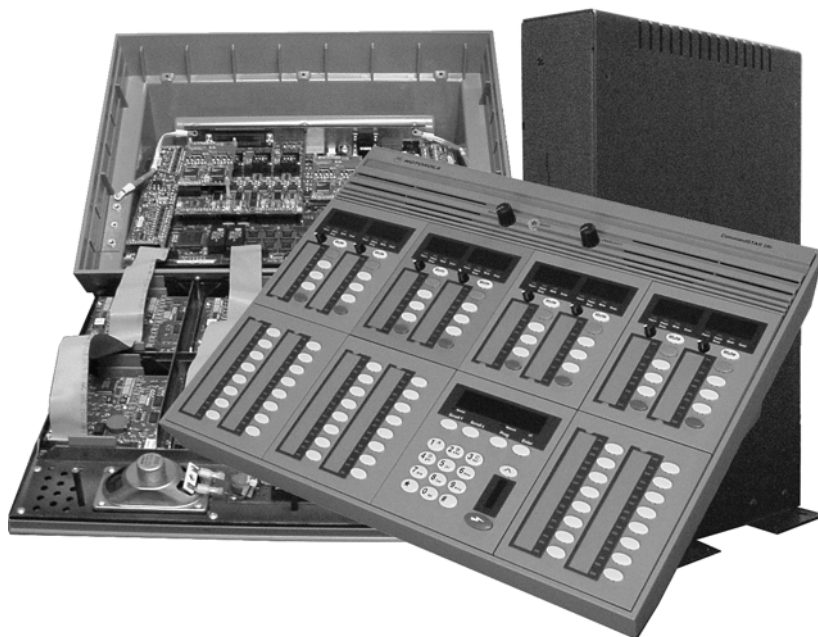




MOTOROLA

CommandSTAR Lite™

Installation and Troubleshooting Manual



6880309J98-C
30 June 2003

COMMERCIAL WARRANTY

(STANDARD)

Motorola radio communications products are warranted to be free from defects in material and workmanship for a period of ONE (1) YEAR, [except for crystals and channel elements which are warranted for a period of ten (10) years] from the date of shipment. Parts, including crystals and channel elements, will be replaced free of charge for the full warranty period but the labor to replace defective parts will only be provided for ONE (1) Year from the date of shipment. Thereafter purchaser must pay for the labor involved in repairing the product or replacing the parts at the prevailing rates together with any transportation charges to or from the place where warranty service is provided. This express warranty is extended by Motorola Communications and Electronics, Inc., 1301 E. Algonquin Road, Schaumburg, Illinois 60196, to the original purchaser only, and only to those purchasing for purpose of leasing or solely for commercial, industrial, or governmental use.

THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED WHICH ARE SPECIFICALLY EXCLUDED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

In the event of a defect, malfunction or failure to conform to specifications established by seller, or if appropriate, to specifications accepted by Seller in writing, during the period shown, Motorola, at its option, will either repair or replace the product or refund the purchase price thereof, and such action on the part of Motorola shall be the full extent of Motorola's liability hereunder.

This warranty is void if:

- a. the product is used in other than its normal and customary manner;
- b. the product has been subject to misuse, accident neglect or damage;
- c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

This warranty extends only to individual products, batteries are excluded, but carry their own separate limited warranty. Because each radio system is unique, Motorola disclaims liability for range, coverage, or operation of the system as a whole under this warranty except by a separate written agreement signed by an officer of Motorola.

Non-Motorola manufactured products are excluded from this warranty but subject to the warranty provided by their manufacturers, a copy of which will be supplied to you on specific written request.

In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

This warranty applies only within the United States.

WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Version 6880309J98-C
30 June 2003

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Contents

Preface	v
Safety Summary	v
General	vi
For Canadian Users	vii
 Chapter 1	
Introduction	1-1
About This Manual	1-1
Updates	1-1
Related Information	1-1
 Chapter 2	
System Overview	2-1
The CommandSTAR Lite	2-1
Console Architecture	2-2
Reference Part Numbers	2-2
Optional Console Accessories	2-3
Field Replacement Kits	2-4
Replacement Part Ordering	2-5
CommandSTAR Lite Specifications	2-6
 Chapter 3	
Site Preparation	3-1
Environmental Preparation	3-1
Power Supply	3-1
Grounding	3-2
Power Ground Wiring	3-2
Electrostatic Discharge (ESD)	3-3
Electromagnetic Interference (EMI) and Shielding	3-3
Interface Protection	3-4
Interface Wiring	3-4
Fire Protection	3-5
Lightning Protection	3-5
 Chapter 4	
Installing the CommandSTAR Lite Console	4-1

Introduction	4-1
Desktop Console	4-1
Rackmount console	4-2
Peripheral Equipment	4-6
Console Interface Description	4-7
Microphone Sensitivity Adjustment	4-9
Audio Input Adjustment	4-10
Installing the Headset Jackbox (BLN7074)	4-11
Installing the Headset Jackbox (DDN6516)	4-12
Using the Call Director Interface	4-13

Chapter 5	
Console-to-CSDM Lite Interconnection	5-1
CSDM Lite-to-Console Connection	5-1
Test Your Installation	5-2

Chapter 6	
Options and Upgrade Procedure	6-1
Introduction	6-1
Opening the Desktop Assembly	6-2
Closing the Desktop Assembly	6-3
Removing an Operator Control Module from the Desktop	6-4
Removing an Operator Control Module from the Rackmount	6-5
Installing an Operator Control Module in the Console	6-5
Adding or Removing Modules - Reconfiguration of the CSDM Lite	6-6
Installing the Four-channel Expansion Module	6-7
Installing an I/O Module	6-8
Installing a Two-CO Line Module	6-14
Installing a Digital Radio Interface Module	6-15
Installing a Direct Current Option Module	6-17
Labelling the Digital Radio Control Module and Keypad	6-18

Chapter 7	
Diagnostics Mode	7-1
Diagnostics on the Desktop or Rackmount Console	7-1
Keypad Features	7-2
Tests: Purpose and Procedures	7-3

Chapter 8	
CommandSTAR Lite System Database Manager (CSDM Lite)	8-1
Introduction	8-1
CSDM Lite Hardware Requirements	8-1
CSDM Lite Alarms and Messages	8-1
Software on Back-up Disks	8-3
Vendor Software	8-4
Hardware Diagnostics	8-4
Software Upload	8-4

System Alarms	8-4
---------------	-----

Chapter 9 Troubleshooting Specific Problems	9-1
--	------------

Introduction	9-1
Quick Reference	9-1
Radio Channels	9-2
Troubleshooting the CommandSTAR Lite	9-2

Chapter 10 Preventive Maintenance	10-1
--	-------------

Introduction	10-1
Monitoring the CommandSTAR Lite with the CSDM	10-1
Site Maintenance	10-1

Appendix A Pin-outs and Settings	A-1
---	------------

Connector Pin-outs	A-1
Jumper Settings	A-7
DIP Switch Settings	A-8

Appendix B Component Layouts	B-1
---	------------

Component Layout Diagrams	B-1
---------------------------	-----

Appendix C Schematics	C-1
--	------------

Schematic Diagrams	C-1
--------------------	-----

Glossary	Glossary-1
-----------------	-------------------

Index	Index-1
--------------	----------------

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Preface

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the product. Motorola assumes no liability for the customer's failure to comply with these requirements.

GROUND THE EQUIPMENT

To minimize shock hazard, the console must be connected to an electrical ground. The equipment is supplied with a three-conductor AC power cable. This power cable must be plugged into an approved three-contact electrical outlet with the grounding wire (green) firmly connected to an electrical ground at the power outlet. The power cables meet International Electrotechnical Commission (IEC) safety standards. The chassis ground lead must be connected to the site ground.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not open the console. Component replacement and internal adjustments required must be made by qualified maintenance personnel. Do not replace components with power cable connected. To avoid injuries, always disconnect power and discharge circuits before removing equipment shelves or making major modifications.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt major component replacement or internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

REPLACEMENT OF PLUG-IN MODULES

Replacement of plug-in circuit modules in the console may be made without powering down of the system. However, this should only be done by qualified maintenance personnel.

ELECTROSTATIC DISCHARGE — SENSITIVE PARTS

This product contains CMOS and other circuit components which may be damaged by electrostatic discharge. Proper precaution must be taken when handling circuit modules. As a minimum, grounded wrist straps should be used at all times when handling circuit modules.

DO NOT SUBSTITUTE PARTS OR MODIFY THE PRODUCT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Contact an authorized Sales and Service Office for service and repair to ensure that safety features are maintained.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING: The voltages employed in this equipment are sufficiently high to endanger human life. Every reasonable precaution has been observed in design to safeguard the operating personnel. Operating personnel should be prohibited from tampering with protective devices such as door switches. The power should be removed completely and the high voltage capacitors in power supplies discharged manually with a shorting bar before making internal adjustments.

GENERAL

WARNING: This equipment complies with part 68 of the FCC rules. Under the console there is a label that contains, among other information, the FCC registration number and the ringer equivalence number (ren) for this equipment. If requested, this information must be provided to the telephone company.

The ring equivalent number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

The REN of this unit is: 1.0 B for AC operation and 0.25 B for DC operation

Connector types used with this equipment:RJ11C/W

An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment has two lines that are designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See Installation Instructions for details. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of certified connector assembly (telephone extension cord).

If the terminal equipment (CommandSTAR Lite) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in it's facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Before installing this equipment, the user should ensure that it is permissible to be connected to the facilities of the local telecommunications company. This equipment cannot be used on public coin service provided by the telephone company. Connection to party line service is subject to state tariffs. (Contact the state public utility commission, public service commission, or corporation commission for information.)

If trouble is experienced with this equipment (CommandSTAR Lite), for repairs or warranty information, please contact:

Motorola Inc.
System Support Center
2214 Galvin Dr.
Elgin, IL 60123

800-221-7144
847-576-7300 (International calls)

ELECTRICAL SAFETY ADVISORY

Because of the risk of electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources, we recommend that the customer should install an AC surge arrester in the AC outlet to which the CommandSTAR is connected.

For Canadian Users

NOTICE: The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

The Load Number for the CommandSTAR Lite console is 4.6.

AVIS : L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Toutefois, le Ministère n'assure pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit assurer qu'il soit permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif de raccordement homologué (cordon rallonge téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations. Actuellement, les entreprises de télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur, ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, soient raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

AVERTISSEMENT : L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours aux services d'un électricien.

L'indice de charge (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordée à un circuit téléphonique bouclé utilisé par ce dispositif. La terminaison du circuit bouclé peut être constituée de n'importe quelle combinaison de dispositifs, pourvu que la somme des indices de charge de l'ensemble des dispositifs ne dépasse pas 100.

L'indice de charge de la console CommandSTAR Lite est 4,6.

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Chapter 1

Introduction

About This Manual

The purpose of this manual is to help you install and troubleshoot the CommandSTAR Lite. It is written for qualified installers who are responsible for the installation and troubleshooting of a CommandSTAR Lite system. It also provides reference information for other technical personnel and Motorola field support engineers and technicians.

This manual details generic installation techniques to assemble a CommandSTAR Lite and troubleshoot rapidly. This manual assumes that you are familiar with the tools, test equipment, the system architecture, and the configuration of your CommandSTAR Lite system.

Updates

This manual will be updated as new installation techniques are developed. If you can contribute to any technique that you feel should be included in this manual for the benefit of other users, please contact Motorola.

Related Information

Related manuals and reference material include:

- *CommandSTAR Lite System Planner* (R4-8-2000)
- *CommandSTAR Lite Operator Manual* (6880309J99)
- *CommandSTAR Lite System Database Manager Manual* (6880309K01)
- *Motorola R56—Standards and Guidelines for Communication Sites* (6881089E50); also available on CD-ROM (9882904Y01)

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Chapter 2 System Overview

The CommandSTAR Lite

The CommandSTAR Lite is a digital, modular radio dispatch console that is entirely contained within a console unit (also available within a desktop or rackmount unit). It is designed to interface to up to eight channels and two telephone lines.

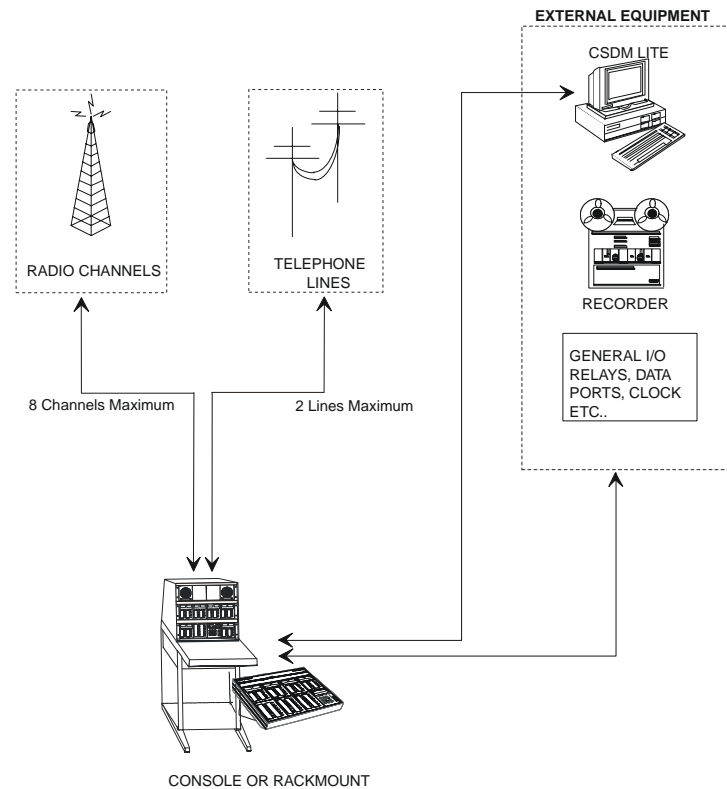


Figure 2-1: CommandSTAR Lite Block Diagram

The CommandSTAR Lite System Database Manager (CSDM Lite) can be connected locally via an RS-232 port.

The CommandSTAR Lite console consists of processor modules to interface external analog circuits. The modules facilitate communications between console operators, radio channels, telephone lines, legal recorders, and any other external devices connected to the console.

The console equipment is entirely modular and configurable from the CommandSTAR Lite System Database Manager (CSDM Lite). The desktop and rackmount models include control modules equipped with push-buttons and LED indicators to provide user-friendly controls and indicators designed for high degree of operational ease.

Console Architecture

The console architecture is such that the failure of one module does not result in a total failure, but only in the loss of use of the equipment associated with the defective module.

Reference Part Numbers

MANUFACTURER PART NUMBER	MOTOROLA ORDER NUMBER	DESCRIPTION
3210739+2210316	DDN6125	110/220 VAC 50-60hz Power Supply; "A" Version Desktop models
3210820	DDN7243	110/220 50-60 Hz Power Supply; Rackmount and "B" Version Desktop models
2260375	DDN6126	CommandSTAR Lite Main Board
3210718	DDN6127	Four-channel Expansion Module
3210725	DDN6137	Digital Radio Interface Module
3210537	TDN9897	DC Control Module for Four Channels
3210547	CDN6275	Two-CO (telephone) Line Module
3210502	CDN6179	I/O Module
3210709	DDN6128	I/O Module to CommandSTAR Lite Cable
3210592	CDN1304	I/O Module Expansion Cable (For 2-4 Modules)
3210337	DDN7130	Power Supply Unit for I/O Module
3210713	DDN6129	Keypad Control Module (KCM)
3210714	DDN6131	Dual Channel Control Module (DCCM) with Display
3210715	DDN6130	Dual Channel Control Module (DCCM) without Display
3210716	DDN6132	Auxiliary Control Module (ACM)
3210717	DDN6138	Digital Radio Control Module (DRCM)
3210556	TDN9894	Blank Cover Module
3210779	DDN6696	Single Display Channel Control Module (SDCCM)
3220280	DDN6133	Speaker Module to Main Board Cable (Desktop)
3220316	DDN6135	Operator Control Modules Cable
3210564	CDN6181	25 Ft. Computer to CSDM Lite Cable (DB25 On PC)
3210565	CDN6182	25 Ft. Computer to CSDM Lite Cable (DB9 On PC)
3210774	DDN6697	Lite Rackmount Select Speaker Module
3210575	CDN1306	Lite Rackmount Unselect Speaker Module
2210244	DDN6698	Audio/Data Cable for Lite Rackmount Shelf
3210751	DDN6481	Protected Punch Block

MANUFACTURER PART NUMBER	MOTOROLA ORDER NUMBER	DESCRIPTION
	CDN6300	15 ft. Telco cable for punch block
	CDN6301	50 ft. Telco cable for punch block
	CDN6302	100 ft. Telco cable for punch block

Optional Console Accessories

Motorola Part Number	Description
HMN3000	Deskmic
TDN9941	Gooseneck Microphone (Desktop)
DDN6516	Headset Jackbox, 6-wire (black)
BLN7074	Headset Jackbox, 6-wire (gray)
CDN6281	Headset Base w/ PTT switch
CDN6282	Amplifier Module Base, w/o PTT switch
CDN6297	Supra Monaural Headset
CDN6290	Supra Monaural Headset Noise Canceling
CDN6286	Encore Monaural Headset
CDN6293	Encore Monaural Headset-Noise Canceling
CDN6287	Encore Binaural Headset
CDN6294	Encore Binaural Headset-Noise Canceling
CDN6285	TriStar Headset
CDN6292	TriStar Headset-Noise Canceling
CDN6295	StarSet Headset
CDN6288	StarSet Headset-Noise Canceling

Field Replacement Kits

Motorola Part Number	Description
CDN1299	Panel Frame Spare
CDN1306	Spare Unselect Speaker
CDN1307	Cable, Speaker to Interconnect Board (DB9-DB9)
DDN6249	Numbered Keypad Set
DDN6250	Removable Grey Keycap "SHIFT"
DDN6251	Elastomer for CCM
DDN6252	Elastomer for ACM
DDN6253	Elastomer for Keypad Module
DDN6254	Button Kit
DDN6255	Keypad Red Transmit Button
DDN6256	Channel Module Volume Knob
DDN6257	Speaker Volume Knob
DDN6258	Select/Unselect Speaker
DDN6259	Condenser Microphone with Cable
DDN6260	Fuse Kit
DDN6698	Cable, Electronics Box to Panel Frame (DB25M-DB25F)
DDN7378	Interconnect Board, Internal to Electronics Box
DDN7379	Interconnect Board, External to Electronics Box
DDN6697	Spare Select Speaker
DDN7381	Ground Cable Assembly
DDN7382	Brackets, 19" Rackmount (Set of 2)
DDN7383	Ribbon Cable, Interconnect Board to Mainboard
DDN7384	Ribbon Cable, Interconnect Board to DB25 Male
DDN7385	Ribbon Cable, Interconnect Board to DB25 Female

Replacement Part Ordering

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part and sufficient description of the desired component to identify it.

Order parts from:

Parts Service Manager

Motorola Accessories and Aftermarket Division
2200 Galvin Dr.
Elgin, IL 60123

800-422-4210
847-538-8023 (International calls)

CommandSTAR Lite Specifications

GENERAL SPECIFICATIONS	
Dimensions:	Desktop = 7" (18 cm) H x 18" (46 cm) W x 13" (33 cm) D [+ 4"(10 cm) for cabling] Rackmount console box = 3" (8 cm) H x 17" (43 cm) W x 11" (28 cm) D [+ 4"(10 cm) for cabling]
Weight:	Max. 17 lb. (7.7kg)
Temperature Range:	32° to 122° F (0° C to +50° C)
Humidity:	95% at 122° F (50° C) (non-condensing)
Control Type:	16-bit Microprocessor
Audio Switch Type:	Time Division Multiplexing
Voice Digitization:	64 Kb μ LAW PCM
Electrostatic Discharge Immunity:	15,000 volts on all exposed operator control areas. At 4kV no operation is disturbed and at 15kV no permanent failures.
Flammability:	All plastic parts used in operator controls comply with UL 94V-0 flammability standards.
Line Protection:	Fast-acting solid-state surge protection.
Memory Protection:	Settings preserved in non-volatile memory.
Maximum number of remote:	10 parallel units
END-TO-END SPECIFICATION	
Frequency Response:	300 to 3300 Hz +1, -3 dB @ less than 2% distortion.
Hum and Noise:	65 dB below rated output at any port.
Cross Talk:	Less than -65 dB at 0 dBm transmit level.
Level Control:	Digital Automatic Gain Control (AGC)-Gain adjustment performed through Digital Signal Processors (DSPs). Gain will not increase in the presence of noise or the absence of voice. Constant output (less than 3 dB change) for all voice input levels over the rated range: Microphone: -60 to -22 dBm; Receive line: -40 to +11 dBm

CommandSTAR Lite Specifications (Continued)

BASE STATION CONTROLS	
Channel Control:	Each channel can be separately configured for E&M, Tone, Digital control (SB9600), or DC control.
Tone Control:	Guard tone and one function tone in the 300 to 3300 Hz range, frequency adjustable in 0.1 Hz increments. Total tone duration adjustable from 0 to 60000 ms in 1 ms increments. Parallel status update on function tones (550 to 2050 Hz in 100 Hz increments). Guard tone configurable for 2100 Hz, 2175 Hz, 2300 Hz, or 2325 Hz.
DC Control:	125 VDC. Positive and negative currents (0.5 to 12.5 mA in 0.5 mA increments). Maximum loop resistance including base station termination: 10K ohms.
TRANSMIT LINE OUTPUTS	
Line Output:	Adjustable from -40 to +11 dBm.
Output Impedance:	600 ohm or 10K ohm
RECEIVER LINE INPUTS	
Receive Sensitivity:	Adjustable from -40 to +11 dBm.
Call Light Sensitivity:	Adjustable from -5 to -32 dB, per receive sensitivity.
Line Balance:	60 dB @ 1004 Hz.
Input Impedance:	600 ohm or 10K ohm.
OTHER AUDIO PORTS	
Recorder Port (per channel):	The output shall consist of summed transmit/ receive audio of the channel with a 2175 Hz filter. The output level shall be programmable from -40 to +11 dBm into 600 ohm.
Recorder Port (per console):	The output shall consist of mixed selected receive audio (telephone and radio) and the operator's transmit audio. A fix nominal output of -10dBm into 600 ohm.
Aux./Paging Input:	Adjustable from -40 to +11 dBm, balanced 600-ohm input.

CommandSTAR Lite Specifications (Continued)

AUDIO CONTROLS	
Individual Volume:	0 to -21 dB in 8 discrete 3 dB steps. Muting configurable for -24 dB or full mute.
All Mute:	24 dB or full muting of unselected channels with timer programmable from 1 to 120 seconds or for infinite duration.
STATUS OUTPUTS AND INPUTS	
Panel Indicators:	Solid state LED indicators. Red, yellow, green depending on function.
PTT relay:	Form A dry closure. 150 mA max. or 60 VDC max. Switching power 3 watts max.
Auxiliary Outputs (I/O Module):	Form C dry closures. 150 mA max. or 60 VDC max. Switching power 3 watts max.
Auxiliary Inputs (I/O Module):	Opto-coupled inputs, 5K ohm impedance, 5 to 20 mA input current, unbalanced.
POWER SUPPLY	
AC Input Voltage:	110-240 VAC, 6A max.
Input Frequency:	50/60 Hz, +/- 3Hz
Power Output:	110 watts max.
DC Outputs:	V1 +5 VDC @ 10 amps V2 -5VDC @ 1.0 amp V3 +12 VDC @ 5.0 amps V4 -12VDC @ 1.0 amp
Agency Approvals	UL (Underwriters Laboratories) CSA (Canadian Standards Association) CE Mark (Conformité Européenne)

Specifications subject to change without notice.

Chapter 3

Site Preparation

For the equipment to perform reliably and safely, certain requirements regarding the site preparation must be met according to the equipment specifications. These requirements may affect new construction or require modification of an existing site. This chapter is a review of site related topics to minimize the problems at the time of installation and with the future operation of the system.

Environmental Preparation

The equipment specification states a minimum requirement for the control of operating ambient temperature and humidity. Confirm with the site architect that the additional air conditioning load is accommodated.

- operating temperature: 32° to 122° F (0° to 50° C)
- operating humidity: 95% relative humidity, without condensation

Do not install the system under the following conditions:

- extremely high or low temperature or extremely high or low humidity
- areas of high dust concentration
- areas of extreme vibration
- areas of high electrostatic discharge (ESD)
- areas of high Electromagnetic Interference (see page 3-3) and Radio Frequency Interference (RFI)

Power Supply

The power to each console is supplied through a single 115 or 220 VAC power supply. The total power requirements for the system components depend largely on the specific configuration (i.e., the number and types of modules).

If an Uninterruptable Power Supply (UPS) is used with the system, confirm with the site architect that the power required by the system, when added to all the other systems to be connected, does not exceed the rated capacity of the UPS. In general, the CommandSTAR Lite system does not require more than 720 Watts. Refer to the configuration report produced by the CSDM Lite to obtain the site-specific power requirements.

The power supplies of all CommandSTAR Lite equipment are electrically isolated between input and output; however, for safety reasons, the chassis ground is connected to the ground wire in the AC power cable.

The power supply unit has air intake vents on the top for cooling, as shown in Figure 3-1. It is important that air is able to circulate freely around these vents.



Figure 3-1: CommandSTAR Lite Power Supply Unit

Caution: When installing the CommandSTAR Lite console, care must be taken to ensure that the air intake vents of the power supply unit do not become blocked. Failure to do so could result in overheating.

Grounding

Proper grounding of the system is important for human safety, equipment protection and quality of system performance. Ground lugs are provided on all CommandSTAR Lite systems to ensure adequate protection.

The potential hazards of human and equipment damage require that the ground system provide protection from electrostatic discharge (ESD), lightning strikes and power failures.

The quality of system performance is enhanced by minimizing noise and crosstalk due to power, and ground voltages added to the signals.

See Sections 6 and 7 of the *Motorola R56—Standards and Guidelines for Communications Sites* for internal and external grounding specifications.

Power Ground Wiring

The voltage and current capacity of power systems make human contact dangerous. Power system wiring and components can fail in such a manner that the cabinets housing the equipment become live and dangerous to touch. For safety reasons, all equipment cabinets are connected to a power system ground.

Signal cable shields are connected to ground at only one end of the cable for safety, to decrease chances of creating ground loops, thereby preventing current flow in the shield. The end that should be grounded will be specified in the site specific wiring details in the appendix.

See Sections 6, 7 and 8 of the *Motorola R56—Standards and Guidelines for Communications Sites* for internal and external grounding specifications, and AC power distribution.

Electrostatic Discharge (ESD)

All objects, including the human body, collect charge due to air movement, friction or electrical fields. The charge collected results in a voltage difference between itself and other objects from which it is insulated. Connecting charged objects together may result in a flow of current between the objects until they are all at the same voltage. This process is referred to as electrostatic discharge (ESD).

ESD currents can damage electronic components. With large structures and charges, ESD can be dangerous for humans. A charge build-up is prevented by connecting objects together with a conducting path, keeping all the objects at the same voltage potential. The conducting path is usually a ground path. When packaging, installing or when handling electronic modules, the personnel involved must be connected to ground with an ESD strap.

See Section 11.9 of the *Motorola R56—Standards and Guidelines for Communications Sites* for more detailed information.

Electromagnetic Interference (EMI) and Shielding

The presence of electromagnetic fields will induce unwanted signals and noise into the equipment wiring and electronics. This phenomenon is called Electromagnetic Interference (EMI). Possible sources include power transmission lines; radio transmitters, television, radar and microwave communication sites; hospital X-rays and other imaging or treatment equipment and even elements of the radio system itself.

Non-linear devices used in electronics are capable of rectifying or demodulating strong pickups in the analog portions of the system. The result of this interference is audio noise, hum or unwanted external audio.

The proximity of the system installation to sources of interference should be investigated prior to installation.

Shielding of external audio circuits twisted pairs is usually not required in balanced applications. Digital data circuits are usually shielded for regulatory and/or performance reasons. These special shielding requirements apply to RS-232, RS-422, Ethernet and other equipment of similar applications. Consult Motorola engineering for application requirements.

See Section E-1 of the *Motorola R56—Standards and Guidelines for Communications Sites* for more detailed information.

Interface Protection

The engineering design of the CommandSTAR Lite equipment employs several methods for minimizing problems due to grounding and other faults in equipment connected externally.

All analog audio circuits such as telephone inputs/outputs and CommandSTAR Lite equipment use transformer coupling. Transformer coupling disconnects any external audio ground, eliminating common mode noise due to ground loops. It also minimizes the risk of equipment damage from common mode (between wire and ground) high voltage transients. Differential transients (between two wires) are also inhibited from doing damage by using transient suppressors connected across the secondary of the transformer.

All discrete (ON/OFF switch) inputs to CommandSTAR Lite use optical couplers. These devices convert current to light that is detected by a light sensitive diode without electrical contact with the input circuit. This device similarly disconnects any source ground.

All analog audio inputs to the system are converted to digital format for processing and switching. Audio transmission between the consoles is digital. This method of handling audio minimizes crosstalk due to ground loops and other mechanisms within the electronic equipment.

Interface Wiring

Wiring connections between the Motorola system and customer equipment are made via a cross-connect block. Typically, a cross-connect block is an equipment frame or cabinet that houses terminal strips, connectors and jack fields as required.

As an alternative, the system can be wired first to an intermediate surge-protected cross-connect or local surge-protected cross-connect block, that is then wired to a main cross-connect. All external equipment are usually wired to their own intermediate cross-connect block, then to the same main cross-connect clock. Systems are interconnected at the main cross-connect. Bridging clips and jack fields may be provided at the main cross-connect to allow for the easy separation of systems for troubleshooting and maintenance.

Planning for the installation must include additional space requirements for cross-connect facilities, cable trays, conduits, floor and wall passages and worker access. A drawing should be prepared to show and label all locations of equipment, cable trays, cable routes, cross-connects, power supplies and grounding. The wiring tables describe the detailed connections of all circuits installed.

See Section 5 of the *Motorola R56—Standards and Guidelines for Communications Sites* for site design information.

Fire Protection

Lightning or power transients can cause fires not preventable by circuit breakers and fuses. Clean agent fire extinguishing systems are preferred for the protection of fires caused by electrical equipment failures. The instant and dry operation of these systems confines damage to the faulted equipment. Sprinklers, though required in most buildings, will cause considerable damage to the equipment installation. Clean agent extinguishing systems will respond before sprinklers and usually prevent any equipment fire from reaching a magnitude otherwise possible with other systems.

See Section 5 of the *Motorola R56—Standards and Guidelines for Communications Sites* for fire protection information.

Lightning Protection

Lightning protection should be implemented at the point of entry of the building. Severe damage can result to a building and electronic equipment if lightning protection is done only at the equipment level.

See Section 6 of the *Motorola R56—Standards and Guidelines for Communications Sites* for more detailed information.

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Chapter 4

Installing the CommandSTAR Lite Console

Introduction

This chapter describes the installation procedures for the CommandSTAR Lite consoles. Before installing the system, you must read the handling instructions regarding protection against ESD and the site preparation described in Chapter 3.

Desktop Console

The Desktop installation is much simplified in the fact that the Desktop console is shipped completely assembled as ordered by the customer. The Desktop installation consists of:

- placing the Desktop consoles on a desk or a table
- connecting to the peripheral equipment (jackboxes, microphone, operator headset and others) to the consoles

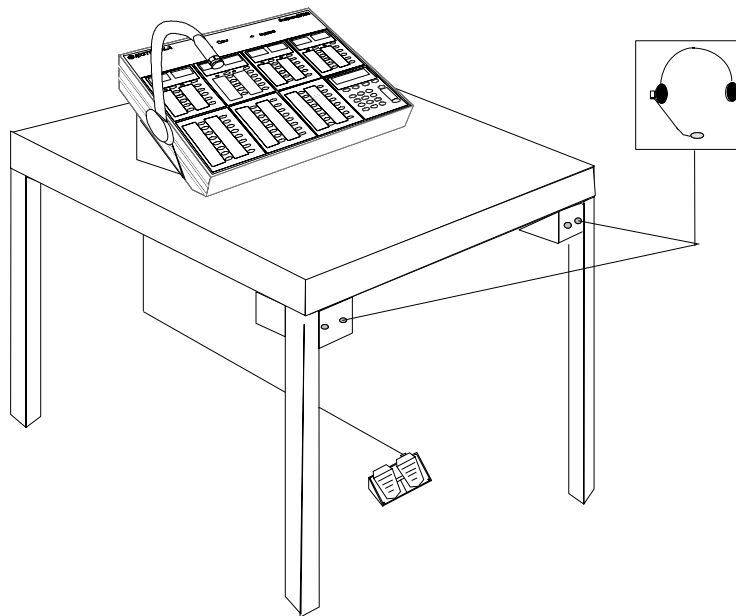


Figure 4-1: Typical Desktop Console Layout

Rackmount console

The Rackmount console is characterized by rack-mounted control modules installed on a standard 19-inch EIA-size cabinet as shown in Figure 4-2. The CommandSTAR Lite main board and any optional boards are located in a rackmount box, typically located either horizontally beneath the Master frame or at the bottom of the console on end as a free-standing tower.

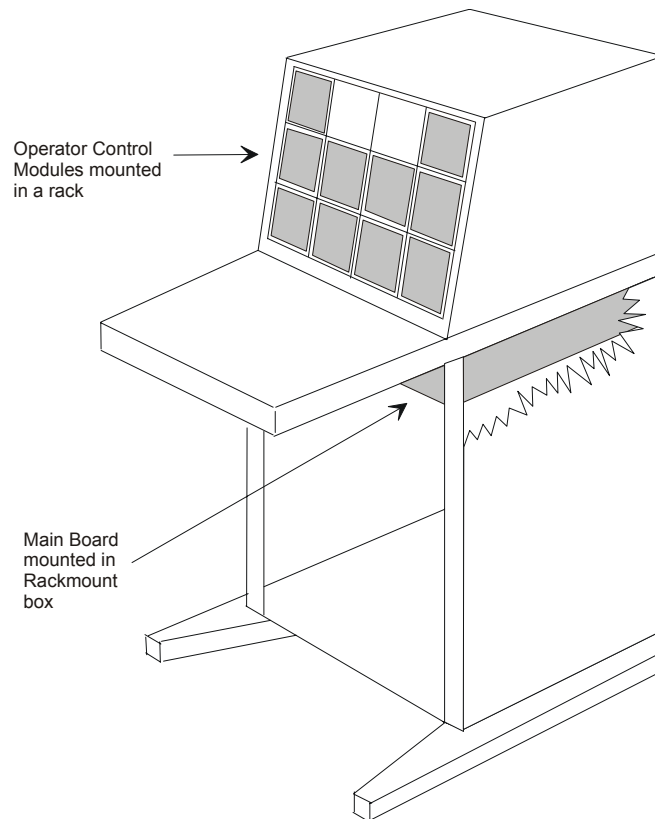


Figure 4-2: Typical Rackmount Console

The modules are shipped already mounted as part of a Master frame (3210775) or an Additional frame (3210577). Figure 4-3 shows a typical fully configured Rackmount using different frames.

WARNING: Before removing or replacing an operator module in a desktop or a rackmount, make sure the power is turned off. Failure to shut down the power may result in permanent damage to the modules.

Note: Constraints of power distribution and cable length limit the placement of operator control modules to the Master frame and the first Additional frame only. The second Additional frame is reserved for speakers, although the speakers can be moved to the Master frame or the first Additional frame if there are fewer than eight (8) operator control modules.

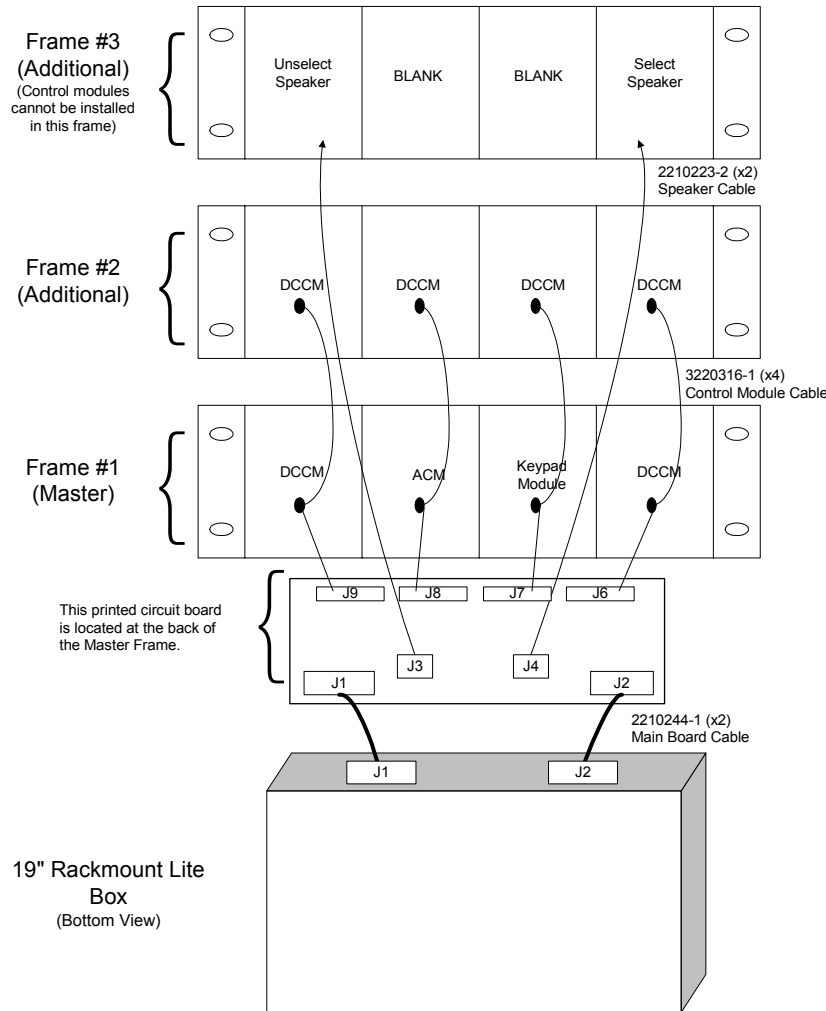


Figure 4-3: CommandSTAR Lite Rackmount Console (Back View)

Installing Operator Control Modules in Racks

1. Refer to your Configuration Manual or consult the site manager for the precise mounting location of each frame in the appropriate position.
2. Insert the clips shown in Figure 4-4 to line up with the holes in the console furniture.

Note: Allow a minimum vertical height of 5.75 inches (147 mm) for each rack unit when installing the Master and Additional frames (per Figure 4-3)

Note: When installing the frames in Centracom console furniture, blocks must be inserted behind the side of the frame to make the side of the Centracom console level across the width of the mounting area. These blocks are generally made of Bakelite and the back is equipped with a tab that can be peeled-off to reveal a sticky surface. The spacing blocks can be glued to the Centracom mounting surface to assure a firm, even surface to mount the frame.

3. Align the frame with the appropriate holes in the console furniture.

4. Tighten the screws supplied with the frame to the console furniture. Make sure that you do not overtighten the screws as this might damage and distort the side of the frame.
5. Push the screw cover over the top of the screws to cover the screws.
6. Repeat Steps 1–5 for the remaining frame(s).

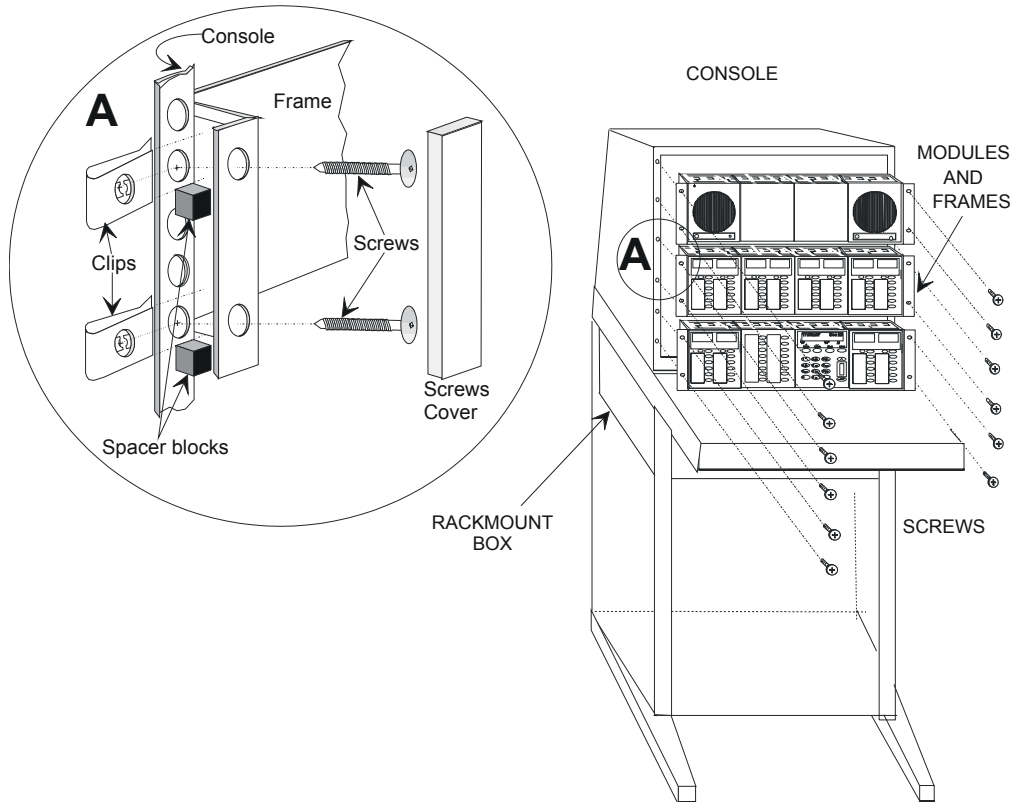


Figure 4-4: Console Frame Mounting Procedure

Connecting the Master Frame to Additional Frames

Using the flat, ribbon cables (DDN6135A) supplied with your system, connect each the operator control module (maximum of four modules per frame) on the Additional frame to one end of the cable, connect the middle connector to the operator control module directly below it on the Master frame, then connect the other end of the cable to the connector (J6–J9) directly below it on the printed circuit board at the back of the Master frame. Refer to Figure 4-3 for a detailed view.

WARNING: Do not connect any operator modules while power is on. This may permanently damage the LED display on the modules.

Connecting Speakers to the Master Frame

Normally, the Select and Unselect speakers are assembled as part of an Additional frame. It is a good practice, however, to assure that the connections to both speakers are properly established.

Make sure that the Select speaker is connected to J4 of the printed circuit board at the back of the Master frame using a speaker cable (CDN1307). The Unselect speaker should be connected to J3 on the same board using the same type of cable. Refer to Figure 4-3 for a detailed view.

Installing the Rackmount Box

The rackmount box containing the CommandSTAR Lite circuitry comes with four L-brackets. Two L-brackets may be used to attach the rackmount box securely to the rack in a horizontal orientation (See Figure 4-5) or four brackets may be used as stabilizers to permit the box to stand vertically on one end like a tower (See Figure 4-6).



Figure 4-5: Rackmount Box in Horizontal Orientation

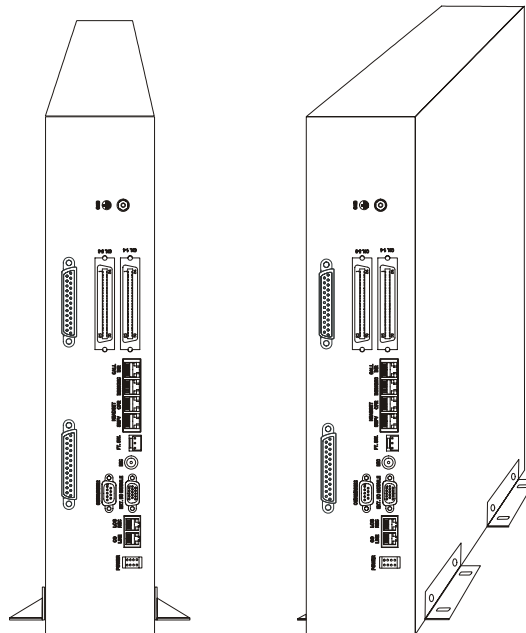


Figure 4-6: Two Views of Rackmount Box in Vertical Orientation

Peripheral Equipment

The following peripheral equipment may be connected directly to the console back panel:

- Power cable
- Telephone line
- Instant logging recorder
- CSDM Lite
- I/O module
- PTT footswitch
- Gooseneck microphone
- Supervisor headset
- Operator headset
- Deskmic
- Call Director
- Punch-block cables for access to radio channels
- Ground

Peripheral equipment is connected to the back panel of the console located at the lower rear panel. Table 4-1 describes the function of each connector on the back panel. See Figure 4-7 and Figure 4-10 for a view of the equipment that may be connected.

Console Interface Description

Refer to Figure 4-7 and Figure 4-10 to see the console back panel with connections.

Table 4-1: Console Interface Description

Connector Name	Interface Description
POWER (+5VIN)	Connection for the power cable.
CO LINE	Connection for two (2) telephone lines.
LOG REC	Connection for the instant logging recorder.
CSDM/RS232	Connection for the CSDM Lite, serial printer, WWVB receiver, or external paging encoder.
EXT. I/O MODULE	Connection for an I/O Module.
MIC	Connection for a gooseneck microphone.
FT SW	Connection for a PTT Footswitch.
SUPV	Connection for a supervisor headset jackbox.
OPR	Connection for an operator headset jackbox.
DESKMIC	Connection for a desktop microphone jackbox.
CALL DIR	Connection for the Call Director.
CH 1-4	Connection to the punch block for radio channels 1–4.
CH 5-8	Connection to the punch block for radio channels 5–8.
GND	Connection to site ground.
J1	Connection to Master Frame (Rackmount only)
J2	Connection to Master Frame (Rackmount only)

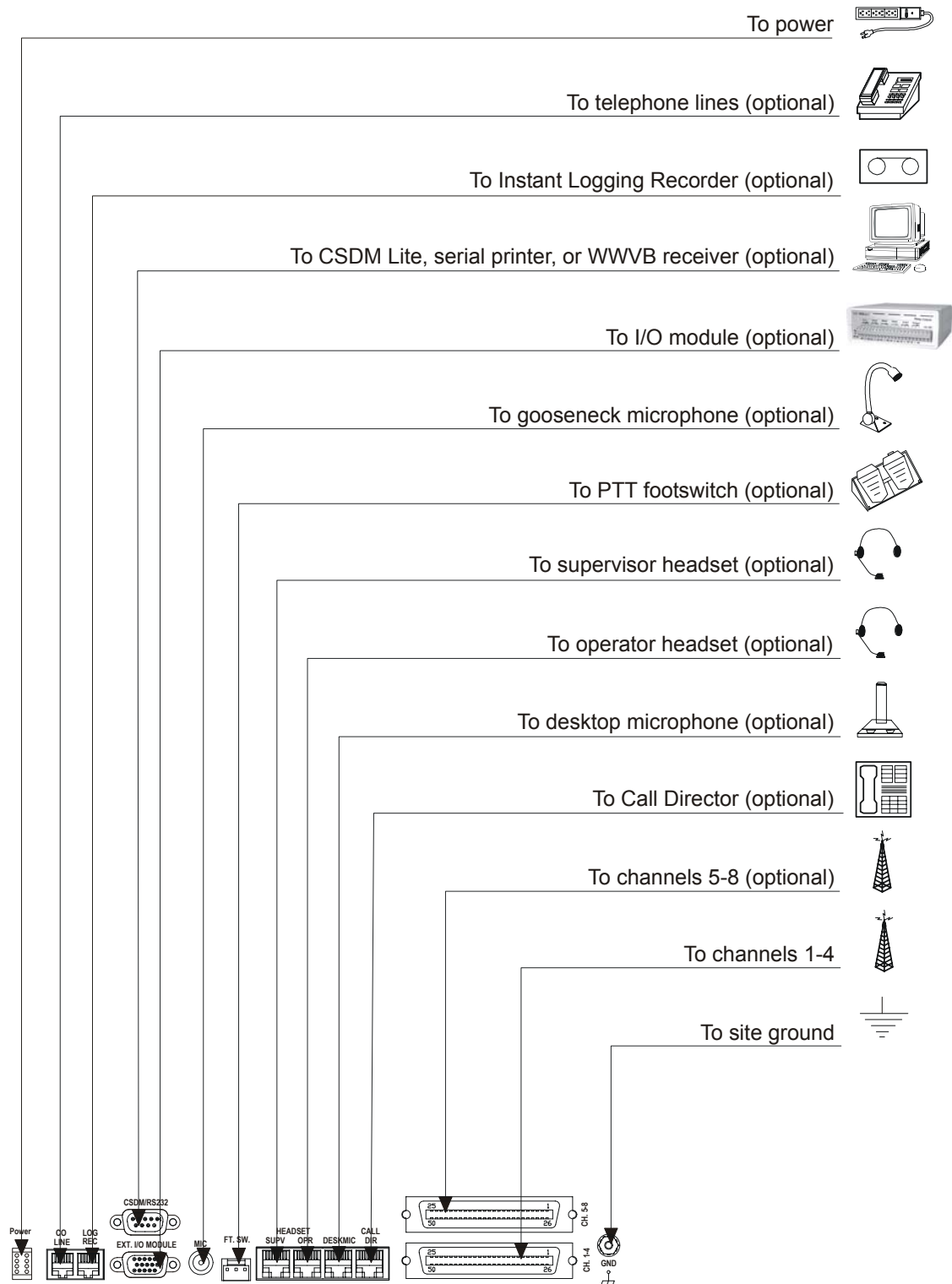


Figure 4-7: Main Console Back Panel Connections (All Models)

Microphone Sensitivity Adjustment

Each CommandSTAR Lite console is shipped with the microphone sensitivity adjusted for the standard audio accessories used under normal conditions. Should the microphone sensitivity require adjustment, use the following procedure.

WARNING: These adjustments are potentially dangerous procedures. Excessively high gain may cause distortion and/or output amplifier saturation. When adjusting potentiometers, you should verify that the resultant quality of the audio signal default values are not exceeded.

Operator Headset Microphone

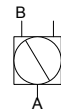
Operator Headset Microphone Sensitivity Adjustment

The sensitivity can be adjusted using potentiometer R28 on the console main board.

1. Use a multi-meter to measure the resistance between the single pin on the bottom (side nearest the back panel) of R28 and the left-most pin on the top (side farthest from the back panel) of R28.
2. Rotate R28 to adjust the value.

The lower the value is, the higher the gain.

The default value for R28 is 16.3 K ohms.



Supervisor Headset Microphone

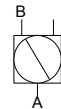
Supervisor Headset Microphone Sensitivity Adjustment

The sensitivity can be adjusted using potentiometer R34 on the console main board.

1. Use a multi-meter to measure the resistance between the single pin on the bottom (side nearest the back panel) of R34 and the left-most pin on the top (side farthest from the back panel) of R34.
2. Rotate R34 to adjust the value.

The lower the value is, the higher the gain.

The default value for R34 is 16.3 K ohms.



Call Director Audio Input

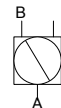
Call Director Audio Input Sensitivity Adjustment

The sensitivity of the Call Director's carbon interface can be adjusted using potentiometer R22 on the console main board.

1. Use a multi-meter to measure the resistance between the single pin on the bottom (side nearest the back panel) of R22 and the left-most pin on the top (side farthest from the back panel) of R22.
2. Rotate R22 to adjust the value.

The lower the value is, the higher the gain.

The default value for R22 is 4.92 K ohms.



Internal Microphone

Internal Microphone Sensitivity Adjustment

The sensitivity can be adjusted using potentiometer R140 on the console main board.

1. Use a multi-meter to measure the resistance between the two pins on the top (side nearest the back panel) of R140.
2. Rotate R140 to adjust the value.



The lower the value is, the higher the gain.

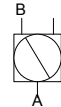
The default value for R140 is 8.14 K ohms.

Gooseneck Microphone

Gooseneck Microphone Sensitivity Adjustment

The sensitivity can be adjusted using potentiometer R96 on the console main board.

1. Use a multi-meter to measure the resistance between the single pin on the bottom (side nearest the back panel) of R96 and the left-most pin on the top (side farthest from the back panel) of R96.
2. Rotate R96 to adjust the value.



The lower the value is, the higher the gain.

The default value for R96 is 10 K ohms.

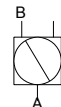
Note: You can only connect one (1) gooseneck or one (1) deskmic at a time, not both.

Deskmic

Deskmic Sensitivity Adjustment

The sensitivity can be adjusted using potentiometer R18 on the console main board.

1. Use a multi-meter to measure the resistance between the single pin on the bottom (side nearest the back panel) of R18 and the left-most pin on the top (side farthest from the back panel) of R18.
2. Rotate R18 to adjust the value.



The lower the value is, the higher the gain.

The default value for R18 is 10 K ohms.

Audio Input Adjustment

For information on adjusting audio input levels, see the section on radio channel configuration in Chapter 4 of the *CommandSTAR Lite System Database Manager Manual* for RX Level, RX detect threshold, and RX hangover delay settings. Typical settings are:
RX Level = -10 dBm, RX detect threshold = -29 dB, and RX hangover delay = 2000 ms.

Installing the Headset Jackbox (BLN7074)

1. Before installing the operator headset jackbox, consult the site manager for the precise location of the jackbox then measure the cable length for the Desktop-to-operator jackbox path.
2. Install the operator and/or supervisor headset jackbox (Figure 4-8) in the location designated by the site manager. Ensure that the cable length is adequate to connect to the console electronics before mounting. Figure 4-1 shows a typical table installation.

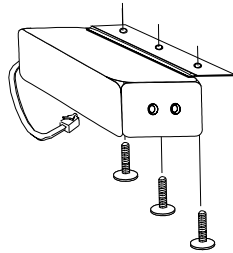


Figure 4-8: Installing the Headset Jackbox (BLN7074)

Modifying a Six-wire Jackbox for use with 4-Wire Headsets (BLN7074)

Some models of headset jackbox (e.g., BLN7074) are equipped to handle a headset that has its own PTT button. These headsets and jackboxes use six (6) wires rather than four (4). When a four-wire headset (without a PTT button) is plugged into one of these jackboxes, the headset microphone transmits continuously on the selected channel. To modify such a jackbox to work with a four-wire headset, proceed as follows:

1. Open the jackbox cover.
2. Cut the RED wire and the jumper wire as shown in Figure 4-9.

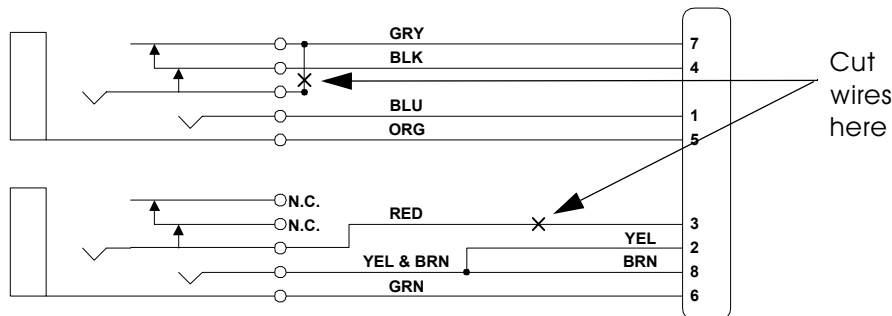


Figure 4-9: Modifying a Six-wire Jackbox (BLN7074)

3. Close the jackbox cover.

The Desktop console installation is now complete. Verify that all connectors are secured and assure overall console neatness.

Installing the Headset Jackbox (DDN6516)

Modifying a Six-wire Jackbox into a Four-wire Jackbox (DDN6516)

This headset jackbox is equipped to handle a headset that has its own PTT switch. These headsets use six (6) wires rather than four (4) wires. When a four-wire headset (without a PTT switch) is plugged into an unmodified jackbox, the headset microphone transmits continuously on the selected channel. Use these procedures to modify the jackbox to work with a four-wire headset:

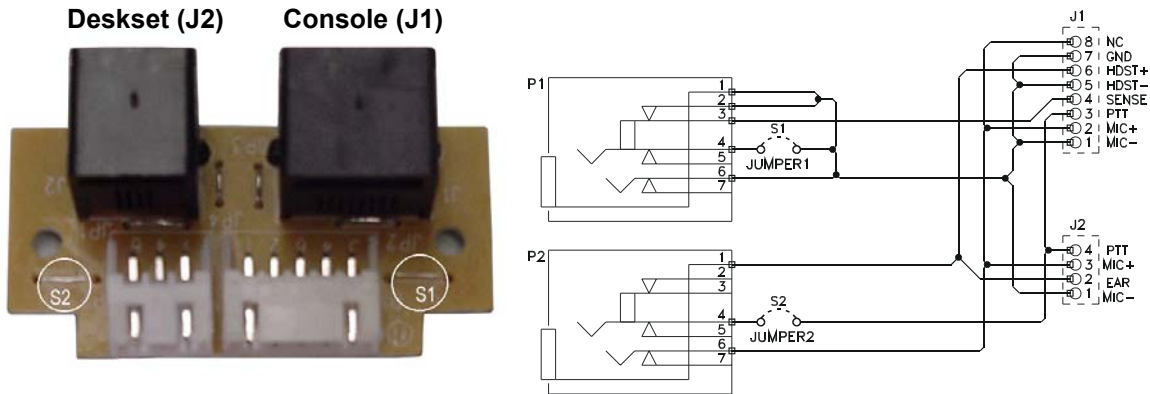


Figure 4-10: Six-wire Jackbox to a 4-wire Jackbox/Schematic, Including Pin-out

1. Open the jackbox cover. Use a Phillips screwdriver to remove the four (4) screws in its base.
2. Carefully separate the top and bottom covers by unplugging the two plastic connectors.
3. Use a Phillips screwdriver to remove the two (2) screws holding the PC board to the jackbox housing.
4. Cut the wire for jumpers S1 and S2 (circled in Figure 4-9).
5. Replace the PC board and reconnect the two small connectors.
6. Close the jackbox cover and replace the screws.

	S1	S2
6-wire (default)	IN	IN
4-wire	OUT	OUT

Using the Call Director Interface

The optional Call Director Interface on the CommandSTAR Lite enables the connection of an external key set telephone to the console that allows the operator to use a single headset for all communication functions.

These system conditions must be present to enable the Call Director Interface option:

1. The key set telephone must be equipped with 4-Wire audio
2. The telephone is in an off-hook condition

Normally, if there are two operators monitoring the radio console and the 911 console, the Call Director interface streams the audio from the 911 call to both the radio console and the radio headset. These operating conditions are true when Call Director is enabled:

1. Audio from the 911 call is routed to the radio console
2. The Jack Sense test determines that the key set telephone is off-hook.
3. Audio is removed from the headset to the Select Speaker on the radio console and audio from the 911 call is transferred to the headset.
4. With different settings of the Call Director option, the 911 call may also be patched to an alternate radio channel.

Set these parameters in the CommandSTAR light console when using the Call Director Interface option:

1. Set the Call Director Receive level.
2. Set the Transmit level.

For more information about setting the parameters for the Call Director Interface option, consult the CommandSTAR Lite Operator manual (6880309J99).

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Chapter 5

Console-to-CSDM Lite Interconnection

This chapter provides installation information regarding CSDM Lite-to-console interconnection.

CSDM Lite-to-Console Connection

The CSDM Lite is used for reconfiguring consoles, logging events for analysis and archiving, monitoring built-in tests for maintenance and reliability, and upgrading to a new release of software.

The main components of the CSDM Lite are:

- CSDM Lite software
- Intel-based PC (486 or better)
- DOS version 5.0 (or better), Windows 9x
- VGA Monitor
- Keyboard
- Mouse
- Hard disk (100 MB minimum)
- 16 MB RAM
- Printer port
- COM port

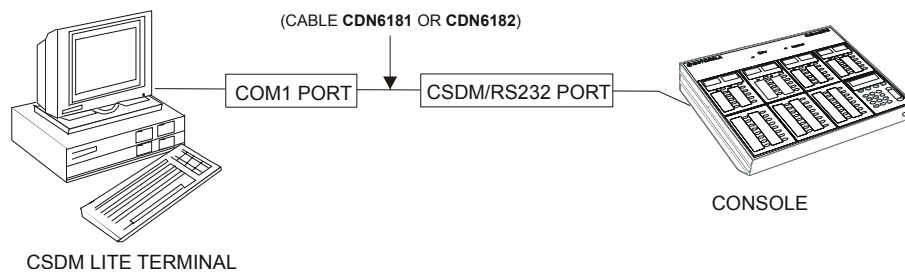


Figure 5-1: CSDM Lite-to-Console Local Connection

The CSDM Lite must be physically connected to the console you wish to reconfigure, monitor, or test. The CSDM can be configured as a local connection to the console (Figure 5-1).

The CSDM Lite and the console are connected with a cable equipped with a DB9 connector at both ends or a DB9 at the console end and a DB25 at the PC end. The pinout connections are given below.

Table 5-1: RS-232 Connector Pinouts

Function	DB9 Console Side	Color	DB9 PC Side	DB25 PC Side
RX	3	Yellow	2	3
TX	2	Green	3	2
GND	5	Red	5	7

Figure 5-2 shows the DB9 to DB9 cable that connects between the console and the PC.

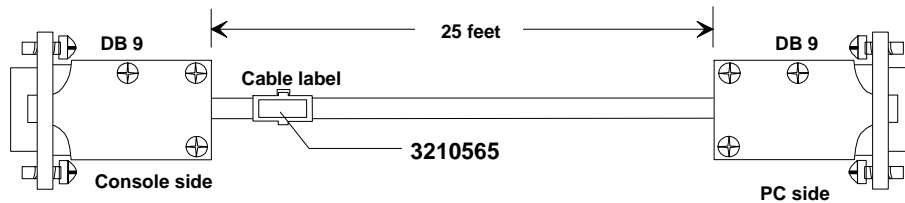


Figure 5-2: DB9 to DB9 Connectors and Cable from Console to PC (CDN6182)

Figure 5-3 shows the DB9 to DB25 cable that connects between the console and the PC.

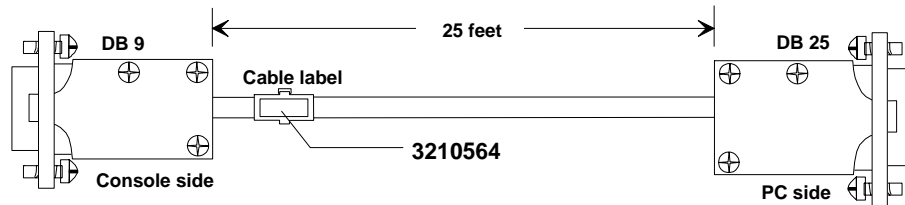


Figure 5-3: DB9 to DB25 Connectors and Cable from Console to PC (CDN6181)

Test Your Installation

Use the CSDM Lite to verify the operational status of all peripheral equipment connected to the console.

1. Connect the CSDM Lite to the console.
2. Select the Hardware Diagnostics display. (Select **Diagnostic>Status>Hardware.**)
3. Review the status of connected peripheral equipment.
4. If the status of any peripheral is not “passed”, consult Chapter 9 of this manual, “Troubleshooting Specific Problems”, for troubleshooting information.

Chapter 6

Options and Upgrade Procedure

Introduction

This chapter describes procedures required to install optional equipment. The following procedures are described:

- Opening the Desktop Assembly
- Closing the Desktop Assembly
- Removing an Operator Control Module from the Desktop
- Installing an Operator Control Module in the Console
- Adding or Removing Modules - Reconfiguration of the CSDM Lite
- Installing the Four-channel Expansion Module
- Installing an I/O Module
- Installing a Two-CO Line Module
- Installing a Digital Radio Interface Module
- Installing a Direct Current Option Module
- Labelling the Digital Radio Control Module and Keypad

Note: Some sections of this chapter only apply to either the desktop console or the rack-mount version; for example, the instructions for opening and closing the Desktop Assembly do not apply to the rackmount version.

Opening the Desktop Assembly

Caution: Before opening the Desktop console, make sure the power to the console is removed and that all the cables are disconnected from the Desktop back-plane. Failure to remove the power may result in permanent damage to the display units on the Operator Control modules.

To open the Desktop assembly, follow these steps:

Tool required: one (1) Phillips screwdriver

1. The top of the Desktop assembly is held to the bottom part with five (5) pan head Phillips screws; three (3) at the back, and two (2) at the front, as shown in Figure 6-1. The Phillips screws can be reached from the bottom of the Desktop assembly. Remove the five (5) Phillips screws.

Note: Do *not* remove the screws at the right and left sides of the underside.

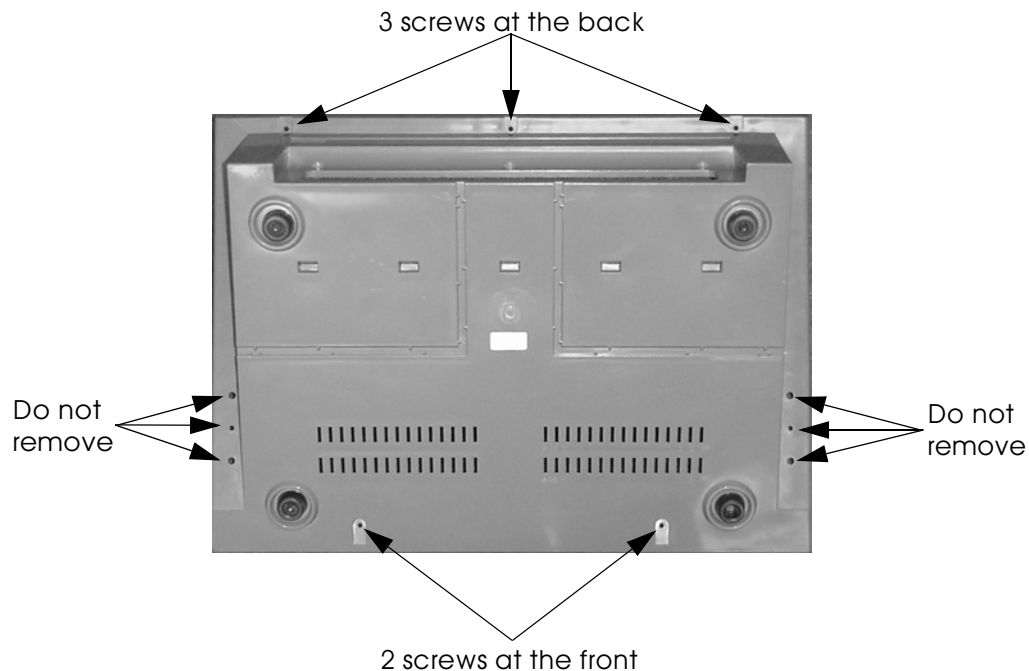


Figure 6-1: Location of Desktop Assembly Screws on Bottom of Console

2. Once the top of the Desktop assembly is free, bring the Desktop forward and up at a 90° angle, while holding the top of the desktop, as shown in Figure 6-2.

Caution: Pulling too hard or too far on the desktop assembly may damage the cabling.

3. Tilt the bottom of the Desktop assembly by another 20° while holding the top of the Desktop. By tapping the back of the console gently, as shown in Figure 6-2 (B), the top of the Desktop should loosen and come forward. If the top of the Desktop does not

come loose, you can use nail pressure, as shown in Figure 6-2 (A), to help it come loose.

4. Place the Desktop assembly back on your working area and hold the top of the Desktop at a 20° angle, which should give enough room to work inside the unit.
5. Remove the cables from the main board, then remove the top of the Desktop assembly carefully and set it on a static free pad to avoid damage.

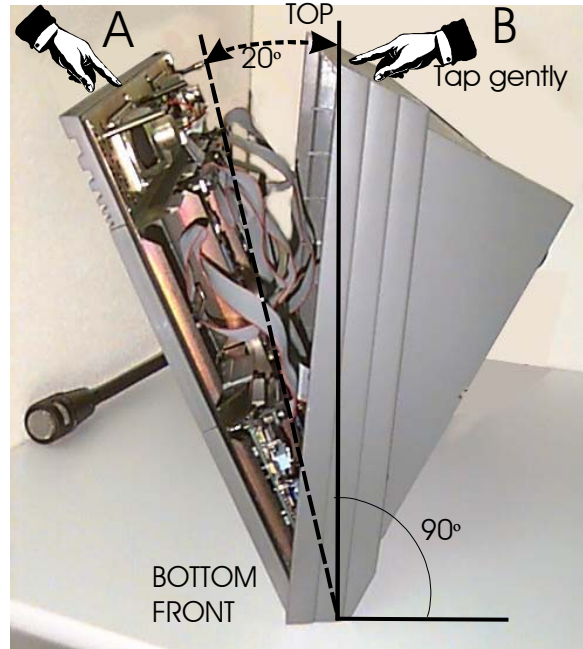


Figure 6-2: Removing the Top of the Desktop Assembly

Closing the Desktop Assembly

Caution: When closing the Desktop assembly, make sure that no cables are protruding from the console. A cable that is not completely inside the console when the cover is closed may be damaged by pinching.

To close the Desktop assembly, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Make sure that all the modules are properly inserted and secured on the top of the Desktop assembly. All the modules must be connected to their respective cable and all the cables must be connected and secured to the main board.
2. Carefully set the top of the Desktop on the top of the plastic housing and press it closed.

3. Move the unit into a position that allows you to insert and tighten the five pan head Phillips screws at the bottom of the console. Figure 6-1 shows the location of the screws.

Note: Make sure that your other hand protects the top of the console from falling.

4. Insert and tighten each pan head Phillips screw in the holes provided at the bottom of the console plastic cover making sure not to overtighten the screws in the process.

Removing an Operator Control Module from the Desktop

To remove an operator control module from the Desktop, the top of the desktop must be opened and the module must be released from the rear of the Desktop top panel.

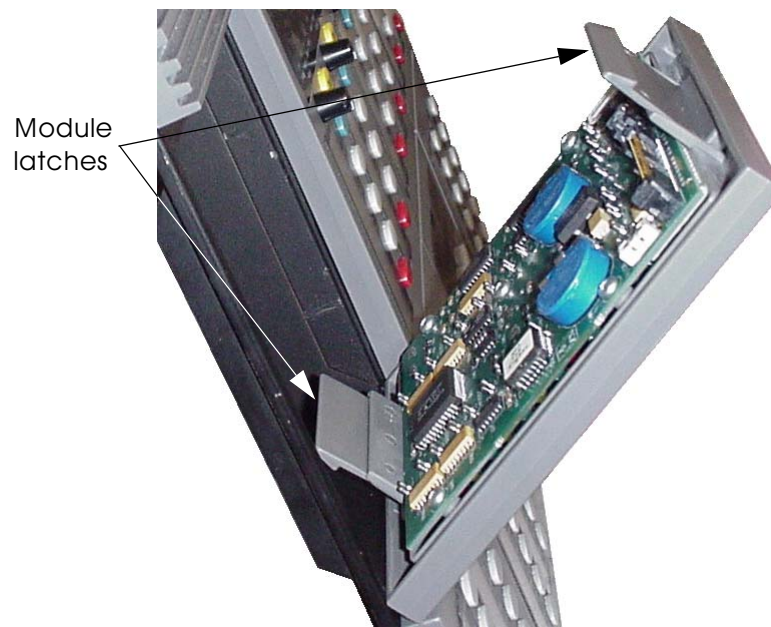


Figure 6-3: Module Latches (Desktop)

Caution: When detaching the ribbon cable from an operator control module, hold the connector, not the cable. Pulling on the cable may damage it.

1. Open the Desktop assembly as described on page 6-2.
2. Once the top of the Desktop assembly is open, lift it carefully and locate the module to be released from the desktop.
3. Remove the cable from the module.
4. Press the two (2) module latches shown in Figure 6-3, while gently pushing the module out. Use your other hand to protect the module from damage (as from dropping it).

Instructions for removing a operator control module from a rackmount console is discussed in the following section.

Removing an Operator Control Module from the Rackmount

Removing an operator control module from the Rackmount console, is similar to the method used for the desktop model and requires fewer steps

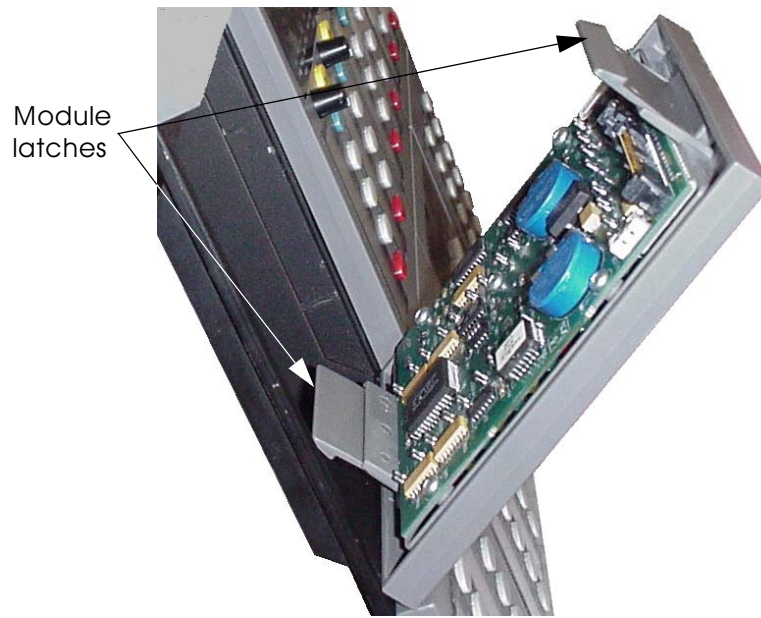


Figure 6-4: Module latches (Rackmount)

Caution: When detaching the ribbon cable from an operator control module, hold the connector, not the cable. Pulling on the cable may damage it.

1. Remove the cable from the module.
2. Press the two (2) module latches shown in Figure 6-4, while gently pushing the module out. Use your other hand to protect the module from damage (as from dropping it).

Installing an Operator Control Module in the Console

Caution: When detaching the ribbon cable from an operator control module, hold the connector, not the cable. Pulling on the cable may damage it.

To install a module in a Desktop or Rackmount console, proceed with the corresponding steps above in reverse, making sure that the module is properly connected and secured and that the cabling is properly connected and secured. For the Desktop, finish the installation by closing the Desktop assembly as described on page 6-3 (where applicable).

Adding or Removing Modules - Reconfiguration of the CSDM Lite

Whenever you add or remove an operator control module in the Desktop console, you must update the console configuration stored in the CSDM Lite. Connect the CSDM Lite to this console, log on to the CSDM Lite, and select **Console>Module** from the **Configuration** menu.

This step is important because the CSDM Lite updates the database it uses to assess problems with the CommandSTAR Lite console. The CSDM Lite assigns identification addresses to each module that is added to the console. On the CSDM Lite, select **File>Report>Configuration** to view the Console Configuration Report, which shows the identification address assigned to a new module.

Consult the *User Manual for the CommandSTAR Lite System Database Manager* for more information on configuring the Desktop console and viewing reports.

The module address must be set in the module using the DIP switches at SW1 of each module. See "SW1 Operator Control Module ID" on page A-10 of Appendix A.

When adding a new operator control module, you should proceed in the following order:

1. Update the configuration database in the CSDM Lite.
2. View or print the Console Configuration Report to get the module identification address.
3. Set the module address using the DIP switches at SW1.
4. Install the new module in the Desktop console.

Installing the Four-channel Expansion Module

The Four-channel Expansion module adds the capability of interfacing to four additional radio channels (5–8). The module, shown in Figure 6-5 (with optional Digital Radio Option module attached) is designed for easy insertion.

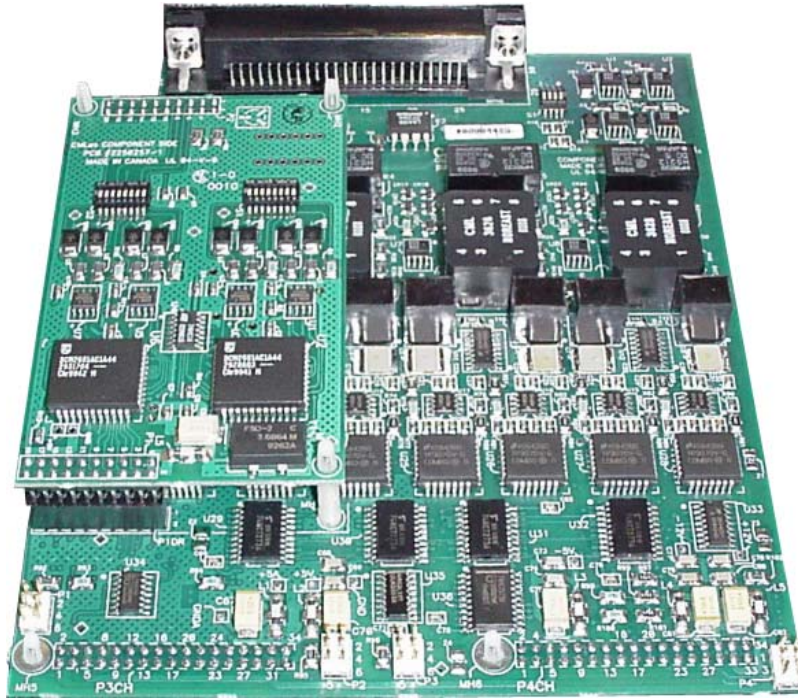


Figure 6-5: Four-channel Expansion Module (with Optional Digital Radio Interface Module)

To install a Four-channel Expansion module, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Open the Desktop assembly as described on page 6-2.
2. Locate the position reserved for the Four-channel Expansion module, above the main board and toward the left-hand side.

The champ connector on the Four-channel Expansion module fits into the opening in the console back panel above the champ connector for channels 1–4.

Note: Consult the “Component Layout Diagrams” on page B-1 of Appendix B for information on the locations of components.

3. Insert the three locking support posts into their receptacles in the main board (MH4, MH5, MH6).
4. Remove the metal protector covering the opening for the connector in the console back panel.

5. Insert the champ connector of the expansion module into the opening in the console back panel above the main board.
Note: The locking brackets must be closed for the connector to fit through the hole in the console cabinet.
6. Slide the expansion module into place making sure that the pins of the two connectors on the underside at the near end of the module line up correctly with the two receptacles on the main board.
7. Press the Four-channel Expansion module downward until the pins of the connectors are correctly inserted into their receptacles on the main board and the locking support posts are all the way through.
8. Check to make sure the module is seated correctly.
9. Insert and tighten the two Phillips screws on either side of the champ connector at the back panel of the console.
Note: To enable DC signaling or to re-enable tone signaling, See “Jumper Settings” on page A-7 of Appendix A.

Installing an I/O Module

If your CommandSTAR Lite requires the installation of one or more I/O modules (Z114 for the first module if ordered with the console, CDN6179 for all other I/O modules), proceed with the details in the following paragraphs.

An I/O Module provides the means to remotely operate up to six relay contacts and sense/read opto-coupled inputs via a serial link. Its applications allow remote operation of doors, alarms, Main/Standby operation and visual indicators from console control at the Operator Position for a CommandSTAR Lite installation.

Note: To enable the I/O module's opto-coupled inputs, the common lead (COM) must be connected to the +5 VIN and the input detection is done with a ground lead.

Caution: The console must be powered OFF when connecting it to an I/O module. Connecting an I/O module to a console with the power on may result in damage to the console or the I/O module.

General Description

Mechanical

The I/O Module is packaged into a flame-retardant two-piece ABS plastic module. The gray case is 5.24" W x 5.24" D x 2.01" H and has a matte textured finish.

Figure 6-6 shows that the face plate has apertures for 2 PCB-mount LEDs and 21 high-current PCB terminal blocks (6 relays, +5V, ground, and unused).

The I/O module relays are form C dry closures with a 150 mA maximum or 60 VDC maximum; switching power is 3 watts maximum. The I/O module's opto-coupled inputs have 5K ohm impedance and an unbalanced 5 to 20 mA input current.

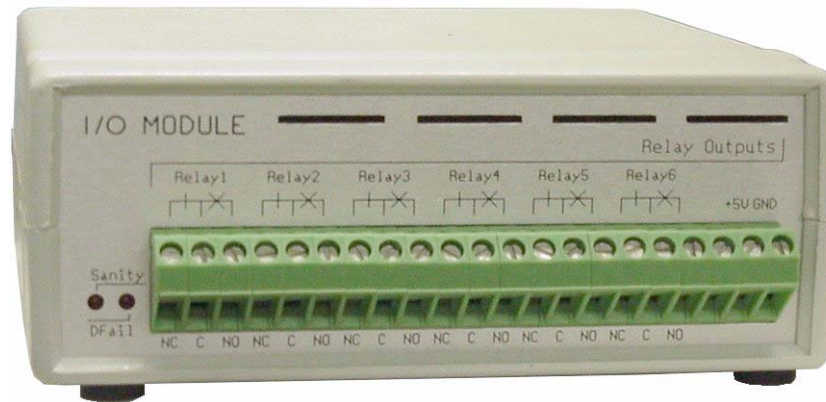


Figure 6-6: I/O Module (Front View)

The terminal blocks have screw-clamp contacts that provide easy and quick means for secure electrical and mechanical connections to the relay contacts and to both +5V and ground.

Figure 6-7 shows that the back plate is assembled with:

- one female SUB-D 25-pin connector for RS-422 operation
- one male SUB-D 9-pin connector for RS-232 operation (not used)
- one jack for the +5V IN supply (optional; P/N DDN7130). Use this option when the I/O module is greater than 8 ft. (2.4 m.) from the CommandSTAR lite console.
- 15 high current PCB terminal blocks providing the means for connections to the 12 opto-coupler inputs and to both +5V and ground

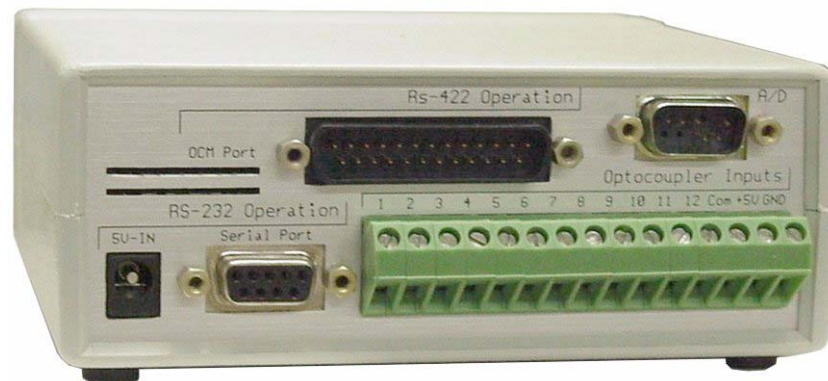


Figure 6-7: I/O Module (Back View)

Operational Requirements

The I/O Module has two modes of operation: RS-422 and RS-232. The RS-232 mode is *not used* in this environment. Only the RS-422 mode is used with a CommandSTAR Lite, by using the RS-422 connector.

Selection is done via the use of their respective connectors mounted on the back panel:
Male SUB-D 25 Pin for RS-422.

RS-422 Operation

For most installations, an 8 ft. cable (DDN 6128PN) is used to connect a console to an I/O Module. This cable provides all connections shown in Table 6-1, including power, for short distance applications.

If the I/O module is located at a distance greater than the length of this cable, a +5 V power supply must be provided separately to the I/O module using the 5V-IN jack. Cables for long distance applications use the pins marked with an asterisk (*) in Table 6-1. Distances up to 4000 feet can be accommodated with the appropriate cable.

Table 6-1: Operator Control Module Port

Pin	Signal	Pin	Signal
1 [*]	SHIELD	14 [*]	–TX ON
2 [*]	+TX ON	15 [*]	–RX ON
3 [*]	+RX ON	16	+5V
4	+5V	17	+5V
5	GND	18	GND
6	GND	19	GND
7	GND	20	+5V
8	+5V	21 [*]	+MOD-RST
9 [*]	–MOD-RST	22	VU
10	POT2	23	reserved
11	reserved	24	reserved
12	reserved	25	—
13	POT3		

* If the module is operated remotely (more than 8 ft. away from the Console, use only the pins shown with a star (*). If used remotely, an external +5 VDC supply (DDN7130) is required on the module for operation.

The I/O module relay contacts are clearly labelled 1–6 and the opto-coupler contacts are clearly labelled 1–12. Use a no. 2 screwdriver to loosen and tighten the contacts.

Connecting One I/O Module to the Console

When one I/O module is used, connect one end of cable DDN6128 to the RS-422 Operation port at the back of the I/O module, then connect the other end of the cable to the connector labeled EXT, I/O MODULE at the back of the console. Figure 6-8 shows a typical installation of one I/O module connected to a console.

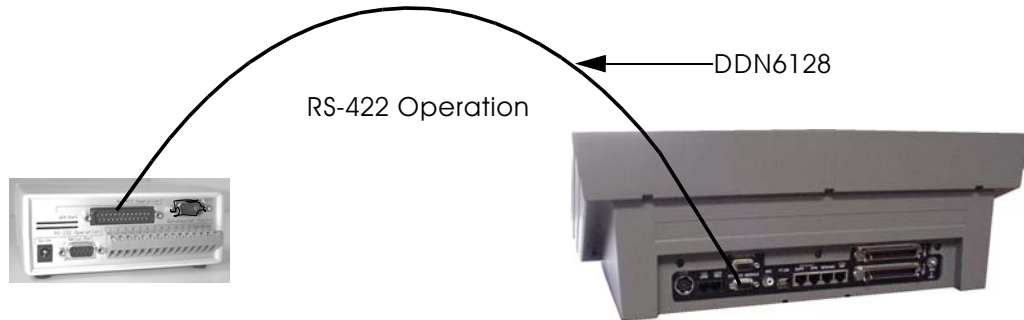


Figure 6-8: Single I/O Module Installation

Table 6-2 shows the Module DB-15 to SUB-D 25 connector pinout:

Table 6-2: DB-15 to SUB-D 25 PIN Connector Pinout

SUB-D 25-pin Male				
FUNCTION	DESKTOP	COLOR	I/O MODULE	FUNCTION
SHIELD	1*	-	1*	SHIELD
+MOD RX	8	BLK	2*	+TX ON
-MOD RX	13	RED	14*	-TX ON
+MOD TX	10	BLK	3*	+RX ON
-MOD TX2	15*	WHT	15*	-RX ON
+MOD RST2	6	BLK	21*	+RX RESET
-MOD RST	11	GRN	9*	-RX RESET
+5 D	2*	BLK	16	+5V
GND	7	BLU	5	GND
DB 15				
FUNCTION	DESKTOP	COLOR	I/O MODULE	FUNCTION
SHIELD	1	-	1	SHIELD
+5 D	3	BLK	4	+5V
GND	9	YEL	18	GND
+5 D	4	BLK	17	+5V
GND	12	BRN	6	GND
+5 D	5	BLK	20	+5V
GND	14	ORG	19	GND

* If the module is operated remotely (more than 8 ft. away from the console), use only the pins shown with a star (*). If used remotely, an external +5 VDC supply (P/N 3210337-1 SR1) is required on the module for operation.

Connecting Multiple I/O Modules (CDN6179A) to the Console

A maximum of four I/O modules can be used together. When two or more I/O modules are used together, connect one end of cable DDN6128 to one end of cable CDN1304. Then connect the other end of the cable to the connector labeled EXT, MODULE at the back of the console. Daisy-chain all the modules used using cable CDN1304. Figure 6-9 shows a typical installation of four I/O modules connected to a console.

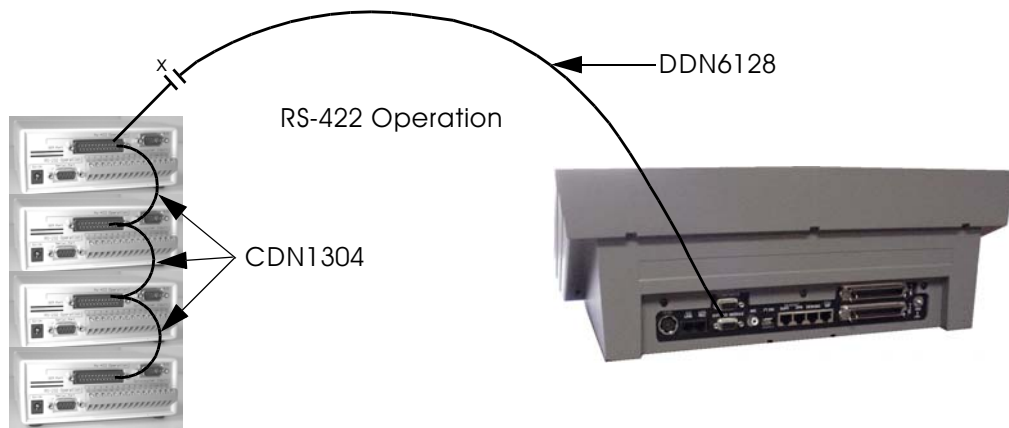


Figure 6-9: Multiple I/O Module Installation

Note: The default ID factory setting for the I/O module is 30H. If you are using more than one (1) I/O module or if you are adding I/O modules to your system, make sure that the DIP switch settings inside the I/O modules indicate a different ID for each.

DIP Switch and Jumper Settings

With jumpers S5, S7 and S16 IN, the standard settings for DIP switch S8 and S10 are as shown in Table 6-3.

Table 6-3: I/O Module DIP Switch Settings

ID	SW	BIT 1	BIT 2	BIT 3	BIT 4	BIT 5	BIT 6	BIT 7	BIT 8
30H	S8	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
	S10	OFF	ON	ON	OFF	—	—	—	—
31H	S8	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
	S10	OFF	ON	ON	OFF	—	—	—	—
32H	S8	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
	S10	OFF	ON	ON	OFF	—	—	—	—
33H	S8	ON	ON	OFF	OFF	ON	ON	OFF	OFF
	S10	OFF	ON	ON	OFF	—	—	—	—

Note: BITS 7 and 8 of Switch S8 may not always be present.

Installing a Two-CO Line Module

The Two-CO Line module adds the capability of interfacing to two telephone lines. The module, shown in Figure 6-10 is designed for easy insertion.



Figure 6-10: Two-CO Line Module

To install a Two-CO Line module, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Open the Desktop assembly as described on page 6-2.
2. Locate the position reserved for the Two-CO Line module, above the main board and toward the right-hand side.

Note: Consult the “Component Layout Diagrams” on page B-1 of Appendix B for information on the locations of components.

3. Insert the two locking support posts into their receptacles in the main board (MH14, MH15).
4. Slide the Two-CO Line module into place making sure that the pins of the two connectors on the underside (one at the near end and one at the far end) of the module line up correctly with the two receptacles on the main board.
5. Press the Two-CO Line module downward until the pins of the connectors are correctly inserted into their receptacles on the main board and the locking support posts are all the way through.
6. Check to make sure the module is seated correctly.
7. DIP switch settings for the three DIP switches on this module must be as shown in Table 6-4.

Table 6-4: Two-CO Line Module DIP Default Switch Settings

Switch	S1	S2	S3
BIT 1	OFF	OFF	OFF
BIT 2	OFF	ON	ON
BIT 3	OFF	OFF	OFF
BIT 4	OFF	ON	ON

Installing a Digital Radio Interface Module

The Digital Radio Interface module adds the capability of interfacing to up to four trunked analog or digitally-controlled radio channels. It also provides the capability for digital control of Control Stations. The module, shown in Figure 6-11, is designed for easy insertion. The Digital Radio Interface module can support up to four radio channels. A CommandSTAR Lite console in which a four-channel expansion module has been installed requires *two* Digital Radio Interface modules to support five or six digital channels.

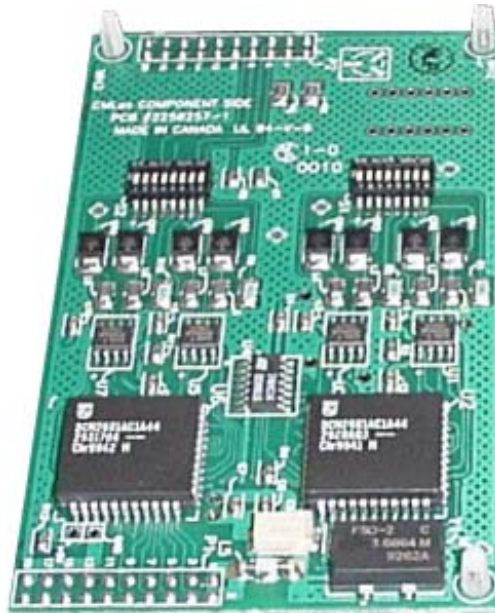


Figure 6-11: Digital Radio Option Module

To install a Digital Radio Interface module for channels 1–4, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Open the Desktop assembly as described on page 6-2.

2. Locate the position reserved for the Digital Radio Interface module above the main board, just to the right of the center line.

Note: Consult the “Component Layout Diagrams” on page B-1 of Appendix B for information on the locations of components.

3. Insert the three locking support posts into their receptacles in the main board (MH1, MH2, MH3).
4. Slide the Digital Radio Interface module into place, making sure that the pins of the two connectors on the underside (one at the near end and one at the far end) of the module line up correctly with the two receptacles on the main board.
5. Press the Digital Radio Interface module downward until the pins of the connectors are correctly inserted into their receptacles on the main board and the locking support posts are all the way through.
6. Check to make sure the module is seated correctly.

To install a Digital Radio Interface module for channels 5 or 6¹, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Open the Desktop assembly as described on page 6-2.
2. Locate the position reserved for the Digital Radio Interface module above the Four-channel Expansion module.

Note: Consult the “Component Layout Diagrams” on page B-1 of Appendix B for information on the locations of components. The layout of the Four-channel Expansion module is shown on page B-4.

3. Insert the three locking support posts into their receptacles in the Four-channel Expansion module (MH1, MH2, MH3).
4. Slide the Digital Radio Interface module into place, making sure that the pins of the two connectors on the underside (one at the near end and one at the far end) of the module line up correctly with the two receptacles on the Four-channel Expansion Module.
5. Press the Digital Radio Interface module downward until the pins of the connectors are correctly inserted into their receptacles on the Four-channel Expansion module and the locking support posts are all the way through.
6. Check to make sure the module is seated correctly.

Note: To enable or disable digital radio, See “DIP Switch Settings” on page A-8 of Appendix A.

1. Channels 7 and 8 cannot be configured as digital channels. The CommandSTAR Lite only supports six digital channels.

Installing a Direct Current Option Module

The Direct Current Option module permits direct current base station control for up to four channels. The module, shown in Figure 6-12 is designed for easy insertion.

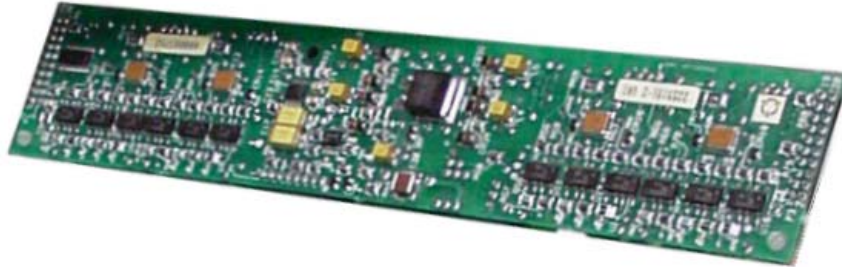


Figure 6-12: Direct Current Option Module

To install a Direct Current Option module, follow these steps:

Tool required: one (1) Phillips screwdriver

1. Open the Desktop assembly as described on page 6-2.
2. Locate the position reserved for the Direct Current Option module:
 - For channels 1–4, along the left-hand side of the main board. (Look for connectors P3DCA, P2DCA, and P1DCA.)
 - For channels 5–8, along the right-hand side of the main board. (Look for connectors P1DCB, P2DCB, and P3DCB.)

Note: Consult the “Component Layout Diagrams” on page B-1 of Appendix B for information on the locations of components.

3. Insert the three locking support posts into their receptacles in the main board (MH8, MH9, MH19 for channels 1–4 or MH12, MH13, MH219 for channels 5–8).
4. Prior to insertion, move jumpers P1 to P4 to the 3-4 position to enable and route the audio through the DC module.

Note: Remove the cover plate on the inside of the console near the DC Option board to aid in the removal and insertion of the module.

5. Slide the Direct Current Option module into place making sure that the pins of the two connectors on the underside (one at the near end and one at the far end) of the module line up correctly with the two receptacles on the main board.
6. Press the Direct Current Option module downward until the pins of the connectors are correctly inserted into their receptacles on the main board and the locking support posts are all the way through
7. Check to make sure the module is seated correctly.

Note: To enable DC signaling or to re-enable tone signaling, See “Jumper Settings” on page A-7 of Appendix A.

Labelling the Digital Radio Control Module and Keypad

The CommandSTAR Lite Digital Radio Control Module (DRCM) emulates the control head of Motorola MCS 2000 (model III), Digital Spectra (model W9—ASTRO), and CDM1550 Series (e.g., LTR or Passport) digital radios. The corresponding buttons and LEDs on the DRCM should be labelled to show the functions programmed into the radios. The keypad module also participates in the emulation of the programmable features and may, in some circumstances require labelling.

The diagrams on the following pages show how the function buttons and LEDs on the DRCM correspond to the programmable buttons on the MCS 2000, iDEN, Digital Spectra, and CDM1550 Series control heads.

Note: Digital Radio types are assigned to digital channels using the CSDM Lite. Channels must be assigned before they can be used. See the *CommandSTAR Lite System Database Manager Manual* for information on assigning digital radio channels. Refer to the Label Program in Appendix A.

ASTRO Digital Radios

Figure 6-13 shows a CommandSTAR Lite DRCM with its function buttons labelled A–P and a Keypad module. (When a letter is preceded by “^”, it means the shift button (^) on the keypad must be pressed first.) Figure 6-14 shows a Digital Spectra (ASTRO) radio control head with its programmable buttons labelled A–P (except the Del [#] and Rcl [*] buttons). To activate a function programmed into a Digital Spectra radio, press the corresponding button on the DRCM.

The programmable buttons labelled A–F on the Digital Spectra (ASTRO) radio control head (see Figure 6-14) return an acknowledgement that is indicated by a lit LED on the DRCM when the corresponding button is pressed on the DRCM. These LEDs are labelled A–F in Figure 6-13.

For information on the programmable features of the Digital Spectra radio, refer to the user manual.

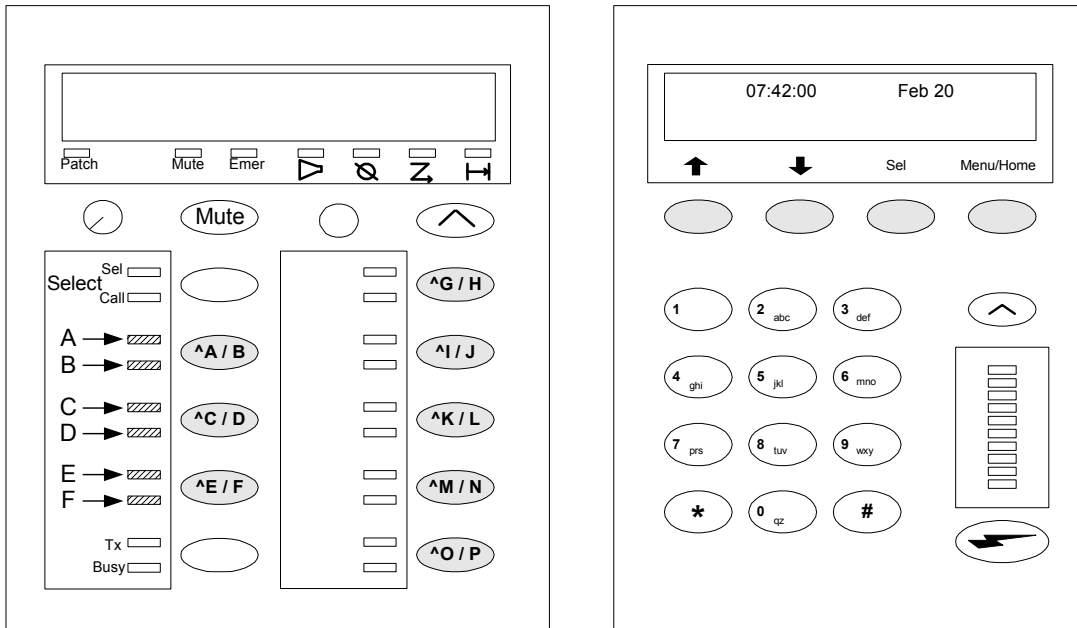


Figure 6-13: Using a DRCM and Keypad with Digital Spectra (ASTRO) Radio

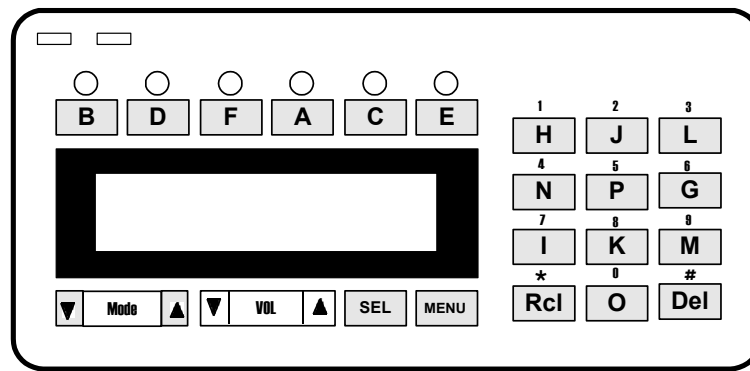


Figure 6-14: Control Head for Digital Spectra (ASTRO) Radio

MCS 2000 Radios

Figure 6-15 shows a CommandSTAR Lite DRCM with its function buttons labelled A–I and a Keypad module. (When a letter is preceded by “^”, it means the shift button (^) must be pressed first.) Figure 6-16 shows an MCS 2000 radio control head with its programmable buttons labelled A–I). To activate a function programmed into an MCS 2000 radio, press the corresponding button on the DRCM.

The programmable buttons labelled D–I on the MCS2000 radio control head (see Figure 6-16) return an acknowledgement that is indicated by a lit LED on the DRCM when the corresponding button is pressed on the DRCM. These LEDs are labelled D–I in Figure 6-15.

For information on the programmable features of the MCS2000 radio, refer to the user manual.

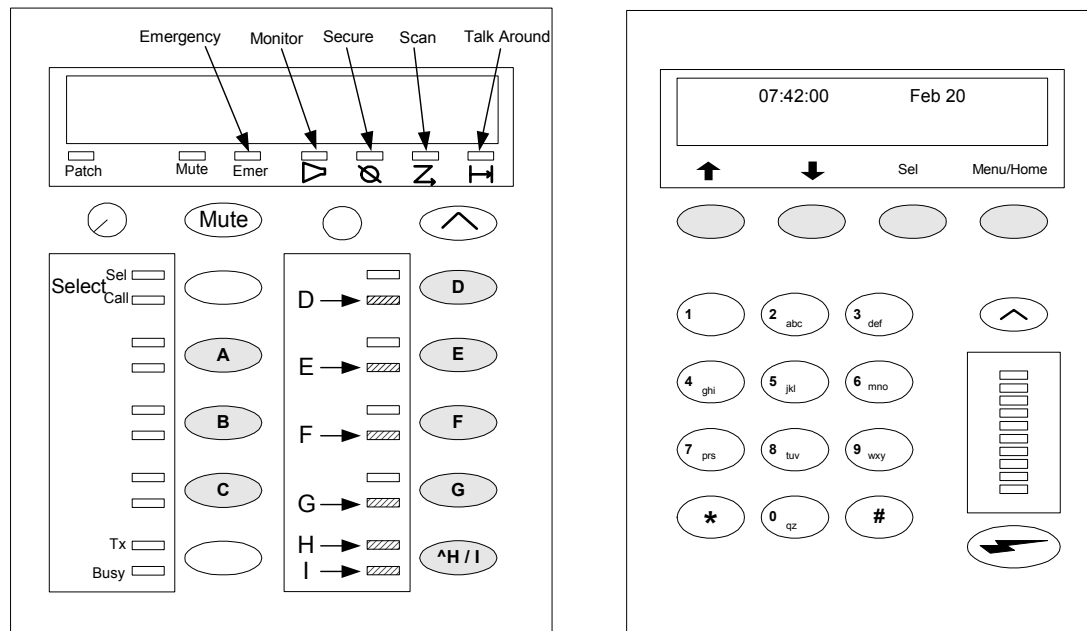


Figure 6-15: Using a DRCM and Keypad with CS 2000 Radio

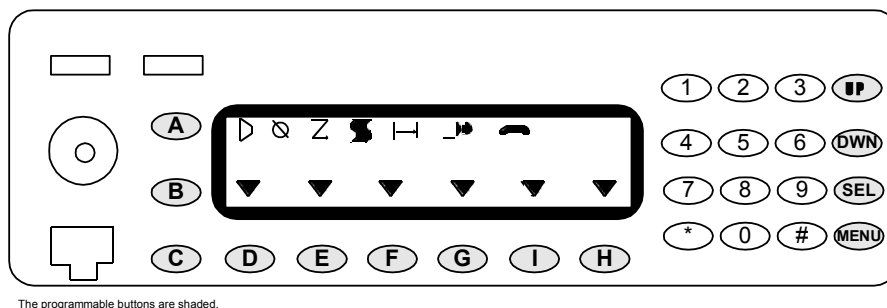


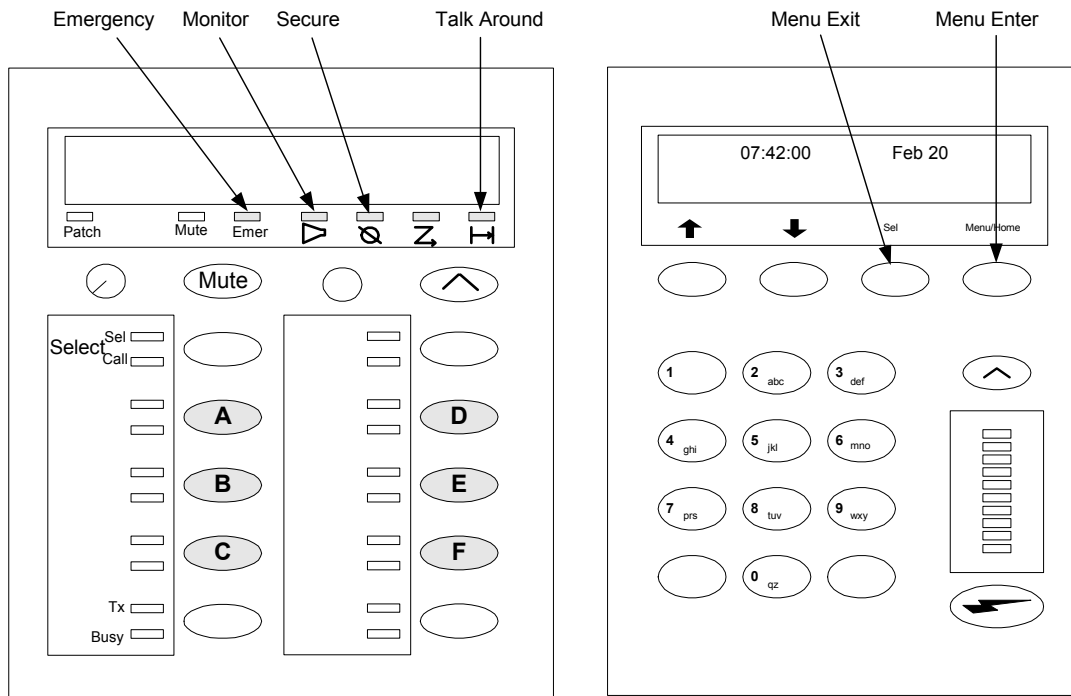
Figure 6-16: Control Head for MCS 2000 Radio

CDM1550 Series Radios

Figure 6-17 shows a CommandSTAR Lite DRCM with its function buttons labelled A–F and a Keypad module. Figure 6-18 shows a CDM1550 Series radio control head with its function buttons labelled A–F. To activate a function programmed into a CDM1550 Series radio, press the corresponding button on the DRCM. To activate the menu (☐/● button on the CDM1550 Series radio) press the Menu/Home button on the Keypad module. To exit the menu (☐ button on the CDM1550 Series radio) press the Sel button on the Keypad module.

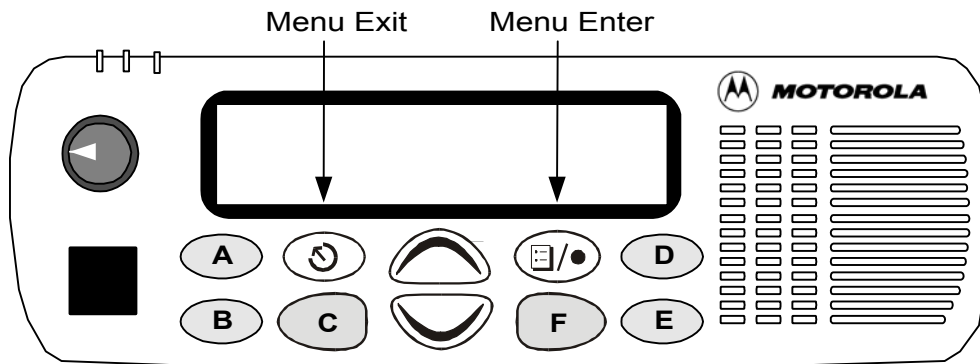
The Emergency, Monitor (Squelch), Secure, and Talk Around icons from the CDM1550 Series radio display are emulated by LEDs on the DRCM, as indicated in Figure 6-17.

For information on the features of the CDM1550 Series radios, refer to the user manual.



The function buttons are shaded.

Figure 6-17: Using a DRCM and Keypad with CDM1550 Series Radio



The function buttons are shaded.

Figure 6-18: Control Head for CDM1550 Series Radio

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Chapter 7

Diagnostics Mode

Diagnostics on the Desktop or Rackmount Console

All desktop and rackmount consoles are equipped with a keypad module that allows the operator to dial a telephone number, view the time of day in the 12 or 24-hour clock format, view the date and monitor the audio level (VU) of the selected radios and microphone audio. The keypad module is equipped with 12 standard buttons for dialing and six standard function buttons: Scroll Up (↑), Scroll Down (↓), Select (Sel), Menu/Home, Shift (^), and PTT (⚡) that are used to set the features of the console or to start the console tests.

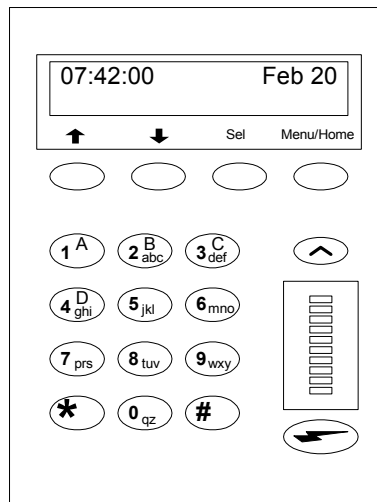






Figure 7-1: Keypad Module

Note: You cannot gain access to tests and programs on the console when it is in transmission mode (for example, when the PTT button has been pressed, or when the patch or local repeat feature has been enabled).

Keypad Features

The keypad features are described in the next table.

Table 7-1: Keypad Features

Button name	Description
Menu/Home	Validates the digits entered on the keypad and confirms programming entries.
Keypad	Allows the entry of digits.
Select (Sel)	Enables console tests and configuration operations.
PTT ()	Allows the operator to transmit over a selected radio channel.
Scroll Up ()	Used in console tests and programming mode to move up the list of actions.
Scroll Down ()	Used in console tests and programming mode to move down the list of actions.
Shift ()	Used to select alternate keypad functions.
VU meter	Displays the volume level of the microphone and incoming audio.

In addition, the keypad module accesses internal tests and programming, such as button test, time and date set-up.

Use the following procedures to view the internal tests and setups or programs on the keypad display:

View Internal Tests and Programs

1. Press the Shift () and the Select (Sel) buttons on the keypad module.

The keypad displays TEST/SETUP #.

2. Press Scroll Up () or Scroll Down ().


Tests and programs are shown in sequence on the keypad display.

Note: A number, shown on the left-hand side of the keypad display, is assigned to each test and program.

Entering a Test Program

There are two methods to initiate a test/setup:

Method 1

1. Press the Shift () and the Select (Sel) buttons on the keypad module.

The keypad displays TEST/SETUP #.

2. Press Scroll Up (↑) or Scroll Down (↓) until the desired test or program appears on the keypad display.

The keypad displays the name and the corresponding number of the program.

3. Press Menu/Home on the keypad to initiate an internal test or setup:

Only the program name is displayed.

Method 2

1. Press the Shift (∧) and the Select (Sel) buttons on the keypad module.

The keypad displays TEST/SETUP #.

2. Enter the digits corresponding to the test or program then press Menu/Home to initiate an internal test or setup.

Exit a Test

1. Press the Select (Sel) button at any time to exit during a test or program.

The time and date are displayed on the keypad.

Note: Tests 50 to 75 are reserved for maintenance. To access tests 50 and above, 1. Press the Shift (∧) and the Select (Sel) buttons 2. Hold the PTT button on the Keypad, and press either the Scroll Up (↑) or Scroll Down (↓) buttons to browse through the menu.

Tests: Purpose and Procedures

The step procedures and the purpose for each test and program are summarized in the Quick reference table following. A detailed description is given in the following pages. Use Method 1 or 2 explained on page 7-2 to enter the test/setup.

Table 7-2: Quick Reference Table

Test	Description
0-TIME MODE?	This feature allows to select the 12 hour (AM and PM) or the 24 hour time display format.
1-SET TIME?	Allows setting of the system time.
2-SET DATE?	Allows setting of the system date.
3-DISP LEVEL?	Allows the increase or decrease of the intensity of the displays on the operator control modules.
4-LED LEVEL?	Allows the increase or decrease of the intensity of the LED on the control modules.
11-PROG PAGE?	Allows programming of a speed page or a manual page.

Table 7-2: Quick Reference Table (Continued)

Test	Description
12-SET RAD VOL?	Adjusts the volume of the radio channels programmed on an Auxiliary Control Module (ACM).
13-SET DIAL UP?	Specifies phone numbers for dial-up connections for data and/or voice; connects and disconnects dial-up modem. This program applies to digital (DRCM) control only.
51-S/W NUMBER?	Displays the part number and the version number of the current console software installed.
52-DBASE REV?	Displays the version of the current database.
53-LED TEST?	Verifies the functionality of the LED and the segments of the displays on the operator modules.
54-BUTTON TEST?	Verifies that the buttons are operational and associated to the appropriate function.
55-VOLUME TEST?	Verifies that the volume controls are operational and associated with the appropriate function.
56-SENSE TEST?	Verifies that the operator or supervisor headset jackbox can sense a device connected to the headset jack.
61-TONE TEST?	Verifies speaker and headset operation using a tone frequency of 1000 Hz.
62-MIC TEST?	Verifies operation of the microphone.
63-PTT TEST?	Verifies the foot-switch and microphone PTT operation.
64-CALL DIR RX?	Adjusts the receive level of the Call Director.
65-CALL DIR TX?	Adjusts the transmit level of the Call Director.
68-SET GRANT?	Adjusts the level of the grant tone.
69-TONE TO I/F?	Routes a test tone to an interface.
70-RESET?	Initiates a console reset.
71-SET MIC AGC?	Sets the Automatic Gain Control (AGC) on the microphone (ON, OFF).
72-PAGING TONE?	Adjusts the level of the paging tone.
73-SERIAL PORT?	Specifies the use of the console's RS-232 port (CSDM, PRINTER, CLOCK).
74-MIC INPUT?	Specifies which microphone is in use (INTERNAL, GOOSE, DESKMIC).
75-SLV S/W NUM?	Displays the part number and the version number of the current TMS software installed.

0-TIME MODE?

The TIME MODE feature allows you to select the 12 hour (AM and PM) or the 24 hour time display format.

Note: This test is only valid if the option is enabled by CSDM Lite.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 0 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 0-TIME MODE?, then press Menu/Home.
3. Press digit 1 on the keypad to select the 12 hour format.

The Keypad displays FORMAT: 12-hour.

4. Press digit 2 on the keypad to select the 24 hour format.

The Keypad displays FORMAT: 24-hour.

5. Press Menu/Home to validate the Time Mode.

1-SET TIME?

SET TIME allows you to set the time of the console. As a preliminary step, identify the Time Mode (see “0-TIME MODE?”) before modifying the SET TIME.

Note: This test is only valid if the option is enabled by CSDM Lite.

SET TIME in 12-hour format

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 1 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 1-SET TIME?, then press Menu/Home.
3. Enter the hour and minutes in 12-hour format.

The Keypad displays “?M”, prompting the dispatcher to enter A for AM or P for PM.

4. To select A, press digit 1. To select P, press digit 2.
5. Press Menu/Home to validate the time.

Note: It is not possible to set the time in the 12 hour format while the Time Mode is in 24 hour format

SET TIME in 24-hour format

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 1 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 1-SET TIME?, then press Menu/Home.

3. Enter the hour and minutes in 24-hour format.
4. Press Menu/Home to validate the time.

Note: It is not possible to set the time in the 24 hour format while the Time Mode is in 12 hour format

2-SET DATE?

The SET DATE allows you to modify or set a new date.

Note: This test is only valid if the option is enabled by CSDM Lite.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 2 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 2-SET DATE?, then press Menu/Home.

3. Using the Keypad, enter the DAY/MONTH/YEAR.

DD/MM/YYYY

4. Press Menu/Home to validate the date.

3-DISP LEVEL?

The DISP LEVEL allows you to increase or decrease the intensity of the displays on the control modules of a console.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 3 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 3-DISP LEVEL?, then press Menu/Home.

The Keypad displays DISPLAY UP/DOWN.

3. Scroll Up (↑) or Scroll Down (↓) to increase or decrease the control module display intensity.
4. Press Menu/Home to validate the intensity setting of the displays.

4-LED LEVEL?

The LED LEVEL allows you to increase or decrease the intensity of the LED on the control modules of a console.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 4 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 4-LED LEVEL?, then press Menu/Home.

The Keypad displays LED UP/DOWN.

3. Scroll Up (↑) or Scroll Down (↓) to increase or decrease the intensity of the LED on the control module.
4. Press Menu/Home to validate the LED level setting.

11-PROG PAGE?

Programming a manual page changes the annotation only. A Speed Page cannot be programmed to a different destination, but can be assigned to a different alias.

To program a speed page or a manual page:

Manual Page

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.
The display indicates TEST/SETUP #
2. Either enter 11 on the keypad or press the Mode Up (↑) or Mode Down (↓) buttons until the keypad display indicates 11-PROG PAGE?, then press Menu/Home.
The Keypad displays Select PAGE or it shows the current value that was saved.
3. Press the Page # button that you want to reprogram.
The keypad displays the current page format.
4. Mode Up (↑) or Mode Down (↓) to select the page format.
The keypad display shows the new page format.
5. Press Menu/Home to validate the page format.
The keypad displays Annotation: XX.
6. Enter the new annotation using the keypad digits and Clear.
The keypad displays the new digits entered.
7. Press Menu/Home to validate the annotation.
The keypad displays the time.

Speed Page

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.
The display indicates TEST/SETUP #
2. Either enter 11 on the keypad or press the Mode Up (↑) or Mode Down (↓) buttons until the keypad display indicates 11-PROG PAGE?, then press Menu/Home.
The Keypad displays Select PAGE or it shows the current value that was saved.
3. Press the Speed Page # button that you want to reprogram.
The keypad displays the current speed page destination.
4. Mode Up (↑) or Mode Down (↓) to select the page destination.
The keypad displays the new speed page destination.

5. Press enter to validate the page destination.

The keypad displays the time.

12-SET RAD VOL?

To adjust the speaker volume of a radio Receive channel that is programmed on an ACM:

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 12 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 12-SET RAD VOL?, then press Menu/Home.

The Keypad displays Select CHANNEL.

3. Press the Select button for the channel to be adjusted.

The keypad displays the name of the channel on the ACM (8 characters) followed by the last level setting in dB. The display looks as follows:

CHANNEL_NAME: -3 dB

4. Scroll Up (↑) or Scroll Down (↓) to set the channel volume.

The volume can be varies from maximum to 0 dB to -21 dB in 3-dB steps.

5. Press Menu/Home to validate appropriate level.

13-SET DIAL UP?

This function allows you to specify phone numbers for dial-up connections for data and/or voice and connects and disconnects the dial-up modem. This function is used only on teh DRCM channels.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 13 on the keypad or press the Scroll Up (↑) or Scroll Down (↓) buttons until the keypad display indicates 13-SET DIAL UP, then press Menu/Home.

The display looks as follows:

Dial Up:
Choose Channel

3. To choose the channel, press the Select button on the corresponding DRCM.

The display indicates Dial Up: Voice

4. If required, enter a telephone number for the voice channel and press Menu/Home to return to the main display on the keypad.

OR

Press Scroll Up (↑) to select the next item.

The display indicates Dial Up: Data

5. If required, enter a telephone number for the data channel and press Menu/Home to return to the main display on the keypad.

OR

Press Scroll Up (↑) to select the next item.

The display looks as follows:

Press Menu/Home
To Connect

6. Press Menu/Home to connect and return to the main display on the keypad.

OR

Press Scroll Up (↑) to select the next item.

The display looks as follows:

Press Menu/Home
To Disconnect

7. Press Menu/Home to connect and return to the main display on the keypad.

OR

Press Select (Sel) to cancel and return to the main display on the keypad.

51-S/W NUMBER?

The function displays the part number and version number of the current console software installed.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 51 on the keypad or hold the PTT button while pressing the Scroll Up (↑) and Scroll Down (↓) buttons then Scroll Up (↑) or Scroll Down (↓) until the keypad display indicates 51-S/W NUMBER?, then press Menu/Home.

The keypad displays the P/N and version of the console software
(**example:** 3211931-23 SR1).

3. Press Select (Sel) to end the test.

52-DBASE REV?

The DBASE REV provides the revision code of the current database installed.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 52 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 52-DBASE REV?, then press Menu/Home.

The keypad displays the DATABASE REVISION (**example:** DATABASE REV-003).

3. Press Select (Sel) to end the test.

53-LED TEST?

Verifies the functionality of the LED and the segments of the display on an operator module.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module

The display indicates TEST/SETUP #

2. Either enter 53 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 53-LED TEST?, then press Menu/Home.

The Keypad display indicates LED TEST.

All other display and LED are OFF

3. Press any button, except Select (Sel), on any module.

All indicators and displays on the module are turned ON.

All indicators and displays are cleared, except for the LED TEST indication on the keypad display.

4. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

54-BUTTON TEST?

Verifies that the buttons are associated to the appropriate function.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 54 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 54-BUTTON TEST?, then press Menu/Home.

The Keypad display indicates BUTTON TEST

3. Press the buttons you wish to test.

They keypad display indicates the function of the button: For example Page TX SEL.

4. Release the button.

The keypad display indicates BUTTON TEST.

5. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

55-VOLUME TEST?

Verifies the volume control settings of the CCM, Select and Unselect speakers.

1. Press the Shift (∧) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #.

2. Either enter 55 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 55-VOLUME TEST?, then press Menu/Home.

The Keypad display indicates VOLUME TEST.

3. Vary the Select speaker module volume control.

The keypad display indicates Select: VOL:##., where ## is a value between 00 and 15 depending on the position of the volume control.

4. Vary the Unselect speaker module volume control.

The keypad display indicates Unselect: VOL:##., where ## is a value between 00 and 15 depending on the position of the volume control.

5. Vary the CCM module volume controls.

The keypad display indicates *CHANNEL* VOL:##., where *CHANNEL* is the channel assigned to the CCM and ## is a value between 00 and 15 depending on the position of the volume control.

6. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

56-SENSE TEST?

Verifies that the operator or supervisor headset jackbox can sense a device connected to the headset jack.

1. Press the Shift (∧) and the Select (Sel) buttons on the keypad module

The display indicates TEST/SETUP #

2. Either enter 56 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 56-SENSE TEST?, then press Menu/Home.

The Keypad display indicates DEV: oper supv if no headset/handsets are connected.

3. Insert the jack of a headset into the operator jackbox.

The keypad display should indicate DEV: OPER supv.

4. Insert the jack of a headset into the supervisor jackbox.

The keypad display should indicate DEV: OPER SUPV.

5. Remove the operator headset plug from the jackbox.

The keypad display should return to indicating DEV: oper SUP.

6. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

61-TONE TEST?

To verify the speaker and headset operation.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module

The display indicates "TEST/SETUP #"

2. Either enter 61 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 61-TONE TEST?, then press Menu/Home.

The keypad display indicates the name of the audio output device and a tone is sent to that device.

3. Select the audio output device you want to test by pressing the Scroll Up (↑) and Scroll Down (↓) buttons on the keypad.

The keypad display indicates the name of the audio output device where a tone is sent.

4. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

62-MIC TEST?

To verify the microphone operation.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module

The display indicates TEST/SETUP #

2. Either enter 62 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 62-MIC TEST?, then press Menu/Home.

The Keypad display indicates MIC TEST

3. Select the audio input device you want to test by pressing the Scroll Up (↑) and Scroll Down (↓) buttons on the keypad. Both the operator and supervisor headset and desk/gooseneck microphone can be tested.

The keypad display indicates one of the following:
OPERATOR HS
SUPERVISOR HS
MIC IN: TEST #74

4. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

OPERATOR HS: the microphone on the operator headset is tested.

SUPERVISOR HS: the microphone on the supervisor headset is tested.

MIC IN: TEST #74: the selected microphone is tested. The selected microphone may be either the console's internal microphone, a gooseneck microphone, or a deskmic. See "74-MIC INPUT?" on page 7-18 to select a microphone.

5. Speak into the microphone.

The audio from the microphone is sent to the headset or Select speaker.

The VU meter indicates the loudness of your voice.

6. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

63-PTT TEST?

Use this test verify the foot-switch and microphone PTT operation.

When the test is selected, the keypad display indicates:

- PTT - Push-to-talk
- lh - left hand
- rh - right hand
- mic - microphone

Whenever a switch is detected, it appears on the keypad in capital letters. For instance, if you are testing the left switch on the footswitch the Keypad display would indicate PTT: LH rh mic. Notice that LH is shown in capital letters to indicate that it is detected.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module

The display indicates TEST/SETUP #

2. Either enter 63 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 63-PTT TEST?, then press Menu/Home.

The Keypad display indicates PTT: lh rh mic.

3. Press the left switch of the foot-switch or the monitor button on the microphone.

The keypad display indicates PTT: LH rh mic.

4. Release the left switch of the foot-switch or the monitor button on the microphone.

The keypad display indicates PTT: lh rh mic.

5. Press the right switch of the foot-switch.

The keypad display indicates PTT: lh RH mic.

6. Release the right switch of the foot-switch.

The keypad display indicates PTT: lh rh mic.

7. Press the mic PTT.

The keypad display indicates PTT: lh rh MIC.

8. Release the mic PTT.

The keypad display indicates PTT: lh rh mic.

9. Press Select (Sel) to end the test.

The CommandSTAR Lite console returns to normal operating condition.

64-CALL DIR RX?

To set the receive level of the call director.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 64 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 64-CALL DIR RX?, then press Menu/Home.

The Keypad displays the current level from 0 to 7, in 3 dB steps.

3. Use Scroll Up (↑) or Scroll Down (↓) to select the receive level of the call director.

Level shows on the keypad display.

4. Press Menu/Home to select appropriate level.

Return to the main display on the keypad.

65-CALL DIR TX?

To set the transmit level of the call director.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 65 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 65-CALL DIR TX?, then press Menu/Home.

The Keypad displays the current level from 0 to 7, in 3 dB steps.

3. Use Scroll Up (↑), Scroll Down (↓), Menu/Home to select the transmit level of the call director.

Level shows on the keypad display.

4. Press Menu/Home to select appropriate level.

Return to the main display on the keypad.

68-SET GRANT?

This function allows you to adjust the level of the grant tone by allowing three levels of adjustment: NONE, SOFT, or LOUD.

To set the level of the grant tone of the console:

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 68 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 68-SET GRANT?, then press Menu/Home.

The Keypad displays GRANT TONE: [setting], where setting is the last value that was saved.

3. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

- NONE
- SOFT
- LOUD

4. Press Menu/Home to select appropriate setting.

Return to the main display on the keypad.

69-TONE TO I/F?

This test function routes an internally generated 1 kHz tone at a specific audio level instead of using the microphone audio. This test is used in the event the MIC audio path does not work and the dispatcher wants to test a specific audio path that would normally require the microphone.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 69 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 69-TONE TO I/F?, then press Menu/Home.

The Keypad displays TONE TO I/F:OFF.

It shows the status ON or OFF when test 69 is called.

3. Use Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate status.

The display indicates ON or OFF.

4. Press Menu/Home to select appropriate status.

Return to the main display on the Keypad.

70-RESET?

This function allows the maintenance personnel to initiate a console reset.

WARNING: Console reset should only be performed by qualified maintenance personnel. Resetting a console will affect system operation.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 70 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 70-RESET?, then press Menu/Home.

The Keypad displays PASSWORD

3. Enter the PASSWORD. The password is **12345**.

This is not a hidden password, it is only a number that you enter so that the RESET is not immediate when RESET is selected.

If you enter the wrong numbers the keypad displays WRONG PASSWORD.

4. Press Menu/Home to select validate RESET.

The console resets is equivalent to turning the power OFF, then ON.

71-SET MIC AGC?

This function allows you to set the Automatic Gain Control (AGC) ON or OFF on the microphone.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 71 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 71-SET MIC AGC?, then press Menu/Home.

Depending on the actual setup, the Keypad displays one of the following:

AGC: ON
AGC: HDST ONLY
AGC OFF

3. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

AGC: ON — AGC is set on all microphones.

AGC: HDST ONLY — AGC is set on headset microphones but not on the Gooseneck or the Desktop microphones.

AGC OFF — NO AGC on the microphones.

4. Press Menu/Home to select appropriate setting.

Return to the main display on the keypad.

Note: If using a noise cancelling headset, the AGC must be set to “OFF”.

72-PAGING TONE?

This function allows you to adjust the level of the paging tone heard at the console by allowing three levels of adjustment: NONE, SOFT, or LOUD.

To set the level of the paging tone heard at the console:

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 72 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 72-PAGING TONE?, then press Menu/Home.

The Keypad displays PAGING TONE: [setting], where setting is the last value that was saved.

3. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

- NONE
- SOFT
- LOUD

4. Press Menu/Home to select appropriate setting.

Return to the main display on the keypad.

73-SERIAL PORT?

This function allows you to specify the use of the Desktop console's RS-232 port (CSDM, PRINTER, CLOCK).

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 73 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 73-SERIAL PORT?, then press Menu/Home.

Depending on the current setting, the Keypad displays one of the following:

SERIAL PORT: CSDM
SERIAL PORT: PRINTER
SERIAL PORT: CLOCK

3. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

SERIAL PORT: CSDM — the console's RS-232 port is connected to the CSDM Lite computer.

SERIAL PORT: PRINTER — the console's RS-232 port is connected to a printer.

SERIAL PORT: CLOCK — the console's RS-232 port is connected to an external clock source.

4. Press Menu/Home to select appropriate setting.

Return to the main display on the keypad.

74-MIC INPUT?

This function allows you to specify which microphone is in use (INTERNAL, GOOSE, DESKMIC).

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 74 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 74-MIC INPUT?, then press Menu/Home.

Depending on the current setting, the Keypad displays one of the following:

MIC INPUT: INTERNAL
MIC INPUT: GOOSE
MIC INPUT: DESKMIC

3. Use the Scroll Up (↑) and Scroll Down (↓) buttons to select the appropriate setting.

The following settings are available:

MIC INPUT: INTERNAL — the console's internal microphone is in use.

MIC INPUT: GOOSE — a gooseneck microphone is in use.

MIC INPUT: DESKMIC — a deskmic is in use.

4. Press Menu/Home to select appropriate setting.

Return to the main display on the keypad.

75-SLV S/W NUM?

This function displays the part number and version number of the current TMS software installed.

1. Press the Shift (^) and the Select (Sel) buttons on the keypad module.

The display indicates TEST/SETUP #

2. Either enter 75 on the keypad or hold the PTT button while pressing the Scroll Up (↑) or Scroll Down (↓) buttons then Scroll Up (↑) and Scroll Down (↓) until the keypad display indicates 75-SLV S/W NUM?, then press Menu/Home.

The keypad displays the P/N and version of the TMS software (**example:** Command-STAR 3211932-10 SR1).

3. Press Select (Sel) to end the test.

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Chapter 8

CommandSTAR Lite System Database Manager (CSDM Lite)

Introduction

The CommandSTAR Lite System Database Manager (CSDM Lite) is a powerful configuration and maintenance tool for CommandSTAR Lite consoles. Through the use of an intuitive user interface, a CommandSTAR Lite system can be configured to fit numerous system requirements. Diagnostic monitoring, alarm, and messaging features enable troubleshooting down to the replaceable module level.

This chapter lists the options provided at the CSDM Lite to verify the integrity of individual modules.

CSDM Lite Hardware Requirements

A CSDM Lite terminal consists of an Intel-based PC (486 or better) equipped with 16 or more MB of RAM, a mouse, DOS Version 5.0 (or better) or Windows 9x/ME, and CSDM Lite software CD-ROM.

Note: CSDM Lite is not compatible with Windows NT, 2000 or XP.

CSDM Lite Alarms and Messages

General

The CommandSTAR Lite console reports all error conditions and system diagnostics to a connected CSDM Lite.

To help identify system errors quickly and efficiently, CSDM Lite displays on the screen and stores on magnetic media for future reference, any events reported by a CommandSTAR Lite console. Reporting of events on the screen and on the magnetic media is performed regardless of the active menu at the CSDM Lite. For error recording, the CSDM Lite can always record errors reported by the CommandSTAR Lite console to which it is connected.

User Interface

CommandSTAR Lite maintains a separate file containing the daily log. Utilities such as page up, page down, search are provided to help qualified personnel browse through the log file and search for specific events.

At midnight daily, the current log file is closed for archival purposes and a new log file is opened. The log file name always reflects the current system date.

Each error log contains the following fields:

1. Time Stamp; the date and time at which the event has occurred
2. Error string; an English sentence or a set of abbreviations that easily identify the nature of the event
3. Source file; name of the file where the log is originating
4. Source line; number; line number in the source file where the log is originating

For any error logging level, these four fields are stored on the CSDM Lite magnetic media. When the CSDM Lite is not present, the latest logs are kept at the consoles in non-volatile memory.

See the *CommandSTAR Lite System Database Manager Manual* for more detailed information.

Browsing the Log Files

At the CSDM Lite terminal, a menu is provided to browse the log files.

A set of edit utilities provides the necessary media to navigate within a log file. The following utilities are provided:

- text search
- search again
- page up
- page down
- start of text
- end of text
- scroll line up
- scroll line down

See the *CommandSTAR Lite System Database Manager Manual* for more detailed information.

CSDM Lite Messages on CSDM Lite Problems

The CSDM Lite software is an executable program; in the event of any problem occurring during application start-up, either the application will fail to start or the operating system will return an error message.

After the application has started, any alarms and messages stored in the CommandSTAR Lite unit (if connected) are displayed. An alarm is always generated when a PC is connected to the CSDM Lite Console.

In any case, you should always look at the screen carefully to identify any message that is not normal. Write the error message with associated number, string number or reference and report the problem immediately to Motorola.

Software on Back-up Disks

If the CSDM Lite software becomes corrupted, it is usually indicated by a DOS or Windows error message, by a system crash or lockup, or by the inability of the program to display the start-up screen. You can use your backup copy to replace the software or if Motorola provides a new and improved version of the CSDM Lite software, you can use the upgrade disk to load the changes.

To re-install the CSDM Lite software enter A:SETUP from the DOS prompt, then follow the screen instructions.

Note: Be sure to store your backup and upgrade disks securely.

Reloading the Factory Database

If a console indicates "NOT IN DATABASE" at power-up, you must upload the configuration database. A copy of the database should be available on the CSDM Lite hard disk from the last time a Save Configuration command was executed. At the very least, a copy of the initial database generated at installation will be available on CD-ROM.

Note: Whenever you make configuration change (especially at initial set-up), be sure to save a copy of the new configuration.

If multiple databases are present, upload the database that is appropriate. This is done in two steps:

1. Load the configuration.
2. Execute a database upload command.

See the *CommandSTAR Lite System Database Manager Manual* for more detailed information.

Reloading the Console Software

If a console indicates "BOOTSTRAP" at power-up, you must upload the console software. If you have previously received an software upgrade kit for the console, you can use the software included in the CommandSTAR Lite Software CD bundle (CD-ROM # 4211073-01 SR1). Otherwise, contact Motorola for a copy of the software.

Follow these steps to upload the console software:

1. Copy the three console software files to the directory on the CSDM Lite computer that holds the CSDM Lite executable program.

If necessary, extract the files from an archive (e.g., a zip file). The three files are: LITETMS.hi, LITETMS.lo, and Cop.x

2. At the CSDM upgrade menu, click **Upgrade>Software Upload\Console>Start**.

See the *CommandSTAR Lite System Database Manager Manual* for more detailed information.

Vendor Software

If you encounter problems with non-Motorola software, such as MS-DOS, PC-DOS, or Windows, use standard PC utilities to investigate further. If you come to a dead-end, contact the appropriate vendor.

Hardware Diagnostics

CSDM Lite is capable of performing hardware testing of a CommandSTAR Lite console. These tests provide in-depth verification of analog and digital paths of the system audio routing and assist the CSDM Lite operator in isolating audio circuitry faults to the sub-circuit level.

See “Hardware Status” in the “Diagnostics” chapter of the *CommandSTAR Lite System Database Manager Manual* for detailed information on reviewing hardware diagnostic status.

Software Upload

From time to time, improvements and new features are made to CommandSTAR Lite consoles. These improvements and new features are packaged as an upgrade kit that you can order from Motorola or your Motorola dealer. Usually, these upgrades take the form of new software for components of the CommandSTAR Lite console. The CSDM Lite is used to upload new software to the components of a CommandSTAR Lite console.

See the “Upgrade Menu” chapter in the *CommandSTAR Lite System Database Manager Manual* for instructions on how to upload a software upgrade.

System Alarms

General

Regardless of the login level of the user, when a malfunction or a failure is detected by the system, an alarm is triggered at the CSDM Lite to warn you that something has happened. The visual ALARM string appears and blinks in the status bar, at the left of the Active database: field in the top right corner of the screen.

User Interface

The Software setup under the Setup menu pad allows the user to select the type of audible alarm that will be heard at the console.

When a malfunction or a failure is detected, the ACK ALARM action box is enabled, that is, it is highlighted in white in the second level of the Hardware diagnostic menu, allowing the user to acknowledge the alarm. When selected, the blinking visual indicator stops

blinking and remains permanently ON, the audible alarm is muted and the action box is dimmed (gray).

The visual ALARM indicator disappears when the alarm is acknowledged and all tests are good. The various alarm conditions resume as follows:

- Blinking: a new fail diagnostic has been received
- Steady ON: the user has acknowledged the alarm but the test still fails
- OFF: all tests are good

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Chapter 9

Troubleshooting Specific Problems

Introduction

This chapter provides helpful information to perform preliminary verifications on the CommandSTAR Lite should the dispatcher encounter operational problems during radio or telephone operations. References to additional troubleshooting information and procedures are also specified in this chapter.

Quick Reference

Problem	Page No.
Headset cannot transmit or receive signal	9-2
Incorrect display on Control Module or Keypad	9-3
Internal tests cannot be monitored	9-3
No audio at customer equipment	9-3
No Radio communication	9-4
No radio, telephone line, intercom, or control over external devices	9-4
Non-operational LED	9-4
Radio Channels	9-2
Select or unselect speaker volume control does not work	9-5
The console is not working (no LED or no display)	9-5
The Keypad display says "BOOTSTRAP"	9-6
The Keypad display says "NOT IN DATABASE"	9-6
Hardware diagnostic status is not "PASSED"	9-6
CSDM does not communicate with CommandSTAR Lite	9-6

Radio Channels

When you have a problem with a radio channel, verify whether the problem occurs:

- on a single radio channel
- on multiple radio channels
- on a single console
- at multiple consoles

Once you have established the scope and type of the problem, you can proceed to find the condition in the next paragraphs and take whatever action is required to identify and eliminate the problem.

Troubleshooting the CommandSTAR Lite

The following tables are organized into three columns to assist in diagnosing the problem: The number of steps required to verify a procedure; a description of the action describing the procedure to locate the problem; and, references for additional information, when required. These initial verifications and procedures require no special tools or equipment.

Headset cannot transmit or receive signal

Step	Action	Reference
1	Perform the Sense test (Test Program # 56) on the operator port to verify that the headset jackbox is operational.	See the <i>Sense Test</i> in Chapter 7.
2	If the Sense test fails, connect the jackbox to the Supervisor port and perform the sense test again.	See <i>Installing the Headset Jackbox</i> in Chapter 4.
3	If both sense tests fail, try another jackbox. If it fails again, contact Motorola for assistance.	See Chapter 7.
4	If the tests pass, perform the Tone tests (Test Program #61) to verify the headset is functional and perform the MIC test (Test Program #62).	See the <i>Tone Test</i> and <i>Mic Test</i> in Chapter 7.
5	If the Tone or Mic tests fail, replace the headset.	

Incorrect display on Control Module or Keypad

Step	Action	Reference
1	Perform LED test (Test Program # 53) and to verify that all segments are working.	See the <i>LED Test</i> in Chapter 7.
2	If any segment are found not to be working, replace the faulty module.	See <i>Releasing an Operator Control Module from the Desktop</i> in Chapter 6.

Internal tests cannot be monitored

Step	Action	Reference
1	From the CSDM Lite, monitor audio tests on the console.	See the <i>CSDM Lite Manual</i> .
2	Verify that all modules are firmly inserted in the console and the cables between console and peripheral equipment are tightly in place and secured.	

No audio at customer equipment

Step	Action	Reference
1	If no Tx audio to the radio, perform the Tone to I/F Test (Test Program #69) to verify that a tone can be routed to the output of the console. Note: If the signal is present at the cross-connect terminal, the problem is outside the CommandSTAR Lite.	See the <i>Tone to I/F Test</i> in Chapter 7.
2	Verify vendor equipment.	Refer to the Vendor information.
3	If the signal is not present at the cross-connect terminal, replace defective console module.	
4	Cable to the console could be missing.	

No Radio communication

Step	Action	Reference
1	From the CSDM Lite, consult the Hardware Status menu.	See <i>Hardware Status</i> in the <i>CSDM Lite Manual</i> .
2	Perform the Tone to Device tests (Test Program #61) to verify that a tone can be routed from the CSDM Lite to the headset or speaker.	See the <i>Tone Test</i> in Chapter 7.
3	Perform the Sense test (Test Program #56) and determine the operator/supervisor headset and jackbox functionality.	See Chapter 7.
4	Perform the Tone to I/F Test (Test Program #69) to verify that a tone can be routed to the output of the console.	See the <i>Tone to I/F Test</i> in Chapter 7.
5	Replace any module that does not meet requirements.	

No radio, telephone line, intercom, or control over external devices

Step	Action	Reference
1	Verify the telephone and other external device connections to console back panel.	See the <i>Console Interface description</i> in Chapter 4.
2	Verify the headset or desk microphone connections.	
3	Peripheral cards may be down. From the CSDM Lite, monitor audio tests on the console peripherals.	See the <i>CSDM Lite Manual</i> .
4	Replace any module that does not meet requirements.	

Non-operational LED

Step	Action	Reference
1	Perform LED test (Test Program #53) and to verify that all LED light upon pressing a button on the control module.	See Chapter 7.
2	Replace any module that has defective LED.	See <i>Releasing an Operator Module from the Desktop</i> in Chapter 6.

Select or unselect speaker volume control does not work

Step	Action	Reference
1	Perform the Volume Test (Test Program #55) on the speakers and the Control Module.	See the <i>Volume Test</i> Chapter 7.
2	If Control Module fails the test, replace the defective module.	See <i>Releasing an Operator Module from the Desktop</i> in Chapter 6.
3	Perform the Tone test (Test Program #61) to verify that a tone can be routed from the console to the speaker.	See the <i>Tone Test</i> in Chapter 7.
4	If the Tone test fails, replace the speaker module.	See <i>Opening the Desktop Assembly</i> in Chapter 6.

The console is not working (no LED or no display)

Step	Action	Reference
1	Verify that the console power supply is plugged to the 115 VAC output. Make sure the 115 VAC outlet is serviceable.	See Power Supply in Chapter 3.
2	Verify that the power supply cord is properly plugged into the console.	
3	Verify that the fuses on the main board have continuity.	See the <i>Desktop Console main-board in Appx. B</i> (F1, F2 etc.)
4	Verify that all the cables from the console to peripheral equipment are tight and secured.	
5	If all the above fails, contact Motorola for assistance.	See the <i>General</i> heading in the <i>Preface</i> section of this manual.

The Keypad display says “BOOTSTRAP”

Step	Action	Reference
1	Use the CSDM Lite Upgrade menu to upload console software.	See <i>Reloading the Console Software</i> in Chapter 8.
2	If the above fails, or if you do not have a copy of the console software, contact Motorola for assistance.	

The Keypad display says “NOT IN DATABASE”

Step	Action	Reference
1	Use the CSDM Lite to upload the configuration database.	See <i>Reloading the Factory Database</i> in Chapter 8.
2	If the above fails, or if you do not have a copy of your customer database, contact Motorola for assistance.	

Hardware diagnostic status is not “PASSED”

Step	Action	Reference
1	Connect a loopback cable to the console connector for the channel or channels in question.	See <i>Appendix A</i> to create a cable for loopback testing.
2	Test the channel or channels in question to determine if the problem is in the console or in the connected equipment.	
3	If the problem is in the console, contact Motorola for repair or replacement of parts.	

CSDM does not communicate with CommandSTAR Lite”

Step	Action	Reference
1	Check console Keypad Test 73 to confirm the RS-232 port is set to CSDM	See <i>Test 73</i> .
2		

Chapter 10 Preventive Maintenance

Introduction

This chapter describes the tests and procedures that should be performed at regular intervals to avoid or minimize problems with your CommandSTAR Lite system.

Monitoring the CommandSTAR Lite with the CSDM

A feature of the CommandSTAR Lite is the internal storage of fault diagnostics. The CSDM for the CommandSTAR Lite provides messages log that gives you direct information on how the system is behaving. A log file keeps a record of all system diagnostics that occur while the CSDM is running. The Diagnostics are recorded regardless of whether a user is logged in. The CSDM is capable of storing up to 100 messages which are retrieveable when the CSDM is powered on.

Monitoring Messages

The CSDM Lite message should be verified regularly. The CSDM Lite messages provide alarms and diagnostics of critical problems and may identify minor problems that may be attended at an early stage, before they develop into major problems. Motorola offers maintenance contracts where Motorola monitors your system remotely and identifies possible problems which may become major concerns.

Site Maintenance

For the equipment to perform reliably and safely, certain requirements regarding the site maintenance must be met according to the equipment specifications. However, the site should be monitored on a continuous basis to ensure that the system is not affected by environmental changes such as new constructions, additions and modifications to an existing site. This chapter reviews site related topics necessary to minimize problems in the future.

Cleaning the Consoles, Modules

WARNING: The use of isopropyl alcohol or strong detergents to clean the outside surface of the equipment, may permanently damage or dull the finish of the equipment.

Outside Surface

It is recommended that any outside surface be cleaned using a soft damp cloth with warm water and a soft soap solution.

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Appendix A Pin-outs and Settings

Connector Pin-outs

CHAMP1 50-pin Connector (CH. 1–4)

PIN	SIGNAL		PIN	SIGNAL	
	CONVENT'L	DIGITAL		CONVENT'L	DIGITAL
1	GND		26	GND	
2	TX+ CH 1		27	TX– CH 1	
3	RX+ CH 1		28	RX– CH 1	
4	RCU+ CH 1	DATA+ CH 1	29	RCU– CH 1	DATA– CH 1
5	M LEAD+ CH 1		30	M LEAD– CH 1	
6	E LEAD CH 1	DIG BUSY CH 1	31	GND	
7	RECORDER+ CH 1		32	RECORDER– CH 1	
8	TX+ CH 2		33	TX– CH 2	
9	RX+ CH 2		34	RX– CH 2	
10	RCU+ CH 2	DATA+ CH 2	35	RCU– CH 2	DATA– CH 2
11	M LEAD+ CH 2		36	M LEAD– CH 2	
12	E LEAD CH 2	DIG BUSY CH 2	37	GND	
13	RECORDER+ CH 2		38	RECORDER– CH 2	
14	TX+ CH 3		39	TX– CH 3	
15	RX+ CH 3		40	RX– CH 3	
16	RCU+ CH 3	DATA+ CH 3	41	RCU– CH 3	DATA– CH 3
17	M LEAD+ CH 3		42	M LEAD– CH 3	
18	E LEAD CH 3	DIG BUSY CH 3	43	GND	
19	RECORDER+ CH 3		44	RECORDER– CH 3	
20	TX+ CH 4		45	TX– CH 4	
21	RX+ CH 4		46	RX– CH 4	
22	RCU+ CH 4	DATA+ CH 4	47	RCU– CH 4	DATA– CH 4
23	M LEAD+ CH 4		48	M LEAD– CH 4	
24	E LEAD CH 4	DIG BUSY CH 4	49	GND	
25	RECORDER+ CH 4		50	RECORDER– CH 4	

To create a cable for loopback testing (see *CSDM Lite Manual*), connect the following pins:

- Pin 2 to Pin 3 and Pin 27 to 28 for Channel 1
- Pin 8 to Pin 9 and Pin 33 to 34 for Channel 2
- Pin 14 to Pin 15 and Pin 39 to Pin 40 for Channel 3
- Pin 20 to Pin 21 and Pin 45 to Pin 46 for Channel 4

CHAMP2 50-pin Connector (CH. 5–8)

PIN	SIGNAL		PIN	SIGNAL	
	CONVENT'L	DIGITAL		CONVENT'L	DIGITAL
1	GND		26	GND	
2	TX+ CH 5		27	TX– CH 5	
3	RX+ CH 5		28	RX– CH 5	
4	RCU+ CH 5	DATA+ CH 5	29	RCU– CH 5	DATA– CH 5
5	M LEAD+ CH 5		30	M LEAD– CH 5	
6	E LEAD CH 5	DIG BUSY CH 5	31	GND	
7	RECORDER+ CH 5		32	RECORDER– CH 5	
8	TX+ CH 6		33	TX– CH 6	
9	RX+ CH 6		34	RX– CH 6	
10	RCU+ CH 6	DATA+ CH 6	35	RCU– CH 6	DATA– CH 6
11	M LEAD+ CH 6		36	M LEAD– CH 6	
12	E LEAD CH 6	DIG BUSY CH 6	37	GND	
13	RECORDER+ CH 6		38	RECORDER– CH 6	
14	TX+ CH 7		39	TX– CH 7	
16	RX+ CH 7		40	RX– CH 7	
16	RCU+ CH 7	DATA+ CH 7	41	RCU– CH 7	DATA– CH 7
17	M LEAD+ CH 7		42	M LEAD– CH 7	
18	E LEAD CH 7	DIG BUSY CH 7	43	GND	
19	RECORDER+ CH 7		44	RECORDER– CH 7	
20	TX+ CH 8		45	TX– CH 8	
21	RX+ CH 8		46	RX– CH 8	
22	RCU+ CH 8	DATA+ CH 8	47	RCU– CH 8	DATA– CH 8
23	M LEAD+ CH 8		48	M LEAD– CH 8	
24	E LEAD CH 8	DIG BUSY CH 8	49	GND	
25	RECORDER+ CH 8		50	RECORDER– CH 8	

To create a cable for loopback testing (see *CSDM Lite Manual*), connect the following pins:

- Pin 2 to Pin 3 and Pin 27 to 28 for Channel 5
- Pin 8 to Pin 9 and Pin 33 to 34 for Channel 6
- Pin 14 to Pin 15 and Pin 39 to Pin 40 for Channel 7
- Pin 20 to Pin 21 and Pin 45 to Pin 46 for Channel 8

Call Director RJ45 Connector (CALL DIR)

PIN	SIGNAL
1	CALL DIRECTOR RX-
2	CALL DIRECTOR RX+
3	OFF HOOK
4	HANDSET SENSE
5	CALL DIRECTOR TX-
6	CALL DIRECTOR TX+
7	SHIELD
8	GND

Deskmic RJ45 Connector (DESKMIC)

PIN	SIGNAL
1	—
2	—
3	MIC PTT
4	MIC IN+
5	MIC IN-
6	MONITOR
7	—
8	—

Headset RJ45 Connector (HEADSET OPR)

PIN	SIGNAL
1	OPER MIC-
2	OPER MIC+
3	PTT SWITCH
4	HEADSET SENSE
5	OPER HDST-
6	OPER HDST+
7	SHIELD
8	—

Supervisor Headset RJ45 Connector (HEADSET SUPV)

PIN	SIGNAL
1	SUPV MIC–
2	SUPV MIC+
3	PTT SWITCH
4	HEADSET SENSE
5	SUPV HDST–
6	SUPV HDST+
7	SHIELD
8	—

PTT Footswitch Connector (FT SW)

PIN	SIGNAL
1	FOOTSWITCH PTT
2	GND
3	MONITOR

Gooseneck Microphone Connector (MIC)

PIN	SIGNAL
1	MIC–
2	MIC+
3	MIC–

CSDM Lite DB9 RS-232 Connector (CSDM/RS232)

PIN	SIGNAL
1	SHIELD
2	RS-232 RX
3	RS-232 TX
4	—
5	GND
6	EXT TONE ENCODER RX+
7	EXT TONE ENCODER RX–
8	EXT TONE ENCODER SENSE
9	GND

I/O Module DB15 RS-422 Connector (EXT. I/O MODULE)

PIN	SIGNAL
1	SHIELD
2	+5V
3	+5V
4	+5V
5	+5V
6	RESET+
7	GND
8	RS-422 RX+
9	GND
10	RS-422 TX+
11	RESET–
12	GND
13	RS-422 RX–
14	GND
15	RS-422 TX–

Instant Logging Recorder RJ12 Connector (LOG REC)

PIN	SIGNAL
1	—
2	RELAY/NO
3	RECORD+
4	RECORD–
5	RELAY/CM
6	—

CO Line RJ12 Connector (CO LINE)

PIN	SIGNAL
1	—
2	LINE 2 TIP
3	LINE 1 RING
4	LINE 1 TIP
5	LINE 2 RING
6	—

Power Supply Connector (+5VIN)

PIN	SIGNAL
1	GND
2	IN -12V
3	IN +5V
4	IN -5A
5	IN +12V
6	GND
7	IN +5V
8	—

Jumper Settings

Main Board and Four-Channel Expansion Module

There are four jumpers on the Desktop console Main Board (P1–P4) and four more on the Four-channel Expansion module (also P1–P4). These jumpers are used to enable or disable the Direct Current Option module and to set its operation. Each jumper applies to one channel in the following order:

Channel 1:	Main board P1
Channel 2:	Main board P2
Channel 3:	Main board P3
Channel 4:	Main board P4
Channel 5:	Four-Channel Expansion Module P1
Channel 6:	Four-Channel Expansion Module P2
Channel 7:	Four-Channel Expansion Module P3
Channel 8:	Four-Channel Expansion Module P4

The following table shows the settings for these eight jumpers.

DC Option

PINS	OPEN	CLOSED
1–2	DC Option module present	No DC Option module
3–4	DC Option disabled	DC Option enabled
5–6	DC Loop	Line-to-ground

DIP Switch Settings

S2 Console ID

Use S2 to specify the console address for digital radio. S2 is located toward the left front corner of the console main board (B3).

SWITCH	SETTING
BIT 1	Reserved (must be OFF — erases program code)
BIT 2	Reserved (must be OFF)
BIT 3	Reserved (must be OFF)
BIT 4	Reserved (must be OFF)
BIT 5	Reserved (must be OFF)
BIT 6	Reserved (must be OFF)
BIT 7	Always ON
BIT 8	Reserved (must be OFF — erases ROM database)

S1 Main Board — Console Radio Type

S1 is located near the left rear corner of the console main board (A1).

When a bit in this DIP switch is OFF, the corresponding radio channel is analog. When a bit is ON, the corresponding radio channel is digital.

SWITCH	SETTING
BIT 1	E1/BUSY1 (OFF/ON)
BIT 2	E2/BUSY2 (OFF/ON)
BIT 3	E3/BUSY3 (OFF/ON)
BIT 4	E4/BUSY4 (OFF/ON)

S1 Four-channel Expansion Module — Console Radio Type

S1 is located near the right rear corner of the four-channel expansion module.

When a bit in this DIP switch is OFF, the corresponding radio channel is analog. When a bit is ON, the corresponding radio channel is digital.

SWITCH	SETTING
BIT 1	E5/BUSY5 (OFF/ON)
BIT 2	E6/BUSY6 (OFF/ON)
BIT 3	E7/BUSY7 (OFF/ON)
BIT 4	E8/BUSY8 (OFF/ON)

S1 Digital Radio Interface Module — Loading (Ch. 3–4)

S1 is located near the right rear corner of the Digital Radio Interface module. The DRI module installed on the console main board controls channels 1–4.

SWITCH	SETTING
BIT 1	ON — CH 4 DATA –
BIT 2	ON — CH 4 (WITH LOAD)
BIT 3	ON — CH 4 DATA +
BIT 4	—
BIT 5	—
BIT 6	ON — CH 3 (WITH LOAD)
BIT 7	ON — CH 3 DATA –
BIT 8	ON — CH 3 DATA +

Note: By default, Bit 2 and Bit 6 are OFF.

S2 Digital Radio Interface Module — Channel Loading (Ch. 1–2)

S2 is located near the left rear corner of the Digital Radio Interface module. The DRI module installed on the console main board controls channels 1–4.

SWITCH	SETTING
BIT 1	ON — CH 2 DATA –
BIT 2	ON — CH 2 (WITH LOAD)
BIT 3	ON — CH 2 DATA +
BIT 4	—
BIT 5	—
BIT 6	ON — CH 1 (WITH LOAD)
BIT 7	ON — CH 1 DATA –
BIT 8	ON — CH 1 DATA +

Note: By default, Bit 2 and Bit 6 are OFF.

S2 Digital Radio Interface Module — Channel Loading (Ch. 5–6)

S2 is located near the right rear corner of the Digital Radio Interface module. The DRI module installed on the Four-channel Expansion module controls channels 5–6.

SWITCH	SETTING
BIT 1	ON — CH 6 DATA –
BIT 2	ON — CH 6 (WITH LOAD)
BIT 3	ON — CH 6 DATA +
BIT 4	—
BIT 5	—
BIT 6	ON — CH 5 (WITH LOAD)
BIT 7	ON — CH 5 DATA –
BIT 8	ON — CH 5 DATA +

Note: By default, Bit 2 and Bit 6 are OFF.

SW1 Operator Control Module ID

The keypad module always has an address of 0 (i.e., all bits ON). The first ACM always has an address of 1. The other operator control modules have addresses ranging from 2 to 7, as identified in the CSDM Lite Configuration Report.

Before you install a new operator control module, you must add it to the console's configuration database in the CSDM Lite. The module is assigned an address by the CSDM Lite that you must then enter using the SW1 DIP switches.

SWITCH	SETTING
BIT 1	Module address (MSB)
BIT 2	Module address
BIT 3	Module address (LSB)
BIT 4	—

Example Operator Control Module IDs

SWITCH	KEYPAD	1st ACM	NEXT MODULE	NEXT MODULE	NEXT MODULE	NEXT MODULE	NEXT MODULE	LAST MODULE
BIT 1	ON	ON	ON	ON	OFF	OFF	OFF	OFF
BIT 2	ON	ON	OFF	OFF	ON	ON	OFF	OFF
BIT 3	ON	OFF	ON	OFF	ON	OFF	ON	OFF
BIT 4	ON	ON	ON	ON	ON	ON	ON	ON

Appendix B

Component Layouts

Component Layout Diagrams

This appendix contains component layout diagrams for the following modules:

- Console Main Board (DDN6126)
- Four-channel Expansion Module (DDN6127)
- Two-CO Line Module (CDN6275)
- Keypad Control Module (DDN6129)
- Channel Control Modules (DDN6130, DDN6131 and DDN6696)
- Auxiliary Control Module (DDN6132)
- Digital Radio Interface Module (DDN6137)
- Digital Radio Control Module (DDN6138)
- Direct Current Option Module (TDN9897) Top and Bottom Views

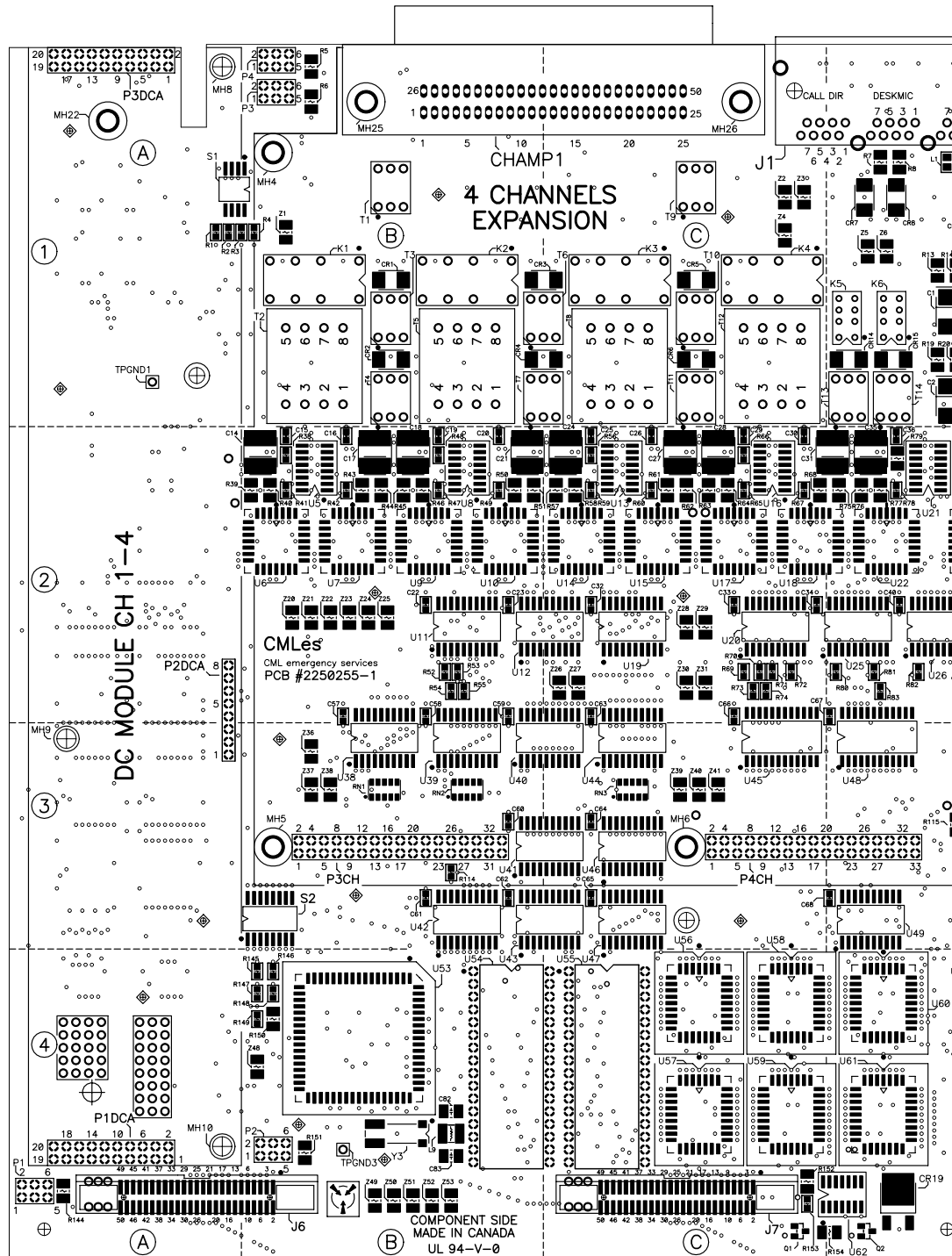


Figure B-1: Console Main Board (DDN6126)

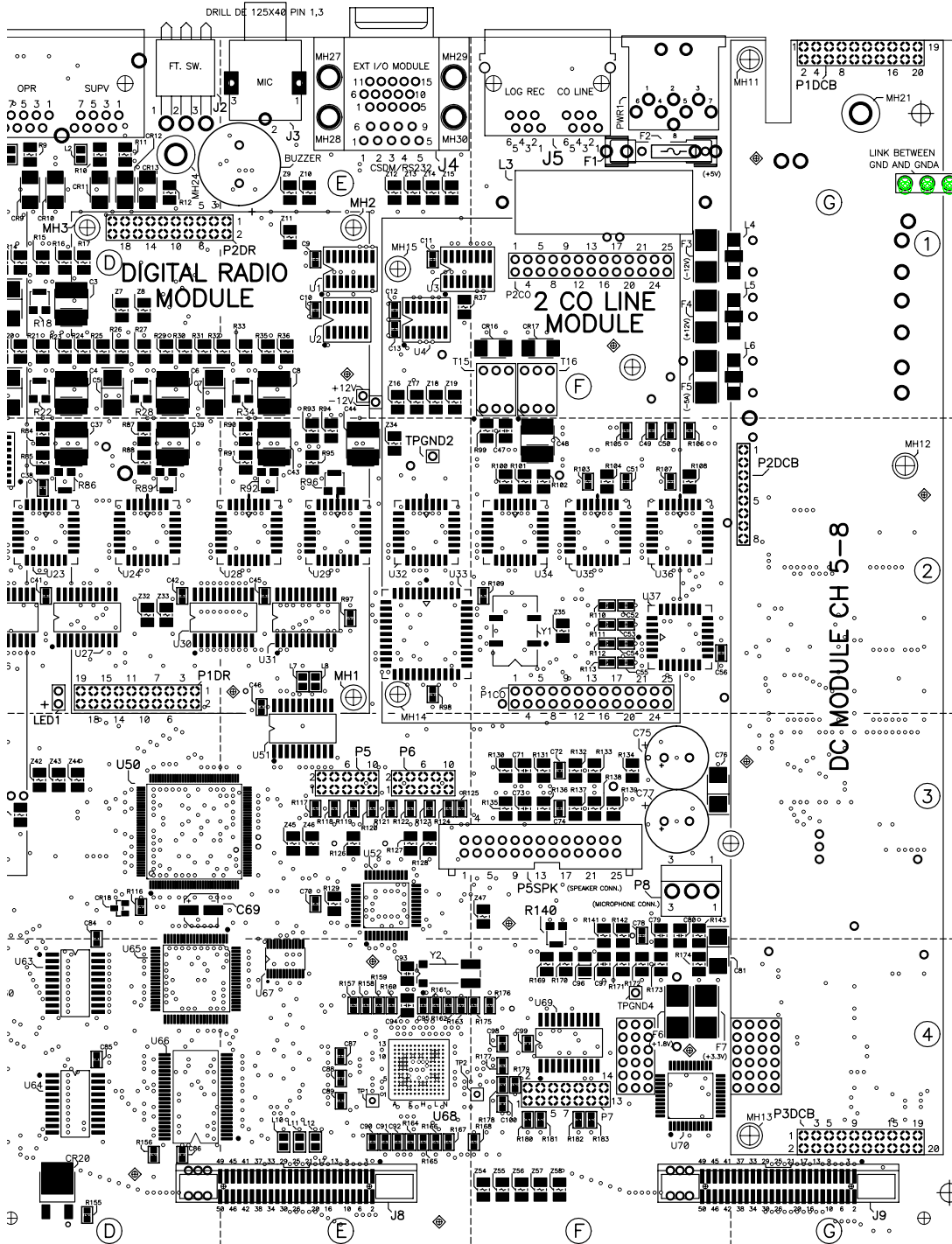


Figure B-2: Console Main Board (DDN6126) (Continued)

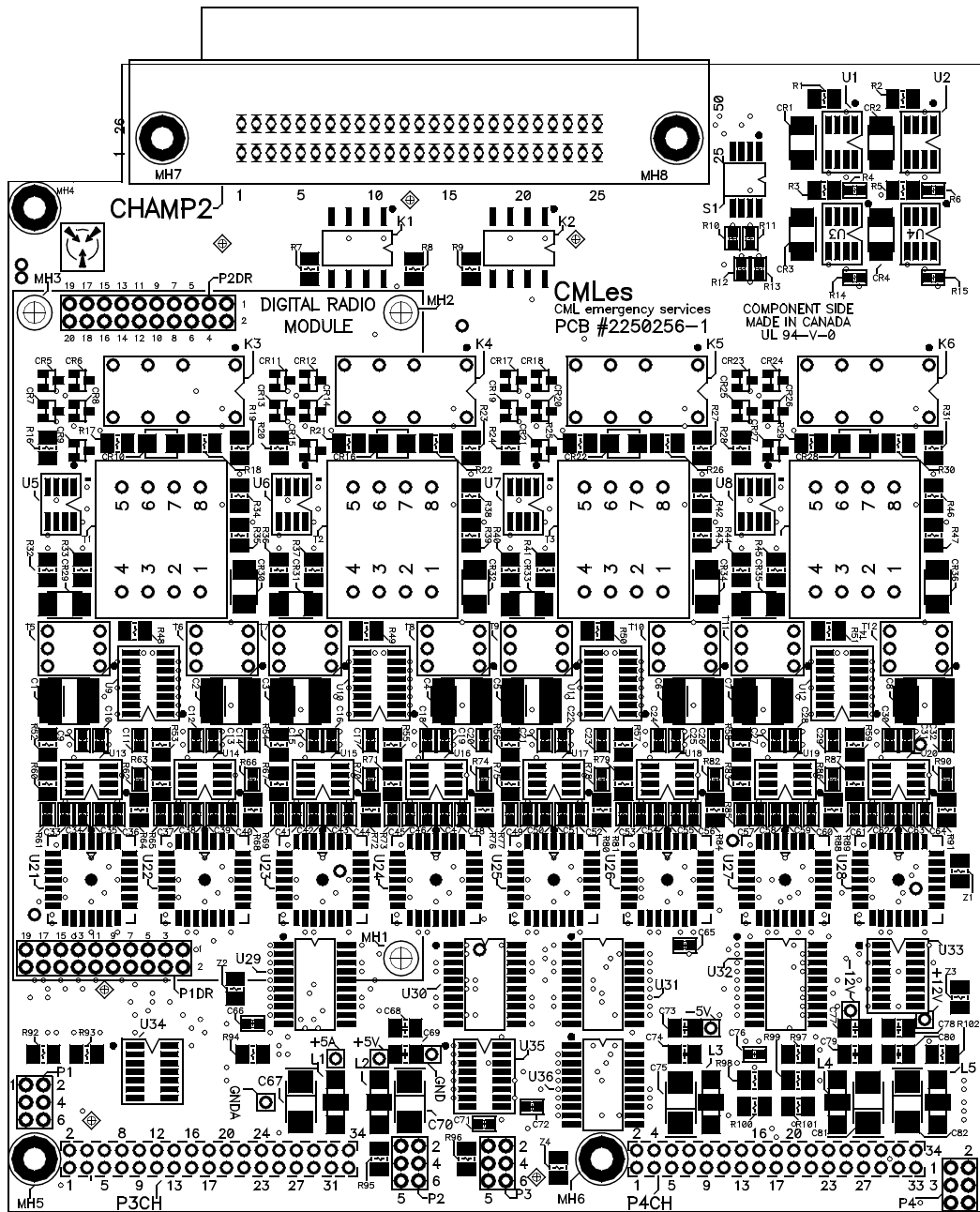


Figure B-3: Four-channel Expansion Module (DDN6127)

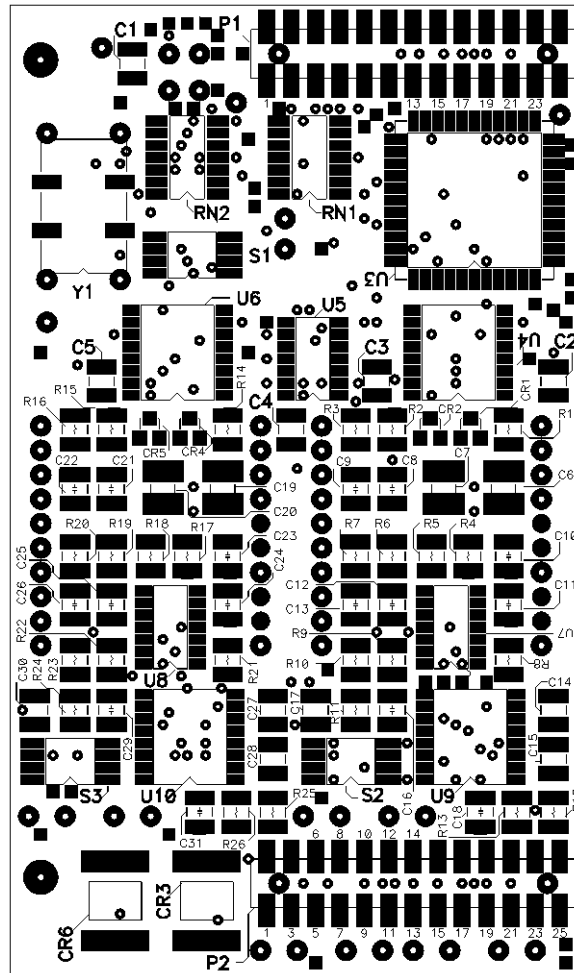


Figure B-4: Two-CO Line Module (CDN6275)

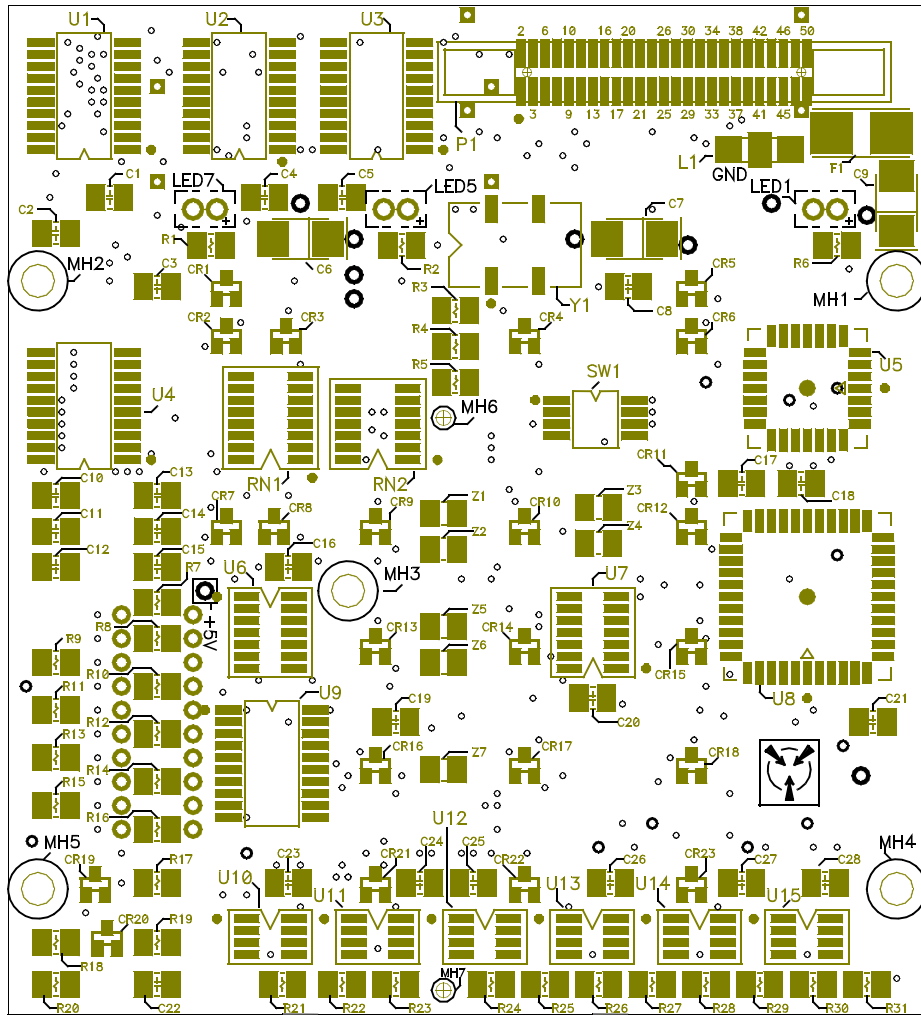


Figure B-5: Keypad Control Module (DDN6129)

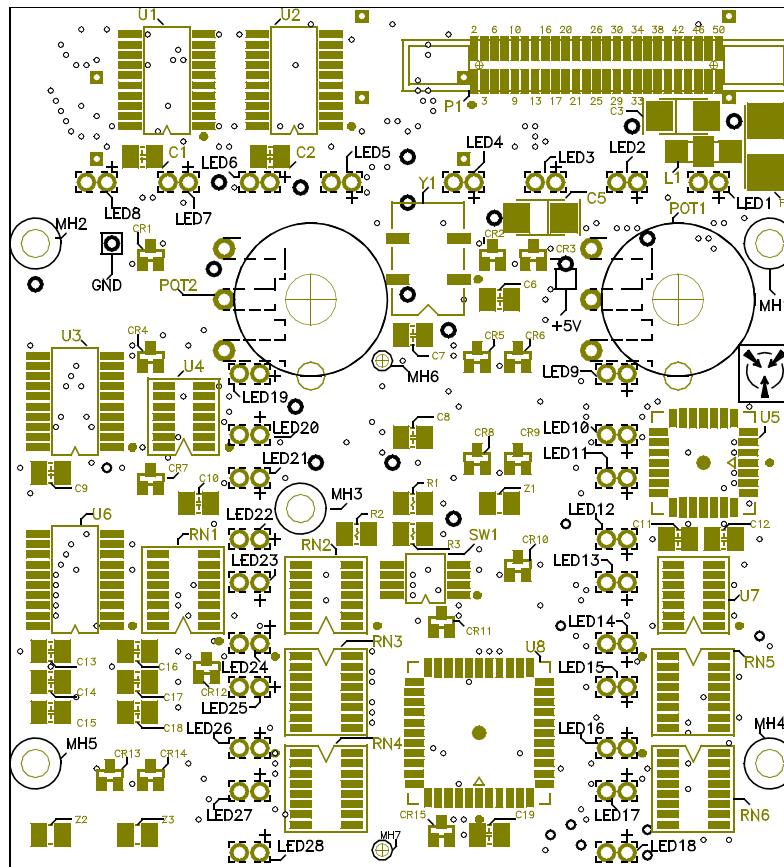


Figure B-6: Channel Control Modules (DDN6130, DDN6131 and DDN6696)

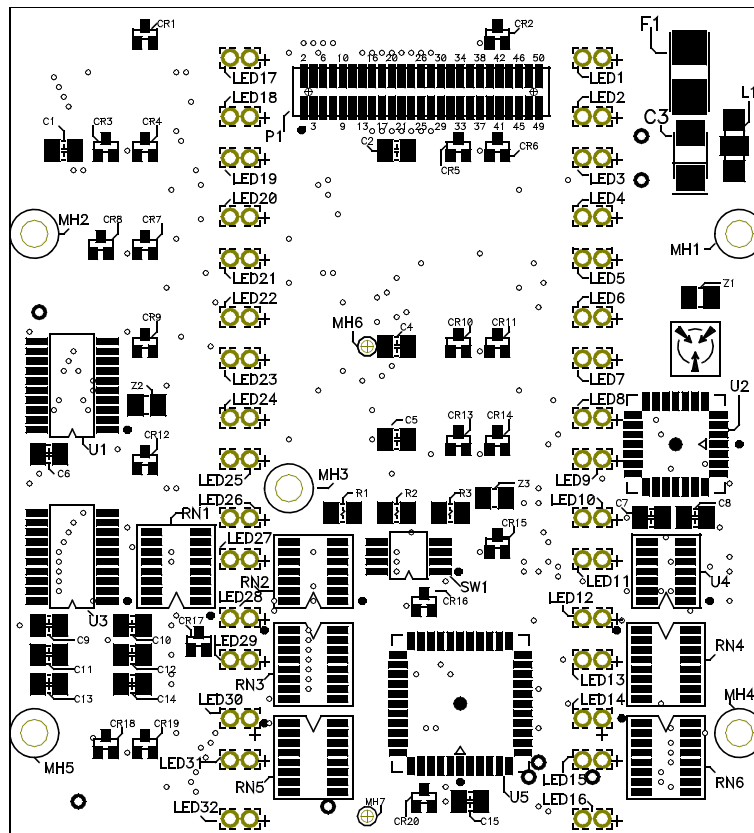


Figure B-7: Auxiliary Control Module (DDN6132)

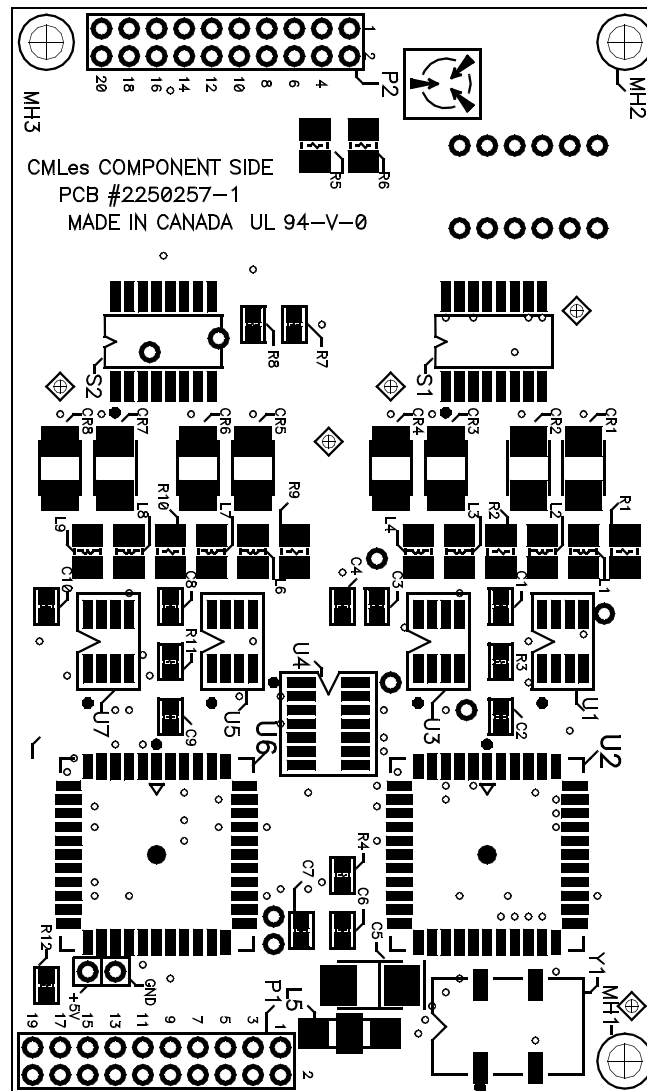


Figure B-8: Digital Radio Interface Module (DDN6137)

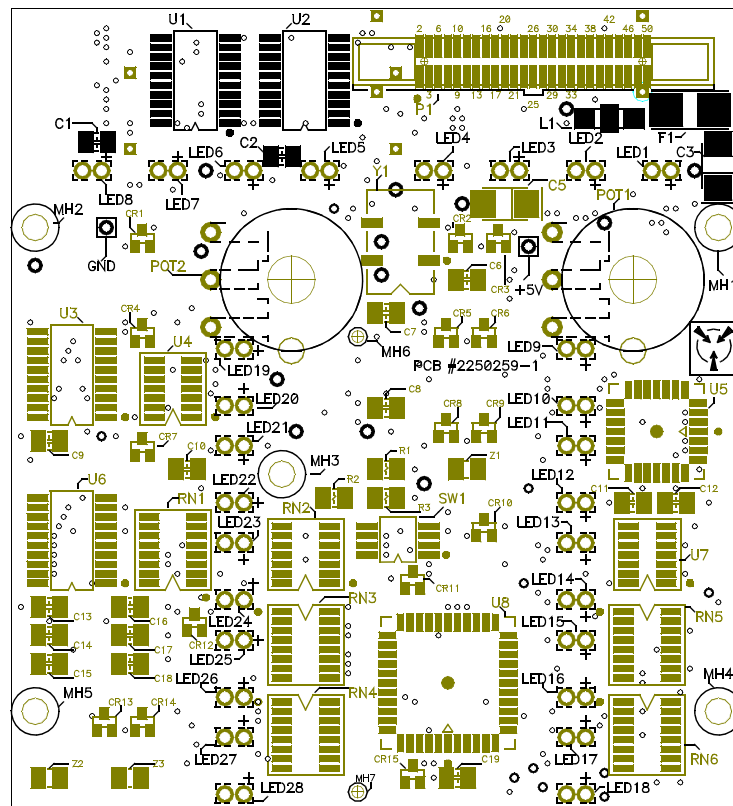


Figure B-9: Digital Radio Control Module (DDN6138)

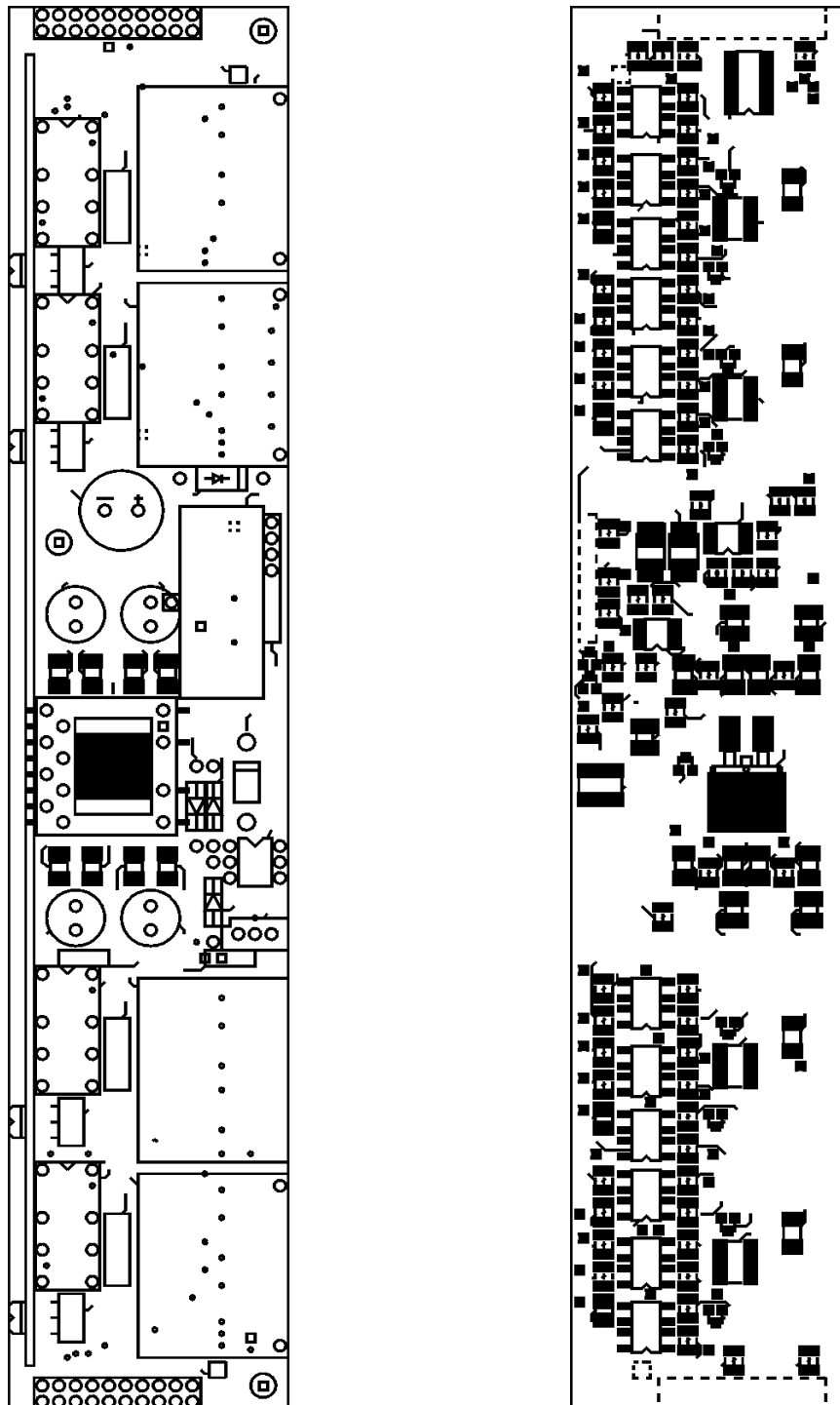


Figure B-10: Direct Current Option Module (TDN9897) Top and Bottom Views

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Appendix C Schematics

Schematic Diagrams

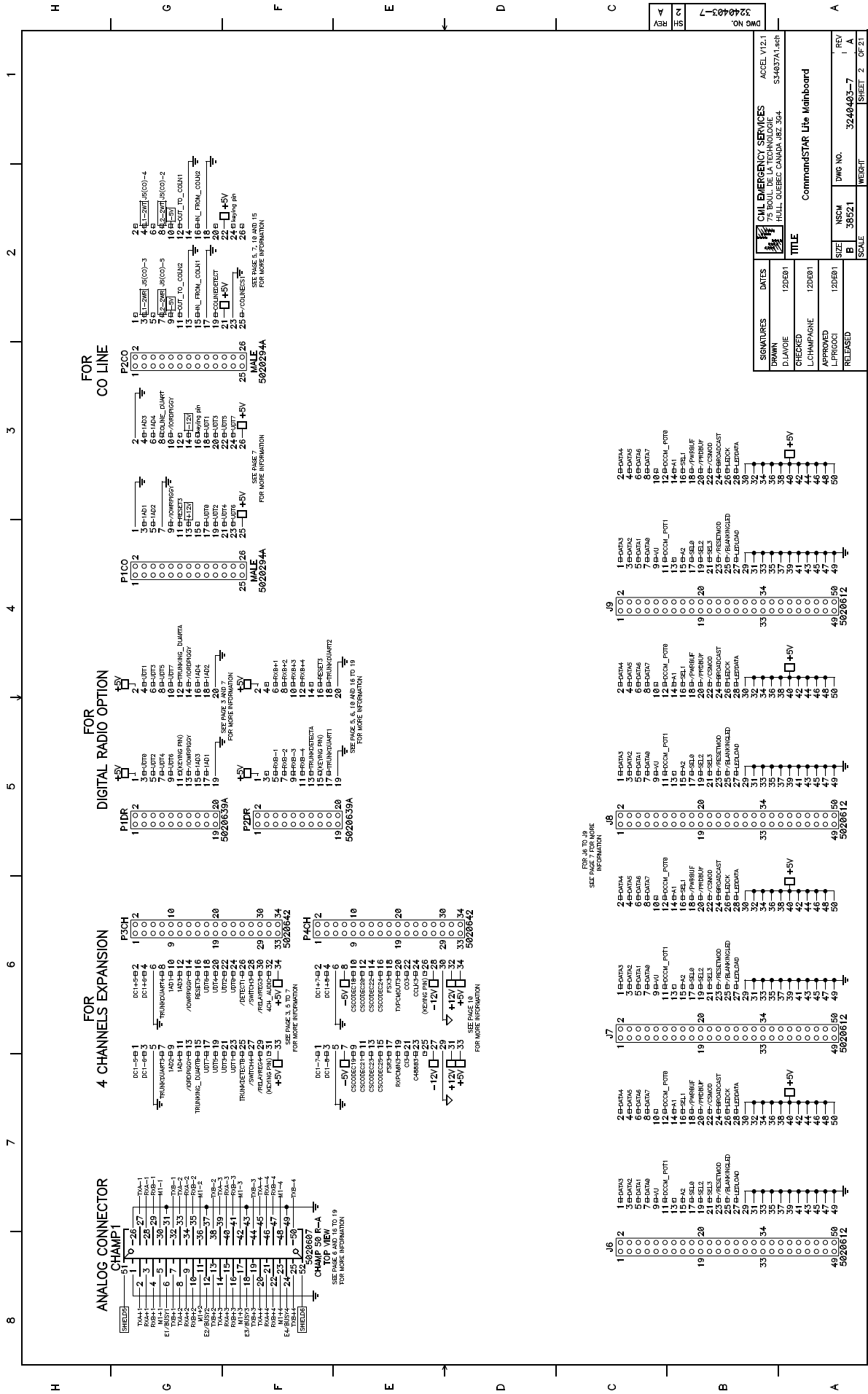
This appendix contains schematic diagrams for the following modules:

- Desktop Console Main Board (DDN6126)
- Four-channel Expansion Module (DDN6127)
- Two-CO Line Module (CDN6275)
- Keypad Control Module (DDN6129)
- Dual Channel Control Module without Display (DDN6130)
- Dual Channel Control Module with Display (DDN6131)
- Single Display Channel Control Module (DDN6696)
- Auxiliary Control Module (DDN6132)
- Digital Radio Interface Module (DDN6137)
- Digital Radio Control Module (DDN6138)
- Direct Current Option Module (TDN9897)
- I/O Module (CDN6179)

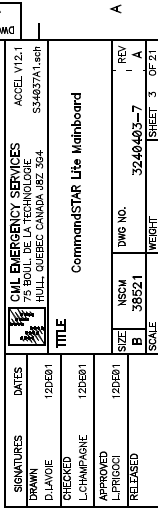
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3-0

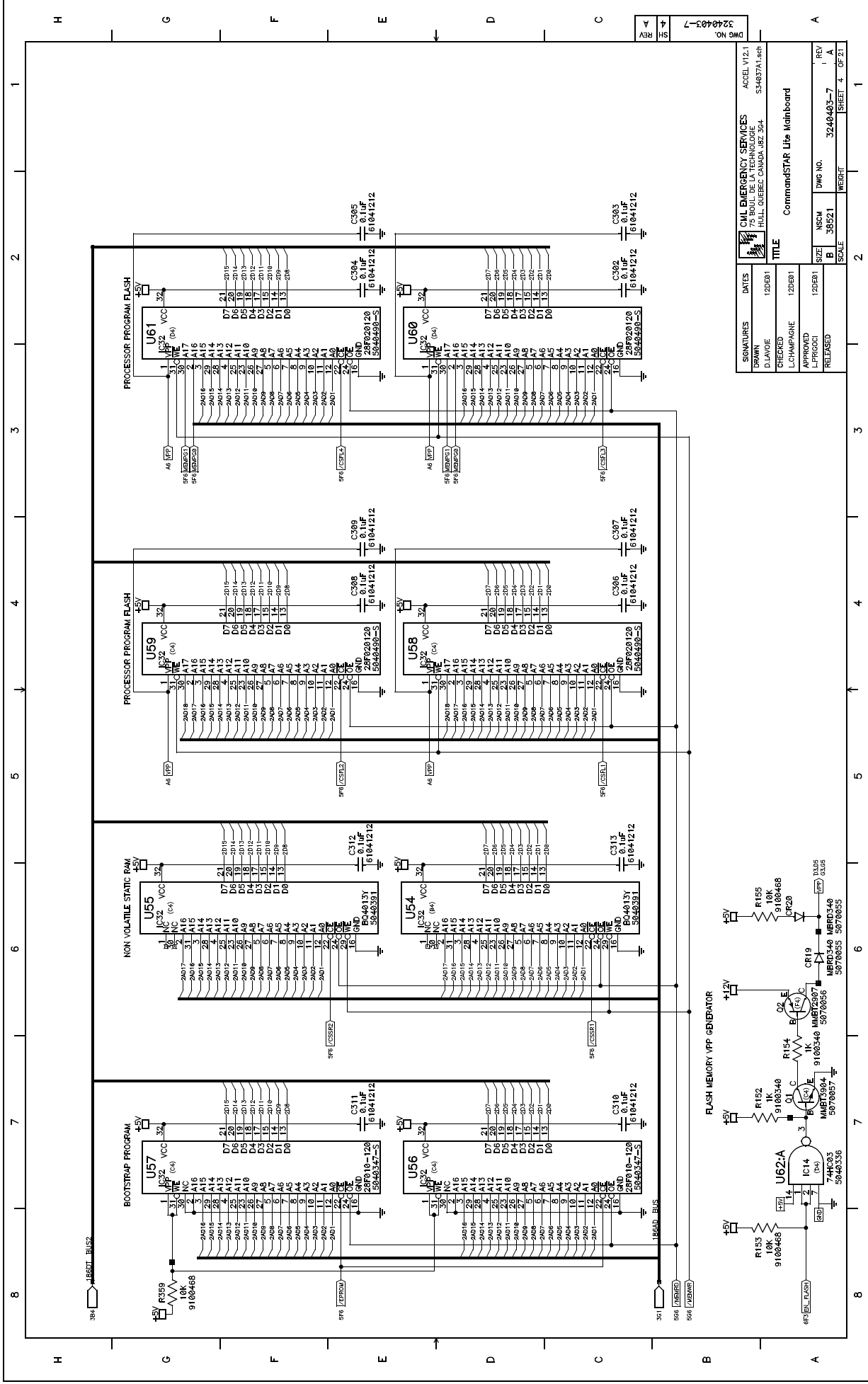


C-4



Schematics — (DDN6126) Console Main Board (4 of 20)

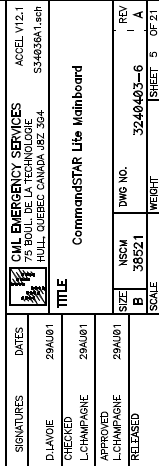
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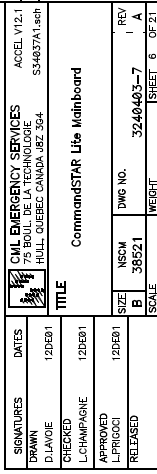
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DR: J. L. Lavoie	12-ED-01	3240403-7	B	4	21
CHECKED: L. Champagne	12-ED-01				
APPROVED: L. Prigot	12-ED-01				
RELEASED:					

GUIL EMERGENCY SERVICES		ACCEL V12.1	
75, RUE DE LA TECHNOLOGIE		S34837A1.sch	
HULL, QUEBEC CANADA J8Z 3G4			
TITLE			
CommandSTAR Lite Mainboard			
SIZE		DWG NO.	
B		3240403-7	
SCALE		WEIGHT	
B		38521	

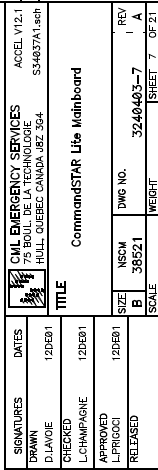
C-6



C-7

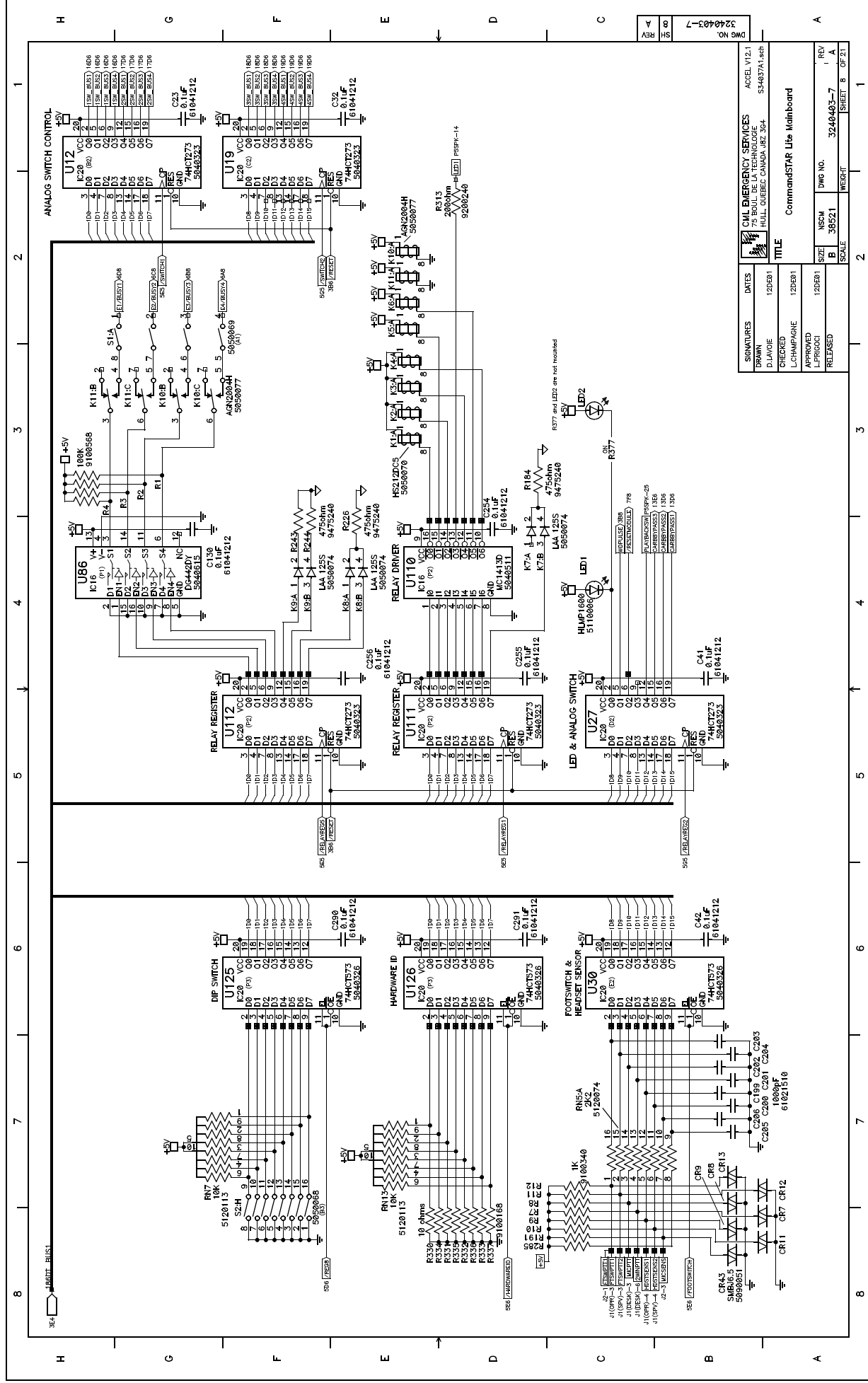


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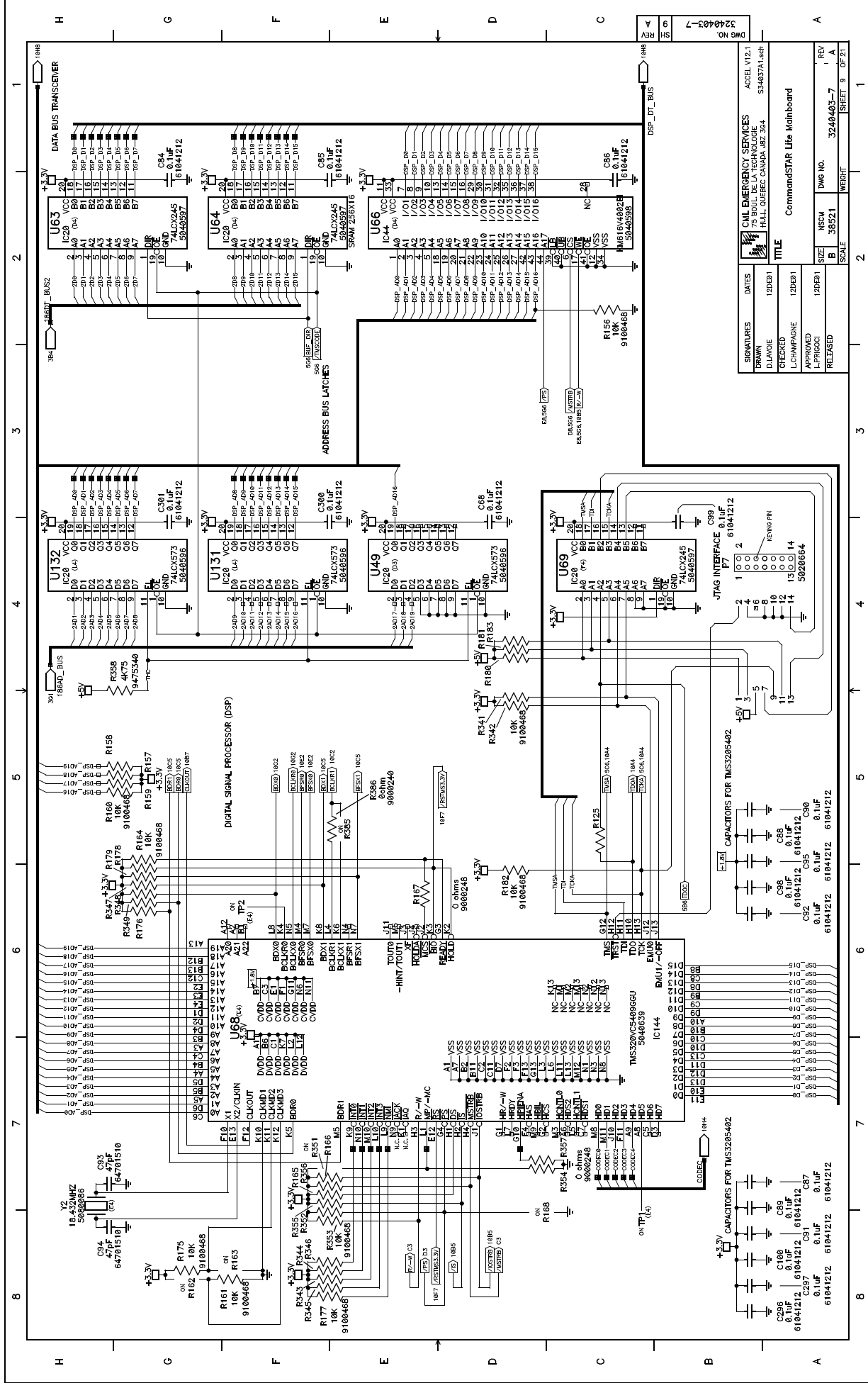
Schematics — (DDN6126) Console Main Board (8 of 20)

C-9



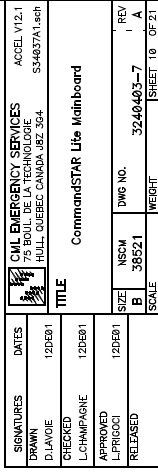
Schematics — (DDN6126) Console Main Board (9 of 20)

C-10



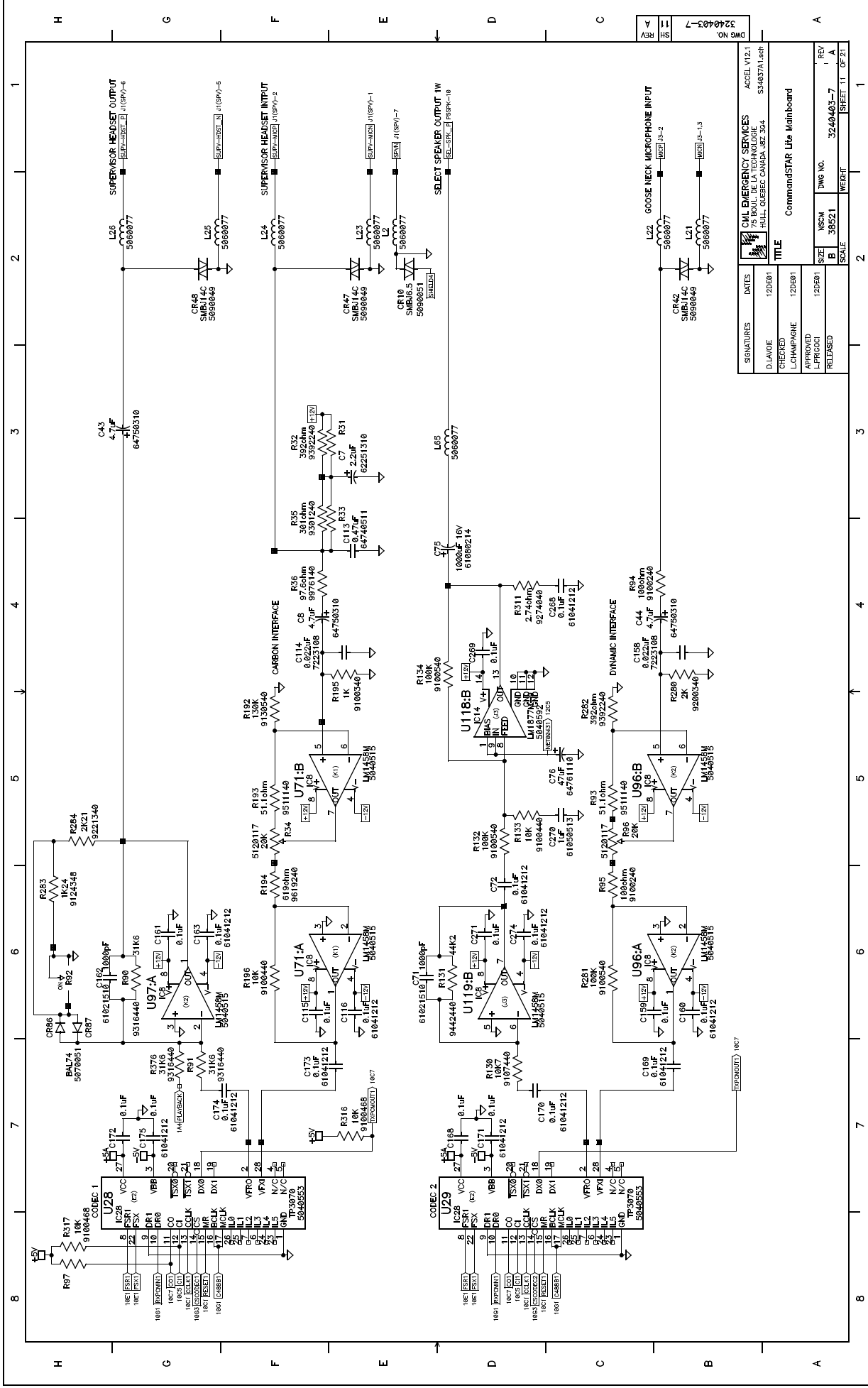
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CHECKED	12/20/01	75 TRAIL BLAZER TECHNOLOGIE
APPROVED	12/20/01	HULL QUEBEC CANADA JEE 304
L-PROOCCI	12/20/01	CommandSTAR Life Mainboard
RELEASED	12/20/01	
SIZE	NSCM	38521
SCALE	DWG NO.	3240403-7
WEIGHT	SHEET	9 OF 21

C-11



Schematics — (DDN6126) Console Main Board (11 of 20)

C-12



SIGNATURES	DATES	REV
DLAVOIE	12-DE-01	1
CHECKED		
L-CHAMPAGNE	12-DE-01	1
APPROVED		
L-PRIGODI	12-DE-01	1
RELEASED		

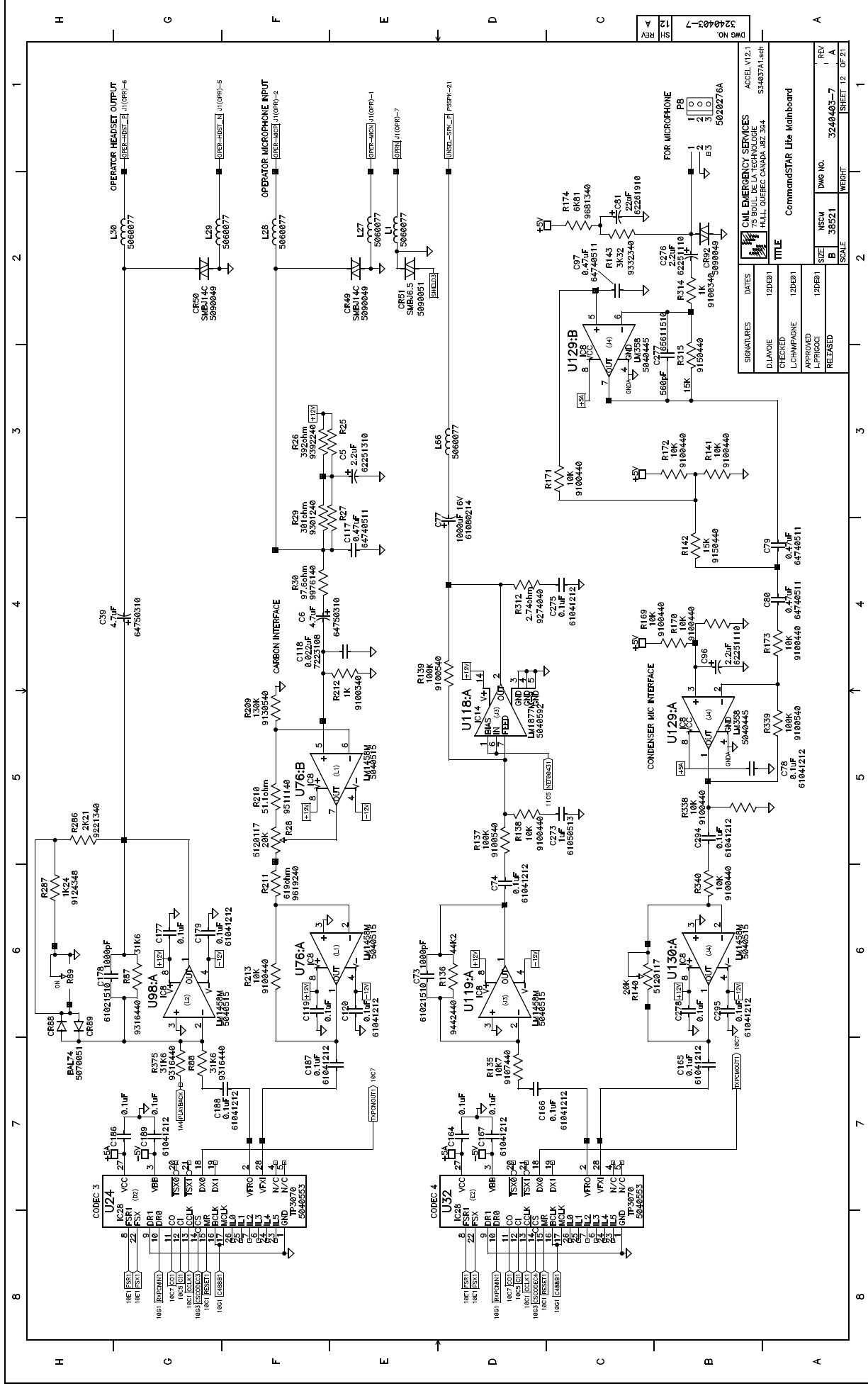
QUL EMERGENCY SERVICES	ACCEL V12.1
75 BOUL. DE LA TECHNOLOGIE	S34837A1.sch
HULL QUEBEC CANADA J8E 3G4	

TITLE	
CommandSTAR Life Mainboard	

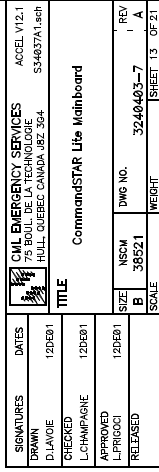
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SCALE	WEIGHT	SHEET 11 OF 21

Schematics — (DDN6126) Console Main Board (12 of 17)

C-13

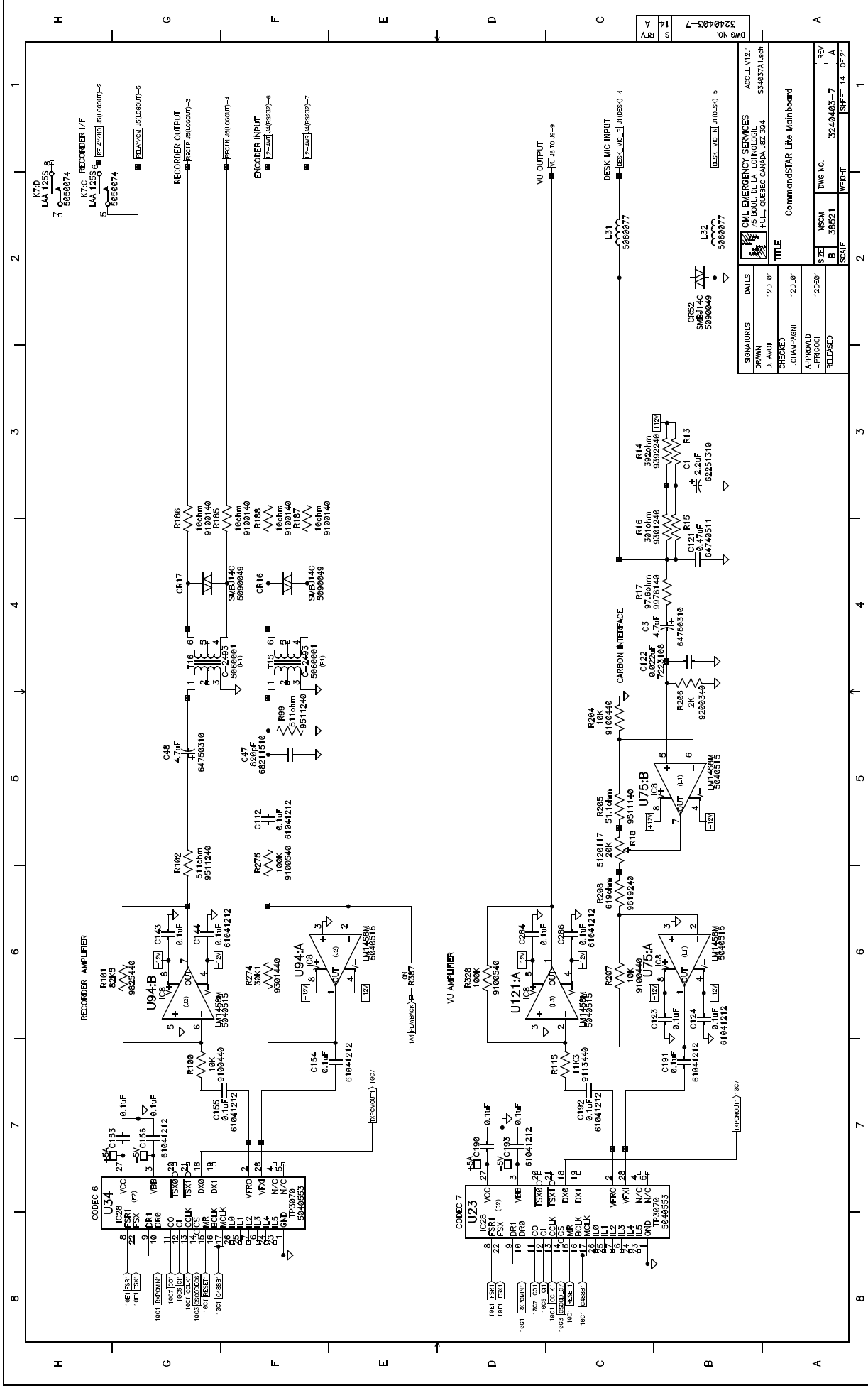


C-14

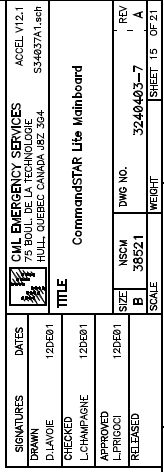


Schematics — (DDN6126) Console Main Board (14 of 20)

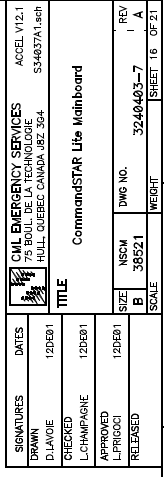
C-15



C-16

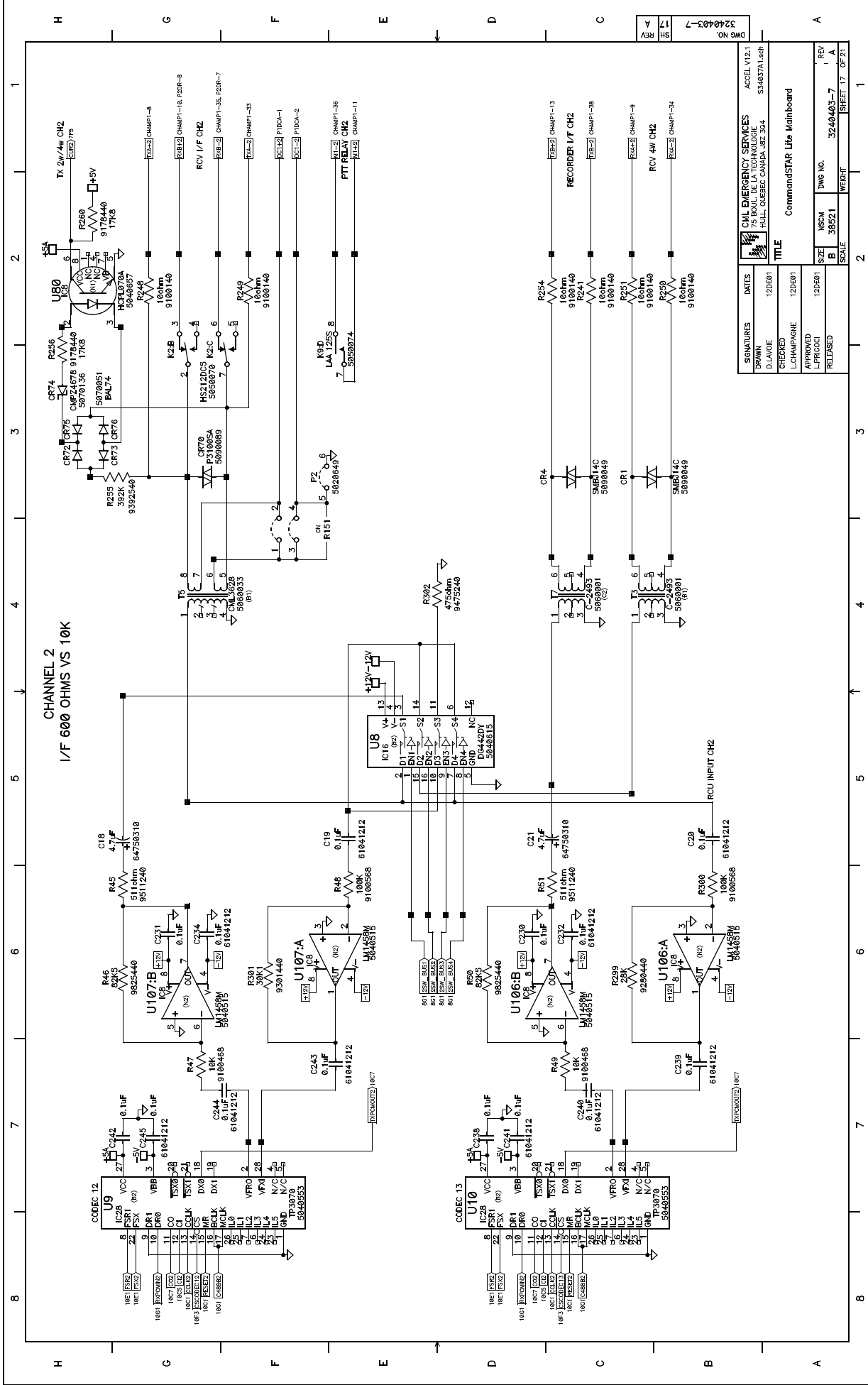


C-17



Schematics — (DDN6126) Console Main Board (17 of 20)

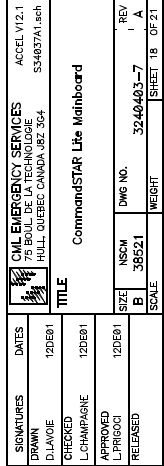
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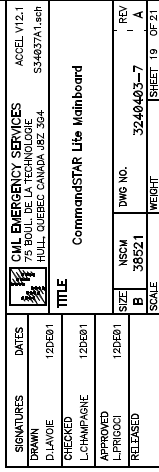
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CHECKED		HULL QUEBEC CANADA JEE 364	
L-COMPAGNE	12-ED01		
APPROVED			
L-PROGOC	12-ED01		
RELEASED			
SIZE	NSCM	DWG NO.	3240403-7
B	38521	A	REV
SCALE		WEIGHT	SHEET 17 OF 21

CommandSTAR Life Mainboard

C-19



C-20

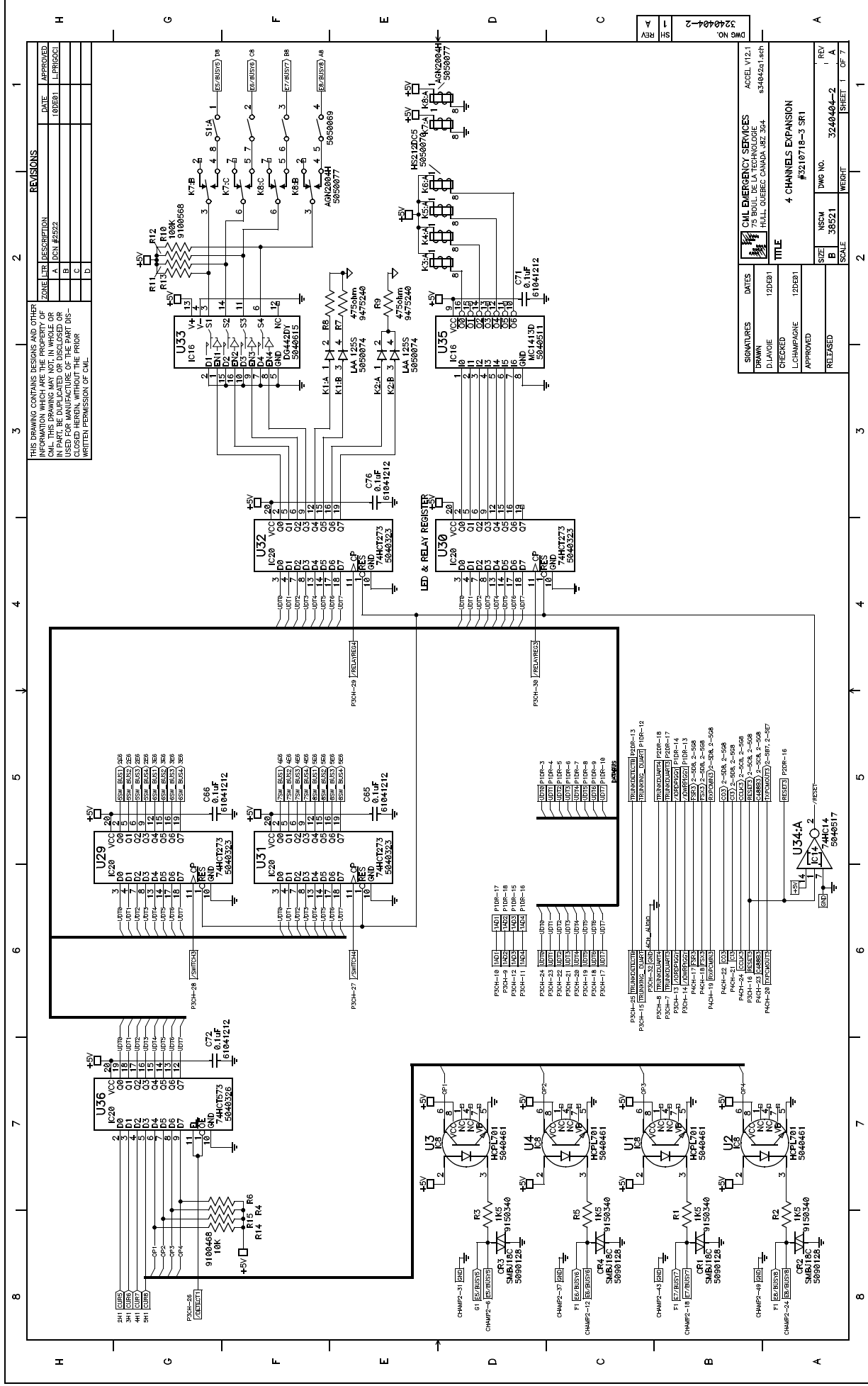


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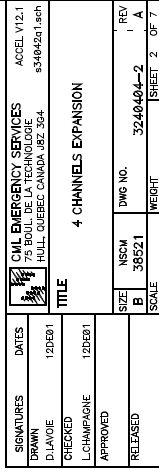


Schematics — (DDN6127) Four-channel Expansion Module (1 of 6)

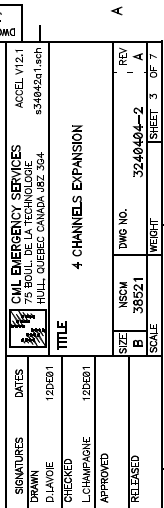
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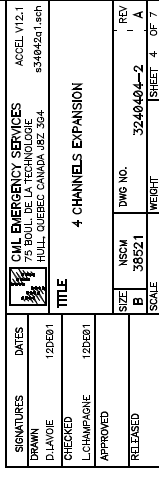
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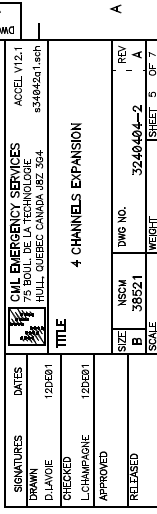
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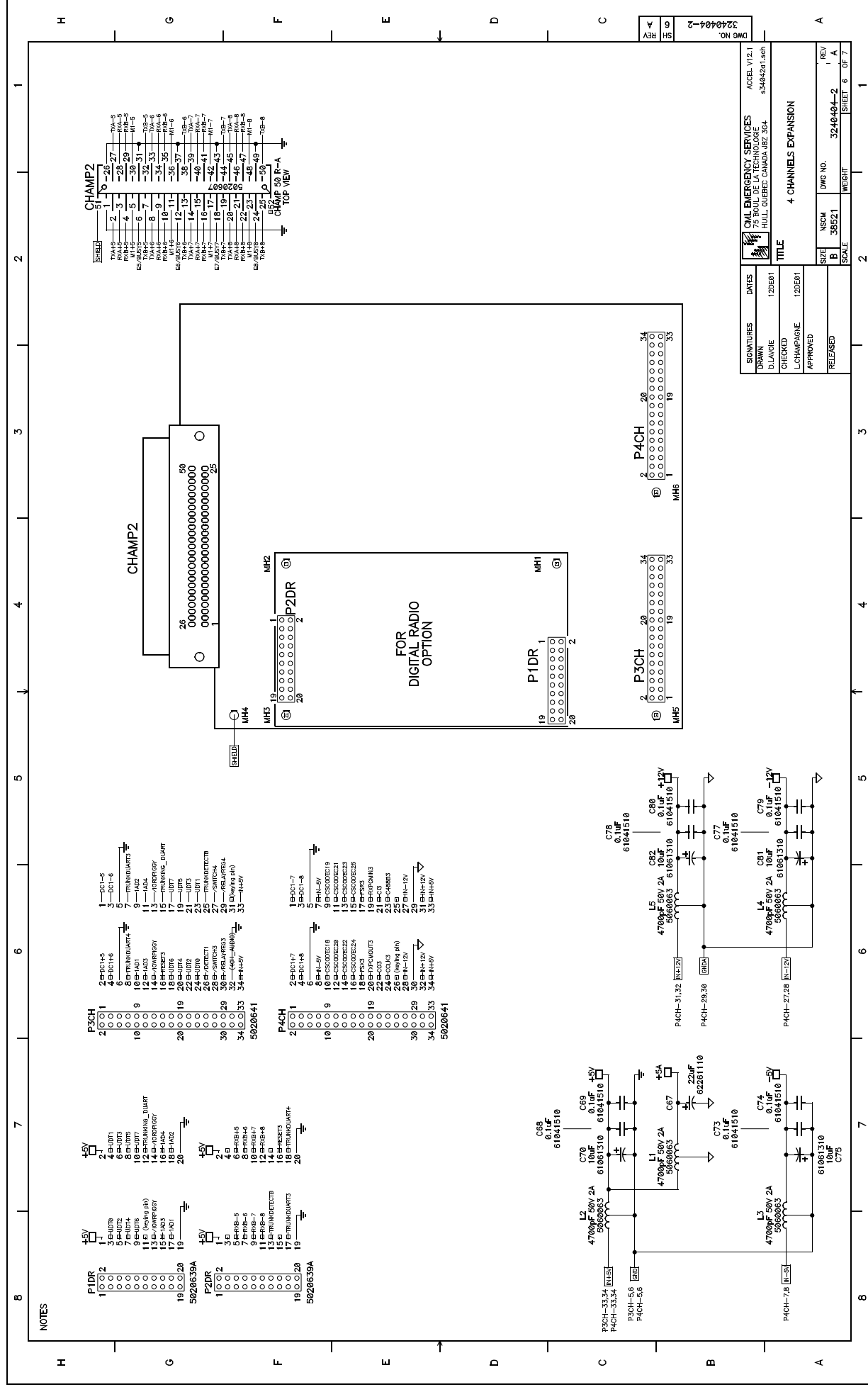
C-25



C-26

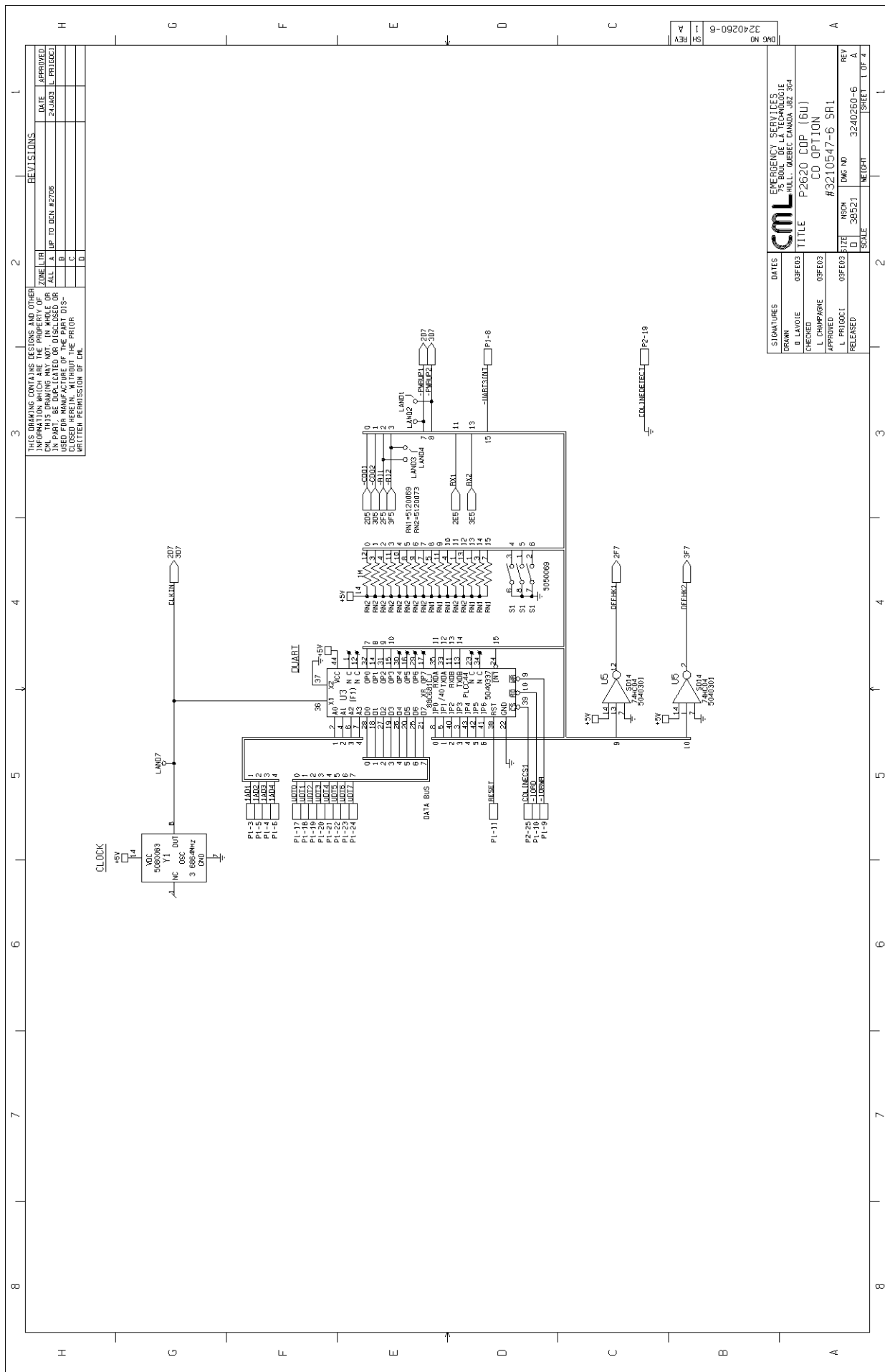


Four-channel Expansion Module (6 of 6)



Schematics — (CDN6275) Two-CO Line Module (1 of 4)

C-28



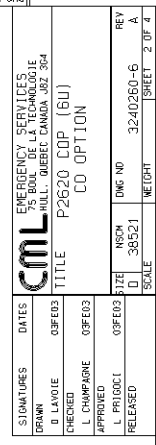
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DRN	03FE03
CHECKED	03FE03
APPROVED	03FE03
RELEASED	03FE03
SCALE	1 OF 4
WEIGHT	1 OF 4

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1000 RUE DU COMMERCE
HULL, QUEBEC CANADA J8T 3K4

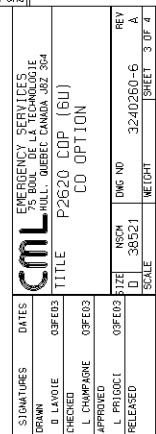
TITLE P2620 COP (BU)
CO OPTION

DWG NO 3240260-6
REV 1
NSCH 38521

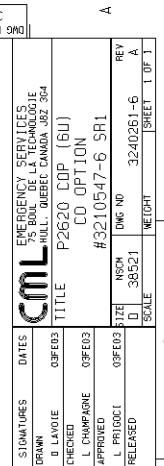
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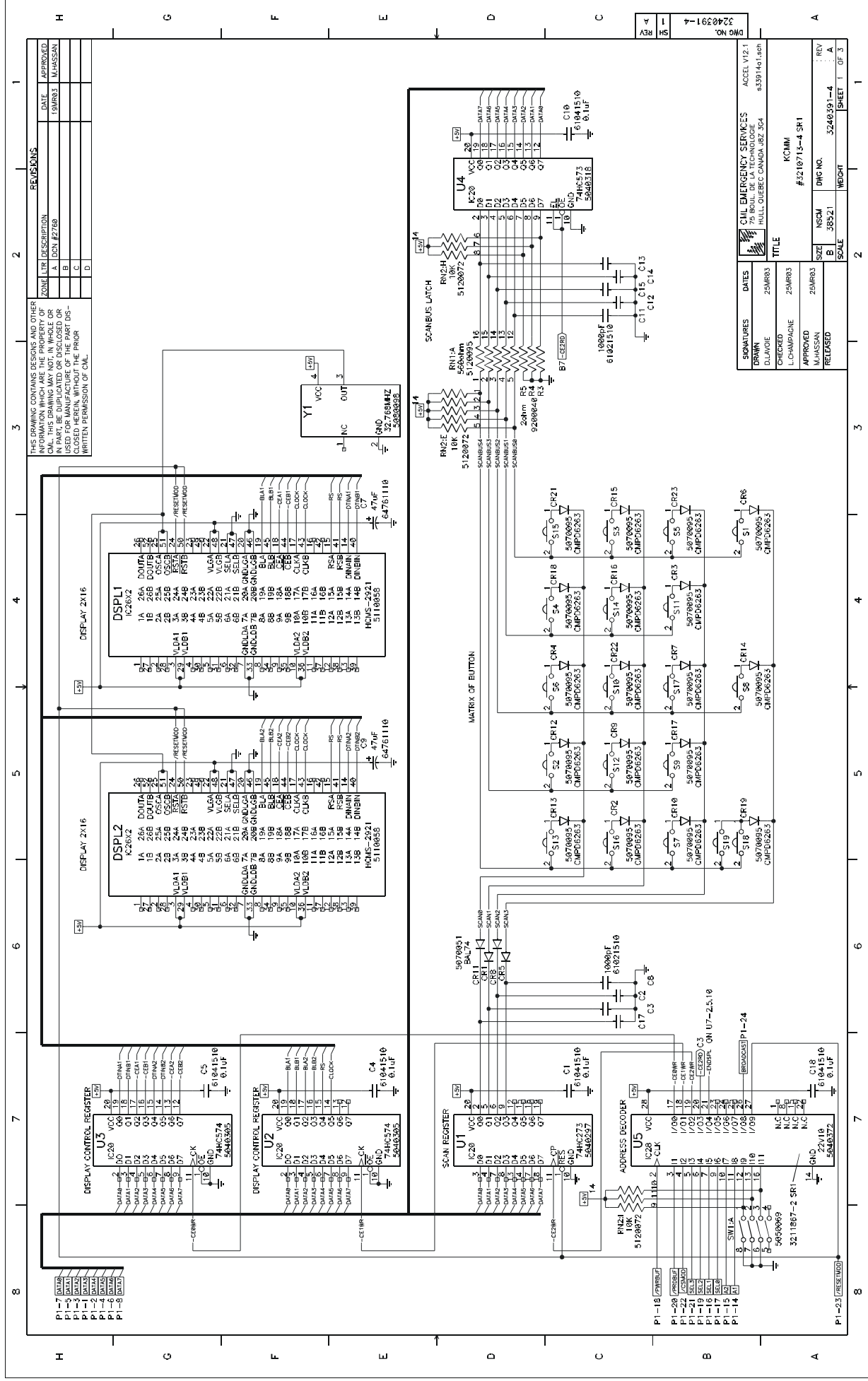
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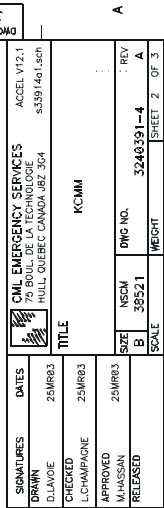
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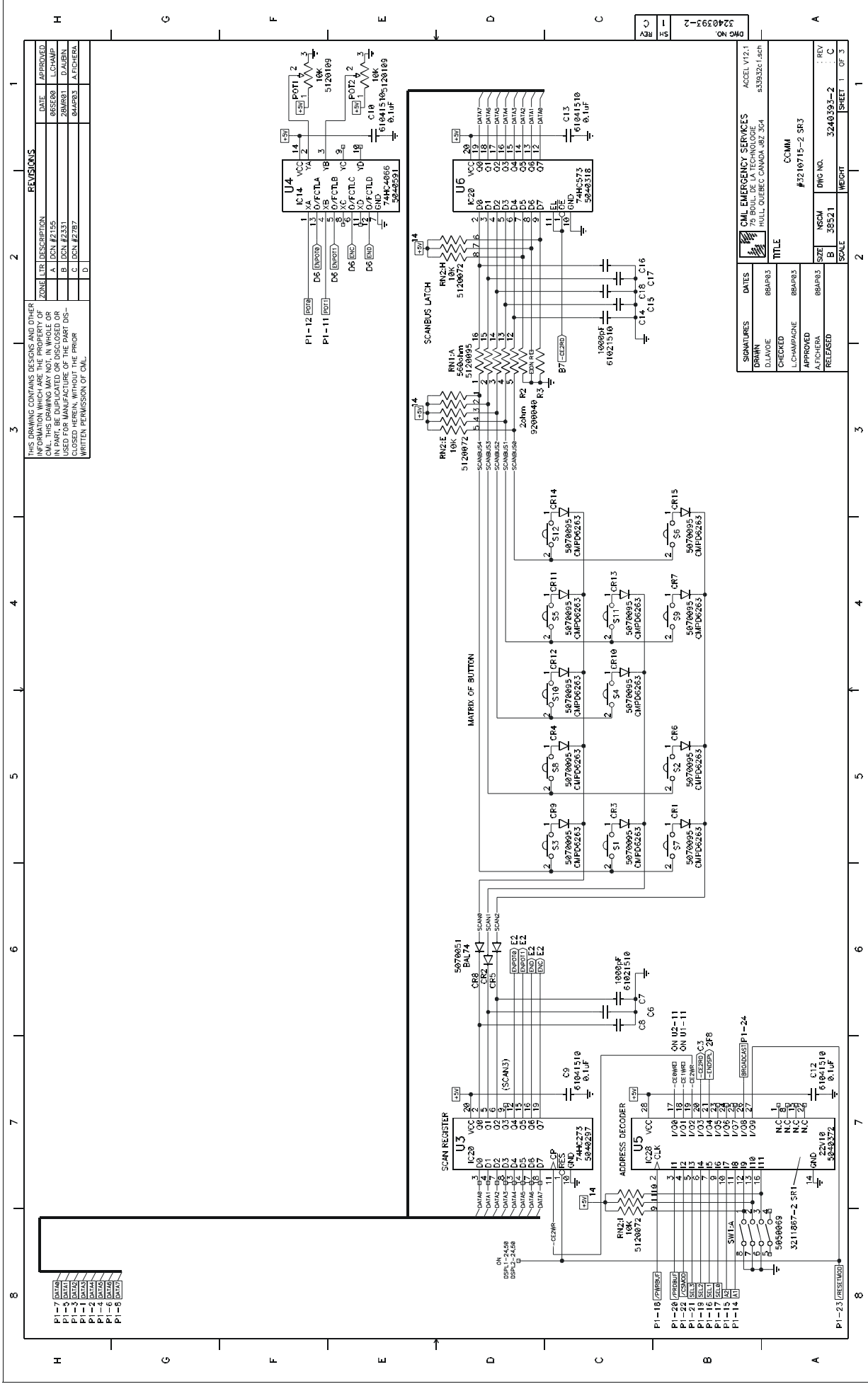


Schematics — (DDN6129) Keypad Control Module (1 of 2)

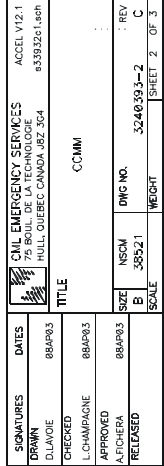


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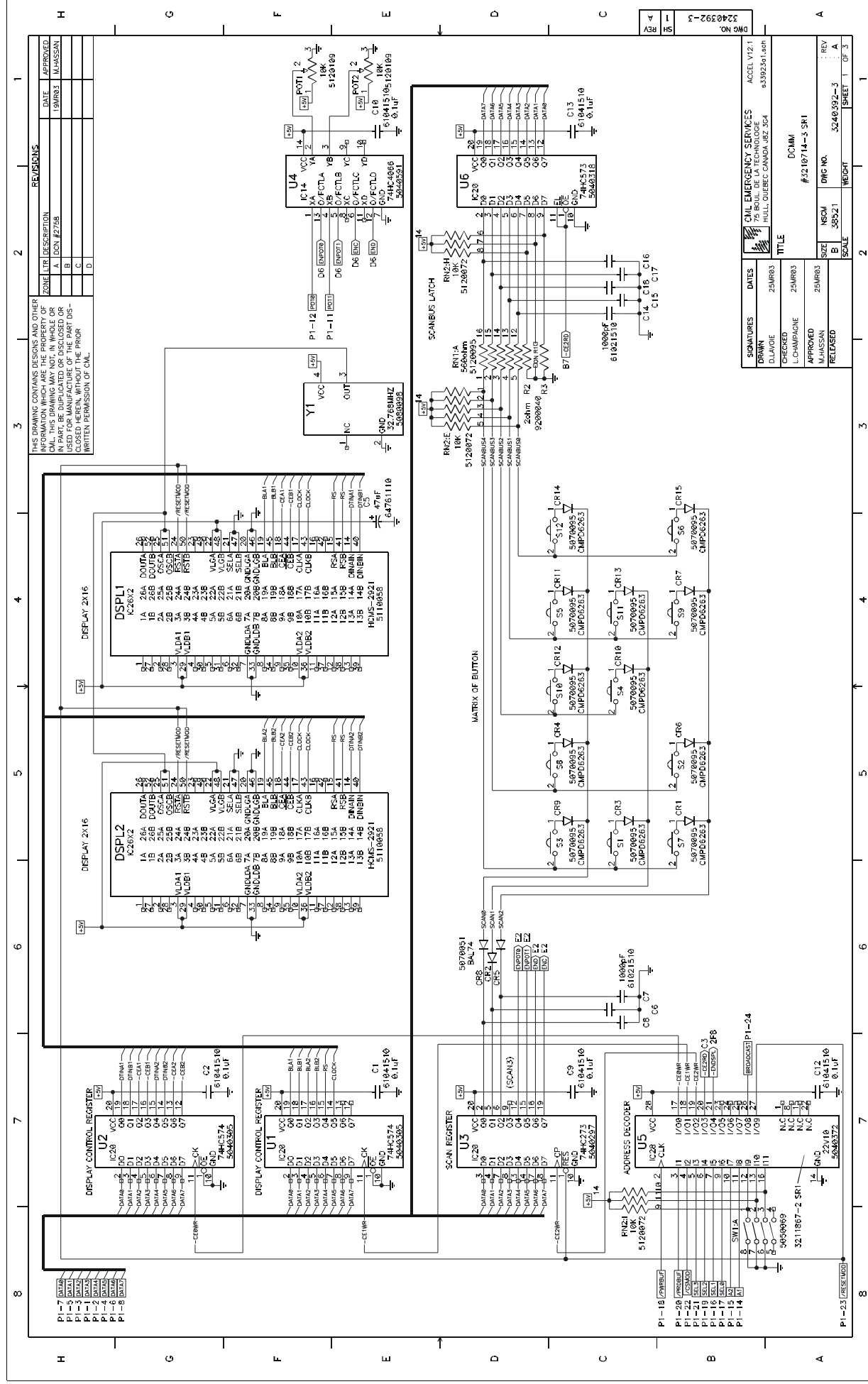




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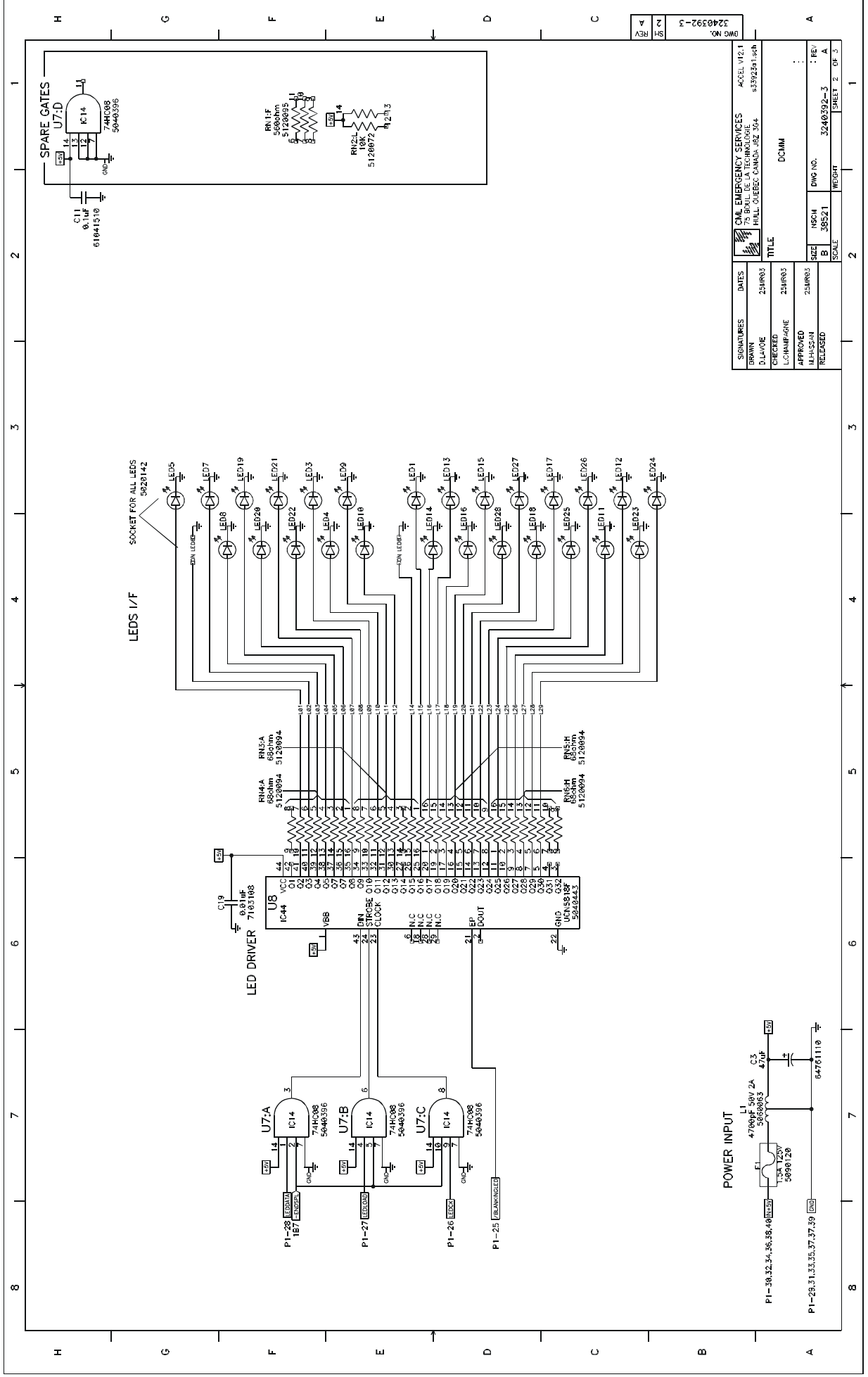


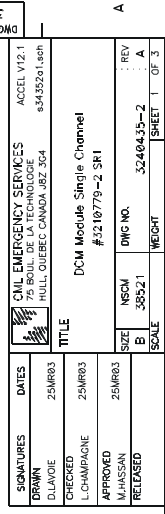
Dual Channel Control Module with Display (1 of 2)



Schematics — (DDN6131) Dual Channel Control Module with Display (2 of 2)

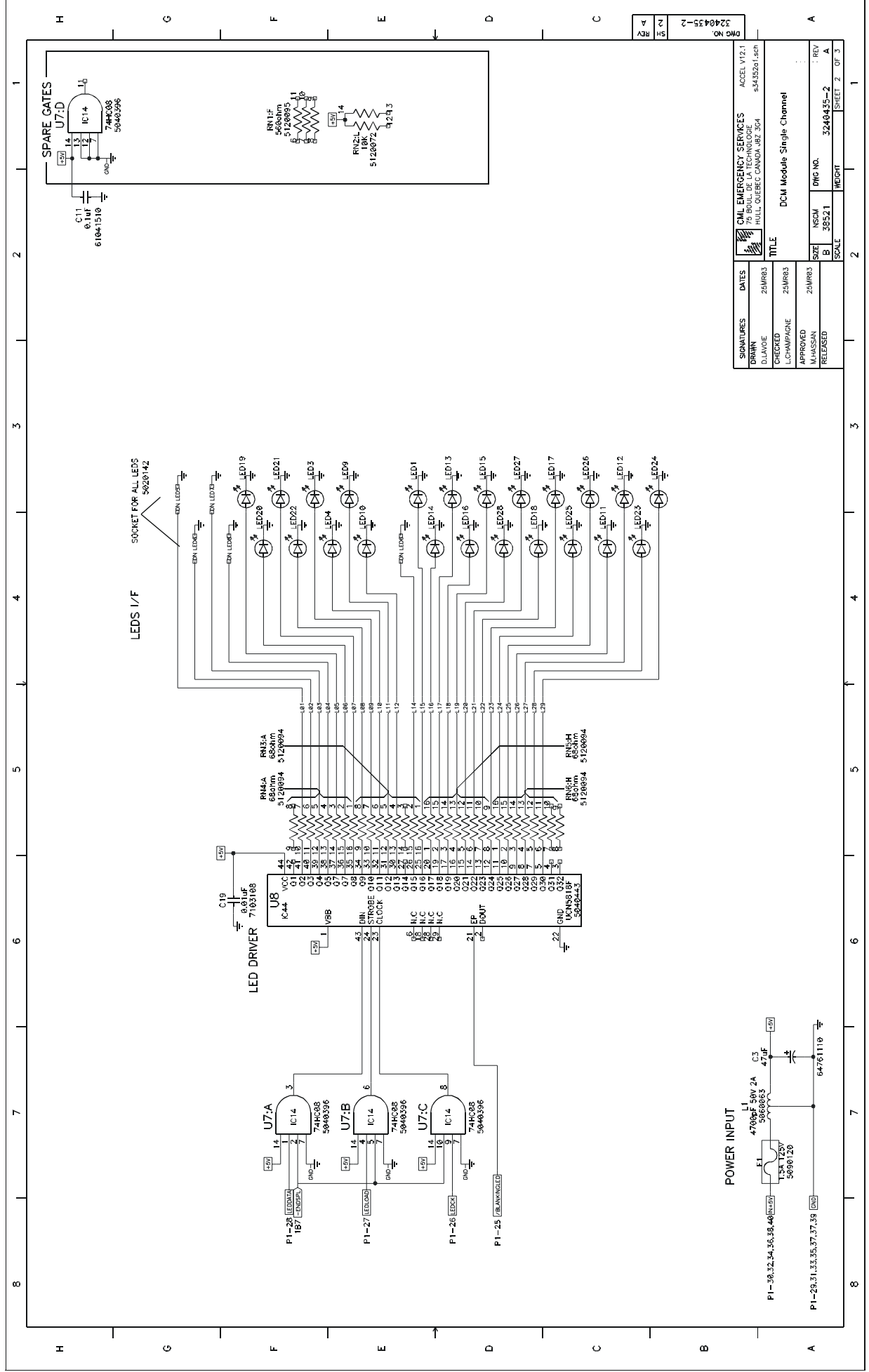
C-37





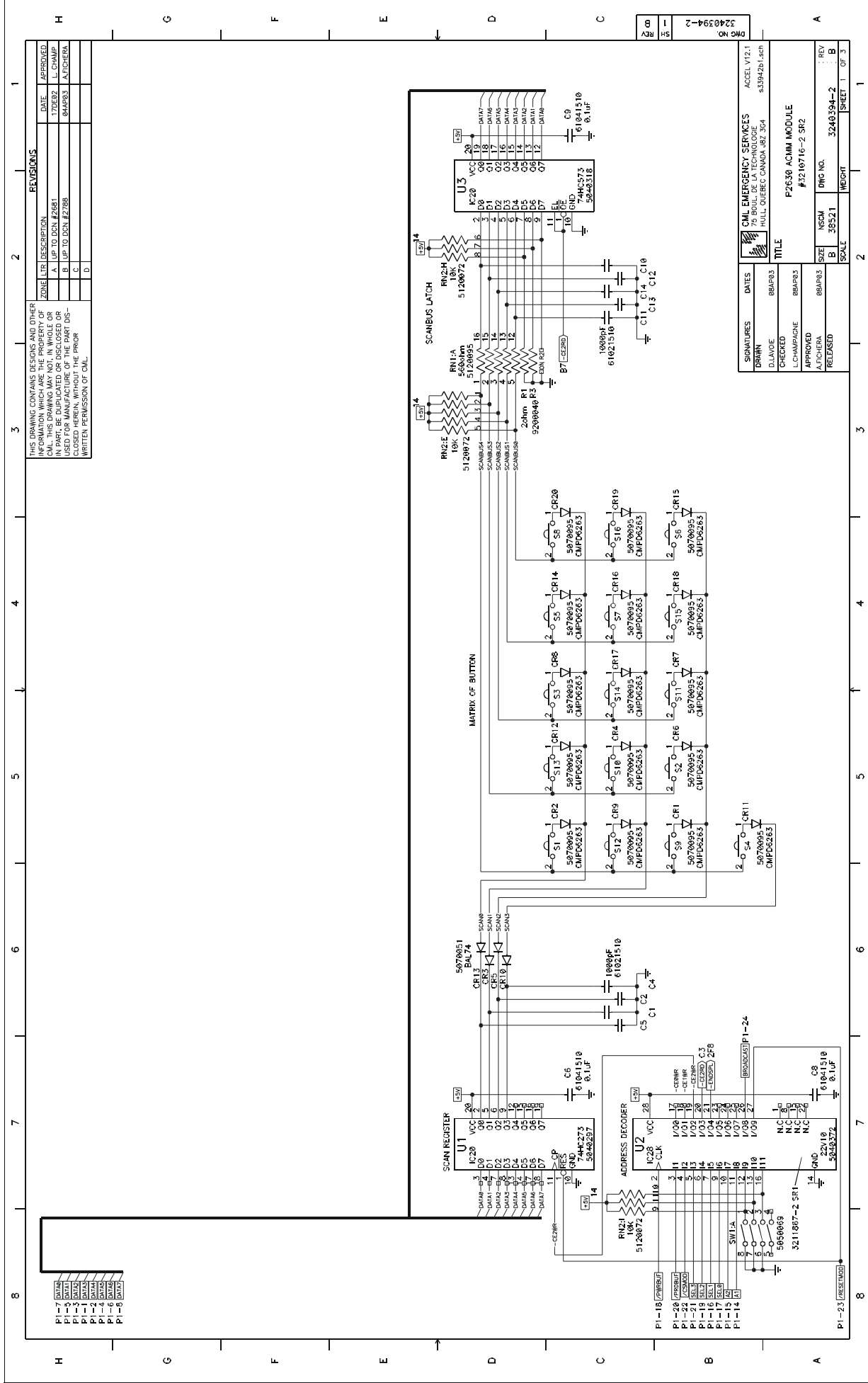
Schematics — (DDN6696) Single Display Channel Module (2 of 2)

C-39

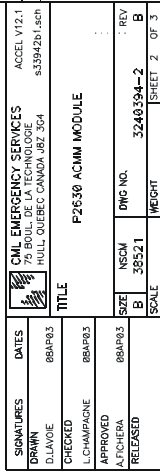


Schematics — (DDN6132) Auxiliary Control Module (1 of 2)

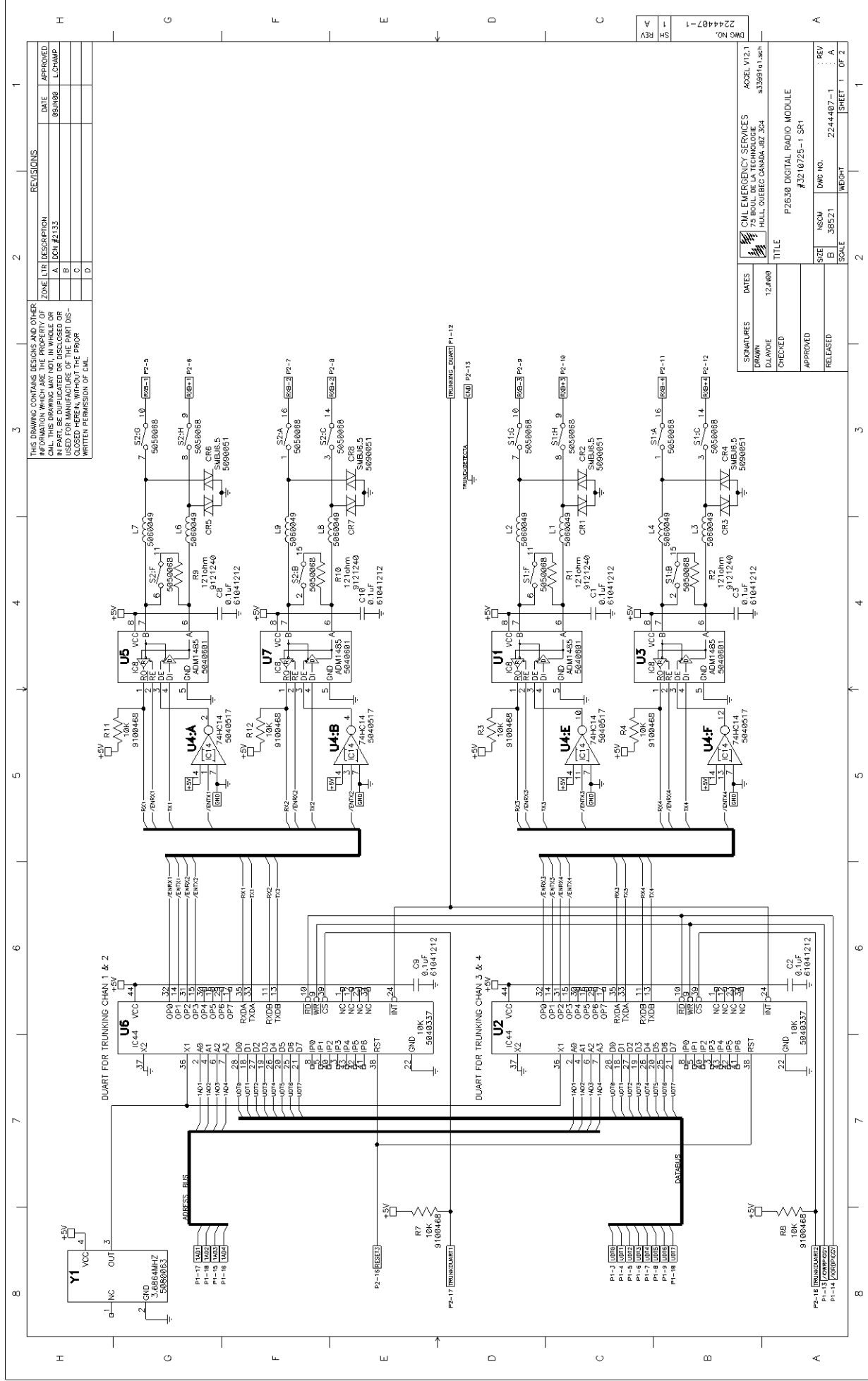
C-40



C-41



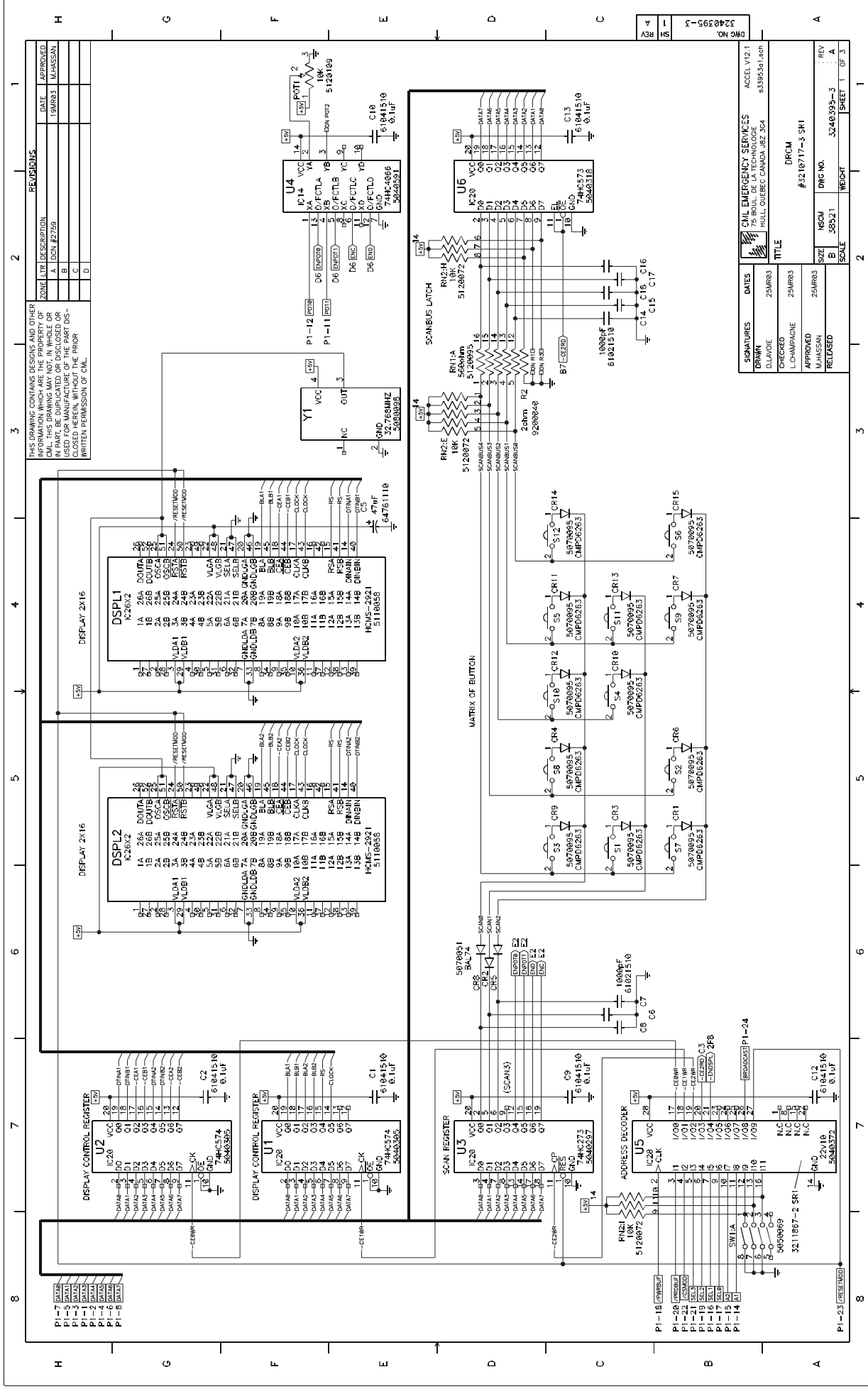
Schematics — (DDN6137) Digital Radio Interface Module (1 of 1)



Schematics — (DDN6138)

Digital Radio Control Module (1 of 2)

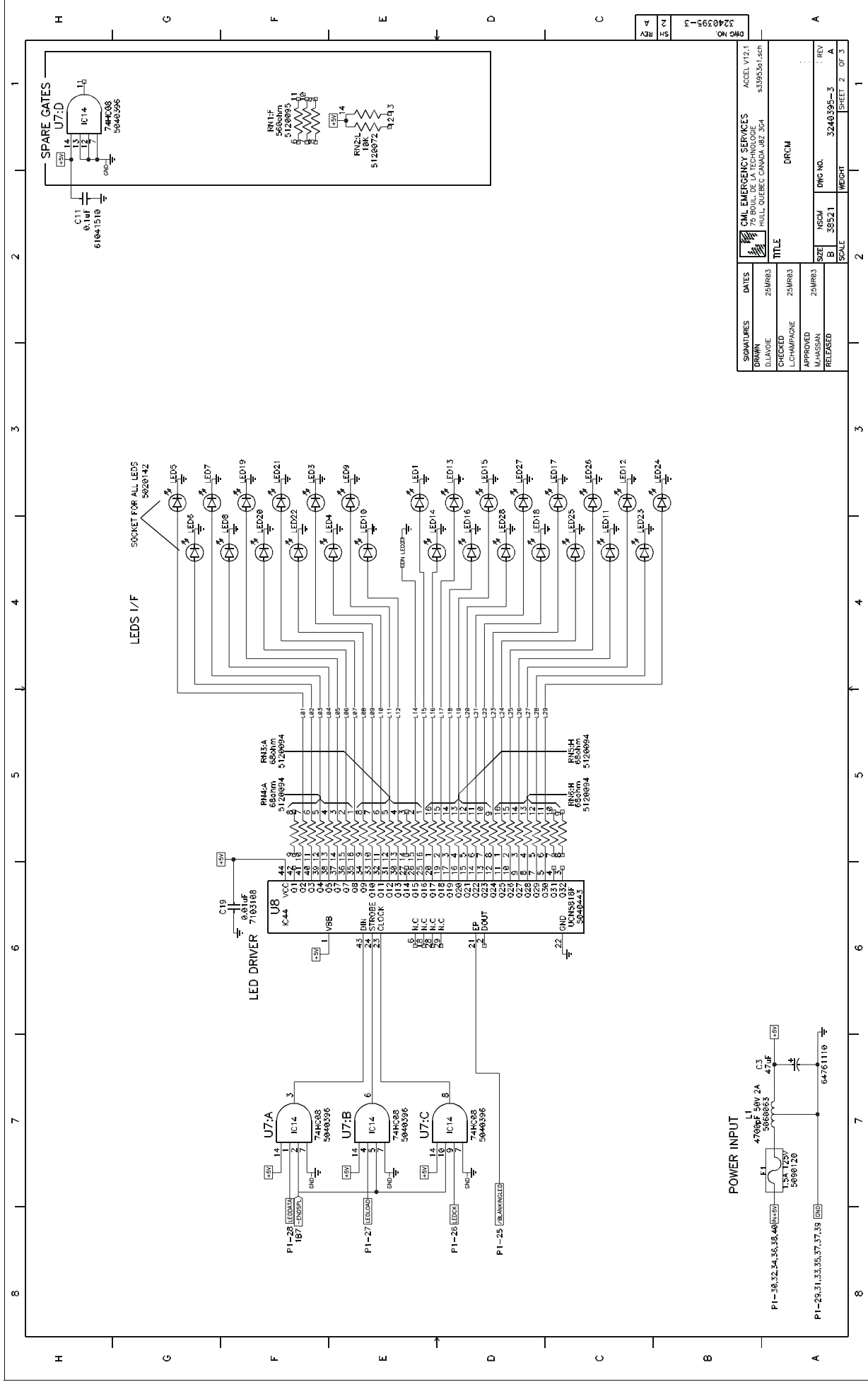
C-43



Schematics — (DDN6138)

Digital Radio Control Module (2 of 2)

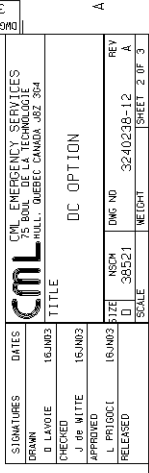
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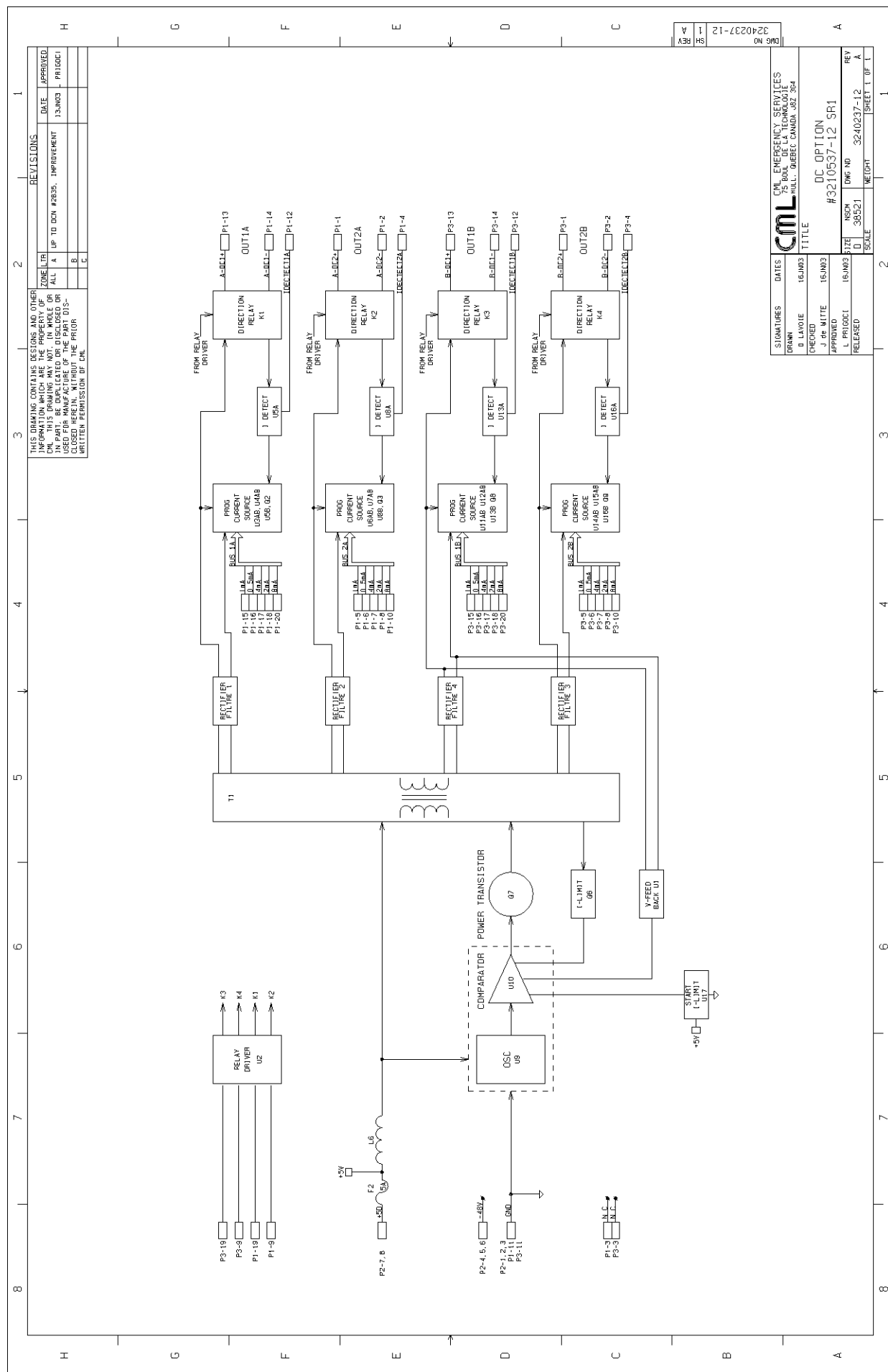


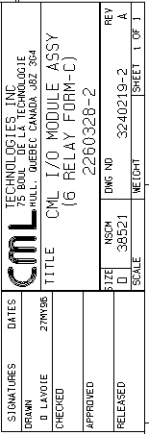
C-45



C-46

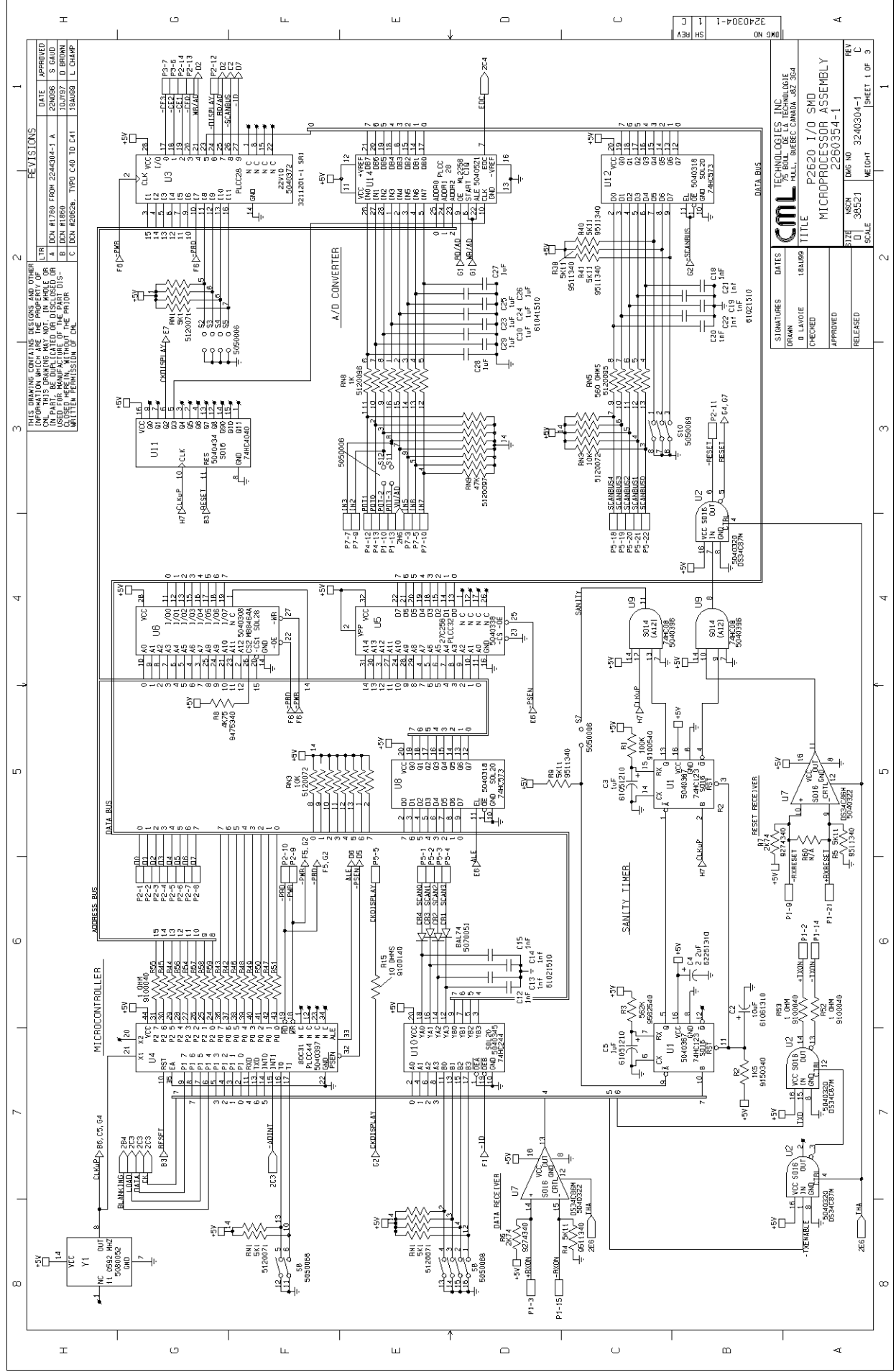






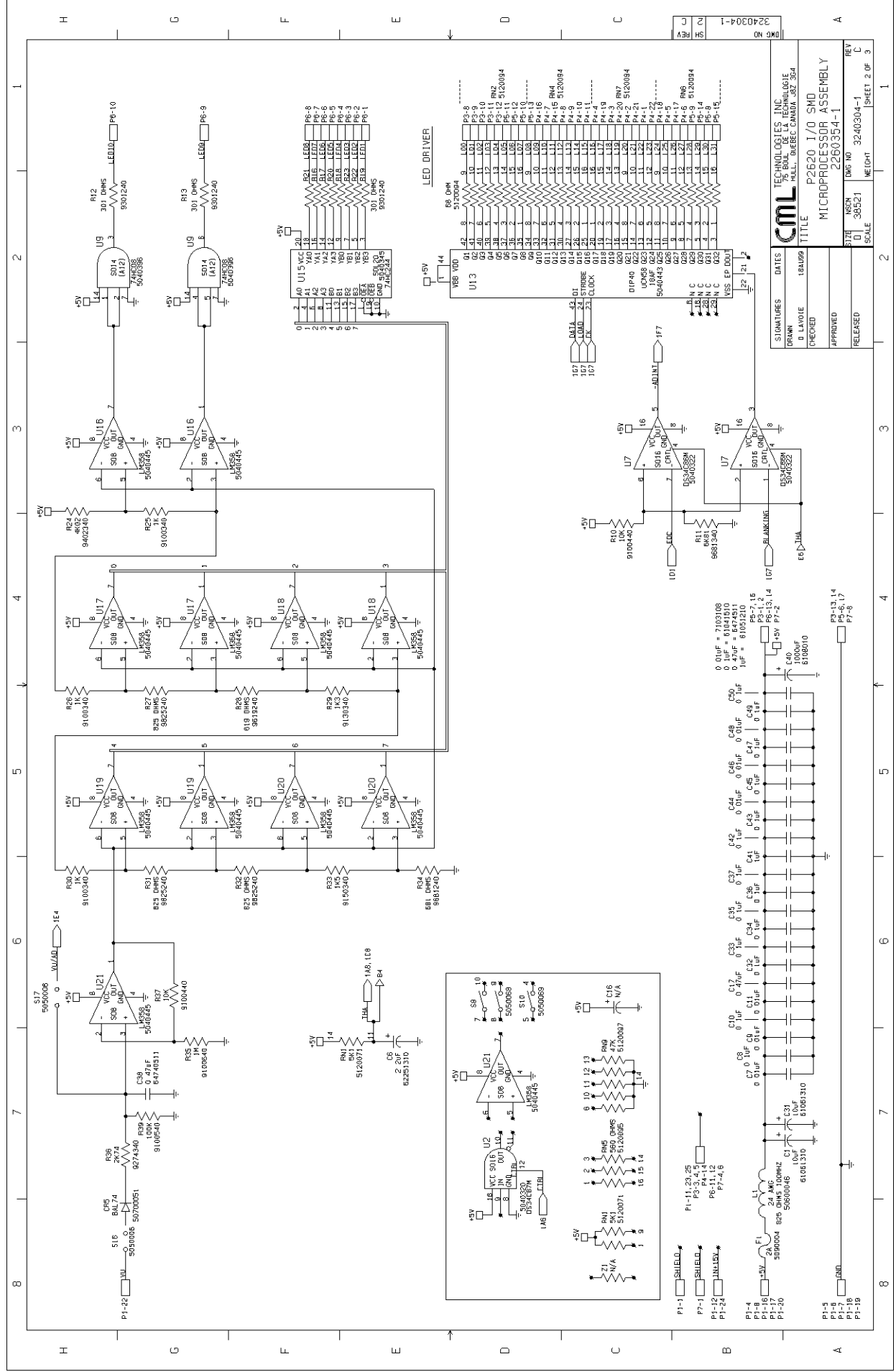
Schematics — (CDN6179) I/O Module (4 of 5)

C-51



Schematics — (CDN6179) I/O Module (5 of 5)

C-52



Glossary

ACO	Alarm Cut-off
A/D	Analog/Digital
AGC	Automatic gain control
APB	All points bulletin
Channel	<p>The radio's channel communication is one of the following:</p> <ul style="list-style-type: none">• transmit frequency only; for one-way communication• receive frequency only; for one-way communication• simplex frequency; using one frequency for two-way communication, one way at a time• half-duplex or two frequency simplex; using a separate transmit and receive frequency for two-way communication, one-way at a time• full-duplex frequencies; using a separate transmit and receive frequency for two-way simultaneous communication
CO	Central Office or CO Line
CPU	Central Processing Unit
CRC	Cyclical Redundancy Check
CRC error	The number of seconds in the measurement period, during which a Controlled Slip (CS) event was detected.
CSDM Lite	CommandSTAR Lite System Database Manager
CTCSS	Continuous Tone Carrier Squelch System
Cyclical redundancy check (CRC)	An error-detection system in which parity bits are generated by polynomial encoding and decoding algorithms to detect errors generated during transmission.
DAP	<i>See Digital Audio Processor (DAP) module</i>

dB	decibel; a unit used to express relative difference in power, usually between acoustic or electric signals, equal to ten times the common logarithm of the ratio of the two levels.
dBm	decibel relative to 1 milliwatt
DC	Direct Current
DCCM	Display Channel Control Module
Deskmic	desktop microphone
DEV	device, such as a headset
DIU	Digital Interface Unit
DOS	Data Operated Squelch or Microsoft™ Disk Operating System
DSP	Digital Signal Processor
DTMF	Dual Tone Multiple Frequency
EMI	Electromagnetic Interference
ESD	ElectroStatic Discharge
Hz	A unit of frequency equal to one cycle per second.
I/F	Interface
I/O	Input/Output
k	kilo
kHz	kilo-Hertz; one thousand Hertz (thousand cycles per second)
LED	Light Emitting Diode
mA	milliamperes
Mbps	Megabits (millions of bits) per second
mic	microphone
ms	millisecond
OCM	Operator Control Module
PCB	Printed Circuit Board
Prog	Program
PSTN	See <i>Public Switched Telephone Network</i>
PTT	See <i>Push-to-Talk</i>
Public Switched Telephone Network	Commercial land-based telecommunications

Push-to-Talk	The way a subscriber initiates a call. When the PTT switch on a radio is pressed (also known as keying up), this indicates that a call is being initiated by a user. Also known as press-to-talk.
Radio Frequency (RF)	General term for the range of frequencies used in radio communication systems.
RAC	Repeater Access Code
Radio Channel	<p>In radio technology, the radio's channel communication is one of these types:</p> <ul style="list-style-type: none">• transmit frequency only - for one way communication• receive frequency only - for one way communication• simplex frequency - using one frequency for two way communication, one way at a time.• full-duplex frequencies - using a separate transmit and receive frequency for two-way simultaneous communication.
RCU	Remote Control Unit (parallel unit)
Resources	A general term for network infrastructure and radio channels. Also buttons that execute features related to network infrastructure and radio channels.
RF	See <i>Radio Frequency (RF)</i> .
RX	Receive / Received / Receiving
Talkdown	This is a time interval following the transmission of the paging tones during which the channels are kept open for the dispatcher. The dispatcher must use the common PTT button or footswitch during that interval to make an announcement on the channels that were paged. After the paging announcement, the PTT button and footswitch resume normal operations.
TX	Transmit / Transmitted / Transmitting
voice message delay	The time that the radio channel is held open for the dispatcher to send a voice message; also called "voice annotation delay" or a "hangover delay".
VOL	Volume
VOX	Voice operated switch
VU	Volume Unit; a volume meter that visually indicates the volume over time, usually by mean of green, red, and amber rectangles that form a bar graph.

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Index

A

adjust radio volume 7-8
analog
 conversion 3-4
ASTRO. See also Digital Spectra

B

back panel
 console 4-6
BUTTON TEST? 7-4

C

CALL DIR RX 7-14
CALL DIR RX? 7-4
CALL DIR TX 7-14
CALL DIR TX? 7-4
Chapter 16
 Power supply connectors pinout A-1
Closing the Desktop assembly 6-3
CommandSTAR Lite 2-1
 verifications 9-1
CommandSTAR Lite System Database Manager 2-1, 8-1
Configuration Manual 4-3
connection
 CSDM Lite-to-console 5-1
connectors 3-4
console
 installing headset jackbox procedure 4-11
 microphone sensitivity adjustment 4-9
Console interface description 4-7
Console-to-console interconnection 5-1
conversion
 analog 3-4
 digital 3-4
cross-connect block 3-4
CSDM Lite 2-1, 8-1
 alarms and messages 8-1
 browsing the log files 8-2

components 5-1
 100 MB hard disk 5-1
 16 MB RAM 5-1
 COM port 5-1
 CSDM Lite software 5-1
 DOS 5.0 or better 5-1
 Intel 486 or better PC 5-1
 keyboard 5-1
 mouse 5-1
 printer port 5-1
 VGA Monitor 5-1
hardware diagnostics 8-4
monitoring 10-1
system alarms 8-4
 general 8-4
CSDM Lite-to-console
 connection 5-1
CSDM Lite-to-console interconnection 5-1
Test your installation 5-2

D

DBASE REV? 7-4
desktop console 4-1
 installing headset procedure 4-12
diagnostic mode
 Enter test mode
 Method 1 7-2
 Method 2 7-3
 Exit program 7-3
 Exit test 7-3
 keypad 7-2
 view tests 7-2
 VU meter 7-2
diagnostics
 desktop console 7-1
 rackmount console 7-1
dial-up connection 7-8
digital
 conversion 3-4
Digital Radio Control Module 6-18
Digital Spectra 6-18

DIP Switch Settings		Installing the desktop console	
SW1 Operator Control Module ID	A-10	headset jackbox	4-12
Direct Current Option module		interface protection	3-4
installation	6-17	Interface wiring	3-4
DISP LEVEL?	7-3		
display channel control software version	7-19	J	
display console software version	7-9	jack fields	3-4
DRCM	6-18	Jumper Settings	
labelling	6-18	P1-P4	A-7
E		K	
Electromagnetic Interference		Keypad features	7-2
EMI	3-3		
Electrostatic discharge		L	
ESD	3-3	labelling DRCM	6-18
EMI		LED LEVEL?	7-3
Electromagnetic Interference	3-3	LED TEST?	7-4
Entering a test program	7-2	local cross connect block	3-4
equipment		LTR	6-18
specifications	3-1	M	
ESD		Manual Page	7-7
currents	3-3	MCS 2000	6-18, 6-20
Electrostatic discharge	3-3	MIC INPUT?	7-4
strap	3-3	MIC TEST?	7-4
G		microphone sensitivity adjustment	4-9
General procedures		minimizing	
introduction	6-1	crosstalk	3-2
Glossary	Glossary-1	noise	3-2
H		N	
hardware diagnostics	8-4	noise	
I		induced	3-3
I/O Module		O	
DIP switch settings	6-13	Opening the Desktop assembly	6-2
jumper settings	6-13	operating humidity	3-1
installation	3-1, 3-4, 5-1	operating temperature	3-1
desktop	4-1	optical couplers	3-4
system	3-3		
installing a peripheral module	6-7	P	
Installing the CommandSTAR Lite console	4-1	PAGING TONE?	7-4
Installing the console		Passport	6-18
desktop console	4-1	phone numbers, entry	7-8
headset jackbox	4-11		
introduction	4-1		
rackmount console	4-2		

potential hazards	3-2	69-TONE TO I/F?	7-15
power		70-RESET?	7-16
ground wiring	3-2	71- SET MIC AGC??	7-16
power supply	3-1, 3-2	72-PAGING TONE?	7-17
connectors pinout	A-1	73-SERIAL PORT?	7-17
power supply connectors pinout	A-1	74-MIC INPUT?	7-18
preparation		75-SLV S/W NUM?	7-19
environmental	3-1	Quick reference	7-3
Preventive maintenance	10-1		
cleaning the consoles	10-1	Q	
introduction	10-1	Quick reference	
monitoring CSDM	10-1	Purpose and procedures	7-3
site maintenance	10-1		
problems		R	
operational	9-1	rackmount console	4-2
procedure		radios	
connecting the Master frame to Additional frames	4-4	Digital Spectra	6-18
connecting the Select and Unselect speakers to the Master frame	4-5	LTR	6-18
installing headset		MCS 2000	6-18, 6-20
desktop console	4-12	Passport	6-18
installing headset jackbox	4-11	Related information	1-1
installing operator control modules in a rack	4-3	Reloading the Console Software	8-3
PROG Page		Reloading the Factory Database	8-3
Manual Page	7-7	requirements	3-3, 3-4, 10-1
Speed Page	7-7	RESET?	7-4
PROG PAGE?	7-3		
PTT TEST?	7-4	S	
Purpose and procedures		S/W NUMBER?	7-4
0-TIME MODE?	7-5	SENSE TEST?	7-4
11-PROG PAGE?	7-7	SERIAL PORT?	7-4
12-SET RAD VOL?	7-8	SET DATE?	7-3
13-SET DIAL UP?	7-8	SET DIAL UP?	7-4
1-SET TIME?	7-5	SET GRANT?	7-4
2-SET DATE?	7-6	SET MIC AGC?	7-4
3-DISP LEVEL?	7-6	SET RAD VOL?	7-4
4-LED LEVEL?	7-6	SET TIME	
51-S/W NUMBER?	7-9	12-hour format	7-5
52-DBASE REV?	7-10	24-hour format	7-5
53-LED TEST?	7-10	SET TIME?	7-3
54-BUTTON TEST?	7-10	shielding	
55-VOLUME TEST?	7-11	external audio	3-3
56-SENSE TEST?	7-11	signals	
61-TONE TEST?	7-12	induced	3-3
62-MIC TEST?	7-12	site maintenance	10-1
63-PTT TEST?	7-13	Site preparation	3-1
64-CALL DIR RX?	7-14	requirements	3-1
65-CALL DIR TX?	7-14	SLV S/W NUM?	7-4
68-SETGRANT?	7-15	space requirements	

additional	3-4	CommandSTAR Lite	9-1
specify dial-up connection	7-8	Verify	
Speed Page	7-7	button functions	7-10
System architecture	2-2	call dir RX	7-14
System overview	2-1	CALL DIR TX	7-14
T		Database version	7-10
terminal strips	3-4	date	7-6
Tests		display level intensity	7-6
1-SET TIME		functionality of LED	7-10
12 hour format	7-5	LED intensity	7-6
24 hour format	7-5	microphone	7-12
Purpose and procedures	7-3	prog page	7-7
TIME MODE?	7-3	PTT	7-13
TONE TEST?	7-4	reset feature	7-16
TONE TO I/F?	7-4	sense feature	7-11
transformer coupling	3-4	set grant feature	7-15
transient suppressers	3-4	SET MIC AGC?	7-16
transients		set mic input feature	7-18
power	3-4	set paging tone feature	7-17
Troubleshooting		set serial port feature	7-17
no audio at customer equipment	9-3	time	7-5
quick reference	9-1	time mode	7-5
radio channels	9-2	Tone to I/F	7-15
troubleshooting		tone to I/F feature	7-15
BOOTSTRAP	9-6	tones	7-12
cannot monitor internal tests	9-3	volume control	7-11
headset cannot receive signal	9-2	VOLUME TEST?	7-4
headset cannot transmit signal	9-2		
incorrect display on CCM	9-3		
incorrect display on keypad	9-3		
no control over external devices	9-4		
no display	9-5		
no intercom communication	9-4		
no LED	9-5		
no LED display	9-4		
no radio	9-4		
no radio communication	9-4		
no SELECT or UNSELECT speaker control	9-5		
no telephone line	9-4		
NOT IN DATABASE	9-6		
not PASSED	9-6		
Troubleshooting specific problems			
radio channels	9-2		
twisted pairs	3-3		
V			
verifications			