

SHEET _____ OF _____		TMC SPECIFICATION NO. S 667	C
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<i>[Signature]</i>			

PRODUCTION TESTING OF TMC MODEL HNF-1

DATE 4-2-62
SHEET 1 OF 4

TMC SPECIFICATION NO. S 667

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TITLE: PRODUCTION TESTING OF TMC MODEL HNF-1

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I INTRODUCTION

A. The HNF is a Variable Notch Filter. For test purposes it may be divided into three sections:

1. Variable Frequency Oscillator and Amplifier.
2. 455 kc IF and Filter.
3. 250 kc IF.

B. The Variable Frequency Oscillator and Amplifier

V4006 is a highly stable LC oscillator of the Vackar type. The output frequency is determined by L4002 (and internal components), C4013, C4014 and variable capacitor C4015. With C4015 set at midpoint, the output frequency should be approximately 205 kc. The oscillator signal is then amplified by V4005A and V4005B and then stepped down to the proper impedance by T4001 and T4002 to the mixers V4003 and V4001.

C. The 455 kc IF and Filter

The 250 kc information signal is fed into the grid of V4001. This tube combines the information signal and the oscillator signal.

V4001 then amplifies the new frequency (455 kc). The information is then fed into T4003 which matches the impedance into the notch filter, Z4001.

The notch filter will attenuate any signal which appears at 455 kc + 82 cycles. This attenuation is approximately 60 db. All other information will pass thru this filter.

A beat note or other signal which is not desired can be notched out by moving the entire passband (varying C4015) over the notch at 455 kc.

The information is then fed to the grid of V4002. It is then amplified and fed to the grid of the second convertor, V4003. This convertor in turn takes the difference of the input information and the oscillator signal to produce the original input frequency of 250 kc.

D. The 250 kc IF

T4004 passes the information signal and attenuates both the oscillator and the 455 kc IF signals. The information is then amplified by V4004 and stepped down to 50 ohms by T4005 to produce the original input information with the exception of the notched signal.

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When S4001 is placed in the "OFF" position, the information signal completely passes the notch filter. When S4001 is placed in the "ON" position, power is applied to the oscillator, V4006, and the notch filter is placed in the circuit.

II TEST EQUIPMENT REQUIRED

- A. RF Voltmeter - Ballantine 861 or equivalent.
- B. Signal Generator - Model 82 or equivalent.
- C. Regulated Power Supply - 200 VDC at 100 ma.
- D. 6.3 VAC at 3A.
- E. 50 ohm $\frac{1}{2}$ watt Dummy Load.
- F. Frequency Counter or Heterodyne Frequency Meter.

III PRELIMINARY

- A. Inspect unit for mechanical imperfections and for proper placement of components.
- B. Inspect for obvious wiring errors.
- C. Check for B+ shorts with ohmmeter.

IV TEST OF VARIABLE FREQUENCY OSCILLATOR AND AMPLIFIER

NOTE: Apply power to all equipment, including HNF. Turn S4001 to "ON" position. Connect Frequency Counter to B2 of T4002. Adjust C4015 to mid-range. Tune core of L4002 to a frequency of 205kc, as indicated on counter. Tighten lock-nut. Adjust C4015 for maximum capacitance (+KCS). The frequency should be $196 \text{ KC} \pm 1.5 \text{ KC}$. Adjust C4015, for minimum capacitance (-KCS). The frequency should be $214 \text{ KC} \pm 0.5 \text{ KC}$. Record these frequencies on Test Sheet. Remove Counter from T4002. Check RF voltage at B2 of T4002 and B1 of T4001. Record these voltages on Test Sheet. This voltage should be 1.0 volt $\pm 20\%$. This completes the oscillator and amplifier test.

TEST OF 455kc IF AND FILTER

Remove V4006. Adjust Signal Generator to 455kc and connect to J4001. Connect RF Voltmeter to pin 9 of V4001. Temporarily place a short jumper between the green lug of T4003 and ground.

NOTE: Throughout these measurements always reduce the Signal Generator output so as to produce 1.0 volt or less at the point being measured.

Adjust top core of T4003 for maximum indication on Meter. Tighten lock-nut. Remove jumper and adjust bottom core of T4003 for minimum indication on Meter.

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Tighten lock-nut. Connect Meter to pin 1 of V4002. Vary Signal Generator frequency VERY SLOWLY around 455kc. There should be a noticeable notch at 455kc. Remove Generator and connect to pin 1 of V4002, frequency 455kc. Connect Meter to pin 6 of V4002 and adjust core of L4001 for maximum indication on Meter. Tighten lock-nut. Remove Generator and connect to the green lug of T4003. Adjust Generator to 2.2 volts output. Connect frequency Counter to Signal Generator. Tune Generator to 454kc.

NOTE: Meter voltage.

Adjust Meter scale, as needed, while slowly bringing Generator to 455kc. The notch depth should exceed 50db*. Record the notch depth on Test Sheet. Remove Meter, Counter, and Generator. This completes the 455kc IF and filter test.

VI TEST OF 250kc IF

Adjust Signal Generator to 250kc and connect to pin 6 of V4003. Connect Meter to pin 9 of V4003. Temporarily connect a short jumper between pin 1 of V4004 and ground. Adjust top core of T4004 for maximum indication on Meter. Tighten lock-nut. Remove jumper and adjust bottom core of T4004 for minimum indication on Meter. Tighten lock-nut. Connect Meter and dummy load at J4002. Adjust core of T4005 for maximum indication on Meter, adjusting Generator output so as not to exceed 0.5 volts at the Meter. Tighten lock-nut.

VII GAIN

Connect signal generator to J4001. Reinsert V4006 in socket. Switch S4001 to "OFF" position. Set generator for 250KC with 1 volt on AC-VTVM. Set C4015 off zero position and switch S4001 to "ON" position. The difference in setput between "OFF" and "ON" should not exceed 2DB. Disconnect all test equipment from unit.

* Actual notch depth may not be possible to measure because of generator sidebands (hum).

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THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N. Y.
HNF-1 TEST DATA SHEET

SERIAL NO. _____

MFG. NO. _____

OSCILLATOR RANGE

FROM _____ kc
TO _____ kc

OSCILLATOR AMPLIFIER OUTPUT

T4002 _____ Volts
T4001 _____ Volts

NOTCH DEPTH

_____ db

HNF-1 GAIN

S4001 "OFF" _____ Volts
S4001 "ON" _____ Volts

DATE _____

TESTER _____

