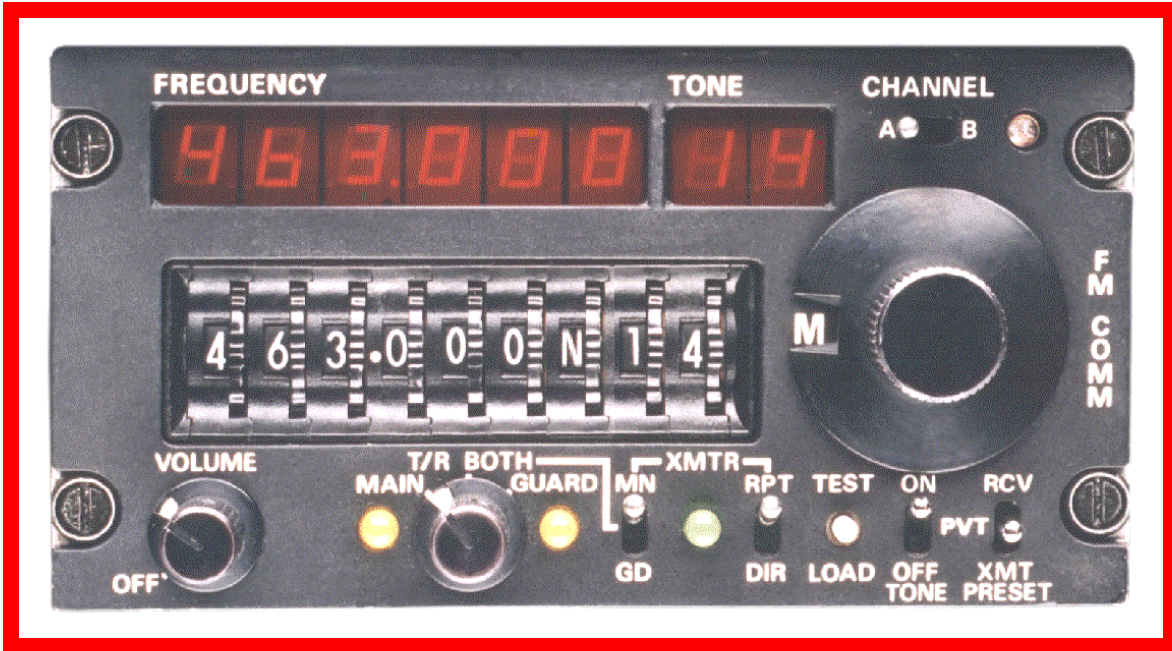# C-1000/S OPERATOR'S MANUAL
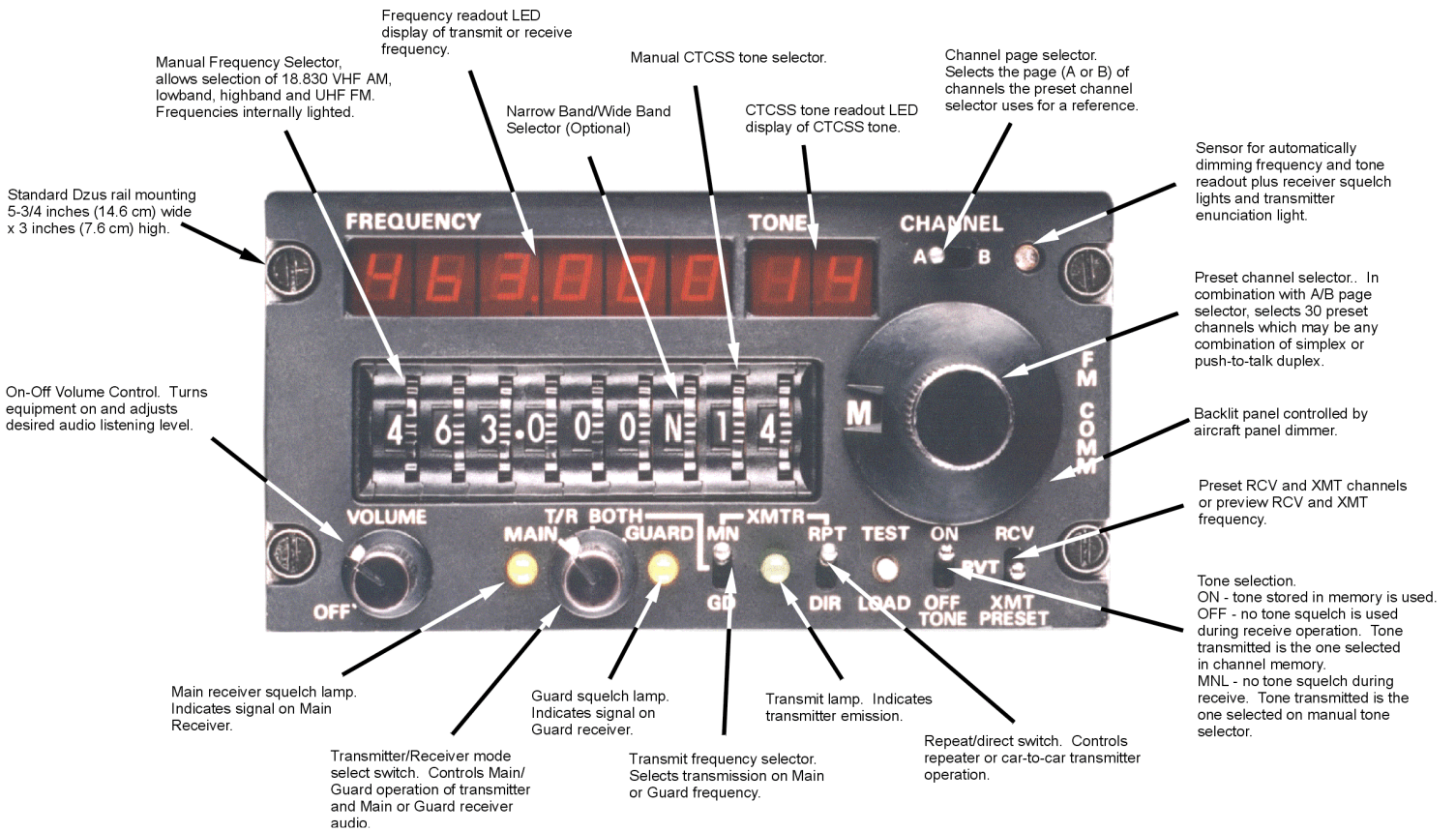

Wulfsberg Electronics Division
A Chelton Group Company

INTRODUCTION

This Operator's Manual contains detailed information to assist you in the proper operation of the C-1000/S Control Head.

Refer to the picture on the following page as you read the operating instructions.

Frequency readout LED display of transmit or receive frequency.

Manual Frequency Selector, allows selection of 18.830 VHF AM, lowband, highband and UHF FM. Frequencies internally lighted.

Manual CTCSS tone selector.

Channel page selector. Selects the page (A or B) of channels the preset channel selector uses for a reference.

Narrow Band/Wide Band Selector (Optional)

CTCSS tone readout LED display of CTCSS tone.

Sensor for automatically dimming frequency and tone readout plus receiver squelch lights and transmitter enunciation light.

Standard Dzus rail mounting 5-3/4 inches (14.6 cm) wide x 3 inches (7.6 cm) high.

Preset channel selector.. In combination with A/B page selector, selects 30 preset channels which may be any combination of simplex or push-to-talk duplex.

On-Off Volume Control. Turns equipment on and adjusts desired audio listening level.

Backlit panel controlled by aircraft panel dimmer.

Preset RCV and XMT channels or preview RCV and XMT frequency.

Main receiver squelch lamp. Indicates signal on Main Receiver.

Guard squelch lamp. Indicates signal on Guard receiver.

Transmit lamp. Indicates transmitter emission.

Tone selection.
ON - tone stored in memory is used.
OFF - no tone squelch is used during receive operation. Tone transmitted is the one selected in channel memory.
MNL - no tone squelch during receive. Tone transmitted is the one selected on manual tone selector.

Transmitter/Receiver mode select switch. Controls Main/ Guard operation of transmitter and Main or Guard receiver audio.

Transmit frequency selector. Selects transmission on Main or Guard frequency.

Repeat/direct switch. Controls repeater or car-to-car transmitter operation.

PURPOSE OF EQUIPMENT

The C-1000/S control unit is designed for use with Wulfsberg's Flexcomm communication systems. Flexcomm provides FM communications in low band VHF, high band VHF, UHF and VHF AM. Flexcomm provides total flexibility for interagency communications. The units provide channeling capability for all the FM bands plus the air traffic control band.

The C-1000/S is a fully frequency-agile control unit. It provides the ability to thumbwheel control all of the authorized Flexcomm system channels. It also provides 30 programmable preset channels. And the programming capability to change any of the preset channel frequencies is built into the control unit. This built-in operator programming capability can be disabled if the user desires. *Transceivers must be used only on your specifically authorized frequencies.*

NOTE: The C-1000/S Control Unit has shop accessible mode of operation selector switches. The configuration of the switches alters the operation of the control and the configuration must be known to properly utilize the features of the C-1000/S.

Features and capabilities of the C-1000/S that may be internally enabled/disabled are:

❑ THUMBWHEEL LIGHTING - normally the thumbwheels are back-lit continuously for night use but may be internally disabled.

❑ FREQUENCY AND TONE DISPLAY - normally the display is off except when the present RCV/XMT switch is depressed either to preset channel frequency and tone information or to re-program the channel information. The display may be configured internally for the display to be on continuously.

❑ GUARD CHANNEL PROGRAMMING - may be internally disabled.

❑ PAGE A AND B CHANNEL PROGRAMMING – may be internally disabled for page A or page B channels or both.

❑ MANUAL SIMPLEX CHANNEL - may be internally restricted to receive only.

❑ CHANNEL MEMORY DISCRETE OUTPUTS – may be shop programmed with each channel to provide control of external accessory equipment. Should the operator re-program a channel without access to the internal switches, pre-programmed channel memory discrete information may be lost. If the unit has been modified for narrow/wide band operation, memory discrete number two will not be a user-defined discrete output.

DESIGN FEATURES

❑ The C-1000/S is designed for ease of operation, maintenance and installation.

❑ Channel Memory retention maintained with no power applied. Some restrictions may apply with S version installations.

❑ All Flexcomm control units are interchangeable within the system wiring.

❑ Guard channel transmit frequencies and tones.

❑ Five Channel Memory Discrete Outputs (four when modified for narrow band); shop programmable with each channel.

❑ Direct/Repeat feature.

❑ Integral front panel lighting.

FREQUENCY SELECTION AND DISPLAY

Please note that the international aircraft standard is used in the frequency selection and frequency presentation of the 0.5 kHz frequencies. That is:

> 154.320 reads 154.320
> 154.3225 reads 154.322
> 464.325 reads 464.325
> 464.3275 reads 464.327

CONTROL OPERATION

The following describes the operation of each operator accessible control knob, switch or indicator:

❑ PRESET CHANNEL SELECTORS: Allows selection of 30 channels of pre-programmed frequencies, tones and Channel Memory Discretes.

❑ TEST/LOAD Switch: Disables the receiver squelch, also, when activated simultaneously with the Preset switch, loads preset frequencies, tones and five Channel Memory Discretes.

❑ PRESET - RCV/XMT Switch: Used in conjunction with the LOAD/TEST Switch, selects either receive or transmit half of channel memory. Activates seven segment frequency and tone LED displays.

❑ MAIN RECEIVER Squelch Lamp: Indicates signal on Main Receiver. Dims automatically.

❑ GUARD RECEIVER Squelch Lamp: Indicates signal on Guard Receiver. Dims automatically.

❑ ON/OFF/VOLUME Control

❑ TONE - ON/OFF/MNL Switch: Allows manual selection of transmitted tone by way of thumbwheel TONE selectors in MNL position, allows Main and Guard tone squelches to operate in the ON position, and allows Main and Guard receiver tone squelches to be disabled in either the MNL or OFF positions. In either the OFF or MNL positions the receiver's squelches operate via their noise squelch circuitry.

❑ T/R SELECT Switch -MAIN/BOTH/GUARD: In the MAIN position - enables the Main Receiver only and transmits on the main channel selected. In the BOTH position - enables both the Main and Guard Receivers and transmits on either the main or guard channel (dependent on the XMTR-MN/GD switch); in the GUARD position - enables only the Guard Receiver and transmits on the selected guard channel.

❑ XMTR - MN/GD Switch: Selects either main channel or guard channel during transmitter operation only if the T/R-MAIN/BOTH/GUARD switch is in the BOTH position.

❑ XMTR Lamp: Indicates transmitter operating, dims automatically.

❑ RPT/DIR Switch: Selects transmitter to operate on different frequency than receiver (RPT) or same frequency as receiver (DIR) during main channel operation. Selects one of two guard channels during guard channel transmitter operation and during guard transmit channel programming.

❑ FREQUENCY and TONE Selectors: Internally lighted thumbwheels used in manual selection and programming of frequencies and tones. Lighting may be disabled by means of an internal switch.

❑ N/W SWITCH: Selects either Narrow or Wide Band operation. When N is selected and the channel selector switch is on M, an LED lights in the lower right corner of the kHz display. The LED also lights when a preset memory channel has been programmed for narrow band.

PRESET CHANNEL PROGRAMMING INSTRUCTIONS

Turn the equipment On by rotating the MAIN ON/OFF volume control clockwise. Aircraft or vehicle power must be available to the unit by operating the appropriate switches and/or circuit breakers.

To hear the audio, the appropriate audio select switches, if any, must be in the proper position and the volume control set to the appropriate level. The volume level can be tested setting the background noise level generated when the TEST/LOAD button is depressed.

NOTE: To optimize system performance, allow five minutes for warm-up. Two and one-half minutes warmup is required to insure the transmitter frequency is within the FCC requirements.
The programming procedures described in detail in the following steps consist of

(1) Selecting the channel to be programmed.
(2) Setting up the channel frequency, tone and narrow/wide band mode if the unit has the narrow band modification.
(3) Selecting receive or transmit with the PRESET switch.
(4) Pressing the TEST/LOAD Button while holding the PRESET switch.
(5) Verification of proper load.

NOTE: Internal switches are provided to prevent control unit programming or manual transmit frequency selection by operators not having an FCC second class, or higher, commercial operator license.

MAIN RCV/XMT FREQUENCY

1. Select the desired channel (page and number) to be programmed on the channel selectors.
2. Set up the XMT frequency and CTCSS tone on the thumbwheels. If no tone is desired, set the CTCSS selector to the OFF position. To choose the proper tone code to be used, refer to the Tone Selection Chart. If the unit has the narrow band modification, set the N/B switch to the desired setting.
3. Set the T/R - MAIN/BOTH/GUARD to MAIN.
4. Operate the PRESET switch to the XMT position and hold.
5. Push and release the LOAD button. The XMT frequency is now loaded for the selected channel.
6. Set up RCV frequency and CTCSS tone on the Thumbwheels.
7. Operate PRESET switch to the RCV position and hold.
8. Push and release LOAD button. The RCV frequency is now loaded for the selected channel.

GUARD XMT FREQUENCY

1. Set the T/R MAIN/ BOTH/GUARD Switch to GUARD.
2. Any channel may be selected for the Guard frequency programming operation.
3. Set XMTR RPT/DIR Switch to RPT.
4. Set up the Guard XMT repeater frequency and CTCSS tone on the thumbwheels. If the unit has the narrow band modification, set the N/B switch to the desired setting.
5. Operate PRESET Switch to XMT position and hold.
6. Push and release LOAD button. The Guard XMT Repeater frequency is now loaded.
7. Change the XMTR RPT/DIR Switch to DIR and repeat steps 5 through 7 to load the Guard XMT direct or simplex frequency. If the guard channel is not configured for talk around or Repeat/Direct operation, program the same XMT frequency for both positions of the XMTR RPT/DIR switch.

TONE CODES

CTCSS TONE CODES					
TONE FREQ HZ	EIA TONE CODE	FLEXCOMM TONE CODE	TONE FREQ HZ	EIA TONE CODE	FLEXCOMM TONE CODE
67.0	XZ	01	118.8	26	21
71.9	XA	02	123.0	3Z	22
744	WA	03	127.3	3A	23
77.0	XB	04	131.8	36	24
79.7	SP	05	136.5	4Z	25
82.5	YZ	06	141.3	4A	26
85.4	YA	07	146.2	4B	27
88.5	YB	08	151.4	5Z	28
91.5	ZZ	11	156.7	5A	31
94.8	ZA	12	162.2	5B	32
97.4	ZB	13	167.9	6Z	33
100.0	1Z	14	173.8	6A	34
103.5	IA	15	179.9	6B	35
107.2	IB	16	186.2	7Z	36
110.9	2Z	17	192.8	7A	37
114.8	2A	18	203.5	M1	38

FREQUENCY REVIEW

To review main channel information, set the T/R MAIN/BOTH/GUARD to the MAIN position or if the T/R MAIN/BOTH/GUARD Switch is in the BOTH position, set the XMTR MN/GD Switch to MN. The TONE Switch can be in either the ON or OFF position, but should not be in the MNL position. To review the XMT half of the memory, place the PRESET Switch to the XMT position. To review the RCV half, place the PRESET Switch to the RCV position. The frequency and tone code stored in memory will be displayed.

To review guard channel information, set the T/R MAIN/BOTH/GUARD Switch to the GUARD position or if the T/R MAIN/BOTH/GUARD Switch is in the BOTH position, set the XMTR MN/GD Switch to the GD position. Place the PRESET Switch in the XMT position. To select between the repeater (duplex/channel 1) or the direct (simplex/channel 2) guard transmit frequency, use the XMTR RPT/DIR Switch.

MANUAL OPERATION

1. Rotate the Channel Selector Switch to the M channel.
2. Set the thumbwheels to the frequency and tone desired. The selected frequency and tone is common to both transmit and receive operation.
3. If modified for narrow band operation, set to either 'N' or 'W' depending on whether narrow or wide band operation is desired.

NOTE: The operator of a C-1000/S control unit must hold a FCC Second Class, or higher, Commercial Operator's License to utilize the manual channel frequency selector mode of operation or the operator channel programming feature for FM channels. When VHF-AM frequencies are selected in the manual channel frequency mode, the transmitter is automatically enabled regardless of the operator restrictions for FM channels. Internal switches are provided to prevent operation in the manual ("M") mode.

TONE SQUELCH

The CTCSS tone squelch may be preset to one of 32 possible tone frequencies on each of the 30 programmable channels. The transmit and receive tones may be different. Receive tone squelch may be disabled for open receiver operation independent of programmed tone via the "TONE OFF" switch. Transmitter tones are not effected. Manual selection of the transmitted tone only may be made via the "TONE MNL" switch and the thumbwheel Tone Selector.

CHANNEL MEMORY DISCRETES

Five electronic switches (four if the unit has the narrow band modification) for each channel are provided and are shop programmable for each transmit and receive frequency. They can be configured to activate or deactivate features or accessory units as part of the Flexcomm System.

C-1000/S FREQUENCY CHART

Page A

Channel	Transmit	CTCSS Tone	Receive	CTCSS Tone	Channel Designator
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

"GUARD DIRECT"

'GUARD REPEATER'

Page B

Channel	Transmit	CTCSS Tone	Receive	CTCSS Tone	Channel Designator
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

"GUARD DIRECT"

'GUARD REPEATER'

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