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Phone (805) 642-7184  
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**Model 8000**

**FULL DUPLEX INTERCONNECT**

**USER'S INSTRUCTION MANUAL**

Rev. B

Made in U.S.A.

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**CONGRATULATIONS:** You have just purchased the most powerful and versatile full duplex interconnect ever developed.

Twenty eight dip switches, twelve jumper strap options and fully user programmable normal/toll override access codes make the 8000 more user configurable than any other interconnect.

Two built in connectors permit instant factory or field installation of powerful options:

8001 ANI Code Validator  
8002 1000 Call Two Tone Sequential Signalling  
8003 32 Call CTCSS Signalling  
8004 FCC Registered Coupler

Additionally, the 8005 message accounting system permits the simultaneous message accounting of up to sixteen model 8000 terminals. All from your office.

To gain familiarity with your new 8000 it is suggested that you first read (and understand) this manual from cover to cover. Then proceed with the actual installation and set-up.

## **INSTALLATION**

Installing the 8000 is easy and straight forward. We suggest using shielded wire for all five connections. For the sake of reliability and neatness please use "crimp-on" spade style end terminations when connecting to the 8000 barrier strip.

Please refer to Figure 1 when making the following connections:

1. POWER: Connect to a source of 10-16 VDC that can supply up to 100 MA. the 8000 is reverse polarity protected so a polarity mistake will not cause damage.
2. AUDIO IN: Locate the repeat audio path. Break the path and
3. AUDIO OUT: connect the source end (from RX) to AUDIO IN. Connect the load end (TX) to AUDIO OUT.
4. PTT: Connect to the TX keying line.
5. COS: Connect to (in order of preference) Busy light, COR, or squelch audio gate control voltage. A point must be chosen that swings substantially in DC level, and rapidly follows mobile transmitter keying.

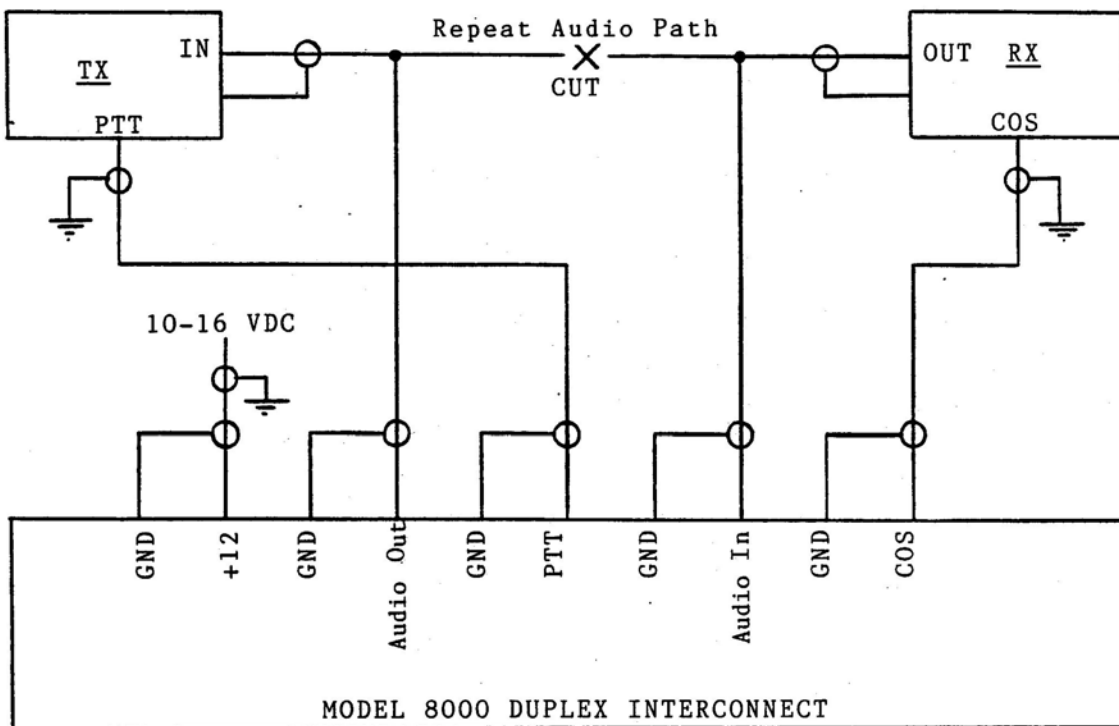


Figure 1  
Installation of the 8000

## USER PROGRAMMING

A great deal can be learned about the 8000 by thoroughly reading the following three topics... Dip Switch Programming, Jumper Strap Options, and Access codes.

As you read, make your dip switch selections. We suggest not changing jumper strap options until last. That is after the 8000 is up and running. Then only make one change at a time. If something goes wrong, you will know which step caused it.

### DIP SWITCH PROGRAMMING

#### **AUTOMATIC ANSWER RING NUMBER**

Enables ringout or "Auto Answer" on the first, second, fourth, or eighth incoming ring.

**Important:** Only one of the four switches may be on at a time.

#### **MDA/\*#**

Select: "Multi digit access" or \* connect, # disconnect

#### **COS-/COS+**

"Carrier operated squelch" polarity reverse. Select such that the front panel COS led lights when a carrier is received.

#### **LD/TR**

Select: "Long Distance" (Defeats toll protection) or "toll restricted" (use toll override code to make long distance calls)

#### **OFF/TB**

"Tone Block" eliminates the transmission of regenerated DTMF to the Telco after a phone number has been dialed. Leave in "TB" unless over dialing is required.

#### **SCL/ACL**

Choose: "Selective Calling" or "all call" (ringout). Determines how mobiles will receive incoming calls.

#### **DEF/MTR**

Defeats or enables a mobiles ability to perform a "mobile timeout reset" by pressing the \* digit on his touch tone keyboard.

#### **RINGDETECT/OFF**

Must be in the ringdetect position if ringout, selective calling or telephone control modes are to be functional. Turn off only if the 8000 is used strictly to make outgoing calls.

#### **MAT/OFF**

Enables or disables the 30 second "mobile activity timer".

#### **HALF/FULL**

Must be in "full duplex" if any of the mobiles are duplexed. Otherwise select "half duplex" to enable half duplex privacy. (Mobile side of conversation not heard on repeater output)

**CMON/CMOF**

"Channel monitor on" prevents ringout, selective call or telephone control if the channel is in use. Emergency services may want to select "CMOFF" so that emergency calls will not be missed.

**RO M/RO O**

Select "multiple" ringout beeps or "once". Note: this control is only functional if the SCL/ACL dip switch is in ACL (ringout).

**STONE/PULSE**

Selects regenerated tone or pulse dialing.

**TIMEOUT**

Select: 2,3,5 or 10 Minutes. Leaving all switches off defeats the timeout timer.

**Note:** Only one of the four switches may be on at a time.

**FIRST DIGIT**

Toll restrict first digit lockout. Select: 1,0,8 or 9 in any combination.

**HYB COMP**

Sixteen values of Hybrid compensation capacitance are selected by switch settings 0000 through 1111 binary. More about hybrid alignment in the adjustments section.

**JUMPER STRAP OPTIONS**

- JP-1** Strap factory installed. Enables regenerated DTMF for selective calling. Remove only if it is desired to selective call with two tone sequential (option 8002) or CTCSS (option 8003).
- JP-2** Strap factory installed. Enables manual speed accessing. Remove strap for high speed ANI only accessing.
- JP-3** Selects ground or +12V closure for transmitter keying. Factory strapped in ground position.
- JP-4** Strap factory installed. Removal increases input preamp gain by a factor of five. Cut only if P4 (Mobile->Land) is fully CW and still not loud enough as heard on the distant telephone.
- JP-5** Installing strap eliminates selective call alert beeps.
- JP-6** Strap factory installed. Removal turns off front panel Leds. (A current saving measure for solar powered installations.)
- JP-7** Installation defeats the digit counting portion of toll restrict. (leaves first digit lockout in operation).

- JP-8** Installation completes +V power path to the "aux. mobile signalling" connector. Must be strapped if option 8002 or 8003 are installed.
- JP-9** Installation completes +V power path to the validator connector. Must be strapped if option 8001 is installed.
- JP-10** Removal enables mobile to mobile signalling. Strap factory installed.
- JP-11** Installation enables message accounting end of call tone.
- JP-12** Remove if option 8002 is installed. Alters alert tone timing.

### ACCESS CODES

You can operate the 8000 with single digit control (\* connect, # disconnect) or "multi-digit access" Depending on the position of the "MDA/\*#" dip switch.

It is necessary to use "MDA" if you want the toll override code to operate.

Two independently programmable access codes permit heirarchy toll privileges. The normal user code can make local calls only, while the toll override code can call anywhere.

The MDA codes are programmed with wire straps soldered to a removeable dip plug inserted in the "access code" socket on the printed circuit board.

"ABC" are the program inputs for the normal code while "XYZ" are the program inputs for the toll override code. The plug has been factory strapped with A connected to 1, B to 2, C to 3, X to 4, Y to 5 and Z to 6. This makes the factory supplied normal code 123 and the toll override code 456.

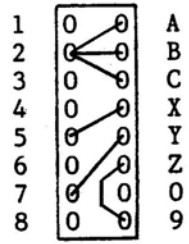
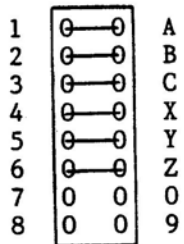
To connect, send \* followed by either the normal (\*123) or toll override code (\*456)

To disconnect, send # followed by either the normal or toll override code. (#123 or #456).

The factory installed codes will funtion until they are user re-programmed.

Several examples shown in figure 2 should make the programming clear.

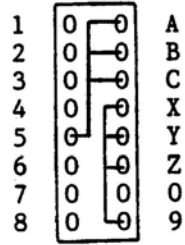
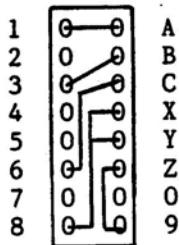
**Caution:** Do not reprogram until the 8000 is installed and operating correctly. Save re-programming for last.



Normal Code  
Toll Override Code

123  
456

222  
579



Normal Code  
Toll Override Code

136  
889

555  
999

Figure 2

Examples of MDA Code Programming

## OPERATION

### TO MAKE A CALL

Send the normal connect code (\* or \*123) for local calls or the toll override code (\*456) to call long distance. After a dialtone has been heard dial your intended phone number just as you would from any telephone. A disconnect beep will be heard if you attempted to dial long distance without using the toll override code. When your call has been completed send the appropriate disconnect code (#, #123 or #456).

**TIMEOUT TIMER:** Your call will be limited to the time selected by the "timeout" dip switches. A short low frequency (437 HZ) Beep heard at two second intervals during the final 40 seconds warns of impending timeout disconnect. The timeout timer can be reset by the mobile by transmitting the \* digit assuming the "DEF/MTR" dip switch is in the "MTR" (mobile timeout reset) position.

**MOBILE ACTIVITY TIMER:** If the mobile has not been heard for thirty seconds the 8000 will automatically disconnect. High frequency (874HZ) beeps heard twice per second during the final 10 seconds give the mobile plenty of warning time. A quick press of the push to talk button will instantly reset and refresh the timer.

Mobile activity timer warning beeps are readily distinguishable from timeout warning beeps both in frequency (pitch) and repetition rate. Higher pitch and faster rate were chosen because of the more imminent nature of the mobile activity warning

Duplex mobiles will not be concerned with the mobile activity timer because they never stop transmitting while in use. Hence no lack of activity.

The mobile activity timer can be defeated by placing the "MAT/DEF" dip switch in the defeat position.

**NOTE:** Check the rules governing your particular radio service. It may not be permissible to defeat the timeout or mobile activity timers or reset the timeout timer from the mobile. The call duration limit is 3 minutes in most services.



## TO RECEIVE INCOMING CALLS

### **RINGOUT**

(Voice path enabled by mobile DTMF)  
(SCL/ACL dip switch in ACL)

Select ringout mode to receive incoming calls just as you would from a telephone.

You may select ring once or ring with multiple alert sequences. Select with the RO M/RO O dip switch.

You may also select which incoming ring will trigger the alert beeps. This is useful to only allow ringout to the mobile if the office phone has not been answered by the quantity of rings pre-selected by the auto answer dip switches.

After an alert has been heard simply send your connect code to answer your call. You can now communicate with the calling party. Send your usual disconnect code when through.

NOTE: Multiple ringout beeps are not permissible in most U.S. business radio applications.

### **SELECTIVE CALLING OR PAGING**

(Voice path enabled by mobile DTMF)  
(SCL/ACL dip switch in SCL)

Selective calling allows a caller to direct his call to a specific mobile or portable.

The 8000 can selectively call mobiles with regenerated touch tone (standard feature) or two tone sequential signalling (option 8002) or CTCSS signalling (option 8003).

The caller first dials the phone number of the 8000 terminal. If the channel is not in use the call is automatically answered on the first, second, fourth, or eighth incoming ring depending on the setting of the auto answer dip switches. When the call is auto-answered, the caller will hear an acknowledge beep. The caller then sends a selective call code. The code format varies depending on the type of signalling in use...

**DTMF Signalling:** The mobile call code can be any length or sequence that you desire. The sequence is followed by # (for example 4369#). The # is optional. It merely speeds up the process by letting the 8000 know that the code sequence is completed rather than waiting five seconds to default.

**CTCSS Signalling:** When option 8003 is installed, up to 32 mobiles can be selectively called using the format XX#. The sequence must end with # when using the 8003 option.

**Two Tone Sequential Signalling:** When option 8002 is installed up to 1000 mobiles and/or pagers can be selectively called using the format \*XX for 100 call operation or \*XXX for 1000 call operation. # is never used in the two tone format.

Note: The MDA/\*# dip switch must be in MDA if it is desired that the mobile complete the voice path.

(X's are the mobile call code)

When the correct mobile has been signalled, he responds by sending a connect code to complete the voice path. Two way voice communication can immediately proceed. The usual disconnect code should be sent by the mobile when the call has been completed.

After sending a selective call code, the 8000 holds the incoming call for approximately 35 seconds. The 8000 disconnects the call if there is no mobile response within this period.

NOTE: The caller must begin sending the selective call code within five seconds of hearing the acknowledge beep. Otherwise the opportunity is lost.

**TELEPHONE INITIATED CONTROL FROM A TOUCHPHONE**

(Voice path enabled from originating phone)

(SCL/ACL dip switch in SCL)

By using the telephone control mode, a caller can take full control of the 8000 from any touch phone and initiate two way voice (and/or selectively call) mobiles that are not equipped with touch dialers.

The telephone control mode has many exciting solutions to formerly difficult communications problems. Such as calling any roaming portable in the plant from any telephone. Or remote controlling a repeater base station without dedicated wire pairs by using standard dial up lines.

To take control, the caller calls the terminal as in selective calling. However, after the acknowledge beep the caller sends the system access code (same access code that mobiles use) to connect ("\*" or "\*123"). This completes the voice path to permit two way voice communication.

To selectively call and also activate tel-control, the following formats are used...

**DTMF Signalling:**    XXXX\*        If using \*# connect/disconnect  
                      XXXX\*12     If using MDA

**CTCSS Signalling:**  XX\*         If using \*# connect/disconnect  
                      XX\*12       If using MDA

(X's are the mobile call code)

Once in the tel-control mode, the touch phone has complete control. Timers are resettable with \* and a the disconnect code should be sent when through.

All status beeps including the disconnect beep are heard by the telephone party.

#### **TALK BACK PAGING FROM A TOUCHPHONE**

(Voice path enabled from originating phone)  
(SCL/ACL dip switch in SCL)  
(JP-12 must be cut)

When option 8002 is installed you can beep pagers and deliver a voice message from any touchphone.

If the MDA/\*# dip switch is in the \*# position, simply send the pager call code.

For example: \*XX In 100 call operation.  
\*XXX In 1000 call operation.

X's Are the pager call code.

If the MDA/\*# dip switch is in the MDA position, the three digit user programmable access code must precede the pager call code.

For example: \*123\*XX In 100 call operation.  
\*123\*XXX In 1000 call operation.

X's Are the pager call code.

#### **MOBILE TO MOBILE SIGNALLING**

(JP-10 Must be cut)

The 8000 will cross mobile DTMF to either CTCSS or two tone sequential if either of these signalling options are installed in the 8000 (options 8003 or 8002)

This capability allows each mobile and/or portable to respond to separate CTCSS or two tone codes. Thus each radio is spared the annoyance of listening to everyone elses chatter.

The command "###" instructs the 8000 that the digits to follow are to be converted into another tone format. The digits that follow ### are precisely the same as those that would be sent from a telephone to selectively call a mobile.

Examples: ###XXXX# for DTMF Signalling  
###XX# for 32 call CTCSS  
###XX for 100 call two tone sequential  
###XXX for 1000 call two tone sequential

(X's are the mobile call code)

## ADJUSTMENTS

If the 8000 is properly installed and the dip switches are in the desired settings you are ready to adjust and put your 8000 into service.

Thanks to modern digital engineering, there are only seven adjustments in the 8000...

- P1 Land to Mobile audio level
- P2 DTMF to Mobile level
- P3 Beeps to Mobile level
- P4 Mobile to Land audio level
- P5 Hybrid Balance
- P6 Mobile to Mobile (repeat) audio level
- P7 COS Threshold

### COS THRESHOLD

Measure the DC level at TP-1 (a pad just to the right of COS potentiometer P7) both with the squelch open and closed. Note these two DC voltage levels.

Next, move your meter to TP-2 (just below the COS potentiometer P7). Rotate the COS threshold control P7 until a reading midway between the two previously measured TP-1 readings is obtained.

For example: TP-1 reads 2 volts squelch closed and 4 volts squelch open. Adjust COS (P7) for a reading of 3 volts on TP-2.

Select the COS polarity (COS-/COS+ dip switch) that causes the front panel COS led to light when a carrier is received. The COS led must extinguish when there is no carrier present.

### REPEAT LEVEL

The M->M (Mobile to Mobile) repeat level control (P6) gives you a separate repeat level adjustment independent of phone patch settings.

With the 8000 in disconnect, adjust P6 until the repeat modulation is normal. (Usually 1/3 to 1/2 rotation).

### MOBILE TO LAND LEVEL

Find a setting of the M->L level control (P4) that allows mobile touch tone decoding as indicated by the front panel strobe led.

Have the mobile place a call through the patch to a phone that can give you assistance. Adjust P4 until the mobile level is satisfactory as heard on the telephone.

If P4 is adjusted fully clockwise and the level is still too low, cut strap JP-4 just behind the barrier strip. This will give a 14.5 DB boost in receiver level without affecting the repeat level setting already made. Complete the adjustment of P4.

#### **LAND TO MOBILE LEVEL**

The L->M level control (P1) should now be adjusted until the telephone originated audio produces the desired level of transmitter modulation.

#### **DTMF TO MOBILE**

The DTMF->M level control (P2) adjusts the modulation level of all regenerated repeat DTMF (touch tones).

Regenerated repeat touch tone is used for selective signalling and message accounting.

The amount of modulation required will depend on the brand of decoders installed in the mobiles. Probably 2-3 KHZ deviation will be satisfactory. These levels are certainly satisfactory for message accounting.

If neither selective calling nor message accounting are used, touch tones can be eliminated on the repeater output by rotating P2 fully CCW. Only a brief chirp rather than full duration bursts will be heard.

#### **MOBILE BEEP LEVEL**

The level of mobile Status beeps (mobile activity/timeout warnings, ringout beeps and disconnect beep) are controlled by the setting of the Beeps->M level control P3.

Each time the connect/disconnect switch is pushed toward disconnect (after a connect) a disconnect beep will be produced. Adjust P3 until the desired transmitter modulation level is achieved.

#### **WHAT IS A HYBRID?**

Every telephone has a hybrid (sometimes called a network). The purpose of the hybrid is to attenuate the level at which you hear yourself speaking, without affecting your level at the other end or vice-versa.

Various noises in mobile radio communications systems demand that the hybrid in a full duplex terminal should have significantly better performance than a telephone hybrid. Otherwise the mobile would hear excessive return trip audio (echo) and noise. To achieve optimum trans-hybrid isolation, resistive and capacitive nulling (balance) adjustments are required.

When the hybrid is adjusted to produce minimum return trip audio (optimum adjustment) very little of the residual mobile audio will be heard on the repeater output in comparison to the telephone party audio. But of course the mobile and the telephone party hear each other perfectly.

If there are only half duplex mobiles (push to talk) on the terminal it may be desirable to slightly unbalance the hybrid so two or more mobiles may participate in the same telephone conversation.

If half duplex privacy mode is used (half/full dip switch in the half position) there is no need to balance the hybrid at all.

#### **ALIGNMENT PROCEEDURE**

The alignment must take place on the phone line the 8000 will normally be connected to.

Have a mobile place a call through the 8000 into a commonly called area. The party answering the called phone should leave the phone off hook during the alignment procedure.

Monitor the repeater output with a service monitor or connect an oscilloscope to the audio out terminal on the rear of the 8000. Place all four "HYB comp" dip switches in the off position. See Figure 3.

Have the mobile simultaneously press digits 3 and 6 on his touch tone keyboard. This will result in the transmission of a single 1477 HZ tone. The front panel strobe led must not be illuminated during alignment.

Adjust the "HYB BAL" potentiometer (P5) to produce the least repeater audio output. Switch the "HYB comp" dip switches to the next higher capacitance (see Figure 3) and re-null P5. Repeat this procedure until maximum rejection of the 1477 HZ tone is obtained.

Changes made within the telephone company or re-routing of telephone lines could occasionally require re-adjustment of the hybrid.

The 8000 is now fully ready for use. Enjoy.

	HYB COMP SWITCHES				COMPENSATION CAPACITANCE
	4	3	2	1	
Initial Setting	0	0	0	0	0 uF (min)
	0	0	0	1	.010
	0	0	1	0	.022
	0	0	1	1	.032
increase	0	1	0	0	.050
until	0	1	0	1	.060
optimum	0	1	1	0	.072
null	0	1	1	1	.082
is	1	0	0	0	.100
achieved	1	0	0	1	.110
	1	0	1	0	.122
	1	0	1	1	.132
	1	1	0	0	.150
	1	1	0	1	.160
	1	1	1	0	.172
Maximum setting	1	1	1	1	.182 uF (max)

0 = OFF  
 1 = ON

FIGURE 3

Table of hybrid compensation settings.

## WARRANTY

We guarantee the Model 8000 to be free from defects in material and workmanship for one year from purchase. Tempering, misuse or modification shall void this agreement.

Several components in the 8000 are mounted in sockets. We reserve the right to not cover these parts under warranty if failure is traceable to removal/re-insertion.

The quality of components used in the 8000 are excellent. It could give many years of trouble-free service. Should it fail, we shall repair it at our factory, and return it to you within one day if possible.

We reserve the right to not repair units which have been "modified".

This warranty does not cover damage caused by external overloads such as lightning or power source surges. Further, the warranty does not cover damage caused by any acts of GOD.

The 8000 utilizes two metal oxide varistors connected from phone line to ground. These "MOV'S" should protect the 8000 from all but the most severe lightning strikes. However, we reserve the right to not repair a unit which in our opinion is too extensively damaged. Further the warranty of a unit which has been hit by lightning is terminated. This is because of latent damage which can surface at a later date.

Should repair become necessary, please send a copy of your sales invoice together with the interconnect.

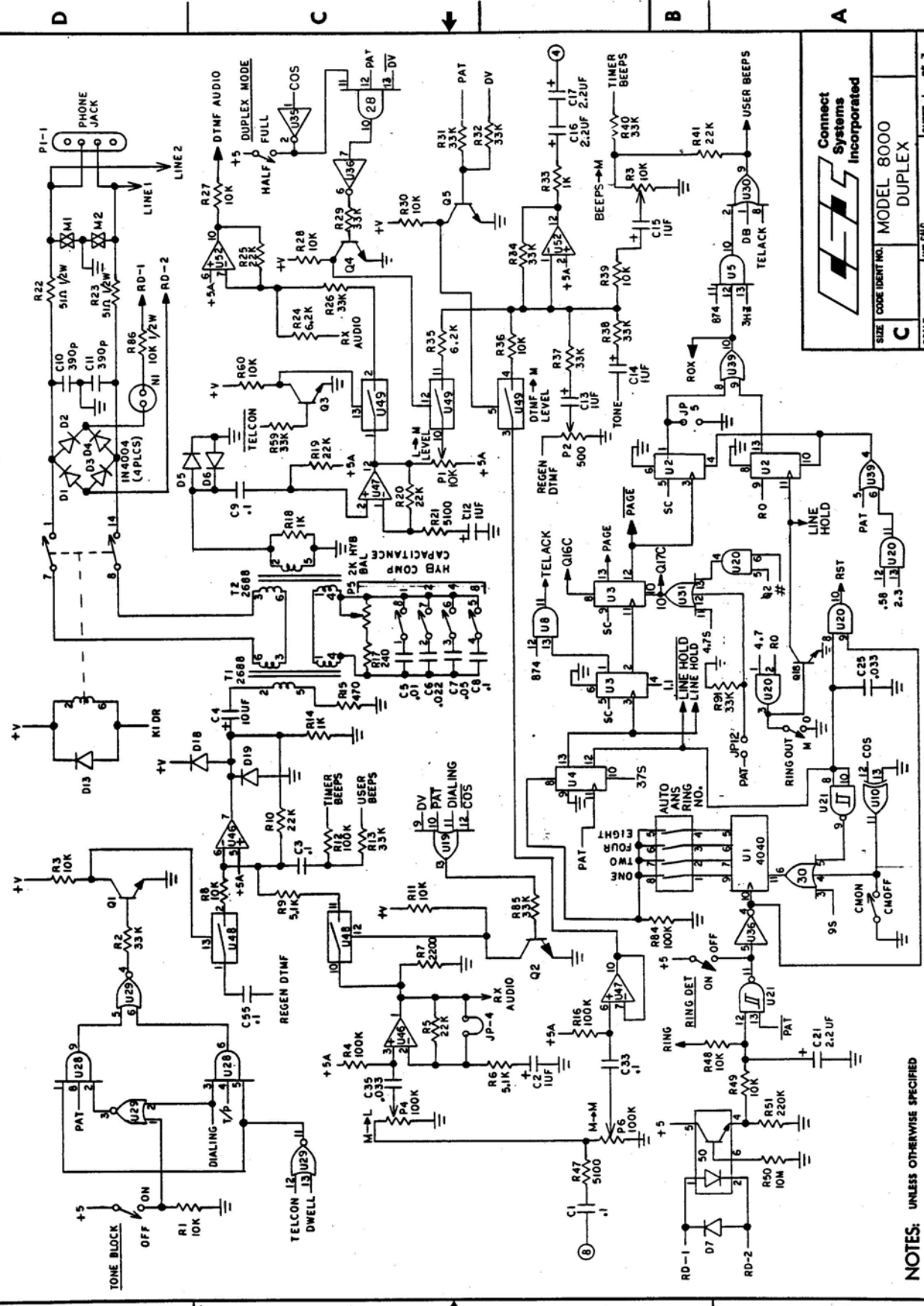
Address repairs to: **Connect Systems Inc.**  
2064 Eastman Ave. Suite 113  
Ventura, Ca. 93003  
Phone (805) 642-7184  
Fax (805) 642-7271



### LOGIC NAMES

CON	Connect
COS	Carrier operated squelch
DCK	Data Clock
DV	Data Valid
O1	Strobe Phase 1
O2	Strobe Phase 2
DB	Disconnect Beep
DBX	Disconnect Beep Transmit
PAT	Patch
PO	Patch Off
RO	Ringout
ROX	Ringout Transmit
RST	Reset
SC	Selective Call
TELACK	Telephone Acknowledge
TELCON	Telephone Control
TRANS	Transmit
T/P	Tone/Pulse
VAL CK	Validator Clock
VL	Led Voltage

ZONE LTR	DESCRIPTION	DATE	APPROVAL
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**Connect Systems Incorporated**

MODEL 8000  
DUPLIX

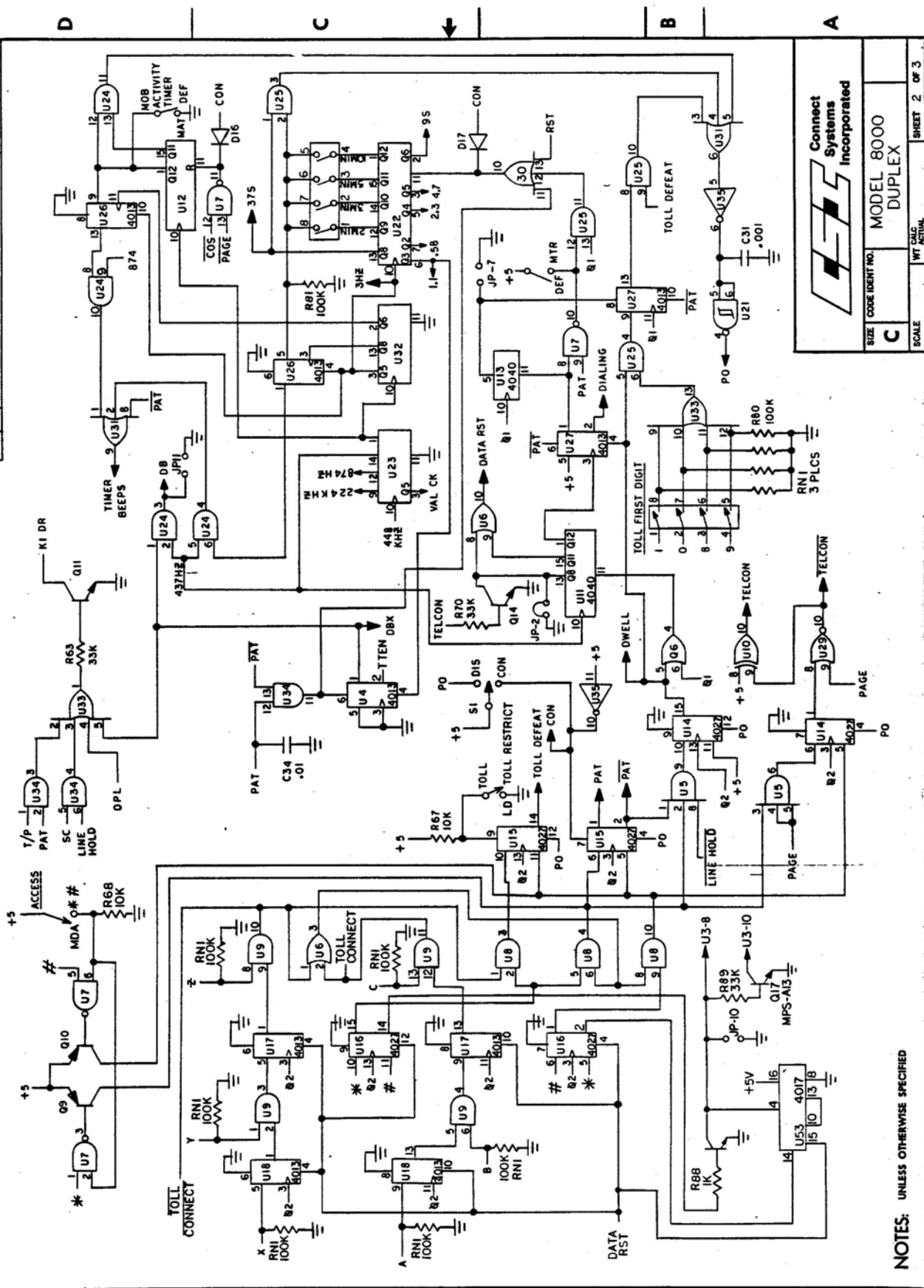
SIZE CODE IDENT NO. **C**

SCALE: 1/8" = 1"

SHEET 1 OF 3

NOTES: UNLESS OTHERWISE SPECIFIED

ZONE	LTR	DESCRIPTION	DATE	APPROVAL



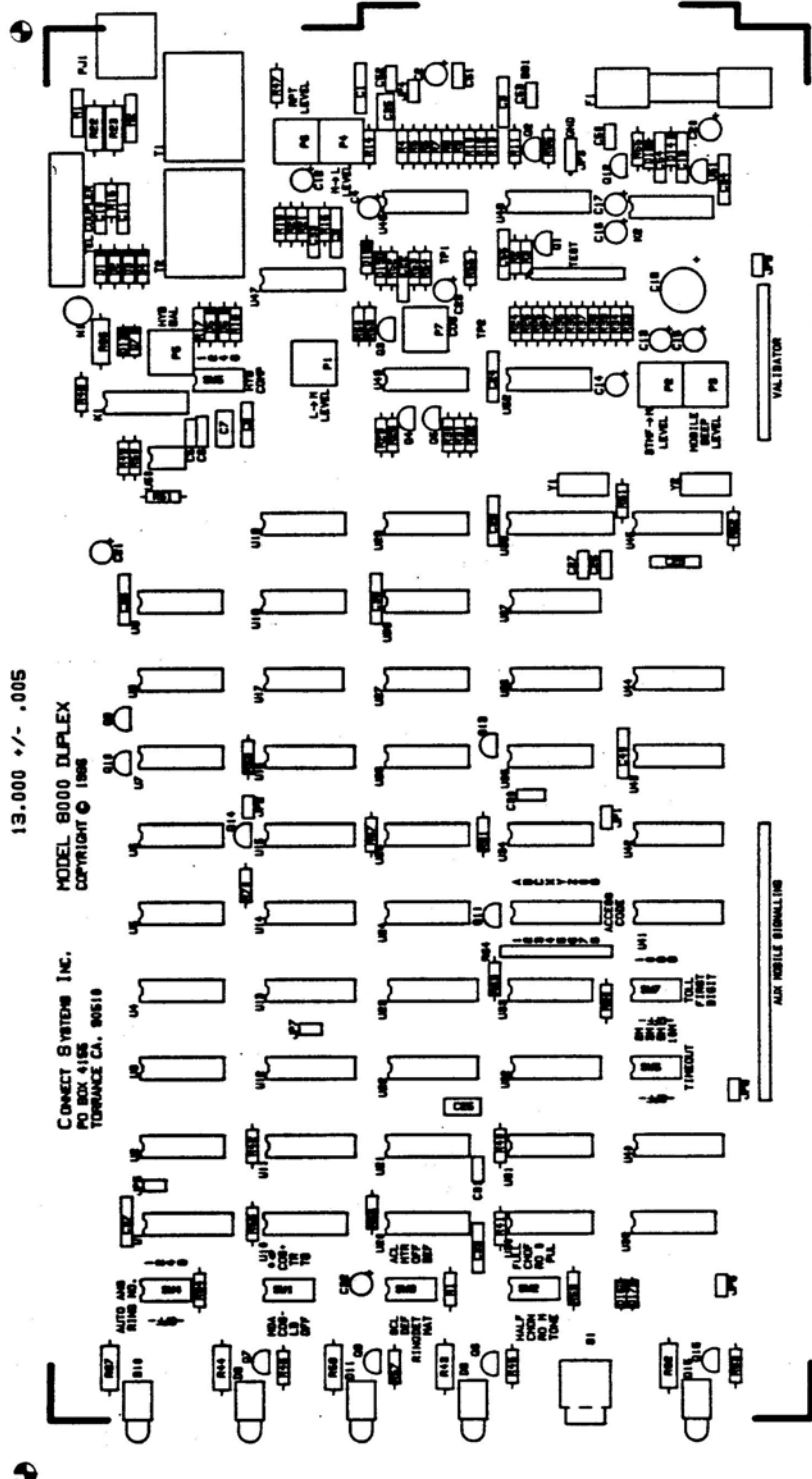
**Connect Systems Incorporated**

SIZE	CODE IDENT NO.	MODEL 8000 DUPLX
SCALE		WT CALG. RETURN
SHEET 2 OF 3		1

NOTES: UNLESS OTHERWISE SPECIFIED

4      3      2      1





13.000 +/- .005  
 MODEL 8000 DUPLEX  
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 CONNECT SYSTEMS INC.  
 PO BOX 4188  
 TORRANCE CA. 90510

SILKSCREEN

CADD1301  
 CASE MANAGEMENT INC.  
 WAHNE

PARTS LIST

Integrated Circuits

U1 4040  
 U2 4013  
 U3 4013  
 U4 4013  
 U5 4073  
 U6 4071  
 U7 4093  
 U8 4081  
 U9 4081  
 U10 4070  
 U11 4040  
 U12 4040  
 U13 4040  
 U14 4027  
 U15 4027  
 U16 4027  
 U17 4013  
 U18 4013  
 U19 4072  
 U20 4081  
 U21 4093  
 U22 4040  
 U23 4040  
 U24 4081  
 U25 4081  
 U26 4013  
 U27 4013  
 U28 4073  
 U29 4001  
 U30 4075  
 U31 4075  
 U32 4040  
 U33 4072  
 U34 4081  
 U35 4069  
 U36 4049  
 U37 4029  
 U38 202  
 U39 4071  
 U40 4017  
 U41 4028  
 U42 4028  
 U43 14408  
 U44 \*82S23N  
 U45 2579  
 U46 324  
 U47 747  
 U48 4066  
 U49 4066  
 U50 4N25  
 U51 78L05  
 U52 747

Transistors

Q1 PN2222A  
 Q2 PN2222A  
 Q3 PN2222A  
 Q4 PN2222A  
 Q5 PN2222A  
 Q6 MPSA13  
 Q7 MPSA13  
 Q8 MPSA13  
 Q9 PN2907  
 Q10 PN2907  
 Q11 MPSA13  
 Q12 MPSA13  
 Q13 PN2907  
 Q14 MPSA13  
 Q15 MPSA13

Diodes

D1 1N4004  
 D2 1N4004  
 D3 1N4004  
 D4 1N4004  
 D5 1N4148  
 D6 1N4148  
 D7 1N4148  
 D12 1N4148  
 D13 1N4148  
 D14 1N4004  
 D16 1N4148  
 D17 1N4148  
 D18 1N4004  
 D19 1N4004

Leds

D8 5300H1  
 D9 5300H5  
 D10 5300H1  
 D11 5300H5  
 D15 5300H5

Resistors

R1 10K  
 R2 33K  
 R3 10K  
 R4 100K  
 R5 22K  
 R6 5100

R7 2200  
 R8 10K  
 R9 5100  
 R10 22K  
 R11 10K  
 R12 100K  
 R13 33K  
 R14 1K  
 R15 470  
 R16 100K  
 R17 240  
 R18 1K  
 R19 22K  
 R20 22K  
 R21 5100  
 R22 51  $\frac{1}{2}$ w  
 R23 51  $\frac{1}{2}$ w  
 R24 6.2K  
 R25 22K  
 R26 33K  
 R27 10K  
 R28 10K  
 R29 33K  
 R30 10K  
 R31 33K  
 R32 33K  
 R33 1K  
 R34 33K  
 R35 6.2K  
 R36 10K  
 R37 33K  
 R38 33K  
 R39 10K  
 R40 33K  
 R41 22K  
 R42 10K  
 R43 1K  $\frac{1}{2}$ w  
 R44 1K  $\frac{1}{2}$ w  
 R45 33K  
 R46 33K  
 R47 5100  
 R48 10K  
 R49 10K  
 R50 10M  
 R51 220K  
 R52 100K  
 R53 10K 1%  
 R54 10K 1%  
 R55 10M  
 R56 10K  
 R57 33K  
 R58 1K  $\frac{1}{2}$ w

R59	33K	C28	.1 Disc
R60	10K	C29	.1 Disc
R61	1M	C30	.01 Mylar
R62	10M	C31	.001 Mylar
R63	33K	C32	33 50V
R64	100K network	C33	.1 Disc
R65	33K	C34	.1 Disc
R66	33K	C35	.033 Mylar
R67	10K	C36	.1 Disc
R68	10K	C37	.1 Disc
R69	10K	C38	.1 Disc
R70	33K	C39	.1 disc
R80	100K	C40	.1 Disc
R81	100K	C50	.001 Mylar
R82	1K $\frac{1}{2}$ w	C51	.001 Mylar
R83	33K	C52	.001 Mylar
R84	100K	C53	.001 Mylar
R85	33K	C54	.1 Disc
R86	10K $\frac{1}{2}$ w	C55	.1 Disc
R87	1K $\frac{1}{2}$ w		

Capacitors

C1	.1 Disc
C2	1 50V
C3	.1 Disc
C4	10 50V
C5	.01 Mylar
C6	.022 Mylar
C7	.05 Mylar
C8	.01 Mylar
C9	.1 Disc
C10	390 pf Disc
C11	390 pf Disc
C12	1 50V
C13	1 50V
C14	1 50V
C15	1 50V
C16	2.2 50V
C17	2.2 50V
C18	1000 25V
C19	.1 Disc
C20	33 50V
C21	2.2/50V
C22	.001 Mylar
C23	2.2 50V
C24	.1 Disc
C25	.033 Mylar
C26	.01 Mylar
C27	.01 Mylar

Varistors

M1	V150LA10
M2	V150LA10

Misc.

N1	NE2B
P1	10K
P2	500
P3	10K
P4	100K
P5	2K
P6	100K
P7	10K
Y1	3.58 MHZ XTAL
Y2	3.58 MHZ XTAL
T1	2688
T2	2688
K1	JWD-171-23
K2	JWD-107-3
FUSE	2AFB
DIP SW	CTS 206-4

\* Used only if  
option 8002 is  
installed

**TELEPHONE COUPLER**  
(Option 8004)

U.S. customers wishing to make direct connection to the public switched telephone network must use an FCC approved telephone coupler. A coupler is not required on private phone systems.

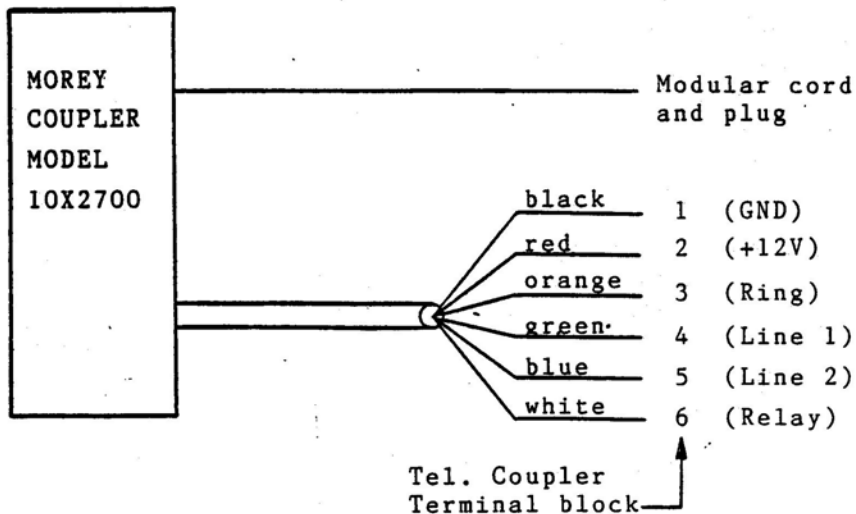
You can either use your own coupler, or we offer the Morey coupler factory installed. Please affix the enclosed compliance label to the rear of the interconnect if you purchased this option.

When requesting a line, the following information must be given the phone company:

FCC registration AB3985-62455-PC-E  
Ringer equivalence no. 0.4A,1.0B

You must notify the phone company when discontinuing use. Also, connection to coin or party lines is prohibited.

**If your interconnect contains the Morey coupler, do not plug anything into the rear panel modular phone jack. Use the phone cord which exits from the rear panel.**



MOREY/8000 INTERFACE