



## TECHNICAL BULLETIN NUMBER 2025

Tone Intelligence Unit  
Model TIS-3A (TH-39B/UGT)

*Featuring:*

ADJUSTABLE FREQUENCY SHIFT DIRECT READING IN CYCLES



- High Stability, Multi-purpose Audio Tone Keyer
- True Frequency Shift by means of 200 KC oven controlled oscillator with reactance control
- Variable Frequency Shift, 12 to 1000 cycles
- Voltage or Current Inputs
- Complete compatibility with current FSK systems
- 1,000 cps CW channel

Model TIS-3A is a multi-purpose Audio Tone Keyer that provides CW, FSK, or FAX modes of operation when used with an SSB transmitter, telephone lines, or microwave links.

The TIS-3A provides maximum flexibility in a single piece of terminal equipment. When used with an SSB transmitter, FSK, CW, and FAX modes of operation are compatible with conventional systems. (See illustrations on last page.)

In FSK and FAX modes, frequency shift is a true FM system utilizing reactance control of a 200 kc oscillator in order to obtain clean, transient-free keying.

A precisely calibrated, direct reading counter-type dial provides fast, simple and accurate adjustment of the desired frequency shift from 12 to 1000 cycles. When used in the FAX mode, frequency shifted tones are a direct function of the input DC control voltage; therefore, linear shift of up to 1200 cps is available for photographic transmission.

## Tone Intelligence Unit

A front panel switch allows the selection of four discreet center frequencies to provide compatibility with the following types of operation.

1. 1,900 cps International standard for FAX transmissions.
2. 2,000 cps For use with transmitters and receivers limited to tuning in 1 kc steps.
3. 2,550 cps Standard center frequency used for 850 cps shift.
4. Spare Any audio tone center frequency may be selected by installing the appropriate crystal (extra-cost option) in the spare crystal socket. Use of this spare crystal greatly enhances the TIS-3A capabilities. For example, a crystal that produces a 1000 cps audio center frequency tone may be used for FAX or FSK transmission. This procedure makes it possible to off-set a synthesized transmitter 1000 cps, eliminating the need to retune the transmitter when changing from CW to FSK or FAX transmission.

An audio CW channel fixed at 1000 cycles is also provided.

Additional features include front panel selection of MARK and SPACE test tones and output level adjustment and metered monitoring.

Voltage or current keying loops can be accommodated by the four position KEY MODE switch. Standard values of 50 volts, 100 volts, 20 ma and 60 ma are provided. Temperature controlled crystal and oscillator components offer exceptionally high stability with a minimum of warm-up time.

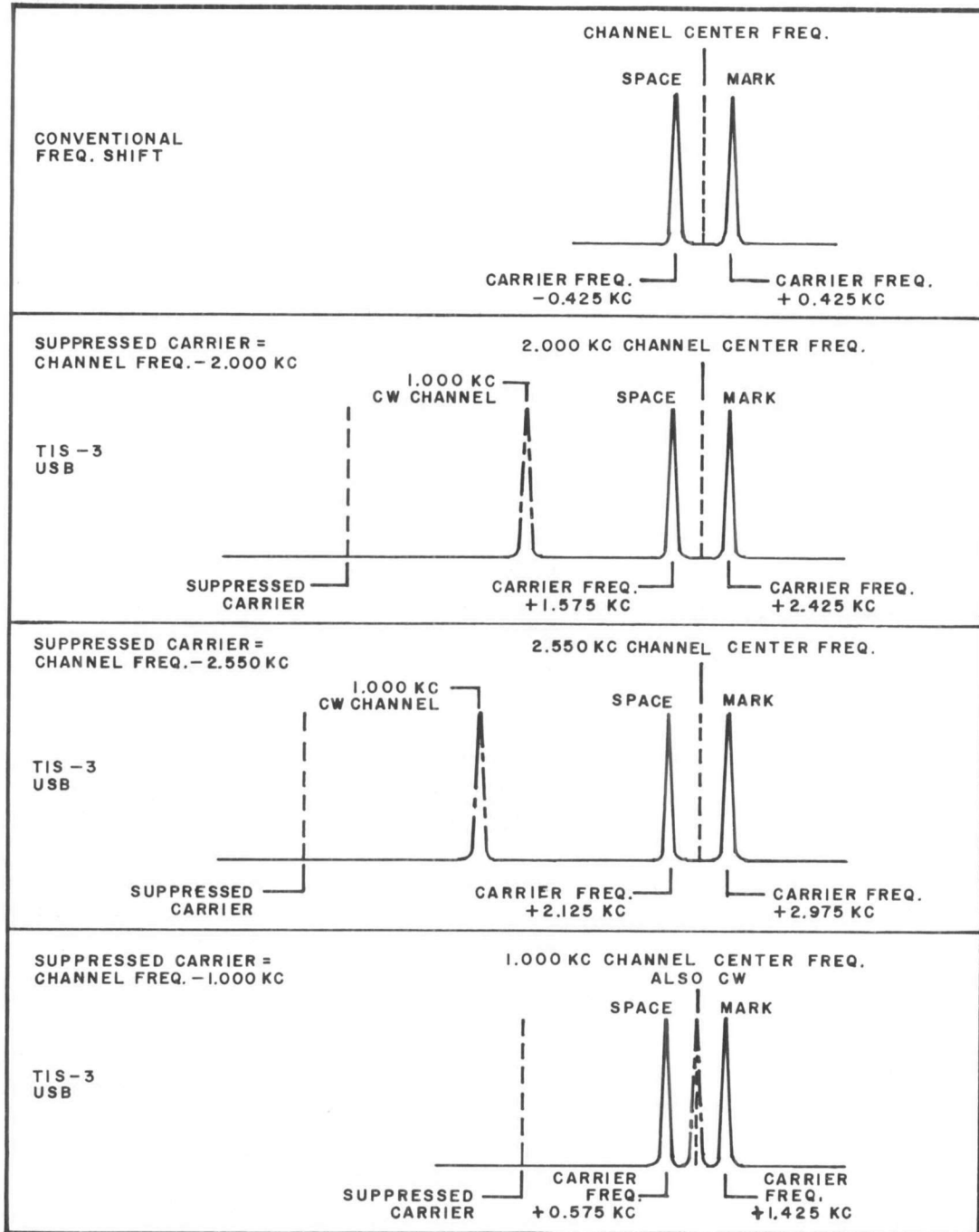
## TECHNICAL SPECIFICATIONS:

KEYING SPEEDS:	Up to 400 bauds FSK and FAX; up to 140 bauds CW.
KEYING INPUTS:	<ol style="list-style-type: none"><li>1. 50 v, 100 v, 20 ma, 60 ma. All neutral, floating, or either side grounded.</li><li>2. 0-20 volts positive for a linear shift of 1200 cycles for facsimile operation.</li></ol>
SHIFT:	12 cycles to 1000 cycles continuously adjustable
AUDIO CENTER FREQUENCIES:	<ol style="list-style-type: none"><li>1. 2550 cps</li><li>2. 2000 cps</li><li>3. 1900 cps</li><li>4. Spare (for customer-selected center frequency. See CRYSTAL TYPE.)</li></ol>
CW TONE FREQUENCY:	1000 cps
FREQUENCY STABILITY:	Better than 1% for: <ol style="list-style-type: none"><li>1. 0-50° C. ambient temperature change.</li><li>2. ±10% line voltage variation.</li><li>3. 0 to 95% relative humidity.</li></ol>
OUTPUT LEVEL:	Continuously adjustable to 0 dbm (0 to 1 milliwatt)

## Model TIS-3A

CRYSTAL TYPE: CR-47A/U	for: 1900 cps C.F. use CR-47A/U 0.198100-P for: 2000 cps C.F. use CR-47A/U 0.198000-P for: 2550 cps C.F. use CR-47A/U 0.197450-P Spare position (extra-cost option): Order CR-47A/U, $f_x = 0.2 \cdot \text{C.F.}$ (both in mc) $f_x =$ crystal frequency, C.F. = desired tone center frequency.										
OVEN TEMPERATURE:	70° C										
POWER INPUT:	115/230 volts; 50/60; Single Phase, 100 watts continuous; 170 watts intermittent (oven cycling).										
OUTPUT IMPEDANCE:	600 ohms balanced										
INPUT IMPEDANCE:	60 ma position 1000 ohms 20 ma position 2200 ohms 50 v position 47,000 ohms 100 v position 100,000 ohms FAX position 0-20 v 47,000 ohms										
FRONT PANEL CONTROLS:	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">CONTROL</th> <th style="text-align: left; border-bottom: 1px solid black;">FUNCTION</th> </tr> </thead> <tbody> <tr> <td>B+ ON/STANDBY* TEST</td> <td>Controls B+ Power a. LINE b. Continuous MARK c. Continuous SPACE</td> </tr> <tr> <td>CENTER FREQUENCY FUNCTION</td> <td>Selects one of four center frequencies Selects FSK, FAX, or CW mode of operation</td> </tr> <tr> <td>SHIFT CPS</td> <td>Permits extremely accurate selection of shift frequency</td> </tr> <tr> <td>LEVEL ADJ</td> <td>Adjust output level</td> </tr> </tbody> </table>	CONTROL	FUNCTION	B+ ON/STANDBY* TEST	Controls B+ Power a. LINE b. Continuous MARK c. Continuous SPACE	CENTER FREQUENCY FUNCTION	Selects one of four center frequencies Selects FSK, FAX, or CW mode of operation	SHIFT CPS	Permits extremely accurate selection of shift frequency	LEVEL ADJ	Adjust output level
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KEY MODE:	Adjusts keying input circuits to accept voltage and current inputs listed										
EXCITER:	Allows selection of FSK, FAX, or CW tones, or external audio input to an exciter when the TIS-3A is installed in the exciter frame. When the TIS-3A is installed in a control console, the EXCITER switches are left in CW/FAX/FSK position.										
INSTALLATION DATA:	5¼ × 19 × 14 inches, 38 lb.										
SHIPPING INFORMATION:	50 lbs., 8 × 21 inches (1.85 cu. ft.)										
MILITARY NOMENCLATURE:	TH-39B/UGT										
INSTRUCTION BOOKS:	TMC IN2025 NAVSHIPS 0967-035-6010										
COMPONENTS AND CONSTRUCTION:	All equipment is manufactured in accordance with JAN/MIL specifications wherever practicable.										
OPTIONS/ACCESSORIES (PRICED SEPARATELY):	Crystals for SPARE CENTER FREQUENCY position. See CRYSTAL TYPE for ordering information.										

\* Filaments and oven heaters are ON when power is applied to the unit.



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