

UNI – MOD

HO MODULAR SYSTEM

Standards of the Brazos
Valley Modular Railroad
Association

Revised 9/26/2008

THE BRAZOS VALLEY MODULAR RAILROAD ASSOCIATION

The Brazos Valley Modular Railroad Association is a loose-knit group of HO-scale enthusiasts who got together to build a modular HO-scale layout. We began in 1998 when Jeff Cermin made the suggestion that we should have a modular layout in the Bryan/College Station area. Of course, the fact that Jeff already had modules from when he was a member of another club helped! Our first setup was at Post Oak Mall over Father's Day weekend, 1998. Who knew that four corners and four six-foot modules forming a 10' by 22' layout would grow into a modular layout capable of filling a 40' by 40' room?

Membership is open to anyone who wants to build modules. The only requirements for membership are 1. You must have your own transportation, and 2. a desire to build and display modules to the public, and best of all, there are NO DUES! If the club needs materials for construction of new club-owned modules, a collection is taken at that time. Individual modules are owned by club members, except for the yard, corners, and lift-bridge module, all of which belong to the club. No constraints are placed on what a member may build on his or her module, except that the mainline tracks must conform to club standards. Our members have built small rural towns, farms, industrial areas, rivers with bridges crossing them, and many other interesting modules. One member is currently working on a 6' module of the Canyon Diablo Bridge!

This packet will describe in detail the standards of the BVMRRA so that anyone can use them to build modules that will be fully compatible with each other, allowing setups ranging from a 10' by 10' square to whatever configuration we can come up with. Our standards are adapted from an old concept, UNI-MOD, which was created in the 1970's and later adopted with modifications by the NMRA. Our standards differ from the current NMRA specs in two main places; rail height from the floor (NMRA recommends 40", we use 36") and electrical (NMRA standards call for 2-prong plugs for each mainline, we use 4-prong plugs for the mainlines and have both mains on the same connector).

So, as you read this packet, think of what you could do! If you have any questions regarding anything in the packet, do not hesitate to ask another club member...we will be more than happy to answer!

Also, you should find a membership application at the end of this packet. Feel free to fill it out and return it to the address on our website (<http://pages.suddenlink.net/bvmrra>) via snail-mail or email.

UNI-MOD

HO MODULAR RAILROAD SYSTEM

No space for a 4' by 8' layout! However, you want the enjoyment of creating your own railroad with scenery and lots of operation. UNI-MOD is the answer. UNI-MOD is an HO (1:87) scale modular layout built to specific dimensions with regard to height, width, and length. The trackage as well as intermodular wiring must also meet these specifications. UNI-MOD provides a new way of spreading the hobby of HO model railroading as well as giving people who have limited space a place to operate their trains. In the next few pages, the UNI-MOD system will be explained.

THE MODULAR CONCEPT

The modular concept was introduced in the 1970's in the form of N-TRAK, an N-gauge modular system.

UNI-MOD can be set up in malls, churches, National Guard Armories, etc. Layouts can be set up for conventions, charity events, and many other functions. A small UNI-MOD layout can be set up in approximately 45 minutes, and trains can be running a short time later.

Building a module is a learning experience for new model railroaders as well as a challenging experience for seasoned modelers. Begin with one module which has a double-track mainline, and from there the sky is the limit.

One module is only a beginning then as the fever hits, one module becomes two and so on. Before long a dream railroad appears...one module at a time.

The basic track plan consists of a double-track mainline. Some modules have a yard or terminal operation which provides switching activity for operators.

Some modelers with large home layouts have constructed their modules so they can be used as a segment of the home layout. For a UNI-MOD event the module is removed from the home layout and inserted back again after the UNI-MOD event.

MODULE SPECIFICATIONS

Please note that these are the specifications used by the BVMRRA-HO, and contain deviations from the true UNI-MOD specifications.

BENCHWORK

- I. Regular modules – see plans at the back of this booklet.
 - A. Length – 4 or 6 feet, 4-foot modules preferred due to these being easier to transport.
 - B. Width – Modules will be no narrower than 2 feet (24”) and no wider than 4 feet (48”). Most modules are constructed as 2 foot wide modules, again for ease of transportation.
 - C. Module Top – decks will be constructed of ½-inch plywood cut to fit the module frame. Decks MAY be cut down to 1” from track center if foam scenery is to be used in order to reduce the weight of the module.
 - D. Frames – Framing for each module of 4 or 6 feet in length will be of 1x4 boards of quality lumber, or ¾” by 3-1/2” strips of high-quality plywood. See plans at the back of this booklet for dimensions for frames.
- II. Outside Corner Modules – see plans at the back of this booklet.

Note that the original corners are NOT standard.

 - A. Length and Width – Use either a 4’ by 4’, 4’ by 6’, or 4’ by 8’ piece of ½ inch plywood for the module top. The size used depends on the mainline radius used.
 - B. Use the factory cuts for the edge of the module that joins other modules. This will give a true edge.
 - C. Frames – Framing for each module of 4 or 6 feet in length will be of 1x4 boards of quality lumber. See plans at the back of this booklet for dimensions for frames.
- III. Transition Module – This type of module is constructed the same as a standard module, except for the track locations. A transition module moves the track centers from 5” and 7” from the front edge to any other position as needed, such as to move from the front edge to the back edge of the module.

IV. General Information

- A. All modules are to be constructed to prevent warping, twisting, etc.
- B. All wood joints will be screwed together using wood or drywall screws. Gluing is optional, however this does help with stability.
- C. All mainline trackage is to be level...that is, NO GRADES!!

LEGS

Legs will be constructed as follows, see back of this booklet for plans:

Vertical pieces: Shall be constructed from 2x2 lumber, though ripping a 2x4 into two 2x2's is also acceptable, as it is often easier to find straight 2x4's than it is to find straight 2x2's.

Upper plates (2x per leg): Shall be cut from 3/8" or greater thickness of plywood. Each plate shall be cut 22-3/8" long by 3-1/2" wide. One plate shall be attached to each side of a leg set, with the top edge of the leg centered between the top and bottom of the plywood.

Lower brace (1x per leg): May be any type of lumber, as available.
Example: scrap 1x4, leftover 2x2, plywood, etc.
brace needs to be 22-3/8" long, other dimensions are optional.

Assembly: Lower brace should be attached to legs using wood or drywall screws. Glue may be used, but is not required. Upper plates should be held in place by wood or drywall screws, and the use of glue is not permitted, since the plates may need to be loosened to allow a module to slide in.

Setup: One leg unit is required at each module joint. Hold the leg upright, and set the end plate of one module between the upper plates, resting on top of the vertical 2x2. Next, slide the second module in the same way. The leg supports both modules while maintaining alignment. This way, no C-clamps are needed, and setup takes much less time.

Specialty Legs: Specialty legs are designed for specific modules, i.e. 1' wide modules or corner modules. Specialty legs should be marked with the owner's initials or name and the name of the module that they are designed for.

TRACK

Developing a Track Plan

The UNI-MOD system is designed with a double-track mainline with track centers being 5 and 7 inches from the viewer's side of the module. Mainline trackage will enter and exit 4 1/2" from the module ends. DO NOT stray from the above dimensions.

Use a #6 or larger turnout when leaving the mainline. BVMRRA Modules will use Peco Large-radius insulfrog turnouts to exit from the mainline. For secondary trackage, Peco turnouts are strongly recommended, but not required. Atlas turnouts are NOT permitted on the mainline.

Remember, do not use too complicated of a track plan, as this will make the wiring much more complicated. Remember to make the mainline track conform to UNI-MOD specifications.

The next step is to draw your track plan onto the module top as well as your streets and highways. It is also recommended that you draw your plan on a 3x5" index card and give it to the layout coordinator or club president. This will help with planning the layout for various shows, as it helps plan out which modules work well together scenery-wise.

ROADBED

All mainline trackage will have a roadbed from 5mm (.200") to 1/4" (.250") above the module top. Midwest's HO-Scale Cork Roadbed is the recommended choice for this. The roadbed for the mainline shall run along the centerline for the track and shall end at the module edge at both ends of the module. The roadbed may be glued, nailed, or stapled in place. Staples are recommended because of the fact that it is much easier to remove the roadbed if necessary.

Rubber and Homasote roadbeds are NOT to be used under ANY circumstances!

TRACKWORK

For mainline trackage, use only Code 100 Nickel-Silver flex track. The only exception to this is the 9" joiner track used in between modules.

Both rails are to be insulated when leaving either mainline by turnout if the secondary trackage is wired to be controlled by a different controller than the mainline, i.e. if a yard is wired for local control as well as mainline control. NEVER insulate the mainline! No mainline rail is to be insulated except for crossovers between mainlines. Sidings and spurs may be insulated to isolate them from the mainline as needed. It is recommended that all rail joints be soldered.

Hand-laid track is not recommended for mainlines, but it is permissible for secondary trackage. Bear in mind that the modules will be transported, however. This will increase the likelihood of damage to hand-laid track as well as misalignments. Any hand-laid track must meet NMRA specifications.

Minimum radius on mainline tracks is to be 36 inches, but may be larger. Minimum radius for secondary trackage is 18 inches.

Mainlines are to be laid with NO grades. Secondary trackage may have a maximum grade of 1.5%, but with the exception of modules designed to always fit together, must have the rail height specified at each end of the module. Local trackage with no connection to other modules may have any practical grade necessary for the operation intended on that module.

CORNER MODULE TRACKAGE

Two types of corner modules can be constructed for the UNI-MOD system. Outside corner modules are the basic corners necessary to form a large loop. Inside corners are the type necessary to form an L-shaped or U-shaped layout.

Before constructing corner modules, read the following and see the plans for both types of corner module at the back of this booklet.

If you are using a solid plywood deck on the corner module, draw the track plan onto the module top before removing any waste material from the plywood.

For each mainline, mark a 9-inch straight line from the end of the module that will join another module. Next, mark off 4½" from the end of the module for the beginning of the flextrack. At the end of the 9" mark is the beginning of the curve.

Track centers are 5" and 7" respectively from the front (viewer's side) of the module; however track centers are 3" apart in the center of the module curve track. This is to prevent long equipment from sideswiping in the curve. The radius of each mainline will differ as the length of the corner module increases.

Outside corner modules may be any length, depending on the radius desired. Inside corner modules must be built to the same dimensions as standard modules to avoid having odd gaps between modules (i.e. having a 3-foot gap instead of a 4-foot gap where a module would fit).

See plans at the back of this booklet for dimensions for the different types of corner modules.

WIRING

Each module will be equipped with power leads to each mainline as well as spurs and yards. Color-coding is recommended, however simply tagging each wire is usually sufficient. If color-coding, the following is recommended:

<u>Plug/Socket Pin #</u>	<u>Rail</u>	<u>Color</u>
1	Outside main, outside rail	Red
2	Outside main, inside rail	Blue
3	Inside main, outside rail	Green
4	Inside main, inside rail	Yellow

Intermodular wiring is to be #18 or #16 gauge stranded wire. The wire harness will terminate with a 4-pin Cinch-Jones Plug (available from Jameco electronics at www.jameco.com or Mouser Electronics at www.mouser.com), with the male on the viewer's left and the female on the viewer's right. Each module harness will extend 6" – 8" past the end of the module end. Drawing a wiring diagram on the bottom of the module is recommended to aid in troubleshooting wiring.

The main cable harness will feed trackage through a terminal strip, mounted approximately in the middle of the module. The terminal strip will be mounted to the back of the module on the underside. If the track on the module is mainline only, a four-position terminal strip may be used. If there is secondary trackage, use a terminal strip with two positions per track, including the mainline tracks.

Wiring between the terminal strip and trackage is to be either #18 or #20 wire. Solid core wire is preferred, but stranded may be used.

LOCAL POWER WIRING

Wiring for a spur or yard may be fed by mainline power or by a separate power source. This is accomplished through a DPDT toggle switch. Use a toggle switch for each track in the secondary trackage. Wire from the track will run to the terminal strip then to the center terminals of the toggle switch. Two of the remaining connections on the toggle switch will go to the terminal strip to be connected to whichever mainline the secondary track connects to. The other wires will terminate at a plug for the secondary power supply to connect to. Please refer to the wiring plans at the back of this booklet.

MAINLINE POWER WIRING

Wiring for the mainline trackage is simple. Run feeder wires from each rail to a terminal strip and number them in the following order:

1. Outside main, outside rail
2. Outside main, inside rail
3. Inside main, outside rail
4. Inside main, inside rail

The wiring harnesses will have each wire marked 1, 2, 3, or 4. Connect each wire to the appropriate terminal on the terminal strip.

To add connections for the power supplies, use a female 4-position Cinch-Jones plug and connect wires to terminals 1 and 3 on the back side of the plug. Connect those wires to terminals 1 and 2 on the terminal strip to feed the outside mainline. Use a separate female Cinch-Jones plug connected the same way to terminals 3 and 4 on the terminal strip to feed power to the inside mainline. The female Cinch-Jones plugs should be mounted to the back of the module (operator's side) so that the power supplies may be easily plugged into them.

Note that for the power connections, only pins 1 and 3 of the Cinch-Jones plugs were used. Pins 2 and 4 may be used if the power supply requires an external power source, as is the case with Aristo-Craft / Crest wireless analog throttles. Simply hook up the power supply to pins 2 and 4 of the C-J plug and mount the power supply under the module.

Since the club owns all the corners, it is recommended that the power connections be made at the corners. This prevents problems that would occur if straight modules with the power connections were to be unavailable for a particular show.

SCENERY

Turning a module with only track and roadbed into a realistic miniature scene is easy.

After the complete trackwork and wiring have been inspected and verified to work with existing modules, begin planning your scenery. After deciding your scenery plans, draw building outlines and other scenery features onto the module top. Be sure to leave plenty of clearance for all types of rolling stock

When scenicking the module, remember that keeping the weight of the completed module to a minimum is important. Lightweight material in your scenery will be a great advantage when transporting your module. You may either fasten your buildings to the module or make them removable (removable is recommended, since it is easy to damage buildings fastened to a module while transporting it).

Before adding your buildings to the module, paint your track. The detail on the plastic track is good, but the unpainted shiny plastic gives the track a “toy-like” appearance. Painting your track also makes the sides of the rails look more like the real thing. Any Brown/rust/black paint may be used, but the BVMRRA recommends Badger’s Model-Flex Rail Brown (Walthers part# 165-16175). Paint the rails before ballasting. For turnouts, be sure to mask the contact points between the outside rails and the point rails. After painting, clean the tops of the rails thoroughly and remove any masking material used in the points.

Ballasting the rail is not required, but it improves the appearance of the track immensely. The BVMRRA uses Woodland Scenics’ Medium Gray Blend ballast (Walthers part# 785-94 for a medium-sized bag, or 785-1394 for a large shaker bottle) for the mainline. Secondary trackage ballast is the choice of the module builder.

Connecting tracks (the 9” sections that fit between modules) should be ballasted as well to help hide the joints between modules. Paint the track to match the rest of the trackwork. Apply 1 ¼” masking tape to the underside of the track, making sure the track is centered on the tape. Lay track sections on waxed paper, tape side down. Sprinkle ballast onto the track sections, then brush excess ballast from the tops of the ties. Apply “wet water” (tap water with a few drops of liquid dishwashing detergent) to the track sections using a spray bottle. Apply a 50/50 mix of water and white glue to the track sections, then let them dry. When dry, the sections should peel off of the waxed paper fairly easily.

There are also no constraints placed on the type of scenery used on a module. We have members who have built rural towns, industrial scenes, bridges spanning 4’-wide canyons, and river scenes from the Pacific Northwest. If it strikes your fancy, model it!

BACKDROPS

Backdrops are optional. If used, the backdrops will be the length of each module. Height will be 18” from the module top. Construct backdrops from 1/8” Masonite painted light blue (Sherwin Williams # 8-M 33-4). Backdrop framing will be 1x2 boards screwed to the Masonite. For more information, see plans at the back of this booklet.

LOCOMOTIVES AND ROLLING STOCK

Each locomotive and each piece of rolling stock must meet minimum NMRA standards for wheel gauge, coupler height, etc. Standard couplers on all equipment will be Kadee or Kadee compatible couplers. The only exceptions to this will be unit trains, such as high-speed trains designed to be permanently coupled, or specialty trains such as Thomas the Tank Engine, equipped with “hook-and-loop” type couplers.

Train consists are entirely up to the operators. BVMRRA does not place ANY constraints on what an operator may run, except that it must stay coupled and not derail.

OPERATIONS

The BVMRRA doesn't set many rules for operations, but we do have a few “common courtesy” rules:

1. Please leave as many tracks clear in the yard as possible. If you have a train on the layout, don't put another one on until you have pulled the one you are currently running off. Put simply, “One train, one track.” Obviously, if you are the only operator, you may have as many trains on as you want. Also, the yard is not for long-term storage of your train/trains. Please put your trains away if you are not going to be operating for an extended period.
2. Please keep an eye on your train as it is running. Since we frequently run using DCC now, it is very easy for one train to run into another. If you create or cause an accident, you are financially responsible for the damage you do to another club member's equipment/modules.
3. The public doesn't want to hear club members arguing with each other. Other club members don't want to hear arguing, nit-picking, or negative comments, either. If you don't have anything nice to say, don't say anything!
4. If your train keeps having difficulties making it around the layout without derailling or uncoupling, please pull it off and attempt to correct the problem. Most equipment that is well-adjusted as far as wheel gauge and coupler height will make it around the layout even if there are high or low spots on the layout without problems. If you are still having problems, ask for assistance!
5. Above all else, have fun running trains and talking to people! This is a hobby...different members will have different expectations and participation levels; do not assume that your level of involvement or participation is superior, equal to or inferior to theirs.

LAYOUT SPECIFICATIONS :
DRAWINGS AND PLANS

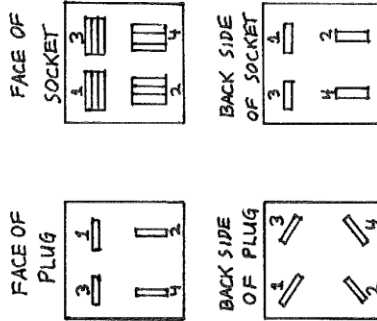
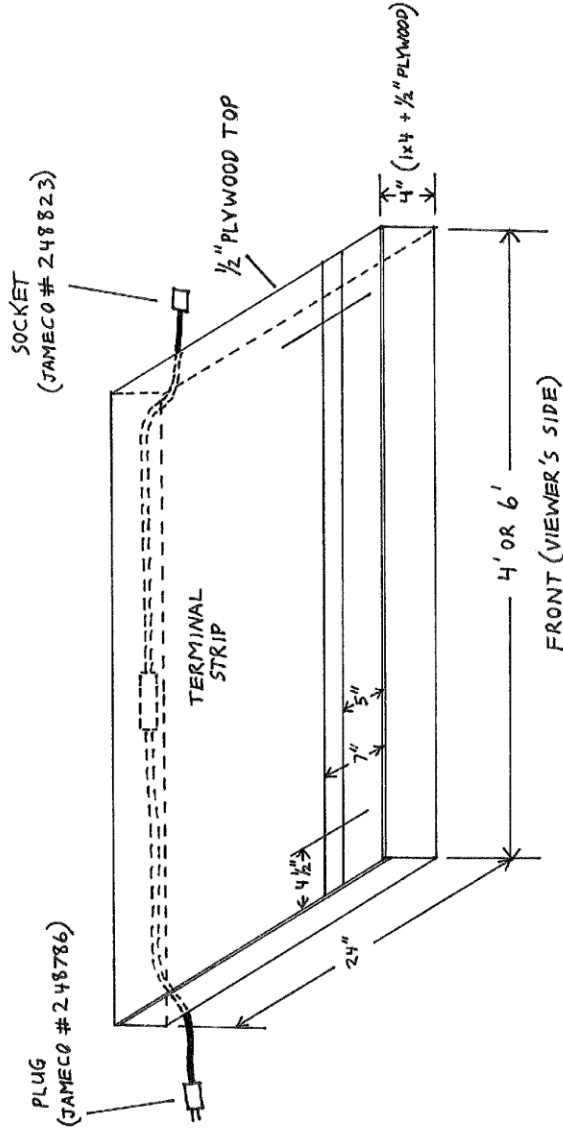
BV.MRRA CONSTRUCTION STANDARDS

WIRING STANDARDS

CABLE HARNESS
PIN NUMBERS

PIN	MAINLINE	RAIL
1	OUTER	OUTER
2	OUTER	INNER
3	INNER	OUTER
4	INNER	INNER

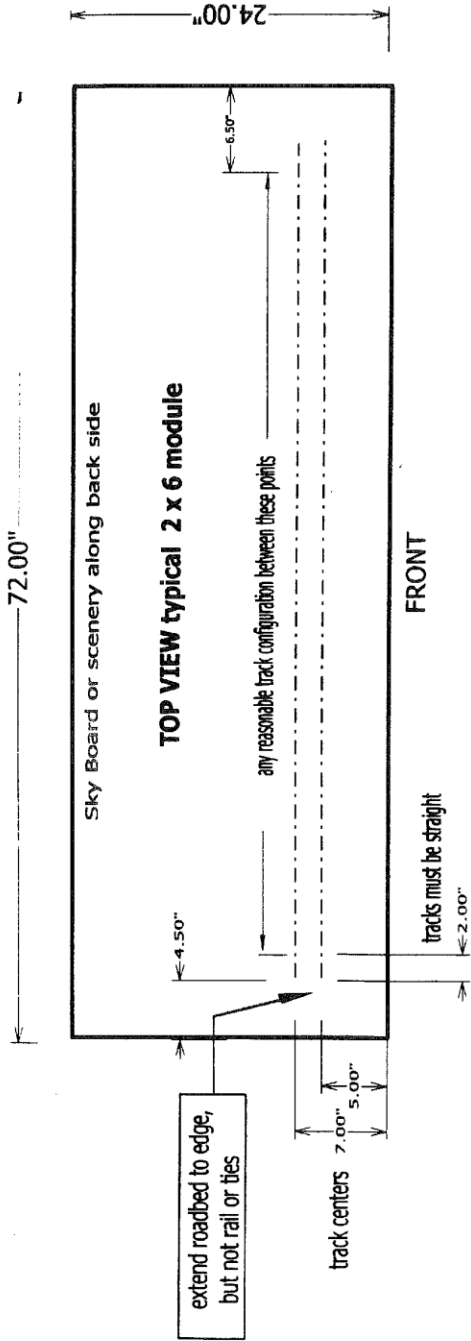
ALL WIRING TO BE
CONFINED TO INSIDE
OF MODULE FRAME



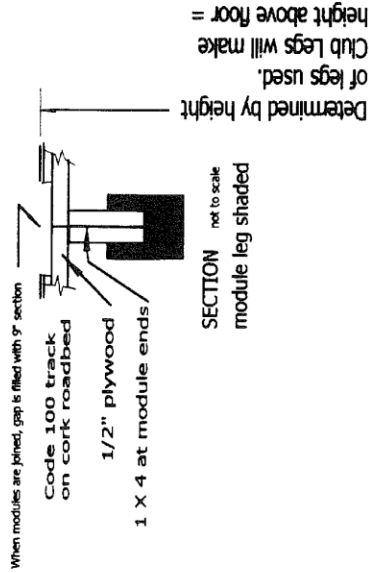
SEE ELECTRICAL FOR
DETAILED WIRING INFORMATION.

MODULAR STANDARDS

- CODE 100 NICKEL-SILVER FLEX-TRACK
- 36" MINIMUM RADIUS
- #6 OR LARGER TURNOUTS ON MAINLINES
(PECO LARGE-RADIUS INSULFROG PREFERRED)
- CORK ROADBED UNDER ALL MAINLINE TRACK



- * Straight parallel main lines min. spacing 2" c - c
- * 36" min radius main line curves (adjust c - c spacing)
- * #6 (or higher) turnouts on mains



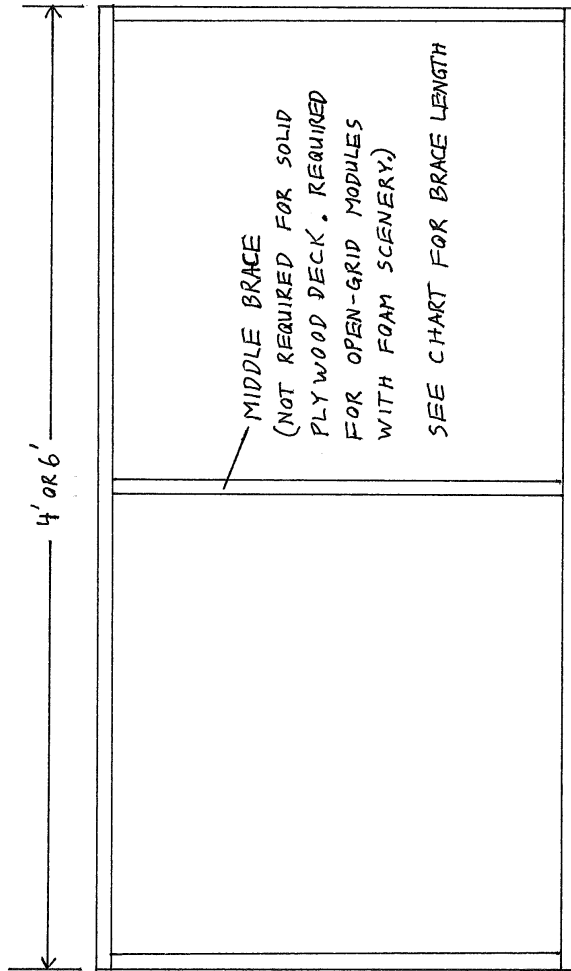
H O MODULE STANDARDS

STRAIGHT MODULE FRAME

PLYWOOD DECKING IS ONLY REQUIRED UNDER TRACK. ALL OTHER AREAS MAY BE FOAM TO REDUCE WEIGHT.

PLYWOOD DECKING WILL BE A MINIMUM OF 4" WIDE FOR DOUBLE TRACKS, OR 2" WIDE PER TRACK.

2" DRYWALL SCREWS AND WOOD GLUE RECOMMENDED FOR MODULE ASSEMBLY.



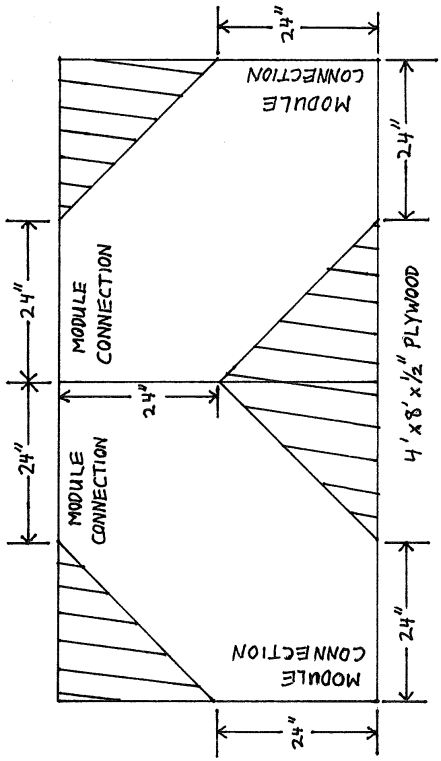
MODULE WIDTH	BRACE/END LENGTH
24" (2') *	2 2 1/2"
30" (2 1/2')	2 8 1/2"
36" (3')	3 4 1/2"

* 24" MODULES STANDARD.

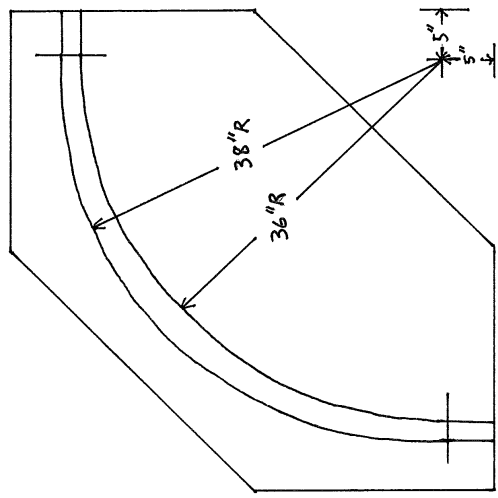
B.V.M.R.R.A.
CORNER MODULE
CONSTRUCTION STANDARDS

NOTE: FOR WIRING DIAGRAM,
 SEE ELECTRICAL.

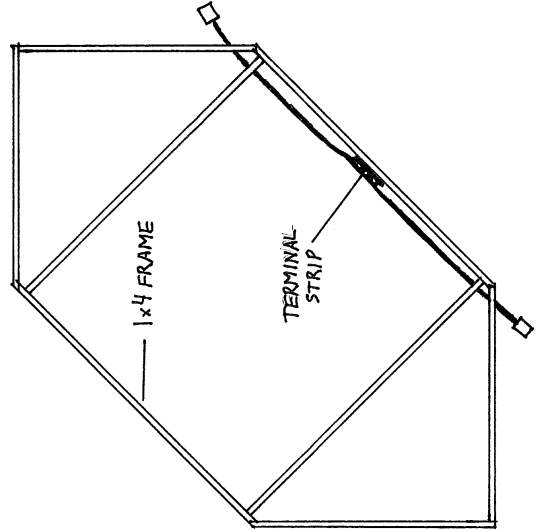
ELECTRICAL AND TRACK
 SPECIFICATIONS ARE THE
 SAME FOR STRAIGHT AND
 CORNER MODULES.



PLYWOOD CUTTING PATTERN
 USE FACTORY CUTS FOR MODULE CONNECTIONS

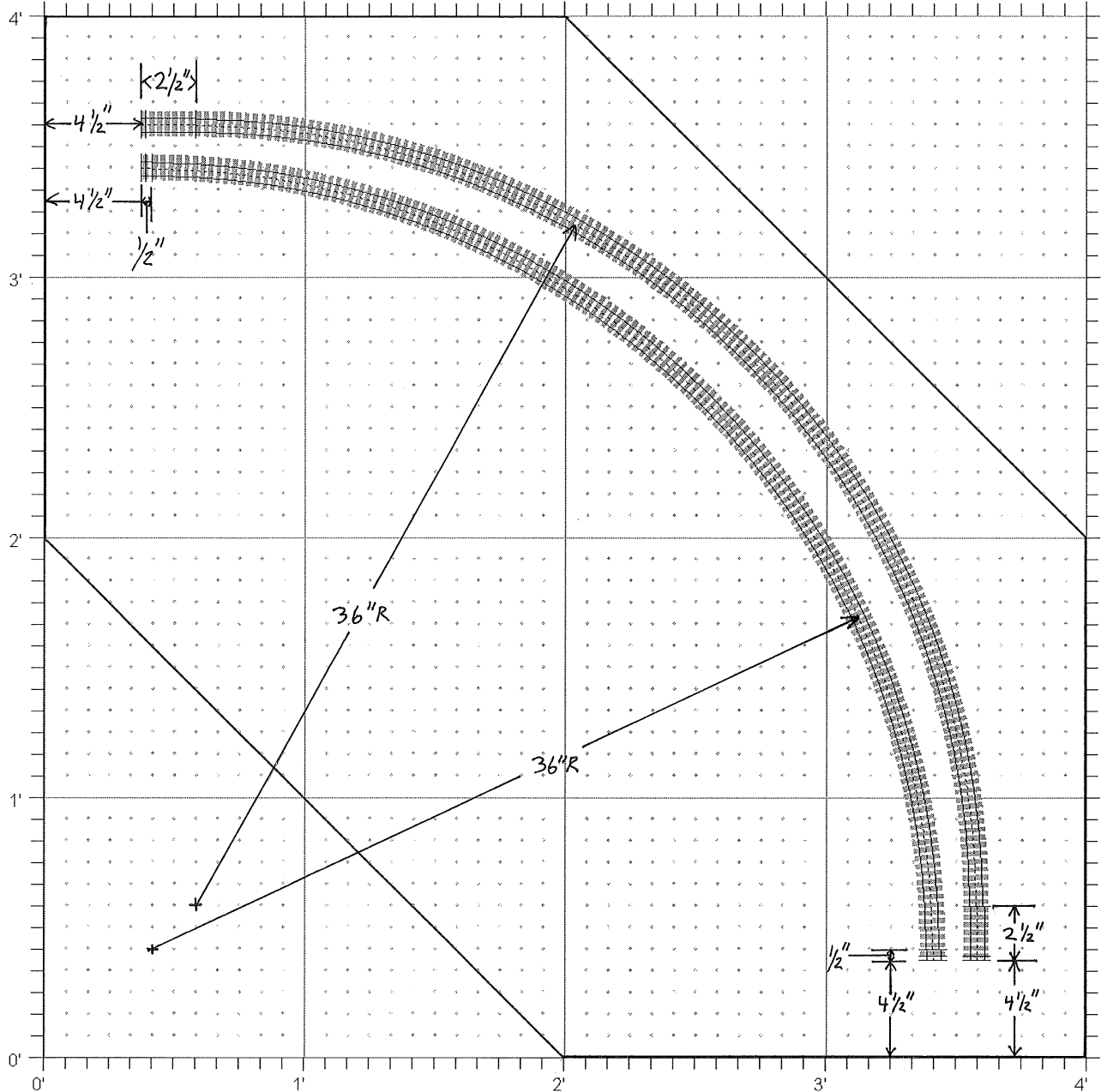


TRACK DIAGRAM



FRAME DETAIL

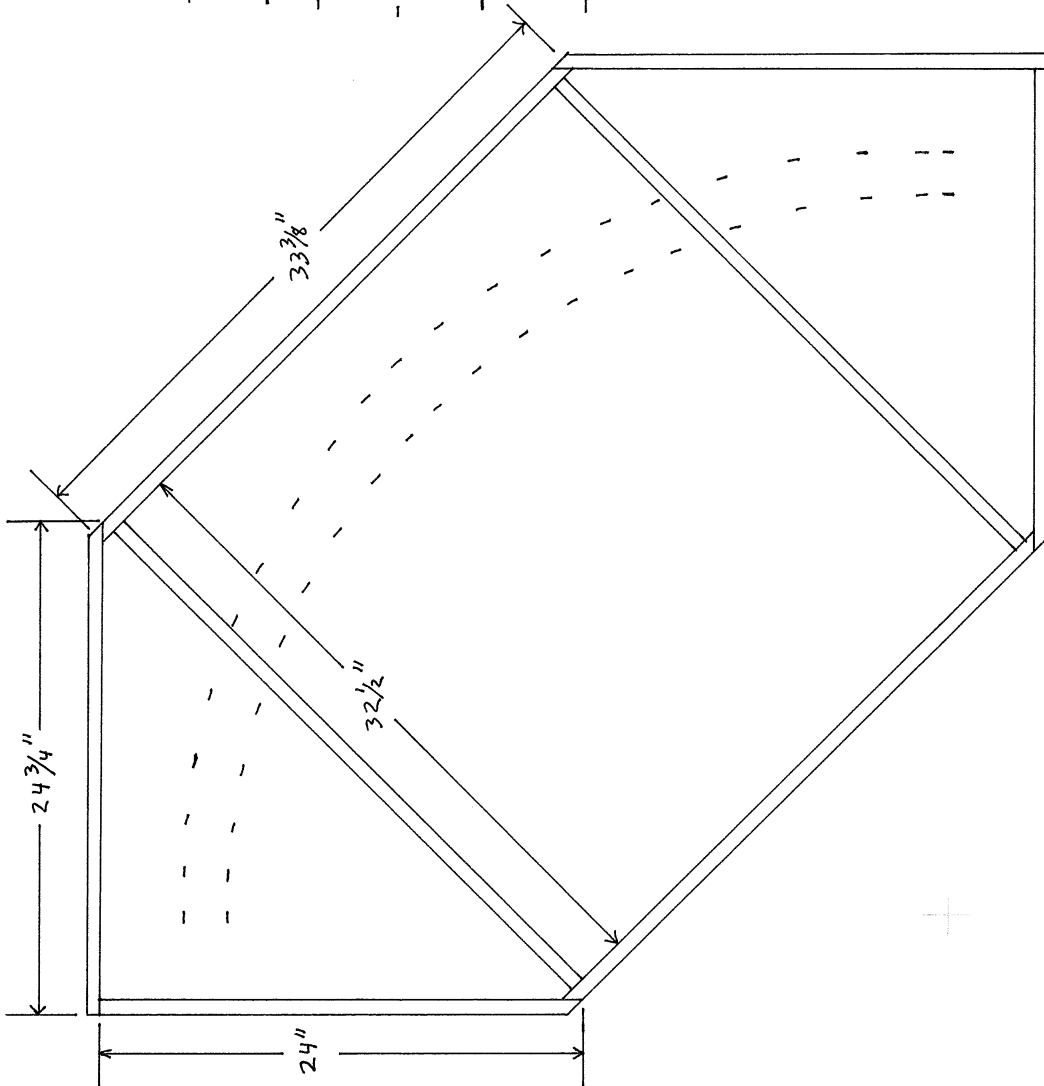
Outside Corner Modules - New Design

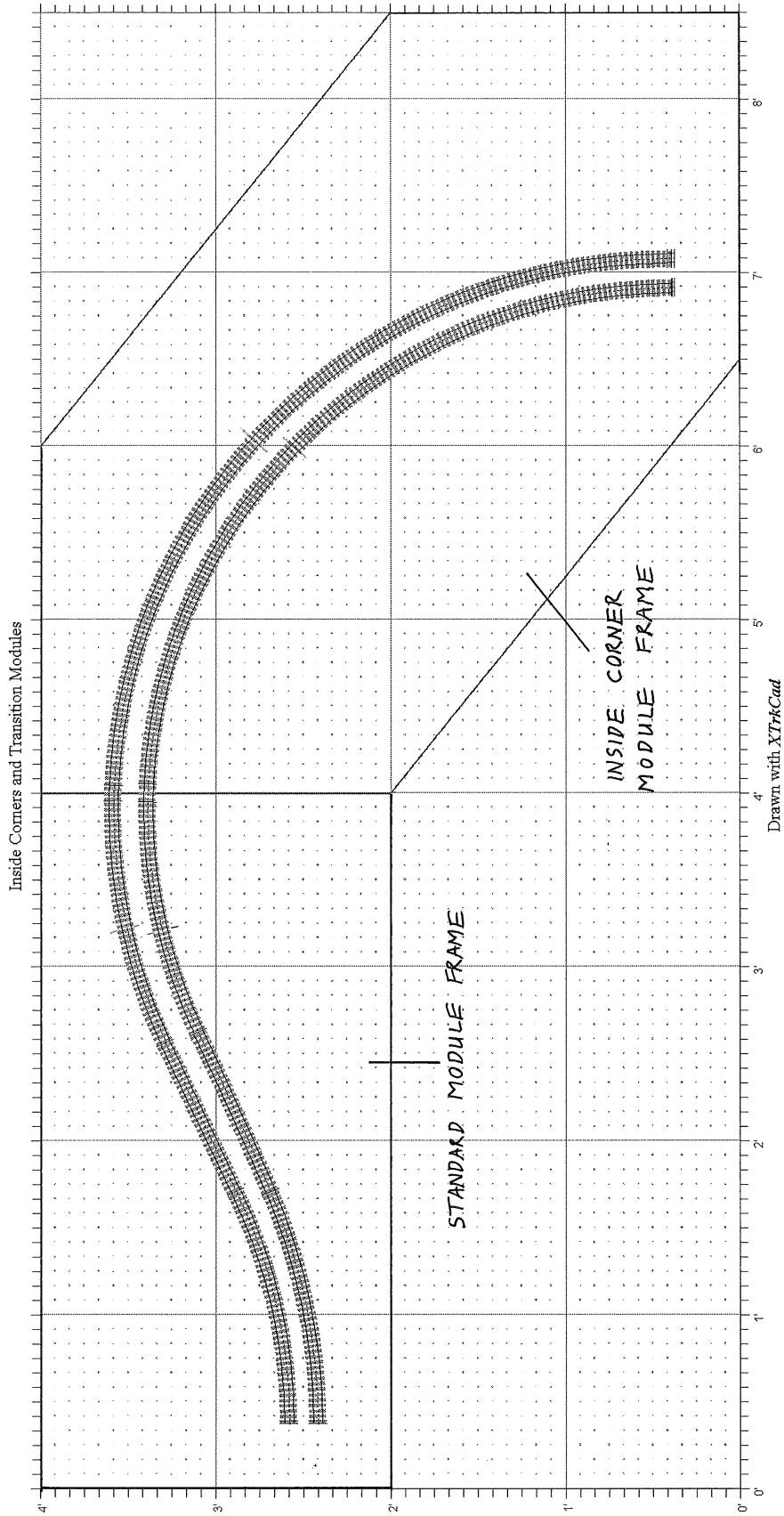


Drawn with XTrkCad

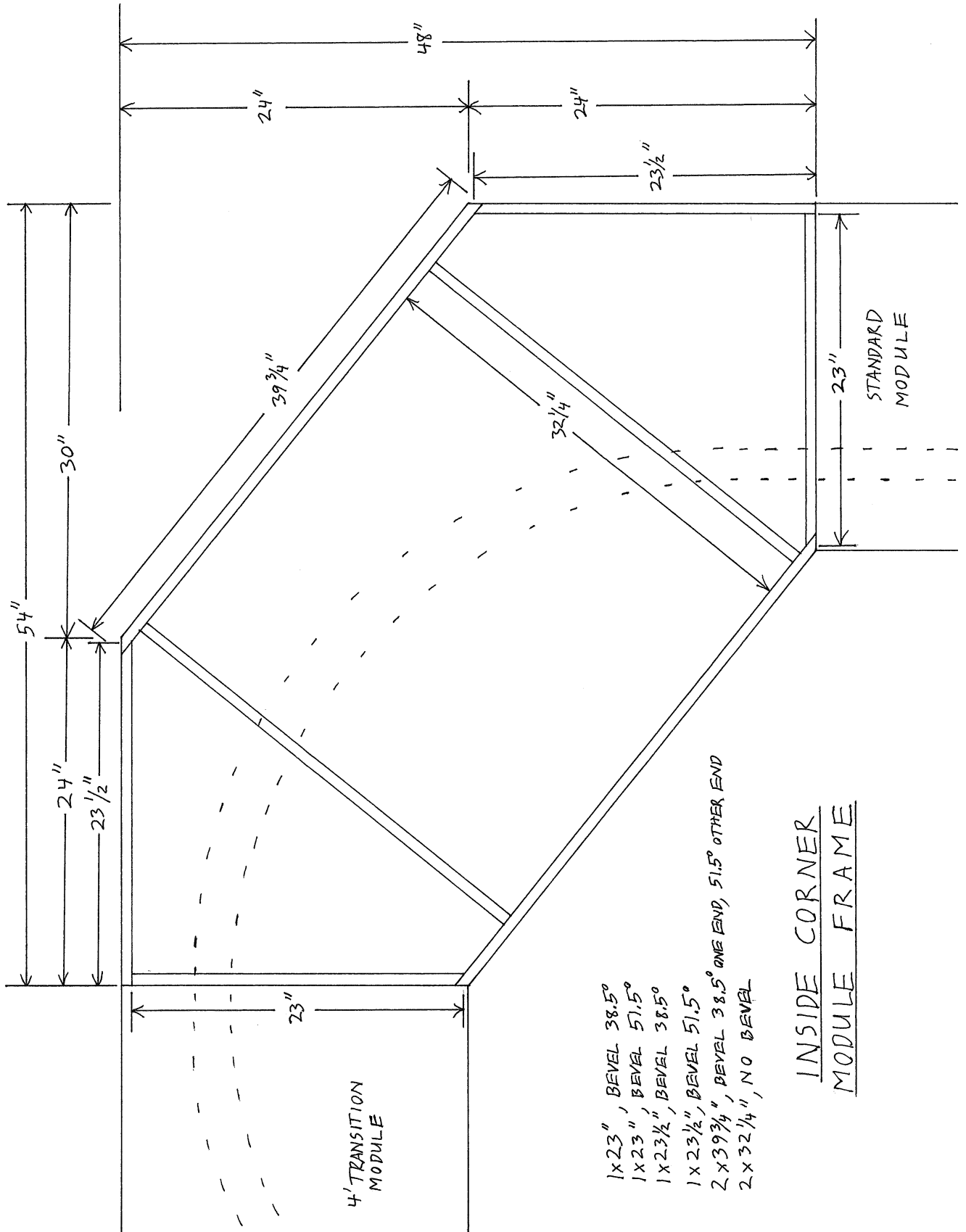
OUTSIDE CORNER
FRAME

- ALL FRAME PIECES FROM 1x4 LUMBER.
- ALL BEVELS 45°.
- FRONT + BACK PIECES BEVEL BOTH ENDS.
- END PIECES BEVEL ONLY ONE END.
- INSIDE BRACES HAVE NO BEVEL.
- CUT 2 OF EACH DIMENSION LISTED PER FRAME.

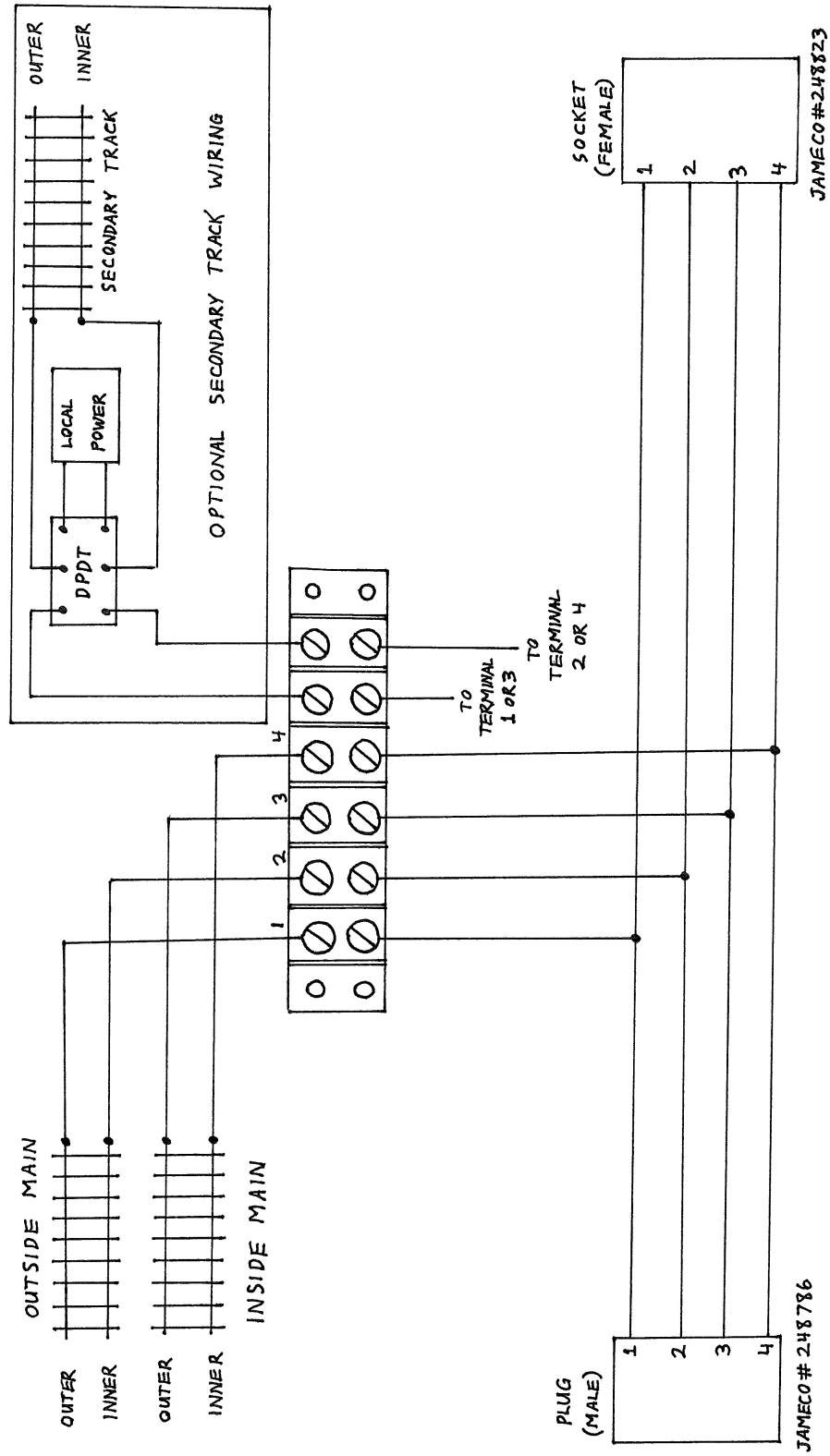




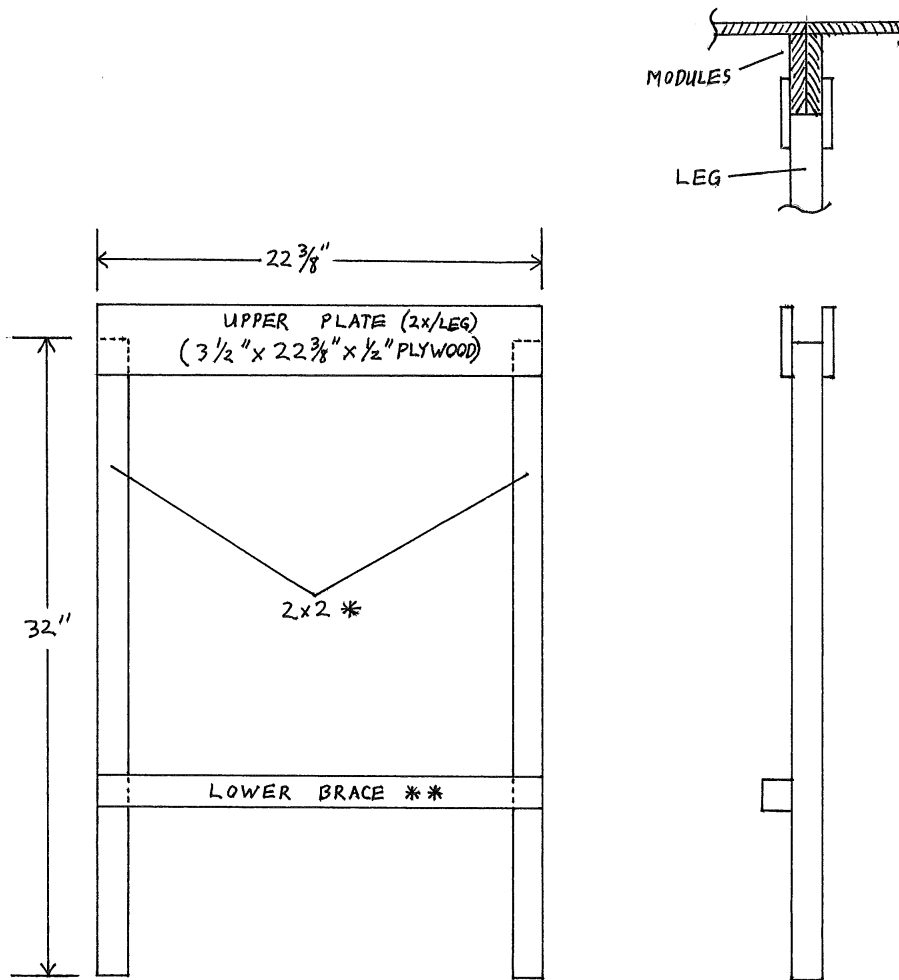
2 SETS NEEDED FOR U-SHAPED LAYOUT - OTHER PAIR MIRROR IMAGE.



ELECTRICAL



LEGS



* IT IS EASIER AND CHEAPER TO RIP 2x4'S THAN TO FIND STRAIGHT 2x2'S.

** LOWER BRACE MAY BE ANY SIZE LUMBER, SUCH AS LEFTOVER 2x2, CUT TO 22 $\frac{3}{8}$ " LENGTH.

NMRA STANDARDS	
MODULE STANDARDS STANDARD GAUGES	
Revised 1-90	MS-1.0

Modules built prior to the acceptance of these Standards will be exempt from these standards. However, if non-conforming modules are to interface with conforming modules, a transition module will be required to accommodate any difference in trackage, electrical, etc.

(*) denotes change from previous issue.

Gauge	Height From Floor To Top of Rail	Hand Laid or Commercial Rail Code***	Track Clearances* H=Horiz V=Vertical	Interface Track Center Lines from Module Front	Track Setback From End of Module	Center Lines On Curves	Track Centers For Parallel Tracks
Z	40" (1016mm)	60 (40) ¹	H=15/32" (12mm) V=1-19/64 (33mm)	(*)5" (127mm) 6" (152mm)	2-3/16" (55mm)	1" (25mm)	1" (25mm)
*Two through tracks required							
N	40" (1016mm)	80 ⁵ 55-70(*)	H=19/32" (15mm) V=1-21/32" (42mm)	4,5-1/2,7" (101.6mm) (139.7mm) (177.8mm)	2-15/32" (62.7mm)	1-1/2" (38.1mm)	1-1/2" (38.1mm)
Three through tracks required, Mainline. One through track required, Secondary.							
TT	40" (1016mm)	70	H=3/4"(19mm) V=2-3/16" (56mm)	4"(101.6mm) 5-3/4"(146mm) 9-1/2"(241mm)	3" (76.2mm)	1-3/4" (44.5mm)	1-3/4" (44.5mm)
Two through tracks, Mainline. One through track, Secondary.							
HO	40" (1016mm)	100	H=1-1/32" (26.2mm) V=3"(76.2mm)	5"(127mm) 7"(177.8mm)	4-1/2" (114.3mm)	2-1/2" (63.5mm)	2" (50.8mm)
Two through tracks required, Mainline. Others optional.							
OO	40" (1016mm)	100	H=1-3/16" (30.2mm) V=3-7/16" (87.3mm)	5" (127mm) 7-3/8" (187.3mm)	4-1/2" (114.3mm)	2-5/8" (66.7mm)	2-3/8" (60.3mm)
Two through tracks required. Mainline.							
S	42" (1067mm)	**	H=1-3/32" (27.8mm) V=4-1/8" (104.8mm)	6-1/8"**** (155.6mm) 8-7/8" (225.4mm)	2" (50.8mm)	3-1/2" (88.9mm)	2-3/4" (69.8mm)
(*) One or two mainlines optional. Check local NASG group for details.							
O	42" (1067mm)	148	H=1-7/8" (47.6mm) V=5-1/2" (139.7mm)	6" (152.4mm) 10" (254mm)	2" (50.8mm)	5" (127mm)	4" (101.6mm)
Two mainlines required							
HIGH RAIL Tinplate	36" (914mm)	O Gauge Tinplate	V=1-7/8" (47.6mm) H=5 1/2" (39.7mm)	4" (101.6mm) 7 1/2" (190.5mm)	5" (127)	21 ² (533.4mm) 35 ³ (89mm)	3 1/2" (88.9mm)
Two mainlines required.							

Module lengths for all scales shall be in 2' increments with 2' allowed as transition module. ⁴

* All track clearances are per S-7 and include all other pertinent Standards.

** No rail code recommended, S scale only use RP-3 for track gauge.

*** Hand laid track in N scale and smaller is very fragile and easily damaged in handling and is not recommended.

**** Recommended but not required S scale only.

NOTES: (1) If code 40 rail is used, it must be brought back to code 60 rail 2" from interface.

(2) Inside radius on corner.

(3) Outside radius on corner.

(4) NSG has larger modules in 2' increments up to 24'.

(5) NTRAK uses Atlas or Peco code 80 rail. Code 55-70 is allowed within module but must be brought back to code 80 at interface.

5/17/00

NMRA RECOMMENDED PRACTICES	
RECOMMENDED PRACTICES STANDARD GAUGES, MODULES	
Revised 1-90	MRP-1.0

Recommended Practices are only less mandatory than Standards by virtue of their slightly less critical subject matter and/or the fact that deviation for specific reason is permissible.

(*) denotes change from previous issue.

Scale	Minimum Parallel Tangent Track Length *+	Maximum Mainline Grade	Minimum Mainline Turnout	Minimum Mainline Radius **	Minimum (*)Industrial Radius +++)
Z	(*)2-3/16" (55mm)	4%	#5	7-1/2" (195mm)	6" (152.4mm)
N***	2-1/2" (63.5mm)	(*) 0%	#6	(*)24 (609.6mm)	17" (431.8mm)
TT	3-1/2" (88.9mm)	3%	#6	28-3/4" (730.2mm)	20" (508.0mm)
HO	(*)3" (76.2mm)	3%	#6	32" (812.8mm)	24" (609.6mm)
OO	3" (76.2mm)	3%	#6	36" (914mm)	30" (762.0mm)
S	(*)3" (76.2mm)	2%	#6	43" (1092.2mm)	34" (863.6mm)
O	4" (101.6mm)	2%	#6	60" (1524mm)	36" (914.4mm)
HIRAIL TINPLATE	5-1/2 (139.7mm)	2%	O22 or equal	21" (533.4mm) inside 36" (914mm) outside	

* Tangent track length is the distance from the end of the bridge track at the interface to the first deviation in mainline, i.e., a switch, curve, crossover, etc.

** This is the minimum radius according to Standard S-8, Class 1-A. It is suggested, however, that a larger radius be used. The only exception being HIGHRAIL/TINPLATE.

*** NTRAK specifies mainline grade of 0% with 1.5% allowed on secondary or branch lines. Other options and restrictions apply. Check with NTRAK S.I.G.

RECOMMENDED PRACTICES FOR ALL SCALES

1. Module width (except Z) will be 24" minimum, 36" maximum; ++ Z scale will be 14"(406.4mm) minimum, 36" (914mm) maximum.
2. All trackage behind the mainlines shall be insulated from mainlines.
3. All trackage behind the mainlines should have its own power source, separate from mainline power source.
4. A maximum mainline grade according to MRP-1 for each scale/gauge may be used if proper care is given to the construction of sub-roadbed and grading back to 0 elevation; it should be noted that the use of grades may restrict the length of trains and require the use of more locomotives or power units. NTRAK excepted, 0% mainline grade.
5. If uncoupler magnets are used on the mainlines, they should be the electromagnetic type. It is recommended that permanent magnets NOT be used on mainlines.
6. All trackage behind the mainlines is not covered by NMRA Module Standards and is left to the discretion of

the individual or group, with the exception of S-7 Standards pertaining to mainline clearances.

7. If sky boards are used, recommended range is 8" to 18"; (optimum 14") scenery dividers are optional.

8. Recommended roadbed can be cork, wood or Homosote.

9. Legs should be 2"x2" construction with either 1/4" or 5/16" bolts in leg bottom for adjustment of 1", plus or minus; legs can be attached by way of slip-in boxes, bolts, hinges or cleated.

10. Construction of module should be of either 1/2" plywood or L-girder top.

11. Forward extension modules, i.e., those protruding toward the public viewing side rather than inward toward the back of module, will mark the "front edge of module" reference point as the point at which the front edge would be located if it were not extended outward. This is the point of reference for center lines of mains. Check the S.I.G. for your scale for specific details.

(*)+ **S scale only:** The minimum unrestricted tangent would be 10" from interface (S"+2") because of the possibility of 2 modules with opposite curves interfacing together, creating an undesirable "S" curve. See section III-A-5-b. page 10 of NASG "S" module standards.

(*)++ **S scale only:** Width not specified as modules are sometimes reversed.

(*)+++ Sometimes referred to as "Short Line" or "Secondary" which allow for shorter radii curves including complete helix (loops) where the locomotive passes over the rear of its own train.

05/17/00

Brazos Valley Modular Railroad Association Membership Application

Name _____
Address _____
City _____ State ____ Zip _____
Phone (____) ____ - ____
Email _____

Do you have your own transportation? Yes ____ No ____

If no, do you have someone who can/will transport you
and your modules/equipment to the setups/work
sessions? Yes ____ No ____

Interests (check all that apply):

- Prototype modeling (locomotives, cars, etc.)
- Scenery (terrain, plant life, structures, etc.)
- Wiring
- Benchwork (module frames)
- Trackwork
- Other (specify) _____