MR1 00 Media Retrieval Module
and MR200 Chassis
Installation

RAULAND-BORG CORPORATION ● 3450 West Oakton Street, Skokie, Illinois 60076-2951 ● (708) 679-0900

Version 6.0 Software

Changes

The latest version of the module's EPROM software remaps the keypad commands for the video players. The illustration on the next page shows the new layouts; you can effect them by closing switches 1, 2, and 4 on the module's DIP switch, the standard setting. To continue using the older layouts, close switches 1, 3, and 4 (i.e., close 3 instead of 2).

VCR Commands

The new VCR layout has eliminated the "Power" (6), 'VCR/TV" (7), and "Keep" (#) commands. In addition, it has moved the "Release" command from the asterisk key to the zero key (to make the release process the same as for laser-disk players), and has added one new command: "Frame Advance" (6).

Laser-Disk Commands

The keypad layout for the laser-disk play mode was remapped to parallel the VCR layout. For example, "2" now means "Play" for both types of players.

The new layout includes three additional commands, which select the audio output from the laser player: "Channel 1" (7), 'Channel 2" (*), and "Stereo or Combined Channels" (# in the Numeric Mode). These commands are explained in detail in the TC4411 "CPU3" manual, KI-1655A.

EPROM Location

The U7 EPROM is in the middle of the MRl00 printed circuit board, between the largest chip and the DIP switch. Its software version number is printed on its label.

TELECENTER® IV PLUS Media-Retrieval: Classroom Operating Guide

Accessing and Releasing

1. Tune the television set to the desired channel.
2. Dial the number of the desired player.
3. Wait for a "beep."
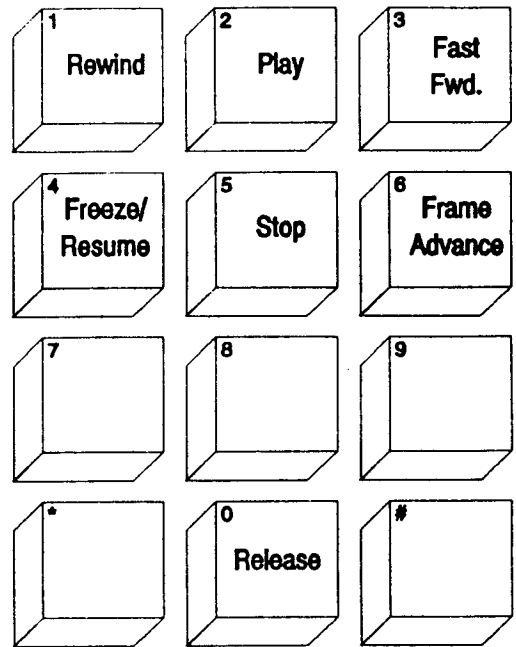4. Use the phone keypad to control the player.

   To hang up without releasing a player, make sure you are in the play mode, then hang up.
   To resume contact with a player, call its number again and wait for a "beep."

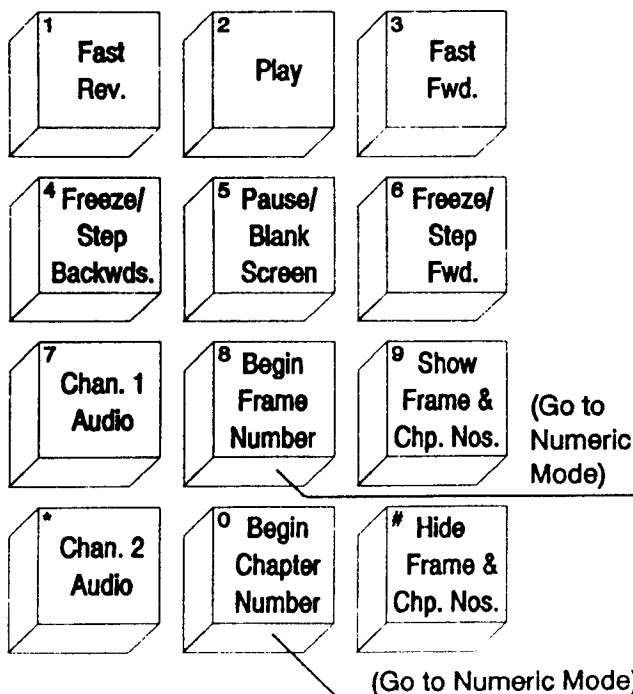5. *To release a player*, press "0" and hang up.

Special Laser Commands

To select a laser-disk frame: 8-[frame no.]-*.
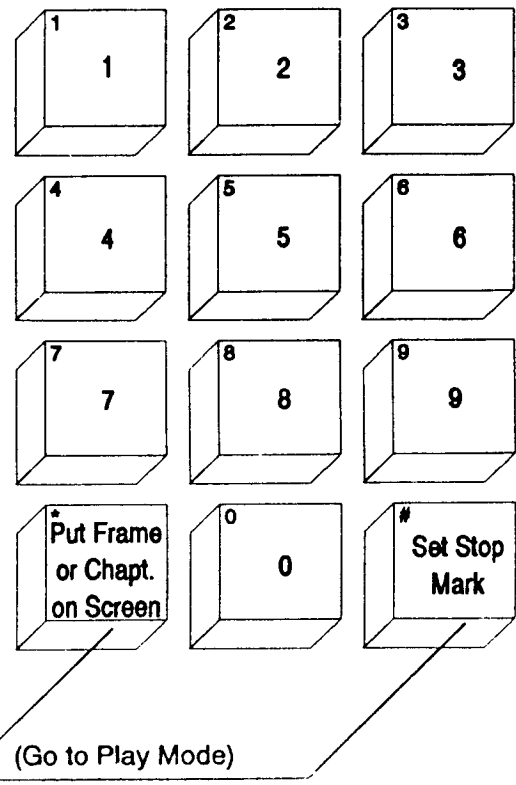*To select a laser-disk chapter:* 0-[chpt. no.]-*.

VCR Commands

1 Rewind	2 Play	3 Fast Fwd.
4 Freeze/ Resume	5 Stop	6 Frame Advance
7	8	9
*	0 Release	#

Laser Play Mode

1 Fast Rev.	2 Play	3 Fast Fwd.
4 Freeze/ Step Backwds.	5 Pause/ Blank Screen	6 Freeze/ Step Fwd.
7 Chan. 1 Audio	8 Begin Frame Number	9 Show Frame & Chp. Nos.
* Chan. 2 Audio	0 Begin Chapter Number	# Hide Frame & Chp. Nos.

(Go to Numeric Mode)

(Go to Numeric Mode)

Laser Numeric Mode

1	2	3
4	5	6
7	8	9
* Put Frame or Chapt. on Screen	0	# Set Stop Mark

(Go to Play Mode)

IL0344 [A]

MR1 00 Media Retrieval Module and MR200 Chassis

Installation

RAULAND-BORG CORPORATION ● **3450 West Oakton Street, Skokie, Illinois 66076-2951** ● **(708) 679-9900**

General Information

Description

The MRlOO module is an interface that enables a user to operate a video cassette recorder or a Pioneer LD-V2200 Laser Disk video player via a Telecenter® IV push-button telephone. With this system, all an institution's video players can be kept in one secure location. An authorized user "calls" the player with the desired program, tunes the room's television monitor to the appropriate channel, and then uses the phone's dial pad to control the player.

The MR200 is a rack-mounting chassis that holds up to six MRlOO modules.

Equipment Requirements

supplied Parts

Qty.	Description	Rauland Part No.
	MR100 **Module's** *Supplied Parts*	
1	**Eight-pin connector for all standard wiring to the module.**	**SFO458-08**
1	**E&M hybrid to adapt the associated LLM fine.**	VC7330
1	Plastic **optic cable, to carry the infrared signal from the remote control to the associated VCR**	VW2234
1	**Tinner-man clip to secure the optic cable.**	I30440
1	**#1O X ⅝" slotted hex, washer-head, thread-forming screw to secure the cable clip.**	WA24
1	**Optic disk, to secure the optic cable to the VCR and diffuse the signal over the VCR's infrared receptor.**	**QP1031**
1	**Label to fist the dialing number of this MRlOO on its MR200 chassis.**	**N1749**
	MR200 *Chassis' Supplied Parts*	
4	**#1O-32 X ⅜ black pan-head Phillips machine screws for rack-mounting.**	**BO439**
4	**#1O black Rat washers for rack-mounting.**	**WJ0305**
4	**Black fiber washers for rack-mounting (to protect the panel finish).**	**wlo315**
	#1O Tinnerman nuts for racks with untapped holes.	**AB3640**
6	**Labels for listing the dialing number of each MRlOO.**	N1749
5	**Smaller hole** plugs, **for unused chassis slots.**	QP 1033
5	**Larger hole plugs, for unused chassis slots.**	**QP1034**

Customer-supplied Parts

✓ **The MR100** module is designed for a Telecenter IV Plus system. This system includes a TC44 11 (CPU3), which has a faster processor, more memory, and new software (see KI-1655). Each module requires its own LLM line.

✓ The MRlOO is designed to be held in an MR200 Chassis, which can accommodate six modules. The chassis, in turn, is designed to be installed **in a** standard 19-inch rack; it takes 3% inches of vertical space and about ten inches of depth, including an inch for the wiring.

✓ For power, use either Rauland 12-VDC, 300-mA regulated supply: theVP0145 or the VPO057. Either supply will accommodate up to four MRlOO modules. Each supply requires a proximate AC outlet; keep in mind that these supplies will impinge upon adjacent sockets.

✓ For all the connections to the MRlOO module, use #22-gauge twistedpairs. To mate with the supplied connector, the pairs should be ma& from either solid or tinned stranded wires.

✓ The supplied universal remote control will work with most **VCRs that use infrared** signals, but check the control's instruction booklet for compatible models. When installing several VCRs, make sure that they can be rack-mounted or otherwise accommodated within reach of the MRlOOs' optic cable. When stacking or rack-mounting VCRs, use front-loading models.

✓ For each Pioneer laser-disk player, construct a separate cable in accordance with the attached KM 1005. The cable may be up to 25 feet long.

Related Manuals

The following Telecenter manuals contain important installation, programming, and operating information:

RI-1655 (CPU3): Besides installation instructions for the TC44 11, this manual contains programming and operating instructions for the media retrieval functions.

RI-1584 (TClV Progamming): This explains the general procedures for programming *the* Telecenter system, e.g., Location Codes, Attributes, Physical Numbers, Architectural Numbers, and 'dialing" methods.

Installation

Caution

For personal safety, do not apply power to the modules until you have completed and checked all of the wiring. Never connect an MRlOO module to an LLM line that has a standard *Ul* **hy**brid **circuit. That hybrid can produce a ring voltage of 90 to 110 VAC, which could damage the module.**

Refer as necessary to the installation diagrams: KM 1009 for VCRs, and KM 1005 for laser-disk players.

Step 1. On each LLM line used with an MRlOO, replace the "Ul" hybrid with the supplied E&M hybrid. (The "U 1" sockets are along the rear section of the LLM Board; each socket is directly behind the rest of the circuitry for its line; the numbering appears along the front section of the LLM Board.)

Step 2. Orient the MRlOO module with the component side of the PC board on top and the header pointing at you. Locate DIP switch "SW 1" (on the middle left side) and remove the protective tape from it.

Step 3. Make sure that all four switches are set to the appropriate position:

SW1 Dip-Switch **Setting**

Desired **output**	**SW. 1**	**SW. 2**	**SW.** 3	SW. 4
VCR	1	1	1	1
Laser disk	1	1	0	1
ASCII (for diagnostics)	1	1	1	0

1 = Closed   O=open

Notes: **(1)** Both the "Open" position and the individual switch numbers are printed on the DIP switch.

(2) For diagnostic purposes, unplug the universal remote control and set Switch 3 to its closed ("1") position and Switch 4 to its open ("0") position. This will change the control instructions to ASCII characters. A computer connected to the port can then provide a readout of the digits dialed Gom a remote station.

The unit's serial port comprises the last four pins on the header. Pins 9 ("send") and 10 (ground) output the same data as are sent to the remote control. Pins 11 (ground) and 12 (PC input) can be used to send signals from a computer directly to the remote control (factory use only).

Step 4. If the rack's holes are not tapped, clip the four supplied Tinnerman nuts, flat sides to the front, over the appropriate holes.

Step 5. Install the MR200 chassis in the rack with the supplied mounting hardware; the fiber washers go be-

tween the flat washers and the front of the chassis, to protect the latter's finish.

Step 6. Remove the "U" shaped locking bar and its two thread-forming screws from the rear of the chassis and set them aside.

VCR Installation

Steps 7V-9V **here are** for the installation of a video tape recorder; to install a laser video player, follow Steps 7L-9L under "Laser Player Installation," below.

Step 7V. Loosely install the #lO hex thread-forming screw and the cable clamp on the module's mounting bracket for the remote control. Push one end of the optic cable through the groove in the cable clamp, working from the rear (connector-side) of the module. Thread the cable through the hole in the plastic guide; feed the cable through until it touches the remote control. Tighten the clamp. Temporarily insert the module into its intended slot in the MR200 chassis.

Step 8V. Cut each MRlOO module's optic cable so that it has reasonable, but not excessive, slack between the module's mounting position and the infrared receptor of the associated VCR. You can use a sharp knife or blade cutter.

Step 9V. Insert the other end of the optic cable into the optic disk: insert it far enough so that it will remain firmly attached, but do **not insert more it than one-quarter inch.** Do **not attach the disk to the** VCR at this time.

Skip to Step 10 under "Final Installation," below.

Laser Player Installation

Steps 7G9L here are for installlng a Pioneer Laser-Disk Video Player; for installing a video tape player, follow Steps 7V-9V under 'VCR Installation," above.

Step 7L. To prepare the MRlOO for a laser-disk player, unplug Connector J2 to disconnect the universal VCR remote control from the MRlOO.

Step 8L. Obtain or fabricate a serial control cable (see KM1005). Plug its "D" connector into the rear of the laser-disk player, and wire the other end to Pins 9 ("send") and 10 (ground) on the MRlOO. Set the player's rear-panel DIP switch to "0-0" ("OF'-see KM1005).

Step 9L. Insert the module into its intended slot in **the MR200** chassis.

Continue witb the Step 10 of "Final Installation.

Final Installation

These concluding steps are for both tape and laser video players.

Step 10. Complete the wiring in accordance with the appropriate attached wiring diagram (for a VCR, KM 1009; for a laser-disk player, KM1005). Note that the supplied connector will fit either way on the rear terminals; to avoid confusion, both now and for future servicing, use Socket 1 on the connector for "LR," the top pin of the module's header.

Important: On the earlier ("0") versions of the PC board, the `LR` and `LT` terminals are reversed. Starting

with the "'A" revision **(AC2945-A),** the boards are correctly labeled. The correct wiring is to regard the top pin of the module's header (JI-1) as "LR" and the second pin (J1-2) as **"LT." The** attached diagrams show the correct wiring.

Step 11. When all the wiring has been completed, program the MRlOOs' and users' Telecenter lines in accordance with RI-1655 and RI-1584 (part of RI-1435).

Step 12. For *laser-disk players,* skip to Step **13.**

For *VCRs, perform the* following substeps:

(a) Power up the MRlOO. Program the remote control to work with its corresponding **VCR. Instructions** for this are contained in the control's manual.

(b) For each MRlOO module, locate the infrared recep tor on its associated VCR. Find the adhesive side of the disk (it has a "doughnut" stuck on it, and you can see the cable channel through it). Hold this side of the disk against the **VCR's infrared** receptor. Find a suitable alignment by working'the remote control's keys and moving the optic disk around the receptor until the **VCR readily** responds to the control. To pinpoint the **VCR's** infrared receptor chip, which may be off-center inside the infrared window, hold a paper with a small hole between the disk and the **VCR.**

⇒ The LED on the remote control will flash green when you press a key that is valid for the selected VCR, or red for an invalid key.

(c) Remove the "doughnut" from the optic disk. Center the disk over the infrared chip, then momentarily press it to attach it there.

Step 13. If necessary, turn on the Telecenter system and the MRlOO modules and test each module by operating it via a Telecenter phone.

Step 14. When the tests have been satisfactorily completed, turn off all power to the modules. Make sure that all of them are fully inserted into the MR200 chassis, then secure them with the locking bar and screws you removed in Step 6. Note that the open end of the "U" shaped bar faces away from the chassis.

Step 15. For each module, fill out a supplied label (e.g., with the Physical and Architectural numbers and an indication of the type of 'device-laser player *or* VCR-controlled by the module. Stick this label on the corresponding white rectangle on the front of the MR200 chassis.

Step 16. If there are unused module positions, fill their front-panel holes with the supplied plugs.

Troubleshooting

Terminals "LT" and "LR," which use E&M (ear and mouth logic), carry signals for both audio and DC logic. Thus, by connecting a DC voltmeter between either terminal and ground, you can gain useful troubleshooting data.

The following table interprets the readings:

Software History

Terminal	VDC	Meaning
LT	12	The MR100 is available to any authorized user.
LT*	6	The MR100 is available only to the last user.
LT	0	Abnormal-indicates a wiring problem.
LR	12	The MR100 is not connected to a TCIV link.
LR†	6	The MR100 is connected to a TCIV link.
LR	0	Abnormal-indicates a wiring problem.

• *The* "LT" voltages are controlled by the MRlOO's U5 flip flop.

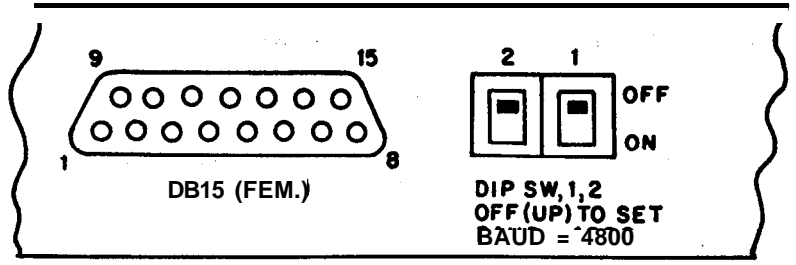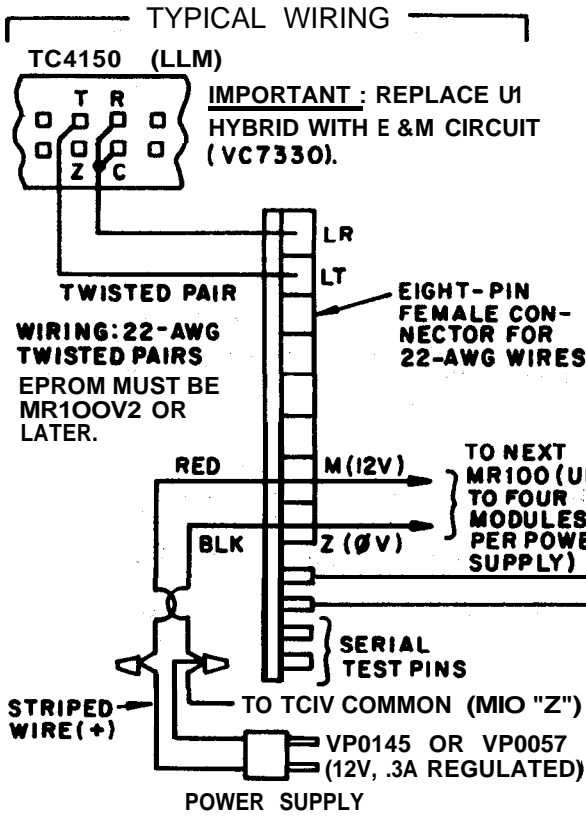† The MRlOO's "LR" terminal is wired to the TC IV's "R" and "C" terminals.

MRlOO Vl(ED0314)

This is the originally released version. It supports VCRs but not laser-disk players.

MRlOO V2(ED0317)

This version, released in October 1990, also supports Pioneer LD-V2200 video laser-disk players.

TYPICAL WIRING

TC4150 (LLM)

IMPORTANT : REPLACE U1
HYBRID WITH E &M CIRCUIT
(VC7330).

T R
Z C

DB15 (FEM.)

DIP SW, 1, 2
OFF (UP) TO SET
BAUD = 4800

OFF
ON

2 1

9 15
1 8

LR
LT

EIGHT-PIN
FEMALE CON-
NECTOR FOR
22-AWG WIRES

TWISTED PAIR

WIRING: 22-AWG
TWISTED PAIRS

EPROM MUST BE
MR1OOV2 OR
LATER.

RED

M (12V)

TO NEXT
MR1OO (UP
TO FOUR
MODULES
PER POWER
SUPPLY)

9 15

0 0 0 0 0 0 0

DB15 (MALE) TO MATE WITH
VI DE0 DISK PLAYER.

B

BLK

Z (ØV)

1

SERIAL
TEST PINS

STRIPED
WIRE(+)

TO TCIV COMMON (MIO "Z")

VP0145 OR VP0057
(12V, .3A REGULATED)

POWER SUPPLY

Laser-Disk Installation Summary

1. In the TC IV, for each MR1OO's LLM line, replace the' standard "U1" hybrid with the supplied E&M hybrid.

2. Install the MR200 chassis in the video rack where 25-foot cables can reach the disk players (see KM1 009 for VCRs). A 12-V, 0.3-A power supply (e.g., 'Rauland's VP01 45 and VPO057) will power four MR1 00s; it needs an AC outlet.

3. Unplug the cable between the MR1OO and its universal remote control. Set the switches on the MR1OO's SW1 DIP switch In accordance with the table at the right:

4. Insert the MR1OO in its assigned chassis slot. Connect the power, TC IV lines (including a ground wire from each

MR1OO's common to an MI0 "Z" terminal), and laserdisk player's lines as shown.

5. List each MR1 00s' Telecenterdialing and TV-channel numbers on a supplied label and attach it to the MR200 chassis.

6. Program theCPU3 (TC4411) as required by the Telecenter® IV Plus manual (KI-1555).
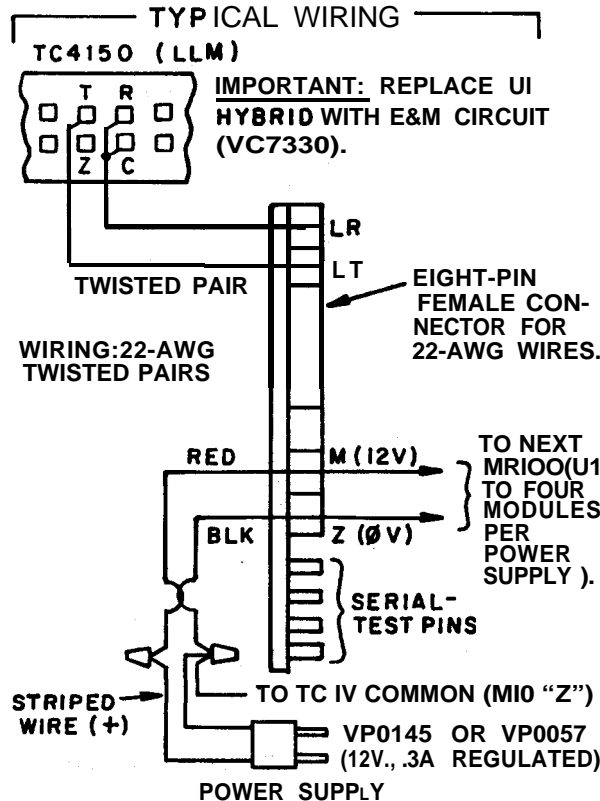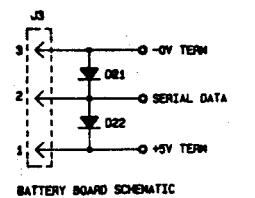
Sw. 1	Sw. 2	Sw. 3	Sw. 4
1	1	0	1

l=Closed   O=Open

MRIOO MEDIA RETRIEVAL MODULE:
LASER DISK INSTALLATION AND WIRING
KM1005 [0]

REMOTE CONTROL

← **OPTIC-CABLE GUIDE**
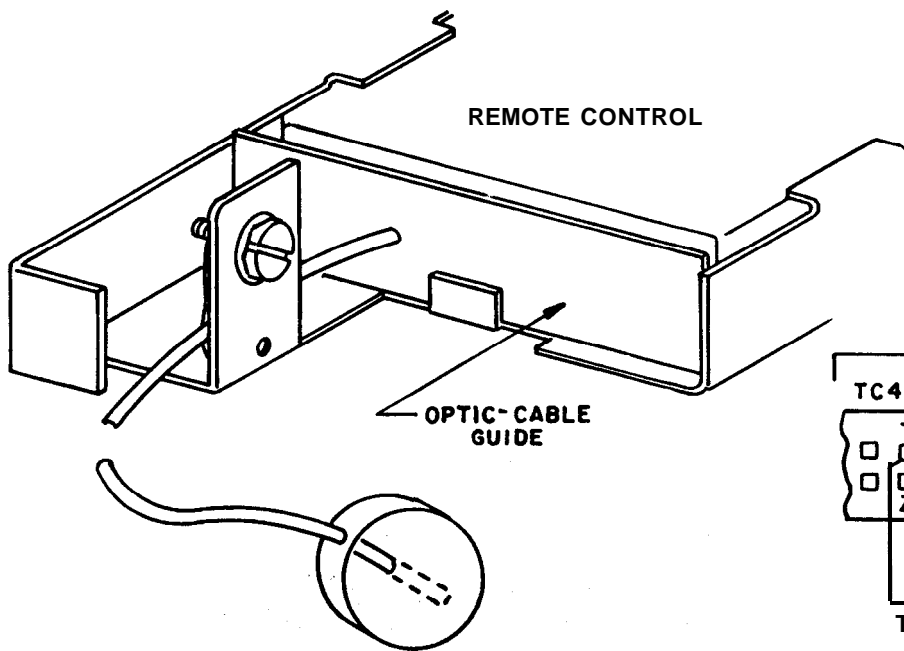
FORCE ONE END OF THE OPTIC CABLE INTO THE DISK, NOT MORE THAN ¼ INCH.

MOUNT THE OPTIC DISK OVER THE INFRARED RECEPTOR OF THE VCR.

┌──── **TYP**ICAL WIRING ────┐
TC4150 (LLM)

IMPORTANT: REPLACE UI HYBRID WITH E&M CIRCUIT (VC7330).

T   R
Z   C

TWISTED PAIR

WIRING:22-AWG TWISTED PAIRS

LR
LT — **EIGHT-PIN FEMALE CONNECTOR FOR 22-AWG WIRES.**

RED   **M (12V)** — **TO NEXT MR1OO(U1 TO FOUR MODULES PER POWER SUPPLY).**

BLK   **Z (ØV)**

SERIAL-TEST PINS

STRIPED WIRE (+) — **TO TC IV COMMON (MIO "Z")**

VP0145 OR VP0057 (12V., .3A REGULATED)

POWER SUPPLY

VCR Installation Summary

1. In the TC IV, **for** each MR1OO's LLM line, replace the standard "U1" hybrid with the supplied E&M hybrid.

2. Install the MR200 chassis in the video rack where the optic cables can reach the VCRs (see **KM1005** for laser-disk players). A 12-V, 0.3-A power supply (e.g., Rauland's VP01 45 and VPOO57) will power four MR1OOs; it needs **an** AC outlet.

3. Temporarily power each MR1OO until you have programmed its universal remote control and tested its operation with its associated VCR. See the control's manual.

4. Set the switches on the **MR1** 00's SW1 DIP switch **as** follows:

Sw. 1	Sw. 2	Sw. 3	Sw. 4
1	1	1	1

1= Closed **0 = Open**

5. Insert the MR1OO in its assigned chassis slot. Connect the power and TC IV lines, including a ground wire from each MR1OO's common to an MIO "Z" terminal, as shown.

6. Install one end of the optic cable through the clamp terminal and against the remote control. The cable should reach the corresponding VCR without coiling or making a sharp bend; if necessary, shorten it with a sharp wire cutters.

7. Insert the optic cable into the optic disk, then center the disk over the VCR's infrared receiver chip (which may be off-center in the infrared window).

8. List each MR1OOs' Telecenterdialing and TV-channel numbers on a supplied label and attach it to the MR200 chassis.

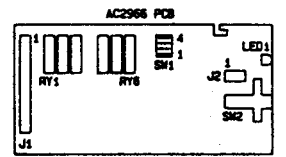9. Program the CPU3 (TC4411) as required by the Telecenter® IV Plus manual (KI-1655).

MR1OO MEDIA RETRIEVAL MODULE:
VCR INSTALLATION AND WIRING
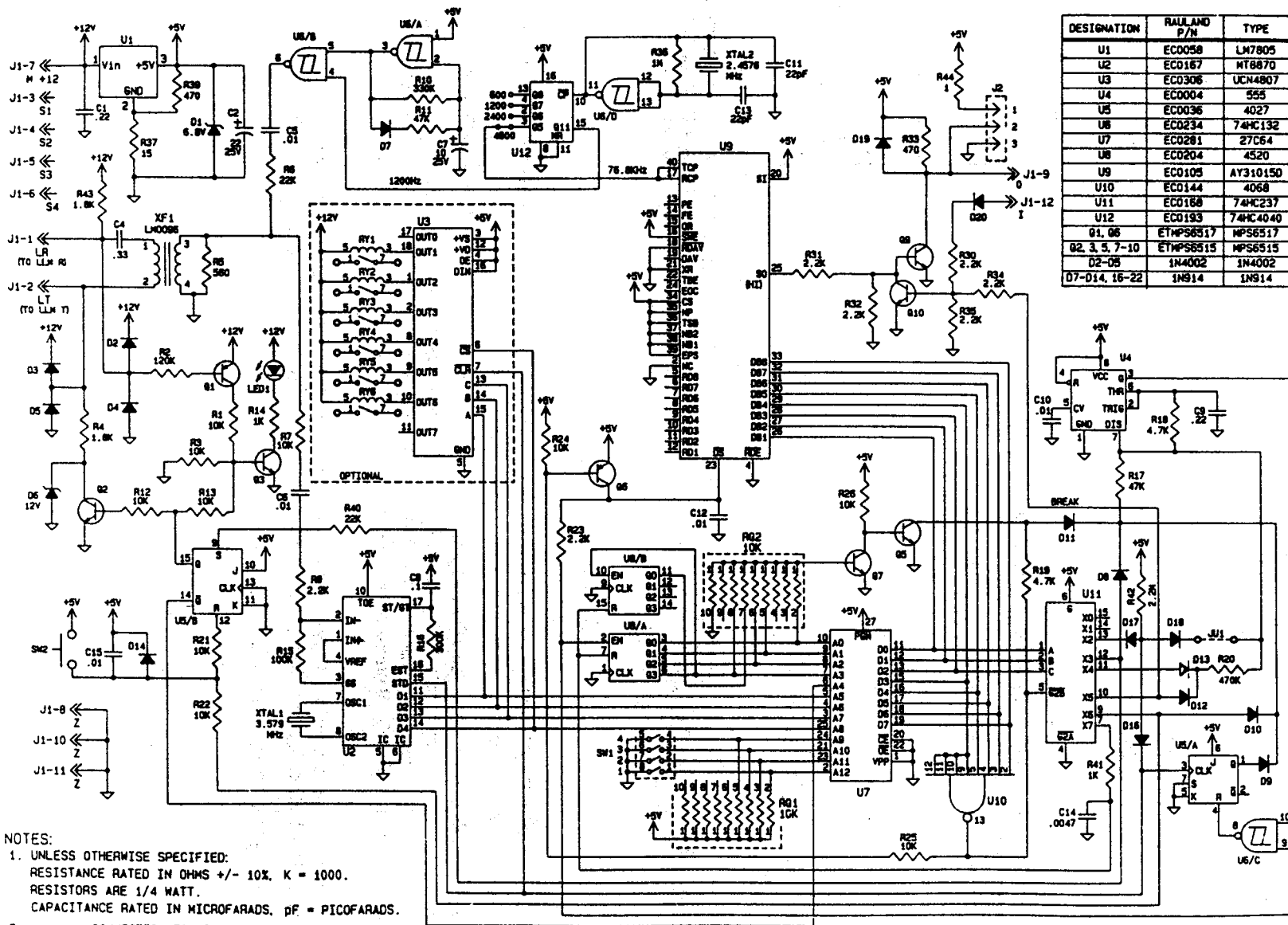
DESIGNATION	RAULAND P/N	TYPE	GND	+5V	+12V
U1	EC0058	LM7805		3	1
U2	EC0167	MT8870	9	18	
U3	EC0306	UCN4807	5	12	
U4	EC0004	555	1	8	
U5	EC0036	4027	8	16	
U6	EC0234	74HC132	7	14	
U7	EC0281	27C64	14	28	
U8	EC0204	4520	8	16	
U9	EC0105	AY310150	3	1	
U10	EC0144	4068	7	14	
U11	EC0166	74HC237	8	16	
U12	EC0193	74HC4040	8	16	
Q1, Q6	ETMPS6517	MPS6517			
Q2, 3, 5, 7-10	ETMPS6515	MPS6515			
D2-D5	1N4002	1N4002			
D7-D14, 16-22	1N914	1N914			

KC1652 C

DATE 3-9-90

CHANGE	
A	ADDED TRACE FROM U7-6 TO U5-14. WAS CONNECTED TO U9. ADDED SW1 TBL. A10 WAS 9, 9 SWITCHED "2" AND "1" LABELS. 9-25-90
B	U12 WAS EC0307 (74HC74). REMOVED U5 PIN 7. REMOVED R30 AND SW1 TBL. ADDED BAUD ADJUST PADS. C9 WAS .1. C13/C13 WERE 680pF. R19&R29 1000. R18 WAS 10K, R36 WAS 1M. R50 WAS 1M. R37 WAS 1. PCB WAS AC2945. 11-13-90
C	CORRECTED BAUD RATE CONNECTIONS ON U12. 1-7-91

AC2966 PCB

J3
3 ─── 0 -0V TERM
2 ─── 0 SERIAL DATA
1 ─── 0 +5V TERM

BATTERY BOARD SCHEMATIC

MODEL MR100
RAULAND-BORG CORP.
SKOKIE, IL
MADE IN U.S.A
KC1652-C

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE RATED IN OHMS +/- 10%, K = 1000.
   RESISTORS ARE 1/4 WATT.
   CAPACITANCE RATED IN MICROFARADS, pF = PICOFARADS.
2. ⏚ = CONNECTION TO CIRCUIT COMMON.
3. CUT JU1 TO DEFEAT AUTOREPEAT KEY.

SYSTEM PROGRAMMING WORKSHEET

INSTALLATION:_____ RT4000-_____

DISTRIBUTOR:_____ ORDER NO._____ DATE_____

PHY NO.	ARCH NO.	(A) ATTRIBUTES	(B) ATTRIBUTES	(Z-ZONE) ASSIGNMENT	LINE TYPE

NOTES:

1. Initial architectural numbers are set to PHYS number plus 100 for lines used in this system.

2. Initial zone settings: phys 0-49 = zone 1, 50-99 = zone 2, etc.

COMMENTS:

SYSTEM PROGRAMMING WORKSHEET
<u>LOCATION CODES</u>

INSTALLATION: _____ RT4000- _____

DISTRIBUTOR: _____ ORDER NO. _____

LOCATION CODE:	SETTING:	PHYSICAL NO. AFFECTED:	DESCRIPTION: