JOHN WALKER

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1.1 A2 MODE SWITCH

EQUIPMENT REQUIRED

7854
PULSER
7A16
7B85
7B80
067-0912-00
3 BNC CABLES
TEST SCOPE
T CONNECTOR
TG 501

INSTALL:

PULSER	LEFT VERTICAL
7A16	RIGHT VERTICAL
7B85	A HORIZONTAL
7B80	B HORIZONTAL
067-0912	DISPLAY SLOT

SET:

PULSER

TEST	**STEP RESP.**
REP RATE	**10KHZ**

7A16

VOLTS PER DIV	**1V**

7B85

TIME PER DIV	**.2MS**
TRIGGERS	**P-P-AC-INT**

7B80

TIME PER DIV	**.1MS**
TRIGGERS	**P-P-AC-INT**

TEST SCOPE

TIME PER DIV	**.1MS**
VOLTS PER DIV	**1V**
TRIGGERING	**EXT**

TG 501

MARKERS	**1MS**

CONNECT: T CONNECTOR TO CAL OUT JACK

BNC FROM T CONNECTOR TO INPUT OF 7A16

BNC FROM TG 501 MARKERS OUT TO TEST SCOPE EXT TRIGGER IN

A2 MODE SWITCH

INSTALL: BOARD UNDER TEST

SET: 7854

POWER	**ON**
CALIBRATOR	**4V**
HORIZ MODE	**A**
VERT MODE	**LEFT**
TRIGGERS	**VERT MODE**

CHECK: LOGIC MODES BY FOLLOWING TABLE.

(1) A HORIZ

VERT MODE

LEFT	ONE 10KHZ SQUAREWAVE ONLY-TRIGGERED.
ALT	TWO TRACES, ONE 10KHZ AND ONE 1KHZ-BOTH TRIGGERED.
ADD	BOTH VERTICALS HAVE CONTROL OF POSITION.
CHOP	TWO TRACES, ONE 10KHZ AND ONE 1KHZ-TRIGGERED INDEPENDENTLY BY PRESSING RESPECTIVE A TRIGGER SOURCE.
RIGHT	ONE 1KHZ SQUAREWAVE ONLY-TRIGGERED.

(3) HORIZ ALT

LEFT	TWO 10KHZ SQUAREWAVES-BOTH TRIGGERED.
ALT	TWO TRACES, ONE 10KHZ AND ONE 1KHZ-BOTH TRIGGERED.
ADD	BOTH VERTICALS HAVE CONTROL OF POSITION.
CHOP	FOUR TRACES, TWO 10KHZ AND TWO 1KHZ
RIGHT	TWO 1KHZ SQUAREWAVES-BOTH TRIGGERED.

(4) HORIZ CHOP

LEFT	TWO 10KHZ SQUAREWAVES-BOTH TRIGGERED.
ALT	SET:A TRIGGER SOURCE TO RIGHT SET:B TRIGGER SOURCE TO LEFT TWO TRACES, ONE 10KHZ AND ONE 1KHZ-BOTH TRIGGERED.
ADD	BOTH VERTICALS HAVE CONTROL OF POSITION.
CHOP	FOUR TRACES, TWO 10KHZ AND TWO 1KHZ-ONE OF EACH TRIGGERED
RIGHT	SET:A TRIGGER SOURCE TO VERT MODE SET:B TRIGGER SOURCE TO VERT MODE TWO 1KHZ SQUAREWAVES-BOTH TRIGGERED.

(2) B HORIZ

LEFT	ONE 10KHZ SQUAREWAVE ONLY-TRIGGERED.
ALT	TWO TRACES, ONE 10KHZ AND ONE 1KHZ-BOTH TRIGGERED.
ADD	BOTH VERTICALS HAVE CONTROL OF POSITION.
CHOP	TWO TRACES, ONE 10KHZ AND ONE 1KHZ-TRIGGERED INDEPENDENTLY BY PRESSING RESPECTIVE B TRIGGER SOURCE.
RIGHT	ONE 1KHZ SQUAREWAVE ONLY-TRIGGERED.

ADJUST: **1KHZ** R25 FROM LOCK TO LOCK WHILE OBSERVING TEST SCOPE.

CHECK: WAVEFORM SMOOTHLY CHANGES FROM ROLLING TO STABLE DISPLAY

ADJUST: **1KHZ** R25 FOR STABLE DISPLAY.

ADJUST: **.4V A▩J** R15 FROM LOCK TO LOCK WHILE OBSERVING TEST SCOPE.

CHECK: FOR 4 DIVISION SQUARE WAVE THAT SMOOTHLY CHANGES IN AMPLITUDE

PRESS: .4V, 40MV CALIBRATOR SWITCHES WHILE CHECKING FOR CORRESPONDING DISPLAY ON TEST SCOPE.

1.2 A7 AUX REGULATOR

EQUIPMENT REQUIRED

7854
DM501
SMARTS DUMMY LOAD

INSTALL: LOAD IN DIGITIZER SLOT
AUX REG BOARD ON 7854

SET: DM501
RANGE 20V DC

7854
POWER ON

CHECK: THE FOLLOWING SUPPLYS ON THE AUX REG BOARD UNDER NORMAL LOAD AND STRESSED LOAD.

+5V	WITHIN +4.95 TO +5.20 VOLTS
+12V	WITHIN +11.52 TO +12.48 VOLTS
-5V	WITHIN -4.92 TO -5.15 VOLTS

PRESS: SWITCH ON 067-0912

CHECK: ALL MODE SWITCH LIGHTS ARE EQUAL INTENSITY.

1.3 A9 HORIZONTAL CHANNEL SWITCH

EQUIPMENT REQUIRED

HORIZONTAL CH SW SIGNAL EXTENDER
7854 (ANALOG)
PULSER
7B80

INSTALL: HORIZONTAL CHANNEL SWITCH SIG EXT IN TEST 7854.
PULSER IN B HORIZONTAL
7B80 IN LEFT VERTICAL

CONNECT: BNC CABLE FROM PULSER PRETRIGGER OUT TO 7B80 EX TRIGGER IN.

100 OHM RESISTER ACROSS END OF WHITE COAX CABLE (PICKOFF OUT).

X10 PROBE FROM TEST SCOPE TO CENTER CONDUCTOR SIDE OF 100 OHM RESISTER (PIN 2).

BNC CONN. TO PG4 FROM 7A20

SET: 7B80

TIME PER DIV	50NS
MAG	X10
TRIGGERS	AUTO-AC-INT

TEST SCOPE

VOLTS PER DIV	20MV
VERT COUPLING	GND
TIME PER DIV	10NS
TRIGGERING	AUTO-AC-EXT
VERT POSITION	CENTERED
COUPLING	DC

CHECK: RESISTANCE OF BOARD UNDER TEST BEFORE INSTALLING.

SUPPLY	RESISTANCE (20K SCALE)
+15	12K - 9K
+5	400
-5	OVER SCALE
-15	6.5K 7.5K

-5 OVER SCALE
+15 ≃12K
-15 ≃6.5K
+5 400

INSTALL: BOARD TEST ON FIXTURE

SET: 7854

POWER	ON
VERT MODE	LEFT
HORIZ MODE	B

PULSER

TEST	COM MODE
REP RATE	1MHZ

CHECK: FOR VERTICAL TRACE CLOSE TO GRAT CENTER.

SET: PULSER

TEST	VERT HORIZ GAIN
POSITION	CENTER TRACE OVER GRAT

CHECK: FOR GAIN OF APPROX. 1 TRACE PER DIV (NOTE GAIN).

MOVE: PULSER TO A HORIZONTAL

SET: 7854

HORIZ MODE	A

CHECK: FOR SAME GAIN AS B HORIZONTAL (WITHIN .08 DIVS).

CHECK: PICKOFF CENTERING R45 FOR 2 DIV RANGE, ON TEST SCOPE, WITH AT LEAST .5 DIVS EACH SIDE OF CENTER.

GAIN R42 FOR 1 DIV RANGE ON A ~~5.5~~ 6.5 DIV DISPLAY.

SET: PULSER

TEST	VERT-HORIZ +STEP
AMPLITUDE	6 DIV SQ WAVE
POSITION	CENTERED

7B80

TRIGGERING	EXT

CHECK: FOR A TIPICAL FRONT CORNER ON 7854 CRT.

SET: TEST SCOPE

TRIGGERING	INT

CHECK: FOR FRONT CORNER, ON TEST SCOPE, THAT IS SLIGHTLY ADJUSTABLE BY R41,C41,R65,C65. No SIG - CHECK R9 - R14

MOVE: PULSER BACK TO B HORIZONTAL

1.4 A13 TRIGGER AMPLIFIER

EQUIPMENT REQUIRED

TRIGGER BOARD SIGNAL EXTENDER
7854
7BXY
PULSER
PELTOLA TO BNC ADDAPTER
36" COAX CABLE
6" PELTOLA TO PELTOLA CABLE
50 OHM TERMINATOR

REMOVE: TRIGGER BOARD FROM 7854.

CONNECT: TRIGGER BOARD SIGNAL EXTENDER ON 7854 IN PLACE OF TRIGGER BD.

SET: TEST SCOPE SO GROUND IS AT CENTER SCREEN.

CHECK: RESISTANCE OF POWER SUPPLYS ON BOARD USING FOLLOWING CHART.

SUPPLY	LOCATION	RESISTANCE
+15V	BU	2K
+5V	BV	560
-15V	BW	527
+15V	CD	1K
+5V	CA	550
-15V	CC	460

INSTALL: BOARD TO BE CHECKED IN FIXTURE.

CONNECT: COAX, BNC ADDAPTER, AND 6" PELTOLA CABLE FROM TEST SCOPE INPUT TO SINGLE PELTOLA CONNECTOR ON TRIGGER BD. CONNECT 4 PELTOLA CABLES TO CONNECTORS AT TOP OF BOARD. CONNECT HARMONICA PLUG.

INSTALL: 7BXY INTO A HORIZONTAL
PULSER INTO LEFT VERTICAL

SET 7854

POWER	**ON**
VERT MODE	**LEFT**
HORIZ MODE	**A**
A TRIGGER SOURCE	**VERT MODE**
B TRIGGER SOURCE	**VERT MODE**

TEST SCOPE

VOLTS PER DIV	**1V**

PULSER

TEST	**COMMON MODE**

ADJUST: **VERT SIGNAL OUT DC CENTER** R547 TO CENTER TRACE ON TEST SCOPE.

ADJUST: **A TRIGGER DC CENTER** R586 TO CENTER SPOT ON 7854 HORIZONTALY.

SET: PULSER

TEST	**TRIG GAIN**

CHECK: TEST SCOPE FOR 5 DIV OF SIGNAL + - 1 DIV

CONNECT: 50 OHM TERMINATOR INTO COAX GOING TO TEST SCOPE.

SET: TEST SCOPE

VOLT PER DIV	**50MV**

CHECK: 5 DIV OF SIGNAL ON TEST SCOPE + - 1 DIV.

ADJUST: **A TRIGGER GAIN** R589 FOR ONE DOT PER DIV ON 7854 SCREEN.

SET: 7854
A TRIGGER MODE **LEFT**

CHECK: DISPLAY DOES NOT CHANGE.

SET: 7854
A TRIGGER MODE **RIGHT**

CHECK: DOT AT CENTER SCREEN.

MOVE: PULSER TO RIGHT VERTICAL.

CHECK: ONE DOT PER DIV.

MOVE: 7BXY TO B HORIZONTAL.

SET: 7854
VERT MODE **RIGHT**

PULSER
TEST **COMMON MODE**

ADJUST: **B TRIGGER DC CENTER** R686 TO CENTER SPOT ON 7854 SCREEN HORIZONTALY.

SET: PULSER
TEST **TRIG GAIN**

ADJUST: **B TRIGGER GAIN** R689 FOR ONE SPOT PER DIV ON 7854.

SET: 7854
B TRIGGER MODE **LEFT**

CHECK: DISPLAY DOES NOT CHANGE.

SET: 7854
B TRIGGER MODE **RIGHT**

CHECK: SPOT CENTERED ON SCREEN HORIZONTALY.

MOVE: PULSER TO RIGHT VERTICAL.

CHECK: ONE SPOT PER DIV HORIZONTALY.

1.5 A14 LOGIC BOARD

EQUIPMENT REQUIRED

7854
PULSER
7A26'S(2)
7B80

INSTALL:

7A26	LEFT VERTICAL
7A26	RIGHT VERTICAL
7B85	A HORIZ
7B80	B HORIZ

SET: 7A26'S

DISPLAY MODE	CH1
COUPLING	GND
CH 1 POSITION	CENTERED
CH 2 POSITION	CENTERED

7B85

TRIGERING	AUTO-AC-INT
TIME PER DIV	.2MS
MAG	X1
DELAY MODE	INDEPENDENT
TRACE SEP	OFF
POSITION	CENTERED

7B80

TRIGGERING	AUTO-AC-INT
TIME PER DIV	.2MS
MAG	X1
POSITION	CENTERED

7854

POWER	ON
HORIZ MODE	A
VERT MODE	LEFT
A TRIGGER SOURCE	VERT MODE
B TRIGGER SOURCE	VERT MODE
READOUT	OFF
VERT TRACE SEP	CENTERED

POSITION: LEFT 7A26 CH 1 POSTION CONTROL SO TRACE IS 2 DIV ABOVE GRAT CENTER.

RIGHT 7A26 CH 1 POSTION CONTROL SO TRACE IS 2 DIV BELOW GRAT CENTER.

VERTICAL AND HORIZONTAL MODES

CHECK: VERTICAL AND HORIZONTAL MODES USING FOLLOWING CHART.

VERT MODE	HORIZ MODE A	HORIZ MODE ALT	HORIZ MODE CHOP	HORIZ MODE B
LEFT	SINGLE TRACE DISPLAYED IN UPPER HALF OF SCREEN DISPLAYED BY A HORIZ	A HORIZ 2MS B HORIZ 20MS 2 TRACES UPPER HALF ALT BETWEEN A AND B HORIZ	A HORIZ 1S BHORIZ .1S CHECK A AND B DISPLAYED SIMULTANOUSLY	B HORIZ 20MS ONE TRACE BOTTOM SCREEN B HORIZ
ALT	A HORIZ 20MS ALTERNATES BETWEEN LEFT AND RIGHT	A HORIZ 2MS TWO TRACES 1 A HORIZ RIGHT 2B HORIZ LEFT (TWO SCOPES)	A HORIZ 1S B HORIZ 1S TWO TRACES LEFT AND RIGHT DISPLAYED SIMUTANIOUSLY	B HORIZ 20MS LEFT AND RIGHT ALTERNATE
ADD	A HORIZ 20MS SINGLE TRACE POSITIONED BY LEFT AND RIGHT VERTICALS	A HORIZ .2MS B HORIZ 20MS TWO TRACES ALTERNATE BETWEEN A AND B HORIZ	A HORIZ .1S B HORIZ .1S TWO TRACES LEFT AND RIGHT POSITION FULL DISPLAY	BHORIZ 20MS ONE TRACE RIGHT AND LEFT POSITION TRACE
CHOP	A HORIZ TWO TRACES	A HORIZ .2MS B HORIZ 20MS FOUR TRACES A AND B HORIZ ALTERNATE	A HORIZ .1S B HORIZ .1S FOUR TRACES DISPLAYED	B HORIZ TWO TRACES DISPLAYED
RIGHT	A HORIZ .2MS ONE TRACE BOTTOM OF SCREEN	A HORIZ .2MS B HORIZ 20MS RIGHT VERT ALTERNATES BETWEEN A AND B HORIZ	A HORIZ .1S B HORIZ .1S TWO TRACES A AND B HORIZ DISPLAYED AT ONCE	B HORIZ .2MS ONE TRACE DISPLAYED BOTTOM OF SCREEN

TRACE SEPERATION

SET: 7854
HORIZ MODE A
VERT MODE LEFT

POSITION: TRACE TO BOTTOM GRAT LINE WITH LEFT 7A26 POSITION CONTROL.

TURN: VERT TRACE SEPERATION CW.

SET: 7854
HORIZ MODE CHOP

CHECK: 2ND TRACE IS 4 TO 6 DIV ABOVE BOTTOM GRAT LINE.

TURN: VERT TRACE SEPARATION CCW.

POSITION: TRACE TO TOP GRAT LINE WITH 7A26 POSITION CONTROL.

CHECK: 2ND TRACE IS 4 TO 6 DIV BELOW TOP GRAT LINE.

CENTER: VERT TRACE SEPARATION

Z AXIS GAIN

CHECK: THAT WHEN R165 IS ADJUSTED FROM MAX TO MIN THAT TRACE ON SCREEN CHANGES BRIGHTNESS.
**NOTE BE CAREFUL NOT TO BURN PHOSPHOR.

PLUG-IN DRIVE

SET: 7854

HORIZ MODE	A
VERT MODE	LEFT

7B85

TIME PER DIV	50MS

LEFT 7A26

DISPLAY MODE	ALT

CHECK: 7B85 ALTERNATES BETWEEN CH 1 AND CH 2 OF LEFT 7A26

SET: LEFT 7A26

DISPLAY MODE	ADD

CONNECT: CALIBRATOR SIGNAL TO CH 2 INPUT.

CHECK: CAL SIGNAL IS DISPLAYED AND CH 1 POSITION CONTROL MOVES TRACE.

SET: LEFT 7A26

DISPLAY MODE	CHOP

CHECK: TWO TRACES ONE CONTROLED BY CH 1 POSITION AND ONE CONTROLED BY CH 2 POSITION CONTROL.

SET: LEFT 7A26

DISPLAY MODE	CH 2

CHECK: CAL SIGNAL DISPLAYED.

CHECK: RIGHT 7A26 DISPLAY MODES SAME AS THE LEFT.

1.6 A17 HORIZONTAL AMPLIFIER

EQUIPMENT REQUIRED

7854
PULSER
7B80

INSTALL: PULSER — B HORIZONTAL
7B80 — LEFT VERTICAL

CONNECT: COAX CABLE FROM PULSER PRETRIGGER OUT TO 7B80 EXT TRIGGER IN.

SET:

PULSER

TEST	**COM MODE**
REP RATE	**10KHZ**

7B80

TIME PER DIV	**20NS**
TRIGGERS	**AUTO-AC-EXT**

CHECK: RESISTANCES OF BOARD UNDER TEST BEFORE INSTALLING ON 7854

(ALL RESISTANCES TAKEN ON 20K SCALE)

SUPPLY	RESISTANCE
+130	16K OHMS
+50	OVER SCALE
+15	9K OHMS
+5	9K "
-5	4.7K "
-15	11K "
-50	6.5K "

INSTALL: BOARD UNDER TEST

SET: 7854

POWER	**ON**
HORIZ MODE	**B**
VERT MODE	**LEFT**

CONNECT: JUMPER WIRE FROM TP 141 TO TP 41

ADJUST: **LIMIT CENTER** R160 TO CENTER TRACE.

REMOVE: JUMPER

ADJUST: **HORIZONTAL CENTER** R15 TO CENTER TRACE.

SET: PULSER

TEST	**VERT HORIZ GAIN**

ADJUST: **HORIZONTAL GAIN** R30 FOR ONE TRACE PER DIV.

SET: PULSER

TEST	**VERT HORIZ +STEP**
REP RATE	**1 MHZ**
GAIN	**6 DIV SQUARE WAVE**

7B80

TRIGGERING	**STABLE DISPLAY**
POSITION	**FRONT CORNER DISPLAYED**

ADJUST: C155, C55, C32 FOR CLEAN FRONT CORNER.

SET: PULSER

TEST	**COM MODE**
REP RATE	**10KHZ**

1.7 A18 VERTICAL AMPLIFIER

EQUIPMENT REQUIRED

7854
PULSER
7B80

INSTALL:	PULSER	LEFT VERTICAL
	7B80	B HORIZONTAL

SET:

PULSER

TEST	**COM MODE**
REP RATE	**10KHZ**

7B80

TIME PER DIV	**.1MS**
TRIGGERING	**AUTO-AC-INT**

CHECK: RESISTANCE OF BOARD UNDER TEST AFTER INSTALLING ON 7854

(ALL RESISTANCES TAKEN ON 2K SCALE)

LOCATION	RESISTANCE
R136,137,167,166	150 OHMS
L133,163	100 "
Q79,99	280 "
P207 PINS	
1 GND	0 "
2 +50	1.7K
3 +15	50
4 +5	4 "
5 X-Y INH	1K "
6 BEAM FIND	3
7 -5	400

INSTALL: BOARD ON 7854

SET: 7854

POWER	**ON**
HORIZ MODE	**B**
VERT MODE	**LEFT**

PULSER

TEST	**COM MODE**

ADJUST: VERTICAL CENTER R105 TO BRING TRACE TO GRAT CENTER.

SET: PULSER

TEST	**VERT HORIZ GAIN**

ADJUST: **VERTICAL GAIN** R160 FOR ONE TRACE PER DIV.

ADJUST: **RO-WFM-CTR** R65 AND **RO-WFM-GAIN** R81 TO PROPERLY POSITION READOUT.

SET: PULSER

TEST	**VERT HORIZ +STEP**
REP RATE	**100HZ**

ADJUST: ABERRATIONS BY TABLE.
NOTE THE INTENT OF THIS ADJUSTMENT IS TO SEE IF THE TWEEKS ARE FUNCTIONAL AND NO UNUSUAL CHARACTERISTICS ARE DISPLAYED.

PULSER	7B80	ADJUSTMENT
100HZ	2MS	R139
1KHZ	.2MS	R169
1 MHZ	.2US	R142,R172
1 MHZ	5NS	L20,R18,C18

1.8 A19 VERTICL CHANNEL SWITCH

EQUIPMENT REQUIRED

7854
PULSER
7B80

INSTALL: 7B80 — B HORIZONTAL
PULSER — LEFT VERTICAL (LEAVE PARTIALLY OUT)

SET: PULSER

TEST	**VERT HORIZ +STEP**
REP RATE	**1KHZ**

7B80

TIME PER DIV	**.2MS**
TRIGGERING	**AUTO-AC-INT**

CHECK: RESISTANCE BY TABLE BELOW

LOCATION		RESISTANCE
P176		
1	+5	590 OHMS
2	+15	1.7K "
3	GND	0 "
4	-5	850 "
5	-15	920 "
6	DIS L	1.4K "
7	DIS R	1.4K "
8	X-Y INH	1.7K "

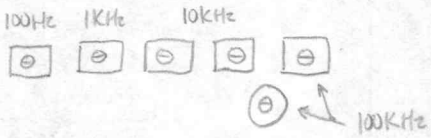
INSTALL: BOARD UNDER TEST

REMOVE: PULSER

SET: 7854

POWER	**ON**
VERT MODE	**CHOP**
HORIZ MODE	**B**

ADJUST: **LEFT BALANCE** R120 & **RIGHT BALANCE** R21 THOUGH THERE RANGE CHECKING FOR APPROX. 1 DIV TRACE MOVEMENT AND THE TWO TRACES CAN BE OVERLAYED.



INSTALL: PULSER LEFT VERTICAL

SET: 7854

VERT MODE **LEFT**

PULSER

GAIN **6 DIV SQUAREWAVE**

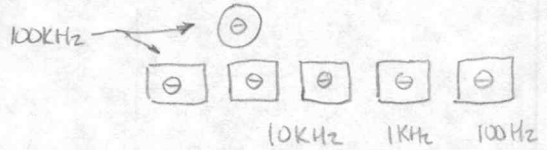
ADJUST: POTS ON THE TOP EDGE OF BOARD CHECKING FOR SMOOTH OPERATION, ALSO AS YOU PROGRESS FROM LEFT TO RIGHT THE ADJUSTMENTS HAVE A SHORTER TIME CONSTANT.

MOVE: PULSER RIGHT VERTICAL

SET: 7854

VERT MODE **RIGHT**

ADJUST: POTS ON BOTTOM EDGE THROUGH THERE RANGE CHECKING FOR SMOOTH OPERATION, ALSO AS YOU PROGRESS FROM RIGHT TO LEFT THE ADJUSTMENTS HAVE A SHORTER TIME CONSTANT.



1.9 A20 HIGH VOLTAGE

EQUIPMENT REQUIRED

7854 (REAR CASTING REMOVED)
CROSS HATCH-RASTER GENERATOR

INSTALL: CROSSHATCH GENERATOR IN B HORIZONTAL

SET: CROSSHATCH

MODE	CROSSHATCH
DUTY-LINE	2.0 PERCENT 11 LINE
AUX Y	ON
AUX Z	ON

CHECK: RESISTANCE OF BOARD UNDER TEST BEFORE INSTALLING. (RESISTANCES TAKEN ON 20K SCALE)

P20

PINS	
1	14K
2	OVER RANGE
3	OVER RANGE
4	10K → 8K
5	0
6	6K
7	OVER RANGE
8	10K → 16K
9	OVER RANGE
10	OVER RANGE

PRESET: ALL POTS TO MIDRANGE

INSTALL: BOARD UNDER TEST

SET: 7854

POWER	ON
VERT MODE	LEFT
HORIZ MODE	B

CAUTION: EXTREME TRACE INTENSITY MAY OCUR

ADJUST: **GRID BIAS** R65 FOR DIM TRACE (WITH B INTENSITY AT 10 O CLOCK)

CHECK: B INTENSITY FOR NORMAL OPERATION

SET: DM 501

RANGE	200V DC

CONNECT: DM 501 + LEAD (X1) TO TP 127, - LEAD TO GND.

ADJUST: **HV ADJ.** R115 FOR 100V WITH B INTENSITY AT MINIMUM.

ROTATE: B INTENSITY CHECKING DM 501 FOR LESS THAN 60V READING AT MAX INTENSITY. (LEAVE B INTENSITY AT USABLE LEVEL)

MOVE: DM 501 + LEAD TO P20 PIN 2, CHECKING FOR A READING BETWEEN 128.5V AND 131.5V

MOVE: DM 501 + LEAD TO TP 156, ADJUST **SHIELD VOLTS** R155 FROM LOCK TO LOCK, CHECKING FOR 33V TO 35V RANGE. SET AT 34.5V.

REMOVE: DM 501 + LEAD

ADJUST: **FOCUS PRESET** R55 FOR BEST FOCUS, CHECKING FOR SMOOTH OPERATION.

ADJUST: **GEOMETRY** R143 FOR BEST GEOMETRY, CHECKING FOR SMOOTH OPERATION.

CONNECT: X1000 PROBE TO DM 501

SET: DM 501
RANGE 20V DC

CONNECT: DM 501 - LEAD TO GND, X1000 LEAD TO TP 79.

CHECK: FOR -2.925V TO -3.005V ON DM 501

REMOVE: X1000 LEAD FROM TP 79 AND DM 501

1.10 A21 Z-AXIS AUTO FOCUS AMPLIFIER

EQUIPMENT REQUIRED

7854
7B80
7A26
TEST SCOPE
TWO X10 PROBES
DM 501

INSTALL: 7B80 B HORIZONTAL
7A26 LEFT VERTICAL

SET: 7B80

TIME PER DIV	**.1US**
TRIGGERING	**AUTO-AC-EXT**

7A26

POSITION	**CW(OFF SCREEN)**

TEST SCOPE

TIME PER DIV	**.2US**
CH1 VOLTS PER DIV	**.2V**
CH1 POSITION	**2 DIV FROM TOP GRAT**
CH2 VOLTS PER DIV	**2V**
CH2 POSITION	**1 DIV FROM BOTTOM**
VERT MODE	**CHOP**
TRIGGERING	**CH1**

DM 501

FUNCTION	**2V DC**

A21 Z-AXIS AUTO FOCUS AMPLIFIER

INSTALL: BOARD ON 7854

SET: 7854

POWER	**ON**
HORIZ MODE	**A**
VERT MODE	**LEFT**
A & B INTENSITY	**CCW(MINIMUM)**

CONNECT: TEST SCOPE CH1 X10 PROBE TO TP106
TEST SCOPE CH2 X10 PROBE TO TP183
DM 501 +LEAD TO TP122, -LEAD GND.

NOTE: VOLTAGE DISPLAYED ON DM 501

MOVE: DM 501 +LEAD TO TP103

ADJUST: **GSF LEVEL** R102 FOR A READING 40MV LOWER THAN PRIOR NOTED VOLTAGE.

REMOVE: DM 501 LEADS

SET: 7854

HORIZ MODE	B

CHECK: FOR TTL LEVEL (.5V TO 2.5V) SQUARE WAVE ON TEST SCOPE TOP TRACE.

ROTATE: **B INTENSITY** TO MAXIMUM(CW) OBSERVING TEST SCOPE TOP TRACE REMAINS STABLE.

ADJUST: **Z-AXIS GAIN** R125 TO POSITION TEST SCOPE BOTTOM TRACE UPPER LEVEL TO 1 DIV ABOVE GRAT CENTER (80V).
(ADJUST C180 TO IMPROVE SQUARE WAVE IF NECESSARY.)

ADJUST: **OUTPUT LEVEL** R135 TO POSITION LOWER TRACE BOTTOM TO 1.5 DIV ABOVE GRAT BOTTOM EDGE (10V)

CONNECT: CH2 X10 PROBE TO TP186

SET: TEST SCOPE

CH2 VOLTS PER DIV	**50MV**
CH2 VARIABLE	**OUT**
CH2 GAIN AND POS	**8 DIV DISPLAY**

7854

B INTENSITY	**6 DIV DISPLAY** ON TEST SCOPE

ADJUST: C180, C155, R155, C150 AND R150 FOR SQUARE FRONT CORNER. (9 TO 15NS RISE 3 PERCENT ABERRATION)

REMOVE: TEST SCOPE CH2 X10 PROBE

SET: TEST SCOPE

CH2 VOLTS PER DIV	**2V**
CH2 VARIABLE	**IN**
CH2 GND REFERANCE	**1 DIV UP FROM BOTTOM GRAT**

7854

B INTENSITY	**MAX**
HORIZ MODE	**CHOP**

CONNECT: TEST SCOPE CH2 X10 PROBE TO TP83

ADJUST: **OUTPUT LEVEL** R70 & **FOCUS GAIN** R63 FOR A SQUARE WAVE FROM 1 DIV BELOW TOP GRAT(120V) TO .5 DIV ABOVE BOTTOM GRAT(-10V).

1.11 POWER SUPPLY

TEST EQUIPMENT REQUIRED

DM 501
7A22
7A26
VARIAC
HI POT TESTER
7K SERIES PROGRAMMABLE ACTIVE LOAD
7104 @! 7854 PROGRAM CARD
X1 PROBE (2 EA)
X10 PROBE
TEST SCOPE

VISUAL INSPECTION

CHECK: FOR MISSING PARTS, LOOSE SCREWS, AND CAPACITOR POLARITIES ON BOARDS.

INITIAL TURN ON

SET: VARIAC

SWITCH	**OFF**
DIAL	**CCW (0V)**

PLUG: SUPPLY ONTO VARIAC

CONNECT: LOAD BOX CABLES.

TURN: VARIAC SWTCH ON , AND SLOWLY ROTATE VARIAC DIAL UP TO LINE VOLTAGE WATCHING THE WATT METER (SUPPLY SHOULD START AT ABOUT 90V).

108V

SET: LOAD BOX

5V SW	**MAX**
OTHER LOADS	**MIN**

DM501

DC VOLTS	**200V**

CONNECT: DM LEADS TO GROUND AND 108V TEST POINT ON CAP RECTIFIER BOARD.

ADJUST: PRE REG R93 FOR 108.5V ON 108V TEST POINT.

REMOVE: LEADS.

LOW VOLTAGE REGULATION

CONNECT: DMM LO LEAD TO GROUND SENS TEST POINT. HI LEAD TO -50V TEST POINT ON LOW VOLTAGE BOARD.

ADJUST: - 50V ADJUST R15 FOR -50.00 ON DMM.

CHECK: SUPPLIES FOR REGULATION WITHIN TOLERANCES GIVEN IN FOLLOWING CHART , CHECK OVER 90V TO 132V LINE VOLTAGE RANGE.

+50V	**50.25 TO**	**49.75**
+15V	**15.09 TO**	**14.91**
+5V	**5.05 TO**	**4.95**
-15V	**15.09 TO**	**14.91**

-50V	50.10 TO 49.90

LOW VOLTAGE RIPPLE

INSTALL: 7A22 INTO TEST SCOPE LEFT VERTICAL.

CONNECT: X1 PROBES ONTO 7A22.

SET: TEST SCOPE

VERT MODE	LEFT

7A22

COUPLING	AC
HF -3DB POINT	1MHZ
LF -3DB POINT	DC
VOLTS PER DIV	1MV
POSITION	MIDRANGE

CONNECT: ONE PROBE FROM 7A22 TO GROUND SENS TEST POINT, AND THE OTHER PROBE TO TO -50V TEST POINT.

SET: LOAD BOX

+50 LOAD	MAX
-50 LOAD	MAX

CHECK: LESS THAN 2MV OF RIPPLE WHILE VARYING LINE VOLTAGE FROM 90V TO 132V , CHECK REMAINING SUPPLIES USING FOLLOWING CHART (SET LOAD ON SUPPLY TO BE CHECKED TO MAX).

100V	300MV
+50V	3MV
+15V	1MV
+5V	1MV
-15	1MV
-50	3MV
5VL	50MV **

** 5VL TEST POINT PIN 10 OF P82 ON LOW VOLTAGE BD.

SHORT TESTS

SET: LOAD BOX

5V	MAX
OTHER LOADS	MIN
SELECTOR SW	-50

VARIAC

LINE VOLTAGE	120V

PRESS: SHORT BOTTON ON LOAD BOX

CHECK: POWER SUPPLY GOES INTO BURST MODE.

CHECK: SUPPLY RECOVERS AFTER BUTTON IS RELEASED.

CHECK: EACH SUPPLY WILL SHUTDOWN AND RECOVER WHILE SHORTING BY SELECTING EACH SUPPLY WITH LOAD BOX SELECTOR SW.

LINE TRIGGERS

REMOVE: 7A22 FROM TEST SCOPE.

INSTALL: 7A26 INTO TEST SCOPE.

SET: 7A26

DISPLAY MODE	**CH 1**
TRIGGER MODE	**CH 1**
COUPLING	**AC**
POSITION	**MIDRANGE**
BANDWITH	**FULL**
VOLTS PER DIV	**.1V**

TEST SCOPE

TRIGGERING	**P-P AUTO-AC-LINE**
MAG	**X1**
TIME PER DIV	**10MS**
POSITION	**MIDRANGE**

CONNECT: X10 PROBE FROM 7A26 CH 1 INPUT TO PIN 2 OF P54 ON LOW VOLTAGE BD.

CHECK: WAVEFORM SLOPE ON TEST SCOPE IS THE SAME AS SLOPE SELECTED ON TEST SCOPE HORIZONTAL TRIGGER.

POWER ON LOGIC

CONNECT: DM501 LO LEAD TO GROUND SENS, AND HI LEAD TO PIN 4 OF P54 ON LOW VOLTAGE BD.

CHECK: PIN 4 GOES FROM .5V TO 4V APPOXIMATLY 3.5 SEC AFTER SUPPLY IS TURNED ON.

HI POT

INSTALL: ALL SHEET METAL.

CONNECT: HI POT TESTER TO POWER SUPPLY.

INCRESS: VOLTAGE ON HI POT TESTER TO 1.5KV AND LEAVE IT ELEVATED FOR ONE MIN.

CHECK: FOR NC ARCING AND ABOUT 8MA OF CURRENT.

TURN: DOWN HI POT TESTER REMOVE CONNECTIONS AND SHIP.

1.12 A25 DIGITIZER

EQUIPMENT REQUIRED

7854
PULSER
7A26
7B80 M 501
TEST SCOPE
067-0961 TEST PROM
TEN TURN POT

INSTALL:	PULSER	LEFT VERTICAL
	7A26	RIGHT VERTICAL
	7B80	B HORIZONTAL
	TEST PROM	ROM SLOT

SET:	PULSER	
	TEST	GAIN
	REP RATE	10KHZ
	7A26	
	VOLTS PER DIV	.1V
	DISPLAY MODE	CH 1
	7B80	
	TIME PER DIV	.1MS
	TRIGGERING	AUTO-AC-INT
	DM 501	
	FUNCTION	2 VOLTS DC
	TEST SCOPE	
	TIME PER DIV	.2MS
	VOLTS PER DIV	50MV
	TRIGGERING	AUTO-AC-INT

INSTALL:	BOARD UNDER TEST	

SET:	7854	
	POWER	ON
	HORIZ MODE	B
	VERT MODE	LEFT
	TRIGGERING	VERT MODE

PRESS:	7854	
	DELAY	FOR CONTINIOUS ACQUIRE

CHECK: VOLTAGES WITH TEST SCOPE AT THESE LOCATIONS

VERTICAL PICKOFF AMP: PROBE ON LOWER END OF R105(LARGE 100 OHM), CHART LOCATION 1, SHOULD BE **100MV PER DIVISION**

VERT AND HORIZ SAMPLING BRIDGES: PROBE ON UPPERMOST POINT ON BRIDGES, CHART LOCATION 3 AND 6, SHOULD BE APPROX **100MV PER DIVISION** EACH.

VERTICAL VOLTAGE FOLLOWER: PROBE ON LEFT SIDE OF R279 (300 OHM), CHART LOCATION 4, SHOULD BE APPROX **75MV PER DIVISION.**

HORIZONTAL VOLTAGE FOLLOWER: PROBE ON RIGHT SIDE OF R379(300 OHM), CHART LOCATION 7, SHOULD BE APPROX **75MV PER DIVISION.**

VERT-HORIZ CHANNEL SWITCH: PROBE ON RIGHT-HAND PIN OF P509, CHART LOCATION 8, SHOULD BE APPROX **250MV PER DIVISION.**

CHECK: FOR STORED DISPLAY ON SCREEN

CONNECT: TEST SCOPE PROBE TO LOWER END OF R105.

ADJUST: R80 TO CENTER WAVEFORM.

REMOVE: TEST SCOPE PROBE.

ADJUST: STORED DISPLAY ROUGHLY TO OVERLAY REALTIME DISPLAY BY FOLLOWING LIST.

VERTICAL POSITION	R280
HORIZONTAL POSITION	R380
VERT-HORIZ GAIN	R290

SET: PULSER

TEST	STEP RESP
REP RATE	1MHZ

7B80

TIME PER DIV	10NS

ADJUST: ROUGHLY SQUARE UP FRONT CORNER WITH FOLLOWING LIST TO ENSURE FUNCTIONALITY OF TWEEKS.

SLOW	R13
	R12
	R11
	R58
	R40,C40
	R60,C61
FAST	C62

BIT SYMETRY

CONNECT: TEN TURN POT TO P509, X1 PROBE FROM SAWTOOTH OUT TO RIGHT-HAND TEST POINT ON TEN TURN POT, X10 PROBE FROM CH1 INPUT OF 7A26 TO TP 523, AND DM501 LEAD TO LEFT TP ON TEN TURN POT.

SET: 7B80

TIME PER DIV	2MS
TRIGGERING	AUTO-AC-EXT

PRESS: 7854

WIDTH	STOPS ACQUIRE
ID	FOR REALTIME DISPLAY

ADJUST: R515 LOCATED BELOW TEN TURN POT, FOR MOST SYMETRICAL SQUAREWAVE ON 7854 SCREEN.

SELECT: C561, IF R515 DOES NOT HAVE ENOUGH RANGE TO ATAIN PROPER SYMETRY.

ADJUST: TEN TURN POT TO 310MV (31 CODE) ON DM 501.

ADJUST: LSB MATCH, R623, FOR A SYMETRICAL SQUAREWAVE **NOTE** IF NO EFFECT IS OBSERVED, ADJUST TEN TURN POT SLIGHTLY UNTIL THE EFFECT IS NOTICED.

REMOVE: X1 PROBE AND DM 501 LEAD.