DATE 30 April 1963 SHEET 1 OF 7	**TMC SPECIFICATION NO. S** - 757	
NP COMPILED / CHECKED N.P.	TITLE:	
APPROVED BP		

CPO-1A TEST PROCEDURE

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 439M

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I. Preliminary

A. Connect RF and power cables to units as shown in CK-651.

B. Inspect rack for mechanical imperfections.

1. Insure that cables are free when separate units are pulled out and tilted from rack.

2. Units should line up in rack together; there should not be any contact between front panel edges.

3. Units should slide freely.

C. Connect power to rack input J909.

D. Set CPP-2 and CHG power switches to "ON". CHG and CMO oven lights should be on. Because of the delay tube in the CPP-2, a 60 second wait is necessary before B+ is applied to its associated units. This should be observed.

E. The CSS power switch should be turned to the "ON" position.

F. The CPO-1A system should have at least a 24 hour warm-up period before testing. This will allow ovens to warm-up and cycle.

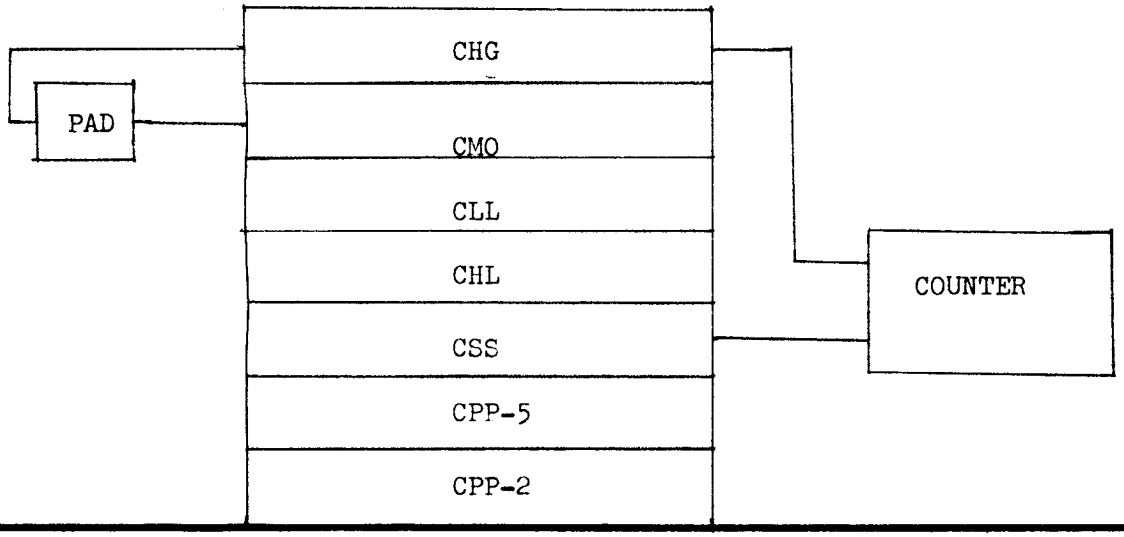
II. Test Equipment Required

A. 1-70 ohm, non-inductive, 5 watt resistance.

B. 1-electronic counter, H.P. 524C or equivalent.

C. 1-RF VTVM, H.P. 410B or equivalent.

FIGURE 1.



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III. Test Equipment Set-up

A. CHG J-1104 output connected to load.

B. CHG J-1105 monitor connected to analyzor and counter signal input connectors.

C. CSS J-1602 1MC out to counter frequency standard input; set counter standard switch to external. This is to eliminate any error in the output frequency readout on the counter due to a difference in frequency between the CPO standard (CSS) and the standard in the counter.

IV. General Checkout

This can only be accomplished by the completion of a 24 hour warm-up.

A. Observe if ovens are cycling in CMO and CHG (i.e. oven lights should go on and off).

B. The CMO drive control should be turned as needed. This is to prevent pinning the CHG MF meter.

C. A square should appear on the scope in the L-1, L-2 and L-3 positions of the CLL. This should be true for all the positions on the KCS and CPS switches.

D. The CHG sync indicator light should remain on in each of the band switch positions.

E. Connect test equipment as shown in Figure 1.

F. Set CMO counter dial to 1750 KCS, function switch in calibrate position. Beat should be observed on calibrate indicator light. If not, alignment of the oscillator ends is necessary.

1. Oscillator Alignment -

a. Set CMO counter to 1750 KCS. 1750 KCS should be approached from the lower frequency side (i.e. 1650 KCS to 1750 KCS). This will prevent any error due to backlash.

b. Rotate calibrate knob until beat on calibrate indicator light is observed. As an additional check, the output of the CMO through a 20 db pad, can be read on the counter.

c. Set CMO counter to 3750 KCS. Again, as in the 1750 KCS case, 3750 KCS should be approached from the lower frequency side (i.e. 3650 KCS to 3750 KCS).

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d. Rotate MO "High End" trimmer until beat on calibrate indicator light is observed. This trimmer is located behind the front panel hole adjacent to the calibrate knob.

e. Repeat step a. through d. until beat is observed at 1750 KCS and 3750 KCS without further adjustments. This completes the oscillator alighment.

V. CPO Tuning

A. Determining Output Frequency -

The output frequency is determined by adding the bandswitch numeral which is in MCS, to the CMO output frequency. Take, for example, that a frequency of 12,751,200 cycles is desired. Bandswitch is set to 11.750-13.750, number 10 position.

10,000,000 cycles + 2,751,200 cycles-12,751,200 cycles.

B. CMO and CLL Adjustment -

1. Turn CMO function switch to operate and MO counter to 2750 KCS.

2. Vary Tuning KCS control for maximum reading on output tune meter. This will occur at approximately 2.75 on the panel dial.

3. The KCS switch is set to (1) one, and the CPS switch at (2) two. This is because the synthesizer only controls the 100 cps and 1000 cps digits of the MO. We depend on the MO accuracy for the thousand, hundred, and ten digits on the MO counter. Note the color coding and CLL and CMO panels.

4. Synchronizing of CMO at 2750 KCS:

a. Vary the MO control approximately 2 KC above and below 2750 KCS. The sync meter will follow in the same direction as this control is varied (i.e. when the MO control is varied to the right the sync meter pointer will move to the right). At the same time the sync indicator will ignite.

b. Vary the MO control 1KC above and below 2750 KCS (i.e. 2751 KCS-2749 KCS). The sync indicator light should remain on. The sync meter should follow the variation of the MO control through the green range of the sync meter face. This

V. Cont'd.

is regarded as the lock-in range.

c. As a final check on sync action, vary the MO control slowly approximately 3 KCS above and below 2750 KCS. As the loop drops out of sync, (sync meter will fall to center scale position) the sync indicator light will go off.

C. CHG. Adjustment -

1. Bandswitch is set to the output frequency desired. In the case of the example, it is set at 11.750-13.750, Bandswitch No. (10) ten.

2. Vary the MF tuning control for maximum indication on the CHG MF tuning meter. Care should be taken as in Part III B. This will occur at approximately 2.75 on the panel dial in the example. MF tuning meter must never be operated in the red region.

3. Turn B+ switch to "ON" position.

4. Peak output meter at 1750 KCS with the main tuning control.

5. Rotate output control to an output meter reading of approximately 8 or 9.

6. The counter will read the output frequency ±1 count. In the case of the example, it will read 12,751,200 cycles.

7. Set up frequencies 25,200,400 cycles and 30,800,900 cycles. Note the read-out on the counter. It can be seen in the Test Equipment set-up, Figure 1, that the CSS is also used as the standard for the counter. Therefore, any error in the counter read-out is due to the CSS 1MC STANDARD.

8. With the output control fully clockwise, the output voltage across the 70 ohm load should be 8.5 volts or better.

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APPROVED

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y.

CPO-1A TEST DATA SHEET #1

SERIAL NO.:_____

MFG. NO.:_____

A. Mechanical

1. Slides_____ OK
2. Front panel line-up_____ OK
3. Cables_____ OK

B. Oven Cycling

1. CMO_____ OK
2. CHG_____ OK

C. CMO

1. Calibration_____ OK
2. Beat Indicator_____ OK

D. CHG

1. Output Voltage_____ Volts

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CPO-1A TEST DATA SHEET #2

TEST FREQUENCIES			BANDSWITCH NUMBER	OUTPUT TUNING DIAL BAND	COUNTER
1.750	2.750	3.750	0	A	
3.750	4.750	5.750	2	B	
	4.000		2	B	
	5.000		2	B	
5.750	6.750	7.750	4	C	
7.750	8.750	9.750	6	C	
9.750	10.750	11.750	8	C	
11.750	12.750	13.750	10	C	
13.750	14.750	15.750	12	D	
15.750	16.750	17.750	14	D	
17.750	18.750	19.750	16	D	
19.750	20.750	21.750	18	D	
21.750	22.750	23.750	20	D	
23.750	24.750	25.750	22	D	
25.750	26.750	27.750	24	D	
27.750	28.750	29.750	26	D	
29.750	30.750	31.750	28	D	
31.750	32.750	33.750	30	D	

DATE: _____

TESTER: _____

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