MARATHON

20K Pro

Owner's Manual

Release 5.1 and above

Part Number 800-1901-51, Rev. A
Model Number 5020BP

December 1996

Notice of Filing

Declaration of CE Conformance (for International sales)

A Declaration of CE Conformance is on file at the MICOM addresses shown below. The declaration lists the models described in this manual. If the unit carries the CE mark, this declaration certifies that it meets the specific EMC standards and safety (LVD) standards required for CE marking. If the product is a module, the module is CE-compliant only if it is placed in a MICOM CE-marked base unit.

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Any units not carrying the CE approval are not CE-compliant. Modules placed in these units may not meet emission standards for CE compliance.

Trademark Notice

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Notice

Specifications, tolerances, and design characteristics described in this manual are subject to change without notice.

Safety Warnings and Cautions

Various safety agencies request statements of warning or caution to help you in the safe operation of the MICOM unit. These statements also apply to any and all modules installed within the unit.

To ensure adequate cooling of the equipment a 2.0 inch unobstructed space must be maintained around all sides of the unit.

The ac power socket shall be installed near the equipment and shall be easily accessible.

Installation and access to the interior of this unit shall be made only by a qualified technician.

Connection to the network is to be disconnected before the (mains) plug is removed.

Warning
Remove power plug from the power socket before performing any service work on the unit.

Lithium Battery Caution
Danger of explosion if battery is incorrectly replaced. Replace only with the same type or equivalent battery, as recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.

The power supply is auto-ranging in this model.

The power supply cordset to be supplied in Europe must have 0.75^{2}mm, 3 conductor "HAR" cord type H05VV-F, terminated in a grounding type Shucko plug on one end and a molded-on IEC 320 connector on the other end.

Technical Data

Input Volts	:	100-240 Vac −5%, +10%
Input Current		
Marathon		
5K Turbo, 10K, 5KT Pro, 20K, 20K Pro	:	3A-1.5A
Marathon 2K, 2K *Plus*, 3K		
NetRunner 75E	:	2A-1A
STADIA		
Integration Hub:		6A-3A
Frequency	:	47-63 Hz

Um die Kühlung des Gerätes nicht zu beschränken, ist es notwendig um das Gerät herum an allen Seiten ca 5 cm Raum zu lassen.

Stellen Sie das Gerät in der Nähe einer geerdeten Schutzkontakt-steckdose so auf, dass diese leicht erreichbar und zugänglich ist.

Die Montage und der Zugang ins Innere des Gerätes sind nur einem qualifizierten Techniker gestattet.

Ehe der Netzstecker aus der Steckdose gezogen wird, müssen sämtliche äusserliche Verbindungen vom Gerät getrennt werden.

Warnung
Vor öffnen des Gerätes, muss der Netzstecker aus der Steckdose gezogen werden.

Lithium Batterie Warnung
Explosionsgefahr besteht wenn die Batterie nicht richtig ersetzt ist. Die Batterie darf nur mit einer gleichen oder gleichwertigen Batterie ersetzt werden.

Netzteil ist mit automatischer Umschaltung entsprechend der Versorgungsspannung versorgt.

Die Netzleitung sollte ein harmonisierter Typ (HAR) sein, mit der Bezeichnung H05VV-F oder H05VVH2-F, 3G 0.75^{2}mm, mit einem Schutzkontakt – und einem Kaltgerätestecker (IEC 320).

Technische Daten

Nennspannung	:	100-240 V∼ −5%, +10%
Nennstrom		
Marathon		
5K Turbo, 10K, 5KT Pro, 20K, 20K Pro	:	3A-1.5A
Marathon 2K, 2K *Plus*, 3K		
NetRunner 75E	:	2A-1A
STADIA		
Integration Hub:		6A-3A
Frequenz	:	47-63 Hz

Pour assurer un refroidissement adéquat, maintenir un espace libre de 5 cm (2 pouces) tout autour de l'appareil.

Installer la prise AC à proximité de l'appareil, dans un rayon d'accès facile.

L'installation et l'ouverture de cet appareil est permise par un technicien autorisé seulement.

Avant de débrancher la prise de courant, assurer que toutes les connexions externes ont été déconnecté de l'appareil.

Avertissement
Débrancher la prise de courant avant d'entreprendre aucun travail de réparation de l'appareil.

Batterie Au Lithium Avertissement
Un danger d'explosion existe si la batterie est remplacée incorrectement. Remplacer avec une batterie identique ou similaire, recommandée par le fabriquant. Disposer des batteries utilisées selon la méthode prescrite par le fabriquant.

Ce modèle s'adapte automatiquement au courant électrique ou voltage de la prise murale.

En Europe, brancher l'appareil à la prise murale au moyen d'un fil "HAR" comprenant 3 cables H05VV-F ou H05VVH2-F de 0.75^{2}mm chacun, avec à une extremité une prise de terre genre SHUCKO et à l'autre une prise IEC 320.

Donnees Techniques

Voltage d'Accès	:	100-240 V∼ −5%, +10%
Courant d'Accès		
Marathon		
5K Turbo, 10K, 5KT Pro, 20K, 20K Pro	:	3A-1.5A
Marathon 2K, 2K *Plus*, 3K		
NetRunner 75E	:	2A-1A
STADIA		
Integration Hub:		6A-3A
Fréquence	:	47-63 Hz

Notification of FCC Requirements

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

Changes or modifications to this product, that could increase the amount of Radio Frequency Emissions from this product, without the expressed written approval of MICOM Communications Corp., could cause the product and the user to violate the FCC's Rules and Regulations, thus requiring the product to be turned off or disconnected.

If this unit is used on a DTE which requires use of shielded cables for compliance with FCC Part 15, then use of a filtered pin connector may be required to maintain FCC compliance. See the Installation section for specific applications.

Notification of Canadian Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

United Kingdom Requirement: Interconnection of Ports Warning

Interconnection directly, or by way of other apparatus, of ports marked "SAFETY WARNING. See instructions for use", with ports marked or not so marked may produce hazardous conditions on the network. The advice of a competent engineer must be obtained before such a connection is made. None of the ports provide isolation sufficient to satisfy the relevant parts of BS 6301. Apparatus connected to the ports, must either have been approved to the relevant parts of BS 6301 or to have been previously evaluated against BS 6301 British Telecom Technical Guides 2 or 26, and given permission to attach. Other usage will invalidate any approval given to this apparatus.

Any or all of the ports on the following modules may be configured as non-network ports:

- Communications Control Modules (CCM): 6 D-type ports
- Up to 4 Channel Expansion Modules (CEM): up to 6 D-type or 12 RJ45 ports
- LAN modules (including RTS, RLB, or IRM): AUI, BNC, and 8-pin modular jack ports
- NMS module: 1 log port, 1 command port
- Up to 4 2-port voice cards
- Alarm port

WARRANTY

MICOM warrants that to the extent that the equipment delivered is hardware, such equipment shall be free from defective material and workmanship for a period of 3 years from the date of shipment of equipment from MICOM when given normal, proper and intended usage. MICOM further agrees to provide, without cost, emergency replacement equipment, shipped freight prepaid, for a period of ninety (90) days from date of shipment of the equipment and factory repair for the remainder of the warranty period provided that:

(a) MICOM is promptly notified upon discovery that the equipment is defective;

(b) The equipment is returned freight prepaid to MICOM;

(c) MICOM's examination of the equipment shall disclose that any defect was not caused by failure of electrical power or air conditioning, damage from lightning or weather-related causes, accident, misuse, neglect, alteration, improper installation, unauthorized repair or improper testing.

To the extent the equipment is or contains software or firmware (collectively "Software"), MICOM warrants that for a period of one (1) year from the date of shipment, the Software shall be free from defects in material and workmanship under normal use and that the programs will perform according to the specifications contained in MICOM's user manual. MICOM does not warrant that the functions contained in the Software will meet a specific requirement or that the operation will be uninterrupted or error free.

INSTALLING NON MICOM SOFTWARE IN MICOM EQUIPMENT SHALL VOID THIS WARRANTY.

MICOM may, in its sole discretion, except for the first ninety (90) days of warranty, elect to repair or replace the equipment, in which event MICOM shall have a reasonable time to make repairs or to replace the equipment. MICOM will return the equipment freight prepaid.

THE PROVISIONS OF THIS WARRANTY ARE IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND MICOM'S LIABILITY ARISING OUT OF THE MANUFACTURE, SALE, OR SUPPLYING OF THE EQUIPMENT OR ITS USE, WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, PRODUCTS LIABILITY OR OTHERWISE, SHALL NOT EXCEED THE ORIGINAL AMOUNT PAID BY THE BUYER FOR THE EQUIPMENT. IN NO EVENT SHALL MICOM BE LIABLE TO THE BUYER OR ANY OTHER PERSON OR ENTITY FOR UNINTENDED OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR USE DAMAGES) ARISING OUT OF THE MANUFACTURE, SALE OR SUPPLYING OF THE EQUIPMENT.

SERVICE INFORMATION

If you experience difficulty with this product, contact your MICOM Certified Distributor for prompt assistance.

MICOM offers complete factory repair for both in-warranty and out-of-warranty equipment.

Before returning any equipment, you *must* obtain a Return Authorization number. Contact your distributor for assistance.

MICOM warrants all out-of-warranty repairs or upgrades performed at its factory location or performed by MICOM Customer Service for a period of 90 days after completion.

Shipping charges must be prepaid.

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Preface

Welcome

Welcome to MICOM Communications Corp., a Northern Telecom (Nortel) Company, headquartered in California, U.S.A. We develop communication products that integrate voice/fax traffic with data networks.

Our Marathon products integrate data, voice, fax and LAN traffic using industry-leading technologies.

The Marathon 20K Pro integrates traffic over low-cost 56/64 Kbps leased lines as well as over public or private frame relay networks.

Objective

This Owner's Manual is designed to highlight the Marathon 20K Pro features. It is intended for the user who has support from a qualified technician or MICOM Certified Distributor. The following information is provided:

Section 1: An Introduction which highlights the unit's capabilities

Section 2: A sequence of steps to start your unit's operation

Appendix A: A blank worksheet which we suggest be filled out by you or your Distributor and kept near the unit.

Appendix B: A diagram of the 20K Pro base module and a brief description of each component. The base module's port interface descriptions and cable numbers are provided.

Appendix C: Specifications

Appendix D: Telephone company requirements if your unit contains an optional ISU module.

Detailed information about the features and operation of the unit and all its options is available in the optional System Manual Set.

Along With This Manual

Along with this Owner's Manual, you should have received the following:

- Marathon Release Notes – The Release Notes provide an overview of new software enhancements and any new hardware releases, and an in-depth discussion of new features.

- Menu Flow Diagram – This large sheet provides a roadmap of the menus in the Command Facility. It provides a means for finding a menu or for following a menu path to various submenus.

- A CD-ROM providing all the manuals in the System Manual Set.

Optional System Manual Set

A set of binders containing documentation on the unit and all of the modules is available through your MICOM Certified Distributor. The set consists of the following:

- Hardware manuals

- Wide Area Network (WAN) and data manuals

- Command Facility Reference Guide

- Voice manuals

- LAN manuals

- A CD-ROM providing all the manuals in the System Manual Set.

Packing Materials

Save the packing materials, you may need the materials to repack the unit for factory update or repair.

Introduction 1

Contents

The Marathon 20K Pro is a member of MICOM's family of Integration Multiplexers. The unit offers the following link and channel capabilities.

Marathon 20K Pro Capabilities

- WAN links
  - Interconnect link, 12 maximum:

    Switching hub link capacity, up to 384 Kbps:
      3 @ 128 Kbps,
      6 @ 64 Kbps, or
      12 @ 19.2 Kbps
    Terminated node link capacity, up to 256 Kbps:
      2 @ 128 Kbps, or
      4 @ 64 Kbps
  - Frame Relay link, 6 maximum:
      1 @ up to T1 (externally clocked), and 5 @ F-T1 (see chart on page C-8)
  - Permanent Virtual Circuits (PVCs):
      up to 36 PVCs
      with mesh, maximum 12 PVCs

- Secondary links, 6 maximum, up to 128 Kbps

- Local Interconnect links, 12 maximum
  - Switching hub
      5 @ 64 - 256 Kbps
  - Terminated hub
      2 @ 64 - 256 Kbps

- Mux links, 5 maximum, up to 19.2 Kbps

- Voice channels
  – Analog: 8 maximum
  – Digital: 30 maximum

- Sync channels: 18 maximum

- Async channels: 41 maximum

- LAN modules:
  – Remote Terminal Server, maximum 2 modules
  – Integration Router Module, maximum 2 modules
  – Integral Hub Module, 1-4 8-hub port modules, up to 32 connections

- Communications Control Module can be installed in a STADIA Hub unit.

Marathon in an Integrated Network

The Marathon 20K Pro offers a flexible connectivity solution for Marathons
in a star, string, or mesh network topology. In addition, the 20K Pro can act
as a high-performance central site for a larger Marathon network.
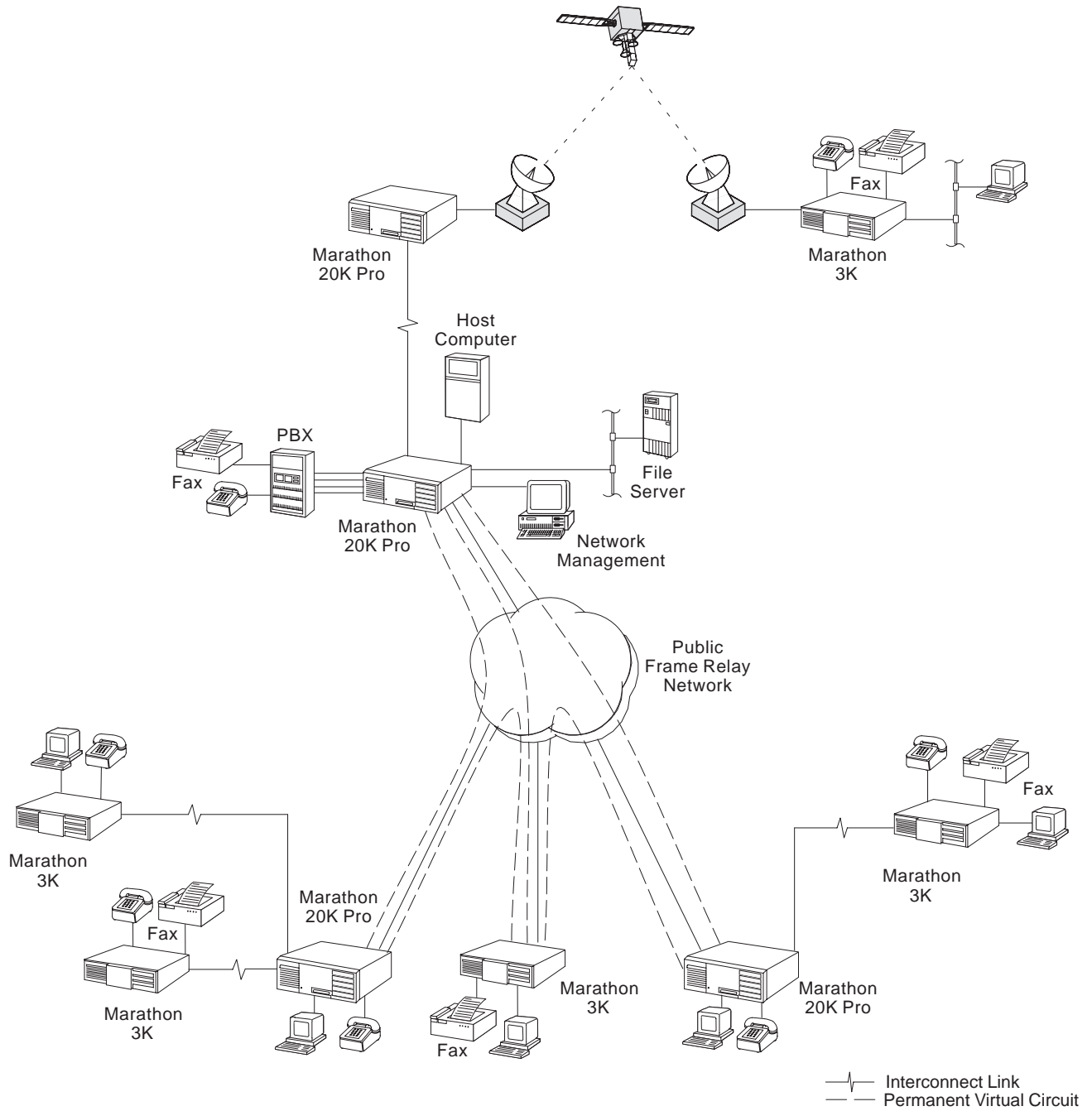
Terms to Know

It may be helpful to become familiar with the following terms which are used in this manual:

Node	Each Marathon and MICOM mux is referred to as a node. The Marathon node and any attached MICOM muxes are considered a hub group.
FlashPak cartridge	A cartridge containing the software on Flash memory for the module (e.g., the Communications Control Module, a LAN Module). New software can be downloaded to the FlashPak. This cartridge is installed into the module.
Module	A printed circuit board and components with specific functionality that plugs into one of the module locations. An integral board in the unit.
Communications Control Module	The main or base module where the major processing occurs. Software for the Communications Control Module is contained in a FlashPak cartridge. Software can be upgraded by downloading code to the Flash memory.
Module location	A physical and logical location of a module within the unit. These are described from bottom to top as A-E.

Link Types

Frame Relay Link	For connecting to a frame relay service or for higher speed connection between another co-located Marathon, or across leased lines, or for connection of a router running frame relay (premise-side frame relay).
Interconnect Link	A composite link that connects one Integration unit to another Integration unit at a remote location. It uses MICOM proprietary protocol (*MicroBand* ATM). It is also known as a WAN link.
Local Interconnect Link	For connecting to a co-located Integration unit that supports local interconnect links.
Secondary Interconnect Link	For a backup link or for bandwidth on demand to another interconnect link. (*MicroBand* ATM only)
Mux Link	For connecting to a MICOM mux over a leased line.
X.21 Link	For connecting to a MICOM mux over an X.21 link.

Starting The Unit's Operation 2

Contents

This section provides you with steps to make your unit operational. It follows the installation provided by your technician or distributor. Once you have completed this section, your unit is on-line, ready for communication traffic.

Step 1. Connect Terminal or PC
to Access Command Facility

Connect an ASCII terminal, or a PC with terminal emulation software, to any asynchronous port in the unit. This terminal provides local access to the Command Mode and Command Facility until you define a node ID (name) and node number.
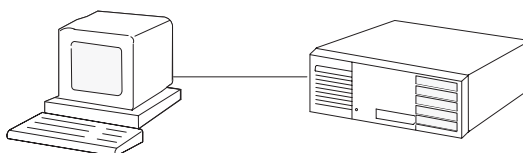
Async Terminal Settings

Set the terminal to the settings shown below.

Data Rate	9600
Code Level	8 bits per character
Stop Bits	1
Parity	None
Operation	Full-Duplex

After the initial connection to the Command Mode, the terminal parameters (except Operation) may be reconfigured. Once the new parameters are selected, exit the Command Mode by entering **<break>**. The new parameters will now be in effect. Set the terminal to the new parameters and reenter the Command Mode, if desired.

Step 2. Install a Cartridge
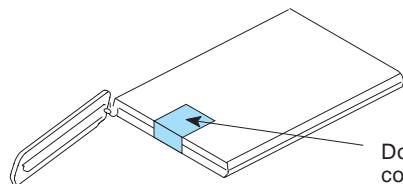
Do not remove the copper tape. Removal constitutes a violation of the warranty and EMI agency requirements.

When a cartridge is not being used, it should be stored in an anti-static bag.

⚠ ! *WARNING*

Any time a FlashPak cartridge is installed or removed, be sure that the power cord is unplugged. Failure to do so could result in damage to the cartridge.

Installation steps for Communications Control Module cartridge

① Leave the power cord unplugged.

② Slide in the cartridge.

③ Push in cartridge until flush against unit. There must be no gap between cartridge and unit.
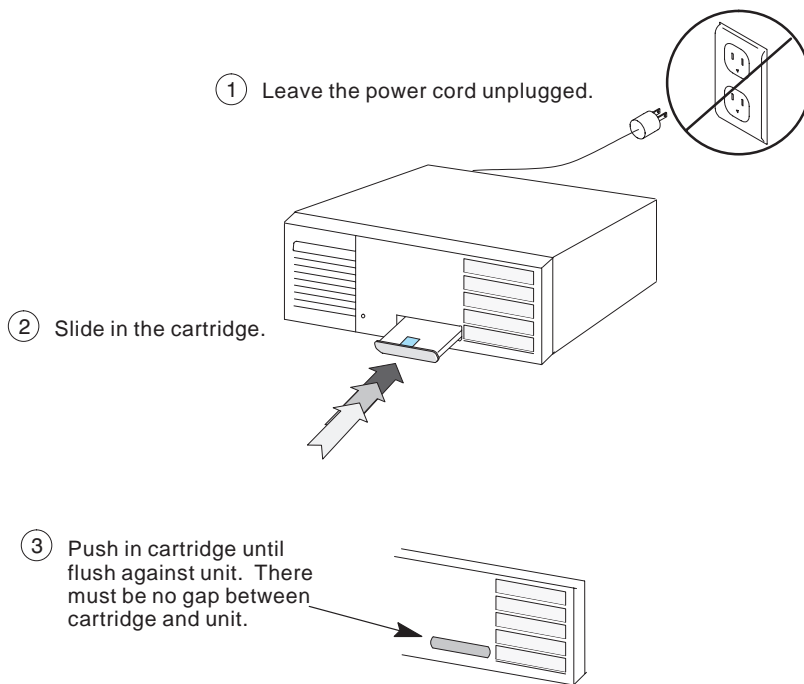
Removal steps for cartridge

① Unplug the power cord.

② Pull out the extractor handle.

③ Slide out the cartridge.
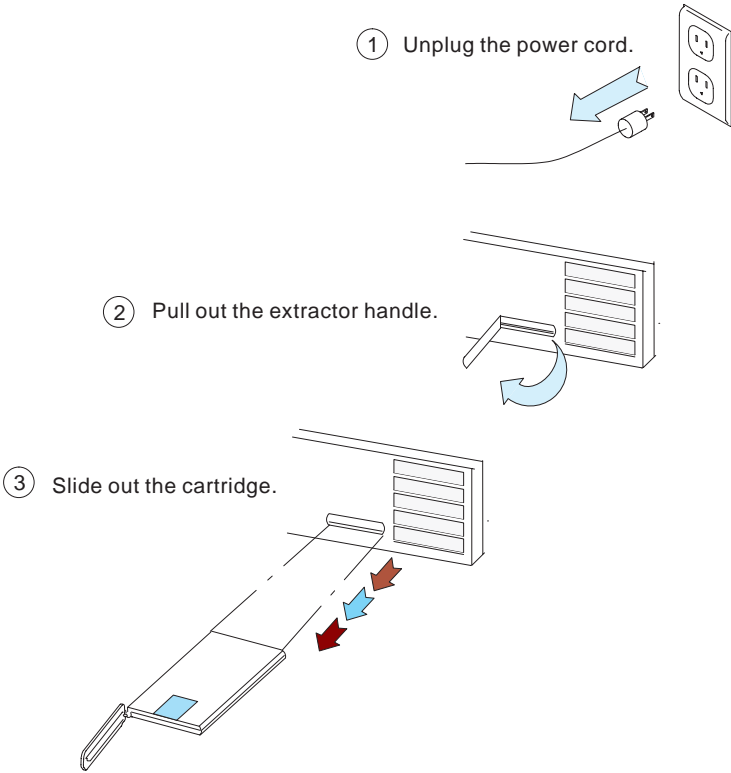
Step 3. Power Up the Unit

Important

Prior to powering up a unit containing a LAN module, first connect the LAN module's Ethernet interface to the network hub or backbone.

⚠ **WARNING**

Be sure to use the power cable supplied by your MICOM Certified Distributor.
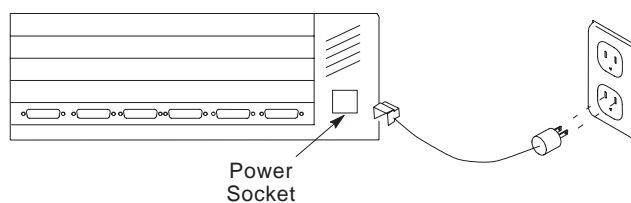
Power
Socket

Check the Indicators

On powering up, the unit goes through a series of self-tests and initialization as shown in the table.

Initialization and Self Test Stages of the Integration Unit

	AT	BO	A6	A5	A4	A3	A2	A1
Core local RAM test	❍	●	❍	❍	❍	❍	❍	❍
Static memory of cartridge test	❍	●	●	❍	❍	❍	❍	❍
Cartridge PROM checksum test	❍	❍	●	❍	❍	❍	❍	❍
Initialization of ports proceeding	❍	❍	❍	●	❍	❍	❍	❍
Link processor RAM test	❍	●	❍	●	❍	❍	❍	❍
Link processor code checksum	❍	❍	●	●	❍	❍	❍	❍
Key: ❍ LED off ● LED on								

Once the unit's initialization and self-tests have been completed, the Communications Control Module indicators on the front of the unit should display AT *on* and BO *off* as shown below.

Communications Control
Module Indicators
Normal Status on Power Up

Key:

○   Off   ✸   Blinking
●   On   ☼   Off or Blinking
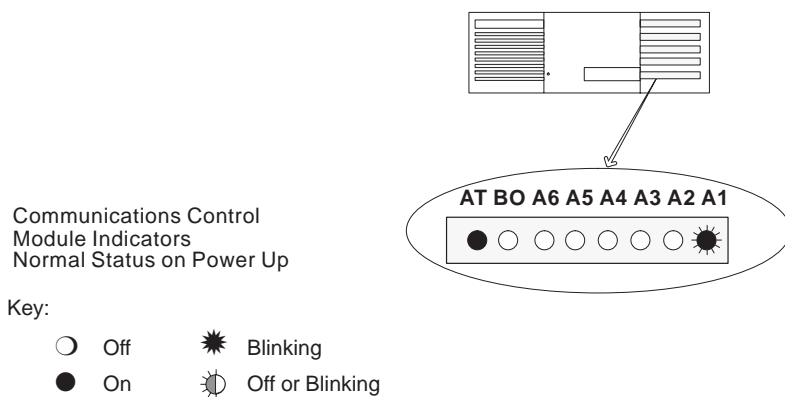
If your unit does not display as shown, check that the wall outlet is operational; then refer to the next table for indicator interpretation.

Interpretation of Indicators on Communications Control Module

	AT	BO	A6	A5	A4	A3	A2	A1
Normal equipment status	●	❍	x[1]	x[1]	x[1]	x[1]	x[1]	x[1]
Ready for Communications Control Module code download process (illuminated for 17-20 seconds upon power on or hardware reset)	❍	●	●	●	●	❍	❍	❍
ROM test failure[2] (FEATUREPAK or FlashPak cartridge failure)	❍	❍	●	❍	❍	❍	❍	❍
CMOS failure [2,3]	❍	❍	❍	❍	❍	❍	❍	●
Battery low[4]	❍	❍	❍	❍	❍	❍	●	❍
RAM failure in FEATUREPAK or FlashPak	❍	●	●	❍	❍	❍	❍	❍
Parity error	❍	●	❍	●	❍	●	❍	●
FEATUREPAK or FlashPak not installed properly or defective unit	●	●	●	●	●	●	●	●
RAM test failure[2]	❍	●	❍	❍	❍	❍	❍	❍
Link processor local RAM test failure	❍	●	❍	●	❍	❍	❍	❍
Link processor code load failure	❍	❍	●	●	❍	❍	❍	❍

Key:

❍   LED off

●   LED on

x   not applicable

[1] If configured as a link, this indicator blinks with no established link.
[2] Contact your MICOM Certified Distributor.
[3] System can still operate with CMOS failure. All configuration data has been lost in the affected CMOS section and default values supplied.
[4] System can still operate with low battery. Configuration data may be lost if unit loses power.

Step 4. Access the Command Facility

You will use the terminal you connected in a previous step to access the Command Facility of the unit. The Command Facility contains menus to configure the ports, node, and data channels.

The screen of the terminal is blank except for the cursor position. Choose one of the following methods to enter the Command Facility. Either method can be used to enter and reenter the Command Facility. The instructions for using both methods follow.

- Via $CMD. Use this method if your terminal is configured as DTR connect protocol.

- Via the Command Mode using ^X <break>.

Note: Menu flows in this section show the name of the menu option you should choose. To select the menu option, enter the number shown on your screen that is associated with the option desired.

For example, enter 3
to select this option.

```
COMMAND FACILITY MAIN MENU
```

Command Facility accessed via $CMD

Press `Enter`

At the prompt, enter $CMD

```
                    ENTER CLASS: $CMD
```

The default password is no password, so press `Enter`

```
              ENTER CLASS PASSWORD:  Enter
```

```
   COMMAND FACILITY MAIN MENU [!240]

        1.  VIEW CONFIGURATION
        2.  STATUS/STATISTICS
        3.  CONFIGURE LOCAL NODES
        4.  CONFIGURE/VIEW REMOTE NODE
            .
            .
            .
            EXIT COMMAND FACILITY
```

Command Facility accessed via
Command Mode using ^X <break>

Press ^X
then <break>

```
┌──────┐  ┌──────┐
│ Ctrl │  │  X   │
└──────┘  └──────┘
┌──────────┐
│  Break   │
└──────────┘
```

The Command Mode Menu is displayed. (If your keyboard does not have a
<break> key, use the $CMD access method, which precedes this one.)

```
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      COPYRIGHT LAWS OF THE UNITED STATES.

     COMMAND MODE: CHANNEL XX
           1.  ASYNC CHANNEL LOOPBACK
           2.  LOCAL CHANNEL CONFIGURATION
           3.  COMMAND FACILITY MAIN MENU
           4.  EXIT
```

Select the option to access the Command Facility Main Menu.

```
     COMMAND MODE: CHANNEL XX

  ┌──┐
  │  │   COMMAND FACILITY MAIN MENU
  └──┘
```
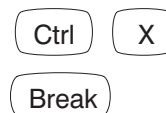
```
     COMMAND FACILITY MAIN MENU [!240]

         1.  VIEW CONFIGURATION
         2.  STATUS/STATISTICS
         3.  CONFIGURE LOCAL NODES
         4.  CONFIGURE/VIEW REMOTE NODE
            .
            .
            .
            EXIT COMMAND FACILITY
```

Exiting

To exit or quit the Command Facility, either select the EXIT COMMAND
FACILITY option, or press <break>. The DISCONNECT message is
displayed.

Step 5. Configure the Node Number and Node ID for the Unit

This configuration establishes a unique node number and node ID for your Marathon. This process can be referred to as "naming" the node.   Each node must have its own node number and node ID, and there can be no duplicates in the network.

The network may have one or multiple nodes containing a Real Time Clock. The node with a Real Time Clock and configured with the lowest node number is the network time master. A Real Time Clock broadcasts time to other nodes in the network.

Syntax

NODE #   Use 1 through 254. (Number 1 is input as 1, not 001.)

NODE ID   One to eight characters. The first character must be an alpha character. The remaining characters can be any combination of alphanumeric characters and the underbar (_). Spaces can not be used. Node IDs are not case-sensitive. It is recommended that they be kept short.

Node Number and Node ID Configuration

```
COMMAND FACILITY MAIN MENU [!240]

    CONFIGURE LOCAL NODES
```

```
    NODE IDS
```

```
NODE ID CONFIGURATION

    LOCAL NODE
```

Enter the node number for the Marathon unit.

```
                ENTER NODE-ID # [240]:
```

Enter the node ID. The Marathon software is not case-sensitive, so for example, Los_A, LOS_A and los_a are all the same.

```
           ENTER NODE-ID (^X TO ABORT) [!240]:
```

```
   **SELECT "Y" TO RESET SYSTEM WHEN NODE CHANGES MADE**
   ENTER "Y" TO RESET "C" TO CONTINUE:   Y
```

Press Y to reset the node. (If you press C, your configuration is placed into "temporary storage," and not implemented.)

⚠ *CAUTION*

To implement the node ID configurations, you must select Y before leaving the Node ID Configuration menu or your new configuration will be lost.

After the reset, you return to one of two locations. If you entered the Command Facility via ^X <break>, you automatically return to the Command Facility Main Menu after the reset. If you entered the Command Facility from the ENTER CLASS prompt, you automatically exit the Command Facility after the reset.

Step 6. Configure Mesh *On*
(if a mesh network)

There are two network types: mesh and non-mesh.

- Non-Mesh   Recommended for all units operating without closed
  (Mesh Off)   loops. This is the default.

- Mesh   For all configured units utilizing a
  (Mesh On)   closed-loop topology (connected in a network with more
                      than one pathway) and units in between closed loop
                      networks. When enabling mesh in frame relay
                      networks, the unit has a maximum DLCI/PVC
                      configuration (see Capabilities on page 1-1).

Each unit required to run mesh or connecting nodes between mesh networks
must have mesh enabled (on).

Configuring a Mesh Node

To enable the mesh feature, use the following path:

```
CONFIGURE LOCAL NODES

     NODE IDS
```

```
NODE ID CONFIGURATION

     MESH ROUTER
```

```
MESH ROUTER

     ON
```

```
     ENTER "Y" TO RESET "C" TO CONTINUE:
```

Press Y which will force the reset. If you press C the change will not take
effect.

Important

The DUPLICATE NODE-ID message will very briefly display if
there are units within the network which should be configured
for mesh and they are currently configured as non-mesh. (This
is assuming that all the nodes have already been given unique
names at the Node IDs Menu.) Do not place a network in
service that displays this message as some nodes may not be
recognized.

Step 7. Configure the Ports

```
COMMAND FACILITY MAIN MENU

     CONFIGURE LOCAL NODES
```

```
     PORT CONFIGURATION
```

Type the node ID, which was just configured, a slash, followed by the channel number. Then press [Enter]

```
  ENTER NODE-ID/CHANNEL # (^X TO ABORT):
```

Select the port type for the channel.

```
PORT CONFIGURATION
     1.  ASYNC
     2.  SYNC
     3.  INTERCONNECT LINK
     4.  LOCAL INTERCONNECT LINK
     5.  SECONDARY INTERCONNECT LINK
     6.  MUX LINK
     7.  X.21 LINK
     8.  FRAME RELAY LINK
```

Async Port

```
     ASYNC
```

All ports except for A1 are by default async ports. This option is used when reconfiguring a port to an async port.

Sync Port:
Protocol Configuration

```
     SYNC
```

When selecting the sync port option, a Set Channel Protocol menu is displayed. The sync devices on both ends of the connection must operate under the same protocol.
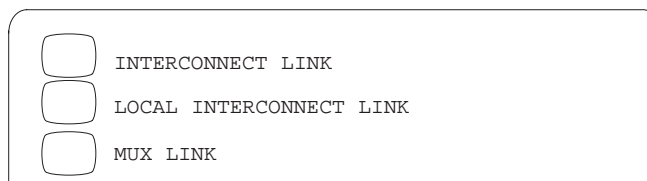
Select the protocol matching that of the sync device. A selection must be made.

```
SET CHANNEL PROTOCOL [DLC]:
     1.  DLC
        .
        .
        .
```

Configuration of the sync channels will be described on page 2-22.

Interconnect, Local Interconnect and Mux Link

```
┌─────────────────────────────────────────
│  ┌──┐
│  └──┘   INTERCONNECT LINK
│  ┌──┐
│  └──┘   LOCAL INTERCONNECT LINK
│  ┌──┐
│  └──┘   MUX LINK
│
```

Link Speed and Clocking

When selecting an interconnect link, local interconnect link, or mux link, a Set Link Rate menu is displayed. If the port is connected to a communication device such as a modem or DSU/CSU, then clocking is supplied to the Marathon from the communication device – sync external clocking.

Select the link rate.

```
┌─────────────────────────────────────────
│  SET LINK RATE [SYNC EXTERNAL CLOCKS]:
│       1.  SYNC EXTERNAL CLOCKS
│                   .
│                   .
│                   .
```
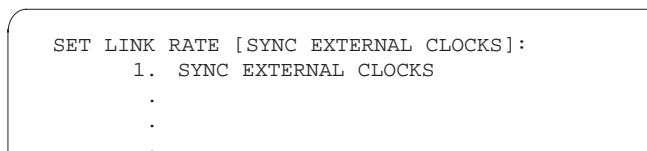
However, if you are connecting the Marathon back-to-back to another Marathon without a communication device, the Marathons must both be set for internal clocking.   If a Marathon is providing clocking to a device such as a channel bank, the Marathon must be set for internal clocking. Be sure that both units are configured for the same speed. A crossover cable must be used.

Local Interconnect Link

This option permits higher speed links to another Integration unit which is co-located (within 25 feet or 8 meters). You can only use this option to connect to another Integration unit supporting a Local Interconnect Link.

Secondary Interconnect Link

This option defines the port as a backup link to another interconnect link.

SECONDARY INTERCONNECT LINK

When you select this option, the following prompt will display:

```
ENTER PRIMARY LINK#, "NO" TO DEASSIGN OR ^X TO ABORT:
```

Type in the number of the link that will serve as the primary link (the one to which the link you are configuring will be the backup), followed by Enter to accept the entry. If this link is already assigned as a secondary and you wish to deassign it, enter *no* at the prompt.

Notes

- The secondary interconnect link must not be assigned as a primary interconnect link to another secondary interconnect link.

- The primary must be configured as an interconnect link.

Remember to set the secondary link parameters from the Configure Local Nodes menu.

Frame Relay Link

FRAME RELAY LINK

After configuring the port as frame relay, reset the node to current configuration. Reset instructions are on page 2-18.

Prior to configuring the frame relay parameters, obtain the following information from the carrier provider:

Configuration Prerequisites

- DLCI numbers (there will be two DLCI numbers for each DLC—one for each end point)
- DLCI parameters (CIR and Be)
- Local management protocol: Annex A, D, LMI Rev 1, or None
- Local management parameters (for Annex A, D, or LMI Rev. 1 Protocol)

Frame Relay Parameters

```
  CONFIGURE LOCAL NODES

        FRAME RELAY PARAMETERS
```

```
ENTER NODE ID/CHANNEL # (^X TO ABORT):
```

```
FRAME RELAY PARAMETERS
    1.   FRAME RELAY LINK PARAMETERS
    2.   LOCAL MANAGEMENT PROTOCOL PARAMETERS
    3.   DLCI CONFIGURATION
```

Frame Relay Link Parameters

```
  FRAME RELAY PARAMETERS

        FRAME RELAY LINK PARAMETERS
```

```
  FRAME RELAY LINK PARAMETERS
    1.   CLOCK SPEED
    2.   PORT CLOCKING
    3.   MAXIMUM FRAME SIZE
    4.   NETWORK ADDRESS
    5.   LOCAL MANAGEMENT PROTOCOL
```

Local Management Protocol Parameters

If you select either Annex A, D, or LMI Rev. 1 local management protocol, you may set the management parameters using the following path:
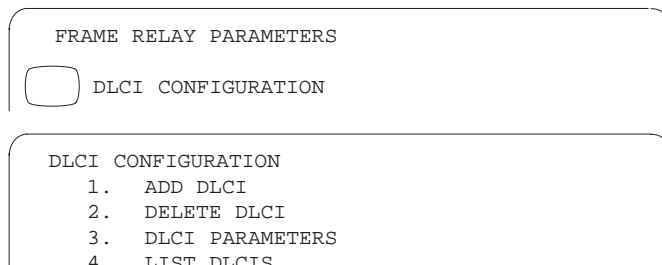
```
  FRAME RELAY PARAMETERS

           LOCAL MANAGEMENT PROTOCOL PARAMETERS
```

```
  LOCAL MANAGEMENT PROTOCOL PARAMETERS

      1.  FULL STATUS POLLING COUNTER
      2.  ERROR THRESHOLD
       .
       .
       .
```

DLCI Configuration

Accessed from the Frame Relay Parameters menu, this menu offers the
following options:

```
 FRAME RELAY PARAMETERS

    DLCI CONFIGURATION
```

```
 DLCI CONFIGURATION
    1.   ADD DLCI
    2.   DELETE DLCI
    3.   DLCI PARAMETERS
    4.   LIST DLCIS
```

Important

Configure the DLCI (add DLCI) at the local unit prior
to connecting to the frame relay network.

Level 2 Protocol

This menu displays when you add a DLCI to your unit:

```
 LEVEL 2 PROTOCOL
    1.   TRANSPARENT
    2.   VIRTUAL LINK
    3.   FRAGMENTATION
```
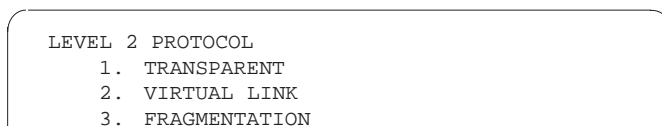
DLCI Parameters

This menu sets the parameters for a specific DLCI. The information comes
from the carrier provider.

```
 DLCI PARAMETERS     [channel #.dlci #]
       1.  COMMITTED BURST SIZE FORWARD (BC.FWD)
       2.  COMMITTED BURST SIZE BACKWARD (BC.BWD)
          .
          .
          .
```
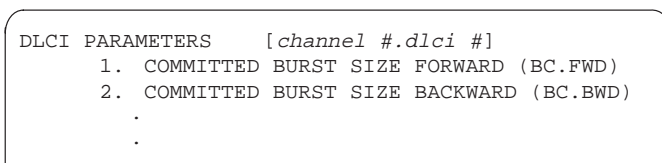
Step 8. Reset the Unit

There are two ways to perform a node reset on the unit: through the Command Facility Main Menu (software reset), and from the front of the unit (hardware reset).

Command Facility Resets

There are several varieties of resets in the Command Facility, as follows:

1. Node −   Resets the local node; all channels connected locally and the Command Facility will be disconnected (except for the T1 or E1 Access Module). All locally attached MICOM muxes will reset. Remote units (and their MICOM muxes) will not be reset by this option. Two options for node reset are factory *default values* (cold start), or *current configuration* (warm start).

    Note: If you are attempting to activate new software, you must use the *Node: Bank Selected Software* option. This option uses the current version of software.

2. Link −   Resets the selected link; all channels currently using the link will be disconnected. If it is a mux or X.21 link, this resets the mux also. Force connected channels automatically reestablish connections. For Frame Relay Link reset options, refer to page 2-20.

3. Channel −   Resets a single channel (voice/fax or data only).

4. Integral LAN − Resets the Integral LAN module to either the current configuration or factory default values. If the default values option is selected, only the LAN module parameters are restored to their factory defaults.

5. T1/E1   This option resets the T1 or E1 Access Module only. It does not interrupt traffic over the wide area network (WAN).

6. Node: Bank   After you have proceeded through all the steps to
   Selected   download and select a bank, this option resets the
   Software −   node and loads the selected bank into RAM. This reset and download will take several minutes to complete.

Node Reset

For a node reset, two selections are offered:

1. Default Values – returns the entire system configuration to the factory defaults. This is also known as a cold start.

2. Current Configuration – sets the unit to the current configuration and updates the network (once the network is connected). This is also known as a warm start.

Perform a node reset to current configuration by following these selections through the menus:

```
COMMAND FACILITY MAIN MENU

    RESET
```

```
RESET

    NODE
```

```
     ENTER "Y" TO CONFIRM OR "N" TO ABORT: Y
```

Be sure to select the Current Config-uration option.

```
PARAMETER RESTORATION

    CURRENT CONFIGURATION
```

Depending on the method used to enter the Command Facility, you either remain in the Command Facility or exit after the reset.

Frame Relay Link Reset

After changing access link parameters, you must reset the access link. After changing DLCI parameters, you must reset the DLCI. Follow this path to the reset options.

```
COMMAND FACILITY MAIN MENU

        RESET
```

```
RESET

        LINK
```

```
   ENTER LINK CHANNEL # (^X TO ABORT):
```
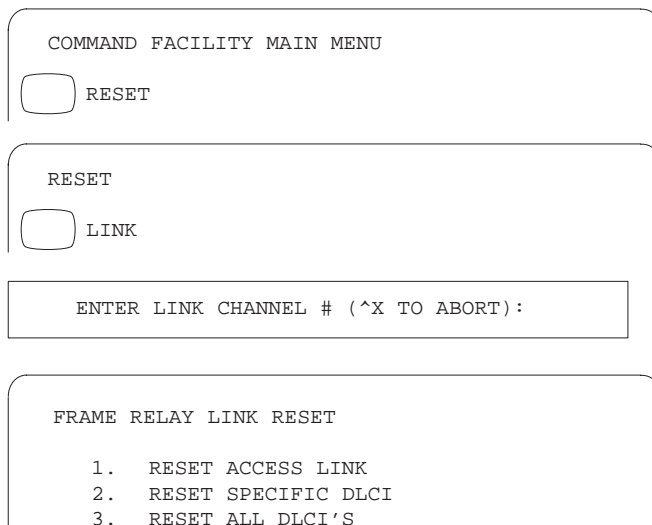
If the port is configured as a frame relay link, the Frame Relay Link Reset menu will display.

```
FRAME RELAY LINK RESET

   1.   RESET ACCESS LINK
   2.   RESET SPECIFIC DLCI
   3.   RESET ALL DLCI'S
```

Hardware Reset

The hardware reset is performed at the front of the unit. With a narrow or pointed object (such as a pen), carefully depress the recessed reset button and hold it for two seconds. This also resets the clock.

Hardware
Reset Button
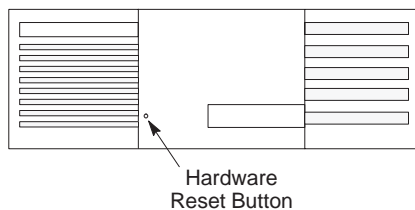
Step 9. Configure the Number and ID for the Local MICOM Muxes (if any)

This configuration establishes a node number and node ID for a MICOM mux, if one is attached to a port in the network (or attached via an X.21 bis link).

```
COMMAND FACILITY MAIN MENU

    CONFIGURE LOCAL NODES
```

```
    NODE IDS
```

```
NODE ID CONFIGURATION

    MUX/X.21 LINK NODE(S)
```

Enter the module location A, and the port number.

```
            ENTER LINK CHANNEL NO:
```

Enter the node number.

```
            ENTER NODE-ID # [xxx]¹:
```

Enter the node ID.

```
      ENTER NODE-ID (^X TO ABORT) [!xxx]¹:
```

```
**SELECT "Y" TO RESET SYSTEM WHEN NODE CHANGES MADE**
ENTER "Y" TO RESET "C" TO CONTINUE:
```

If your local network has additional MICOM muxes, press C to continue configuring. If there are no more local MICOM muxes to configure, press Y to reset the unit and implement the configuration.

⚠ CAUTION

To implement the node ID configurations, you must select Y before leaving the Node ID Configuration menu or your new configuration will be lost.

_____

[1] The number displayed in the prompt [xxx] is the current mux link channel number just entered. For A1, the default node ID # will display [241], and the default node ID will display [!241].

Step 10. Configure the Channels

Synchronous Channel Configuration

Sync channels are supported only as direct attachments on Marathons. (Muxes can only support async or voice channels.) A sync connection cannot be made to a MICOM mux.

<div align="center">

⚠ **CAUTION**

</div>

The sync channel is not switchable and *must* be force connected.

When configuring a synchronous channel, you must determine if the sync device is providing the clocking. If the sync device provides clocking, configure the Marathon unit for external clocking, and set the sync channel data rate to match the attached sync device. If it does not provide clocking, configure the Marathon unit for internal clocking.

```
COMMAND FACILITY MAIN MENU

    CONFIGURE LOCAL NODES
```

```
CONFIGURE LOCAL NODES

    SYNC CHANNEL
```

Enter the node ID, a slash, and the sync channel number.

```
    ENTER NODE-ID/CHANNEL # (^X TO ABORT):
```

If you see CONFIGURATION INHIBITED and WRONG CHANNEL TYPE error messages now, it is likely that a reset was not performed after changing the port configuration to sync. Abort the entry and perform a node reset before returning to this sequence (reset instructions are on page 2-18).

There is a different Sync Channel Characteristics menu for each sync protocol. (Remember, the protocol was selected as part of the port configuration procedure.) The display shows the current data rate value.

Refer to the sync device and adjust any parameters as appropriate (such as data rate and block size).

```
SYNC CHANNEL CHARACTERISTICS

    1. DATA RATE            [2400]
```

Asynchronous Channel Configuration

All user channels (A2-A6 plus expansion module data channels) are asynchronous by factory default.

To access the Async Channel menu, follow this menu path:

```
COMMAND FACILITY MAIN MENU

    CONFIGURE LOCAL NODES
```

```
CONFIGURE LOCAL NODES

    ASYNC CHANNEL
```

Enter the node ID, a slash, and the async channel number.

```
    ENTER NODE-ID/CHANNEL # (^X TO ABORT):
```

```
ASYNC CHANNEL
        1.  CHANNEL CHARACTERISTICS
        2.  CHANNEL FEATURES
        3.  EXTENDED FEATURES
        4.  SWITCHING PARAMETERS
```

Note: Changes made to the channel accessing the Command Facility take effect after exiting the Command Facility. Also, if the channel being configured is in use, the changes take effect after the channel becomes idle.

To Terminal   Be sure to access the Channel Characteristic menu, and configure any channels connected to terminals as To Terminal.

Echo   Also, you may want to turn Echo on.

To Host   For channels connected to hosts, access the Channel Characteristic menu, and configure those channels as To Host.

Parity   All async ports must be configured to match the host or terminal to which they are connected. The software performs parity conversion between Marathons (Release 3.0 and above).

Channel Password

The channel password provides security for the specific async channel
entered above. When configured, it is the first prompt a user encounters
(even before the ENTER CLASS prompt). After two incorrect passwords, the
channel is disconnected. The default is no password.

Syntax   Up to eight alphanumeric characters. Erase a password by
entering a space and then ⌷Enter⌷ at the password prompt.

```
 ASYNC CHANNEL

     SWITCHING PARAMETERS
```

If the Character Set
option, in the Switch-
ing Parameters Menu
is configured as Non-
ASCII, *do not* assign
a password.

```
 ASYNC CHANNEL SWITCHING PARAMETERS

     CHANNEL PASSWORD
```

Enter the password
you want assigned to
the channel.

```
     ENTER CHANNEL PASSWORD (^X TO ABORT):
```

The channel passwords can be viewed under View Configuration by selecting
Async Channel and then Switching Parameters.

Step 11. Configure Command Facility Passwords

The Command Facility passwords provide different types of security for access to the Command Facility.

Global: Allows access to all functions.

Status: Allows access only to view, status, and exit functions.

⚠ *CAUTION*
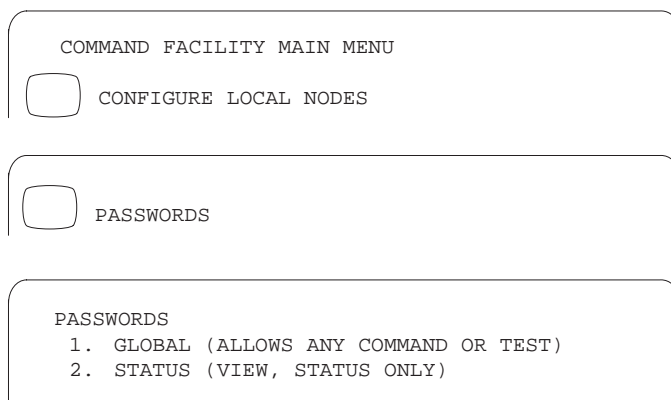
Record these passwords because they cannot be viewed anywhere. If forgotten, a Cold Start is required, and the system defaults will be reinstated.

Syntax for Global and Status Passwords

Up to eight alphanumeric characters. Erase a password by entering a space and then `Enter` at the password prompt. The default value is no password.

Global and Status Password Configuration Procedure

```
COMMAND FACILITY MAIN MENU

      CONFIGURE LOCAL NODES
```

```
      PASSWORDS
```

Select option.
```
PASSWORDS
 1.  GLOBAL (ALLOWS ANY COMMAND OR TEST)
 2.  STATUS (VIEW, STATUS ONLY)
```

Enter the characters for the password.

Step 12. Configure the Command Facility

The Command Facility Parameters menu controls such parameters as the system time, date, system reports, and the no activity timeout.

Event and alarm message reporting turns *on* or *off* the report of a normal change of state in the system, or the report of a vital error in the system.

```
COMMAND FACILITY MAIN MENU

      CONFIGURE LOCAL NODES
```

```
      COMMAND FACILITY PARAMETERS
```

```
COMMAND FACILITY PARAMETERS
   1.TIME
   2.DATE
    .
    .
    .
```
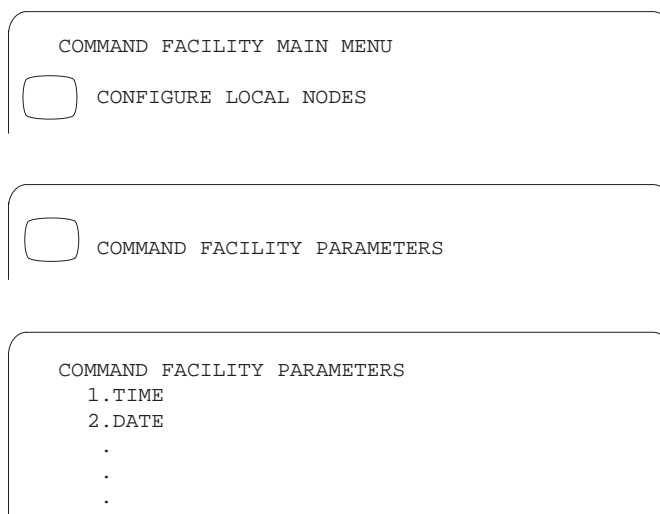
Time is set in hh:mm:ss format, 24-hour time, so 1:00 pm is entered as 13:00:00.   System date is set in mm/dd/yy (month/day/year) format.

If your unit contains an optional NMS Module (model 5000NMS/CE/RTC), it contains a Real Time Clock. If the unit is configured with the lowest node number in the network, it broadcasts time to other nodes in the network.

The no activity timeout is a timer that monitors activity on the Command Facility port and disconnects the channel if the time is exceeded.

Once the required parameters are configured, press M to return to the Command Facility Main Menu.

Basic Unit Information A

This section should be completed by the technician or distributor who is installing the unit. When completed, it should represent your node's information. It is intended as a reference tool for identifying the node, its port connections and data rates.

Node ID: _____

Node #: _____

Port Connection Type, Data Rate

For example:
A1 Interconnect Link
128 Kbps

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____
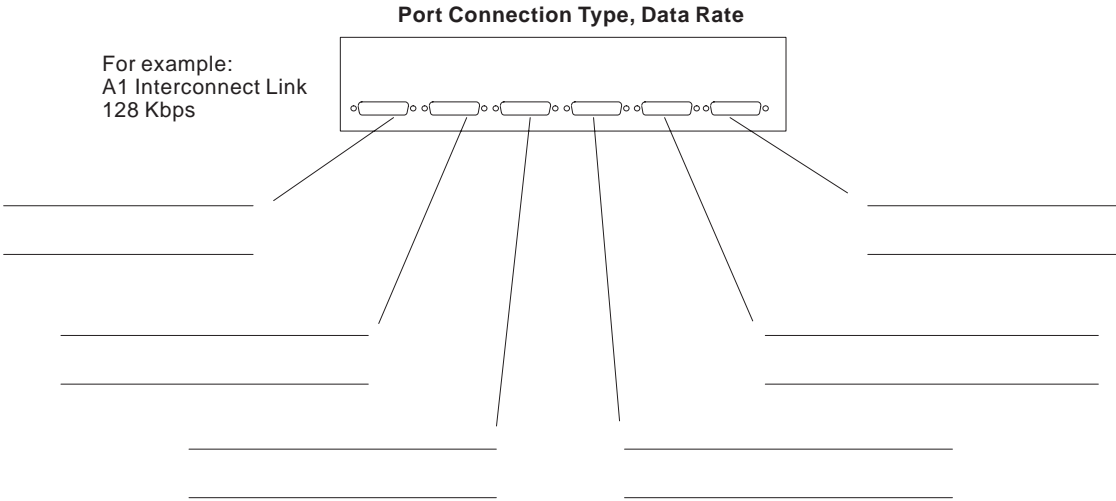
Port A1 interface (check one):

      RS-232   _____

      V.35   _____

      X.21   _____

Base Module Components B

Contents

This section contains descriptions of the base module components, port connectors and cable references.

Marathon 20K Pro Base Module Components

Back

① **Port A1 Interfaces**

RS232
V.35
X.21

RS232
V.35
X.21

Strapped for Default: RS-232 (V.24)

② **Clock Inversion Headers**

E6
E5

E6 Inverts External Transmit Clock
E5 Inverts External Receive Clock

FlashPak Cartridge

Front
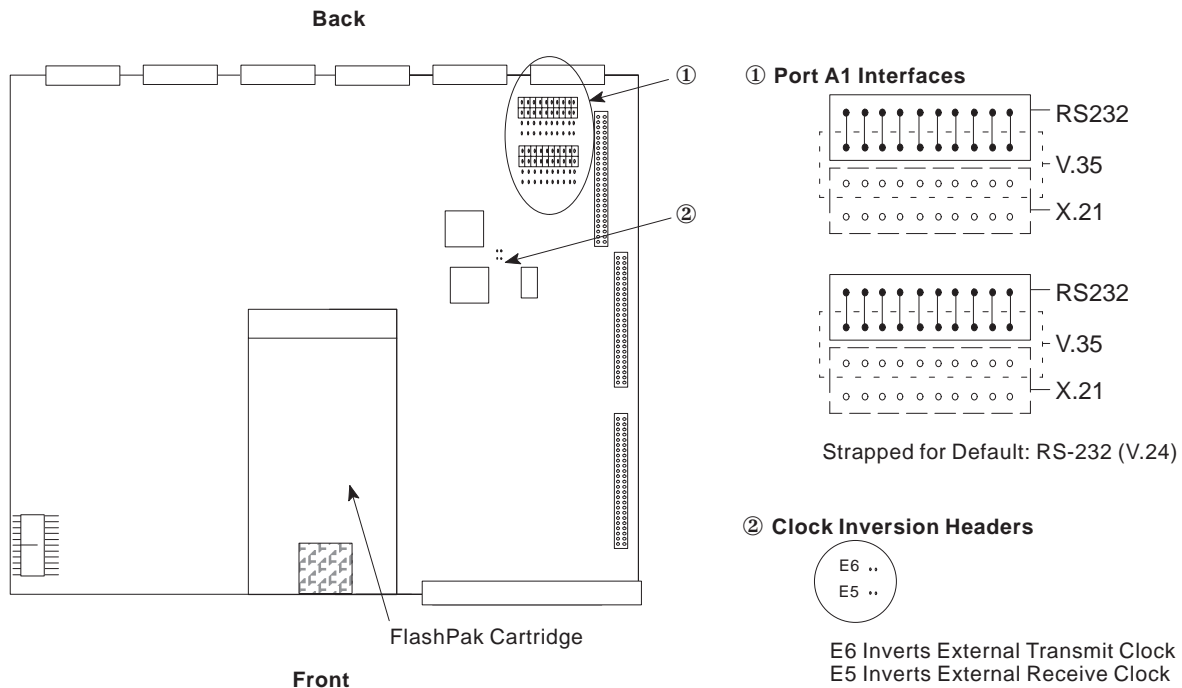
⚠ *CAUTION*

Jumper block setting for A1 *must* be RS-232 (V.24) for an integral ISU installed in the unit.

Port A1 Interface Selection

The Marathon 20K Pro base module has a pair of user configurable jumper blocks for the port A1 interface. The jumpers can be set for RS-232 (V.24), V.35, or X.21; the default is RS-232 (V.24). The two blocks must be set for the same interface.

Clock Inversion Jumpers

In most instances, the Clock Inversion jumpers remain in place on headers E5 and E6. When running frame relay over long cables, if instances of intermittent data errors occur, these jumpers compensate for the cable length by creating a 180° phase shift. Jumpers should be moved as a pair: either both on or both off. The default is both jumpers are on.

Base Module Port Interfaces

Communications Control Module Back Panel

Port A1

Note: DCE = Data Communications Equipment
DTE = Data Terminal Equipment

Pin 1

Pin 25
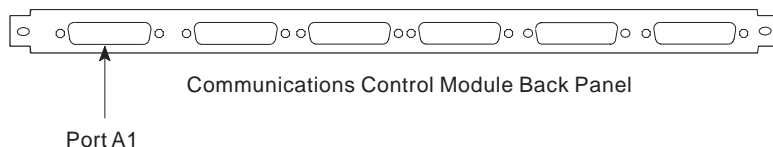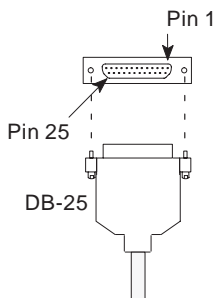
DB-25

All CCM ports
RS-232, V.24 Interface
DB-25 Pin Assignments

Chassis Ground	1
Transmit Data (TD)	2
Receive Data (RD)	3
Request to Send (RTS)	4
Clear to Send (CTS)	5
Data Set Ready (DSR)	6
Signal Ground	7
Carrier Detect (CD)	8
Unassigned	11
Transmit Clock	15
Receive Clock	17
External Receive Clock	18
Data Terminal Ready (DTR)	20
Ring Indicator (RI)*	22
External Transmit Clock	24
Busy*	25

*   Pins 22 and 25 are not used on 345-5429,
345-5431, 345-5430 and 345-5432.

Port A1 only
X.21 Interface, to DCE
DB-25 Pin Assignments

Transmit A (T A)	3
Transmit B (T B)	16
Receive A (R A)	2
Receive B (R B)	14
Control A (C A)	15
Control B (C B)	13
Indication A (I A)	24
Indication B (I B)	23
Signal Element Timing A (S A)	18
Signal Element Timing B (S B)	21
Signal Ground	7
Shield	1

Port A1 only
V.35 Interface, to DCE
DB-25 Pin Assignments

Send Data A	2
Send Data B	14
Serial Clock Receive External A	18
Serial Clock Receive External B	21
Receive Data A	3
Receive Data B	16
Serial Clock Receive A	17
Serial Clock Receive B	19
Serial Clock Transmit External A	24
Serial Clock Transmit External B	23
Data Set Ready (DSR)	6
Data Terminal Ready (DTR)	20
Unassigned	11
Request to Send (RTS)	4
Receive Line Signal Detector (RLSD)	8
Ring Indicator	22
Local Test	25
Clear to Send (CTS)	5
Signal Ground	7
Frame Ground	1

Port A1 only
V.35 Interface, to DTE
DB-25 Pin Assignments

Send Data A	2
Send Data B	14
Serial Clock Transmit A	15
Serial Clock Transmit B	13
Receive Data A	3
Receive Data B	16
Serial Clock Receive A	17
Serial Clock Receive B	19
Serial Clock Transmit External A	24
Serial Clock Transmit External B	23
Data Set Ready (DSR)	6
Data Terminal Ready (DTR)	20
Request to Send (RTS)	4
Clear to Send (CTS)	5
Receive Line Signal Detector (RLSD)	8
Ring Indicator	22
Local Test	25
Unassigned	11
Signal Ground	7
Frame Ground	1

Base Module Cables

Communications Control Module Back Panel

Port A1
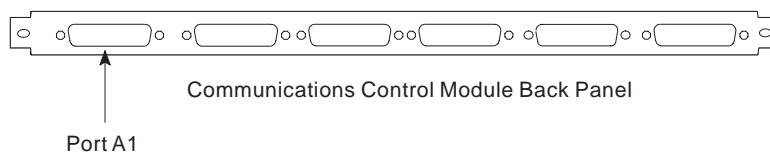
Type Cable Connector	Interface[1]	MICOM Cable Model No.	Part No.	Application/Description
DB-25 DCE	RS-232 (V.24)	5000C/5340	345-5340	To DTE, Straight (Male-to-Male)
		5000C/5341	345-5341	To DCE, Crossover (Male-to-Male)
		5000C/5341-4	345-5341-004	To DCE, Crossover (Male-to-Male), 4-foot version of 5000C/5341
		5000C/5342	345-5342	To DCE, Crossover (Male-to-Female)
		5000C/5343	345-5343	To DTE, Straight (Male-to-Female)
		–	345-5373	To X.21 bis Line Terminator or Composite, Crossover (Male-to-Male)
		–	345-5429	To DCE, Crossover (Male-to-Male) European Applications
		–	345-5431	To DCE, Crossover (Male-to-Female) European Applications
		–	345-5430	To DTE, Straight (Male-to-Male) European Applications
		–	345-5432	To DTE, Straight (Male-to-Female) European Applications
	V.35	5000C/V35-DTE	345-5397	V.35, to DTE, Straight (Male-to-Female)
		5000C/V35-DCE	345-5398	V.35, to DCE (Male-to-Male)
	X.21	5000C/X21-DTE	345-5408	X.21, to DTE, Straight (Male-to-Female)
		5000C/X21-DCE	345-5407	X.21, to DCE (Male-to-Male)

[1] For port A1 only, the RS-232 (V.24), V.35 or X.21 interface can be selected by changing the position of a pair of jumper blocks on the 20K Pro base module; RS-232 (V.24) is the default.

Note: DCE = Data Communications Equipment
        DTE = Data Terminal Equipment

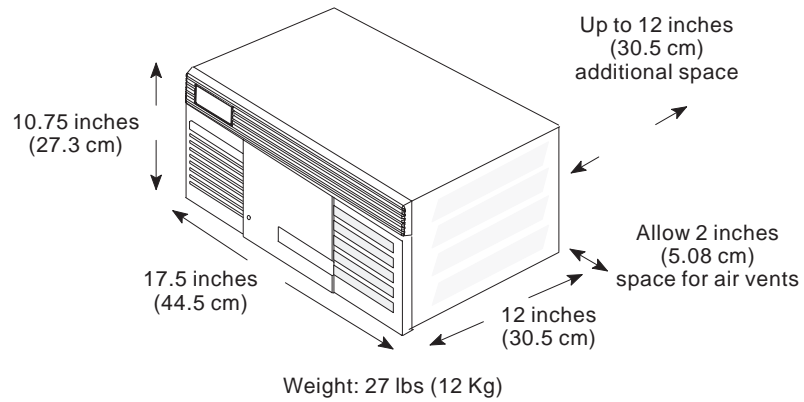# Specifications C

Contents

Unit Size

Note: Allow additional space behind all units for the following:
● cable connectors: 3 inches (7.6 cm)
● interface converter or SNAPS: 6 inches (15.2 cm)
● LAN Cartridge: 12 inches (30.5 cm)
Allow space on the side for air vents.

Up to 12 inches
(30.5 cm)
additional space

6.5 inches
(16.5 cm)

Allow 2 inches
(5.08 cm)
space for air vents

17.5 inches
(44.5 cm)

12 inches
(30.5 cm)

Weight: 22 lbs (10 Kg)

Standard Unit

Up to 12 inches
(30.5 cm)
additional space

10.75 inches
(27.3 cm)

Allow 2 inches
(5.08 cm)
space for air vents

17.5 inches
(44.5 cm)

12 inches
(30.5 cm)

Weight: 27 lbs (12 Kg)
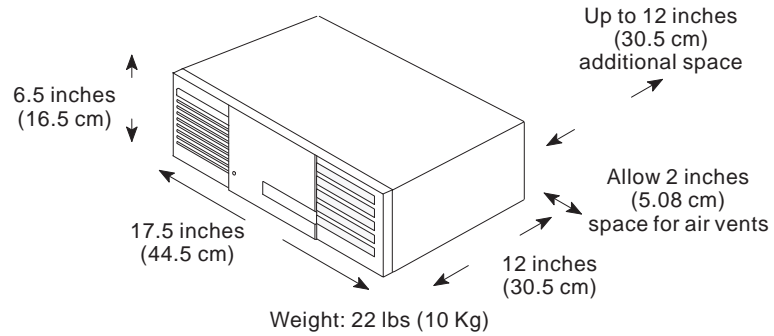
Unit with Power Plus

Operating Environment

Temperature

    Operating   32 to 122ºF (0 to 50ºC)

    Storage   -40 to 158ºF (-40 to 70ºC)

Humidity

    Operating   10 to 90% relative humidity (noncondensing)

    Storage   0 to 95% relative humidity (noncondensing)

Memory

Lithium battery	Located on the base module, the battery preserves the configuration of the CMOS RAM for eight to ten years.
Flash Memory for Code	Dual-bank Flash memory

Interface Connections

Industry Standard Connections	All industry standard connection interfaces are supported, including: RS-232, RS-530, RS-449, V.35, X.21, FXS, FXO, E&M I through V, Ethernet, and G3 fax
Ports	All ports present themselves as Data Communications Equipment.
Port A1	Jumper blocks on the base module set the Port A1 interface for RS-232 (V.24), V.35 or X.21.

⚠ *CAUTION*

Jumper block setting for A1 *must* be RS-232 (V.24) if an Integrated Service Unit (ISU) is installed in the unit.

Agency Compliance

Safety	UL 1950:1993
	CSA Standard C22.2 No. 950:1993
	IEC 950:1991+A1:1992
	TÜV: EN 60950:1992
	EN 41003:1993
	VDE 0805
	BABT 340: Sixth Edition (Manufacturing)
Electromagnetic Compatibility	FCC Part 15 Level A
	C.R.C., c, 1374
	EN55022 (CISPR 22)
	EN50082-1:1992
	IEC 801-2:1991/prEN55024-2:1992,
	3KV CD, 8KV AD
	IEC 801-3:1984/prEN55024-3:1991,
	3 V/m
	IEC 801-4:1988/prEN55024-4:1993,
	0.5KV Signal, 1KV Power
	EN60555 Power Harmonics (June 1996 and later)
Telephone Registration (as applicable)	FCC Part 68 (U.S.A.)
	DOC CS-03 (Canada)
	European Union (see Voice Manual for NTRs)
EU Declaration of Conformity	
Safety	Directive: 73/23/EEC
EMC	Directive: 89/336/EEC
BABT	License #604342
CE-Compliant	The unit meets the European EMC directive 89/336/EEC.

Power

Power	100 to 240 Vac -5%, +10% 47 to 63 Hz 135 Watts maximum 1½ to 3 Amps
Distance to ac Power Socket	The distance to an ac power socket should not exceed six feet (1.8 meters). Do not use extension cords, which may hinder your ability to unplug the system in the event of an emergency.
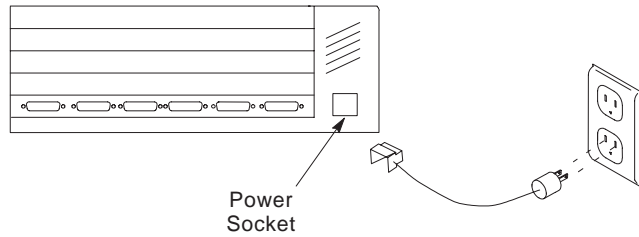
Power
Socket

⚠️ **WARNING**

Before the unit is powered up or turned on, make sure there is a separate ground wire connection between the unit chassis and input power source ground.

The power cord supplied with your unit should be one of the following:

1. a molded three-prong power cord with an appropriate connector to match the power outlet in your country, as shown in Figure A below, or

2. a power cord with a two-prong power connector and a green-with-yellow stripe ground wire, as the examples in Figure B show. Since you do not have a grounded power outlet, contact an electrician to connect the green-with-yellow stripe wire to a fixed earth bonding point.

Figure A

Three-Prong, Country-Specific
Power Cord

Typical
Connector

Figure B

Two-Wire
Power Cord

Two-Prong
Power Connector

Green-with-Yellow Stripe
Ground Wire

≤0.5 ohms

to a Fixed Earth
Bonding Point

Three-Wire
Power Cord

Two-Prong
Power Connector

Green-with-Yellow Stripe
Ground Wire

≤0.5 ohms

to a Fixed Earth
Bonding Point
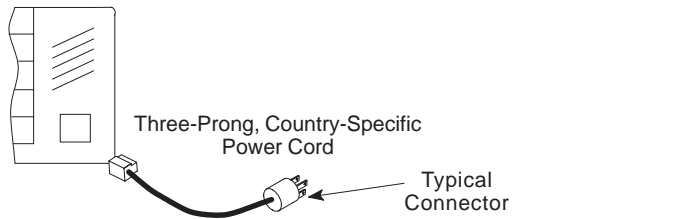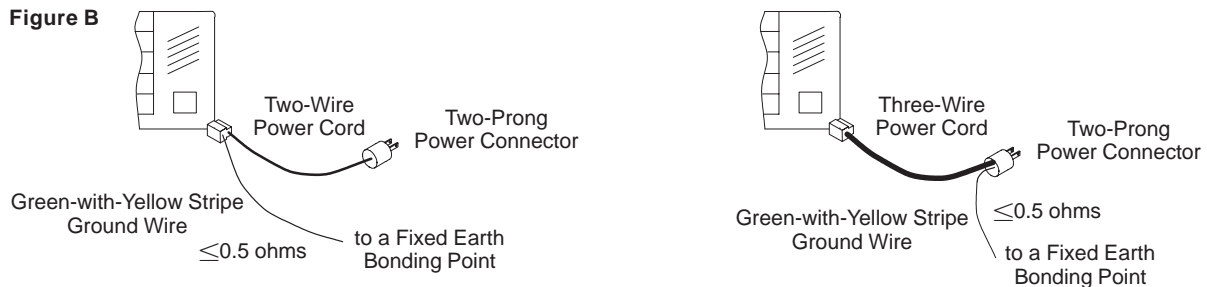
Port Options

Connectors are called ports. All ports except for A1 are by default async ports.

Port (Channel) Number	Default	Possible Port Configuration
A1	Interconnect Link	Interconnect, Secondary Interconnect, Local Interconnect, Frame Relay, Mux or X.21 Link
A2-A5	Async	Interconnect, Secondary Interconnect, Local Interconnect, Frame Relay, Mux or X.21 Link; Sync or Async
A6	Async	Interconnect, Secondary Interconnect, Local Interconnect, or Frame Relay Link; Sync or Async
B1-B6[1]	Async	Interconnect, Secondary Interconnect, Local Interconnect Link; Sync[2] or Async
B1-B12[3]	Async	Sync[2] or Async
C1-D12	Async	Sync[2] or Async
B-E	–	Can be used for Voice or LAN

[1] With 5000E/6DMA module installed in module location B.
[2] Sync channel available only on the 5000E/6 or 5000E/6DMA module.
[3] With any CEM other than 5000E/6DMA, installed in module location B.

Links

WAN Links

Interconnect Link	0-12 links, up to 128 Kbps
Secondary Link	0-6 links, up to 128 Kbps
Local Interconnect Link	0-12 links, 64-256 Kbps
Mux Link	0-5 links, up to 19.2 Kbps
Frame Relay Access Links	0-6 links, 56 Kbps - T1 (T1 requires external clocks)
Maximum number of configurable DLCIs	128
CIRs	User determined
Frame Size	Up to 8189 octets of information per frame (including frame header). Does not include CRC.
Voice	80% of CIR

Interconnect Link

Link Capacity

Terminated	256 Kbps
Switched	384 Kbps (3 @ 128 Kbps)
Delays	Six link hops maximum for units with voice/fax modules. Limit the link hops to three (four nodes total) if you are configuring *dynamic rate adaption* on your voice/fax module.

Notes:
- Port A1, when configured for frame relay can be externally clocked to T1 rates. V.35 is required.
- Generally, use RS-232 (V.34) interfaces for rates up to 64 Kbps. For faster rates, use V.35 or X.21 interfaces.

Frame Relay Link

Note: The maximums given are for a frame relay only application. In a hybrid network (frame relay and interconnect links) the numbers may vary. Contact your MICOM Certified Distributor for additional information.

Maximum Link Speed Combinations

On a frame relay only unit, the maximum link rates combination (in Kbps) per port

A1	A2	A3	A4	A5	A6
T1	512^1	–	–	–	–
768	512	512	–	–	–
512	512	384	384	–	–
512	512	384	256	256	–
512	512	384	256	128	128

Frame Relay Links and DLCIs

Maximum Access Links	6
Ports which can be Frame Relay Access Links	A1-A6
Configured DLCIs per Node (maximum)	128
Maximum PVCs on a Node with Mesh	12

Activated PVC Maximums

Virtual Links	36
Premise-Side PVCs (two DLCIs per PVC)	46

Utilized PVC Maximums

Total per Node (application dependent)	32
Virtual Links	20
Premise-Side PVCs	20

---

[1] Requires V.35 adapter.

Voice Channels

Analog	0-8 channels, 4-16 Kbps
Digital	0-30[1] channels, 4-16 Kbps

Asynchronous Channels

Capacity	0-41
Speed	50-38,400 bps
ABR	to 19.2 Kbps
Parity	Odd, Even, Mark, Space, None
Stop Bits	1, 1.5, 2
Characters	5-8 bits/character plus parity (code levels 5 through 9)
Classes	64
Delay Characteristics	40 msec depending upon channel and composite speed. Satellite operation will affect delay time.

Synchronous Channels

Capacity (@ 9600 bps)	0-18
Clock Rate and Protocols	
ASCII Bisync, EBCDIC Bisync, H-P Sync	1200-19,200
MICOM DLC, RTS/CTS, Sync-Pad	1200-48,000
DLC	1200-64,000
MICOM Voice	9600-14,400
Fast Packet	1200-64,000
TDM	1200-64,000
Delay Characteristics	30-40 msec @ 9600 bps. Satellite operation will affect delay time.

---

[1] More than 18 requires a power supply upgrade.

MICOM Mux

MICOM Mux Compatibility

Mux	FEATUREPAK Cartridge	Prom No. and Revision
MB2	ESM	907-1911-0F or higher
	FSM	907-2102-0A or higher
	FSV	907-2120-0B or higher
		907-2157-0A or higher
MB3	ESS	907-2002-0G or higher
	FSS	907-2103-0C or higher
MB5	ESM	907-1992-0B or higher
	ESS	907-1993-0D or higher
	FSS	907-2105-0B or higher
LCi/Val-U-Mux[1]	n/a	907-2013-0A or higher

[1] Will not support X.21 bis application.

Other Specifications

Status Displays	System status and port activity indicator lights.
Command Facility	Menu driven. Provides message broadcast, dynamic channel configuration, centralized troubleshooting, alarm messages, and periodic reports.
Diagnostics	Local channel tests, local and remote composite loopback tests, data output test, ISU module tests, voice/fax module tests and control signal monitoring.
Multiplexing Technique	*MicroBand* ATM — dynamically combines voice, fax, async, sync and LAN data onto one communications link.
Transparency	Normally transparent to ASCII user data. However, a port configured as *terminal* is transparent only when the data link is operational. The terminal port transmits *link down* in response to ^**X** when the link is not operational. A port configured as *host* is always transparent to ^**X**.
	Command Facility functions are activated by a ^**X** <**break**> or ^**X**^**Y** sequence. Transparency to these sequences is obtained by disabling the Command Mode using the Channel Features menu.

Telephone Requirements D

Contents

Telephone Company Requirements, ISU Module

Notifying the Telephone Company

You must notify the telephone company whenever the Integrated Service Unit (ISU) module is connected to, or disconnected from, a telephone company line. This equipment complies with Part 68 of the FCC Rules. On the back of this equipment is a label that contains, among other information, the FCC registration number.

You must supply the following information upon request:

- Whether the notification is a connection or disconnection
- Manufacturer of the device: MICOM Communications Corp.
- Model number of the device: 5000I/56-1 or 5000I/56-2
- FCC Registration Number: BEB9E9-16166-DE-N
- Ringer Equivalence: 0.0B
- Quantity of jack(s) which may be used: 1- or 2-RJ45
- Facility Interface Code: 04DU5-56
- Service Order Code: +6.0N

In addition to the above information you will be required to supply the following supplemental information if your system is an XD, DD, DE, or OT requiring three (3) or more C.O. Lines.

- Sequence in which the trunks are to be connected.
- Facility Interface Codes by position.
- Service Order Codes by position.

Note: The FCC Registration label includes the Ringer Equivalence, because at the time FCC Part 68 was established, digital systems without ringing had not been established. Even though the Ringer Equivalence must appear on the label, it is inconsequential in the case of digital communications devices.

Registration

Connection of this unit to the nationwide telecommunications network must be through a standard network interface jack (RJ48S) which you must order from your telephone company.

Affidavit Requirements for Connection to Digital Services

- An affidavit is required to be served to the telephone company whenever digital terminal equipment without encoded analog content and billing protection is used to transmit digital signals containing encoded analog content which are intended for eventual conversion into voice band analog signals and retransmitted on the network.

- The affidavit shall affirm that either no encoded analog content or billing information is being transmitted or that the output of the device meets Part 68 encoded analog content or billing protection specification.

- End user/customer will be responsible to file an affidavit with the local exchange carrier when connecting unprotected CPE to a 1.544 Mbps or Subrate digital services.

- Until such time as subrate terminal equipment is registered for voice applications, the affidavit requirement for subrate services is waived.

The following form is a copy of the affidavit to be used.

AFFIDAVIT FOR CONNECTION OF CUSTOMER PREMISES EQUIPMENT TO 1.544 MBPS AND/OR SUBRATE DIGITAL SERVICES

For the work to be performed in the certified territory of _____(Telco Name), State of_____, county of_____,
I,_____(name) , _____(business address) _____ (telephone number) being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to_____1.544 Mbps and/or _____Subrate digital services. The terminal equipment to be connected complies with Part 68 of the FCC rules except for the encoded analog content and billing protection specifications with respect to analog content and billing protection:

( ) I attest that all operations associated with the establishment, maintenance, and adjustment of the digital CPE with respect to encoded analog content and encoded billing protection information continuously complies with Part 68 of the FCC Rules and Regulations.

( ) The digital CPE does not transmit digital signal containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.

( ) The encoded analog content and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s)/maintainer(s) of the digital CPE responsible for the establishment, maintenance, and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully having completed one of the following (check appropriate blocks):

( )___a. A training course provided by the manufacturer/grantee of the equipment used to encode analog signals: or

( )___b. A training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or

( )___c. An independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signal; or

( )___d. In lieu of the preceding training requirements, the

operation(s)/maintainer(s) is (are) under the control of a supervisor trained in accordance with_____(circle one) above.

I agree to provide_____(telco's name) with proper documentation to demonstrate compliance with the information as provided in the preceding paragraph, if so requested.

_____(signature)
_____(title)
_____(date)

Subscribed and Sworn to before me this
day of   , 19

_____
 Notary Public
 My commission expires:

Telephone Company Rights and Responsibilities

If your data terminal equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be given the opportunity to correct the situation and you will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operation, or procedures that could affect the proper functioning of your data communications equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted service.

Repair Instructions

If you experience trouble with the ISU equipment, follow this procedure:

1. Determine whether the problem is your data terminal equipment. If you have another data terminal equipment, connect it in place of the inoperative unit to see if the data terminal equipment or the line is at fault.

2. If you find the problem is in your MICOM equipment, refer to the following guidelines for obtaining service:

> ⚠ **WARNING**
>
> Do not attempt to repair the module. Attempting to repair the module may cause injury, and may also damage equipment on the telephone network. Attempts to repair the module are violations of FCC rules. Repair to this equipment can only be made by the manufacturer, and its authorized agents, and by others who may be authorized by the FCC. Please contact your MICOM Certified Distributor for further information.

  a. If the unit is covered by the manufacturer's warranty, follow the procedure set forth in the warranty (refer to page v) for obtaining repair or replacement of the unit.

  b. If the unit is no longer covered by the manufacturer's Warranty, you may return the unit to the manufacturer for repair or refurbishment. You will be billed for any repairs. The manufacturer's policy and procedure on repair and refurbishment is available upon request either by writing to or contacting your MICOM Certified Distributor.

Repair to this equipment can only be made by the manufacturer, and its authorized agents, and by others who may be authorized by the FCC. Please contact your MICOM Certified Distributor.

The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected or you are sure that the equipment is not malfunctioning.

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MICOM welcomes your evaluation of this manual and any suggestions you may have. These help us to improve the quality and usefulness of our publications.

Manual Name _____*Marathon 20K Pro Owner's Manual*_____ Part No. _____800-1901-51, Rev. A_____

	Excellent	Good	Fair	Poor
How would you rate the manual overall?	❑	❑	❑	❑
Are the *installation instructions* effective?	❑	❑	❑	❑
Are the *operating instructions* clear and complete?	❑	❑	❑	❑
Is the manual properly *organized*?	❑	❑	❑	❑
Is the *artwork* clear and easy to understand?	❑	❑	❑	❑
Is the *index* useful?	❑	❑	❑	❑

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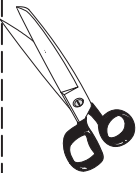
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