

SPECIFICATIONS

NAV-750A

RF POWER OUT

Accuracy: . . . . .  $\pm 1.5$  dB from -6 dBm to -50 dBm  
 $\pm 2.5$  dB from -50 dBm to -120 dBm

Leakage: . . . . . Less than  $3\mu\text{V}$  at 334.700 MHz and  
(With all unused  $1\mu\text{V}$  at 108.000 MHz induced in a  
outputs properly two-turn one inch diameter (#20  
terminated) gauge wire) loop, measured one  
inch away from any surface and  
into a 50 ohm receiver.

INTERNAL TEMPERATURE CONTROLLED CRYSTAL OSCILLATOR (TCXO)

Accuracy: . . . . . Better than  $\pm 1$  ppm at  $15^\circ$  to  $35^\circ$  C  
(After calibration  
at  $25^\circ$  C) . . . . . Better than  $\pm 3$  ppm at  $10^\circ$  to  $45^\circ$  C

Aging: . . . . . Less than  $\pm 2$  ppm/year

CLOCK OSCILLATOR (2.16 MHz)

Accuracy: . . . . .  $\pm 0.02\%$

SPECTRAL PURITY

NOTE

All level observed with the NAV-750 output attenuator set to -10 dBm. However, other level may be used for convenience to meet test equipment requirements.

Harmonics: . . . . . 30 dB below carrier, maximum  
(108.000 through 335.000 MHz).

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SPECTRAL PURITY (cont'd)

Close-In Noise (Single-sideband Noise):

- At 108.000 MHz . . . . . 78 dB below carrier at  $\pm 15$  kHz in 300 Hz resolution bandwidth, or 83 dB below carrier at  $\pm 15$  kHz in 100 Hz resolution bandwidth.
- At 130.000 MHz . . . . . 78 dB below carrier at  $\pm 15$  kHz in 300 Hz resolution bandwidth, or 83 dB below carrier at  $\pm 15$  kHz in 100 Hz resolution bandwidth.
- At 334.700 MHz . . . . . 74 dB below carrier at  $\pm 20$  kHz in 300 Hz resolution bandwidth, or 79 dB below carrier at  $\pm 20$  kHz in 100 Hz resolution bandwidth.

Harmonic Spurious Noise:

NOTE

The NAV-750 phase-lock control frequency is 12.5 kHz.

- At 108.000 MHz . . . . . 75 dB below carrier at  $\pm 12.5$  kHz, and 83 dB below carrier at  $\pm 25.0$  kHz in 300 Hz resolution bandwidth.
- At 334.700 MHz . . . . . 66 dB below carrier at  $\pm 12.5$  kHz, and 77 dB below carrier at  $\pm 25.0$  kHz in 300 Hz resolution bandwidth.

Broadband Noise:

- At 108.000 MHz . . . . . 82 dB below carrier at  $\pm 100$  kHz in 1 kHz resolution bandwidth.
- At 334.700 MHz . . . . . 82 dB below carrier at  $\pm 100$  kHz in 1 kHz resolution bandwidth.

Residual FM: (Post-detection noise bandwidth, 20 Hz to 15 kHz)

- At 108.000 MHz . . . . .  $\pm 200$  Hz p-p, or less.
- At 334.700 MHz . . . . .  $\pm 400$  Hz p-p, or less.

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MODULATION

AM Depth: . . . . . G/S.....0% to 93%  
 VOR, LOC, & COMM.....0% to 98%

Accuracy: . . . . . As listed below, with front panel  
 Modulation controls in CAL position.

NOTE

\* Indicates 0-100 meter scale is selected. All others on 0-30% Modulation Scale. All values are for single-tone of the indicated frequency.

Modulation Frequency	RF Range	Acceptable Level of Modulation (absolute) at RF output Connector	Meter Indication Tolerance Referenced to Absolute Value at RF output Connector
30 Hz	VOR	30%(28.8 to 31.2)	±1.2% Modulation
9960 Hz	VOR	30%(28.8 to 31.2)	±1.2% Modulation
90 Hz	LOC	20%(19.2 to 20.8)	±0.8% Modulation
150 Hz	LOC	20%(19.2 to 20.8)	±0.8% Modulation
90 Hz	G/S	*40%(38.4 to 41.6)	±1.6% Modulation
150 Hz	G/S	*40%(38.4 to 41.6)	±1.6% Modulation
1020 Hz	Comm	30%(28.8 to 31.2)	±1.2% Modulation

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TONES

<u>Distortion:</u>	9960Hz . . . . .	1.5% Max.
	30Hz Var . . . . .	0.5% Max.
(Measured at Sum	30Hz Ref . . . . .	0.5% Max.
of Tone Jack or	1020Hz . . . . .	0.5% Max.
individual Tone	90Hz . . . . .	0.4% Max.
Jacks)	150Hz . . . . .	0.4% Max.

Frequencies:

90 Hz	. . . . .	These tones are derived from the 2.16 MHz crystal oscillator and therefore reflect the accuracy of the oscillator ( $\pm 0.02\%$ ).
150 Hz		
30 Hz Ref.		
30 Hz Var.		
9960 Hz . . . . .		Phase-locked to 30 Hz Ref. tone which is derived from the 2.16 MHz crystal oscillator.
1020 Hz . . . . .		$\pm 0.5\%$

NOTE

Tone distortion should increase no more than 0.2% at the DEMOD jack.

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DDM ACCURACY (Theoretical - not measured)

COMPOSITE AUDIO ERROR = Centering Error +.02% DDM Setting (.00025 DDM)

PERCENTAGE OF MODULATION ERROR = DDM setting X  $\frac{\left[ \begin{array}{l} \text{measured, single} \\ \text{tone, \% of modu-} \\ \text{lation at centering} \end{array} \right] - \left[ \begin{array}{l} \text{desired \% of} \\ \text{modulation at} \\ \text{centering} \end{array} \right]^*}{\left[ \begin{array}{l} \text{Desired \% of modulation} \\ \text{at centering} \end{array} \right]}$  \*

TOTAL ERROR = Composite Audio Error + Percentage of Modulation Error

\* desired % of modulation at centering for LOCALIZER 20%

\* desired % of modulation at centering for Glide Slope 40%

DDM setting	Composite Audio Error (DDM)	max % of Mod Error (DDM)	TOTAL (maximum error) (DDM)
<b>LOCALIZER:</b>			
.046	.00101	.00230	.00331
.093	.00102	.00465	.00567
.155	.00103	.00775	.00878
.200	.00104	.01000	.01104
<b>GLIDE SLOPE:</b>			
.045	.00101	.00225	.00326
.091	.00102	.00455	.00557
.175	.00104	.00875	.00979
.400	.00108	.02000	.02108

## SPECIFICATIONS

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### Technical Summary

#### VOR SECTION:

Bearing Selection: Twelve preset bearings each 30°. Additional +10° and -10° steps from any bearing selected. Bearing control provides continuous bearing adjustment in 0.01° or 0.05° steps.

Bearing Accuracy: ±0.05° on all bearings.

Bearing Monitor: By independent counter; displays bearing to 0.01° resolution.

VOR Tones: 30Hz REF and 30Hz VAR tones derived from 2.16 MHz crystal oscillator. 9960 Hz is frequency locked to the 2.16 MHz crystal oscillator.

Ident Tone: 1020 Hz tone may be added from 0 to 60% mod.

#### LOC SECTION:

Deviation: ±0.046 DDM, ±0.093 DDM, ±0.155 DDM, ±0.200 DDM, and continuously adjustable ±0.4 DDM. One tone may be deleted while the other is at 20%.

Centering Accuracy: ±0.001 DDM (±0.85µA)

Tones: 90Hz and 150Hz tones phase-locked to ±0.1° or phase variable at five times the angle selected by the VOR bearing selector. 1020 Hz tone may be added.

#### GS SECTION

Deviation: ±0.045 DDM, ±0.091 DDM, ±0.0175 DDM, ±0.400 DDM, and continuously adjustable ±0.8 DDM. One tone may be deleted while the other is at 40%.

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### Technical Summary

#### GS SECTION: (cont'd)

Centering Accuracy:  $\pm 0.001$  DDM ( $\pm 1\mu\text{A}$ )  
Tones: Same as LOC

#### COMM SECTION:

Modulation: 1020 Hz tone 0-60% for audio tests.  
External modulation may also be added.

#### RF GENERATOR:

Frequency Range: 108 to 156 MHz in 25 kHz increments and 329 to 335 MHz.

Frequency Selection: Manually by thumbwheel switch. Automatically at a variable rate in 25, 50, 100, or 200 kHz increments, up in frequency only. Auto channeling stops at 117.950 and 135.975 MHz. External channeling is available via Ext. channeling input at rear panel.

Variable Frequency:  $\pm 50$  kHz minimum to 108 to 156 MHz 150 kHz minimum from 329 to 335 MHz. Generator remains phase locked at all fixed and variable frequencies.

Frequency Accuracy: Controlled by oven crystal to  $\pm 0.0001\%$ .

Frequency Monitor: By independent counter to 1 kHz or 0.1 kHz resolution. Counter time base  $\pm 0.0001\%$ .

Remote Function: Frequency in use fed to rear panel as 2 out of 5 channeling and parallel BCD. Remote channeling follows manual or auto selection.

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### NAV-750A

#### Technical Summary

#### RF GENERATOR: (cont'd)

Modulation Selection: Automatic by frequency selected, VOR mod applied if on any VOR freq, LOC mod applied if on any LOC freq, GS mod applied if on any LOC freq and LOC/GS switch in GS position.

#### EXTERNAL MODULATION:

May be added to any signal through rear panel jack. (J18). On sets S/N 381 & on, J-18 must be terminated with 100 ohms or less when External Modulation is not used.

Impedance (J18): 1K ohm Nominal

Sensitivity: For NAV-750A units through S/N 380: 9.1V p-p ( $\pm 0.6V$ ) = 30% (MASTER MOD in Cal position).

For NAV-750A units S/N 381 & on: 9.1V p-p ( $\pm 0.6V$ ) = 90% (MASTER MOD in Cal position).

#### DEMOD OUTPUT:

For any signal at a rear panel jack. (J23).

Impedance (J23): Minimum Resistance: 1K ohms:

DC Voltage: 3.75V ( $\pm 0.3V$ )

AC Voltage: 2.72V ( $\pm 0.2V$ ) = 100% Modulation ( $\pm 0.2V$  due to difference in sets)

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### Technical Summary

REAR PANEL CONNECTORS:

External Modulation Input  
Composite Tones output  
VOR 30 Hz VAR Tone output  
VOR 9960 Hz FM Tone output  
1020 Hz Tone output  
VOR 30 Hz REF Tone output  
150 Hz Tone output  
90 Hz Tone output  
RF Demod output  
AC Power Input (See power requirements next page)  
External Clock Input  
Remote Channeling Input  
Remote Channeling output  
Remote Frequency output

POWER REQUIREMENTS:

105 to 120 VAC or 220 to 250 VAC,  
50 to 400 Hz  
(Cooling fan 50/60 Hz only. Optional  
dc cooling fan available for  
400 Hz operation)

POWER CONSUMPTION:

250 W Maximum, 110 W Nominal

SIZE:

7.5" high by 16.75" wide by  
18.375" deep.

WEIGHT:

Approximately 45 pounds.