



Training Program



MCL, INC.
501 South Woodcreek Road
Bolingbrook, IL 60440 USA
Phone: 630-759-9500
Fax: 630-759-5980

Overview

- MCL offers a training program that incorporates classroom theory with practical hands-on instruction. MCL tailors the training classes for the specific needs of the customer. Students are instructed on the operation, maintenance, repair, power supply theory, and tube theory (TWT or Klystron). The Technical Instructor can travel to a customer site and perform training for operators, technicians, engineers, and management personnel. Cost for on-site instruction will be provided by contacting the MCL Customer Service Department.
- When applying for an in-house training class, please specify the model number and class that you are interested in attending. Many times, classes are tailored to a specific HPA, depending on the students registered in the class.

Training can be provided on the following systems

Current Product Line

- **MT2300** Low Power Amplifier outdoor HPA in a lightweight package. Comes in 120 W & 200 W Ku-Band frequencies.
- **MT2500** Low Power Amplifier outdoor HPA in a lightweight package. Comes in 200 W X-Band frequencies.
- **MT3200A** Low Power Amplifier replacement for the MT3200 design, similar in operation to the MT4000. Comes in 400 watts at C-, X- & Ku band frequencies.
- **MT3300 / 3400 / 3600** Low Power Amplifier outdoor HPA in C, X, DBS or Ku-band configurations (MT3400), or Ka-Band configurations for the MT3300 / MT3600.
- **MT4000** Medium Power Amplifier replacement for the MX/MT5000 design and comes in C, DBS & Ku-band frequencies, with a power option of 750 watts.
- **MT4400** Medium Power Amplifier outdoor HPA in C, X, DBS or Ku-band configurations with a power option of 750 watts.
- **MT7100** High Power Amplifier BFC based system design and comes in a 2.0 & 2.2kW C or 2.2 kW X-band frequency. Also dual band capability of X-(2KW) & C-(1KW) Band.

Older Product Line

- **MT3000 / 3500** Low Power Amplifier includes the MX design and comes in 400 watts at C-band frequency and 350 watts at Ku-band frequency.
- **MT3200** Low Power Amplifier replacement for the MX/MT3000 design and comes in 400 watts at C-, X- & Ku band frequencies.
- **MT5000** Medium Power Amplifier includes the MX design and comes in C, DBS & Ku-band frequencies, with a variety of power options from 400 - 750 watts.
- **MT7000** High Power Amplifier includes the MX design and comes in a 2.0 & 2.2kW C or 2.2 kW X-band frequency
- **MX9000** Klystron Amplifier comes in a variety of frequency and power options.



2012 In-House Schedule

Rev A. 1/3/2012

MCL
 In
 House
 Training
 Schedule

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	<u>10</u>	<u>11</u>	<u>12</u>	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

MT4000

FEBRUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	<u>14</u>	<u>15</u>	<u>16</u>	17	18
19	20	21	22	23	24	25
26	27	28	29			

MT3300 / MT3400
MT3600

MARCH

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	<u>13</u>	<u>14</u>	<u>15</u>	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

MT4400

APRIL

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	<u>10</u>	<u>11</u>	<u>12</u>	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

MT3200A

MAY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	<u>15</u>	<u>16</u>	<u>17</u>	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

MT7100

JUNE

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	<u>12</u>	<u>13</u>	<u>14</u>	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MSC/Software

JULY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	<u>10</u>	<u>11</u>	<u>12</u>	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

MT4000

AUGUST

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	<u>14</u>	<u>15</u>	<u>16</u>	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

MT3300 / MT3400
MT3600

SEPTEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	<u>11</u>	<u>12</u>	<u>13</u>	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MT4400

OCTOBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	<u>16</u>	<u>17</u>	<u>18</u>	19	20
21	22	23	24	25	26	27
28	29	30	31			

MT3200A

NOVEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	<u>13</u>	<u>14</u>	<u>15</u>	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MT7100

DECEMBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	<u>11</u>	<u>12</u>	<u>13</u>	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

MSC/Software

Training Agenda

HPA Description

Frequency and Power Option
Inside the HPA
Back of the HPA
Top of the Rack
LXC / MXC Controllers

Hazards

General Hazards
AC Hazards
Internal Hazards
Back of the HPA Hazards
Prime Power Converter (PPC) Hazards
High Voltage P/S (HVPS) Hazards
Tube Hazards
Safety Precautions
Hazard Worksheet

Installation

Specifications
Dimensions
Tools & Pre-Installation
Cabinet Installation
HPA Installation
Switchover
Ducting Installation
Helpful Hints and Worksheet

HPA Operation

Description
Menu Selection
Back of BFC connections / options
Summary Fault / Alarm Modes
Test Points & pots
Diagnostic Interface Connection
Diag. Interface Menu Selection
HPA External Interface
Remote Interface (COMP / REMOTE)
Operation Worksheet

Tube Theory

Electron Gun
Slow Wave Structure
Tube Turn on
Bunching of Electrons
Magnets
Collector
Gain
Tube Theory Worksheet

Power Supply Theory

EMI Filter / PCD Theory
PPC
HVPS
Filament Power Supply
Low Voltage Power Supplies
Power Supply Worksheet

RF Chain

Output Waveguide
Solid State Amplifier (SSA)
Linearizer Option
Block Upconverter Option
Harmonic Filters
Directional Coupler
Circulator
Phase Combined
RF Chain Worksheet

Preventative Maintenance &

Troubleshooting

Internal Cleaning / Cabinet Cleaning
Panel Lamps / Blower & Fan
/ Switches & Interlocks
Extending Tube Life

On-Site Training

- On-site training is performed by MCL's Technical Instructor. Sometimes, personnel requirements necessitate that the MCL Technical Instructor travel on-site and perform training on one or more HPAs. Special attention is given to a customer's individual requirements. On-site, the student will be instructed on the HPA that is in service at their facility. The student attending will be familiar with the HPA and therefore benefit from past experiences. Class size is limited to ten students for safety reasons; however, the Technical Instructor can increase the size at the customer's request.
- The following charges are based on an eight hour day:
 - Instructors Labor Rate \$1000.00 per day (8 hr maximum)
 - Travel Time \$50.00 per hour
 - Per Diem Cost + Administration
 - Lodging " "
 - Miscellaneous Expenses " "
 - Air Coach " "
 - Air Business (Overseas) " "
 - Rental Car " "
 - Freight Charges " "
 - Training Material \$150.00 per student
- Each class lasts approximately three (3) days. In that time, the student will be instructed on the theory of operation, maintenance, and troubleshooting. Depending upon the class, instruction can include basic RF testing & Calibration, extra troubleshooting instruction where failures are induced by the instructor to simulate real life situations that would require the student to repair the HPA.

On-Site Training

- Customers can request and schedule training trips by contacting the MCL Customer Service Department. A budgetary quote will be issued and tentative training dates will be arranged.
- All classes will be performed in English. Students who do not speak English may have difficulty keeping up with the information and an interpreter is highly recommended by the Technical Instructor. It is the customers' responsibility to provide an interpreter who is fluent in English and available while instruction is being performed.
- When trips extend into the weekend, even if class is not in session, the normal rate of \$1000.00 per day will apply.

In-House Training

- During the course of the year, MCL will schedule a class for specific units. MCL requires a minimum of two students per class. If you do not have enough students for a class, contact MCL to determine if inquiries can be made to other customers in order to create a class. There is a charge for the training course. The current pricing is \$950.00 per student. The charge includes Training Material and lunch for every student while class is in session. Registration is on a first come, first serve basis.
- ***MCL reserves the right to cancel the in-house training classes at any time. Should it become necessary to cancel a class, a full refund for TRAINING MATERIAL will be issued. MCL assumes NO responsibility for airfare or hotel costs.***

Training Application

Please return this completed form to
the MCL - MITEQ Customer Service
Department
501 South Woodcreek Road
Bolingbrook, IL 60440
or
Fax: (630) 759-5980

Name _____ Title _____
Company _____ Phone _____
Address _____ Fax _____
City, State _____ Country _____

Applicants Experience in Satellite Communications and Electrical Background

Schools _____

Experience _____

Training Dates Requested (Refer to Schedule) _____

Frequency of HPA _____

Model Number of HPA (example:10999) _____

YES, I would like to purchase _____ copy / copies of the training material

Check enclosed. Make check payable to MCL, INC. Please bill my account. PO# HARD COPY P.O. MUST BE ENCLOSED

Visa / MasterCard number _____ Exp. Date _____

NO, I do not wish to purchase the training material

Hotel Information

- 1) aloft Bolingbrook (www.aloftbolingbrook.com) **(Recommended)**

500 Janes Ave.

Bolingbrook, IL 60440

Phone 630-410-6367

Fax 630-410-6368

This hotel is approximately 10 minutes away from the MCL facility; however, it is within walking distance to the Promenade Bolingbrook, which offers more dining, shopping, and entertainment options. It's also conveniently located near I-355 & I-55.

Note: Current MCL Corporate Rate is \$103.00 Per night

- 2) Spring Hill Suites (www.marriott.com) **(Recommended)**

125 Remington Blvd

Bolingbrook, IL 60440

Phone 630-759-0529 * Fax 630-759-0530

Note: Check with Hotel for the current MCL Corporate Rate

- 3) Holiday Inn Hotel & Suites (www.holiday-inn.com) **(Recommended)**

205 Remington Blvd

Bolingbrook, IL 60440

Phone 630-679-1600 * Fax 630-679-1616

Note: Check with Hotel for the current MCL Corporate Rate

- 4) AmericInn (www.americinn.com)

175 West Remington Blvd

Bolingbrook, IL 60440

Phone 630-378-5300 * Fax 630-378-5400

- 5) Ramada Limited (www.ramada.com)

520 S. Bolingbrook Drive

Bolingbrook, IL 60440

Phone 630-972-9797 * Fax 630-972-1991

Hotel Information

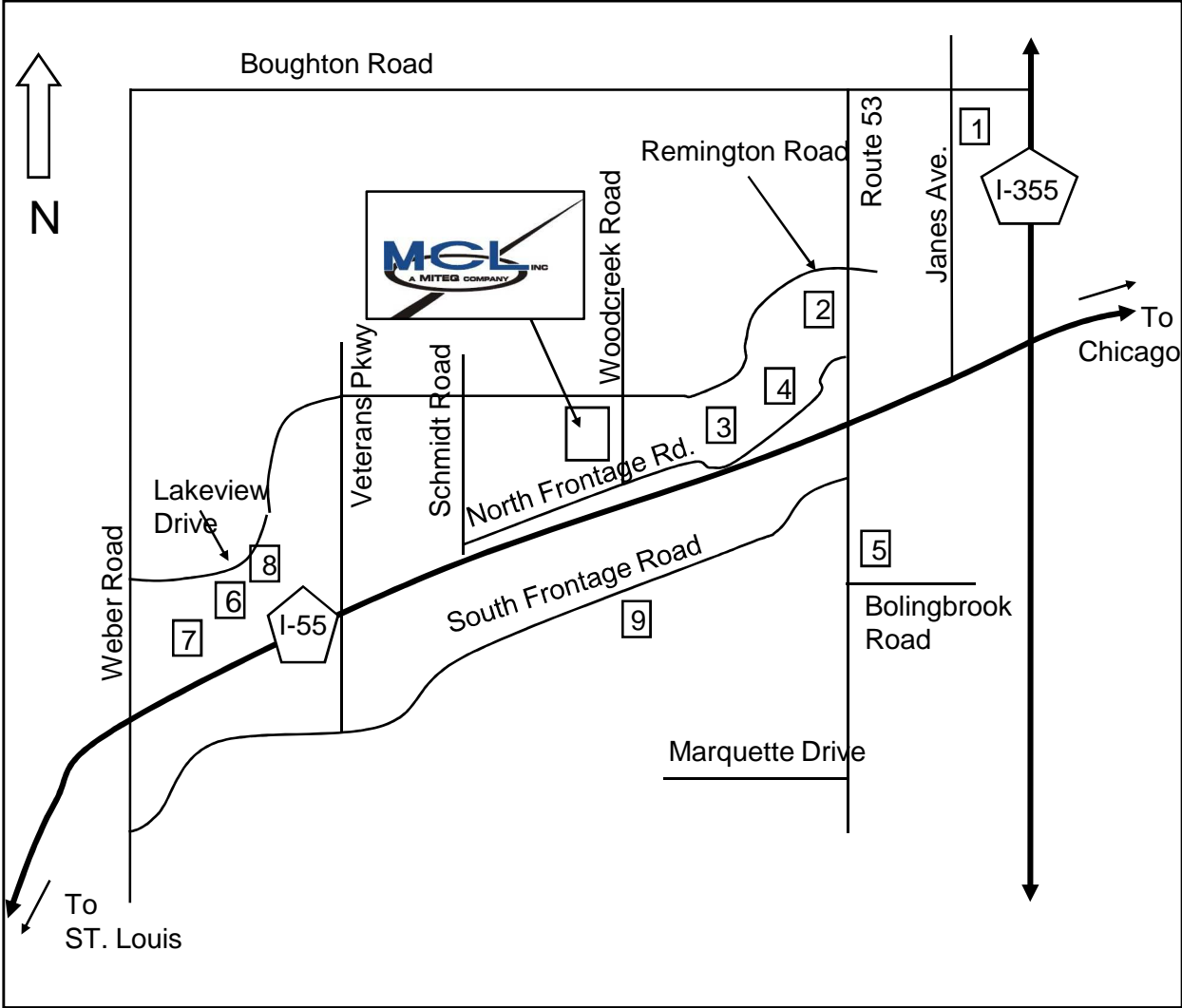
- 6) Comfort Inn Bolingbrook (www.comfortinn.com)
1235 Lakeview Drive
Romeoville, IL 60446
Phone 630-226-1900 * Fax 630-226-6454

- 7) Country Inn & Suites (www.countryinns.com)
1265 Lakeview Drive
Romeoville, IL 60446
Phone 630-378-1052 * Fax 630-378-1053

- 8) Extended Stay America (www.extendedstay.com)
1225 Lakeview Drive
Romeoville, IL 60446
Phone 630-226-8966 * Fax 630-226-8967

- 9) La Quinta of Bolingbrook (www.lq.com)
225 W. South Frontage Road
Bolingbrook, IL 60440
Phone 630-226-0000 * Fax 630-226-1111

Hotel Information Map



Local Information

- Limousine Information:
- Embarque Chicago - 866-444-2144 (www.embarquechicago.com -Toyota Camry's)
- American Coach Limousine - 630-629-0001 (www.americancoach.net - limos)
- If you decide to rent a vehicle, these are directions from O'Hare Airport to MCL:
 - Start going towards the **AIRPORT EXIT** on **I-190 EAST**
 - Take the **I-294 SOUTH** exit towards **INDIANA**, exit #1D
 - Merge on **I-294 SOUTH**
 - Take the **I-55/STEVENSON EXPY** exit towards **CHICAGO/ST LOUIS**
 - Continue on **I-55 SOUTH RAMP** towards **ST LOUIS**
 - Merge on **I-55 SOUTH**
 - Take the **S BOLINGBROOK DR (Rt. 53)** exit towards **BOLINGBROOK**, exit #267
 - Turn Right on **S BOLINGBROOK DR**
 - Turn Left on **REMINGTON BLVD**
 - Proceed ½ mile to **WOODCREEK ROAD** and turn left
 - First drive on the right is **MCL, INC.**

