TR-36

NAV/COMM TEST SET

Datasheet

Description

The **TR-36** NAV/COMM Test Set is a modern precision test instrument that provides comprehensive avionics ramp test capability for rapid functional testing of VOR, LOC/GS, ILS, MB, VHF-UHF COMM (AM/FM), ELT and EPIRB equipment. It is conveniently packaged in a rugged, yet lightweight weather-proof case with a highly visible color LCD display. The Test Set was designed to be simple and easy to use as your one source for COMM/NAV ramp testing.

The new TR-36 features several new advancements:

- Test capability for ELT and 406 MHz EPIRB
- High resolution LCD COLOR display with intuitive user interface
- Audio measurement capability for (S+N) N testing and Audio/Intercom system testing

P/N – 90 000 136

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Sales – Extension - 368

Features

- ❖ VOR, LOC, GS, ILS and MB receiver testing
- ❖ ELT (121.5 / 243 MHz) EPIRB/PLB (406 MHz) testing
- ❖ SELCAL tone generation
- ❖ VHF, and UHF COMM AM/FM Transmit/Receive testing
- ❖ High Resolution graphical displays of aircraft simulated results
- ❖ Large easy to read 5.1" COLOR display
- ❖ Simple intuitive interface and menu structure
- ❖ High capacity long life Li-ion batteries
- ❖ Rugged 8 lb. MIL-PRF-28800F, Class 2 case
- ❖ Remote software updates via Ethernet interface

VOR

Provides RF signal generation across the entire VOR band. Complete simulation of VOR bearing in 0.1º increments.

- Accurate generation of 30 Hz variable, reference, and 9960 Hz sub-carrier
- Preset bearing simulation or slew in 0.1° increments
- 30 Hz REF & VAR, and 9960 Hz modulation can be deleted to check flag operation
- Covers the entire VOR band of 108.00 to 117.95 MHz.
- 1020 Hz IDENT tone Selectable ON/OFF
- FM Immunity Test
- "On the Fly" adjustments
- Precise control of RF output power in Direct Connect and Antenna operation

LOC and GS

CAT I, II, and III Simulation of GS and LOC signals. Variable DDM in .001 DDM values

- Precise RF simulation of LOC/GS ILS signals
- Allows selection of preset DDM deflections or manual slew in 0.001 increments
- 90 Hz and 150 Hz ON/OFF selection
- 1020 Hz IDENT tone Selectable ON/OFF
- FM Immunity Test
- Simultaneous LOC/GS/MB Mode for coupled autopilot testing
- Complete Auto Sweep selection
- "On the Fly" adjustments
- Precise control of RF output power in Direct Connect and Antenna operation

Marker Beacon and ILS

Simple user selection of 400 Hz, 1300 Hz, or 3000 Hz MB tones at 95% modulation of the 75 MHz carrier

- Output Power easily adjustable from +13 to -67 dBm
- *ON the FLY* changes
- Auto cycling of MB tones and carrier

SELCAL

- Continuous or Single Burst Tones
- Selectable Pulse Pairs
- Variable Modulation (Continuous)
- Monitor broadcast on headphone jack

Headset / Microphone Connections

- Headset jack for monitoring audio from UUT transmission
- Microphone (or external modulation input) for transmitting from TR-36 to aircraft receiver UUT

ELT

- Continuous monitoring of ELTs on 121.5 & 243 MHz
- Accurate Power and Frequency measurements
- Monitor broadcast on headphone jack

EPIRB (406 MHz Beacon)

- Continuous monitoring of all COSPAS/SARSAT signals
- Accurate Sensitivity and Frequency measurements
- Decoding and display of: Position(LAT/LONG), ID, Beacon Type, Type of Locating Device, Device Activation Code

COMM Receiver – Audio S+N/N System Testing

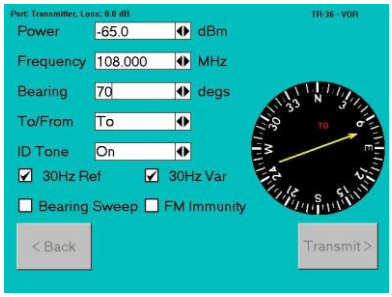
- Automatic audio S+N/N ratio detection during COMM receiver testing
- TR-36 monitors receiver UUT audio output while transmitting tone modulated signal
- Provides system testing through aircraft audio/intercom panel via Intercom connector

RF Signal Generator

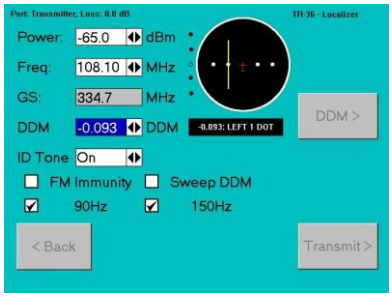
RF FREQUENCIES		FREQUENCY RANGE		
FUNCTION		FROM	TO	RESOLUTION
VOR Channels	VOR	108.000 MHz	117.950 MHz	50 kHz Steps
Variable VOR		108.000 MHz	117.950 MHz	1 kHz Steps
LOC Channels*	LOC	108.1000 MHz	111.950 MHz	50 kHz Steps
GS Channels*	GS	329.1500 MHz	335.000 MHz	50 kHz Steps
COMM AM	COMM AM	10.00 MHz	511.900 MHz	100 kHz Steps
AM Variable		10.00 MHz	511.900 MHz	1 kHz Steps
COMM FM	COMM FM	10.00 MHz	511.900 MHz	100 kHz Steps
FM Variable		10.00 MHz	511.900 MHz	100 kHz Steps
SELCAL	SELCAL	10.00 MHz	511.900 MHz	100 kHz Steps
Variable		10.00 MHz	511.900 MHz	1 kHz Steps
Marker	MB	75.0000 MHz	N/A	N/A
* Localizer and Glideslope Frequencies are Automatically Paired				

RF ACCURACY	FREQUENCY RANGE	RF OUTPUT RANGE, ACCURACY		
@ Antenna Connector	10.00 to 75.00 MHz	0 to -69.9 dBm	1.0 dB Steps	± 2 dB
(same as Time Base)	75.00 to 335 MHz	0 to -69.9 dBm	1.0 dB Steps	± 2 dB
	335 to 511.999 MHz	0 to -69.9 dBm	1.0 dB Steps	± 3 dB
Dual Mode LOC		0 to -69.9 dBm	1.0 dB Steps	± 2 dB
Dual Mode GS		0 to -69.9 dBm	1.0 dB Steps	± 2 dB
Tri- Mode LOC		0 to -69.9 dBm	1.0 dB Steps	± 2 dB
Tri-Mode GS		0 to -69.9 dBm	1.0 dB Steps	± 2 dB
Marker Beacon		0 to -69.9 dBm	1.0 dB Steps	± 2 dB
Tri-Mode MB		-20 dBm (FIXED)	N/A	± 2 dB
Note – All Modes Variable 0.1 dB				
@ RF Direct Connect	10.00 to 75 MHz	-40 to -110 dBm	1.0 dB Steps	± 2 dB
	75.00 to 335.00 MHz	-40 to -110 dBm	1.0 dB Steps	± 2 dB
	335 to 511.999 MHz	-40 to -110 dBm	1.0 dB Steps	± 3 dB
Dual Mode LOC		-40 to -110 dBm	1.0 dB Steps	± 2 dB
Dual Mode GS		-40 to -110 dBm	1.0 dB Steps	± 2 dB
Tri- Mode LOC		-40 to -110 dBm	1.0 dB Steps	± 2 dB
Tri-Mode GS		-40 to -110 dBm	1.0 dB Steps	± 2 dB
Marker Beacon		-40 to -110 dBm	1.0 dB Steps	± 2 dB
Tri-Mode MB		-60 dBm (FIXED)	N/A	± 2 dB
Note – All Modes Variable 0.1 dB				
Spectral Purity				
	Harmonics	<-40 dBc		
	Non-Harmonics Spurious	<-40 dBc		

TIME BASE	
TCXO Temperature Stability -30 to +75C	+/- 1 ppm
Aging	+/- 1 ppm/year
Accuracy	+/- 1 ppm



VOR



Localizer

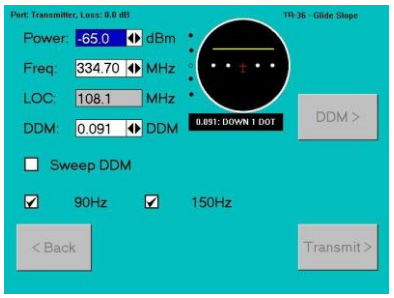
Modulation Characteristics

VOR Mode		LOC Mode		GS Mode	
30 Hz Reference	± 0.01%	90 Hz	± 0.01%	90 Hz	± 0.01%
30 Hz Variable	± 0.01%	150 Hz	± 0.01%	150 Hz	± 0.01%
1020 Hz	± 2%	1020 Hz	± 0.01%		
9960 Hz	± 0.01%				
AM MOD Fixed		*AM MOD Fixed*		*AM MOD Fixed*	
30 & 9960 Hz Tones	30% AM ± 1%	90 & 150 Hz	20% AM ± 1%	90 & 150 Hz	40% AM ± 1%
1020 Hz	30% AM ± 2%	1020 Hz	20% AM ± 2%	1020 Hz	40% AM ± 2%
AM Mod Variable		*AM Mod Variable*		*AM Mod Variable*	
30 & 9960 Hz Tones	0 to 55%	90 & 150 Hz	10 to 30%	90 Hz	30 to 60%
1020 Hz	0 to 55%	1020 Hz	TBD	150 Hz	20 t0 50%
Distortion	<1%	Distortion	<1%	Distortion	<1%

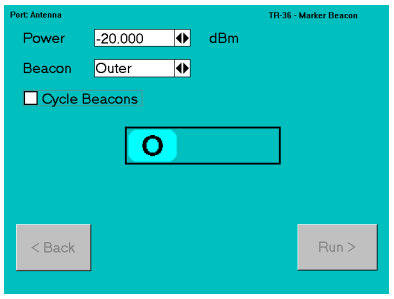
VOR FM MOD	30 Hz reference at ± 480 Hz Peak Deviation on 9960 Hz Sub carrier
Accuracy	± 10 Hz
Distortion	<2% (For 30 Hz Reference)
Variable Bearing	0.1° Increments ± 0.15°
VOR Bearing Sweep	TBD

PRESETS		U1/R1	U2/R2	FS	0C	FS	D2/L2	D1/L1
LOC DDM	± 0.0015 DDM	0.093	0.155	0.200	0.000	-0.200	-0.155	-0.093
GS DDM	± 0.003 DDM	0.091	0.175	0.400	0.000	-0.400	-0.175	-0.091
LOC Sweep		TBD						
GS Sweep		TBD						

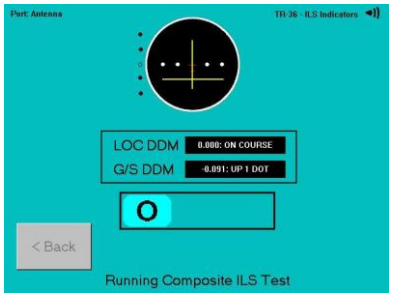
Marker Beacon	Single Carrier	TRI-Mode
400 Hz	± 0.01% (<1% distortion)	± 0.25% (<1% distortion)
1300 Hz	± 0.01% (<1% distortion)	± 0.4% (<1% distortion)
3000 Hz	± 0.01% (<1% distortion)	± 0.9% (<1% distortion)
Modulation		
95% AM Fixed	± 2% Accuracy	± 2% Accuracy
COMM AM		
Tone 1020 Hz	30% ± 1.5% Accuracy	0 to 100% in 1% steps ± 2%
Tone 10 Hz to 10 kHz	TBD	TBD
COMM FM		
Tone 10 to 35 Hz	± 0.2% Accuracy (<1% distortion)	0.1 kHz Steps
35 Hz to 100 Hz	± 0.02% Accuracy (<1% distortion)	0.1 kHz Steps
100 Hz to 10 kHz	± 0.01% Accuracy (<1% distortion)	0.1 kHz Steps
1000 Hz Tone 5 kHz Deviation	± 1% Accuracy	
0 to 25 Hz deviation	± 0.2 kHz +1% of setting (<1% distortion)	0.1 kHz Steps
Tone 10 Hz to 10 kHz	TBD	TBD
SELCAL		
Tone Frequency Accuracy	± 0.01% (<1% distortion)	
	Single Transmission	Enabled
	Continuous 7.5 sec	Enabled
Modulation Tone	Fixed	30% AM ± 2%
	Variable	0 to 99% in 1% Steps, ± 2%



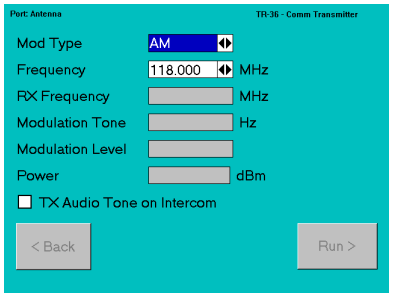
Glideslope



Marker Beacon

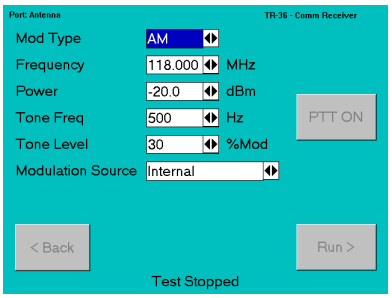


ILS Composite

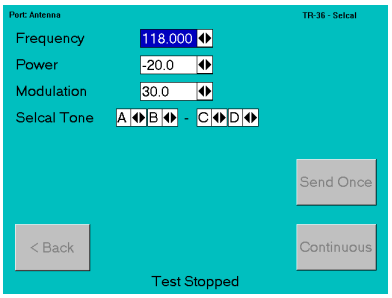


COMM TX

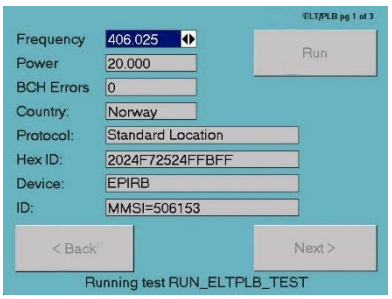
MEASURMENT FUNCTIONS				
FREQUENCY RANGE				
@ Antenna Connector	10.00 to 515 MHz	Resolution – TBD	Accuracy – TBD	
@ RF Direct Connect	10.00 to 515 MHz	Resolution – TBD	Accuracy – TBD	
SENSITIVITY				
@ Antenna Connector	≤ - 25 dBm			
@ RF Direct Connect	≤ + 5 dBm			
@ Video/Out – Mod/In	≥ 1 Vp-p (50Ω)			
POWER RANGE				
@ RF Direct Connect	10.00 to 515 MHz	0.1 to <1 W TBD	1 to <100 W TBD	100 to 1999 W TBD
External Attenuator Required for all Measurements > 30 W				
Accuracy	< 100 MHz : ± 12% of Reading	± 1 Count (CW Only)		
	10 to 515 MHz : ± 12% of Reading	± 1 Count (CW Only)		
DUTY CYCLE				
	≤ 10 W			
	> 10 to ≤ 20 W			
	> 20 to ≤ 30 W			
MODULATION METER				
AM				
Modulation Range & Accuracy	400 Hz to 1 kHz			
	10 to 100% ± 10% of reading			
Sensitivity	@ Antenna Connector	≤ - 25 dBm		
	@ RF Direct Connect	≤ + 5 dBm		
FM				
Deviation Range & Accuracy	400 Hz & 1 kHz			
	1 to 25 kHz			
	± 0.4 kHz + 8% of reading			
Minimum Input Level	@ Antenna Connector	≤ - 25 dBm		
	@ RF Direct Connect	≤ + 5 dBm		
121.5/243 Beacon Monitor	400 Hz to 1 kHz	By Similarity AM Meter		
Modulation Range & Accuracy	10 to 100% ± 10% of reading			
406 Beacon Monitor				
Deviation Range & Accuracy	400 Hz & 1 kHz	By Similarity FM Meter		
	1 to 25 kHz			
	± 0.4 kHz + 8% of reading			
VSWR				
Range	10 to 350 MHz			
Accuracy	SWR < 3:1 of reading			



COMM RX



SELCAL



406 EPIRB (1)

INPUT/OUTPUT Connectors	
Direct Connect	Type N
Impedance	50 Ω
Max Input	30 Watts Max.
VSWR	TNC
10.00 to ≤ 350 MHz	< 1.3:1 Ratio
> 350 to 512 MHz	< 1.3.5:1 Ratio
Antenna Connector	BNC
Impedance	50 Ω
Max Input	0.1 Watts
MIC/EXT Mod	PJ-068 (.206 " 3 conductor)
Headset	PJ-055 (.25" 2 conductor)
Intercom	U-174/U (.281" 4 conductor)

Power Specifications	
Battery	Lithium Ion
	7.4 V; 8800 mAh
Duration – fully charged	> 4.5 Hours Continuous
AC Input voltage	100 to 240VAC 50/60 & 400 Hz
DC Input voltage	12 VDC, 3.33 A (max)
Fuse Requirements	1.0 A SB (2 req.)
Operating Temperature	-40ºC to +55ºC
Storage Temperature	-40ºC to +70ºC

Physical Characteristics	
Case Style	MIL-PRF-28800F, Class 2
Height	3 3/8" (8.6 cm)
Width	12 13/16" (32.5 cm)
Depth	7 3/8" (18.7 cm)
Weight Static	8.1 lb (3.7 kg)

Tel-Instrument Electronics Corp.
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Standard Accessories and Options

- Standard 2 Year Limited Warranty included
- Multi-Band, Telescoping Omni Antenna
- Operational Manual
- External Battery Charger
- Direct Connect Cable
- Intercom Jack to Audio System Cable Options
- Optional Transit Case