KI-1573

TCS4530 REMOTE SC25 TRANSMITTER AND TCS4531 REMOTE SC25 RECEIVER

INSTALLATION

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

GENERAL INFORMATION

DESCRIPTION

The Rauland TCS4530 Remote SC25 Transmitter and TCS4531 Receiver Module make it possible to locate SC25 (TC4110) and SCC25 (TC4120) Speaker-Control Assemblies up to 1,000 feet (305 meters) away from the Telecenter® TCS or Telecenter IV central switch; without these modules, the Speaker-Control Assemblies cannot be located more than 15 feet (4.6 meters) away.

The extension is accomplished in two ways. First, the Transmitter lowers the output impedance of the digital control signals to the speaker-control boards; second, the Receiver changes the room call-in signals (made by grounding the "T" terminal directly or via a 1,500Ω resistor) from analog to digital signals, and sends them over four wires directly to the input/output (CIO or MIO) board of the central switch.

Using digital call-in signals results in considerable savings in wiring costs where staff stations are located in clusters away from the central switch. Instead of having to home-run wires from each call-in switch to the central switch, these individual wires need be run only to a local cluster of speaker-control boards. All of the wiring that is needed between this local cluster and the central switch is a 12-twisted-pair 24-AWG cable, such as AT&T's ICPVC12P24B telephone cable. This is a far cry from the 400 conductors that a group of 100 staff stations would require in a standard configuration.

Important: The Transmitter and Receiver handle only control signals. Hence, in addition to the wiring between them, there must be a shielded audio pair (the "S" bus) for each VCM2 Voice-Controlled Module used with the staff stations and paging speakers. The shielded pairs should be of a heavier gauge (depending upon the number of stations at the remote location) to minimize audio-power loss during paging.

NUMBER OF UNITS

Each Receiver can serve any number of speaker-control modules (up to the system limit), and each Transmitter can serve up to three Receivers. However, the 1,000-foot limitation is the total length of cable for *all* of the Receivers connected to the *same* Transmitter, so whatever length of cable is used for a second Receiver reduces the amount that can be used by the first. Each Transmitter used has a 1,000-foot cabling ability.

LOCATION

The TCS4530 Transmitter must be located within 15 feet of the central switch. On a Telecenter TCS system, a single Transmitter may be mounted directly on the CIO Board. When there is more than one Transmitter or a Telecenter IV system is used, the Transmitters may be mounted in any convenient place; the supplied plastic feet have adhesive bottoms to simplify mounting (e.g., on the side of a rack).

The TCS4531 Receiver must be located within 15 feet of the speaker-control boards that it serves, and near a standard 120-volt outlet (within the length of its power-supply cord).

PARTS

TCS4530 Transmitter Module

Qty.	Description	Rauland Part No.
1	P.C. Board Assembly	VC7372
1	Cable Clamp	QP0255
4	Standoffs	QP0935
1	26-Pin Connector	SF0426-26
1	#6-32 × 3/8" Pan-head Machine Screw	WA58
1	#6-32 × 1/4" × 3/32" Hex Nut	WB506
1	Four-Pin Jumper Assembly	VW2191

TCS4531 Receiver Module

Qty.	Description	Rauland Part No.
1	P.C. Board Assembly	VC7373
1	Cable Clamp	QP0255
4	Standoffs	QP0935
1	Plug-in Power Supply	VP0057
1	#6-32 × 3/8" Pan-head Machine Screw	WA58
1	#6-32 × 1/4" × 3/32" Hex Nut	WB506

EQUIPMENT DAMAGED IN TRANSIT

These products were carefully inspected and tested at the factory before they were shipped. If your equipment was damaged in transit, notify the transportation company at once to place your claim.

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SPECIFICATIONS

TCS4530

Power Requirement: 12 VDC (provided by the central switch).
System Limit: Three modules per system.
Size: 3.5" (8.9 cm) wide, 4.8" (12.2 cm) long.

TCS4531

Power Requirement: 120 VAC, 0.1A.
System Limit: Three modules per TCS4530 Transmitter module.
Size: 4.2" (10.7 cm) wide, 4.8" (12.2 cm) long.
Wiring Requirement: Twelve twisted pairs, 22- or 24-gauge. One shielded pair for audio.

Associated Equipment:

TCS4501	Central Switch (TCS)
TC4001	Central Control (TCIV)
TC4110	Speaker-Control Assembly
TC4120	Speaker-Control Assembly
Director™	Series Intercom Systems

INSTALLATION

The TCS4530 and TCS4531 are designed to mount on PC-board standoffs, which are provided with both units. These standoffs have an adhesive back that permits mounting these units on any flat surface. Space is provided on the CIO board in the Telecenter TCS to mount one TCS4530.

Refer as necessary to the attached wiring diagram, KM0937, for both the TCS4530 and the TCS4531 installations.

TCS4530 TRANSMITTER

Step 1. Make sure that the system power is off.

Step 2. Remove the CIO (TCS) or MIO (TCIV) assembly from the central switch.

Step 3. Note that the Transmitter PC board has mounting holes. The two adjacent to the 26-pin header are for attaching strain reliefs to the cabling. Working from the foil side of the Transmitter, snap the four supplied adhesive-backed standoff feet (QP0935) into the other four holes.

Step 4. *(a) When installing a single Transmitter on a TCS System:* Orient the Transmitter so that its 26-pin connector is towards the front of the CIO board. Remove the adhesive backing from the standoffs, align them with the four "footprint" outlines near the "CPU" connector on the CIO board, and press the Transmitter into place on top of the CIO board.

(b) For all other installations: Find a flat surface near the input/output board, preferably a place within reach of (1) the flat cable that is daisy-chained to the central system's speaker-control boards and (2) the supplied four-pin jumper assembly. Orient the Transmitter so that its 26-pin connector is towards the input/output board, remove the adhesive backing from the standoffs, and press the unit in place.

Step 5. If the Transmitter is close enough to the input/output board, plug one end of the four-pin jumper assembly (VW2191) onto the four-pin *J3* header of the Transmitter. Plug the other end onto the "Remote" header on the input/output board (look at the latter so that its lettering appears right-side up, then find the four-pin header about a quarter of the way from the right side and midway between the top and bottom of the board).

If the jumper assembly does not reach or you are installing more than one Transmitter, make a custom jumper. For two or three Transmitters, use pass-through connectors in the middle, so that you can daisy-chain these connections.

Step 6. Plug the input/output board back into the central switch.

Step 7. Connect a cable with 12 twisted pairs of 24-AWG (or larger) wire between the Transmitter and each Receiver it is to serve (see the table on the next page). Use either wire-wrapping or a push-on connector to attach the twisted pairs to the 22-pin header (*J1*). If there is more than one Receiver, you can either use wire-wrapping or a mass-termination block at the Transmitter. For wire-wrapping or insulation-piercing connectors, use solid or tinned cabling. Use the supplied cable clamp, screw, and nut to attach the cable to one of the holes near *J2*, for strain relief.

Important: The *total* length of cable running between each Transmitter and its Receivers must not exceed 1,000 feet. Thus, if one Receiver is 750 feet away, a second one could not be more than 250 feet away. Contact Rauland's Sales Engineering if it is necessary to exceed this limit.

Step 8. If the flat-cable connector that is daisy-chained between the central system's input/output and speaker-control boards will reach the Transmitter, use the supplied 26-pin connector (SF0426-26) to tap into it. Otherwise, you will have to make a new flat cable that will accommodate whatever Transmitters you are installing as well as the standard connections.

Step 9. Plug this 26-pin connector to the *J1* header on the TCS4530 module. Make sure that Pin 1 of connector on the input/output board gets connected to Pin 1 of the *J1* header on the Transmitter.

TCS4531 RECEIVER

Step 1. Locate a flat surface on which to mount the Receiver; if possible, place it within reach of (1) the flat cable that is daisy-chained to the speaker-control modules and (2) a standard 120-VAC outlet.

Step 2. Starting from the solder side of the module, insert the four standoffs into the mounting holes.

Step 3. Peel off the adhesive backing from the feet and press them onto the flat surface.

Step 4. Wire the 12-pair cable from the Transmitter to the 22-pin header (*J2*) on the TCS4531 (see the tables below). Make sure that Pin 1 on this header is wired to Pin 1 of the Transmitter's header.

Step 5. If the flat-cable connector that is daisy-chained between the remote speaker-control boards will reach the Receiver, use the supplied 26-pin connector (SF0426-26) to tap into it. Otherwise, you will have to make a new flat cable that will accommodate both the speaker-control boards and the Receiver.

Step 6. Plug this 26-pin connector to the *J2* ejector header on the Receiver. Make sure that Pin 1 of connector on the input/output board gets connected to Pin 1 of the headers on the speaker-control boards.

Step 7. Plug the cord from the power supply into the Receiver's *SF1* connector, then plug the power supply into a 120-VAC socket.

ADJUSTING THE COMPARATOR

The TCS4531 Receiver has a comparator circuit, for call-in sensing, that is similar that on the input/output boards on the TCS and TCIV systems. Accordingly, the *RP1* trim pot on the TCS4531 needs to be adjusted in the same way as the *RP2* pot on the input/output board.

Note: These adjustments require the use of an administrative display phone.

Step 1. Turn the *RP1* trim pot on each TCS4531 completely counterclockwise.

Step 2. Use the *#74* adjustment procedure to set *RP2* on the CIO or MIO board—see "Call-in Sensitivity Adjustment" in the TCS *Diagnostics, Troubleshooting, and Drawings* manual (KI-1550) or the TCIV *Troubleshooting* manual (KI-1585).

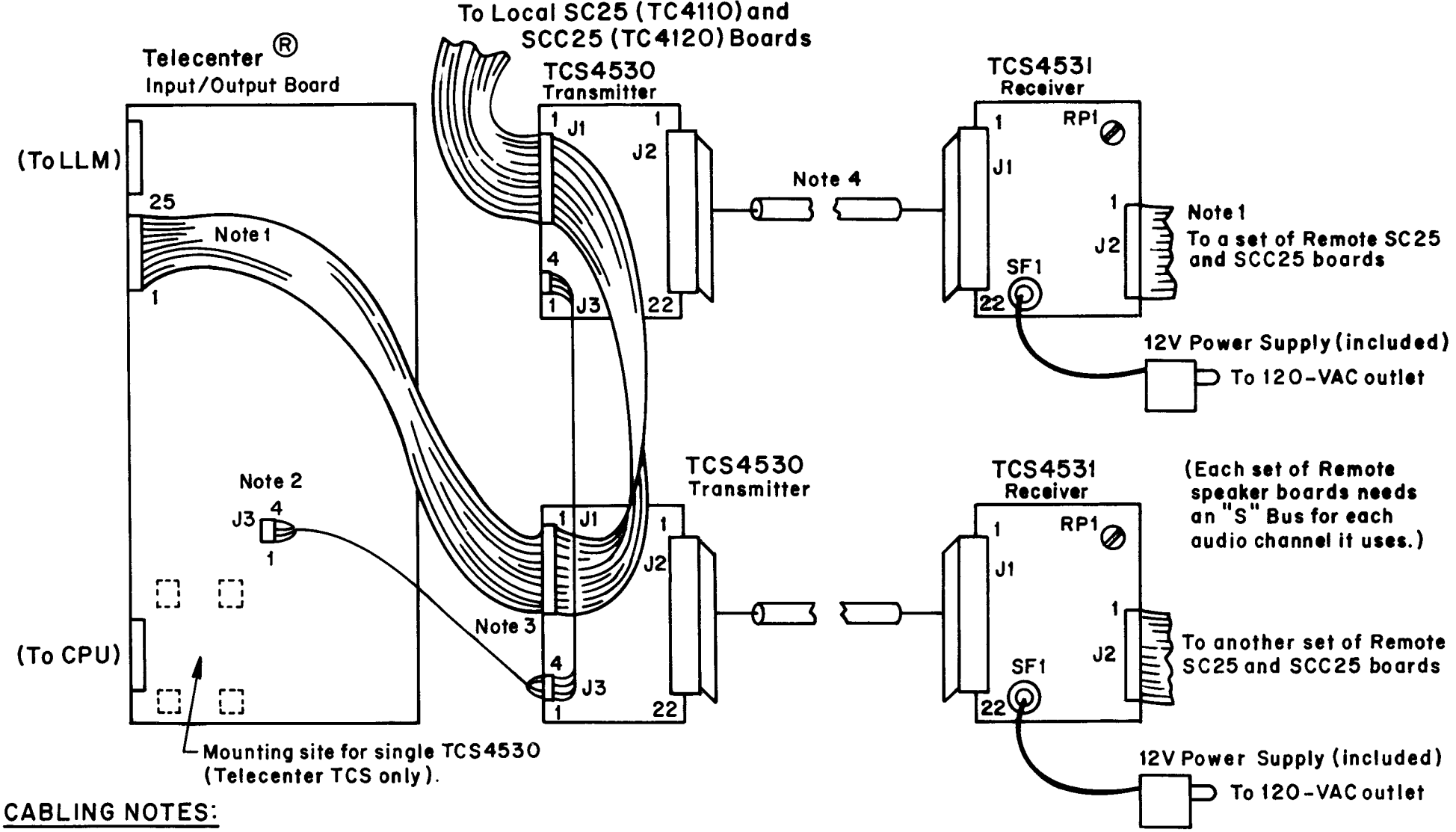
Step 3. Adjust the *RP1* trim pot on each Receiver, one at a time, by repeating the above procedure, using one of the staff stations that it serves.

Transmitter-to-Receiver Wiring (Single Receiver)

Transmitter TCS4530-*J2* Terminal #	Receiver TCS4531-*J1* Terminal #	Cable	TCS CIO TCIV MIO Designation
1 2	1 2	White-Blue Blue-White	Common P
3 4	3 4	White-Orange Orange-White	ALC S
5 6	5 6	White-Green Green-White	Mod. Select 1 Mod. Select 0
7 8	7 8	White-Brown Brown-White	Mod. Select 2 Mod. Select 3
9 10	9 10	White-Slate Slate-White	Mod. Select 4 Mod. Select 5
11 12	11 12	Red-Blue Blue-Red	RY Select 4 RY Select 3
13 14	13 14	Red-Orange Orange-Red	RY Select 2 RY Select 1
16	16	Red-Green	B1
17 18	17 18	Red-Brown Brown-Red	B0 GT
19	19	Red-Slate	GR
Not Connected	20 21	Not Connected	
22 15	22 15	Black-Blue Blue-Black	Common RY Select 0

Transmitter-to-Receiver Wiring (Multiple Receivers)

Transmitter TCS4530-*J2* Terminal #	Receiver TCS4531-*J1* Terminal #	Cable	TCS CIO TCIV MIO Designation
1 2	1 2	White-Blue Blue-White	Common P
3 4	3 4	White-Orange Orange-White	ALC S
5 6	5 6	White-Green Green-White	Mod. Select 1 Mod. Select 0
7 8	7 8	White-Brown Brown-White	Mod. Select 2 Mod. Select 3
9 10	9 10	White-Slate Slate-White	Mod. Select 4 Mod. Select 5
11 12	11 12	Red-Blue Blue-Red	RY Select 4 RY Select 3
13 14	13 14	Red-Orange Orange-Red	RY Select 2 RY Select 1
16	16	Red-Green	B1
17 18	17 20	Red-Brown Brown-Red	B0 GT
19	21	Red-Slate	GR
Not Connected	18 19	Not Connected	
22 15	22 15	Black-Blue Blue-Black	Common RY Select 0



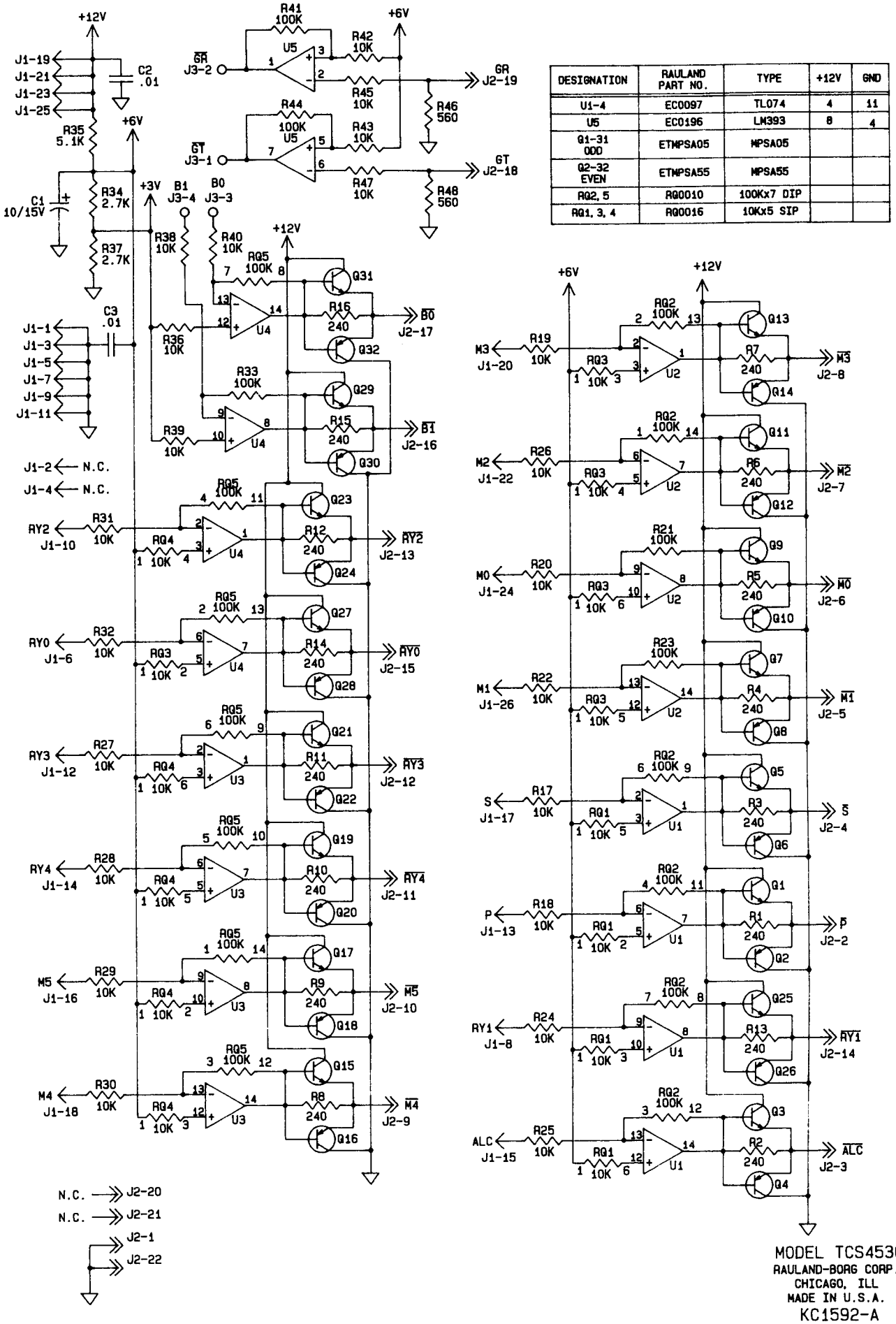
CABLING NOTES:

1. Telecenter's 26-wire flat cable or a custom cable up to 15 ft.
2. For input/output boards without J3, contact Sales Engineering.
3. Supplied four-wire harness with customer-furnished pass-through connector (or custom harness).
4. Customer-furnished cable with 11 twisted pairs of 24-AWG conductors (solid or tinned for insulation-piercing connectors or wire-wrapping).

IMPORTANT:

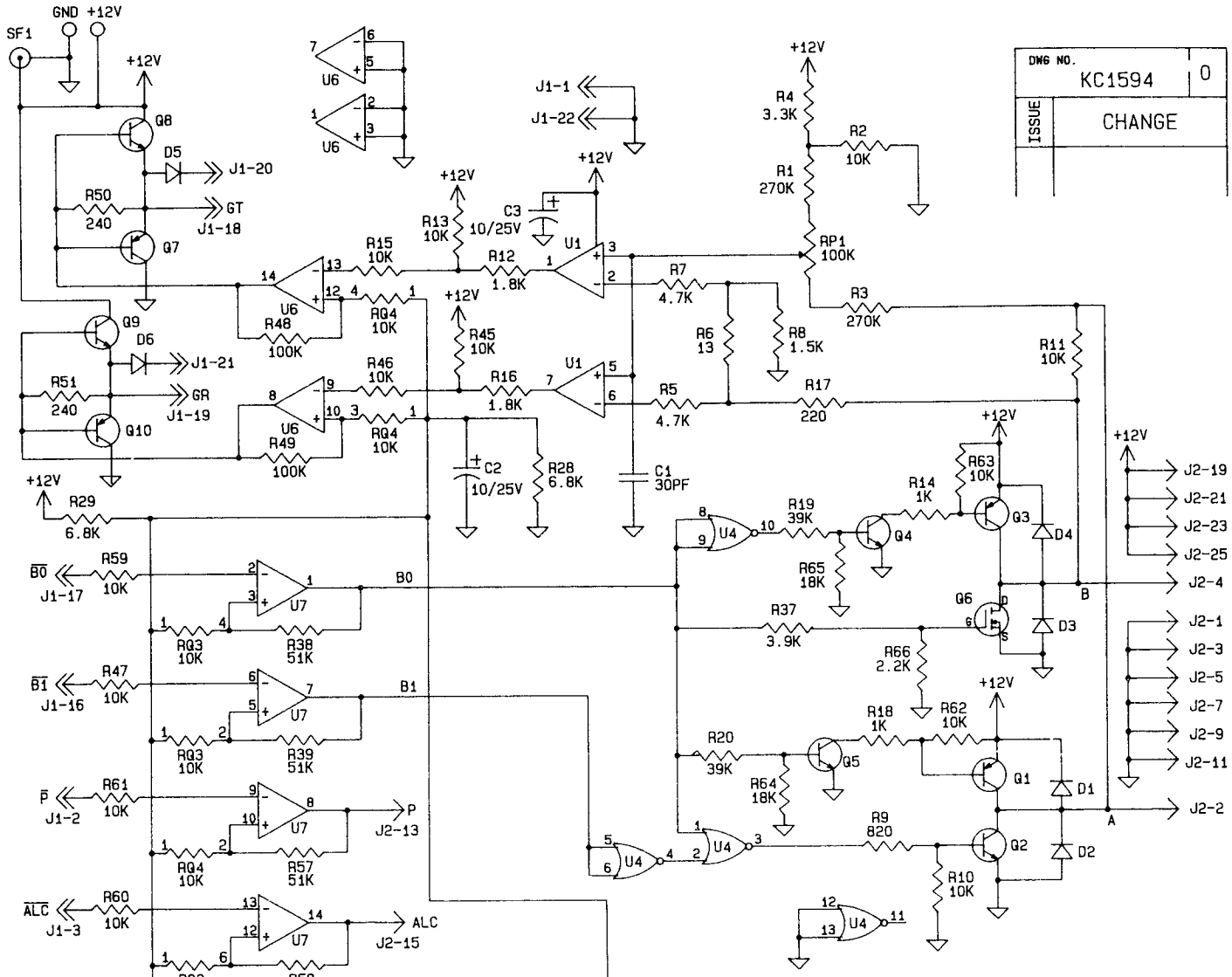
The combined length of all the cables between each Transmitter and all of its Receivers must not exceed 1,000 feet.

TCS4530 REMOTE SC25 TRANSMITTER
TCS4531 REMOTE SC25 RECEIVER
KM0937 O



DESIGNATION	RAULAND PART NO.	TYPE	+12V	GND
U1-4	EC0097	TL074	4	11
U5	EC0196	LM393	8	4
Q1-31 ODD	ETMPSA05	MPSA05		
Q2-32 EVEN	ETMPSA55	MPSA55		
RQ2, 5	RQ0010	100Kx7 DIP		
RQ1, 3, 4	RQ0016	10Kx5 SIP		

MODEL TCS4530
RAULAND-BORG CORP.
CHICAGO, ILL
MADE IN U.S.A.
KC1592-A



DWG NO.	
KC1594	0
ISSUE	CHANGE

DESIGN.	TYPE	RAULAND P/N	+12V	GND
U1	LM393	EC0196	8	4
U2, 3, 5, 6, 7	TL074	EC0097	4	11
U4	MC14001	EC0111	14	7, 12, 13
Q1, 3, 7, 10	MPSA55	ETMPSA55		
Q2, 8, 9	MPSA05	ETMASA05		
Q4, 5	MPSA18	ETMPSA18		
Q6	IRFF121	ETS041		
D1-6	1N914B	1N914B		
RQ1-4	10Kx5 SIP	RQ0016		

NOTES:
1. UNLESS OTHERWISE SPECIFIED RESISTORS ARE 1/4W, 5% AND ARE RATED IN OHMS. K = 1,000 OHMS. CAPACITORS ARE RATED IN MICROFARADS.

MODEL TCS4531
RAULAND-BORG CORP.

MADE IN U.S.A.
KC1594 - 0

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
LOCATION CODES

INSTALLATION: _____ RT4000 - _____

DISTRIBUTOR: _____ ORDER NO. _____

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