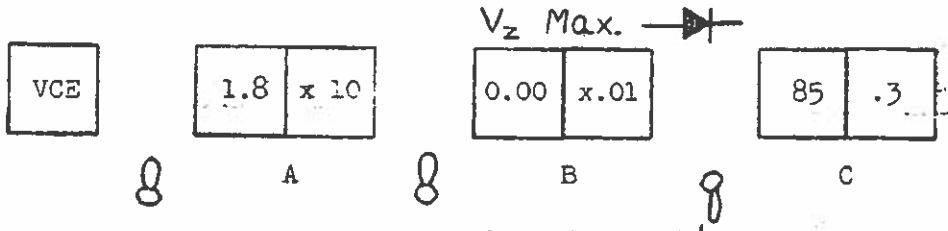
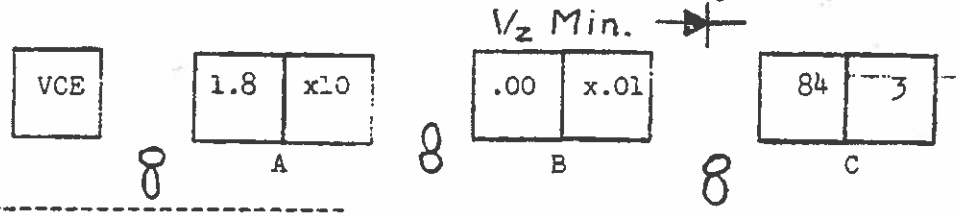
Test A for 3 KC Oscillator board #1

NOTE: Manufacturing should leave out R1 and have installed for CR4, CR5, CR6, and CR7 the matched diodes - according to the teradyne test shown below.

TEST 1



TEST 2



NOTE: Positions of toggle switches

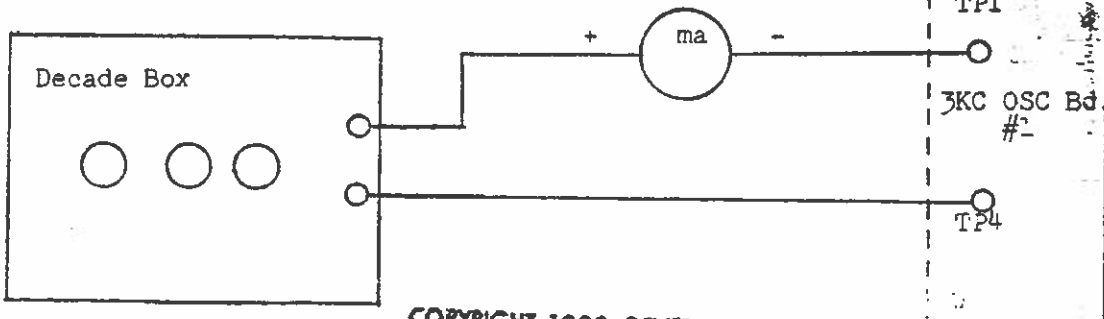
A. Wire up the patchboard (if not already done) to handle all three boards on the plug in panel, as per Figure 1 and wiring diagram #1.

B. Plug in our "House Test" boards into PCR-3 and PCR-4.

C. Plug in the manufactured board into PCR-2 and close SW4. (Down position)

D. Connect a resistance decade box between TP1 and TP4 of 3KC OSC Bd. #1 with the resistance initially set to 260 ohms and in series with a reliable milliameter as in Figure 11.

FIGURE 11



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E. Adjust the decade box until the millimeter reads 11 ma ±.005 ma. This value ± 1% of resistance should then be installed on the board permanently.

NOTE: If this value is not available, select and R1 and R2 to the 1% tolerance based on the sum of R1 and R2.

F. On the test data sheet, record the boards serial number.

G. Close SW6 (down position) and open SW5 (up position). This selects a 15 ohm load on the network.

H. Adjust R7 (Bd.#1) to its middle position (11 turns from either end). Adjust R11 for 16.97 VPP with a calibrated oscilloscope between BP1 and BP2. It may be necessary to trim R7 for the desired output voltage and the sine wave on the scope should be free of harmonics. Use ungrounded scope . (Differential input.)

I. Read and record the sine wave frequency with a frequency counter and double checking with a scope. It should be 3030 to 3150 Hz. **

J. Load regulation: Set SW6 open (up). Read and record the output voltage with the scope. It should be less than 18.21 volts p-p.

K. Close SW6 (down) and then close SW5 (down). There should be no distortion of the 3KC sine wave.

L. On Bd. #1 with dvm (-) lead on tp3 and (+) lead on tp2, read +7.0 to +8.0 volts. With oscilloscope (ungrounded and differential input,) read 16.97 to 17.53 volts p-p.

*NOTE: If the frequency is out of the allowable limits, lift one side of C6 and C7 and measure their capacitance using the Wayne Kerr Bridge.

They should agree with table shown below or with formula

$$C7 = \frac{2/9\ C6}{C6 - 2/9}$$ (All values in mfd's.)

TABLE 1

C6 (mfd)	C7 (mfd)
.255	1.70 - 1.79
.254	1.73 - 1.83
.253	1.79 - 1.89
.252	1.84 - 1.94

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TABLE 1 (continued)

C6 (mfd)	C7 (mfd)
.251	1.90 - 2.05
.250	1.96 - 2.06
.249	2.03 - 2.13
.248	2.10 - 2.20
.247	2.18 - 2.28
.246	2.26 - 2.36
.245	2.35 - 2.40

M. With no load selected SW6 (up) monitor BP1 - BP2 with an oscilloscope, open SW4 and close SW4. This test will insure the oscillator will start up -- perform the same test under 15 ohm load (SW6 down.)

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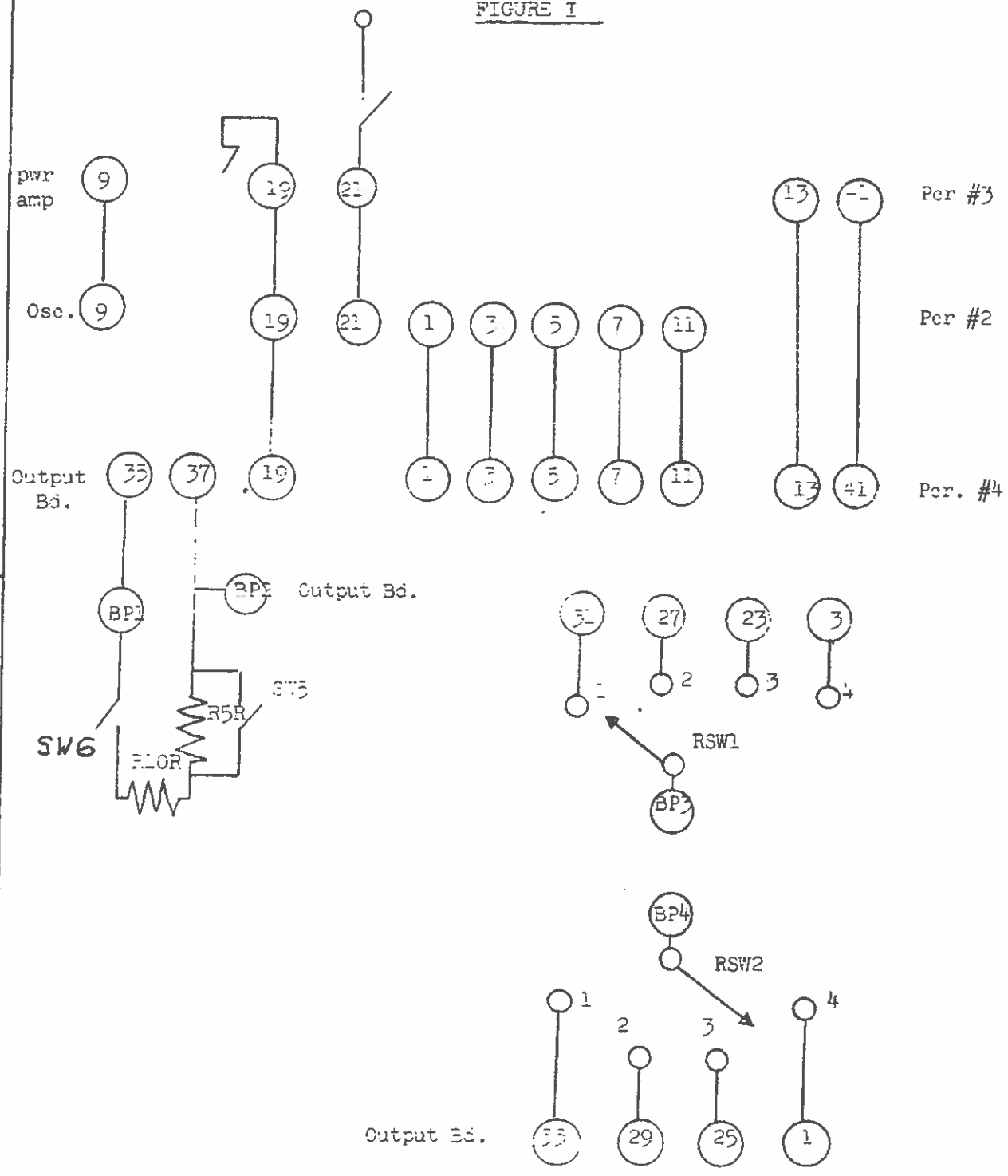
FIGURE I



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TITLE: TEST INSTRUCTION FOR 3KC Osc. Boards

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WIRING DIAGRAM #1

3KC Board Test

POWER L21 to F21 to C27

C26 to B11

FOR Gnd B12 to L19 to F19 to R19
L9 to F9
L13 to R13
M9 to S9
F1 to R1 to B22
F3 to R3 to K28
F5 to K5
F7 to R7
F11 to R11
N27 to R10n
S5 to B16 to R5n - G26
S3 to N26 to B15
junction of R5n & R10n - G-27

R31 - K25
R27 - K26
R23 - K27
K31 - B17 Bp3

S1 - B19
R29 - B20
R25 - B21
B25 - B18 Bp4

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TEST DATA SHEET for 3KC Board #1

872D421

Serial No. _____

Measured Freq. _____ Hz (3030 - 3150)

Output at Max. Load (10n) _____ VP-P

Output at No Load _____ VP-P Max. 18.21 VP-P

With 15r load, check between pin 35 and 37 _____ Vpp (16.38 - 17.51 Vpp)

DC voltage with respect to TP3 (-22V Pwr)

To C24 cathode _____ V (16.83 to 17.17)

To TP4 _____ V (7.98 to 8.82)

To CR6 cathode _____ V (16.83 to 17.17)

DC voltage TP1 to TP4 : V1 _____ V

DC Current through R1 = $\frac{V1}{R1}$ = _____ ma (10.89 to 11.11)

ET-2

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Test B for 3KC power amplifier board (Bd.#2)

A. Wire up the patchboard (if not already done) to handle all three boards on the plug in panel as per Figure 1 and wiring diagram #1 of Test Instruction A.

B. Plug in our "House Test" boards into PCR3 and PC24.

C. Plug in the manufactured board into PCR3 and close SW4 (down position)

D. On the applicable test data sheet, record the boards serial number.

E. Close SW6 (down position) and open SW5 (up position). This selects a 15 ohm load on the network.

F. Connect a d.v.m. between TP3 and TP4 on the power amp. board, turn R102 fully in both directions to see that the d.v.m. reads 0.740 to 0.860 volts, record end values on data sheet. Adjust R102 for 0.800, this should correspond to 400 ma through each collector.

* G. Record on the data sheet in space provided, the voltage drop on the power amplifier board between V1 = TP5 (+) TP3 (-) and V2=TP2 (+) to TP3 (-). Calculate 1000 x (V_2 - V_1) - this should be less than **10 volts (absolute value).**

H. If this value (in magnitude) is not less than 5 volts, the transistors HS101 and HS102 are probably the cause if all component values agree with the print.

I. Load regulation: Set SW6 to the open position (this selects no load on the circuit) read and record the output voltage between BP1 and BP2 using a calibrated scope. It should be less than 18.21 VPP. Using the load switches, record maximum load without distortion. This should be less than or equal to 10 ohms.

J. Reset the load to 15 ohms. The output between BP1 and BP2 should be 16.96 VPP.

K. On the power amplifier board, check and record the DC voltage between TP6 (+) and TP5 (-) should be 0.5 to 1.0.

L. Also check and record the DC voltage between TP1 (+) and TP2 (-) which should also be 0.5 to 1.0 V.

M. Read and record the voltage drop between TP2 (+) and TP4(-).

N. With an oscilloscope, monitor the output voltage between BP1 and BP2 - set SW5 up and SW5 up - open SW4 (SW4 up), then close SW4 (SW4 down) this test will insure oscillator will start up every time; perform the same test with SW6 down.

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PRINTS

Test Data Sheet for 3KC Oscillator Bd. #2

Board Serial No. _____

Sect. F. TP3 to TP4 Min _____V Max. _____V

Sect. G. TP5 (+) to TP3 (-) = V1 = _____V

TP2 (+) to TP3 (-) = V2 = _____V

* 1000 x (V_2 - V_1) should be less than 10V.

record valve _____V

Sect. I. Output _____ VPP

Sect. J. Output _____ VPP

Sect. K. TP6 (+) to TP5 (-) _____V (0.5 to 1.0)

Sect. L. TP1 (+) to TP2 (-) _____V (0.5 to 1.0)

Sect. M. TP2 to TP4 _____ V

DATE _____

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Test C for 3KC output board (BD.#3)

A. Wire up patchboard (if not already done) to handle all three boards on the plug in panel as per figure 1 and wiring diagram 1 of Test Instruction A.

B. Plug in our "House Test" boards into PCR2 and PCR3

C. Plug in the manufactured board into PCR4 and close SW4 down position.

D. On the applicable test data sheet record the boards' serial number.

E. Set load SW6 (Down) and SW5 (Down) check output BP1 - BP2 for distortion at 10n.

F. Set the load switches (SW6 down) and SW5 (Up), this selects 15 ohm load. Read and record output voltage between BP3 and BP4 as listed on test data sheet according to "G" below.

G. Start with RSW1 in pos: 1 and RSW2 in position 2, this corresponds to pin 31 on BP3 and pin 33 on BP4; by rotating RSW2 through positions 2, 3, and 4 on RSW1 through position 4, you will match all the positions on the test data sheet.

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PRINTS 1

With 15n load check for output (16.38 to 17.51 VPP)

Board Serial No. _____

Between pin 35 and 37 _____ VPP

	31 and 33	RSW	2	Pos	1
	31 and 29	"	2	"	2
RSW-1	31 and 25	"	2	"	3
Pos 1	31 and 01	"	2	"	4
	27 and 31	"	2	"	1
RSW-1	27 and 29	"	2	"	2
Pos 2	27 and 25	"	2	"	3
	27 and 01	"	2	"	4
	23 and 33	"	2	"	1
RSW 1	23 and 29	"	2	"	1
Pos 3	23 and 25	"	2	"	3
	23 and 01	"	2	"	4
	03 and 33	"	2	"	1
RSW 1	03 and 29	"	2	"	2
Pos 4	03 and 25	"	2	"	3
	03 and 01	"	2	"	4

DATE _____

INITIAL _____

GENERAL ELECTRIC

P24B-AL-4819

REV NO. 2	TITLE	CONT ON SHEET — SH NO. 11
P24B-AL-4819	TEST INSTRUCTION FOR 3KC Osc. Boards	
CONT ON SHEET — SH NO. 11	FIRST MADE FOR	

REVISIC

DEC 21 1970

PREPARED BY _____ DATE 12/12/70

C.J. Barrigher
Control Design Engineering

APPROVED BY _____ DATE 12-11-70

P.C. Callan - MANAGER
CONTROL DESIGN ENGINEERING

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MADE BY D.DeNora Dec. 17, 1970	APPROVALS	Steam Turbine DIV OR DEPT.	P24B-AL-
ISSUED DEC 21 1970		Schenectady, N.Y. LOCATION	CONT ON SHEET — SH NO. 12

FF-803-WA (1-70)
PRINTED IN U.S.A.

CODE IDENT

Data Sheet

Job # _____

Serial # _____

Date _____

Data Sheet for __145D3580G0002_____

Test Procedure __P24B-AL-4819_____

Burn-in Start _____

Burn-in Stop _____

Technician _____

Test Procedure Step	Nominal	Lower Limit	Pre-Burn in Results	Post Burn in Results	Upper Limit	Pot Values If applicable CW	Pot Values If applicable CCW	Pass/Fail
BD#1								
Test A								
H	16.97V	16.97V			16.97V			
H - R11								
I - a	3090Hz	3030Hz			3150Hz			
I -b	3050Hz	3050Hz			3050Hz			
J	< 18.21V							
Comments: Step I-b is Brunswick specfic setting for BD# 1								

1/9/2012

CW

Data Sheet

Job # _____					Burn-in Start _____			
Serial # _____								
Date _____								
Data Sheet for __872D496G0001_____					Burn-in Stop _____			
Test Procedure __P24B-AL-4819_____					Technician _____			
Test Procedure Step	Nominal	Lower Limit	Pre-Burn in Results	Post Burn in Results	Upper Limit	Pot Values If applicable CW	CCW	Pass/Fail
BD#2								
Test B								
F	0.800V	> 0.740V			< 0.860V			
G	< 10.0VAC							
H	< 5.0VAC							
I - a	< 18.21V							
I - b	< 10 ohms							
J	16.96V	16.86V			17.2V			
K	0.75V	> 0.5V			< 1.0V			
L	0.75V	> 0.5V			< 1.0V			
M								

1/9/2012

cw

Data Sheet

Job # _____					Burn-in Start _____			
Serial # _____								
Date _____					Burn-in Stop _____			
Data Sheet for __117D7344G0001_____					Technician _____			
Test Procedure __P24B-AL-4819_____								
Test Procedure Step	Nominal	Lower Limit	Pre-Burn in Results	Post Burn in Results	Upper Limit	Pot Values If applicable CW	CCW	Pass/Fail
BD#3								
Test C								
F - Pin-33								
F - Pin-29								
F - Pin-25								
F - Pin-1								
F - Pin-31								
F - Pin-27								
F - Pin-23								
F - Pin-3								

1/9/2012

cw