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SHEET <u>1</u> OF <u>18</u>			
<i>G.E.M.</i> COMPILED	<i>[Signature]</i> CHECKED	TITLE: Production Test of M del SBE-2	
<i>[Signature]</i> APPROVED			

**COMPLETE PRODUCTION TEST
INSTRUCTIONS FOR
TMC MODEL SBE-2
TRANSMITTING MODE SELECTOR**

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TEST EQUIPMENT REQUIRED

Hewlett Packard Model	524-C	Frequency Counter
Ballentine	" 314	A.C. Voltmeter
Hewlett Packard	" 410B	VTVM
Hewlett Packard	" 200CD	Audio Generator
TMC	" PTE-3	Spectrum Analyzer
Heath Kit	" AV-3	VTVM
Crystal	TMC Type CR-27/U	2.000 MC
Crystal	TMC Type CR-27/U	4.000 MC
Crystal	TMC Type CR-27/U	2.270 MC
Crystal	TMC Type CR-27/U	4.270 MC

70Ω 2 Watt Resistor

1 Megohm Resistor ½ Watt

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***A. PRELIMINARY:**

1. Inspect the unit for mechanical imperfections, proper type and placement of filters, vacuum tubes/ and obvious wiring errors. Attach jumper to terminals 2 & 3 of E-101.
2. Check the oven heaters by measuring the resistance between pins D and E of J-109. For 115 V AC connections this value should be $300 \pm 10\%$; for 230 V AC connections $600 \pm 10\%$.
3. Check ALDC circuitry as follows: From J113 to ground (chassis) reading should be $470 K \pm 10\%$; From J113 to pins 2 and 7 of V113 reading should be $23K \pm 10\%$ in each case.
4. Check to insure that the RF and MF dial calibration marks line up with the Red line at the counterclockwise dial stop.
5. Connect the 70Ω load to the RF Output connector J-103.
6. Place test crystals in the oven as follows:

<u>Position</u>	<u>Frequency</u>
1.	2.0 mc
2.	4.0 mc
3.	2.27 mc
4.	4.27 mc

7. Connect the unit to the power supply and apply AC power. The Oven and Dial lamps should light up. After a brief warmup period, when oven lamp commences to cycle ON and OFF, proceed with the tests below.
8. With the Meter Switch in the CAL position, adjust the CAL potentiometer for ZERO reading of Meter M-101.

***B. 17KC Oscillator Check:**

1. With the VTVM at Pin 4 of T105, measure Output Voltage. The reading should be between .9 and 2.4 volts.

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2. With the Frequency Counter check the frequency of the 17 Kc Oscillator at Pin 4 of T-105. Should read 17 K \pm 8.5 cps at 70°C.

*C. 287 KC Oscillator Check:

1. With the VTVM at Pin 8 of Z103 or at the arm of R113, measure the Output Voltage. The reading should be between .7 and 1.5 volts.
2. Remove the VTVM and connect the frequency counter to Pin 8 of Z103 or the arm of R113. Adjust C-120 as necessary to bring 287Kc Oscillator on frequency. Should be 287 Kc \pm 57.4 cps at 70°C.

*D. Modulator Tests:

1. LSB Carrier Balance

- a. LSB, USB Switches in OFF or minimum position.
- b. Carrier Insert fully CCW, minimum.
- c. Connect VTVM across output of Z101 (LSB) filter.
- d. Adjust R110 for minimum indication on VTVM.
- e. Repeat above test for Z102 (USB) filter and R-112.

*2. 287Kc Modulator and 270 Kc Amplifier:

- a. LSB-USB Controls off or minimum.
- b. Set R113 Potentiometer and C259 to MID Position.
- c. Set C258 for maximum capacitance.
- d. Carrier Insert Maximum CW.
- e. Connect VTVM to Pin 2 or 7 of V113.
- f. Tune T108 and T107 bottom and top slugs for maximum output. Reduce carrier insert as necessary to prevent broad responsive tuning.

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- g. Remove VTVM and connect Frequency counter at Pin 2 or 7 of V113 and read frequency of 270 KC. This is the proper modulation product.
- h. Carrier Insert minimum, CCW.
- i. Connect VTVM to pin 7 of V109A and balance out 287 KC completely with R113 and C259.
- j. Lock nuts.

***E. Audio & Sideband Reversal Test.**

***1. Microphone Input.**

- a. Connect the AF generator unbalanced output in series with 1 megohm resistor to pin 1 of Mik Input jack and thence to ground, Pin 2.
- b. Set the USB and LSB Selector switches to OFF and Carrier Insert to minimum.
- c. Set RF Bandswitch to position 2-4 mes.
- d. Turn LSB Selector switch to Mike position. With the AF generator set to 1000 cps and an output of .05 volt, adjust the LSB Gain control for a deflection of 100% on LSB meter position. This point on the gain control should be reached before its maximum gain position.
- e. Connect the VTVM across the Output terminals of LSB filter Z-101 on the 0-1 volt scale. Note output indication. Turn RF Bandswitch to the 4-8 mes band the output indication should now be transferred from the LSB filter Z-101 to the output of the USB filter Z-102.

***2. Channel 1 Input.**

- a. Connect the AF generator balanced output to terminals 6 and 8 of E-101 with a twisted shielded pair and shield connected to terminal 7 thence by jumper to terminal 5, ground.
- b. Set USB and LSB Selector switches to OFF and Carrier Insert to minimum.

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- c. Set RF Bandswitch to position 2-4 mcs.
 - d. Turn LSB Selector switch to Channel 1 position. With the AF generator set to 1000 cps and an output of .05 volt, as measured across one side of the AF generator balanced output and ground. Adjust the LSB Gain control for a deflection of 100% on the LSB meter position. This point on the gain control should be reached before its maximum gain position.
 - e. Connect the VTVM across the Output terminals of LSB filter Z101 on the 0-1 volt scale. Note output indication. Turn RF bandswitch to the 4-8 mcs band the output indication should now be transferred from the LSB filter Z101 to the output of the USB filter Z102.
- *3. Channel 2 Input.
- a. Connect the AF generator balanced output terminals 10 and 12 of E-101 with a twisted shielded pair and shield connected to terminal 11 thence by jumper to terminal 9, ground.
 - b. Repeat the tests for paragraphs b thru of Channel 1 Input above, with the exception that USB should be substituted for LSB and vice versa, Z101 for Z102 and vice versa. Requirements remain as for Channel 1 Input above.

*F. VOX Tests:

*1. Gain

- a. Set VOX gain R-140 to maximum.
- b. All other gain controls to minimum.
- c. Increase Carrier Insertion R-106 until the Exciter Lamp and Relay K-101 energize as indicated by 5 ohms resistance from terminal 4 of K101 to ground.
- d. With the VTVM on Pin 2 of V110 a reading of .17 to .5 volt should be obtained.
- e. With the Carrier Insertion R-106 reduced to

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minimum, the Exciter Lamp and Relay K-101 should deenergize as indicated by infinite resistance from terminal 4 of E101 to ground.

f. Set the Transmitter switch S-104 to ON, the resistance reading from terminal 4 to ground of K-101 should again be ZERO.

***2. Squelch Test and Push to Talk:**

- a. Set VOX gain R-140 to maximum.
- b. All other gain controls to minimum.
- c. Increase Carrier Insertion R-106 until Exciter Lamp lights.
- d. Place Squelch Gain R-129 to maximum.
- e. Connect AF generator unbalanced output to Terminals 13 and 14 of E-101. With the generator set to 1000 cps adjust its output until the Exciter Lamp extinguishes.
- f. With the VTVM measure the voltage at Pin 9 of V110 it should be between .5 to 1.0 volt.
- g. To simulate closing of the Push to Talk circuit short terminal 1 of E-101 to ground. The Exciter Lamp should light and Relay K-101 should operate. Repeat for Pin 3 J-101.
- h. Return VOX gain and Squelch controls to minimum.

***G. M.F. ALIGNMENT-INJECTION-CARRIER BALANCE**

***1. Mid Frequency Alignment.**

a. At the mixer grid of V113 there may appear two frequencies, a 270Kc frequency (carrier inserted) and a VMO injection frequency. At the band extremes the following table applies.

<u>XTAL OR VMO</u>	<u>DIAL READING</u>	<u>LF</u>	<u>RESULTING FREQ.</u>
2000 Kc	2.0 Mc	270 K	1.73 Mc
4000 K	4.0 Mc	270 Kc	3.73 M

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- b. The MID FREQUENCY is aligned so that the proper product is chosen when the dial is set to the VMO or XTAL frequency, that is, when a 2000 Kc xtal is injected, the MF dial is set to 2.0 Mc but the actual frequency is 1.73 Mc which is the difference between the 2000 Kc xtal and the 270 KC LF. With this in mind, preliminary alignment may be accomplished by using the 2000 Kc and 4000 Kc xtals (or VMO).
- c. Before aligning the MF, see that the tuning capacitors are in full mesh when the dial is set to the mark r on the MF dial.
- d. Remove P107 from J110 on Z107. Connect VTVM to Pin 2 of Z107. Unbalance injection with R130, MF Balance Control.
- e. Select xtal position 1 (2000 Kc). Set MF dial to 2.27 MC. Tune T-109 and T110 for maximum output.
- f. Select xtal position 2 (4000 Kc). Set MF dial to 4.27 MC. Tune trimmers C140 and C141 for maximum output.
- g. This preliminary alignment will ensure subsequent selection of the proper mixer product on the MF dial.

*2. Carrier Balance.

- a. Select xtal position 1 (2000 Kc)
- b. MF dial to 2.27 Mc.
- c. Carrier Insert CCW, adjust R130 for minimum carrier as indicated by observing Meter in MF position. Lock R130. Reconnect P107 to J110.
- d. Correct MF alignment will be indicated when a signal indication is noted on the MF dial at 2.0 mc and 2.54 mc with carrier inserted and Xtal Position 1.
- e. Insert full carrier. Select xtal position 1 (2000 Kc) Set MF dial to 2.0 Mc. Tune T109 and T110 for maximum output. Select xtal position 2 (4000) Kc. Set MF dial to 4.0 mc. Tune C140 and C141 for maximum output in each case reduce the carrier to insure that proper mixer product has been selected. Repeat until band is tracked. Lock slugs with spintite to ls.

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***3. Crystal and VMO Injection Check.**

- a. Connect the VOX-5 output from the PTE analyzer to VMO input J104. Maintain a .1 on VOX-5 output meter level for all subsequent tests.
- *b. Connect the RF voltmeter at the junction of C163 and C164 and measure the voltages under conditions indicated below:

<u>S-107 Position</u>	<u>Freq.</u>	<u>Min. Voltage Limit</u>
1	2.0 mc	1.5 V.
2	4.0 mc	.6 V.
VMO	2.0 mc	1.5 V.
VMO	4.0 mc	.6 V.

***H. R.F. CIRCUITS ALIGNMENT**

***1. HF Oscillator and Multiplier Alignment.**

- a. Remove lead from J-108 and make connections from J-108 to RF VTVM.
- b. All controls except "Power On" and "Exciter ON" switches in OFF Position or minimum.
- c. Adjust L101 through L114 for maximum indication on RF VTVM at the corresponding "Injection" Frequency shown below. Output requirement is not less than 3. volts.
- d. Remove VTVM and connect frequency Counter to J-108.
- e. Adjust C-233 through C-240 for the correct frequency as indicated by the Frequency Counter for the frequencies shown in "Injection" Column below.
- f. Repeat above until frequency and output voltages are correct. Reconnect P105 to J108.

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BAND MC POS.	XTAL F. (mc)	INJECT F. (mc)	ADJUSTMENTS	REMARKS
4	8	8	C233 L101	<u>NOTE</u> When adjusting all slugs L101 thru L114 turn slug all the way out and adjust on the first peak indication.
5	10	10	C234 L102	
6	12	12	C235 L103	
7	14	14	C236 L104	
8	8	16	L105	
9	18	18	C237 L106	
10	10	20	L107	
11	11	22	C238 L108	
12	12	24	L109	
13	13	26	C239 L110	
14	14	28	L111	
15	10	30	L112	
16	8	32	L113	
17	17	34	C240 L114	

2. Preliminary RF Amplifier Alignment:

- a. Before alignment, check full meshing of capacitors C-181 against dial marking at low frequency end of dial.
- b. Channel 1 and 2 selector switches OFF.
- c. XTAL Switch Position 3 (2.270 mc), Carrier Insert set for maximum, CW.
- d. MF Tuning tuned at 2.270 mc. Meter in MF Position.
- e. RF Output terminated in 70Ω load.
- f. RF Voltmeter across 70Ω load.
- g. In subsequent RF alignment tests the drive should be sufficiently low to preclude broad response meter indications.

3. 2-4 MC Band Alignment:

- a. Output Tuning Bandswitch to 2-4 Mc Band.
- b. Band MC Switch to Band 0. MF Tuning to 2.27 mc. Meter in MF Position.

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- c. RF Tuning tuned to 2 MC, RF Meter switch in RF output position.
 - d. Tune T-116 and T-120 for maximum output.
 - e. XTAL position 4 (4.270 mc), carrier inserted and MF Tuning tuned to 4.270 mc on MF Meter position.
 - f. RF Tuning tuned to 4.0 mc. Meter in RF position.
 - g. Peak C-191 and C-179 for maximum output.
 - h. Repeat above steps to insure proper band alignment with reduced drive to insure sharp tuning peaks.
4. 4-8 MC Band.
- a. Output Tuning Bandswitch to 4-8 MC Band.
 - b. Tune MF to 4.270 mc, Output Tuning tuned to 4 m., RF Meter Switch in RF Output position.
 - c. Tune T-113, T-117, and T-121 for maximum output.
 - d. Carrier insert CCW, minimum carrier.
 - e. MF XTAL Switch in VMO position (remains in this position for subsequent RF band alignments).
 - f. Band MC Switch in Band 4. (8MC)
 - g. Output tuning tuned to 8 MC.
 - h. Peak capacitors C-203, C-192 and C-180 for maximum output.
 - i. Repeat above procedure to insure proper band alignment with reduced drive to insure sharp tuning peaks.
5. 8-16 MC Band.
- a. Output Tuning Bandswitch to 8-16 MC Band.
 - b. Output Tuning tuned to 8 MC. Meter switch in RF position.

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- c. Band MC Switch in Band 4 (8 MC).
 - d. Tune T-115, T-119 and T-122 for maximum output.
 - e. Band MC Switch to band 8 (16 MC)
 - f. Output Tuning tuned to 16 MC. Meter switch in RF position.
 - g. Peak capacitors C-202, C-190 and C-718 for maximum output.
 - h. Repeat above procedure to insure proper band alignment with reduced drive to insure sharp tuning peaks.
- 6.. 16-32 MC Band.
- a. Output Tuning Bandswitch to 16-32 Band.
 - b. Output Tuning tuned to 16 MC. Meter switch in RF Position.
 - c. Band MC Switch in Band 8 (16MC)
 - d. Tune T-114, T-118 and T-112 for maximum output.
 - e. Band MC Switch to Band 16 (32MC)
 - f. Output Tuning tuned to 32 MC, and RF Meter Switch to RF Output position.
 - g. Peak capacitors C-201, C-189 and C-177 for maximum output.
 - h. Repeat above procedure to insure proper band alignment with reduced drive to insure sharp tuning peaks.
- *7. Output Voltages and HF Carrier Balance.
- a. Carrier insert CCW, minimum.
 - b. Band MC Switch to Position 0, RF tuning tuned to 18MC.
 - c. RF Output Control set for mid scale reading on meter in RF position.

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- d. Balance R-150 of Z107 for minimum indication on RF output meter.
- e. Band MC Switch to band 0
- f. Set xtal selector switch to position 3 (2.270 Mc)
- g. With carrier inserted, tune MF to 2.270 Mc as indicated on Meter in MF Position.
- h. Audio generator connected to terminals 6-8 of E-101 Carrier Insert to CGW, LSB or USB gain set for 100% on MF Meter.
- i. Set RF bandswitch to 2-4 MC range. Tune output amplifier to 2 Mc. Observe VTVM.
- j. Check for 10.V minimum across 70 Ω load.
- k. The above Output Voltage test procedure must be repeated in two (2) megacycles increments from 2 through 32 Mc, each time checking that a minimum 10 volt RF output is obtained across the 70 Ω load.
- l. When performing above tests insure dial calibration is correct.

I. OVERALL TESTS & REQUIREMENTS

- *1. Power Output & Signal to Distortion Test.
 - a. This test will be made on one frequency selected at random in each one of the four RF Bands, note sheet 18 of 18, Data Sheet.
 - b. Connect the two AF test tones from the PTE analyzer with a twisted shielded pair to Channel 1 input, terminals 6 and 8 of E-101 with the shield connected to terminals 7 and 5. Connect the analyzer RF input to the Monitor Jack J102.
 - c. With the USB selector set to channel 1 and USB gain set to about -6 db, tune the unit to the selected output frequency for an output of 8.4 RF volts across the 70 Ω load.

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- d. Setup and adjust PTE as follows to measure the S/D in the USB;
 - (a) Gain fully clockwise.
 - (b) Amplitude scale switch to LOG.
 - (c) CAL OSC to OFF.
- e. IF attenuator to 20 db Position.
- f. Sweep selector to 14 Kc.
- g. AFC to OFF.
- h. The VOX-5 in the PTE should be adjusted for a frequency 500 kc higher than the signal frequency to be displayed. The two tone test signal should be set to the center of the analyzer.
- i. Adjust input attenuator switches so that two tone test signal peaks are as close as possible to the 0 line or slightly above. With the gain control set these peaks to the 0 line on the analyzer.
- j. Place IF attenuator switch to 0 position thus expanding the 0 to 40 db scale to 0 to 60 .
- k. Turn USB switch to OFF and adjust R109 and C119 of Z106 for maximum carrier suppression. Must be at least 55db down.
- L. Turn USB switch ON and note distortion products.

Requirement: The S/D must be at least 45 db below either tone of a standard two tone test for 1 watt PEP output as viewed on a PTE Panalyzer.

* 2. Carrier Suppression.

- a. This test will be performed on the same frequencies as the test in paragraph 1 above and with the same general PTE Setup.
- b. Turn USB and LSB switches to OFF, no AF input.
- c. Tune the unit to the desired frequency with carrier insert drive for 1 watt PEP output. Carrier presentation in center of analyzer and peak adjusted to the 0 line with IF 20 db attenuator IN.

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*d. Set IF attenuator switch to 0 and place carrier insert fully CW, carrier drive at minimum. Note level of the remaining carrier on analyzer.

Requirement: Maximum carrier suppression must be at least 55 db below the test signal at 1 Watt PEP.

*3. Unwanted Sideband Rejection.

a. This test will be performed on the same frequencies as the test in Paragraph 1 above and with the same general PTE setup.

b. Connect 500 \sim AF to terminals 6 & 8 of E-101, USB Channel 1 adjusted for -6 db and unit tuned to desired frequency for 1 watt PEP. PTE sweep at 14 Kc adjust presentation of 500 \sim tone signal to 0 line on analyzer with IF 20 db attenuator in.

c. Set LSB to Channel 1. This will provide a dual 500 \sim tone signal presentation. Note position of the LSB 500 \sim tone signal and then place LSB to OFF.

*d. Set IF 20 db attenuator to 0 and read the level of the 500 \sim tone appearing as an unwanted signal in the LSB.

*e. Repeat the above test for the LSB.

Requirement: Unwanted Sideband rejection shall be at least 60 db below 500 \sim ton test signal for 1 Watt PEP, both USB and LSB.

*4. 2nd Harmonic Suppression.

a. This test will be performed on a frequency in the 4-8 mc band.

b. Set both LSB and USB OFF and tune the unit with carrier drive to 1 Watt PEP output at the 2nd Harmonic of the fundamental frequency to be measured. (Example: -If desired frequency to be measured is 4

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MC, the unit would be tuned to 8 MC).

- c. Adjust presentation on PTE with IF 20 db attenuator IN and signal peak on 0 line. Leave all PTE controls at their present settings.
- d. Tune the unit to the fundamental frequency at the same output as above.
- *e. Set the IF 20 db attenuator to 0. The 2nd harmonic component will now be presented on the analyzer. Note the level of this 2nd harmonic signal.

Requirement: The 2nd harmonic shall be at least 40 db below the level of the fundamental frequency at 1 Watt PEP output.

***5. Frequency Response Test.**

- a. Setup AF generator to approximately the center frequency of the bandpass spectrum (1650~) at .05V output connected to terminals 6 and 8 of E-101., with shielded twisted pair, shield connected to 7 and 5. Monitor AF Generator output with Heath Kit AV-3 VTVM. Output should be constant.
- b. Connect VTVM at the LSB filter Z101 terminal 5 to ground.
- c. Advance LSB gain control to -6 db and adjust RF Output for center scale reading on VTVM.
- d. Maintaining constant output from the AF generator vary the frequency from 350~ to 3300~ noting the maximum and minimum readings indicated by the VTVM.
- e. Repeat above test for the USB with AF generator connected to terminals 10 and 12 on E-101 with the ground shield tied to terminals 11 and 14, and the VTVM connected at USB filter terminal 5 to ground.
Requirement: The difference between the maximum and minimum readings in step 5 above shall not exceed 3 db for LSB and USB.

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1. (A-1 thru 8) Preliminary check & tests completed _____ (✓)
2. (B) 17 Kc OSC. Checks
(1) Output Voltage _____ V.
(2) Frequency _____ Kc + _____ ~
3. (C) 287 Kc OSC. Check
(1) Output Voltage _____ V.
(2) Frequency _____ Kc + _____ ~
4. (D) Modulator Tests.
(1) LSB/USB Bal. completed _____ (✓)
(2) 287 Kc OSC. and 270 Kc amplifier adjustments completed _____ (✓)
5. (E) Audio & Sideband Reversal
(1) Microphone input completed _____ (✓)
(2) Channel 1 input completed _____ (✓)
(3) Channel 2 input completed _____ (✓)
6. (F) VOX Tests.
(1) Gain & K101 relay operation checked _____ (✓)
(2) Squelch & Push to Talk checked _____ (✓)
7. (G) MF ALIGNMENT
(1a thru g) Alignment Completed _____ (✓)
(2) Carrier Balance completed (a thru e) _____ (✓)
(3b) Crystal Injection at 2MC _____ V. at 4MC _____ V.
VMO Injection at 2MC _____ V. at 4MC _____ V.
8. (H) RF Circuits Alignment
(1) HF OSC and Multiplier Alignment completed _____ (✓)
(7) Output Voltages across 70Ω load for frequencies obtained as below:

2 MC _____ V.	14 MC _____ V.	26 MC _____ V.
4 MC _____ V.	16 MC _____ V.	28 MC _____ V.
6 MC _____ V.	18 MC _____ V.	30 MC _____ V.
8 MC _____ V.	20 MC _____ V.	32 MC _____ V.
10 MC _____ V.	22 MC _____ V.	
12 MC _____ V.	24 MC _____ V.	

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(H) OVERALL TESTS & REQUIREMENTS

BAND SW POS.	F OUT (mcs)	MADE AT 1 WATT PEP OUTPUT						
		S/D RATIO		MAX CAR SUP		UNWANTED SB. REJ.		SECOND HARM REJ.
		USB	LSB	db		USB	LSB	
2-4 mcs								
4-8 "								
8-16 "								
16-32"								

POWER OUTPUT: 1 Watt PEP obtained across 70 Ω load with 8.4 V. RF

Requirements:

- a. S/D at least 45 db below either tone of a two tone test signal at 1 watt PEP.
- b. Maximum Carrier Suppression at least 55 db below the signal at 1 watt PEP.
- c. Unwanted Sideband Rejection at least 60 db Below 500 \sim tone test signal at 1 watt PEP.
- d. 2nd Harmonic Rejection at least 40 db below two tone test signal at 1 watt PEP.
- e. Frequency Response from 350 \sim to 3300 \sim flat within 3 db (+ 1 $\frac{1}{2}$ db).

Max. Output (1) USB _____ DB
 Variation (2) LSB _____ DB

MFG. NO. _____ SERIAL NO. _____ DATE _____

TESTED BY _____ APPROVED BY _____

REMARKS

REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S-410

MODEL SBE-2

PROJECT NO. _____

DATE	REV.	PAGE	EMN #	DESCRIPTION	CHK.	APP.
7/31/62	A	3	6991	Chg. No. 3 to "A"		
				Add "III PROCEDURE"		
		5		Add letter "B" to "TITLE"		
				Add No. 1 to remark,		
				Add letter "C" to "MICROPHONE INPUT" Sect.		
		6		Add letter "D" to "CHECK INPUTS" Sect. Add No. 1 on "CHANNEL 1"		
				Chg. No's. to letters		
		7		Number "CHANNEL 2, No. 2 Letter "17KC CARRIER BAL." Sect. "E"		
		8		Letter "CARRIER RE-INSERTION" Sect. "F" Letter "VOX SQUELCH" Sect. "G"		
		9		Add letter "H" to "PUSH TO TALK" Sect. Number "287KC" Sect.		
		10		Add letter "J" to "AMPLITUDE MOD. SIMULATION TEST" Sect. Add letter "K" to "FINAL CHECK" Sect.		
		11		Add letter "L" to "MID FREQ. CRYSTAL" Sect. Add letter "M" to "MID FREQ. ALIGNMENT" Sect.		
		12		Number "MID FREQ. ALIGNMENT" Sect. Add letter "N" to "SETTING OF C258" Sect.		
		13		Add letter "O" to "MID FREQ. CARRIER BAL." Sect. Add letter "P" to "FINAL AMPLIFIER ALIGNMENT" Sect. Add letter "Q" to "3-4MC BAND ALIGNMENT" Sect.		
		14		Add letter "R" to "4-8MC BAND ALIGNMENT" Sect.		
		15		Add letter "S" to "8-16MC BAND ALIGNMENT" Sect. Add letter "T" to "16-32MC BAND ALIGNMENT" Sect.		
		16		Chg. from "FINAL TEST" Sect. to "OUTPUT TEST" Sect. Add letter "U"		
		17		Renumber items 1,2, add No. 11		
		18,19,20		Add sheets 18,19,20		
		all pages		Renumber all pages from 1 of 17 to 1 of 20		
9/8/64	B	-----	12308	Revised completely per EMN		
9/25/64	C	-----	12463	SH 5,6,14,15 Revised per EMN		
10/30/64	D	4	12828	Revised sht. 4 per EMN		
2/26/65	E	16,18	13590	Revised shts. 16 and 18 per EMN		