DATE 4/24/63	TMC SPECIFICATION NO. S -761	A
SHEET 1 OF 6		
COMPILED FRE	CHECKED N.P.	TITLE: PRODUCTION TEST SPECS [redacted]-424, RFO MODULE
APPROVED YFH		

PRODUCTION TEST SPECS [redacted]-424 RFO MODULE

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 459M

DATE 4/24/63	TMC SPECIFICATION NO. S-761	A
SHEET 2 OF 6		
FRD COMPILED / CHECKED	TITLE: PRODUCTION TEST SPECS [illegible] BFO MODULE	
APPROVED		

I THEORY OF OPERATION:

A. Variable Oscillator. Q-181 acts as a Hartley Oscillator with the output taken off of the emitter. The tuned circuit is unusual in that it is a transformer with the tuning portion on the primary and the transistor connected to the secondary. This is done because of the need for a high impedance tuned circuit and the low impedance characteristics of transistors. C-304, on the front panel, tunes the oscillator through a range of approximately 3.5kcs. R-182, the base-collector resistor, is used for DC stabilization.

B. Fixed Oscillator. Q182 operates the same as the variable oscillator with the exception of the tuned circuit. Here C-185, which is mounted on the module, is a variable-fixed fine tuning adjustment with a range of approximately 275 cycles. This is used to zero adjust the BFO.

Two oscillators are used so that any frequency drift due to temperature and voltage changes is approximately cancelled out.

Example: Oscillators are set at 43kc and 40kc, difference equals 3kc. Temperature change causes a +0.1% change in frequency so that new oscillator frequencies are 40.04kcs and 43.043kc, the difference frequency is now 3.003kcs.

C. BFO Mixer; The two oscillator signals are mixed in the base-emitter junction of Q-183. The output at the collector is filtered by L-181, L-182, the low pass filter. This filter has a cutoff of approximately 3kc thereby eliminating the oscillator signals and passing the difference signal.

D. BFO Amplifier. Q-186 operates as a common emitter amplifier with a gain of approximately 40db. The output of this stage is fed into the bases of the product detector, Q-184 and Q-185, in phase.

E. Product Detector. R-192 in the emitters of this stage balances the gains of Q-184 and Q-185 so that the BFO signal does not appear on the output (T-183). The low-pass filter, FLT-181, has a cutoff frequency of 2.5kcs thereby blocking the IF signal, or the BFO signal from reaching the audio module, but allowing the difference signal to pass.

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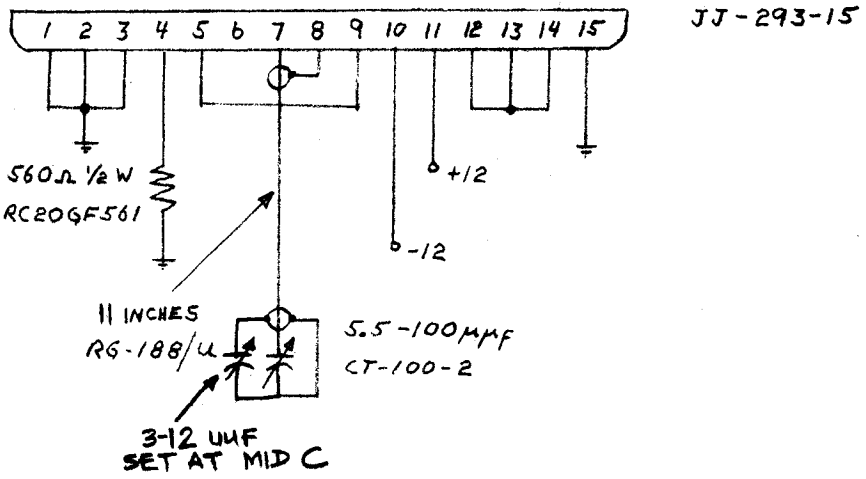
II ALIGNMENT PROCEDURE:

A. Equipment Required

1. VTVM Heathkit #V-7A or equivalent.
2. ACVTVM Ballantine #314A or equivalent.
3. Frequency Counter-Berkeley #5500 or equivalent.
4. +12V Power Supply. - Harrison Labs #855B or equivalent.
5. Test Jig (See diagram).
6. -12V Power Supply. - Harrison Labs #855B or equivalent.



B. Preliminary

1. Inspect unit for mechanical imperfectious such as loose screws, cold solder joints etc.
2. Connect test jig to module and apply power.
3. Test DC voltages as per chart, on Sheet 5.

C. Test Procedure NOTE: RECORD DATA INDICATED BY *.

1. Fixed Oscillator

a. Place a short jumper across 7 and 8 of connector.
b. Connect counter to collector of Q-183.
c. Adjust C-185 to mid-range.
**d. Adjust core of T-182 for a frequency of 40.00kcs +10%-0%*.

2. Variable Oscillator

a. Remove jumper from across 7&8 and place across C-185.
b. Adjust test jig capacitor to maximum capacitance.
** c. Adjust core of T-181 for a frequency 3.00kcs above that of the fixed oscillator*.
d. Adjust test jig capacitor to minimum capacitance.
e. Output frequency must be greater than 5.75 KCS above that of the fixed oscillator*.

3. Mixer

a. Remove jumper from across C-185.
b. Remove counter from Q-183 and connect to pin #13 of connector.
c. Adjust test jig capacitor to maximum capacitance.
d. Fine tune C-185 for 3.000kc +.005kc*.
e. Adjust test jig capacitor for minimum capacitance.
f. Frequency should be 6.250kcs +500cps*.
g. Connect ACVTVM to Pin #13.
h. Adjust R-199 for .7VRMS output at pin #13. Tighten lock-nut.*
i. Adjust test jig capacitor for maximum reading on ACVTVM. It should be less than 1.0VRMS. *

4. Product Detector

a. Connect ACVTVM to Pin #5 of connector.
b. Adjust test jig capacitor for maximum capacitance.
c. Adjust R-192 for minimum reading.
d. Adjust test jig capacitor for maximum reading.
e. Readjust R-192 for minimum reading. Tighten lock-nut.*
f. Output at Pin #4 of connector should be zero*.

THIS CONCLUDES THE TEST PROCEDURE OF THE BFO MODULE, VLR-1.

**NOTE: IT MAY BE NECESSARY TO PHYSICALLY REPOSITION THE CORES OF T181 AND T182 TO OBTAIN REQUIRED FREQUENCY. THIS IS DONE BY TURNING THE TOP HALF OF CORE WHILE THE BOTTOM HALF REMAINS STATIONARY.

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 459M

DATE 4/24/63
SHEET 5 OF 6

TMC SPECIFICATION NO. S-761

A

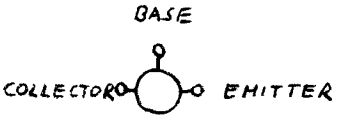
FRD COMPILED | N.P. CHECKED | TFH APPROVED

TITLE: PRODUCTION TEST SPECS AK-424, [redacted] MOBILE

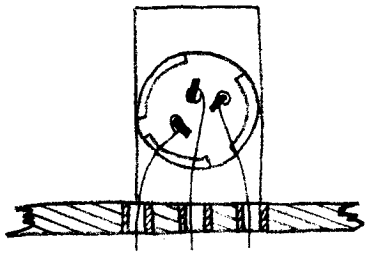
Voltage Chart

NO INPUT SIGNAL,

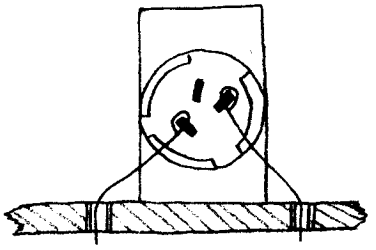
ALL VOLTAGES ARE D.C. ±20%.



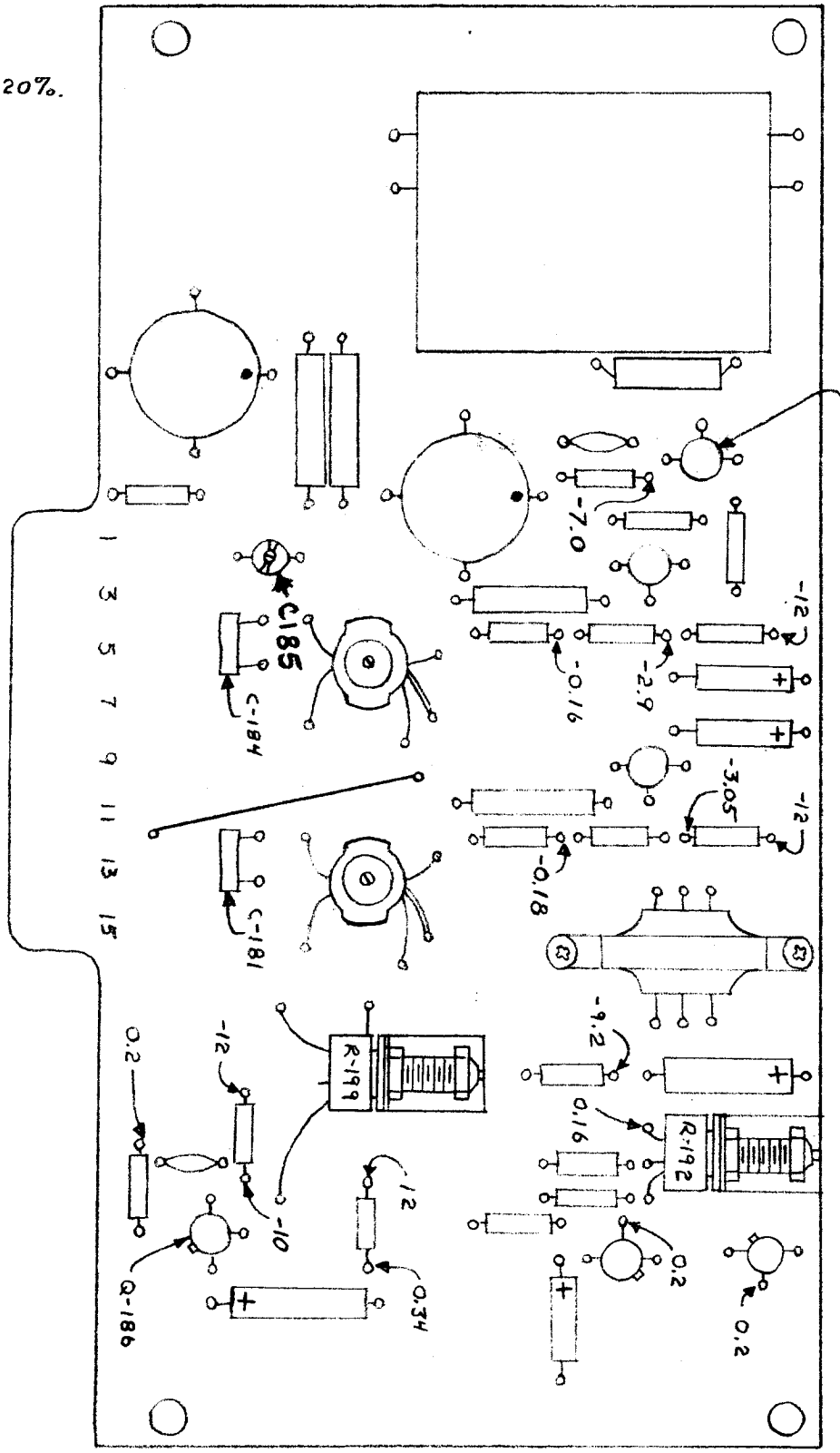
TRANSISTOR WIREING



R-192 DETAIL



R-199 DETAIL



DATE 4/24/63	TMC SPECIFICATION NO. S-761	A
SHEET 6 OF 6		
FRD COMPILED / N.P. CHECKED	TITLE: PRODUCTION TEST SPECS AX-424, BFO MODULE	
TFA APPROVED		

TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y.

AX-424, BFO MODULE, TEST DATA SHEET

MFG. NO. _____

SERIAL NO. _____

1.	(B)	Preliminary inspection _____	OK.
2.	(C1d)	Fixed Oscillator Frequency 40KCS+10%-0% _____	KCS.
3.	(C2c&e)	Variable Oscillator Freq. 43-51KCS _____ to _____	KCS.
4.	(C3d)	C-135 Fine Tuned @ 3.00KC _____	OK.
5.	(3f)	BFO maximum Output Freq. 6.250±.5KCS _____	KCS.
6.	(C3h&i)	BFO Output o.7-1.0 VRMS _____ VRMS to _____	VRMS.
7.	(C4e)	R-192 null _____	OK.
8.	(C4f)	Output Pin #4 _____	VRMS.

DATE _____

TESTER _____

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 430M

REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S761
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
10/30/64	A	ALL	12792	Revised ALL SHTS per EMN	16