

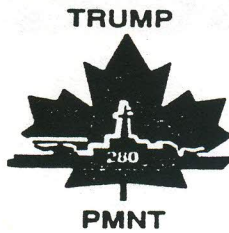
FSCM No. 09691  
DUNS No. 201 455557

DOCUMENT NO. CBS-H0001

DATE 24 APRIL 1988

REVISION IDENTIFICATION N/C

DATE \_\_\_\_\_



**Litton**

Litton Systems Canada Limited

COMBAT SYSTEM FAMILIARIZATION COURSE  
STUDENT HANDOUT

FOREGROUND TECHNICAL DATA

NOTICE OF CROWN COPYRIGHT

Her Majesty the Queen in Right of Canada 1987.

LSL RELEASE:

DATE:

## PREFACE

This document, CBS-H0001 REV N/C Combat System Familiarization Course Trainee Handout is based on the information available to the TRUMP ILS Training as of 5 April 1989, and as such, is subject to change, without notice, as the TRUMP Combat System undergoes design refinements.

NON CLASSIFIED

"Use, duplication or disclosure of this document or any of the information contained herein is subject to the restriction on the title page of this document."

## CONTENTS

PARAGRAPH		PAGE
1.	INTRODUCTION	1
2.	PRESENT CONFIGURATION	1
2.1	Introduction	1
2.2	Helicopters	2
2.3	Sonar Systems	2
2.4	Point Defence Missile System	2
2.5	Gun Weapon System (GWS)	2
2.6	Integrated Electronic Warfare System (EWIS)	2
2.7	Radar System and Navigation	3
2.8	Command and Control System	3
2.9	Communications	3
3.	TRUMP	5
3.1	Introduction	5
3.2	TRUMP Combat System Primary Functions	6
3.2.1	Above-Water Warfare	6
3.2.1.1	Anti-Air Warfare (AAW)	6
3.2.1.2	Surface-to-Surface Warfare	7
3.2.2	Command Task Group Functions	7
3.2.3	Anti-Submarine Warfare (ASW)	8
3.3	Secondary Functions	8
3.4	System Definition	8
3.4.1	General	8
3.4.2	Anti-Air Warfare (AAW)	9
3.4.3	Surface-to-Surface Warfare (SSW)	9
3.4.4	Anti-Submarine Warfare (ASW)	9
3.4.5	Command and Control System (CCS)	11
3.4.6	Electronic Warfare System (EWS)	11
3.4.7	Communication	11
3.4.8	Navigation	11
4.	System Description	12
4.1	General	12
4.2	Command and Control System (CCS)	12
4.2.1	Serial Data Bus (SDB)	14
4.2.2	CCS Processors	15
4.2.3	Operator Displays	15
4.2.4	Command Task Group Display and Slave Monitor	16
4.2.5	System Controller Group	16
4.2.6	Electronic Warfare System Interface (EWSI)	16
4.2.7	Data Processing Set, AN/UYQ-504	16
4.2.8	Data Storage Devices	17
4.2.9	Data Link Equipment	17
4.2.10	Printer	17
4.2.11	Data Converter Subsystem	17
4.2.12	IFF Mk XII Decoders	18

NON CLASSIFIED

"Use, duplication or disclosure of this document or any of the information contained herein is subject to the restriction on the title page of this document."

## CONTENTS (cont'd)

PARAGRAPH		PAGE
4.2.13	Radar Data Distribution Switchboard (RDDS)	18
4.2.14	CCS Software	20
4.3	Radar System	21
4.3.1	LW08 Long Range Radar	21
4.3.1.1	Antenna System	21
4.3.1.2	Antenna Control Cabinet	21
4.3.1.3	Transmitter Cabinet	24
4.3.1.4	Receiver Cabinet	24
4.3.1.5	Remote Control Unit	25
4.3.2	DA08 Medium Range Radar	26
4.3.2.1	Antenna System	26
4.3.2.2	Antenna Control Cabinet	26
4.3.2.3	Transmitter Cabinet	26
4.3.2.4	Receiver Cabinet	28
4.3.2.5	Remote Control Unit	28
4.3.3	Automated Track Management System	29
4.3.3.1	Video Extractor	29
4.3.3.2	Track Plot Combiner	29
4.3.3.3	Upper Panel	29
4.3.3.4	Front Panel	29
4.4	Fire Control System (FCS)	29
4.4.1	STIR System Description	31
4.4.1.1	STIR Maintenance Characteristics	36
4.4.1.2	STIR Maintenance Test Tools	36
4.4.2	LIROD System Description	36
4.4.2.1	LIROD Maintenance Characteristics	38
4.4.3	Continuous Wave Illuminator (CWI) System Description	38
4.4.4	Weapon Direction System (WDS)	40
4.4.5	Weapon Interface Cabinet (WIC)	40
4.4.6	Control Console	40
4.5	Surface-to-Air Missile (SAMS)	41
4.5.1	Mk 41 Vertical Launching System (VLS)	41
4.5.1.1	Launch Control System (LCS)	43
4.5.1.2	Status Panel	45
4.5.1.3	System Module	45
4.5.1.4	Standard Module	46
4.5.1.5	Strikedown Module	49
4.5.2	Standard Missile 2 Block 2 (SM2 Block 2)	49
4.5.2.1	General	49
4.5.2.2	Initialization	52
4.5.2.3	Boost Phase	52
4.5.2.4	Mid-Course Phase	52
4.5.2.5	Homing Phase	52
4.5.2.6	Endgame	54

NON CLASSIFIED

ii

## CONTENTS (cont'd)

PARAGRAPH		PAGE
4.6	Gun Weapon System (GWS)	55
4.6.1	OTO Melara 76/62 Super Rapid Gun Mounting (SRGM)	55
4.6.1.1	SRG Main Components	55
4.6.2	Ammunition	58
4.6.3	Ammunition Lower Hoists	58
4.7	Close-In Weapon System (CIWS)	59
4.7.1	Operational Concepts	59
4.7.2	CIWS System Description	60
4.7.2.1	Weapon Group	60
4.7.2.2	Local Control Panel (LCP)	61
4.7.2.3	Remote Control Panel (RCP)	61
4.8	Electronic Warfare (EW) System	61
4.8.1	LF/MF/HF ESM System	61
4.8.2	Radar ESM System	62
4.8.3	On-board ECM System	62
4.8.4	SHIELD-2	62
4.8.4.1	List of Major Units	63
4.9	Sonobuoy Processing System (SPS)	63
4.9.1	AN/ARR-75 Sonobuoy Receiver Set	65
4.9.2	AN/UYS-503 Sonobuoy Processor and Keyboard	65
4.9.3	FWSI Model 15-SPS Recorder/Reproducer Set	67
4.9.4	FWSI Model 15-SPS Time Code/Remote Unit	67
4.9.5	CRT Monitor	67
4.9.6	Audio Control Box	67
4.10	Torpedo Handling and Stowage System (THSS)	67
4.11	Interior Communications System (ICS)	70
4.11.1	System Description	70
4.11.1.1	Control Processor Group	74
4.11.1.2	Network Group	77
4.11.1.3	Power Group	77
4.11.1.4	Maintenance/Administration Group	77
4.11.1.5	Main Distribution Frame Group	78
4.11.1.6	Terminal Group	78
4.11.1.7	Terminal Ancillary Equipments	79
4.11.1.8	Interface Group	80
4.12	Integrated Navigation System (INS)	80
4.12.1	Satellite/Omega Navigator	80
4.12.2	Inertial Navigation Set	82
4.12.2.1	AN/WSN-5(Mod) Functional Description	83
4.12.2.2	INDB General	83
4.12.3	INDB Functional Description	84

## FIGURES

FIGURE		PAGE
1	Pre-TRUMP CCS 280 Configuration	4
2	TRUMP Combat System Configuration	10
3	Command and Control System Functional Block Diagram	13
4	Radar Data Distribution Switchboard Interface Block Diagram	19
5	Radar System Functional Block Diagram	22
6	LW08 Long Range Radar Functional Block Diagram	23
7	DA08 Medium Range Radar Functional Block Diagram	27
8	Automatic Track Management System Block Diagram	30
9	DUAL STIR Block Diagram	33
10	Display Functional Block Diagram	34
11	Weapon Control Functional Block Diagram	35
12	LIROD Fire Control System Functional Block Diagram	37
13	CWI System Block Diagram	39
14	Vertical Launch System	42
15	VLS Block Diagram	44
16	VLS 8-Cell System/Standard Module	47
16A	VLS 8-Cell System/Standard Module	48
17	VLS Strikedown Module	50
17A	VLS Strikedown Module	51
18	SM-2 Configuration Layout	53
19	76/62mm Super Rapid Gun Right Side View	56
20	76/62mm Super Rapid Gun Left Side View	57
21	SHIELD-2 Off-Board ECM System Block Diagram	64
22	Sonobuoy Processing System	66
23	Torpedo Handling and Stowage System	68
24	Overhead Rail Assembly Cross Section	69
25	Bridgecrane Assembly	71
26	Stowage Chocks	72
27	Combination Loader Tray/Torpedo Dolly	73
28	SHINCOM "Dual Star" Configuration	75
29	SHINCOM Functional Block Diagram	76
30	AN/WSN-5(Mod) Inertial Navigation Set Block Diagram	81
31	Integrated Navigation Data Bus (INDB) Block Diagram	84
ATTACHMENT 1	Command and Control System	
ATTACHMENT 2	Integrated Navigation System	
ATTACHMENT 3	Radar System	
ATTACHMENT 4	Fire Control System	
ATTACHMENT 5	Vertical Launch Missile System	
ATTACHMENT 6	Sonobuoy Processing System	

NON CLASSIFIED

iv

Table I  
Glossary of Terms

AA	Anti-Air
AAW	Anti-Air Warfare
ACB	Audio Control Box
ACB	Audio Control Box
AGC	Automatic Gain Control
AIP	Anti-Icing Panel
ASSMs	Anti-Surface Ship Missiles
ASW	Anti Submarine Warfare
ATMS	Automatic Track Management System
AWW	Above-Water Warfare
BAM	Bus Access Module
BAS	Bus Access System
BIS	Bus Interface Set
BIT	Built-in-Test
BITE	Built-in-Test Equipment
BM	Bridge Module
CANEWS	Canadian Electronic Warfare System
CCS	Command and Control System
CIWS	Close-In Weapon System
COMM	Communication
CM	Command Module
CMTU	Cartridge Magnetic Tape Unit
CORSO	Conical Scan
COT	Captain-of-Turret
CPU	Central Processing Unit
CRACOM	Encrypted Radio Interface
CRT	Cathode Ray Tube
CRTM	Cathode Ray Tube Monitor
CTG	Commander Task Group

NON CLASSIFIED

"Use, duplication or disclosure of this document or any of the information contained herein is subject to the restriction on the title page of this document."

Table I  
Glossary of Terms

CWI	Continious Wave Illuminator
DCJB	Damage Control Junction Box
DCU	Data Converter Unit
DCS	Data Converter Subsystem
DOS	Distributed Operating System
DTS	Digital Terminal Set
ECCM	Electronic Counter-Countermeasures
ECM	Electronic Countermeasures
EQUIP	Equipment
EPM	Emergency Power Module
ESM	Electronic Support Measures
EW	Electronic Warfare
EWIS	Integrated Electronic Warfare System
EWSI	Electronic Warfare System Interface
EXCOM	External Trunk Interface
FCS	Fire Control System
FCRS	Fire Control Radar System
FCU	Frequency Control Unit
FREQ	Frequency
FM	Frequency Modulation
GMFCS	Guided Missile Fire Control System
GMLS	Guided Missile Launching System
GWS	Gun Weapon System
HE	High Explosive
HF	High Frequency
HMS	Hull-Mounted Sonar
HSP	High Speed Printer
HV	High Voltage
Hz	Hertz

NON CLASSIFIE

vi

"Use, duplication or disclosure of this document or any of the information contained herein is subject to the restriction on the title page of this document."

Table I  
Glossary of Terms

ICI	Inter Computer Interface
ICP	Interface Control Panel
ICS	Interior Communication System
IFF	Identification Friend or Foe
IOCC	Input/Output Control Console
IMU	Inertial Measurement Unit
INDB	Inertial Navigation Data Bus
INS	Integrated Navigation System
ITE	Integrated Test Equipment
Kw	Kilo Watt
LCC	LIROD Control Console
LCC	Launch Control Console
LCM	Launcher Control Module
LCP	Local Control Panel
LCU	LIROD Control Unit
LCU	Launch Control Unit
LED	Light Emitting Diode
LF	Low Frequency
LORO	Lobe on Receive Only
LIROD	Lightweight Radar/Optronic Director
LNTA	Low-Noise Transistor Amplifier
LRR	Long Range Radar
LSEQ	Launch Sequencer
MAI	Maintenance/Administration Interface
MCP	Motor Control Panel
MDF	Main Distribution Frame
MF	Medium Frequency
MHz	Mega Hertz
MLJB	Module Lighting Junction Box

Table I  
Glossary of Terms

mm	Millimeter
MOD	Modification
MOM	Multirole OTO Munition
MRR	Medium Range Radar
MTI	Moving Target Indication
MTTU	Multi-Task Tracker Unit
MTP	Module Transformer Platform
NAV	Navigation
NGS	Naval Gunfire Support
NIXIE	Acoustic Warfare Countermeasure System
OMEGA	Radio Navigation System
PACOM	Public Address Interface
PCP	Processor Control Panel
PD	Point Detonation
PDP	Power Distribution Panel
Ph	Phase
PRF	Pulse Repetition Frequency
PTT	Press To Talk
QOT	Quick Operability Test
RACOM	Radio Interface
RAM	Random Access Memory
RECOM	Recorder Interface
RCP	Remote Control Panel
RCU	Remote Control Unit
RDDS	Radar Data Distribution Switchboard
RDF	Radio Direction Finder
RIG	Radar Integration Group
RLEP	Remote Launch Enable Panel
R/R	Recorder/Reproducer Set

Table I  
Glossary of Terms

RS	Radar Description
RTU	Radar Track Unit
SAM	Surface-to-Air Missile
SATCOM	Satalite Communications
SATNAV	Satalite Navigation
SM	Standard Missile
SAMS	Surface-to-Air Missile System
SAU	Search and Attack Unit
SAWS	Surface and Air Weapons System
SAPOM	Semi-armour Piercing Surface Rounds
SBPS	Sonobuoy Processor and Keyboard
SCC	STIR Control Console
SCR	Silicon Controlled Rectifier
SDB	Serial Data Bus
SDC	Signal Data Converter
SHINCOM	Shipboard Integrated Communications System
SHINPADS	Shipboard Integrated Processing And Display System
SLJB	System Lighting Junction Box
SLS	Side Lobe Suppression
SMRI	SMR Interface
SP	Status Panel
SPS	Sonobuoy Processing System
SOCOM	Sound Powered Telephone Interface
SOT	System Operability Test
SRGM	Super Rapid Gun Mounting
STC	Sensitivity Time Control
STIR	Signaal Tracking/Illumination Radar
STP	System Transformer Platform
SSD	SHINPADS Standard Display

NON CLASSIFIE

ix

"Use, duplication or disclosure of this document or any of the information contained herein is subject to the restriction on the title page of this document."

