

DATE 2-14-61  
SH. 1 OF 5  
COMPILED BY

# TMC SPECIFICATION NO. S-536

TITLE: TEST PROCEDURE SBT-1KD

JOB

APPROVED

*Roukoh*

## A. INTRODUCTION

The SBT-1KD is a general purpose radio transmitter providing FS and CW operation throughout a frequency range of 2 to 32 megacycles at an output power of 1KW.

## B. MAIN COMPONENTS

The SBT-1KD consists of 8 separate units integrated to form the system. These units are:

- |                                  |        |
|----------------------------------|--------|
| 1. RACK ASS'Y.                   | RAK-9D |
| 2. ANTENNA TUNING SYSTEM         | ATS-2  |
| 3. LINEAR POWER AMPLIFIER        | RFD-1  |
| 4. AUXILIARY POWER PANEL         | APP-4  |
| 5. FREQUENCY SHIFT EXCITER       | XFK    |
| 6. VARIABLE FREQUENCY OSCILLATOR | VOX    |
| 7. LOW VOLTAGE POWER SUPPLY      | P.S.-4 |
| 8. HIGH VOLTAGE POWER SUPPLY     | P.S.-5 |

## C. TEST PROCEDURE

The test procedure for the SBT-1KD system is outlined on the following pages. Before the system can be tested correctly, all components except the RAK-9D rack assembly must be tested and passed by the test department as per the specific test requirements for each unit.

### I. EQUIPMENT REQUIRED

1. 52  $\Omega$  load, 1KW dissipation.
2. AC input power cable.
3. RF output cables, RG-8/U.
4. HP VTVM, Model 410B.

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5. Test chart, SBT-1KD (sheet 5 of S-536).
6. Square Wave Generator, Boonton Model 71.
7. Two, (2) conductor shielded cables.
8. Test Receiver (GPR-90 or equivalent).

II. PROCEDURE

1. Connect a jumper between terminals 5 and 8 on the rear of the APP-4 chassis. This completes the external interlock circuit.
2. Connect RF output cable from J609 on AX-198 assembly to RF input terminal of TU-2 antenna tuner which is part of ATS-2 unit.
3. Connect an RF cable from the output terminal of the TU-2 to the dummy load.
4. Set MAIN POWER switch on APP-4 to ON position. The red MAIN POWER indicator lamp should light.
5. Set MAIN POWER switch on PS-4 to ON position. The green MAIN POWER indicator lamp should light and RFD-1 blower and PS-5 fan should start running.  
NOTE: PS-4 TRANSMITTER VOLTAGES switch should be in STANDBY position; FINAL VOLTAGES switch on OFF position and OVERLOAD breakers in ON position. Adjust line voltage to 115 volts, rack fan should start running.
6. After a warm-up time of approximately 5 minutes, set the TRANSMITTER VOLTAGES switch to ON position. The red indicator lamp should light.
7. Set the FINAL VOLTAGES switch to ON position. The red indicator should light and approximately 220 MA of plate current should appear on the PA PLATE CURRENT meter on the RFD.
8. Place voltmeter across terminals 3 and 4 of E501 on rear of APP-4. Meter should read 115 volts A.C. This is transmitter antenna relay voltage, and may vary  $\pm$  10%.
9. With voltmeter connected as in (15) above, set XMTR VOLTAGES switch on PS-4 to STANDBY POSITION.
  - a. Voltmeter should read zero volts.
  - b. FINAL VOLTAGES and TRANSMITTER VOLTAGES indicators on P.S.-4 should go out. Remove meter.

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## PROCEDURE CONT'D

10. Place a jumper across terminals 1 and 2 on T601. TRANSMITTER VOLTAGES and FINAL VOLTAGES indicator should light. Remove jumper. This checks the REMOTE XMTR PLATE circuit to the P.S.-4.
11. Place an ohmmeter across terminals 24 and 25 E502. The ohmmeter should read 10 ohm  $\pm$  10% between 24 and 25 and  $\infty$  between 23 and 24.
12. Place a jumper across terminals 1 and 2 to key the unit. An ohmmeter connected between 23 and 24 should read 10 ohm + 20%; between 24 and 25 should read  $\infty$ . Remove jumper and meter.
13. Set POWER switch on the XFK to ON position. POWER and xtal indicators should light.
14. Place a jumper across terminals 27 and 28 on the APP-4 chassis. This completes the KEY circuit to the XFK.
15. Set POWER switch on the VOX to ON position.
16. Turn METER switch on the VOX to the HFO position.
17. With the XFK XTAL switch in the EXT. position and MODE switch in CW, adjust the POWER control for about 25MA on XFK PA PLATE CURRENT meter.
18. Turn the VOX OUTPUT control to minimum output.
19. Set the TRANSMITTER VOLTAGES switch on the P.S.-4 to the ON position. The FINAL VOLTAGES and TRANSMITTER VOLTAGES indicators should light.
20. Using the VOX, XFK and RFD-1, adjust the system for 1KW, CW, at test frequency. Use the ATS-2 to obtain minimum standing wave ratio. (See chart).
21. Reduce transmitter output to zero and set TRANSMITTER VOLTAGES switch to STANDBY position.
22. Connect a piece of 2 conductor shielded cable from the two uppermost S.W. output terminals on the SQUARE WAVE GENERATOR to the rear of APP-4 chassis terminal board E502 so that the upper S.W. output terminal is connected to terminal 32 on E502 and the other S.W. output terminal connected to terminal 31 on E502.

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## PROCEDURE CONT'D.

23. Set the MULTIPLY BY frequency selector on the SQUARE WAVE GENERATOR to 1 position.
24. Turn the CYCLES frequency selector maximum counter-clockwise and observe fluctuating meter reading.
25. Turn the control knob under the PEAK VOLTS meter maximum counter-clockwise.
26. Set the small OUTPUT selector switch to the 50 position.
27. Turn the MODE selector switch on the XFK to "L" (LINE) position.
28. Set the FREQUENCY control to 0 CPS.
29. Set the FREQUENCY SHIFT CPS control to 850.
30. Set up test receiver to receive test frequency. BFO on.
31. Adjust SBT-1KD for 1KW output at test frequency. A varying tone above and below the center frequency should be heard.
32. Reduce the FREQUENCY SHIFT CPS indicator to a lower value. A narrower shift should be heard.
33. Reduce transmitter output to zero.
34. Change the small OUTPUT selector on the SQUARE WAVE GENERATOR to the 10 position.
35. Disconnect the wires from terminals 31 and 32 of test cable assembly and connect to terminals 27 and 29. This connects the generator to the FAX input.
36. Set the MODE selector switch on the XFK to the FAX position.
37. Increase transmitter output to 1000 watts. A varying tone should be heard.
38. Reverse the output leads at the SQUARE WAVE GENERATOR and note a change in frequency of output tone of receiver.
39. Reduce transmitter output to zero.
40. Turn off all power switches and reduce all gain controls to zero. Remove AC connections to line. Remove all test equipment and cables. This completes operational testing of system SBT-1KD. Check cables, hardware and slides for ease of movement. Units should tilt without obstruction. This completes testing of system SBT-1KD.

TEST CHART SBT-1KD

DATE \_\_\_\_\_  
TEST BY \_\_\_\_\_

SBT-1KD ser. no. \_\_\_\_\_  
ATS-2 ser. no. \_\_\_\_\_

RFD ser. no. \_\_\_\_\_  
VOX-3 ser. no. \_\_\_\_\_  
XFK ser. no. \_\_\_\_\_

P.S.-4 ser. no. \_\_\_\_\_  
P.S.-5 ser. no. \_\_\_\_\_  
APP-4 ser. no. \_\_\_\_\_

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FREQ MC	VOX SETTING	XFK BAND	DRIVER BAND	1KW PEP, SSB							1KW, CW			REMARKS		
				1st AMPL. TUNE	PA GRID TUNE	PA TUNING	PA LOADING	PA LOADING SWITCH	MA, PA PLATE CURRENT	MA, PA SCREEN CURRENT	3rd ORDER DISTORTION -DB	MA, PA PLATE CURRENT	MA, PA SCREEN CURRENT		FORWARD POWER WATTS	REFLECTED POWER WATTS
2																
5																
10																
20																
30																

NOTE: 1. 1KW, CW, is 225 VRMS ACROSS 52 LOAD.

ITEMS	ACCEPT	REJECT
1. A.C. POWER TO APP-4	_____	_____
2. A.C. POWER TO PS-4	_____	_____
3. A.C. POWER TO XFK	_____	_____
4. A.C. POWER TO VOX-3	_____	_____
5. INTERLOCK CIRCUITS	_____	_____
6. KEY CIRCUIT (XFK)	_____	_____
7. REMOTE XMTR PLATE CIRCUIT	_____	_____
8. RECEIVER MUTING	_____	_____
9. 115V ANTENNA RELAY	_____	_____

SYM	DESCRIPTION	DATE	CH. NO.	DRAFTS	CHECKER	ENG. APP.

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
TOLERANCES ON  
FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 1/2°

SCALE:  
MAXIMUM ALLOWABLE TOLERANCES HAVE  
BEEN DETERMINED AND ANY DEVIATIONS  
WILL BE CAUSE FOR REJECTION.  
REMOVE ALL BURRS AND SHARP EDGES

REQ. PER UNIT	MODEL	SECTION	ASS'Y. NO.	DATE

USED ON

REQ. ITEM	PART NO.	DESCRIPTION	SYMBOL
THE TECHNICAL MATERIEL CORP. MAMARONECK, NEW YORK			
S-536 SHEET 5			
TEST PROCEDURE CHART, SBT-1KD			
MATERIAL		<i>Ron Kohn</i>	
TYPE & TEMPER	HEAT TREAT. SPEC.	DRAWN	CHECKER
FINISH & SPEC. NO.		FINAL APPROVAL	
		<i>RK</i>	
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