

FRP I. Techn. Unterlagen für
ANalex 5-300 160Z/2.

Scha für

für 31/07 - 310025

SERIES 5 PRINTER/CONSOLE

(Unbuffered)

ADJUSTMENT AND FINAL TEST PROCEDURE

AC-TP-3011

Customer ZUSE #1 A.O. No. 1562/5685
Printer No. 50624-1-2485 Console No. 1724

Tested By E. MORGAN

Date 3/17/65

TEST REVIEWED AND APPROVED BY:

E. J. [Signature] _____
Chief Test Engineer Manager, Printer Electronics

3/19/65 _____
Date Date

Customer Representative

Date

1.0 SYSTEM SPECIFICATIONS

- | | | |
|------|-----------------------------|---|
| 1.1 | Material List--Printer | <u>50624-1</u> |
| 1.2 | Material List--Console | <u>62747</u> |
| 1.3 | Wiring Options and Addendum | <u>31651</u> |
| 1.4 | Print Wheel Speed | <u>333</u> RPM $\pm 3\%$ |
| 1.5 | Paper Feed Slew Rate | <u>18</u> IPS $+20\%$
<u>6</u> -5% |
| 1.6 | Lines Per Inch | <u>6</u> |
| 1.7 | No. of Columns | <u>160</u> |
| 1.8 | Character Selection | <u>64</u> |
| 1.9 | Format Channels | <u>8</u> |
| 1.10 | Line Supply | <u>230</u> Volts
<u>50</u> cycles
<u>1</u> phase
<u>3</u> wire |
| 1.11 | Print Wheel Engraving | <u>51030</u> |
| 1.12 | Code Wheel | <u>30314</u> |

2.0 STATIC CONSOLE TEST

- | | | |
|-----|---|------------------|
| 2.1 | Check all fuses and circuit breakers for correct size and type. | By <u>P.A.A.</u> |
| 2.2 | Check resistance of all power supply outputs at test terminals--should be no shorts or open circuits. | |
| | Note: -36V output will normally read 1 ohm $\pm 25\%$ | By <u>P.A.A.</u> |
| 2.3 | Check resistance between frame ground and DC return--should be open circuit. | By <u>P.A.A.</u> |
| 2.4 | Check for correct AC jumpers at TB401 on sequencer. | By <u>P.A.A.</u> |
| 2.5 | Check mechanical operation of all circuit breakers. | By <u>P.A.A.</u> |

CAUTION: In the following series of tests be sure to turn Power OFF before inserting or removing P. C. Cards, jumpers, etc.

3.0 DYNAMIC CONSOLE TEST

Note: (1) Do not connect printer or test set.

(2) Main AC circuit breaker OFF.
Fan, Printer and Yoke breakers ON.

(3) Connect P201 from control panel.

(4) Check that loose connectors are not shorting.

3.1 Connect AC power cable to TB301 and specified voltage source and check for correct voltage on Utility Outlet.

By PAV.

3.2 Turn on main AC circuit breaker CB01 at sequencer. "OFF" light should energize.

By PAV.

3.3 Momentarily depress "ON" button. This should result in the following sequence of operations:

3.3.1 Both "ON" and "OFF" lights should be OFF.

By PAV.

3.3.2 "TRACTOR INDEX" and "ALARM STATUS" lights on front control panel should be ON and "TOP OF FORM" light on front and rear panels should be ON.

By PAV.

3.3.3 "INTERLOCK" light on sequencer should be ON.

By PAV.

3.3.4 K10 should be energized supplying AC to the Multiple Power Supply. Check for outputs.

By PAV.

3.3.5 When the +6V, -6V and -18V are present at the sensing sector, relay K01 should energize supplying AC to the -36V Power Supply. Check for -36V output.

By PAV.

3.4 Measure and record outputs of all Power Supplies using dummy loads.

	<u>REGULATED</u>	<u>MARGINAL</u> ±10%
+6V ±3½%	(5.79/6.21) <u>5.79</u>	<u>5.03</u> to <u>6.68</u> (5.4 to 6.6 Min.)
-6V ±3½%	(5.79/6.21) <u>5.79</u>	<u>5.02</u> to <u>6.71</u> (5.4 to 6.6 Min.)
-18V ±3½%	(17.37/18.63) <u>17.9</u>	<u>15.7</u> to <u>19.9</u> (16.2 to 19.8 Min.)
-36V ±5%	(34.2/37.8) <u>36.2</u>	

By Pat.

3.5 Simulate trouble in the DC circuit by removing the +6V output fuse.

The "DC ALARM" and "ALARM STATUS" lights should be ON. All other lights should be OFF.

All DC voltages should be OFF.

By Pat.

3.5.1 Check "OVERRIDE" circuit by depressing switch and checking for presence of output voltages at -6V and -18V supplies

By Pat.

3.5.2 With dummy load still connected repeat Par. 3.5 removing the -6V, -18V and -36V fuses, one at a time. By Pat.

3.6 Insert one Hammer Driver card and check DC voltages at basket:

Pin 1: -18V
Pin 19: -36V
Pin 23: + 6V

By Pat.

3.7 Remove wire from TB401-53 and insert Monitor 5 card in Position A08.

By Pat.

3.8 Jumper pin 13 to 14 on A08 and check B29-13 for -18V. "ALARM STATUS" and "INTERLOCK" lights should be OFF.

By Pat.

3.9 Check CIRCUIT BREAKER alarm circuit by opening and closing breakers causing "ALARM STATUS" light to go ON, and OFF.

3.9.1 FAN circuit breaker

By PAS.

3.9.2 PRINTER circuit breaker

By PAS.

3.9.3 YOKE circuit breaker

By PAS.

3.10 Insert blown fuse in "LOAD" card and insert card in position A28.

"CARD ALARM" and "ALARM STATUS" lights should go ON. Remove card.

By PAS.

3.11 Insert blown fuse in "P.F. and CONTROL SENSE" card and insert in position A10.

"CARD ALARM" and "ALARM STATUS" lights should go ON. Remove card.

By PAS.

3.12 Remove jumper which was installed in Par. 3.8 (A08-13 to A08-14).

"INTERLOCK" and "ALARM STATUS" lights should go ON.

By PAS.

3.13 Replace wire on TB401-53. "PHOTO ALARM" light should go ON in addition to "INTERLOCK" and "ALARM STATUS" lights.

By PAS.

3.14 Check all FUSE INDICATORS.

By PAS.

4.0 STATIC PRINTER TEST

4.1 CODE WHEEL--visual check

By JH

4.2 PAPER TENSION CONTROL--check operation and adjust for center of range.

By NA

4.3 TRACTORS--adjust alignment and tension and check for binds.

By JH

4.4 BELTS--adjust tension

By JH

4.5 RIBBON MANDRELS--adjust brake torque for 8 to 12 inch-ounces.

By JH

5.0 DYNAMIC PRINTER TEST

- Note: (1) Connect Printer to Console at TB101.
- (2) Turn Yoke, Printer, and Fan circuit breakers OFF.
- (3) Turn main AC circuit breaker ON.

5.1 Depress YOKE CIRCUIT BREAKER and check operation of OPEN/CLOSE YOKE circuit.

By JPL

5.1.1 Release yoke switches at approximately 3/4 of maximum OPEN position and check for positive mechanical stop.

By JPL

5.1.2 Visual check of print wheel engraving.

By JPL

5.1.3 Adjust PENETRATION KNOBS for minimum penetration setting and return yoke to print position.

By JPL

5.2 Depress FAN CIRCUIT BREAKER.

5.2.1 Depress "ON" button and check operation of PRINTER FANS.

By JPL

5.2.2 Check voltage for CONSOLE FANS.

115V AC 60 cycle at TB201-32 & 33 and TB201-32 & 34_____.

or

230V AC 50 cycle at TB 201-33 & 34K.

By JPL

5.3 Depress PRINTER CIRCUIT BREAKER

5.3.1 Check operation of PRINTER DRIVE MOTOR.

By JPL

5.3.2 Check tracking of BELTS

By JPL

- 5.4 Check for correct ROTATION of PRINT ROLL--should be CCW when viewed from code wheel end. By JRL
- 5.5 Measure PRINT WHEEL SPEED and compare to Par. 1.4. 390 RPM By JRL
- 5.6 Measure paper feed flywheel speed and compute SLEW RATE. Compare to Par. 1.5. 160 RPM x 7.5 = 19.5 IPS By JRL
60
- 5.7 Connect P101 and P102 to Printer. Connect Test Set to Console.
- 5.7.1 "NO PAPER" and "PAPER LOW" lights on control panel should go ON. By HF
- 5.7.2 Simulate "PAPER IN" condition and check that both lights go OFF. By HF
- 5.7.3 Operate Yoke Open/Close switches and check operation of "YOKE OPEN" light on control panel. By HF
- 5.8 Insert STROBE 5 and DATA 5 cards.
- 5.9 Examine INPUT and OUTPUT CODE WHEEL PULSES and adjust light source where necessary. (See Fig. 1 for tol.) By HF
- 5.10 Adjust Paper Feed Limiter resistors for approximate tap setting. By HF
- 5.11 Insert P. F. Control-Sense and P. F. Hold-Pulse cards.
- 5.11.1 Adjust test set for correct "SKEW TIMING" and select legitimate character. By HF
- 5.11.2 Depressing "START/STOP switches on test set or front and rear printer panels should control PAPER FEED. By HF
- 5.11.3 Check tracking of TIMING BELT, where used. By HF

5.12 Examine and record PAPER FEED "DRIVE" and "BRAKE" waveforms and adjust amplitudes and pulse widths. (See Fig. 4 for tol.)

Note: Do not record line marker time until par. 9.1.

By HF

5.13 PAPER FEED RUN-IN--At some convenient time prior to par. 7.0 operate paper feed at maximum rate for a period of 8 hours.(min.)

By HF

5.14 FORM POSITIONING CONTROL--Check travel with power ON. (9/16" Min.)

By HF

5.15 Examine INPUT and OUTPUT paper feed STROBE and TRACTOR INDEX PULSES and adjust light source where necessary. (See Fig. 2 for tol.)

5.15.1 6 L. P. I.

By HF

5.15.2 8 L. P. I.

By HF

5.15.3.10 L. P. I.

By HF

5.15.4 Check control panel indication for above modes of operation, where applicable.

By HF

5.15.5 Tractor index

By HF

5.16 Check operation of TRACTOR INDEX circuit.

By HF

Depressing switch should result in $\frac{1}{2}$ " paper advance.

By HF

5.17 Check operation of TOP OF FORM circuit.

Depressing switch on either front or rear control panel should result in SINGLE LINE operation without format tape.

(Tape hold-down **should** be DOWN).

By HF

5.18 Check operation of "PHOTO ALARM" circuit.

5.18.1 Remove "NO PAPER" sense lamp.

"PHOTO ALARM" and "ALARM STATUS" lights should go ON.

By HF

5.19 Insert RIBBON CONTROL card. Operate paper feed and adjust RIBBON REVERSAL for 5 ± 3 turns. (Check twice) By HF

5.19.1 Check FORCE RIBBON circuit by depressing switch at test set. By HF

5.20 Install paper and check HAMMER CIRCUIT operation as follows:

CAUTION: Penetration controls should be adjusted for LIGHT print.

5.20.1 Install one LOAD card and the three corresponding HAMMER DRIVER CARDS (one at a time). By HF

5.20.2 Repeat Par. 5.20.1 with remaining LOAD cards. By HF

5.21 Adjust HAMMER DRIVER OUTPUT PULSE WIDTHS as per the following chart:

HIGH SPEED modules 1.25 ms
LOW SPEED modules ✓ 1.50 ms
(check type used)

By HF

6.0 PRINT HAMMER ADJUSTMENTS

6.1 Operate printer in "SOLID CHARACTER" mode, select character "E" and adjust PHASING of code wheel. By HF

6.2 Operate printer in "SOLID RIPPLE" mode and check for correct CHARACTER SEQUENCE. By HF

6.3 Adjust yoke stop screws for MAXIMUM PENETRATION using standard procedure. By HF

6.4 Make preliminary penetration and flight time adjustments, printing character "B" on 15 lb. single-part paper, and check IMPACT on 6-part paper, bottom copy. By HF

6.5 Print character "M" on hammer heads and perform HORIZONTAL ALIGNMENT as follows:

6.5.1 Adjust YOKE laterally and lock adjusting screw. By HF

- 6.5.2 Align modules and check print for absence of vertical or horizontal "CLIPPING" on 6-part paper, bottom copy By EM
- 6.6 Check for "COCKED" hammers printing character "M" on 15 lb. single part paper. (File copy) By EM
- 6.7 Make FINAL PENETRATION adjustment printing character "B" on 15-lb. single part paper. (File copy) By EM
- 6.8 Check uniformity of penetration on 6-part paper, bottom copy. (File copy) By EM
- 6.9 Run short scan of all characters (4 to a page) at same penetration level and examine print for damaged characters and print roll runout. (File copy). By EM
- 6.10 Using character "E" recheck setting of "SKEW TIMING". Rotate character phasing control and adjust for uniform fadeout of character lands at both ends of print roll. By EM
- 6.11 Adjust hammer FLIGHT TIMES printing character "E" and using end characters adjusted in par. 6.10 as reference.

Vertical displacement shall not exceed $\pm .010$ referenced to a common centerline.

Check with comparator using minus (-) sign. By EM
- 6.12 Check that line of print is parallel to paper tear line and readjust tractors where necessary. By EM

7.0 VERTICAL FORMAT ADJUSTMENT

- 7.1 Align diode blocks with holes in punched tape, taking care not to interfere with sprocket. By HF
- 7.2 Adjust tape hold-down. By HF
- 7.3 Examine INPUT and OUTPUT VFU PULSES and adjust light source where necessary (See Fig. 3 for tolerance. By HF

7.4 Adjust TIMING between STROBE and VFU PULSES to satisfy 6, 8 and 10 LPI, where applicable, and check operation on all channels.

7.4.1 6 L. P. I.

By HF

7.4.2. 8 L. P. I.

By HF

7.4.3. 10 L. P. I.

By HF

7.5 Check "TOP OF FORM" operation

By HF

8.0. PAPER PULLER ADJUSTMENT

8.1 Install single-part paper and adjust clutch torque and roller pressure for smooth operation in "single-space" mode.

By EM

8.2 Recheck operation using a format channel.

By EM

8.3 Install 6-part paper and repeat Par. 8.1 and 8.2.

By EM

9.0 PAPER FEED OPERATION

9.1 Electrical Paper Feed Time--

Examine and record single space line marker time. (See Fig. 4 for tol.)

By HF

9.2 Total Paper Feed Time--

Note: Install platens and paper tension device (for 2-tractor machine).

Using "FEED WHILE PRINT" function on test set, compute time with single-part paper.

4 Tractors MS
(12 MS)

2 Tractors MS
(18 MS)

By HF

10.0 ACCEPTANCE TEST

Note: (1) Use single-part paper unless otherwise noted.

(2) All print to be observed during operation for stability, legibility, accurate format and uniform line spacing.

10.1 CHARACTER SCAN (Solid Char. Mode)

Print approximately $\frac{1}{4}$ page of each character engraved on the print roll.
(File copy)

By _____

10.2 STROBE (Cycle Print Mode)

10.2.1 Print 2 pages of single space, using manual "single line" mode on test set.

By _____

10.2.2 Print 10 pages of single space, using "continuous" mode on test set.

By _____

10.3 FORMAT (Cycle Print Mode)

Note: Were 6 and 8 line per inch operation is available, the time run for each channel should be divided between the two.

10.3.1 Print 4 pages of each channel and check for accuracy.

By _____

10.3.2 Print on all channels for a period of 10 minutes each.

By _____

10.3.3 Using 6-part paper, print on any channel for a period of 2 minutes.

By _____

11.0 INTERFACE CHECKOUT

Check operation and indication of following functions (where applicable) using remote panel on test set:

11.1 On/Off

By _____

11.2 Start/Stop

By _____

11.3 Yoke Open/Closed

By _____

11.4 No Paper

By _____

11.5 Paper Low

By _____

11.6 Tractor Index

By _____

11.7 Top of Form

By _____

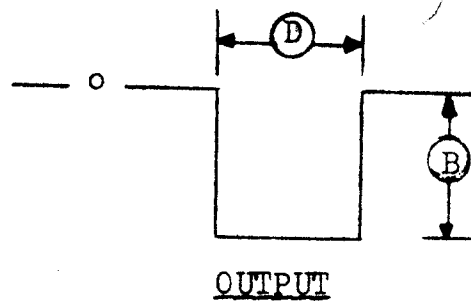
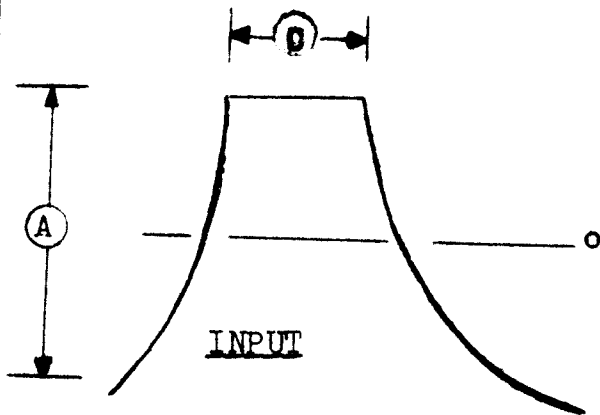
11.8 Ready/Not Ready

By _____

11.9 Additional Tests

TOLERANCES

		PRINT	ROLL	SPEED
		333	666	1250
VOLTS	A	8/12	8/12	8/12
VOLTS	B	5/7	5/7	5/7
MILSEC	C	.5/2.5	.5/1.5	.1/1.0
MILSEC	D	.5/3.0	.5/2.0	.1/1.5



CODE WHEEL PULSES

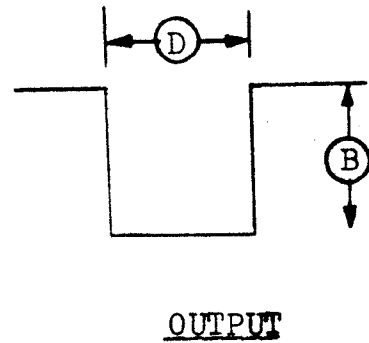
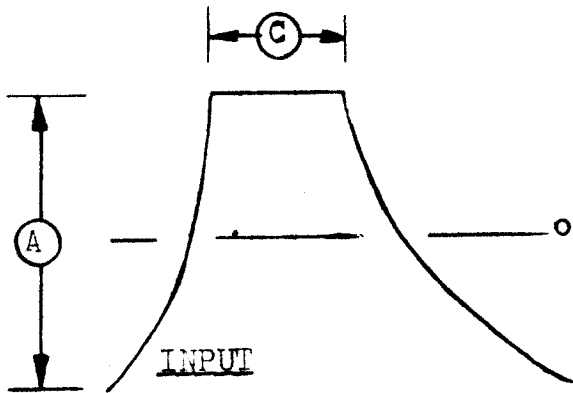
(A)	(C)	(B)	(D)
11	OK 1.0 HF	6	OK 1.2 HF
—	OK —	—	OK —
11	OK 1.1 HF	6	OK 1.2 HF
11	OK 1.5 HF	6	OK 1.7 HF
11	OK 1.3 HF	6	OK 1.4 HF
11	OK 1.5 HF	6	OK 1.6 HF
11	OK 1.2 HF	6	OK 1.4 HF
10	OK 1.8 HF	6	OK 2.0 HF
11	OK 1.3 HF	6	OK 1.5 HF
—	OK —	—	OK —

FIG. 1

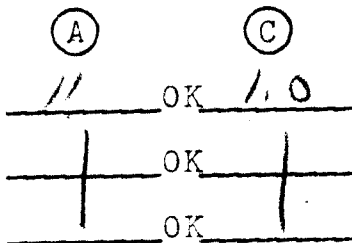
ANALOG CORPORATION

TOLERANCES

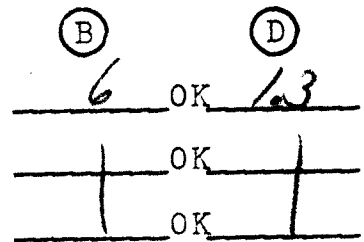
		SLEW RATE	
		18 IPS	27.5 IPS
VOLTS	A	8/12	8/12
VOLTS	B	5/7	5/7
MILSEC	C	1.0/3.0	0.5/2.5
MILSEC	D	1.0/3.5	0.5/3.0



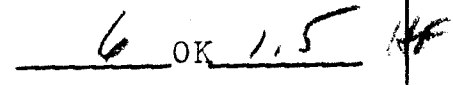
STROBE PULSES



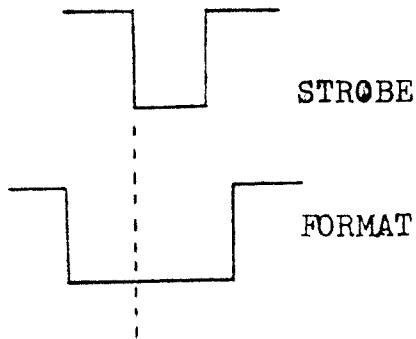
6 LPI
8 LPI
10 LPI



TRACTOR INDEX



STROBE/FORMAT TIMING



6 LPI HF OK

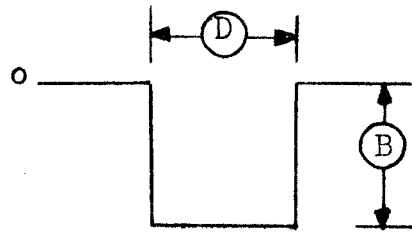
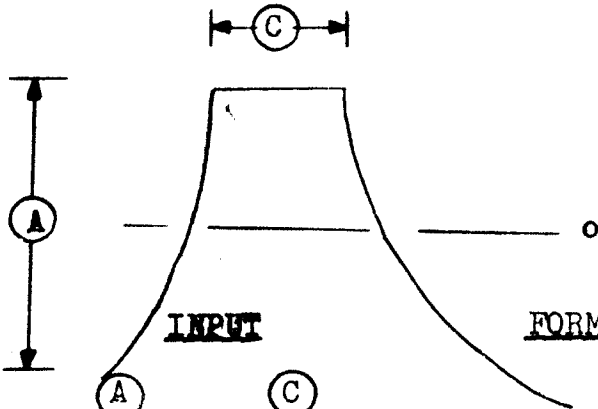
8 LPI OK

10 LPI OK

FIG. 2

TOLERANCES

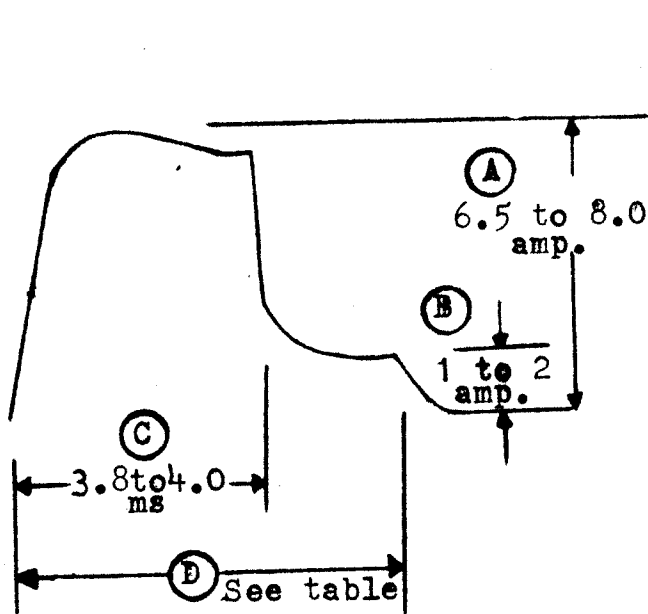
		SLEW RATE	
		18 IPS	27.5 IPS
VOLTS	A	8 / 12	8 / 12
VOLTS	B	5 / 7	5 / 7
MILSEC	C	4 / 8	3 / 7
MILSEC	D	4 / 10	3 / 8



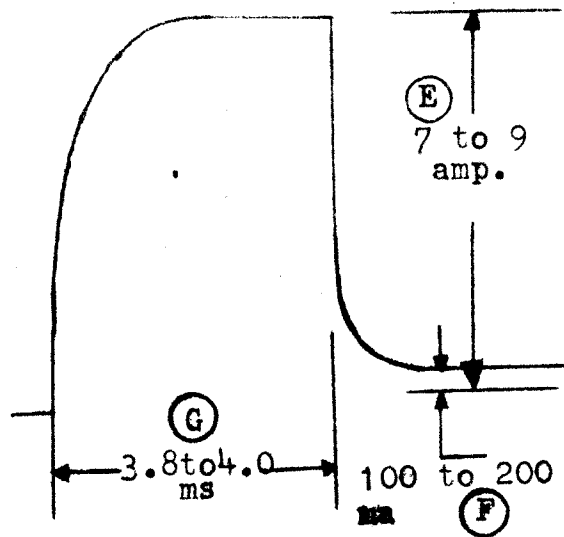
FORMAT PULSES

Channel	Input A	Input C	Output B	Output D
CH 1	11 OK	4 HF	6 OK	5.0 HF
CH 2	11 OK	4.5 HF	6 OK	5.5 HF
CH 3	11 OK	4.0 HF	8 OK	5.0 HF
CH 4	11 OK	5.0 HF	6 OK	6.0 HF
CH 5	11 OK	4.5 HF	6 OK	5.2 HF
CH 6	11 OK	5.0 HF	6 OK	6.0 HF
CH 7	11 OK	5.0 HF	6 OK	5.5 HF
CH 8	11 OK	4.5 HF	6 OK	5.2 HF
CH 9	OK		OK	
CH 10	OK		OK	
CH 11	OK		OK	
CH 12	OK		OK	

FIG. 3



DRIVE



BRAKE

PAPER FEED PULSES

A	<u>7.5</u> AMP	BY	<u>HF</u>	E	<u>8</u> AMP	BY	<u>HF</u>
B	<u>1.5</u> AMP	BY	<u>HF</u>	F	<u>200</u> MA	BY	<u>HF</u>
C	<u>3.8</u> MS	BY	<u>HF</u>	G	<u>3.8</u> MS	BY	<u>HF</u>

(D) MS	18 IPS	27.5 IPS
6 LPI	<u>7.9</u>	<u> </u>
	<u>7.5/9.5</u>	<u>6.0/8.0</u>
8 LPI	<u> </u>	<u> </u>
	<u>6.0/8.0</u>	<u>4.5/6.5</u>

FIG. 4

ANALEX CORPORATION

ACCEPTANCE TEST

1. PURPOSE

The purpose of this document is to define an acceptance procedure that will ensure that the equipment to be delivered ZUSE

under referenced Contract No. _____ complies with the operational requirements of referenced Specification No. with effective Amendments; and that the physical appearance of the equipment delivered indicates that it has been fabricated in conformance with good commercial practice. This test is to be performed at Anelex Corporation, prior to shipment, and may be witnessed by technical representatives of the client.

2. SCOPE

The scope of this test and associated log shall be limited to a final acceptance test. This test will be limited to:

a. Visual Inspection. The equipment shall be inspected for operation and tightness of all parts, neatness of cabling and overall workmanship. The above shall conform to good commercial practice and be of a level compatible with other commercial equipment currently being delivered by Anelex. It should be understood that in many areas Anelex employs point-to-point wire-wrap techniques.

By 

b. Dynamic Operational Test. Actual acceptance test performed shall be limited to that required to demonstrate conformance to operational requirements of the specification, as interpreted by Anelex and client's representative Project Engineer. Details of this test are defined in paragraph 3.

- c. It is to be understood that although the parts, materials, and process employed in the manufacture of this equipment have been selected to conform with the intent of the environmental, reliability, operating life, failure rate and interference requirements of the Specification, no test to indicate conformance with these items is required.

3. ACCEPTANCE TEST

3.1 Preparation for Printing

3.1.1 Load VFU paper tape loop.

The tape shall be pre-punched according to the following schedule.

By  _____

Channel 1	TOF (Line 2)
Channel 2	BOF (Line 65)
Channel 3	Every line (Single)*
Channel 4	Double line space*
Channel 5	Triple line space*
Channel 6	Skip Four (4) spaces*
Channel 7	Skip Five (5) spaces*

NOTE: *Commencing with line two (2) and terminating on or before line 65, the tape loop shall be 66 lines in length.

By  _____

3.1.2 Press Top-of-Form control to position paperfeed mechanism.

By  _____

3.1.3 Open Yoke and load paper in printer. Position the tear-line at the top of hammer heads.

By  _____

3.1.4 Select code for Character E on the Maintenance panel.

By  _____

3.1.5 Press Test control to obtain printout; adjust penetration control for good print quality. Observe that inked ribbon advances while printing.

By  _____

3.1.6 Press Stop Control to stop printing. Observe that paper advances to 2nd Top of Form. Note that no loss of data occurs when stopping.

By  _____


3.1.7 Press TOF Control several times and check Top-of-Form position.

By  _____

3.2 Print Control

This test demonstrates the action caused by operating the operator controls not heretofore demonstrated.

3.2.1 With paper loaded, Yoke closed and Simulator either disconnected or inoperative, press START control. Check that this control is illuminated, STOP control is not illuminated and no printing or paperfeeding occurs.

By  _____

3.2.2 Repeat 3.2.1 with: (a) Yoke open, (b) Paper out.

Check (a) YOKE OPEN indicator is illuminated.
(b) PAPER OUT indicator is illuminated.

(a & b) *STOP SEC 3/10/65*
STOP control and START control are not illuminated.


Press STOP control, reload paper and close Yoke

By  _____

3.2.3 Press in order, the START, STOP and TOP-OF-FORM controls at rear of printer console and check for action specified in 3.2.1 and 3.1.7 above.

By  _____

- 3.2.4 (a) Block lamps on format Ch. 1 (so that no light is picked up by photodiode). Press TOF control. Check that paper advances for a minimum of two forms (maximum should not exceed 5 forms). Check that Paper Runaway indicator is illuminated. ✓
- (b) Press START control. Paper Runaway indicator should go out. ✓ Press STOP control. ✓
- (c) Repeat (a). Press TEST; Paper Runaway indicator should go out. ✓ Press RESET on Maintenance control panel. ✓
- (d) Repeat (a). Restore format lamps to normal. Press TOF control. Paper Runaway indicator should go out. ✓

By 

3.4 ON LINE MODE (Simulator Logic Drawings)

The following tests demonstrate Interface capabilities of the controller.

- 3.4.1 Program Simulator for Solid character--see Chart C. Print out at least three (3) pages. Check printout for single-line spacing and solid pattern.

By 

- 3.4.2 Program Simulator for Ripple pattern and print the following number of columns:

0,1,2,3,5,9,10,27,34,58,96,100,120,136*, 160*
and any other(s) that client may desire.
See Chart A for switch setting. Print out about five lines for each counter setting.

By 

- 3.4.3 Program Simulator for full line of Print and Ripple pattern. See Chart C for switch setting. Print out about 3 pages.

By 

- * Does not apply to 120-column system.
** Does not apply to 120- or 136-column system.

CHART A

Select following codes and press START control.
All codes are decimal (excess three).

<u>Switch</u>	<u>Select</u>			<u>Result</u>
VFU	4			Single Line Feed
Character DATA	All switches on C (count)			Ripple Pattern
PRINT/CLEAR	Print			Allows Print
Character Counter	<u>Units</u>	<u>Tens</u>	<u>Hundreds</u>	
	3	3	3	No print, feed paper
	4	3	3	Print 1st column
	5	3	3	Print 2 columns
	6	3	3	Print 3 columns
	8	3	3	Print 5 columns
	12	3	3	Print 9 columns
	3	4	3	Print 10 columns
	10	5	3	Print 27 columns
	7	6	3	Print 34 columns
	11	8	3	Print 58 columns
	9	12	3	Print 96 columns
	3	3	4	Print 100 columns
	3	5	4	Print 120 columns
	9	6	4	Print 136 columns
	3	9	4	Print 160 columns

CHART B

Select following codes and press START control.
All codes decimal (excess three).

<u>Switch</u>	<u>Select</u>	<u>Result</u>
PRINT/CLEAR	Print	
Character DATA	All sw. on C (count)	
Character Counter	Set for full line of data	
	<u>Units</u> <u>Tens</u> <u>Hundreds</u>	
	3 5 4	120-col. printer
	9 6 4	136-column printer
	3 9 4	160-column printer
VFU	(a) 3	Print, No line feed.
	(b) 4	Print, Single line fd
	(c) 5	Print, Double line fd
	(d) 6	Print, Ch. 1 (TOP of Form)
	(e) 7	Print, Ch. 2 (BOT of Form)
	(f) 8	Print, Ch. 3 Single line fd
	(g) 9	Print, Ch. 4 Double line fd
	(h) 10	Print, Ch. 5 3 lines
	(i) 11	Print, Ch. 6 4 lines
	(j) 12	Print, Ch. 7 5 lines
	(k) 0,1,2	Print, No line feed.
	13, 14, 15]	Scope T.P. 1 on simulator should indicate an ALARM I condition (Invalid Excess)

CHART C

All codes decimal (excess 3).

Select the following codes and press START control.

I. Full line of data, Ripple pattern.

<u>Switch</u>	<u>Setting</u>	
PRINT/CLEAR	Print	
Character	All switches on C	
VFU	4	Single Line
Character Counter	<u>Units</u> <u>Tens</u> <u>Hundreds</u>	
	3 5 4	120-col. printer
	9 6 4	136-col. printer
	3 9 4	160-col. printer

Printout will start at highest column addressed, data will be incremented by 1 as column counter steps down towards Col. 1 (only excess 3 characters will be generated, only valid characters will be printed).*

II. Full line of data Solid character.

All switch settings, same as I above with the exception of Character Switches.

Character Data	Switch	
Example:	<u>Units</u> <u>Tens</u>	
	3 3	= Character "O"
	3 9	= Character "A"
	7 9	= Character "E"

See Code Sheet for desired code.

*Example of Printout
for 160-col. Printer:

Col.	148,	149,	150,	151,	152,	153,	154,	155,	156,	157,	158,	159,	160
Char.	etc	[/	-	-	-	Z	Y	X	W	V	U	T

(160 - 1st column printed, _ indicates blank)