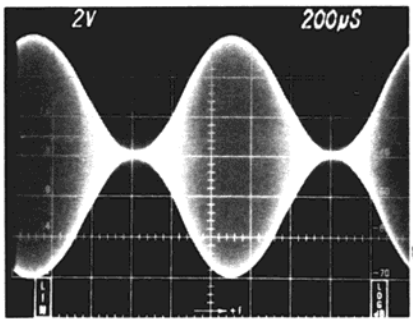
FIG. 5-9 TRANSMITTER ALIGNMENT PROCEDURE

INITIAL SET-UP
Connect the transceiver to a 13.8 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 13. (See Figure 5-3.)
STEP 1 With no modulation, key the transmitter and adjust L4, L6, L8, and L10 for maximum wattmeter indication not to exceed 4 watts.
STEP 2 Set the audio oscillator to 1 KHz. Adjust output level for about 80% modulation. While observing scope, adjust L8 and L10 for best modulation symmetry.
STEP 3 Adjust the audio oscillator's level for 50% modulation. Read level on AC voltmeter and increase level until the AC voltmeter reads 8 times as great (about 18db). Adjust VR1 for 100% modulation.

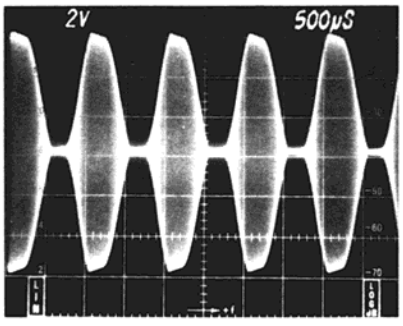
FIG. 5-10 MODULATION WAVEFORMS



50% MODULATION

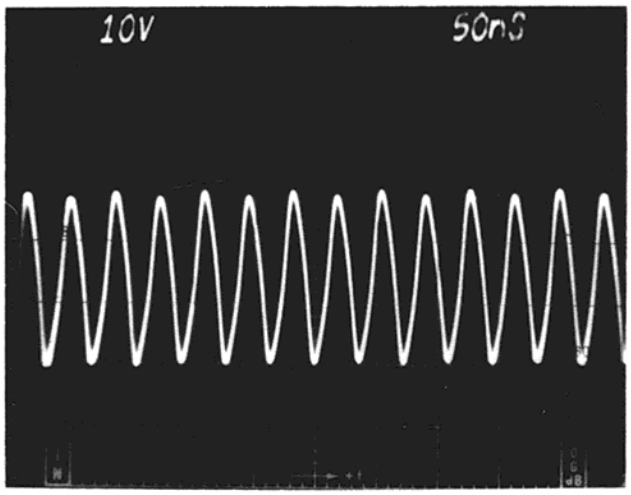


100% MODULATION

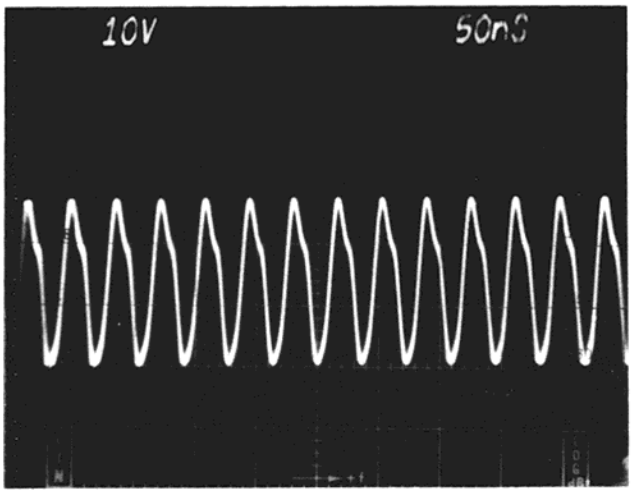


OVERMODULATION

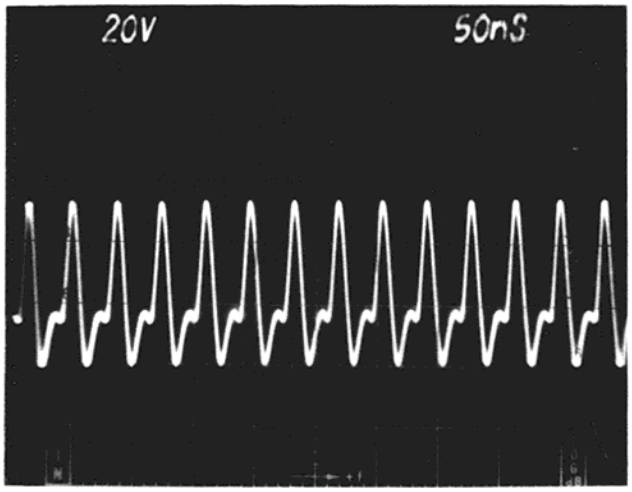
FIG. 5-11 TRANSMITTER ALIGNMENT WAVEFORMS



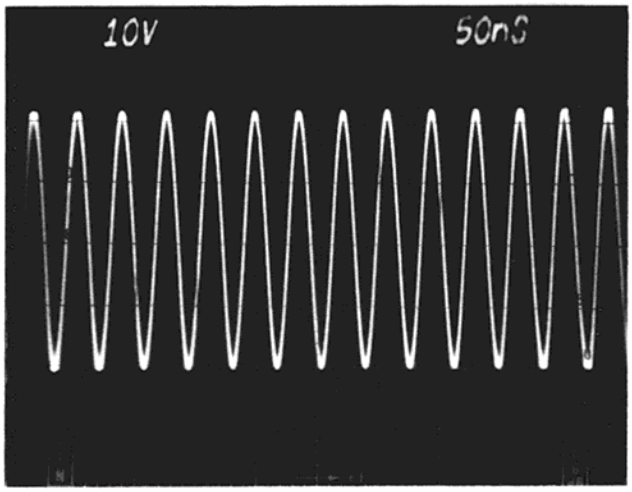
(a) Q6 COLLECTOR-OSCILLATOR 5*



(b) Q7 COLLECTOR-TX BUFFER 6



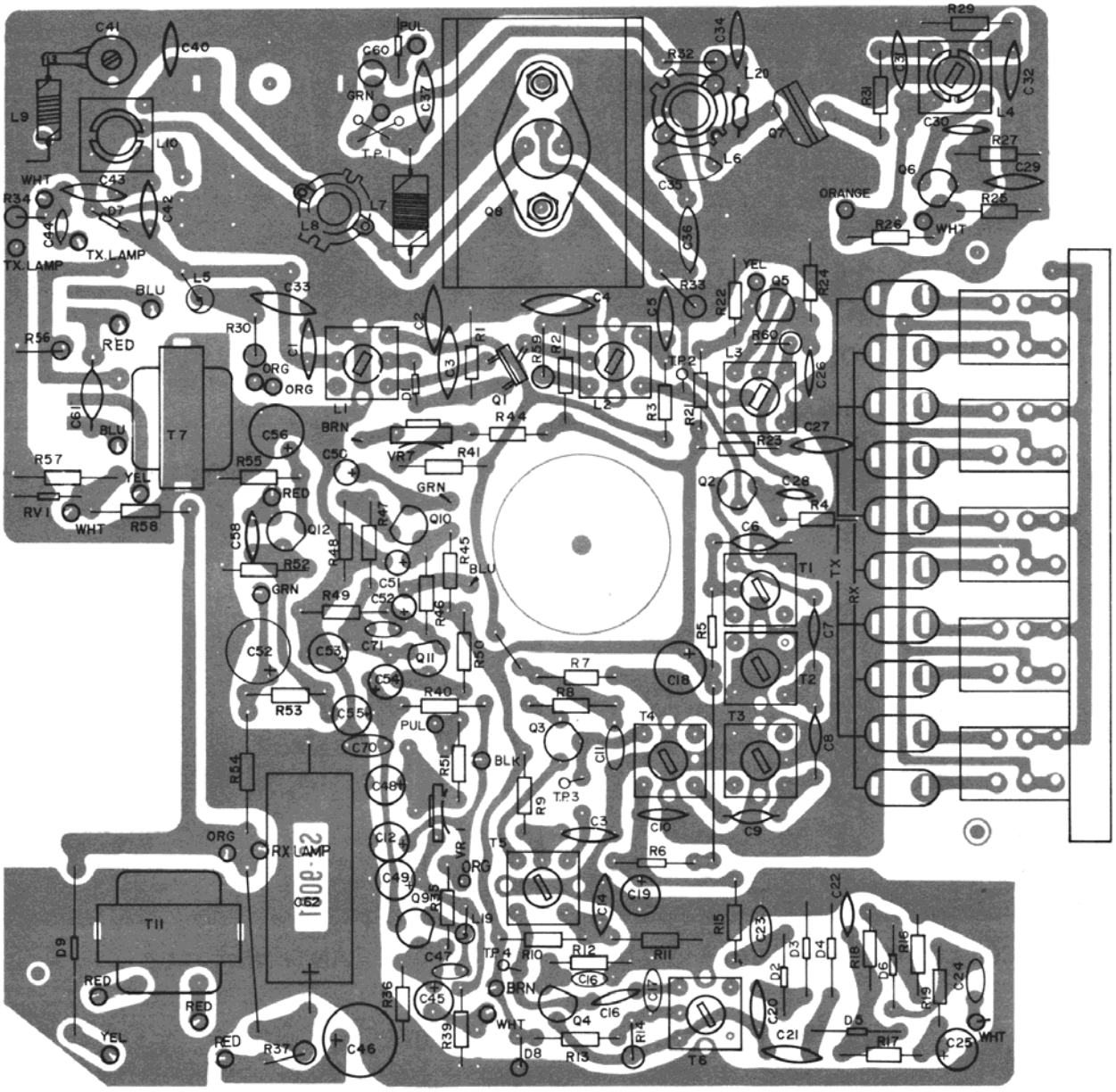
(c) Q8 COLLECTOR-TX FINAL 7



(d) ANTENNA JACK 8

* Numbers in corner of pictures correspond to numbers in boxes on schematic diagram and component location.

FIG. 5-12 COMPONENT LAYOUT



TOP VIEW

SBE-23CB CAPRI II PARTS LIST

SYMBOL #	PART #	DESCRIPTION
C1	8000-00035-026	Cap., Fixed, Cer., 270pfd, 50V, ±10%
C2	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C3	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C4	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C5	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C6	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C7	8000-00001-002	Cap., Fixed, Cer., 7pfd, 50V, ±10%
C8	8000-00001-002	Cap., Fixed, Cer., 7pfd, 50V, ±10%
C9	8000-00001-002	Cap., Fixed, Cer., 7pfd, 50V, ±10%
C10	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C11	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C12	8000-00001-016	Cap., Fixed, Elect., 33mfd, 16V
C13	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C14	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C15	8000-00006-049	Cap., Fixed, Cer., 2pfd, 50V, ±10%
C16	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C17	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C18	8000-00004-009	Cap., Fixed, Elect., 47mfd, 16V
C19	8000-00006-063	Cap., Fixed, Elect., 1mfd, 16V
C20	8000-00006-057	Cap., Fixed, Cer., 100pfd, 50V, ±10%
C21	8000-00006-059	Cap., Fixed, Cer., 150pfd, 50V, ±10%
C22	8000-00006-078	Cap., Fixed, Cer., .002mfd, 50V, ±10%
C23	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C24	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C25	8000-00035-032	Cap., Fixed, Tantalum, .47mfd, 25V
C26	8000-00006-061	Cap., Fixed, Cer., 330pfd, 50V, ±10%
C27	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C28	8000-00006-078	Cap., Fixed, Cer., .0022mfd, 50V, ±10%
C29	8000-00006-059	Cap., Fixed, Cer., 150pfd, 50V, ±10%
C30	8000-00035-024	Cap., Fixed, Cer., 18pfd, 50V, ±10%
C31	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C32	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C33	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C34	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C35	8000-00004-024	Cap., Fixed, Cer., 30pfd, 50V, ±10%
C36	8000-00006-057	Cap., Fixed, Cer., 100pfd, 50V, ±10%
C37	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C40	8000-00006-023	Cap., Fixed, Cer., 300pfd, 50V, ±10%
C41	8000-00004-204	Cap., Cer., Trimmer, 10pfd
C42	8000-00006-059	Cap., Fixed, Cer., 150pfd, 50V, ±10%
C43	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±10%
C44	8000-00006-055	Cap., Fixed, Cer., 13pfd, 50V, ±10%
C45	8000-00035-031	Cap., Fixed, Tantalum, .22mfd, 25V
C46	8000-00006-067	Cap., Fixed, Elect., 100mfd, 16V
C47	8000-00006-079	Cap., Fixed, Cer., .01mfd, 50V, ±20%
C48	8000-00035-029	Cap., Fixed, Elect., 10mfd, 6.3V
C49	8000-00001-016	Cap., Fixed, Elect., 33mfd, 6.3V
C50	8000-00001-014	Cap., Fixed, Elect., 4.7mfd, 6.3V
C51	8000-00001-014	Cap., Fixed, Elect., 4.7mfd, 6.3V

SYMBOL #	PART #	DESCRIPTION
C52	8000-00006-063	Cap., Fixed, Elect., 1mfd, 16V
C53	8000-00001-016	Cap., Fixed, Elect., 33mfd, 6.3V
C54	8000-00006-063	Cap., Fixed, Elect., 1mfd, 16V
C55	8000-00006-063	Cap., Fixed, Elect., 1mfd, 16V
C56	8000-00004-009	Cap., Fixed, Elect., 47mfd, 16V
C57	8000-00006-067	Cap., Fixed, Elect., 100mfd, 16V
C58	8000-00006-069	Cap., Fixed, Mylar, .001mfd, 50V, ±10%
C60	8000-00035-031	Cap., Fixed, Tantalum, .22mfd, 25V
C61	8000-00006-072	Cap., Fixed, Mylar, .047mfd, 50V, ±10%
C62	8000-00006-068	Cap., Fixed, Elect., 1000mfd, 16V
C63	8000-00006-081	Cap., Fixed, Feed-thru, 2200pfd, 50V
C70	8000-00006-077	Cap., Fixed, Cer., .001mfd, 50V, ±20%
C71	8000-00006-077	Cap., Fixed, Cer., .001mfd, 50V, ±20%
D1	8000-00006-007	Diode, 1N60
D2	8000-00006-007	Diode, 1N60
D3	8000-00006-007	Diode, 1N60
D4	8000-00006-007	Diode, 1N60
D5	8000-00006-007	Diode, 1N60
D6	8000-00035-001	Diode, WG1010A
D7	8000-00035-002	Diode, SR1K-8
D8	8000-00006-009	Diode, ZB1-9
D9	8000-00035-002	Diode, SR1K-8
D10	8000-00035-001	Diode, WG1010A
DS1	8000-00006-093	Lamp, Transmit
DS2	8000-00006-094	Lamp, Receive
L1	8000-00035-004	Ant. Coil, S4-9004
L2	8000-00035-005	RF Coil, S4-9006
L3	8000-00035-006	Oscillation Coil
L4	8000-00035-010	Transmit oscillator coil
L5	8000-00035-013	RF Choke Coil 15μh
L6	8000-00035-011	Driver Coil
L7	8000-00035-012	RF Choke Coil, .65μh
L8	8000-00035-014	L.P.F. Coil
L9	8000-00004-059	Coil, Fixed, .85μh
L10	8000-00035-015	L.P.F. Coil
L11	8000-00035-035	Coil, Choke, S4-9068
L19	8000-00012-015	Coil, Fixed, 2.2μh
Q1	8000-00035-003	Transistor, 2SC535 (B)
Q2	8000-00011-047	Transistor, 2SC710 (C)
Q3	8000-00011-047	Transistor, 2SC710 (C)
Q4	8000-00011-047	Transistor, 2SC710 (C)
Q5	8000-00011-047	Transistor, 2SC710 (C)
Q6	8000-00011-047	Transistor, 2SC710 (C)
Q7	8000-00003-042	Transistor, 2SC1018
Q8	8000-00006-002	Transistor, 2SC778
Q9	8000-00011-047	Transistor, 2SC710 (C)
Q10	8000-00011-047	Transistor, 2SC710 (C)
Q11	8000-00011-047	Transistor, 2SC710 (C)

SYMBOL #	PART #	DESCRIPTION
Q12	8000-00011-047	Transistor, 2SC710 (C)
Q13	8000-00004-087	Transistor, 2SC1014
Q14	8000-00004-087	Transistor, 2SC1014
R56	8000-00006-042	Wire Wound Resistor, 1Ω
T1	8000-00035-007	IFT Coil, S4-9006
T2	8000-00035-008	IFT Coil, S4-9007
T3	8000-00035-008	IFT Coil, S4-9007
T4	8000-00035-008	IFT Coil, S4-9007
T5	8000-00035-009	IFT Coil, S4-9008
T6	8000-00035-009	IFT Coil, S4-9008
T7	8000-00035-018	Input Transformer, S3-9003
T8	8000-00035-017	Output Transformer, S3-9002
RV1	8000-00004-067	Varister, MV-3
VR1	8000-00035-023	Semi-fixed, Resistor
VR2	8000-00035-023	Semi-fixed, Resistor
VR3	8000-00035-021	Variable Resistor, 50K Ω w/switch A
VR4	8000-00035-036	Resistor, Variable, 5K
	8000-00006-085	Speaker
	8000-00006-233	Microphone, Complete
	8000-00006-088	External Speaker Jack
	8000-00006-090	Ant. Connector
	8000-00006-091	Cylindrical Fuse, 2A
	8000-00006-096	External Speaker Plug
	8000-00006-098	Mike Hanger
	8000-00035-034	Cabinet Top
	8000-00006-109	Cabinet Bottom
	8000-00006-110	Mounting Bracket
	8000-00006-111	Mounting Pin
	8000-00035-037	Switch, 5 position, Push Button
	8000-00035-038	Knob, Push Button
	8000-00035-040	Lamp Holder
	8000-00035-041	Power Cord Retainer
	8000-00035-042	Heat Sink, Final Amp.
	8000-00035-043	Over Lay Front Panel, Black
	8000-00035-044	Crystal Cover
	8000-00035-045	Bezel
	8000-00035-046	Overlay Capri II
	8000-00035-047	Overlay, Receive
	8000-00035-048	Overlay, Transmit
	8000-00035-049	Lamp Cover, Blue
	8000-00035-050	Lamp Cover, Red
	8000-00035-051	Rubber Cap., Ant tuning
	8000-00006-128	Speaker Insulator
	8000-00035-052	F.C.C. Label
	8000-00006-096	External Speaker Lead
	8000-00006-091	Fuse, 2 amp
	8000-00006-138	Bolt, Mounting Bracket

SYMBOL #	PART #	DESCRIPTION
	8000-00006-098	Mike Hanger
	8000-00006-132	Styrofoam Box
	8000-00035-053	Display Box
	8000-00006-135	Plastic Bag, Mike
	8000-00006-136	Plastic Bag, Radio

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