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### TKM MX-385

by Michel Avionics, Inc.



The MX 385 is designed to be electrically and mechanically interchangeable with the RT 385 and RT 485. The MX 385 is available with the black faceplate as shown above or a beige faceplate used with most Cessna panels. The MX 385 operates

| Specifications      |   |
|---------------------|---|
| Frequency range     | Comm - 760 channels 118.000 to 136.975 Mhz<br>Nav - 200 channels 108.00 to 117.95 Mhz<br>Preselect channel storage capacity - 100 |
| Frequency stability | +/- .003 %, -20C to 50C   |
| Transmitter power   | 8 watts min.  |
| Modulation          | 85% minimum with limiting at 90%  |
| Sidestone           | Adjustable to 20 mw into 500 ohms   |
| Squelch             | Noise adaptive squelch with manual override   |
| Audio output        | 5 watts into a 4 ohm speaker; 40 mw into 500 ohm headphones   |
| Demod output        | VOR adjustable from .25 to .75 vrms   |
| Weight              | 4 lbs.  |
| Size                | 6.7" wide x 2.5" high x 10.4" mounting depth  |
| Tso                 | C34e, C36e, C37d, C38d, C40c  |



[\[Description\]](#) [\[Specifications\]](#) [\[Limitations\]](#) [\[Installation\]](#) [\[Operation\]](#) [\[Environmental\]](#)

EQUIPMENT DESCRIPTION

The unit features digital (LED) displays for active (yellow) frequently channel and standby (red) frequency channel for both COMM and NAV.

For channel selection a MHz knob and a KHz knob are provided. For 25 KHz increments in COMM a 25 KHz button is provided. To activate COMM or NAV frequency selection an N / C button is provided; a "tic"\* appears in the selected standby channel display.

Channel selection operates on the standby channel only. When the desired channel is indicted in the standby display it may be placed into the active position by depressing the "Flip-flop" button located to the left of the displays (labeled COMM and NAV); the active channel is then placed into the standby position.

The NAV receiver features a VC / ID button to permit selection of the voice or ident reception. In the Ident condition a "tic" is displayed on the active NAV channel display.

The COMM transceiver features a test button which overrides the squelch to verify proper receiver operation and to allow reception of weak signals. Also provided on the active COMM display is a "tic" to indicate transmitter power output.

The adjustment hole by the MHz switch permits operator adjustment of the display dimmer range for optimum nighttime brightness.

The adjustment hole by the KHz switch permits squelch adjustment and has a range of 10 db.

\* The "tic" is the upper half of "1" and is found to the left of the 100's digit.

● NOTICE TO INSTALLER

The TKM MX385 NAVCOMM is authorized by the FAA to TSO C34e, C36e, C37d, C38d and C40c. The product is an incomplete system. In order to achieve a complete TSO quality system, the MX385 **must** be installed to configure in conjunction with a TSO C37/C38 authorized antenna and a TSO C34 authorized navigation receiver. It is the responsibility of the installer to ensure proper installation.

CONTINUED AIRWORTHINESS (HBA 98-18)

Permission is hereby given to installers approved by the recognized aviation authority to reference relevant excerpts from the installation instructions provided by TKM Inc. in order to fulfill documentation requirements for Instructions for Continued Airworthiness. Adequacy of the documents should not be assumed by this permission. ICA documentation rests solely with the ICA applicant. The MX385 product is 'Repair on Condition Only'

[\[Description\]](#) [\[Specifications\]](#) [\[Limitations\]](#) [\[Installation\]](#) [\[Operation\]](#) [\[Environmental\]](#)

SPECIFICATIONS

Mounting: Panel mounted, no shock

|                                  |   |
|----------------------------------|---|
|                                  | mounting required.                                |
| Size:                            | 6.22 x 2.60 x 12.6 inches w/ connectors.          |
| Weight:                          | 4.2 lbs excluding external connector and harness. |
| Power Requirements:              | 27.5 Vcd  |
| NAV and COMM Recv'r              | 0.7 A   |
| Max COMM Total w/Transmit (Tone) | 3.7 A   |

#### **COMM Transceiver**

|                      |                       |
|----------------------|-----------------------|
| Crystal Controlled:  | 760 Channel           |
| Frequency Range:     | 118.00 to 136.975 MHz |
| Frequency Stability: | +/- .003%. -20 to 50C |

#### **Transmitter**

|                   |  |
|-------------------|--|
| VHF Power Output: | 10 watts minimum, 50 ohm   |
| Modulation:       | 85% capability with 90% limiting   |
| Microphone:       | Dynamic mike containing transistorized pre-amp or carbon (must provide at least 120 mV rms into 500 ohm load). |
| Sidetone:         | Adjustable up to 20 mw into 500 ohm headphones.  |
| Duty Cycle:       | 1 minute on, 4 minutes off (20%).  |

#### **Receiver**

|                      |  |
|----------------------|--|
| Sensitivity:         | - 103 dbm will provide a 6 db minimum S + N / N (1 KHz. 30%)               |
| Selectivity:         | Typical 6 db at + / - 7.5 KHz. 45 db at +/- 17.5 KHz. 65 db at +/- 25 KHz. |
| Spurious Responses:  | Down at least 70 db.   |
| Squelch:             | Noise adaptive squelch with manual override.                               |
| AGC Characteristics: | From -10 1 to -7 dbm audio output will not vary more than 1 db.            |

#### **NAV Receiver**

|                     |   |
|---------------------|---|
| Crystal Controlled: | 200 Channels  |
| Frequency Range:    | 108.00 to 117.95 MHz                                  |
| Sensitivity:        | - 107 dbm will provide at least half-flag indication. |

|                        |  |
|------------------------|--|
| Selectivity:           | Typical 6 db at + 15 KHz, 50 db at +/- 35 KHz, 65 db at +/- 50 KHz                               |
| Spurious Responses:    | Down at least 70 db  |
| Ident Filter:          | 15 db minimum  |
| AGC Characteristics:   | From -101 to -7 dbm audio output will not vary more than 1 db                                    |
| NAV Receiver Accuracy: | Two sigma limit, +/- 1 degree  |
| NAV Output:            | With LOC adjusted for 0.5 Vrms VOR = 0.71 Vrms (typical) into 20k ohms or greater load impedance |
| DME Channeling:        | 2 x 5  |
| G / S Channeling:      | 2 x 5  |

### AUDIO

|                         |   |
|-------------------------|---|
| Auxiliary Audio Inputs: | Seven 500 ohm inputs with 30 db isolation. One high gain input. |
| Frequency Response:     | Within 6 db from 350 Hz to 2500 Hz                              |
| Headphone Output:       | 40 mw into 500 ohm  |
| Speaker Output:         | 1.5 Vrms into auxiliary input produces 5 watts audio output.    |

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### EQUIPMENT LIMITATIONS

The following limitations indicate where the MX385 may be installed and meet the applicable TSO requirements.

1. Equipment is intended for installation within a nonpressurized but controlled temperature location in an aircraft that is operated at altitudes up to 35000 feet MSL.
2. Equipment is intended for use in a Standard Humidity Environment.
3. Equipment is intended to be panel mounted in single and Multi Engine Fixed Wing Aircraft with Reciprocating and Turbopropeller Engines.
4. Equipment shall not be mounted less than 0.3 in from magnetic compass.
5. Unit has not been tested with autopilots.

### ASSOCIATED EQUIPMENT

The MX385 is designed to be used as a direct replacement for the ARC RT385 and RT485 Units. The unit is dimensionally identical to the ARC units and can therefore use existing aircraft installations. The unit is electrically interchangeable with the ARC units and will provide the proper audio navigation signal and channeling signals for existing installations.

The remote channeling outputs of the unit permit channeling of Glide Slope receivers and DME using 2 x 5 channeling codes.

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### INSTALLATION

The MX385 is designed to be an exact replacement for the ARC RT385 and similar units. As a replacement unit the MX385 may be inserted directly into the mounting tray for the ARC unit and tightened down with a long (10" min) standard screwdriver.

To remove the MX385 from the mounting tray it is important to note that the Channel Selector knobs should not be used as handles. Using a long screwdriver, engage the clamp screw thru front panel access hole and rotate it CCW. The unit will be slowly retracted from the mounting tray and when the screw is completely disengaged the MX385 may be removed by sliding it out.

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### OPERATING INSTRUCTIONS

Operating controls for the MX385 are located on the unit front panel or are remote inputs thru the rear panel.

The unit front panel is shown in [figure 1](#). The left hand COMM readout indicates the active COMM frequency and the right hand COMM readout indicates the standby COMM frequency. The left hand NAV readout indicates the active NAV frequency and the right hand NAV readout indicates the standby NAV frequency. A "Tic" readout is provided on the upper left hand corner of the first digit of each of the four frequency readouts,.

The active COMM "Tic" indicates the presence of transmitter power.

The standby COMM "Tic" indicates that the Frequency Selection knobs will control COMM standby frequency.

The standby NAV "Tic" indicates that the Frequency Selector knobs will control NAV standby frequency.

Power Application. The COMM volume control contains the master power switch and activates both the NAV and COMM functions internal to the MX385.

Frequency Selection. The N / C button is used to activate either the COMM or the NAV frequency selection as indicated by the appropriate "Tic" display. The MHz and KHz controls can then be used to select a desired standby channel. In COMM the "25" button is used to advance the frequency by 25 KHz.

After the desired standby frequency is selected it may be transferred to thee active position by pressing the flip-flop button to the left of the ACTIVE display. The active and standby channels will be interchanged each time the button is pressed.

Ident / Voice Selection. The ID / VC button can be used to select a tone filter in order to receive voice signals on the NAV receiver. The switch is also used for frequency storage as described below.

Test. The TEST button is a dual function switch. In normal operation it is used to override the squelch to verify receiver operation and to receive weak signals. The switch is also used for frequency storage as described below.

VT. The VT button is used to test external equipment if the installation has been wired for that function.

PRESET FREQUENCY OPERATION

To erase all frequency presets with one operation simply turn on the power to the radio while holding the TEST button depressed.

EXAMINING / CHANGING / INSERTING / DELETING FREQUENCY PRESETS

The operation on individual frequency presets are accomplished in EDIT mode. To enter EDIT mode turn on the power to the radio while holding the VT button depressed. When The radio is in EDIT mode the ACTIVE displays show the reference number of the preset and the STDBY displays show the actual preset frequency. After a CLEAR operation as described above, the only presets will be the default of 112.0

EDIT mode operations are performed on either the COMM or NAV preset list according to where the tuning tic indicator is displayed. The tuning tic appears immediately to the left of the COM or NAV between NAV and COMM preset editing.

EXAMINING PRESETS (EDIT MODE)

Pressing the COMM button will step to the next frequency in the preset list. Pressing the TEST button will step to the previous frequency in the preset list. Pressing COMM when the last preset is displayed will cause the first preset to display. Similarly pressing TEST when the first preset is displayed will cause the last preset to display.

**WARNING:** When there is only one preset in the list the radio will not appear to "do anything" when COMM or TEST is pressed. This is because the current, previous, and next presets are all the same preset.

CHANGING A PRESET (EDIT MODE)

Press COMM or TEST until the desired insert point is displayed (the new preset will be inserted AFTER this insert point). Dial in the desired frequency using the tuning controls and press NAV. Remember that a preset list may contain a maximum of 50 entries. Insert commands that would cause this limit to be exceeded are ignored.

DELETING A PRESET (EDIT MODE)

Press COMM or TEST until the preset to be deleted is displayed, then press the VC - ID switch to delete. If the deleted preset was not at the end of the list all the presets that followed it are renumbered. Each preset list (NAV and COMM) must always contain at least one entry. If there is only one entry remaining in a preset list it may not be deleted (it can be changed to another frequency).

FREQUENCY PRESET NORMAL OPERATION

At any time the radio is in normal operation (Not EDIT MODE) COMM preset frequencies may be called into the STDBY frequency display by pressing COMM while the TEST button is depressed. During the time that both buttons are held simultaneously depressed the reference number for the preset appears in the ACTIVE window. Each time this operation is repeated it will copy the "next" preset to the COMM STDBY frequency.

NAV preset operation is similar with the exception that presets are retrieved by pressing NAV while the VC - ID button is depressed.

DIMMER

Display Dimmer Adjustment. The dark end of the automatic display dimmer range is adjustable through the front panel hole by the MHz switch marked "D".

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ENVIRONMENTAL QUALIFICATION FORM

MODEL MX385 NAV / COMM as specified in MX385 Specifications is manufactured by TKM, INC., 14811 NORTH 73<sup>rd</sup> STREET, SCOTTSDALE, AZ 85260.

|                       |       |                                 |
|-----------------------|-------|---------------------------------|
| Temperature and Alt.  | 4.0   | Category C1                     |
| Low temperature       | 4.5.1 | Category C1                     |
| High temperature      | 4.5.2 | Category C1                     |
| Altitude              | 4.6.1 | Category C1                     |
| Decompression         | 4.6.2 | Not Tested                      |
| Overpressure          | 4.6.3 | Not Tested                      |
| Temperature Variation | 5.0   | Category C                      |
| Humidity              | 6.0   | Category A                      |
| Shock                 | 7.0   | Tested for all conditions       |
| Vibration             | 8.0   | Category M/N<br>(no shock mts). |
| Explosion             | 9.0   | X: Not Tested                   |
| Waterproofness        | 10.0  | X: Not Tested                   |
| Fluid Susceptibility  | 11.0  | X: Not Tested                   |
| Sand and Dust         | 12.0  | X: Not Tested                   |
| Fungus                | 13.0  | X: Not Tested                   |
| Salt Spray            | 14.0  | X: Not Tested                   |
| Magnetic Effect       | 15.0  | Category A                      |
| Power Input           | 16.0  | Category B                      |
| Voltage Spike Cond.   | 17.0  | Category B                      |
| Audio Cond. Suscept.  | 18.0  | Category B                      |
| Induced Sig. Suscept. | 19.0  | Category B                      |
| RF Susceptibility     | 20.0  | Category B                      |
| RF Emission           | 21.0  | Category B                      |
| Lightening Suscept.   | 22.0  | X: Not Tested                   |

Installation Instructions: The MX385 is designed to be a slide in replacement for ARC radios and, as such, shall be installed with all of the original equipment precautions.

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