

INSTRUCTION MANUAL

Serial Number _____

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067-0945-99

1450 TEST MODULATOR

I.F. BOARD KIT

37.0 MHZ

COMPANY CONFIDENTIAL

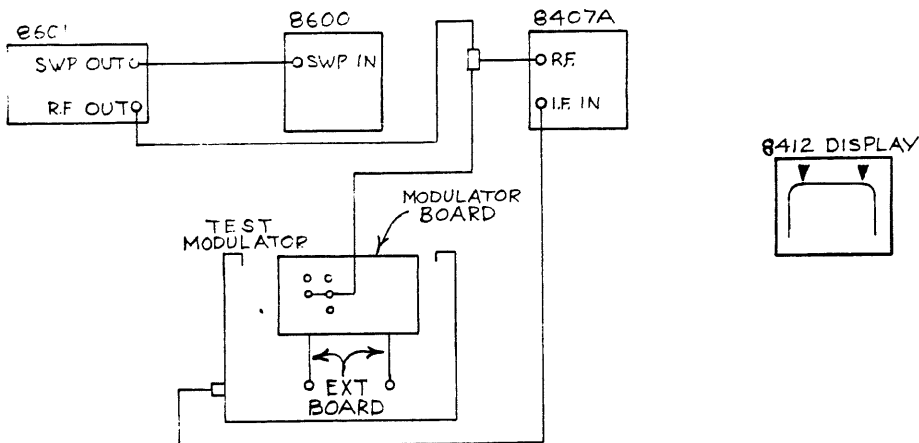
Calibration Procedure for 1450 Test Modulator I.F. Modulator Board

Equipment Needed: 8600A
 8601
 8407A
 8412A
 1410
 1450
 1480
 250 KHZ Low pass Filter

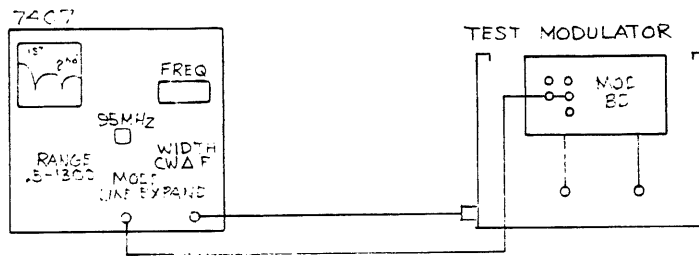
Set-up for Trap Adjustment:

<u>45.75 MHZ</u>	8601=Video-0dBm Range to 11MHZ	8600A Markers to 32MHZ, 50MHZ 8407A Amp1 to .25dB/DIV
<u>38.9 MHZ</u>	8601=Video-0dBm Range to 110MHZ	8600A Markers to 28MHZ, 44MHZ 8407A Amp1 to .25dB/DIV
<u>37.0 MHZ</u>	8601=Video-0dBm Range to 110MHZ	8600A Markers to 22MHZ, 42MHZ 8407A Amp1 to .25dB/DIV

Flatness Bandpass Set-up



Traps



Trap Adjustments 45.75, 38.9, 37.0

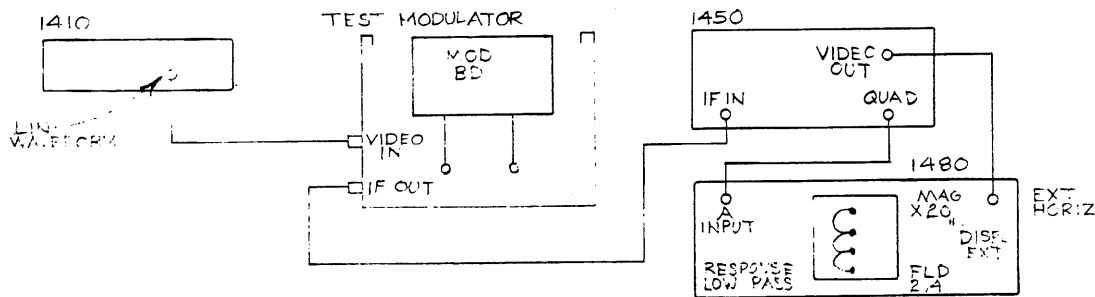
Traps are adjusted by having the right number of turns on coils (L504, L505) and the right diameter, then open or close turns to adjust to bottom of notch. NOTE: Coils have already been cut for proper number of turns. If re-calibration is required, it should require only opening or closing turns on the coils. Use Network Analyzer or 7L13 & TR502. Flatness is adjusted by adjusting C504, L509, and C509 for flatness response.

45.75MHZ 1st Harminic is 91.5NHZ, 2nd Harmonic is 137.25MHZ

38.9MHZ 1st Harmonic is 77.8MHZ, 2nd harmonic is 116.7MHZ


37.0MHZ 1st Harmonic is 74MHZ, 2nd Harmonic is 111MHZ


Quadrature Adjust Set-up



To adjust Quadrature, adjust display dots * for a vertical display with test modulator Quad Balance in center if its range, by bending wire strap "gimmick" on Modulator Board - usually goes toward shield and closest to board. NOTE: If Quad Balance won't adjust properly, replace the 472 transistors with 472 transistors that have matched Betas'.

*  in-correct

 in-correct

 correct

CALIBRATION PROCEDURE for 1450 TEST MODULATOR
VISUAL I.F. OSC. BOARD

Equipment needed: DVM

Oscilloscope

1. Connect DVM from emitter of Q701 to ground. Set DVM to 2v scale.
2. Connect oscilloscope to pin 2 of board.
3. Adjust L706 to get .325v on DVM (across emitter resistor).
4. Adjust L704 to get greatest signal amplitude at pin 2.
5. These adjustments interact, repeat steps 3-4 until voltage at emitter of Q701 is no greater than .325v and the signal at pin 2 is as large as possible.

NOTE: If voltage at emitter of Q701 is greater than .325v, then Q701 will run extremely hot and will be prone to failure.

CALIBRATION PROCEDURE for 1450 TEST MODULATOR

AUDIO MODULATOR BOARD:

Equipment needed: 1450 Television Demodulator
5103 Mainframe with 5L4N Spectrum Analyzer
7403 Mainframe with 7A26 and 7L12 Spectrum Analyzer
TM500 Mainframe
SG502 Oscillator
Misc: x10 probe, two 75 Ω coax cables, Audio out cable
with 30dB pad for 1450 Demodulator

Set Up:

1450 Demodulator

- push Aural Only, Audio Source Split, De-Emphasis Out and Manual buttons
- Set Manual Gain for approx. -30dB

5103-5L4N

- push 10dB/Div, dBm600 Ω , Display On, Auto Freq and 10ms buttons
- Set Log Ref for -10 and Span/Div for 2KHZ

7403-7L12

- push Log 10dB/Div, Center, P-P Auto, and Int. buttons
- Set Reference Level for -10dB, Time/Div for 1ms and Freq Span/Div for .1MHZ

1450 Test Modulator

- Set Aural Carrier Source switch to Crystal Ref and Pre-Emp switch to Audio Off
- Set Center Freq. pot to mid-range
- Center all pots on board

1. Adjust Crystal Oscillator

- Monitor Oscillator output with x10 probe on pin 11, set scope to approx. 100mv/Div.
- Adjust C403 for maximum output
- *- Adjust R407 for 320mv P-P

2. Adjust L.C. Oscillator

- Connect coax from I.F. Out on Test Modulator to R.F. In on 7L12 spectrum analyzer.
- Locate crystal oscillator output on 7L12.
- Change Aural Carrier Source switch to Modulator.
- While pressing Center Freq. Ref. button, adjust L410 to overlay pulses on 7L12.
- Release Center Freq. Ref. button and adjust C434 for max. output at pin 11.
- *- Adjust R443 for 320mv at pin 11.
- Remove coax from 7L12 and connect it to I.F. In on front of 1450 Demodulator.
- Connect coax from SG502 Oscillator output to Audio In an Test Modulator.
- Set Pre-Emp switch to Pre-Emp Out.
- Monitor TP06 (TP07) on 1450 Demodulator Audio Interface board and set SG502 for 2.5v at 5KHZ.
NOTE: Adjust variable on SG502 as needed to maintain 2.5v amplitude at TP06 (TP07).
- Connect cable with 30dB pad from 600Ω Audio Out on rear panel of 1450 Demodulator to input of 5L4N spectrum analyzer.
- Locate 5KHZ pulse and adjust variable on 5L4N for eight divisions(full scale).
- Adjust R445 for minimum distortion (Second harmonic -70dB or better).
- Remove coax from 1450 Demodulator I.F. In and connect it to 7L12 input.
- Return Pre-Emp switch to Audio Off.
- Push Center Freq. Ref. button and adjust Center Freq. pot(R444) from stop to stop. Check for equal range on both sides of Crystal Reference pulse on 7L12 (change Freq. Span/Div to .2MHZ or .5MHZ if necessary).
- If not equal, re-center R444 and re-Adjust L410 and R445 for best compromise of minimum distortion, correct frequency, and equal range of Center Freq. Pot.
- R440 is a fine adjust.
- Re-adjust R443 for 320mv at pin 11.
- Repeat procedure as many times as necessary to eliminate interaction.

- Dis-connect coax from SG502 and connect it to output of 5L4N tracking generator.
 - Have 5L4N set to 2dB/Div and tracking generator enabled.
 - Have Pre-Emp Out on Test Modulator, have De-Emp out on 1450 Demodulator, check that the trace on 5L4N is flat.
 - Have Pre-Emp in on Test Modulator, have De-Emp in on 1450 Demodulator, check that the trace on 5L4N is flat.
- * Adjust these two pots for the same amplitude Aural Carrier as peak sync power from vid modulator with variable aural level front panel control fully CW.

067-0945-99
 1450 TEST MODULATOR
 IF MODULATOR & FILTER BOARD
 37.0 MHz

QTY	STATUS	PART NUMBER	DESCRIPTION
1		VB126X	IF MODULATOR & FILTER BOARD
HARDWARE			
1		175-1286-00	CABLE, RF
1		176-0120-00	WIRE, ELECTRICAL
2		200-0945-01	COVER HALF, XSTR
2		211-0022-00	SCREW, MACHINE
2		337-2459-00	SHIELD, ELEC.
1		337-2578-00	SHIELD, ELEC.
3	CM2418A	NO PART NUMBER	GROUND CLIPS
CONNECTORS			
2		131-0265-00	CONN, RCPT, ELEC.
10		131-0589-00	TERMINAL PIN
2		131-1771-00	CONN, RCPT, ELEC.
CAPACITORS			
2		281-0097-00	CAP. 9-35PF
1		281-0592-00	CAP. 4.7 PF 500V
1		283-0158-00	CAP. 1PF 50V
2		283-0260-00	CAP. 5.6PF 200V
1		283-0728-00	CAP. 120PF 500V
1		283-0636-00	CAP. 36PF 100V
1		283-0639-00	CAP. 56PF 100V
1		283-0644-00	CAP. 150PF 500V
1		283-0646-00	CAP. 170PF 100V

37.0 MHz
IF MODULATOR AND FILTER BOARD CONT'D

QTY	STATUS	PART NUMBER	DESCRIPTION
DIODES			
1		152-0650-00	SEMICON DVC, DI
TRANSISTOR			
1		151-0472-00	TRANSISTOR
COILS			
2		108-0436-00	COIL, CHOKE
1		114-0232-00	COIL, VARIABLE
4		276-0528-00	CORE, TORROID
1		3T 3/16 DIAMETER	COIL, AIR
1		4T 3/16 DIAMETER	COIL, AIR
RESISTORS			
1		315-0182-00	RES. 1.8K Ω 1/4W 5%
2		315-0181-00	RES. 180 Ω 1/4W 5%
1		315-0300-00	RES. 30 Ω 1/4W 5%
1		315-0471-00	RES. 470 Ω 1/4W 5%
2		315-0473-00	RES. 47K 1/4W 5%
1		321-0064-00	RES. 45.3 Ω 1/8W 1%
1		321-0096-00	RES. 97.6 Ω 1/8W 1%
1		321-0144-00	RES. 309 Ω 1/8W 1%
1		321-0233-00	RES. 2.61K 1/8W 1%

1450 TEST MODULATOR
 37.0 MHz
 IF OSCILLATOR

QTY	STATUS	PART NUMBER	DESCRIPTION
1		VD127X	IF OSCILLATOR 37MHz
CONNECTOR			
2		131-1771-00	RECEPTACLE, PW BERG
1		120-0382-00	CORE, 27-557, 14T #27
1		PURCHASED CRYSTAL	37.0 MHz + .001% 0-70°C Z13
CAPACITOR			
1		283-0631-00	CAP. FXD. 95PF 500V
1		283-0598-00	CAP. FXD. 253PF 500V
3		283-0028-00	CAP. CER .0022 μ F 50V
1		283-0111-00	CAP. FXD. CER. .1 μ F 50V
1		283-0032-00	CAP. FXD. 470PF 500V
1		283-0629-00	CAP. FXD. 62PF 500V
2		283-0634-00	CAP. FXD. 65PF 500V
1		283-0640-00	CAP. FXD. 160PF 500V
TRANSISTORS			
1		151-0260-00	NPN, 2N5189
1		151-0333-00	NPN, MPS 918 Selected
COILS			
1		108-0182-00	COIL, RF .3 μ H
1		108-0215-00	COIL, RF 1.1 μ H
2		108-0262-00	COIL, RF .6 μ H
2		114-0307-00	COIL, VARIABLE

37.0 MHz

IF OSCILLATOR CONT'D

QTY	STATUS	PART NUMBER	DESCRIPTION
RESISTORS			
2		315-0100-00	RES. 10 Ω 1/4W 5%
2		315-0131-00	RES. 43 Ω 1/4W 5%
2		315-0222-00	RES. 2.2K 1/4W 5%
1		315-0271-00	RES. 270 Ω 1/4W 5%
1		315-0331-00	RES. 330 Ω 1/4W 5%
1		315-0430-00	RES. 43 Ω 1/4W 5%
1		315-0470-00	RES. 47 Ω 1/4W 5%
SOCKETS			
1		136-0183-00	SOCKET, 3 CONTACT
1		136-0208-00	SOCKET , CRYSTAL AUGAT
1		136-0220-00	SOCKET, 3 PIN

1450 TEST MODULATOR
 AUDIO MODULATOR
 32.5 MHZ AUDIO IF

QTY	CIRCUIT #	PART NUMBER	DESCRIPTION
1		VF128X	AUDIO MODULATOR BOARD
HARDWARE			
4		TEK MADE	GROUND CLIP
1		337-1417-00	SHIELD, TRANSFORMER
2		337-2459-00	SHIELD, ELEC.
2		337-2578-00	SHIELD, ELEC.
CAPACITORS			
2		281-0096-00	CAP. VAR. 5.5-18 PF
1		281-0526-00	CAP. CER. 1.5 PF 500V
1		281-0562-00	CAP. CER. 39 PF 500V 1%
5		283-0111-00	CAP. FXD. 1 μ F 50V
3		283-0204-00	CAP. FXD. .01 μ F 50V
1		283-0594-00	CAP. FXD. 1000 PF 100V
2		283-0599-00	CAP. FXD. 98 PF 500V
4		283-0629-00	CAP. FXD. 62 PF 500V
2	C404, C413	283-0639-00	CAP. FXD. 56 PF 100V
1		283-0655-00	CAP. FXD. 3300 PF 500V
2		283-0672-00	CAP. FXD. 200 PF 500V
1	C409	283-0674-00	CAP. FXD. 85 PF 80V 1%
1		285-1098-00	CAP. FXD. .22 μ F 25V
1		290-0770-00	CAP. FXD. 100 μ F 25V
2		290-0745-00	CAP. FXD. 22 μ F 35V
3		290-0782-00	CAP. FXD. 4.7 μ F 35V

AUDIO MODULATOR CONT'D
32.5 MHZ AUDIO IF

DIODES

1 152-0665-00

TRANSISTORS

1		151-0188-00	TRANS. PNP 2N3906
3		151-0192-00	TRANS. NPN
1		151-0207-00	TRANS. NON 2N3415
2		151-0472-00	TRANS. NPN
1		152-0665-00	VARACTOR 29 PF
1		156-0921-00	CA3140 OP AMP

COILS

1		108-0182-00	COIL, CHOKE, 285 μ H
2		108-0215-00	COIL, CHOKE, 1.1 μ H
1	L403	108-0262-00	COIL, CHOKE, 525 μ H
2			
	L402, L407	108-0072-00	COIL, CHOKE
1		108-0897-00	COIL, CHOKE
1		114-0220-00	COIL, VAR. 1-3 μ H
2		120-0382-00	TOROID, CHOKE, 196 μ H

RESISTORS

1		311-1138-00	RES. VAR. 1K
1		311-1319-00	RES. VAR. 10K
2		311-1918-00	RES. VAR. 2K
1		315-0103-00	RES. FXD. 10K 1/4W 5%
1		315-0106-00	RES. FXD. 10M 1/4W 5%
1		315-0243-00	RES. FXD. 24K 1/4W 5%
4		315-0302-00	RES. FXD. 3K 1/4W 5%
1		315-0473-00	RES. FXD. 47K 1/4W 5%
2		315-0510-00	RES. FXD. 51 Ω 1/4W 5%
1		315-0621-00	RES. FXD. 620 Ω 1/4W 5%

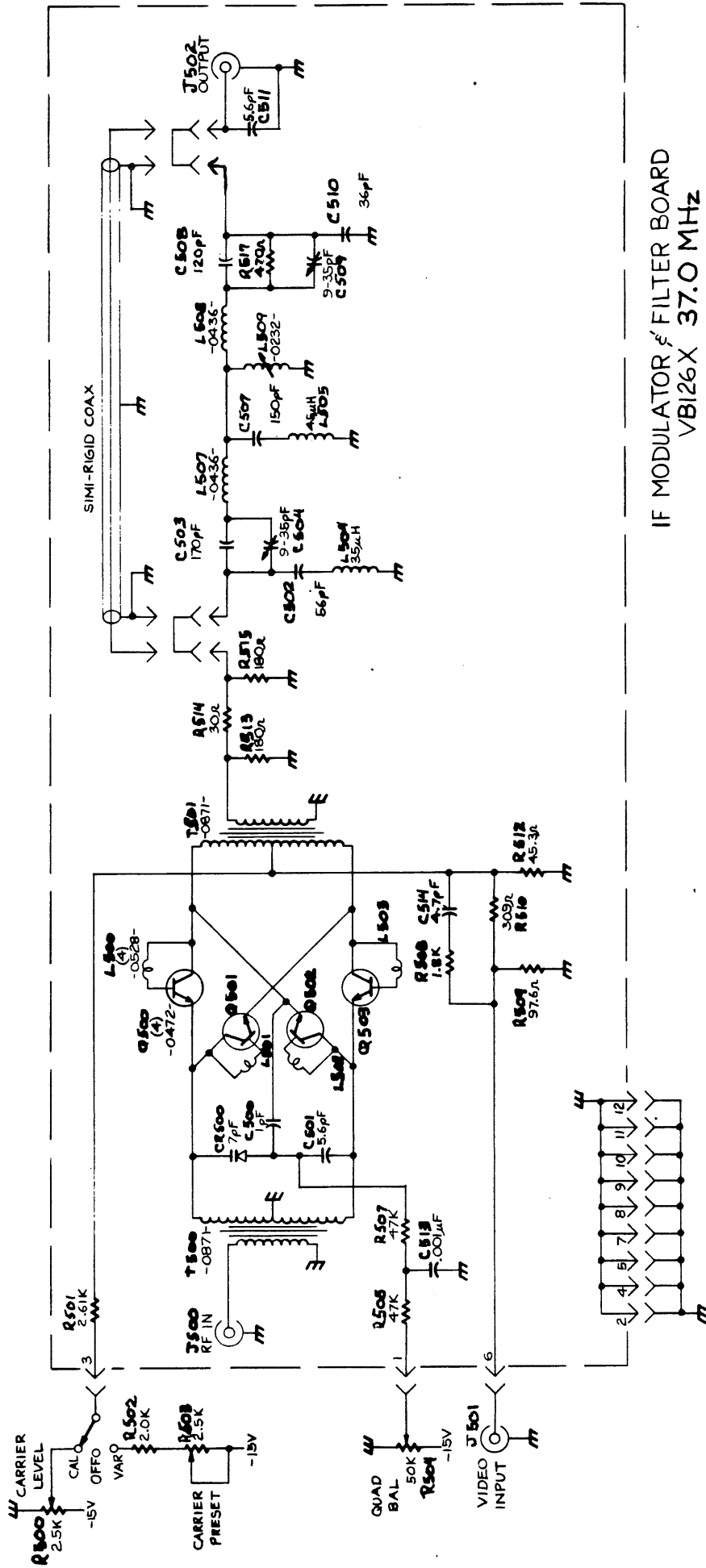
32.5 MHZ AUDIO IF
AUDIO MODULATOR CONT'D

QTY	CIRCUIT #	PART NUMBER	DESCRIPTION
2		315-0680-00	RES. FXD. 68 Ω 1/4W 5%
4		321-0097-00	RES. FXD. 100 Ω 1/8W 1%
2		321-0184-00	RES. FXD. 806 Ω 1/8W 1%
2		321-0193-00	RES. FXD. 1K 1/8W 1%
1		321-0239-00	RES. FXD. 3.01K 1/8W 1%
1		321-0251-00	RES. FXD. 4.02K 1/8W 1%
1		321-0256-00	RES. FXD. 4.75K 1/8W 1%
3		321-0273-00	RES. FXD. 6.81K 1/8W 1%
4		321-0289-00	RES. FXD. 10.0K 1/8W 1%
1		321-0323-00	RES. FXD. 22.6K 1/8W 1%
1		321-0385-00	RES. FXD. 100.0K 1/8W 1%
1		321-0414-00	RES. FXD. 200K 1/8W 1%
SOCKETS			
1		136-0208-00	SOC. CRYSTAL AUGAT
8		136-0220-00	SOC. 3 PIN
8		75640-001	SOC., BERG MINI-INSERT
1	Y400	PUR. PART	CRYSTAL, 32.5 MHZ, Z13, +0.005% \emptyset -70°C SERIES RESONANT

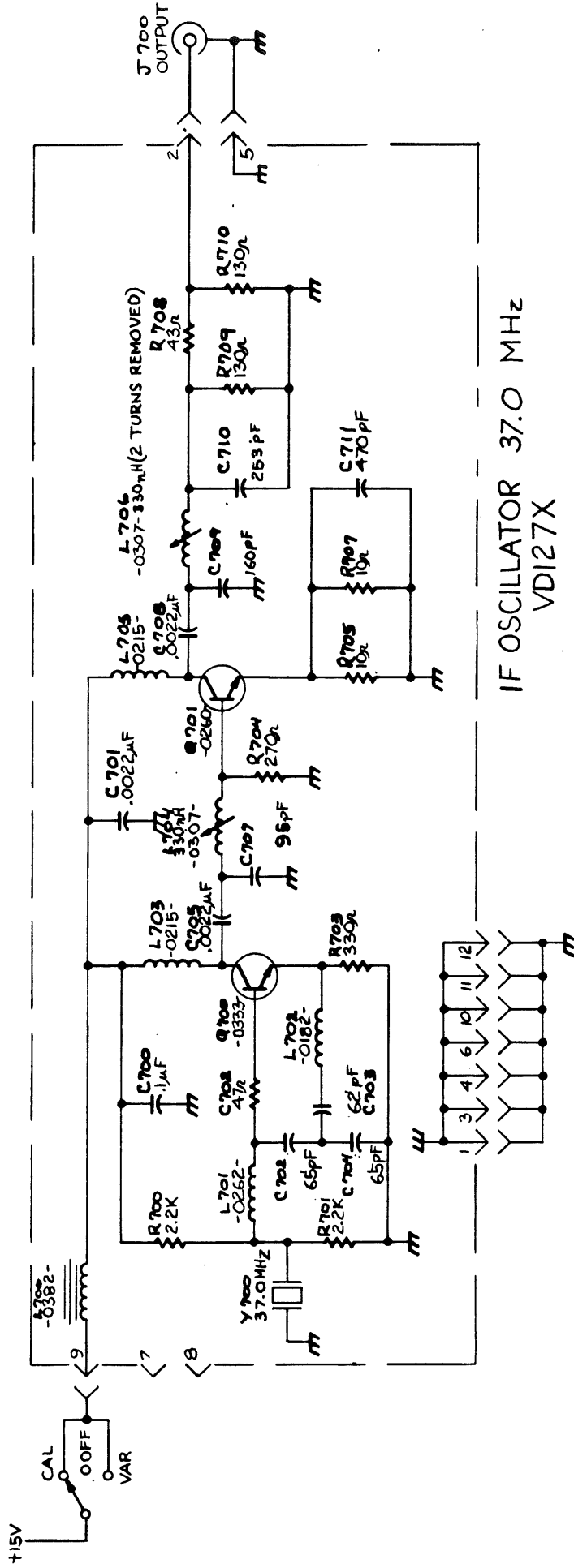
I.F. BOARD KIT SHIPPING CONTAINER

For 067-0886-99 Test Modulator

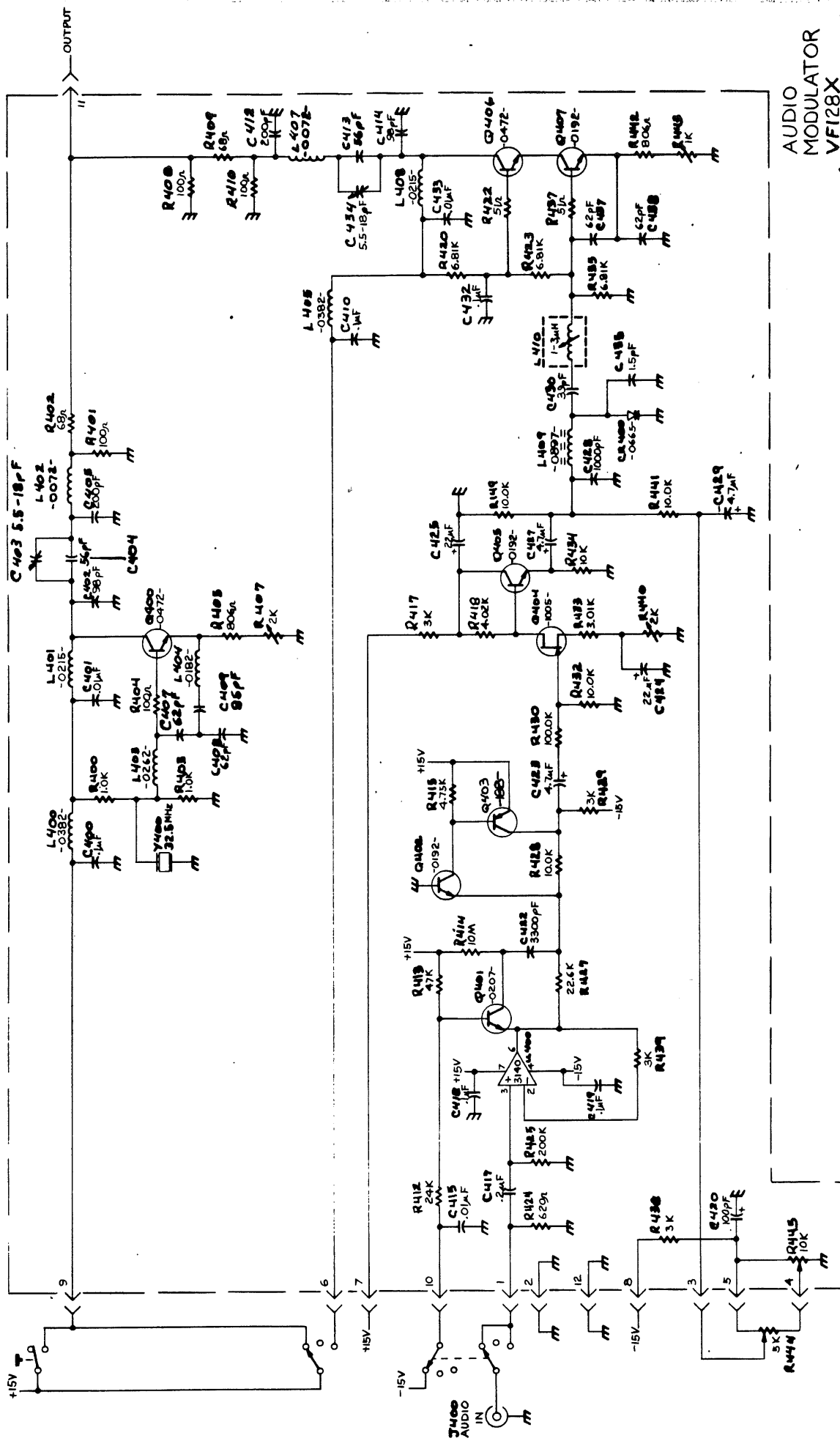
1	PURCHASED PART	GLOBE, STEEL CARD FILE, TAN, NO. 846
1	367-0007-00	HANDLE, BOW
2	212-0039-00	8-32 X .375 TRUSS HEAD SCREW
1	214-0531-01	LATCH ASSEMBLY
1	105-0054-01	CATCH STRIKE
4	210-0777-00	POP RIVETS, .232 X .125
10	351-0087-04	GUIDE, CIRCUIT BOARD
1	DWG 3-1450-0034	INSERT, SHIPPING CONT.
1	NO PART NUMBER	3.7" X 6.0" PIECE CUT FROM 006-2356-00
1	NO PART NUMBER	3.7" X 21.7" PIECE CUT FROM 006-2356-00
1	NO PART NUMBER	5.2" X 7.9" PIECE CUT FROM 006-2356-00
1	NO PART NUMBER	POLYESTERURETHANE FOAM, REF. TEK. PKG DESIGN. NUMBER PDB004



IF MODULATOR & FILTER BOARD
 VB126X 37.0 MHz



IF OSCILLATOR 37.0 MHz
VDI27X



AUDIO MODULATOR
VF128X
(32.5 MHz AUDIO IF)