B=Y
Y=B

GENERAL ELECTRIC

P3K -AL-0404-A01

CONT ON SHEET 2 SH NO. 1

REV NO. 01

P3K-AL-0404-A01

CONT ON SHEET 2 SH NO. 1

TITLE
TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
ANALOG (LOAD SET MOTOR POSITION INDICATOR)
FIRST MADE FOR FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS

OCT 27 1981 O'Palisi no chg. this sht

I. SCOPE

This instruction outlines the specification for testing the Plant Communication Analog board 1PC1-C001.

CIRCUIT BOARD 117D7374 -- LOAD SET MOTOR POSITION INDICATOR

II. CIRCUIT DESCRIPTION

The plant communications (PC) load set motor position indicator is designed to incorporate the following features:

1. Provides a means to convey to the customer the EHC load set motor position signal.

2. Analog signal processing done in a manner that provides protection to the EHC circuits that provide the signal, in the event that the output is abused, even seriously abused, by the customers equipment.

3. The isolation is provided by having a second RVDT on the load set motor drive unit. This RVDT is excited by a local oscillator on the 117D7374 board which is powered by the separate ± 15 VDC power supply. The same oscillator and power supply operate the necessary demodulator on the 117D7374 board to convert the AC signal to DC and amplify it.

4. No isolation circuits are required because the whole circuit is electrically isolated from the EHC control circuits.

5. The oscillator has adjustment pots for SHAPE CONTROL (VR50) and AMPLITUDE CONTROL (VR51). This amplitude control is for oscillator output not DC load set position output. The latter level is set by the output gain (VR1).

To provide the isolation, a separate power supply is required furnishing plus and minus 15 VDC power.

A zero balance pot is provided on the output IC op amp.

III. CIRCUIT SPECIFICATIONS

ACTIVE FOR _____
BY _____ DATE _____

A. Power Supply Requirements

1. Power Supply 1: +15.0 ± 0.1 VDC (Pins 21 & 25)

2. Power Supply 2: -15.0 ± 0.1 VDC (Pins 20 & 25)

273-2
273-12
273-71
273-138
273-221
273-227
PRINTS TO

MADE BY J Placer SEP 21 1977
ISSUED SEP 22 1977

APPROVALS

Steam Turbine DIV OR DEPT.
Schenectady, N.Y. LOCATION

P3K-AL-0404-A01
CONT ON SHEET 2 SH NO. 1

FF-803-WA (4-73) PRINTED IN U.S.A.

770 CODE IDENT NO.

REV NO. 1

P3K-AL-0404-A01
CONT ON SHEET 3 SH NO. 2

TITLE
TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
ANALOG (LOAD SET MOTOR POSITION INDICATOR)
FIRST MADE FOR FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS
① PAM OCT 27 1981 no chg. this sht

III. CIRCUIT SPECIFICATIONS (continued)

B. Operating Signal Levels

1. Oscillator Output (TP1 to TP5)

a. Voltage: 6.0 VRMS
b. Frequency: 3050 $\pm$ 150 HZ

2. Board Output (TP7 to TP5)

a. Voltage: -5 to +7 VDC for -25° to +35° rotational travel of the RVDT or -100° to +140° rotational travel of the motor drive manual shaft.

C. Output Loads

1. The oscillator is loaded by the demodulator circuit including the RVDT.

2. The board output (pins 10 and 23): 2K Ohms.

D. Continuity

1. Continuity exists between pins 23 and 25.

IV. REQUIRED TESTS AND SETTINGS

A. 3 KHZ Oscillator

All tests, except that for temperature sensitivity, are to be done with the oscillator normally loaded with the transformer, and RVDT, and the demodulator.

1. Initial Starting

Adjust VR50 to mid range and observe TP1 with a scope (2 volt/div. amplitude, 50 usec/div. sweep). If necessary readjust for a non-distorted sine wave.

2. Distortion

a. FET (2N3822) Distortion

Adjusting VR50 too far CW will cause the output TP1 to distort. Check distortion by centering the signal on both the amplitude and sweep coordinates as shown in Figure 1. Distortion occurs when the absolute value of $T_1 - T_2$ is greater than 10 usec and can be eliminated by backing down on VR50 (TP6).

PRINTS TO

MADE BY Polacek SEP 21 1977 | APPROVALS | Steam Turbine DIV OR DEPT. | P3K-AL-0404-A01
ISSUED SEP 22 1977 | | Schenectady, N.Y. LOCATION | CONT ON SHEET 3 SH NO. 2

REVISIONS
① Paris OCT 27 1981 * orig. made

IV. REQUIRED TESTS AND SETTINGS (continued)

A. 3 KHZ Oscillator (continued)

a. (continued)

a. (continued)

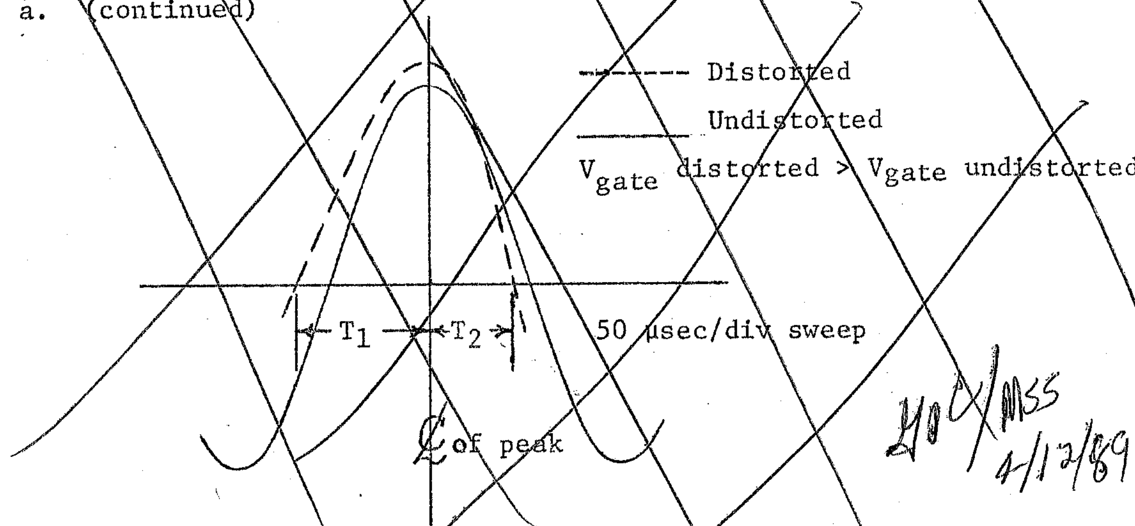

FIG. 1 FET DISTORTION $|T_1 - T_2| \geq 10$ μsec

J.O.C./MSS 4/17/89

b. Saturation Distortion

Saturation will occur when V_{peak} of TP1 is greater than the supply voltage (15V). It is eliminated by decreasing VR51.

3. V_{gate} (TP6) Setting

Adjust VR50 so that the oscillator runs at the upper limit of linearity (absolute value of $T_1 - T_2$ approaches 10 usec), i.e.: Set V_{gate} so that its magnitude is approximately 10 mv below the distortion level. Operation around this point give maximum temperature and load change stability. A sampling of 25 FET's has shown the upper limit of V_{gate} to be between -2.6 and -1.0.

ADJUST VR50 FOR -2.5V AT TP6. Per MSS. 4/17/89

4. Amplitude Setting

Adjust VR51 for $V_{TP1} = 6.000 \pm .010$ RMS.

* 5. Frequency

$3000 < f < 3400$ Hz

PRINTS TO

REVISIONS

① PAllis OCT 27 1981 no chg. this sht

IV. REQUIRED TESTS AND SETTINGS (continued)

A. 3 KHZ Oscillator (continued)

6. Regeneration

The oscillator must restart in all of the following situations:

a. Simultaneously interrupt the +15 VDC and the -15 VDC power. Reconnect.

b. Interrupt the +15 VDC power. Reconnect.

c. Interrupt the -15 VDC power. Reconnect.

d. Withdraw and reinsert the Load Set Motor Position Indicator board.

7. Temperature Stability

This test may be conducted with the oscillator unloaded.

With V_{gate} (TP6) set as in step 3 at ambient temperature, the absolute magnitude of the voltage at TP1 must not vary more than ± .060V RMS ~~as the temperature ranges between~~ ambient ~~and [illegible]~~ °F.

A small change in V_{gate} (AT) may be necessary to meet this spec. If the change at TP1 exceeds +.060, decrease the V_{gate}. If the change at TP1 exceeds -.060, increase V_{gate}.

PG 4/12/89 pw M&S

8. Load Variance

No angular change in the RVDT between ± 35° should cause the voltage at TP1 to vary more than ± .015V RMS.

9. Envelop Modulation.

Envelop modulation should not exceed .015V peak to peak.

B. Output Setting

Note. RVDT Is Geared 4:1 (100° shaft Displacement = 25° RVDT Displacement)

1. Adjust VR1 so that the output (pin 10 and TP7) is ± 5.0 VDC for ± 25° displacement of the RVDT from zero or ± 100° displacement of the motor drive manual shaft from zero.

2. Confirm that the output is linear within ± 1%.

4-12-89

Connect TP8 To Com. Then Adjust VR52 For 0V DC ± .005V at TP7 (Remove TP8 To Com Jumper)

PRINTS TO

TITLE
TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS ANALOG (LOAD SET MOTOR POSITION INDICATOR)
FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS
① Pauls OCT 27 1981 no chg. this sht

IV. REQUIRED TESTS AND SETTINGS (continued)

C. RVDT Connections

RVDT		TERMINAL	PIN OR BOARD
R1	Red	21	35
R2	Black	22	34
S1	Yellow	23	18
S2	Blue	24	19

PRINTS TO

REV NO. 01

P3K-AL-0404-A01
CONT ON SHEET SH NO. 6

TITLE
TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
ANALOG (LOAD SET MOTOR POSITION INDICATOR)
FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS
OCT 27 1981
NO CHG. THIS ART

PREPARED BY George W Kessler DATE 5/1/74
G.W. Kessler
EHC DESIGN ENGINEERING
Mark 9/24/81

APPROVED BY P C Callan DATE 9-12-77
P.C. Callan - MANAGER
EHC DESIGN ENGINEERING

TEST PROCEDURE
REVIEWED BY R. Debertolis DATE 9-8-77
R. Debertolis
EHC TEST ENGINEER

PRINTS TO

MADE BY Palacer SEP 21 1977
ISSUED SEP 22 1977

APPROVALS

Steam Turbine DIV OR DEPT.
Schenectady, N.Y. LOCATION

P3K-AL-0404-A01
CONT ON SHEET SH NO. 6

FF-803-WA (4-73)
PRINTED IN U.S.A.

CODE IDENT NO.