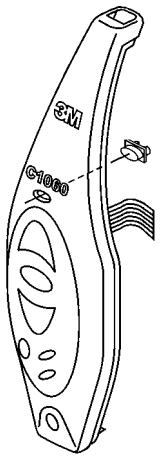
Wireless Intercom Systems

Technical Bulletin 11/23/05

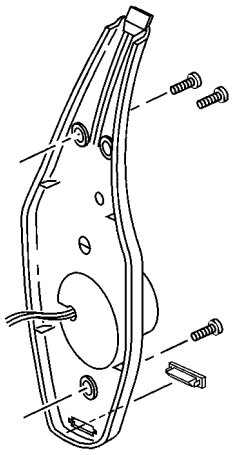
Additional C1060 Headset Parts Available

Three additional C1060 headset replacement parts are now available.
Please refer to the "Replacement Parts and Service" procedures attached to this letter for detailed information.

C1060 Outer Case Assembly
78-8117-4133-5



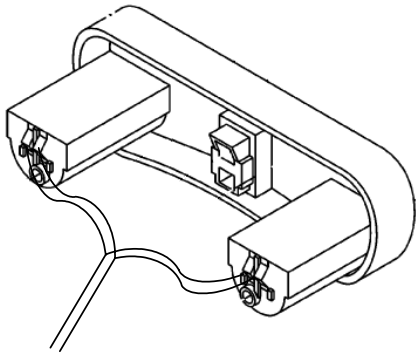
C1060 Inner Case Assembly
78-8117-4127-7



C1060 Battery Latch and Button Kit
78-6911-4910-4

C860 Beltpack Part Available

The C860 Beltpack Base, 78-6911-4653-0, will be available mid-December, 2005. It is beige color and includes battery contacts and battery wires. The base does NOT include the telephone style headset jack and cable. Please save the headset jack and cable from an existing C860 base.



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Replacement Parts List

Ordering Replacement Parts

The following pages show replacement parts for the model C1060 Headset Intercom.

Order parts by the model number, part number, part name and quantity required.

Replacement parts and their prices are available by calling:

1-800-328-0033

Replacement parts correspondence, write to:

3M Commercial Care Division
Food Service Business
3M Center
St. Paul, MN 55144-1000

Technical Service

For technical assistance, call:

1-800-328-0033

Write to:

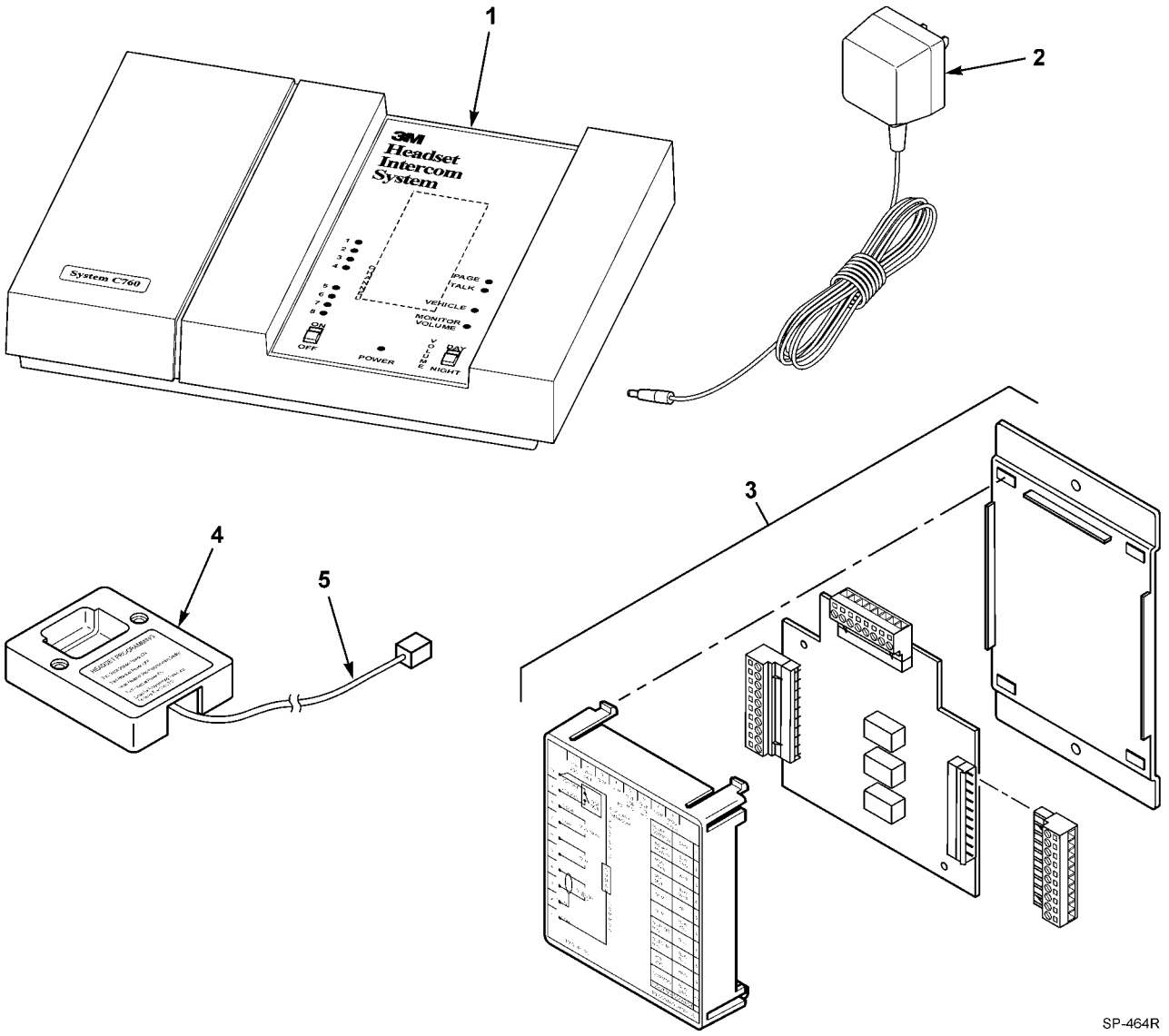
3M Commercial Care Division
Food Service Business
3M Center
St. Paul, MN 55144-1000

Or visit our website:

www.3M.com/foodservice

Replacement Parts List (continued)

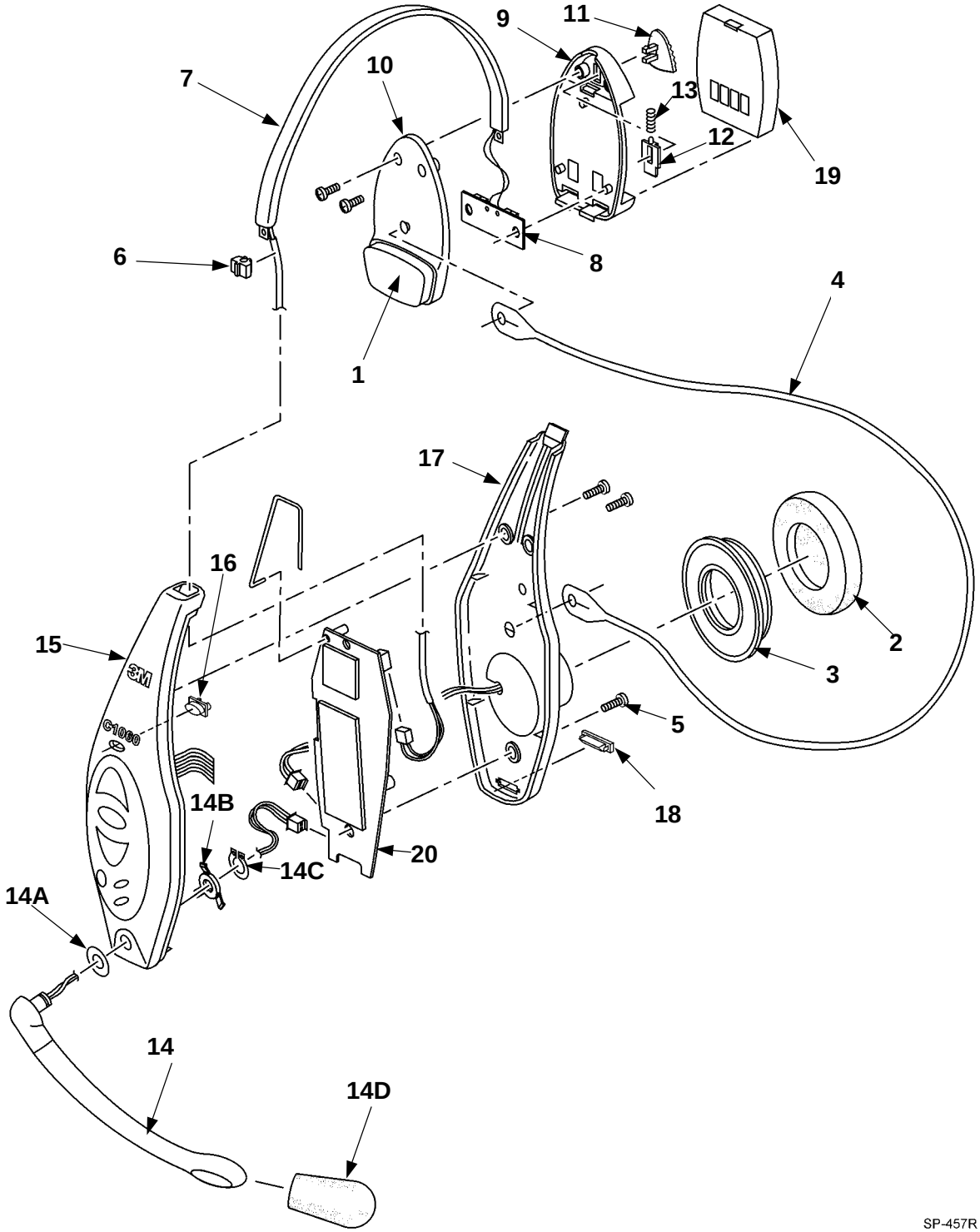
Section 1 – Base Station Assembly, Interconnect Module, and Programming Station



Item No.	Part Number	Description	Qty.
0	78-9236-6826-9	BASE STATION ASSEMBLY, Model C922 (w/o Power Supply)	1
1	78-8095-0500-7	CABINET, Base Station	1
1A	78-8095-0965-2	HINGE, Assembly, (Replacement)	1
2	78-6911-4430-3	POWER SUPPLY, 13.5 VDC, 20 VA	1
3	78-6911-3777-8	INTERCONNECT MODULE	1
4	78-6911-4722-3	PROGRAMMING STATION	1
5	N/A separately	CORD, connecting Base Station to Programming Station	1

Replacement Parts List (continued)

Section 2 – Headset Assembly



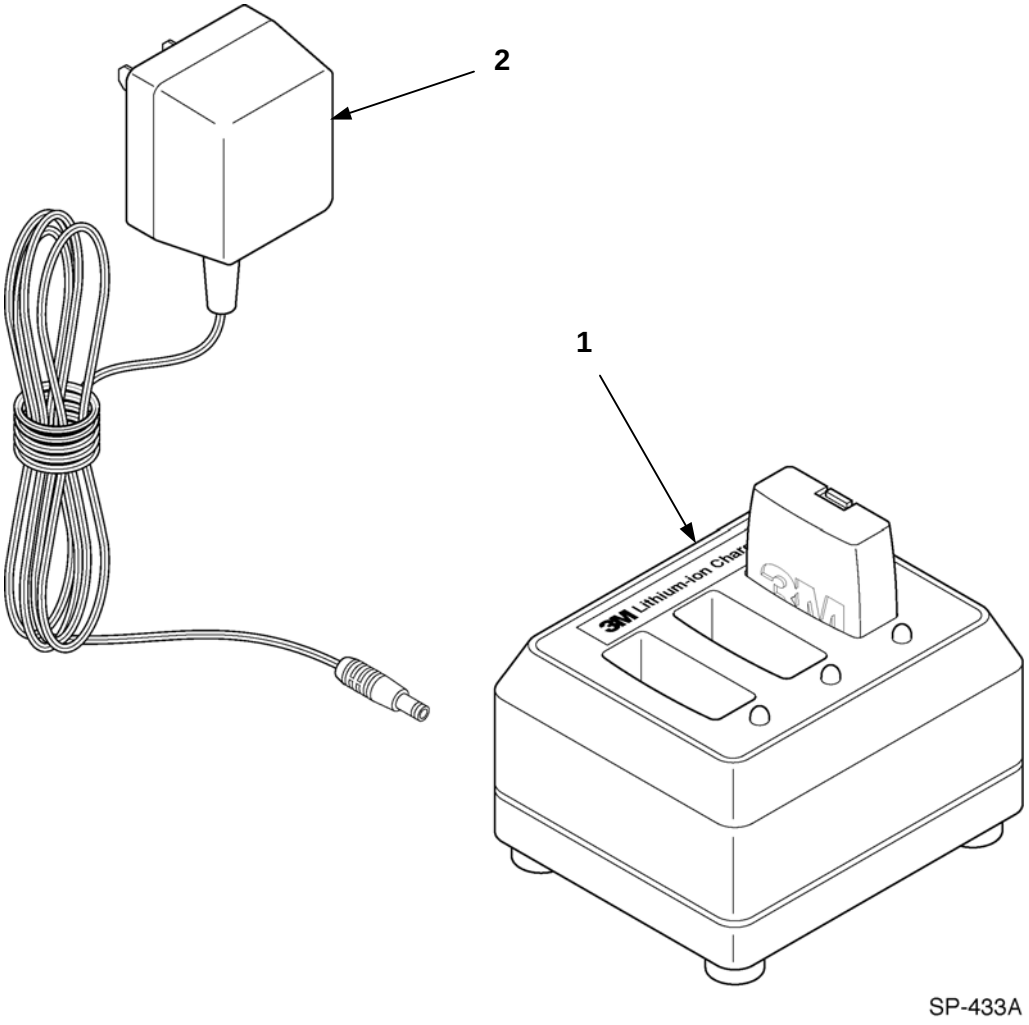
Item No.	Part Number	Description	Qty.
0	78-6911-4723-1	Headset Model C1060	1
1	78-6911-4727-2	Headband Pad, for Model C1060 (pkg of 10)	1
2	78-6911-4728-0	Ear Pad, for Model C1060 (pkg of 10)	1
3	78-6911-4729-8	Ear Cup, for Model C1060 (pkg of 5)	1
4	78-8117-4110-3	Safety Strap	1
5	N/A separately	Screw, 2-56 X .4375 Pan Hd. Phillips, Stainless, Black	5
6	78-8117-4088-1	Clip, Headband Slide (min. order qty. 20)	1
7	78-8117-4123-6	Headband Assembly (includes Clip, Headband Slide)	1
8 *	N/A separately	PWA, Battery Holder	1
9 *	N/A separately	Base, Battery Holder	1
10*	N/A separately	Cover, Battery Holder	1
11*/ **	N/A separately	Button, Battery Latch	1
12*/ **	N/A separately	Latch, Battery	1
13*/ **	N/A separately	Spring, Battery Latch	1
14	N/A	Mic, Boom	1
14A	N/A	Washer, Nylon, Mic Boom	1
14B	N/A	Washer, Spring, Mic Boom	1
14C	N/A	Retaining Ring, Mic Boom	1
14D	78-6911-4745-4	Windscreen Mic (pkg of 10)	1
15	78-8117-4133-5	Outer Case Assembly (contains LED Lens, Bezel, Switches)	1
16	N/A separately	Lens, LED (contained in Outer Case Ass'y (item 15))	1
17	78-8117-4127-7	Inner Case Assembly (contains IR Lens, Speaker, 3 Screws)	1
18	N/A separately	Lens, IR (contained in Inner Case Ass'y (item 17))	1
19	78-6911-4721-5	Battery Model C1060	1
20	N/A	PWA, Main, Model C1060	1

* These parts are contained in Battery Terminal Kit, 78-6911-4160-8 including two Screws (item 5) and one Headband Pad (item 1)

**These parts are contained in Battery Latch and Button Kit, 78-6911-4910-4

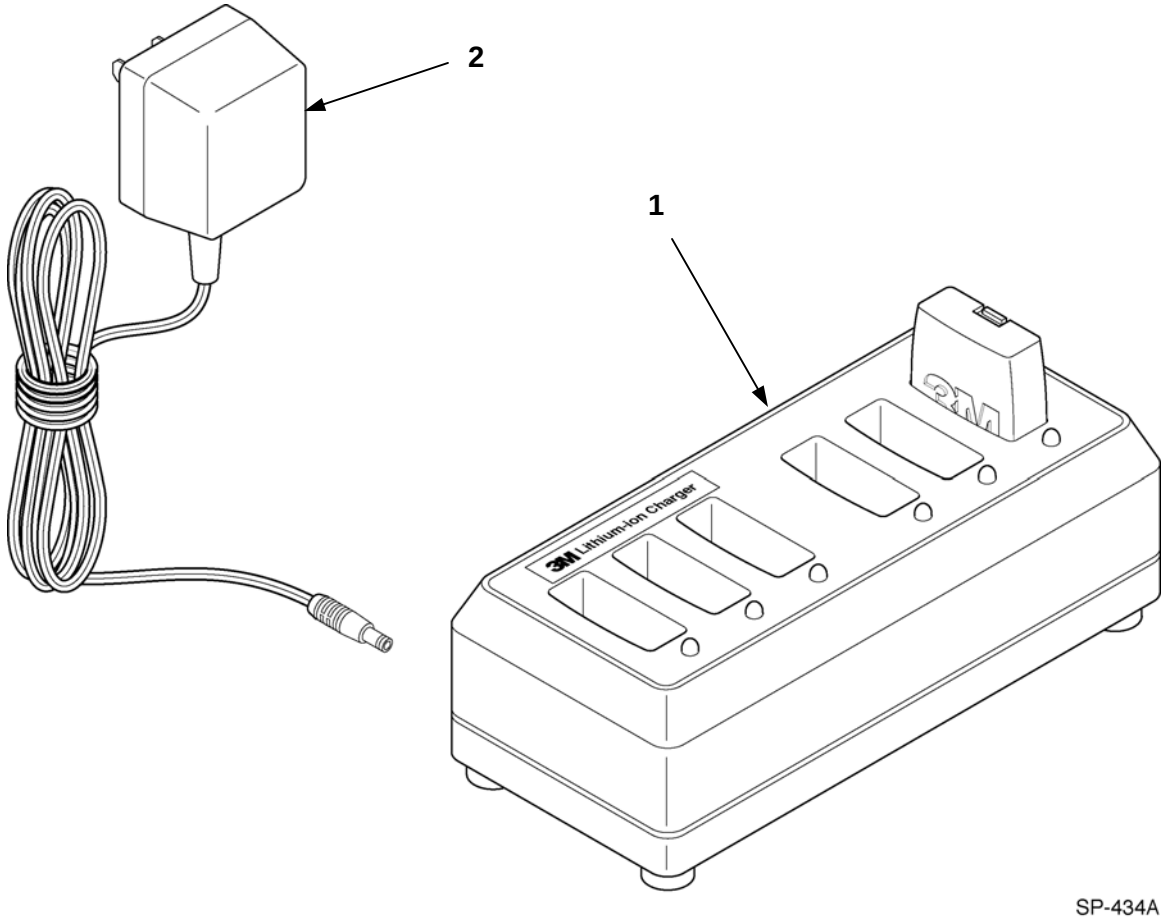
Replacement Parts List (continued)

Section 3 – 3-Slot Battery Charger Assembly



Item No.	Part Number	Description	Qty.
1	78-6911-4724-9	BATTERY CHARGER, 3-Slot,.for Model C1060	1
2	78-8028-9283-2	POWER SUPPLY, 14 VAC (battery charger)	1

Section 4 – 6-Slot Battery Charger Assembly



Item No.	Part Number	Description	Qty.
1	78-6911-4725-6	BATTERY CHARGER, 6-Slot, for Model C1060	1
2	78-8028-9283-2	POWER SUPPLY, 14 VAC, (Battery Charger)	1

Service Procedures

Replacing the Ear Cup, the Ear Pad, or the Headband Pad

Tools Required:

None

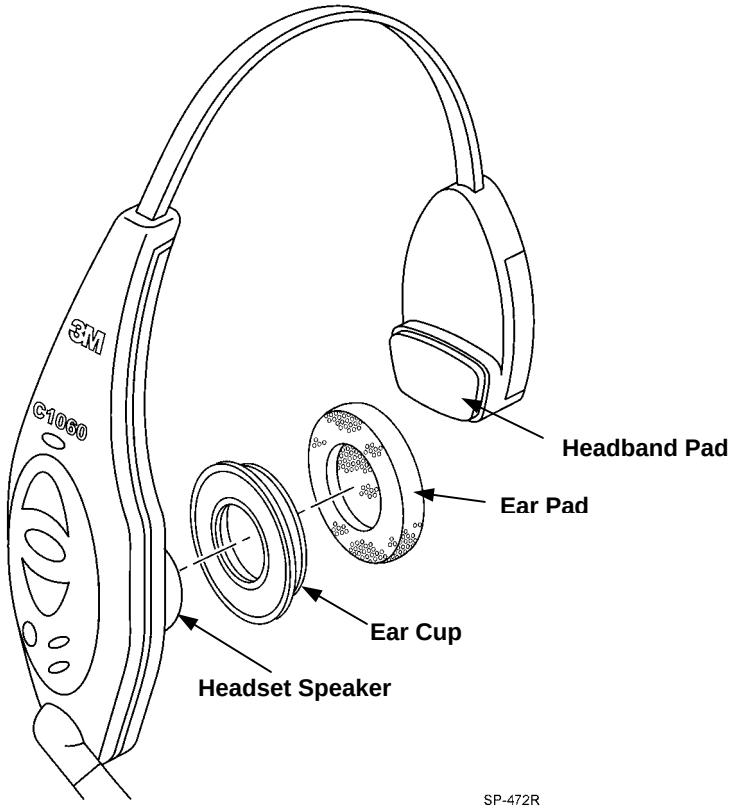
Procedures:

Ear Cup and Ear Pad Replacement:

1. Twist and pull the Ear Cup and Ear Pad together free of the speaker on the Inner Case.
2. Separate the Ear Pad from the Ear Cup. Replace Ear Pad and/or Ear Cup with a new one and reassemble.
3. Twist and press into place over speaker.

Headband Pad Replacement:

1. Peel the Headband Pad away from the Battery Holder Cover. Clean off any adhesive residue.
2. Remove the protective backing from a new Headband Pad, align and press into place.



Service Procedures (continued)

Replacing Inner Case Assembly or Outer Case Assembly

Tools Required:

1 - Small size Phillips Screwdriver

1 – External retaining ring pliers

Procedure:

> ⚠ **IMPORTANT**
>
> Always be careful to avoid pinching wires between case halves when reassembling the case. Damaged wiring may cause the headset to fail during use.

> ⚠ **CAUTION**
>
> It is important to disconnect the speaker from the Main PWA as soon as the Inner and Outer Cases are separated to avoid stress on the wires inside the sealed enclosure. Replace the entire Inner Case Assembly if the wires are broken at the speaker. **Do not attempt to replace the speaker separately!**

Disassembly procedure

1. Make sure power is off and remove the battery.
2. Remove the Ear Pad and Ear Cup.
3. Remove three screws from the Inner Case.
4. Separate the case halves by pulling the Inner Case down, then apart at the bottom. Carefully raise the Inner Case just over the On-Off Button and slide down slightly to separate. Support the Inner Case so the speaker cable is not strained.
5. Disconnect the speaker cable from the Main PWA. Take care to avoid hitting the capacitor, located near the speaker connector, this may damage the capacitor.
6. Set the Inner Case aside.

Removing Outer Case:

1. Disconnect the power connector located at the top of the Main PWA.
2. Carefully pull the power wires out of the top groove of the Headband Clip as shown in illustration on page 11.
3. Remove the Headband Clip from the Headband end by rotating it 90 degrees and pulling it free of the headband.
4. Pull the Headband Assembly and cable out of the Outer Case.
5. Disconnect the switch bezel ribbon cable by first releasing the two locking tabs on the sides of the ribbon connector. To release, move both tabs toward the edge ot the PWA with your finger tips.
6. Disconnect Mic Boom cable from the Main PWA.
7. Remove Main PWA and antenna.
8. Remove Mic Boom assembly as described in the next section.

Service Procedures (continued)

Mic Boom Assembly:

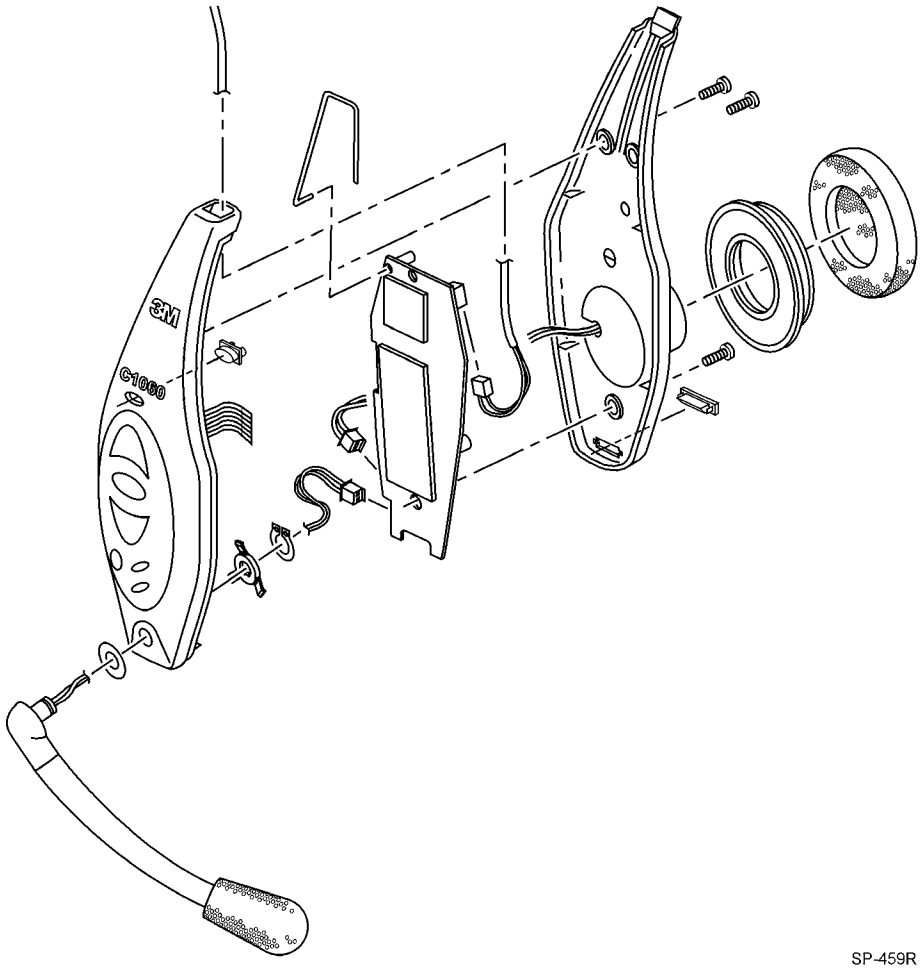
1. Locate and remove the retaining ring using the retaining ring pliers.

> ⚠ Caution
>
> Make sure you set the retaining ring tool adjustment screw to limit how far the retaining ring is expanded. Unless this is done, the retaining ring will stretch out of shape to a point where it will not stay in its groove.

2. Remove the Spring Washer, Nylon Washer, and Mic Boom.

3. Reinstall the Mic Boom by performing steps 1 – 3 in reverse order.

> ⚠ Caution
>
> Care must be taken when reinstalling Mic Boom Retaining Ring to not roll the edge of the shaft into the ring retention slot.

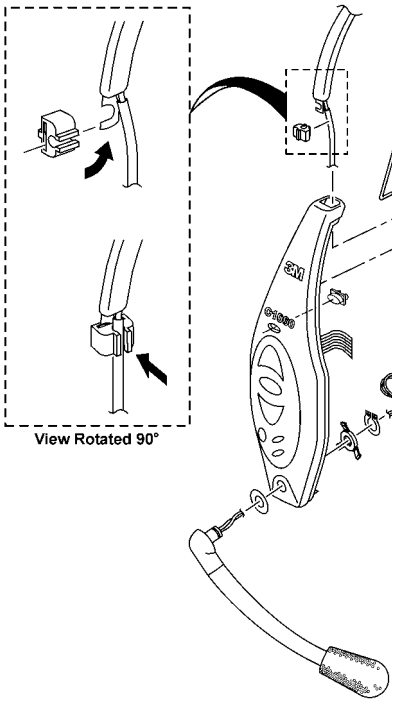


SP-459R

Service Procedures (continued)

Reassembly procedure

1. Replace Mic Boom assembly as described. (see previous section Mic Boom Assembly:)
2. Install Main PWA and antenna in Outer Case.
3. Connect Mic Boom cable to bottom connector on PWA.
4. Connect switch bezel ribbon cable by first making sure the two locking tabs on the sides of the ribbon connector are released (positioned toward the edge of the PWA). Take care to insert the ribbon cable into the center of the connector, not underneath the connector. Make sure the ribbon cable is inserted straight on, not skewed. To lock, move both tabs toward the connector with your finger tips.
5. Insert power cable and Headband through the top of Outer Case with Headband curve arching away from the front of the Outer Case.
6. Grasp Headband Clip with open wire groove up and side slot facing Headband. Insert on Headband and rotate 90 degrees in place.
7. Carefully press the power wires, one on top of the other, into the open wire groove of the Headband Clip. Be sure to press the wires completely down into the wire groove.
8. Plug in the power cable connector located at the top of the PWA. Route the power cable between the On-Off Button and the large capacitor on the PWA. The power cable MUST route down the center of the PWA or the Headband will not extend properly.
9. Plug the speaker cable into the top connector of the two connectors located near the bottom of the Main PWA.
10. Align Headband Clip into Outer Case tracks.
11. Assemble the case halves by inserting the tab at the top of the Inner Case through the slot at the top of the Outer Case and carefully lower the Inner Case over the On-Off Button and snap it shut at the bottom. Care must be taken not to pinch any wires.
12. Reinstall the battery, power up and checkout operation of the headset, including Headband slide.
13. Replace three case screws, Ear Cup and Ear Pad on Inner Case.



Service Procedures (continued)

Replacing the Headband Assembly

Tools Required:

1 - Small size Phillips Screwdriver

1 – Soldering iron

Procedure:

1. Make sure power is off and remove the battery.

2. Remove the Ear Pad and Ear Cup.

3. Remove three screws from the Inner Case.

4. Separate the case halves by pulling the Inner Case down, then apart at the bottom. Carefully raise the Inner Case just over the On-Off Button and slide down slightly to separate. Support the Inner Case so the speaker cable is not strained.

5. Disconnect the power connector located at the top of the Main PWA.

6. Carefully pull the power wires out of the top groove of the Headband Clip as shown in illustration.

7. Remove the Headband Clip from the Headband end by rotating it 90 degrees and pulling it free of the headband.

8. Pull the Headband Assembly and cable out of the Outer Case.

9. Refer to Instructions for "Replacing Battery Holder Parts".

10. Reassemble by inserting power cable and Headband through the top of Outer Case with Headband curve arching away from the front of the Outer Case.

11. Grasp Headband Clip with open wire groove up and side slot facing Headband. Insert on Headband and rotate 90 degrees in place.

12. Carefully press the power wires, one on top of the other, into the open wire groove of the Headband Clip. Be sure to press the wires completely down into the wire groove.

13. Plug the power cable into the connector located at the top of the PWA. Route the power cable between the On-Off Button and the large capacitor on the PWA. The power cable MUST route down the center of the PWA or the Headband will not extend properly.

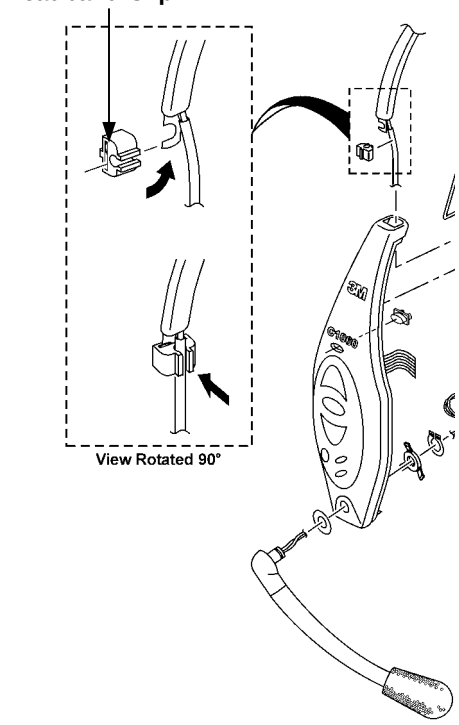
14. Plug the speaker cable into the top connector of the two connectors located near the bottom of the Main PWA.

15. Assemble the case halves by inserting the tab at the top of the Inner Case through the slot at the top of the Outer Case and carefully lower the Inner Case over the On-Off Button and snap it shut at the bottom. Care must be taken not to pinch any wires.

16. Reinstall the battery, power up, and checkout operation of the headset, including Headband slide.

17. Replace three case screws, Ear Cup and Ear Pad on Inner Case.

Headband Clip



Service Procedures (continued)

Replacing Battery Holder Parts

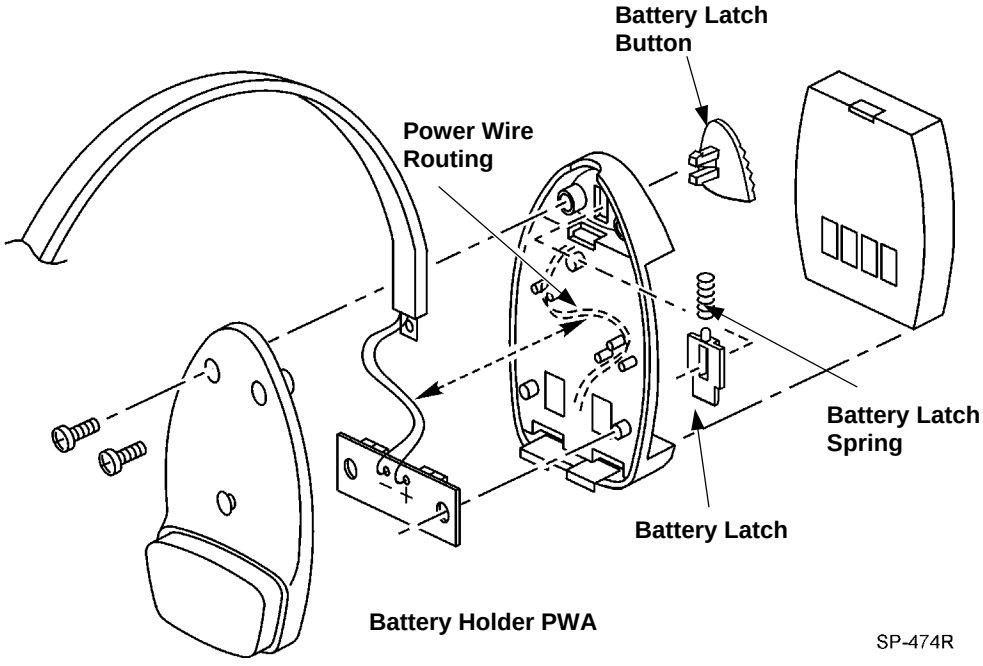
Tools Required:

1 – Number 0 Phillips Screwdriver

1 – Soldering iron.

Procedures:

1. Make sure power is off and remove Battery.
2. Remove two screws and Cover. (If replacing old style Battery Contacts, discard all Battery Holder parts, they are not compatible with newer Battery Holder parts.)
3. Unsolder the two Battery Holder PWA wires.
4. Insert the Headband wires through the holes from the back side of the replacement Battery Holder PWA. Solder the **RED** wire to the **+** connection point and the **BLACK** wire to the **–** connection point.
5. Press the Battery Latch Spring onto the top peg of the Battery Latch. Insert the Latch with Spring down through the top of the Base as shown. The beveled bottom edge of the Latch MUST face the battery.
6. Press the top of the Spring into the small molded ribs located inside the top of the Base.
7. Insert the Battery Latch Button through the front of BOTH the Base and Latch. Squeeze the parts until they snap securely together.
8. Press the Battery Holder PWA onto the pegs of the Base noting that one hole is larger than the other.
9. Place the hole in the Headband over the retaining peg in the Cover. Route the power wires between the two posts near the top and the three posts near the bottom as shown. Be careful to avoid pinching wires while replacing Cover and two screws.
10. Install new Headband Pad on Battery Holder Cover.



Service Procedures (continued)

Checking out Headset Operation

Tools Required:

Functioning Wireless Intercom System with at least one additional model C1060 Headset.

Procedure:

NOTE

Check headset operation before replacing the case screws. It is a good idea to simply snap the case together without the screws until the headset is completely checked out.

1. Make sure a fully charged battery is installed in the headset being tested.
2. Turn on the headset and cycle through all of the operating modes described in *Headset Intercom System Model C1060 Operating Instructions*. These Operating instructions are available by ordering 3M Stock Number 70-0710-3648-0
3. Replace three case screws, ear cup and pad.

Intercom Systems

Accessories

Technical Bulletin 9/15/2005

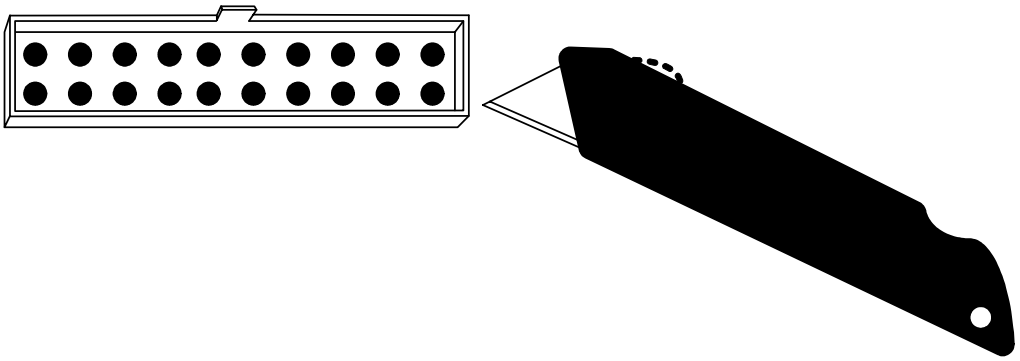
A125 Noise Reduction Module, Internal, 78-9236-6453-2

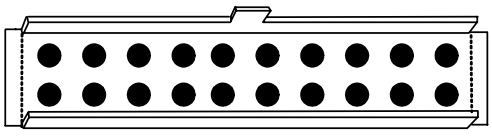
Important installation notice

Starting with serial number 125002477, the **A125 Noise Reduction Module, Internal** has a wider ribbon cable plug. A limited number of these Noise Reduction Modules have two individual ribbon cable plugs. The wider ribbon cable plug(s) are too wide to fit into the blue 20-pin base station receptacle. The receptacle on the wireless base station board must be trimmed and and the ends opened. Use a sharp razor knife and make four vertical cuts. Fold the ends of the blue recepticle down as shown below.
Caution **-** Be careful to not cut any components or circuit traces on the base station circuit board.
Caution **-** Be careful to pull only on the ribbon connector plug. Pulling on the ribbon cable itself may cause it to separate from the plug.

Instructions for trimming and opening the base station receptacle:

1. Make a vertical cut at each corner of the blue 20 pin receptacle on the base station circuit board.
2. Fold the short end sides down as shown
3. Carefully insert the ribbon cable plug(s) into the blue receptacle. The locking tab will not engage and should not be a problem.





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3M Wireless Intercom Systems

Technical Bulletin July 18, 2005

Speech Intelligibility and Sound Quality

Competitive Comparison

3M Commercial Care Division contracted with Orfield Laboratories, Inc.[1], a sound testing company, to independently compare the audio of the 3M™ Wireless Intercom, C1060 analog intercom system to a competitive digital intercom system. Testing focused on inbound intercom intelligibility performance, specifically in the presence of a uniform background noise field at the menu post.

For the tests, Speech Transmission Index (STI) was calculated in accordance with International Electrotechnical Commission (IEC) 60268-16; Objective rating of speech intelligibility by speech transmission index. System frequency response was also measured.

For speech intelligibility testing, a broadband noise signal (pink noise) was used at the menu order post to provide various background noise conditions. This noise was used to simulate typical environmental sound levels found in real intercom installations. For all tests, system inbound and outbound levels were calibrated to provide identical levels (dBA). Background noise levels were also calibrated and monitored.

The relationship between reported STI scores and "subjective evaluation" can be described as shown in Table 1.

STI	"Subjective Evaluation"
0.0 – 0.3	Bad
0.31 – 0.45	Poor
0.46 – 0.60	Fair
0.61 – 0.75	Good
0.76 – 1.00	Excellent

Table 1: STI Score vs. "Subjective Evaluation"

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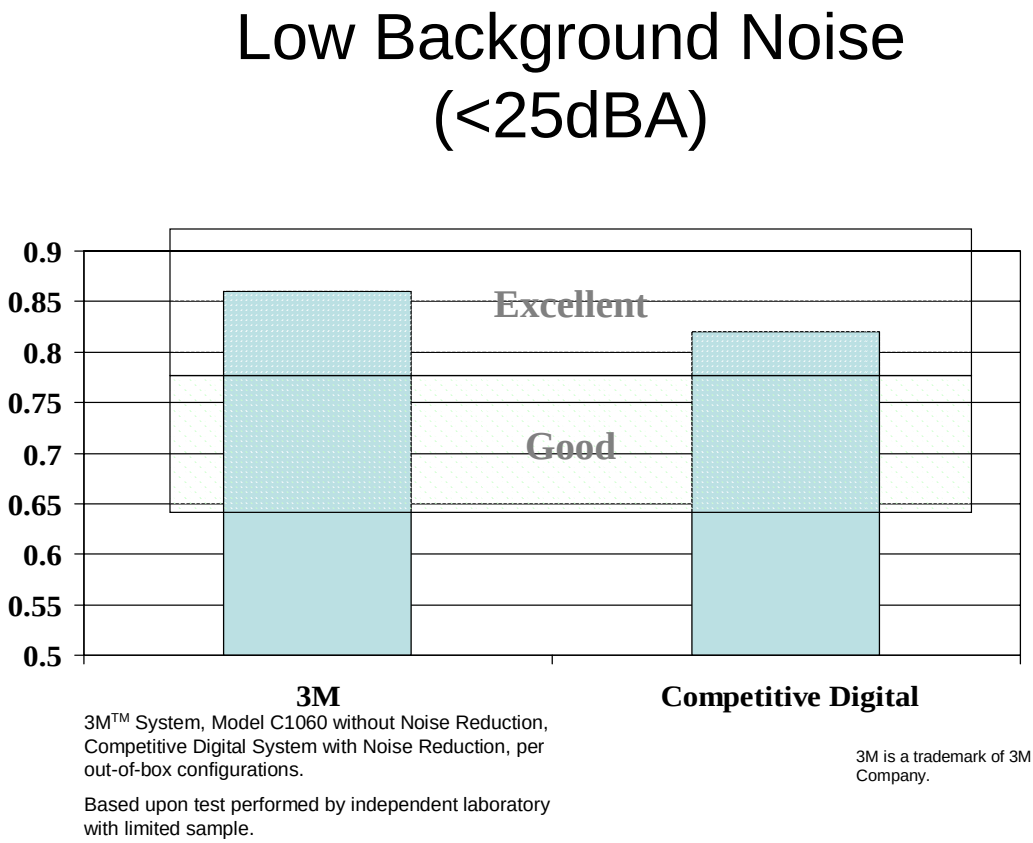
TEST RESULTS

Table 2 summarizes the results of the intelligibility testing. Sample results are also shown in the bar graphs, below.

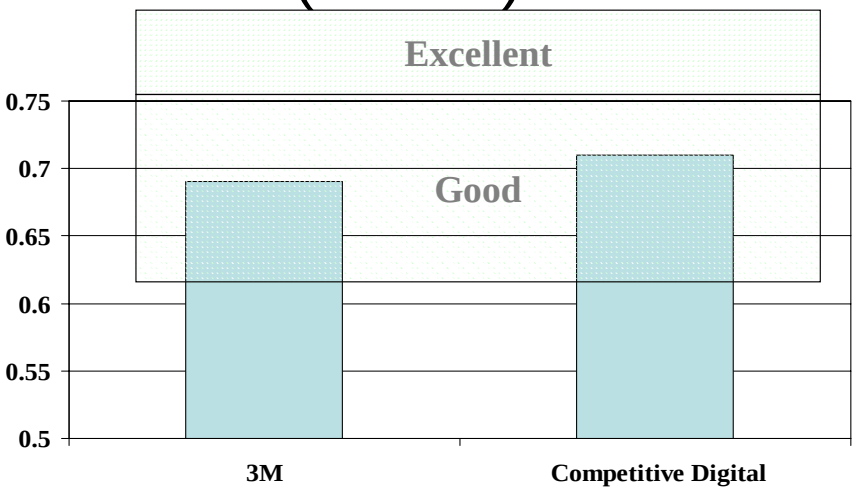
System	Noise Reduction Setting	Low Noise <25dBA	Medium Noise (70dBA)	High Noise (80dBA)
3M™ C1060 (Analog)	Off	0.86	0.55	0.26
Competitive Digital	Off	0.84	0.58	0.28
3M™ C1060 (Analog)	On (-6dB)	0.76	0.69	0.49
Competitive Digital	On (-6dB)	0.82	0.71	0.46

Table 2: Speech Intelligibility Index (STI) Test Results, Inbound

The relationship between reported STI scores and "subjective evaluation" can be described as shown in Table 1.



Medium Background Noise (70dBA)



3M™ System, Model C1060 with Noise Reduction, Competitive Digital System with Noise Reduction.

Based upon test performed by independent laboratory with limited sample.

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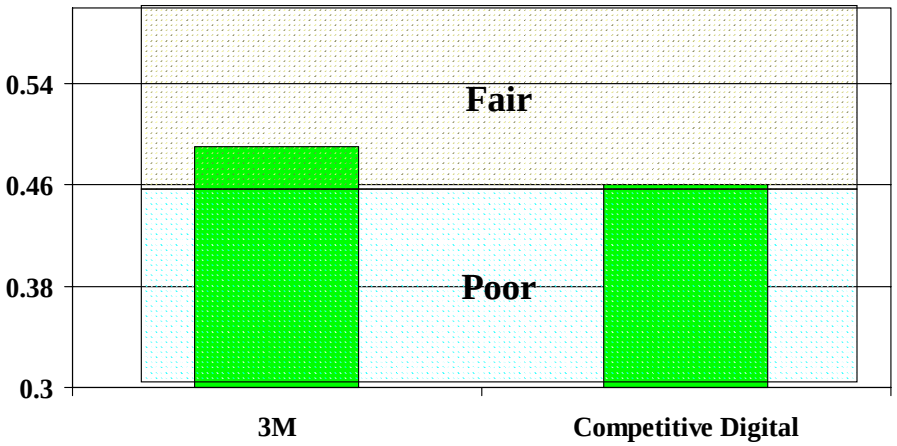
High Background Noise (80dBA)



3M™ System, Model C1060 with Noise Reduction, Competitive Digital System with Noise Reduction.

Based upon test performed by independent laboratory with limited sample.

3M is a trademark of 3M Company.

SOUND/LISTENING SURVEY

Objective measurements do not necessarily reflect perceived intercom sound quality; therefore, 3M conducted an initial survey of QSR employees familiar with using intercom equipment, rating their sound preference of the 3M™ Wireless Intercom System, C1060 as compared against the competitive digital intercom system. The audio recordings prepared by Orfield Laboratories, Inc. were used for this survey; the 3M™ Wireless Intercom System, C1060 did not include noise reduction; the competitive digital intercom system did include noise reduction. Results showed that 91% of the QSR employees surveyed preferred the 3M™ Wireless Intercom System, Model C1060 over the competitive digital intercom system.

SYSTEMS TESTED

Two manufacturers' systems were tested:

	Model	Base Station Serial #
3M	3M C1060 Wireless C922AA	0922005932
Competitive Digital	Wireless IQ 6000	07F00339

Table 3: Models Tested

Conditions:

- Manufacturers' new, standard, out-of-box intercom systems
- Systems installed per manufacturers' recommendations
- Demonstration recordings used in the survey above were fully calibrated and created under identical conditions by Orfield Laboratories, Inc.[1], an independent sound testing company.

CONCLUSIONS

In terms of speech intelligibility scores in the presence of background noise and similar noise reduction settings, 3M's system performed similarly (i.e. neither significantly better or worse) to the competitive digital intercom tested. All units had excellent intelligibility when tested in the absence of noise. The sound/listening survey results concluded that 91% preferred the 3M™ Wireless Intercom System, Model C1060..

[1] Orfield Laboratories, located in Minneapolis, MN, is a multi-disciplinary laboratory serving North American and international clients. They provide services in acoustics vibration, vision, lighting, architecture and market research. Orfield is unrivaled in the extensive use of objective and subjective methods, offering design, research and testing services and solutions for corporate and architectural clients since 1971. The firms' projects and research have been broadcast on television and featured in the Wall Street Journal, Architecture, Sound & Communications, Sound & Vibration, Lighting Design + Application, Contract and Appliance Manufacture Magazine.

Wireless Intercom Systems

Technical Bulletin June/23/2005

Short RF Range Issue on C1060 Wireless Base Stations Potential serial numbers: 0922005319 through 0922006920

We have identified a potential RF range issue with base stations in the serial range mentioned above. The distance from the base station to a headset before the signal breaks up or encounters static may be less than normal. If you have any of these units in your inventory/stock, please return them to 3M for upgrade or replacement. Please use the 3M CCD Repair Center Repair/Return Form and indicate "Short Range per Tech Bulletin" as Problem/Symptom. If you encounter problems in the field with short RF range symptoms, please contact Dave Heffelbower, 3M Technical Service @ 1-800-328-0033. Dave will work with you in resolving the problem.

Outside Order Taking using 3M Cross-Lane Module (78-6911-4396-6)

During periods when an order taker is standing outside for sunny day or speed team type of order taking, the menu speaker, menu microphone and menu loop detector may be disabled. This allows vehicles to pass by the menu post and vehicle detector loop without alerting the drive-thru intercom operators. Disabling the menu post components can be accomplished by using the Cross-Lane Module as a switch to cut off the order menu post components.

Mount the Cross-Lane Module to a wall near the base station. Connect the menu speaker, microphone and loop detector through the Cross-Lane Module as shown in the figure on the following page. When the Cross-Lane Switch is in the down position, the menu speaker, microphone and loop detector will be disabled.

Note: This assumes that an external loop detector is used. If using a 3M internal loop detector, call 3M Tech Service (800)328-0033 for additional instructions, or convert to an external detector.

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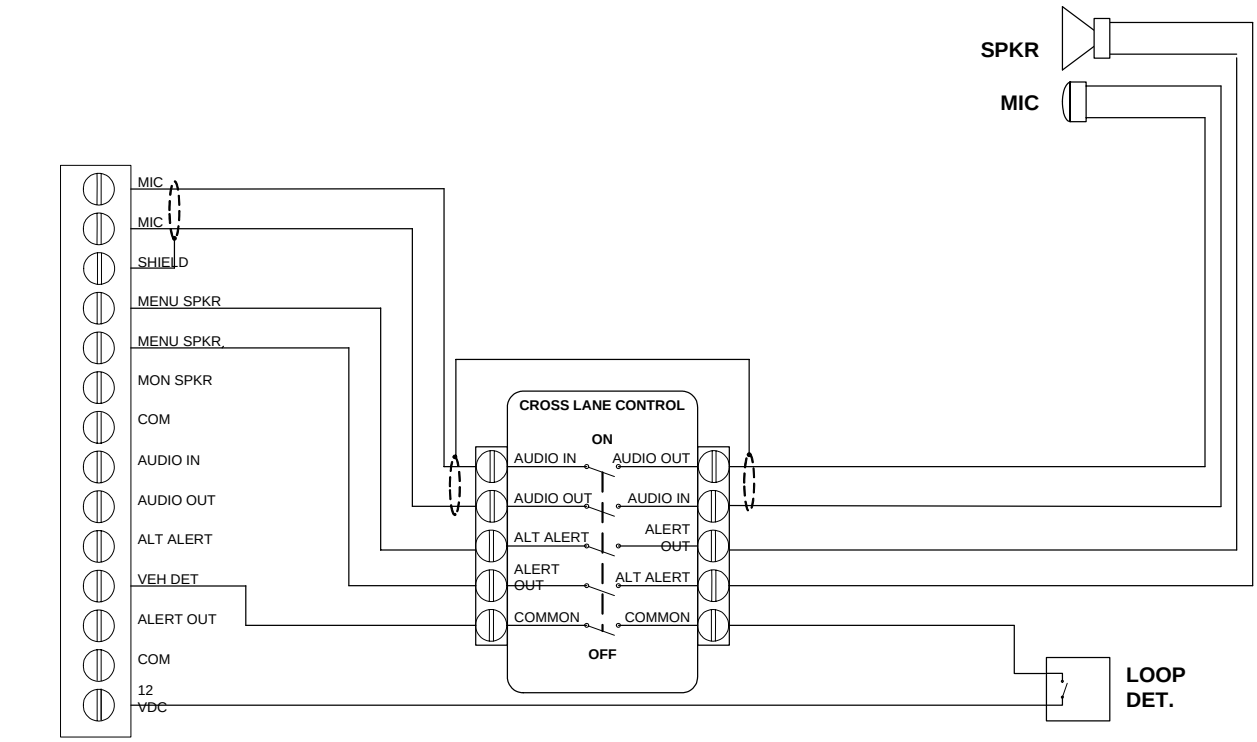


Outside Order Taking using 3M Cross-Lane Module to Disable Menu Post Components

Wireless Intercom Systems

Technical Bulletin 4/1/04

Expanded Technical Service Availability

To better respond to 3M Dealers' in-depth technical questions, the 3M Communications Technicians have **expanded their dealer phone coverage** to 7 days a week from 7:00 a.m. to 7:00 p.m. (Central Time).

NOTE: end user/customer basic troubleshooting calls will continue to be answered 7 days a week/24 hours per day.

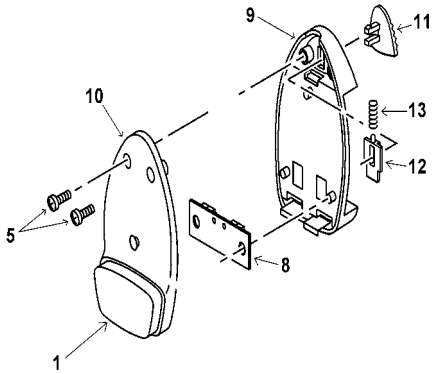
Call (800)-328-0033. Dealers select option 1, 2. End users select option 2, 2.

Reminder - In addition to Technical Service telephone support, faxed copies of our Installation Instructions, Selling Sheets, Spec Sheets, Operating Guides and Trouble-Shooting Guides are available by calling our Fax-on-Demand @ 1-800-240-4799. You may find these documents on the 3M FST web site: www.3M.com/foodservice, click on "Customer & Technical support".

C1060 Headset – New Parts Available

C1060 Headband Assembly, Part # 78-8117-4123-6 (includes Headband and Clip) $13.47 dealer cost
C1060 Clip, Headband Slide, Part # 78-8117-4088-1 (Clip only) MOQ=5, $1.86 dealer cost
(See Service Procedures, attached)

C1060 Battery Terminal Kit, Part Number 78-6911-4882-5 (includes parts below) $16.20 dealer cost
(Previously announced in Technical Service Bulletin 10/14/2003)



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Service Procedures – 3M C1060 Headset

Replacing the Headband Assembly

C1060 Headband Assembly - Part Number 78-8117-4123-6 (includes Headband and Clip)
C1060 Clip, Headband Slide - Part Number 78-8117-4088-1 (Clip available separately)

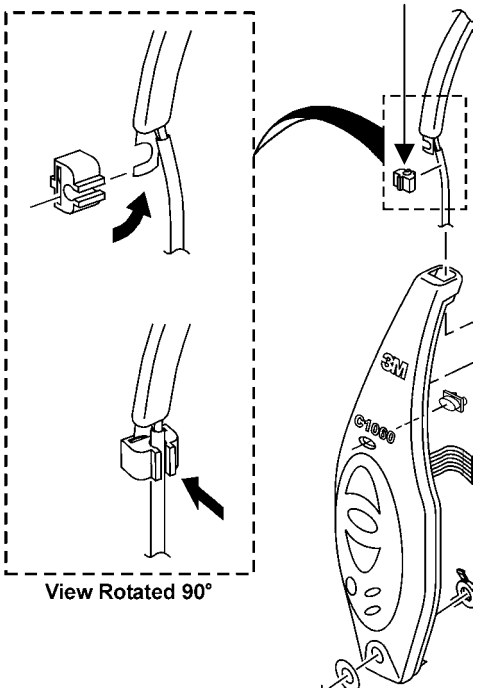
Tools Required:

1 - Small size Phillips Screwdriver

1 – Soldering iron

Procedure:

1. Make sure power is off and remove the battery.
2. Remove the ear pad and cup.
3. Remove three screws from the inner case of the headset.
4. Separate the case halves by pulling down on the inner case and apart at the bottom. Carefully raise the inner case just over the On-Off button and slide down slightly to separate. Support the inner case so the speaker wires are not strained.
5. Disconnect the power cable connector located at the top of the main circuit board.
6. Carefully pull the power cable out of the top groove of the Headband Clip as shown in illustration.
7. Remove the headband clip from the headband end by rotating it 90 degrees and pulling it free of the headband.
8. Pull the headband assembly (including the power cable) out of the outer case.
9. Refer to Instructions for Replacing Battery Latch and Battery Holder PWA.
10. Insert the power cable from the replacement Headband through the top of the outer case. Hold replacement Headband Clip with the open wire groove facing up. Hold the Clip so the curved portion inside the slot of the Clip faces next to the curved section of the Headband end. Rotate the Clip 90 degrees as you slide it into the curved section of the Headband end as shown in illustration.
11. Carefully press the power wires, one on top of the other, into the top wire groove of the Clip. Be sure to press the wires completely down into the wire groove.
12. Plug in the power cable connector. Route the power cable between the On-Off button and the large capacitor on the PWA. The power cable MUST route down the center of the PWA or the Headband will not extend properly.
13. Assemble the case halves by inserting the tab at the top of the inner case through the slot at the top of the outer case and carefully lower it over the On-Off button and snap it shut at the bottom. Care must be taken not to pinch any wires.
14. Replace three case screws, ear cup and pad.



3M Wireless Intercom Systems

Technical Bulletin 10/14/03

New Wireless Base Station

We have introduced a new 3M™ Wireless Base Station, Model C922AA, stock number 78-9236-6826-9, beginning with serial number 0922001001, produced after approximately late-September 2003. This replaces the 3M™ Base Station, Model C921BA, stock number 78-9236-6491-2, and will be shipped with all future wireless intercom system orders. The new 3M™ Wireless Base Station, Model C922AA has the following improvements:

- A redesigned antenna and receiver circuitry. This allows base stations to be mounted as close as two feet apart without cross-channel interference. This will simplify Dual-Lane and Cross-Lane installations.

- A new "SWT THLD" jumper J10. This jumper is functional only with jumper J5 set to Full-Duplex mode. It is designed to stabilize inbound audio volume from the menu microphone only when using a C1060 headset while operating in Talk Lock mode. This issue generally does not occur if operating without Talk Lock. It is labeled "HIGH - NRML".
  HIGH – Set this jumper to HIGH when using a C1060 headset, and ONLY if you experience reduced volume from the menu microphone during use with Talk Lock. With the left 2 pins jumpered, the menu microphone dynamic gain circuit will operate at a higher threshold, which is compatible with the C1060 headset.
  NRML – Set this jumper to NRML for headsets other than the C1060. With the right 2 pins jumpered, the menu microphone dynamic gain circuit will operate at the normal threshold, which is compatible with C960, C960SL, C860, C1025 headsets.

3M Wireless Base Stations beginning with serial number 0921012545, produced after approximately November 2002 have a redesigned "TALK MON LVL" jumper J9. This jumper was previously labeled "REDUCE - NONE". It is now labeled "REDUCE - FULL".

REDUCE - With the left 2 pins jumpered, the monitor speaker volume will be reduced 16 dB when the Talk button is pressed.

Note - This includes the time Talk-Lock operation is activated.

FULL - With the right 2 pins jumpered, the monitor speaker volume will not be affected.

Note - This setting may cause feedback if the headset is operated near the monitor speaker.

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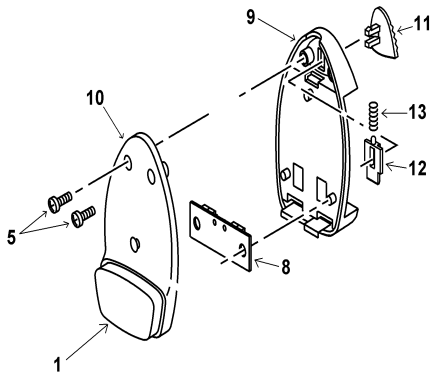
C1060 Headset Parts Available

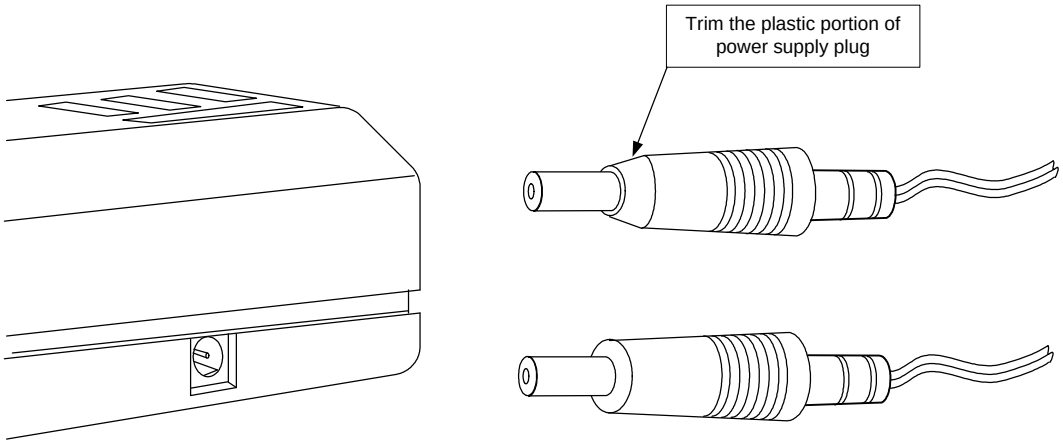
The Battery Terminal Kit for the C1060 headset is now available. Part number 78-6911-4882-5 contains the parts listed below. When replacing the wires on the circuit board (part #8), please note the polarity marked on the board.



ITEM	DESCRIPTION	QTY
#	**78-6911-4882-5**	
	C1060 BATTERY TERMINAL KIT	1
9	Base, Battery Holder	1
10	Cover, Battery Holder	1
11	Button, Battery Latch	1
13	Spring, Battery Latch	1
12	Latch, Battery	1
8	PWA, Battery Holder	1
5	Screw, 2-56 X .375 Pan Hd, Phillips, Zinc	2
1	Pad, Head	1

C1060 Battery Charger Power Supply Plug May Fall Out

The power supply plug may fall out of some C1060 Battery Chargers. The plastic portion of the power supply plug can easily be trimmed with a razor knife to allow a snug fit. See illustration:
The power receptacle was assembled too far into the case of a few chargers within the following serial number range:
C1060 3-slot charger s/n 0933005550 thru 0933005700
C1060 6-slot charger s/n 0936005020 thru 0936005170
C1060 chargers with this problem may also be shipped to the 3M Repair Center for warranty repair.



Wireless Intercom Systems

Models C1060

Technical Bulletin 12/7/01 Revision B

C1060 Batteries

Early versions of the **C1060 batteries** had 4 contacts. The contacts were labeled "-, ID, TM, +". Recent versions of the batteries do not have the ID contact. The ID contact has no function. The batteries will perform identically.

C1060 Headbands

C1060 headbands beginning with serial 0930007103 are now made of hardened spring steel. Hardened spring steel should not be bent. **Do not advise the customers to bend it.** If the customer wants the headband to fit more tightly, we recommend adding a second battery Head Pad (78-8117-4102-0) on top of the original one.

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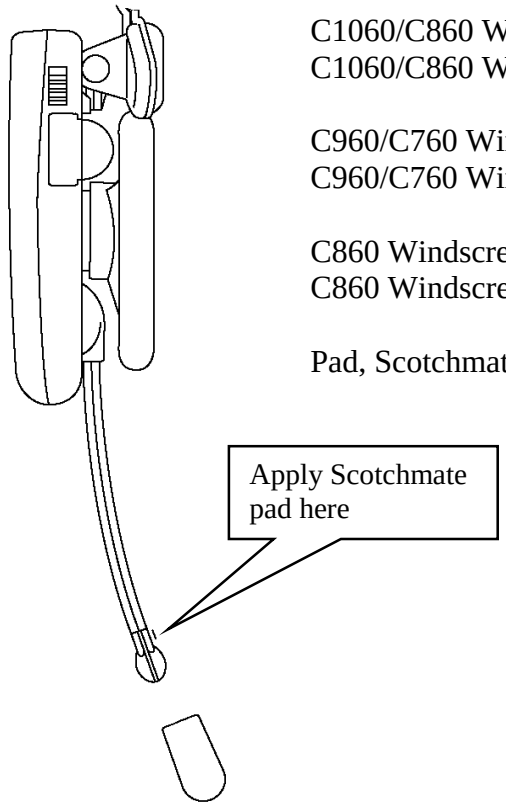
Wireless Intercom Systems

Models C1060/C960/C860

Technical Bulletin 09/18/01

C760/860/960/1060 Windscreens

Clogged microphones are the number one reason that **C960** headsets are returned for repair. It is important to replace missing or worn windscreens immediately. New and repaired C960 headsets are now being shipped with a "Scotchmate" pad attached to the underside of the boom, near the microphone. This provides additional security to keep the windscreen in place. The gray windscreens are longer and fit tighter than the original ones. Part numbers are listed below:



C1060/C860 Windscreen, each, Black	78-8117-4061-8
C1060/C860 Windscreen, 10 pack, Black	78-6911-4745-4
C960/C760 Windscreen, each, Gray	78-8117-3937-0
C960/C760 Windscreen, 10 pack, Gray	78-6911-4506-0

C860 Windscreen, each, Gray 78-8095-0573-4 *Available until stockout*
C860 Windscreen, 10 pack, Gray78-6911-4720-*7 Available until stockout*

Pad, Scotchmate, 35 pack	78-6911-4652-2

C1060 Battery Chargers

Early versions of the **C1060 Battery Charger** and the combination C1060/C960 Battery Charger, used in demo kits, may produce the following symptoms:

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- The red LED will blink quickly 3 or 4 times and then go off.
- If you put another battery in the slot, you get the same symptoms.

FIX: Unplug the charger for a short time; then plug it back in. The problem will go away. If the problem comes back, send it into 3M Repair Center. In normal operation, the red LED blinks 5 or 6 times then stays red until charging is complete.

Tips and Tricks

- When troubleshooting intercom audio problems, it is a good idea to have a spare 8-Ohm speaker available. You can quickly connect it to the output of most intercoms. This reduces the need to send someone outside to listen for audio. A 3.5-inch speaker will also serve as a microphone for checking inbound audio. This is the same speaker used in many 3M intercoms and accessories. Use 3M speaker, 3.5-inch, waterproof, 78-8028-9179-2.
- Certain **Wireless Base Stations** may exhibit some level of microphonics, which is normal. Microphonics occurs when a mechanical vibration of the base station is heard in the headsets/beltpacks. Any vibration in the crystal or transmitter section of the base station will cause frequency shifts that will be demodulated in the headset. Some units could be more susceptible to the problem than others. If the crystal is suspended above the PCB, its case may vibrate when shocked. If the transmitter shield (metal can) is loosely soldered, it can cause microphonics. Mounting the base station on a Sorbothane pad may help. Here is a link to their website: www.sorbothane.com. If the base station is an older one (C762AA) with the monopole wire transmit antenna, taking the cover off and placing a piece of the Sorbothane on the tip of the antenna may help. Just make sure that the tip of the antenna is loaded against the housing so it can't vibrate freely.
- **Talk Lock** mode is one of the best features of the 3M Wireless Intercom System. Unfortunately, it can cause problems if not used correctly. If a headset operator presses Talk Lock, all other headset microphones will be disabled. Talk Lock should be disabled at McDonalds and at any location where it is not thoroughly understood. Talk-Lock is enabled on all new and repaired headsets/beltpacks. Even though the installing technician initially disabled Talk-Lock on all headsets, if one headset is sent in for repair, it will be returned with Talk-Lock enabled. Talk Lock is normally not available on C762AA base stations.

  Talk-Lock is a toggle function that must be checked first to see if it is enabled or disabled. If the Talk LED on the base station lights when the L button is pressed, Talk-Lock is enabled.
  To disable Talk-Lock, turn the headset OFF, press and hold the L button while pressing ON for 5 seconds. You will hear a series of beeps indicating the headset has been programmed.
  Recheck the Talk-Lock function by pressing the L button. The Talk LED on the base station should not light. The LED indicator on C1060 headsets will light red when Talk/Lock is used.
- An alternate use for the **C960 Day/Night Switch** is to re-label it on the base station. Re-label “Night” to “Hearing Impaired” and adjust the night volume higher. If the base station is located near the order-taker, a flip of the Day/Night switch may make communication clearer. Don’t forget to switch back to “Day” when finished.
- In **Dual-Lane** and **Cross-Lane** installations, occasionally, when T1 is pressed the customer at the Lane 2 menu sign will hear the conversation. A greater degree of frequency separation can be achieved by separating the two base stations by 20 feet. Additional separation can be gained by mounting both base stations some distance away from any headsets, such as on an inside wall. Revised “Cross Lane System Installation” instructions are included with this bulletin.

3M
Installation Instructions
Cross-Lane System
78-6911-4396-6

Description

The Cross-Lane System is designed for facilities that have two menu signs. It consists of two system C960 base stations that are connected to a Cross–Lane Module. A Cross–Lane Module is a five–pole switch that allows the two systems to be separated during hours of peak activity. The Cross-Lane System can be used with C760, C860, C960, and C1060 headsets. The C760 headset may require additional equipment.

A Cross–Lane Module can be useful if the manager wishes to operate each lane with a separate crew during periods of peak activity. This is accomplished by turning the Cross–Lane switch **OFF**. By pressing the **T1** button on any headset, the operator can communicate with a customer at menu sign 1. By pressing the **T2** button on any headset, another operator can communicate with a customer at menu sign 2. When the Cross–Lane Module is **OFF**, the operator will only hear the vehicle detector alert from the menu sign with which he or she last talked.

During periods of lower activity, the Cross–Lane Module is turned **ON**, allowing one headset order–taker to operate both lanes. When the Cross–Lane Module is turned **ON**, the operator will always hear vehicle detector alerts from both menu signs. A single alert indicates a vehicle is a menu sign 1, while a double alert indicates a vehicle is at menu sign 2.

Additional Material Required

- A sufficient length of two-conductor 20 AWG twisted pair shielded audio cable (not supplied) for connecting the Cross-Lane Module to the two base stations.
- Applicable screws/fasteners (not supplied) for mounting the Cross-Lane Module.

Installation

Wiring the System:

1. Use the applicable screws/fasteners and mount the Cross-Lane Module to the wall in a convenient location next to one of the base stations.

   Note

   To ensure access to the switch on the Cross-Lane Module, locate the module near one of the base stations.

2. Run a length of two-conductor 20 AWG twisted pair shielded audio cable between the Cross-Lane Module and the nearest base station.

3. Run a length of two-conductor 20 AWG twisted pair shielded audio cable between the Cross-Lane Module and the other base station.

4. Connect the cables from the module to the base stations as shown in Figure 1.

Important!
Both Base stations must be set to the same channel number and different lane numbers.

Important!
For proper operation, the base stations must be at least 20 feet apart.

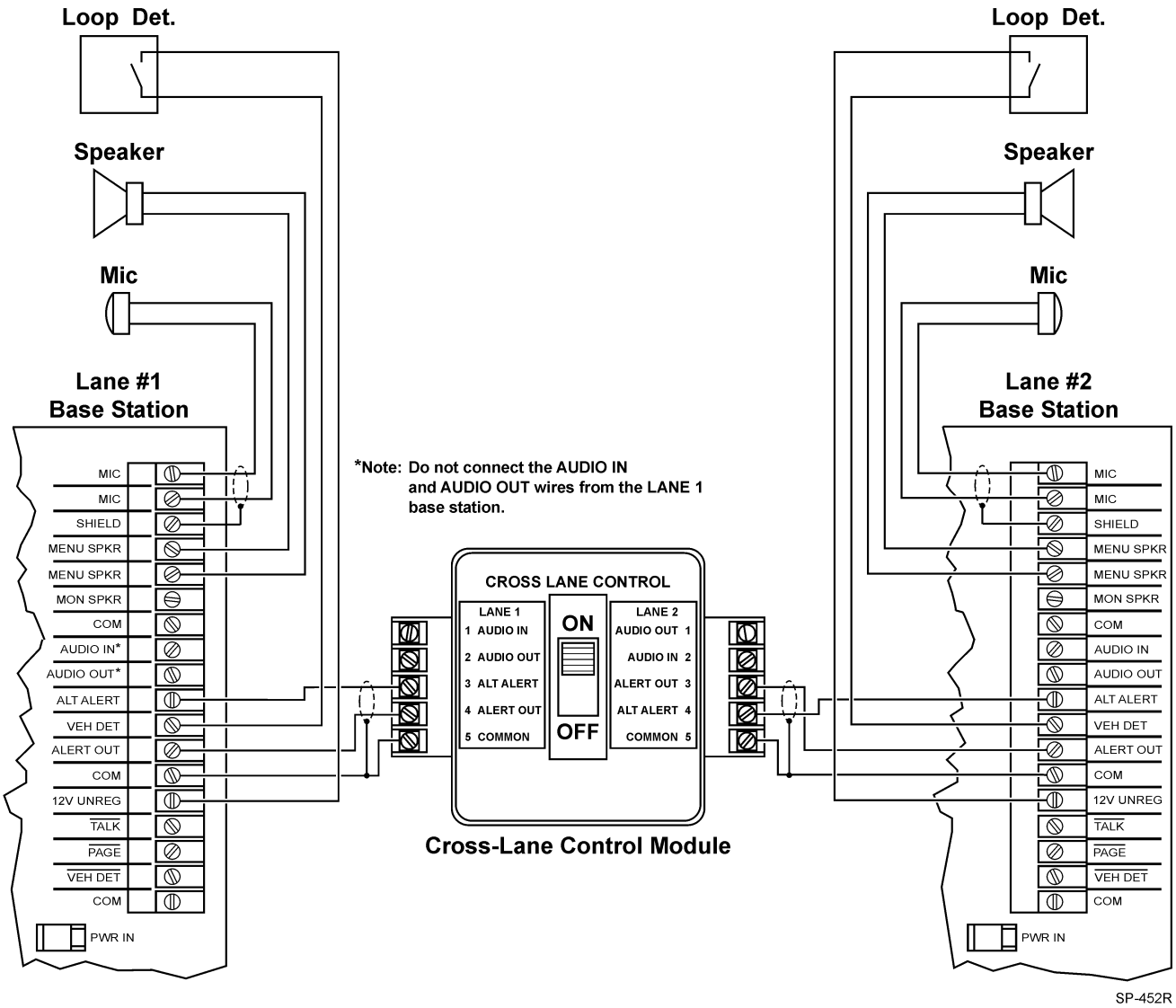

Figure 1

Programming the Headsets for Cross–Lane Operation

Follow the steps below to program the headsets for Cross–Lane operation, and disable the Talk—Lock function. It does not matter which base station is used to program the headsets. By pressing **T1**, the headset will communicate with the lane 1 base station; by pressing **T2**, the headset will communicate with lane 2 base station.

1. Disable the Talk Lock function:

Talk–Lock is a toggle function that must be checked first to see if it is enabled or disabled. If the Talk LED on the base station lights when the **L** button is pressed, Talk–Lock is enabled.

- To disable Talk–Lock, turn the headset **OFF**, press and hold the L button while pressing **ON** for 5 seconds. You will hear a series of beeps indicating that Talk–Lock is off.

- Recheck the Talk–Lock function by pressing the **L** (talk-lock) button. The Talk LED on the base station should not light.

2. Programming the headsets for Cross–Lane Operation:

a. Start with the headset **OFF**. Then, hold down the **T1** and **T2** buttons while pressing **ON** for 5 seconds. You will hear a series of beeps indicating that the headset has been programmed.

b. Verify that the headsets are properly programmed for Cross–Lane operation as follows:

(1) Press **T1** and verify that the Talk LED lights on the lane 1 base station and does not light on the lane 2 base station.

(2) Press **T2** and verify that the Talk LED lights on the lane 2 base station and does not light on the lane 1 base station.

c. To remove the Cross–Lane function and return the headsets to the normal (single lane) operating mode, first turn the headset **OFF**, and then do one of the following operations:

– **For lane 1 operation only,** hold down **T1** while pressing **ON** for 5 seconds. You will hear a series of beeps indicating that Cross–Lane function is no longer active. Reprogram the headsets from the lane 1 base station if you want to communicate with lane 1.

– **For lane 2 operation only,** hold down **T2** while pressing **ON** for 5 seconds. You will hear a series of beeps indicating that Cross–Lane function is no longer active. Reprogram the headsets from the lane 2 base station if you want to communicate with lane 2.

Operation

Cross–Lane Module OFF:

Vehicle detector alerts

The operator will only hear the vehicle detector alert from the menu sign with which he or she last talked. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

Answering customers

Pressing **T1** will only allow communications with the lane 1 customer. Pressing **T2** will only allow communication with the lane 2 customer.

Paging function
Pressing the **P** (Page) button will communicate using the base station last communicated with (via **T1** or **T2**). Headsets programmed for the last used base station will receive the page.

Cross–Lane Module ON:

Vehicle detector alerts
The operator will always hear both vehicle detector alerts. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

Answering customers
Pressing **T1** will only allow communications with the lane 1 customer. Pressing **T2** will only allow communication with the lane 2 customer.

Paging function
Pressing the **P** (Page) button will communicate using the base station last communicated with (via **T1** or **T2**). Headsets programmed for the last used base station will receive the page.

Notes:

1. **Both vehicle alert tones will be heard at all times with the Cross–Lane Module ON.**

   The order–taker may object to hearing the vehicle alert from the other lane while taking an order, if so, we suggest you decrease ALERT TONE LEVEL on each base station so that it is audible in the headsets but not objectionable.

2. **Listening and Paging in a Cross–Lane system.**

   The **T1** and **T2** buttons control which menu sign to talk or listen to. They also control which headsets to Page to. If a cook or cashier needs to monitor both lanes follow the suggestions below

   - The cook/cashier can press T1 when they hear a single alert tone or, they can press T2 when they hear a double alert tone.
   - Paging function:
     a. When order-taker Pages cook/cashier: If cook/cashier is listening on lane 2, order-taker must press T2 then Page cook/cashier.
     b. When cook/cashier Pages order-taker: If order-taker is listening on lane 2, cook/cashier must press T2 then Page order-taker.
   - A monitor speaker from each base station may be installed in the kitchen.

CAUTION!
Monitor speakers are generally not recommended for duplex systems using base stations earlier than Model C921BA. The speaker location and volume are usually too critical to avoid feedback. C921BA base stations can usually be configured successfully to allow operation of monitor speakers.

Wireless Intercom Systems

Model C960/C860

Technical Bulletin 12/12/00

C920 Microphone Boom Screws Loosening

We have found some inconsistency in screw lengths that are used to hold the microphone boom assembly together. Some of the screws used are shorter in length then specified. Units with the shorter screw have the potential of coming loose over time. Units shipped in October and November may be effected. We have corrected the problem by specifying a custom made (with tight tolerance) new "Flat Head" screw. Dealers may obtain a small quantity of properly sized screws at no charge by calling one of our Customer Service Representatives at 1-800-328-0033.

Please specify part number 3M03146A.

C920 Headset and C820 Beltpack Switch Covers

Protective Switch Covers, made of thin polyurethane are now available to help protect these units by preventing liquid and airborne particle damage.

78-6911-4709-0 Cover, C920 Headset

78-6911-4710-8 Cover, C820 Belt Pack

C920 Headset Retainer

A 24-inch clear, vinyl retainer strap is now available for use with the **C920** Headsets. The Retainer Strap wraps around the C920 headset (by the side pads) and snaps in place. The strap provides a secure link to the headset and functions similar to an eyeglass strap—preventing loss or damage. The strap has a breakaway feature and provides a convenient resting-place during off peak hours. The part number is:

78-8117-4014-7 Retainer, C920 Headset

Cable, 3 Pair, Twisted Combination Duplex in 1000-Foot Rolls

The **Cable, 3 pair, twisted (approximately 1000')** has been listed the Price Pages under "Service Parts, Misc." since April 2000. **This 1000' cable is no longer available.**

Please continue to order this cable (78-8095-0180-8) in 140' lengths.

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Tips and Tricks

- When troubleshooting inbound noise or interference problems on the **C960 Intercom System** try removing the outside microphone by disconnecting the top 4-position connector from the Base Station momentarily, during the interference.
  If the all the noise disappears, the problem may be solved by improving the wire shielding or the acoustic isolation of the microphone.
  If the noise remains, try changing channels or the Lane jumper, L3 on the Base Station. Then re-program the headsets. You may need to locate and remove other sources of 900 MHz interference.

3M

Wireless Intercom Systems

Model C960/C860

Technical Bulletin 8/24/00

3M Loop Detectors, Models A200 and A201 on Hold

The 3M Loop Detectors, Models **A200 and A201** are on hold until further notice. A problem with the sensitivity has been discovered that causes some units to fail to detect cars that are very close together in the drive-thru lane.

We are supplying our former Model 917-1 Loop Detector (78-8028-9317-8) as an alternate until this problem is corrected. Pricing for this unit will be the same as the current new external unit. We recommend against installing any Models A200 and A201 Detectors that you might have in your inventory. You will be notified when corrected units are in stock and we will exchange them at that time.

There is no alternate unit available for the internal base station unit. You will have to use an external unit.

You may return any previously installed units that are not operating satisfactorily. We apologize for any inconvenience and hope to have corrected units in stock shortly.

New C860 Headsets Low Outbound Volume

The new **C860** "Type 2" (78-8117-3964-4) headset was released in March 2000. Early units have lower microphone output than C960 headsets. To correct this problem, replace the 2.2k Ohm resistor across the microphone, located under the ear cup cover, with a 4.7k Ohm resistor. The microphone output will then match that of the C960. The microphone output on all units in our stock has been corrected.

All new "Type 2" C860 headsets have lower inbound volume than C960 units. This should not be a problem if all units in a system consist of C860 "Type 2" headsets. The Menu Mic Sensitivity may be increased on the Base Station to compensate for this. If C860 "Type 2" headsets are mixed with C960 units the inbound volume must be increased by three steps on each C860 beltpack. This will compensate for the lower inbound volume.

3M *"Internal"* Noise Reduction Module, Model A125

We have identified a problem in some of our early *internal* noise reduction modules, pn: 78-9236-6453-2. The symptom you may experience is a "clicking" or "motorboating" sound on outbound audio, particularly on hard consonants. This is primarily evident when the unit is turned "Off". The only way to eliminate this is to disconnect the unit from the base station. Shipments made after July 21, 2000 have been screened and tested and are good. If you have some earlier units that exhibit this problem please return them to us for replacement.

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© 3M August 2000

3M
Wireless Intercom Systems
Model C960

Technical Bulletin 6/9/00 Rev. B

New C860 Headsets

A new **C860** "Type 2" (78-8117-3964-4) headset replaced the original C860 "Plantronics" (78-8095-0598-1) headset in March 2000. The new Type 2 headsets have a high-resin polyurethane cable, which is much more resistant to heat and oil/grease found in the fast food environment. Other differences between the two are the Plantronics had a swivel earpiece and a flat steel band; the Type 2 has a fixed earpiece and a black plastic-covered round band. The Type 2 headsets use a new ear pad. The original Plantronics ear pads 78-8069-2667-7 are no longer stocked but the new Type 2 ear pads will fit.
Ear pads for both Plantronics and Type 2 (78-8117-3965-1) each, MOQ = 5.
Ear pads for both Plantronics and Type 2 (78-6911-4693-6) 10-pack.
Both headsets use the same microphone windscreen as the C960 headsets 78-6911-4506-0 for a 10-pack.

Stronger C960 Ear Cup Joint

A stronger **C960** ear cup joint, (78-8095-0564-3) was introduced in March 2000. The part number has not changed. All previous ear cup joints have been purged from inventory.

Redesigned Microphone Windscreens

The **C960** microphone windscreens (78-6911-4506-0) (10 pack) have been redesigned. They will also fit C760 headsets, and the "Plantronics" and the "Type 2" models of the C860 headsets. The new windscreens are larger and fit more tightly. If a customer is still having problems with the windscreen falling off, a "Scotchmate" tab (hook and loop) (78-6911-4653-2) (35 pack) can be attached to the microphone base.
Windscreens should be replaced regularly. If a windscreen is torn or missing, dirt or grease can plug the holes in the microphone case.

Noise Reduction Module

The **A121** (external) Noise Reduction Module requires a system with a separate outside microphone.
The **A125** (C960 internal) Noise Reduction Module can be configured to use either a separate outside microphone or a single speaker that is used as a speaker and a microphone.

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Service Parts for C960 Field Repairs

Below is a list of service parts, which will enable technicians to repair 80-85% of all **C960** headsets. The only repairs, which can't be handled at the dealer level, are those of a defective printed circuit board. Based on 100 headsets, we recommend purchasing the following: Pricing can be found in your 3M Communication Products Service Parts Price Pages.

3M Part #	Description	Qty
78-8095-0525-4	Outer Case	5
78-8095-0557-7	On/Off Keypad	5
78-8095-0574-2	Keypad	5
78-8095-0551-0	Button, battery release	5
78-8095-0524-7	Speaker assembly	5
78-8095-0563-5	Joint, ear cup	10
78-8095-0582-5	Headband assembly/main	10
78-8095-0559-3	Inner case (remember to transfer s/n)	5
78-8095-0565-0	Lock, mic boom	10
78-8095-0566-8	Base, mic boom	5
78-6911-4630-8	Battery terminal kit	1
78-8095-0517-1	Spring, battery ejector	3
78-8095-0607-0	Headband cap	25

C860 Parts List

Service parts for the C860 Belt Pack are listed below:

78-8095-0551-0	BUTTON, Battery Release
78-8095-0556-9	SPRING, Battery Release Button
78-8095-0513-0	CASE Top
78-8095-0515-5	KEYPAD
78-8095-0517-1	SPRING, Battery Ejector
78-6911-4653-0	CASE, Base Assembly (includes battery contacts)
78-8095-0518-9	KEYPAD PWA
not available	MAIN PWA
not available	SCREW, 6x16x3/8 pan-plastite
not available	SCREW, 6x1/4, pan-plastite
78-8117-3964-4	HEADSET, Type 2 (standard headset)
78-8117-3965-1	EAR PAD, Type 2 and Plantronics, each
78-6911-4693-6	EAR PAD, Type 2 and Plantronics, 10-pack
78-6911-4506-0	WINDSCREEN, Microphone, Type 2 and Plantronics, 10-pack
78-8095-0598-1	HEADSET, Plantronics (discontinued March 2000)
78-8069-2667-7	EAR PAD, Plantronics, 4-pack (discontinued June 2000)
78-8095-0599-9	LAPEL, Microphone and Earpiece (optional headset)
78-8095-0531-2	POUCH
78-8095-0528-8	BELT
not available	PHONE JACK and Cable Assembly

Acoustic Dampening Foam

Below is purchase information for acoustic dampening foam. This foam is recommended to enhance duplex operation in **C960** speaker posts:

Illbruck Inc.	Part #:	LP200U 1.5" x 12" x 12"
3800 Washington Ave. N.	Description:	LP200U Charcoal foam, size: 1.5 x 12 x 12 inch
Minneapolis, MN 55412	Qty	Price (EA)
Phone: 612-521-3555	100	$3.960
Fax 612-521-5639	250	$3.350
Website: www.illbruck-sonex.com	500	$3.240

4 - 6 weeks lead-time

C960 Cross-Lane System Installation

The **C960** Cross-Lane System provides communication for facilities that have two menu signs. This information has been rewritten in a clearer format. It is attached to this bulletin.

Tips and Tricks

- When troubleshooting "short range" problems, don't overlook the physical location of the **C960**/**C760** Base Station. Remember, the left-hand side, containing the RF section, must be at least 3 feet from large metal objects, such as refrigerators, ranges, coolers, etc., and other metal or electrical devices. This also includes metal window frames, water pipes, and electrical conduits, which could be hidden beneath the wall surface. The Installation Instructions recommend that you move a powered Base Station around the desired mounting area as someone talks and listens on a headset for the optimum range.
- A high percentage of failed **C960 Battery Chargers** are returned for processor failure. This component failure primarily stems from the power plug accidentally contacting the analyzer terminals, located directly next to the power jack. This has the potential of ruining the processor! Because of this potential problem and due to the lack of demand for the optional analyzer, we are discontinuing putting the analyzer terminals on chargers. The terminal/port has been removed from both chargers.
- When replacing a boom microphone on a **C960** headset, the mic boom base cover should also be replaced. The self-tapping screw will hold better if it is installed in a new base cover. If this is not possible, and the base must be re-used, place a very small drop of white wood glue on the threads of the self-tapping screw before inserting it into the base cover.
- A previous Technical Bulletin, dated 7/14/99, had an article listed under "Tips and Tricks" about cleaning grease buildup from under the **C960** silicone switches. It mentioned cleaning the switches and circuit board with a Q-tip moistened with alcohol.
  We have found that alcohol will dissolve grease. The grease will get into some tuned components in the multiple-layer circuit board. This could cause circuit board problems!
  Do not use alcohol to clean the switch traces on the C960 circuit board! Use only a soft dry cloth. Technicians in the 3M Repair Center have the best success with a 3M brand "Scotch-Brite High Performance Cloth". These cloths can be found in the FST Related Products Price Pages "CFM-700" U.P.C. number 500-4811-25889-3 or, with cleaning supplies in most retail stores. You may

continue to use alcohol to clean the silicone switches, but use only a dry cloth to clean the circuit board.

- Symptoms of hearing constant programming tones in **C860** Belt Packs can be caused by dirty switches or poor solder connections to the switch circuit board. Clean the silicone switches with alcohol or replace them. Clean the switch circuit board with a clean dry cloth. Resolder the wiring header from the switch circuit board to the main board.
- If a **C860** belt is not long enough to fit an operator, a second belt can be added by simply connecting the buckles.
- The **C860** Lapel Microphone and Earpiece (78-8095-0599-9) was intended for people who find a headset too obtrusive. The microphone, when mounted on the lapel is too far away from the mouth to have the same audio level as that of a headset. Consequently, the outbound audio level will be lower.

Cross-Lane System Installation

Description

The Cross-Lane system is designed for facilities that have two menu signs. It consists of two base stations that are connected to a Cross-Lane Module. A Cross-Lane Module is a five-pole switch that allows the two systems to be separated during hours of peak activity. Refer to the installation instructions included with the Cross Lane Module (78–6911–4396–6). These instructions are also located in the C960 Service Manual.

A Cross-Lane Module can be useful if the manager wishes to operate each lane with a separate crew during periods of peak activity. This is accomplished by turning the Cross-Lane switch OFF. By pressing the T1 button on any headset, the operator can communicate with a customer at menu sign 1. By pressing the T2 button on any headset, another operator can communicate with a customer at menu sign 2. When the Cross-Lane Module is OFF, the operator will only hear the vehicle detector alert from the menu sign with which he or she last talked.

During periods of lower activity, the Cross-Lane Module is turned ON, allowing one headset order-taker to operate both lanes. When the cross-lane module is turned ON, the operator will always hear vehicle detector alerts from both menu signs. A single alert indicates a vehicle is at menu sign 1 while a double alert indicates a vehicle is at menu sign 2.

Installation

Important!
Both base stations must be set to the same channel number and different lane numbers.
Both base stations must be at least 20 feet apart.

Wiring the System

Run a proper length of 20 AWG twisted-pair, shielded audio cable between the Cross-Lane Module and each Base Station as shown in Figure 1.

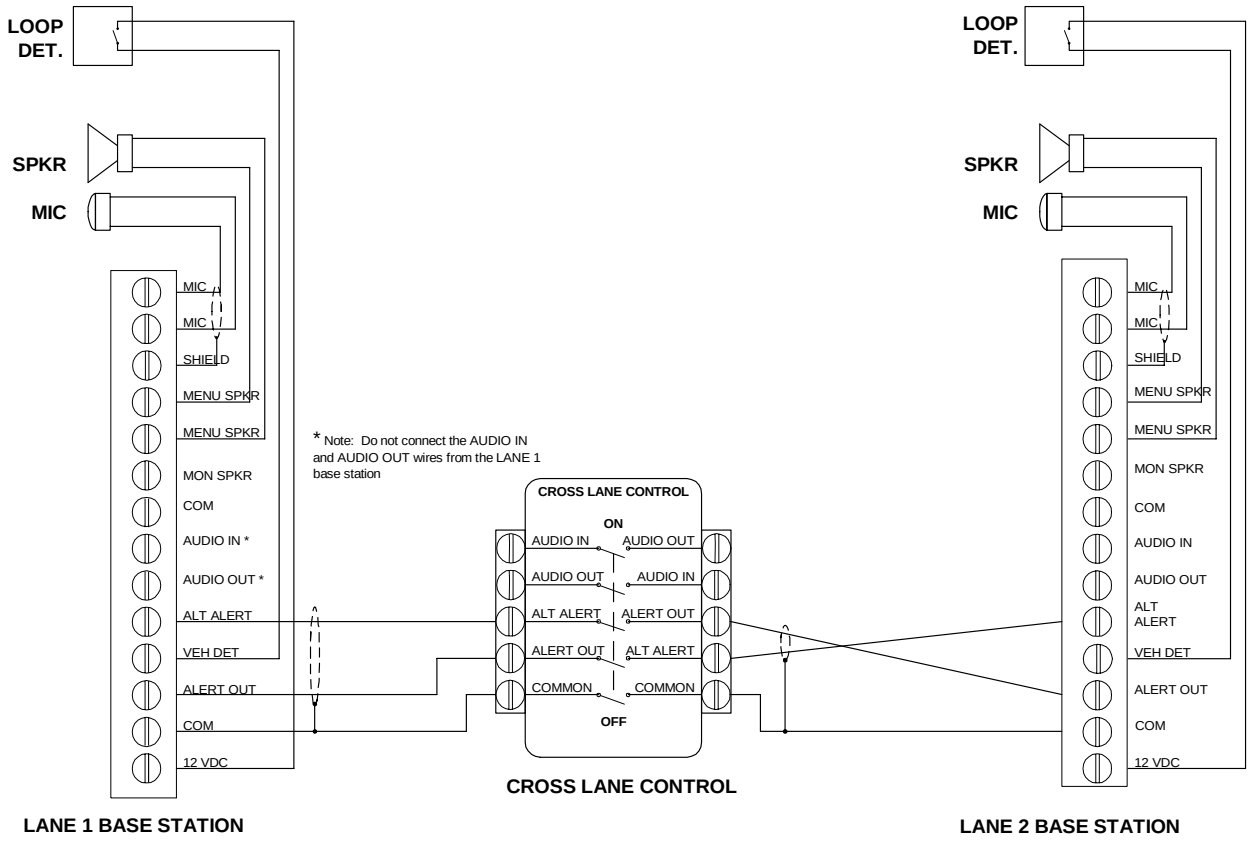

Figure 1. Cross-Lane Wiring Diagram

Programming the Headsets for Cross-Lane Operation

Follow the steps below to program the C960 headsets for Cross-Lane operation, and disable the Talk-Lock function. It does not matter which base station is used to program the headsets. By pressing T1, the headset will always communicate with the lane 1 base station; by pressing T2, the headset will always communicate with the lane 2 base station.

1. Disable the Talk Lock function.

Talk-Lock is a toggle function that must be checked first to see if it is enabled or disabled. If the Talk LED lights when the L button is pressed, Talk-Lock is enabled.

- ✓ To disable Talk-Lock, turn the headset OFF, press and hold the L button while pressing ON for 5 seconds. You will hear an acknowledging beep.
- ✓ Recheck the Talk-Lock function by pressing the L button. The Talk LED on the base station should not light.

2. Program the Headsets for Cross-Lane Operation

- ✓ With the headset OFF, press and hold T1 and T2 while pressing ON for 5 seconds. You will hear an acknowledging beep.
- ✓ Verify that the headsets are properly programmed for Cross-Lane operation:
  Press T1 and verify that the Talk LED lights on the lane 1 base station and does not light on the lane 2 base station.
  Press T2 and verify that the Talk LED lights on the lane 2 base station and does not light on the lane 1 base station.
- ✓ To remove the Cross-Lane function and return the headsets to the normal operating mode, first turn the headset OFF, and then hold down T1 while pressing ON for 5 seconds. You will hear an acknowledging beep. Reprogram the headsets from the Lane 2 base station if you desire to communicate with lane 2.

Operation

Cross-Lane Module OFF

Vehicle detector alerts

The operator will only hear the vehicle detector alert from the menu sign with which he or she last talked. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

Answering customers

Pressing T1 will only allow communication with the lane 1 customer. Pressing T2 will only allow communication with the lane 2 customer.

Paging function

Pressing Page will communicate via the base station last communicated with (via T1 or T2) and to the headsets programmed to it.

Cross-Lane Module ON

Vehicle detector alerts

The operator will always hear both vehicle detector alerts. Vehicles at menu sign 1 will be heard as a single repeating alert. Vehicles at menu sign 2 will be heard as a double repeating alert.

Answering customers
Pressing T1 will only allow communication with the lane 1 customer. Pressing T2 will only allow communication with the lane 2 customer.

Paging function
Pressing Page will communicate via the base station last communicated with (via T1 or T2) and to the headsets programmed to it.

NOTES

1. Both vehicle alert tones will be heard at all times with the Cross-Lane Module ON.

The order-taker may object to hearing the vehicle alert from the other lane while taking an order; if so, we suggest you decrease ALERT TONE LEVEL on each base station so it is audible in the headsets but not objectionable. The tone should be low enough so that the order-taker can ignore it, yet know that someone is waiting at the other lane.

2. Listening and Paging in a Cross Lane system

With the AUDIO IN and AUDIO OUT wires disconnected, the T1 and T2 buttons control which menu sign to talk or listen to. They also control which headsets to PAGE to. Disconnecting the AUDIO IN and AUDIO OUT wires presents some issues if a cook or cashier needs to monitor both lanes:

- If the cook or cashier is using a headset to monitor lane 1, and the order-taker is taking an order from menu lane 2, or if the order-taker needs to PAGE the cashier, he/she must first press T1 momentarily, then press PAGE to communicate privately with the cashier on lane 1. Then the order-taker can press T2 to resume taking the order on lane 2.

- As an alternative, a monitor speaker from each base station may be installed in the kitchen. (Caution: Monitor speakers are generally not recommended for duplex systems using C921AA base stations. The speaker location and volume are usually too critical to avoid feedback. C921BA base stations can usually be configured successfully to allow operation of monitor speakers.)

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Wireless Intercom Systems

Model C960

Technical Bulletin 9/27/99

New C921BA Base Station

Two problems have appeared only on new C921BA Base Stations. They have been corrected on higher serial numbered units.

- Low inbound menu microphone volume may be noticed on serial numbers below 0921001987, in situations where the menu mic is more than four feet from the customer's car. The "Menu Mic Sens" potentiometer must be turned up excessively for adequate inbound volume.

  A field fix for this problem is to reduce the size of the two 1500-Ohm resistors in the attenuator cable, shipped with the 3.5-Inch Duplex Microphone (78-6911-4476-6). A matched pair of resistors of approximately 750 Ohms each will increase the inbound volume.

  A permanent fix for this problem is to replace the 100 kilo-Ohm resistor with a 330 kilo-Ohm resistor as shown in Figure 1 below: This is an 850 series surface-mount resistor, part number P330KACT-ND. It may be ordered from Digi-Key at (800)344-4539 www.digi-key.com or obtained from 3M Technical Service.

  If you are aware that this problem exists at a location, you can choose to fix it yourself by performing one of the two fixes listed above, or return the Base Station to 3M for an exchange. Please indicate why you are returning it.

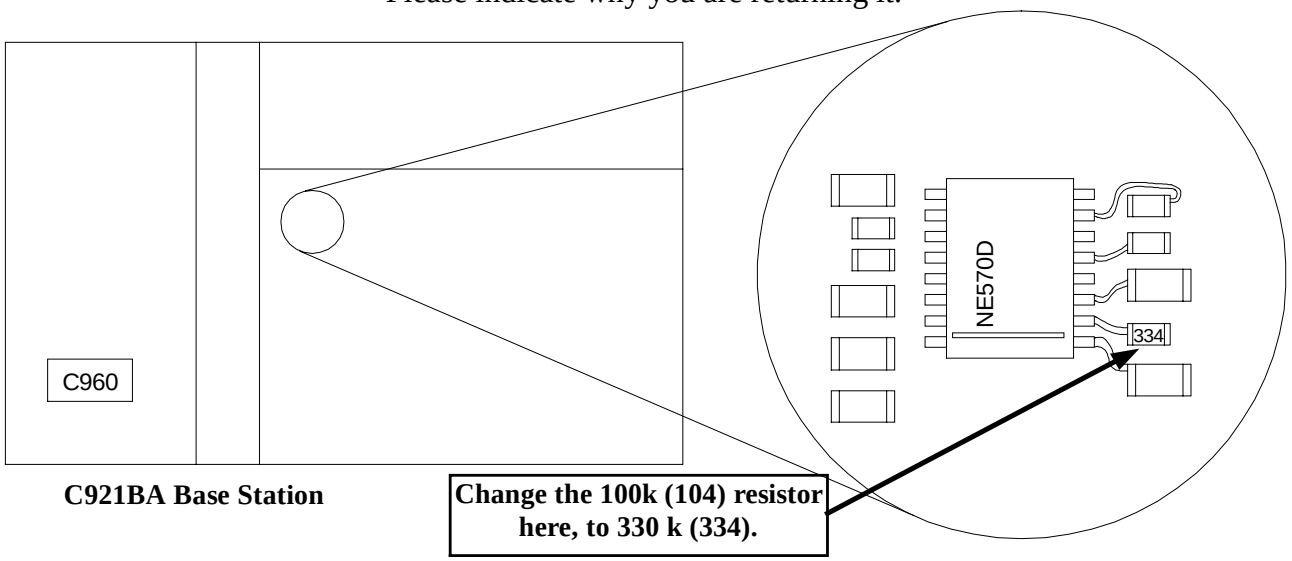

Figure 1

- Cross talk may occur on serial numbers below 0921002348, when two Base Stations are in the same area, such as, in a Dual Lane or Cross Lane System. When the Talk button is pressed, the Talk LED will light on both Base Stations even though the second Base Station is set for Lane 2.

If you are aware that this problem exists at a location, the Base Station needs to be returned to 3M for an exchange. This is not field-repairable. Please indicate why you are returning it.

Attached to this bulletin are Installation Instructions for the new C921BA Base Station. It also contains a short description of the new features.

C860 Lapel Microphone Assembly

A Lapel Mic and Earpiece (78-8095-0599-9) is now available as an optional component for the **C860** Beltpack. The price is the same as the original headset. C860 Systems and Upgrade Systems are only available with the original headset (78-8095-0598-1). The Lapel Mic and Earpiece is more comfortable when used for long periods. A **C860**, when used with the original headset (78-8095-0598-1), can be used in conjunction with C760 and C960 headsets. However, the Lapel Microphone, when mounted on the lapel is too far away from the mouth to have the same audio level as that on a headset. Consequently, the outbound audio level will be lower by 6 to 9 dB. The lapel mic was brought into the line for use by banks and convenience stores; people who would normally find a headset too obtrusive.

C860 Lapel Mic and Earpiece 78-8095-0599-9
Figure 2

C860 Redesigned Pouch

The pouch currently being shipped with the C860 Beltpack is now made of matte black leather, secured with snaps. The part number (78-8095-0531-2) is the same as that of the previous pouch. The web belt remains the same.

A200 and A201 Loop Detectors

Two new Loop Detectors will soon be released. Both have two sets of output contacts.

The Model A200 Loop Detector comes with a 12VDC plug-in power supply and is designed as a stand-alone loop detector. Use this detector if a backup wired intercom is used to support the primary intercom.

The Model A201 Loop Detector comes with a special ribbon cable and is designed specifically as an optional accessory for the 3M C921BA or later Base Station. Power and switch closure signals are supplied through a ribbon cable.

C960 Updated Replacement Parts List

Attached to this bulletin are updated Replacement Parts and Service pages 3-5 and 3-6, to replace the ones dated “September 1997” in the C960 Service Manual.

Speaker/mic, horn (OSM) Sale

We are currently offering the OSM horn speaker/mic (78-8016-9810-7) at a sale price of $15 each. Hurry, while supplies last.

Tips and Tricks

- A **C960** system in a location with a 900 MHz cordless phone can experience loss of communication. We recommend that you don't use a 900 MHz phone near a C960 Intercom System. If there is no choice, and interference is encountered, change channels on the Base Station to one at least three channels away. It may be necessary to go further than three channels away. Lane 2 frequencies are also available.
  Most modern 900 MHz cordless phones should be smart enough to select an unused channel on which to operate. One thing to try which might be a solution if the phone is "smart" is to:
  - ✓ Turn off the power switch on the portable phone handset.
  - ✓ Hang up the phone.
  - ✓ Unplug it from the power line.
  - ✓ Turn on the C960 and hold down the talk switch (while doing the next two steps).
  - ✓ Plug the phone back in and take it off hook.
  - ✓ Turn on its power switch.

  If the phone is "smart", it will see that the talk and listen frequencies of the C960 are busy and go to some other channel.

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St. Paul, MN 55144-1000

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3

C921BA Base Station

Installation Instructions

This is an addendum to the C960AA Headset Intercom System Installation Instructions. The only change in the System is the C921BA Base Station.

Description

The 3M C921BA Base Station is improved over the C921AA Base Station in several ways:

- Improved Duplex Operation
- Improved Monitor Speaker Operation
- A reduced click when the Talk button is pressed
- Ability to add an optional Internal Loop Detector
- Ability to add an optional internal Noise Reduction Module
- C5000 compatibility

Installation

Installation of the C921BA Base Station (78-9236-6491-2), is the same as the C921AA Base Station (78-9236-6330-2), with the following additions:

Additional Jumper Settings:

J6 - MENU PWR SEL - STD or DPLX

STD - applies power to outbound speaker amplifiers only when the TALK switch is pressed.

Note: For Standard (half-duplex) systems jumper J6 must be placed in the STD position.

DPLX - applies power to outbound speaker amplifiers constantly. This will reduce the click that is sometimes heard in duplex mode when the TALK button is pressed.

J9 – TALK MON LVL

REDUCE – reduces the volume to the Monitor Speaker by 16dB while the TALK button is pressed. This decreases the chance of feedback when a headset is operating near the Monitor Speaker in duplex mode.

NONE – mutes the volume to the Monitor Speaker while the TALK button is pressed.

Additional Connectors:

C5000 Terminal Strip – 4 terminals at the bottom of the right-hand terminal block.

J7 – Loop Detector Connector

J8 - Noise Reduction Connector (under left cover)

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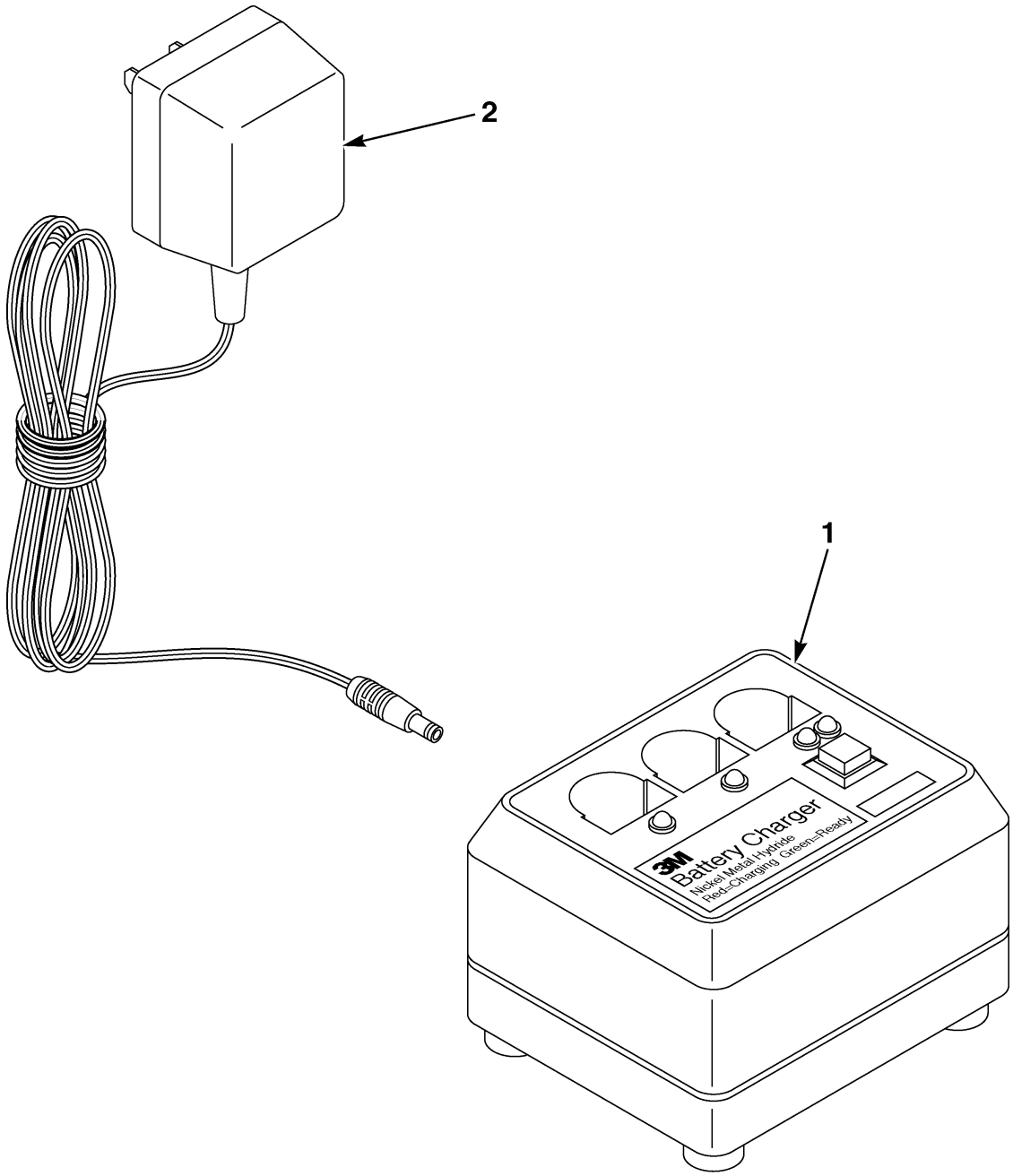
Item No.	Part Number	Description	Qty.
0	78-6911-4492-3	HEADSET ASSEMBLY, Model C920AC	1
1	78-8095-0525-4	OUTER CASE (with logo)	1
2	78-8095-0557-7	ON/OFF KEYPAD	1
3	78-8095-0574-2	KEYPAD	1
4*	Not Available	HEADSET PWA	1
5	78-6911-4630-8	BATTERY Terminal Kit (5 pairs)	1
6	78-8095-0556-9	SPRING, Battery Release Button	1
7	78-8095-0559-3	INNER CASE ASSEMBLY	1
8	78-8095-0551-0	BUTTON, Battery Release	1
9	26-1014-3441-8	SCREW, Flat Head, CS, Hi-Low, 4-40 x 1/4”	1
10	78-8095-0523-9	MIC BOOM ASSEMBLY (Replacement)	1
10A	78-8095-0566-8	BASE, Mic Boom	1
10B*	Not Available	BOOM, Mic	1
10C	78-8095-0565-0	LOCK, Mic Boom	1
10D*	Not Available	SCREW, Pan Head, 4-40 x 1/4”	1
10E	78-6911-4506-0	MIC WINDSCREEN (Package of 10)	1
11	78-8095-0524-7	SPEAKER ASSEMBLY (Replacement)	1
11A*	Not Available	EAR CUP, Speaker Cover	1
11B*	Not Available	GASKET, Speaker	1
11C*	Not Available	SPEAKER ASSEMBLY	1
11D*	Not Available	FOAM, Speaker	1
11E	78-8095-0563-5	JOINT, Ear Cup	1
11F*	Not Available	EAR CUP	1
12	78-6911-4505-2	EAR PAD (Package of 10)	1
13A	78-8095-0583-3	HEADBAND ASSEMBLY, Adjustable	1
13B	78-8095-0582-5	HEADBAND ASSEMBLY, Main	1
14	26-1014-3439-2	SCREW, Pan Head, 6-32 x 7/16”	1
15	78-6911-4510-2	SIDE PAD ASSEMBLY (Package of 10)	2
16	78-6911-4507-8	TOP PAD ASSEMBLY (Package of 5)	1
17	78-6911-4491-5	BATTERY ASSEMBLY	1
18	78-8095-0591-6	CAP/VISOR CLIP (Package of 5)	1
13B-1	78-8095-0607-0	CAP, HEADBAND WIDTH ADJUSTMENT	1

Section 3 - 3-Slot Battery Charger Assembly



SP-248A

Item No.	Part Number	Description	Qty.
1	78-8095-0580-9	3-SLOT BATTERY CHARGER ASSEMBLY, Model C923AA	1
2	78-8028-9283-2	TRANSFORMER ASSEMBLY, 14 VAC, 20 VA	1

#

C-Series Intercom Systems

Model C960

Technical Bulletin 7/14/99

C960 Headband Width Adjustment Tab Cover

A new plastic cover (78-8095-0607-0) is now available to repair C960 main headband assemblies with broken width adjustment tabs. Clean the old tab halves with alcohol, apply "super glue", and slip on new cover.

Tips and Tricks

- **C960** headbands are made of glass-filled nylon. This type of plastic is susceptible to stretching and re-forming and may fit loose on the head for a variety of reasons. Here are some headband cautions and corrections:
  - ✓ Avoid resting the headset on your shoulder between orders. Your shoulder is much larger than your head and this will stretch the headband over time.
  - ✓ Avoid setting the width adjustment tab too tight for a large head. This will stretch the headband over time.
  - ✓ Change all headband pads regularly for hygienic reasons and to assure a comfortable fit. New pads can tighten the headband by 3/4 inch.
  - ✓ Cut a piece of 1/16" to 3/16" thick, double-stick foam tape to 1" long by 1/4" wide. Apply this tape to the folding headband arm directly under the width adjustment tab. This method will work on the old style as well as the new style headbands with the two raised width adjustment stops molded onto the folding arm.
  - ✓ Apply a heat gun to both sides of the folding headband arm for approximately 30 seconds. This should soften it enough to allow it to be bent to a tighter arc. If enough heat is not applied, the nylon might return to its original arc after cooling.
- **C960** headsets with low or no listen volume may merely have the speaker hung up on the magnet. This is generally the result of a drop. Many times this can be corrected in the field. Place a small dowel rod, such as a wooden Q-tip handle or a toothpick, through one of the speaker cover holes and gently push the speaker back over the magnet.
- If extra pressure on **C960** or **C760** headset buttons is needed to activate the base station TALK or PAGE LEDs the problem may be grease buildup under the headset buttons. Disassemble the case and clean the bottom of the silicone switches and the circuit traces with a Q-tip and alcohol. If this is not done, the extra pressure will flex the circuit board and fracture components.
- Replace **C960** and **C760** microphone windscreens regularly. If the windscreen is torn or missing, dirt and grease can plug the holes in front or back of the microphone. Sometimes the holes can be cleaned with a toothpick. Solvents will ruin the mic.

- The **C960** charger automatically discharges cells that are placed in it. However the left two slots can only remove 10% of a full charge and the right hand slot can only remove 20% of a full charge. Therefore, as often as is practical, leave the batteries in the headset/beltpack until the low battery alert sounds.
- An improved **C960** Outer Case is now available from spare parts. The part number has not changed (78-8095-0525-4). It has threaded brass inserts for the case screws and it includes the screws. Avoid over-tightening the screws to prevent the screw ends from protruding through the Inner Case.
  To prevent the plastite screws from loosening on the old-style case place a VERY small drop of white wood glue on the screw threads before tightening.

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#

C-Series Intercom Systems

Model C960

Technical Bulletin 3/28/99

No Talk LED or Delayed Talk LED

Some **C960/760** base Stations may experience symptoms where the Talk LED won't light at all or lights after a delay when the Talk button is pressed on any headset. This can also happen to the Page LED when the Page button is pressed. This usually occurs on C760 Systems, which were recently upgraded by adding C960 Headsets. This is caused by the fact that C960 systems are adjusted to closer tolerances than C760 systems. Before adjusting anything, make sure the problem is not caused by RF interference. Changing channels is the usual fix for RF interference.
Refer to Figure 1 while performing the following steps:

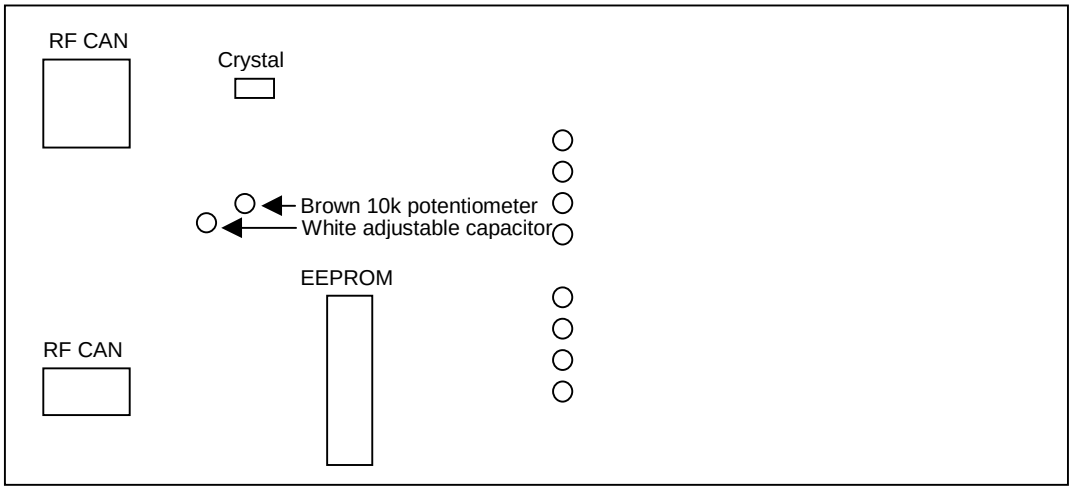

Figure 1. Base Station Circuit Board

- Remove both base station covers to expose the entire circuit board.
- Refer to Figure 1. and locate the brown 10K Ohm potentiometer on the Base Station. It is located to the right of an adjustable white capacitor with a brass screw. It is marked with a number "104". There are no component designators on the board.
- Mark the original position of the slot on the potentiometer on the board using a pencil.
- Press the Talk button on a programmed headset and adjust the 10k potentiometer counterclockwise until the Talk LED first lights; continue turning it until the Talk LED goes out.
- Continue pressing the Talk button while turning the potentiometer clockwise, noting where the LED lights and then goes out.
- Adjust the potentiometer to the mid-point of the range you have noted above. Check to make sure the Talk button causes the Talk LED to light reliably and with no delay.

Instructions for replacing the C960 Inner Case

The **C960** Inner Case Assembly is now available as a spare part (78-8095-0559-3). Be sure to transfer the serial number sticker to the new case to continue the warranty, and it is a good idea to write the serial number on the case with an indelible marker. Use this procedure if you want to re-use the speaker assembly. This procedure should work 90% of the time. Occasionally you may need to disassemble the Speaker Assembly to gain access to the Ear Cup Joint and finish the job.
Refer to Figures 3-1 through 3-4 which are included in this bulletin and located on pages 3-8 through 3-10 in the "Model C960 Headset Intercom System" Service Information Manual (78-6912-0673-0).

1. Refer to Figure 3-2. Remove two screws in the battery compartment and separate the case halves. Be careful not to lose the battery release button and leaf spring.
2. Refer to Figure 3-3. Remove the mic and speaker plugs by forcing the tweezers under the lips of the plugs.
3. Refer to Figure 3-4. Remove the speaker connector terminals from the connector housing by prying the retaining tab up with the tip of the razor knife.
4. Refer to Figure 3-1. Rotate the ear cup joint clockwise in the two slots in the inner case. This can be done by pushing the two feet with a pair of tweezers or a small screwdriver.
5. Remove the speaker assembly and leads from the inner case.
6. Transfer the small rectangular foam pad from the old inner case to the new inner case.
7. Feed the speaker leads through the hole in the new case.
8. Pre-twist the ear cup joint feet clockwise. They should remain slightly past the halfway point of the slots in the speaker assembly.
9. Align the two feet of the joint with the slots in the case.
10. Push down hard on the speaker assembly and twist clockwise while rocking it side to side until the two feet come through the slots in the case. The tweezers or screwdriver will help this process.
11. Rotate the feet fully counterclockwise in the slots to lock the speaker assembly in place. The tweezers or screwdriver will help this process.

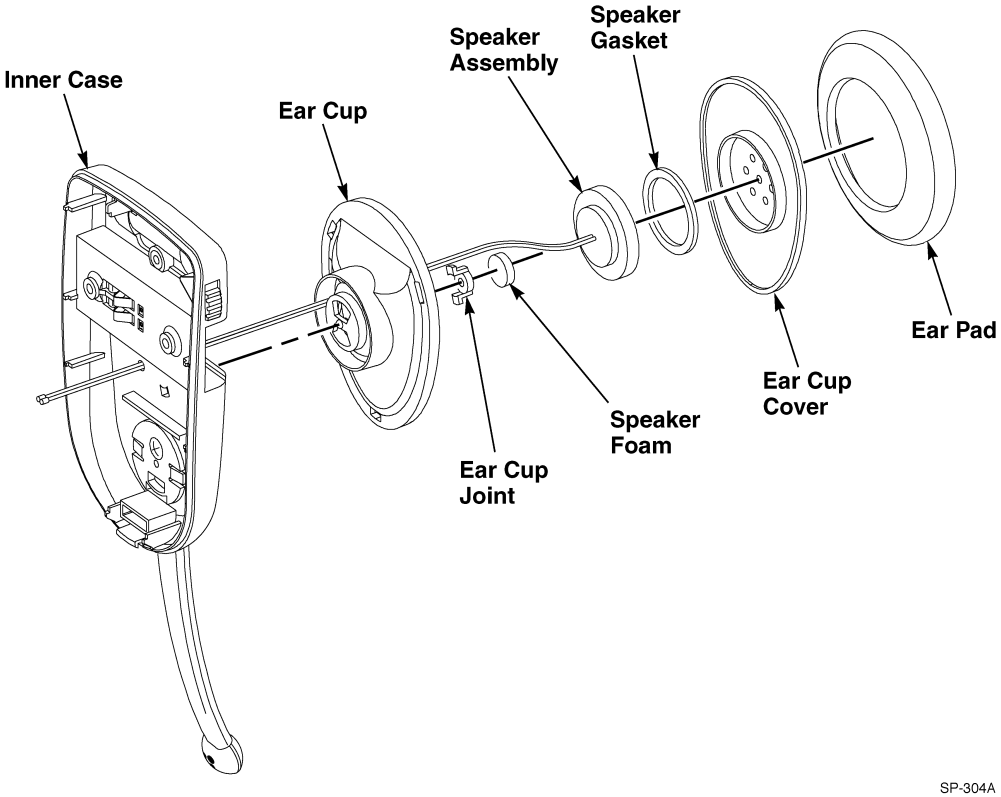

Figure 3-1.

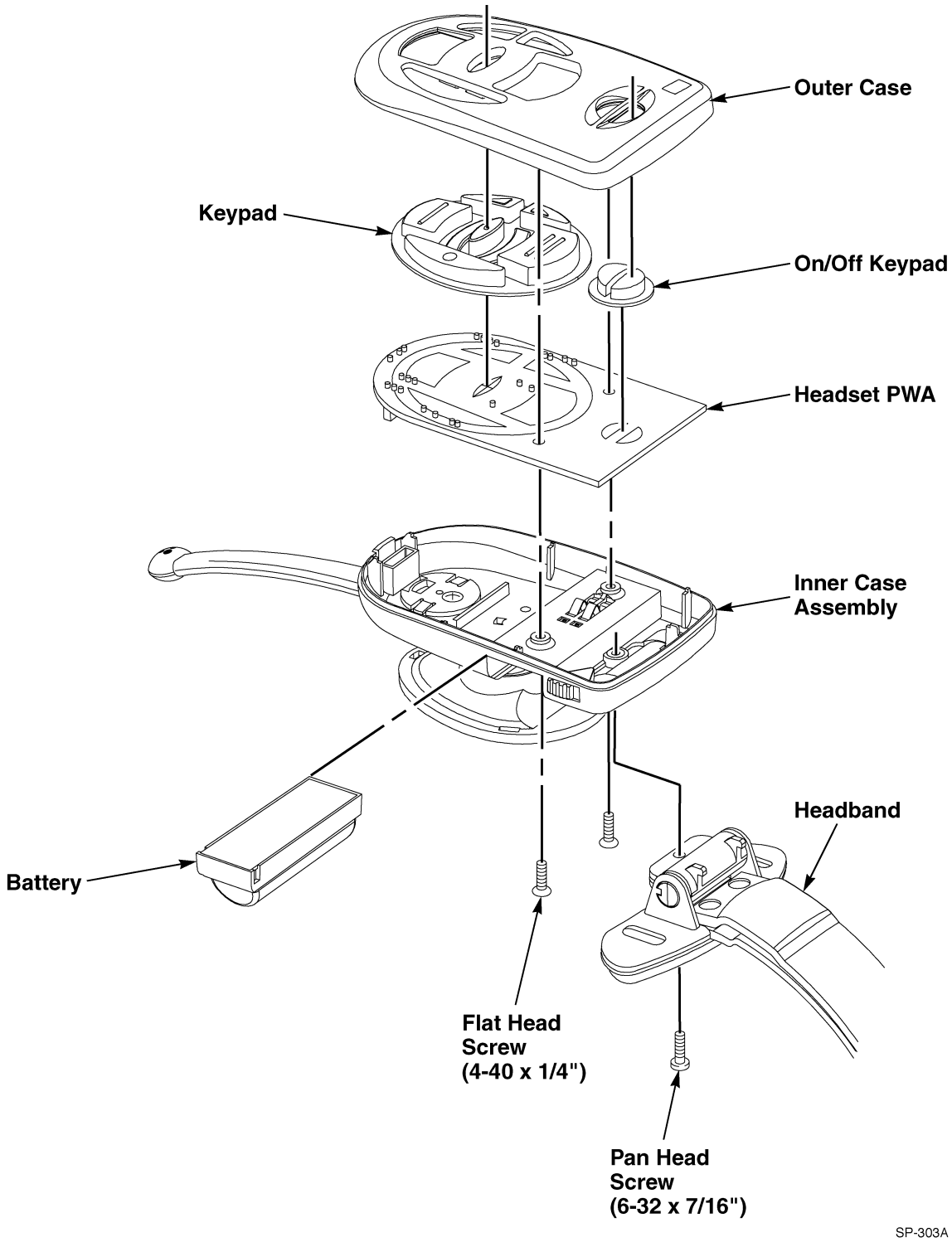
Outer Case
Keypad
On/Off Keypad
Headset PWA
Inner Case
Assembly
Headband
Battery
Flat Head
Screw
(4-40 x 1/4")
Pan Head
Screw
(6-32 x 7/16")
SP-303A

Figure 3-2.

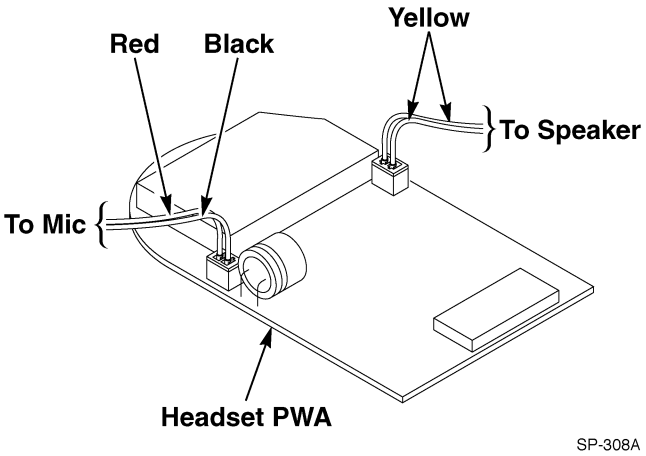

Figure 3-3.

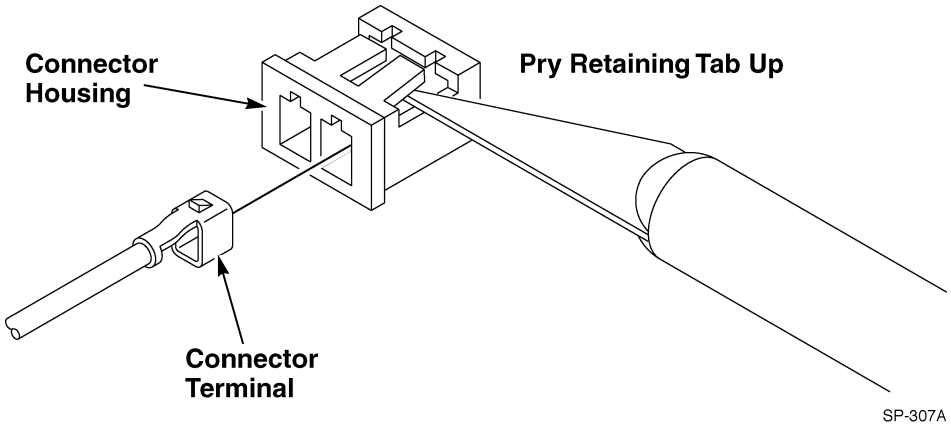

Figure 3-4.

Replacement Hinge for C760/C960 Base Station Cover

A replacement metal hinge (78-8095-0965-2) is now available to repair **C760/C960** half-covers with broken hinge teeth. It is supplied with double-stick tape and requires removal of the original teeth and struts. It is listed in the May 1, 1999 Service Parts pages.

Battery Contacts for C960 Headsets

A battery contact kit (78-6911-4630-8), containing 5 pairs of contacts is now available. It is listed in the May, 1999 Service Parts pages.

Tips and Tricks

- **C960** headbands are made of glass-filled nylon. This type of plastic is susceptible to stretching and re-forming and may fit loose on the head for a variety of reasons. Here are some headband cautions and corrections:
  - ✓ Avoid resting the headset on your shoulder between orders. Your shoulder is much larger than your head and this will stretch the headband over time.

- ✓ Avoid setting the width adjustment tab too tight for a large head. This will stretch the headband over time.
- ✓ Change all headband pads regularly for hygienic reasons and to assure a comfortable fit. New pads can tighten the headband by 3/4 inch.
- ✓ Cut a piece of 1/16" to 3/16" thick, double-stick foam tape to 1" long by 1/4" wide. Apply this tape to the folding headband arm directly under the width adjustment tab. This method will work on the old style as well as the new style headbands with the two raised width adjustment stops molded onto the folding arm.
- ✓ Apply a heat gun to both sides of the folding headband arm for approximately 30 seconds. This should soften it enough to allow it to be bent to a tighter arc. If enough heat is not applied, the nylon might return to its original arc after cooling.

- **C960** headsets with low or no listen volume may merely have the speaker hung up on the magnet. This is generally the result of a drop. Many times this can be corrected in the field. Place a small dowel rod, such as a wooden Q-tip handle or a toothpick, through one of the speaker cover holes and gently push the speaker back over the magnet.
- If extra pressure on **C960** or **C760** headset buttons is needed to activate the base station TALK or PAGE LEDs the problem may be grease buildup under the headset buttons. Disassemble the case and clean the bottom of the silicone switches and the circuit traces with a Q-tip and alcohol. If this is not done, the extra pressure will flex the circuit board and fracture components.
- Replace **C960** and **C760** microphone windscreens regularly. If the windscreen is torn or missing, dirt and grease can plug the holes in front or back of the microphone. Sometimes the holes can be cleaned with a toothpick. Solvents will ruin the mic.
- The **C960** charger automatically discharges cells that are placed in it. However the left two slots can only remove 10% of a full charge and the right hand slot can only remove 20% of a full charge. Therefore, as often as is practical, leave the batteries in the headset/beltpack until the low battery alert sounds.
- An improved **C960** Outer Case is now available from spare parts. The part number has not changed (78-8095-0525-4). It has threaded brass inserts for the case screws and it includes the screws. Avoid over-tightening the screws to prevent the screw ends from protruding through the Inner Case.
  To prevent the plastite screws from loosening on the old-style case place a VERY small drop of white wood glue on the screw threads before tightening.

Food Services Trade Department

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Instructions for replacing the C960 Inner Case

The **C960** Inner Case Assembly is now available as a spare part (78-8095-0559-3). Be sure to transfer the serial number sticker to the new case to continue the warranty, and it is a good idea to write the serial number on the case with an indelible marker. Use this procedure if you want to re-use the speaker assembly. This procedure should work 90% of the time. Occasionally you may need to disassemble the Speaker Assembly to gain access to the Ear Cup Joint and finish the job.
Refer to Figures 3-1 through 3-4 which are included in this bulletin and located on pages 3-8 through 3-10 in the "Model C960 Headset Intercom System" Service Information Manual (78-6912-0673-0).

1. Refer to Figure 3-2. Remove two screws in the battery compartment and separate the case halves. Be careful not to lose the battery release button and leaf spring.
2. Refer to Figure 3-3. Remove the mic and speaker plugs by forcing the tweezers under the lips of the plugs.
3. Refer to Figure 3-4. Remove the speaker connector terminals from the connector housing by prying the retaining tab up with the tip of the razor knife.
4. Refer to Figure 3-1. Rotate the ear cup joint clockwise in the two slots in the inner case. This can be done by pushing the two feet with a pair of tweezers or a small screwdriver.
5. Remove the speaker assembly and leads from the inner case.
6. Transfer the small rectangular foam pad from the old inner case to the new inner case.
7. Feed the speaker leads through the hole in the new case.
8. Pre-twist the ear cup joint feet clockwise. They should remain slightly past the halfway point of the slots in the speaker assembly.
9. Align the two feet of the joint with the slots in the case.
10. Push down hard on the speaker assembly and twist clockwise while rocking it side to side until the two feet come through the slots in the case. The tweezers or screwdriver will help this process.
11. Rotate the feet fully counterclockwise in the slots to lock the speaker assembly in place. The tweezers or screwdriver will help this process.

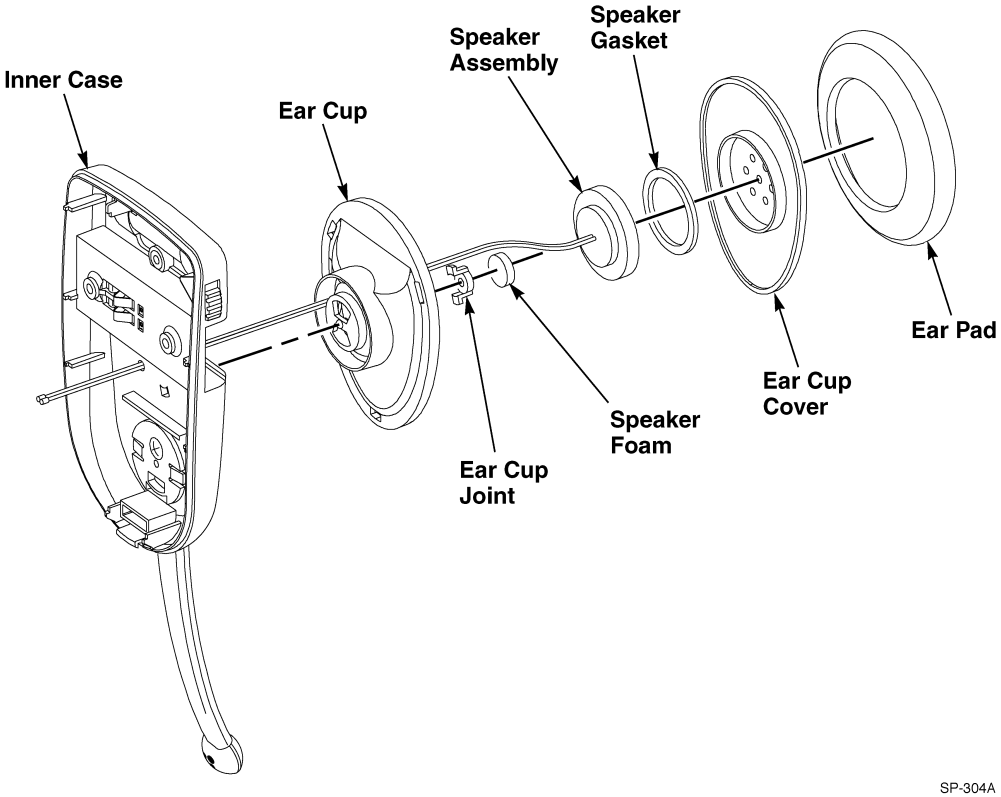
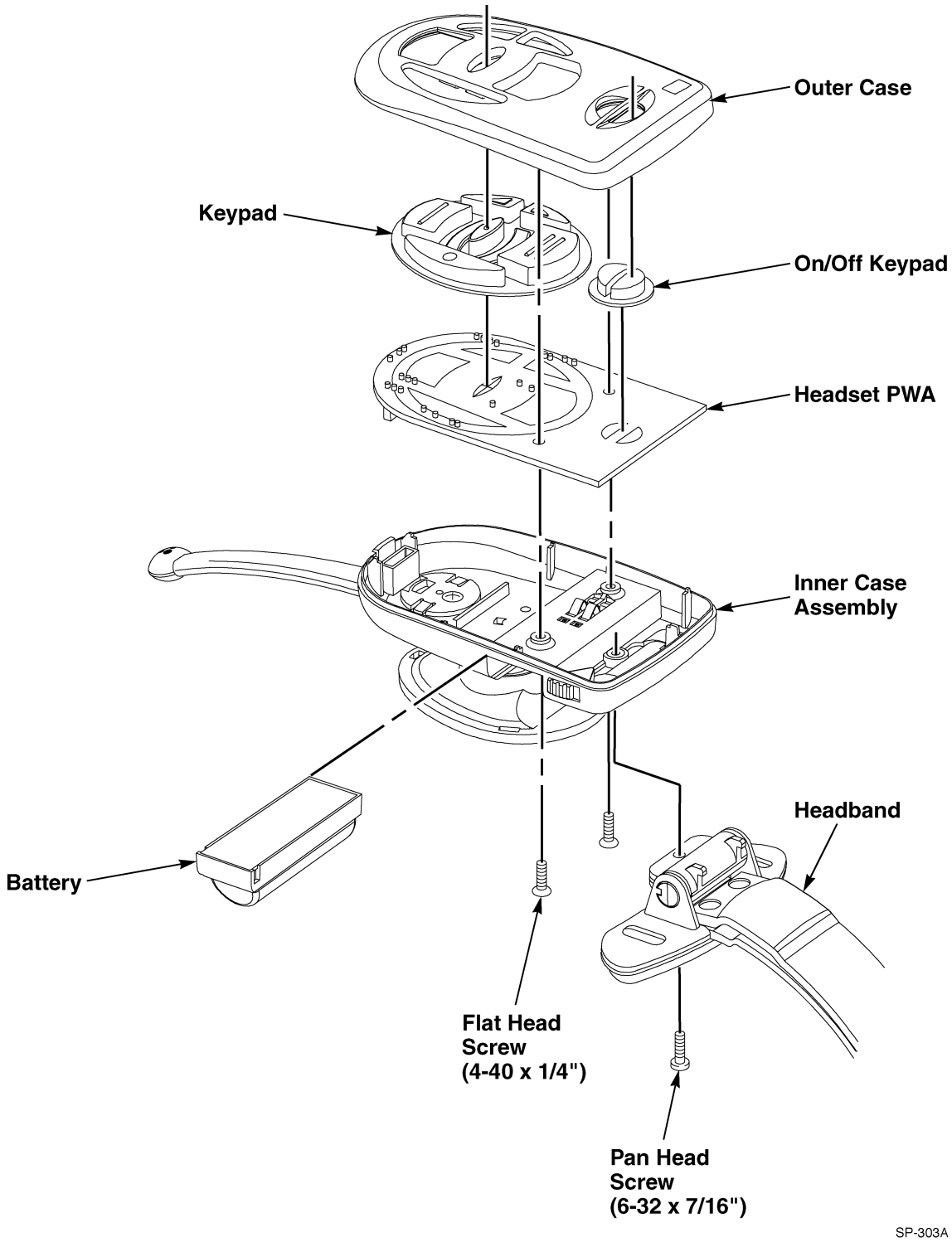


Figure 3-1.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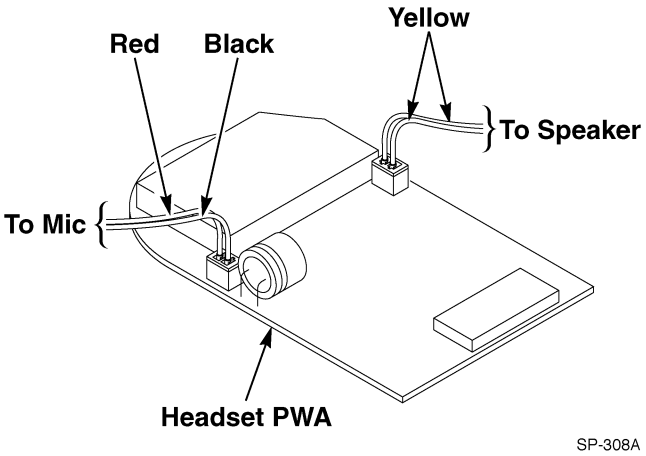

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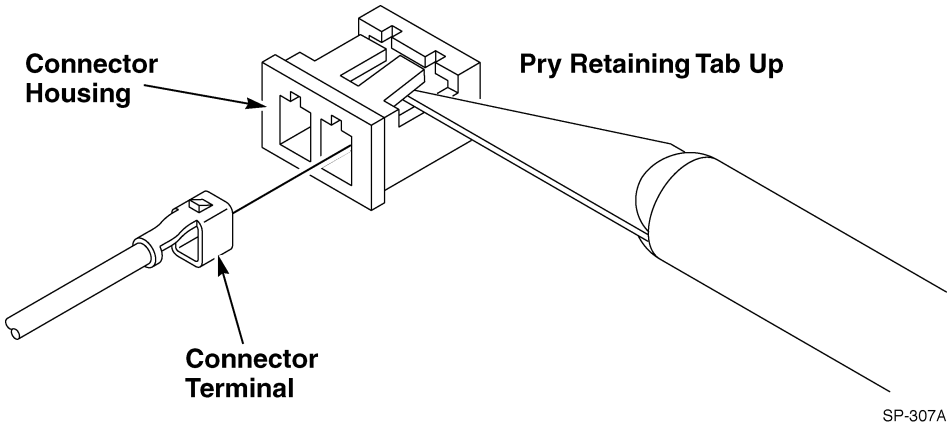

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#

C-Series Intercom Systems

Model C960

Technical Bulletin 11/3/98

In this Technical Bulletin, we will discuss three issues followed by a series of Tips and Tricks.

1. *C960 Cross Lane Operation*
2. *C960 Radio Interference*
3. *C960 – 900MHz vs. Licensed frequencies*
4. *C960 Tips and Tricks*

1. C960 Cross Lane Operation

When installing two C960 Base Stations and a Cross Lane Module, where one headset may communicate with both base stations, please note the four basic facts below:

1. You must configure the headsets for CROSS LANE operation.

a. With the headset OFF, press and hold T1 and T2 while pressing ON for 5 seconds. You will hear an acknowledging beep.

b. To remove this function and lock T1 and T2 back together, first turn the headset OFF, then hold down either T1 or T2 while pressing ON for 5 seconds. You will hear an acknowledging beep. (Holding down T1 configures the headset to be a LANE 1 headset; holding down T2 configures it for LANE 2.)

2. Both vehicle alert tones may be heard at all times.

The operator may object to hearing the vehicle alert from the other lane while taking an order; if so, we suggest you turn the ALERT TONE LEVEL down on each base station so it is audible in the headsets but not objectionable. The tone should be low enough so that the operator can ignore it, yet know that someone is waiting at the other lane.

3. Both menu mics may be heard at the same time.

If the operator is talking to lane 1 and the lane 2 alert tone sounds, the operator should ignore the tones and finish the transaction on lane 1. If the operator presses T2 to cancel the tone, the operator will hear both menu mics at the same time until one car drives off the loop. This **is not** a recommended mode of operation.

If this is a problem, the AUDIO IN and AUDIO OUT wires may be disconnected from the Cross-Lane Module. Then the operator will only hear the menu mic from the lane with which he/she last talked. (Caution: With the Audio In and Out wires disconnected, anyone monitoring both lanes will only hear the lane with which his/her headset last talked.)

4. **Listen and Page follow the T(x) button.**

Disconnecting the Audio In and Out wires presents some issues if a cook or cashier needs to monitor both lanes:

a. If the cook or cashier is monitoring lane 1 and the operator is taking an order on lane 2, and if the operator needs to PAGE the cashier, he/she must first press T1 momentarily then press PAGE to communicate privately with the cashier. Then the operator can press T2 to resume taking the order on lane 2.

b. As an alternative, a monitor speaker from each base station may be installed in the kitchen, or, if the audio wires are still connected to the Cross-Lane Module, only one monitor speaker. (Caution: Monitor speakers are generally not recommended for Duplex Systems. The speaker location and volume are usually too critical to avoid feedback.)

2. C960 Radio Interference Discussion

Radio interference is the number one field service problem with most wireless systems today. It is also the most misdiagnosed. The net effect of interference is reduced operating range.

Symptoms of interference:

- The operating range between the base station and the headsets gets very short, sometimes 25 feet or less.
- Normally, you will hear nothing to indicate interference. Occasionally, you might hear a whistle in the background, but seldom, if ever, will you hear talking.
- The Talk or Page LED flickers briefly causing one of the following:
  1. The system may leave the STANDBY mode, and go into the LISTEN mode with no vehicle alert heard.
  2. The system may drop out of TALK LOCK by itself.

Solutions:

- Change the base station to another channel, at least three channels away. A better solution is to change the jumper to Lane 2 if possible.
- Locate and shut off other 900 MHz devices in the building, such as cordless phones, video systems, and speaker systems.
- In cases where a cellular phone tower is nearby, certain combinations of cell frequencies may cause interference. In some cases, changing channels may have no effect. Please call 3M FST Communications Products Technical Service (800-328-0033 press 2, 4) in these cases.

3. C960 – 900MHz vs. Licensed Frequencies

Quick Service Restaurants currently use three frequency ranges for wireless intercoms. All require FCC licensing except for those in the 900 MHz range. Licensed systems offer greater operating range since their radios emit about 100 milliwatts. However, this power comes at a price:

- These units are typically larger and heavier.
- Batteries typically do not last as long.
- They are noisier.
- They are generally more susceptible to interference.
- They have larger “dead spots”.

475 MHz

These licensed units must compete with other radios of local businesses that may have up to 5 watts of power. However, to maximize battery life, power is restricted to less than 5% of this figure. This makes them susceptible to interference from these high-powered radios operating nearby.

In addition, there are mobile radios within this frequency range on service trucks, ambulances, and inventory systems. Therefore, interference is rather unpredictable.

30 and 160 MHz

The lower frequency of these systems is extremely susceptible to interference from CB radios since they are only about 1 MHz away in frequency. A CB radio in the parking lot or one of the common, but illegal, radio boosters on a semi on the freeway a mile away can render these systems unusable for short periods of time. Devastating to a restaurant, and very unpredictable.

Manufactured electrical noises also inhabit the 30MHz spectrum. Fluorescent lights, electric drills, milkshake machines, light dimmers all cause noises that are picked up on radios operating at this frequency.

900MHz

The FCC limits the power of all devices operating in this band such that their typical operating range seldom exceeds 250 feet. A device operating at this frequency seldom can be located close enough to a restaurant to cause interference. However, when it does occur, our system has 16 frequencies available for instant channel changes.

The largest user in this band is the cordless telephone. Although it can cause interference, a quick channel change can avoid it. 900MHz phones have begun to use “spread spectrum” technology, which causes no interference to our system.

Since 900 MHz systems emit about 0.001 Watt of power, they can operate longer on smaller and lighter batteries.

Few manufactured electrical noises are encountered at these higher frequencies.

Another advantage is the length of a “dead spot”. Bouncing radio waves off steel surfaces cause cancellations of other waves and the net effect is an area where the radio picks up nothing. At 900 MHz the length of this spot is only a few inches versus a few feet for the lower frequency licensed equipment.

4. Tips and Tricks

- **C960** headsets with symptoms of constant “static in the listen mode” are occasionally appearing. If programming has no effect on the static, these headsets must be returned to the Repair Center to be “factory programmed”. Early tests indicate that dirty battery contacts may be responsible. A preventive solution is to clean the battery and headset contacts monthly with alcohol and a Q-tip.

- When troubleshooting a **C960/C760** base station with intermittent or no power, it is possible to use the 14VAC power supply supplied with the battery charger and most wired intercoms *temporarily*. The base station will work with AC or DC. In fact, some installers have mixed up the charger and base station supplies. Because of the detrimental effect on the signal to noise ratio, we do not recommend anything but the proper supply for a permanent installation. Another symptom is that the batteries don’t last very long in the headsets because the base station power supply will not properly operate the charger.

- The **C960** Battery Charger contains 3 or 6 independent charger modules. They share only the power supply. Therefore, you may see several independent symptoms but seldom will it affect all slots.

- The **C960** Battery Charger automatically discharges the battery for about 15 minutes or down to 1 volt, whichever comes first. However, it cannot remove more than about 20% of a full charge. Therefore, to prevent memory build-up, as often as is practical, use the batteries until the low battery alert sounds. It is OK to change the battery at shift change time most of the time as long as it *occasionally* gets completely discharged in the headset. Otherwise, you may need to occasionally press the Condition button with the cell in that slot. A rechargeable cell can typically be recharged 500 to 1000 times; the process of conditioning uses up two of those charge cycles, so it should not be done indiscriminately.

- Some **C960** mics are reported to be lower in volume than others. We noticed some returned mics have the holes plugged with food. This can decrease or increase the power of the mic. Do not use solvents; use a toothpick to clean the holes. Don't forget to replace the foam mic cover; this is probably how the holes got plugged in the first place.

- Since the **C960** microphone is of a noise canceling type, it MUST be positioned at the corner of the mouth…not below the chin, or low outbound audio will result.

- Older style **C960** mics with the butt joint can be reinforced with a piece of clear shrink tubing. Place a short piece of tubing over the butt joint where the plastic tip meets the rubber boom; then carefully apply heat. Tubing can be purchased from Newark Electronics - Alpha, p/n FIT 295, 3/8" clear, semi-rigid poly.

- Complaints of "loose fitting" **C960** headsets may stem from not replacing the headband side pads often enough. These compress with age resulting in discomfort and a loose fit.

- If a **C760** system has been upgraded with **C960** headsets, a symptom of delayed or no TALK LED has been reported. Please call 3M FST Communications Products Technical Service (800-328-0033) for a solution to this problem.

#

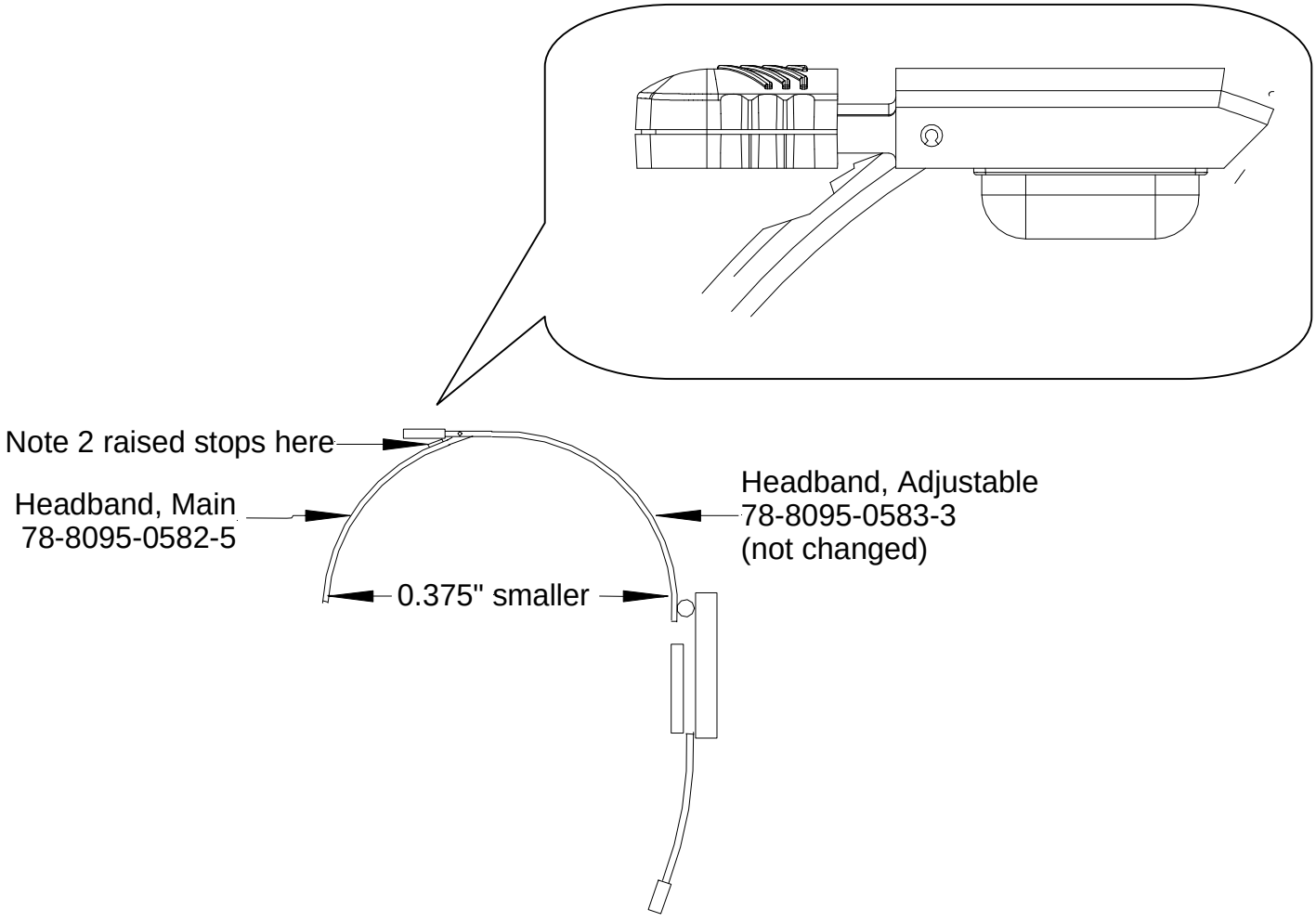
Headset Intercom System

Model C960AA

Technical Bulletin 6/15/98

Headbands

The C960 headbands have been redesigned to be 0.375” smaller when they are adjusted to the smallest setting. At the largest setting they will open to the same size as the original design. Only the headband assembly, main (78-8095-0582-5) will change. The headband assembly, adjustable (78-8095-0583-3) attached to the headset with a single screw, will not change. The new headbands can be identified by 2 narrow raised stops on the swinging band directly below the adjusting tab. They are in production and spare parts now. See drawing below:



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#

Headset Intercom System

Model C960AA

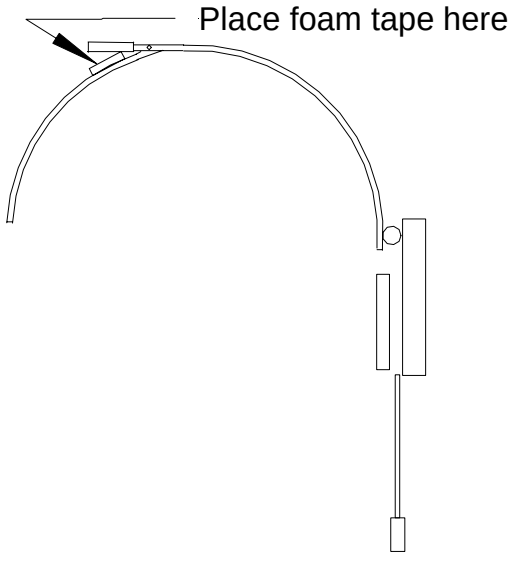
Technical Bulletin 4/27/98

Mic Booms

We are getting some **C960** headsets in for repair with "no talk" symptoms due to broken mics or mic wires. These failures can be traced to over-flexing the rubber mic boom by the operator. This could be reduced if the installer would instruct the operator to rotate the microphone boom up or down so that its tip is in line with the corner of the mouth, but not to bend the rubber microphone boom. We have recently redesigned the tip to be more robust and you will recognize it as being slightly longer than the original tip. It is now available in spare parts and will soon appear on production headsets. The mic boom lock is a disk that keeps the boom at the proper height. It has also been redesigned.

Headbands

Here are some suggestions to reduce the problem of headbands slipping. Replace any worn or damaged headband pads with new ones; they compress with age. Change pads every few months. Attach a piece of approximately 1/8" thick double stick foam tape to the main headband, directly below the width adjustment tab. Then wrap strapping or packaging tape over the foam tape and the headband to keep it in place as shown below: Headbands are being redesigned to be 0.375" smaller. They will be in production and spare parts soon.



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Talk Lock Explanation

TALK LOCK mode was designed to allow order takers to communicate hands free without pressing any buttons. In TALK LOCK mode, the C960/C860 automatically switches from STANDBY to TALK/LISTEN when a vehicle is detected at the menu sign and then back to standby when the vehicle leaves the menu sign. When the next vehicle arrives, a single alert tone (or one double tone if set to LANE 2) will be heard and the system will automatically start talk/listen operation.
TALK LOCK is only available if it has not been disabled, if the system is operating in duplex, and if the system has a "presence detecting" type of vehicle detector.
To use the TALK LOCK mode, press the TALK LOCK switch. To return to normal operation, press either TALK switch or the PAGE switch. For those customers who DO NOT wish their employees to use TALK LOCK, the function can by disabled by a special programming step. (All units are shipped with TALK LOCK enabled.)

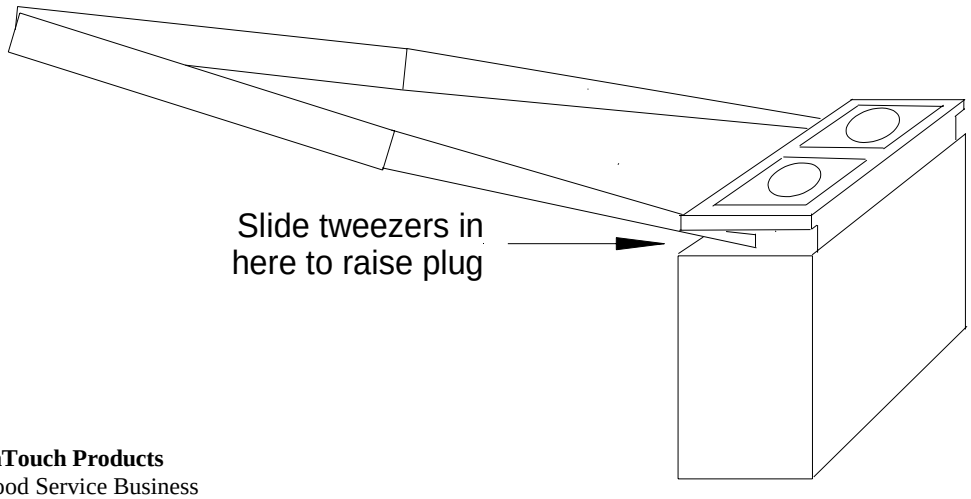
To disable TALK LOCK;
Turn the C960/C860 off.
Press and hold the TALK LOCK button
Press and hold the ON switch.
Hold both switches depressed for 2 seconds until a programming tone is heard in the headset.

Test the headset to verify that TALK LOCK has been disabled. With the TALK LOCK feature disabled, pressing the L button will have no effect on the system function. With the TALK LOCK feature enabled, the C960/C860 base station switches from STANDBY to TALK mode when the TALK LOCK button is pressed.

To re-enable TALK LOCK;
Repeat the same procedure you used to disable TALK LOCK
This is a "toggle function" and each time the procedure is repeated, the function setting is reversed.

Mic Connector/Speaker Plug Replacement

Refer to the C960 Replacement Parts and Service section of the manual page 3-11 “Replacing the Mic Boom Assembly”. Use a pair of tweezers to "wedge" (not pull) the mic connector off when replacing. Push the small pointed pair of tweezers forward along the short sides of the mic plug as shown below. This will force the plug up from the receptacle. Remove the speaker plug the same way.



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C-Series Intercom Systems

Model C960

Technical Bulletin 4/15/98

C960/C860 BATTERY FACTS

- The battery for the C960/860 is a 1.25 Volt, 1200 milli-Amp hour, nickel metal-hydride cell in a plastic case. Inside the case with the cell is a thermostat and 2 contacts.
- Average battery life = 4 ½ to 6 hours.
- The low battery tone from headset will sound when the battery reaches 1 volt.
- A battery fresh from the charger is typically 1.5 volts then settles to about 1.4 volts after an hour.
- The contacts of an empty battery charger will measure approximately 20 VDC.
- Recharge time is about 2 hours; 3 ½ hours to both condition and recharge a battery.
- Typically you should expect at least 1000 charge/discharge cycles.
- The battery is considered by the industry to be worn out when its capacity decreases to 80% of rated capacity. This is also applicable to use time. When a battery only provides a charge life of 80% of original, the industry says it's worn out.
- 3M does accept warranty claims for defective thermostats.
- To test for a defective thermostat, plug the battery into a known good charger. If the contacts are good and the charger LED does not light, the thermostat is bad.
- Batteries are warranted for six months from date of shipment to the end user and covers defects in manufacture. A four digit code is stamped on one end denoting the week and year of manufacture (4897 would indicate the 48th week of 1997). 3M does not accept warranty claims for short life, broken batteries, damaged contacts, or claims traceable to damage

Reminder: To troubleshoot batteries effectively you should use the optional analyzer. It will condition the battery in the left-most slot (as viewed from the front), removing any "memory problems" that it may have. You have a choice of determining how many times it charges/discharges the battery (1 through 4) or you can allow it to operate "automatically." At the end of the total cycle, it will leave the battery in a charged condition and display the capacity of the battery in terms of "milli-Amp hours". (A capacity rating of how many hours the battery can supply one milli-Ampere of current).

Ordering Information

The unit is identified as "3M Battery Analyzer Model DA801M" and the price is $125 each.

To order one, please contact: Specialty Engineering, Inc.
1403 S. Harrison St.
Mason City, IA 50401
(515) 424-5305

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3M Wired/C5000 Intercom Systems

Technical Bulletin 04/01/2003, Rev. B

C5000 POS Translator

The current C5000 POS Translator (78-9236-6753-5) will function ***only*** with the current 0 thru 9-key (model 2475) Station Selector (78-9236-6513-3). It is ***not*** backwards compatible with the original 8-button (model 5208) or 16-button (model 5216) Station Selector.

If a customer needs to order a POS Translator, you need to ask whether it is to be used with a current (model 2475) Station Selector or with the original 8-button (model 5108) or 16-button (model 5116) Station Selector.

The 3M Repair Center will repair or replace the original POS Translator (78-9236-6387-2) as needed.

Recommending Wire Gauges for 3M™ Intercom Systems

Audio and Call Station Wiring: The goal is to achieve less than 10 Ohms for the total distance of the longest wire run.

Audio Wiring

Wire Gauge	Distance Between Components
22	Up to 309 feet
20	310-493 feet
18	494-783 feet
16	784-1245 feet

Wiring ONLY for the RS485 buss on the C5000 and Performance Series Intercoms: These wires also supply DC power to the Station Selectors. When installing a Station Selector for the C5000 and Performance Series Intercoms we recommend adding a separate power supply to the Station Selector if it is located more than 100 feet from the Communications Controller.

RS 485 Wiring ONLY

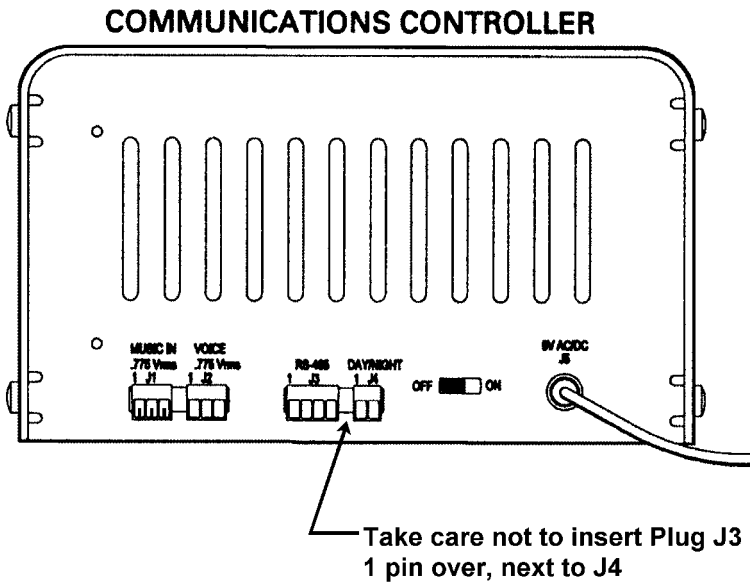
Wire Gauge	Distance Between Components
22	Up to 62 feet
20	63-99 feet
18	100-157 feet

Separate Power Supply for C5000 and Performance Series Station Selectors

When installing a Station Selector for the C5000 and Performance Series Intercoms we recommend adding a separate power supply to the Station Selector if it is located more than 100 feet from the Communications Controller. This insures adequate power for the Station Selector. The part number is 78-8095-0910-8 for a 9VDC, 2 Amp power supply.

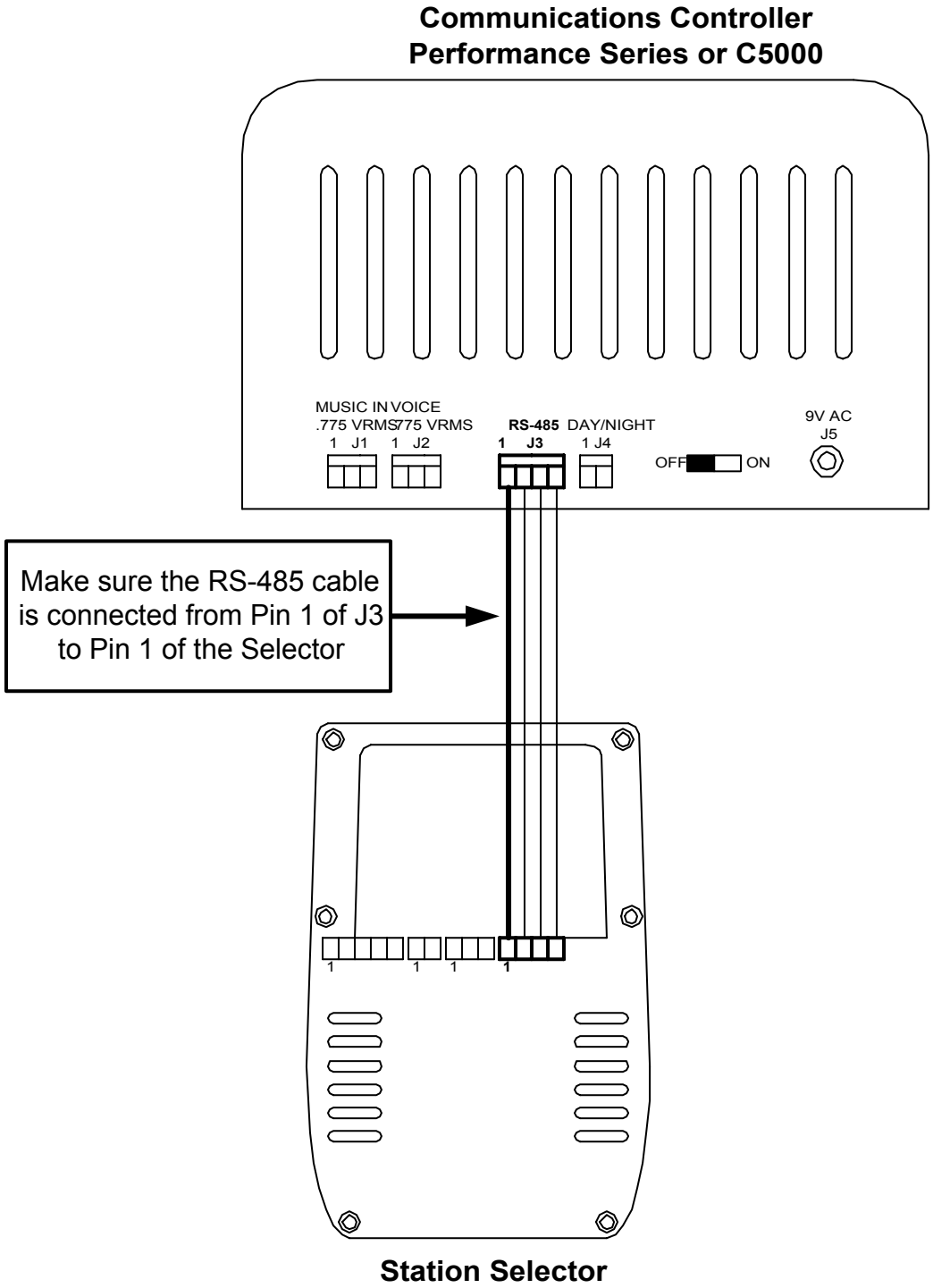
Power Supply Failures for Performance Series (2470) Systems

One cause of the 9 VAC Power Supply failing for the model 2470 Communications Controller is shown below. If you plug the J3 connector incorrectly into the socket, with pin 4 in the gap between J3 and J4, it will short out the power supply causing it to fail. See drawing below.



Power Supply Failures for Performance Series (2470) and C5000 Systems

Another cause of the 9 VAC Power Supply failing on the Performance Series model 2470 and the C5000 systems is incorrect RS-485 cable wiring. Pins 1,2,3,4 from J3 on the Controller must be routed to Pins 1,2,3,4 on the 4-pin connector on the Selector. PROPER POLARITY MUST BE MAINTAINED. The power supply, Controller and Selector may fail if polarity is not correct. See drawing below.



D-20V Gooseneck VOX Microphone Change

The D-20V, 6-station, (model 445) intercom, original *dynamic*, gooseneck, VOX, mic (78-8050-8485-7) will be replaced with a 16" *electret* , gooseneck, VOX, mic (78-8095-0839-9). This electret mic is the same one used on C5000 and Performance Series intercoms. This mic change will begin approximately May 2003. No changes will be made to the circuit boards. The D-120V, 12-station intercom mic will remain unchanged at this time.
If an original *dynamic*, gooseneck, VOX, mic (78-8050-8485-7) needs to be replaced, order a (Microphone, Flexible, without switch, 78-8010-4847-7). You will need to re-use the original VOX mic base flange.

D-15, D-20, D-120, 18-terminal Connection Cable

The 9-pair, 18-conductor cable, supplied with the Classic Series intercoms was changed in 1996 to provide improved shielding. The current part number is 78-8095-0213-7. The original cable (78-8050-8524-4), which still appears in the older parts manuals, was discontinued in 1996.

D-120, 16.5 VAC Power Transformer is Obsolete

D-120 and D-120V intercoms produced after March 2000 require a 14VAC, 2.88Amp, power supply transformer. The 16.5VAC, 40 VA power supply transformer (78-6911-2383-6) is not compatible with the current D120 and D-120V 12-station intercom. These intercoms require a 14VAC power supply **ONLY**. The 14VAC power supply is backwards compatible with all D-120 intercoms and has the same part number as the 16.5VAC power supply. Please check you spare parts stock and remove any 16.5VAC power supplies.

The current 14VAC power supply transformer does not have the wire colors marked on the terminals. The Black wire from the D-120 connects to the transformer GND terminal. The Red and White wires from the D-120 connect to either AC terminal.

Symptoms of a current D120 16-station intercom powered by an obsolete 16.5VAC power supply are: "ALL CALL" works fine, but when an individual station is selected, there is no audio.

Best Wiring Practices for Terminal Strips

Strip and fold the wire when connecting to a screw-clamp terminal block, such as those found on most 3M™ intercoms and accessories. Use this method for wires less than 18 AWG. See Figure A.

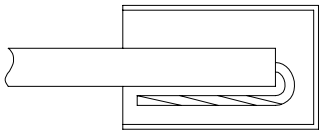


Figure A

Use this strip-only method for wires 18 AWG and larger. Smaller gauge wires may break when flexed. See Figure B.

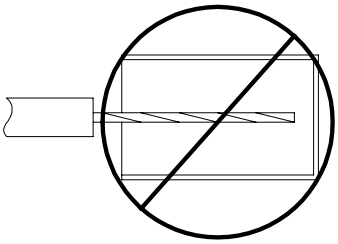


Figure B

If more than one wire must be inserted into a single terminal, strip, then twist the wires together before inserting them. Use this method only for wires less than 18 AWG. See Figure C

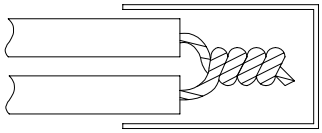
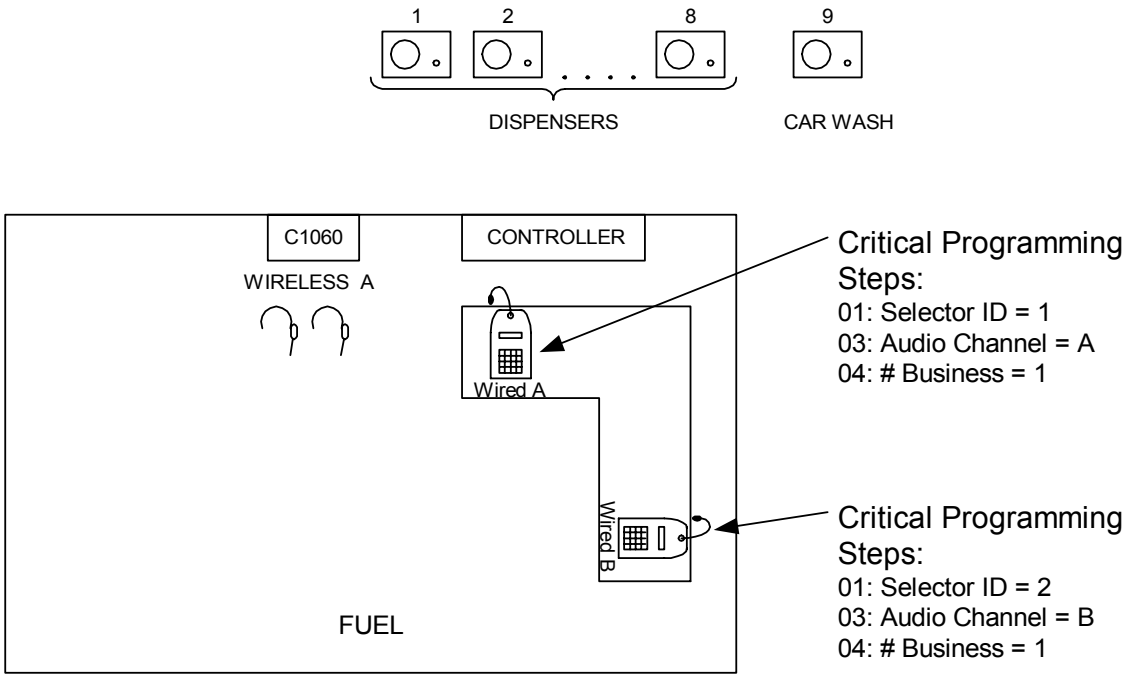


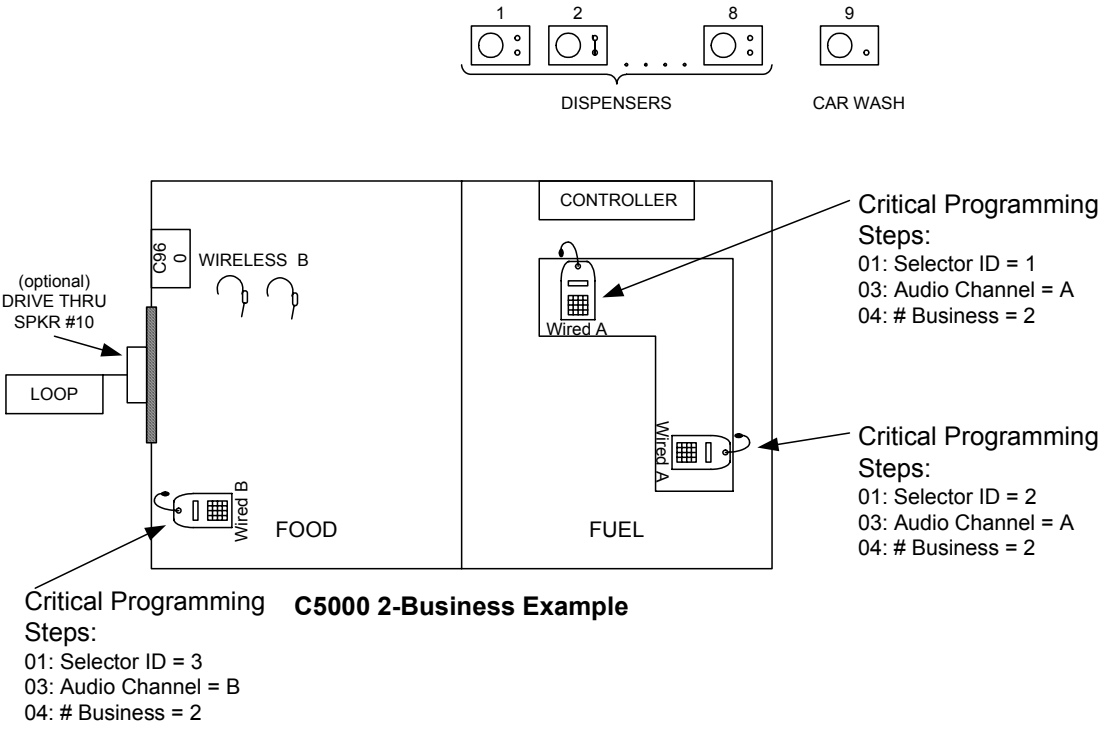
Figure C

C5000 Installation Examples

The following two examples are intended to show an overview of typical C5000 Installations.



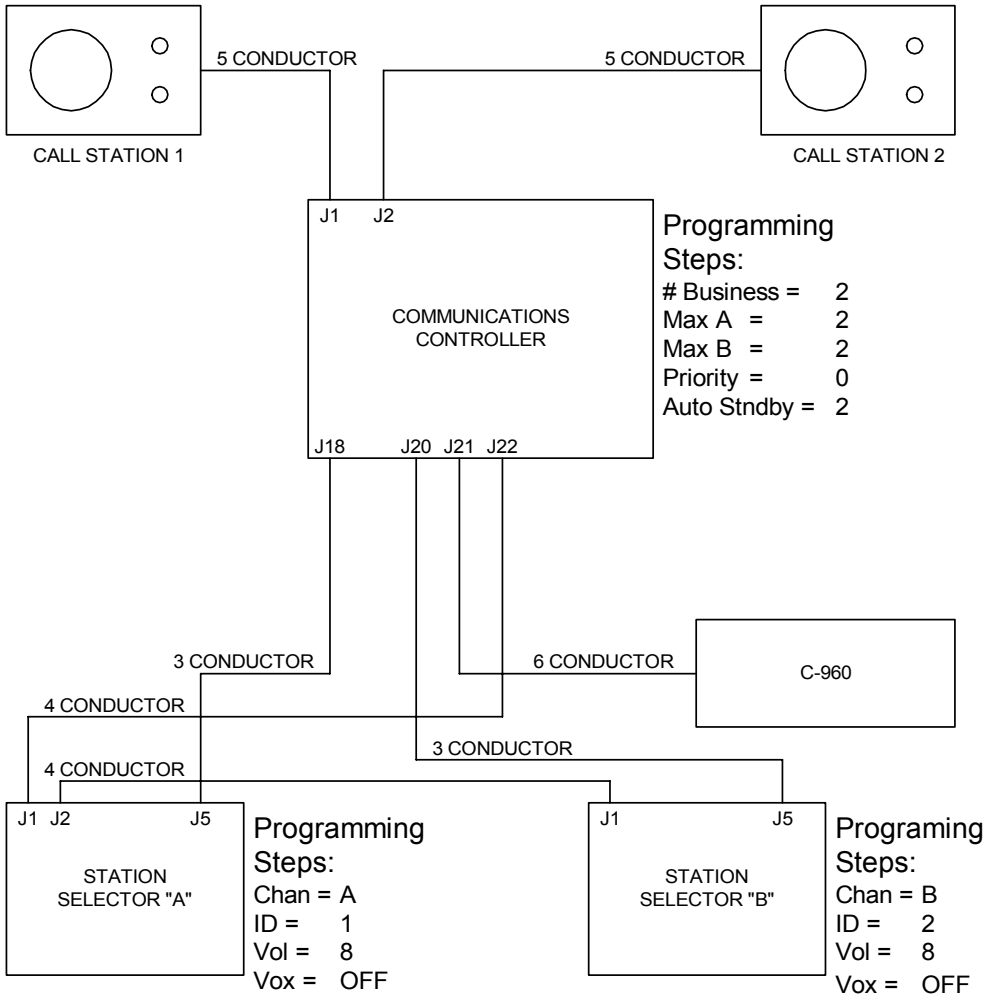
C5000 1-Business Example



C5000 2-Business Example

C5000 Demo Kit Wiring Diagram

The following diagram shows the connections and programming steps in the C5000 Demo Kit. Some kits may have one Station Selector and some kits may have one Call Station. Please insert a copy of this page into the kit.



C5000 Demo Kit Wiring Diagram

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#

C5000 Intercom Systems

C5000

Technical Bulletin 9/20/99

C5000 Software Revision History

C5000 Communications Controllers are now being shipped with software revision, "CONTROLLER VERSION 2.10" printed the microcontroller chip located near the center of the circuit board at reference designator UB1.

Version 2.10

C5000 Communications Controllers with software revision, "CONTROLLER VERSION 2.10" or greater will trigger more reliably with a Heavy Duty Security Handset (78-6911-2379-4), if the capacitor and resistor in the handset are replaced with a length of wire. Add a length of wire from handset terminals 6B to 5B. The existing capacitor and resistor may remain connected if desired. *See Figure 1. (attached).*

Another feature, added with this revision, is the ability to use a Station Selector to pre-select a station number for the C960. When a station number is pressed on the appropriate (Food or Fuel) Station Selector, it will flash for three seconds. If the Talk button is pressed on a C960 headset while the number button is flashing, the C960 will be connected to that station.

Note:
With this revision the TALK button MUST be pressed to initiate a call out to a Call Station, after pressing a station number on the Station Selector.

C5000 8 Station Communications Controllers starting with serial number 5108001690 and C5000 16 Station Communications Controllers starting with serial number 5116001308 contain software version 2.10.

It is possible to upgrade existing Controllers to "Version 2.10". Please contact 3M Technical Service (800-328-0033) for update instructions.

Version 1.10

On earlier C5000 systems, replace the 1 micro-Farad capacitor and the 100 kilo-Ohm resistor in the handset with a 10 micro-Farad 50 Volt capacitor and a 20 kilo-Ohm 1/4 Watt resistor. These Communications Controllers can be identified by noting software revision, "CONTROLLER VERSION 1.10" or lower printed on the microcontroller chip located near the center of the circuit board at reference designator UB1.

Note: All Heavy Duty Security Handsets manufactured after July, 1998 have the above modification.

A feature, added with this revision, is the ability to disable the 30 second automated station connection timeout. A 5th programming step was added to the Communication Controller to accomplish this.

See C5000 Installation Instruction replacement pages 5 and 7 (attached) to update your C5000 Installation Instructions.

C5000 Remote Microphone

The 3M C5000 Three-Button Remote Microphone (78-8095-0893-6) functions as a remote workstation for a Station Selector in the C5000 System. It can be used to answer incoming calls in the order they were received or broadcast to all Call Stations simultaneously. It is a less expensive alternative to an extra Station Selector.

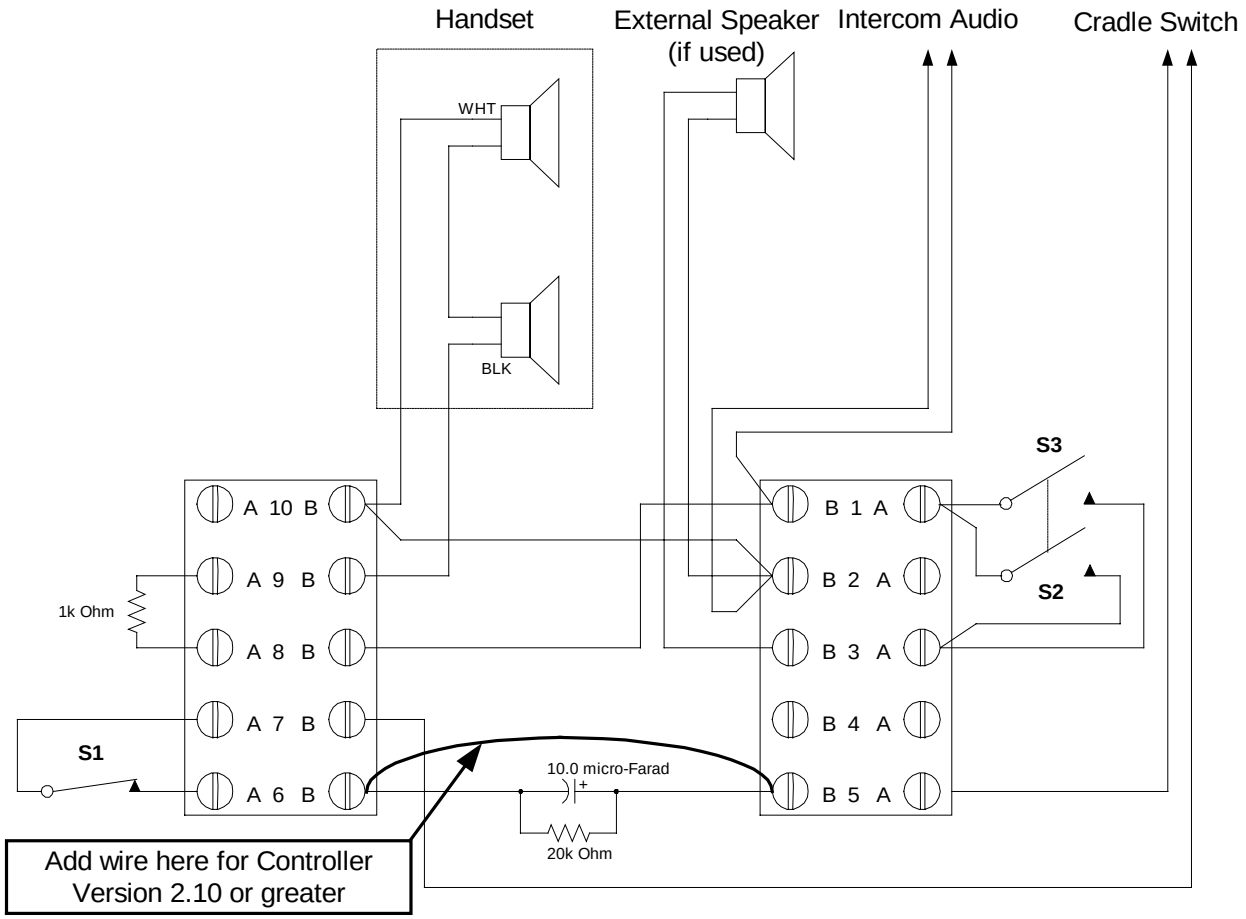

Figure 1. Heavy Duty Security Handset (78-6911-2379-4)

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Programming

Program the Station Selectors and the Communications Controller to conform to your planned configuration and desired operation.

Programming the Communications Controller

Before adjusting the Communications Controller, you must place it in the programming mode:

1. Turn the Communications Controller off.
2. Hold down either of the PARM keys while turning the Communications Controller on.
3. Release the PARM key when the STANDBY, QUEUE, A ACTIVE, and B ACTIVE LEDs next to PB4 illuminate simultaneously.

Parameters and Values

The Communications Controller is configured by setting five parameters. The value set for each parameter determines the parameter's function. The parameters and their range of values are:

Parameter	Value	Function
1. Number of Businesses	1 or 2	Configures the Communications Controller as a dual-channel intercom (1 business type) or two single intercoms (2 business types).
2. A Maximum	1 to 16	The highest Call Station number (starting from 1) that A Audio Channel devices can access.
3. B Maximum	1 to 16	The highest Call Station number (starting from 1) that B Audio Channel devices can access.
4. Priority Station	OFF, 1 to 16	Selects one Call Station to be the top priority. While all other Call Stations will be answered in the order in which inbound calls are received, a call from the priority Call Station is answered first.
5. *Auto-Standby	1 or 2	Cancels a Call Station selection if a TALK key (on selector, headset, or beltpack) has not been pressed within 30 seconds. 1. Enables Auto-Standby. 2. Disables Auto-Standby.

* Requires software revision, "CONTROLLER VERSION 1.1" or greater printed on the microcontroller chip located near the center of the circuit board at reference designator UB1.

Software

Program the Communications Controller for the settings shown in Table 2:

Table 2. Communications Controller Programming Options

Parameter	Parameter Display	Value	Value Display
1. Number of Businesses	○○○●	1=One Business (Food OR Fuel)	○○○●
		2=Two Businesses (Food AND Fuel)	○○●○
2. Maximum Number of Call Stations Accessible on **Channel A**	○○●○	Minimum = 1	○○○●
		Maximum = 16	●●●● (Flashing)
3. Maximum Number of Call Stations Accessible on **Channel B**	○○●●	Minimum = 1	○○○●
		Maximum = 16	●●●● (Flashing)
4. Priority Station **OFF, 1-16**	○●○○	OFF = 0 Minimum = 1	○○○○ ○○○●
		Maximum = 16	●●●● (Flashing)
5. * Auto–Standby	○●○●	1= Auto–Standby enabled	○○○●
		2=Auto–Standby disabled	○○●○

* Requires software revision, "CONTROLLER VERSION 1.1" or greater printed on the microcontroller chip located near the center of the circuit board at reference designator UB1.

#

C-Series Intercom Systems

Model C5000

Technical Bulletin 11/4/98

- If a **Heavy Duty Security Handset** (78-6911-2379-4) is to be used with a **C5000** system, the trigger pulse from the handset needs to be lengthened. Replace the 1 microFarad capacitor and 100k Ohm resistor on the terminal block with a 10 microFarad capacitor and 20k ohm resistor. All handsets from our stock received after July, 1998 have these updates. They can be recognized by a "07/98 Rev. C" sticker on the outside of the shipping box and inside the stainless cradle switch cover. This modification is compatible with all D-Series intercoms.

- If a **C5000** Station Selector occasionally resets itself (shuts off, then comes back on with a series of beeps), the RS-485 buss wiring may be too small. We recommend that the RS-485 buss wiring from the Controller to the Selectors be 18 gauge. Another solution is to use an additional 9 VDC power supply on the offending Station Selector.

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3M Intercom Systems

Accessories

Technical Bulletin 12/3/01

A200BA and A201BA Magnetic Loop Detectors

We have redesigned the Model A200/A201 Magnetic Loop Detectors for improved effectiveness. The wiring configuration and part numbers will be identical to the previous models. We will discontinue the Model 917-2 Detector. The redesigned detectors are designated as follows:
Detector, Magnetic Loop, External, Model A200BA, 78-9236-6456-5
Detector, Magnetic Loop, Internal, Model A201BA, 78-9236-6498-7

A300 Audio Greeter

When using the Model A300 Audio Greeter with a C921BA Base Station, any message playing over the menu speaker will be cancelled when the order-taker presses the TALK button for at least one second. A short tap of the TALK button will cancel only the alert tones, allowing the message to continue, and be heard in the headset/beltpack.
These features are available if all connections are made as shown in Figure 4 in the A300 Installation Instructions. The A300 internal DIP SW2-8 must also be set to ON. This will mute the menu microphone during the message. The message will continue to be heard in the headset/beltpack via the AUDIO IN terminal on the base station.

Accessory Microphones, Flexible

We recently changed the manufacturing process for the flexible microphones, which are used primarily with the older D-Series intercoms. They are functionally the same as the past models. The wire colors have changed. Please note the wiring installation diagram shown in Figure 1.
Microphone, Flexible, Normally Open, 78-8010-4873-3
Microphone, Flexible, Normally without Switch, 78-8010-4847-7

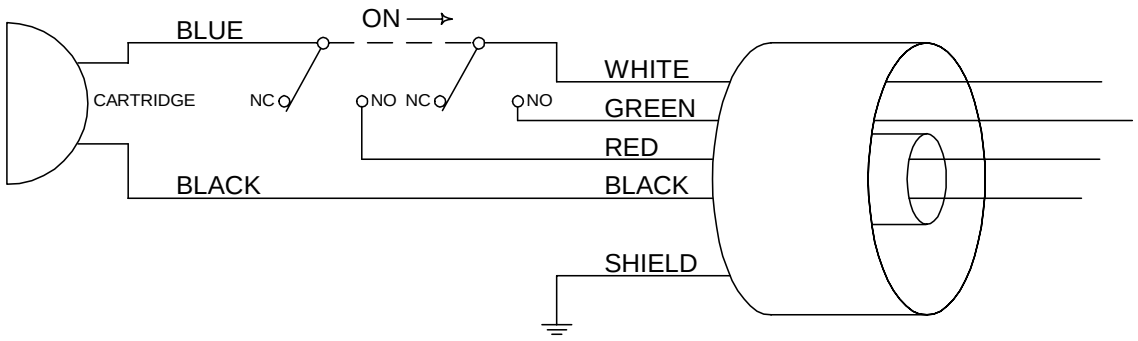

Figure 1. Flexible Microphone Wiring Diagram

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3M Intercom Systems

Accessories

Technical Bulletin 2/14/01

New Heavy Duty Handset with Magnetic Switches

A new Heavy Duty Handset with sealed magnetic cradle switches **(78-8117-4029-5)** will replace the previous Heavy Duty Handset with open-contact cradle switches (78-6911-2379-4). It is pin-for-pin and mounting size compatible with the previous models of Heavy Duty Handsets. Very little has changed except for the cradle switches. See Figure 1.

Advantages:

- Increased cradle switch reliability
- Smaller profile increases interior workspace for wire connections

Notes:

- Cradle switches S1, S2 are shown with the handset off-hook.
- Note polarity of Call Switch connections to intercom.
- If outbound volume to the handset needs to be adjusted in relation to a separate outside speaker, change the resistor value between terminals 8A and 9A.
- To provide compatibility with C5000 8 Station Controllers starting with serial number 5108001690 and C5000 16 Station Controllers starting with serial number 5116001308, replace the existing capacitor and resistor connected from handset terminals 6B to 5B with a length of wire.
- When connecting a single wire to a terminal strip, which is 22 gauge or less, strip 1/2" of insulation and fold the bare wire over double before inserting. When connecting more than one wire to a terminal strip, twist them together first, apply a small amount of solder, and then insert them into the terminal strip.

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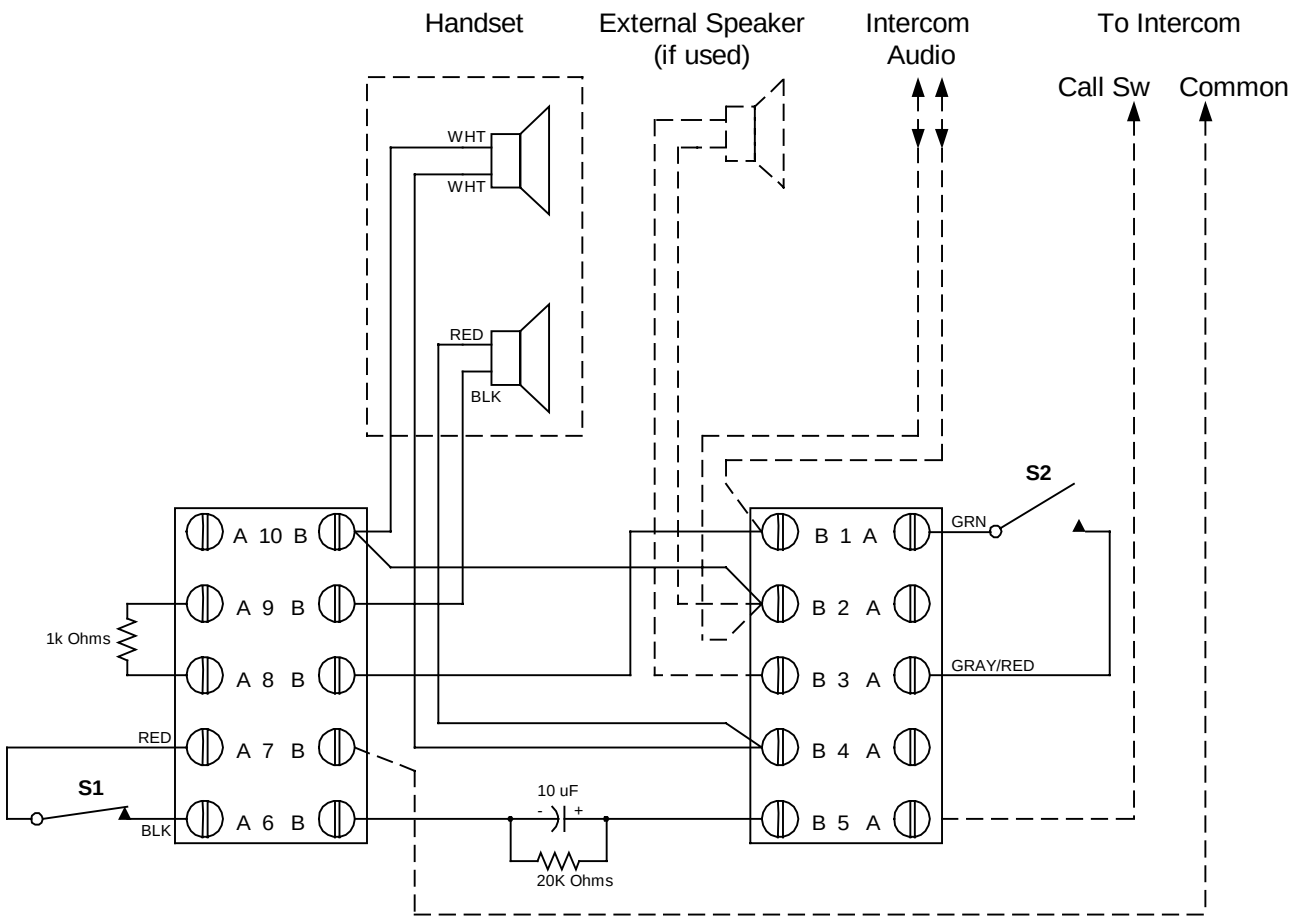
Handset
External Speaker
(if used)
Intercom
Audio
To Intercom
Call Sw
Common
WHT
WHT
RED
BLK
S2
A 10 B
A 9 B
A 8 B
A 7 B
A 6 B
B 1 A
B 2 A
B 3 A
B 4 A
B 5 A
GRN
GRAY/RED
1k Ohms
RED
S1
BLK
10 uF
-
+
20K Ohms

Figure 1.

Intercom Systems

Accessories

Technical Bulletin 11/20/00

3M Loop Detectors, Models A200 and A201

The 3M Loop Detectors, Models **A200 and A201** are now available. Sensitivity settings have been modified for performance with various vehicle sizes. The new units have "Version 1.5" or greater printed on a label on the processor chip.

Note:

The A201 Internal Loop Detector is powered by the 12 Volts provided by the C960 Base Station. When the Base Station is powered down to allow the use of the backup intercom, the Loop Detector is also powered down. We currently recommend using an A201 External Loop Detector for these installations.

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Intercom Systems

Accessories

Technical Bulletin 5/5/99

Magnetic Loop Kit (Saw-in), revision

We have revised the contents of the saw-in magnetic loop kit (78-8016-9813-1). The quart-sized cartridges, applied with a standard caulking gun are no longer available. 3M has repackaged the Detector Loop Sealant. The sealant is the same, however it is now only available in 1-liter Ply pack cartridges. The new Ply packs require a special applicator gun, which you will need to purchase. The manual Applicator Gun part number is: 78-6911-4656-3, dealer net = $75.00. The $250 minimum order requirement will be waived for the purchase of this gun for a limited time.

Additional 3M Detector Loop Sealant can be purchased as follows:

4 Ply packs (4 ea., 1-liter Ply packs)	PN: 78-8110-9504-7, dealer net = $100.00
12 Ply packs (12 ea., 1-liter Ply packs)	PN: 78-8110-9503-9, dealer net = $225.00

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Intercom Accessories

All Models using Vehicle Detectors

Technical Bulletin 12/3/98

Installing a Sonic Detection Alert Vehicle Detector (78-6911-4432-9) using only three wires when four wires are not available

Description:
Thanks to Brad Wolfe from Midwest Systems and Services Inc., Fort Wayne, IN for this suggestion. This modification eliminates the need to run two additional wires though the conduit to the menu sign when replacing a defective loop or sodar detector with a sonic detector. Normally, the sonic detector requires four wires, two wires to supply 12 Volts AC for power and two wires to supply a switch closure to the intercom. We recommend using four wires when possible.

The sonic detector will perform equally well on 12 to 20 Volts DC, which is available on the switch closure wires from the intercom. Therefore, this available DC voltage and an additional ground wire, normally found as a shield on an audio cable, are all that is needed to operate the sonic detector.

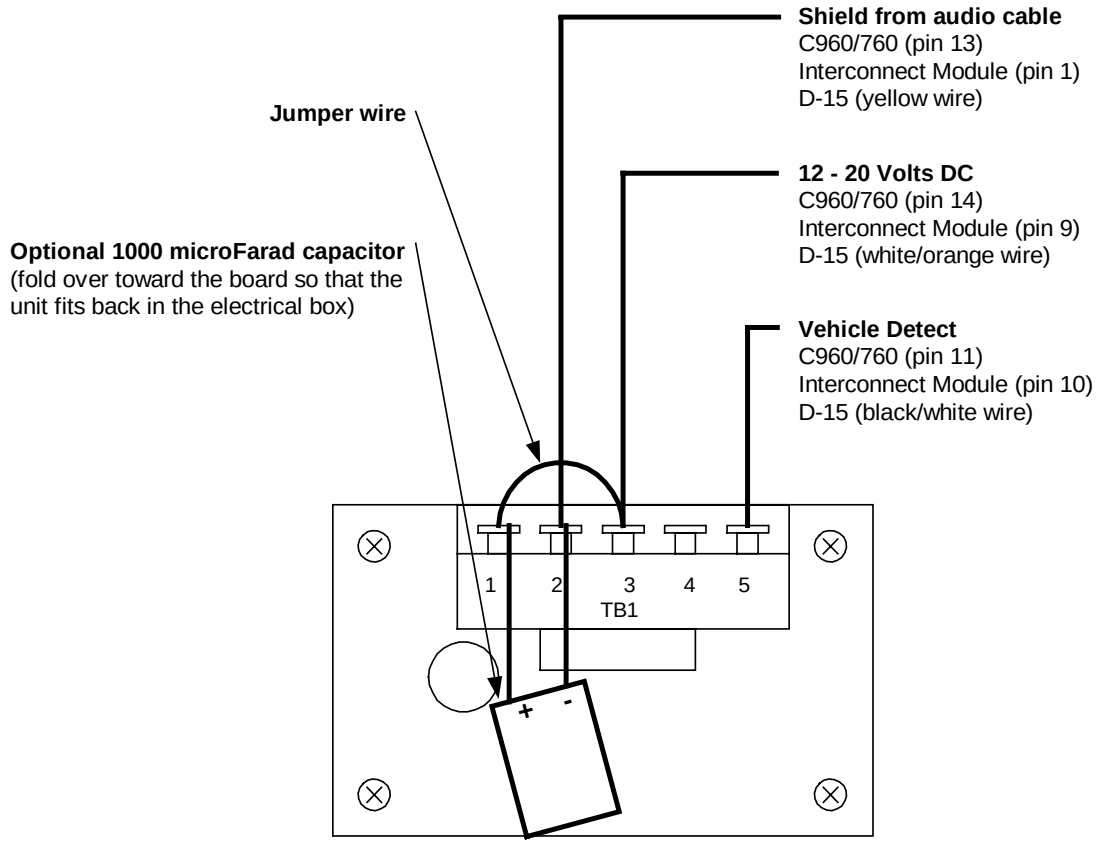
Parts needed:
1 each, 3M Sonic Detector (78-6911-4432-9)
1 each, 1000 microFarad, 25 Volt capacitor (optional)
2 each, 1 inch lengths of shrink tubing or wire insulation to insulate the capacitor leads.
1 each, 1 inch jumper wire, 22 – 18 gauge

Procedure:
Follow the mounting instructions included with Sonic Detector. The 12 VAC plug-in transformer, included with the sonic detector, is not needed.

For the following steps use the wiring diagrams attached to this bulletin.

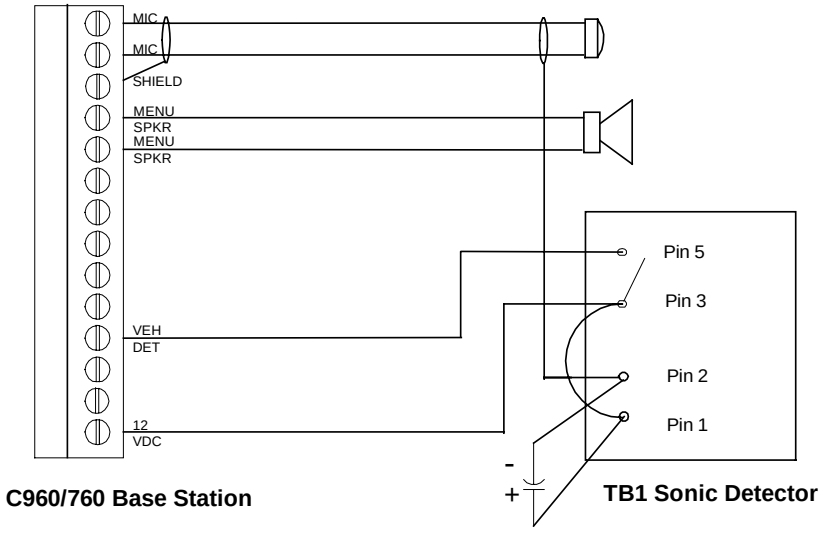
1. Connect the optional capacitor positive lead and one end of the jumper wire to TB1, Pin 1. Make sure to insulate the capacitor leads and tuck it in toward the board so the unit will fit back in the electrical box.
2. Connect the optional capacitor negative lead and the shield from the microphone cable to TB1, Pin 2.
3. Connect the other end of the jumper wire and the +12 to 20 Volts DC supply wire from the intercom to TB1, Pin 3. **Remember that polarity is important.**
4. TB1, Pin 4 is not used.
5. Connect the "Vehicle Detect" input wire from the intercom to TB1, Pin 5. **Remember that polarity is important**.

Wiring Diagram



Sonic Detector Circuit Board

Schematic Diagram



C960/760 Base Station

TB1 Sonic Detector

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#

D-Series Intercoms

Technical Bulletin 1/22/98

1-98 Heavy Duty Security Handset Reliability Improvement

This modification reduces potential problems caused by the cradle switch contacts. It can be used when the handset is used alone or with a separate speaker/mic and switch assembly. **All handsets shipped from our stock after July, 1998 have these updates**. They can be recognized by a "07/98 Rev. C" sticker on the outside of the shipping box and inside the stainless cradle switch cover.

Advantages:

- The handset audio is always on, eliminating potential audio failure from dirty, worn, or misaligned switch contacts.
- When the handset is in the cradle, the separate speaker/mic is connected by 2 switch contacts wired in parallel, effectively doubling its reliability.
- A 6-32 x 1 ¾" screw and nut are added to the terminal strip support plate preventing the plate from flexing if the cables are improperly stuffed in the electrical box during installation.

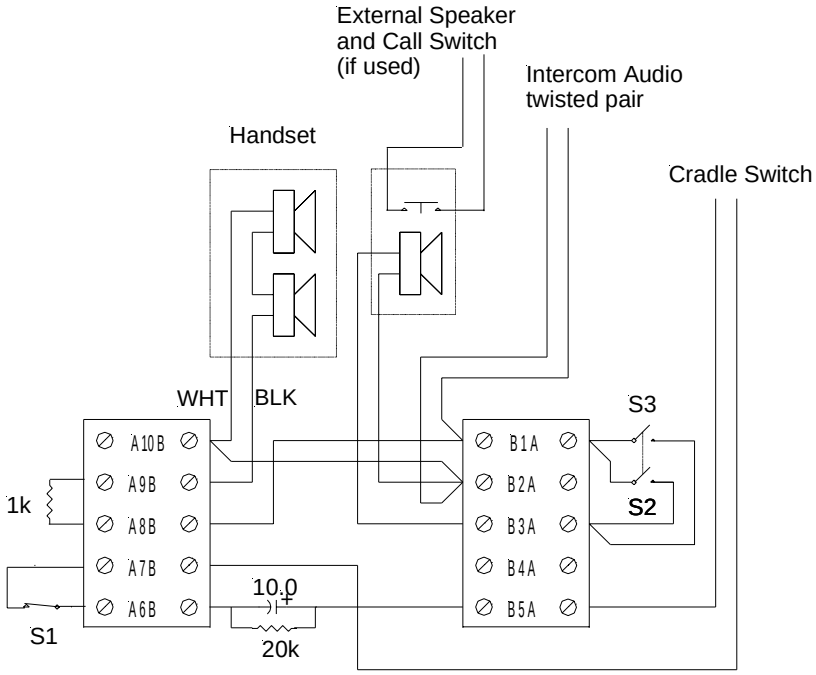
Parts needed:
1 each, 10 micro Farad capacitor, 50 Volts, axial leads (Required for C5000 compatibility only)
1 each, 20 k Ohm resistor, ¼ Watt (Required for C5000 compatibility only)
1 each, 6-32x1 ¾" Phillips or slotted screw and nut

Procedure:
1. Remove the 4-40 Phillips screw from the lower right side terminal block and discard the screw. Pivot the terminal and drill the hole to accept the 6-32 x 1 ¾" screw. Insert the new screw through the block and plate and install the nut.
2. Remove the brown wire from terminal 2A. Connect this wire to terminal 1A
3. Remove the brown wire from terminal 4A. Connect this wire to terminal 3A
4. Cut the brown wire from terminal 8B near the end attached to S3. Strip back the insulation ¼" and connect to terminal 1B.
5. Cut the brown wire from terminal 10A near the attached to S2. Strip back the insulation ¼" and connect to terminal 2B. Remove the end of this same wire from terminal 10A and connect to 10B along with the black wire from the handset.

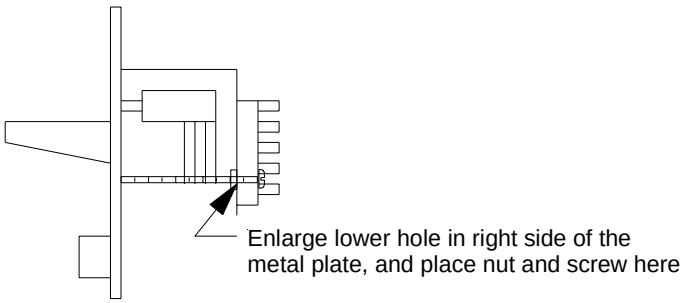
Notes:
- Cradle switches S1, S2 and S3 are shown with the handset off-hook.
- When more than 1 wire is connected to a terminal, twist them together first, then insert them into the terminal.
- If outbound volume to the handset needs to be adjusted in relation to a separate outside speaker, change the resistor value between terminals 8A and 9A.

- To provide compatibility with the C5000 intercom, replace the existing capacitor and resistor connected from handset terminals 6B to 5B with a 10 micro Farad 50V electrolytic capacitor and a 20 k Ohm ¼ watt resistor as shown below.

Heavy Duty Security Handset Reliability Improvement
wiring diagram



Handset (side view)



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