DATE 31 May 1963 SHEET 1 OF 8	TMC SPECIFICATION NO. S 765	A
FRD COMPILED / N.P. CHECKED	TITLE: AX-425 PRODUCTION TEST	
APPROVED	IF MODULE	

AX-425 PRODUCTION TEST
IF MODULE

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 439M

TMC SPECIFICATION NO. S -765 A

COMPILED FRD | CHECKED N.P.

APPROVED

TITLE: [redacted] PRODUCTION TEST

IF MODULE

I. THEORY OF OPERATION

A. 1st Converter:- The information signal is fed to the bases of Q-101 and Q-102 in push-pull while the HFO signal is fed to the bases single-ended. Mixing takes place in the base-emitter junctions. R-104 is used to balance the gains of the two transistors so that the HFO signal across the collector tank circuit is cancelled out.

T-101 is tuned to the IF frequency of 3.0 Kc and serves to attenuate the RF signal and couple the IF signal to the base of Q-103. The tuned circuit of the IF transformers is a tertiary. This is done because of the need for a high impedance tuned circuit and the low impedance characteristics of transistors.

B. IF:- The 3.0 Kc information signal is fed to the base of Q-103 which operates as a common-emitter amplifier. Capacitor C-104 in the base of this stage is used to bypass any RF appearing at the base.

The 2nd IF amplifier, Q-111, is also a common-emitter stage taking its signal from a tap on T-102.

T-105, the 2nd IF amplifier output transformer, has a push-pull secondary which is used to drive the 2nd converter bases. The tap on the secondary is used to feed the BFO signal to the bases single ended. R-138 is used to fix the overall (RF & IF) bandwidth at 100 cycles.

C. AGC:- The information signal is taken from the tap on T-102 and applied to the base of the 1st AGC amplifier. This stage is operated in the common-emitter mode. Capacitor C-108 in the base is used to bypass any RF appearing at the base.

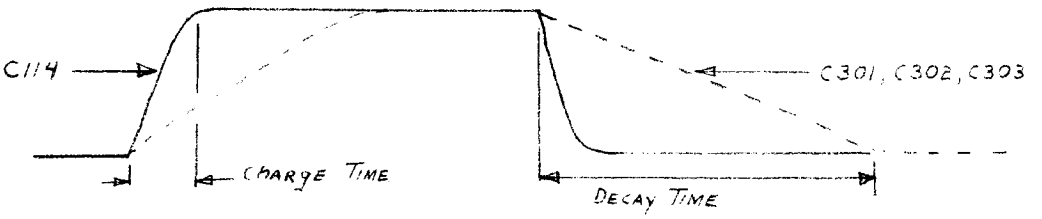
The output of Q-104 is capacitor coupled to the base of the 2nd AGC amplifier, Q-105. This stage is also common-emitter with an RF bypass capacitor, C-111,

OGILVIE PRESS, INC., BROOKLYN 17, N. Y. STOCK NO. 439M

on the base.

The output of Q-105 is capacitor coupled to the AGC detector, CR-101 and CR-102. CR-102 is back biased so that no detection takes place until a fixed input level is reached. This is so that the RF stages have maximum gain for very low level input signals.

Q-106 is a common-collector, DC amplifier. C-114 in the base of this stage determines the rise time of the AGC voltage and the fast decay time. This stage is operated as an emitter follower so that a low impedance output is obtained resulting in a short charge time and a long decay time of the AGC decay capacitors, C-301, C-302 and C-303.

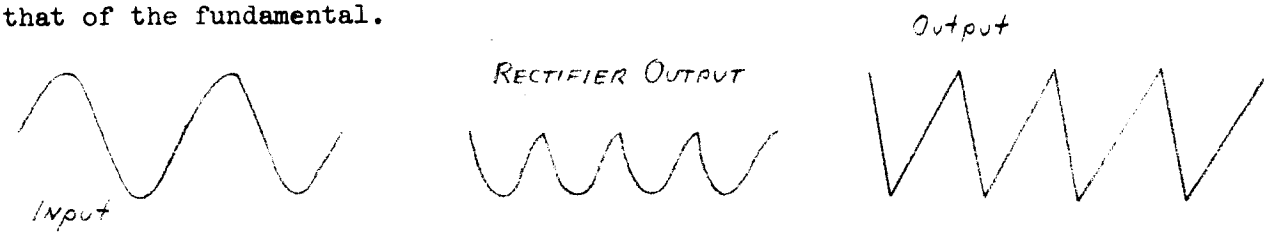


The 2nd DC amplifier, Q-107, receives the DC signal from the emitter of Q-106 or, in the manual gain position, from a variable (RF Gain Control, R-302) positive supply. This stage is operated as an emitter follower, providing a low impedance output to the 1st and 3rd RF stages.

D. TRF Amplifier:- The TRF Amplifier, Q-108, obtains an RF signal from the base of the 3rd amplifier. It is operated in the common-emitter mode. T-103 is a broadband RF output transformer.

E. Noise Silencer:- The noise silencer signal is taken from the collector of the 1st stage in the RF module. The signal is then applied to the base of Q-109, a common-emitter amplifier. T-104 applies the amplified signal to a full wave rectifier, CR-103 and CR-104, which has an output of twice the frequency of the

input. This helps to prevent RF feedback from taking place. The time constant of C-119 and R-131 (in parallel with R-301) is such that it attenuates the 2nd harmonic twice that of the fundamental.

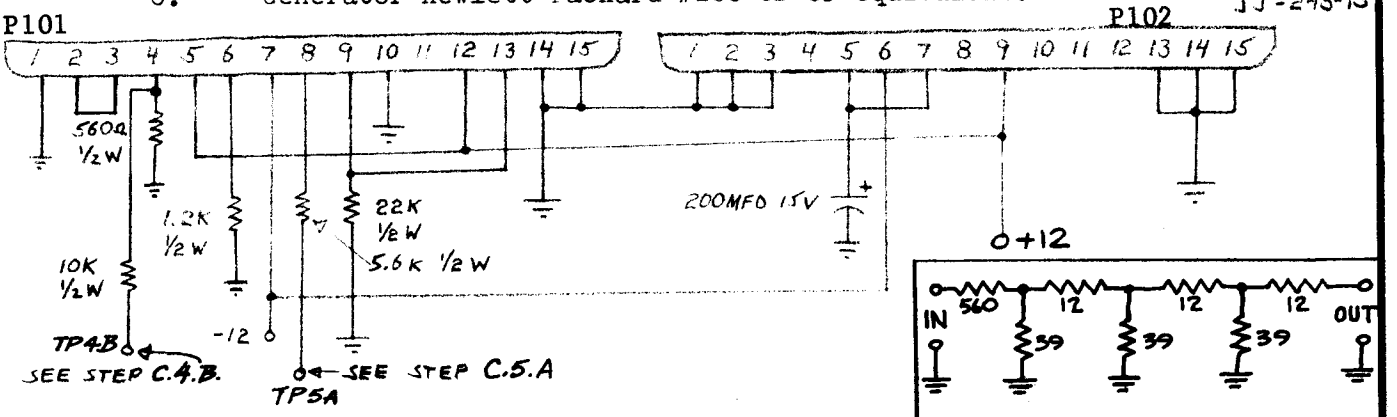


The signal is then attenuated by the Noise Silencer Gain control, R-301, and applied to the base of Q-110, an emitter-follower stage. The low impedance output is then fed through a coupling capacitor to the emitters of the 2nd RF stage. Any noise pulses will cause this stage to go into cutoff.

II. ALIGNMENT PROCEDURE

A. Equipment Required:-

1. VTVM Heathkit #V-7A or equivalent.
2. ACVTVM Ballantine #314A or equivalent.
3. +12V Power Supply. - Harrison Labs #855B or equivalent.
4. -12V Power Supply. - Harrison Labs #855B or Equivalent.
5. Test Jig (See Diagram).
6. Generator Hewlett-Packard #200 CD or equivalent.



7. Oscilloscope Tektronix #545A or equivalent.
8. Attenuator pad(SEE DIAGRAM).

B. Preliminary:-

1. Inspect unit for mechanical imperfections such as loose screws, cold solder joints, etc.

2. Connect test jig to module and apply power.

3. Test DC voltages as per chart.

C. Test Procedure:- (NOTE: Record data indicated by *.)

1. First Converter

a. Connect generator to pin 2 of P-101 and set to 3.00 Kc at 10MV.

b. Connect ACVTVM to collector of Q-103.

c. Adjust R-104 fully clockwise.

d. Adjust T-101 core for maximum output.

e. Adjust T-102 core for maximum output. (1V SCALE)

* f. Adjust R-104 for minimum output. Tighten lock-nut. (10MV SCALE)

2. IF

a. Remove generator from pin 2 of P-101 and connect it to the junction of the secondary of T-101 and R-108.

b. Remove ACVTVM from collector of Q-103 and connect it across R-138 (P-102 pins 10 and 12).

c. Re-adjust T-102 core for maximum reading.

d. Adjust core of T-105 for maximum reading.

*e. Adjust R-139 for 2.0V reading.

f. Remove ACVTVM from across R-138.

3. AGC

a. Reduce generator output to 1 MV.

b. Connect DC-VTVM to pin 8 of P-102 .

* c. Check DC Voltage at pin 8. Reading should be 4.5V ±1V.

* d. Disconnect generator from T-101 and check AGC decay time. Decay time should be greater than 20 seconds.

* e. Re-connect generator to T-101 secondary and check AGC rise time. Rise time should be less than 10 seconds.

4. TRF Amplifier

a. Disconnect oscilloscope, meters and generator.

b. Connect generator to TP-4B. Set to 20 Kc at 1 MV on pin 4, of P101.

* c. Connect ACVTVM to pin 6 of P-101. Meter should indicate 60 MV ±5 MV.

d. Remove generator and ACVTVM.

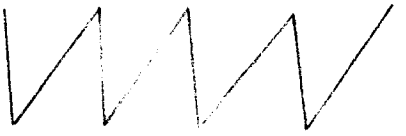
5. Noise Silencer (See Diagram)

* a. Connect generator to TP-5A. Set to 20 Kc at 20 MV on pin 8, of P101.
(Input signal must be a sine wave.)

* b. Connect ACVTVM and oscilloscope to cathode of CR-103 and CR-104. Meter should indicate 1000MV ± 100MV. Oscilloscope should indicate waveshape shown.

* c. Remove meter and oscilloscope from diode and connect to pin 11, P-101. Meter should indicate 15MV ± 5MV. Oscilloscope should indicate waveshape shown below.

Step 5a & 5b - 20KC



Step 5c - 40KC

d. Remove all test equipment.

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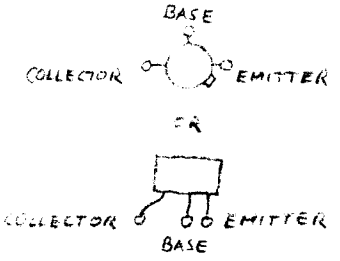
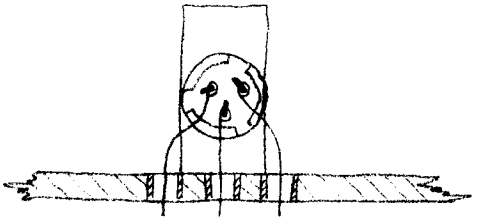
APPROVED	IF MODULE (Voltage Chart)	

NO INPUT SIGNAL.

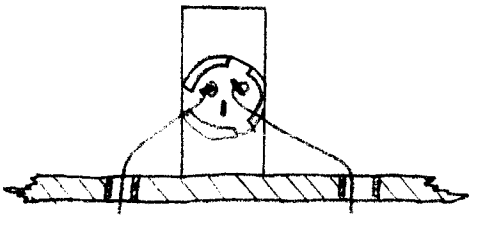
ALL VOLTAGES ARE DC ±20%.



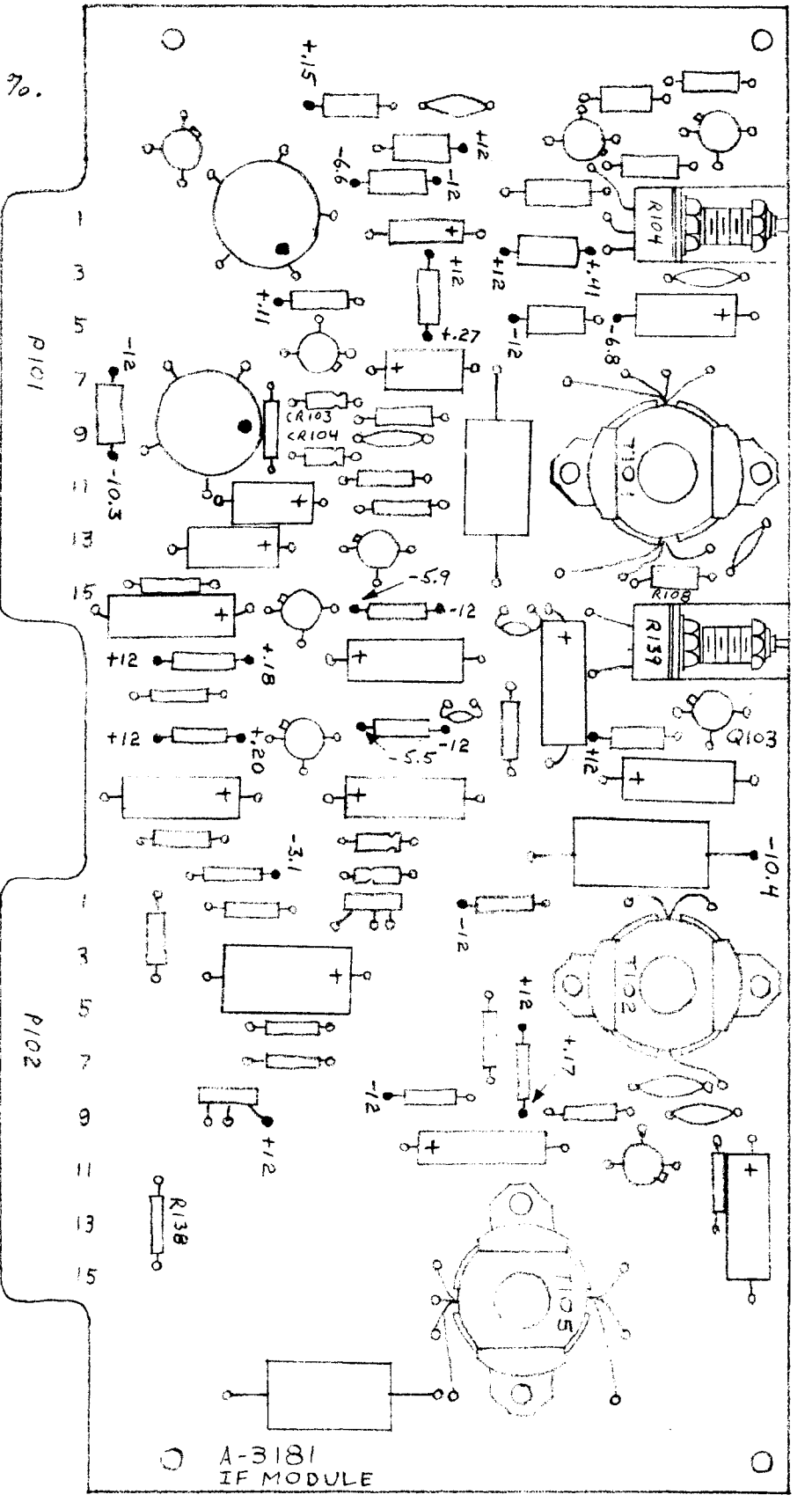
TRANSISTOR WIREING



R104 DETAIL



R139 DETAIL



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TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y.

AX-425 IF MODULE TEST DATA SHEET

MFG. NO.: _____

SERIAL NO.: _____

1.	Preliminary Inspection (2B1).	_____ OK
2.	DC Voltages (2B3)	_____ OK
3.	R-104 Null (2C1f)	_____ OK
4.	IF Gain (2C2e)	_____ 2V
5.	AGC Gain (2C3c)	_____ 4.5 ±1V
6.	AGC Decay Time (2C3d)—More than 20 seconds.	_____ OK .
7.	AGC Rise Time (2C3e)—Less than 10 seconds.	_____ OK .
8.	TRF Gain (2C4c)	_____ 60MV ±5MV
9.	NS Input Signal (2C5a)	_____ OK
10.	Passive Doubler Input Waveshape (2C5b)	_____ OK
11.	Passive Doubler Input (2C5b)	_____ 1000MV ±100MV
12.	Noise Silencer Waveshape (2C5c)	_____ OK
13.	Noise Silencer Gain (2C5c)	_____ 15MV±5 MV

DATE: _____

TESTER: _____

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REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S765
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
10/30/64	A	4,5,6,8	12792	Revised shts. 4,5,6,8 per EMN	

TMC FORM MLR-1, OGILVIE PRESS, INC. NO. 459M TYPEMASTER