DATE 12/27/[illegible]	TMC SPECIFICATION NO. S-799	D
SHEET 1 OF 5		
FED COMPILED	CHECKED NP	TITLE:
APPROVED BP		

PRODUCTION TEST PROCEDURE TRX-1

SILVIC PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 4000

TMC SPECIFICATION NO. S-799

D

FRD COMPILED | NP CHECKED

TITLE: PRODUCTION TEST PROCEDURE TRX-1

APPROVED

I. INTRODUCTION

A. The model TRX-1 is a crystal oscillator and control panel providing HFO, IFO, and BFO injection frequencies. The model TRX-1 contains 13 crystals with a stability of one part in 10^5 per day for a 15^oC ambient change between 0 to 50^oC. With the addition of the crystal oven assembly AO-111, a stability of one part in 10^6 per day for an ambient of 0 to 70^oC is obtained.

The model TRX-1 incorporates a self-contained solid-state power supply for operation from a 110/220 VAC supply.

For test purposes, the model TRX-1 may be divided into four sections: The power supply, the IFO, the BFO, and the HFO, and amplifier.

(1) The Power Supply - The power supply is a conventional full wave bridge supplying 200VDC unregulated. The standby-operate switch, S-103, disconnects the B+ from the oscillators and amplifiers. When the optional oven, AO-111, is used in the 110VAC configuration, it is connected across the power line. In the 220VAC configuration, it is connected across one half of the power transformer primary in auto-transformer operation.

NOTE: SO LONG AS THE TRX-1 IS CONNECTED TO A POWER SOURCE, THE OVEN AND ALL FILAMENTS ARE OPERATING AND THERE IS HIGH VOLTAGE PRESENT.

(2) The IFO - The IF oscillator (V-105) is a modified Colpitts type, crystal controlled, operating at 3.5MC. C-129 serves as a fine frequency adjustment and T-102 couples the output of the oscillator into 47 ohm loads at J-104 and J-105.

(3) The BFO - The beat frequency oscillator (V-106) is a modified Colpitts type, crystal controlled, operating in the range of 445 to 465KCS. C-125 serves as the fine frequency adjustment for frequency "A", C-128 serves as the fine frequency adjustment for frequency "B". Switch S-102 selects crystal "A" or "B" and disconnects the B+ for the BFO in the "OFF" position. L-114 acts as the load for V-106 and is tuned so that both "A" and "B" frequencies have th same output. R-137 adjusts the output to 1.0 V. into a high impedance load (Approx. 1K ohms) at J-106 and J-107.

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(4) The HFO and Amplifier - The high frequency oscillator (V-101) is similar to the BFO and IFO. Each HFO crystal has a trimmer for fine frequency adjustment. S-101 selects the crystal desired in positions 1 through 10. In position 11 and 12 no crystal is operating in the circuit.

In the plate circuit of V-101, CR-101 clips the positive portion of the RF signal to generate harmonics of the fundamental.

The RF signal is then RC coupled to V-102, amplified and RC coupled to the phase splitter, V-103.

With the signal at the grid of V-103 as the reference, the plate signal lags by 180° while the cathode signal is in phase. The two output impedances (Xp and Xk) are approximately equal.

Variable, R-115, is the balance control for the push-pull HFO final amplifier. J-101 couples the RF signal from the plates of V-104 to the load at J-101 and J-102 (47 ohm).

II. TEST EQUIPMENT REQUIRED

A. VTVM Hewlett-Packard 410BR or equivalent.
B. RF Generator - Measurements Corporation MO.82 or equivalent.
C. RF. Counter Hewlett-Packard 524C or equivalent.
D. Crystals - 3.5MC 455KC*2MC,8MC and 15MC.

E. 2 dummy loads :2-300 ohm,1/2 watt resistors (for BFO)
2-50 ohm,1/2 watt resistors (IFO & HFO)

*NOTE: THE 455KC TEST CRYSTAL IS USED IN THE BFO FOR ALIGNMENT PURPOSES UNLESS OTHERWISE SPECIFIED BY CUSTOMER, IN WHICH CASE THE BFO TEST CRYSTAL FREQUENCY IS CALCULATED AS FOLLOWS: FREQUENCY "A" (KC) + FREQUENCY "B" (KC) /2. A RF GENERATOR MAY BE USED INSTEAD OF THIS CRYSTAL.

III.. PRELIMINARY

A. Inspect unit for mechanical imperfections and for proper placement of components.
B. Inspect unit for obvious wiring errors.
C. Check for B+ shorts with ohmmeter. Meter should indicate higher than 10K ohms.

IV. TEST OF POWER SUPPLY

A. Turn POWER switch (S-103) to ON position.

B. Check B+ voltage across R136. It should be 200VDC±10%.
C. If crystal oven, AO-111, is being used, check DS100 to see if it is operating.

V. TEST OF THE IFO

A. Insert 3.5MC crystal in socket(Y-113).
B. Connect dummy loads to J104 and J105. Counter to J104.
C. Connect VTVM to pin 5, V-105 (AC volts).
D. Tune T-102 for maximum indication on meter. Tighten lock-nut.
E. Tune C-129 for 3500KC at counter.
F. Remove VTVM and connect to yellow lug of T-102.
G. Check RF output voltage of IFO, 1.0 VAC,+50%-10%.
H. Remove VTVM, counter, dummy load, and 3.5MC crystal.

VI. TEST OF THE BFO

A. Insert 455KC test crystal in socket(Y-111) and turn BFO switch(S-102) to "A" position.
(See note under section II Test Equipment Required)
B. Connect counter to J-106. Dummy loads on J106-J107.
C. Connect VTVM to pin 5, V-106(AC volts)
D. Tune L-114 for maximum indication on VTVM. Tighten lock-nut. Connect VTVM to J107.
E. Rotate OUTPUT CONTROL(R-137) to maximum clockwise position.
F. Tune C-125 for 455KC at counter.
G. Remove crystal from socket (Y-111) and place in socket(Y-112) Turn BFO switch(S-102)to "B" position.
H. Tune C-128 for 455KC at counter.
I. Check VTVM for output of both "A" and "B", at least 1.0 VAC.
J. Remove VTVM and counter, and 455KC crystal.

VII. TEST OF THE HFO AND AMPLIFIER

A. Insert test crystal (2MC,8MC,15MC)in crystal socket (Y101).Turn HFO switch(S-101) to position "1".
B. Connect VTVM and dummy load to J-101,and connect counter to J102.
C. Adjust HFO trimmer, C-158 for crystal frequency.
D. Adjust HFO BALANCE(R-115) for maximum indication on VTVM. Tighten lock-nut.
E. Output voltage at J-101 should be 1.0 VAC minimum.
F. Insert test crystal in crystal socket (Y102).
G. Turn HFO switch to position "2" and adjust the proper trimmer for crystal frequency.
H. Repeat steps F and G for positions 3 to 10 on the HFO switch.
I. Turn HFO switch to position 11. Connect generator to J-103. Set generator for 10MC and adjust output for an indication on the VTVM. Remove meter, RF generator, and dummy load, and test crystals.

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THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y.

TRX-1 TEST DATA SHEET

SERIAL NO._____

MFG. NO._____

1. Preliminary

a. Mechanical	_____	OK
b. Electrical	_____	OK
c. B+ short (10K or greater)	_____	ohms.

2. Power Supply

a. B+ (200 VDC±10%)	_____	VDC
b. DS-100 (Oven Light)	_____	OK
c. DS-101 (Power Light)	_____	OK
d. AO-111 (optional)	_____	OK

3. IFO

a. Frequency (3500 kcs)	_____	KCS
b. Output (1.0 VRMS+50%-10%	_____	VRMS

4. BFO

a. Test Frequency "A"	_____	KCS
b. Test Frequency "B"	_____	KCS
c. Output "A"	_____	OK
d. Output "B"	_____	OK

5. HFO and Amplifier

a. Output at test xtals (1.0 VAC MIN)	2MC _____	VRMS
	8MC _____	VRMS
	15MC _____	VRMS
b. HFO switch positions 2 to 11	_____	OK

DATE_____

TESTER_____

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REVISION SHEET	THE TECHNICAL MATERIEL CORP. MAMARONECK NEW YORK	S-799 LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
2/17/64	A	4	10913	Revised Sheet 4 per EMN.	
8/4/64	B	3,4,5	12044	Revised shts. 3,4,5 per EMN	
8/14/64	C	3,4,5	12137	Revised shts. 3,4,5 per EMN	
9/1/64	D	4,5	12280	Revised shts. 4,5 per EMN	