DATE 12/18/62	TMC SPECIFICATION NO. S 697	C
SHEET 1 OF 9		
JNS COMPILED / N.P. CHECKED	TITLE:	
APPROVED BP		

AX-388 TEST PROCEDURE
(HFS) 1MC SELECTOR DECK

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 459M

DATE 12/18/62 SHEET 2 OF 9	TMC SPECIFICATION NO. S 697	C
JNS COMPILED / CHECKED	TITLE: AX-388 TEST PROCEDURE	
APPROVED	(HFS) 1MC SELECTOR DECK	

I FUNCTION & DESCRIPTION:

The main function of the 1MC Selector Deck is to convert the incoming signal from the receiver oscillator, (this signal may vary in frequency from 3.75MC to 33.75MC) to a signal between the frequency of 3.25MC and 4.25MC which is phase referenced to the 1MC system standard.

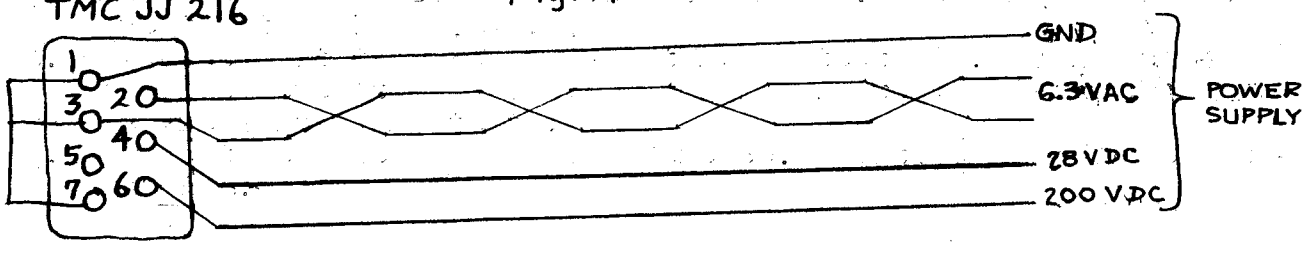
The high frequency loop is designed so that any portion of the incoming frequency spectrum may be selected out to the nearest 1MC step and then converted to a frequency within the 3.25 to 4.25MC band width.

This unit also has the function of amplifying the 1MC standard signal for use in other portions of the synthesizer. It also generates (by second harmonic selection of the 1MC standard) a 2MC signal for use elsewhere in the system.

II TEST [redacted]

a. [redacted] Milli-voltmeter - Boonton Model 91CA or equivalent.
b. TMC model GSS-1-1MC at 1V RMS.
c. Power supply Lambda Mo. 26 or equivalent.
d. Test cable [redacted] (2 required). Fig. A
e. Frequency counter. H.P. Mo. 524C or equivalent.
f. Burroughs nixie (B5031) with TMC cable CA668.
g. Burroughs nixie (B5031) with TMC cable CA667.
h. Signal Generator Measurements Mo. 82 or equivalent.
i. 100KC selector deck, AX387. Previously tuned up.
j. 12" coax cable, RG174U, with PL204 on each end.

Fig. A



To mate with J3506

TMC SPECIFICATION NO. S-697

C

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(HFS) 1MC SELECTOR DECK

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III PRELIMINARY:

A. Inspect unit carefully. See that unit is clear of loose parts, short circuits, etc.
B. Measure resistance of B+ line to ground. Reading should be greater than 10 meg. ohms.
C. Connect unit to power supply though test cable. Turn on B+ and set level to 200 VDC. Allow 15 minutes for warm up before continuing tests.
D. D. Plug in CA667 to J3507 and CA668 to J3508. CA667 indicates the units digit and CA668 indicates the tens digit.

1. Rotate selector switch in clockwise direction. After the two blank positions, the Nixies should read from 02 through 31 in consecutive order(The Nixie that reads "0" is connected to J3507. The Nixie that reads "2" is connected to J3508).

IV ALIGNMENT: PROCEDURE

A. 48.5 - 72.5 Oscillator

1. Turn piston capacitors C3501 to C3530 all the way in (CW).
2. Connect RF milli-voltmeter to pin 1 of V3506.
3. Set selector switch so that the Nixies read 02.
4. Turn C3501, CCW past maximum amplitude until a sharp drop is obtained. Turn C3501 slowly CW to maximum amplitude and one complete turn after that. Maximum amplitude should not be less than 0.8V RMS.
5. Repeat steps 3 and4 for positions 03 to 31, adjusting C3502 to C3530

B. IMC Amplifier, Pulse Generator, and 2nd Harmonic Generator

1. Turn S3501 to blank position.
2. Connect RF Generator to J3501. Set it to 1MC and 1V out.
3. Connect 47 ohm load across J3502.
*4. Connect meter across J3502 and tune T3505 for maximum output. The voltage should be .8 VRMS minimum.
5. Connect 25 ohm load across J3505.
*6. Remove meter from J3502 and connect it across J3505. Tune T3503 for maximum amplitude. The voltage should be .8V RMS minimum.

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C. 40.5MC IF STRIP

1. Connect meter and counter to TP3506.
2. Connect signal generator to TP3505.
3. Set generator frequency on 40.5MC and set output at .2V.
4. Adjust C3635 for maximum amplitude.
5. Remove generator from TP3505 and connect it to TP3504 leaving frequency and output unchanged.
6. Adjust C3628 for maximum amplitude.
7. Remove generator from TP3504 and connect it to TP3509 lowering output to 20MV.
8. Adjust C3623 for maximum amplitude.
9. Trim up capacitors C3635, C3628, C3623, for max. amplitude.
* 10. Vary frequency about 40.5MC and note bandwidth between 3db points. Bandwidth should be less than 500KC.

D. 43.75 - 44.75MC IF Strip

1. Set selector switch to blank position and short TP3504 and TP3505 to ground (this removes any possible interference from the 40.5MC strip).
2. Attach counter to signal generator mark the dial, for frequencies fo 43.75, 44.25 and 44.75MC. Remove counter from signal generator and attach signal generator to TP3508.
3. Detune C3581, C3582, C3590 and C3588 by turning counter CW all the way out.
4. Attach meter to TP3501.
5. Set generator to 44.25MC and output at 100MV.
6. Adjust C3581 to get maximum amplitude at TP3501.
7. Adjust C3582 for maximum dip in meter. The meter dip should be approximately 5 to 6db.
8. Vary the frequency between 43.75 and 44.75MC and note the bandwidth (800KC) between the 3db points. It should be noted that if the meter dip obtained while C3582 (grid capacitor) is tuned is more than 6db, (this indicates too much coupling between primary and secondary of T3501) the bandwidth will be more than 800KC and most probably resonant peaks will show up. If the meter dip obtained in tuning C3582 is less than 5db, (this indicates too little coupling) the bandwidth will be too narrow. If it is found that the coupling is not proper it is necessary to physically move the primary winding, detune C3582 and then repeat steps 6, 7, 8 in sequence.
9. As the frequency is varied it should be noted that either a single resonant peak or 2 separated peaks will appear within the pass band. Either is acceptable provided the bandwidth is 800 to 900KC. If the single resonant peak appears it should be at 44.25MC. If this peak appears at another frequency, C3582 should be adjusted a small amount to shift the peak to 44.25MC.

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If 2 resonant peaks appear they should be of equal amplitude to within ½db. C3582 should be adjusted to equalize the amplitude of the peaks.

10. Attach meter to TP3502 and set generator back at 44.25MC.
11. Tune C3588 for maximum amplitude at TP3502.
12. Adjust C3590 for maximum meter dip at TP3502. Meter dip should be 6 to 7db. If meter dip is outside these limits, the primary coil must be moved to adjust the coupling, C3590 must be detuned, and step 11 must be repeated followed by step 12.
13. Vary the frequency of the generator and note positions and relative amplitudes of the 2 resonant peaks. These peaks should be approximately 1MC apart and within 1db of
e each other. The 2 peaks may be equalized by adjusting C3590 a small amount.
14. Attach meter to [redacted]. Set generator at frequency of 44.25 MC.
15. Adjust C3593 for maximum amplitude at TP3503.
* 16. Vary the generator frequency and note the bandwidth between the 3db points. The bandwidth should be 1MC ±100KC between 43.75MC and 44.75MC.

17. Short TP3503 to ground.
18. Attach signal generator to TP3506. Set frequency at 3.4mc and output to .1VRMS.
19. Connect meter to TP3507 and tune T3504 for maximum amplitude.

E. OVERALL OUTPUT

1. Connect 47 ohm load across J3504.
2. Connect meter across 47 ohm load.
3. Remove all shorts from test points to ground.
4. Remove generator from TP3506 and connect it to J3503. Set generator at frequency of 3.50 MC and adjust output to 20MV RMS.
5. Connect 1MC signal from CSS unit to J3501.
6. Set selector switch to "02" position.
7. Note meter reading as frequency of generator is varied from 3.75 to 4.75. The amplitude should be not less than 15MV between 3.75MC to 4.75MC.
8. Set generator at 4.75MC and set selector switch to "03" position. Increase frequency by 1MC and note meter reading. Response should be the same as in step 7 as frequency is increased between 4.75 and 5.75MC.

9. Run through all remaining switch positions and in each case increasing the starting frequency 1MC above that used in the previous position. That is, a 1MC bandwidth should be observed between 1.75 MC and 2.75MC above position setting (pos. "04" should be from 5.75 to 6.75MC, for pos. "05" 6.75 to 7.75MC, pos. "06" from 7.75 to 8.75MC, etc.)

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TMC SPECIFICATION NO. S 697 C

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The DC voltages in the voltage chart are for reference only. Thes voltages should be within ±10%, no signal applied and the selector switch in a blank position.

DC VOLTAGE CHART

TUBE	TYPE	1	2	3	4	5	6	7	8	9
V3501	6AW8	1.4	0	165	-	-	3.2	0	120	150
V3502	6EW6	-.8	0	-	-	135	125	-	-	-
V3503	6AB4	60	-	-	-	-	-.5	-.1	-	-
V3504	6AK5	0	1.8	-	-	150	105	-	-	-
V3505	6S4	-	10	0	-	-	0	-	-	-
V3506	6AK5	0	2.5	-	-	150	65	-	-	-
V3507	6AK5	0	1.5	-	-	155	115	-	-	-
V3508	6AK5	0	1.8	-	-	150	110	-	-	-
V3509	6AK5	0	1.8	-	-	150	110	-	-	-
V3510	6AK5	0	1.8	-	-	150	110	-	-	-
V3511	6BE6	0	1.8	-	-	160	90	0	-	-
V3512	6AU6	0	1.4	-	-	165	120	1.4	-	-

-INDICATES NO MEASUREMENT TO BE TAKEN

The voltages shown below, are with signal applied and for reference only.

TP3501	.15VRMS
TP3502	.25VRMS
TP3503	.5 VRMS
TP3504	.1 VRMS
TP3505	.15VRMS
TP3506	1VRMS
TP3507	.2 VRMS
TP3508	.1 VRMS
TP3509	.1 VRMS

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DATE Dec. 7, 1962
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C

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OSCILLATOR TRIMMER CAPACITOR CHART

KEY

C3501 → (2) ← SYMBOL NO.
READ-OUT ON NIXIE LIGHTS
48.5 ← XTAL FREQ.

C3513	C3515	C3511	C3512	C3507	C3505	C3504	C3502			
(14) 60.5	(16) 62.5	(12) 58.5	(13) 59.5	(8) 54.5	(6) 52.5	(5) 51.5	(3) 49.5			
C3517	C3510	C3516	C3514	C3508	C3506	C3503				
(18) 64.5	(21) 67.5	(17) 63.5	(15) 61.5	(9) 55.5	(7) 53.5	(4) 50.5				
C3518	C3522	C3524	C3526	C3510	C3509	C3501				
(19) 65.5	(23) 69.5	(25) 71.5	(27) 73.5	(11) 57.5	(10) 56.5	(2) 48.5				
C3519	C3523	C3525	C3527	C3528	C3529	C3530				
(20) 66.5	(24) 70.5	(26) 72.5	(28) 74.5	(29) 75.5	(30) 76.5	(31) 77.5				
C3521										
(22) 68.5										

J3506 J3503 J3502 J3501

T3503 T3505

V3501 6AW8 V3502 6EW6

FRONT

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THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N. Y.
AX-388 TEST DATA SHEET

MFG. NO._____

1. 48.5-77.5MC Oscillator
   Positions 02-31, .8VRMS min._____OK.
2. 1MC Amplifier
   Output J3502 (47 ohm load)_____VRMS
3. 2MC Second Harmonic Generator
   Output J3505 (25 ohm load)_____VRMS
4. 40.5MC IF Strip
   Bandwidth between 3db points_____KC
5. 43.75-44.75MC IF Strip TP3503.
   Lower 3db point_____MC.
   Upper 3db point_____MC.
   Bandwidth _____MC.

6. 3.25 - 4.25 Amplifier_____OK.

7. Overall Output at J3504 across 47 ohm load.

SWITCH POS.	OUTPUT THROUGHOUT BANDWIDTH 15 MV. RMS MIN,	SWITCH POS.	OUTPUT THROUGHOUT BANDWIDTH 15 MV RMS MIN.
02	_____ V. RMS	16	_____ V. RMS
03	_____ V. RMS	17	_____ V. RMS
04	_____ V. RMS	18	_____ V. RMS
05	_____ V. RMS	19	_____ V. RMS
06	_____ V. RMS	20	_____ V. RMS
07	_____ V. RMS	21	_____ V. RMS
08	_____ V. RMS	22	_____ V. RMS
09	_____ V. RMS	23	_____ V. RMS
10	_____ V. RMS	24	_____ V. RMS
11	_____ V. RMS	25	_____ V. RMS
12	_____ V. RMS	26	_____ V. RMS
13	_____ V. RMS	27	_____ V. RMS
14	_____ V. RMS	28	_____ V. RMS
15	_____ V. RMS	29	_____ V. RMS
		30	_____ V. RMS
		31	_____ V. RMS

DATE_____

TESTER_____

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REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S697
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
4/23/64	A	-----	11283	Revised shts. 2,5,6,9 per EMN - Renumbered to 8 SH.	16
12/4/64	B	5	13055	Revised sht. 5 per EMN	16
7/6/65	C	ALL	14399	Revised shts. 5 and 8 as per EMN. Renumbered to 9 shts.	16